Appendix F

KINGSWOOD
STORMWATER MANAGEMENT NARRATIVE

Introduction

This report addresses the engineering design of the stormwater management and conveyance system for the proposed Kingswood project in the Village of Rye Brook, New York.

Project Description/Location

This site is located on the south side of Anderson Hill Road in the Village of Rye Brook, Westchester County, New York (County Tax Map: Section 129.35, Block 1, Lot 13). A portion of the property is also located in the Town of Greenwich, State of Connecticut (Tax Map 28, Lot 1). It is approximately 15.44 acres in size and is bounded by Anderson Hill Road to the north and King Street (NYS Route 120A) to the east.

The proposed Kingswood residential development will consist of the construction of 30 semi-attached, single-family dwellings with a gate house, gazebo, tennis court, and associated site improvements and utilities. These include access roads, parking areas, concrete curbs, site lighting, landscaping, a stormwater collection/management system, a sanitary sewer system and other utilities to serve the development.

The duration of construction is expected to last approximately 24 months and will be completed in one phase.

Existing Conditions

The site is presently undeveloped with the westerly portion of the property consisting of tall grasses and the easterly portion consisting of low-density woods. A significant portion of the center of the property (5.27 acres) is delineated as wetlands. A swale runs from the southeast corner of the property toward the Blind Brook Country Club located directly to the west of the property. This swale is fed from an existing 18" culvert under King Street.

The site slopes from the northeast corner (elev. 314±) toward the west and south (elev. 292±). The site contains no existing storm drainage facilities and drains via sheet flow towards the Blind Brook Country Club to the west.

This site is not located within the 100-year flood plain (see *FIRM Flood Insurance Rate Map, Westchester County, New York, Map Number 360930 0005 B*). The site is tributary to Blind Brook which is classified by NYSDEC as a 303(d) segment. See appendix A for these maps.

A soil boring was performed on the site by Soil Mechanics Drilling Corp. on December 4, 2006 and revealed that the area is blanketed by approximately 2'0" of loam, overlying moderately dense sand with varying amounts of silts and clay to a depth of 26'0" below grade, at which point decomposed rock was encountered. Perched water was encountered 4'6" below grade.

The soil classification from the *U.S.D.A. Soil Survey of Putnam and Westchester Counties* lists the soil types in this area as RdA-Ridgebury Loam and WdB-Woodbridge Loam. (See Appendix

A) The Hydrologic Soil Group (HSG) is "C" based on *TR-55, Exhibit A: Hydrologic Soil Groups for the United States.*

The site plans by Barrett, Bonacci & Van Weele, P.C. should be referred to for additional information.

Proposed Conditions

As noted above, the proposed development will include the construction of 30 semi-attached, single family dwellings with a gate house, gazebo, tennis court, and associated site improvements and utilities. A stormwater collection/detention system is proposed which will collect surface and roof runoff in a series of catch basins, drywells and inlet structures located throughout the property. These structures are interconnected by an underground pipe system which flows (via gravity) to an on-site stormwater detention pond. This pond is divided into two sections by a proposed emergency access road. These sections are connected by two 30" diameter culverts that allow water to pass freely between the sections to enable the two areas to function as one pond.

Of the 15.4 acres of property, 5.9 acres will be disturbed during construction. Of this, 3.9 acres will be impervious improvements (roads, buildings, etc.). A small portion (<0.5 acres) of the existing wetlands will be disturbed by this development. See the site plan for proposed disturbance limits and wetland mitigation measures.

The existing central wetlands area will continue to drain via sheet flow to the west, but will be required to pass through a new inlet control structure and culvert located under the development's proposed access road. The flow from the proposed culvert will be collected in a proposed vegetated swale located along the western property line of the site. Overflow from this vegetated swale will be directed towards the existing swale and wetlands located in the southwest corner of the property. The capacity of this existing swale is outlined in Appendix B.

The site plans by Barrett, Bonacci & Van Weele, P.C. should be referred to for additional information.

Stormwater Management

The objectives of the proposed stormwater management system are as follows:

- To provide on-site storage in excess of the Water Quality Volume (WQv) in order to meet pollutant removal goals dictated by the New York State Department of Environmental Conservation.
- To provide on-site storage of the 1-year, 24-hour storm event for the protection of down-site channels.
- To control the peak discharges from the site for the 10 and 100-year storms to 75% of predevelopment rates for overbank and extreme flood control.
- To minimize the adverse effects of erosion and sediment transport.

Water Quality

In accordance with the "New York State Stormwater Design Manual", a Micropool Stormwater Detention Pond (Practice P-1) was designed to capture and treat the full Water Quality volume (WQv) from the developed portion of the property. Section 4.2 of the Manual requires that the 90% rainfall event be captured in the proposed pond. Utilizing the following equation, a Water Quality volume (WQv) of 16,291 cf is required for the developed portion of the site (see site plan):

$$WQv = \frac{(P)\,(R_v)(A)}{12}$$

Where:
- WQv = water quality volume (in acre-feet)
- P = 90% Rainfall Event Number (=1.3)
- R_v = 0.05 + 0.009(I), where I is percent impervious cover (=60.2%)
- A = site area in acres (contributing area) (=5.88 Ac)

In accordance with Section 5 of the Stormwater Design Manual, the proposed pond treats the majority of the water quality volume through extended detention, and incorporates a Micropool at the outlet of the pond to prevent sediment resuspension.

The proposed Micropool includes a sediment forebay, wetlands vegetation, rip-rap pilot channel and extended detention area which are provided in accordance with the Design Manual for 80% TSS removal and 40% TP removal as required.

Extended Detention (1-year, 24-hour storm event)

In accordance with the "New York State Stormwater Design Manual" Section 4.3, extended detention of the 1-year, 24-hour storm event is required to protect down-stream channels from erosion. The extended detention volume required in the proposed detention pond was determined utilizing the modified version of the USDA Soil Conservation Service's TR-55 "short cut" sizing technique outlined in Appendix B of the "New York State Stormwater Design Manual."

The required storage volume was calculated by the following:

$$V_s = \frac{(V_s/V_r)(Q_d)(A)}{12} = \frac{(0.64)(1.8)(5.88)}{12} = .56 \text{ acre-feet}$$

$$V_s/V_r = 0.682 - 1.43\,(q_o/q_i)^2 - 0.804(q_o/q_i)^3$$

- V_s= required storage volume (acre-feet)
- V_r= runoff volume (acre-feet)
- Q_d= The post-developed runoff for the design storm (inches)
- A= total drainage area (acres)
- q_o= peak outflow discharge (cfs)
- q_i= peak inflow discharge (cfs)

0.56 acre–feet of storage is required in the proposed pond to detain the 1-year, 24-hour storm event from the proposed development.

Flood Control

As required by the Village of Rye Brook, 75% of the present (no-build) 10-year and 100-year peak discharge rates shall not be exceeded under proposed conditions. In order to attenuate these peak flows, additional storage volume is provided in the proposed detention pond. Outflow from the detention pond to the adjacent existing swale is controlled by a concrete outlet structure.

The required additional pond storage volume was calculated using the USDA Soil Conservation Service Publication TR-55 "Urban Hydrology for Small Watersheds". TR-55 outlines a methodology to reduce the post-construction peak to pre-construction rates by routing the storm through a detention basin (see Appendix C).

Using TR-55 methodology, the developed portion of the property (5.9 acres) was simulated as multiple watersheds to determine the 10-year and 100-year peak flows under developed and undeveloped conditions, Areas, curve numbers (CN), and times of concentration (T_c) were calculated for each scenario.

The curve number is a land sensitive coefficient that dictates the relationship between total rainfall depth and direct storm runoff. Based on the coverage of soil groups and land use in the watershed, an average CN was determined for both the existing and proposed conditions.

As noted above, all existing soils within the watershed are divided into hydrologic soil group C. The SCS classification system evaluates the runoff potential of a soil according to its infiltration and transmission rates. "A" soils have the lowest runoff potential, while "D" soils have the greatest runoff potential.

The time of concentration T_c is defined as the time for runoff to travel from the hydraulically most distant point in the watershed to a point of interest (in this case, the proposed detention pond.) Values of the time of concentration were determined for existing and proposed conditions based on land cover and slope of the flow path using methods outlined in TR-55.

The following table summarizes the results of the TR-55 analysis (See Appendix C):

		Peak Runoff (cfs)				Runoff Volume (cf)	Peak Outflow (cfs)	
		Existing Conditions		Proposed Conditions		Proposed Conditions	Proposed Conditions	
Storm Event	Rainfall (in)	Area A	Areas B-G	Area A	Areas B-G	Areas B-G	Areas B-G	Pond Water Surface El.
1 Year	2.8	3.14	2.09	n/c	7.56	24,588	0	295.5
10 Year	5.0	12.27	8.14	n/c	16.05	82,706	1.5	296.5
100 Year	7.5	24.86	16.48	n/c	26	135,528	5.58	297.8

Under all scenarios, the peak discharge from the site does not exceed 75% of those from the existing conditions.

Stormwater Collection System Design

Design Criteria

The on-site subsurface storm sewer collection system was designed to convey the 25-year storm event. Maximum inlet flow rates shall not exceed 5 cfs. A minimum time of concentration of 5 minutes was utilized.

Design Methodology

The storm sewer system was analyzed using the rational method for estimating runoff for a 25-year design storm. The site was divided into sub-areas, each contributing runoff to a pair of catch basins or a manhole. A value for area, time of concentration, and a runoff coefficient was calculated for each contributing sub-area. Runoff coefficients were calculated using the following values:

CONDITION	C
Natural	0.15
Grass/Landscaping	0.30
Roof/Paved/Impervious	0.95

Rainfall intensities were taken from the intensity-duration-frequency curve for New York City, New York. Storm drainage pipes were then sized based on calculated flows using Manning's Equation and were verified for the hydraulic grade line.

Summary

Review of the hydraulic grade line results for the proposed storm drainage conveyance systems verify the pipes have been sized properly to convey the 25-year storm event without surcharging the roadway system. Supporting calculations and documentation are included in Appendix D

Stormwater Pollution Prevention

Pursuant to Section 402 of the Clean Water Act, stormwater discharges associated with certain construction activities are unlawful unless covered under the Phase II SPDES General Permit for Discharges from Construction Activity (GP-02-01). This permit requires that the proposed grading and drainage designs meet certain criteria for water quality, water quantity and soil erosion controls. This project has been designed to meet these criteria, and will be subject to the conditions and requirements of this permit. (See Appendix E.)

Erosion control measures, consistent with the practices outlined in the *New York Guidelines for Urban Erosion & Sediment Control*, have been proposed to protect both the subject property and adjacent properties from erosion and sediment transportation during and after construction. The SWPPP was developed with a focus on meeting or exceeding the Water Quality Volume (WQv) and minimizing the adverse effects of erosion and sediment transport in the event of an Extreme Flood Condition. The SWPPP includes detailed measures for controlling erosion and sediment

transport during construction. Upon completion of construction, disturbed areas will be graded and revegetated so as to reduce or eliminate erosion potential. As noted above, the storm water management system will provide for collection and detention of runoff for the 1-year 24-hour storm event. Any overflow from the site will only occur after runoff in excess of the computed Water Quality Volume occurs.

Construction Sequencing & Maintenance

As detailed on the project Stormwater Pollution Prevention Plan (SWPPP), the following pollution control measures, in accordance with the provisions of the General Permit, shall be employed:

A. Existing vegetation to remain shall be protected (by installation of construction fence or other approved means) and shall remain undisturbed.
B. Clearing and Grading shall be scheduled so as to minimize the extent of exposed areas and the length of time that areas are exposed. Graded and stripped areas shall be kept stabilized through the use of temporary seeding as required. Seed mixtures shall be in accordance with the Soil Conservation Service recommendations.
C. Bare soils shall be seeded within 14 days of exposure, unless construction will begin within 21 days, as sections are completed, or if construction on an area is suspended, the area shall be seeded immediately.
D. The length and steepness of cleared slopes shall be minimized to reduce runoff velocities. Runoff shall be diverted away from cleared slopes.
E. Sediment shall be trapped on the site and not permitted to enter adjacent properties or public roads. Sediment barriers shall be installed along the limits of disturbance prior to the start of construction and shall be maintained until construction is complete.
F. A stabilized construction entrance shall be maintained to prevent soil and loose debris from being tracked onto local roads. The construction entrance shall be maintained until the site is permanently stabilized. Any sediment tracked onto public roads to be removed or cleaned on a daily basis.
G. All runoff shall be retained on-site and diverted to the proposed silt basins (future detention ponds). Drainage inlets installed on-site shall be protected from sediment buildup through the use of appropriate inlet protection.
H. Appropriate means shall be used to control dust during construction.
I. Sediment barriers and other erosion control measures shall remain in place until upland disturbed areas are permanently stabilized. Following permanent stabilization, paved areas shall be cleaned of soil and debris and drainage systems shall be cleaned and flushed as necessary.
J. The owner/operator/contractor is responsible for inspection and proper maintenance of erosion control measures. Inspections must be performed by a certified erosion control specialist, licensed professional engineer or a trained technician working under the supervision of a licensed professional engineer every seven calendar days and immediately after periods of rainfall greater than one half inch. Maintenance measures are to include, but are not limited to, cleaning of sediment traps and drywells, cleaning and repair of sediment barriers, repair of berms and runoff diverters, and cleaning and repair of inlet protection devices. The owner/operator/contractor is required to maintain

copies of the NOI, SWPPP & General Permit on-site at all times. NOI and General Permit shall be posted at all times.

K. During construction, the contractor will comply with all local regulations concerning the disposal of solid waste and debris and toxic and hazardous waste, as well as sanitary sewer and septic system regulations. Temporary fencing shall be erected around the perimeter of the site along with the placement of dumpsters to control the build up of debris. The contractor shall periodically clean up any debris accumulated along the temporary fence and empty dumpsters regularly.

L. After the project is complete, the owner/operator will be responsible for filling a Notice of Termination (NOT) with the NYSDEC to close out the open SPDES General Permit No. 02-01 for Storm Water Runoff from the construction activity.

M. See the landscaping plan sheet for permanent vegetation stabilization.

N. The contractor must complete the construction sequence schedule in the report with start and end dates. Unless otherwise directed by the owner, the contractor is responsible for maintaining the necessary records of construction activities, preparation of inspection reports, and reporting release of pollutants to the proper authorities as necessary to comply with the Nationwide Permit. The contractor will report any required modification to the SWPPP as necessitated by field conditions or construction activities to the Engineer.

CONCLUSION

The stormwater management system for the proposed development has been designed to store the Water Quality Volume (WQv) as well as the 1-year, 24-hour rainfall event. In addition, the peak discharges from the site during the 10 and 100-year storm events do not exceed 75% of those from the existing conditions.

The existing swale running from the southwest corner of the property is adequate to carry the (reduced) runoff flow from the project.

The subsurface stormwater collection system has been adequately sized to convey the 25-year storm event.

REFERENCES

1) New York State Stormwater Design Manual, New York State Department of Environmental Conservation, August 2003.

2) New York Guidelines for Urban Erosion & Sediment Control, New York State Department of Environmental Conservation, August 2005.

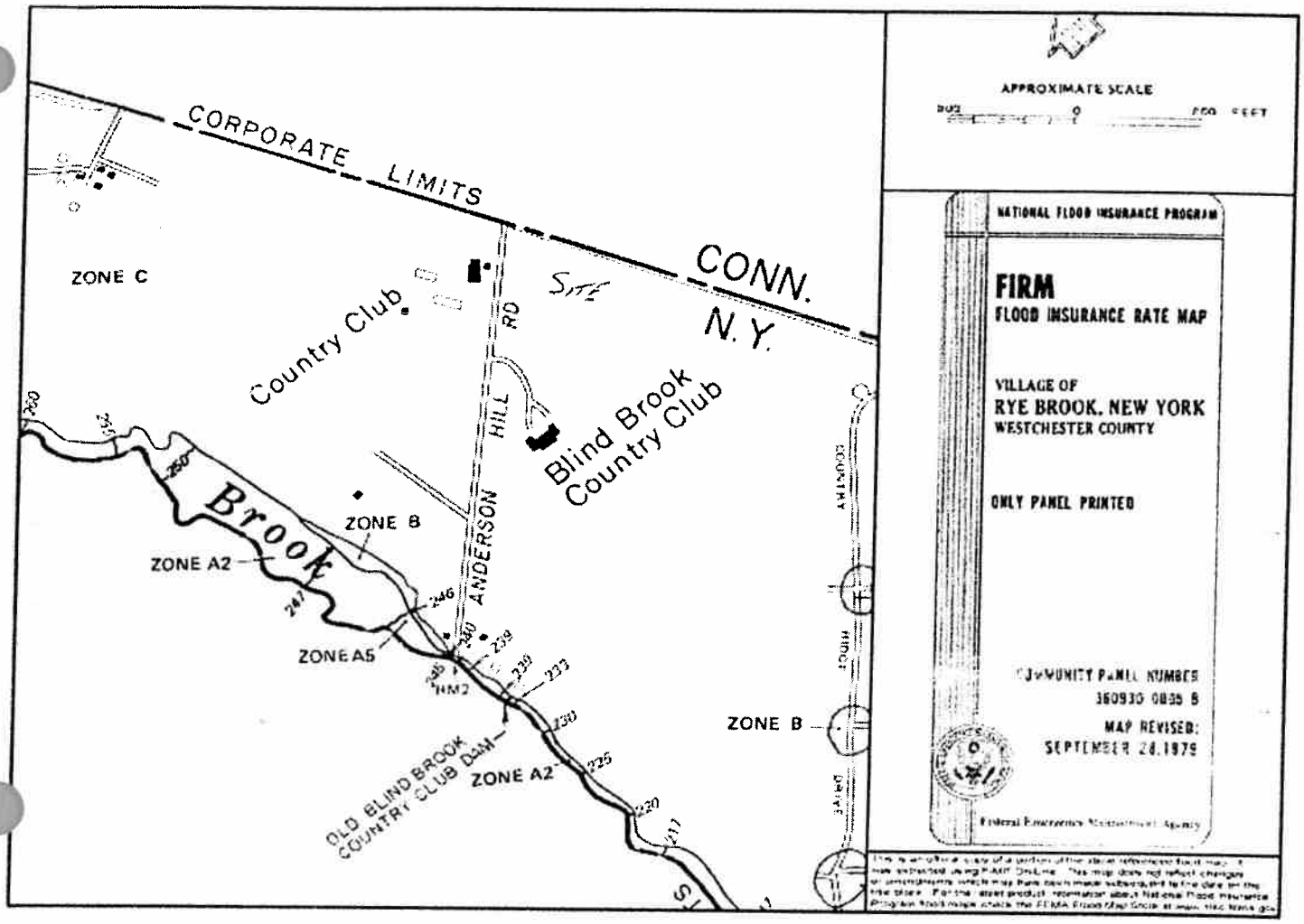
3) Urban Hydrology for Small Watersheds, Technical Release No. 55, USDA Soil Conservation Publication, June 1986.

4) Intensity Duration Frequency Curves, Technical Paper No. 25, United States Department of Commerce.

APPENDIX A

Woodlands Homes - Rye Brook

303d Segments


CORPORATE LIMITS
CONN.
N.Y.
ZONE C
Country Club
Site
Blind Brook Country Club
ANDERSON HILL RD
Brook
ZONE B
ZONE A2
ZONE A5
HM2
OLD BLIND BROOK COUNTRY CLUB DAM
ZONE A2
ZONE B
HIGH
APPROXIMATE SCALE
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
VILLAGE OF
RYE BROOK, NEW YORK
WESTCHESTER COUNTY
ONLY PANEL PRINTED
COMMUNITY PANEL NUMBER
360930 0035 B
MAP REVISED:
SEPTEMBER 28, 1979

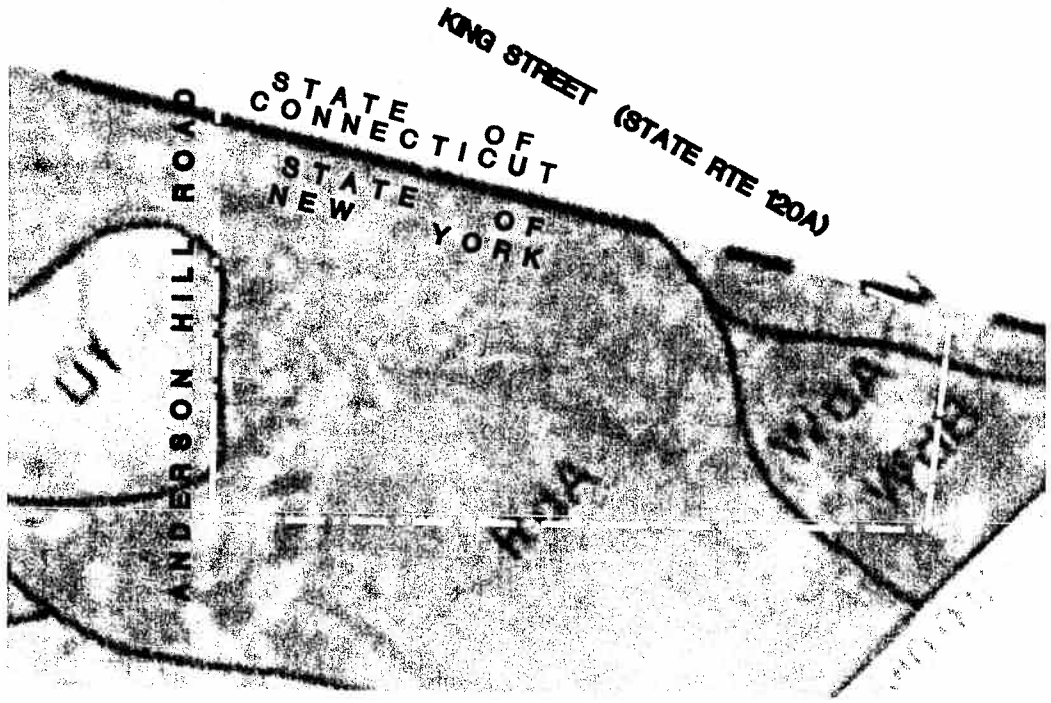
KINGSWOOD

SOILS MAP

BARRETT, BONACCI & VAN WEELE P.C.

DATE: 3/30/07
SCALE 1"=300'

REFERENCE: SOIL SURVEY OF PUTNAM AND WESTCHESTER COUNTIES, NEW YOR.
ISSUED SEPTEMBER 1994
SHEET 155

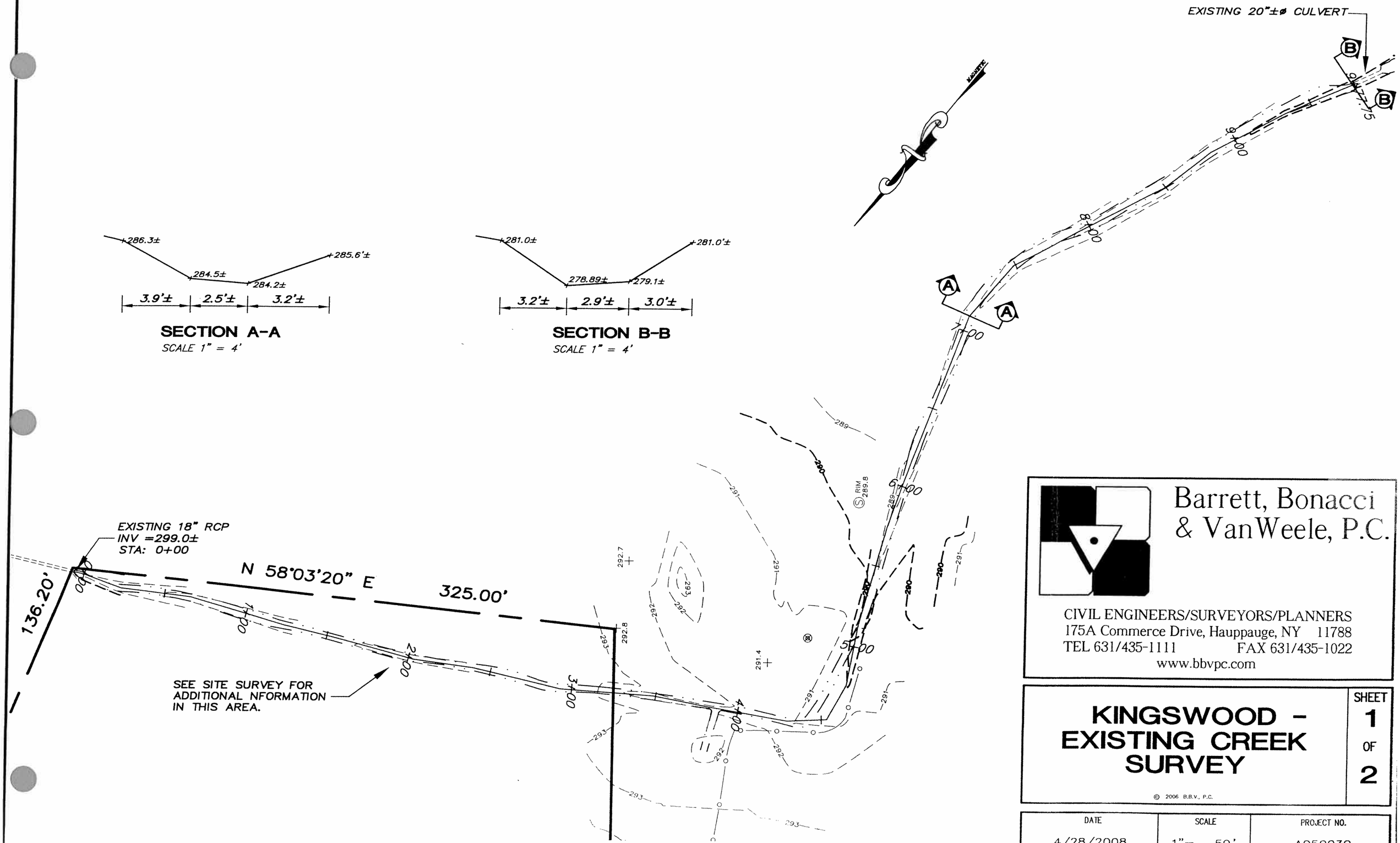


APPENDIX B

Existing Stream Analysis

SECTION A-A
SCALE 1" = 4'

SECTION B-B
SCALE 1" = 4'



Barrett, Bonacci
& VanWeele, P.C.

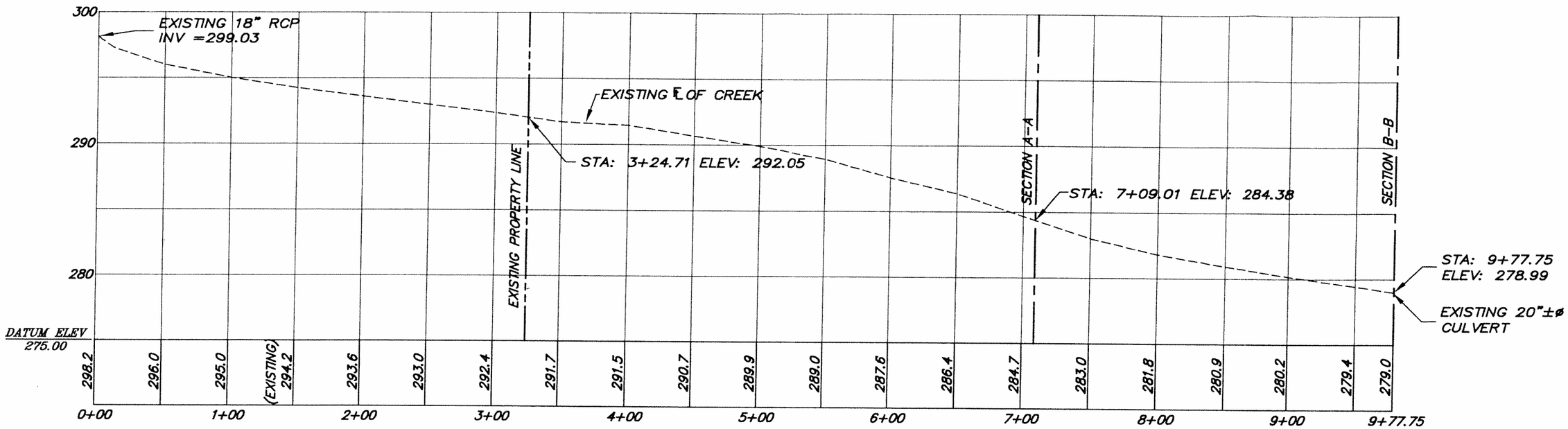
CIVIL ENGINEERS/SURVEYORS/PLANNERS
175A Commerce Drive, Hauppauge, NY 11788
TEL 631/435-1111 FAX 631/435-1022
www.bbvpc.com

KINGSWOOD - EXISTING CREEK SURVEY

SHEET 1 OF 2

© 2006 B.B.V., P.C.

DATE	SCALE	PROJECT NO.
4/28/2008	1"= 50'	A050030



EXISTING STREAM PROFILE

SCALE 1" = 80' HORZ.
1" = 8' VERT.

Barrett, Bonacci
& VanWeele, P.C.

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KINGSWOOD - STREAM PROFILE	SHEET 2 OF 2

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DATE	SCALE	PROJECT NO.
4/28/2008	1"= 50'	A050030

Channel Calculator

Existing Conditions - 100 Year Event

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	41.3400 cfs ← Area A = 24.86
Slope	0.0200 ft/ft Area: B-6 = 16.48
Manning's n	0.0400
Height	2.0000 ft
Bottom width	2.5000 ft
Left slope	0.6700 ft/ft (V/H)
Right slope	0.6700 ft/ft (V/H)

Computed Results:

Depth	1.6333 ft
Velocity	5.1259 fps
Full Flowrate	62.6215 cfs
Flow area	8.0650 ft2
Flow perimeter	8.3687 ft
Hydraulic radius	0.9637 ft
Top width	7.3756 ft
Area	10.9701 ft2
Perimeter	9.6863 ft
Percent full	81.6657 %

Critical Information

Critical depth	1.5125 ft
Critical slope	0.0272 ft/ft
Critical velocity	5.7449 fps
Critical area	7.1960 ft2
Critical perimeter	7.9348 ft
Critical hydraulic radius	0.9069 ft
Critical top width	7.0151 ft
Specific energy	2.0416 ft
Minimum energy	2.2688 ft
Froude number	0.8642
Flow condition	Subcritical

Existing Channel Rating Curve Data

Depth - ft	Flowrate - cfs
0.00000000,	0.00000000
0.10000000,	0.28499582
0.20000000,	0.91612351
0.30000000,	1.82981628
0.40000000,	3.01081081
0.50000000,	4.45639064
0.60000000,	6.16929280
0.70000000,	8.15504619
0.80000000,	10.42073482
0.90000000,	12.97435007
1.00000000,	15.82442415
1.10000000,	18.97981091
1.20000000,	22.44954938
1.30000000,	26.24277619
1.40000000,	30.36866810
1.50000000,	34.83640364
1.60000000,	39.65513726
1.70000000,	44.83398188
1.80000000,	50.38199711
1.90000000,	56.30818134
2.00000000,	62.62146669

Channel Calculator

Proposed Conditions - 100 Year Event

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	18.7900 cfs
Slope	0.0200 ft/ft
Manning's n	0.0400
Height	2.0000 ft
Bottom width	2.5000 ft
Left slope	0.6700 ft/ft (V/H)
Right slope	0.6700 ft/ft (V/H)

Area A = 13.21
Perim B-6 = 5.58

Computed Results:

Depth	1.0943 ft
Velocity	4.1545 fps
Full Flowrate	62.6215 cfs
Flow area	4.5228 ft2
Flow perimeter	6.4318 ft
Hydraulic radius	0.7032 ft
Top width	5.7664 ft
Area	10.9701 ft2
Perimeter	9.6863 ft
Percent full	54.7126 %

Critical Information

Critical depth	0.9845 ft
Critical slope	0.0299 ft/ft
Critical velocity	4.8081 fps
Critical area	3.9080 ft2
Critical perimeter	6.0375 ft
Critical hydraulic radius	0.6473 ft
Critical top width	5.4389 ft
Specific energy	1.3625 ft
Minimum energy	1.4768 ft
Froude number	0.8270
Flow condition	Subcritical

APPENDIX C

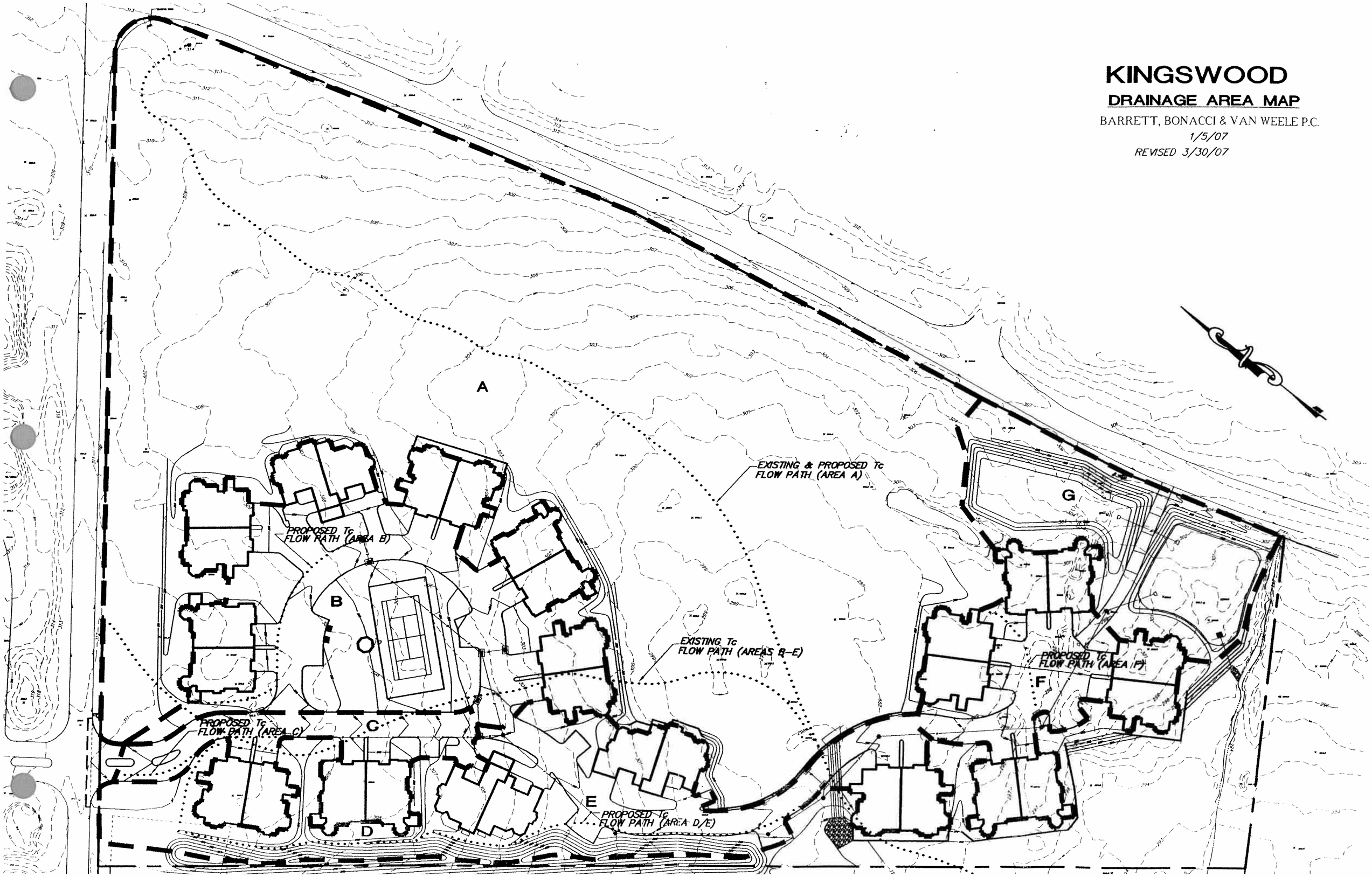
KINGSWOOD

DRAINAGE AREA MAP

BARRETT, BONACCI & VAN WEELE P.C.

