Drainage Report for The Waterfront Addition
Wichita, Kansas

Location

The site is located in Wichita, Sedgwick County, Kansas, on the northeast corner of Webb Road and 13th Street North. The site is bounded by Webb Road to the west, 13th Street to the south, and undeveloped meadow area to the east. The Burlington Northern Railroad abuts the property to the north, with the Eastminster Addition to the north of the railroad. It lies in the Southwest Quarter, Section 9, Township 27 South, Range 2 East. Currently, the total site area accounted for in this report is approximately 165 acres. The site is shown on the Andover, Kansas Quadrangle located in Appendix A.

Soils

According to the NRCS (SCS) Sedgwick County Soil Survey (Appendix B), most of the site is in the Irwin Series (Ia: Irwin silty clay loam, with 1 to 3 percent slopes) and the Rose Hill Series (Rd: silty clay, 1 to 3 percent slopes). A small portion in the northwest corner of the site is in the Vanoss Series (Va: Vanoss silt loam, with 1 to 3 percent slopes). The Hydrological Soil Group (HSG) for the Irwin and Rose Hill series soils is D. The HSG for the Vanoss series soil is B. The Vanoss series comprises a very small portion of the area, therefore the drainage calculations were based on soil group D.

Pre-Project Conditions

Development

The site was undeveloped open space prior to the Waterfront Addition. The site was used as a recreational area for an employee's club.

Landform and Slope

Slopes across the site ranged from 1-4% from east to west. An existing lake covered approximately 14 acres of the site, with a 1.5 acre silt pond to the north of the lake. Elevations on the site ranged from 1386 ft. in the northeast corner to 1369 ft. at the lake water surface. The lake exits the property to the south through a bridge under 13th St. North. The bridge opening was 27' wide. On the south side of 13th Street, the lake is still used by the Beech Employees Club. The lake flowed to the southwest through a concrete weir structure. This structure controlled flow from both the north and south portions of the lake.

Drainage Conditions

An area surrounding the existing lake was designated as Zone A (FIRM Panel 150, Sedgwick County, June 3, 1986) (shown in Appendix C). The remainder of the site is in Zone C.

Upstream of Site

Approximately 794 acres drained into the lake. Approximately 225 acres drained from the north to the Eastminster Addition, directly north of the site. This runoff passed through an existing detention facility east of the Eastminster Presbyterian Church, north of the railroad. An additional 105 acres drained to the existing 11'x9' reinforced concrete box (RCB) which passed under the railroad tracks. The runoff then passed through an existing channel and into the silt pond on the site. An additional 28 acres drained to the silt pond. An existing earthen dam separated the silt pond from the lake. The runoff must pass around the dam to the west and into the lake. An

additional 196 acres drained to the existing lake. This includes approximately 48 acres from the west side of Webb Road. This area drains through an existing RCB under Webb Road and into the lake. Most of the developable area upstream of the site is already developed, with the exception of the area just west of Webb Road, which is currently undeveloped pasture land. An area of approximately 17 acres on the northeast corner of 13th Street and Webb Road drains into the pond. This land is platted as the Foliage Addition, but is currently undeveloped. This land has been modeled as undeveloped in the pre-project condition.

Runoff Characteristics

The pre-project watershed has been divided into watersheds to correspond with the future conditions model. Additional watershed boundaries have been added at locations where ponds have been or will be constructed. These areas, their time of concentration, and curve number are shown on the Pre-Project TR-20 Key Map, Appendix D.

The SCS TR-20 software model was used to calculate peak flows using the SCS 24-hour Type II design storm, Appendix E. A peaking factor of 484 was used for these calculations. The curve numbers used for the sub-watersheds were calculated based on percentage of development within each sub-watershed. The Time of Concentration for each watershed was calculated using the FAA method. Excel spreadsheets were used for detailed calculations of both Curve Number and Time of Concentration, Appendix F.

Due to the complexity of modeling the lakes north and south of Webb Road as separate reservoirs, the lakes were combined and modeled as one reservoir. Since the lakes are at the same normal pool elevation, the north lake and silt pond elevations are controlled by the elevation of the lake downstream. The lakes were modeled based on an existing control structure and spillway at the south end of the south lake. The existing weir is a concrete structure with a 12' low flow crest at elevation 1368.7', and an additional 70' high flow crest at elevation 1369.7'. Rating curves for the weir were developed using the HY-8 computer software program. The pre-project lakes provided 164 acre-feet of storage in the 100-year design event. Storage calculations are shown in Table 1.

A summary of pre-project flows from the TR-20 output is in Table 2

Table 1 Current Storage Calculations.

Current Conditions Total Storage=167ac-ft		
Main Pond Storage = 167c-ft	**100-Year=1372.0**	
Stage	**Discharge (cfs)**	**Storage (ac-ft)**
1368.7	0	0
1369	100	13.6
1370	180	60.4
1371	490	109.58
1372	1160	167.28

Table 2. Pre-Project Flowrates.

TR-20 ID	**Description**	**Design Storm Flows (cfs)**					
		2-Yr	5-Yr	10-Yr	50-Yr	100-Yr	500-Yr
070	Flow into lakes	1046	1446	1710	2319	2596	2927
018	Flow from lake at Webb Rd	224	396	527	970	1167	1520

Post-Project Conditions

Development

The Waterfront is planning to expand commercial development east of the current development and the Foliage Addition will develop as commercial. Current and future development in Basins 045, 053, 055, 061, 064, and 066 has been modeled for commercial land use. Future development associated with the Waterfront Addition and the Foliage Addition is shown on the Future TR-20 key map, Appendix G.

Landform and Slope

The project will maintain slopes similar to pre-project slopes. The area will be shaped to drain to the existing lake both through the Waterfront Addition and under 13th Street North.

Drainage Conditions

A Letter of Map Revision will be completed once all construction around the lake is complete. As-built survey will be done of the area and the hydraulic model will be updated to match the existing conditions.

Upstream of Site

The developments of this site are designed to maintain the 100-year water surface elevation at the North property line of the site. There will not be an increase in water surface elevation upstream of the site.

Runoff Characteristics

The current detention ponds do not provide adequate detention for future development Table 3 shows the detention characteristics of the main lake and the hotel pond. The size of the detention will need to be increased to decrease peak flow rates from the property. In the post-project model, the outlet structure of the hotel pond has been modified to provide more detention and the area of the pond has been increased. This pond expansion provides an additional 8 acre-feet of storage. The post-project site was modeled using SCS TR-20 software with the remaining and future portions of the Waterfront Addition and the Foliage Addition developed as Commercial, Appendix H. Time of concentration calculations were done by the FAA method, Appendix I. Post-Project flow rates are summarized in Table 4. The detention in this project provides detention for both future Waterfront development and Foliage Addition development.

Additional detention was added in Basin 064 to detain runoff to 13th Street. The runoff to 13th Street was calculated in Hydraflow Hydrographs 2004 by Intellisolve, Appendix J. The detention will detain a portion of the commercial site and a portion of the undeveloped offsite property. Runoff flow rates to 13th Street are summarized in Table 5. Post-Project runoff to 13th Street is equal to pre-project runoff. Basins 064 and a portion of 066 drain to an existing 5'x4' RCB under 13th Street. The RCB was analyzed using HY-8, Appendix K. The RCB has a capacity of 157 cfs before overtopping 13th Street. This RCB will handle a 10-year design storm.

The additional storage in Basins 053 and 064 reduce the peak flow rates from the site near or below pre-project conditions. Table 6 shows the storage provided in the basin. Peak flow rates for pre-and post-project conditions are shown in Table 7.

In the Waterfront Sixth Addition, stormwater sewer will be necessary to route the existing drainage to the proposed detention and to the RCB under 13th Street. Flows to the pipes were determined using the Rational Method and the pipes were sized using Manning's equation in a spreadsheet, Appendix L. The layout of the stormwater sewer required is shown in the Drainage and Utility plan for the Sixth Addition, Appendix M.

Table 3 Current Storage Calculations.

Current Conditions Total Storage=176 ac-ft		
Main Pond Storage = 167c-ft		**100-Year=1372.0**
Stage	**Discharge (cfs)**	**Storage (ac-ft)**
1368.7	0	0
1369	100	14.4
1370	180	63.09
1371	490	113.69
1372	1160	167
Hotel Pond = 11 ac-ft		**100-Year=1376.08**
Stage	**Discharge (cfs)**	**Storage (ac-ft)**
1373	0	0
1374	9.46	1.98
1375	158.5	4.44
1376	256.63	7.73
1377	331.69	11.24

Table 4. Post-Project Flow rates.

TR-20 ID	Description	Design Storm Flows (cfs)					
		2-Yr	5-Yr	10-Yr	50-Yr	100-Yr	500-Yr
070	Flow into lakes	1057	1417	1652	2168	2400	2825
018	Flow from lake at Webb Rd	237	398	519	954	1143	1479

Table 5. Flow rates to 13th Street.

Description	Design Storm Flows (cfs)			
	2-Yr	5-Yr	10-Yr	100-Yr
Pre-Project	78.3	116.8	142.8	238.5
Post-Project	78.0	116.8	142.9	238.4

Table 6. Post-Project Storage Calculations.

Post-Project Conditions Total Storage=189 ac-ft		
Main Pond Storage = 167 ac-ft		**100-Year=1372.0**
Stage	**Discharge (cfs)**	**Storage (ac-ft)**
1368.7	0	0
1369	100	14.4
1370	180	63.09
1371	490	113.69
1372	1160	167
Hotel Pond = 19 ac-ft		**100-Year=1377.6**
Stage	**Discharge (cfs)**	**Storage (ac-ft)**
1373	0	0
1374	3.239	1.978
1375	71.91	5.349
1376	104.758	10.221
1377	129.355	15.443
1378	150.069	21.185
Commercial = 3 ac-ft		**100-Year = 1384.0**
Stage	**Discharge (cfs)**	**Storage (ac-ft)**
1380	0	0
1381	2.674	0.618
1382	10.877	1.368
1383	26.254	2.257
1384	38.337	3.287

Table 7. Comparison.

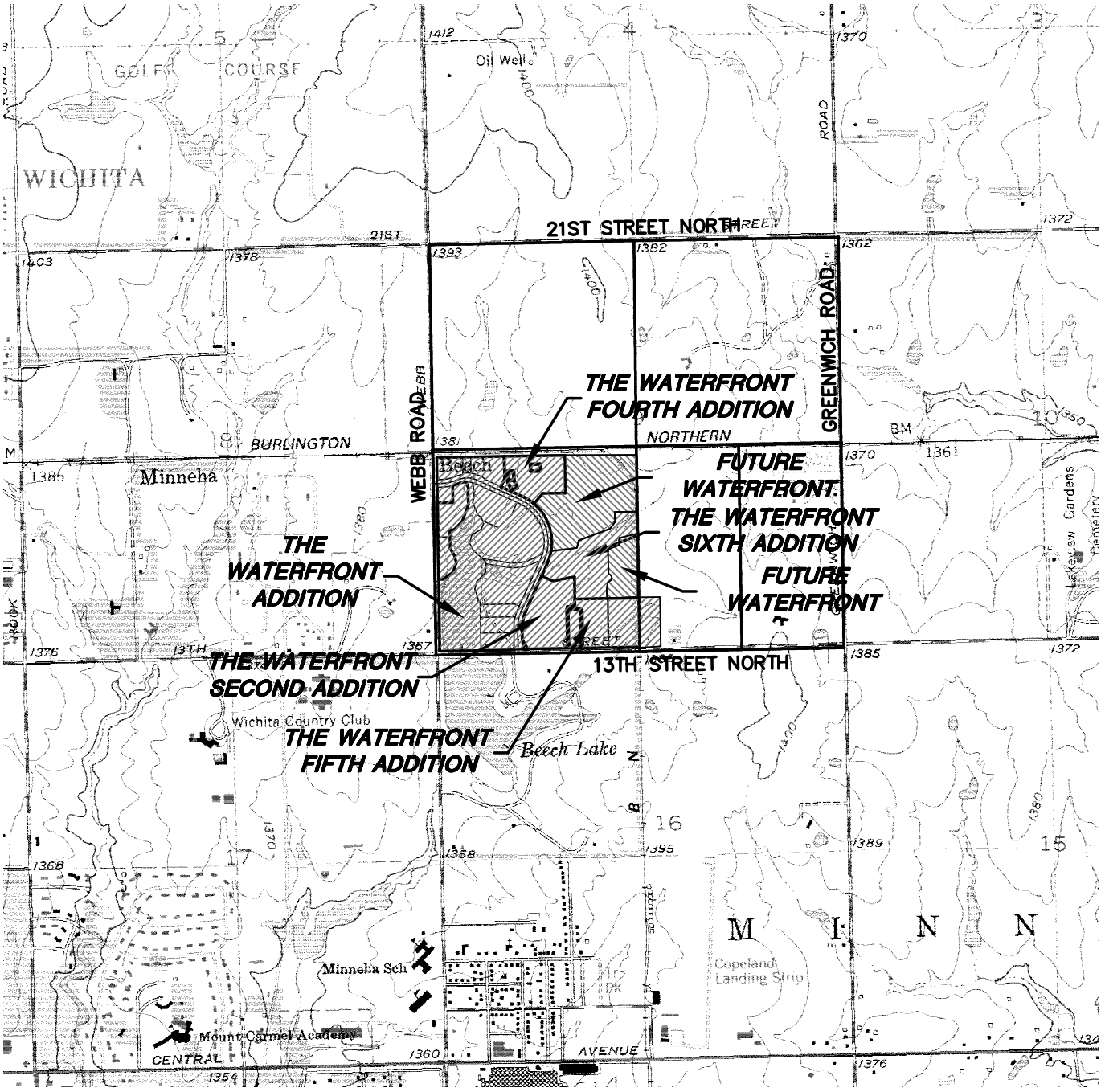
TR-20 ID	Description	Design Storm Flows (cfs)					
		2-Yr	5-Yr	10-Yr	50-Yr	100-Yr	500-Yr
018	Pre-Project Flow from lakes	224	396	527	970	1167	1520
018	Post-Project Flow from lakes	237	398	519	954	1143	1479

Summary

The Waterfront Addition is a multi-use development. Many of the areas around the lake have developed as banks, restaurants, and office space. The site is continuing to develop with planned uses including restaurants and office space. An existing detention pond near the hotel will be expanded and modified to provide detention for future commercial development of the Waterfront Addition and Foliage Addition. Detention will also be added north of 13th Street to maintain peak flow rates to 13th Street. The peak outflow at the outlet of Beech Lake will not increase from pre-project conditions with the development of the Waterfront Addition and the Foliage Addition. The detention in this project provides detention for future Waterfront development. This project also provides detention for the future developed needs of the Foliage Addition.

Appendix A

Quadrangle Map



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MKEC ENGINEERING CONSULTANTS, INC.

411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

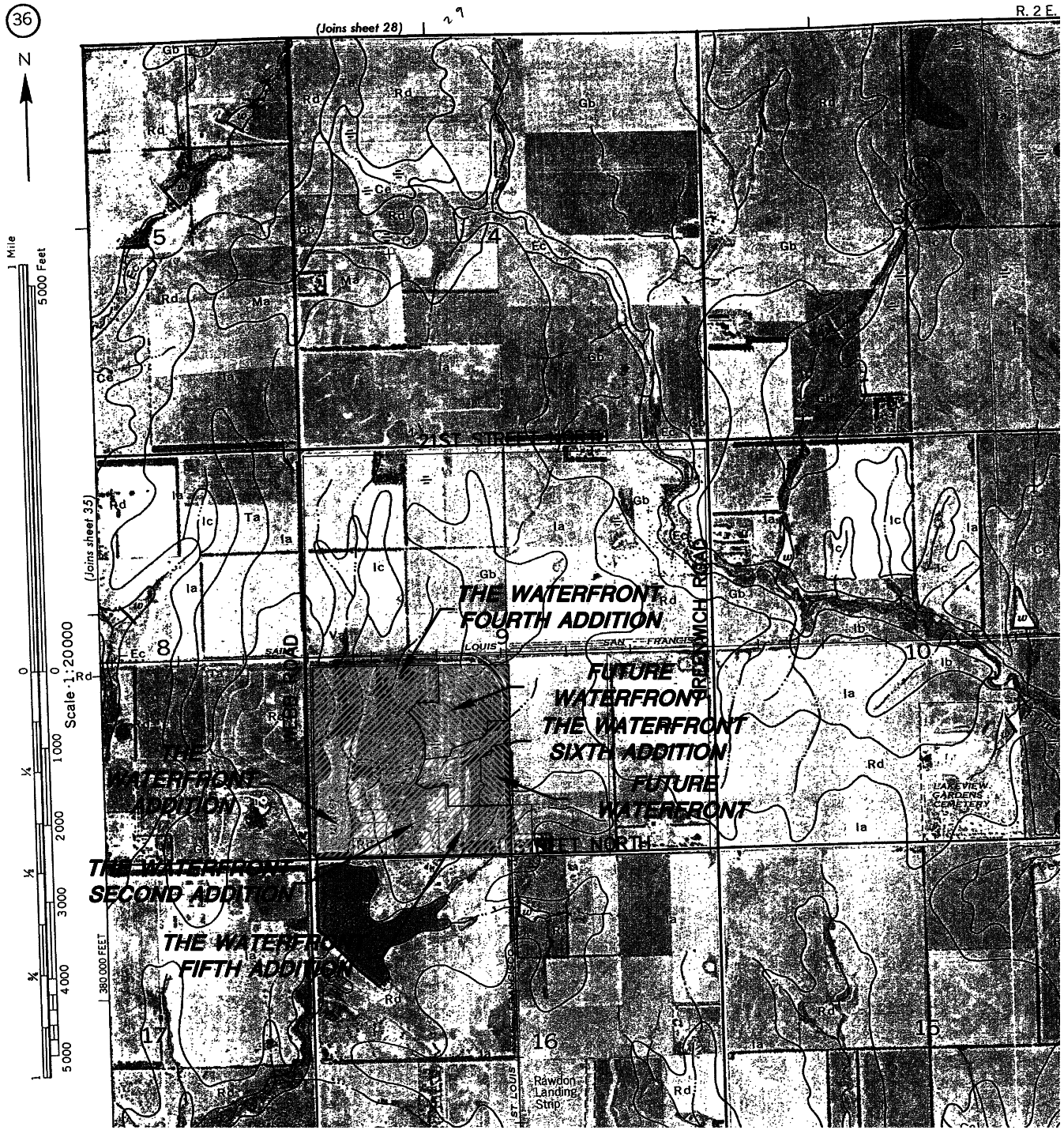
THE WATERFRONT ADDITION
PROJECT NAME

ANDOVER, KANSAS QUADRANGLE
SHEET TITLE

KLA	KLA	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JANUARY 2007	02014	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix B

Soil Survey



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MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

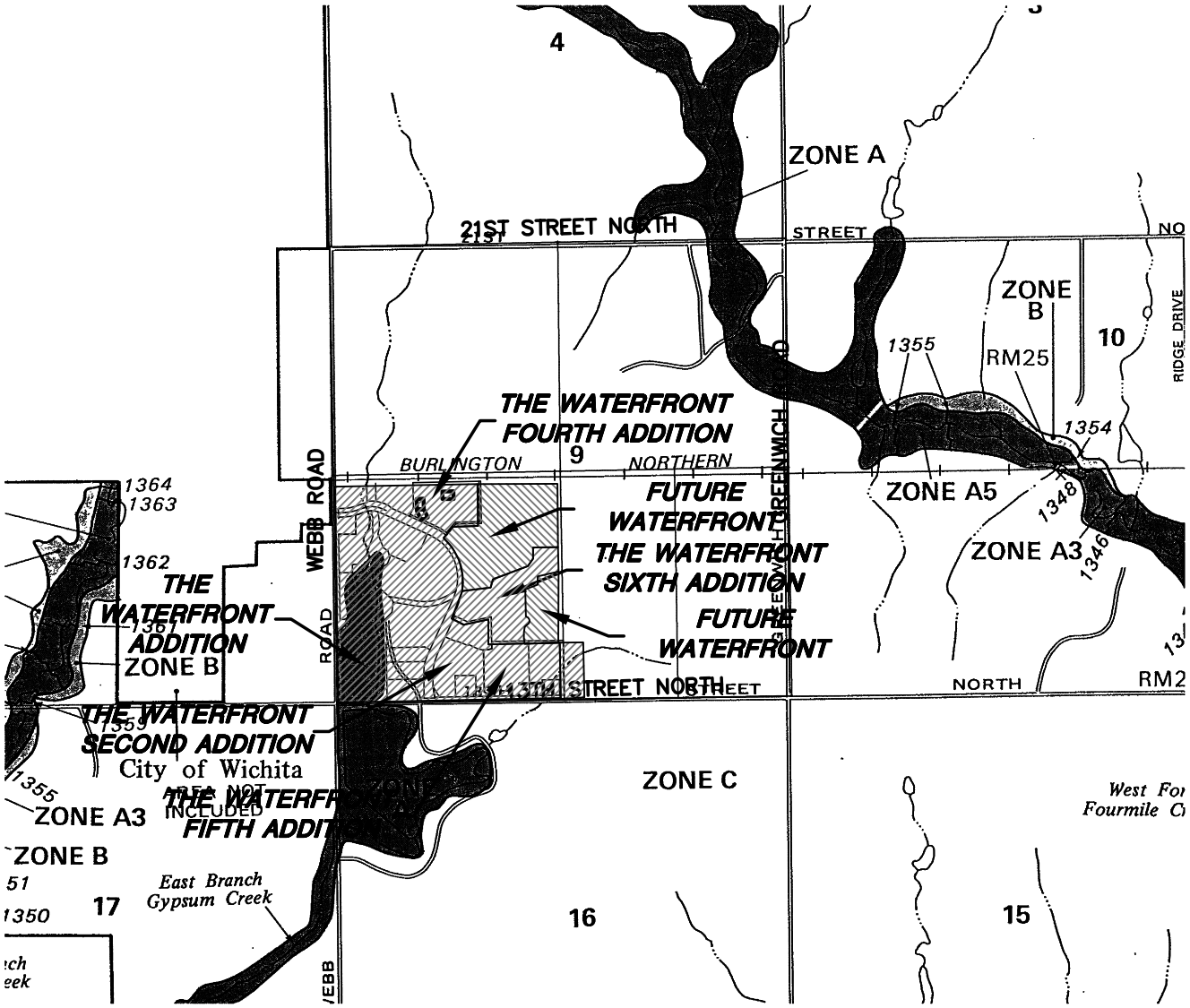
THE WATERFRONT ADDITION
PROJECT NAME

SOIL SURVEY OF SEDGWICK COUNTY, KANSAS
SHEET TITLE

KLA	KLA	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
SEPTEMBER 2002	02014	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix C

Flood Insurance Rate Map (FIRM)



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
(UNINCORPORATED AREAS)

PANEL 150 OF 300

COMMUNITY-PANEL NUMBER
200321 0150 A

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency

APPROXIMATE SCALE
2000 0 2000 FEET

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MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

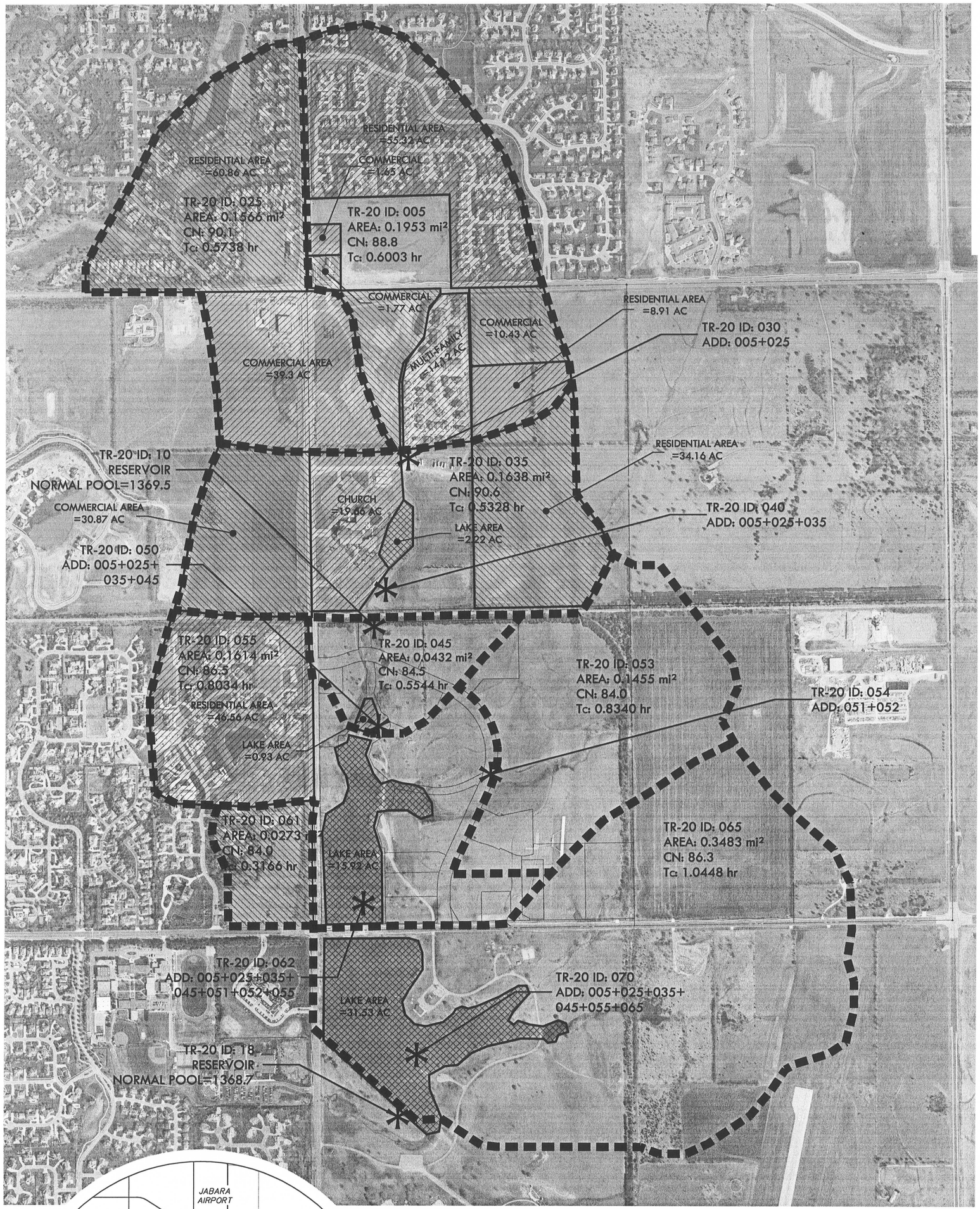
THE WATERFRONT ADDITION
PROJECT NAME

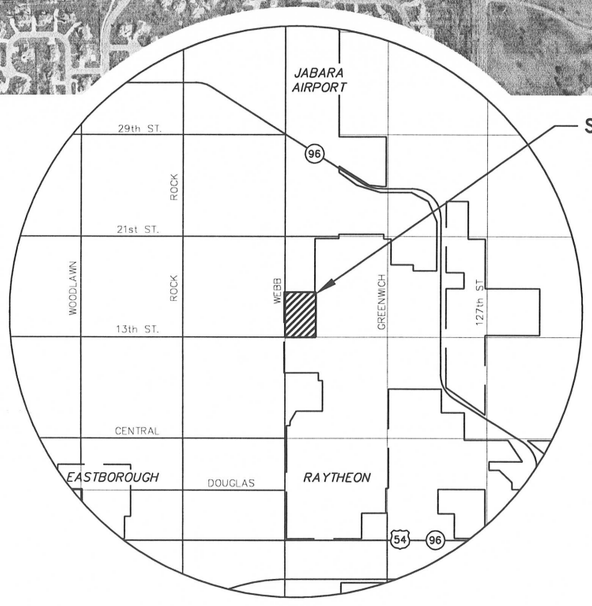
FIRM PANEL 150 OF 300
SEDGWICK COUNTY, KANSAS
SHEET TITLE

KLA	KLA	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
SEPTEMBER 2002	02014	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix D

Pre-Project TR-20 Key Map





VICINITY MAP

LEGEND

- POLE - POLE
- HLP - HIGH LINE POLE
- WATERSHED BOUNDARIES
- PP - POWER POLE AND GUY ANCHOR
- TR - TELEPHONE RISER
- INLET
- BM - BENCHMARK

BENCHMARKS

BM#1 Square cut SE. corner headwall 44' N. and 42' E. of W. ¼ cor., Sec. 9, T27S, R2E
ELEV. = 192.73'(City Datum)
1380.13 NGVD

BM#2 Square cut SW. corner signal light pole base NE. corner Webb and 13th.
ELEV. = 185.945'(City Datum)
1373.345' NGVD

SCALE: 1"=400'
400 0 400 800

REVISED: 1/8/07
REVISED: 10/20/06
2000 AERIAL

WATERFRONT ADDITION
PROJECT NAME

PRE-PROJECT TR-20 KEY MAP
DESIGN TITLE

KLA	JFL
DESIGN	DRAWN BY:
GJA	FEB. 2006
CHECKED BY:	DATE
02014	1 / 1
JOB NO.	SHEET/OF

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Appendix E

Pre-Project TR-20 Output

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 *****************80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY*****************

 JOB TR-20                    FULLPRINT          SUMMARY   NOPLOTS
 TITLE 001 PRE-PROJECT - EAST BRANCH GYPSUM CREEK 2/14/06  ADD BASIN 052 & 051
 TITLE WTRFTPP5.T20 50%(2) 20%(5) 10%(10) 5%(50) 1%(100) & .2%(500) ANNUAL CHANCE
  4 DIMHYD               0.02                                          484 SCS
  8          .000        .030        .100        .190        .310       UNIT HYD
  8          .470        .660        .820        .930        .990
  8         1.000        .990        .930        .860        .780
  8          .680        .560        .460        .390        .330
  8          .280        .241        .207        .174        .147
  8          .126        .107        .091        .077        .066
  8          .055        .047        .040        .034        .029
  8          .025        .021        .018        .015        .013
  8          .011        .009        .008        .007        .006
  8          .005        .004        .003        .002        .001
  8          .000        .000        .000        .000        .000
  9 ENDTBL
  3 STRUCT      10                                                        R-EB-BN
  8                      1369.4      0.0         0.0                     RAILROAD
  8                      1370.4      6.0         0.279                   ESTMNSTR
  8                      1371.4      14.0        1.093
  8                      1372.4      30.0        2.269
  8                      1373.4      60.0        3.606
  8                      1374.4      320.0       7.212
  8                      1375.4      580.0       11.361
  8                      1376.4      760.0       16.450
  8                      1377.4      925.0       23.036
  8                      1378.4      1085.0      31.035
  8                      1379.4      1240.0      40.834
  9 ENDTBL
  3 STRUCT      18                                                        NORTH &
  8                      1368.7      0.0         0.0                     SOUTH
  8                      1369.0      100.0       13.60                   BEECH
  8                      1370.0      180.0       60.40                   LAKE
  8                      1371.0      490.0       109.58
  8                      1372.0      1160.0      167.28
  9 ENDTBL
  6 RUNOFF 1 005       3 0.1953      88.8        0.6003              1 N&S21EWB
  6 RUNOFF 1 025       1 0.1566      90.1        0.5738              1 WWEBB
  6 ADDHYD 4 030   1 3 2                                            1
  6 RUNOFF 1 035       1 0.1638      90.6        0.5328              1
  6 ADDHYD 4 040   1 2 3                                            1
  6 RESVOR 2    10 3   1 1369.4                                     1 EM/RR
  6 RUNOFF 1 045       2 0.0432      84.5        0.5544              1 NWTRFT
  6 ADDHYD 4 050   1 2 3                                            1
  6 RUNOFF 1 053       4 0.1455      84.0        0.8340              1
  6 RUNOFF 1 055       2 0.1614      86.5        0.8034              1
  6 ADDHYD 4 059   4 2 5                                            1
  6 ADDHYD 4 060   5 3 1                                            1
  6 RUNOFF 1 061       2 0.0273      84.0        0.3166              1
  6 ADDHYD 4 062   2 1 4                                            1
```

```
 *********************80-80 LIST OF INPUT DATA (CONTINUED)*********************

  6 RUNOFF 1 065       3 0.3483      86.3        1.0448               1
  6 ADDHYD 4 070   4 3 2                                              1
  6 RESVOR 2    18 2   1 1368.7                                       1 BEECHLKE
    ENDATA
  7 INCREM 6             0.10
  7 COMPUT 7 005      18 0.0         3.50        1.0         2 2  11  01
    ENDCMP 1
  7 COMPUT 7 005      18 0.0         4.55        1.0         2 2  12  02
    ENDCMP 1
  7 COMPUT 7 005      18 0.0         5.25        1.0         2 2  13  03
    ENDCMP 1
  7 COMPUT 7 005      18 0.0         6.98        1.0         2 2  13  04
    ENDCMP 1
  7 COMPUT 7 005      18 0.0         7.80        1.0         2 2  14  05
    ENDCMP 1
  7 COMPUT 7 005      18 0.0         9.35        1.0         2 2  15  06
    ENDCMP 1
    ENDJOB 2

