

**REVISED
DRAINAGE PLAN
AND
SUPPORTING CALCULATIONS**

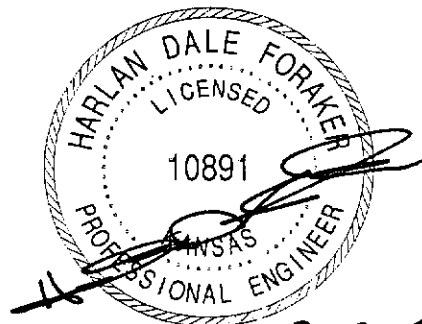
**FOR
NGUYEN ADDITION
WICHITA, KANSAS**

**PREPARED FOR:
MR. TOM NGUYEN.
4930 HARBORSIDE DRIVE
WICHITA, KS 67501**

SEPTEMBER 11, 2007

PREPARED BY:

**CERTIFIED ENGINEERING DESIGN, P.A.
810 WEST DOUGLAS, SUITE C
WICHITA, KANSAS 67203-6105
(316)262-8808 PHONE
(316)262-1669 FAX**



9.12.07



**Public Works, Engineering Division
Final Drainage Plan Submittal Checklist**

Reviewer: _____ Date: 6-11-07
 Subdivision Name: NGUYEN ADDITION Location: 9801 EAST HARRY
 Total Land Area Of Ownership: 2.43 Acres
 Type: _____ Residential Commercial _____ Industrial _____ Recreation _____ Municipal _____ Other _____
 Applicant: TOM NGUYEN Contact: _____ Phone #: _____
 Engineer: CERTIFIED ENG. DESIGN. P.A. Contact: HARLAN FORAKER Phone #: 316-262-8808

Please check the appropriate box:

I = Included; NA = Non-Applicable; R= Required prior to development
 (If "NA" is checked, an explanation must be entered)

Tab 1. Project Narrative	Applicant			Engr	
	I	NA	Explanation / Location in Plan	I	NA
A. Site Location Map, using USGS Map				<input checked="" type="checkbox"/>	
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain				<input checked="" type="checkbox"/>	
C. Discussion of offsite conditions				<input checked="" type="checkbox"/>	
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series				<input checked="" type="checkbox"/>	
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design				<input checked="" type="checkbox"/>	
F. Copy of the plat				<input checked="" type="checkbox"/>	
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)				<input checked="" type="checkbox"/>	
H. Professional Engineer seal, signature and date on cover of report				<input checked="" type="checkbox"/>	
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover				<input checked="" type="checkbox"/>	

Tab 2. Existing Conditions Runoff Calculations	Applicant			Engr	
	I	NA	Explanation / Location in Plan	I	NA
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)					
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)				<input checked="" type="checkbox"/>	
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)				<input checked="" type="checkbox"/>	
D. Total Site Area and Total Impervious Area (acres)				<input checked="" type="checkbox"/>	
E. Benchmarks used for site control				<input checked="" type="checkbox"/>	
F. Streams, creeks, and waterway labeled			<u>NO STREAMS ON-SITE.</u>		<input checked="" type="checkbox"/>
G. Predominant soils from USDA soil surveys, and/or on site soil borings				<input checked="" type="checkbox"/>	
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted			<u>NO WETLANDS, LAKES, PONDS PRESENT</u>		<input checked="" type="checkbox"/>
I. Location of existing roads, buildings, parking lots and other impervious areas.				<input checked="" type="checkbox"/>	



J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements				✓	
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow				✓	
L. Flow paths				✓	
M. Location and dimensions of existing channels, bridges or culvert crossings				✓	
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration				✓	
O. Assumed pre-developed runoff curve numbers				✓	
P. Existing time of concentrations used in calculations				✓	
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site					
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)				✓	
S. Cross-section data for open channels					✓
T. Ground water elevations, if applicable					✓

Tab 3. Post-Development Hydrologic Analysis	Applicant			Engr	
	I	NA	Explanation / Location in Plan	I	NA
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)				✓	
B. Proposed time of concentrations used in calculations				✓	
C. Assumed post-developed runoff curve numbers				✓	
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)			TO BE INCLUDED IN SITE GRADING DESIGN		✓
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration			15' SW'S OUTLET CONTROLS DISCHARGE	✓	
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities			TO BE INCLUDED IN SITE GRADING DESIGN		✓
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary				✓	
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)			TO BE INCLUDED IN SITE GRADING DESIGN		✓
I. Design water surface elevations and normal pool elevation for ponds.					✓
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.				✓	
K. Proposed limits of clearing and grading				✓	
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.				✓	
M. Location of existing and proposed utilities (e.g., water, sewer) and easements			WATER AND SEWER ARE EXISTING		✓
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow				✓	
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings			NO CHANNELS OR BRIDGES		✓