1/5/07

REVISED 3/30/07



APPENDIX C

EXISTING CONDITIONS
TR-55 OUTPUT

WinTR-55 Current Data Description

--- Identification Data ---

User: MCM
Project: Kingswood
SubTitle: Existing Conditions
State: New York
County: Westchester
Filename: C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

Date: 3/16/2007
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
B-G	Future Developement Area	Outlet	5.88	70	.466
A	Area to remain natural	Outlet	8.18	70	.381

Total area: 14.06 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.8

Storm Data Source: Westchester County, NY (NRCS)
Rainfall Distribution Type: Type III
Dimensionless Unit Hydrograph: <standard>

==========

MCM

Kingswood
Existing Conditions
Westchester County, New York

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.8

Storm Data Source: Westchester County, NY (NRCS)
Rainfall Distribution Type: Type III
Dimensionless Unit Hydrograph: <standard>

==========

Existing Conditions
Westchester County, New York

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)
SUBAREAS							
B-G	3.80	6.62	8.14	11.38	14.75	16.48	2.09
75% B-G →	2.85		6.11			12.36	1.57
A	5.71	9.97	12.27	17.13	22.24	24.86	3.14
REACHES							
OUTLET	9.42	16.42	20.22	28.24	36.65	40.96	5.19

MCM

Kingswood
Existing Conditions
Westchester County, New York

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)
SUBAREAS							
B-G	3.80	6.62	8.14	11.38	14.75	16.48	2.09
	12.37	12.35	12.33	12.34	12.34	12.34	12.40
A	5.71	9.97	12.27	17.13	22.24	24.86	3.14
	12.30	12.29	12.27	12.27	12.27	12.27	12.32
REACHES							
OUTLET	9.42	16.42	20.22	28.24	36.65	40.96	5.19

MCM

Kingswood
Existing Conditions
Westchester County, New York

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
B-G	5.88	0.466	70	Outlet	Future Developement Area
A	8.18	0.381	70	Outlet	Area to remain natural

Total Area: 14.06 (ac)

MCM Kingswood

Existing Conditions
Westchester County, New York

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B-G							
SHEET	100	0.0160	0.400				0.374
SHALLOW	700	0.0170	3.5				0.092
					Time of Concentration		.466
A							
SHEET	100	0.0400	0.400				0.259
SHALLOW	900	0.0160	3.5				0.122
					Time of Concentration		.381

MCM

Kingswood
Existing Conditions
Westchester County, New York

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B-G	Meadow -cont. grass (non grazed)		C	1.82	71
	Woods	(good)	C	4.06	70
	Total Area / Weighted Curve Number			5.88	70
A	Woods	(good)	C	8.18	70
	Total Area / Weighted Curve Number			8.18	70

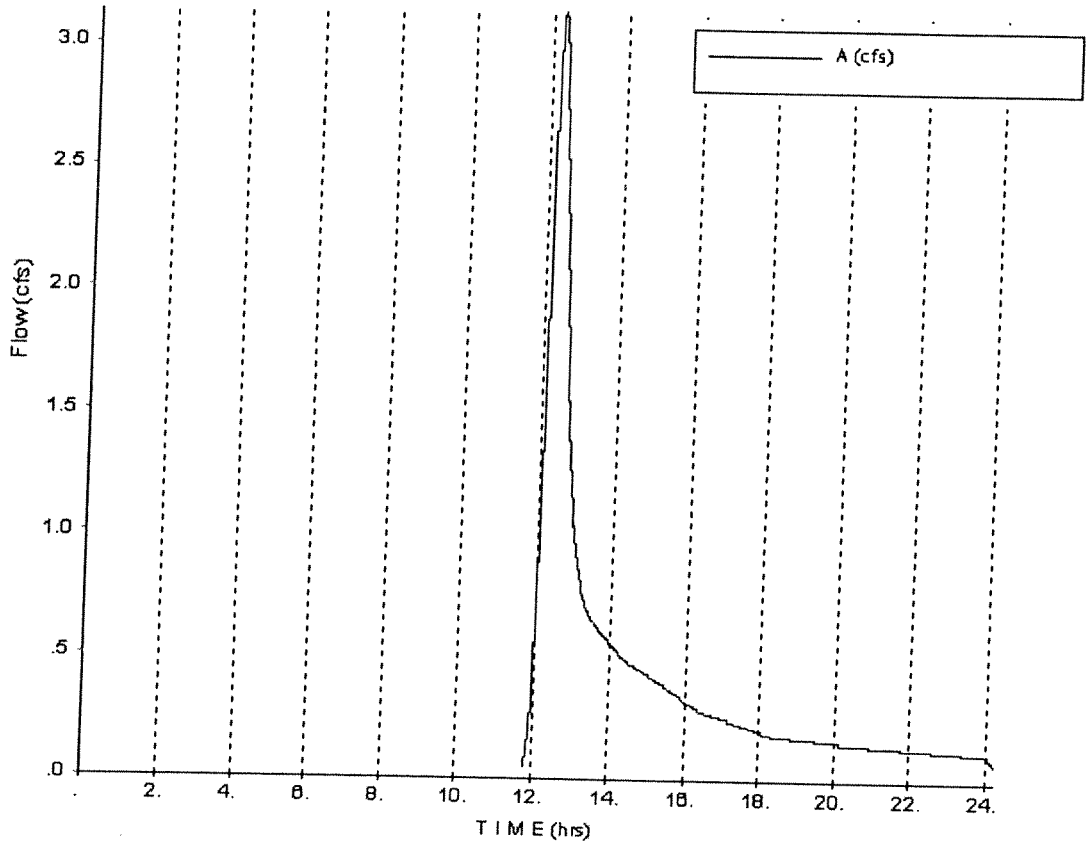
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (A) Storm: 1-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



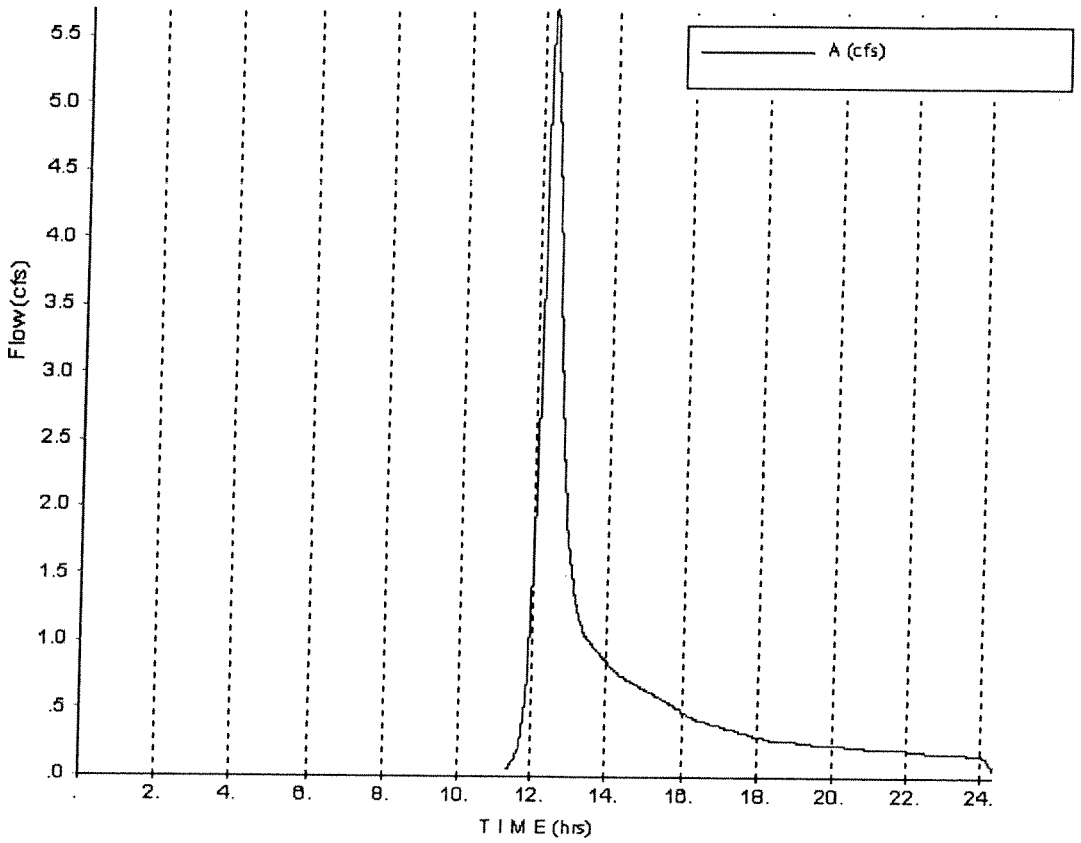
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (A) Storm: 2-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



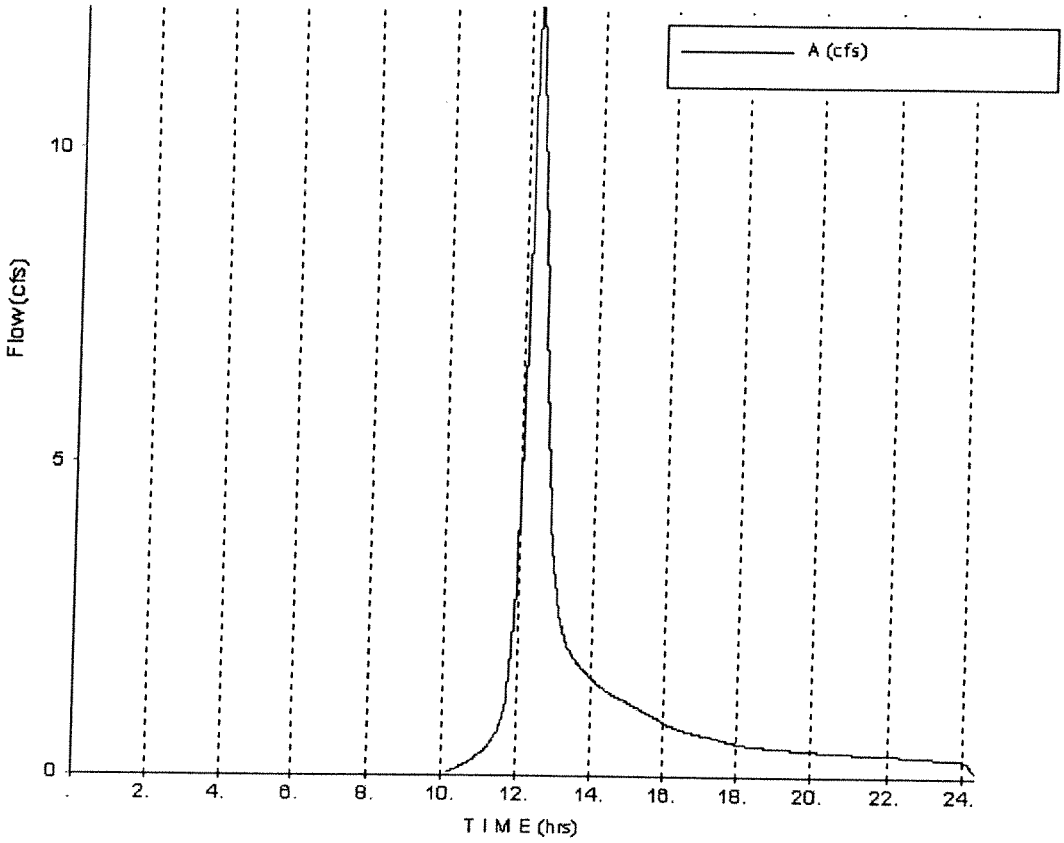
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (A) Storm: 10-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



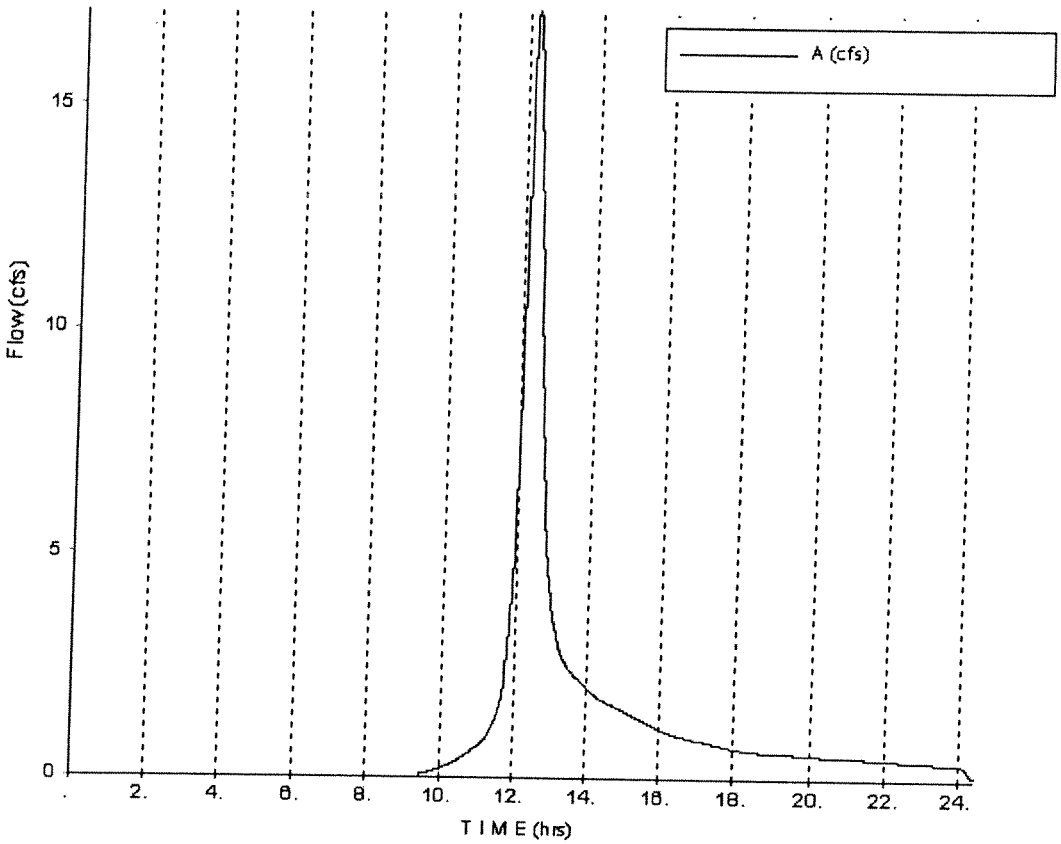
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (A) Storm: 25-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

11/2/2007



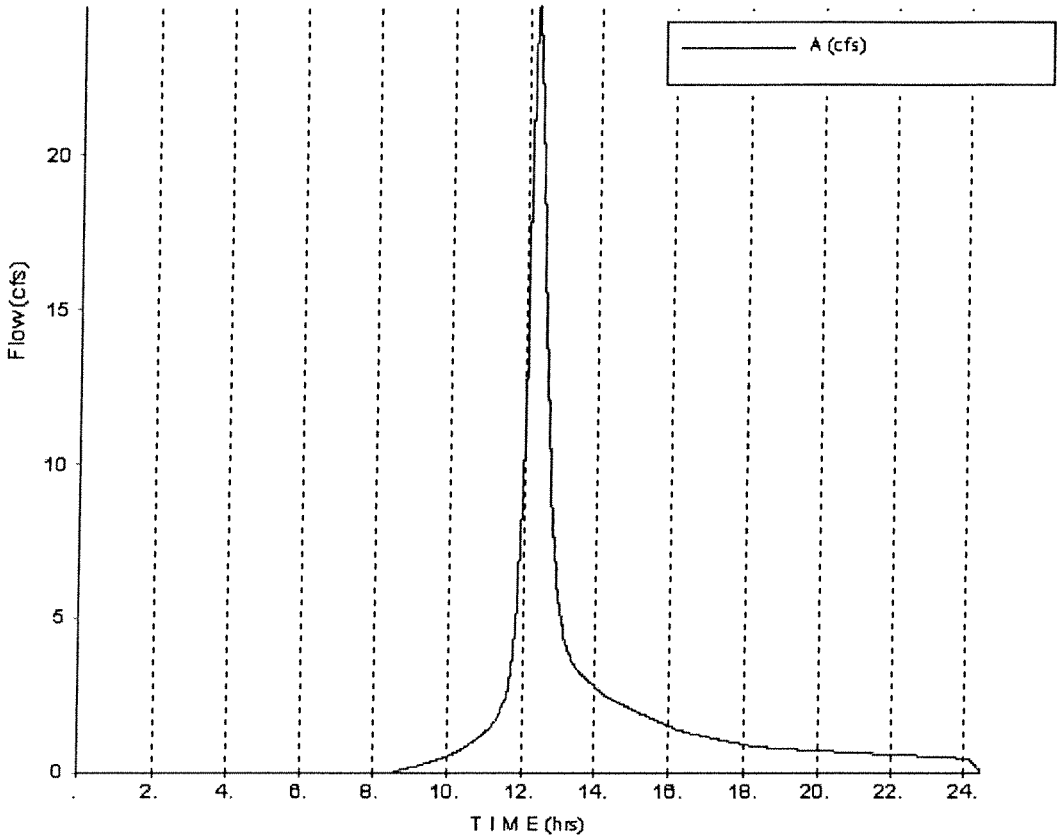
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (A) Storm: 100-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



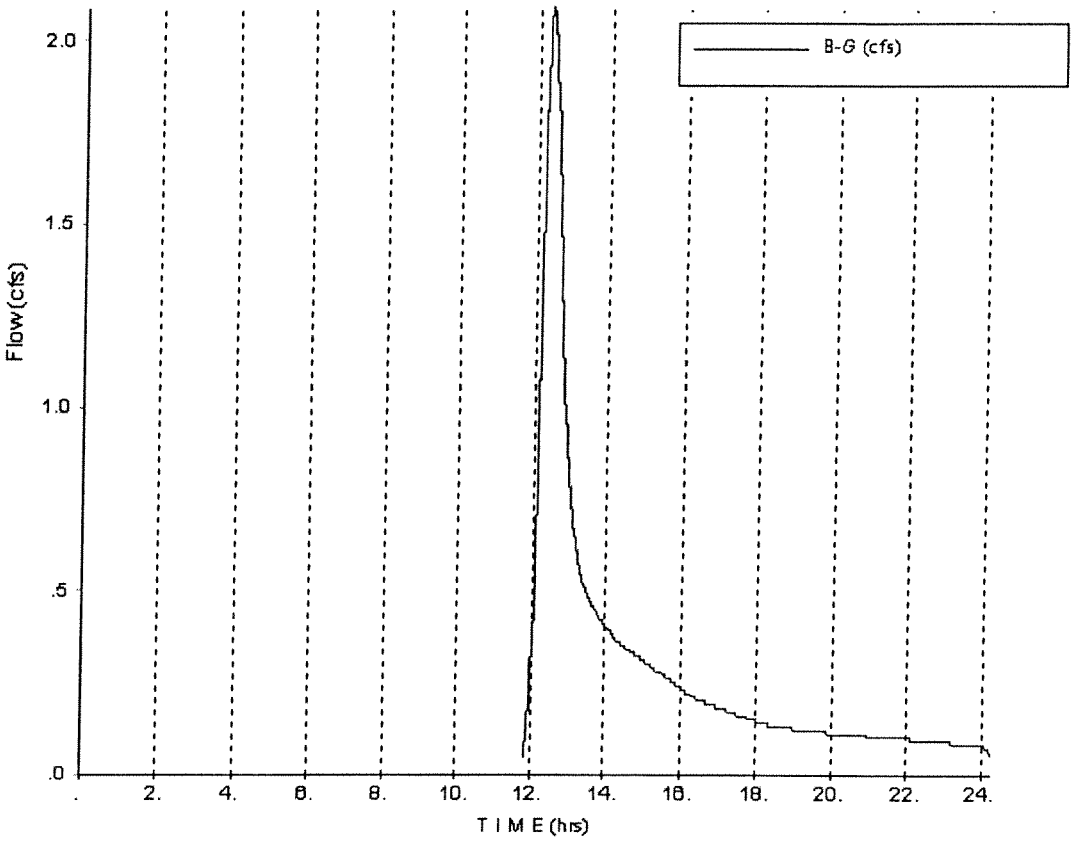
WinTR-55 Output Hydrograph

Project: Kingswood

4/11/2007

Subarea: (B-G) Storm: 1-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55



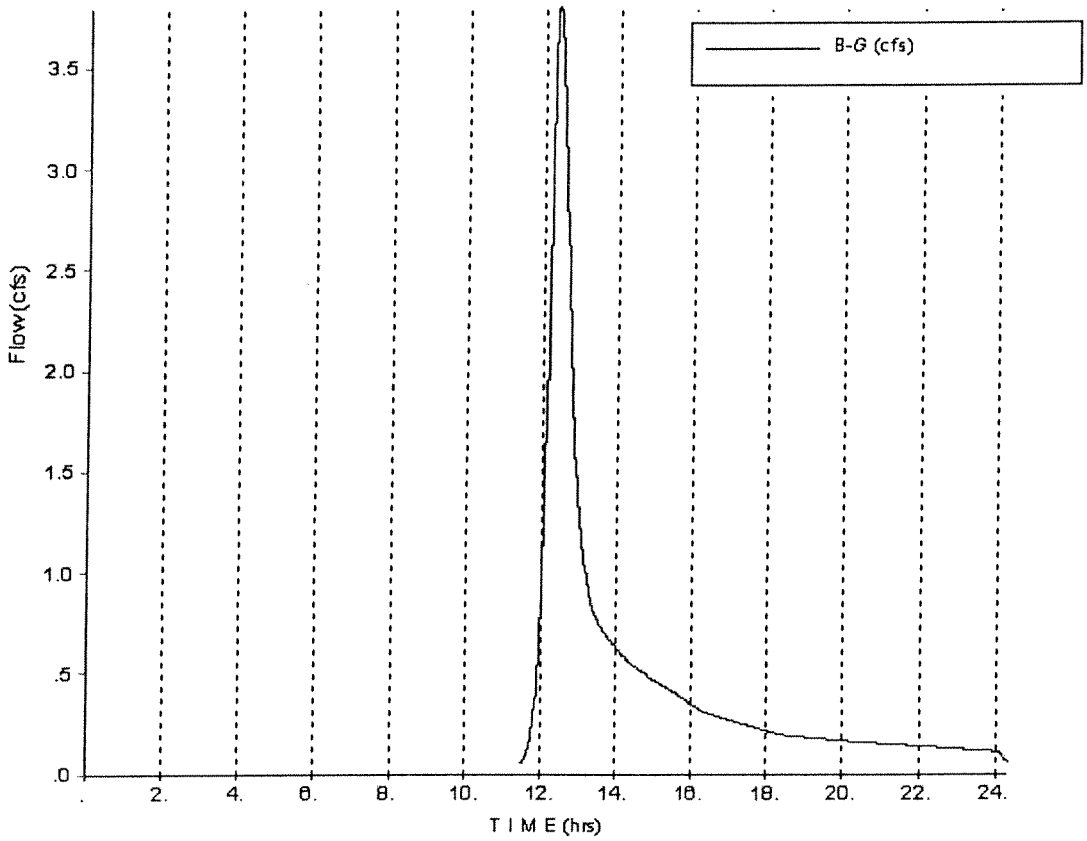
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (B-G) Storm: 2-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

4/11/2007



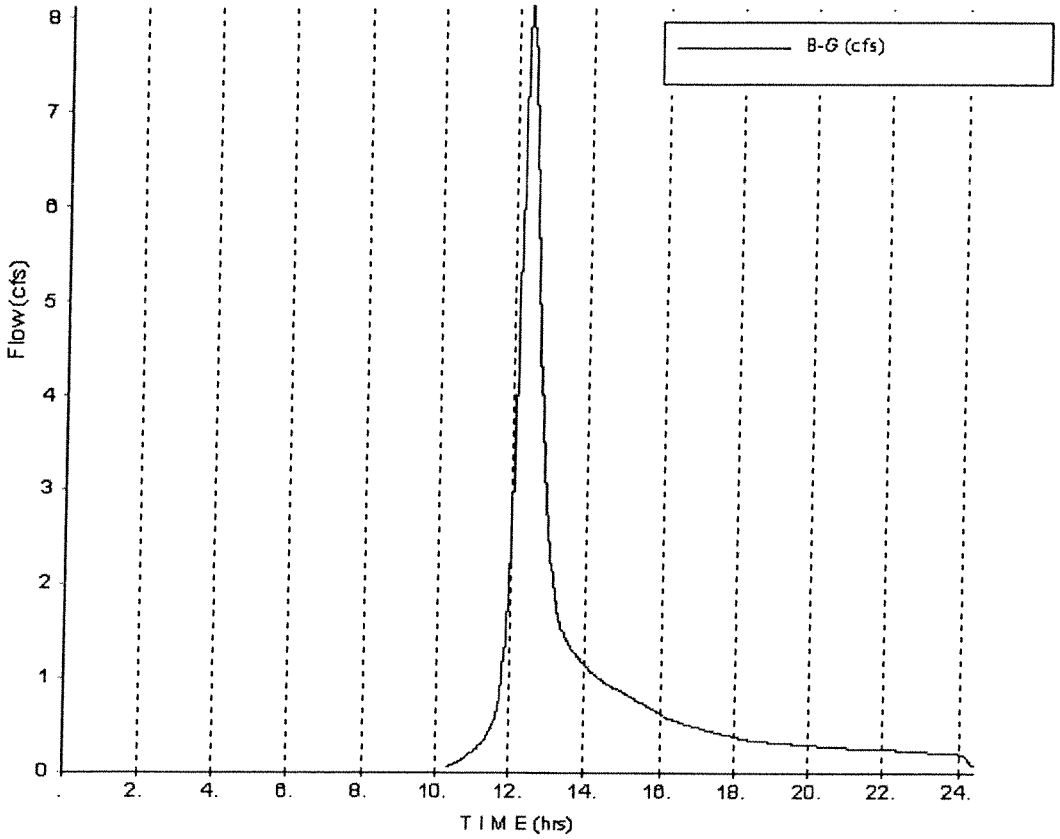
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (B-G) Storm: 10-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

4/11/2007



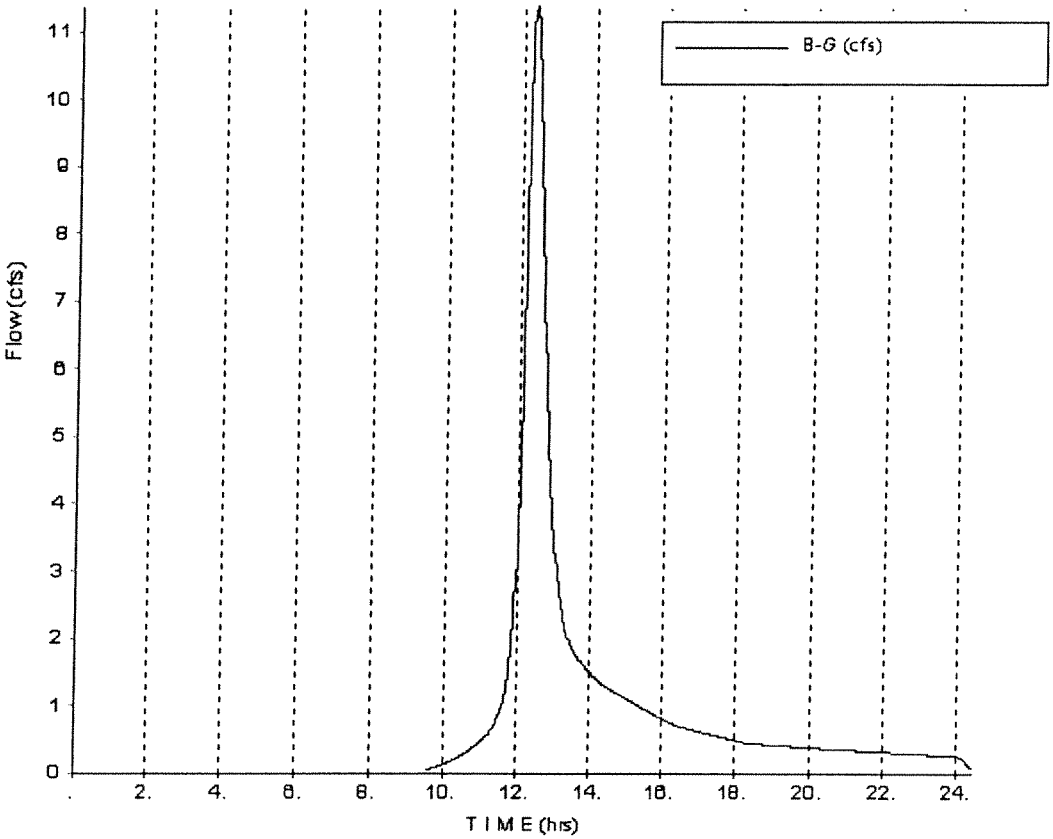
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (B-G) Storm: 25-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

11/2/2007



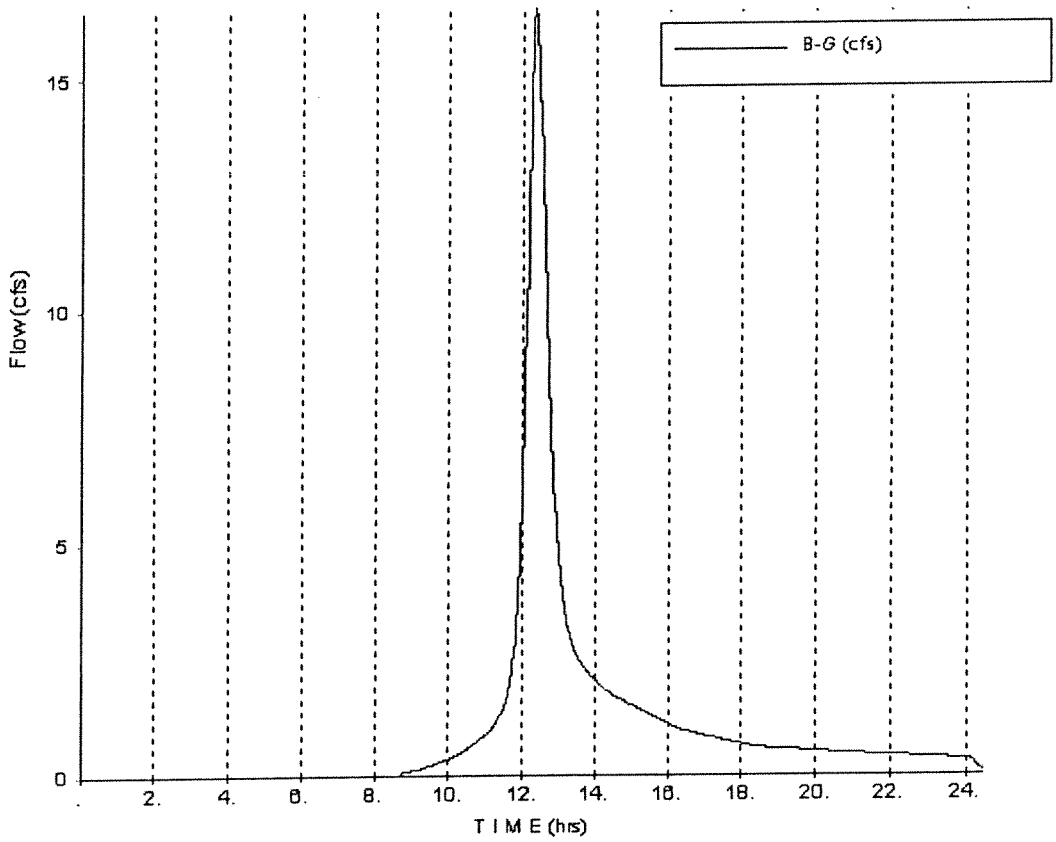
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (B-G) Storm: 100-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

4/11/2007



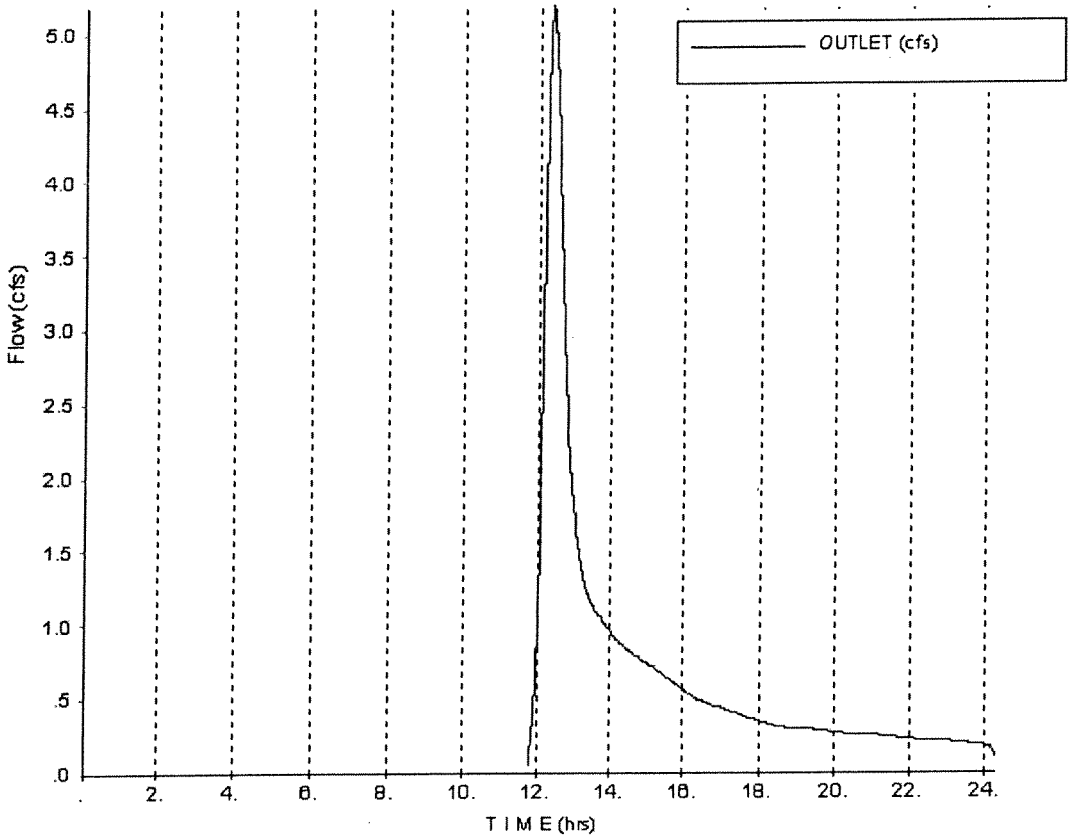
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (Outlet) Storm: 1-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



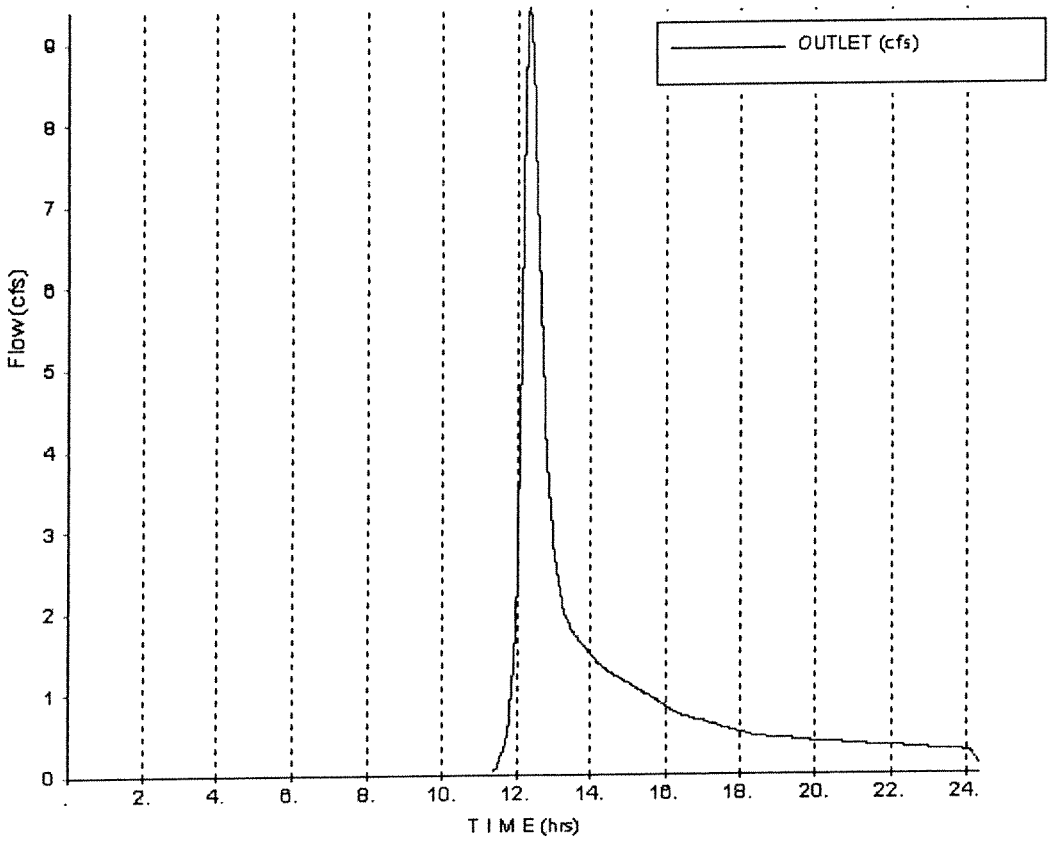
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (Outlet) Storm: 2-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