 *****************************END OF 80-80 LIST*****************************
1
```

DIMENSIONLESS HYDROGRAPH TABLE ENTERED

8	.0000	.0300	.1000	.1900	.3100
8	.4700	.6600	.8200	.9300	.9900
8	1.0000	.9900	.9300	.8600	.7800
8	.6800	.5600	.4600	.3900	.3300
8	.2800	.2410	.2070	.1740	.1470
8	.1260	.1070	.0910	.0770	.0660
8	.0550	.0470	.0400	.0340	.0290
8	.0250	.0210	.0180	.0150	.0130
8	.0110	.0090	.0080	.0070	.0060
8	.0050	.0040	.0030	.0020	.0010
8	.0000	.0000	.0000	.0000	.0000

9 ENDTBL

COMPUTED TIME INCREMENT = .0200

COMPUTED PEAK RATE FACTOR = 484.000

1

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .100 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 3.50 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =11 STORM NO. = 1 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.24	219.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.34 WATERSHED INCHES; 295 CFS-HRS; 24.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	188.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.46 WATERSHED INCHES; 248 CFS-HRS; 20.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	407.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.39 WATERSHED INCHES; 543 CFS-HRS; 44.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.20	210.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.50 WATERSHED INCHES; 264 CFS-HRS; 21.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	616.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.42 WATERSHED INCHES; 807 CFS-HRS; 66.7 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	515.1	1375.15

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.42 WATERSHED INCHES; 807 CFS-HRS; 66.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 85. TIME OF CONCENTRATION = .55 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0739 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	43.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
1.97 WATERSHED INCHES; 55 CFS-HRS; 4.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	550.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.39 WATERSHED INCHES; 862 CFS-HRS; 71.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 4 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .83 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0910 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	110.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
1.94 WATERSHED INCHES; 182 CFS-HRS; 15.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = .80 HOURS
COMPUTED INTERNAL TIME INCREMENT = .1071 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	136.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.14 WATERSHED INCHES; 223 CFS-HRS; 18.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 59
INPUT HYDROGRAPHS 4,2 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	246.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.04 WATERSHED INCHES; 405 CFS-HRS; 33.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 5,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	797.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.27 WATERSHED INCHES; 1267 CFS-HRS; 104.7 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .32 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0422 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.08	36.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
1.94 WATERSHED INCHES; 34 CFS-HRS; 2.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	810.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.26 WATERSHED INCHES; 1301 CFS-HRS; 107.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 65
OUTPUT HYDROGRAPH = 3 AREA = .35 SQ MI
INPUT RUNOFF CURVE = 86. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.52	249.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.12 WATERSHED INCHES; 477 CFS-HRS; 39.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.39	1045.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.22 WATERSHED INCHES; 1778 CFS-HRS; 146.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.49	224.1	1370.14

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.21 WATERSHED INCHES; 1772 CFS-HRS; 146.4 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 4.55 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =12 STORM NO. = 2 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	309.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.32 WATERSHED INCHES; 419 CFS-HRS; 34.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	263.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.45 WATERSHED INCHES; 349 CFS-HRS; 28.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	572.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.38 WATERSHED INCHES; 767 CFS-HRS; 63.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	291.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.50 WATERSHED INCHES; 370 CFS-HRS; 30.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	861.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.42 WATERSHED INCHES; 1137 CFS-HRS; 94.0 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	677.3	1375.94

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.42 WATERSHED INCHES; 1138 CFS-HRS; 94.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 85. TIME OF CONCENTRATION = .55 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0739 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	63.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.91 WATERSHED INCHES; 81 CFS-HRS; 6.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	727.3	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.38 WATERSHED INCHES; 1219 CFS-HRS; 100.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 4 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .83 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0910 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	162.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.86 WATERSHED INCHES; 269 CFS-HRS; 22.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = .80 HOURS
COMPUTED INTERNAL TIME INCREMENT = .1071 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	195.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.09 WATERSHED INCHES; 322 CFS-HRS; 26.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 59
INPUT HYDROGRAPHS 4,2 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	358.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.98 WATERSHED INCHES; 591 CFS-HRS; 48.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 5,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	1085.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.24 WATERSHED INCHES; 1810 CFS-HRS; 149.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .32 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0422 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.08	53.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.86 WATERSHED INCHES; 50 CFS-HRS; 4.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	1105.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.23 WATERSHED INCHES; 1860 CFS-HRS; 153.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 65
OUTPUT HYDROGRAPH = 3 AREA = .35 SQ MI
INPUT RUNOFF CURVE = 86. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	359.2	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.07 WATERSHED INCHES; 691 CFS-HRS; 57.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	1445.9	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.18 WATERSHED INCHES; 2551 CFS-HRS; 210.8 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.31	396.4	1370.70

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.17 WATERSHED INCHES; 2543 CFS-HRS; 210.1 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 5.25 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =13 STORM NO. = 3 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	368.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.99 WATERSHED INCHES; 502 CFS-HRS; 41.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	313.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.12 WATERSHED INCHES; 417 CFS-HRS; 34.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	681.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.05 WATERSHED INCHES; 919 CFS-HRS; 76.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	344.3	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.18 WATERSHED INCHES; 442 CFS-HRS; 36.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1023.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.09 WATERSHED INCHES; 1361 CFS-HRS; 112.5 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.42	776.9	1376.50

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.09 WATERSHED INCHES; 1361 CFS-HRS; 112.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 85. TIME OF CONCENTRATION = .55 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0739 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	77.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.55 WATERSHED INCHES; 99 CFS-HRS; 8.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	835.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.05 WATERSHED INCHES; 1460 CFS-HRS; 120.7 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 4 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .83 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0910 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.39	198.5	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.50 WATERSHED INCHES; 328 CFS-HRS; 27.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = .80 HOURS
COMPUTED INTERNAL TIME INCREMENT = .1071 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.35	238.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.75 WATERSHED INCHES; 391 CFS-HRS; 32.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 59
INPUT HYDROGRAPHS 4,2 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	435.9	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.63 WATERSHED INCHES; 719 CFS-HRS; 59.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 5,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	1271.5	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.90 WATERSHED INCHES; 2180 CFS-HRS; 180.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .32 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0422 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.08	65.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.50 WATERSHED INCHES; 62 CFS-HRS; 5.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	1294.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.89 WATERSHED INCHES; 2241 CFS-HRS; 185.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 65
OUTPUT HYDROGRAPH = 3 AREA = .35 SQ MI
INPUT RUNOFF CURVE = 86. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	435.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.73 WATERSHED INCHES; 839 CFS-HRS; 69.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	1709.9	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.84 WATERSHED INCHES; 3080 CFS-HRS; 254.5 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.24	526.9	1371.06

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.83 WATERSHED INCHES; 3070 CFS-HRS; 253.7 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 3
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 6.98 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =13 STORM NO. = 4 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	515.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.66 WATERSHED INCHES; 713 CFS-HRS; 58.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	433.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.81 WATERSHED INCHES; 587 CFS-HRS; 48.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	948.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.73 WATERSHED INCHES; 1300 CFS-HRS; 107.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	478.2	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.87 WATERSHED INCHES; 620 CFS-HRS; 51.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1424.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.77 WATERSHED INCHES; 1921 CFS-HRS; 158.7 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.45	981.5	1377.75

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.77 WATERSHED INCHES; 1920 CFS-HRS; 158.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 85. TIME OF CONCENTRATION = .55 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0739 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	112.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.17 WATERSHED INCHES; 144 CFS-HRS; 11.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	1060.5	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.72 WATERSHED INCHES; 2064 CFS-HRS; 170.6 ACRE-FEET.

1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 4 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .83 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0910 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	288.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.12 WATERSHED INCHES; 481 CFS-HRS; 39.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = .80 HOURS
COMPUTED INTERNAL TIME INCREMENT = .1071 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	336.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.40 WATERSHED INCHES; 562 CFS-HRS; 46.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 59
INPUT HYDROGRAPHS 4,2 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	625.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.27 WATERSHED INCHES; 1043 CFS-HRS; 86.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 5,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	1684.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.56 WATERSHED INCHES; 3108 CFS-HRS; 256.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .32 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0422 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.07	94.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.12 WATERSHED INCHES; 90 CFS-HRS; 7.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	1715.9	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.55 WATERSHED INCHES; 3198 CFS-HRS; 264.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 65
OUTPUT HYDROGRAPH = 3 AREA = .35 SQ MI
INPUT RUNOFF CURVE = 86. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	623.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.38 WATERSHED INCHES; 1208 CFS-HRS; 99.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.41	2318.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.50 WATERSHED INCHES; 4406 CFS-HRS; 364.1 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.13	970.3	1371.72

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.48 WATERSHED INCHES; 4389 CFS-HRS; 362.7 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 4
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 7.80 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =14 STORM NO. = 5 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	585.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.46 WATERSHED INCHES; 814 CFS-HRS; 67.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	491.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.61 WATERSHED INCHES; 668 CFS-HRS; 55.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	1076.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.53 WATERSHED INCHES; 1483 CFS-HRS; 122.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	537.2	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.68 WATERSHED INCHES; 706 CFS-HRS; 58.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1610.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.58 WATERSHED INCHES; 2188 CFS-HRS; 180.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.46	1071.4	1378.31

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.57 WATERSHED INCHES; 2188 CFS-HRS; 180.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 85. TIME OF CONCENTRATION = .55 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0739 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	127.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.96 WATERSHED INCHES; 166 CFS-HRS; 13.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.42	1160.5	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.53 WATERSHED INCHES; 2354 CFS-HRS; 194.6 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 4 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .83 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0910 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	330.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.90 WATERSHED INCHES; 554 CFS-HRS; 45.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = .80 HOURS
COMPUTED INTERNAL TIME INCREMENT = .1071 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.35	386.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.20 WATERSHED INCHES; 646 CFS-HRS; 53.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 59
INPUT HYDROGRAPHS 4,2 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	717.3	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.06 WATERSHED INCHES; 1200 CFS-HRS; 99.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 5,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.39	1873.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.36 WATERSHED INCHES; 3554 CFS-HRS; 293.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .32 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0422 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.07	108.5	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.90 WATERSHED INCHES; 104 CFS-HRS; 8.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	1909.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.35 WATERSHED INCHES; 3658 CFS-HRS; 302.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 65
OUTPUT HYDROGRAPH = 3 AREA = .35 SQ MI
INPUT RUNOFF CURVE = 86. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	710.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.17 WATERSHED INCHES; 1386 CFS-HRS; 114.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.41	2596.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.30 WATERSHED INCHES; 5044 CFS-HRS; 416.8 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

*** WARNING - DISCHARGE EXCEEDS HIGHEST RATING POINT FOR STRUCTURE 18,
VALUE EXTRAPOLATED. ***

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.12	1166.5	1372.01

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.27 WATERSHED INCHES; 5023 CFS-HRS; 415.1 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 5
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 9.35 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =15 STORM NO. = 6 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	716.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.98 WATERSHED INCHES; 1006 CFS-HRS; 83.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	601.5	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.15 WATERSHED INCHES; 823 CFS-HRS; 68.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	1317.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.05 WATERSHED INCHES; 1829 CFS-HRS; 151.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	654.2	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.20 WATERSHED INCHES; 867 CFS-HRS; 71.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1968.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.10 WATERSHED INCHES; 2696 CFS-HRS; 222.8 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.49	1224.3	1379.30

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.10 WATERSHED INCHES; 2696 CFS-HRS; 222.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 85. TIME OF CONCENTRATION = .55 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0739 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.20	158.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.46 WATERSHED INCHES; 208 CFS-HRS; 17.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.43	1329.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.05 WATERSHED INCHES; 2904 CFS-HRS; 240.0 ACRE-FEET.

1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 4 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .83 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0910 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	412.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.40 WATERSHED INCHES; 695 CFS-HRS; 57.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = .80 HOURS
COMPUTED INTERNAL TIME INCREMENT = .1071 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	477.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.70 WATERSHED INCHES; 802 CFS-HRS; 66.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 59
INPUT HYDROGRAPHS 4,2 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	887.3	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.55 WATERSHED INCHES; 1496 CFS-HRS; 123.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 5,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.39	2210.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.87 WATERSHED INCHES; 4400 CFS-HRS; 363.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 84. TIME OF CONCENTRATION = .32 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0422 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.07	135.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.39 WATERSHED INCHES; 130 CFS-HRS; 10.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	2254.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.86 WATERSHED INCHES; 4530 CFS-HRS; 374.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 65
OUTPUT HYDROGRAPH = 3 AREA = .35 SQ MI
INPUT RUNOFF CURVE = 86. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	873.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.67 WATERSHED INCHES; 1725 CFS-HRS; 142.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.41	3099.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.81 WATERSHED INCHES; 6255 CFS-HRS; 516.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

*** WARNING - DISCHARGE EXCEEDS HIGHEST RATING POINT FOR STRUCTURE 18,
VALUE EXTRAPOLATED. ***

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.12	1520.5	1372.54

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.77 WATERSHED INCHES; 6226 CFS-HRS; 514.5 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 6
1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
RAINFALL OF 3.50 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
RAINTABLE NUMBER 2, ARC 2							
MAIN TIME INCREMENT .100 HOURS							
ALTERNATE 11 STORM 1							
XSECTION 5	RUNOFF	.20	2.34	---	12.24	219	1095.0
XSECTION 25	RUNOFF	.16	2.46	---	12.22	189	1181.3
XSECTION 30	ADDHYD	.35	2.39	---	12.23	408	1165.7
XSECTION 35	RUNOFF	.16	2.50	---	12.20	210	1312.5
XSECTION 40	ADDHYD	.52	2.42	---	12.22	617	1186.5
STRUCTURE 10	RESVOR	.52	2.42	1375.15	12.38	515	990.4
XSECTION 45	RUNOFF	.04	1.97	---	12.22	43	1075.0
XSECTION 50	ADDHYD	.56	2.39	---	12.36	551	983.9
XSECTION 53	RUNOFF	.15	1.94	---	12.40	110	733.3
XSECTION 55	RUNOFF	.16	2.14	---	12.37	137	856.3
XSECTION 59	ADDHYD	.31	2.04	---	12.38	246	793.5
XSECTION 60	ADDHYD	.87	2.27	---	12.37	797	916.1
XSECTION 61	RUNOFF	.03	1.94	---	12.08	37	1233.3
XSECTION 62	ADDHYD	.89	2.26	---	12.36	811	911.2
XSECTION 65	RUNOFF	.35	2.12	---	12.52	250	714.3
XSECTION 70	ADDHYD	1.24	2.22	---	12.39	1046	843.5
STRUCTURE 18	RESVOR	1.24	2.21	1370.14	13.49	224	180.6
RAINFALL OF 4.55 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 12 STORM 2							
XSECTION 5	RUNOFF	.20	3.32	---	12.23	309	1545.0
XSECTION 25	RUNOFF	.16	3.45	---	12.22	263	1643.8
XSECTION 30	ADDHYD	.35	3.38	---	12.22	572	1634.3
XSECTION 35	RUNOFF	.16	3.50	---	12.19	291	1818.8
XSECTION 40	ADDHYD	.52	3.42	---	12.21	861	1655.8
STRUCTURE 10	RESVOR	.52	3.42	1375.94	12.40	677	1301.9

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 12 STORM 2							
XSECTION 45	RUNOFF	.04	2.91	---	12.21	64	1600.0
XSECTION 50	ADDHYD	.56	3.38	---	12.37	727	1298.2
XSECTION 53	RUNOFF	.15	2.86	---	12.38	163	1086.7
XSECTION 55	RUNOFF	.16	3.09	---	12.37	196	1225.0
XSECTION 59	ADDHYD	.31	2.98	---	12.37	358	1154.8
XSECTION 60	ADDHYD	.87	3.24	---	12.37	1086	1248.3
XSECTION 61	RUNOFF	.03	2.86	---	12.08	54	1800.0
XSECTION 62	ADDHYD	.89	3.23	---	12.36	1105	1241.6
XSECTION 65	RUNOFF	.35	3.07	---	12.51	359	1025.7
XSECTION 70	ADDHYD	1.24	3.18	---	12.40	1446	1166.1
STRUCTURE 18	RESVOR	1.24	3.17	1370.70	13.31	396	319.4
RAINFALL OF 5.25 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 13 STORM 3							
XSECTION 5	RUNOFF	.20	3.99	---	12.23	369	1845.0
XSECTION 25	RUNOFF	.16	4.12	---	12.22	313	1956.3
XSECTION 30	ADDHYD	.35	4.05	---	12.22	682	1948.6
XSECTION 35	RUNOFF	.16	4.18	---	12.19	344	2150.0
XSECTION 40	ADDHYD	.52	4.09	---	12.21	1024	1969.2
STRUCTURE 10	RESVOR	.52	4.09	1376.50	12.42	777	1494.2
XSECTION 45	RUNOFF	.04	3.55	---	12.21	78	1950.0
XSECTION 50	ADDHYD	.56	4.05	---	12.38	836	1492.9
XSECTION 53	RUNOFF	.15	3.50	---	12.39	199	1326.7
XSECTION 55	RUNOFF	.16	3.75	---	12.35	239	1493.8
XSECTION 59	ADDHYD	.31	3.63	---	12.37	436	1406.5
XSECTION 60	ADDHYD	.87	3.90	---	12.38	1272	1462.1
XSECTION 61	RUNOFF	.03	3.50	---	12.08	66	2200.0
XSECTION 62	ADDHYD	.89	3.89	---	12.36	1295	1455.1
XSECTION 65	RUNOFF	.35	3.73	---	12.51	435	1242.9

1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 13 STORM 3							
XSECTION 70	ADDHYD	1.24	3.84	---	12.40	1710	1379.0
STRUCTURE 18	RESVOR	1.24	3.83	1371.06	13.24	527	425.0
RAINFALL OF 6.98 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 13 STORM 4							
XSECTION 5	RUNOFF	.20	5.66	---	12.23	516	2580.0
XSECTION 25	RUNOFF	.16	5.81	---	12.21	434	2712.5
XSECTION 30	ADDHYD	.35	5.73	---	12.22	949	2711.4
XSECTION 35	RUNOFF	.16	5.87	---	12.19	478	2987.5
XSECTION 40	ADDHYD	.52	5.77	---	12.21	1424	2738.5
STRUCTURE 10	RESVOR	.52	5.77	1377.75	12.45	981	1886.5
XSECTION 45	RUNOFF	.04	5.17	---	12.21	112	2800.0
XSECTION 50	ADDHYD	.56	5.72	---	12.40	1061	1894.6
XSECTION 53	RUNOFF	.15	5.12	---	12.38	289	1926.7
XSECTION 55	RUNOFF	.16	5.40	---	12.36	337	2106.3
XSECTION 59	ADDHYD	.31	5.27	---	12.37	625	2016.1
XSECTION 60	ADDHYD	.87	5.56	---	12.38	1684	1935.6
XSECTION 61	RUNOFF	.03	5.12	---	12.07	95	3166.7
XSECTION 62	ADDHYD	.89	5.55	---	12.37	1716	1928.1
XSECTION 65	RUNOFF	.35	5.38	---	12.50	624	1782.9
XSECTION 70	ADDHYD	1.24	5.50	---	12.41	2319	1870.2
STRUCTURE 18	RESVOR	1.24	5.48	1371.72	13.13	970	782.3
RAINFALL OF 7.80 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 14 STORM 5							
XSECTION 5	RUNOFF	.20	6.46	---	12.23	586	2930.0
XSECTION 25	RUNOFF	.16	6.61	---	12.21	491	3068.8

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 14 STORM 5							
XSECTION 30	ADDHYD	.35	6.53	---	12.22	1077	3077.1
XSECTION 35	RUNOFF	.16	6.68	---	12.19	537	3356.3
XSECTION 40	ADDHYD	.52	6.58	---	12.21	1611	3098.1
STRUCTURE 10	RESVOR	.52	6.57	1378.31	12.46	1071	2059.6
XSECTION 45	RUNOFF	.04	5.96	---	12.21	128	3200.0
XSECTION 50	ADDHYD	.56	6.53	---	12.42	1161	2073.2
XSECTION 53	RUNOFF	.15	5.90	---	12.37	331	2206.7
XSECTION 55	RUNOFF	.16	6.20	---	12.35	387	2418.8
XSECTION 59	ADDHYD	.31	6.06	---	12.36	717	2312.9
XSECTION 60	ADDHYD	.87	6.36	---	12.39	1874	2154.0
XSECTION 61	RUNOFF	.03	5.90	---	12.07	108	3600.0
XSECTION 62	ADDHYD	.89	6.35	---	12.37	1909	2144.9
XSECTION 65	RUNOFF	.35	6.17	---	12.50	710	2028.6
XSECTION 70	ADDHYD	1.24	6.30	---	12.41	2596	2093.5
STRUCTURE 18	RESVOR	1.24	6.27	1372.01	13.12	1167	941.1

RAINFALL OF 9.35 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 15 STORM 6							
XSECTION 5	RUNOFF	.20	7.98	---	12.23	716	3580.0
XSECTION 25	RUNOFF	.16	8.15	---	12.21	601	3756.3
XSECTION 30	ADDHYD	.35	8.05	---	12.22	1317	3762.9
XSECTION 35	RUNOFF	.16	8.20	---	12.19	654	4087.5
XSECTION 40	ADDHYD	.52	8.10	---	12.21	1969	3786.5
STRUCTURE 10	RESVOR	.52	8.10	1379.30	12.49	1224	2353.8
XSECTION 45	RUNOFF	.04	7.46	---	12.20	158	3950.0
XSECTION 50	ADDHYD	.56	8.05	---	12.43	1329	2373.2
XSECTION 53	RUNOFF	.15	7.40	---	12.37	412	2746.7
XSECTION 55	RUNOFF	.16	7.70	---	12.34	478	2987.5
XSECTION 59	ADDHYD	.31	7.55	---	12.36	887	2861.3

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

ALTERNATE 15 STORM 6

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION		DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
XSECTION	60	ADDHYD	.87	7.87	---	12.39	2210	2540.2
XSECTION	61	RUNOFF	.03	7.39	---	12.07	135	4500.0
XSECTION	62	ADDHYD	.89	7.86	---	12.37	2254	2532.6
XSECTION	65	RUNOFF	.35	7.67	---	12.50	874	2497.1
XSECTION	70	ADDHYD	1.24	7.81	---	12.41	3100	2500.0
STRUCTURE	18	RESVOR	1.24	7.77	1372.54	13.12	1520	1225.8

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
STRUCTURE 18	1.24					
ALTERNATE 11		224	*********	*********	*********	*********
ALTERNATE 12		*********	396	*********	*********	*********
ALTERNATE 13		*********	*********	527	970	*********
ALTERNATE 14		*********	*********	*********	*********	1167
STRUCTURE 10	.52					
ALTERNATE 11		515	*********	*********	*********	*********
ALTERNATE 12		*********	677	*********	*********	*********
ALTERNATE 13		*********	*********	777	981	*********
ALTERNATE 14		*********	*********	*********	*********	1071
XSECTION 5	.20					
ALTERNATE 11		219	*********	*********	*********	*********
ALTERNATE 12		*********	309	*********	*********	*********
ALTERNATE 13		*********	*********	369	516	*********
ALTERNATE 14		*********	*********	*********	*********	586
XSECTION 25	.16					
ALTERNATE 11		189	*********	*********	*********	*********
ALTERNATE 12		*********	263	*********	*********	*********
ALTERNATE 13		*********	*********	313	434	*********
ALTERNATE 14		*********	*********	*********	*********	491
XSECTION 30	.35					
ALTERNATE 11		408	*********	*********	*********	*********
ALTERNATE 12		*********	572	*********	*********	*********
ALTERNATE 13		*********	*********	682	949	*********
ALTERNATE 14		*********	*********	*********	*********	1077
XSECTION 35	.16					
ALTERNATE 11		210	*********	*********	*********	*********
ALTERNATE 12		*********	291	*********	*********	*********
ALTERNATE 13		*********	*********	344	478	*********
ALTERNATE 14		*********	*********	*********	*********	537
XSECTION 40	.52					
ALTERNATE 11		617	*********	*********	*********	*********
ALTERNATE 12		*********	861	*********	*********	*********
ALTERNATE 13		*********	*********	1024	1424	*********

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
XSECTION 40	.52					
ALTERNATE 14		*********	*********	*********	*********	1611
XSECTION 45	.04					
ALTERNATE 11		43	*********	*********	*********	*********
ALTERNATE 12		*********	64	*********	*********	*********
ALTERNATE 13		*********	*********	78	112	*********
ALTERNATE 14		*********	*********	*********	*********	128
XSECTION 50	.56					
ALTERNATE 11		551	*********	*********	*********	*********
ALTERNATE 12		*********	727	*********	*********	*********
ALTERNATE 13		*********	*********	836	1061	*********
ALTERNATE 14		*********	*********	*********	*********	1161
XSECTION 53	.15					
ALTERNATE 11		110	*********	*********	*********	*********
ALTERNATE 12		*********	163	*********	*********	*********
ALTERNATE 13		*********	*********	199	289	*********
ALTERNATE 14		*********	*********	*********	*********	331
XSECTION 55	.16					
ALTERNATE 11		137	*********	*********	*********	*********
ALTERNATE 12		*********	196	*********	*********	*********
ALTERNATE 13		*********	*********	239	337	*********
ALTERNATE 14		*********	*********	*********	*********	387
XSECTION 59	.31					
ALTERNATE 11		246	*********	*********	*********	*********
ALTERNATE 12		*********	358	*********	*********	*********
ALTERNATE 13		*********	*********	436	625	*********
ALTERNATE 14		*********	*********	*********	*********	717
XSECTION 60	.87					
ALTERNATE 11		797	*********	*********	*********	*********
ALTERNATE 12		*********	1086	*********	*********	*********
ALTERNATE 13		*********	*********	1272	1684	*********
ALTERNATE 14		*********	*********	*********	*********	1874
XSECTION 61	.03					
ALTERNATE 11		37	*********	*********	*********	*********

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
XSECTION 61		.03					
ALTERNATE	12		*********	54	********	********	*********
ALTERNATE	13		*********	*********	66	95	*********
ALTERNATE	14		*********	*********	*********	*********	108
XSECTION 62		.89					
ALTERNATE	11		811	*********	*********	*********	*********
ALTERNATE	12		*********	1105	*********	*********	*********
ALTERNATE	13		*********	*********	1295	1716	*********
ALTERNATE	14		*********	*********	*********	*********	1909
XSECTION 65		.35					
ALTERNATE	11		250	*********	*********	*********	*********
ALTERNATE	12		*********	359	*********	*********	*********
ALTERNATE	13		*********	*********	435	624	*********
ALTERNATE	14		*********	*********	*********	*********	710
XSECTION 70		1.24					
ALTERNATE	11		1046	*********	*********	*********	*********
ALTERNATE	12		*********	1446	*********	*********	*********
ALTERNATE	13		*********	*********	1710	2319	*********
ALTERNATE	14		*********	*********	*********	*********	2596

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 6
STRUCTURE 18		1.24	
ALTERNATE	15		1520
STRUCTURE 10		.52	
ALTERNATE	15		1224
XSECTION 5		.20	
ALTERNATE	15		716
XSECTION 25		.16	
ALTERNATE	15		601
XSECTION 30		.35	

```
   ALTERNATE   15                1317

 XSECTION   35          .16
 ---------------------------
   ALTERNATE   15                 654
1
```

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 6
XSECTION 40	.52	
ALTERNATE 15		1969
XSECTION 45	.04	
ALTERNATE 15		158
XSECTION 50	.56	
ALTERNATE 15		1329
XSECTION 53	.15	
ALTERNATE 15		412
XSECTION 55	.16	
ALTERNATE 15		478
XSECTION 59	.31	
ALTERNATE 15		887
XSECTION 60	.87	
ALTERNATE 15		2210
XSECTION 61	.03	
ALTERNATE 15		135
XSECTION 62	.89	
ALTERNATE 15		2254
XSECTION 65	.35	
ALTERNATE 15		874
XSECTION 70	1.24	
ALTERNATE 15		3100

```
TR20 ------------------------------------------------------------------- SCS -
         PRE-PROJECT - EAST BRANCH GYPSUM CREEK 2/14/06  ADD BASIN 052  VERSION
01/05/** TPP5.T20 50%(2) 20%(5) 10%(10) 5%(50) 1%(100) & .2%(500) ANNUA2.04TEST



END OF  1 JOBS IN THIS RUN
```

SCS TR-20, VERSION 2.04TEST

FILES

INPUT = wtrftpp5.t20	, GIVEN DATA FILE	
OUTPUT = wtrftpp5.OUT	, DATED 01/05/**,11:55:45	

FILES GENERATED - DATED 01/05/**,11:55:45

NONE!

TOTAL NUMBER OF WARNINGS = 2, MESSAGES = 0

*** TR-20 RUN COMPLETED ***

Appendix F

Pre-Project CN and T_c Calculations

Time of Concentration Calculations by the FAA method

The Waterfront Addition - Pre-Project Calculations

$$T_c = \frac{(1.1-C)L^{1/2}}{100\ S^{1/3}}$$

Area Name	Land Use	Soil Group	Maximum Elevation	Minimum Elevation	Length (L)	Rational Runoff Coefficient, C				Time of Concentration (min), T_c				Time of Concentration (hr), T_c				CN
						2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	
005	*Business - Neighborhood*	*D*	*1405.0*	*1375.0*	*3800*	0.68	0.69	0.73	0.80	50.4	49.2	44.4	36.0	0.8404	0.8204	0.7403	0.6003	88.8
025	*Business - Neighborhood*	*D*	*1405.0*	*1375.0*	*3600*	0.68	0.69	0.73	0.80	48.2	47.1	42.5	34.4	0.8034	0.7842	0.7077	0.5738	90.1
035	*Business - Neighborhood*	*D*	*1390.0*	*1370.0*	*2800*	0.68	0.69	0.73	0.80	44.8	43.7	39.4	32.0	0.7459	0.7281	0.6571	0.5328	90.6
045	*Undeveloped Urban*	*D*	*1390.0*	*1369.0*	*2000*	0.52	0.54	0.59	0.68	45.9	44.4	40.4	33.3	0.7656	0.7392	0.6732	0.5544	84.5
053	*Undeveloped Urban*	*D*	*1390.0*	*1373.0*	*3000*	0.52	0.54	0.59	0.68	69.1	66.7	60.8	50.0	1.1517	1.1120	1.0127	0.8340	84.0
055	*Undeveloped Urban*	*D*	*1385.0*	*1369.0*	*2800*	0.52	0.54	0.59	0.68	66.6	64.3	58.5	48.2	1.1095	1.0713	0.9756	0.8034	86.5
065	*Undeveloped Urban*	*D*	*1400.0*	*1369.0*	*5000*	0.52	0.54	0.59	0.68	86.6	83.6	76.1	62.7	1.4429	1.3931	1.2687	1.0448	86.3

Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 005

Total Area = 124.9 Acres
Total Area = 0.1952 sq. mi.
Composite Curve Number = 88.77

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	20.2 84
Commercial and business	85	89	92	94	26.4 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	14.1 92
Residential - 1/4 acre	38	61	75	83	64.2 87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	100

Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 025

Total Area = 100.2 Acres
Total Area = 0.1566 sq. mi.
Composite Curve Number = 90.14

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	84
Commercial and business	85	89	92	94	39.3 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	60.9 87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	100

Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 035

Total Area = 104.8 Acres
Total Area = 0.1638 sq. mi.
Composite Curve Number = 90.62

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0				
		72	81	88	91
Cultivated land with conservation treatement	0				
		62	71	78	81
Pasture or range land - poor condition	0				
		68	79	86	89
Pasture or range land - good condition	0				
		39	61	74	80
Meadow - good condition	0				
		30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0				
		45	66	77	83
Wood or Forest land - good cover	0				
		25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0				
		39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0				17.9
		49	69	79	84
Commercial and business	85				50.5
		89	92	94	95
Industrial	72				
		81	88	91	93
Residential - 1/8 acre or less	65				
		77	85	90	92
Residential - 1/4 acre	38				34.2
		61	75	83	87
Residentail - 1/3 acre	30				
		57	72	81	86
Residential - 1/2 acre	25				
		54	70	80	85
Residentail - 1 acre	20				
		51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-				
		98	98	98	98
Streets and roads - paved with curbs and storm sewers	-				
		98	98	98	98
Streets and roads - gravel	-				
		76	85	89	91
Streets and roads - dirt	-				
		72	82	87	89
Lake/Pond	100				2.2
		100	100	100	100

Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 045

Total Area = 27.6 Acres
Total Area = 0.0431 sq. mi.
Composite Curve Number = 84.52

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	26.7 84
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	0.9 100

Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 053

Total Area = 93.1 Acres
Total Area = 0.1455 sq. mi.
Composite Curve Number = 84.00

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	93.1 84
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	100

Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 055

Total Area = 103.3 Acres
Total Area = 0.1614 sq. mi.
Composite Curve Number = 86.46

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	87.4 84
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	15.9 100

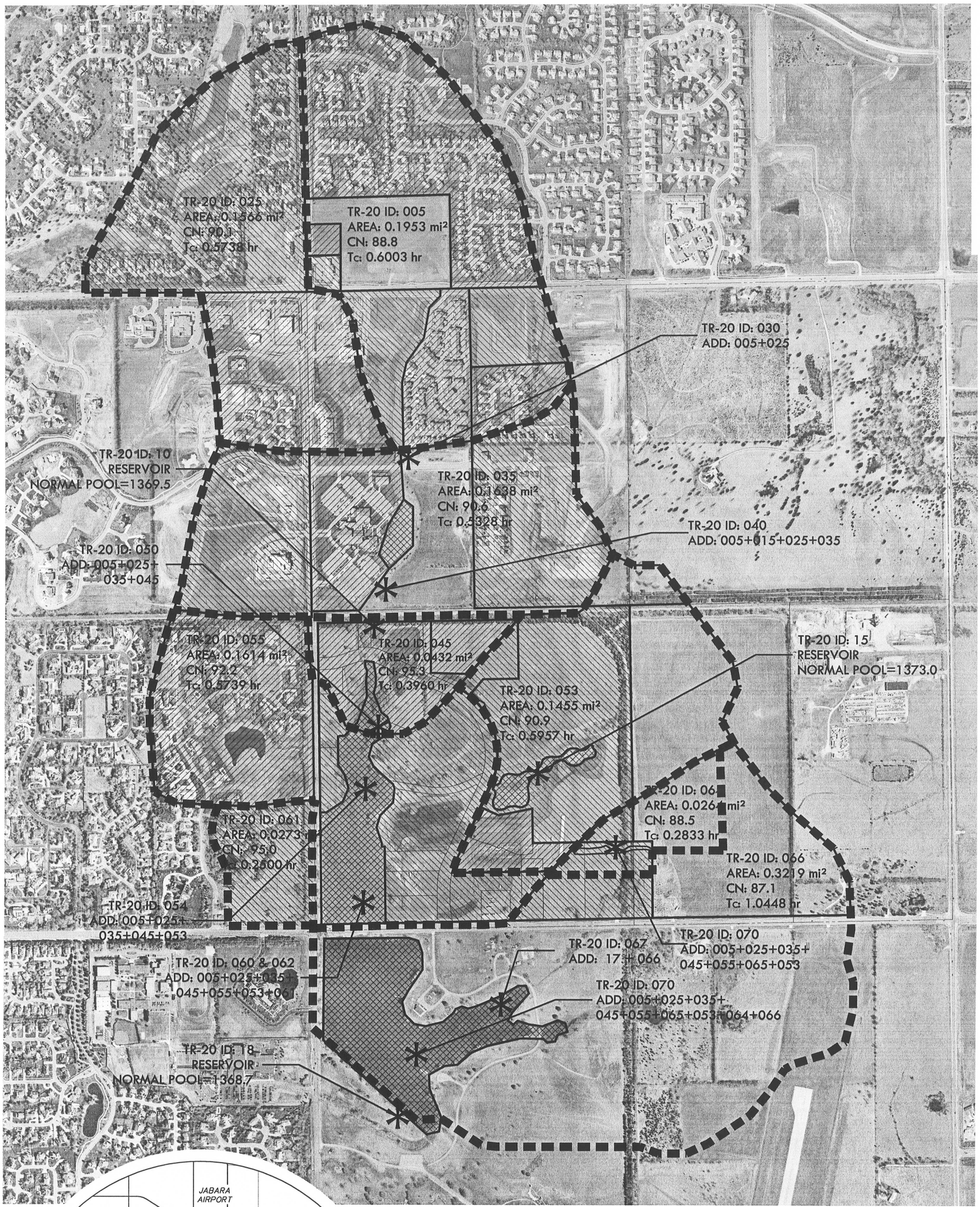
Project Name: The Waterfront Addition - Pre-Project
Project Number: 02014
Basin: TR-20 065

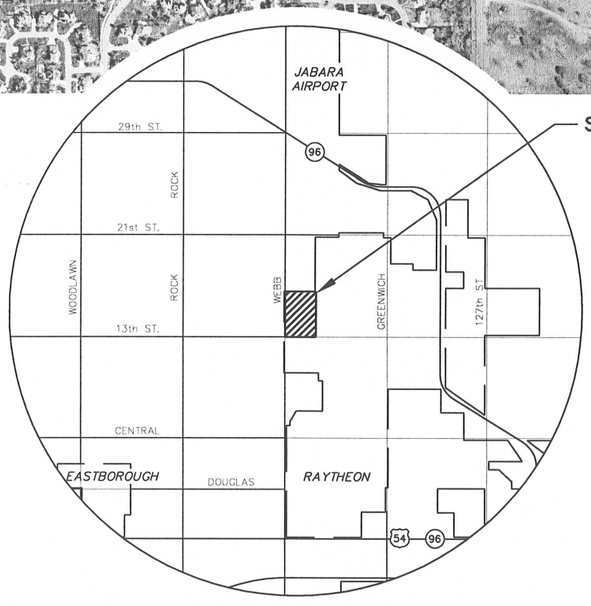
Total Area = 222.9 Acres
Total Area = 0.3483 sq. mi.
Composite Curve Number = 86.26

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	191.4 84
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	31.5 100

Appendix G

Post-Project TR-20 Key Map





SITE LOCATION

VICINITY MAP

LEGEND

- POLE - POLE
- HLP - HIGH LINE POLE
- WATERSHED BOUNDARIES
- PP - POWER POLE AND GUY ANCHOR
- TR - TELEPHONE RISER
- INLET
- BM - BENCHMARK

BENCHMARKS

BM#1 Square cut SE. corner headwall 44' N. and 42' E. of W. ¼ cor., Sec. 9, T27S, R2E
ELEV. = 192.73'(City Datum)
1380.13 NGVD

BM#2 Square cut SW. corner signal light pole base NE. corner Webb and 13th.
ELEV. = 185.945'(City Datum)
1373.345' NGVD

SCALE: 1"=400'
400 0 400 800

REVISED: 1/8/07
REVISED: 10/20/06

2003 AERIAL

WATERFRONT ADDITION
PROJECT NAME

FUTURE CONDITIONS
TR-20 KEY MAP
DESIGN TITLE

KLA	JFL/KWS
DESIGN	DRAWN BY:
GJA	AUG. 2006
CHECKED BY:	DATE
02014	1 / 1
JOB NO.	SHEET/OF

H:\CIVIL\02014\DWG\Dwg\TR-20\TR-20_KEY_Future.dwg 08/16/2006 09:04:53 AM CST

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600
www.mkec.com

Appendix H

Post-Project TR-20 Output

1

**********80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY**********

```
JOB TR-20                    FULLPRINT          SUMMARY   NOPLOTS
TITLE 001 WATERFRONT CURRENT/Future    EAST BRANCH GYPSUM CREEK 1/07
TITLE WTRFTC5.T20 50%(2) 20%(5) 10%(10) 5%(50) 1%(100) & .2%(500) ANNUAL CHANCE
 4 DIMHYD              0.02                                          484 SCS
 8          .000       .030       .100       .190       .310        UNIT HYD
 8          .470       .660       .820       .930       .990
 8         1.000       .990       .930       .860       .780
 8          .680       .560       .460       .390       .330
 8          .280       .241       .207       .174       .147
 8          .126       .107       .091       .077       .066
 8          .055       .047       .040       .034       .029
 8          .025       .021       .018       .015       .013
 8          .011       .009       .008       .007       .006
 8          .005       .004       .003       .002       .001
 8          .000       .000       .000       .000       .000
 9 ENDTBL
 3 STRUCT      10                                                    R-EB-BN
 8                     1369.4      0.0        0.0                   RAILROAD
 8                     1370.4      6.0        0.279                 ESTMNSTR
 8                     1371.4      14.0       1.093
 8                     1372.4      30.0       2.269
 8                     1373.4      60.0       3.606
 8                     1374.4      320.0      7.212
 8                     1375.4      580.0      11.361
 8                     1376.4      760.0      16.450
 8                     1377.4      925.0      23.036
 8                     1378.4      1085.0     31.035
 8                     1379.4      1240.0     40.834
 9 ENDTBL
 3 STRUCT      15
 8                     1373.0      0.0        0.0                   HOTEL
 8                     1374.0      3.239      1.978                 POND
 8                     1375.0      71.910     5.349                 LOWER &
 8                     1376.0      104.758    10.221                MIDDLE
 8                     1377.0      129.355    15.443                Expanded
 8                     1378.0      150.069    21.185
 9 ENDTBL
 3 STRUCT      17
 8                     1380.0      0.0        0.0                   COMMERC
 8                     1381.0      2.674      0.618                 DETENTN
 8                     1382.0      10.877     1.368
 8                     1383.0      26.254     2.257
 8                     1384.0      38.337     3.287
 9 ENDTBL
 3 STRUCT      18                                                    NORTH &
 8                     1368.7      0.0        0.0                   SOUTH
 8                     1369.0      100.0      14.40                 BEECH
 8                     1370.0      180.0      63.13                 LAKE
 8                     1371.0      490.0      113.94
 8                     1372.0      1160.0     167.75
```

1

```
*********************80-80 LIST OF INPUT DATA (CONTINUED)**********************

 9 ENDTBL
 6 RUNOFF 1 005       3 0.1953      88.8        0.6003               1 N&S21EWB
 6 RUNOFF 1 025       1 0.1566      90.1        0.5738               1 WWEBB
 6 ADDHYD 4 030   1 3 2                                             1
 6 RUNOFF 1 035       1 0.1638      90.6        0.5328               1
 6 ADDHYD 4 040   1 2 3                                             1
 6 RESVOR 2    10 3   1 1369.4                                     1 EM/RR
 6 RUNOFF 1 045       2 0.0432      95.3        0.3960               1 NWTRFT
 6 ADDHYD 4 050   1 2 4                                             1
 6 RUNOFF 1 053       6 0.1455      90.9        0.5957               1 EWTRFT
 6 RESVOR 2    15 6   2 1373.0                                     1 HOTELPND
 6 ADDHYD 4 054   2 4 3                                             1
 6 RUNOFF 1 055       2 0.1614      92.2        0.5739               1
 6 ADDHYD 4 060   2 3 1                                             1
 6 RUNOFF 1 061       2 0.0273      95.0        0.2500               1
 6 ADDHYD 4 062   2 1 4                                             1
 6 RUNOFF 1 064       3 0.0264      88.5        0.2833               1
 6 RESVOR 2    17 3   1                                             1
 6 RUNOFF 1 066       2 0.3219      87.1        1.0448               1
 6 ADDHYD 4 067   1 2 3
 6 ADDHYD 4 070   4 3 2                                             1
 6 RESVOR 2    18 2   1 1368.7                                     1 BEECHLKE
   ENDATA
 7 INCREM 6             0.10
 7 COMPUT 7 005      18 0.0         3.50        1.0         2 2  11  01
   ENDCMP 1
 7 COMPUT 7 005      18 0.0         4.55        1.0         2 2  12  02
   ENDCMP 1
 7 COMPUT 7 005      18 0.0         5.25        1.0         2 2  13  03
   ENDCMP 1
 7 COMPUT 7 005      18 0.0         6.98        1.0         2 2  13  04
   ENDCMP 1
 7 COMPUT 7 005      18 0.0         7.80        1.0         2 2  14  05
   ENDCMP 1
 7 COMPUT 7 005      18 0.0         9.35        1.0         2 2  15  06
   ENDCMP 1
   ENDJOB 2

 *****************************END OF 80-80 LIST*****************************
1
```

DIMENSIONLESS HYDROGRAPH TABLE ENTERED

8	.0000	.0300	.1000	.1900	.3100
8	.4700	.6600	.8200	.9300	.9900
8	1.0000	.9900	.9300	.8600	.7800
8	.6800	.5600	.4600	.3900	.3300
8	.2800	.2410	.2070	.1740	.1470
8	.1260	.1070	.0910	.0770	.0660
8	.0550	.0470	.0400	.0340	.0290
8	.0250	.0210	.0180	.0150	.0130
8	.0110	.0090	.0080	.0070	.0060
8	.0050	.0040	.0030	.0020	.0010
8	.0000	.0000	.0000	.0000	.0000

9 ENDTBL

COMPUTED TIME INCREMENT = .0200

COMPUTED PEAK RATE FACTOR = 484.000

1

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .100 HOURS

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 3.50 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =11 STORM NO. = 1 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.24	219.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.34 WATERSHED INCHES; 295 CFS-HRS; 24.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	188.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.46 WATERSHED INCHES; 248 CFS-HRS; 20.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	407.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.39 WATERSHED INCHES; 543 CFS-HRS; 44.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.20	210.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.50 WATERSHED INCHES; 264 CFS-HRS; 21.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	616.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.42 WATERSHED INCHES; 807 CFS-HRS; 66.7 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	515.1	1375.15

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.42 WATERSHED INCHES; 807 CFS-HRS; 66.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .40 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0528 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	75.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.97 WATERSHED INCHES; 83 CFS-HRS; 6.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.35	554.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.47 WATERSHED INCHES; 890 CFS-HRS; 73.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 6 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0794 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	176.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.53 WATERSHED INCHES; 237 CFS-HRS; 19.6 ACRE-FEET.

OPERATION RESVOR STRUCTURE 15
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 2
SURFACE ELEVATION = 1373.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.63	82.4	1375.32

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.51 WATERSHED INCHES; 236 CFS-HRS; 19.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 54
INPUT HYDROGRAPHS 2,4 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	629.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.48 WATERSHED INCHES; 1125 CFS-HRS; 93.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 92. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	208.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.65 WATERSHED INCHES; 276 CFS-HRS; 22.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 2,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.31	819.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.51 WATERSHED INCHES; 1402 CFS-HRS; 115.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .25 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0333 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.03	58.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.94 WATERSHED INCHES; 52 CFS-HRS; 4.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.30	836.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.52 WATERSHED INCHES; 1453 CFS-HRS; 120.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 64
OUTPUT HYDROGRAPH = 3 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .28 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0378 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.06	43.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.31 WATERSHED INCHES; 39 CFS-HRS; 3.3 ACRE-FEET.

OPERATION RESVOR STRUCTURE 17
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = .00
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.42	11.5	1382.04

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.31 WATERSHED INCHES; 39 CFS-HRS; 3.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 66
OUTPUT HYDROGRAPH = 2 AREA = .32 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.52	237.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.19 WATERSHED INCHES; 455 CFS-HRS; 37.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 67
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	249.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.20 WATERSHED INCHES; 494 CFS-HRS; 40.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	1056.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.43 WATERSHED INCHES; 1947 CFS-HRS; 160.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.55	237.0	1370.18

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
2.43 WATERSHED INCHES; 1947 CFS-HRS; 160.9 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 4.55 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =12 STORM NO. = 2 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	309.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.32 WATERSHED INCHES; 419 CFS-HRS; 34.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	263.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.45 WATERSHED INCHES; 349 CFS-HRS; 28.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	572.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.38 WATERSHED INCHES; 767 CFS-HRS; 63.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	291.0	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.50 WATERSHED INCHES; 370 CFS-HRS; 30.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	861.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.42 WATERSHED INCHES; 1137 CFS-HRS; 94.0 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	677.3	1375.94

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.42 WATERSHED INCHES; 1138 CFS-HRS; 94.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .40 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0528 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	99.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.01 WATERSHED INCHES; 112 CFS-HRS; 9.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.35	724.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.46 WATERSHED INCHES; 1249 CFS-HRS; 103.2 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 6 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0794 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	245.2	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.53 WATERSHED INCHES; 332 CFS-HRS; 27.4 ACRE-FEET.

OPERATION RESVOR STRUCTURE 15
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 2
SURFACE ELEVATION = 1373.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.68	101.5	1375.90

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.51 WATERSHED INCHES; 330 CFS-HRS; 27.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 54
INPUT HYDROGRAPHS 2,4 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.37	816.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.47 WATERSHED INCHES; 1578 CFS-HRS; 130.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 92. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	285.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.67 WATERSHED INCHES; 382 CFS-HRS; 31.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 2,3 OUTPUT HYDROGRAPH 1
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.29	1076.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.51 WATERSHED INCHES; 1960 CFS-HRS; 162.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .25 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0333 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.03	77.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.97 WATERSHED INCHES; 70 CFS-HRS; 5.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.27	1101.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.52 WATERSHED INCHES; 2030 CFS-HRS; 167.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 64
OUTPUT HYDROGRAPH = 3 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .28 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0378 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.05	61.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.29 WATERSHED INCHES; 56 CFS-HRS; 4.6 ACRE-FEET.

OPERATION RESVOR STRUCTURE 17
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = .00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.35	20.3	1382.61

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.29 WATERSHED INCHES; 56 CFS-HRS; 4.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 66
OUTPUT HYDROGRAPH = 2 AREA = .32 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	340.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.15 WATERSHED INCHES; 655 CFS-HRS; 54.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 67
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	359.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.16 WATERSHED INCHES; 711 CFS-HRS; 58.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	1416.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.42 WATERSHED INCHES; 2741 CFS-HRS; 226.5 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.38	398.4	1370.70

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.42 WATERSHED INCHES; 2741 CFS-HRS; 226.5 ACRE-FEET.
1

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 5.25 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =13 STORM NO. = 3 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	368.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.99 WATERSHED INCHES; 502 CFS-HRS; 41.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	313.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.12 WATERSHED INCHES; 417 CFS-HRS; 34.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	681.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.05 WATERSHED INCHES; 919 CFS-HRS; 76.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	344.3	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.18 WATERSHED INCHES; 442 CFS-HRS; 36.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1023.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.09 WATERSHED INCHES; 1361 CFS-HRS; 112.5 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.42	776.9	1376.50

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.09 WATERSHED INCHES; 1361 CFS-HRS; 112.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .40 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0528 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	117.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.70 WATERSHED INCHES; 131 CFS-HRS; 10.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.36	829.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.14 WATERSHED INCHES; 1492 CFS-HRS; 123.3 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 6 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0794 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	288.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.21 WATERSHED INCHES; 395 CFS-HRS; 32.7 ACRE-FEET.

OPERATION RESVOR STRUCTURE 15
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 2
SURFACE ELEVATION = 1373.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.71	111.5	1376.28

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.19 WATERSHED INCHES; 393 CFS-HRS; 32.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 54
INPUT HYDROGRAPHS 2,4 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	932.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.15 WATERSHED INCHES; 1885 CFS-HRS; 155.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 92. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	336.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.35 WATERSHED INCHES; 453 CFS-HRS; 37.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 2,3 OUTPUT HYDROGRAPH 1
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.30	1235.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.18 WATERSHED INCHES; 2338 CFS-HRS; 193.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .25 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0333 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.02	90.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.66 WATERSHED INCHES; 82 CFS-HRS; 6.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.28	1263.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.20 WATERSHED INCHES; 2420 CFS-HRS; 200.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 64
OUTPUT HYDROGRAPH = 3 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .28 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0378 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.05	73.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.96 WATERSHED INCHES; 67 CFS-HRS; 5.6 ACRE-FEET.

OPERATION RESVOR STRUCTURE 17
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = .00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	26.0	1382.99

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.96 WATERSHED INCHES; 67 CFS-HRS; 5.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 66
OUTPUT HYDROGRAPH = 2 AREA = .32 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	411.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.81 WATERSHED INCHES; 792 CFS-HRS; 65.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 67
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	436.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
3.83 WATERSHED INCHES; 860 CFS-HRS; 71.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	1651.9	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.09 WATERSHED INCHES; 3280 CFS-HRS; 271.1 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.29	518.6	1371.04

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
4.09 WATERSHED INCHES; 3279 CFS-HRS; 271.0 ACRE-FEET.
1

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 3
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 6.98 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =13 STORM NO. = 4 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	515.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.66 WATERSHED INCHES; 713 CFS-HRS; 58.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	433.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.81 WATERSHED INCHES; 587 CFS-HRS; 48.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	948.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.73 WATERSHED INCHES; 1300 CFS-HRS; 107.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	478.2	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.87 WATERSHED INCHES; 620 CFS-HRS; 51.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1424.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.77 WATERSHED INCHES; 1921 CFS-HRS; 158.7 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.45	981.5	1377.75

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.77 WATERSHED INCHES; 1920 CFS-HRS; 158.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .40 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0528 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	156.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.41 WATERSHED INCHES; 179 CFS-HRS; 14.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.38	1044.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.82 WATERSHED INCHES; 2100 CFS-HRS; 173.5 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 6 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0794 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	398.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.90 WATERSHED INCHES; 554 CFS-HRS; 45.8 ACRE-FEET.

OPERATION RESVOR STRUCTURE 15
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 2
SURFACE ELEVATION = 1373.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.76	133.7	1377.21

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.88 WATERSHED INCHES; 552 CFS-HRS; 45.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 54
INPUT HYDROGRAPHS 2,4 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.41	1167.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.83 WATERSHED INCHES; 2652 CFS-HRS; 219.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 92. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	461.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.06 WATERSHED INCHES; 631 CFS-HRS; 52.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 2,3 OUTPUT HYDROGRAPH 1
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.29	1576.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.87 WATERSHED INCHES; 3282 CFS-HRS; 271.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .25 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0333 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.02	121.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.38 WATERSHED INCHES; 112 CFS-HRS; 9.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.27	1616.8	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.89 WATERSHED INCHES; 3395 CFS-HRS; 280.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 64
OUTPUT HYDROGRAPH = 3 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .28 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0378 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.05	102.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.63 WATERSHED INCHES; 96 CFS-HRS; 7.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 17
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = .00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	36.1	1383.82

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.62 WATERSHED INCHES; 96 CFS-HRS; 7.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 66
OUTPUT HYDROGRAPH = 2 AREA = .32 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	583.5	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.46 WATERSHED INCHES; 1135 CFS-HRS; 93.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 67
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	617.9	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.48 WATERSHED INCHES; 1231 CFS-HRS; 101.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	2168.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.77 WATERSHED INCHES; 4626 CFS-HRS; 382.3 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.14	954.0	1371.69

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
5.77 WATERSHED INCHES; 4625 CFS-HRS; 382.2 ACRE-FEET.
1

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 4
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 7.80 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =14 STORM NO. = 5 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	585.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.46 WATERSHED INCHES; 814 CFS-HRS; 67.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	491.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.61 WATERSHED INCHES; 668 CFS-HRS; 55.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	1076.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.53 WATERSHED INCHES; 1483 CFS-HRS; 122.5 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	537.2	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.68 WATERSHED INCHES; 706 CFS-HRS; 58.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1610.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.58 WATERSHED INCHES; 2188 CFS-HRS; 180.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.46	1071.4	1378.31

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.57 WATERSHED INCHES; 2188 CFS-HRS; 180.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .40 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0528 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	174.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.23 WATERSHED INCHES; 202 CFS-HRS; 16.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.40	1139.1	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.63 WATERSHED INCHES; 2390 CFS-HRS; 197.5 ACRE-FEET.
1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 6 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0794 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	449.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.71 WATERSHED INCHES; 630 CFS-HRS; 52.1 ACRE-FEET.

OPERATION RESVOR STRUCTURE 15
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 2
SURFACE ELEVATION = 1373.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.79	142.5	1377.64

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.68 WATERSHED INCHES; 628 CFS-HRS; 51.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 54
INPUT HYDROGRAPHS 2,4 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.42	1271.7	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.64 WATERSHED INCHES; 3017 CFS-HRS; 249.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 92. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	518.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.86 WATERSHED INCHES; 715 CFS-HRS; 59.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 2,3 OUTPUT HYDROGRAPH 1
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.29	1727.3	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.68 WATERSHED INCHES; 3732 CFS-HRS; 308.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .25 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0333 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.02	135.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.19 WATERSHED INCHES; 127 CFS-HRS; 10.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.26	1772.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.69 WATERSHED INCHES; 3859 CFS-HRS; 318.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 64
OUTPUT HYDROGRAPH = 3 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .28 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0378 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.05	116.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.43 WATERSHED INCHES; 110 CFS-HRS; 9.0 ACRE-FEET.

OPERATION RESVOR STRUCTURE 17
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = .00

*** WARNING - DISCHARGE EXCEEDS HIGHEST RATING POINT FOR STRUCTURE 17,
VALUE EXTRAPOLATED. ***
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	40.8	1384.20

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.43 WATERSHED INCHES; 109 CFS-HRS; 9.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 66
OUTPUT HYDROGRAPH = 2 AREA = .32 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	663.2	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.26 WATERSHED INCHES; 1300 CFS-HRS; 107.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 67
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	702.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.27 WATERSHED INCHES; 1410 CFS-HRS; 116.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.35	2400.3	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.58 WATERSHED INCHES; 5268 CFS-HRS; 435.4 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.13	1143.4	1371.98

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
6.57 WATERSHED INCHES; 5267 CFS-HRS; 435.3 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 5
1

EXECUTIVE CONTROL COMPUT FROM XSECTION 5 TO STRUCTURE 18
STARTING TIME = .00 RAIN DEPTH = 9.35 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. =15 STORM NO. = 6 RAIN TABLE NO. = 2

OPERATION RUNOFF XSECTION 5
OUTPUT HYDROGRAPH = 3 AREA = .20 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0800 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	716.4	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.98 WATERSHED INCHES; 1006 CFS-HRS; 83.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 25
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 90. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	601.5	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.15 WATERSHED INCHES; 823 CFS-HRS; 68.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 30
INPUT HYDROGRAPHS 1,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	1317.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.05 WATERSHED INCHES; 1829 CFS-HRS; 151.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 35
OUTPUT HYDROGRAPH = 1 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .53 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0710 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.19	654.2	(RUNOFF)

1

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.20 WATERSHED INCHES; 867 CFS-HRS; 71.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 40
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	1968.6	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.10 WATERSHED INCHES; 2696 CFS-HRS; 222.8 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1369.40

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.49	1224.3	1379.30

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.10 WATERSHED INCHES; 2696 CFS-HRS; 222.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 45
OUTPUT HYDROGRAPH = 2 AREA = .04 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .40 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0528 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	210.9	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.78 WATERSHED INCHES; 245 CFS-HRS; 20.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 50
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.42	1300.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.15 WATERSHED INCHES; 2941 CFS-HRS; 243.0 ACRE-FEET.

1

OPERATION RUNOFF XSECTION 53
OUTPUT HYDROGRAPH = 6 AREA = .15 SQ MI
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .60 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0794 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.22	546.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.24 WATERSHED INCHES; 774 CFS-HRS; 63.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 15
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 2
SURFACE ELEVATION = 1373.00

*** WARNING - DISCHARGE EXCEEDS HIGHEST RATING POINT FOR STRUCTURE 15,
VALUE EXTRAPOLATED. ***

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.82	159.6	1378.46

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.21 WATERSHED INCHES; 771 CFS-HRS; 63.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 54
INPUT HYDROGRAPHS 2,4 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.44	1447.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.16 WATERSHED INCHES; 3711 CFS-HRS; 306.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 55
OUTPUT HYDROGRAPH = 2 AREA = .16 SQ MI
INPUT RUNOFF CURVE = 92. TIME OF CONCENTRATION = .57 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0765 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.21	626.5	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.40 WATERSHED INCHES; 875 CFS-HRS; 72.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 60
INPUT HYDROGRAPHS 2,3 OUTPUT HYDROGRAPH 1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.29	2000.3	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.21 WATERSHED INCHES; 4586 CFS-HRS; 379.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 61
OUTPUT HYDROGRAPH = 2 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 95. TIME OF CONCENTRATION = .25 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0333 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.02	163.6	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.74 WATERSHED INCHES; 154 CFS-HRS; 12.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 62
INPUT HYDROGRAPHS 2,1 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.26	2056.4	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.22 WATERSHED INCHES; 4740 CFS-HRS; 391.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 64
OUTPUT HYDROGRAPH = 3 AREA = .03 SQ MI
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .28 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0378 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.05	142.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.95 WATERSHED INCHES; 135 CFS-HRS; 11.2 ACRE-FEET.

OPERATION RESVOR STRUCTURE 17
INPUT HYDROGRAPH 3 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = .00
1

*** WARNING - DISCHARGE EXCEEDS HIGHEST RATING POINT FOR STRUCTURE 17,
VALUE EXTRAPOLATED. ***

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	49.6	1384.93

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.95 WATERSHED INCHES; 135 CFS-HRS; 11.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 66
OUTPUT HYDROGRAPH = 2 AREA = .32 SQ MI
INPUT RUNOFF CURVE = 87. TIME OF CONCENTRATION = 1.04 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0964 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.50	814.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.77 WATERSHED INCHES; 1615 CFS-HRS; 133.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 67
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.49	862.0	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
7.79 WATERSHED INCHES; 1750 CFS-HRS; 144.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 70
INPUT HYDROGRAPHS 4,3 OUTPUT HYDROGRAPH 2

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.34	2825.2	(NULL)

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.10 WATERSHED INCHES; 6490 CFS-HRS; 536.4 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18
INPUT HYDROGRAPH 2 OUTPUT HYDROGRAPH 1
SURFACE ELEVATION = 1368.70
1

*** WARNING - DISCHARGE EXCEEDS HIGHEST RATING POINT FOR STRUCTURE 18,
VALUE EXTRAPOLATED. ***

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.13	1479.0	1372.48

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
8.10 WATERSHED INCHES; 6490 CFS-HRS; 536.3 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 6
1

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
RAINFALL OF 3.50 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
RAINTABLE NUMBER 2, ARC 2							
MAIN TIME INCREMENT .100 HOURS							
ALTERNATE 11 STORM 1							
XSECTION 5	RUNOFF	.20	2.34	---	12.24	219	1095.0
XSECTION 25	RUNOFF	.16	2.46	---	12.22	189	1181.3
XSECTION 30	ADDHYD	.35	2.39	---	12.23	408	1165.7
XSECTION 35	RUNOFF	.16	2.50	---	12.20	210	1312.5
XSECTION 40	ADDHYD	.52	2.42	---	12.22	617	1186.5
STRUCTURE 10	RESVOR	.52	2.42	1375.15	12.38	515	990.4
XSECTION 45	RUNOFF	.04	2.97	---	12.11	76	1900.0
XSECTION 50	ADDHYD	.56	2.47	---	12.35	554	989.3
XSECTION 53	RUNOFF	.15	2.53	---	12.23	176	1173.3
STRUCTURE 15	RESVOR	.15	2.51	1375.32	12.63	82	546.7
XSECTION 54	ADDHYD	.70	2.48	---	12.36	629	898.6
XSECTION 55	RUNOFF	.16	2.65	---	12.22	209	1306.3
XSECTION 60	ADDHYD	.87	2.51	---	12.31	819	941.4
XSECTION 61	RUNOFF	.03	2.94	---	12.03	58	1933.3
XSECTION 62	ADDHYD	.89	2.52	---	12.30	836	939.3
XSECTION 64	RUNOFF	.03	2.31	---	12.06	44	1466.7
STRUCTURE 17	RESVOR	.03	2.31	1382.04	12.42	12	400.0
XSECTION 66	RUNOFF	.32	2.19	---	12.52	238	743.8
XSECTION 67	ADDHYD	.35	2.20	---	12.51	249	711.4
XSECTION 70	ADDHYD	1.24	2.43	---	12.34	1057	852.4
STRUCTURE 18	RESVOR	1.24	2.43	1370.18	13.55	237	191.1
RAINFALL OF 4.55 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 12 STORM 2							
XSECTION 5	RUNOFF	.20	3.32	---	12.23	309	1545.0
XSECTION 25	RUNOFF	.16	3.45	---	12.22	263	1643.8

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 12 STORM 2							
XSECTION 30	ADDHYD	.35	3.38	---	12.22	572	1634.3
XSECTION 35	RUNOFF	.16	3.50	---	12.19	291	1818.8
XSECTION 40	ADDHYD	.52	3.42	---	12.21	861	1655.8
STRUCTURE 10	RESVOR	.52	3.42	1375.94	12.40	677	1301.9
XSECTION 45	RUNOFF	.04	4.01	---	12.11	100	2500.0
XSECTION 50	ADDHYD	.56	3.46	---	12.35	725	1294.6
XSECTION 53	RUNOFF	.15	3.53	---	12.23	245	1633.3
STRUCTURE 15	RESVOR	.15	3.51	1375.90	12.68	101	673.3
XSECTION 54	ADDHYD	.70	3.47	---	12.37	817	1167.1
XSECTION 55	RUNOFF	.16	3.67	---	12.22	285	1781.3
XSECTION 60	ADDHYD	.87	3.51	---	12.29	1076	1236.8
XSECTION 61	RUNOFF	.03	3.97	---	12.03	77	2566.7
XSECTION 62	ADDHYD	.89	3.52	---	12.27	1102	1238.2
XSECTION 64	RUNOFF	.03	3.29	---	12.05	61	2033.3
STRUCTURE 17	RESVOR	.03	3.29	1382.61	12.35	20	666.7
XSECTION 66	RUNOFF	.32	3.15	---	12.51	340	1062.5
XSECTION 67	ADDHYD	.35	3.16	---	12.51	359	1025.7
XSECTION 70	ADDHYD	1.24	3.42	---	12.34	1417	1142.7
STRUCTURE 18	RESVOR	1.24	3.42	1370.70	13.38	398	321.0

RAINFALL OF 5.25 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 13 STORM 3							
XSECTION 5	RUNOFF	.20	3.99	---	12.23	369	1845.0
XSECTION 25	RUNOFF	.16	4.12	---	12.22	313	1956.3
XSECTION 30	ADDHYD	.35	4.05	---	12.22	682	1948.6
XSECTION 35	RUNOFF	.16	4.18	---	12.19	344	2150.0
XSECTION 40	ADDHYD	.52	4.09	---	12.21	1024	1969.2
STRUCTURE 10	RESVOR	.52	4.09	1376.50	12.42	777	1494.2
XSECTION 45	RUNOFF	.04	4.70	---	12.11	117	2925.0

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 13 STORM 3							
XSECTION 50	ADDHYD	.56	4.14	---	12.36	829	1480.4
XSECTION 53	RUNOFF	.15	4.21	---	12.23	288	1920.0
STRUCTURE 15	RESVOR	.15	4.19	1376.28	12.71	112	746.7
XSECTION 54	ADDHYD	.70	4.15	---	12.38	932	1331.4
XSECTION 55	RUNOFF	.16	4.35	---	12.21	336	2100.0
XSECTION 60	ADDHYD	.87	4.18	---	12.30	1235	1419.5
XSECTION 61	RUNOFF	.03	4.66	---	12.02	90	3000.0
XSECTION 62	ADDHYD	.89	4.20	---	12.28	1263	1419.1
XSECTION 64	RUNOFF	.03	3.96	---	12.05	73	2433.3
STRUCTURE 17	RESVOR	.03	3.96	1382.99	12.34	26	866.7
XSECTION 66	RUNOFF	.32	3.81	---	12.51	412	1287.5
XSECTION 67	ADDHYD	.35	3.83	---	12.50	436	1245.7
XSECTION 70	ADDHYD	1.24	4.09	---	12.34	1652	1332.3
STRUCTURE 18	RESVOR	1.24	4.09	1371.04	13.29	519	418.5
RAINFALL OF 6.98 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 13 STORM 4							
XSECTION 5	RUNOFF	.20	5.66	---	12.23	516	2580.0
XSECTION 25	RUNOFF	.16	5.81	---	12.21	434	2712.5
XSECTION 30	ADDHYD	.35	5.73	---	12.22	949	2711.4
XSECTION 35	RUNOFF	.16	5.87	---	12.19	478	2987.5
XSECTION 40	ADDHYD	.52	5.77	---	12.21	1424	2738.5
STRUCTURE 10	RESVOR	.52	5.77	1377.75	12.45	981	1886.5
XSECTION 45	RUNOFF	.04	6.41	---	12.11	156	3900.0
XSECTION 50	ADDHYD	.56	5.82	---	12.38	1045	1866.1
XSECTION 53	RUNOFF	.15	5.90	---	12.22	399	2660.0
STRUCTURE 15	RESVOR	.15	5.88	1377.21	12.76	134	893.3
XSECTION 54	ADDHYD	.70	5.83	---	12.41	1168	1668.6
XSECTION 55	RUNOFF	.16	6.06	---	12.21	462	2887.5

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 13 STORM 4							
XSECTION 60	ADDHYD	.87	5.87	---	12.29	1577	1812.6
XSECTION 61	RUNOFF	.03	6.38	---	12.02	121	4033.3
XSECTION 62	ADDHYD	.89	5.89	---	12.27	1617	1816.9
XSECTION 64	RUNOFF	.03	5.63	---	12.05	103	3433.3
STRUCTURE 17	RESVOR	.03	5.62	1383.82	12.33	36	1200.0
XSECTION 66	RUNOFF	.32	5.46	---	12.50	583	1821.9
XSECTION 67	ADDHYD	.35	5.48	---	12.50	618	1765.7
XSECTION 70	ADDHYD	1.24	5.77	---	12.34	2168	1748.4
STRUCTURE 18	RESVOR	1.24	5.77	1371.69	13.14	954	769.4
RAINFALL OF 7.80 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 14 STORM 5							
XSECTION 5	RUNOFF	.20	6.46	---	12.23	586	2930.0
XSECTION 25	RUNOFF	.16	6.61	---	12.21	491	3068.8
XSECTION 30	ADDHYD	.35	6.53	---	12.22	1077	3077.1
XSECTION 35	RUNOFF	.16	6.68	---	12.19	537	3356.3
XSECTION 40	ADDHYD	.52	6.58	---	12.21	1611	3098.1
STRUCTURE 10	RESVOR	.52	6.57	1378.31	12.46	1071	2059.6
XSECTION 45	RUNOFF	.04	7.23	---	12.11	175	4375.0
XSECTION 50	ADDHYD	.56	6.63	---	12.40	1139	2033.9
XSECTION 53	RUNOFF	.15	6.71	---	12.22	449	2993.3
STRUCTURE 15	RESVOR	.15	6.68	1377.64	12.79	143	953.3
XSECTION 54	ADDHYD	.70	6.64	---	12.42	1272	1817.1
XSECTION 55	RUNOFF	.16	6.86	---	12.21	518	3237.5
XSECTION 60	ADDHYD	.87	6.68	---	12.29	1727	1985.1
XSECTION 61	RUNOFF	.03	7.19	---	12.02	136	4533.3
XSECTION 62	ADDHYD	.89	6.69	---	12.26	1773	1992.1
XSECTION 64	RUNOFF	.03	6.43	---	12.05	116	3866.7
STRUCTURE 17	RESVOR	.03	6.43	1384.20	12.33	41	1366.7

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 14 STORM 5							
XSECTION 66	RUNOFF	.32	6.26	---	12.50	663	2071.9
XSECTION 67	ADDHYD	.35	6.27	---	12.50	702	2005.7
XSECTION 70	ADDHYD	1.24	6.58	---	12.35	2400	1935.5
STRUCTURE 18	RESVOR	1.24	6.57	1371.98	13.13	1143	921.8
RAINFALL OF 9.35 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
ALTERNATE 15 STORM 6							
XSECTION 5	RUNOFF	.20	7.98	---	12.23	716	3580.0
XSECTION 25	RUNOFF	.16	8.15	---	12.21	601	3756.3
XSECTION 30	ADDHYD	.35	8.05	---	12.22	1317	3762.9
XSECTION 35	RUNOFF	.16	8.20	---	12.19	654	4087.5
XSECTION 40	ADDHYD	.52	8.10	---	12.21	1969	3786.5
STRUCTURE 10	RESVOR	.52	8.10	1379.30	12.49	1224	2353.8
XSECTION 45	RUNOFF	.04	8.78	---	12.11	211	5275.0
XSECTION 50	ADDHYD	.56	8.15	---	12.42	1300	2321.4
XSECTION 53	RUNOFF	.15	8.24	---	12.22	546	3640.0
STRUCTURE 15	RESVOR	.15	8.21	1378.46	12.82	160	1066.7
XSECTION 54	ADDHYD	.70	8.16	---	12.44	1447	2067.1
XSECTION 55	RUNOFF	.16	8.40	---	12.21	626	3912.5
XSECTION 60	ADDHYD	.87	8.21	---	12.29	2000	2298.9
XSECTION 61	RUNOFF	.03	8.74	---	12.02	164	5466.7
XSECTION 62	ADDHYD	.89	8.22	---	12.26	2056	2310.1
XSECTION 64	RUNOFF	.03	7.95	---	12.05	142	4733.3
STRUCTURE 17	RESVOR	.03	7.95	1384.93	12.33	50	1666.7
XSECTION 66	RUNOFF	.32	7.77	---	12.50	815	2546.9
XSECTION 67	ADDHYD	.35	7.79	---	12.49	862	2462.9
XSECTION 70	ADDHYD	1.24	8.10	---	12.34	2825	2278.2
STRUCTURE 18	RESVOR	1.24	8.10	1372.48	13.13	1479	1192.7

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
STRUCTURE 18		1.24					
	ALTERNATE 11		237	*********	*********	*********	*********
	ALTERNATE 12		*********	398	*********	*********	*********
	ALTERNATE 13		*********	*********	519	954	*********
	ALTERNATE 14		*********	*********	*********	*********	1143
STRUCTURE 17		.03					
	ALTERNATE 11		12	*********	*********	*********	*********
	ALTERNATE 12		*********	20	*********	*********	*********
	ALTERNATE 13		*********	*********	26	36	*********
	ALTERNATE 14		*********	*********	*********	*********	41
STRUCTURE 15		.15					
	ALTERNATE 11		82	*********	*********	*********	*********
	ALTERNATE 12		*********	101	*********	*********	*********
	ALTERNATE 13		*********	*********	112	134	*********
	ALTERNATE 14		*********	*********	*********	*********	143
STRUCTURE 10		.52					
	ALTERNATE 11		515	*********	*********	*********	*********
	ALTERNATE 12		*********	677	*********	*********	*********
	ALTERNATE 13		*********	*********	777	981	*********
	ALTERNATE 14		*********	*********	*********	*********	1071
XSECTION 5		.20					
	ALTERNATE 11		219	*********	*********	*********	*********
	ALTERNATE 12		*********	309	*********	*********	*********
	ALTERNATE 13		*********	*********	369	516	*********
	ALTERNATE 14		*********	*********	*********	*********	586
XSECTION 25		.16					
	ALTERNATE 11		189	*********	*********	*********	*********
	ALTERNATE 12		*********	263	*********	*********	*********
	ALTERNATE 13		*********	*********	313	434	*********
	ALTERNATE 14		*********	*********	*********	*********	491
XSECTION 30		.35					
	ALTERNATE 11		408	*********	*********	*********	*********
	ALTERNATE 12		*********	572	*********	*********	*********
	ALTERNATE 13		*********	*********	682	949	*********

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
XSECTION 30	.35					
ALTERNATE 14		*********	*********	*********	*********	1077
XSECTION 35	.16					
ALTERNATE 11		210	*********	*********	*********	*********
ALTERNATE 12		*********	291	*********	*********	*********
ALTERNATE 13		*********	*********	344	478	*********
ALTERNATE 14		*********	*********	*********	*********	537
XSECTION 40	.52					
ALTERNATE 11		617	*********	*********	*********	*********
ALTERNATE 12		*********	861	*********	*********	*********
ALTERNATE 13		*********	*********	1024	1424	*********
ALTERNATE 14		*********	*********	*********	*********	1611
XSECTION 45	.04					
ALTERNATE 11		76	*********	*********	*********	*********
ALTERNATE 12		*********	100	*********	*********	*********
ALTERNATE 13		*********	*********	117	156	*********
ALTERNATE 14		*********	*********	*********	*********	175
XSECTION 50	.56					
ALTERNATE 11		554	*********	*********	*********	*********
ALTERNATE 12		*********	725	*********	*********	*********
ALTERNATE 13		*********	*********	829	1045	*********
ALTERNATE 14		*********	*********	*********	*********	1139
XSECTION 53	.15					
ALTERNATE 11		176	*********	*********	*********	*********
ALTERNATE 12		*********	245	*********	*********	*********
ALTERNATE 13		*********	*********	288	399	*********
ALTERNATE 14		*********	*********	*********	*********	449
XSECTION 54	.70					
ALTERNATE 11		629	*********	*********	*********	*********
ALTERNATE 12		*********	817	*********	*********	*********
ALTERNATE 13		*********	*********	932	1168	*********
ALTERNATE 14		*********	*********	*********	*********	1272
XSECTION 55	.16					
ALTERNATE 11		209	*********	*********	*********	*********

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
XSECTION 55		.16					
	ALTERNATE 12		*********	285	*********	*********	*********
	ALTERNATE 13		*********	*********	336	462	*********
	ALTERNATE 14		*********	*********	*********	*********	518
XSECTION 60		.87					
	ALTERNATE 11		819	*********	*********	*********	*********
	ALTERNATE 12		*********	1076	*********	*********	*********
	ALTERNATE 13		*********	*********	1235	1577	*********
	ALTERNATE 14		*********	*********	*********	*********	1727
XSECTION 61		.03					
	ALTERNATE 11		58	*********	*********	*********	*********
	ALTERNATE 12		*********	77	*********	*********	*********
	ALTERNATE 13		*********	*********	90	121	*********
	ALTERNATE 14		*********	*********	*********	*********	136
XSECTION 62		.89					
	ALTERNATE 11		836	*********	*********	*********	*********
	ALTERNATE 12		*********	1102	*********	*********	*********
	ALTERNATE 13		*********	*********	1263	1617	*********
	ALTERNATE 14		*********	*********	*********	*********	1773
XSECTION 64		.03					
	ALTERNATE 11		44	*********	*********	*********	*********
	ALTERNATE 12		*********	61	*********	*********	*********
	ALTERNATE 13		*********	*********	73	103	*********
	ALTERNATE 14		*********	*********	*********	*********	116
XSECTION 66		.32					
	ALTERNATE 11		238	*********	*********	*********	*********
	ALTERNATE 12		*********	340	*********	*********	*********
	ALTERNATE 13		*********	*********	412	583	*********
	ALTERNATE 14		*********	*********	*********	*********	663
XSECTION 67		.35					
	ALTERNATE 11		249	*********	*********	*********	*********
	ALTERNATE 12		*********	359	*********	*********	*********
	ALTERNATE 13		*********	*********	436	618	*********
	ALTERNATE 14		*********	*********	*********	*********	702

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	4	5
XSECTION 70	1.24					
ALTERNATE 11		1057	*********	*********	*********	*********
ALTERNATE 12		*********	1417	*********	*********	*********
ALTERNATE 13		*********	*********	1652	2168	*********
ALTERNATE 14		*********	*********	*********	*********	2400

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 6
STRUCTURE 18	1.24	
ALTERNATE 15		1479
STRUCTURE 17	.03	
ALTERNATE 15		50
STRUCTURE 15	.15	
ALTERNATE 15		160
STRUCTURE 10	.52	
ALTERNATE 15		1224
XSECTION 5	.20	
ALTERNATE 15		716
XSECTION 25	.16	
ALTERNATE 15		601
XSECTION 30	.35	
ALTERNATE 15		1317
XSECTION 35	.16	
ALTERNATE 15		654
XSECTION 40	.52	
ALTERNATE 15		1969
XSECTION 45	.04	