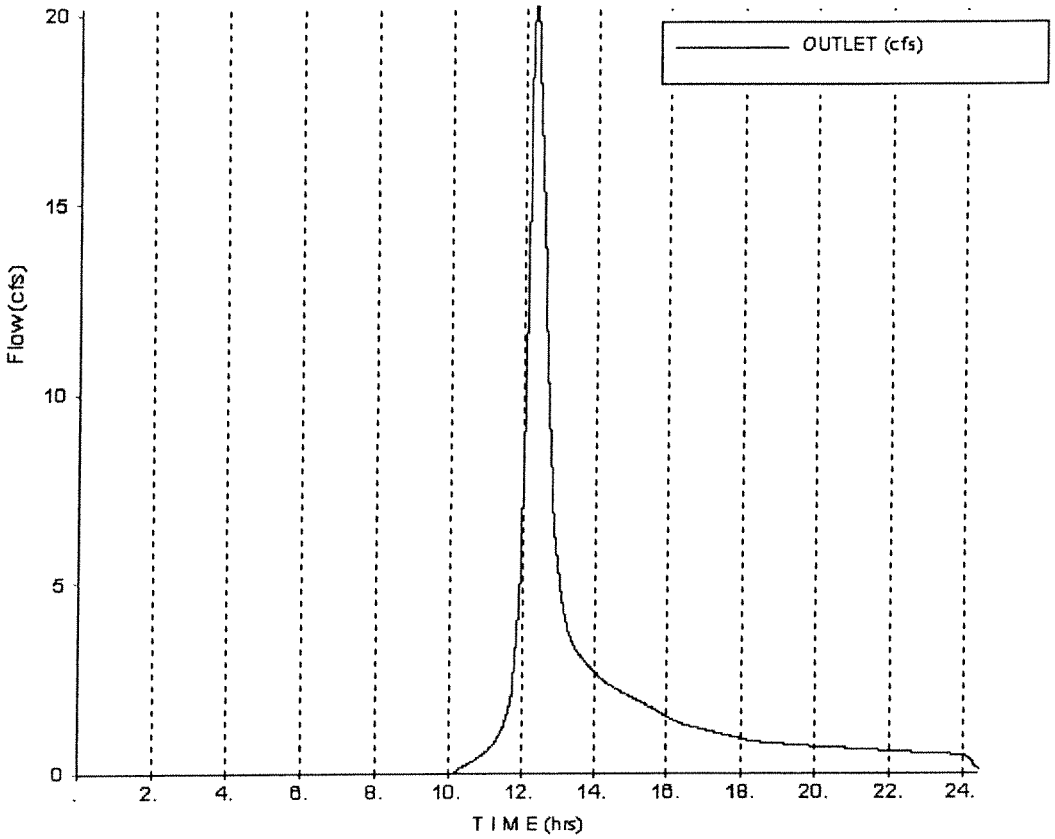
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (Outlet) Storm: 10-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



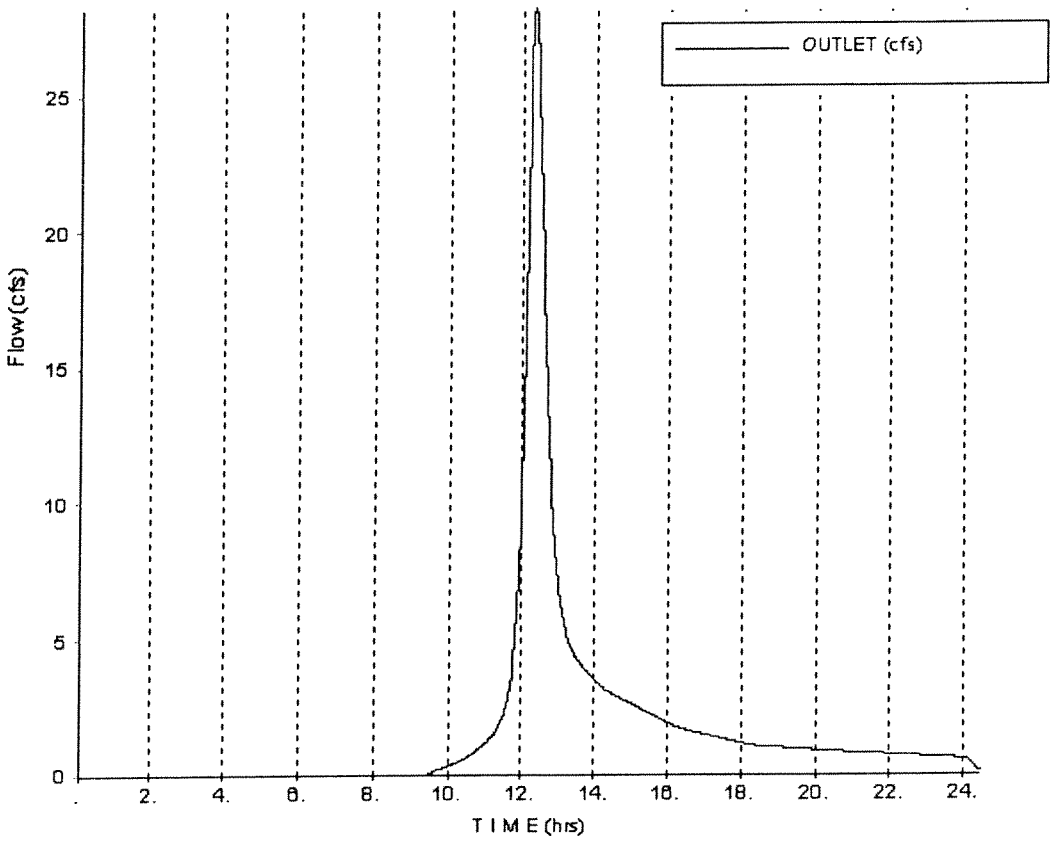
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (Outlet) Storm: 25-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

11/2/2007



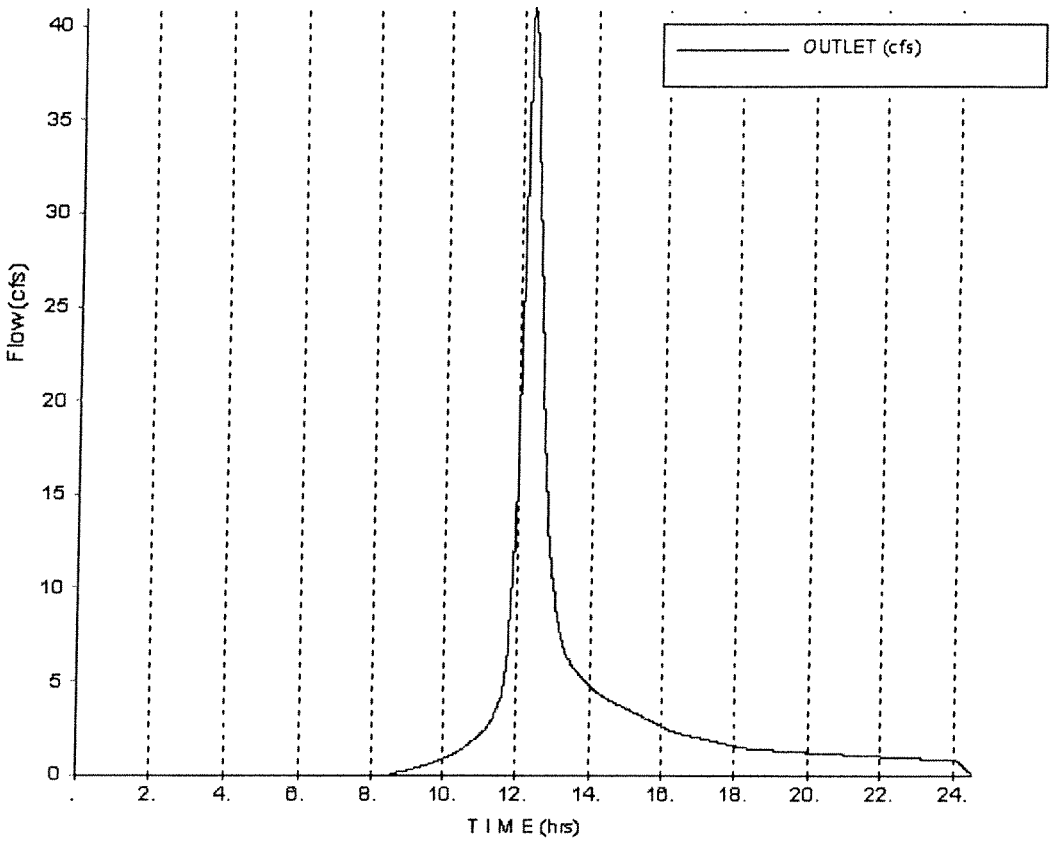
WinTR-55 Output Hydrograph

Project: Kingswood

Subarea: (Outlet) Storm: 100-Yr

C:\Documents and Settings\Mike\Application Data\WinTR-55\existing.w55

3/16/2007



APPENDIX C

PROPOSED CONDITIONS
TR-55 OUTPUT
AREAS B-G

WinTR-55 Current Data Description

--- Identification Data ---

User: MCM
Project: Kingswood
SubTitle: As-Built
State: New York
County: Westchester
Filename: C:\Documents and Settings\Mike\Application Data\WinTR-55\asbuilt.w55

Date: 3/16/2007
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
B	Loop Rd.-Units 1-12	Outlet	1.99	91	.267
C	Main Rd. - Units 27 - 30	Outlet	0.57	96	.184
D/E	Main Rd. & West Berm	Outlet	1.55	87	.357
F	Main Rd. - cul-de-sac	Outlet	0.89	95	.139
G	Pond Area	Outlet	0.88	84	.115

Total area: 5.88 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.8

Storm Data Source: Westchester County, NY (NRCS)
Rainfall Distribution Type: Type III
Dimensionless Unit Hydrograph: <standard>

Kingswood
As-Built
Westchester County, New York

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
B							
SHEET	100	0.0067	0.150				0.242
SHALLOW	180	0.0100	0.025				0.025
				Time of Concentration			.267
							========
C							
SHEET	80	0.0100	0.150				0.172
SHALLOW	90	0.0100	0.025				0.012
				Time of Concentration			.184
							========
D/E							
SHEET	100	0.0050	0.150				0.272
SHALLOW	380	0.0176	0.050				0.049
SHALLOW	260	0.0100	0.025				0.036
				Time of Concentration			.357
							========
F							
SHEET	50	0.0080	0.150				0.129
SHALLOW	75	0.0100	0.025				0.010
				Time of Concentration			.139
							========
G							
SHEET	30	0.0100	0.240				0.115
				Time of Concentration			.115
							========

Kingswood
As-Built
Westchester County, New York

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
B	Open space; grass cover > 75% (good)	C	.58	74
	Paved parking lots, roofs, driveways	C	1.41	98
	Total Area / Weighted Curve Number		1.99	91
			====	==
C	Open space; grass cover > 75% (good)	C	.04	74
	Paved parking lots, roofs, driveways	C	.53	98
	Total Area / Weighted Curve Number		.57	96
			===	==
D/E	Open space; grass cover > 75% (good)	C	.74	74
	Paved parking lots, roofs, driveways	C	.81	98
	Total Area / Weighted Curve Number		1.55	87
			====	==
F	Open space; grass cover > 75% (good)	C	.11	74
	Paved parking lots, roofs, driveways	C	.78	98
	Total Area / Weighted Curve Number		.89	95
			===	==
G	Open space; grass cover > 75% (good)	C	.52	74
	Paved parking lots, roofs, driveways	C	.36	98
	Total Area / Weighted Curve Number		.88	84
			===	==

KINGSWOOD

TR-55 Tabular Hydrograph Method - Input Summary

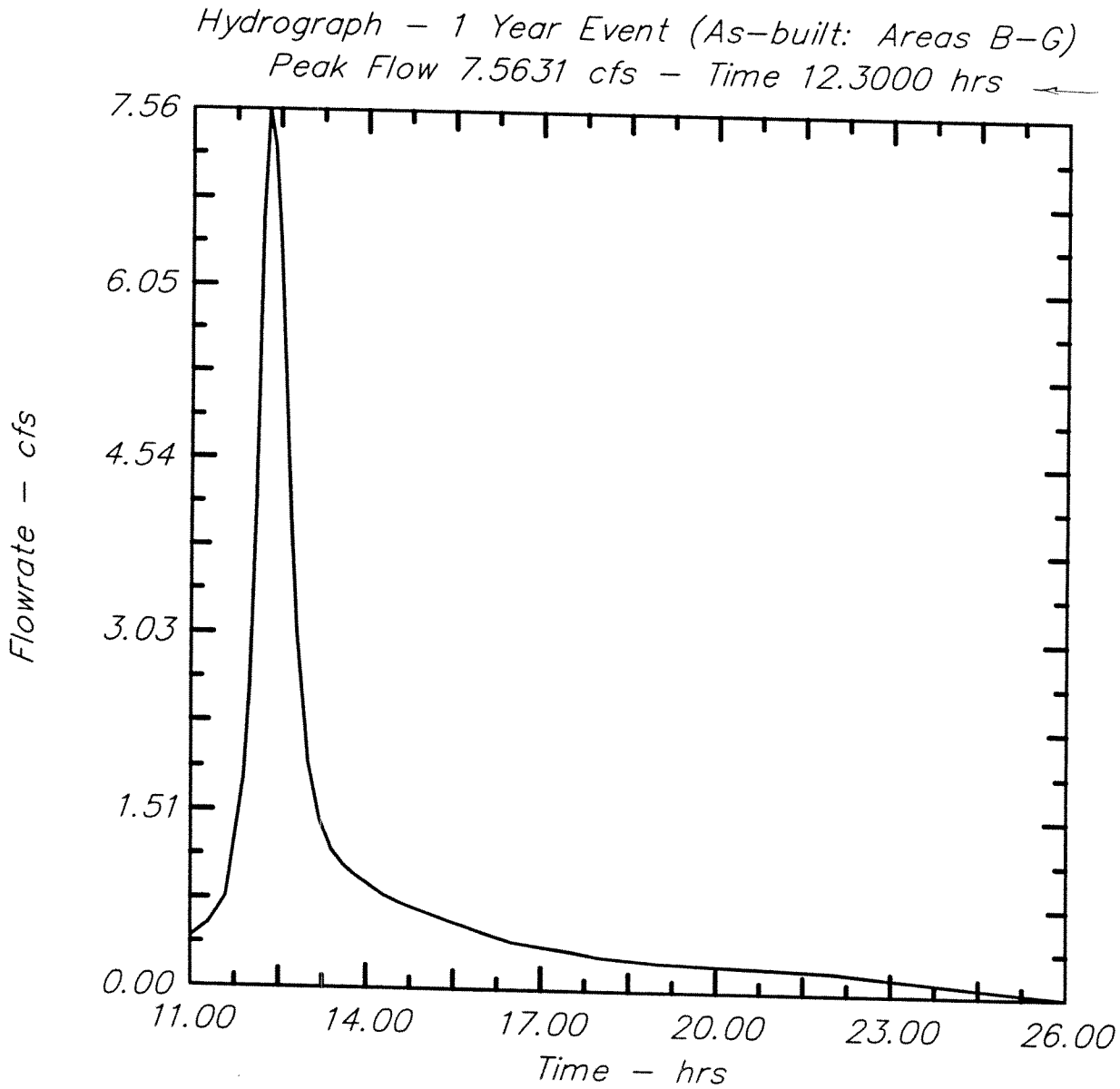
Description	As-Built (Areas B-G) - 1 year
Rainfall Distribution	Type III
Ia/P Interpolation	On
Total Area	5.8800 ac
Peak Time	12.3000 hrs
Peak Flow	7.5631 cfs

Given Input Data:

Subarea Description	D/S Subareas	Area (ac)	CN	Tc (hrs)	Tt (hrs)	Rainfall (in)
b		1.9900	91	0.2670	0.0300	2.8000
c		0.5700	96	0.1840	0.0300	2.8000
d/e		1.5500	87	0.3570	0.0150	2.8000
f		0.8900	95	0.1390	0.0100	2.8000
g		0.8800	84	0.1150	0.0000	2.8000

Composite Runoff Curve Number Calculator

Description		Area (ac)	Curve Number	
B		1.9900	91	
C		0.5700	96	
D/E		1.5500	87	
F		0.8900	95	
G		0.8800	84	
Total Area	----->	5.8800	90	<----- Weighted CN


Hydrograph – 1 Year Event (As–built: Areas B–G)
Peak Flow 7.5631 cfs – Time 12.3000 hrs
7.56
6.05
4.54
3.03
1.51
0.00
Flowrate – cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time – hrs

KINGSWOOD
AS-BUILT CONDITIONS
1-YEAR EVENT

TR-55 Tabular Data

AREA B
11.0000 hrs 0.1466 cfs
11.3000 hrs 0.1818 cfs
11.6000 hrs 0.2580 cfs
11.9000 hrs 0.4925 cfs
12.0000 hrs 0.7270 cfs
12.1000 hrs 1.0612 cfs
12.2000 hrs 1.6827 cfs
12.3000 hrs 2.5855 cfs
12.4000 hrs 2.9197 cfs
12.5000 hrs 2.6442 cfs
12.6000 hrs 2.0989 cfs
12.7000 hrs 1.6182 cfs
12.8000 hrs 1.1960 cfs
13.0000 hrs 0.6918 cfs
13.2000 hrs 0.5101 cfs
13.4000 hrs 0.4104 cfs
13.6000 hrs 0.3694 cfs
13.8000 hrs 0.3400 cfs
14.0000 hrs 0.3166 cfs
14.3000 hrs 0.2814 cfs
14.6000 hrs 0.2580 cfs
15.0000 hrs 0.2287 cfs
15.5000 hrs 0.1993 cfs
16.0000 hrs 0.1700 cfs
16.5000 hrs 0.1407 cfs
17.0000 hrs 0.1290 cfs
17.5000 hrs 0.1173 cfs
18.0000 hrs 0.0997 cfs
19.0000 hrs 0.0821 cfs
20.0000 hrs 0.0762 cfs
22.0000 hrs 0.0645 cfs
26.0000 hrs 0.0000 cfs

AREA C
11.0000 hrs 0.0566 cfs
11.3000 hrs 0.0713 cfs
11.6000 hrs 0.1049 cfs
11.9000 hrs 0.2496 cfs
12.0000 hrs 0.3692 cfs
12.1000 hrs 0.5412 cfs
12.2000 hrs 0.9398 cfs
12.3000 hrs 1.1852 cfs
12.4000 hrs 1.0132 cfs
12.5000 hrs 0.7510 cfs
12.6000 hrs 0.5664 cfs
12.7000 hrs 0.4070 cfs
12.8000 hrs 0.2874 cfs
13.0000 hrs 0.1951 cfs
13.2000 hrs 0.1573 cfs
13.4000 hrs 0.1364 cfs
13.6000 hrs 0.1259 cfs
13.8000 hrs 0.1175 cfs
14.0000 hrs 0.1091 cfs
14.3000 hrs 0.0965 cfs
14.6000 hrs 0.0881 cfs
15.0000 hrs 0.0797 cfs

15.5000 hrs 0.0692 cfs
16.0000 hrs 0.0587 cfs
16.5000 hrs 0.0503 cfs
17.0000 hrs 0.0441 cfs
17.5000 hrs 0.0399 cfs
18.0000 hrs 0.0357 cfs
19.0000 hrs 0.0294 cfs
20.0000 hrs 0.0273 cfs
22.0000 hrs 0.0231 cfs
26.0000 hrs 0.0000 cfs

AREA D/E
11.0000 hrs 0.0843 cfs
11.3000 hrs 0.1063 cfs
11.6000 hrs 0.1429 cfs
11.9000 hrs 0.2384 cfs
12.0000 hrs 0.3347 cfs
12.1000 hrs 0.4875 cfs
12.2000 hrs 0.7355 cfs
12.3000 hrs 1.1512 cfs
12.4000 hrs 1.5854 cfs
12.5000 hrs 1.6937 cfs
12.6000 hrs 1.5764 cfs
12.7000 hrs 1.3085 cfs
12.8000 hrs 1.0414 cfs
13.0000 hrs 0.6175 cfs
13.2000 hrs 0.4127 cfs
13.4000 hrs 0.3139 cfs
13.6000 hrs 0.2607 cfs
13.8000 hrs 0.2340 cfs
14.0000 hrs 0.2187 cfs
14.3000 hrs 0.1920 cfs
14.6000 hrs 0.1729 cfs
15.0000 hrs 0.1576 cfs
15.5000 hrs 0.1348 cfs
16.0000 hrs 0.1155 cfs
16.5000 hrs 0.0965 cfs
17.0000 hrs 0.0850 cfs
17.5000 hrs 0.0771 cfs
18.0000 hrs 0.0694 cfs
19.0000 hrs 0.0579 cfs
20.0000 hrs 0.0503 cfs
22.0000 hrs 0.0425 cfs
26.0000 hrs 0.0000 cfs

AREA F
11.0000 hrs 0.0909 cfs
11.3000 hrs 0.1191 cfs
11.6000 hrs 0.1787 cfs
11.9000 hrs 0.5392 cfs
12.0000 hrs 0.7555 cfs
12.1000 hrs 1.3324 cfs
12.2000 hrs 2.0754 cfs
12.3000 hrs 1.6647 cfs
12.4000 hrs 1.0816 cfs
12.5000 hrs 0.8308 cfs
12.6000 hrs 0.5988 cfs
12.7000 hrs 0.4076 cfs
12.8000 hrs 0.3166 cfs
13.0000 hrs 0.2602 cfs
13.2000 hrs 0.2132 cfs
13.4000 hrs 0.1944 cfs

13.6000 hrs 0.1818 cfs
13.8000 hrs 0.1693 cfs
14.0000 hrs 0.1568 cfs
14.3000 hrs 0.1379 cfs
14.6000 hrs 0.1285 cfs
15.0000 hrs 0.1160 cfs
15.5000 hrs 0.1003 cfs
16.0000 hrs 0.0846 cfs
16.5000 hrs 0.0721 cfs
17.0000 hrs 0.0658 cfs
17.5000 hrs 0.0596 cfs
18.0000 hrs 0.0502 cfs
19.0000 hrs 0.0439 cfs
20.0000 hrs 0.0408 cfs
22.0000 hrs 0.0345 cfs
26.0000 hrs 0.0000 cfs

AREA G
11.0000 hrs 0.0442 cfs
11.3000 hrs 0.0580 cfs
11.6000 hrs 0.0869 cfs
11.9000 hrs 0.2785 cfs
12.0000 hrs 0.4032 cfs
12.1000 hrs 0.7476 cfs
12.2000 hrs 1.2101 cfs
12.3000 hrs 0.9764 cfs
12.4000 hrs 0.6497 cfs
12.5000 hrs 0.5049 cfs
12.6000 hrs 0.3655 cfs
12.7000 hrs 0.2503 cfs
12.8000 hrs 0.1960 cfs
13.0000 hrs 0.1622 cfs
13.2000 hrs 0.1336 cfs
13.4000 hrs 0.1224 cfs
13.6000 hrs 0.1150 cfs
13.8000 hrs 0.1072 cfs
14.0000 hrs 0.0994 cfs
14.3000 hrs 0.0879 cfs
14.6000 hrs 0.0823 cfs
15.0000 hrs 0.0746 cfs
15.5000 hrs 0.0646 cfs
16.0000 hrs 0.0546 cfs
16.5000 hrs 0.0468 cfs
17.0000 hrs 0.0428 cfs
17.5000 hrs 0.0384 cfs
18.0000 hrs 0.0328 cfs
19.0000 hrs 0.0287 cfs
20.0000 hrs 0.0265 cfs
22.0000 hrs 0.0225 cfs
26.0000 hrs 0.0000 cfs

Total Flow Values
11.0000 hrs 0.4226 cfs
11.3000 hrs 0.5364 cfs
11.6000 hrs 0.7714 cfs
11.9000 hrs 1.7983 cfs
12.0000 hrs 2.5897 cfs
12.1000 hrs 4.1699 cfs
12.2000 hrs 6.6435 cfs
12.3000 hrs 7.5631 cfs
12.4000 hrs 7.2497 cfs
12.5000 hrs 6.4245 cfs
12.6000 hrs 5.2060 cfs

12.7000	hrs	3.9915	cfs
12.8000	hrs	3.0375	cfs
13.0000	hrs	1.9268	cfs
13.2000	hrs	1.4269	cfs
13.4000	hrs	1.1774	cfs
13.6000	hrs	1.0527	cfs
13.8000	hrs	0.9680	cfs
14.0000	hrs	0.9006	cfs
14.3000	hrs	0.7958	cfs
14.6000	hrs	0.7299	cfs
15.0000	hrs	0.6566	cfs
15.5000	hrs	0.5682	cfs
16.0000	hrs	0.4836	cfs
16.5000	hrs	0.4064	cfs
17.0000	hrs	0.3666	cfs
17.5000	hrs	0.3322	cfs
18.0000	hrs	0.2877	cfs
19.0000	hrs	0.2420	cfs
20.0000	hrs	0.2211	cfs
22.0000	hrs	0.1870	cfs
26.0000	hrs	0.0000	cfs

TR-55 Tabular Hydrograph Method
Input Summary

Description ..... As-Built (Areas B-G) - 2 year
Rainfall Distribution ..... Type III
Ia/P Interpolation ..... On
Total Area ..... 5.8800 ac

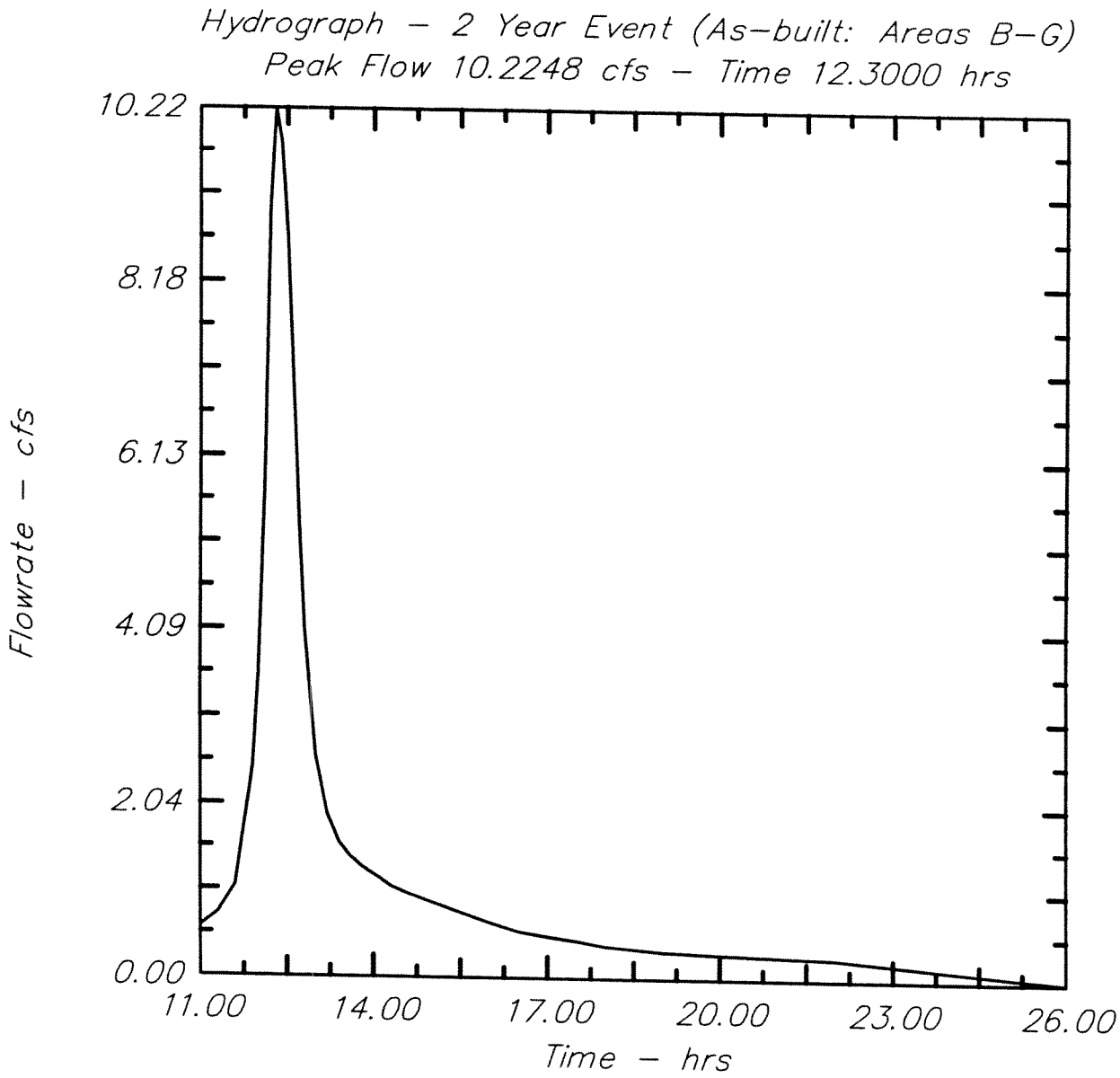
Peak Time ..... 12.3000 hrs
Peak Flow ..... 10.2248 cfs

Given Input Data:

Subarea Description	D/S Subareas	Area (ac)	CN	Tc (hrs)	Tt (hrs)	Rainfall (in)
b		1.9900	91	0.2670	0.0300	3.5000
c		0.5700	96	0.1840	0.0300	3.5000
d/e		1.5500	87	0.3570	0.0150	3.5000
f		0.8900	95	0.1390	0.0100	3.5000
g		0.8800	84	0.1150	0.0000	3.5000

Composite Runoff Curve Number Calculator

Description		Area (ac)	Curve Number	
B		1.9900	91	
C		0.5700	96	
D/E		1.5500	87	
F		0.8900	95	
G		0.8800	84	
Total Area	----->	5.8800	90	<----- Weighted CN


Hydrograph – 2 Year Event (As–built: Areas B–G)
Peak Flow 10.2248 cfs – Time 12.3000 hrs
10.22
8.18
6.13
4.09
2.04
0.00
Flowrate – cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time – hrs

Kingswood
As-BUILT CONDITIONS
2-YEAR EVENT

TR-55 Tabular Data

AREA B
11.0000 hrs 0.1975 cfs
11.3000 hrs 0.2449 cfs
11.6000 hrs 0.3477 cfs
11.9000 hrs 0.6637 cfs
12.0000 hrs 0.9798 cfs
12.1000 hrs 1.4301 cfs
12.2000 hrs 2.2677 cfs
12.3000 hrs 3.4845 cfs
12.4000 hrs 3.9349 cfs
12.5000 hrs 3.5635 cfs
12.6000 hrs 2.8287 cfs
12.7000 hrs 2.1808 cfs
12.8000 hrs 1.6119 cfs
13.0000 hrs 0.9324 cfs
13.2000 hrs 0.6874 cfs
13.4000 hrs 0.5531 cfs
13.6000 hrs 0.4978 cfs
13.8000 hrs 0.4583 cfs
14.0000 hrs 0.4267 cfs
14.3000 hrs 0.3793 cfs
14.6000 hrs 0.3477 cfs
15.0000 hrs 0.3082 cfs
15.5000 hrs 0.2686 cfs
16.0000 hrs 0.2291 cfs
16.5000 hrs 0.1896 cfs
17.0000 hrs 0.1738 cfs
17.5000 hrs 0.1580 cfs
18.0000 hrs 0.1343 cfs
19.0000 hrs 0.1106 cfs
20.0000 hrs 0.1027 cfs
22.0000 hrs 0.0869 cfs
26.0000 hrs 0.0000 cfs

AREA C
11.0000 hrs 0.0732 cfs
11.3000 hrs 0.0922 cfs
11.6000 hrs 0.1356 cfs
11.9000 hrs 0.3228 cfs
12.0000 hrs 0.4773 cfs
12.1000 hrs 0.6998 cfs
12.2000 hrs 1.2151 cfs
12.3000 hrs 1.5324 cfs
12.4000 hrs 1.3100 cfs
12.5000 hrs 0.9710 cfs
12.6000 hrs 0.7323 cfs
12.7000 hrs 0.5262 cfs
12.8000 hrs 0.3716 cfs
13.0000 hrs 0.2522 cfs
13.2000 hrs 0.2034 cfs
13.4000 hrs 0.1763 cfs
13.6000 hrs 0.1627 cfs
13.8000 hrs 0.1519 cfs
14.0000 hrs 0.1410 cfs
14.3000 hrs 0.1248 cfs
14.6000 hrs 0.1139 cfs
15.0000 hrs 0.1031 cfs

15.5000 hrs 0.0895 cfs
16.0000 hrs 0.0759 cfs
16.5000 hrs 0.0651 cfs
17.0000 hrs 0.0570 cfs
17.5000 hrs 0.0515 cfs
18.0000 hrs 0.0461 cfs
19.0000 hrs 0.0380 cfs
20.0000 hrs 0.0353 cfs
22.0000 hrs 0.0298 cfs
26.0000 hrs 0.0000 cfs

AREA D/E
11.0000 hrs 0.1216 cfs
11.3000 hrs 0.1533 cfs
11.6000 hrs 0.2061 cfs
11.9000 hrs 0.3436 cfs
12.0000 hrs 0.4810 cfs
12.1000 hrs 0.6977 cfs
12.2000 hrs 1.0465 cfs
12.3000 hrs 1.6280 cfs
12.4000 hrs 2.2305 cfs
12.5000 hrs 2.3732 cfs
12.6000 hrs 2.2041 cfs
12.7000 hrs 1.8235 cfs
12.8000 hrs 1.4482 cfs
13.0000 hrs 0.8563 cfs
13.2000 hrs 0.5708 cfs
13.4000 hrs 0.4334 cfs
13.6000 hrs 0.3594 cfs
13.8000 hrs 0.3224 cfs
14.0000 hrs 0.3013 cfs
14.3000 hrs 0.2643 cfs
14.6000 hrs 0.2379 cfs
15.0000 hrs 0.2167 cfs
15.5000 hrs 0.1850 cfs
16.0000 hrs 0.1586 cfs
16.5000 hrs 0.1321 cfs
17.0000 hrs 0.1163 cfs
17.5000 hrs 0.1057 cfs
18.0000 hrs 0.0951 cfs
19.0000 hrs 0.0793 cfs
20.0000 hrs 0.0687 cfs
22.0000 hrs 0.0581 cfs
26.0000 hrs 0.0000 cfs

AREA F
11.0000 hrs 0.1185 cfs
11.3000 hrs 0.1553 cfs
11.6000 hrs 0.2330 cfs
11.9000 hrs 0.7030 cfs
12.0000 hrs 0.9850 cfs
12.1000 hrs 1.7370 cfs
12.2000 hrs 2.7057 cfs
12.3000 hrs 2.1703 cfs
12.4000 hrs 1.4101 cfs
12.5000 hrs 1.0831 cfs
12.6000 hrs 0.7806 cfs
12.7000 hrs 0.5313 cfs
12.8000 hrs 0.4128 cfs
13.0000 hrs 0.3392 cfs
13.2000 hrs 0.2779 cfs
13.4000 hrs 0.2534 cfs

13.6000 hrs 0.2371 cfs
13.8000 hrs 0.2207 cfs
14.0000 hrs 0.2044 cfs
14.3000 hrs 0.1798 cfs
14.6000 hrs 0.1676 cfs
15.0000 hrs 0.1512 cfs
15.5000 hrs 0.1308 cfs
16.0000 hrs 0.1104 cfs
16.5000 hrs 0.0940 cfs
17.0000 hrs 0.0858 cfs
17.5000 hrs 0.0777 cfs
18.0000 hrs 0.0654 cfs
19.0000 hrs 0.0572 cfs
20.0000 hrs 0.0531 cfs
22.0000 hrs 0.0450 cfs
26.0000 hrs 0.0000 cfs

AREA G
11.0000 hrs 0.0738 cfs
11.3000 hrs 0.0967 cfs
11.6000 hrs 0.1451 cfs
11.9000 hrs 0.4434 cfs
12.0000 hrs 0.6258 cfs
12.1000 hrs 1.1164 cfs
12.2000 hrs 1.7550 cfs
12.3000 hrs 1.4097 cfs
12.4000 hrs 0.9213 cfs
12.5000 hrs 0.7097 cfs
12.6000 hrs 0.5121 cfs
12.7000 hrs 0.3491 cfs
12.8000 hrs 0.2718 cfs
13.0000 hrs 0.2237 cfs
13.2000 hrs 0.1835 cfs
13.4000 hrs 0.1676 cfs
13.6000 hrs 0.1569 cfs
13.8000 hrs 0.1461 cfs
14.0000 hrs 0.1354 cfs
14.3000 hrs 0.1193 cfs
14.6000 hrs 0.1113 cfs
15.0000 hrs 0.1005 cfs
15.5000 hrs 0.0870 cfs
16.0000 hrs 0.0734 cfs
16.5000 hrs 0.0627 cfs
17.0000 hrs 0.0572 cfs
17.5000 hrs 0.0516 cfs
18.0000 hrs 0.0437 cfs
19.0000 hrs 0.0382 cfs
20.0000 hrs 0.0354 cfs
22.0000 hrs 0.0300 cfs
26.0000 hrs 0.0000 cfs

Total Flow Values
11.0000 hrs 0.5847 cfs
11.3000 hrs 0.7425 cfs
11.6000 hrs 1.0674 cfs
11.9000 hrs 2.4764 cfs
12.0000 hrs 3.5489 cfs
12.1000 hrs 5.6811 cfs
12.2000 hrs 8.9900 cfs
12.3000 hrs 10.2248 cfs
12.4000 hrs 9.8067 cfs
12.5000 hrs 8.7005 cfs

12.6000 hrs 7.0578 cfs
12.7000 hrs 5.4109 cfs
12.8000 hrs 4.1162 cfs
13.0000 hrs 2.6038 cfs
13.2000 hrs 1.9231 cfs
13.4000 hrs 1.5838 cfs
13.6000 hrs 1.4139 cfs
13.8000 hrs 1.2994 cfs
14.0000 hrs 1.2087 cfs
14.3000 hrs 1.0674 cfs
14.6000 hrs 0.9783 cfs
15.0000 hrs 0.8797 cfs
15.5000 hrs 0.7609 cfs
16.0000 hrs 0.6474 cfs
16.5000 hrs 0.5435 cfs
17.0000 hrs 0.4901 cfs
17.5000 hrs 0.4446 cfs
18.0000 hrs 0.3846 cfs
19.0000 hrs 0.3233 cfs
20.0000 hrs 0.2953 cfs
22.0000 hrs 0.2498 cfs
26.0000 hrs 0.0000 cfs