```
   ALTERNATE   15                 211

 XSECTION   50          .56
 ---------------------------
   ALTERNATE   15                1300
1
```

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES
QUESTION MARK (?) AFTER: OUTFLOW PEAK - RISING TRUNCATED HYDROGRAPH.

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 6
XSECTION 53		.15	
	ALTERNATE 15		546
XSECTION 54		.70	
	ALTERNATE 15		1447
XSECTION 55		.16	
	ALTERNATE 15		626
XSECTION 60		.87	
	ALTERNATE 15		2000
XSECTION 61		.03	
	ALTERNATE 15		164
XSECTION 62		.89	
	ALTERNATE 15		2056
XSECTION 64		.03	
	ALTERNATE 15		142
XSECTION 66		.32	
	ALTERNATE 15		815
XSECTION 67		.35	
	ALTERNATE 15		862
XSECTION 70		1.24	
	ALTERNATE 15		2825

```
TR20 ------------------------------------------------------------------- SCS -
          WATERFRONT CURRENT/Future    EAST BRANCH GYPSUM CREEK 1/07    VERSION
01/05/** TC5.T20 50%(2) 20%(5) 10%(10) 5%(50) 1%(100) & .2%(500) ANNUAL2.04TEST



END OF  1 JOBS IN THIS RUN
```

```
                  SCS  TR-20,  VERSION 2.04TEST
                                FILES

    INPUT  = wtrftc5.t20                          , GIVEN DATA FILE
    OUTPUT = wtrftc5.OUT                          , DATED 01/05/**,16:20:13

             FILES GENERATED - DATED 01/05/**,16:20:13

                               NONE!


           TOTAL NUMBER OF WARNINGS =   4,  MESSAGES =   0

                     *** TR-20 RUN COMPLETED ***
```

Appendix I

Post-Project CN and T_c Calculations

Time of Concentration Calculations by the FAA method

The Waterfront Addition - Post-Project Conditions Calcuations

$$T_c = \frac{(1.1-C)L^{1/2}}{100\ S^{1/3}}$$

Area Name	Land Use	Soil Group	Maximum Elevation	Minimum Elevation	Length (L)	Rational Runoff Coefficient, C				Time of Concentration (min), T_c				Time of Concentration (hr), T_c				CN
						2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	
005	*Business - Neighborhood*	*D*	*1405.0*	*1375.0*	*3800*	0.68	0.69	0.73	0.80	50.4	49.2	44.4	36.0	0.8404	0.8204	0.7403	0.6003	88.8
025	*Business - Neighborhood*	*D*	*1405.0*	*1375.0*	*3600*	0.68	0.69	0.73	0.80	48.2	47.1	42.5	34.4	0.8034	0.7842	0.7077	0.5738	90.1
035	*Business - Neighborhood*	*D*	*1390.0*	*1370.0*	*2800*	0.68	0.69	0.73	0.80	44.8	43.7	39.4	32.0	0.7459	0.7281	0.6571	0.5328	90.6
045	*Business - Neighborhood*	*D*	*1390.0*	*1369.0*	*2000*	0.68	0.69	0.73	0.80	33.3	32.5	29.3	23.8	0.5544	0.5412	0.4884	0.3960	95.3
053	*Business - Neighborhood*	*D*	*1390.0*	*1373.0*	*3000*	0.68	0.69	0.73	0.80	50.0	48.8	44.1	35.7	0.8340	0.8141	0.7347	0.5957	90.9
055	*Business - Neighborhood*	*D*	*1385.0*	*1369.0*	*2800*	0.68	0.69	0.73	0.80	48.2	47.1	42.5	34.4	0.8034	0.7843	0.7078	0.5739	92.2
064	*Business - Neighborhood*	*D*	*1400.0*	*1384.0*	*1200*	0.68	0.69	0.73	0.80	23.8	23.2	21.0	17.0	0.3966	0.3871	0.3494	0.2833	88.5
066	*Undeveloped Urban*	*D*	*1400.0*	*1369.0*	*5000*	0.52	0.54	0.59	0.68	86.6	83.6	76.1	62.7	1.4429	1.3931	1.2687	1.0448	87.1

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 005

Total Area = 125.0 Acres
Total Area = 0.1953 sq. mi.
Composite Curve Number = 88.77

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	20.2 84
Commercial and business	85	89	92	94	26.4 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	14.1 92
Residential - 1/4 acre	38	61	75	83	64.2 87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 025

Total Area = 100.2 Acres
Total Area = 0.1566 sq. mi.
Composite Curve Number = 90.14

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	84
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 035

Total Area = 104.8 Acres
Total Area = 0.1638 sq. mi.
Composite Curve Number = 90.62

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0				
		72	81	88	91
Cultivated land with conservation treatement	0				
		62	71	78	81
Pasture or range land - poor condition	0				
		68	79	86	89
Pasture or range land - good condition	0				
		39	61	74	80
Meadow - good condition	0				
		30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0				
		45	66	77	83
Wood or Forest land - good cover	0				
		25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0				
		39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0				17.9
		49	69	79	84
Commercial and business	85				50.5
		89	92	94	95
Industrial	72				
		81	88	91	93
Residential - 1/8 acre or less	65				
		77	85	90	92
Residential - 1/4 acre	38				34.2
		61	75	83	87
Residentail - 1/3 acre	30				
		57	72	81	86
Residential - 1/2 acre	25				
		54	70	80	85
Residentail - 1 acre	20				
		51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-				
		98	98	98	98
Streets and roads - paved with curbs and storm sewers	-				
		98	98	98	98
Streets and roads - gravel	-				
		76	85	89	91
Streets and roads - dirt	-				
		72	82	87	89
Lake/Pond	100				2.2
		100	100	100	100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 045

Total Area = 27.6 Acres
Total Area = 0.0431 sq. mi.
Composite Curve Number = 95.33

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	84
Commercial and business	85	89	92	94	25.8 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	1.8 100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 053

Total Area = 93.1 Acres
Total Area = 0.1455 sq. mi.
Composite Curve Number = 90.87

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	36.2 84
Commercial and business	85	89	92	94	54.1 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	2.8 100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 055

Total Area = 103.3 Acres
Total Area = 0.1614 sq. mi.
Composite Curve Number = 92.19

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	84
Commercial and business	85	89	92	94	40.5 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	46.5 87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	16.3 100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 064

Total Area = 16.9 Acres
Total Area = 0.0264 sq. mi.
Composite Curve Number = 88.49

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	10.0 84
Commercial and business	85	89	92	94	6.9 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	100

Project Name: The Waterfront Addition - Post-Project
Project Number: 02014
Basin: TR-20 066

Total Area = 208.4 Acres
Total Area = 0.3256 sq. mi.
Composite Curve Number = 87.08

Land Use	Percent Impervious	Area/CN Hydrological Soil Group			
		A	B	C	D
Cultivated land without conservation treatment	0	72	81	88	91
Cultivated land with conservation treatement	0	62	71	78	81
Pasture or range land - poor condition	0	68	79	86	89
Pasture or range land - good condition	0	39	61	74	80
Meadow - good condition	0	30	58	71	78
Wood or Forest land - thin stand, poor cover, no mulch	0	45	66	77	83
Wood or Forest land - good cover	0	25	55	70	77
Open spaces - good condition - grass cover on 75% or more of area	0	39	61	74	80
Open spaces - fair condition - grass cover on 50-75% of area	0	49	69	79	164.4 84
Commercial and business	85	89	92	94	12.5 95
Industrial	72	81	88	91	93
Residential - 1/8 acre or less	65	77	85	90	92
Residential - 1/4 acre	38	61	75	83	87
Residentail - 1/3 acre	30	57	72	81	86
Residential - 1/2 acre	25	54	70	80	85
Residentail - 1 acre	20	51	68	79	84
Paved Parking lots, roofs, driveways, etc.	-	98	98	98	98
Streets and roads - paved with curbs and storm sewers	-	98	98	98	98
Streets and roads - gravel	-	76	85	89	91
Streets and roads - dirt	-	72	82	87	89
Lake/Pond	100	100	100	100	31.5 100

Appendix J

13th Street Hydraflow Hydrographs Output

Table of Contents

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	SCS Runoff	-------	-------	78.30	-------	116.81	142.82	-------	-------	238.52	Pre-Project to 13th Street
3	SCS Runoff	-------	-------	27.36	-------	37.62	44.28	-------	-------	68.33	Post-Project Commercial to 13th St
4	SCS Runoff	-------	-------	19.67	-------	27.04	31.83	-------	-------	49.11	Post-Project Commercial to Comm
5	SCS Runoff	-------	-------	17.09	-------	25.60	31.28	-------	-------	52.14	Undeveloped to Commercial Detenti
6	SCS Runoff	-------	-------	48.36	-------	72.45	88.51	-------	-------	147.54	Undeveloped to 13th Street Undetai
7	Combine	4, 5,	-------	34.83	-------	49.81	59.69	-------	-------	95.72	To Commercial Detention
8	Reservoir	7	-------	10.49	-------	18.34	23.85	-------	-------	38.26	Commercial Detention
9	Combine	3, 6, 8	-------	77.95	-------	116.84	142.91	-------	-------	238.35	To 13th Street

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	78.30	6	738	9.039	----	------	------	Pre-Project to 13th Street
3	SCS Runoff	27.36	6	720	1.963	----	------	------	Post-Project Commercial to 13th St
4	SCS Runoff	19.67	6	720	1.411	----	------	------	Post-Project Commercial to Comm
5	SCS Runoff	17.09	6	726	1.599	----	------	------	Undeveloped to Commercial Detenti
6	SCS Runoff	48.36	6	726	4.526	----	------	------	Undeveloped to 13th Street Undetai
7	Combine	34.83	6	726	3.011	4, 5,	------	------	To Commercial Detention
8	Reservoir	10.49	6	750	3.009	7	1381.97	1.345	Commercial Detention
9	Combine	77.95	6	726	9.499	3, 6, 8	------	------	To 13th Street

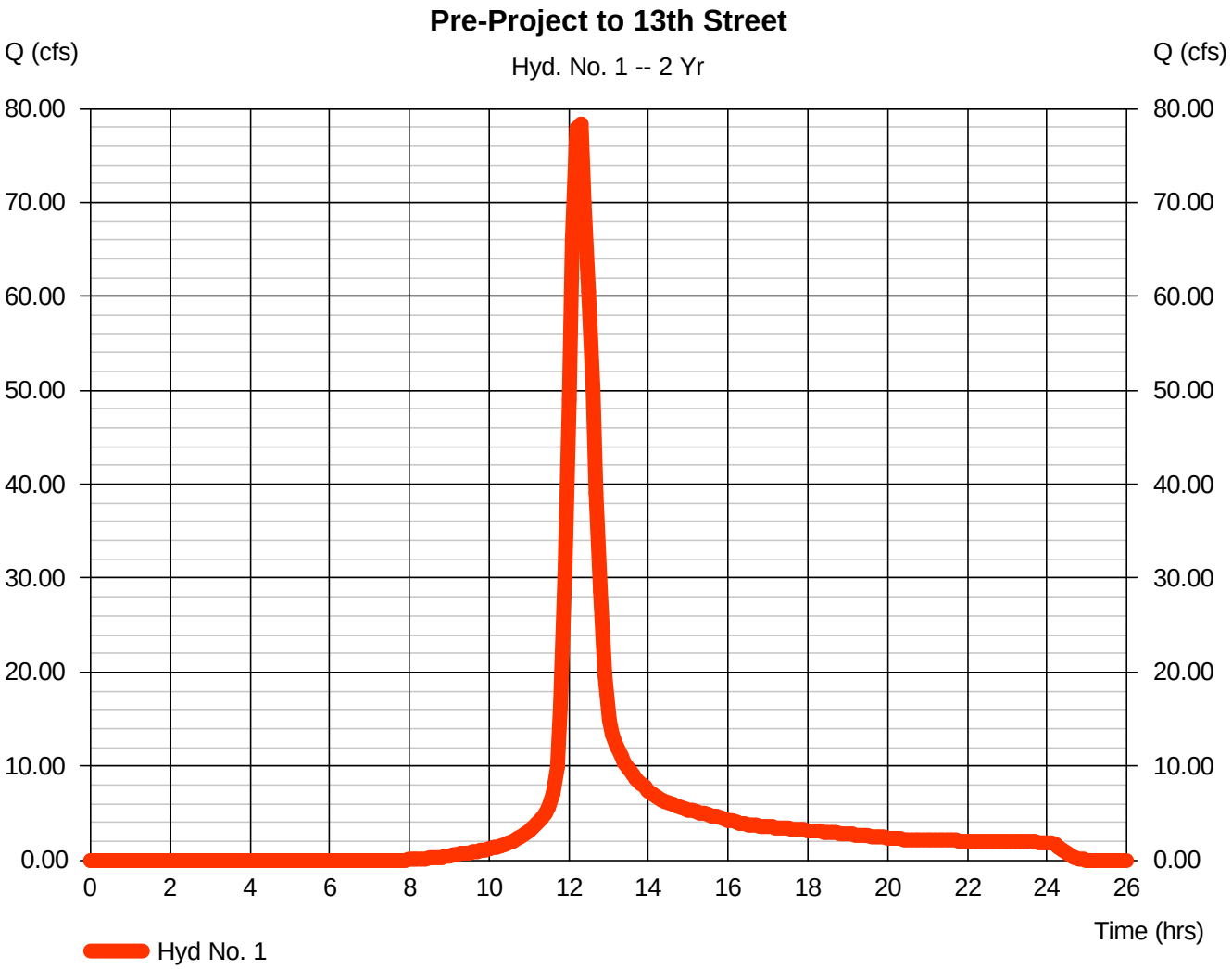
Hydrograph Plot

Hyd. No. 1

Pre-Project to 13th Street

Hydrograph type	= SCS Runoff	Peak discharge	= 78.30 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 54.800 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 30.60 min