Peak Time and Flow
12.3000 hrs 10.2248 cfs

KINGSWOOD

TR-55 Tabular Hydrograph Method - Input Summary

Description ..... As-Built (Areas B-G) - 10 year
Rainfall Distribution ..... Type III
Ia/P Interpolation ..... On
Total Area ..... 5.8800 ac

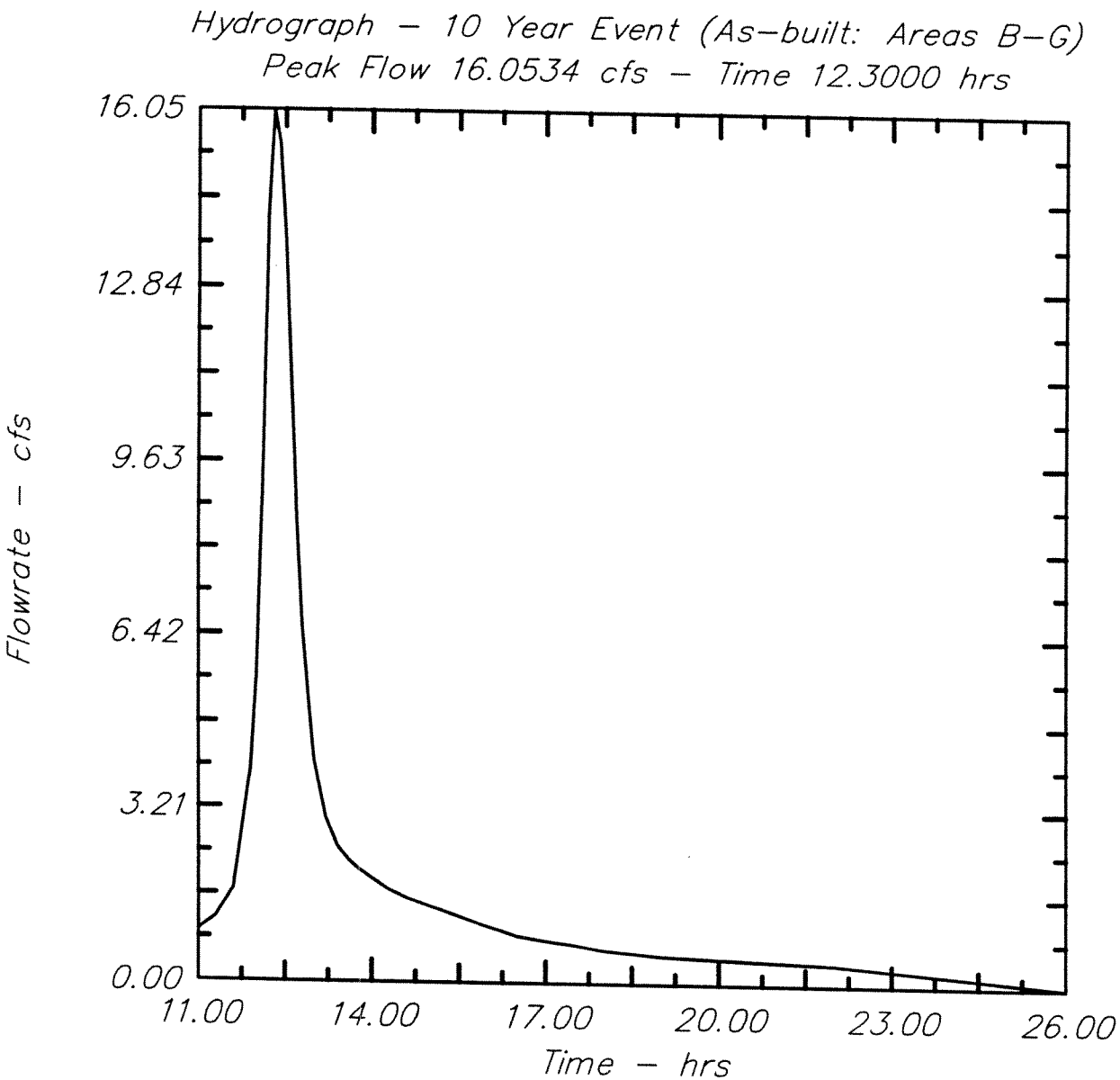
Peak Time ..... 12.3000 hrs
Peak Flow ..... 16.0534 cfs

Given Input Data:

Subarea Description	D/S Subareas	Area (ac)	CN	Tc (hrs)	Tt (hrs)	Rainfall (in)
b		1.9900	91	0.2670	0.0300	5.0000
c		0.5700	96	0.1840	0.0300	5.0000
d/e		1.5500	87	0.3570	0.0150	5.0000
f		0.8900	95	0.1390	0.0100	5.0000
g		0.8800	84	0.1150	0.0000	5.0000

Composite Runoff Curve Number Calculator

Description		Area (ac)	Curve Number	
B		1.9900	91	
C		0.5700	96	
D/E		1.5500	87	
F		0.8900	95	
G		0.8800	84	
Total Area	----->	5.8800	90	<----- Weighted CN


Hydrograph – 10 Year Event (As–built: Areas B–G)
Peak Flow 16.0534 cfs – Time 12.3000 hrs
16.05
12.84
9.63
6.42
3.21
0.00
Flowrate – cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time – hrs

KINGSWOOD
AS-BUILT CONDITIONS
10-YEAR EVENT

TR-55 Tabular Data

AREA B

11.0000	hrs	0.3095	cfs
11.3000	hrs	0.3838	cfs
11.6000	hrs	0.5448	cfs
11.9000	hrs	1.0401	cfs
12.0000	hrs	1.5353	cfs
12.1000	hrs	2.2411	cfs
12.2000	hrs	3.5536	cfs
12.3000	hrs	5.4604	cfs
12.4000	hrs	6.1661	cfs
12.5000	hrs	5.5842	cfs
12.6000	hrs	4.4327	cfs
12.7000	hrs	3.4174	cfs
12.8000	hrs	2.5259	cfs
13.0000	hrs	1.4611	cfs
13.2000	hrs	1.0772	cfs
13.4000	hrs	0.8667	cfs
13.6000	hrs	0.7801	cfs
13.8000	hrs	0.7181	cfs
14.0000	hrs	0.6686	cfs
14.3000	hrs	0.5943	cfs
14.6000	hrs	0.5448	cfs
15.0000	hrs	0.4829	cfs
15.5000	hrs	0.4210	cfs
16.0000	hrs	0.3591	cfs
16.5000	hrs	0.2972	cfs
17.0000	hrs	0.2724	cfs
17.5000	hrs	0.2476	cfs
18.0000	hrs	0.2105	cfs
19.0000	hrs	0.1733	cfs
20.0000	hrs	0.1610	cfs
22.0000	hrs	0.1362	cfs
26.0000	hrs	0.0000	cfs

AREA C

11.0000	hrs	0.1090	cfs
11.3000	hrs	0.1373	cfs
11.6000	hrs	0.2018	cfs
11.9000	hrs	0.4804	cfs
12.0000	hrs	0.7105	cfs
12.1000	hrs	1.0415	cfs
12.2000	hrs	1.8085	cfs
12.3000	hrs	2.2808	cfs
12.4000	hrs	1.9498	cfs
12.5000	hrs	1.4452	cfs
12.6000	hrs	1.0899	cfs
12.7000	hrs	0.7831	cfs
12.8000	hrs	0.5530	cfs
13.0000	hrs	0.3754	cfs
13.2000	hrs	0.3028	cfs
13.4000	hrs	0.2624	cfs
13.6000	hrs	0.2422	cfs
13.8000	hrs	0.2261	cfs
14.0000	hrs	0.2099	cfs
14.3000	hrs	0.1857	cfs
14.6000	hrs	0.1695	cfs

15.0000 hrs 0.1534 cfs
15.5000 hrs 0.1332 cfs
16.0000 hrs 0.1130 cfs
16.5000 hrs 0.0969 cfs
17.0000 hrs 0.0848 cfs
17.5000 hrs 0.0767 cfs
18.0000 hrs 0.0686 cfs
19.0000 hrs 0.0565 cfs
20.0000 hrs 0.0525 cfs
22.0000 hrs 0.0444 cfs
26.0000 hrs 0.0000 cfs

AREA D/E
11.0000 hrs 0.1987 cfs
11.3000 hrs 0.2505 cfs
11.6000 hrs 0.3369 cfs
11.9000 hrs 0.5616 cfs
12.0000 hrs 0.7862 cfs
12.1000 hrs 1.1404 cfs
12.2000 hrs 1.7106 cfs
12.3000 hrs 2.6610 cfs
12.4000 hrs 3.6459 cfs
12.5000 hrs 3.8792 cfs
12.6000 hrs 3.6027 cfs
12.7000 hrs 2.9806 cfs
12.8000 hrs 2.3672 cfs
13.0000 hrs 1.3996 cfs
13.2000 hrs 0.9331 cfs
13.4000 hrs 0.7084 cfs
13.6000 hrs 0.5875 cfs
13.8000 hrs 0.5270 cfs
14.0000 hrs 0.4925 cfs
14.3000 hrs 0.4320 cfs
14.6000 hrs 0.3888 cfs
15.0000 hrs 0.3542 cfs
15.5000 hrs 0.3024 cfs
16.0000 hrs 0.2592 cfs
16.5000 hrs 0.2160 cfs
17.0000 hrs 0.1901 cfs
17.5000 hrs 0.1728 cfs
18.0000 hrs 0.1555 cfs
19.0000 hrs 0.1296 cfs
20.0000 hrs 0.1123 cfs
22.0000 hrs 0.0950 cfs
26.0000 hrs 0.0000 cfs

AREA F
11.0000 hrs 0.1782 cfs
11.3000 hrs 0.2335 cfs
11.6000 hrs 0.3503 cfs
11.9000 hrs 1.0571 cfs
12.0000 hrs 1.4812 cfs
12.1000 hrs 2.6120 cfs
12.2000 hrs 4.0686 cfs
12.3000 hrs 3.2635 cfs
12.4000 hrs 2.1203 cfs
12.5000 hrs 1.6287 cfs
12.6000 hrs 1.1739 cfs
12.7000 hrs 0.7990 cfs
12.8000 hrs 0.6207 cfs
13.0000 hrs 0.5101 cfs

13.2000 hrs 0.4179 cfs
13.4000 hrs 0.3810 cfs
13.6000 hrs 0.3565 cfs
13.8000 hrs 0.3319 cfs
14.0000 hrs 0.3073 cfs
14.3000 hrs 0.2704 cfs
14.6000 hrs 0.2520 cfs
15.0000 hrs 0.2274 cfs
15.5000 hrs 0.1967 cfs
16.0000 hrs 0.1659 cfs
16.5000 hrs 0.1414 cfs
17.0000 hrs 0.1291 cfs
17.5000 hrs 0.1168 cfs
18.0000 hrs 0.0983 cfs
19.0000 hrs 0.0860 cfs
20.0000 hrs 0.0799 cfs
22.0000 hrs 0.0676 cfs
26.0000 hrs 0.0000 cfs

AREA G
11.0000 hrs 0.1304 cfs
11.3000 hrs 0.1709 cfs
11.6000 hrs 0.2563 cfs
11.9000 hrs 0.7735 cfs
12.0000 hrs 1.0837 cfs
12.1000 hrs 1.9112 cfs
12.2000 hrs 2.9769 cfs
12.3000 hrs 2.3878 cfs
12.4000 hrs 1.5514 cfs
12.5000 hrs 1.1917 cfs
12.6000 hrs 0.8589 cfs
12.7000 hrs 0.5846 cfs
12.8000 hrs 0.4542 cfs
13.0000 hrs 0.3732 cfs
13.2000 hrs 0.3058 cfs
13.4000 hrs 0.2788 cfs
13.6000 hrs 0.2608 cfs
13.8000 hrs 0.2428 cfs
14.0000 hrs 0.2248 cfs
14.3000 hrs 0.1979 cfs
14.6000 hrs 0.1844 cfs
15.0000 hrs 0.1664 cfs
15.5000 hrs 0.1439 cfs
16.0000 hrs 0.1214 cfs
16.5000 hrs 0.1034 cfs
17.0000 hrs 0.0944 cfs
17.5000 hrs 0.0854 cfs
18.0000 hrs 0.0719 cfs
19.0000 hrs 0.0630 cfs
20.0000 hrs 0.0585 cfs
22.0000 hrs 0.0495 cfs
26.0000 hrs 0.0000 cfs

Total Flow Values
11.0000 hrs 0.9259 cfs
11.3000 hrs 1.1761 cfs
11.6000 hrs 1.6902 cfs
11.9000 hrs 3.9126 cfs
12.0000 hrs 5.5969 cfs
12.1000 hrs 8.9462 cfs
12.2000 hrs 14.1182 cfs

```
12.3000 hrs 16.0534 cfs
12.4000 hrs 15.4335 cfs
12.5000 hrs 13.7288 cfs
12.6000 hrs 11.1581 cfs
12.7000 hrs 8.5647 cfs
12.8000 hrs 6.5211 cfs
13.0000 hrs 4.1194 cfs
13.2000 hrs 3.0368 cfs
13.4000 hrs 2.4974 cfs
13.6000 hrs 2.2270 cfs
13.8000 hrs 2.0459 cfs
14.0000 hrs 1.9031 cfs
14.3000 hrs 1.6803 cfs
14.6000 hrs 1.5395 cfs
15.0000 hrs 1.3843 cfs
15.5000 hrs 1.1971 cfs
16.0000 hrs 1.0186 cfs
16.5000 hrs 0.8548 cfs
17.0000 hrs 0.7707 cfs
17.5000 hrs 0.6993 cfs
18.0000 hrs 0.6049 cfs
19.0000 hrs 0.5085 cfs
20.0000 hrs 0.4641 cfs
22.0000 hrs 0.3927 cfs
26.0000 hrs 0.0000 cfs
```

TR-55 Tabular Hydrograph Method
Input Summary

Description ..... As-Built (Areas B-G) - 25 year
Rainfall Distribution ..... Type III
Ia/P Interpolation ..... On
Total Area ..... 5.8800 ac

Peak Time ..... 12.3000 hrs
Peak Flow ..... 20.0085 cfs

Given Input Data:

Subarea Description	D/S Subareas	Area (ac)	CN	Tc (hrs)	Tt (hrs)	Rainfall (in)
b		1.9900	91	0.2670	0.0300	6.0000
c		0.5700	96	0.1840	0.0300	6.0000
d/e		1.5500	87	0.3570	0.0150	6.0000
f		0.8900	95	0.1390	0.0100	6.0000
g		0.8800	84	0.1150	0.0000	6.0000

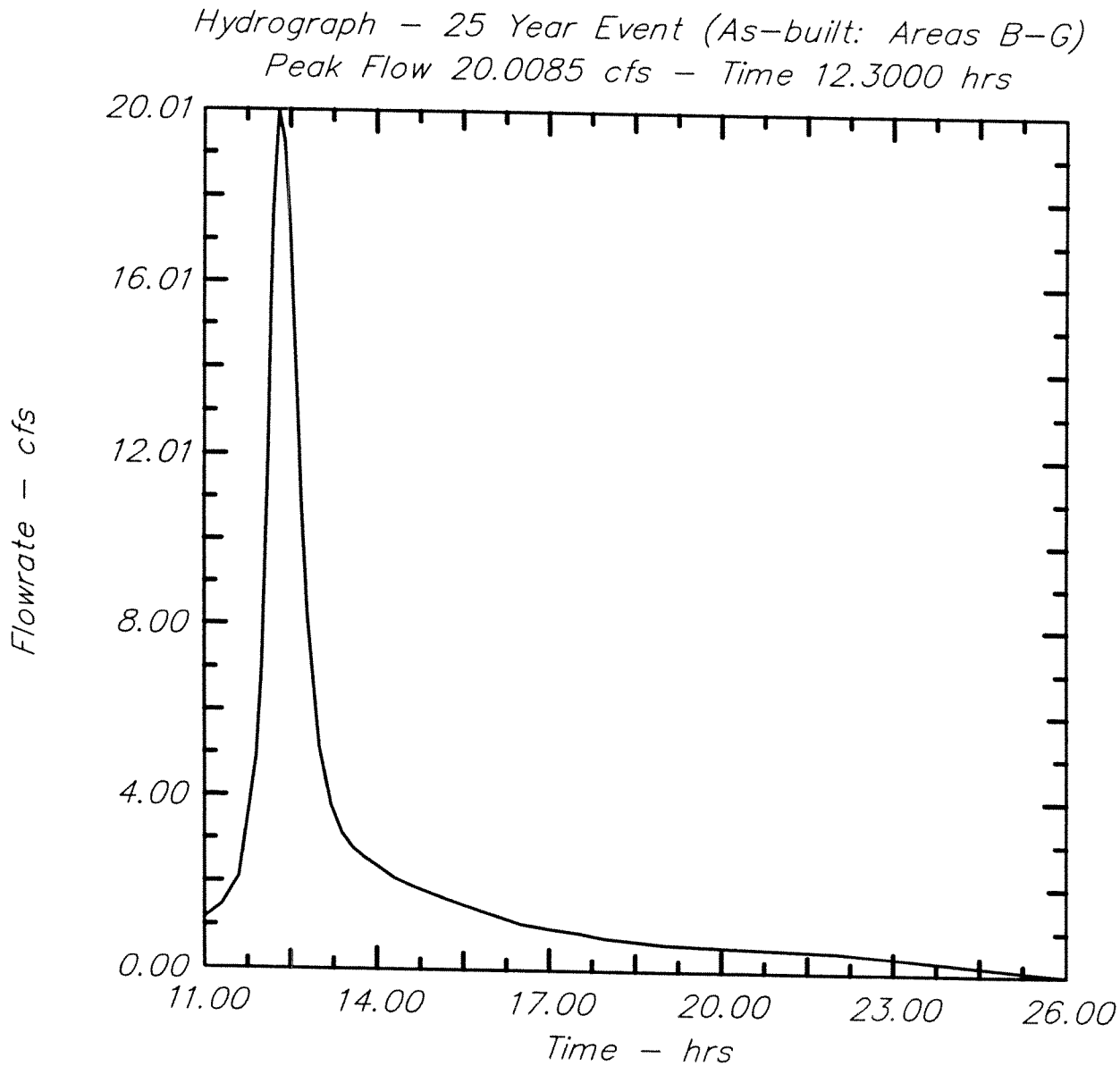
Support Data:

Composite Runoff Curve Number Calculator

Description		Area (ac)	Curve Number	
B		1.9900	91	
C		0.5700	96	
D/E		1.5500	87	
F		0.8900	95	
G		0.8800	84	
Total Area	----->	5.8800	90	<----- Weighted CN

Composite Runoff Curve Number Calculator

Description		Area (ac)	Curve Number	
B		1.9900	91	
C		0.5700	96	
D/E		1.5500	87	
F		0.8900	95	
G		0.8800	84	
Total Area	----->	5.8800	90	<----- Weighted CN


Hydrograph – 25 Year Event (As–built: Areas B–G)
Peak Flow 20.0085 cfs – Time 12.3000 hrs
20.01
16.01
12.01
8.00
4.00
0.00
Flowrate – cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time – hrs

KINGSWOOD
AS-BUILT CONDITIONS
25-YEAR EVENT

TR-55 Tabular Data

AREA B

11.0000	hrs	0.3853	cfs
11.3000	hrs	0.4778	cfs
11.6000	hrs	0.6782	cfs
11.9000	hrs	1.2948	cfs
12.0000	hrs	1.9113	cfs
12.1000	hrs	2.7899	cfs
12.2000	hrs	4.4238	cfs
12.3000	hrs	6.7975	cfs
12.4000	hrs	7.6761	cfs
12.5000	hrs	6.9516	cfs
12.6000	hrs	5.5182	cfs
12.7000	hrs	4.2542	cfs
12.8000	hrs	3.1444	cfs
13.0000	hrs	1.8188	cfs
13.2000	hrs	1.3410	cfs
13.4000	hrs	1.0790	cfs
13.6000	hrs	0.9711	cfs
13.8000	hrs	0.8940	cfs
14.0000	hrs	0.8323	cfs
14.3000	hrs	0.7399	cfs
14.6000	hrs	0.6782	cfs
15.0000	hrs	0.6011	cfs
15.5000	hrs	0.5241	cfs
16.0000	hrs	0.4470	cfs
16.5000	hrs	0.3699	cfs
17.0000	hrs	0.3391	cfs
17.5000	hrs	0.3083	cfs
18.0000	hrs	0.2620	cfs
19.0000	hrs	0.2158	cfs
20.0000	hrs	0.2004	cfs
22.0000	hrs	0.1696	cfs
26.0000	hrs	0.0000	cfs

AREA C

11.0000	hrs	0.1329	cfs
11.3000	hrs	0.1674	cfs
11.6000	hrs	0.2461	cfs
11.9000	hrs	0.5858	cfs
12.0000	hrs	0.8664	cfs
12.1000	hrs	1.2701	cfs
12.2000	hrs	2.2054	cfs
12.3000	hrs	2.7814	cfs
12.4000	hrs	2.3777	cfs
12.5000	hrs	1.7624	cfs
12.6000	hrs	1.3292	cfs
12.7000	hrs	0.9550	cfs
12.8000	hrs	0.6744	cfs
13.0000	hrs	0.4578	cfs
13.2000	hrs	0.3692	cfs
13.4000	hrs	0.3200	cfs
13.6000	hrs	0.2954	cfs
13.8000	hrs	0.2757	cfs
14.0000	hrs	0.2560	cfs
14.3000	hrs	0.2265	cfs
14.6000	hrs	0.2068	cfs
15.0000	hrs	0.1871	cfs

15.5000 hrs 0.1625 cfs
16.0000 hrs 0.1378 cfs
16.5000 hrs 0.1181 cfs
17.0000 hrs 0.1034 cfs
17.5000 hrs 0.0935 cfs
18.0000 hrs 0.0837 cfs
19.0000 hrs 0.0689 cfs
20.0000 hrs 0.0640 cfs
22.0000 hrs 0.0542 cfs
26.0000 hrs 0.0000 cfs

AREAD/E
11.0000 hrs 0.2516 cfs
11.3000 hrs 0.3173 cfs
11.6000 hrs 0.4267 cfs
11.9000 hrs 0.7111 cfs
12.0000 hrs 0.9955 cfs
12.1000 hrs 1.4441 cfs
12.2000 hrs 2.1661 cfs
12.3000 hrs 3.3696 cfs
12.4000 hrs 4.6167 cfs
12.5000 hrs 4.9121 cfs
12.6000 hrs 4.5620 cfs
12.7000 hrs 3.7743 cfs
12.8000 hrs 2.9976 cfs
13.0000 hrs 1.7723 cfs
13.2000 hrs 1.1815 cfs
13.4000 hrs 0.8971 cfs
13.6000 hrs 0.7439 cfs
13.8000 hrs 0.6673 cfs
14.0000 hrs 0.6236 cfs
14.3000 hrs 0.5470 cfs
14.6000 hrs 0.4923 cfs
15.0000 hrs 0.4485 cfs
15.5000 hrs 0.3829 cfs
16.0000 hrs 0.3282 cfs
16.5000 hrs 0.2735 cfs
17.0000 hrs 0.2407 cfs
17.5000 hrs 0.2188 cfs
18.0000 hrs 0.1969 cfs
19.0000 hrs 0.1641 cfs
20.0000 hrs 0.1422 cfs
22.0000 hrs 0.1203 cfs
26.0000 hrs 0.0000 cfs

AREA F
11.0000 hrs 0.2182 cfs
11.3000 hrs 0.2860 cfs
11.6000 hrs 0.4290 cfs
11.9000 hrs 1.2944 cfs
12.0000 hrs 1.8136 cfs
12.1000 hrs 3.1983 cfs
12.2000 hrs 4.9818 cfs
12.3000 hrs 3.9960 cfs
12.4000 hrs 2.5963 cfs
12.5000 hrs 1.9942 cfs
12.6000 hrs 1.4374 cfs
12.7000 hrs 0.9783 cfs
12.8000 hrs 0.7601 cfs
13.0000 hrs 0.6246 cfs
13.2000 hrs 0.5117 cfs
13.4000 hrs 0.4666 cfs

13.6000 hrs 0.4365 cfs
13.8000 hrs 0.4064 cfs
14.0000 hrs 0.3763 cfs
14.3000 hrs 0.3311 cfs
14.6000 hrs 0.3085 cfs
15.0000 hrs 0.2784 cfs
15.5000 hrs 0.2408 cfs
16.0000 hrs 0.2032 cfs
16.5000 hrs 0.1731 cfs
17.0000 hrs 0.1580 cfs
17.5000 hrs 0.1430 cfs
18.0000 hrs 0.1204 cfs
19.0000 hrs 0.1054 cfs
20.0000 hrs 0.0978 cfs
22.0000 hrs 0.0828 cfs
26.0000 hrs 0.0000 cfs

AREA G
11.0000 hrs 0.1673 cfs
11.3000 hrs 0.2193 cfs
11.6000 hrs 0.3289 cfs
11.9000 hrs 0.9925 cfs
12.0000 hrs 1.3906 cfs
12.1000 hrs 2.4523 cfs
12.2000 hrs 3.8199 cfs
12.3000 hrs 3.0640 cfs
12.4000 hrs 1.9907 cfs
12.5000 hrs 1.5291 cfs
12.6000 hrs 1.1021 cfs
12.7000 hrs 0.7501 cfs
12.8000 hrs 0.5828 cfs
13.0000 hrs 0.4789 cfs
13.2000 hrs 0.3924 cfs
13.4000 hrs 0.3578 cfs
13.6000 hrs 0.3347 cfs
13.8000 hrs 0.3116 cfs
14.0000 hrs 0.2885 cfs
14.3000 hrs 0.2539 cfs
14.6000 hrs 0.2366 cfs
15.0000 hrs 0.2135 cfs
15.5000 hrs 0.1846 cfs
16.0000 hrs 0.1558 cfs
16.5000 hrs 0.1327 cfs
17.0000 hrs 0.1212 cfs
17.5000 hrs 0.1096 cfs
18.0000 hrs 0.0923 cfs
19.0000 hrs 0.0808 cfs
20.0000 hrs 0.0750 cfs
22.0000 hrs 0.0635 cfs
26.0000 hrs 0.0000 cfs

Total Flow Values
11.0000 hrs 1.1555 cfs
11.3000 hrs 1.4677 cfs
11.6000 hrs 2.1089 cfs
11.9000 hrs 4.8785 cfs
12.0000 hrs 6.9775 cfs
12.1000 hrs 11.1547 cfs
12.2000 hrs 17.5971 cfs
12.3000 hrs 20.0085 cfs
12.4000 hrs 19.2576 cfs
12.5000 hrs 17.1495 cfs

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12.6000 hrs 13.9488 cfs
12.7000 hrs 10.7120 cfs
12.8000 hrs 8.1593 cfs
13.0000 hrs 5.1525 cfs
13.2000 hrs 3.7959 cfs
13.4000 hrs 3.1204 cfs
13.6000 hrs 2.7815 cfs
13.8000 hrs 2.5550 cfs
14.0000 hrs 2.3767 cfs
14.3000 hrs 2.0983 cfs
14.6000 hrs 1.9224 cfs
15.0000 hrs 1.7287 cfs
15.5000 hrs 1.4949 cfs
16.0000 hrs 1.2720 cfs
16.5000 hrs 1.0674 cfs
17.0000 hrs 0.9624 cfs
17.5000 hrs 0.8732 cfs
18.0000 hrs 0.7554 cfs
19.0000 hrs 0.6350 cfs
20.0000 hrs 0.5794 cfs
22.0000 hrs 0.4903 cfs
26.0000 hrs 0.0000 cfs