Total precip.	= 3.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 9.039 acft



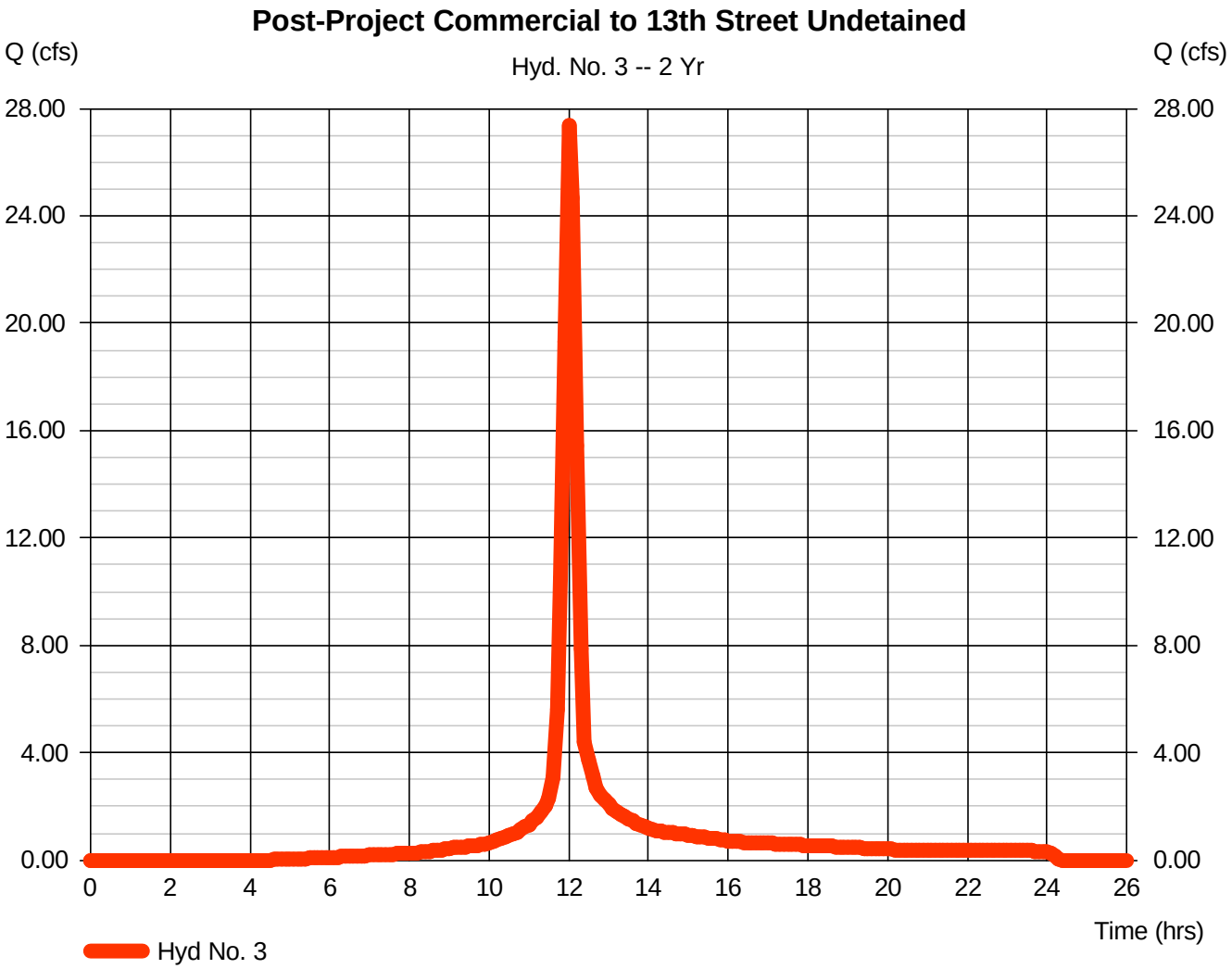
Hydrograph Plot

Hyd. No. 3

Post-Project Commercial to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 27.36 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 9.600 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.963 acft



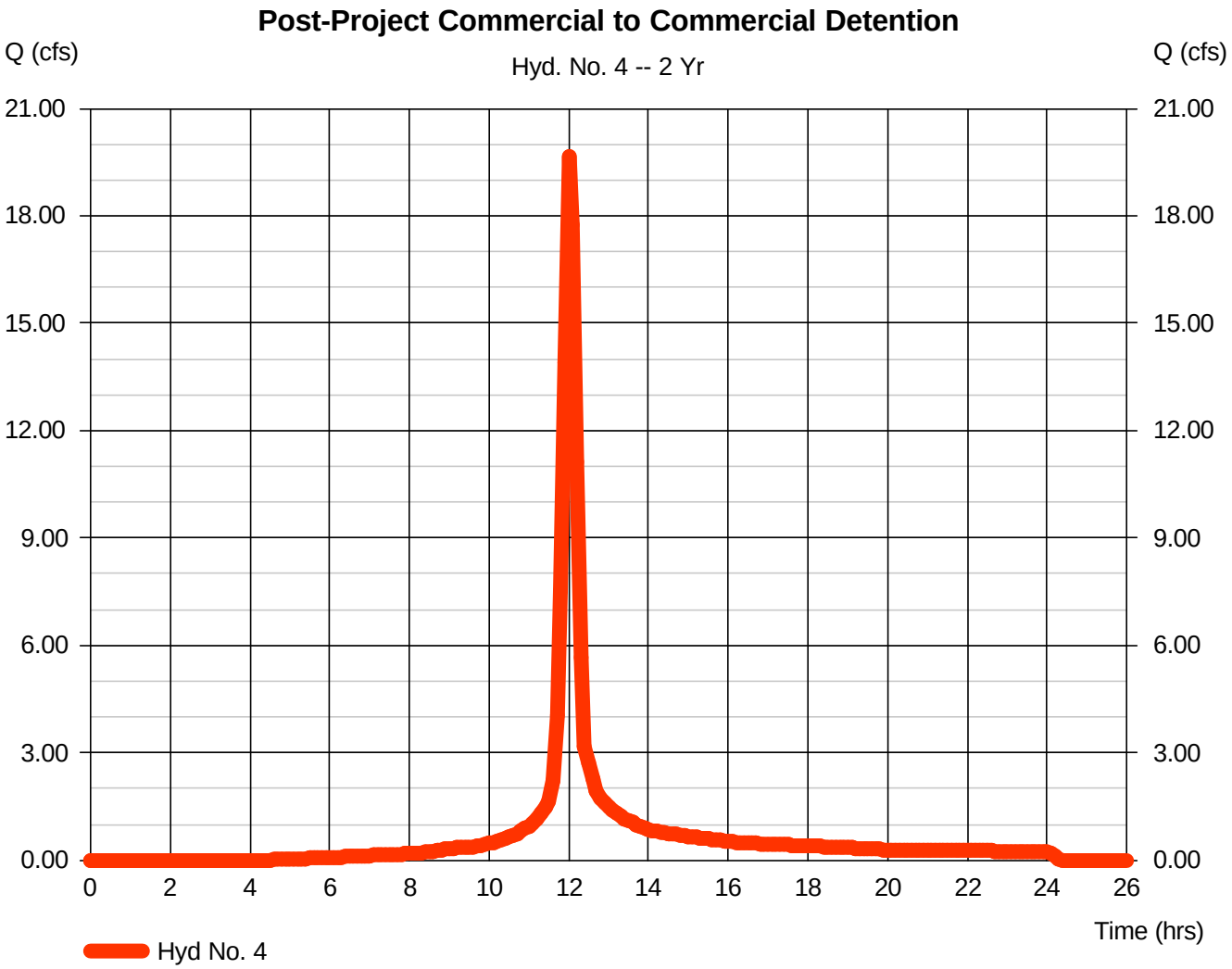
Hydrograph Plot

Hyd. No. 4

Post-Project Commercial to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 19.67 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 6.900 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.411 acft



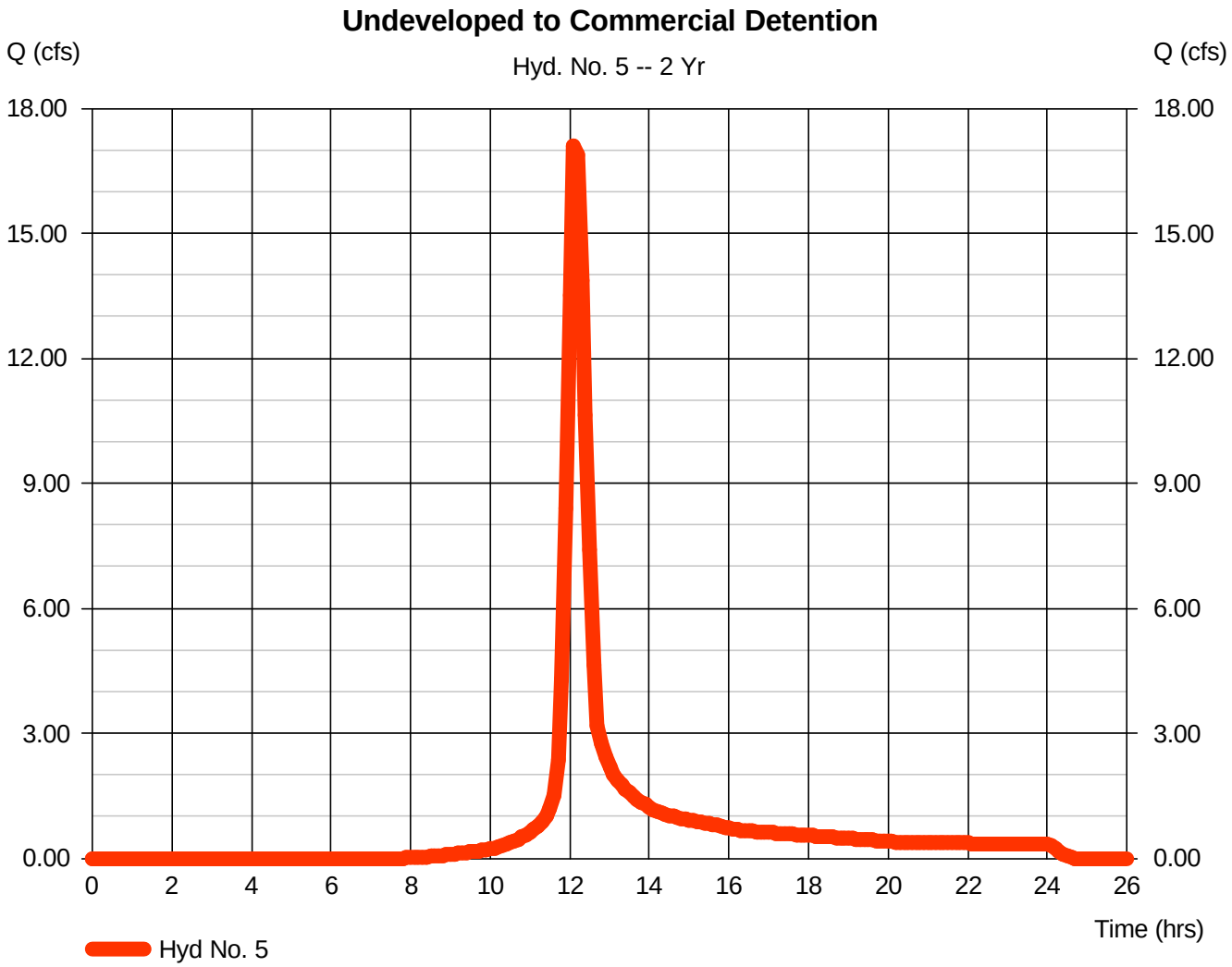
Hydrograph Plot

Hyd. No. 5

Undeveloped to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 17.09 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 10.000 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 3.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.599 acft



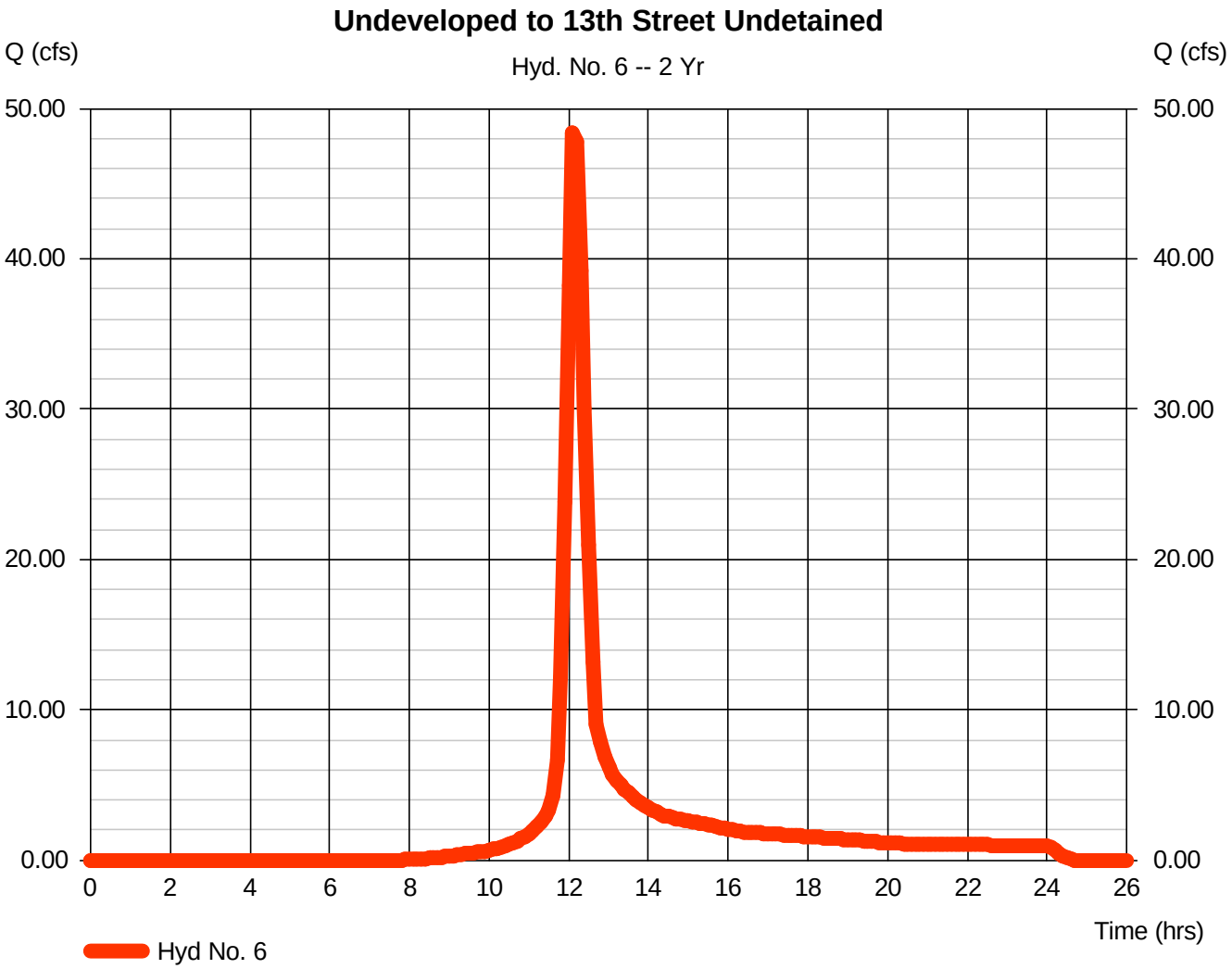
Hydrograph Plot

Hyd. No. 6

Undeveloped to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 48.36 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 28.300 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 3.48 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.526 acft



Hydrograph Plot

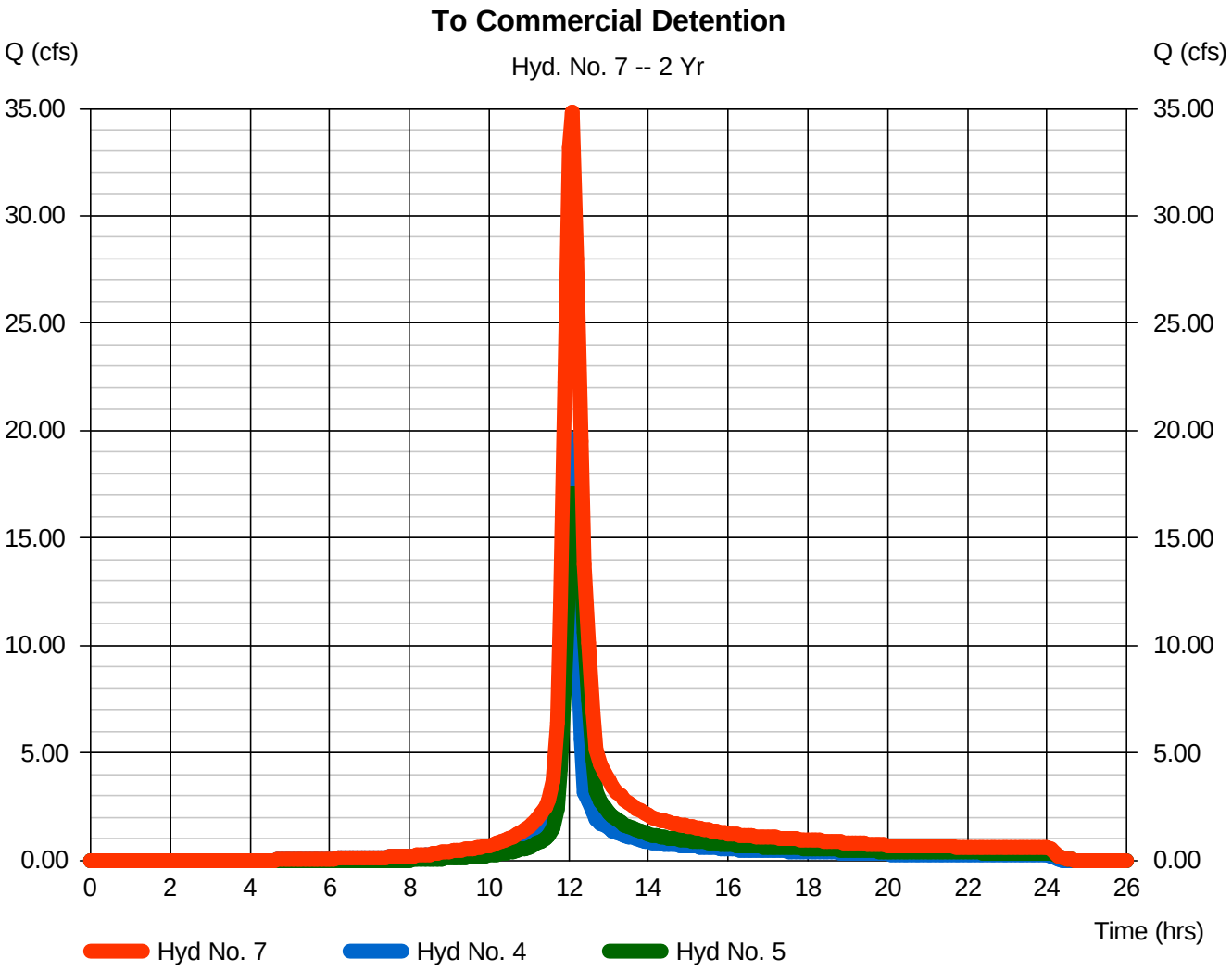
Hyd. No. 7

To Commercial Detention

Hydrograph type = Combine
Storm frequency = 2 yrs
Inflow hyds. = 4, 5

Peak discharge = 34.83 cfs
Time interval = 6 min

Hydrograph Volume = 3.011 acft



Hydrograph Plot

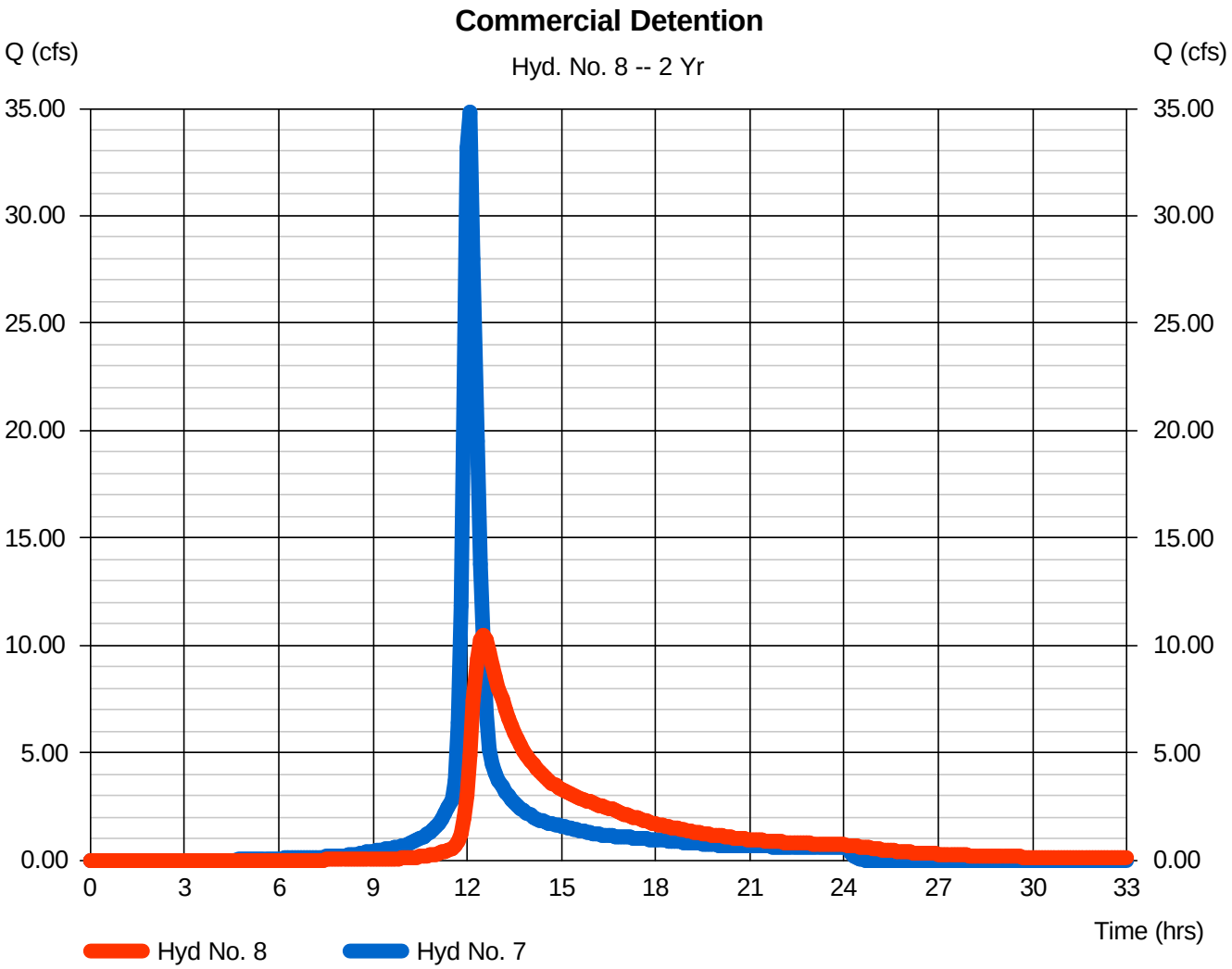
Hydraflow Hydrographs by Intelisolve | Saturday, Jan 6 2007, 11:31 AM

Hyd. No. 8

Commercial Detention

Hydrograph type	=	Reservoir	Peak discharge	=	10.49 cfs
Storm frequency	=	2 yrs	Time interval	=	6 min
Inflow hyd. No.	=	7	Max. Elevation	=	1381.97 ft
Reservoir name	=	Commercial	Max. Storage	=	1.345 acft

Storage Indication method used. | Hydrograph Volume = 3.009 acft



Pond Report

Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Pond No. 1 - Commercial

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1380.00	24,000	0.000	0.000
1.00	1381.00	29,800	0.618	0.618
2.00	1382.00	35,600	0.751	1.368
3.00	1383.00	41,800	0.888	2.257
4.00	1384.00	48,000	1.031	3.287

Culvert / Orifice Structures

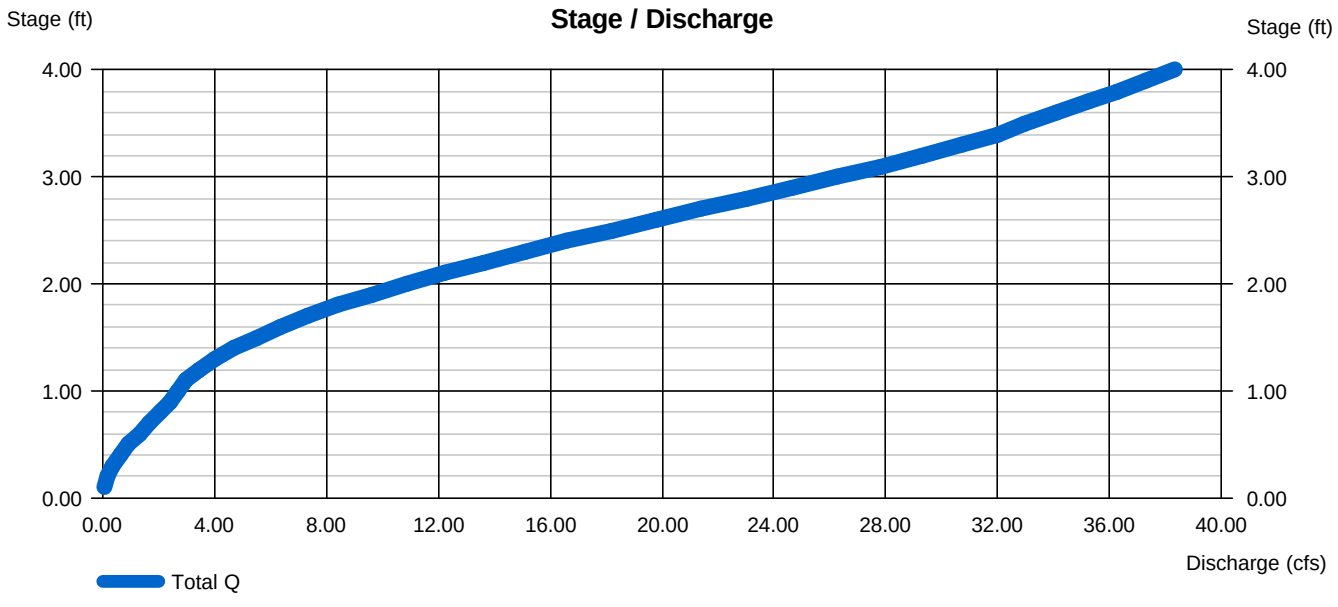
	[A]	[B]	[C]	[D]
Rise (in)	= 12.00	30.00	0.00	0.00
Span (in)	= 12.00	30.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1380.00	1381.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

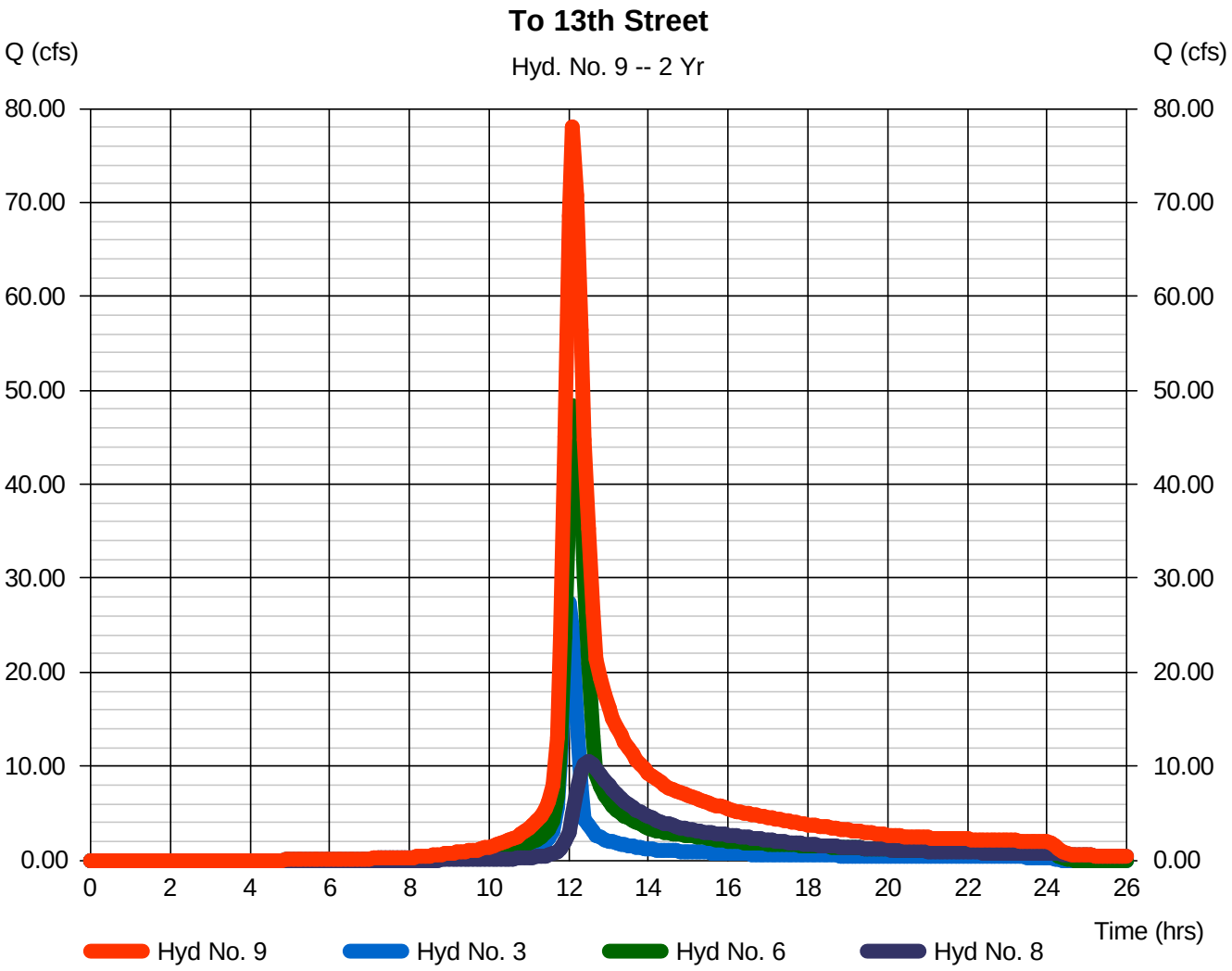
Hyd. No. 9

To 13th Street

Hydrograph type = Combine
Storm frequency = 2 yrs
Inflow hyds. = 3, 6, 8

Peak discharge = 77.95 cfs
Time interval = 6 min

Hydrograph Volume = 9.499 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	116.81	6	732	13.476	----	------	------	Pre-Project to 13th Street
3	SCS Runoff	37.62	6	720	2.738	----	------	------	Post-Project Commercial to 13th St
4	SCS Runoff	27.04	6	720	1.968	----	------	------	Post-Project Commercial to Comm
5	SCS Runoff	25.60	6	726	2.385	----	------	------	Undeveloped to Commercial Detenti
6	SCS Runoff	72.45	6	726	6.749	----	------	------	Undeveloped to 13th Street Undetai
7	Combine	49.81	6	726	4.353	4, 5,	------	------	To Commercial Detention
8	Reservoir	18.34	6	744	4.351	7	1382.51	1.821	Commercial Detention
9	Combine	116.84	6	726	13.838	3, 6, 8	------	------	To 13th Street

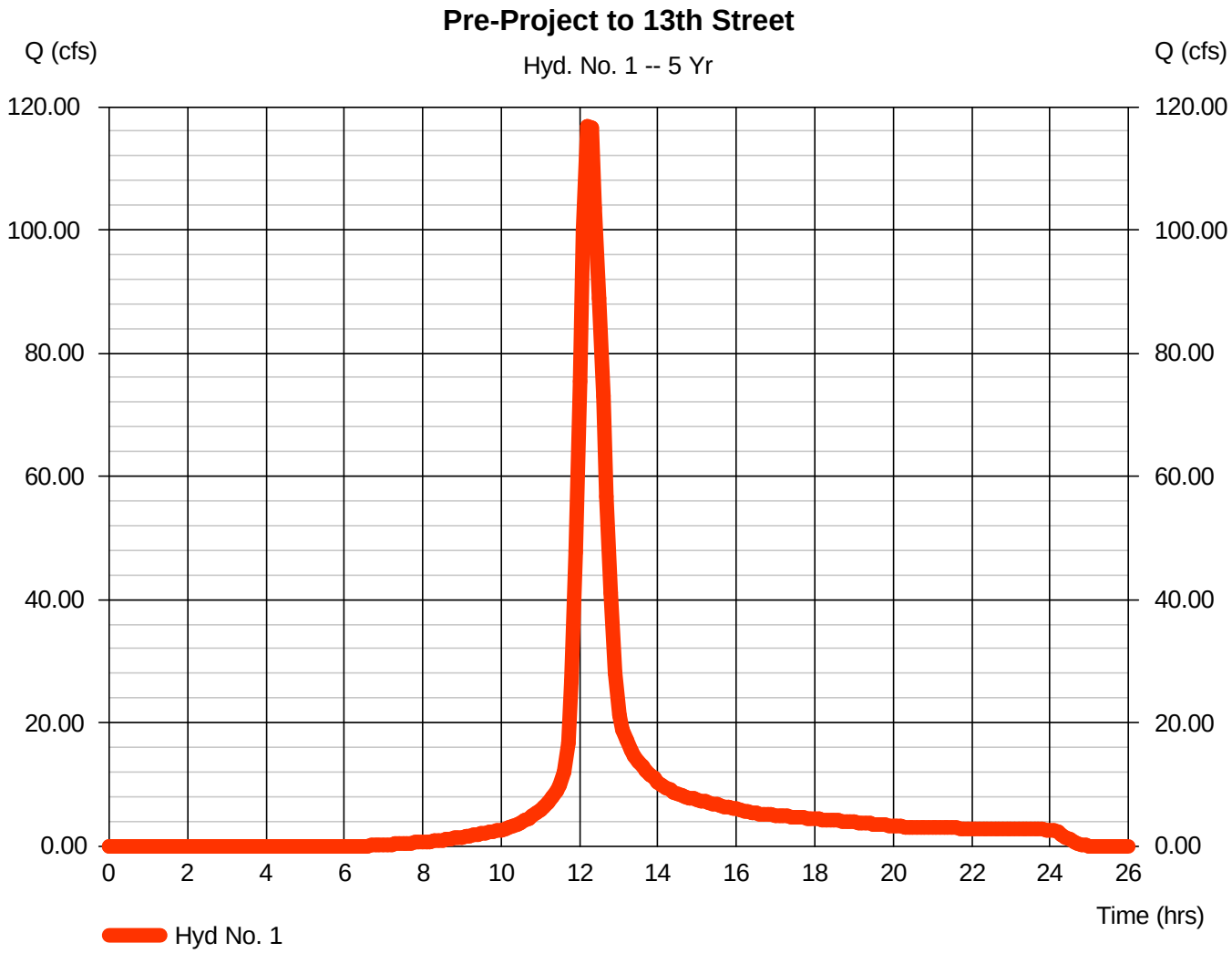
Hydrograph Plot

Hyd. No. 1

Pre-Project to 13th Street

Hydrograph type	= SCS Runoff	Peak discharge	= 116.81 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 54.800 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 30.60 min
Total precip.	= 4.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 13.476 acft



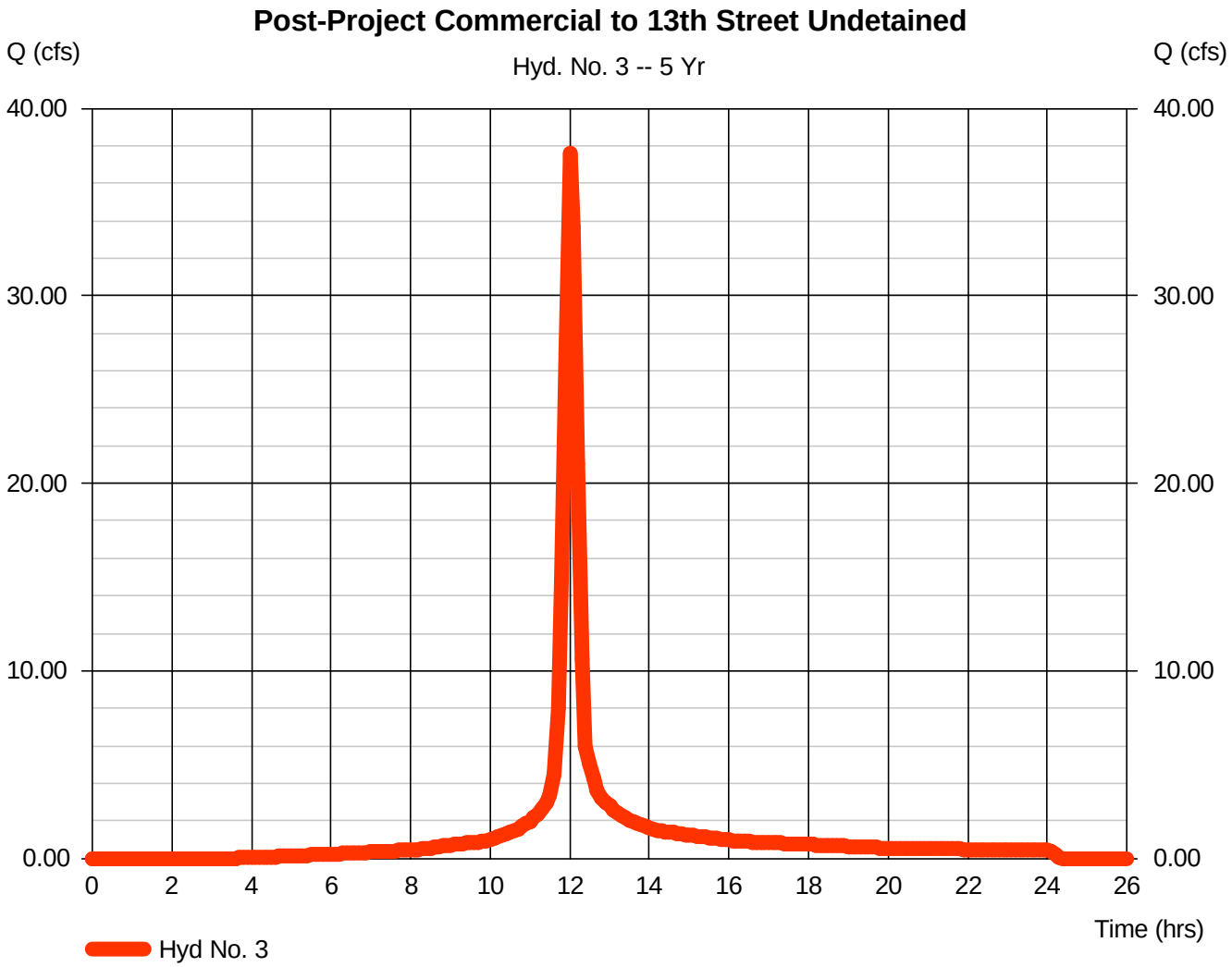
Hydrograph Plot

Hyd. No. 3

Post-Project Commercial to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 37.62 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 9.600 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.738 acft



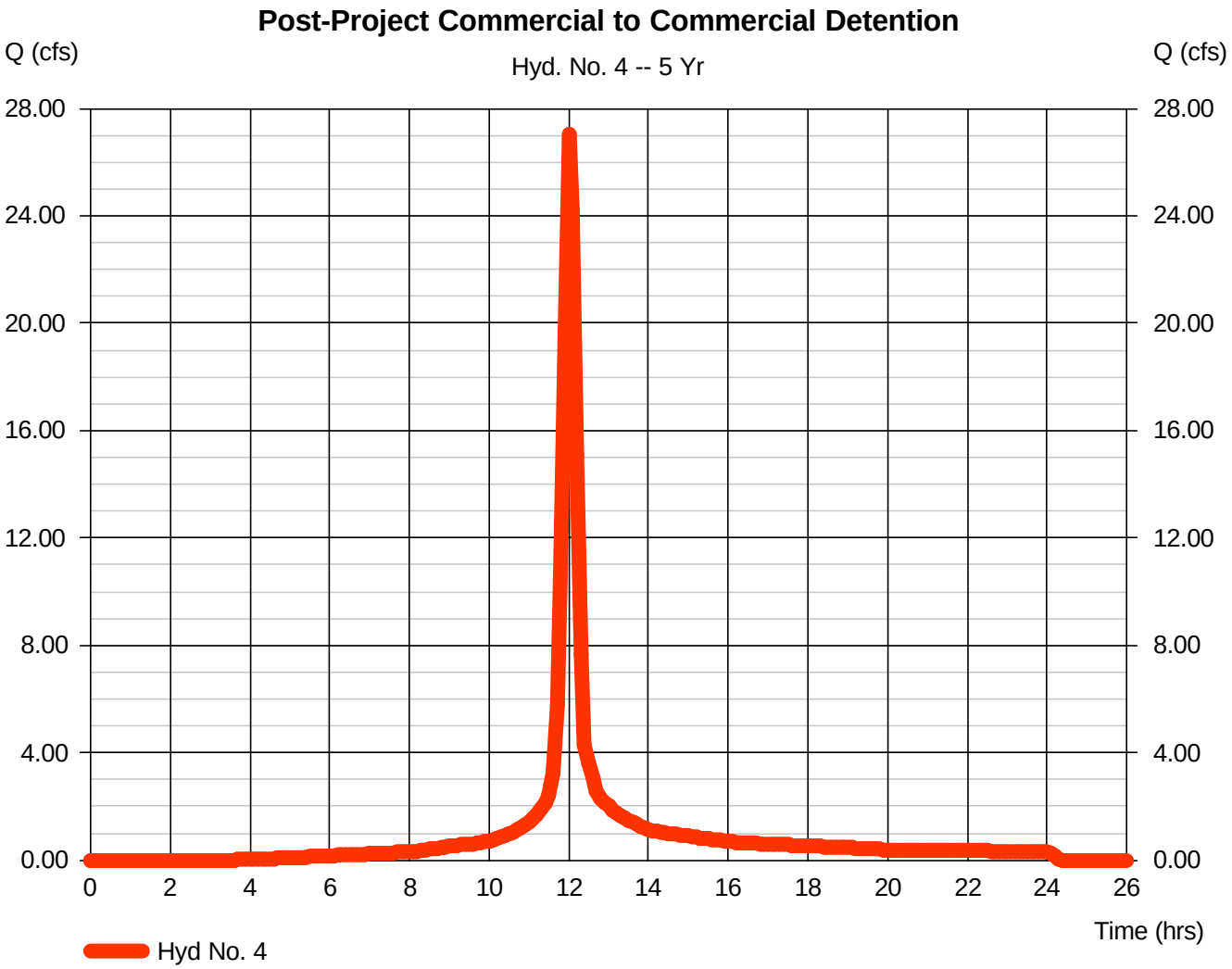
Hydrograph Plot

Hyd. No. 4

Post-Project Commercial to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 27.04 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 6.900 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.968 acft



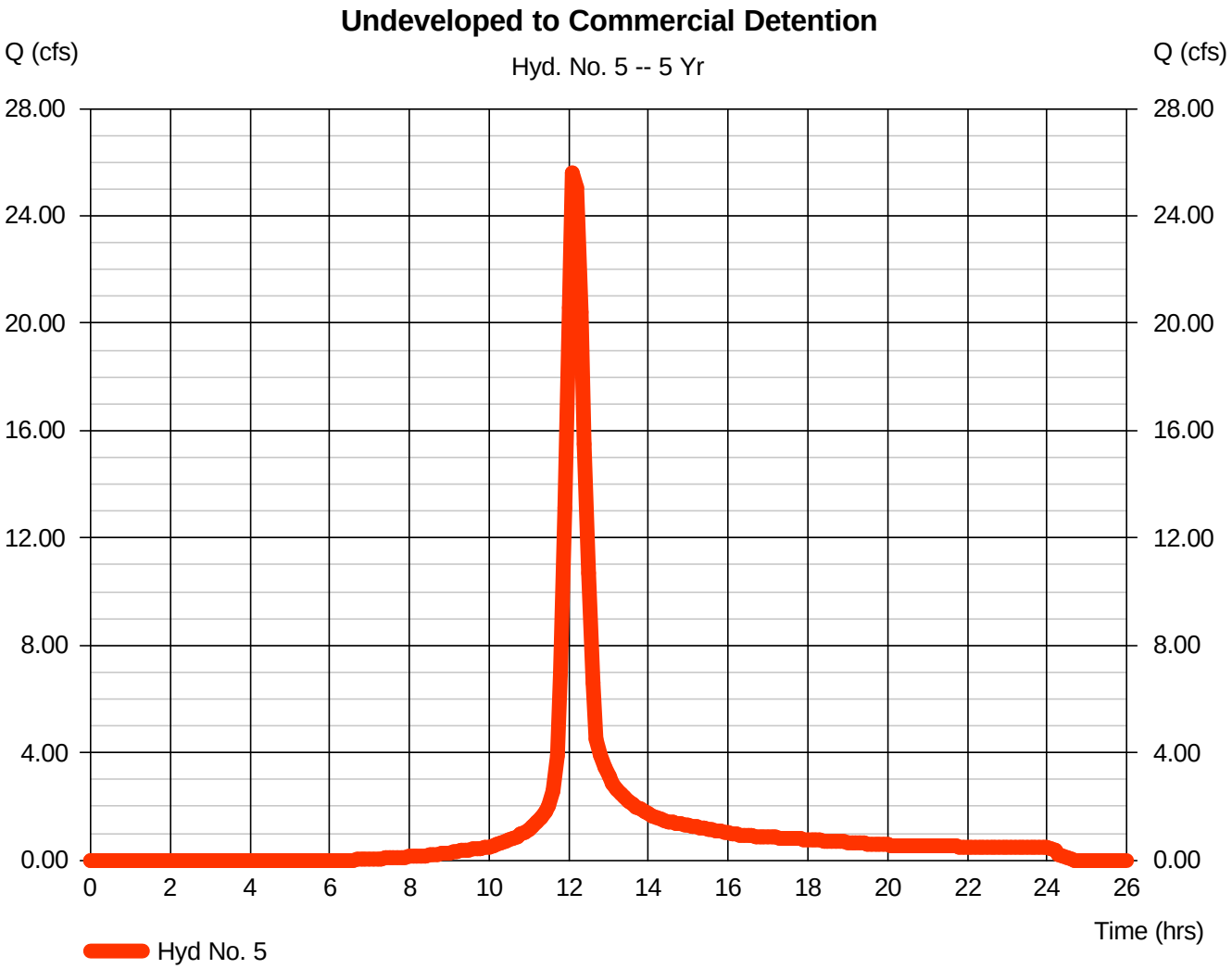
Hydrograph Plot

Hyd. No. 5

Undeveloped to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 25.60 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 10.000 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 4.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.385 acft



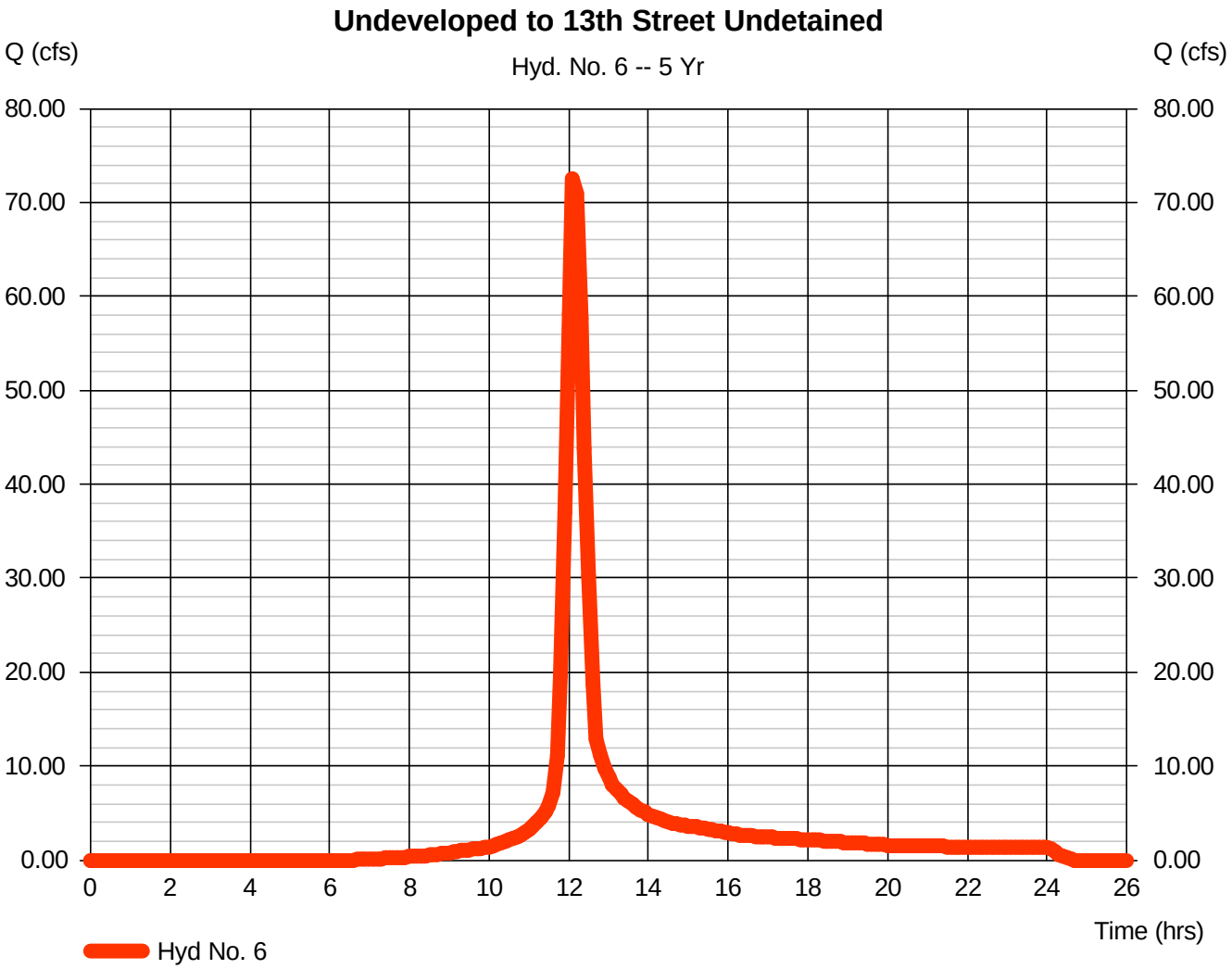
Hydrograph Plot

Hyd. No. 6

Undeveloped to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 72.45 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 28.300 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 4.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 6.749 acft



Hydrograph Plot

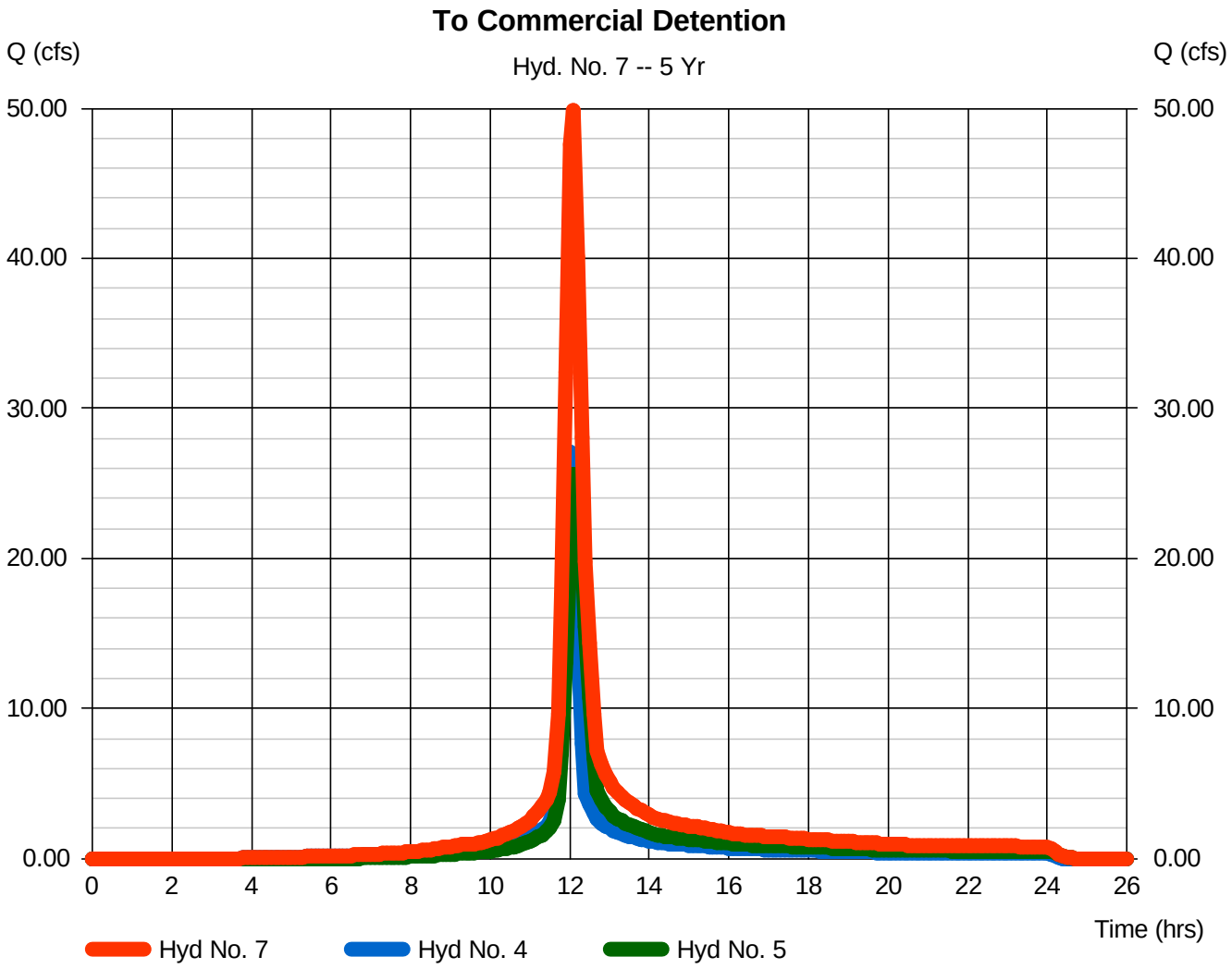
Hyd. No. 7

To Commercial Detention

Hydrograph type = Combine
Storm frequency = 5 yrs
Inflow hyds. = 4, 5

Peak discharge = 49.81 cfs
Time interval = 6 min

Hydrograph Volume = 4.353 acft



Hydrograph Plot

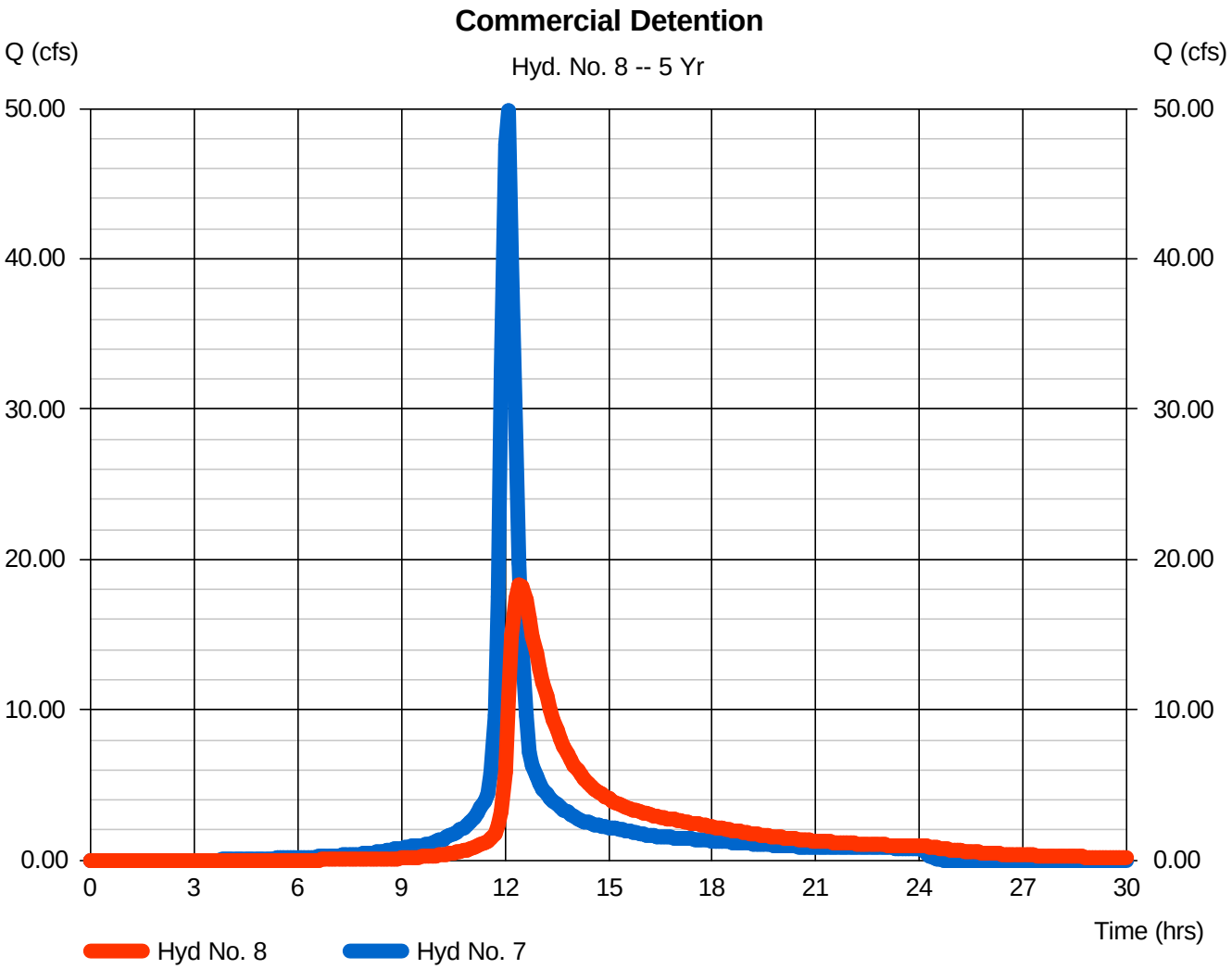
Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Hyd. No. 8

Commercial Detention

Hydrograph type	=	Reservoir	Peak discharge	=	18.34 cfs
Storm frequency	=	5 yrs	Time interval	=	6 min
Inflow hyd. No.	=	7	Max. Elevation	=	1382.51 ft
Reservoir name	=	Commercial	Max. Storage	=	1.821 acft

Storage Indication method used. — Hydrograph Volume = 4.351 acft



Pond Report

Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Pond No. 1 - Commercial

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1380.00	24,000	0.000	0.000
1.00	1381.00	29,800	0.618	0.618
2.00	1382.00	35,600	0.751	1.368
3.00	1383.00	41,800	0.888	2.257
4.00	1384.00	48,000	1.031	3.287

Culvert / Orifice Structures

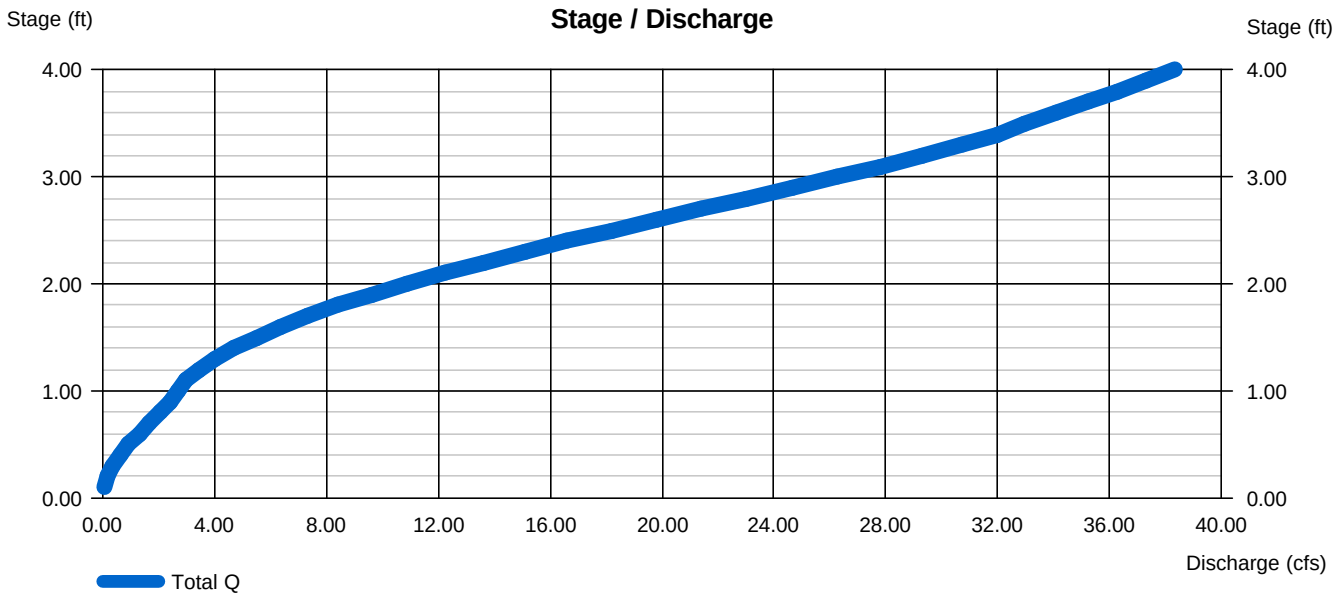
	[A]	[B]	[C]	[D]
Rise (in)	= 12.00	30.00	0.00	0.00
Span (in)	= 12.00	30.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1380.00	1381.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

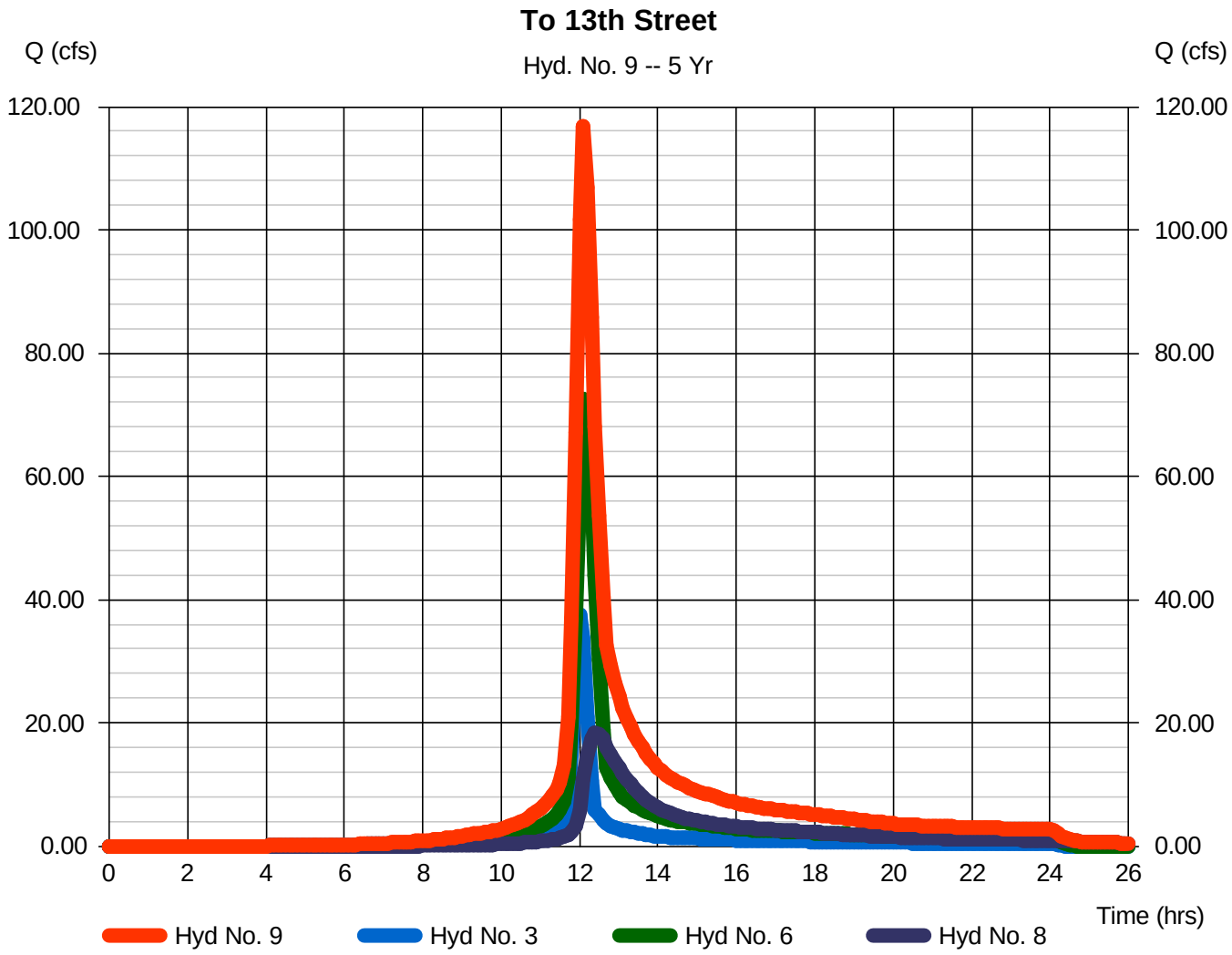
Hyd. No. 9

To 13th Street

Hydrograph type = Combine
Storm frequency = 5 yrs
Inflow hyds. = 3, 6, 8

Peak discharge = 116.84 cfs
Time interval = 6 min

Hydrograph Volume = 13.838 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	142.82	6	732	16.482	----	------	------	Pre-Project to 13th Street
3	SCS Runoff	44.28	6	720	3.250	----	------	------	Post-Project Commercial to 13th St
4	SCS Runoff	31.83	6	720	2.336	----	------	------	Post-Project Commercial to Comm
5	SCS Runoff	31.28	6	726	2.917	----	------	------	Undeveloped to Commercial Detenti
6	SCS Runoff	88.51	6	726	8.254	----	------	------	Undeveloped to 13th Street Undetai
7	Combine	59.69	6	726	5.253	4, 5,	------	------	To Commercial Detention
8	Reservoir	23.85	6	744	5.251	7	1382.85	2.124	Commercial Detention
9	Combine	142.91	6	726	16.756	3, 6, 8	------	------	To 13th Street

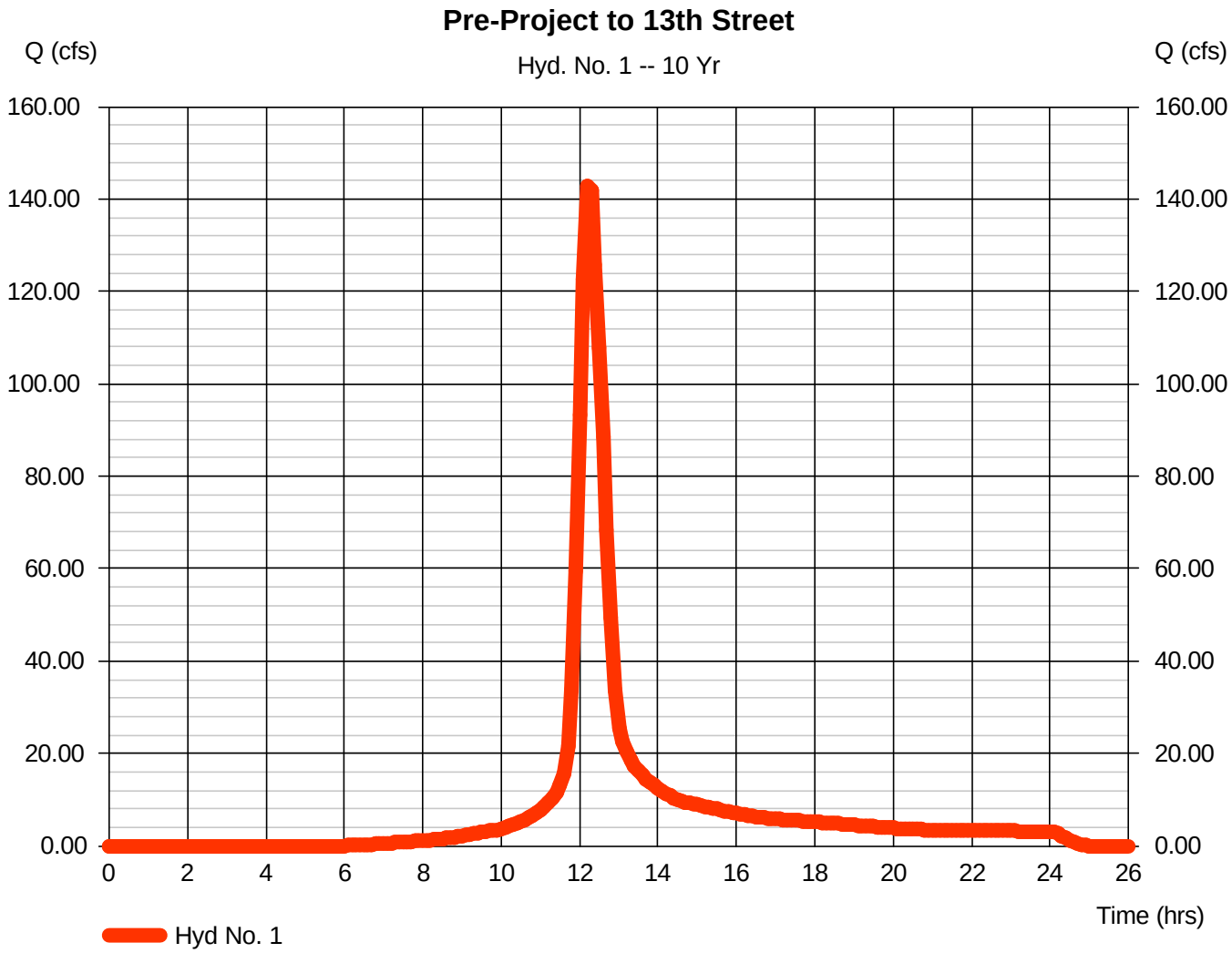
Hydrograph Plot

Hyd. No. 1

Pre-Project to 13th Street

Hydrograph type	= SCS Runoff	Peak discharge	= 142.82 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 54.800 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 30.60 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 16.482 acft



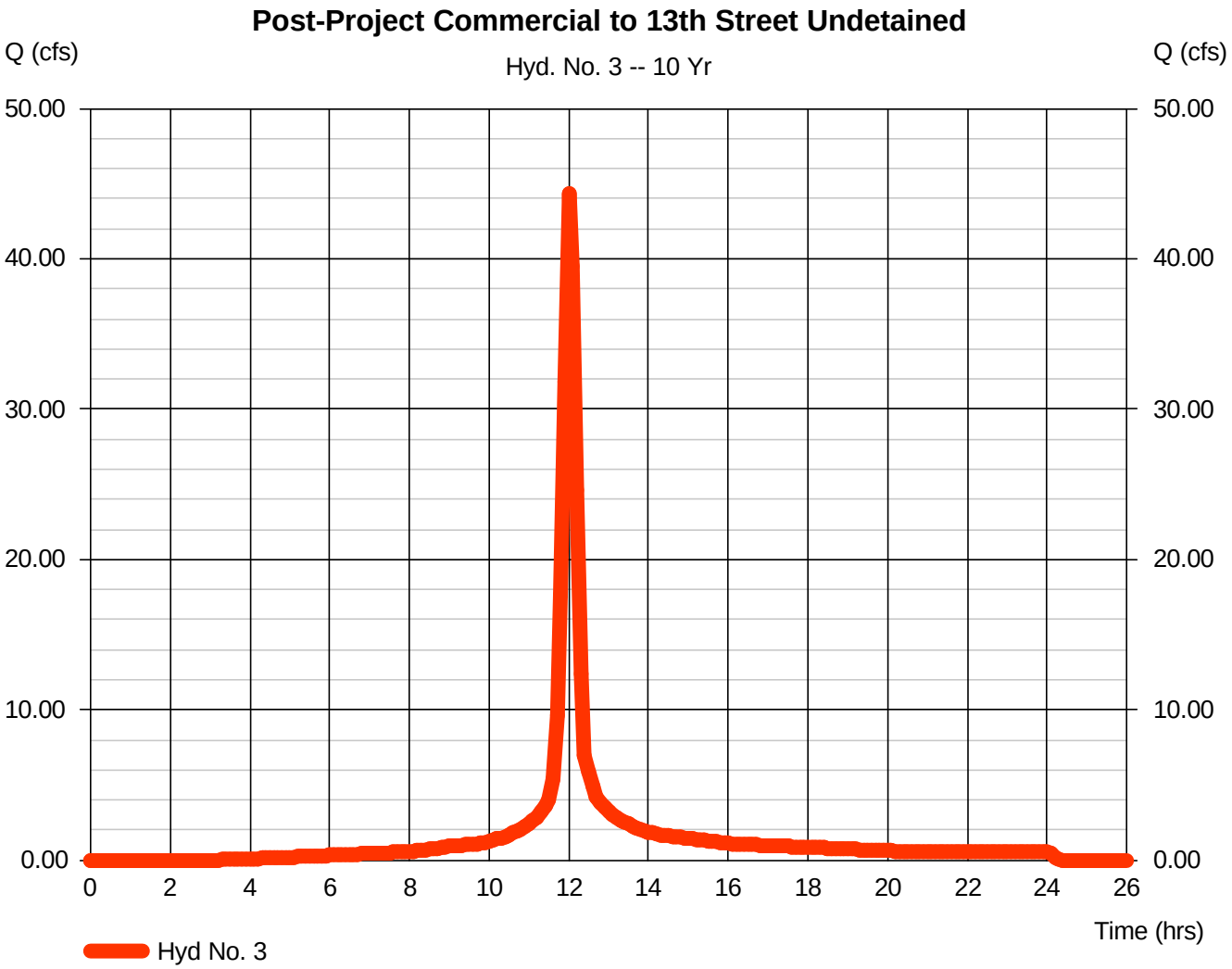
Hydrograph Plot

Hyd. No. 3

Post-Project Commercial to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 44.28 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 9.600 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 3.250 acft



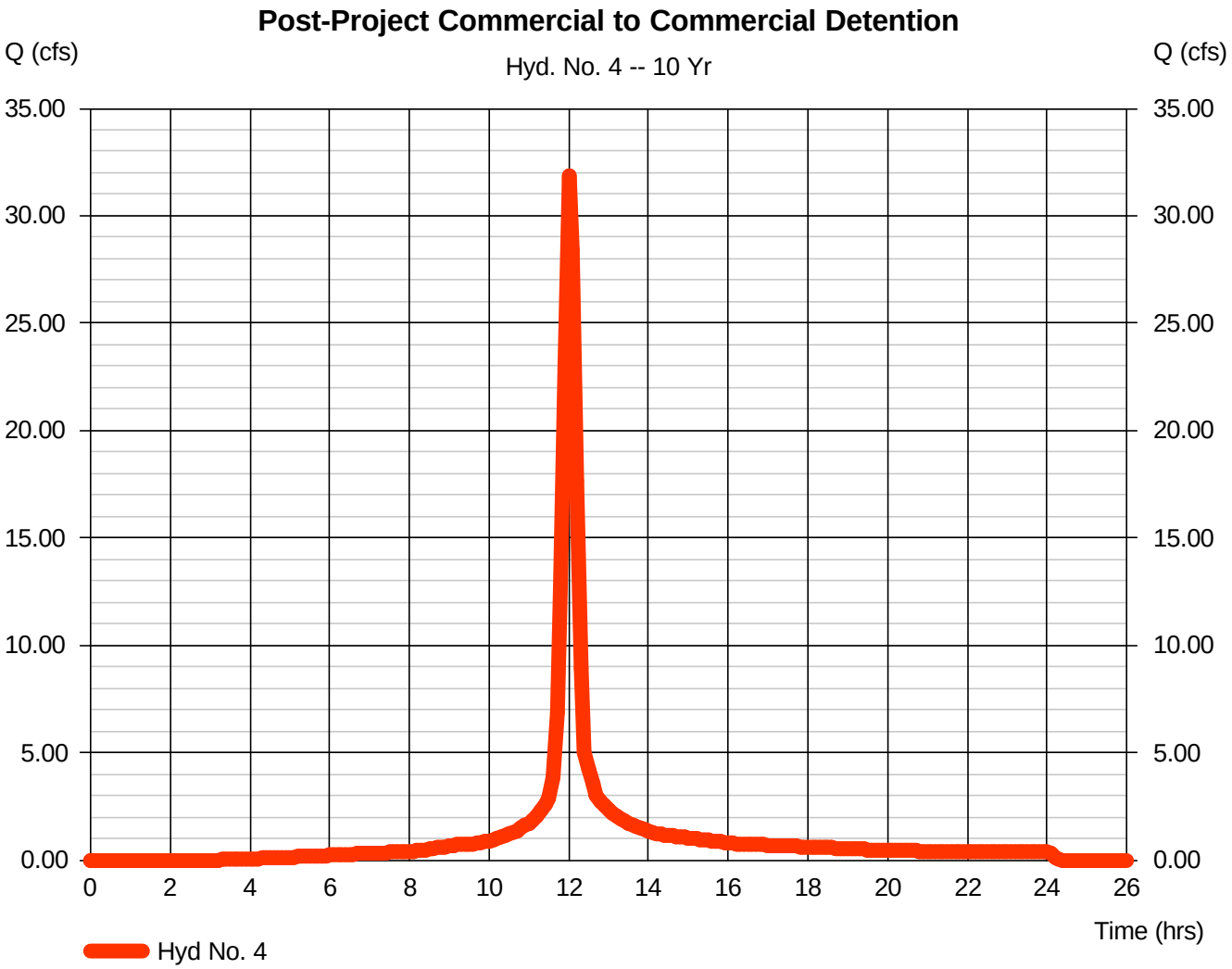
Hydrograph Plot

Hyd. No. 4

Post-Project Commercial to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 31.83 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 6.900 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.336 acft



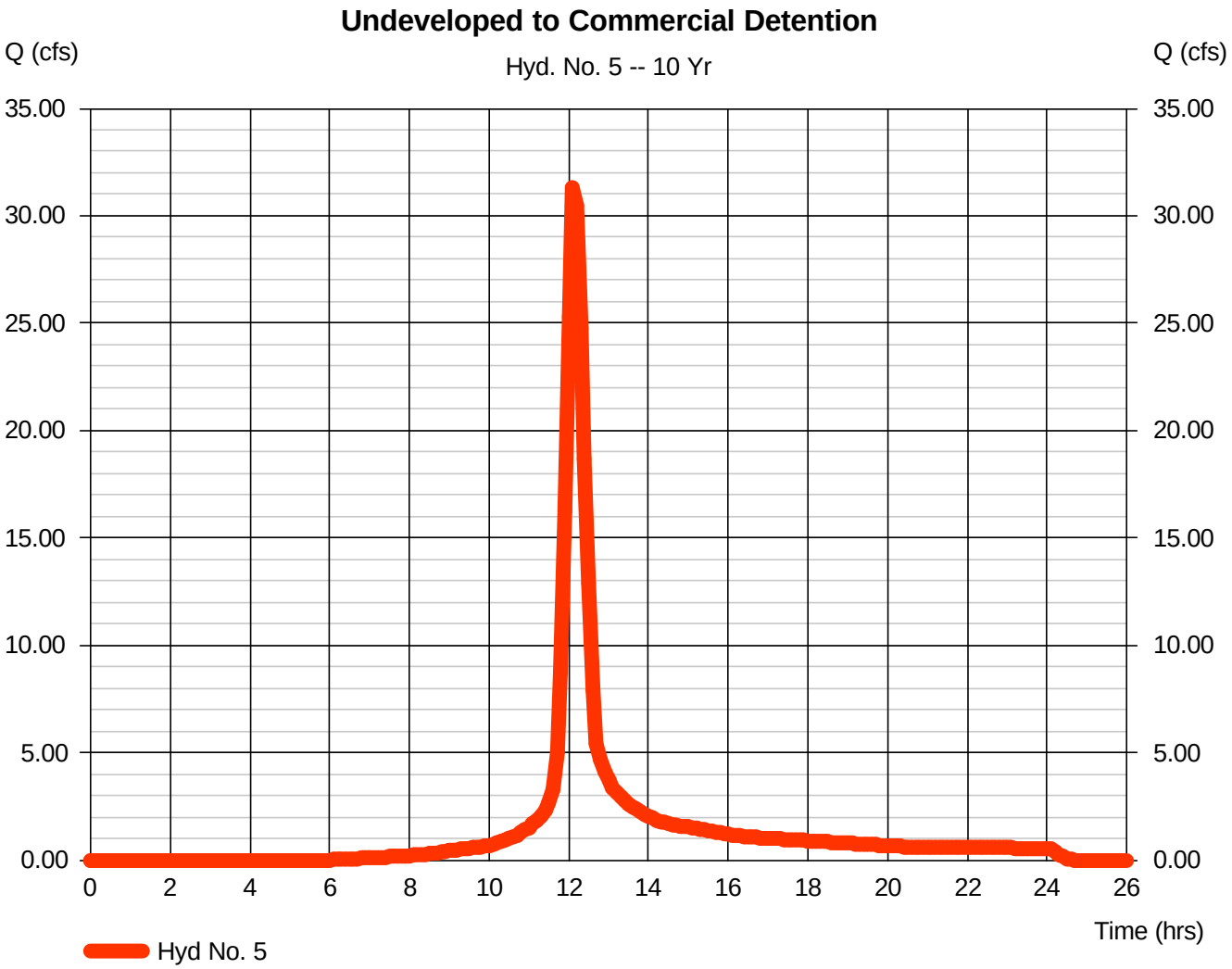
Hydrograph Plot

Hyd. No. 5

Undeveloped to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 31.28 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 10.000 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.917 acft



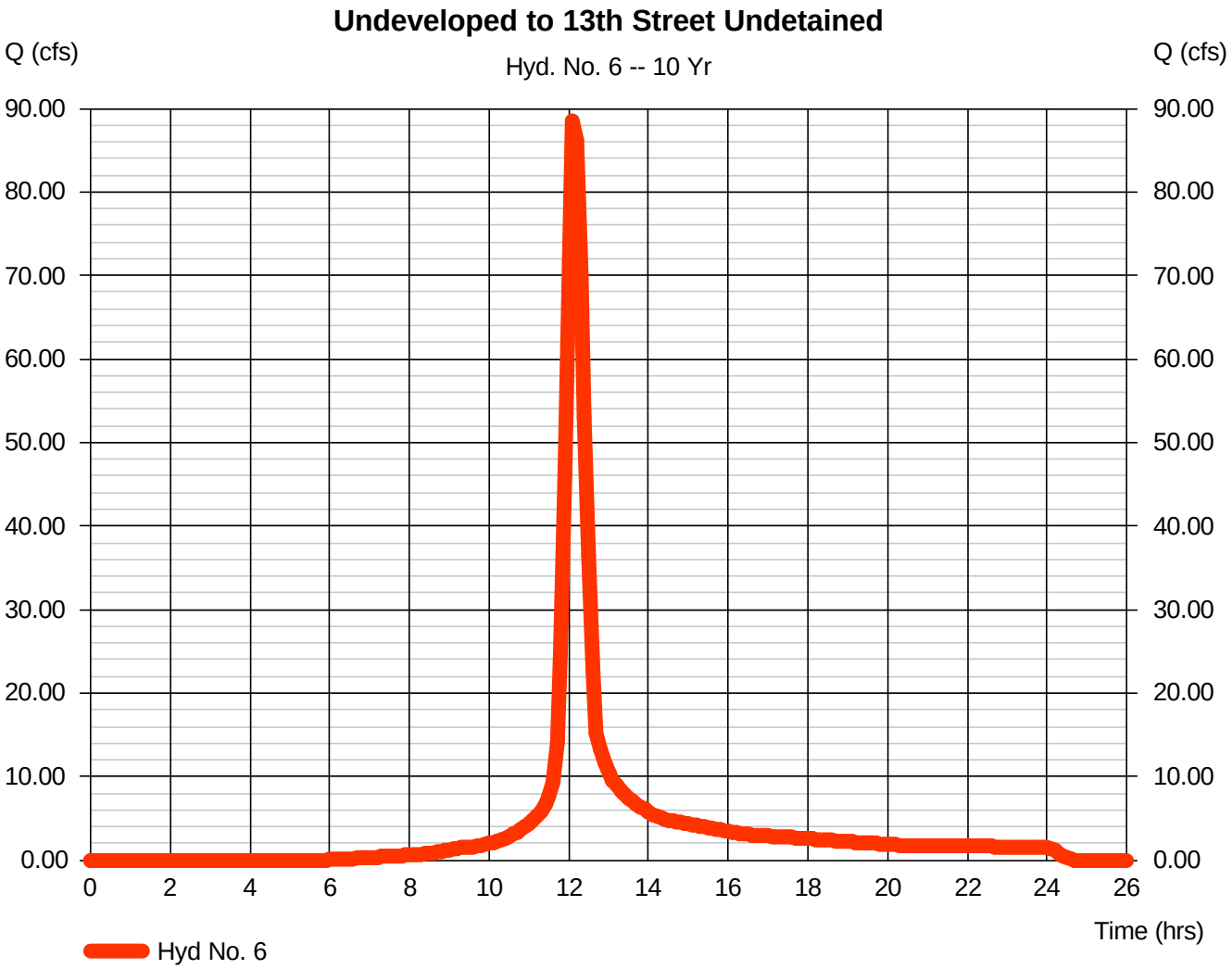
Hydrograph Plot

Hyd. No. 6

Undeveloped to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 88.51 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 28.300 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 5.25 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 8.254 acft



Hydrograph Plot

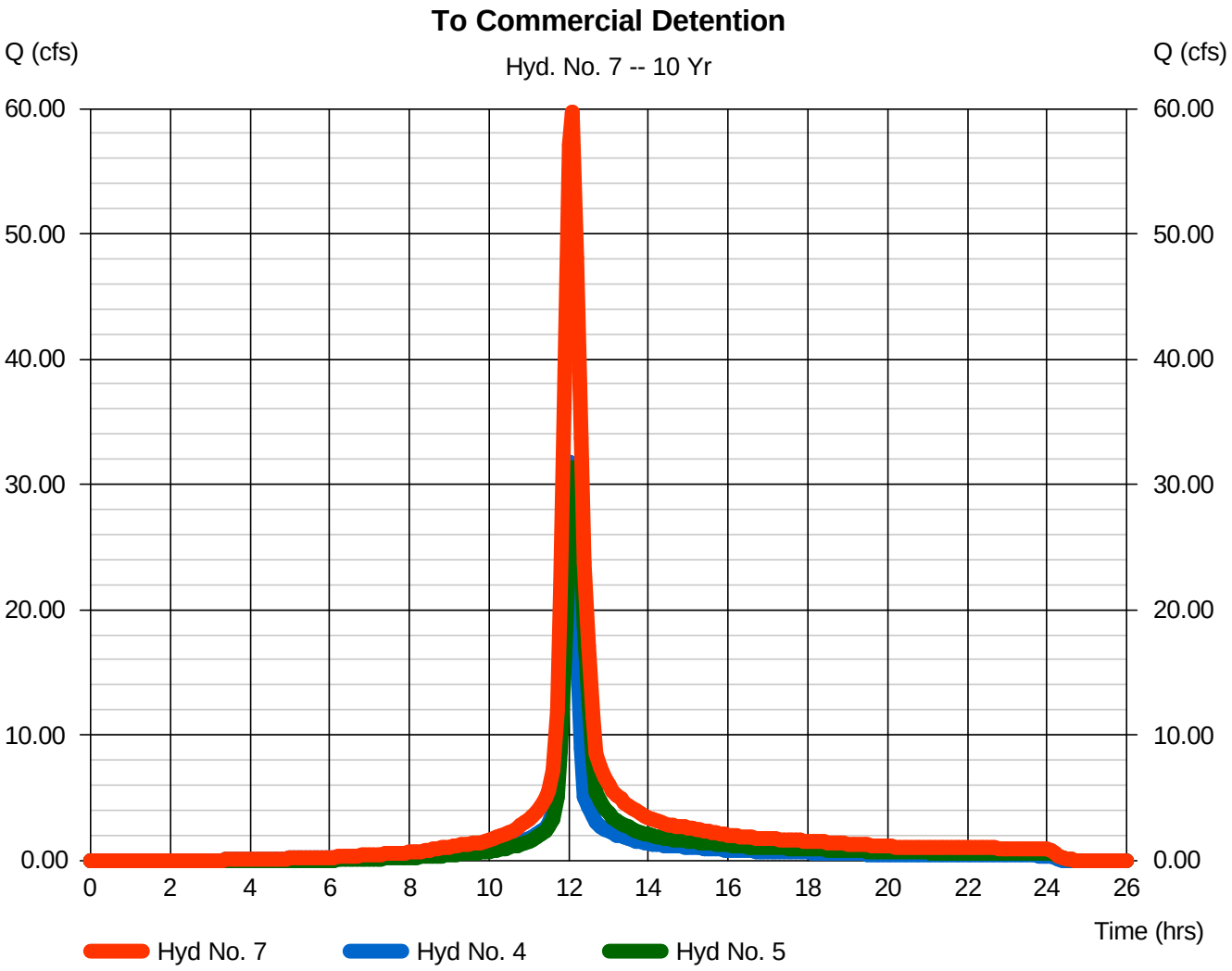
Hyd. No. 7

To Commercial Detention

Hydrograph type = Combine
Storm frequency = 10 yrs
Inflow hyds. = 4, 5

Peak discharge = 59.69 cfs
Time interval = 6 min

Hydrograph Volume = 5.253 acft



Hydrograph Plot

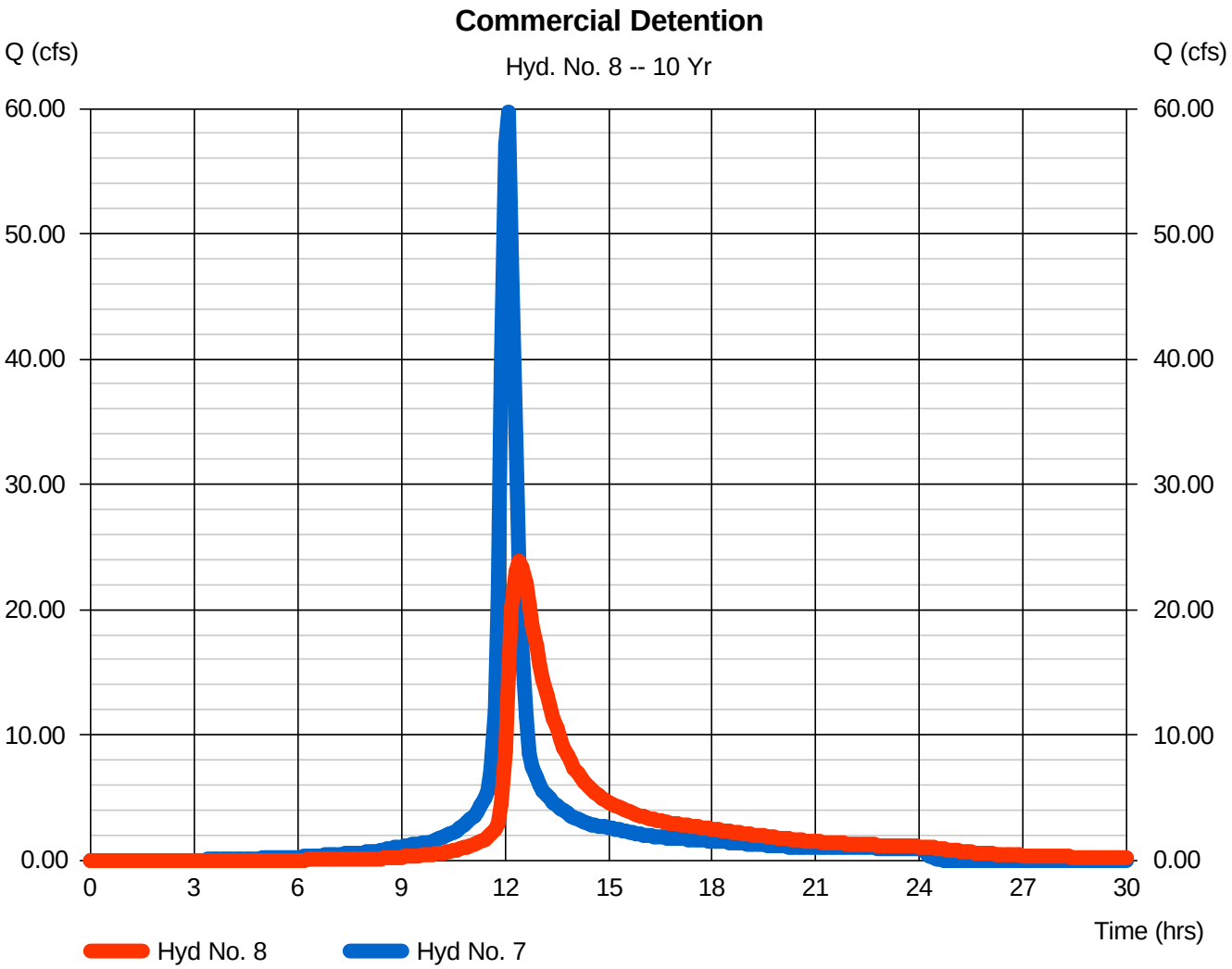
Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Hyd. No. 8

Commercial Detention

Hydrograph type	=	Reservoir	Peak discharge	=	23.85 cfs
Storm frequency	=	10 yrs	Time interval	=	6 min
Inflow hyd. No.	=	7	Max. Elevation	=	1382.85 ft
Reservoir name	=	Commercial	Max. Storage	=	2.124 acft

Storage Indication method used. — Hydrograph Volume = 5.251 acft



Pond Report

Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Pond No. 1 - Commercial

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1380.00	24,000	0.000	0.000
1.00	1381.00	29,800	0.618	0.618
2.00	1382.00	35,600	0.751	1.368
3.00	1383.00	41,800	0.888	2.257
4.00	1384.00	48,000	1.031	3.287

Culvert / Orifice Structures

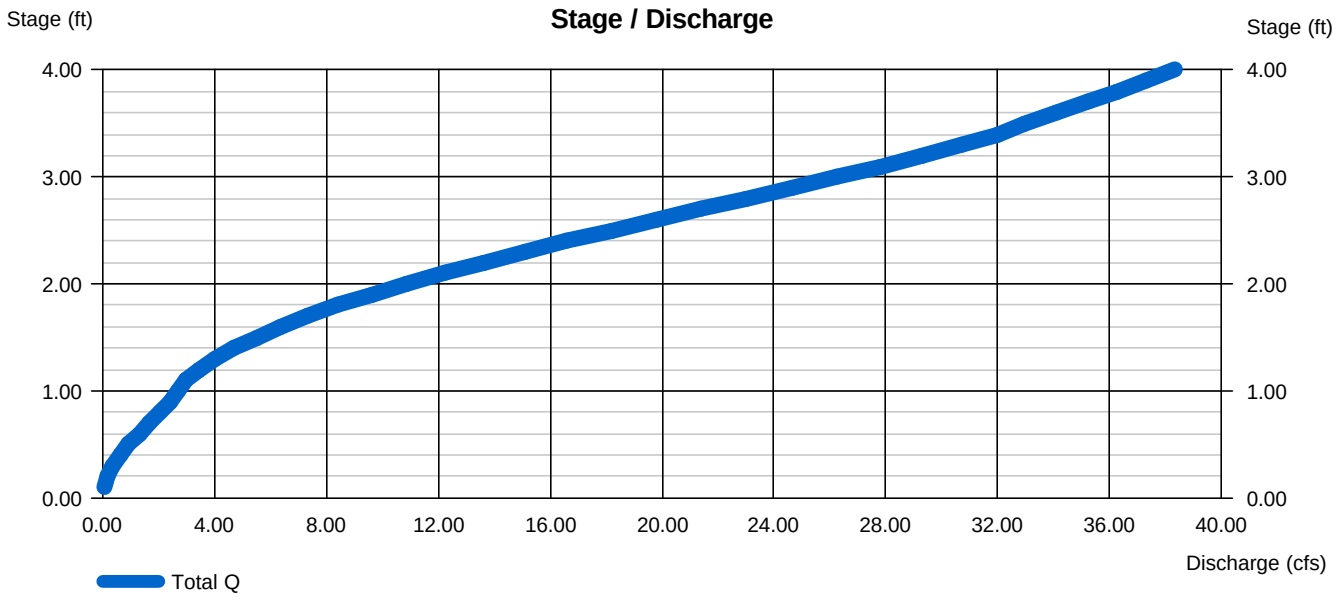
	[A]	[B]	[C]	[D]
Rise (in)	= 12.00	30.00	0.00	0.00
Span (in)	= 12.00	30.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1380.00	1381.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

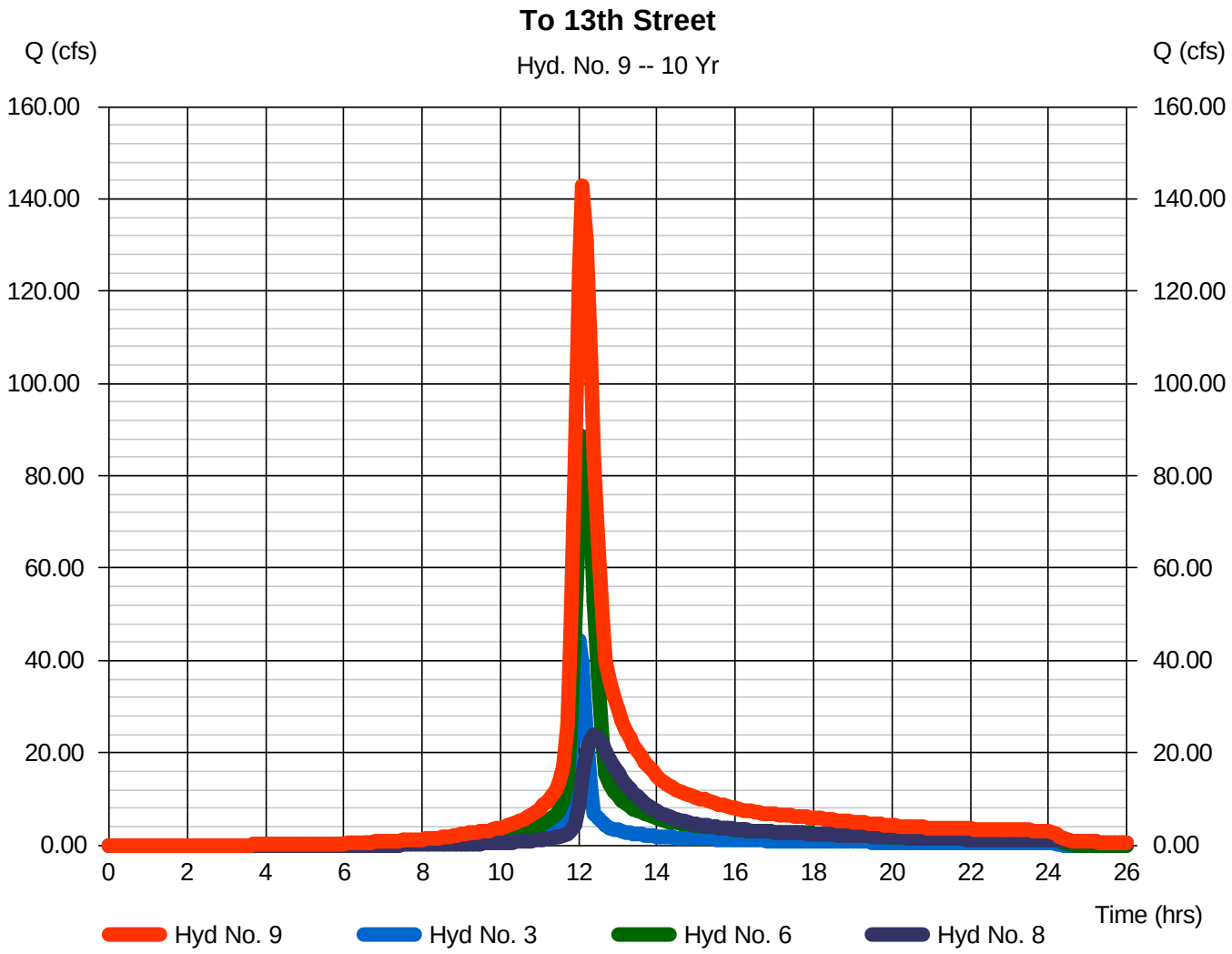
Hyd. No. 9

To 13th Street

Hydrograph type = Combine
Storm frequency = 10 yrs
Inflow hyds. = 3, 6, 8

Peak discharge = 142.91 cfs
Time interval = 6 min

Hydrograph Volume = 16.756 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	238.52	6	732	27.801	----	------	------	Pre-Project to 13th Street
3	SCS Runoff	68.33	6	720	5.134	----	------	------	Post-Project Commercial to 13th St
4	SCS Runoff	49.11	6	720	3.690	----	------	------	Post-Project Commercial to Comm
5	SCS Runoff	52.14	6	726	4.920	----	------	------	Undeveloped to Commercial Detenti
6	SCS Runoff	147.54	6	726	13.922	----	------	------	Undeveloped to 13th Street Undetai
7	Combine	95.72	6	726	8.610	4, 5,	------	------	To Commercial Detention
8	Reservoir	38.26	6	744	8.608	7	1383.99	3.279	Commercial Detention
9	Combine	238.35	6	726	27.665	3, 6, 8	------	------	To 13th Street

Hydrograph Plot

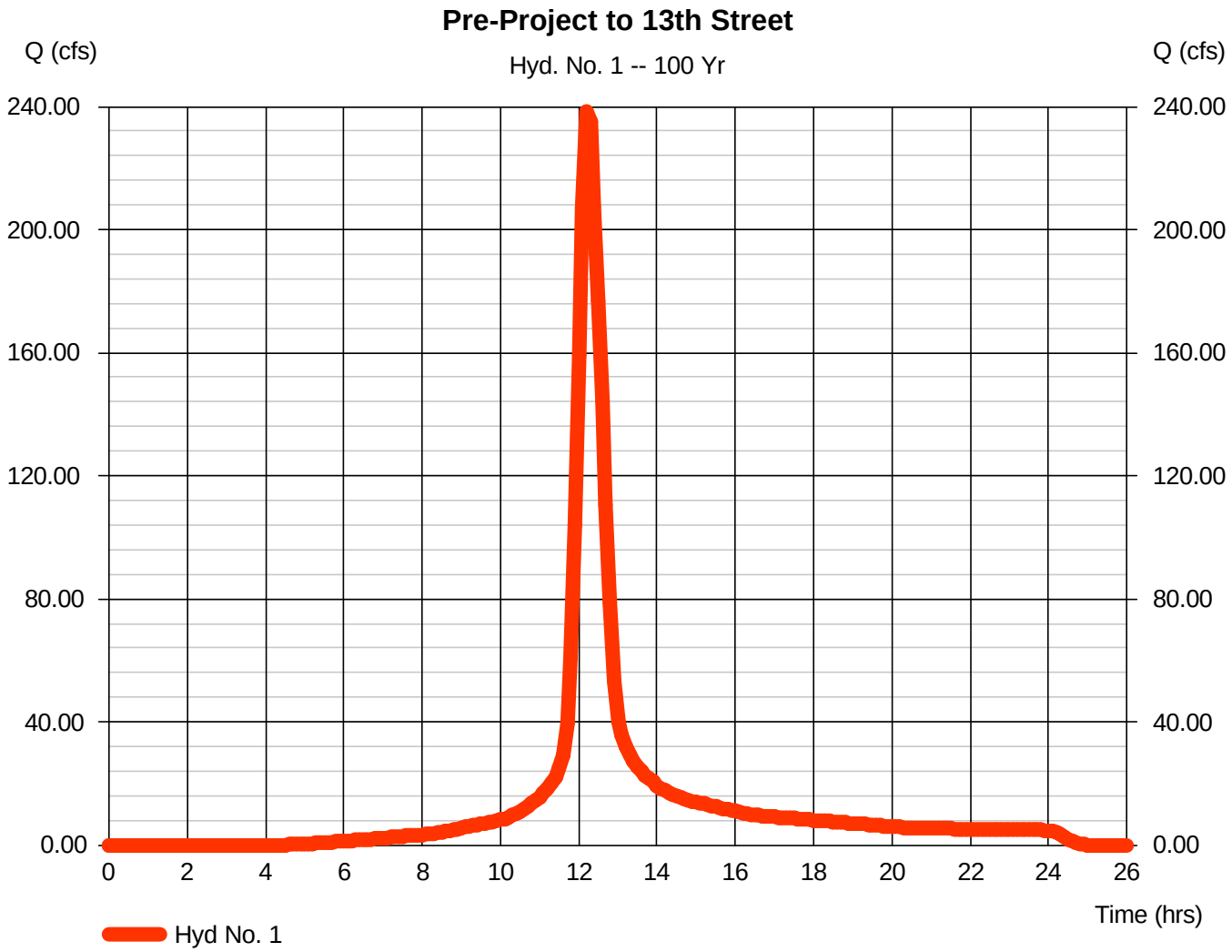
Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Hyd. No. 1

Pre-Project to 13th Street

Hydrograph type	= SCS Runoff	Peak discharge	= 238.52 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 54.800 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 30.60 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 27.801 acft



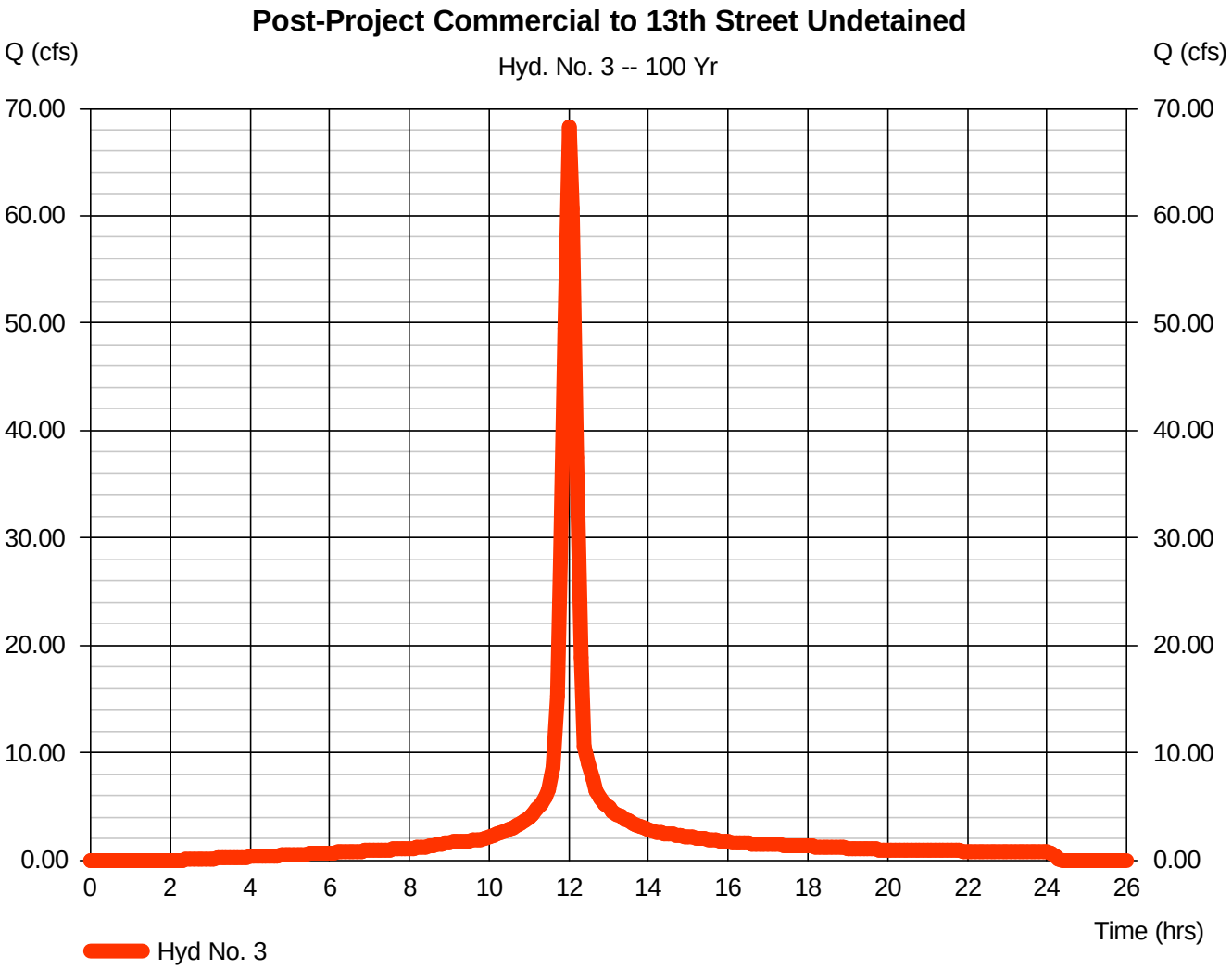
Hydrograph Plot

Hyd. No. 3

Post-Project Commercial to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 68.33 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 9.600 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 5.134 acft



Hydrograph Plot

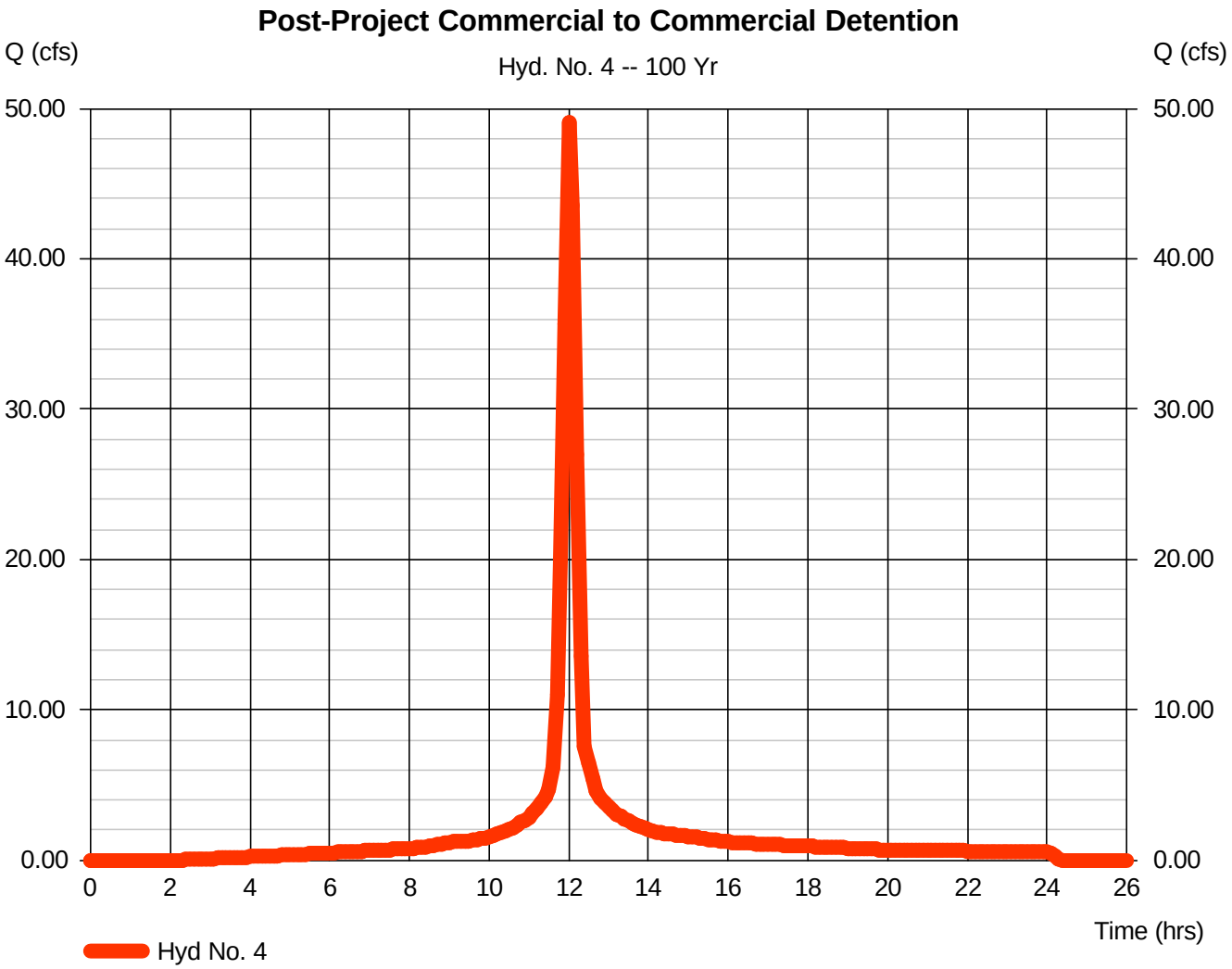
Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Hyd. No. 4

Post-Project Commercial to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 49.11 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 6.900 ac	Curve number	= 92
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 3.690 acft



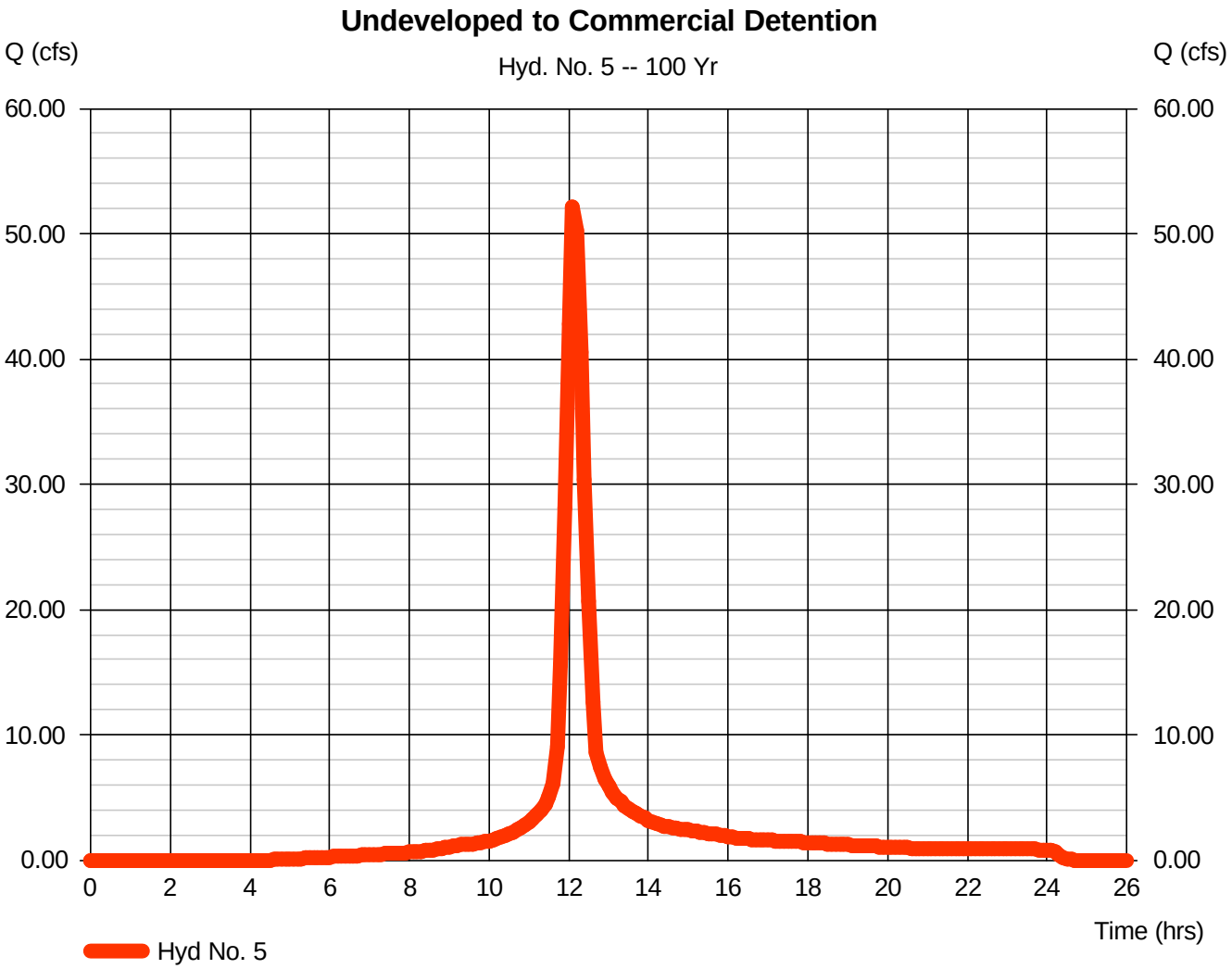
Hydrograph Plot

Hyd. No. 5

Undeveloped to Commercial Detention

Hydrograph type	= SCS Runoff	Peak discharge	= 52.14 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 10.000 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.920 acft



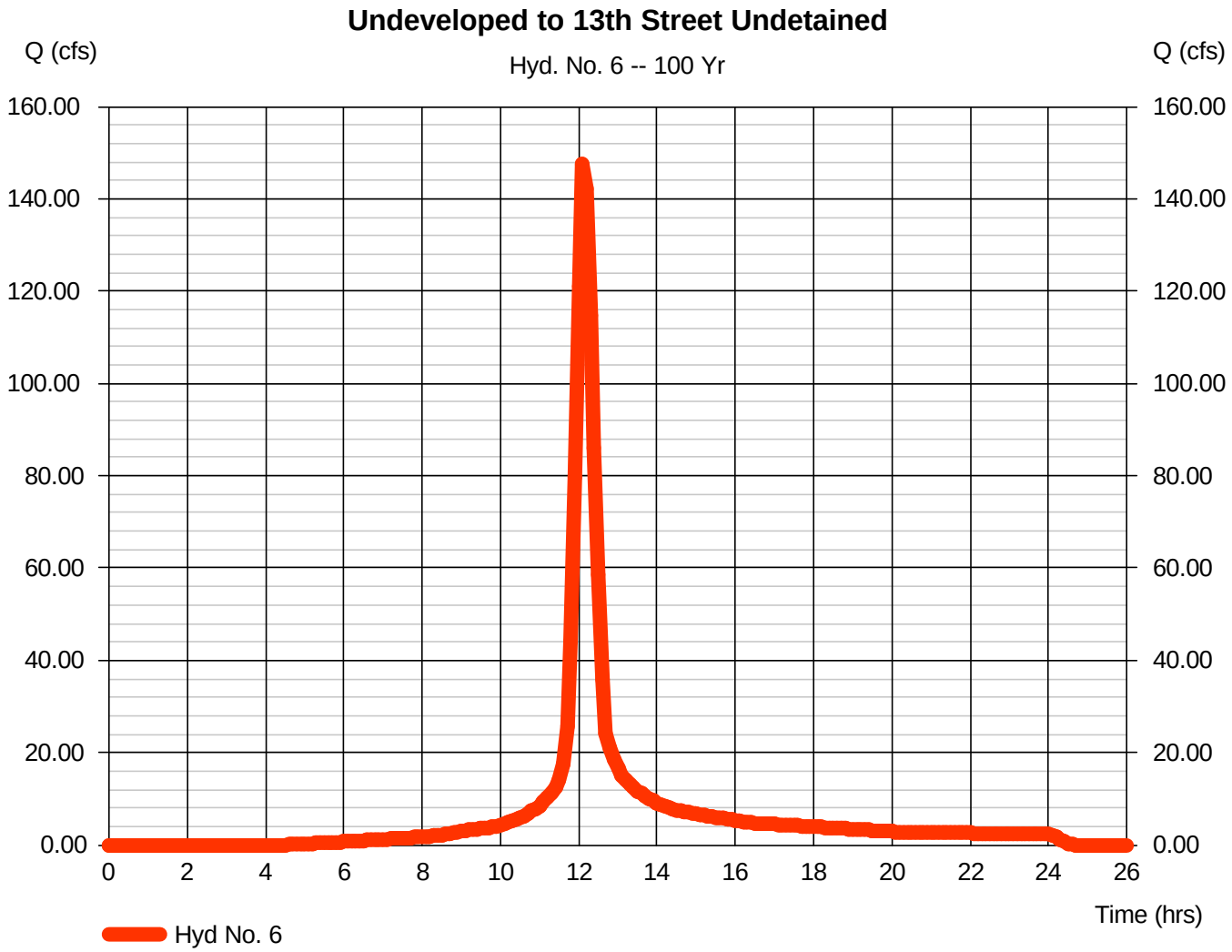
Hydrograph Plot

Hyd. No. 6

Undeveloped to 13th Street Undetained

Hydrograph type	= SCS Runoff	Peak discharge	= 147.54 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 28.300 ac	Curve number	= 84
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25.80 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 13.922 acft



Hydrograph Plot

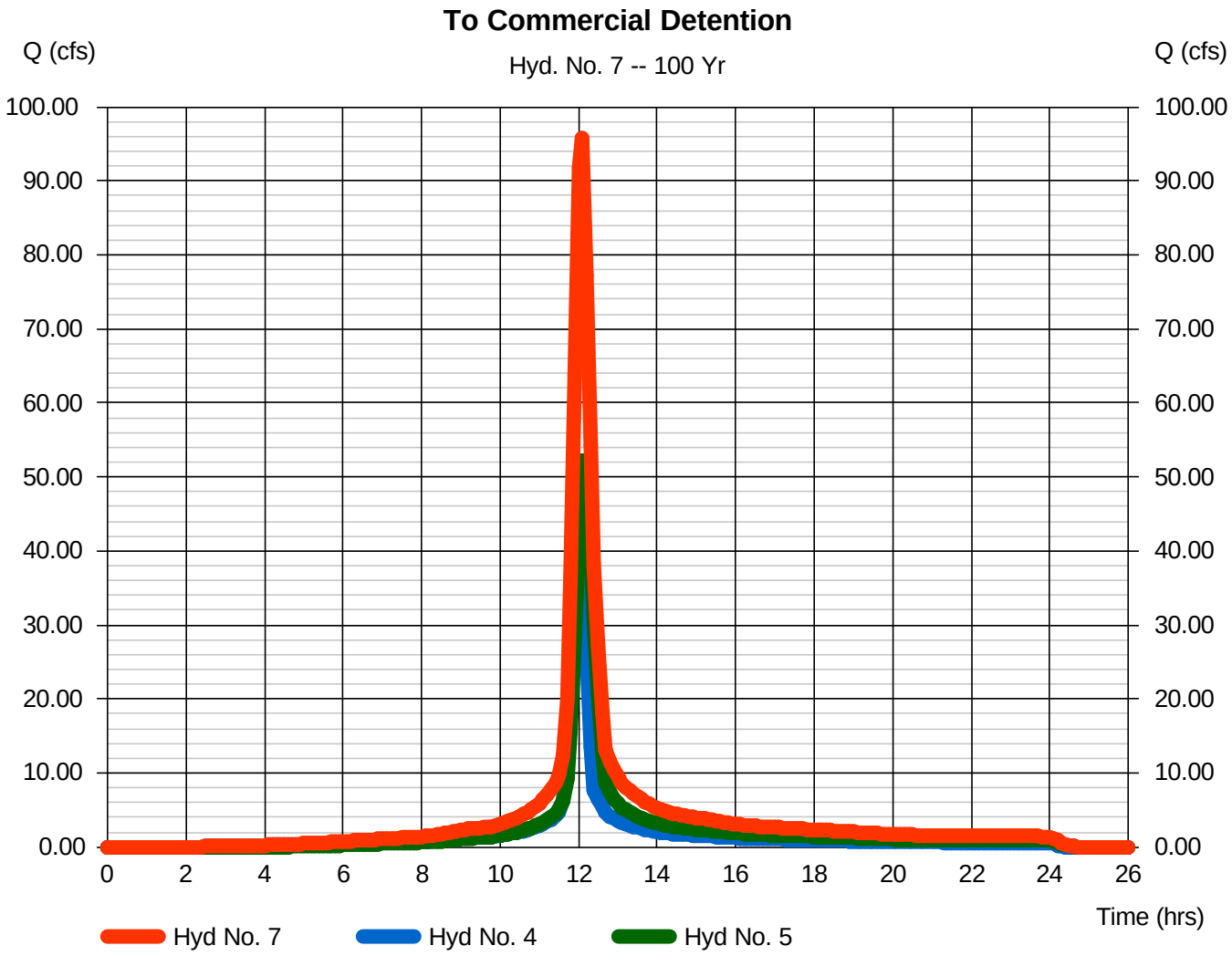
Hyd. No. 7

To Commercial Detention

Hydrograph type = Combine
Storm frequency = 100 yrs
Inflow hyds. = 4, 5

Peak discharge = 95.72 cfs
Time interval = 6 min

Hydrograph Volume = 8.610 acft



Hydrograph Plot

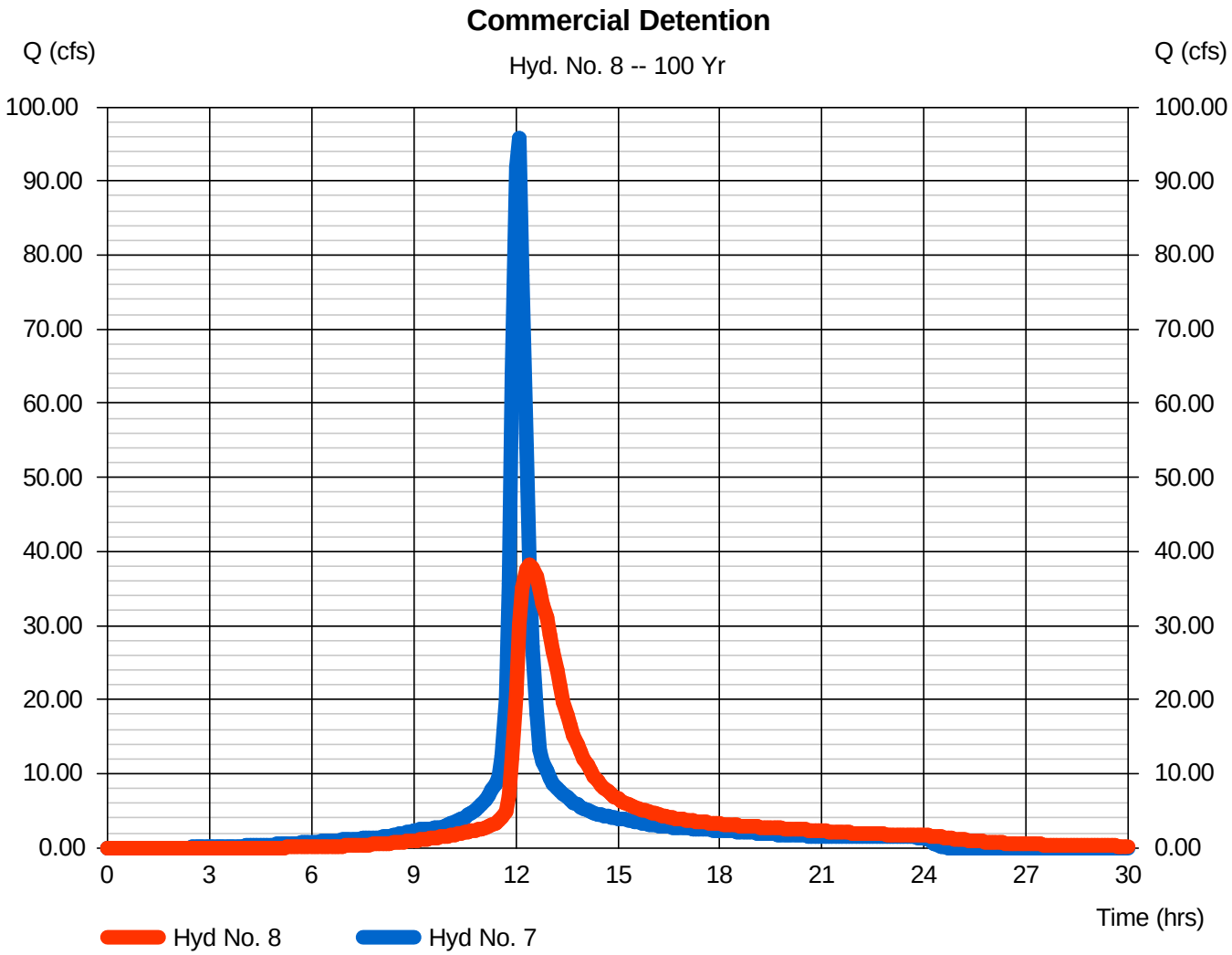
Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Hyd. No. 8

Commercial Detention

Hydrograph type	=	Reservoir	Peak discharge	=	38.26 cfs
Storm frequency	=	100 yrs	Time interval	=	6 min
Inflow hyd. No.	=	7	Max. Elevation	=	1383.99 ft
Reservoir name	=	Commercial	Max. Storage	=	3.279 acft

Storage Indication method used. — Hydrograph Volume = 8.608 acft



Pond Report

Hydraflow Hydrographs by Intelisolve — Saturday, Jan 6 2007, 11:31 AM

Pond No. 1 - Commercial

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1380.00	24,000	0.000	0.000
1.00	1381.00	29,800	0.618	0.618
2.00	1382.00	35,600	0.751	1.368
3.00	1383.00	41,800	0.888	2.257
4.00	1384.00	48,000	1.031	3.287

Culvert / Orifice Structures

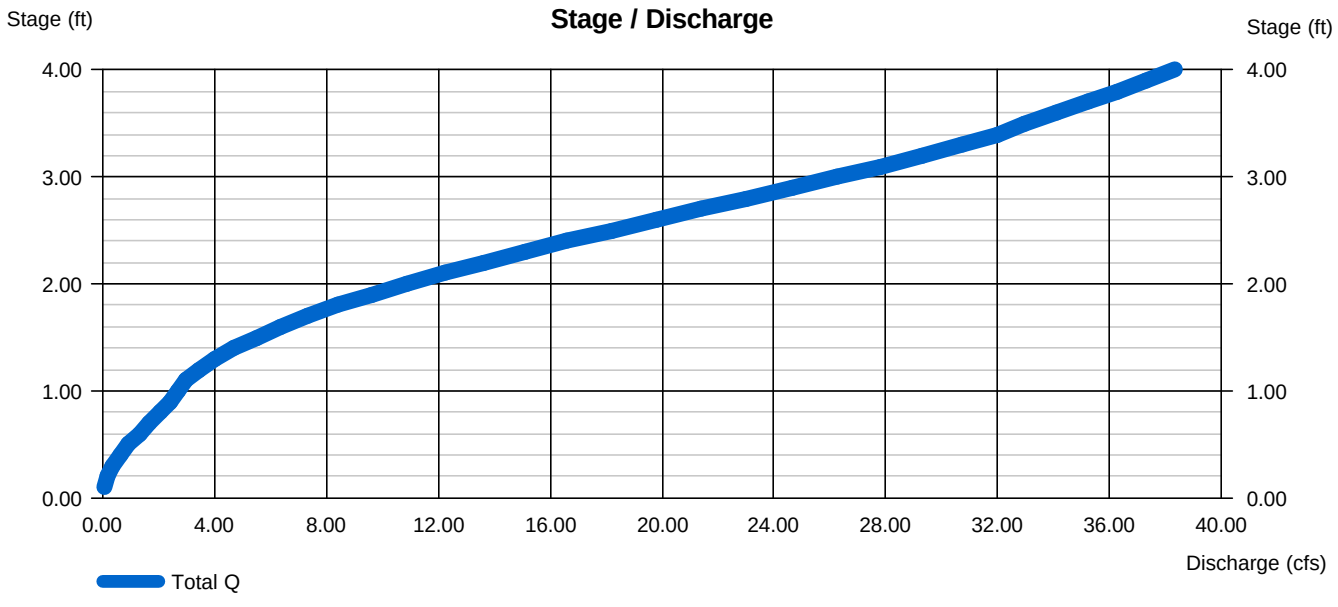
	[A]	[B]	[C]	[D]
Rise (in)	= 12.00	30.00	0.00	0.00
Span (in)	= 12.00	30.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1380.00	1381.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	0.00
N-Value	= .013	.013	.000	.000
Orif. Coeff.	= 0.60	0.60	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



Hydrograph Plot

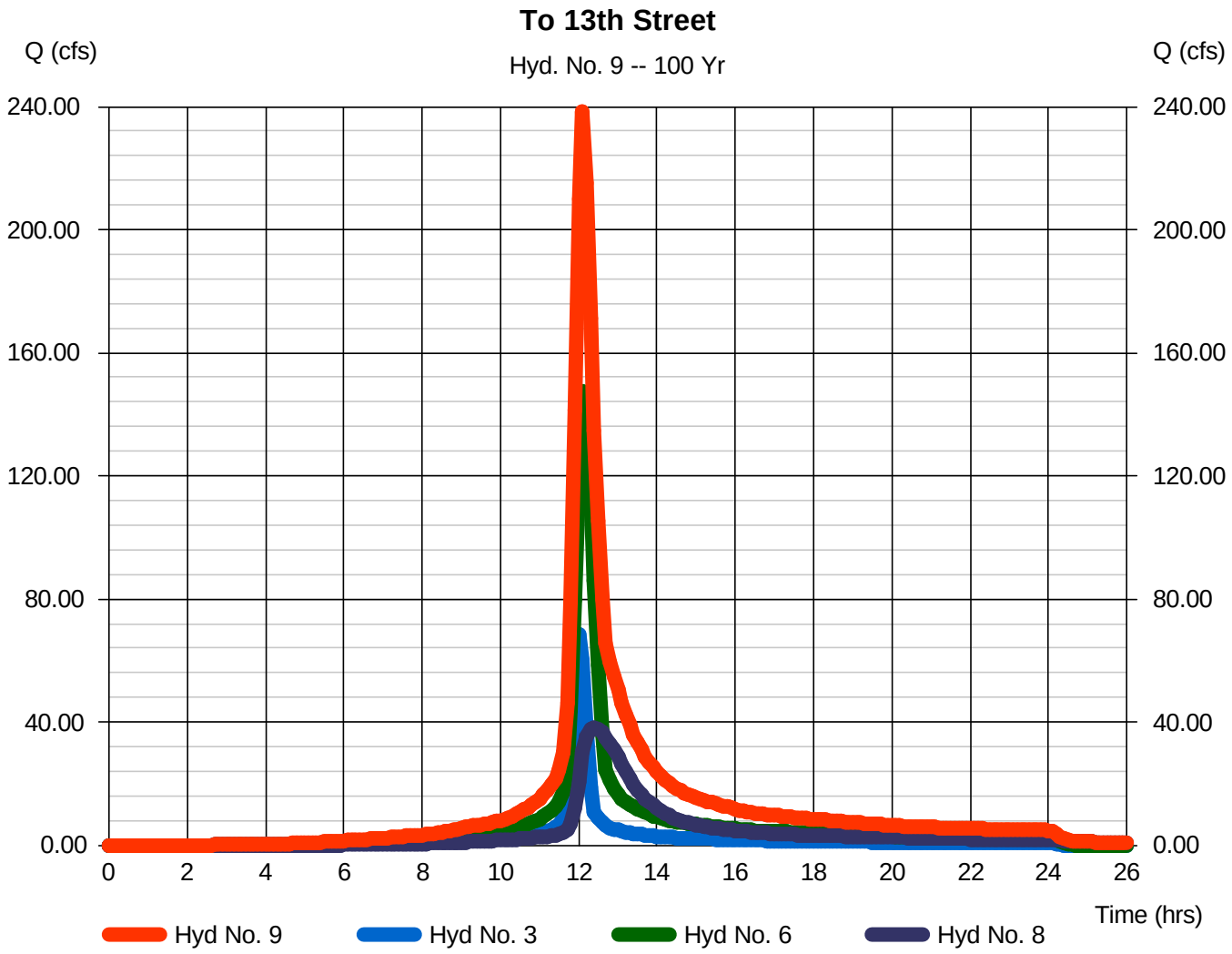
Hyd. No. 9

To 13th Street

Hydrograph type = Combine
Storm frequency = 100 yrs
Inflow hyds. = 3, 6, 8

Peak discharge = 238.35 cfs
Time interval = 6 min

Hydrograph Volume = 27.665 acft



Appendix K

13th Street RCB HY-8

CURRENT DATE: 12-13-2006 FILE DATE: 12-13-2006
CURRENT TIME: 11:44:10 FILE NAME: 5X4WATER

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.1

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	1372.90	1372.50	79.50	1 RCB	5.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: 5X4WATER DATE: 12-13-2006

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1372.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1374.11	20.0	20.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1374.82	40.0	40.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1375.44	60.0	60.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1375.98	80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1376.48	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1376.86	115.0	115.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1377.51	140.0	140.0	0.0	0.0	0.0	0.0	0.0	0.00	1
1378.05	160.0	158.8	0.0	0.0	0.0	0.0	0.0	0.76	5
1378.33	180.0	167.9	0.0	0.0	0.0	0.0	0.0	11.84	4
1378.54	200.0	174.6	0.0	0.0	0.0	0.0	0.0	24.78	3
1377.99	156.8	156.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: 5X4WATER DATE: 12-13-2006

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
1372.90	0.000	0.00	0.00	0.00
1374.11	0.000	20.00	0.00	0.00
1374.82	0.000	40.00	0.00	0.00
1375.44	0.000	60.00	0.00	0.00
1375.98	0.000	80.00	0.00	0.00
1376.48	0.000	100.00	0.00	0.00
1376.86	0.000	115.00	0.00	0.00
1377.51	0.000	140.00	0.00	0.00
1378.05	-0.006	160.00	0.49	0.31
1378.33	-0.003	180.00	0.27	0.15
1378.54	-0.005	200.00	0.59	0.29

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 12-13-2006 FILE DATE: 12-13-2006
CURRENT TIME: 11:44:10 FILE NAME: 5X4WATER