Peak Time and Flow
12.3000 hrs 20.0085 cfs
```

KINGSWOOD

TR-55 Tabular Hydrograph MethoD - Input Summary

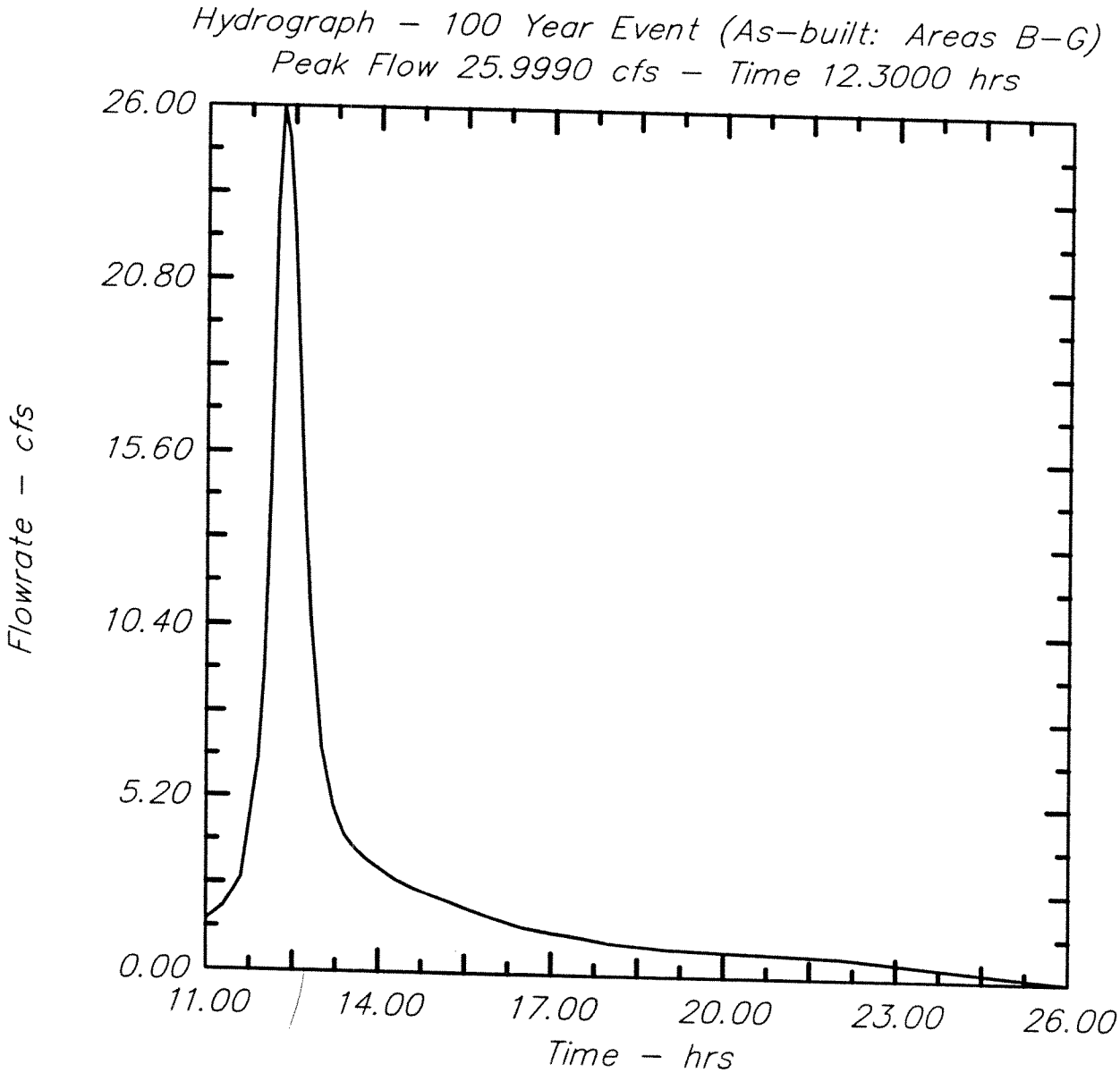
Description	As-Built (Areas B-G) - 100 year
Rainfall Distribution	Type III
Ia/P Interpolation	On
Total Area	5.8800 ac
Peak Time	12.3000 hrs
Peak Flow	25.9990 cfs

Given Input Data:

Subarea Description	D/S Subareas	Area (ac)	CN	Tc (hrs)	Tt (hrs)	Rainfall (in)
b		1.9900	91	0.2670	0.0300	7.5000
c		0.5700	96	0.1840	0.0300	7.5000
d/e		1.5500	87	0.3570	0.0150	7.5000
f		0.8900	95	0.1390	0.0100	7.5000
g		0.8800	84	0.1150	0.0000	7.5000

Composite Runoff Curve Number Calculator

Description		Area (ac)	Curve Number	
B		1.9900	91	
C		0.5700	96	
D/E		1.5500	87	
F		0.8900	95	
G		0.8800	84	
Total Area	----->	5.8800	90	<----- Weighted CN


Hydrograph – 100 Year Event (As–built: Areas B–G)
Peak Flow 25.9990 cfs – Time 12.3000 hrs
26.00
20.80
15.60
10.40
5.20
0.00
Flowrate – cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time – hrs

KINGSWOOD
AS-BUILT CONDITIONS
100-YEAR EVENT

TR-55 Tabular Data

AREA B

11.0000	hrs	0.4999	cfs
11.3000	hrs	0.6199	cfs
11.6000	hrs	0.8799	cfs
11.9000	hrs	1.6797	cfs
12.0000	hrs	2.4796	cfs
12.1000	hrs	3.6194	cfs
12.2000	hrs	5.7391	cfs
12.3000	hrs	8.8186	cfs
12.4000	hrs	9.9585	cfs
12.5000	hrs	9.0186	cfs
12.6000	hrs	7.1589	cfs
12.7000	hrs	5.5191	cfs
12.8000	hrs	4.0794	cfs
13.0000	hrs	2.3596	cfs
13.2000	hrs	1.7397	cfs
13.4000	hrs	1.3998	cfs
13.6000	hrs	1.2598	cfs
13.8000	hrs	1.1598	cfs
14.0000	hrs	1.0798	cfs
14.3000	hrs	0.9599	cfs
14.6000	hrs	0.8799	cfs
15.0000	hrs	0.7799	cfs
15.5000	hrs	0.6799	cfs
16.0000	hrs	0.5799	cfs
16.5000	hrs	0.4799	cfs
17.0000	hrs	0.4399	cfs
17.5000	hrs	0.3999	cfs
18.0000	hrs	0.3399	cfs
19.0000	hrs	0.2800	cfs
20.0000	hrs	0.2600	cfs
22.0000	hrs	0.2200	cfs
26.0000	hrs	0.0000	cfs

AREA C

11.0000	hrs	0.1689	cfs
11.3000	hrs	0.2126	cfs
11.6000	hrs	0.3127	cfs
11.9000	hrs	0.7442	cfs
12.0000	hrs	1.1007	cfs
12.1000	hrs	1.6136	cfs
12.2000	hrs	2.8018	cfs
12.3000	hrs	3.5336	cfs
12.4000	hrs	3.0207	cfs
12.5000	hrs	2.2390	cfs
12.6000	hrs	1.6886	cfs
12.7000	hrs	1.2133	cfs
12.8000	hrs	0.8568	cfs
13.0000	hrs	0.5816	cfs
13.2000	hrs	0.4691	cfs
13.4000	hrs	0.4065	cfs
13.6000	hrs	0.3752	cfs
13.8000	hrs	0.3502	cfs
14.0000	hrs	0.3252	cfs
14.3000	hrs	0.2877	cfs
14.6000	hrs	0.2627	cfs
15.0000	hrs	0.2377	cfs

15.5000 hrs 0.2064 cfs
16.0000 hrs 0.1751 cfs
16.5000 hrs 0.1501 cfs
17.0000 hrs 0.1313 cfs
17.5000 hrs 0.1188 cfs
18.0000 hrs 0.1063 cfs
19.0000 hrs 0.0876 cfs
20.0000 hrs 0.0813 cfs
22.0000 hrs 0.0688 cfs
26.0000 hrs 0.0000 cfs

AREA D/E
11.0000 hrs 0.3322 cfs
11.3000 hrs 0.4189 cfs
11.6000 hrs 0.5633 cfs
11.9000 hrs 0.9388 cfs
12.0000 hrs 1.3143 cfs
12.1000 hrs 1.9065 cfs
12.2000 hrs 2.8598 cfs
12.3000 hrs 4.4485 cfs
12.4000 hrs 6.0951 cfs
12.5000 hrs 6.4850 cfs
12.6000 hrs 6.0228 cfs
12.7000 hrs 4.9829 cfs
12.8000 hrs 3.9575 cfs
13.0000 hrs 2.3398 cfs
13.2000 hrs 1.5599 cfs
13.4000 hrs 1.1843 cfs
13.6000 hrs 0.9821 cfs
13.8000 hrs 0.8810 cfs
14.0000 hrs 0.8233 cfs
14.3000 hrs 0.7222 cfs
14.6000 hrs 0.6499 cfs
15.0000 hrs 0.5922 cfs
15.5000 hrs 0.5055 cfs
16.0000 hrs 0.4333 cfs
16.5000 hrs 0.3611 cfs
17.0000 hrs 0.3178 cfs
17.5000 hrs 0.2889 cfs
18.0000 hrs 0.2600 cfs
19.0000 hrs 0.2166 cfs
20.0000 hrs 0.1878 cfs
22.0000 hrs 0.1589 cfs
26.0000 hrs 0.0000 cfs

AREA F
11.0000 hrs 0.2784 cfs
11.3000 hrs 0.3648 cfs
11.6000 hrs 0.5472 cfs
11.9000 hrs 1.6512 cfs
12.0000 hrs 2.3136 cfs
12.1000 hrs 4.0800 cfs
12.2000 hrs 6.3552 cfs
12.3000 hrs 5.0976 cfs
12.4000 hrs 3.3120 cfs
12.5000 hrs 2.5440 cfs
12.6000 hrs 1.8336 cfs
12.7000 hrs 1.2480 cfs
12.8000 hrs 0.9696 cfs
13.0000 hrs 0.7968 cfs
13.2000 hrs 0.6528 cfs
13.4000 hrs 0.5952 cfs

13.6000 hrs 0.5568 cfs
13.8000 hrs 0.5184 cfs
14.0000 hrs 0.4800 cfs
14.3000 hrs 0.4224 cfs
14.6000 hrs 0.3936 cfs
15.0000 hrs 0.3552 cfs
15.5000 hrs 0.3072 cfs
16.0000 hrs 0.2592 cfs
16.5000 hrs 0.2208 cfs
17.0000 hrs 0.2016 cfs
17.5000 hrs 0.1824 cfs
18.0000 hrs 0.1536 cfs
19.0000 hrs 0.1344 cfs
20.0000 hrs 0.1248 cfs
22.0000 hrs 0.1056 cfs
26.0000 hrs 0.0000 cfs

AREA G
11.0000 hrs 0.2240 cfs
11.3000 hrs 0.2935 cfs
11.6000 hrs 0.4402 cfs
11.9000 hrs 1.3283 cfs
12.0000 hrs 1.8611 cfs
12.1000 hrs 3.2821 cfs
12.2000 hrs 5.1123 cfs
12.3000 hrs 4.1006 cfs
12.4000 hrs 2.6643 cfs
12.5000 hrs 2.0465 cfs
12.6000 hrs 1.4750 cfs
12.7000 hrs 1.0039 cfs
12.8000 hrs 0.7800 cfs
13.0000 hrs 0.6410 cfs
13.2000 hrs 0.5251 cfs
13.4000 hrs 0.4788 cfs
13.6000 hrs 0.4479 cfs
13.8000 hrs 0.4170 cfs
14.0000 hrs 0.3861 cfs
14.3000 hrs 0.3398 cfs
14.6000 hrs 0.3166 cfs
15.0000 hrs 0.2857 cfs
15.5000 hrs 0.2471 cfs
16.0000 hrs 0.2085 cfs
16.5000 hrs 0.1776 cfs
17.0000 hrs 0.1622 cfs
17.5000 hrs 0.1467 cfs
18.0000 hrs 0.1236 cfs
19.0000 hrs 0.1081 cfs
20.0000 hrs 0.1004 cfs
22.0000 hrs 0.0849 cfs
26.0000 hrs 0.0000 cfs

Total Flow Values
11.0000 hrs 1.5033 cfs
11.3000 hrs 1.9097 cfs
11.6000 hrs 2.7432 cfs
11.9000 hrs 6.3423 cfs
12.0000 hrs 9.0694 cfs
12.1000 hrs 14.5016 cfs
12.2000 hrs 22.8682 cfs
12.3000 hrs 25.9990 cfs
12.4000 hrs 25.0505 cfs
12.5000 hrs 22.3331 cfs

12.6000	hrs	18.1789	cfs
12.7000	hrs	13.9673	cfs
12.8000	hrs	10.6432	cfs
13.0000	hrs	6.7188	cfs
13.2000	hrs	4.9466	cfs
13.4000	hrs	4.0646	cfs
13.6000	hrs	3.6219	cfs
13.8000	hrs	3.3265	cfs
14.0000	hrs	3.0944	cfs
14.3000	hrs	2.7319	cfs
14.6000	hrs	2.5027	cfs
15.0000	hrs	2.2506	cfs
15.5000	hrs	1.9461	cfs
16.0000	hrs	1.6560	cfs
16.5000	hrs	1.3895	cfs
17.0000	hrs	1.2528	cfs
17.5000	hrs	1.1368	cfs
18.0000	hrs	0.9834	cfs
19.0000	hrs	0.8267	cfs
20.0000	hrs	0.7542	cfs
22.0000	hrs	0.6382	cfs
26.0000	hrs	0.0000	cfs

APPENDIX C

PROPOSED CONDITIONS
TR-55 OUTPUT
AREA A
(PROPOSED CULVERT)

KINGSWOOD
AREA A - Proposed Culvert (100-year Storm)

TR-55 Tabular Hydrograph Method
Input Summary

Description ..... Proposed Culvert (Area A)
Rainfall Distribution ..... Type III
Ia/P Interpolation ..... On
Total Area ..... 8.2000 ac

Peak Time ..... 750.0000 min
Peak Flow ..... 23.2176 cfs

Given Input Data:

Subarea Description	D/S Subareas	Area (ac)	CN	Tc (min)	Tt (min)	Rainfall (in)
A		8.2000	70	22.7191	0.0000	7.5000

Support Data:

Subarea Name: A, Row: 1

Sheet Flow

Description ..... Area A - sheet
Manning's n 0.4000
Flow Length ..... 100.0000 ft
Two Yr, 24 hr Rainfall ..... 3.5000 in
Land Slope ..... 0.0500 ft/ft
Computed Sheet flow time .....> 14.2323 min

Shallow Concentrated Flow

Description ..... Area A - shallow
Surface ..... Unpaved
Flow Length ..... 900.0000 ft
Watercourse Slope ..... 0.0120 ft/ft
Velocity ..... 1.7674 fps
Computed Shallow flow time .....> 8.4868 min

****
Total Time of Concentration .....> 22.7191 min
****

Composite Runoff Curve Number Calculator

Description	Area (ac)	Curve Number	
Area A (natural)	8.1000	70	
Area A (patios)	0.1000	98	
Total Area ----->	8.2000	70	<----- Weighted CN

Kingswood
Area A - Proposed Culvert

TR-55 Tabular Data
Total Flow Values

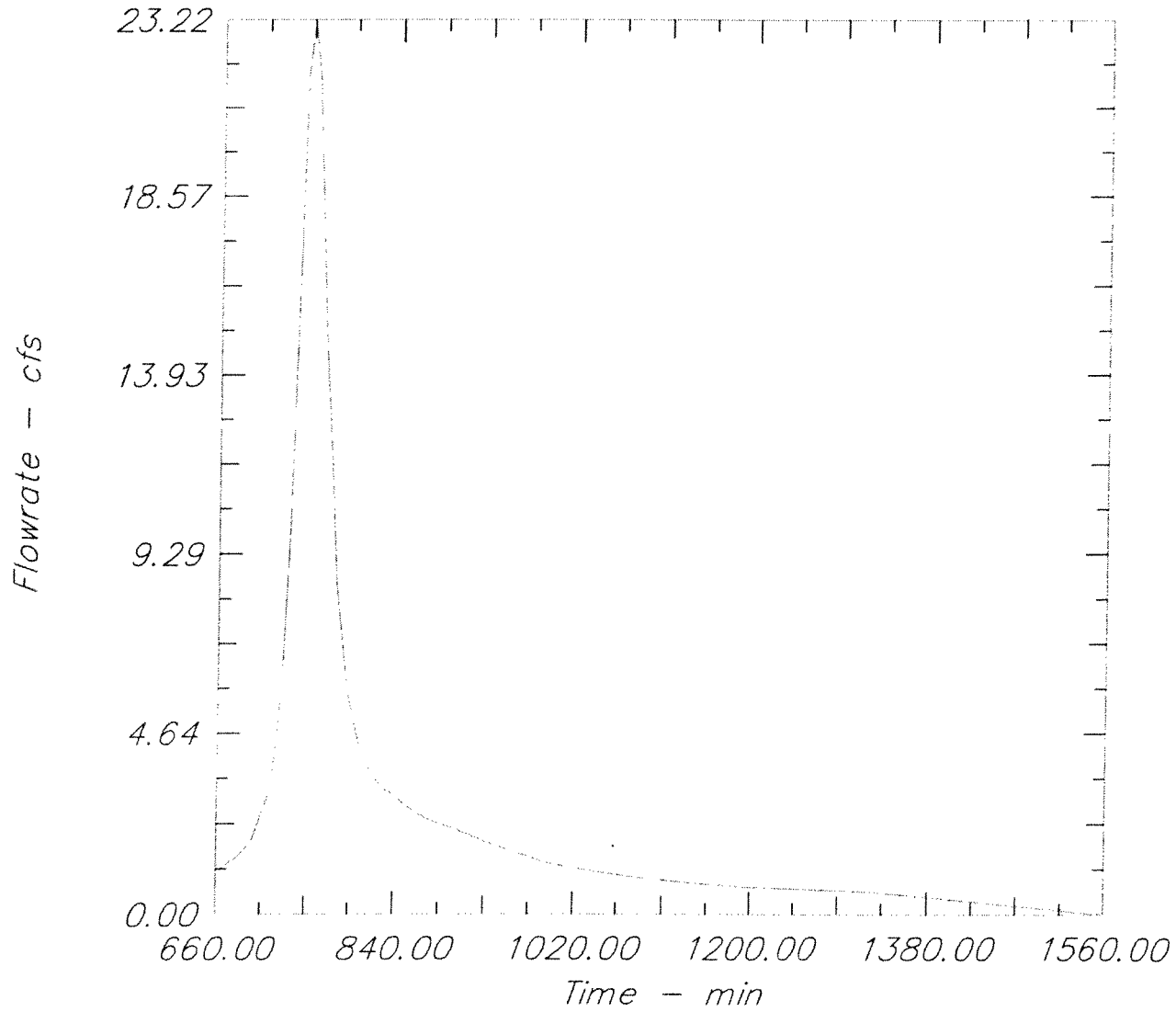
11.0000 min 1.1263 cfs
11.3000 min 1.4201 cfs
11.6000 min 1.9098 cfs
11.9000 min 3.1895 cfs
12.0000 min 4.4886 cfs
12.1000 min 6.5613 cfs
12.2000 min 9.9491 cfs
12.3000 min 15.6571 cfs
12.4000 min 21.6584 cfs
12.5000 min 23.2176 cfs
12.6000 min 21.6506 cfs
12.7000 min 18.0210 cfs
12.8000 min 14.3688 cfs
13.0000 min 8.5401 cfs
13.2000 min 5.7205 cfs
13.4000 min 4.3564 cfs
13.6000 min 3.6221 cfs
13.8000 min 3.2534 cfs
14.0000 min 3.0412 cfs
14.3000 min 2.6725 cfs
14.6000 min 2.4082 cfs
15.0000 min 2.1960 cfs
15.5000 min 1.8795 cfs
16.0000 min 1.6119 cfs
16.5000 min 1.3476 cfs
17.0000 min 1.1877 cfs
17.5000 min 1.0768 cfs
18.0000 min 0.9691 cfs
19.0000 min 0.8092 cfs
20.0000 min 0.7048 cfs
22.0000 min 0.5939 cfs
26.0000 min 0.0000 cfs

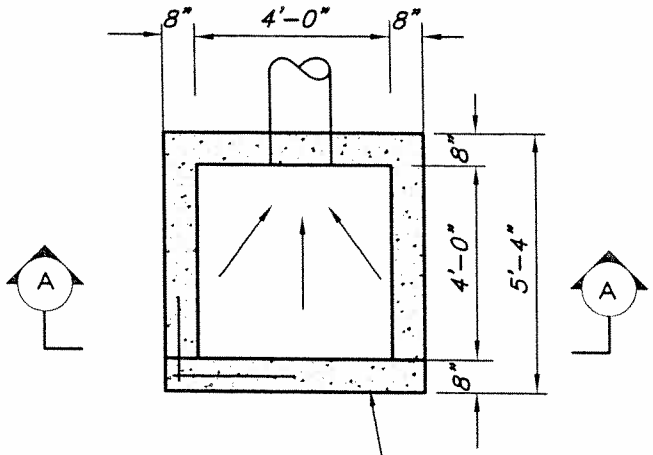
Peak Time and Flow
12.5000 min 23.2176 cfs

AREA A– PROPOSED CULVERT

Tabular Hydrograph

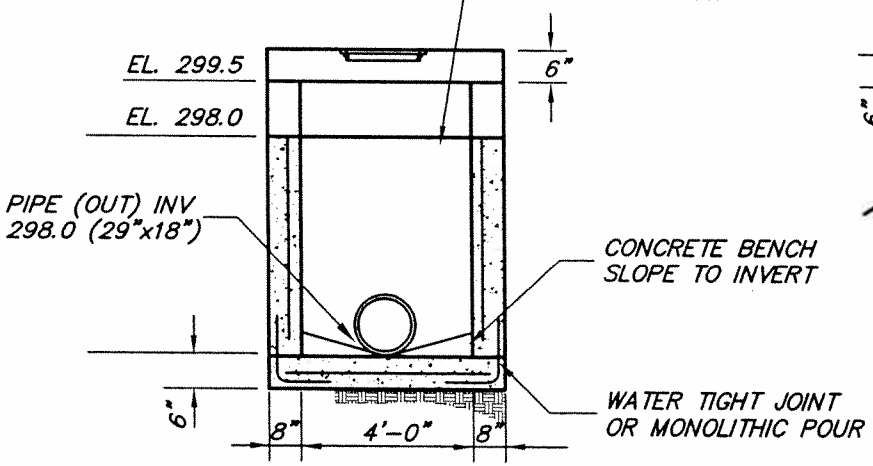
Peak Flow 23.2176 cfs – Time 45000.0000 min



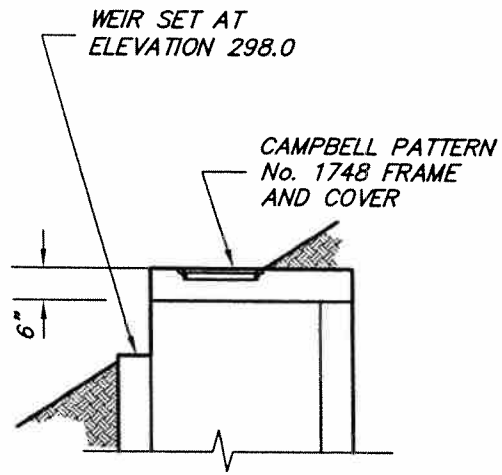


PLAN

NOTE: CONCRETE TO BE 4,000 PSI AT 28 DAYS



SECTION A-A



SIDE ELEVATION

WETLANDS AREA
OUTLET STRUCTURE "A"

N.T.S.

:\Da05\A050030\dwg\A050030-SP9.dwg, DETAILS, 4/29/2008 4:41:36 PM

OutFlow Output

Given Input Data:

Surface Elevation	299.0000 ft

Output Data:

Combined Flowrate	13.2091 cfs
Pond Name	WETLANDS
Pond Rim Elevation	299.0000 ft
Pond Bottom Elevation	298.0000 ft

Structure: Weir - Rectangular1

Weir Calculator

Given Input Data:

Weir Type	Rectangular
Equation	Contracted
Solving for	Flowrate
Structural Rim Elevation	299.0000 ft
Depth of Flow	1.0000 ft
Coefficient	0.6500
Height	1.0000 ft

Computed Results:

Flowrate	13.2091 cfs
Full Flow	13.2091 cfs
Velocity	3.3023 fps
Width	4.0000 ft
Area	4.0000 ft2
Perimeter	6.0000 ft
Wet Perimeter	6.0000 ft
Wet Area	4.0000 ft2
Percent Full	100.0000 %

EXISTING WETLANDS

STAGE - DISCHARGE CURVE
(Pond Outflow Rating Curve Data)

ELEVATION - ft	Flowrate - cfs
297.00000000,	0.00000000
297.10000000,	0.00000000
297.20000000,	0.00000000
297.30000000,	0.00000000
297.40000000,	0.00000000
297.50000000,	0.00000000
297.60000000,	0.00000000
297.70000000,	0.00000000
297.80000000,	0.00000000
297.90000000,	0.00000000
298.00000000,	0.00000000
298.10000000,	0.43749460
298.20000000,	1.23120339
298.30000000,	2.25044150
298.40000000,	3.44719363
298.50000000,	4.79301996
298.60000000,	6.26827765
298.70000000,	7.85821648
298.80000000,	9.55115359
298.90000000,	11.33748567
299.00000000,	13.20909978

Storage Indication Method

Given Input Data:
File ..... L:\A050030\hd\wetlands.sim
Description .... Existing / Proposed Wetlands Area A - 100 Year Storm
Time increment . 6.0000 min

Input Files:
Pre-Dev Hydrograph curve ..
Post-Dev Hydrograph curve . L:\A050030\hd\areaa100.hdc
Stage-Storage curve ..... L:\A050030\hd\wetlands.ssc
Stage-Discharge curve ..... L:\A050030\hd\wetlands.sdc

Output Data:
Routed Peak Flow ..... 13.2091 cfs
Routed Peak Time ..... 0.2100 min
Post-Developed Peak Flow . 23.2176 cfs
Post-Developed Peak Time . 750.0000 min

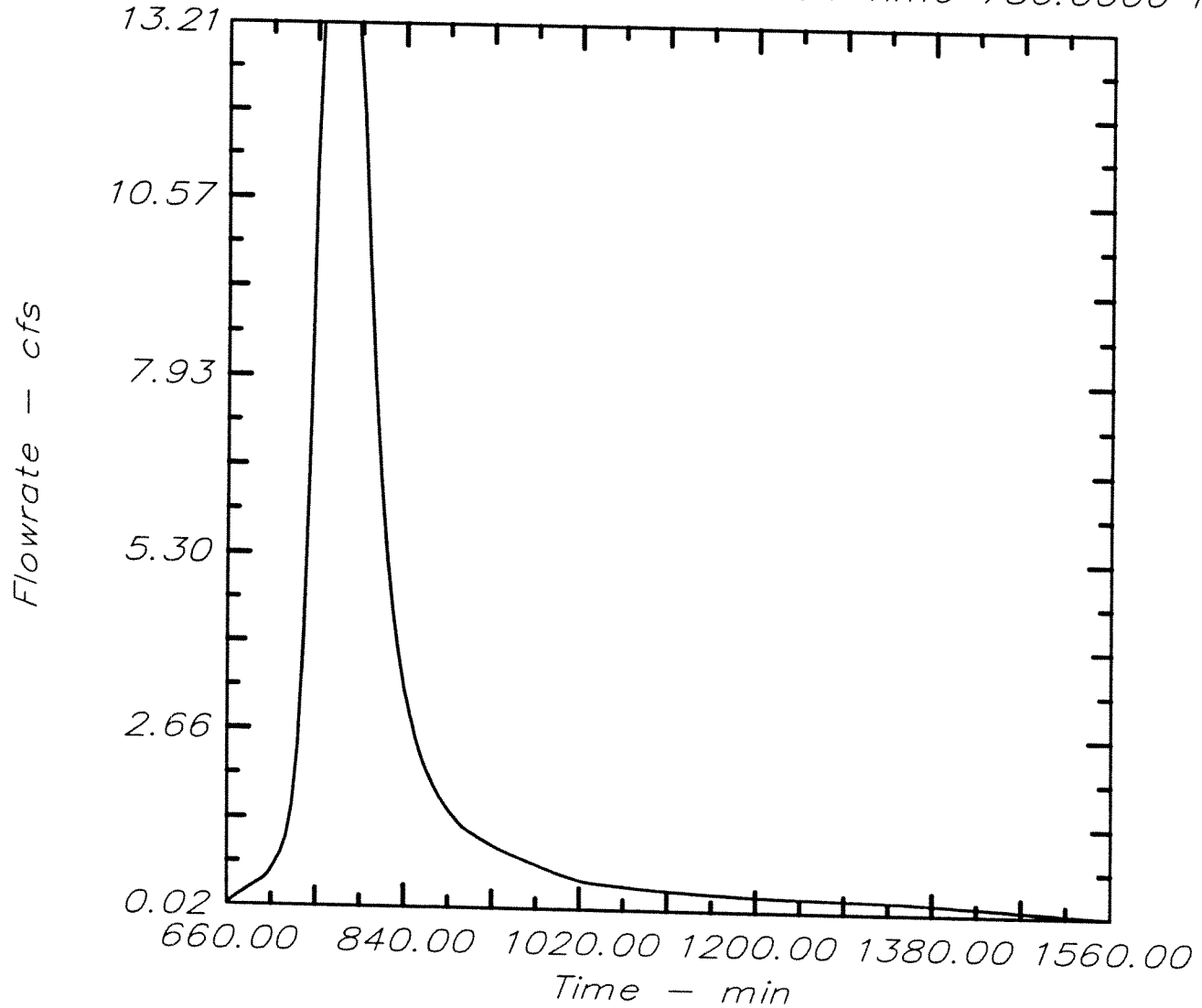
Support Calculations:

Time min	Inflow cfs	(I1+I2)/2 ft3	H1 ft	S1-(O1/2)T ft3	S2+(O2/2)T ft3	H2 ft	Outflow cfs
660.0000	1.1263	202.7314	0.0000	0.0000	202.7314	298.0091	0.0398
666.0000	1.2242	423.0917	298.0091	159.4555	582.5472	298.0262	0.1144
672.0000	1.3222	458.3493	298.0262	458.1942	916.5435	298.0411	0.1800
678.0000	1.4201	493.6069	298.0411	720.8942	1214.5012	298.0545	0.2385
684.0000	1.5833	540.6171	298.0545	955.2486	1495.8657	298.0671	0.2938
690.0000	1.7466	599.3799	298.0671	1176.5519	1775.9318	298.0797	0.3488
696.0000	1.9098	658.1426	298.0797	1396.8338	2054.9764	298.0922	0.4036
702.0000	2.3364	764.3051	298.0922	1616.3124	2380.6176	298.1069	0.4920
708.0000	2.7629	917.8675	298.1069	1872.4409	2790.3084	298.1253	0.6380
714.0000	3.1895	1071.4299	298.1253	2194.6773	3266.1072	298.1466	0.8075
720.0000	4.4886	1382.0612	298.1466	2568.9101	3950.9713	298.1774	1.0515
726.0000	6.5613	1988.9910	298.1774	3107.5802	5096.5712	298.2288	1.5246
732.0000	9.9491	2971.8748	298.2288	4008.6355	6980.5103	298.3134	2.4103
738.0000	15.6571	4609.1238	298.3134	5490.4210	10099.5447	298.4534	4.1654
744.0000	21.6584	6716.8041	298.4534	7943.6531	14660.4571	298.6581	7.1922
750.0000	23.2176	8077.6929	298.6581	11530.9737	19608.6666	298.8802	10.9844
756.0000	21.6506	8076.2850	298.8802	15422.9174	23499.2024	299.0225	13.2091
762.0000	18.0210	7140.8843	299.0225	18851.1562	25992.0405	299.0685	13.2091
768.0000	14.3688	5830.1618	299.0685	21562.6467	27392.8085	299.0944	13.2091
774.0000	11.4545	4648.1966	299.0944	23086.2793	27734.4758	299.1007	13.2091
780.0000	8.5401	3599.0319	299.1007	23457.9150	27056.9469	299.0882	13.2091
786.0000	7.1303	2820.6807	299.0882	22720.9585	25541.6392	299.0602	13.2091
792.0000	5.7205	2313.1427	299.0602	21072.7397	23385.8824	299.0205	13.2091
798.0000	5.0384	1936.6043	299.0205	18727.8966	20664.5009	298.9276	11.8546
804.0000	4.3564	1691.0653	298.9276	16253.3689	17944.4341	298.8055	9.6499
810.0000	3.9892	1502.2116	298.8055	14113.9391	15616.1507	298.7010	7.8753
816.0000	3.6221	1370.0432	298.7010	12282.6609	13652.7041	298.6129	6.4729
822.0000	3.4377	1270.7709	298.6129	10738.3400	12009.1108	298.5391	5.3697
828.0000	3.2534	1204.3945	298.5391	9445.5951	10649.9896	298.4781	4.4980
834.0000	3.1473	1152.1164	298.4781	8376.5976	9528.7139	298.4277	3.8206
840.0000	3.0412	1113.9365	298.4277	7494.6742	8608.6107	298.3864	3.2849
846.0000	2.9183	1072.7211	298.3864	6770.9802	7843.7013	298.3521	2.8740
852.0000	2.7954	1028.4702	298.3521	6169.3515	7197.8217	298.3231	2.5270
858.0000	2.6725	984.2193	298.3231	5661.3442	6645.5634	298.2983	2.2333
864.0000	2.5844	946.2342	298.2983	5226.9733	6173.2075	298.2771	2.0172
870.0000	2.4963	914.5151	298.2771	4855.4484	5769.9635	298.2590	1.8327
876.0000	2.4082	882.7960	298.2590	4538.2826	5421.0786	298.2434	1.6731

882.0000	2.3551	857.3915	298.2434	4263.8722	5121.2636	298.2299	1.5359
888.0000	2.3021	838.3015	298.2299	4028.0570	4866.3585	298.2185	1.4193
894.0000	2.2491	819.2116	298.2185	3827.5650	4646.7766	298.2086	1.3188
900.0000	2.1960	800.1217	298.2086	3654.8559	4454.9776	298.2000	1.2311
906.0000	2.1327	779.1812	298.2000	3503.9992	4283.1804	298.1923	1.1699
912.0000	2.0694	756.3902	298.1923	3368.8746	4125.2648	298.1852	1.1136
918.0000	2.0061	733.5992	298.1852	3244.6682	3978.2674	298.1786	1.0612
924.0000	1.9428	710.8082	298.1786	3129.0496	3839.8578	298.1724	1.0119
930.0000	1.8795	688.0172	298.1724	3020.1854	3708.2026	298.1665	0.9650
936.0000	1.8260	666.9890	298.1665	2916.6339	3583.6229	298.1609	0.9206
942.0000	1.7725	647.7238	298.1609	2818.6476	3466.3714	298.1556	0.8788
948.0000	1.7190	628.4585	298.1556	2726.4250	3354.8835	298.1506	0.8391
954.0000	1.6654	609.1933	298.1506	2638.7359	3247.9291	298.1458	0.8010
960.0000	1.6119	589.9280	298.1458	2554.6124	3144.5404	298.1412	0.7642
966.0000	1.5591	570.7796	298.1412	2473.2935	3044.0731	298.1366	0.7284
972.0000	1.5062	551.7482	298.1366	2394.2723	2946.0205	298.1322	0.6934
978.0000	1.4533	532.7167	298.1322	2317.1505	2849.8671	298.1279	0.6592
984.0000	1.4005	513.6852	298.1279	2241.5224	2755.2076	298.1237	0.6255
990.0000	1.3476	494.6537	298.1237	2167.0693	2661.7230	298.1195	0.5921
996.0000	1.3156	479.3818	298.1195	2093.5403	2572.9221	298.1155	0.5605
1002.0000	1.2836	467.8694	298.1155	2023.6953	2491.5646	298.1118	0.5315
1008.0000	1.2517	456.3570	298.1118	1959.7047	2416.0617	298.1085	0.5046
1014.0000	1.2197	444.8446	298.1085	1900.3189	2345.1635	298.1053	0.4794
1020.0000	1.1877	433.3322	298.1053	1844.5550	2277.8872	298.1023	0.4554
1026.0000	1.1655	423.5827	298.1023	1791.6397	2215.2224	298.0994	0.4351
1032.0000	1.1433	415.5961	298.0994	1742.3516	2157.9477	298.0969	0.4238
1038.0000	1.1212	407.6094	298.0969	1697.3030	2104.9124	298.0945	0.4134
1044.0000	1.0990	399.6228	298.0945	1655.5889	2055.2117	298.0923	0.4036
1050.0000	1.0768	391.6362	298.0923	1616.4975	2008.1336	298.0901	0.3944
1056.0000	1.0552	383.7664	298.0901	1579.4689	1963.2353	298.0881	0.3856
1062.0000	1.0337	376.0136	298.0881	1544.1548	1920.1683	298.0862	0.3771
1068.0000	1.0122	368.2607	298.0862	1510.2810	1878.5417	298.0843	0.3689
1074.0000	0.9906	360.5078	298.0843	1477.5403	1838.0481	298.0825	0.3610
1080.0000	0.9691	352.7550	298.0825	1445.6905	1798.4455	298.0807	0.3532
1086.0000	0.9531	346.0005	298.0807	1414.5417	1760.5422	298.0790	0.3458
1092.0000	0.9371	340.2443	298.0790	1384.7294	1724.9736	298.0774	0.3388
1098.0000	0.9211	334.4881	298.0774	1356.7534	1691.2415	298.0759	0.3321
1104.0000	0.9051	328.7319	298.0759	1330.2219	1658.9538	298.0745	0.3258
1110.0000	0.8892	322.9757	298.0745	1304.8265	1627.8021	298.0731	0.3197
1116.0000	0.8732	317.2195	298.0731	1280.3246	1597.5440	298.0717	0.3137
1122.0000	0.8572	311.4633	298.0717	1256.5255	1567.9888	298.0704	0.3079
1128.0000	0.8412	305.7071	298.0704	1233.2792	1538.9863	298.0691	0.3022
1134.0000	0.8252	299.9509	298.0691	1210.4678	1510.4186	298.0678	0.2966
1140.0000	0.8092	294.1947	298.0678	1187.9983	1482.1929	298.0665	0.2911
1146.0000	0.7988	289.4368	298.0665	1165.7977	1455.2345	298.0653	0.2858
1152.0000	0.7883	285.6773	298.0653	1144.5940	1430.2713	298.0642	0.2809
1158.0000	0.7779	281.9177	298.0642	1124.9595	1406.8772	298.0632	0.2763
1164.0000	0.7674	278.1582	298.0632	1106.5592	1384.7174	298.0622	0.2719
1170.0000	0.7570	274.3986	298.0622	1089.1298	1363.5284	298.0612	0.2678
1176.0000	0.7466	270.6391	298.0612	1072.4638	1343.1029	298.0603	0.2638
1182.0000	0.7361	266.8796	298.0603	1056.3985	1323.2780	298.0594	0.2599
1188.0000	0.7257	263.1200	298.0594	1040.8055	1303.9255	298.0585	0.2561
1194.0000	0.7152	259.3605	298.0585	1025.5840	1284.9445	298.0577	0.2524
1200.0000	0.7048	255.6009	298.0577	1010.6548	1266.2557	298.0568	0.2487
1206.0000	0.6992	252.7228	298.0568	995.9554	1248.6783	298.0561	0.2452
1212.0000	0.6937	250.7262	298.0561	982.1301	1232.8563	298.0553	0.2421
1218.0000	0.6881	248.7295	298.0553	969.6855	1218.4151	298.0547	0.2393
1224.0000	0.6826	246.7329	298.0547	958.3270	1205.0599	298.0541	0.2367
1230.0000	0.6770	244.7362	298.0541	947.8227	1192.5589	298.0535	0.2342
1236.0000	0.6715	242.7395	298.0535	937.9902	1180.7298	298.0530	0.2319
1242.0000	0.6660	240.7429	298.0530	928.6862	1169.4291	298.0525	0.2297
1248.0000	0.6604	238.7462	298.0525	919.7978	1158.5440	298.0520	0.2275
1254.0000	0.6549	236.7496	298.0520	911.2363	1147.9859	298.0515	0.2255
1260.0000	0.6493	234.7529	298.0515	902.9319	1137.6848	298.0511	0.2234

1266.0000	0.6438	232.7563	298.0511	894.8298	1127.5861	298.0506	0.2214
1272.0000	0.6382	230.7596	298.0506	886.8868	1117.6463	298.0502	0.2195
1278.0000	0.6327	228.7629	298.0502	879.0688	1107.8318	298.0497	0.2176
1284.0000	0.6271	226.7663	298.0497	871.3493	1098.1156	298.0493	0.2157
1290.0000	0.6216	224.7696	298.0493	863.7072	1088.4768	298.0489	0.2138
1296.0000	0.6160	222.7730	298.0489	856.1259	1078.8989	298.0484	0.2119
1302.0000	0.6105	220.7763	298.0484	848.5925	1069.3688	298.0480	0.2100
1308.0000	0.6049	218.7796	298.0480	841.0968	1059.8765	298.0476	0.2082
1314.0000	0.5994	216.7830	298.0476	833.6307	1050.4137	298.0472	0.2063
1320.0000	0.5939	214.7863	298.0472	826.1880	1040.9743	298.0467	0.2044
1326.0000	0.5790	211.1157	298.0467	818.7635	1029.8792	298.0462	0.2023
1332.0000	0.5642	205.7710	298.0462	810.0368	1015.8077	298.0456	0.1995
1338.0000	0.5493	200.4263	298.0456	798.9691	999.3954	298.0449	0.1963
1344.0000	0.5345	195.0816	298.0449	786.0602	981.1417	298.0440	0.1927
1350.0000	0.5196	189.7369	298.0440	771.7031	961.4399	298.0432	0.1888
1356.0000	0.5048	184.3922	298.0432	756.2069	940.5990	298.0422	0.1847
1362.0000	0.4899	179.0475	298.0422	739.8148	918.8622	298.0412	0.1805
1368.0000	0.4751	173.7028	298.0412	722.7180	896.4207	298.0402	0.1760
1374.0000	0.4602	168.3581	298.0402	705.0670	873.4250	298.0392	0.1715
1380.0000	0.4454	163.0134	298.0392	686.9800	849.9934	298.0382	0.1669
1386.0000	0.4305	157.6687	298.0382	668.5502	826.2188	298.0371	0.1623
1392.0000	0.4157	152.3240	298.0371	649.8506	802.1746	298.0360	0.1575
1398.0000	0.4009	146.9793	298.0360	630.9390	777.9183	298.0349	0.1528
1404.0000	0.3860	141.6346	298.0349	611.8605	753.4951	298.0338	0.1480
1410.0000	0.3712	136.2899	298.0338	592.6508	728.9407	298.0327	0.1432
1416.0000	0.3563	130.9452	298.0327	573.3379	704.2830	298.0316	0.1383
1422.0000	0.3415	125.6005	298.0316	553.9438	679.5443	298.0305	0.1335
1428.0000	0.3266	120.2558	298.0305	534.4859	654.7416	298.0294	0.1286
1434.0000	0.3118	114.9111	298.0294	514.9777	629.8887	298.0283	0.1237
1440.0000	0.2969	109.5664	298.0283	495.4300	604.9964	298.0272	0.1188
1446.0000	0.2821	104.2217	298.0272	475.8513	580.0729	298.0260	0.1139
1452.0000	0.2672	98.8770	298.0260	456.2481	555.1250	298.0249	0.1090
1458.0000	0.2524	93.5323	298.0249	436.6257	530.1579	298.0238	0.1041
1464.0000	0.2375	88.1876	298.0238	416.9882	505.1757	298.0227	0.0992
1470.0000	0.2227	82.8429	298.0227	397.3388	480.1816	298.0216	0.0943
1476.0000	0.2078	77.4982	298.0216	377.6800	455.1782	298.0204	0.0894
1482.0000	0.1930	72.1535	298.0204	358.0139	430.1674	298.0193	0.0845
1488.0000	0.1782	66.8088	298.0193	338.3420	405.1508	298.0182	0.0796
1494.0000	0.1633	61.4641	298.0182	318.6656	380.1296	298.0171	0.0747
1500.0000	0.1485	56.1194	298.0171	298.9855	355.1049	298.0159	0.0697
1506.0000	0.1336	50.7747	298.0159	279.3027	330.0773	298.0148	0.0648
1512.0000	0.1188	45.4300	298.0148	259.6176	305.0476	298.0137	0.0599
1518.0000	0.1039	40.0853	298.0137	239.9308	280.0161	298.0126	0.0550
1524.0000	0.0891	34.7406	298.0126	220.2427	254.9832	298.0114	0.0501
1530.0000	0.0742	29.3959	298.0114	200.5534	229.9493	298.0103	0.0452
1536.0000	0.0594	24.0512	298.0103	180.8633	204.9145	298.0092	0.0402
1542.0000	0.0445	18.7065	298.0092	161.1726	179.8790	298.0081	0.0353
1548.0000	0.0297	13.3618	298.0081	141.4813	154.8430	298.0070	0.0304
1554.0000	0.0148	8.0171	298.0070	121.7896	129.8066	298.0058	0.0255
1560.0000	0.0000	2.6724	298.0058	102.0975	104.7699	298.0047	0.0206

Wetlands Area Routed Hydrograph – 100 Year Storm
Peak Discharge 13.2091 cfs – Peak Time 756.0000 min



Culvert Calculator

Entered Data:

Shape	Rectangular
Number of Barrels	1
Solving for	Headwater
Chart Number	2
Scale Number	1
Chart Description	CORRUGATED METAL PIPE CULVERT
Scale Decsription	HEADWALL
Overtopping	On
Flowrate	13.2091 cfs
Manning's n	0.0240
Roadway Elevation	301.0000 ft
Inlet Elevation	298.0000 ft
Outlet Elevation	297.8000 ft
Height	1.5000 ft
Width	2.4000 ft
Length	80.0000 ft
Entrance Loss	0.5000
Tailwater	0.1000 ft

Computed Results:

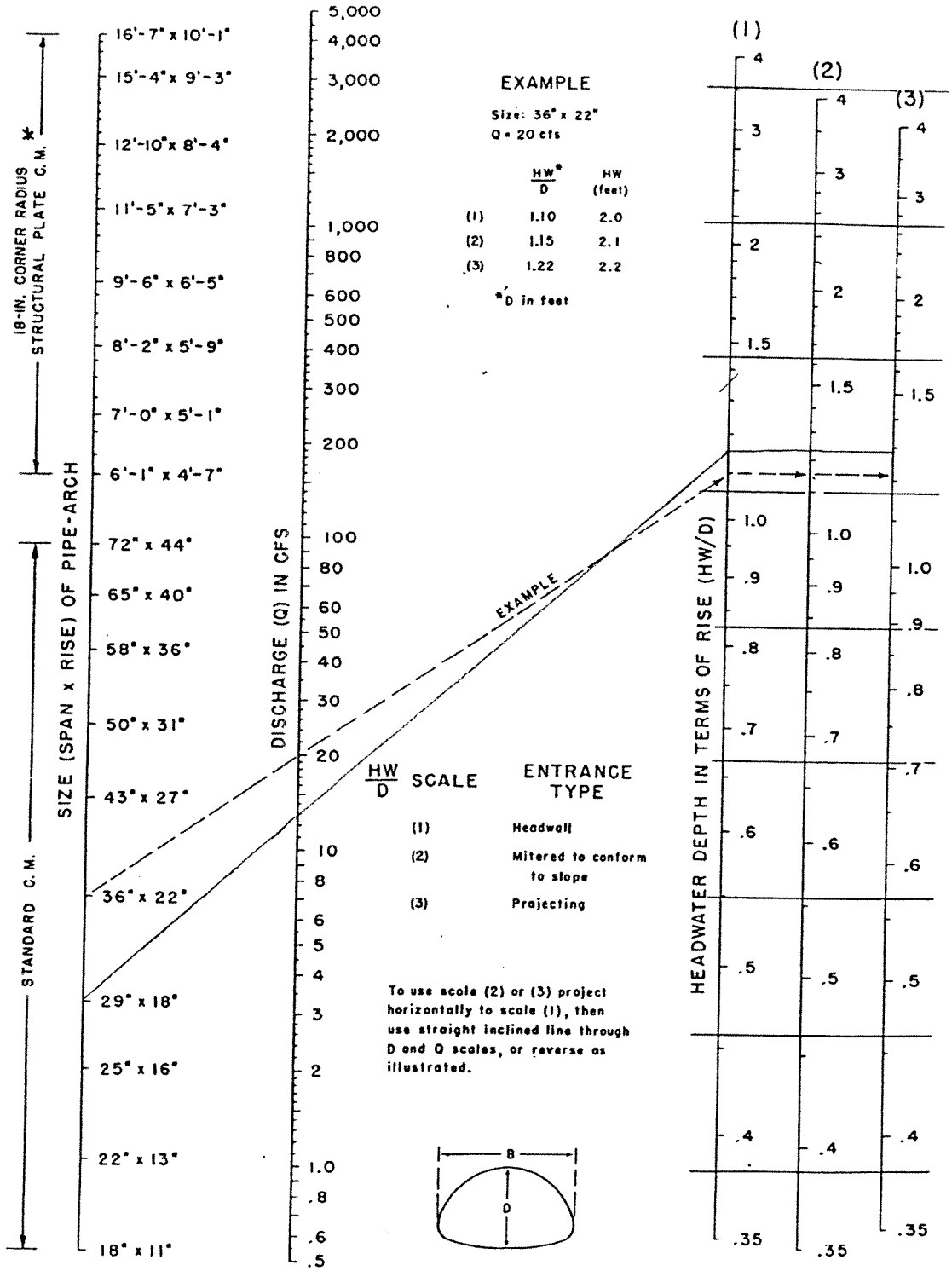
Headwater	299.8124 ft Inlet Control
Slope	0.0025 ft/ft
Velocity	3.6692 fps

Messages:

Computing Inlet Control headwater.
Solving Inlet Equation 26.
Solving Inlet Equation 28.
Headwater: 299.8124 ft

DIS-CHARGE Flow cfs	HEAD-WATER ELEV. ft	INLET CONTROL DEPTH ft	OUTLET CONTROL DEPTH ft	FLOW TYPE	NORMAL DEPTH ft	CRITICAL DEPTH ft	OUTLET VEL. fps	OUTLET DEPTH ft	TAILWATER VEL. fps	TAILWATER DEPTH ft
3.00	298.55	0.55	0.00	NA	0.70	0.36	1.79	0.70	0.00	0.10
6.00	298.89	0.89	0.00	NA	1.15	0.58	2.17	1.15	0.00	0.10
9.00	299.64	1.64	0.00	NA	1.50	1.50	2.50	1.50	0.00	0.10
12.00	299.76	1.76	0.00	NA	1.50	1.50	3.33	1.50	0.00	0.10
15.00	299.90	1.90	0.00	NA	1.50	1.50	4.17	1.50	0.00	0.10
18.00	299.98	1.98	0.00	NA	1.50	1.50	5.00	1.50	0.00	0.10
21.00	300.32	2.32	0.00	NA	1.50	1.50	5.83	1.50	0.00	0.10
24.00	300.72	2.72	0.00	NA	1.50	1.50	6.67	1.50	0.00	0.10

CHART 6



HW/D = 1.3

*ADDITIONAL SIZES NOT DIMENSIONED ARE LISTED IN FABRICATOR'S CATALOG

BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER DEPTH FOR C. M. PIPE-ARCH CULVERTS WITH INLET CONTROL

Channel Calculator

Proposed Vegetated Sawle - 100-Year Event

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	13.2091 cfs
Slope	0.0108 ft/ft
Manning's n	0.0290
Height	2.0000 ft
Bottom width	3.0000 ft
Left slope	0.5000 ft/ft (V/H)
Right slope	1.0000 ft/ft (V/H)

Computed Results:

Depth	0.8333 ft
Velocity	3.7298 fps
Full Flowrate	70.7502 cfs
Flow area	3.5415 ft2
Flow perimeter	6.0418 ft
Hydraulic radius	0.5862 ft
Top width	5.4999 ft
Area	12.0000 ft2
Perimeter	10.3006 ft
Percent full	41.6654 %

Critical Information

Critical depth	0.7414 ft
Critical slope	0.0165 ft/ft
Critical velocity	4.3330 fps
Critical area	3.0485 ft2
Critical perimeter	5.7062 ft
Critical hydraulic radius	0.5342 ft
Critical top width	5.2241 ft
Specific energy	1.0495 ft
Minimum energy	1.1120 ft
Froude number	0.8194
Flow condition	Subcritical

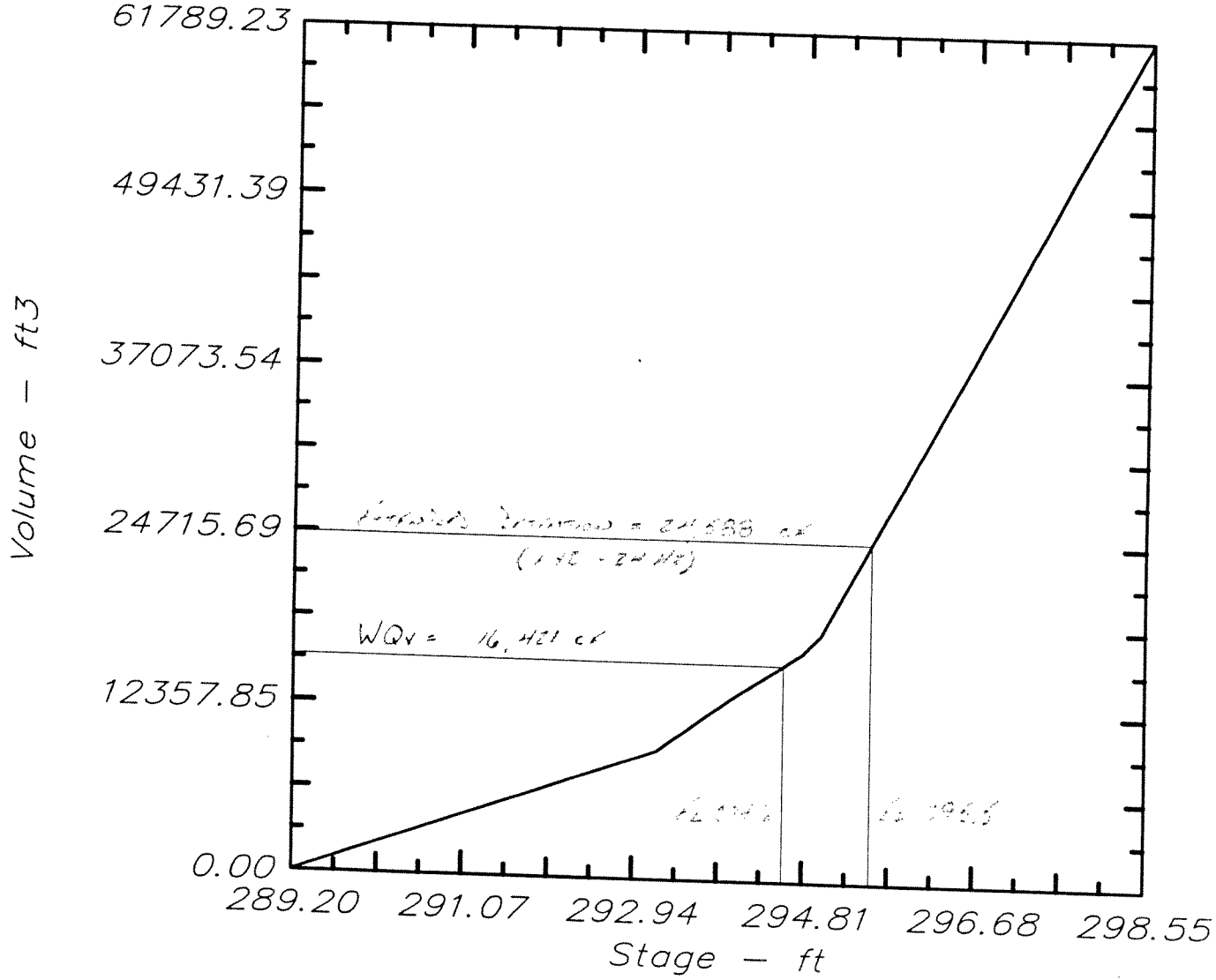
Proposed Vegetated Swale
Channel Rating Curve Data

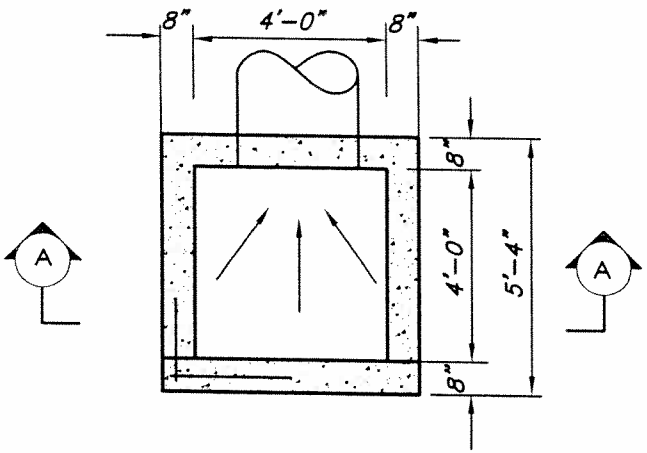
Depth - ft	Flowrate - cfs
0.00000000,	0.00000000
0.10000000,	0.34582613
0.20000000,	1.10771743
0.30000000,	2.20322083
0.40000000,	3.60888431
0.50000000,	5.31693663
0.60000000,	7.32663894
0.70000000,	9.64098664
0.80000000,	12.26514439
0.90000000,	15.20560739
1.00000000,	18.46971488
1.10000000,	22.06535170
1.20000000,	26.00075744
1.30000000,	30.28440030
1.40000000,	34.92489172
1.50000000,	39.93092725
1.60000000,	45.31124515
1.70000000,	51.07459690
1.80000000,	57.22972609
1.90000000,	63.78535321
2.00000000,	70.75016472

APPENDIX C

PROPOSED CONDITIONS
AREAS B-G
(DETENTION PONDS)

PROPOSED POND
Stage–Storage Curve

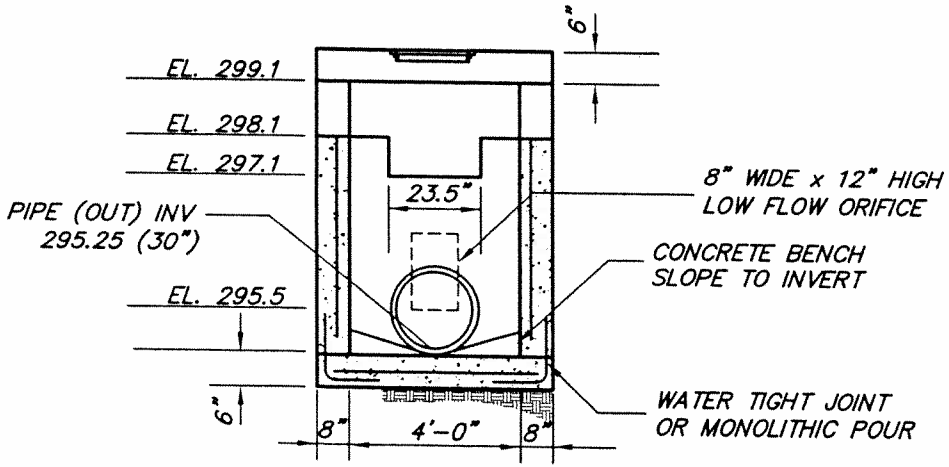




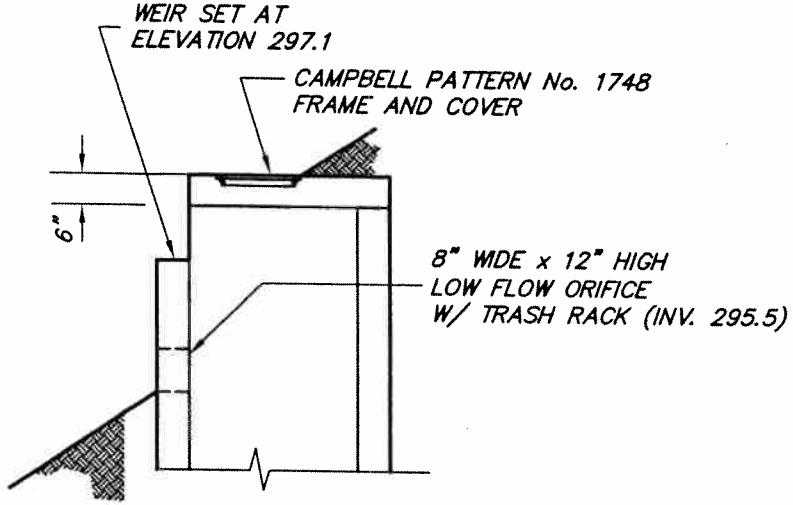
NOTE: CONCRETE TO BE 4,000 PSI AT 28 DAYS

SEE PRECAST CONCRETE STRUCTURE NOTES.

PLAN



SECTION A-A



SIDE ELEVATION

DETENTION POND OUTLET STRUCTURE "B"

OutFlow Output

Given Input Data:

Surface Elevation	298.5500 ft

Output Data:

Combined Flowrate	11.7728 cfs
Pond Name	PROPOSED POND
Pond Rim Elevation	298.5500 ft
Pond Bottom Elevation	289.2000 ft

Structure: Weir - Rectangular1

Weir Calculator

Given Input Data:

Weir Type	Rectangular
Equation	Contracted
Solving for	Flowrate
Structural Rim Elevation	296.5000 ft
Depth of Flow	1.0000 ft
Coefficient	0.6500
Height	1.0000 ft

Computed Results:

Flowrate	1.5700 cfs
Full Flow	1.5700 cfs
Velocity	2.4092 fps
Width	0.6517 ft
Area	0.6517 ft2
Perimeter	2.6517 ft
Wet Perimeter	2.6517 ft
Wet Area	0.6517 ft2
Percent Full	100.0000 %

Structure: Weir - Rectangular2

Weir Calculator

Given Input Data:

Weir Type	Rectangular
Equation	Contracted
Solving for	Flowrate
Structural Rim Elevation	298.1000 ft
Depth of Flow	1.0000 ft
Coefficient	0.6500
Height	1.0000 ft

Computed Results:

Flowrate	6.1000 cfs
Full Flow	6.1000 cfs
Velocity	3.1204 fps
Width	1.9549 ft
Area	1.9549 ft2
Perimeter	3.9549 ft
Wet Perimeter	3.9549 ft
Wet Area	1.9549 ft2
Percent Full	100.0000 %

Structure: Weir - Rectangular3

Weir Calculator

Given Input Data:

Weir Type	Rectangular
Equation	Contracted
Solving for	Flowrate
Structural Rim Elevation	299.1000 ft
Depth of Flow	0.4500 ft
Coefficient	0.6500
Height	1.0000 ft

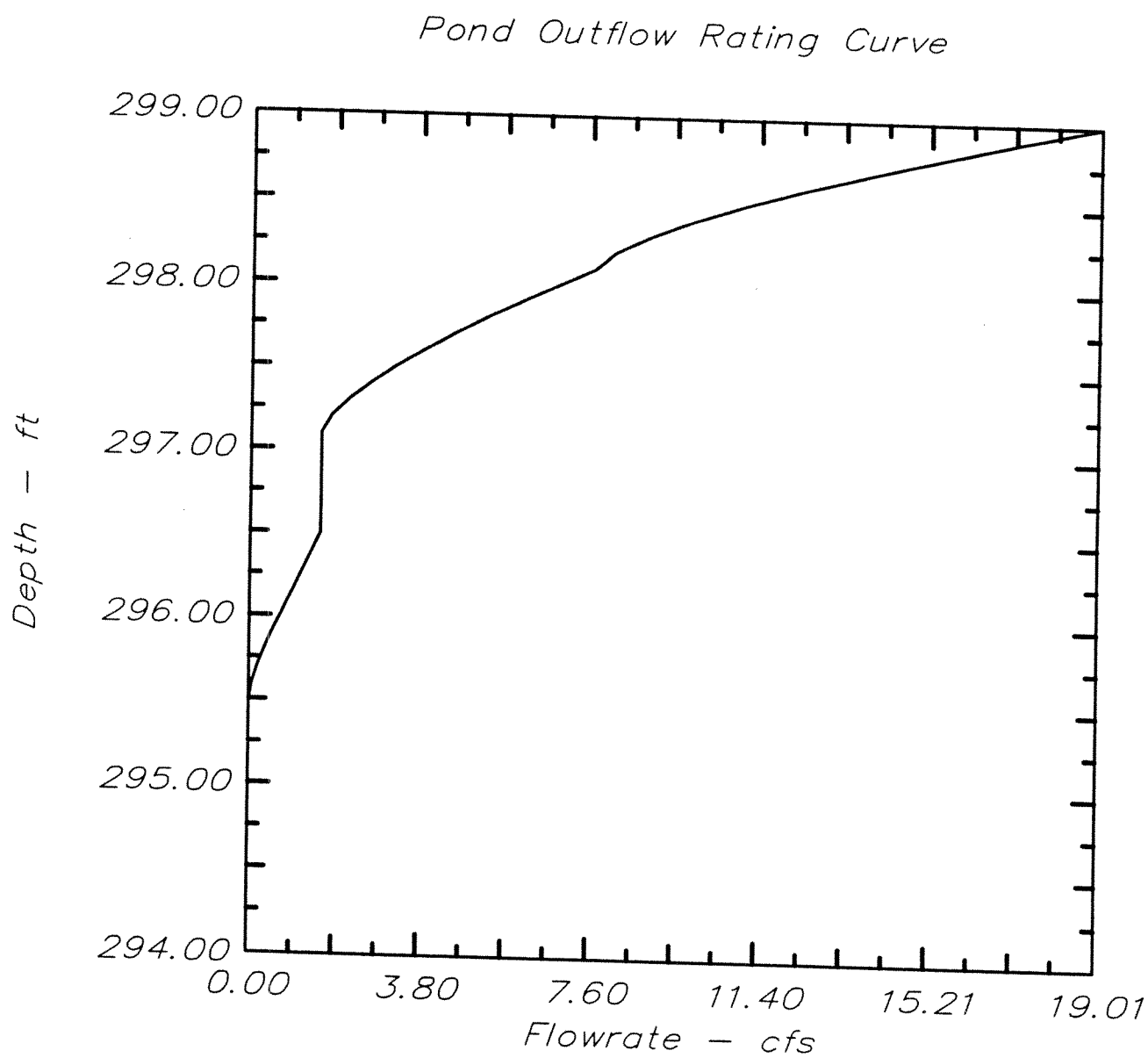
Computed Results:

Flowrate	4.1028 cfs
Full Flow	13.2091 cfs
Velocity	2.2794 fps
Width	4.0000 ft
Area	4.0000 ft2
Perimeter	6.0000 ft
Wet Perimeter	4.9000 ft
Wet Area	1.8000 ft2
Percent Full	45.0000 %

PROPOSED POND

STAGE - DISCHARGE CURVE
(Pond Outflow Rating Curve Data)

ELEVATION - ft	Flowrate - cfs
294.00000000,	0.00000000
294.10000000,	0.00000000
294.20000000,	0.00000000
294.30000000,	0.00000000
294.40000000,	0.00000000
294.50000000,	0.00000000
294.60000000,	0.00000000
294.70000000,	0.00000000
294.80000000,	0.00000000
294.90000000,	0.00000000
295.00000000,	0.00000000
295.10000000,	0.00000000
295.20000000,	0.00000000
295.30000000,	0.00000000
295.40000000,	0.00000000
295.50000000,	0.00000000
295.60000000,	0.06943853
295.70000000,	0.19018361
295.80000000,	0.33796605
295.90000000,	0.50274505
296.00000000,	0.67802798
296.10000000,	0.85898021
296.20000000,	1.04172264
296.30000000,	1.22299537
296.40000000,	1.39997173
296.50000000,	1.57014483
296.60000000,	1.57014483
296.70000000,	1.57014483
296.80000000,	1.57014483
296.90000000,	1.57014483
297.00000000,	1.57014483
297.10000000,	1.57014483
297.20000000,	1.78283536
297.30000000,	2.16550629
297.40000000,	2.65247011
297.50000000,	3.21890589
297.60000000,	3.84977887
297.70000000,	4.53449088
297.80000000,	5.26493165
297.90000000,	6.03456295
298.00000000,	6.83792057
298.10000000,	7.67031568
298.20000000,	8.10781028
298.30000000,	8.90151907
298.40000000,	9.92075718
298.50000000,	11.11750930
298.60000000,	12.46333564
298.70000000,	13.93859333
298.80000000,	15.52853216
298.90000000,	17.22146927
299.00000000,	19.00780135


Pond Outflow Rating Curve
299.00
298.00
297.00
296.00
295.00
294.00
Depth – ft
0.00
3.80
7.60
11.40
15.21
19.01
Flowrate – cfs

Storage Indication Method

Given Input Data:
File .....
Description .... 1-Year Storm
Time increment . 0.1000 hrs

Input Files:
Pre-Dev Hydrograph curve ..
Post-Dev Hydrograph curve . L:\A050030\hd\asbuilt1.hdc
Stage-Storage curve ..... L:\A050030\hd\proposedpond.ssc
Stage-Discharge curve ..... L:\A050030\hd\proposedpond.sdc

Output Data:
Routed Peak Flow ..... 0.0000 cfs
Routed Peak Time ..... 0.0000 hrs
Post-Developed Peak Flow . 7.5631 cfs
Post-Developed Peak Time . 12.3000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 ft3	H1 ft	S1-(O1/2)T ft3	S2+(O2/2)T ft3	H2 ft	Outflow cfs
11.0000	0.4226	76.0766	0.0000	0.0000	76.0766	289.2328	0.0000
11.1000	0.4606	158.9807	289.2328	76.0766	235.0573	289.3014	0.0000
11.2000	0.4985	172.6359	289.3014	235.0573	407.6932	289.3759	0.0000
11.3000	0.5364	186.2910	289.3759	407.6932	593.9841	289.4563	0.0000
11.4000	0.6148	207.2170	289.4563	593.9841	801.2012	289.5457	0.0000
11.5000	0.6931	235.4141	289.5457	801.2012	1036.6153	289.6472	0.0000
11.6000	0.7714	263.6112	289.6472	1036.6153	1300.2264	289.7610	0.0000
11.7000	1.1137	339.3208	289.7610	1300.2264	1639.5472	289.9074	0.0000
11.8000	1.4560	462.5430	289.9074	1639.5472	2102.0902	290.1069	0.0000
11.9000	1.7983	585.7651	290.1069	2102.0902	2687.8553	290.3596	0.0000
12.0000	2.5897	789.8311	290.3596	2687.8553	3477.6865	290.7004	0.0000
12.1000	4.1699	1216.7339	290.7004	3477.6865	4694.4204	291.2253	0.0000
12.2000	6.6435	1946.4183	291.2253	4694.4204	6640.8387	292.0651	0.0000
12.3000	7.5631	2557.1899	292.0651	6640.8387	9198.0286	293.1684	0.0000
12.4000	7.2497	2666.3096	293.1684	9198.0286	11864.3382	293.7429	0.0000
12.5000	6.4245	2461.3626	293.7429	11864.3382	14325.7009	294.2887	0.0000
12.6000	5.2060	2093.5022	294.2887	14325.7009	16419.2031	294.7785	0.0000
12.7000	3.9915	1655.5560	294.7785	16419.2031	18074.7591	295.0201	0.0000
12.8000	3.0375	1265.2214	295.0201	18050.7009	19315.9223	295.1157	0.0000
12.9000	2.4822	993.5398	295.1157	19177.5849	20171.1246	295.1816	0.0000
13.0000	1.9268	793.6109	295.1816	19954.0450	20747.6560	295.2260	0.0000
13.1000	1.6769	648.6565	295.2260	20477.4927	21126.1492	295.2551	0.0000
13.2000	1.4269	558.6763	295.2551	20821.1364	21379.8128	295.2746	0.0000
13.3000	1.3022	491.2339	295.2746	21051.4441	21542.6780	295.2872	0.0000
13.4000	1.1774	446.3291	295.2872	21199.3137	21645.6428	295.2951	0.0000
13.5000	1.1151	412.6512	295.2951	21292.7981	21705.4492	295.2997	0.0000
13.6000	1.0527	390.1999	295.2997	21347.0978	21737.2978	295.3022	0.0000
13.7000	1.0104	371.3516	295.3022	21376.0139	21747.3656	295.3029	0.0000
13.8000	0.9680	356.1062	295.3029	21385.1548	21741.2609	295.3025	0.0000
13.9000	0.9343	342.4123	295.3025	21379.6122	21722.0245	295.3010	0.0000
14.0000	0.9006	330.2699	295.3010	21362.1469	21692.4168	295.2987	0.0000
14.1000	0.8656	317.9138	295.2987	21335.2654	21653.1792	295.2957	0.0000
14.2000	0.8307	305.3442	295.2957	21299.6406	21604.9847	295.2920	0.0000
14.3000	0.7958	292.7745	295.2920	21255.8835	21548.6580	295.2876	0.0000
14.4000	0.7738	282.5346	295.2876	21204.7431	21487.2777	295.2829	0.0000
14.5000	0.7519	274.6244	295.2829	21149.0143	21423.6386	295.2780	0.0000
14.6000	0.7299	266.7142	295.2780	21091.2348	21357.9489	295.2730	0.0000

14.7000	0.7116	259.4596	295.2730	21031.5934	21291.0530	295.2678	0.0000
14.8000	0.6932	252.8608	295.2678	20970.8569	21223.7176	295.2626	0.0000
14.9000	0.6749	246.2619	295.2626	20909.7213	21155.9832	295.2574	0.0000
15.0000	0.6566	239.6630	295.2574	20848.2235	21087.8865	295.2522	0.0000
15.1000	0.6389	233.1836	295.2522	20786.3968	21019.5804	295.2469	0.0000
15.2000	0.6212	226.8235	295.2469	20724.3799	20951.2034	295.2416	0.0000
15.3000	0.6036	220.4635	295.2416	20662.2986	20882.7621	295.2364	0.0000
15.4000	0.5859	214.1034	295.2364	20600.1591	20814.2625	295.2311	0.0000
15.5000	0.5682	207.7434	295.2311	20537.9665	20745.7099	295.2258	0.0000
15.6000	0.5513	201.5153	295.2258	20475.7258	20677.2411	295.2205	0.0000
15.7000	0.5344	195.4191	295.2205	20413.5612	20608.9803	295.2153	0.0000
15.8000	0.5174	189.3228	295.2153	20351.5855	20540.9083	295.2100	0.0000
15.9000	0.5005	183.2266	295.2100	20289.7812	20473.0078	295.2048	0.0000
16.0000	0.4836	177.1304	295.2048	20228.1326	20405.2630	295.1996	0.0000
16.1000	0.4681	171.3063	295.1996	20166.6253	20337.9316	295.1944	0.0000
16.2000	0.4527	165.7541	295.1944	20105.4934	20271.2475	295.1893	0.0000
16.3000	0.4373	160.2020	295.1893	20044.9492	20205.1512	295.1842	0.0000
16.4000	0.4219	154.6499	295.1842	19984.9387	20139.5886	295.1791	0.0000
16.5000	0.4064	149.0978	295.1791	19925.4127	20074.5105	295.1741	0.0000
16.6000	0.3985	144.8871	295.1741	19866.3266	20011.2137	295.1692	0.0000
16.7000	0.3905	142.0179	295.1692	19808.8578	19950.8757	295.1646	0.0000
16.8000	0.3825	139.1487	295.1646	19754.0754	19893.2241	295.1602	0.0000
16.9000	0.3746	136.2795	295.1602	19701.7320	19838.0115	295.1559	0.0000
17.0000	0.3666	133.4102	295.1559	19651.6031	19785.0133	295.1518	0.0000
17.1000	0.3597	130.7364	295.1518	19603.4847	19734.2210	295.1479	0.0000
17.2000	0.3528	128.2579	295.1479	19557.3691	19685.6270	295.1442	0.0000
17.3000	0.3459	125.7794	295.1442	19513.2492	19639.0286	295.1406	0.0000
17.4000	0.3391	123.3009	295.1406	19470.9414	19594.2423	295.1371	0.0000
17.5000	0.3322	120.8224	295.1371	19430.2788	19551.1012	295.1338	0.0000
17.6000	0.3233	117.9817	295.1338	19391.1098	19509.0915	295.1306	0.0000
17.7000	0.3144	114.7789	295.1306	19352.9682	19467.7471	295.1274	0.0000
17.8000	0.3055	111.5761	295.1274	19315.4305	19427.0065	295.1243	0.0000
17.9000	0.2966	108.3732	295.1243	19278.4411	19386.8143	295.1212	0.0000
18.0000	0.2877	105.1704	295.1212	19241.9495	19347.1199	295.1181	0.0000
18.1000	0.2831	102.7461	295.1181	19205.9100	19308.6561	295.1151	0.0000
18.2000	0.2785	101.1004	295.1151	19170.9877	19272.0881	295.1123	0.0000
18.3000	0.2740	99.4548	295.1123	19137.7867	19237.2415	295.1096	0.0000
18.4000	0.2694	97.8091	295.1096	19106.1485	19203.9576	295.1071	0.0000
18.5000	0.2648	96.1634	295.1071	19075.9292	19172.0927	295.1046	0.0000
18.6000	0.2603	94.5177	295.1046	19046.9982	19141.5160	295.1023	0.0000
18.7000	0.2557	92.8721	295.1023	19019.2369	19112.1090	295.1000	0.0000
18.8000	0.2511	91.2264	295.1000	18992.5375	19083.7639	295.0978	0.0000
18.9000	0.2465	89.5807	295.0978	18966.8023	19056.3830	295.0957	0.0000
19.0000	0.2420	87.9351	295.0957	18941.9425	19029.8775	295.0937	0.0000
19.1000	0.2399	86.7364	295.0937	18917.8774	19004.6139	295.0917	0.0000
19.2000	0.2378	85.9849	295.0917	18894.9399	18980.9248	295.0899	0.0000
19.3000	0.2357	85.2334	295.0899	18873.4320	18958.6654	295.0882	0.0000
19.4000	0.2336	84.4818	295.0882	18853.2221	18937.7040	295.0866	0.0000
19.5000	0.2315	83.7303	295.0866	18834.1907	18917.9210	295.0851	0.0000
19.6000	0.2295	82.9787	295.0851	18816.2292	18899.2080	295.0836	0.0000
19.7000	0.2274	82.2272	295.0836	18799.2392	18881.4664	295.0822	0.0000
19.8000	0.2253	81.4756	295.0822	18783.1312	18864.6068	295.0809	0.0000
19.9000	0.2232	80.7241	295.0809	18767.8239	18848.5480	295.0797	0.0000
20.0000	0.2211	79.9726	295.0797	18753.2437	18833.2163	295.0785	0.0000
20.1000	0.2194	79.2900	295.0785	18739.3237	18818.6137	295.0774	0.0000
20.2000	0.2177	78.6764	295.0774	18726.0656	18804.7420	295.0763	0.0000
20.3000	0.2160	78.0628	295.0763	18713.4711	18791.5339	295.0753	0.0000
20.4000	0.2143	77.4492	295.0753	18701.4792	18778.9284	295.0744	0.0000
20.5000	0.2126	76.8357	295.0744	18690.0343	18766.8700	295.0734	0.0000
20.6000	0.2109	76.2221	295.0734	18679.0861	18755.3082	295.0725	0.0000
20.7000	0.2092	75.6085	295.0725	18668.5889	18744.1974	295.0717	0.0000
20.8000	0.2075	74.9949	295.0717	18658.5011	18733.4960	295.0709	0.0000
20.9000	0.2058	74.3813	295.0709	18648.7850	18723.1663	295.0701	0.0000
21.0000	0.2041	73.7677	295.0701	18639.4065	18713.1742	295.0693	0.0000

21.1000	0.2024	73.1541	295.0693	18630.3344	18703.4885	295.0685	0.0000
21.2000	0.2006	72.5406	295.0685	18621.5405	18694.0810	295.0678	0.0000
21.3000	0.1989	71.9270	295.0678	18612.9992	18684.9261	295.0671	0.0000
21.4000	0.1972	71.3134	295.0671	18604.6872	18676.0006	295.0664	0.0000
21.5000	0.1955	70.6998	295.0664	18596.5835	18667.2833	295.0658	0.0000
21.6000	0.1938	70.0862	295.0658	18588.6688	18658.7550	295.0651	0.0000
21.7000	0.1921	69.4726	295.0651	18580.9258	18650.3984	295.0645	0.0000
21.8000	0.1904	68.8590	295.0645	18573.3386	18642.1976	295.0638	0.0000
21.9000	0.1887	68.2455	295.0638	18565.8929	18634.1384	295.0632	0.0000
22.0000	0.1870	67.6319	295.0632	18558.5757	18626.2076	295.0626	0.0000
22.1000	0.1823	66.4835	295.0626	18551.3751	18617.8586	295.0619	0.0000
22.2000	0.1777	64.8004	295.0619	18543.7949	18608.5953	295.0612	0.0000
22.3000	0.1730	63.1173	295.0612	18535.3845	18598.5017	295.0605	0.0000
22.4000	0.1683	61.4341	295.0605	18526.2203	18587.6544	295.0596	0.0000
22.5000	0.1636	59.7510	295.0596	18516.3717	18576.1227	295.0587	0.0000
22.6000	0.1590	58.0679	295.0587	18505.9018	18563.9696	295.0578	0.0000
22.7000	0.1543	56.3848	295.0578	18494.8677	18551.2525	295.0568	0.0000
22.8000	0.1496	54.7016	295.0568	18483.3214	18538.0231	295.0558	0.0000
22.9000	0.1449	53.0185	295.0558	18471.3101	18524.3286	295.0547	0.0000
23.0000	0.1403	51.3354	295.0547	18458.8766	18510.2120	295.0537	0.0000
23.1000	0.1356	49.6522	295.0537	18446.0597	18495.7120	295.0525	0.0000
23.2000	0.1309	47.9691	295.0525	18432.8948	18480.8639	295.0514	0.0000
23.3000	0.1262	46.2860	295.0514	18419.4139	18465.6999	295.0502	0.0000
23.4000	0.1216	44.6029	295.0502	18405.6460	18450.2489	295.0490	0.0000
23.5000	0.1169	42.9197	295.0490	18391.6177	18434.5374	295.0478	0.0000
23.6000	0.1122	41.2366	295.0478	18377.3529	18418.5895	295.0466	0.0000
23.7000	0.1075	39.5535	295.0466	18362.8733	18402.4268	295.0454	0.0000
23.8000	0.1029	37.8704	295.0454	18348.1988	18386.0691	295.0441	0.0000
23.9000	0.0982	36.1872	295.0441	18333.3473	18369.5345	295.0428	0.0000
24.0000	0.0935	34.5041	295.0428	18318.3350	18352.8391	295.0415	0.0000
24.1000	0.0888	32.8210	295.0415	18303.1769	18335.9978	295.0402	0.0000
24.2000	0.0842	31.1378	295.0402	18287.8862	18319.0241	295.0389	0.0000
24.3000	0.0795	29.4547	295.0389	18272.4753	18301.9300	295.0376	0.0000
24.4000	0.0748	27.7716	295.0376	18256.9552	18284.7268	295.0363	0.0000
24.5000	0.0701	26.0885	295.0363	18241.3359	18267.4244	295.0350	0.0000
24.6000	0.0655	24.4053	295.0350	18225.6266	18250.0320	295.0336	0.0000
24.7000	0.0608	22.7222	295.0336	18209.8356	18232.5578	295.0323	0.0000
24.8000	0.0561	21.0391	295.0323	18193.9704	18215.0095	295.0309	0.0000
24.9000	0.0514	19.3560	295.0309	18178.0378	18197.3937	295.0296	0.0000
25.0000	0.0468	17.6728	295.0296	18162.0440	18179.7168	295.0282	0.0000
25.1000	0.0421	15.9897	295.0282	18145.9947	18161.9844	295.0268	0.0000
25.2000	0.0374	14.3066	295.0268	18129.8950	18144.2015	295.0255	0.0000
25.3000	0.0327	12.6235	295.0255	18113.7494	18126.3729	295.0241	0.0000
25.4000	0.0281	10.9403	295.0241	18097.5623	18108.5027	295.0227	0.0000
25.5000	0.0234	9.2572	295.0227	18081.3375	18090.5947	295.0213	0.0000
25.6000	0.0187	7.5741	295.0213	18065.0784	18072.6525	295.0200	0.0000
25.7000	0.0140	5.8909	295.0200	18048.7882	18054.6792	295.0186	0.0000
25.8000	0.0094	4.2078	295.0186	18032.4698	18036.6776	295.0172	0.0000
25.9000	0.0047	2.5247	295.0172	18016.1257	18018.6504	295.0158	0.0000
26.0000	0.0000	0.8416	295.0158	17999.7583	18000.5999	295.0144	0.0000

Storage Indication Method

Given Input Data:
File .....
Description .... 2-Year Storm
Time increment . 0.1000 hrs

Input Files:
Pre-Dev Hydrograph curve ..
Post-Dev Hydrograph curve . L:\A050030\hd\asbuilt2.hdc
Stage-Storage curve ..... L:\A050030\hd\proposedpond.ssc
Stage-Discharge curve ..... L:\A050030\hd\proposedpond.sdc

Output Data:
Routed Peak Flow ..... 0.1317 cfs
Routed Peak Time ..... 13.1000 hrs
Post-Developed Peak Flow . 10.2248 cfs
Post-Developed Peak Time . 12.3000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 ft3	H1 ft	S1-(O1/2)T ft3	S2+(O2/2)T ft3	H2 ft	Outflow cfs
11.0000	0.5847	105.2388	0.0000	0.0000	105.2388	289.2454	0.0000
11.1000	0.6373	219.9453	289.2454	105.2388	325.1841	289.3403	0.0000
11.2000	0.6899	238.8807	289.3403	325.1841	564.0649	289.4434	0.0000
11.3000	0.7425	257.8162	289.4434	564.0649	821.8810	289.5546	0.0000
11.4000	0.8508	286.7825	289.5546	821.8810	1108.6635	289.6783	0.0000
11.5000	0.9591	325.7797	289.6783	1108.6635	1434.4433	289.8189	0.0000
11.6000	1.0674	364.7770	289.8189	1434.4433	1799.2203	289.9763	0.0000
11.7000	1.5371	468.8130	289.9763	1799.2203	2268.0333	290.1785	0.0000
11.8000	2.0067	637.8879	290.1785	2268.0333	2905.9212	290.4537	0.0000
11.9000	2.4764	806.9628	290.4537	2905.9212	3712.8840	290.8019	0.0000
12.0000	3.5489	1084.5526	290.8019	3712.8840	4797.4366	291.2698	0.0000
12.1000	5.6811	1661.3924	291.2698	4797.4366	6458.8290	291.9866	0.0000
12.2000	8.9900	2640.7891	291.9866	6458.8290	9099.6181	293.1259	0.0000
12.3000	10.2248	3458.6722	293.1259	9099.6181	12558.2903	293.8882	0.0000
12.4000	9.8067	3605.6870	293.8882	12558.2903	16163.9773	294.7188	0.0000
12.5000	8.7005	3331.3035	294.7188	16163.9773	19495.2808	295.1295	0.0000
12.6000	7.0578	2836.4913	295.1295	19340.4290	22176.9203	295.3360	0.0000
12.7000	5.4109	2244.3579	295.3360	21775.1586	24019.5164	295.4779	0.0000
12.8000	4.1162	1714.8790	295.4779	23448.0990	25162.9780	295.5660	0.0458
12.9000	3.3600	1345.7258	295.5660	24486.2772	25832.0030	295.6175	0.0906
13.0000	2.6038	1073.4854	295.6175	25093.7022	26167.1875	295.6433	0.1217
13.1000	2.2635	876.1054	295.6433	25398.0248	26274.1303	295.6516	0.1317
13.2000	1.9231	753.5861	295.6516	25495.1209	26248.7070	295.6496	0.1293
13.3000	1.7534	661.7833	295.6496	25472.0385	26133.8218	295.6407	0.1186
13.4000	1.5838	600.6971	295.6407	25367.7312	25968.4283	295.6280	0.1033
13.5000	1.4988	554.8659	295.6280	25217.5662	25772.4322	295.6129	0.0850
13.6000	1.4139	524.2898	295.6129	25039.6163	25563.9061	295.5969	0.0673
13.7000	1.3567	498.6994	295.5969	24850.2902	25348.9895	295.5803	0.0558
13.8000	1.2994	478.0946	295.5803	24655.1618	25133.2564	295.5637	0.0442
13.9000	1.2541	459.6280	295.5637	24459.2922	24918.9201	295.5472	0.0328
14.0000	1.2087	443.2996	295.5472	24264.6907	24707.9903	295.5309	0.0215
14.1000	1.1616	426.6576	295.5309	24073.1821	24499.8397	295.5149	0.0104
14.2000	1.1145	409.7020	295.5149	23884.1969	24293.8989	295.4991	0.0000
14.3000	1.0674	392.7464	295.4991	23697.2179	24089.9643	295.4834	0.0000
14.4000	1.0377	378.9207	295.4834	23512.0604	23890.9812	295.4680	0.0000
14.5000	1.0080	368.2250	295.4680	23331.3985	23699.6235	295.4533	0.0000
14.6000	0.9783	357.5292	295.4533	23157.6600	23515.1892	295.4391	0.0000

14.7000	0.9536	347.7437	295.4391	22990.2074	23337.9511	295.4254	0.0000
14.8000	0.9290	338.8684	295.4254	22829.2883	23168.1567	295.4124	0.0000
14.9000	0.9043	329.9931	295.4124	22675.1276	23005.1206	295.3998	0.0000
15.0000	0.8797	321.1178	295.3998	22527.1030	22848.2207	295.3877	0.0000
15.1000	0.8559	312.4046	295.3877	22384.6495	22697.0541	295.3761	0.0000
15.2000	0.8322	303.8535	295.3761	22247.4014	22551.2548	295.3649	0.0000