PERFORMANCE CURVE FOR CULVERT 1 - 1(5.00 (ft) BY 4.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
0.00	1372.90	0.00	0.00	0-NF	0.00	0.00	0.00	-0.10	0.00	0.00
20.00	1374.11	1.21	1.21	1-S2n	0.68	0.79	0.59	0.80	6.74	1.44
40.00	1374.82	1.92	1.92	1-S2n	1.09	1.26	1.10	1.19	7.25	1.75
60.00	1375.44	2.54	2.54	1-S2n	1.44	1.65	1.45	1.47	8.27	1.96
80.00	1375.98	3.08	3.08	1-S2n	1.77	2.00	1.70	1.71	9.41	2.12
100.00	1376.48	3.58	3.58	1-S2n	2.09	2.32	2.02	1.91	9.90	2.25
115.00	1376.86	3.96	3.96	1-S2n	2.32	2.55	2.25	2.05	10.23	2.33
140.00	1377.51	4.61	4.61	5-S2n	2.68	2.90	2.60	2.26	10.75	2.46
158.75	1378.04	5.14	5.14	5-S2n	2.95	3.16	2.96	2.41	10.73	2.55
167.89	1378.32	5.42	5.42	5-S2n	3.08	3.28	3.10	2.55	10.83	2.62
174.63	1378.53	5.63	5.63	5-S2n	3.18	3.37	3.19	2.68	10.93	2.70

El. inlet face invert 1372.90 ft El. outlet invert 1372.50 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	1372.90 ft
OUTLET STATION	79.50 ft
OUTLET ELEVATION	1372.50 ft
NUMBER OF BARRELS	1
SLOPE (V/H)	0.0050
CULVERT LENGTH ALONG SLOPE	79.50 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	5.00 ft
BARREL RISE	4.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (30-75 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 12-13-2006 FILE DATE: 12-13-2006
CURRENT TIME: 11:44:10 FILE NAME: 5X4WATER

TAILWATER

******* REGULAR CHANNEL CROSS SECTION ****************

BOTTOM WIDTH	10.00 ft
SIDE SLOPE H/V (X:1)	6.0
CHANNEL SLOPE V/H (ft/ft)	0.002
MANNING'S n (.01-0.1)	0.035
CHANNEL INVERT ELEVATION	1372.40 ft
CULVERT NO.1 OUTLET INVERT ELEVATION	1372.50 ft

******* UNIFORM FLOW RATING CURVE FOR DOWNSTREAM CHANNEL

FLOW (cfs)	W.S.E. (ft)	FROUDE NUMBER	DEPTH (ft)	VEL. (f/s)	SHEAR (psf)
0.00	1372.40	0.000	0.00	0.00	0.00
20.00	1373.30	0.268	0.90	1.44	0.11
40.00	1373.69	0.273	1.29	1.75	0.16
60.00	1373.97	0.276	1.57	1.96	0.20
80.00	1374.21	0.278	1.81	2.12	0.23
100.00	1374.41	0.279	2.01	2.25	0.25
115.00	1374.55	0.280	2.15	2.33	0.27
140.00	1374.76	0.282	2.36	2.46	0.29
160.00	1374.91	0.283	2.51	2.55	0.31
180.00	1375.05	0.284	2.65	2.62	0.33
200.00	1375.18	0.285	2.78	2.70	0.35

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	60.00 ft
CREST LENGTH	20.00 ft
OVERTOPPING CREST ELEVATION	1377.99 ft

Appendix L

Sixth Addition Pipe Sizing

Time of Concentration Calculations by the FAA method, Runoff by Rational Method, Pipe sizing by Manning's Equation

Waterfront Sixth Addition

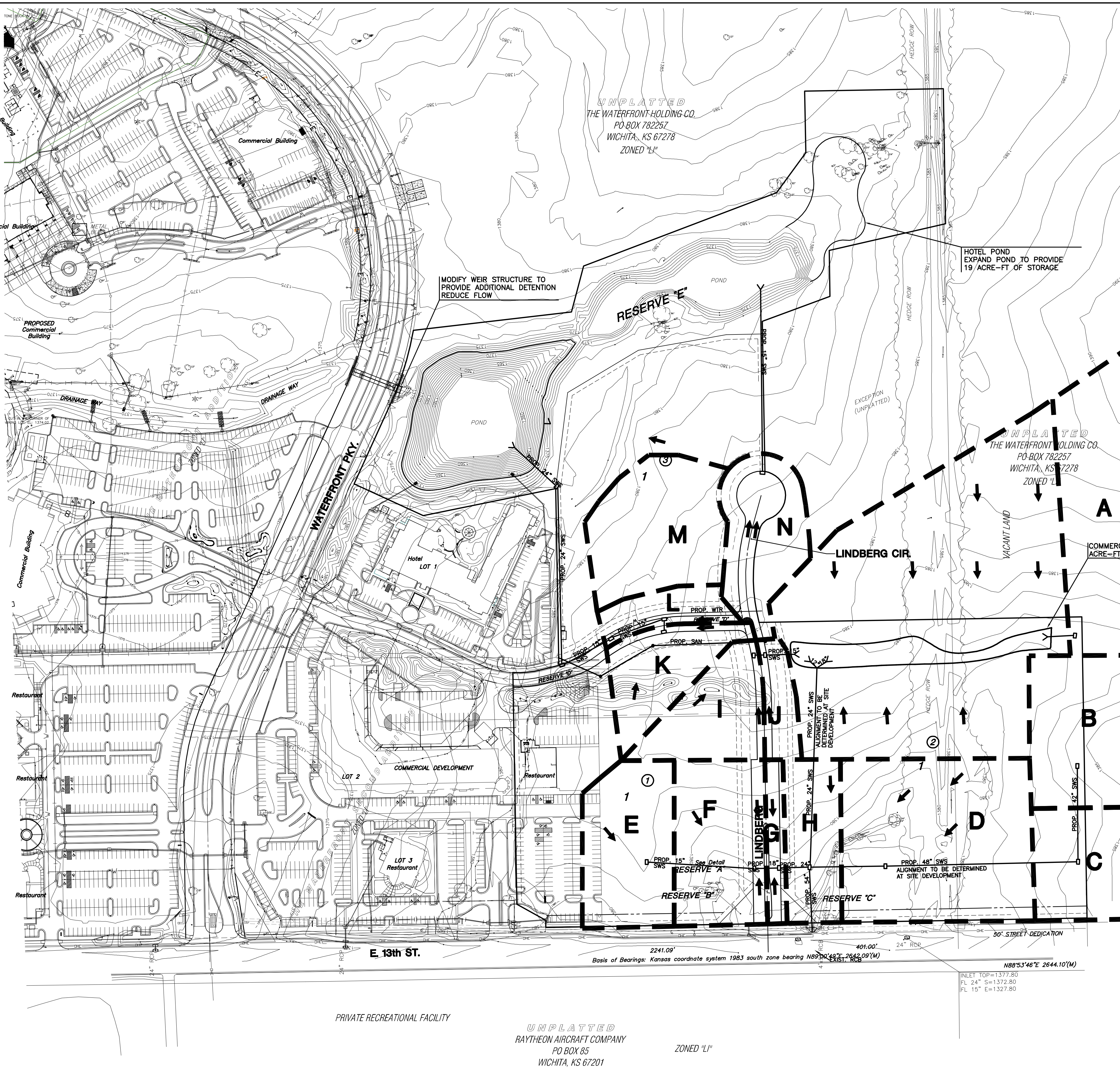
$$T_c = \frac{(1.1-C)L^{\frac{1}{2}}}{100S^{\frac{1}{3}}} \qquad Q = cIA \qquad Q = \frac{1.49}{n} AR_h^{\frac{2}{3}} S_e^{\frac{1}{2}}$$

Manning's n = 0.013

Area Name	Area (ac)	Cumulative Area (ac)	Land Use	Soil Group	Maximum Elevation	Minimum Elevation	Length (L)	Rational Runoff Coefficient, C				Time of Concentration (min), T_c				Rainfall Intensity (in/hr), I				Flow Rate (cfs), Q				Design Storm	Design Q (cfs)	Pipe Size (in)	Design Slope (%)	Minimum Slope (%)	Velocity (fps)	Capacity of Pipe (cfs)
								2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year							
A	*8.2*		*Agricultural - Pasture - Slopes <1%*	*C*	*1395.0*	*1384.0*	*900*	0.26	0.29	0.37	0.53	42.4	40.9	36.9	28.8	2.18	2.76	3.41	5.59	4.65	6.56	10.35	24.29	100	24.29	36	0.14	0.13	3.5	25.0
B	*21.3*		*Agricultural - Pasture - Slopes <1%*	*C*	*1395.0*	*1384.0*	*1200*	0.26	0.29	0.37	0.53	53.9	52.0	46.9	36.6	1.86	2.38	2.97	4.93	10.30	14.70	23.41	55.65	100	55.65	42	0.32	0.31	5.9	56.9
C	*8.8*		*Agricultural - Pasture - Slopes <1%*	*C*	*1390.0*	*1383.0*	*1500*	0.26	0.29	0.37	0.53	75.5	72.8	65.6	51.2	1.43	1.92	2.41	4.09	3.27	4.90	7.85	19.08	None						
B+C		*30.1*	*Agricultural - Pasture - Slopes <1%*	*C*	*1390.0*	*1383.0*	*1500*	0.26	0.29	0.37	0.53	75.5	72.8	65.6	51.2	1.43	1.92	2.41	4.09	11.19	16.76	26.84	65.25	100	65.25	48	0.22	0.21	5.4	67.4
D	*3.2*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	5.11	6.47	8.34	14.82	None						
B+C+D		*33.3*	*Agricultural - Pasture - Slopes <1%*	*C*	*1390.0*	*1383.0*	*1500*	0.26	0.29	0.37	0.53	75.5	72.8	65.6	51.2	1.43	1.92	2.41	4.09	12.38	18.54	29.69	72.18	100	72.18	48	0.26	0.25	5.8	73.2
E	*1.5*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	2.40	3.03	3.91	6.95	5	3.03	15	0.24	0.22	2.6	3.2
F	*1.5*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	2.40	3.03	3.91	6.95	None						
E+F		*3.0*	*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	4.79	6.07	7.82	13.90	5	6.07	18	0.40	0.33	3.8	6.6
G	*0.3*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	0.48	0.61	0.78	1.39	None						
E+F+G		*3.3*	*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	5.27	6.67	8.60	15.29	5	6.67	24	0.40	0.09	4.6	14.3
H	*0.9*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	1.44	1.82	2.35	4.17	None						
B+C+D+E+F+G		*36.6*	*Agricultural - Pasture - Slopes <1%*	*C*	*1390.0*	*1383.0*	*1500*	0.26	0.29	0.37	0.53	75.5	72.8	65.6	51.2	1.43	1.92	2.41	4.09	13.61	20.38	32.64	79.34	100	79.34	54	0.17	0.16	5.1	81.1
I	*1.0*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	1.60	2.02	2.61	4.63	5	2.02	12	0.40	0.32	2.9	2.3
J	*0.4*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	0.64	0.81	1.04	1.85	None						
I+J		*1.4*	*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	2.24	2.83	3.65	6.48	5	2.83	15	0.40	0.19	3.3	4.1
K	*1.0*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	1.60	2.02	2.61	4.63	5	2.02	12	0.40	0.32	2.9	2.3
L	*0.5*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	0.80	1.01	1.30	2.32	None						
K+L		*1.5*	*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	2.40	3.03	3.91	6.95	5	3.03	15	0.40	0.22	3.3	4.1
M	*1.7*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	2.72	3.44	4.43	7.87	None						
K+L+M		*3.2*	*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	5.11	6.47	8.34	14.82	5	6.47	24	0.21	0.08	3.3	10.4
N	*1.2*		*Business - Neighborhood*	*C*	*1390.0*	*1383.0*	*1500*	0.68	0.69	0.73	0.80	37.7	36.8	33.3	27.0	2.35	2.93	3.57	5.79	1.92	2.43	3.13	5.56	5	2.43	15	0.40	0.14	3.3	4.1

Appendix M

Sixth Addition Drainage and Utility Plan


UNPLATTED
THE WATERFRONT HOLDING CO.
PO BOX 782257
WICHITA, KS 67278
ZONED "LI"
HOTEL POND
EXPAND POND TO PROVIDE
19 ACRE-FT OF STORAGE
MODIFY WEIR STRUCTURE TO
PROVIDE ADDITIONAL DETENTION
REDUCE FLOW
RESERVE "E"
POND
HEDGE ROW
EXCEPTION (UNPLATTED)
VACANT LAND
COMMERCIAL DETENTION 3
ACRE-FT OF STORAGE
LINDBERG CIR.
WATERFRONT PKY.
Hotel
LOT 1
LOT 2
LOT 3
Restaurant
COMMERCIAL DEVELOPMENT
Commercial Building
PROPOSED Commercial Building
DRAINAGE WAY
PROP. 15" SWS
PROP. 24" SWS
PROP. 42" SWS
PROP. 48" SWS
PROP. 54" SWS
PROP. WTR
PROP. SAN
ALIGNMENT TO BE DETERMINED AT SITE DEVELOPMENT
RESERVE "A"
RESERVE "B"
RESERVE "C"
RESERVE "D"
A
B
C
D
E
F
G
H
J
K
L
M
N
E. 13th ST.
50' STREET DEDICATION
2241.09'
401.00'
Basis of Bearings: Kansas coordinate system 1983 south zone bearing N89°00'49"E 2642.09'(M)
N88°53'46"E 2644.10'(M)
INLET TOP=1377.80
FL 24" S=1372.80
FL 15" E=1327.80
PRIVATE RECREATIONAL FACILITY
UNPLATTED
RAYTHEON AIRCRAFT COMPANY
PO BOX 85
WICHITA, KS 67201
ZONED "LI"

LEGEND

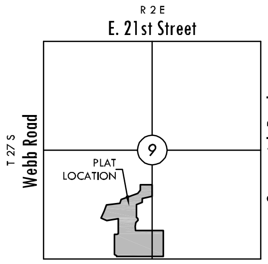
- CONIFEROUS TREE
- DECIDUOUS TREE
- SIGN
- POWER POLE
- ELECTRIC BOX
- LIGHT POLE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- SECTION CORNER
- BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE !

BENCHMARK

Datum BM

Square cut on SW. corner of signal light pole base at NE. corner of Webb Rd. and 13th St.
Elev.=1373.345 (NGVD 29)

MINIMUM PAD ELEVATION LOWEST BUILDING OPENING		
LOT	BLOCK	ELEVATION NGVD 29
1	3	1380.0



VICINITY MAP

NORTH
1"=100' / 1 : 1200
100 0 100

Basis of Bearing: Kansas coordinate system 1983 south zone bearing of S89°00'49"W along the W. Line of SW. ¼, Sec. 9, T27S, R2E, 6th P.M.

H:\CIVIL\02014\6th Add\Drainage\02014DU 6th.dwg

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316-684-9600

THE WATERFRONT SIXTH ADDITION
PROJECT NAME

DRAINAGE AND UTILITY PLAN
SHEET TITLE

DESIGN BY:	DRAWN BY:	CHECKED BY:
KLA	BJM	KLA

DATE	JOB NO.	SHEET/OF
JANUARY 2007	02014	1 / 1