15.3000	0.8084	295.3023	295.3649	22115.0265	22410.3289	295.3540	0.0000
15.4000	0.7847	286.7512	295.3540	21987.0762	22273.8274	295.3435	0.0000
15.5000	0.7609	278.2001	295.3435	21863.1431	22141.3432	295.3333	0.0000
15.6000	0.7382	269.8393	295.3333	21742.8572	22012.6965	295.3234	0.0000
15.7000	0.7155	261.6687	295.3234	21626.0555	21887.7243	295.3138	0.0000
15.8000	0.6928	253.4982	295.3138	21512.5900	21766.0882	295.3044	0.0000
15.9000	0.6701	245.3277	295.3044	21402.1536	21647.4812	295.2953	0.0000
16.0000	0.6474	237.1571	295.2953	21294.4672	21531.6243	295.2863	0.0000
16.1000	0.6266	229.3314	295.2863	21189.2777	21418.6091	295.2776	0.0000
16.2000	0.6059	221.8506	295.2776	21086.6683	21308.5190	295.2692	0.0000
16.3000	0.5851	214.3698	295.2692	20986.7146	21201.0844	295.2609	0.0000
16.4000	0.5643	206.8890	295.2609	20889.1721	21096.0611	295.2528	0.0000
16.5000	0.5435	199.4082	295.2528	20793.8187	20993.2269	295.2449	0.0000
16.6000	0.5328	193.7449	295.2449	20700.4528	20894.1977	295.2372	0.0000
16.7000	0.5222	189.8992	295.2372	20610.5417	20800.4409	295.2300	0.0000
16.8000	0.5115	186.0534	295.2300	20525.4175	20711.4709	295.2232	0.0000
16.9000	0.5008	182.2076	295.2232	20444.6393	20626.8470	295.2167	0.0000
17.0000	0.4901	178.3619	295.2167	20367.8071	20546.1690	295.2104	0.0000
17.1000	0.4810	174.7998	295.2104	20294.5575	20469.3573	295.2045	0.0000
17.2000	0.4719	171.5214	295.2045	20224.8182	20396.3396	295.1989	0.0000
17.3000	0.4628	168.2430	295.1989	20158.5235	20326.7666	295.1935	0.0000
17.4000	0.4537	164.9646	295.1935	20095.3564	20260.3210	295.1884	0.0000
17.5000	0.4446	161.6862	295.1884	20035.0288	20196.7150	295.1835	0.0000
17.6000	0.4326	157.8889	295.1835	19977.2792	20135.1681	295.1788	0.0000
17.7000	0.4206	153.5726	295.1788	19921.3992	20074.9718	295.1742	0.0000
17.8000	0.4086	149.2563	295.1742	19866.7454	20016.0017	295.1696	0.0000
17.9000	0.3966	144.9399	295.1696	19813.2050	19958.1449	295.1652	0.0000
18.0000	0.3846	140.6236	295.1652	19760.6753	19901.2989	295.1608	0.0000
18.1000	0.3785	137.3618	295.1608	19709.0633	19846.4251	295.1566	0.0000
18.2000	0.3724	135.1545	295.1566	19659.2420	19794.3965	295.1526	0.0000
18.3000	0.3662	132.9471	295.1526	19612.0039	19744.9511	295.1487	0.0000
18.4000	0.3601	130.7398	295.1487	19567.1111	19697.8509	295.1451	0.0000
18.5000	0.3540	128.5325	295.1451	19524.3477	19652.8802	295.1417	0.0000
18.6000	0.3478	126.3252	295.1417	19483.5176	19609.8428	295.1383	0.0000
18.7000	0.3417	124.1179	295.1383	19444.4428	19568.5607	295.1352	0.0000
18.8000	0.3356	121.9105	295.1352	19406.9618	19528.8723	295.1321	0.0000
18.9000	0.3294	119.7032	295.1321	19370.9276	19490.6308	295.1292	0.0000
19.0000	0.3233	117.4959	295.1292	19336.2072	19453.7031	295.1263	0.0000
19.1000	0.3205	115.8873	295.1263	19302.6796	19418.5669	295.1236	0.0000
19.2000	0.3177	114.8774	295.1236	19270.7785	19385.6559	295.1211	0.0000
19.3000	0.3149	113.8675	295.1211	19240.8978	19354.7653	295.1187	0.0000
19.4000	0.3121	112.8576	295.1187	19212.8515	19325.7091	295.1165	0.0000
19.5000	0.3093	111.8478	295.1165	19186.4706	19298.3183	295.1143	0.0000
19.6000	0.3065	110.8379	295.1143	19161.6018	19272.4396	295.1124	0.0000
19.7000	0.3037	109.8280	295.1124	19138.1058	19247.9338	295.1105	0.0000
19.8000	0.3009	108.8181	295.1105	19115.8564	19224.6745	295.1087	0.0000
19.9000	0.2981	107.8083	295.1087	19094.7387	19202.5469	295.1070	0.0000
20.0000	0.2953	106.7984	295.1070	19074.6484	19181.4468	295.1053	0.0000
20.1000	0.2930	105.8847	295.1053	19055.4911	19161.3758	295.1038	0.0000
20.2000	0.2907	105.0672	295.1038	19037.2681	19142.3353	295.1023	0.0000
20.3000	0.2884	104.2497	295.1023	19019.9808	19124.2305	295.1009	0.0000
20.4000	0.2862	103.4323	295.1009	19003.5430	19106.9752	295.0996	0.0000
20.5000	0.2839	102.6148	295.0996	18987.8764	19090.4912	295.0983	0.0000
20.6000	0.2816	101.7973	295.0983	18972.9102	19074.7075	295.0971	0.0000
20.7000	0.2794	100.9798	295.0971	18958.5797	19059.5596	295.0960	0.0000
20.8000	0.2771	100.1623	295.0960	18944.8265	19044.9889	295.0948	0.0000
20.9000	0.2748	99.3449	295.0948	18931.5974	19030.9423	295.0938	0.0000
21.0000	0.2726	98.5274	295.0938	18918.8442	19017.3716	295.0927	0.0000

21.1000	0.2703	97.7099	295.0927	18906.5230	19004.2329	295.0917	0.0000
21.2000	0.2680	96.8924	295.0917	18894.5940	18991.4865	295.0907	0.0000
21.3000	0.2657	96.0749	295.0907	18883.0212	18979.0962	295.0898	0.0000
21.4000	0.2635	95.2575	295.0898	18871.7717	18967.0292	295.0888	0.0000
21.5000	0.2612	94.4400	295.0888	18860.8159	18955.2558	295.0879	0.0000
21.6000	0.2589	93.6225	295.0879	18850.1265	18943.7490	295.0870	0.0000
21.7000	0.2567	92.8050	295.0870	18839.6792	18932.4842	295.0862	0.0000
21.8000	0.2544	91.9876	295.0862	18829.4516	18921.4391	295.0853	0.0000
21.9000	0.2521	91.1701	295.0853	18819.4234	18910.5935	295.0845	0.0000
22.0000	0.2498	90.3526	295.0845	18809.5764	18899.9290	295.0837	0.0000
22.1000	0.2436	88.8196	295.0837	18799.8939	18888.7134	295.0828	0.0000
22.2000	0.2374	86.5710	295.0828	18789.7109	18876.2819	295.0818	0.0000
22.3000	0.2311	84.3224	295.0818	18778.4240	18862.7464	295.0808	0.0000
22.4000	0.2249	82.0738	295.0808	18766.1348	18848.2086	295.0797	0.0000
22.5000	0.2186	79.8252	295.0797	18752.9355	18832.7607	295.0785	0.0000
22.6000	0.2124	77.5766	295.0785	18738.9100	18816.4866	295.0772	0.0000
22.7000	0.2061	75.3280	295.0772	18724.1343	18799.4623	295.0759	0.0000
22.8000	0.1999	73.0794	295.0759	18708.6776	18781.7569	295.0746	0.0000
22.9000	0.1936	70.8308	295.0746	18692.6024	18763.4332	295.0732	0.0000
23.0000	0.1874	68.5822	295.0732	18675.9658	18744.5480	295.0717	0.0000
23.1000	0.1811	66.3336	295.0717	18658.8194	18725.1530	295.0702	0.0000
23.2000	0.1749	64.0850	295.0702	18641.2102	18705.2952	295.0687	0.0000
23.3000	0.1686	61.8364	295.0687	18623.1808	18685.0172	295.0671	0.0000
23.4000	0.1624	59.5878	295.0671	18604.7699	18664.3577	295.0655	0.0000
23.5000	0.1562	57.3392	295.0655	18586.0126	18643.3518	295.0639	0.0000
23.6000	0.1499	55.0906	295.0639	18566.9408	18622.0314	295.0623	0.0000
23.7000	0.1437	52.8420	295.0623	18547.5835	18600.4255	295.0606	0.0000
23.8000	0.1374	50.5934	295.0606	18527.9669	18578.5603	295.0589	0.0000
23.9000	0.1312	48.3448	295.0589	18508.1150	18556.4598	295.0572	0.0000
24.0000	0.1249	46.0962	295.0572	18488.0493	18534.1455	295.0555	0.0000
24.1000	0.1187	43.8476	295.0555	18467.7896	18511.6373	295.0538	0.0000
24.2000	0.1124	41.5990	295.0538	18447.3538	18488.9528	295.0520	0.0000
24.3000	0.1062	39.3504	295.0520	18426.7580	18466.1084	295.0503	0.0000
24.4000	0.0999	37.1018	295.0503	18406.0170	18443.1188	295.0485	0.0000
24.5000	0.0937	34.8532	295.0485	18385.1441	18419.9974	295.0467	0.0000
24.6000	0.0874	32.6046	295.0467	18364.1516	18396.7562	295.0449	0.0000
24.7000	0.0812	30.3561	295.0449	18343.0503	18373.4064	295.0431	0.0000
24.8000	0.0750	28.1075	295.0431	18321.8504	18349.9579	295.0413	0.0000
24.9000	0.0687	25.8589	295.0413	18300.5609	18326.4198	295.0395	0.0000
25.0000	0.0625	23.6103	295.0395	18279.1901	18302.8003	295.0377	0.0000
25.1000	0.0562	21.3617	295.0377	18257.7453	18279.1070	295.0359	0.0000
25.2000	0.0500	19.1131	295.0359	18236.2336	18255.3467	295.0340	0.0000
25.3000	0.0437	16.8645	295.0340	18214.6610	18231.5254	295.0322	0.0000
25.4000	0.0375	14.6159	295.0322	18193.0330	18207.6489	295.0304	0.0000
25.5000	0.0312	12.3673	295.0304	18171.3549	18183.7222	295.0285	0.0000
25.6000	0.0250	10.1187	295.0285	18149.6313	18159.7500	295.0267	0.0000
25.7000	0.0187	7.8701	295.0267	18127.8663	18135.7363	295.0248	0.0000
25.8000	0.0125	5.6215	295.0248	18106.0637	18111.6852	295.0230	0.0000
25.9000	0.0062	3.3729	295.0230	18084.2270	18087.5999	295.0211	0.0000
26.0000	0.0000	1.1243	295.0211	18062.3593	18063.4836	295.0193	0.0000

Storage Indication Method

Given Input Data:
File ..... L:\A050030\hd\10.sim
Description .... 10 Year Storm
Time increment . 0.1000 hrs

Input Files:
Pre-Dev Hydrograph curve ..
Post-Dev Hydrograph curve . L:\A050030\hd\asbuilt10.hdc
Stage-Storage curve ..... L:\A050030\hd\proposedpond.ssc
Stage-Discharge curve ..... L:\A050030\hd\proposedpond.sdc

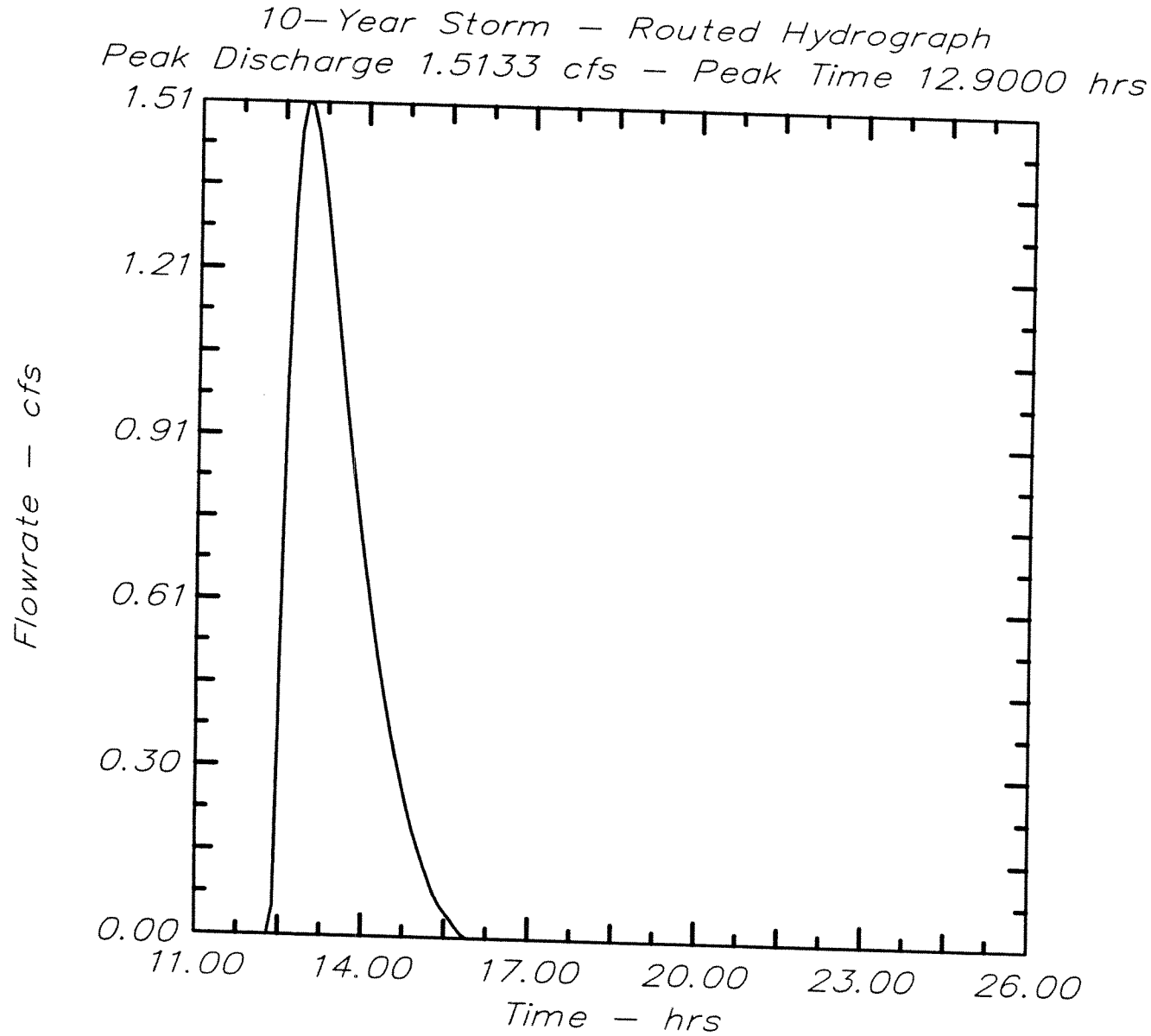
Output Data:
Routed Peak Flow ..... 1.4572 cfs
Routed Peak Time ..... 12.9000 hrs
Post-Developed Peak Flow . 16.0534 cfs
Post-Developed Peak Time . 12.3000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 ft3	H1 ft	S1-(O1/2)T ft3	S2+(O2/2)T ft3	H2 ft	Outflow cfs
11.0000	0.9259	166.6597	0.0000	0.0000	166.6597	289.2719	0.0000
11.1000	1.0093	348.3296	289.2719	166.6597	514.9892	289.4222	0.0000
11.2000	1.0927	378.3500	289.4222	514.9892	893.3392	289.5854	0.0000
11.3000	1.1761	408.3704	289.5854	893.3392	1301.7096	289.7616	0.0000
11.4000	1.3474	454.2302	289.7616	1301.7096	1755.9398	289.9576	0.0000
11.5000	1.5188	515.9293	289.9576	1755.9398	2271.8691	290.1802	0.0000
11.6000	1.6902	577.6284	290.1802	2271.8691	2849.4975	290.4294	0.0000
11.7000	2.4310	741.8192	290.4294	2849.4975	3591.3167	290.7494	0.0000
11.8000	3.1718	1008.5015	290.7494	3591.3167	4599.8182	291.1845	0.0000
11.9000	3.9126	1275.1838	291.1845	4599.8182	5875.0020	291.7347	0.0000
12.0000	5.5969	1711.7072	291.7347	5875.0020	7586.7092	292.4732	0.0000
12.1000	8.9462	2617.7568	292.4732	7586.7092	10204.4660	293.3954	0.0000
12.2000	14.1182	4151.5838	293.3954	10204.4660	14356.0498	294.2958	0.0000
12.3000	16.0534	5430.8897	294.2958	14356.0498	19786.9395	295.1520	0.0000
12.4000	15.4335	5667.6548	295.1520	19605.4873	25273.1421	295.5745	0.0606
12.5000	13.7288	5249.2285	295.5745	24587.2574	29836.4859	295.9260	0.5521
12.6000	11.1581	4479.6441	295.9260	28731.0214	33210.6655	296.1858	1.0158
12.7000	8.5647	3550.1005	296.1858	31794.9599	35345.0604	296.3502	1.3106
12.8000	6.5211	2715.4421	296.3502	33733.1064	36448.5485	296.4352	1.4298
12.9000	5.3203	2131.4394	296.4352	34735.1336	36866.5730	296.4674	1.4572
13.0000	4.1194	1699.1421	296.4674	35114.7225	36813.8646	296.4633	1.4537
13.1000	3.5781	1385.5528	296.4633	35066.8604	36452.4133	296.4355	1.4300
13.2000	3.0368	1190.6715	296.4355	34738.6430	35929.3144	296.3952	1.3912
13.3000	2.7671	1044.6899	296.3952	34263.6408	35308.3308	296.3474	1.3056
13.4000	2.4974	947.6082	296.3474	33699.7539	34647.3621	296.2965	1.2144
13.5000	2.3622	874.7330	296.2965	33099.5585	33974.2915	296.2446	1.1216
13.6000	2.2270	826.0645	296.2446	32488.3738	33314.4382	296.1938	1.0304
13.7000	2.1365	785.4308	296.1938	31889.1912	32674.6220	296.1445	0.9408
13.8000	2.0459	752.8321	296.1445	31308.2032	32061.0353	296.0973	0.8549
13.9000	1.9745	723.6805	296.0973	30751.0332	31474.7137	296.0521	0.7727
14.0000	1.9031	697.9758	296.0521	30218.6213	30916.5971	296.0091	0.6946
14.1000	1.8288	671.7528	296.0091	29711.8212	30383.5740	295.9681	0.6237
14.2000	1.7546	645.0115	295.9681	29227.8072	29872.8187	295.9288	0.5568
14.3000	1.6803	618.2701	295.9288	28764.0136	29382.2837	295.8910	0.4926
14.4000	1.6333	596.4514	295.8910	28318.5812	28915.0326	295.8550	0.4314
14.5000	1.5864	579.5554	295.8550	27894.2918	28473.8471	295.8210	0.3737
14.6000	1.5395	562.6593	295.8210	27493.6714	28056.3308	295.7889	0.3230

14.7000	1.5007	547.2280	295.7889	27114.5439	27661.7719	295.7585	0.2822
14.8000	1.4619	533.2613	295.7585	26756.2630	27289.5243	295.7298	0.2437
14.9000	1.4231	519.2946	295.7298	26418.2419	26937.5365	295.7027	0.2073
15.0000	1.3843	505.3280	295.7027	26098.6179	26603.9459	295.6770	0.1728
15.1000	1.3469	491.6074	295.6770	25795.6995	26287.3069	295.6526	0.1401
15.2000	1.3094	478.1331	295.6526	25508.1741	25986.3072	295.6294	0.1089
15.3000	1.2720	464.6587	295.6294	25234.8500	25699.5087	295.6073	0.0793
15.4000	1.2346	451.1844	295.6073	24974.4214	25425.6058	295.5862	0.0647
15.5000	1.1971	437.7100	295.5862	24725.7027	25163.4127	295.5661	0.0576
15.6000	1.1614	424.5467	295.5661	24487.6171	24912.1637	295.5467	0.0509
15.7000	1.1257	411.6944	295.5467	24259.4694	24671.1637	295.5281	0.0445
15.8000	1.0900	398.8420	295.5281	24040.6283	24439.4703	295.5103	0.0383
15.9000	1.0543	385.9897	295.5103	23830.2381	24216.2278	295.4931	0.0323
16.0000	1.0186	373.1374	295.4931	23627.5218	24000.6592	295.4765	0.0266
16.1000	0.9859	360.8136	295.4765	23431.7737	23792.5873	295.4605	0.0210
16.2000	0.9531	349.0182	295.4605	23242.8331	23591.8513	295.4450	0.0156
16.3000	0.9203	337.2228	295.4450	23060.5540	23397.7768	295.4301	0.0104
16.4000	0.8876	325.4274	295.4301	22884.3237	23209.7512	295.4156	0.0054
16.5000	0.8548	313.6320	295.4156	22713.5863	23027.2183	295.4015	0.0005
16.6000	0.8380	304.7075	295.4015	22547.8365	22852.5440	295.3881	0.0000
16.7000	0.8212	298.6539	295.3881	22389.2228	22687.8767	295.3754	0.0000
16.8000	0.8044	292.6003	295.3754	22239.6959	22532.2962	295.3634	0.0000
16.9000	0.7876	286.5467	295.3634	22098.4203	22384.9670	295.3521	0.0000
17.0000	0.7707	280.4930	295.3521	21964.6374	22245.1304	295.3413	0.0000
17.1000	0.7565	274.8958	295.3413	21837.6582	22112.5540	295.3311	0.0000
17.2000	0.7422	269.7548	295.3311	21717.2716	21987.0265	295.3214	0.0000
17.3000	0.7279	264.6139	295.3214	21603.2858	21867.8997	295.3123	0.0000
17.4000	0.7136	259.4730	295.3123	21495.1123	21754.5852	295.3035	0.0000
17.5000	0.6993	254.3321	295.3035	21392.2165	21646.5486	295.2952	0.0000
17.6000	0.6805	248.3623	295.2952	21294.1134	21542.4757	295.2872	0.0000
17.7000	0.6616	241.5636	295.2872	21199.6095	21441.1731	295.2794	0.0000
17.8000	0.6427	234.7649	295.2794	21107.6213	21342.3862	295.2718	0.0000
17.9000	0.6238	227.9662	295.2718	21017.9174	21245.8836	295.2643	0.0000
18.0000	0.6049	221.1675	295.2643	20930.2878	21151.4553	295.2571	0.0000
18.1000	0.5953	216.0319	295.2571	20844.5418	21060.5737	295.2501	0.0000
18.2000	0.5856	212.5593	295.2501	20762.0163	20974.5756	295.2435	0.0000
18.3000	0.5760	209.0868	295.2435	20683.9254	20893.0122	295.2372	0.0000
18.4000	0.5663	205.6142	295.2372	20609.8614	20815.4756	295.2312	0.0000
18.5000	0.5567	202.1417	295.2312	20539.4540	20741.5956	295.2255	0.0000
18.6000	0.5470	198.6691	295.2255	20472.3669	20671.0360	295.2201	0.0000
18.7000	0.5374	195.1965	295.2201	20408.2950	20603.4915	295.2149	0.0000
18.8000	0.5277	191.7240	295.2149	20346.9609	20538.6849	295.2099	0.0000
18.9000	0.5181	188.2514	295.2099	20288.1130	20476.3644	295.2051	0.0000
19.0000	0.5085	184.7789	295.2051	20231.5226	20416.3014	295.2005	0.0000
19.1000	0.5040	182.2445	295.2005	20176.9821	20359.2266	295.1961	0.0000
19.2000	0.4996	180.6482	295.1961	20125.1551	20305.8033	295.1919	0.0000
19.3000	0.4951	179.0520	295.1919	20076.6438	20255.6958	295.1881	0.0000
19.4000	0.4907	177.4557	295.1881	20031.1435	20208.5992	295.1845	0.0000
19.5000	0.4863	175.8595	295.1845	19988.3772	20164.2366	295.1810	0.0000
19.6000	0.4818	174.2632	295.1810	19948.0936	20122.3568	295.1778	0.0000
19.7000	0.4774	172.6669	295.1778	19910.0644	20082.7314	295.1748	0.0000
19.8000	0.4730	171.0707	295.1748	19874.0824	20045.1531	295.1719	0.0000
19.9000	0.4685	169.4744	295.1719	19839.9593	20009.4337	295.1691	0.0000
20.0000	0.4641	167.8782	295.1691	19807.5241	19975.4023	295.1665	0.0000
20.1000	0.4605	166.4374	295.1665	19776.6218	19943.0592	295.1640	0.0000
20.2000	0.4570	165.1522	295.1640	19747.2525	19912.4047	295.1616	0.0000
20.3000	0.4534	163.8670	295.1616	19719.4165	19883.2835	295.1594	0.0000
20.4000	0.4498	162.5817	295.1594	19692.9729	19855.5546	295.1573	0.0000
20.5000	0.4463	161.2965	295.1573	19667.7935	19829.0900	295.1552	0.0000
20.6000	0.4427	160.0113	295.1552	19643.7623	19803.7736	295.1533	0.0000
20.7000	0.4391	158.7261	295.1533	19620.7735	19779.4996	295.1514	0.0000
20.8000	0.4356	157.4408	295.1514	19598.7315	19756.1723	295.1496	0.0000
20.9000	0.4320	156.1556	295.1496	19577.5490	19733.7046	295.1479	0.0000
21.0000	0.4284	154.8704	295.1479	19557.1471	19712.0175	295.1462	0.0000

21.1000	0.4248	153.5851	295.1462	19537.4540	19691.0391	295.1446	0.0000
21.2000	0.4213	152.2999	295.1446	19518.4046	19670.7044	295.1430	0.0000
21.3000	0.4177	151.0147	295.1430	19499.9396	19650.9542	295.1415	0.0000
21.4000	0.4141	149.7294	295.1415	19482.0053	19631.7347	295.1400	0.0000
21.5000	0.4106	148.4442	295.1400	19464.5529	19612.9971	295.1386	0.0000
21.6000	0.4070	147.1590	295.1386	19447.5382	19594.6971	295.1372	0.0000
21.7000	0.4034	145.8737	295.1372	19430.9208	19576.7945	295.1358	0.0000
21.8000	0.3998	144.5885	295.1358	19414.6642	19559.2527	295.1345	0.0000
21.9000	0.3963	143.3033	295.1345	19398.7354	19542.0386	295.1331	0.0000
22.0000	0.3927	142.0180	295.1331	19383.1040	19525.1220	295.1318	0.0000
22.1000	0.3829	139.6082	295.1318	19367.7428	19507.3511	295.1305	0.0000
22.2000	0.3731	136.0739	295.1305	19351.6058	19487.6797	295.1289	0.0000
22.3000	0.3633	132.5395	295.1289	19333.7431	19466.2826	295.1273	0.0000
22.4000	0.3534	129.0051	295.1273	19314.3134	19443.3185	295.1255	0.0000
22.5000	0.3436	125.4707	295.1255	19293.4607	19418.9314	295.1236	0.0000
22.6000	0.3338	121.9363	295.1236	19271.3160	19393.2523	295.1217	0.0000
22.7000	0.3240	118.4019	295.1217	19247.9979	19366.3998	295.1196	0.0000
22.8000	0.3142	114.8675	295.1196	19223.6144	19338.4820	295.1174	0.0000
22.9000	0.3043	111.3332	295.1174	19198.2635	19309.5966	295.1152	0.0000
23.0000	0.2945	107.7988	295.1152	19172.0340	19279.8328	295.1129	0.0000
23.1000	0.2847	104.2644	295.1129	19145.0069	19249.2712	295.1106	0.0000
23.2000	0.2749	100.7300	295.1106	19117.2553	19217.9853	295.1082	0.0000
23.3000	0.2651	97.1956	295.1082	19088.8460	19186.0416	295.1057	0.0000
23.4000	0.2553	93.6612	295.1057	19059.8393	19153.5006	295.1032	0.0000
23.5000	0.2454	90.1268	295.1032	19030.2903	19120.4172	295.1007	0.0000
23.6000	0.2356	86.5925	295.1007	19000.2488	19086.8412	295.0981	0.0000
23.7000	0.2258	83.0581	295.0981	18969.7600	19052.8181	295.0954	0.0000
23.8000	0.2160	79.5237	295.0954	18938.8652	19018.3889	295.0928	0.0000
23.9000	0.2062	75.9893	295.0928	18907.6016	18983.5909	295.0901	0.0000
24.0000	0.1964	72.4549	295.0901	18876.0031	18948.4580	295.0874	0.0000
24.1000	0.1865	68.9205	295.0874	18844.1005	18913.0210	295.0847	0.0000
24.2000	0.1767	65.3861	295.0847	18811.9219	18877.3080	295.0819	0.0000
24.3000	0.1669	61.8518	295.0819	18779.4925	18841.3442	295.0792	0.0000
24.4000	0.1571	58.3174	295.0792	18746.8354	18805.1528	295.0764	0.0000
24.5000	0.1473	54.7830	295.0764	18713.9716	18768.7546	295.0736	0.0000
24.6000	0.1374	51.2486	295.0736	18680.9201	18732.1687	295.0708	0.0000
24.7000	0.1276	47.7142	295.0708	18647.6981	18695.4123	295.0679	0.0000
24.8000	0.1178	44.1798	295.0679	18614.3213	18658.5011	295.0651	0.0000
24.9000	0.1080	40.6454	295.0651	18580.8039	18621.4493	295.0622	0.0000
25.0000	0.0982	37.1111	295.0622	18547.1589	18584.2700	295.0594	0.0000
25.1000	0.0884	33.5767	295.0594	18513.3980	18546.9747	295.0565	0.0000
25.2000	0.0785	30.0423	295.0565	18479.5319	18509.5741	295.0536	0.0000
25.3000	0.0687	26.5079	295.0536	18445.5701	18472.0780	295.0507	0.0000
25.4000	0.0589	22.9735	295.0507	18411.5216	18434.4952	295.0478	0.0000
25.5000	0.0491	19.4391	295.0478	18377.3943	18396.8335	295.0449	0.0000
25.6000	0.0393	15.9047	295.0449	18343.1955	18359.1002	295.0420	0.0000
25.7000	0.0295	12.3704	295.0420	18308.9317	18321.3020	295.0391	0.0000
25.8000	0.0196	8.8360	295.0391	18274.6088	18283.4448	295.0362	0.0000
25.9000	0.0098	5.3016	295.0362	18240.2324	18245.5340	295.0333	0.0000
26.0000	0.0000	1.7672	295.0333	18205.8073	18207.5745	295.0304	0.0000


10-Year Storm - Routed Hydrograph
Peak Discharge 1.5133 cfs - Peak Time 12.9000 hrs
1.51
1.21
0.91
0.61
0.30
0.00
Flowrate - cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time - hrs

Storage Indication Method

Given Input Data:
File .....
Description .... 25-Year Storm
Time increment . 0.1000 hrs

Input Files:
Pre-Dev Hydrograph curve ..
Post-Dev Hydrograph curve . L:\A050030\hd\asbuilt25.hdc
Stage-Storage curve ..... L:\A050030\hd\proposedpond.ssc
Stage-Discharge curve ..... L:\A050030\hd\proposedpond.sdc

Output Data:
Routed Peak Flow ..... 1.5700 cfs
Routed Peak Time ..... 12.6000 hrs
Post-Developed Peak Flow . 20.0085 cfs
Post-Developed Peak Time . 12.3000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 ft3	H1 ft	S1-(O1/2)T ft3	S2+(O2/2)T ft3	H2 ft	Outflow cfs
11.0000	1.1555	207.9827	0.0000	0.0000	207.9827	289.2897	0.0000
11.1000	1.2595	434.7000	289.2897	207.9827	642.6827	289.4773	0.0000
11.2000	1.3636	472.1694	289.4773	642.6827	1114.8521	289.6810	0.0000
11.3000	1.4677	509.6387	289.6810	1114.8521	1624.4908	289.9009	0.0000
11.4000	1.6814	566.8432	289.9009	1624.4908	2191.3340	290.1454	0.0000
11.5000	1.8951	643.7829	290.1454	2191.3340	2835.1169	290.4232	0.0000
11.6000	2.1089	720.7226	290.4232	2835.1169	3555.8395	290.7341	0.0000
11.7000	3.0321	925.3728	290.7341	3555.8395	4481.2123	291.1334	0.0000
11.8000	3.9553	1257.7335	291.1334	4481.2123	5738.9458	291.6760	0.0000
11.9000	4.8785	1590.0942	291.6760	5738.9458	7329.0400	292.3620	0.0000
12.0000	6.9775	2134.0944	292.3620	7329.0400	9463.1343	293.2402	0.0000
12.1000	11.1547	3263.8113	293.2402	9463.1343	12726.9456	293.9236	0.0000
12.2000	17.5971	5175.3269	293.9236	12726.9456	17902.2725	295.0068	0.0000
12.3000	20.0085	6768.9952	295.0068	17894.0958	24663.0910	295.5275	0.0191
12.4000	19.2576	7067.8826	295.5275	24032.4169	31100.2995	296.0232	0.7200
12.5000	17.1495	6553.2664	296.0232	29876.9242	36430.1906	296.4337	1.4571
12.6000	13.9488	5597.6939	296.4337	34716.0694	40313.7633	296.7327	1.5700
12.7000	10.7120	4438.9522	296.7327	38242.0650	42681.0171	296.9150	1.5700
12.8000	8.1593	3396.8394	296.9150	40391.3556	43788.1951	297.0003	1.5700
12.9000	6.6559	2666.7368	297.0003	41396.5910	44063.3278	297.0215	1.5700
13.0000	5.1525	2125.5111	297.0215	41646.3911	43771.9021	296.9991	1.5700
13.1000	4.4742	1732.8005	296.9991	41381.7982	43114.5987	296.9484	1.5700
13.2000	3.7959	1488.6051	296.9484	40785.0155	42273.6206	296.8837	1.5700
13.3000	3.4581	1305.7142	296.8837	40021.4698	41327.1840	296.8108	1.5700
13.4000	3.1204	1184.1277	296.8108	39162.1757	40346.3034	296.7353	1.5700
13.5000	2.9509	1092.8374	296.7353	38271.6089	39364.4464	296.6596	1.5700
13.6000	2.7815	1031.8435	296.6596	37380.1557	38411.9992	296.5863	1.5700
13.7000	2.6683	980.9594	296.5863	36515.4045	37496.3638	296.5158	1.5700
13.8000	2.5550	940.1851	296.5158	35684.0755	36624.2606	296.4486	1.4826
13.9000	2.4658	903.7518	296.4486	34892.2705	35796.0223	296.3848	1.3730
14.0000	2.3767	871.6597	296.3848	34140.2917	35011.9514	296.3245	1.2662
14.1000	2.2839	838.9111	296.3245	33428.4135	34267.3246	296.2671	1.1633
14.2000	2.1911	805.5061	296.2671	32752.3477	33557.8538	296.2125	1.0642
14.3000	2.0983	772.1011	296.2125	32108.2009	32880.3021	296.1603	0.9691
14.4000	2.0397	744.8426	296.1603	31493.0343	32237.8768	296.1108	0.8787
14.5000	1.9810	723.7305	296.1108	30909.7599	31633.4903	296.0643	0.7943
14.6000	1.9224	702.6184	296.0643	30361.0218	31063.6402	296.0204	0.7149

14.7000	1.8740	683.3456	296.0204	29843.6402	30526.9858	295.9791	0.6413
14.8000	1.8255	665.9123	295.9791	29356.3979	30022.3102	295.9402	0.5732
14.9000	1.7771	648.4790	295.9402	28898.1899	29546.6689	295.9036	0.5090
15.0000	1.7287	631.0457	295.9036	28466.3430	29097.3886	295.8690	0.4516
15.1000	1.6819	613.9121	295.8690	28058.4298	28672.3419	295.8362	0.3977
15.2000	1.6352	597.0783	295.8362	27672.5190	28269.5973	295.8052	0.3466
15.3000	1.5884	580.2446	295.8052	27306.8568	27887.1014	295.7758	0.3021
15.4000	1.5416	563.4108	295.7758	26959.5789	27522.9897	295.7477	0.2607
15.5000	1.4949	546.5770	295.7477	26628.9925	27175.5695	295.7210	0.2212
15.6000	1.4503	530.1371	295.7210	26313.5608	26843.6979	295.6954	0.1846
15.7000	1.4057	514.0910	295.6954	26012.2460	26526.3370	295.6710	0.1551
15.8000	1.3612	498.0449	295.6710	25724.1059	26222.1509	295.6476	0.1268
15.9000	1.3166	481.9989	295.6476	25447.9275	25929.9263	295.6250	0.0997
16.0000	1.2720	465.9528	295.6250	25182.6093	25648.5621	295.6034	0.0735
16.1000	1.2311	450.5626	295.6034	24927.1515	25377.7140	295.5825	0.0573
16.2000	1.1902	435.8282	295.5825	24681.2415	25117.0697	295.5624	0.0434
16.3000	1.1492	421.0939	295.5624	24444.5959	24865.6897	295.5431	0.0299
16.4000	1.1083	406.3595	295.5431	24216.3615	24622.7210	295.5244	0.0169
16.5000	1.0674	391.6252	295.5244	23995.7640	24387.3891	295.5063	0.0043
16.6000	1.0464	380.4777	295.5063	23782.1001	24162.5778	295.4889	0.0000
16.7000	1.0254	372.9171	295.4889	23577.9881	23950.9052	295.4726	0.0000
16.8000	1.0044	365.3566	295.4726	23385.8051	23751.1617	295.4573	0.0000
16.9000	0.9834	357.7960	295.4573	23204.4528	23562.2488	295.4427	0.0000
17.0000	0.9624	350.2354	295.4427	23032.9340	23383.1694	295.4289	0.0000
17.1000	0.9445	343.2459	295.4289	22870.3431	23213.5891	295.4159	0.0000
17.2000	0.9267	336.8275	295.4159	22716.3768	23053.2043	295.4035	0.0000
17.3000	0.9089	330.4091	295.4035	22570.7594	22901.1684	295.3918	0.0000
17.4000	0.8911	323.9906	295.3918	22432.7221	22756.7127	295.3807	0.0000
17.5000	0.8732	317.5722	295.3807	22301.5670	22619.1392	295.3701	0.0000
17.6000	0.8497	310.1202	295.3701	22176.6605	22486.7807	295.3599	0.0000
17.7000	0.8261	301.6347	295.3599	22056.4888	22358.1235	295.3500	0.0000
17.8000	0.8025	293.1492	295.3500	21939.6776	22232.8268	295.3403	0.0000
17.9000	0.7789	284.6637	295.3403	21825.9175	22110.5812	295.3309	0.0000
18.0000	0.7554	276.1782	295.3309	21714.9276	21991.1058	295.3217	0.0000
18.1000	0.7433	269.7678	295.3217	21606.4528	21876.2206	295.3129	0.0000
18.2000	0.7313	265.4326	295.3129	21502.1455	21767.5782	295.3045	0.0000
18.3000	0.7192	261.0975	295.3045	21403.5063	21664.6038	295.2966	0.0000
18.4000	0.7072	256.7623	295.2966	21310.0132	21566.7755	295.2890	0.0000
18.5000	0.6952	252.4271	295.2890	21221.1924	21473.6195	295.2819	0.0000
18.6000	0.6831	248.0919	295.2819	21136.6136	21384.7055	295.2750	0.0000
18.7000	0.6711	243.7567	295.2750	21055.8864	21299.6431	295.2685	0.0000
18.8000	0.6590	239.4215	295.2685	20978.6560	21218.0776	295.2622	0.0000
18.9000	0.6470	235.0864	295.2622	20904.6006	21139.6869	295.2562	0.0000
19.0000	0.6350	230.7512	295.2562	20833.4277	21064.1789	295.2503	0.0000
19.1000	0.6294	227.5844	295.2503	20764.8720	20992.4564	295.2448	0.0000
19.2000	0.6239	225.5859	295.2448	20699.7533	20925.3392	295.2396	0.0000
19.3000	0.6183	223.5875	295.2396	20638.8159	20862.4033	295.2348	0.0000
19.4000	0.6127	221.5890	295.2348	20581.6748	20803.2638	295.2302	0.0000
19.5000	0.6072	219.5906	295.2302	20527.9805	20747.5710	295.2260	0.0000
19.6000	0.6016	217.5921	295.2260	20477.4156	20695.0077	295.2219	0.0000
19.7000	0.5961	215.5937	295.2219	20429.6920	20645.2856	295.2181	0.0000
19.8000	0.5905	213.5952	295.2181	20384.5480	20598.1432	295.2144	0.0000
19.9000	0.5850	211.5967	295.2144	20341.7462	20553.3430	295.2110	0.0000
20.0000	0.5794	209.5983	295.2110	20301.0709	20510.6692	295.2077	0.0000
20.1000	0.5750	207.7968	295.2077	20262.3264	20470.1231	295.2046	0.0000
20.2000	0.5705	206.1922	295.2046	20225.5135	20431.7056	295.2016	0.0000
20.3000	0.5661	204.5875	295.2016	20190.6333	20395.2208	295.1988	0.0000
20.4000	0.5616	202.9829	295.1988	20157.5078	20360.4907	295.1961	0.0000
20.5000	0.5572	201.3783	295.1961	20125.9754	20327.3537	295.1936	0.0000
20.6000	0.5527	199.7737	295.1936	20095.8895	20295.6632	295.1912	0.0000
20.7000	0.5482	198.1691	295.1912	20067.1168	20265.2860	295.1888	0.0000
20.8000	0.5438	196.5645	295.1888	20039.5366	20236.1011	295.1866	0.0000
20.9000	0.5393	194.9599	295.1866	20013.0388	20207.9987	295.1844	0.0000
21.0000	0.5349	193.3553	295.1844	19987.5240	20180.8793	295.1823	0.0000

21.1000	0.5304	191.7507	295.1823	19962.9016	20154.6523	295.1803	0.0000
21.2000	0.5260	190.1461	295.1803	19939.0894	20129.2355	295.1783	0.0000
21.3000	0.5215	188.5415	295.1783	19916.0128	20104.5543	295.1764	0.0000
21.4000	0.5170	186.9369	295.1764	19893.6041	20080.5410	295.1746	0.0000
21.5000	0.5126	185.3323	295.1746	19871.8018	20057.1341	295.1728	0.0000
21.6000	0.5081	183.7276	295.1728	19850.5501	20034.2778	295.1710	0.0000
21.7000	0.5037	182.1230	295.1710	19829.7983	20011.9213	295.1693	0.0000
21.8000	0.4992	180.5184	295.1693	19809.5003	19990.0187	295.1676	0.0000
21.9000	0.4948	178.9138	295.1676	19789.6143	19968.5281	295.1660	0.0000
22.0000	0.4903	177.3092	295.1660	19770.1025	19947.4117	295.1643	0.0000
22.1000	0.4780	174.3006	295.1643	19750.9303	19925.2309	295.1626	0.0000
22.2000	0.4658	169.8879	295.1626	19730.7918	19900.6797	295.1607	0.0000
22.3000	0.4535	165.4752	295.1607	19708.5012	19873.9764	295.1587	0.0000
22.4000	0.4413	161.0626	295.1587	19684.2565	19845.3191	295.1565	0.0000
22.5000	0.4290	156.6499	295.1565	19658.2378	19814.8877	295.1541	0.0000
22.6000	0.4168	152.2372	295.1541	19630.6084	19782.8456	295.1517	0.0000
22.7000	0.4045	147.8245	295.1517	19601.5166	19749.3411	295.1491	0.0000
22.8000	0.3922	143.4119	295.1491	19571.0969	19714.5088	295.1464	0.0000
22.9000	0.3800	138.9992	295.1464	19539.4718	19678.4710	295.1436	0.0000
23.0000	0.3677	134.5865	295.1436	19506.7521	19641.3387	295.1408	0.0000
23.1000	0.3555	130.1738	295.1408	19473.0387	19603.2126	295.1378	0.0000
23.2000	0.3432	125.7612	295.1378	19438.4231	19564.1843	295.1348	0.0000
23.3000	0.3310	121.3485	295.1348	19402.9883	19524.3368	295.1318	0.0000
23.4000	0.3187	116.9358	295.1318	19366.8098	19483.7456	295.1286	0.0000
23.5000	0.3064	112.5232	295.1286	19329.9559	19442.4791	295.1254	0.0000
23.6000	0.2942	108.1105	295.1254	19292.4890	19400.5995	295.1222	0.0000
23.7000	0.2819	103.6978	295.1222	19254.4655	19358.1633	295.1190	0.0000
23.8000	0.2697	99.2851	295.1190	19215.9365	19315.2217	295.1156	0.0000
23.9000	0.2574	94.8725	295.1156	19176.9488	19271.8212	295.1123	0.0000
24.0000	0.2451	90.4598	295.1123	19137.5444	19228.0041	295.1089	0.0000
24.1000	0.2329	86.0471	295.1089	19097.7617	19183.8088	295.1055	0.0000
24.2000	0.2206	81.6344	295.1055	19057.6356	19139.2701	295.1021	0.0000
24.3000	0.2084	77.2218	295.1021	19017.1978	19094.4195	295.0986	0.0000
24.4000	0.1961	72.8091	295.0986	18976.4768	19049.2859	295.0952	0.0000
24.5000	0.1839	68.3964	295.0952	18935.4988	19003.8953	295.0917	0.0000
24.6000	0.1716	63.9838	295.0917	18894.2875	18958.2712	295.0882	0.0000
24.7000	0.1593	59.5711	295.0882	18852.8643	18912.4353	295.0846	0.0000
24.8000	0.1471	55.1584	295.0846	18811.2487	18866.4071	295.0811	0.0000
24.9000	0.1348	50.7457	295.0811	18769.4584	18820.2042	295.0775	0.0000
25.0000	0.1226	46.3331	295.0775	18727.5096	18773.8427	295.0740	0.0000
25.1000	0.1103	41.9204	295.0740	18685.4168	18727.3372	295.0704	0.0000
25.2000	0.0981	37.5077	295.0704	18643.1933	18680.7010	295.0668	0.0000
25.3000	0.0858	33.0950	295.0668	18600.8511	18633.9462	295.0632	0.0000
25.4000	0.0735	28.6824	295.0632	18558.4012	18587.0836	295.0596	0.0000
25.5000	0.0613	24.2697	295.0596	18515.8534	18540.1231	295.0560	0.0000
25.6000	0.0490	19.8570	295.0560	18473.2168	18493.0739	295.0523	0.0000
25.7000	0.0368	15.4444	295.0523	18430.4996	18445.9440	295.0487	0.0000
25.8000	0.0245	11.0317	295.0487	18387.7091	18398.7408	295.0451	0.0000
25.9000	0.0123	6.6190	295.0451	18344.8522	18351.4712	295.0414	0.0000
26.0000	0.0000	2.2063	295.0414	18301.9349	18304.1412	295.0378	0.0000

Storage Indication Method

Given Input Data:
File ..... L:\A050030\hd\100.sim
Description .... 100 - YEAR
Time increment . 0.1000 hrs

Input Files:
Pre-Dev Hydrograph curve ..
Post-Dev Hydrograph curve . L:\A050030\hd\asbuilt100.hdc
Stage-Storage curve ..... L:\A050030\hd\proposedpond.ssc
Stage-Discharge curve ..... L:\A050030\hd\proposedpond.sdc

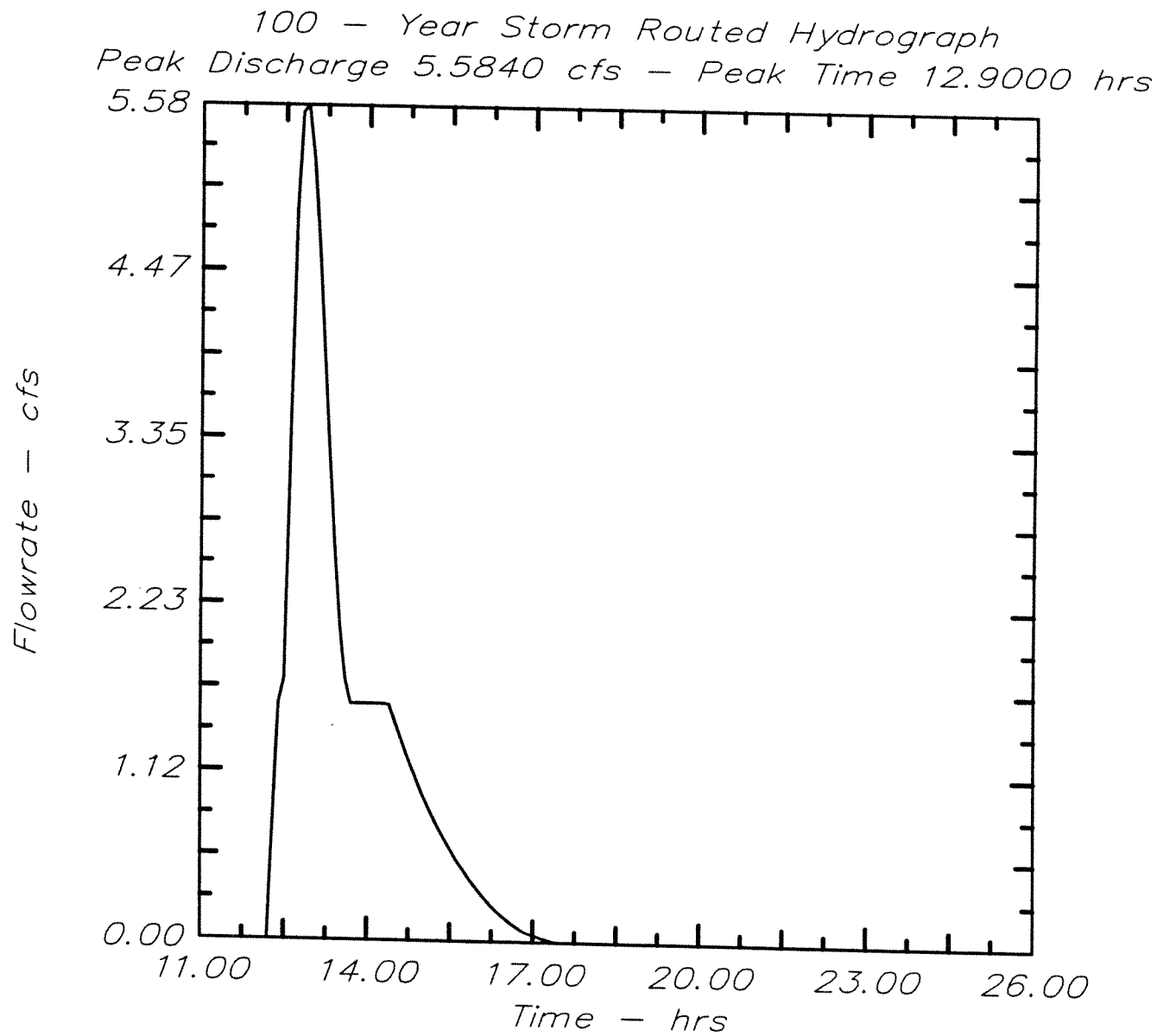
Output Data:
Routed Peak Flow ..... 5.5840 cfs
Routed Peak Time ..... 12.9000 hrs
Post-Developed Peak Flow . 25.9990 cfs
Post-Developed Peak Time . 12.3000 hrs

Support Calculations:

Time hrs	Inflow cfs	(I1+I2)/2 ft3	H1 ft	S1-(O1/2)T ft3	S2+(O2/2)T ft3	H2 ft	Outflow cfs
11.0000	1.5033	270.5996	0.0000	0.0000	270.5996	289.3167	0.0000
11.1000	1.6388	565.5786	289.3167	270.5996	836.1782	289.5608	0.0000
11.2000	1.7742	614.3373	289.5608	836.1782	1450.5155	289.8258	0.0000
11.3000	1.9097	663.0960	289.8258	1450.5155	2113.6115	290.1119	0.0000
11.4000	2.1875	737.4905	290.1119	2113.6115	2851.1020	290.4301	0.0000
11.5000	2.4654	837.5207	290.4301	2851.1020	3688.6227	290.7914	0.0000
11.6000	2.7432	937.5510	290.7914	3688.6227	4626.1738	291.1959	0.0000
11.7000	3.9429	1203.5075	291.1959	4626.1738	5829.6813	291.7151	0.0000
11.8000	5.1426	1635.3903	291.7151	5829.6813	7465.0716	292.4207	0.0000
11.9000	6.3423	2067.2730	292.4207	7465.0716	9532.3446	293.2546	0.0000
12.0000	9.0694	2774.0992	293.2546	9532.3446	12306.4438	293.8355	0.0000
12.1000	14.5016	4242.7757	293.8355	12306.4438	16549.2195	294.8059	0.0000
12.2000	22.8682	6726.5628	294.8059	16549.2195	23275.7823	295.4207	0.0000
12.3000	25.9990	8796.0959	295.4207	22772.8437	31568.9396	296.0593	0.7853
12.4000	25.0505	9188.9094	296.0593	30302.4145	39491.3239	296.6694	1.5700
12.5000	22.3331	8529.0442	296.6694	37495.3511	46024.3953	297.1725	1.7242
12.6000	18.1789	7292.1611	297.1725	43426.8947	50719.0558	297.5341	3.4336
12.7000	13.9673	5786.3226	297.5341	47689.2977	53475.6204	297.7463	4.8727
12.8000	10.6432	4429.8909	297.7463	50192.0536	54621.9445	297.8346	5.5311
12.9000	8.6810	3478.3625	297.8346	51232.8308	54711.1934	297.8415	5.5840
13.0000	6.7188	2771.9768	297.8415	51313.8622	54085.8390	297.7933	5.2160
13.1000	5.8327	2259.2812	297.7933	50746.0868	53005.3680	297.7101	4.6082
13.2000	4.9466	1940.2758	297.7101	49765.0994	51705.3753	297.6100	3.9181
13.3000	4.5056	1701.3978	297.6100	48584.8026	50286.2004	297.5007	3.2233
13.4000	4.0646	1542.6471	297.5007	47296.2972	48838.9442	297.3893	2.6000
13.5000	3.8433	1423.4247	297.3893	45982.2961	47405.7208	297.2789	2.0846
13.6000	3.6219	1343.7306	297.2789	44681.0356	46024.7663	297.1725	1.7243
13.7000	3.4742	1277.2982	297.1725	43427.2315	44704.5297	297.0709	1.5700
13.8000	3.3265	1224.1273	297.0709	42228.5547	43452.6820	296.9745	1.5700
13.9000	3.2105	1176.6558	296.9745	41091.9700	42268.6258	296.8833	1.5700
14.0000	3.0944	1134.8837	296.8833	40016.9350	41151.8187	296.7973	1.5700
14.1000	2.9736	1092.2450	296.7973	39002.9570	40095.2020	296.7159	1.5700
14.2000	2.8527	1048.7397	296.7159	38043.6276	39092.3673	296.6387	1.5700
14.3000	2.7319	1005.2345	296.6387	37133.1281	38138.3626	296.5652	1.5700
14.4000	2.6555	969.7305	296.5652	36266.9627	37236.6932	296.4958	1.5628
14.5000	2.5791	942.2280	296.4958	35448.3139	36390.5419	296.4306	1.4519
14.6000	2.5027	914.7254	296.4306	34680.0713	35594.7968	296.3693	1.3456

14.7000	2.4397	889.6313	296.3693	33957.5938	34847.2251	296.3118	1.2437
14.8000	2.3767	866.9455	296.3118	33278.8543	34145.7999	296.2578	1.1463
14.9000	2.3137	844.2598	296.2578	32642.0123	33486.2720	296.2070	1.0543
15.0000	2.2506	821.5740	296.2070	32043.2100	32864.7840	296.1591	0.9669
15.1000	2.1897	799.2681	296.1591	31478.9450	32278.2132	296.1139	0.8844
15.2000	2.1288	777.3422	296.1139	30946.3822	31723.7244	296.0712	0.8069
15.3000	2.0679	755.4162	296.0712	30442.9477	31198.3639	296.0308	0.7336
15.4000	2.0070	733.4903	296.0308	29965.9593	30699.4496	295.9923	0.6646
15.5000	1.9461	711.5643	295.9923	29512.9822	30224.5465	295.9558	0.6005
15.6000	1.8881	690.1583	295.9558	29081.8055	29771.9638	295.9209	0.5394
15.7000	1.8301	669.2723	295.9209	28670.8939	29340.1662	295.8877	0.4824
15.8000	1.7721	648.3862	295.8877	28278.8538	28927.2401	295.8559	0.4300
15.9000	1.7140	627.5002	295.8559	27903.9476	28531.4477	295.8254	0.3798
16.0000	1.6560	606.6141	295.8254	27544.5975	28151.2117	295.7961	0.3322
16.1000	1.6027	586.5769	295.7961	27199.3714	27785.9483	295.7680	0.2906
16.2000	1.5494	567.3883	295.7680	26867.7394	27435.1277	295.7410	0.2507
16.3000	1.4961	548.1998	295.7410	26549.2204	27097.4202	295.7150	0.2123
16.4000	1.4428	529.0113	295.7150	26242.6070	26771.6183	295.6899	0.1779
16.5000	1.3895	509.8228	295.6899	25946.8031	26456.6258	295.6656	0.1486
16.6000	1.3622	495.3062	295.6656	25660.8133	26156.1195	295.6425	0.1207
16.7000	1.3348	485.4615	295.6425	25387.9759	25873.4375	295.6207	0.0944
16.8000	1.3075	475.6169	295.6207	25131.3216	25606.9385	295.6002	0.0696
16.9000	1.2801	465.7723	295.6002	24889.3604	25355.1326	295.5808	0.0561
17.0000	1.2528	455.9277	295.5808	24660.7393	25116.6670	295.5624	0.0433
17.1000	1.2296	446.8281	295.5624	24444.2302	24891.0584	295.5450	0.0313
17.2000	1.2064	438.4737	295.5450	24239.3943	24677.8681	295.5286	0.0199
17.3000	1.1832	430.1193	295.5286	24045.8334	24475.9527	295.5131	0.0091
17.4000	1.1600	421.7649	295.5131	23862.5092	24284.2741	295.4983	0.0000
17.5000	1.1368	413.4105	295.4983	23688.4793	24101.8898	295.4843	0.0000
17.6000	1.1061	403.7126	295.4843	23522.8879	23926.6004	295.4708	0.0000
17.7000	1.0754	392.6711	295.4708	23363.7382	23756.4093	295.4577	0.0000
17.8000	1.0447	381.6297	295.4577	23209.2173	23590.8470	295.4449	0.0000
17.9000	1.0141	370.5883	295.4449	23058.8990	23429.4873	295.4325	0.0000
18.0000	0.9834	359.5469	295.4325	22912.3964	23271.9433	295.4204	0.0000
18.1000	0.9677	351.2051	295.4204	22769.3581	23120.5632	295.4087	0.0000
18.2000	0.9521	345.5629	295.4087	22631.9162	22977.4791	295.3977	0.0000
18.3000	0.9364	339.9207	295.3977	22502.0065	22841.9272	295.3872	0.0000
18.4000	0.9207	334.2785	295.3872	22378.9354	22713.2139	295.3773	0.0000
18.5000	0.9050	328.6363	295.3773	22262.0733	22590.7096	295.3679	0.0000
18.6000	0.8894	322.9941	295.3679	22150.8485	22473.8426	295.3589	0.0000
18.7000	0.8737	317.3519	295.3589	22044.7420	22362.0939	295.3503	0.0000
18.8000	0.8580	311.7097	295.3503	21943.2824	22254.9921	295.3420	0.0000
18.9000	0.8424	306.0675	295.3420	21846.0419	22152.1094	295.3341	0.0000
19.0000	0.8267	300.4253	295.3341	21752.6321	22053.0574	295.3265	0.0000
19.1000	0.8194	296.2999	295.3265	21662.7002	21959.0001	295.3192	0.0000
19.2000	0.8122	293.6913	295.3192	21577.3032	21870.9946	295.3125	0.0000
19.3000	0.8049	291.0828	295.3125	21497.4007	21788.4835	295.3061	0.0000
19.4000	0.7977	288.4742	295.3061	21422.4868	21710.9610	295.3001	0.0000
19.5000	0.7904	285.8656	295.3001	21352.1021	21637.9678	295.2945	0.0000
19.6000	0.7832	283.2571	295.2945	21285.8297	21569.0868	295.2892	0.0000
19.7000	0.7760	280.6485	295.2892	21223.2909	21503.9394	295.2842	0.0000
19.8000	0.7687	278.0400	295.2842	21164.1419	21442.1818	295.2794	0.0000
19.9000	0.7615	275.4314	295.2794	21108.0706	21383.5020	295.2749	0.0000
20.0000	0.7542	272.8228	295.2749	21054.7937	21327.6165	295.2706	0.0000
20.1000	0.7484	270.4742	295.2706	21004.0538	21274.5280	295.2665	0.0000
20.2000	0.7426	268.3856	295.2665	20955.8534	21224.2390	295.2627	0.0000
20.3000	0.7368	266.2970	295.2627	20910.1947	21176.4918	295.2590	0.0000
20.4000	0.7310	264.2084	295.2590	20866.8438	21131.0522	295.2555	0.0000
20.5000	0.7252	262.1198	295.2555	20825.5880	21087.7078	295.2521	0.0000
20.6000	0.7194	260.0312	295.2521	20786.2345	21046.2658	295.2490	0.0000
20.7000	0.7136	257.9426	295.2490	20748.6082	21006.5508	295.2459	0.0000
20.8000	0.7078	255.8540	295.2459	20712.5500	20968.4040	295.2430	0.0000
20.9000	0.7020	253.7654	295.2430	20677.9156	20931.6810	295.2401	0.0000
21.0000	0.6962	251.6768	295.2401	20644.5737	20896.2505	295.2374	0.0000

21.1000	0.6904	249.5882	295.2374	20612.4055	20861.9937	295.2348	0.0000
21.2000	0.6846	247.4996	295.2348	20581.3029	20828.8025	295.2322	0.0000
21.3000	0.6788	245.4110	295.2322	20551.1677	20796.5787	295.2297	0.0000
21.4000	0.6730	243.3224	295.2297	20521.9109	20765.2333	295.2273	0.0000
21.5000	0.6672	241.2338	295.2273	20493.4516	20734.6854	295.2250	0.0000
21.6000	0.6614	239.1452	295.2250	20465.7164	20704.8616	295.2227	0.0000
21.7000	0.6556	237.0566	295.2227	20438.6386	20675.6952	295.2204	0.0000
21.8000	0.6498	234.9680	295.2204	20412.1576	20647.1256	295.2182	0.0000
21.9000	0.6440	232.8794	295.2182	20386.2186	20619.0980	295.2161	0.0000
22.0000	0.6382	230.7908	295.2161	20360.7716	20591.5624	295.2139	0.0000
22.1000	0.6222	226.8746	295.2139	20335.7713	20562.6459	295.2117	0.0000
22.2000	0.6063	221.1310	295.2117	20309.5173	20530.6483	295.2092	0.0000
22.3000	0.5903	215.3873	295.2092	20280.4659	20495.8532	295.2066	0.0000
22.4000	0.5744	209.6437	295.2066	20248.8745	20458.5181	295.2037	0.0000
22.5000	0.5584	203.9000	295.2037	20214.9770	20418.8770	295.2006	0.0000
22.6000	0.5425	198.1563	295.2006	20178.9858	20377.1421	295.1974	0.0000
22.7000	0.5265	192.4127	295.1974	20141.0937	20333.5063	295.1941	0.0000
22.8000	0.5105	186.6690	295.1941	20101.4756	20288.1446	295.1906	0.0000
22.9000	0.4946	180.9253	295.1906	20060.2905	20241.2158	295.1870	0.0000
23.0000	0.4786	175.1817	295.1870	20017.6827	20192.8644	295.1832	0.0000
23.1000	0.4627	169.4380	295.1832	19973.7831	20143.2211	295.1794	0.0000
23.2000	0.4467	163.6944	295.1794	19928.7108	20092.4051	295.1755	0.0000
23.3000	0.4308	157.9507	295.1755	19882.5736	20040.5243	295.1715	0.0000
23.4000	0.4148	152.2070	295.1715	19835.4697	19987.6767	295.1674	0.0000
23.5000	0.3989	146.4634	295.1674	19787.4880	19933.9513	295.1633	0.0000
23.6000	0.3829	140.7197	295.1633	19738.7093	19879.4290	295.1591	0.0000
23.7000	0.3670	134.9760	295.1591	19689.2071	19824.1832	295.1548	0.0000
23.8000	0.3510	129.2324	295.1548	19639.0480	19768.2804	295.1505	0.0000
23.9000	0.3350	123.4887	295.1505	19588.2924	19711.7811	295.1462	0.0000
24.0000	0.3191	117.7451	295.1462	19536.9953	19654.7403	295.1418	0.0000
24.1000	0.3031	112.0014	295.1418	19485.2065	19597.2079	295.1374	0.0000
24.2000	0.2872	106.2577	295.1374	19432.9713	19539.2290	295.1329	0.0000
24.3000	0.2712	100.5141	295.1329	19380.3308	19480.8449	295.1284	0.0000
24.4000	0.2553	94.7704	295.1284	19327.3223	19422.0927	295.1239	0.0000
24.5000	0.2393	89.0268	295.1239	19273.9797	19363.0065	295.1193	0.0000
24.6000	0.2234	83.2831	295.1193	19220.3338	19303.6169	295.1148	0.0000
24.7000	0.2074	77.5394	295.1148	19166.4125	19243.9519	295.1102	0.0000
24.8000	0.1915	71.7958	295.1102	19112.2411	19184.0369	295.1055	0.0000
24.9000	0.1755	66.0521	295.1055	19057.8427	19123.8948	295.1009	0.0000
25.0000	0.1595	60.3084	295.1009	19003.2381	19063.5466	295.0963	0.0000
25.1000	0.1436	54.5648	295.0963	18948.4465	19003.0113	295.0916	0.0000
25.2000	0.1276	48.8211	295.0916	18893.4849	18942.3060	295.0869	0.0000
25.3000	0.1117	43.0775	295.0869	18838.3690	18881.4465	295.0822	0.0000
25.4000	0.0957	37.3338	295.0822	18783.1131	18820.4469	295.0775	0.0000
25.5000	0.0798	31.5901	295.0775	18727.7300	18759.3201	295.0728	0.0000
25.6000	0.0638	25.8465	295.0728	18672.2314	18698.0779	295.0681	0.0000
25.7000	0.0479	20.1028	295.0681	18616.6280	18636.7309	295.0634	0.0000
25.8000	0.0319	14.3592	295.0634	18560.9295	18575.2886	295.0587	0.0000
25.9000	0.0160	8.6155	295.0587	18505.1445	18513.7600	295.0539	0.0000
26.0000	0.0000	2.8718	295.0539	18449.2811	18452.1529	295.0492	0.0000


100 – Year Storm Routed Hydrograph
Peak Discharge 5.5840 cfs – Peak Time 12.9000 hrs
5.58
4.47
3.35
2.23
1.12
0.00
Flowrate – cfs
11.00
14.00
17.00
20.00
23.00
26.00
Time – hrs