P. Preliminary selection and location of stormwater controls					
Q. Emergency overflow structure's flow path					
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)					
S. The 100-year 24-hour HWL delineated on the plan for detention pond					
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds					
U. Stormwater Management Facilities located within a Reserve					
V. Maintenance responsibility of stormwater management facility shall be specified in the plat text (e.g. HOA, Lot Owners Association, or lot)					
W. Off-site drainage easements or agreements required, where necessary					

Tab 4. Floodplain Submittal	Applicant			Engr	
	I	NA	Explanation / Location in Plan	I	NA
A. Provide source of flood profile					✓
B. Nearest base flood elevations					✓
C. Delineation of pre-developed regulatory floodplain/floodway limits					✓
D. Delineation of post-developed regulatory floodplain and floodway limits					✓
E. Floodplain boundary determination per elevation (project limits shown)					✓
F. Provide source of floodway data table and discharges					✓
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits					✓
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions					✓
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)					✓
J. Flood plains and floodways located within a Reserve, where necessary					✓

Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	Applicant			Engr	
	I/R	NA	Explanation / Location in Plan	I/R	NA
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)					✓
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)					✓
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.					✓
D. Kansas Department of Transportation					✓
E. Sedgwick County Right-of-way Permit					✓

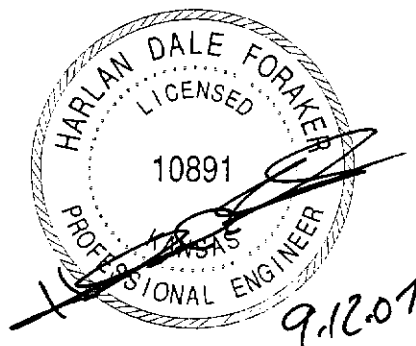
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Nguyen Addition Drainage Plan(Con't)
Ms. Vicki Huang, P.E.
September 11, 2007

CERTIFIED ENGINEERING DESIGN, P.A
810 West Douglas, Suite C
Wichita, KS 67203-6105
(316)262-8808 Office
(316)262-1669 Fax

LETTER OF TRANSMITTAL

DATE: September 11, 2007

TO: Ms. Vicky Huang, P.E.
Engineering Division
455 North Main
Wichita, KS 67202

RE: Revised Drainage Plan
Nguyen Addition
Wichita, KS

FROM: Harlan D. Foraker, P.E.

I. PROJECT NARRATIVE

The site is located east of Webb Road on the south side of Harry Street at an address of 9801 East Harry Street and is currently undeveloped with native grass cover, some trees and the original farmhouse and a few outbuildings on the property. The predominant SCS soil type present within Nguyen Addition is Rosehill Silty Clay which is a SCS Type D Soil.

II. EXISTING CONDITIONS RUNOFF CALCULATIONS

The rational method will be used to determine the peak discharges from the subareas of the study area. Rational 'C' Factors were assigned to the existing site and proposed improvements from "Interim Drainage and Storm Sewer Policy for Design Criteria and Documentation" for the City of Wichita, Kansas.

The rainfall intensity tables for the Sedgwick County, Kansas which were obtained from the Kansas Department of Transportation were utilized to determine the rainfall intensity for the 5 and 100 year design storms.

The Soil Conservation Service TR-55 manual was used to compute the Time of Concentration for the drainage subareas. A design assumptions was made as follows that the minimum subarea time of concentration is 15 minutes

Nguyen Addition Drainage Plan(Con't)

Ms. Vicki Huang, P.E.

September 11, 2007

Soil types were determined from the SCS Soil Survey for Sedgwick County, Kansas.

The developed drainage subareas have been delineated on the 1" = 40' site and topographic mapping survey performed for this site.

Design Storm Events Evaluated: 2, 5, 10, 25, 50 and 100 yr. storm events

The runoff calculations for the street, drainage channel design, drainage pipe design and detention pond storage have been completed utilizing the 5 year storm. A check of the drainage system has been made using the 100 year storm event.

The following tables summarize the peak discharges for existing conditions for the offsite drainage subbasin of 2.70 acres and the subbasins within Nguyen Addition which have a total area of 2.43 acres.

EXISTING PEAK RUNOFF					
Description	C	Tc	I	Area	Q(cfs)
Offsite Drainage Area(2 yr.)	.30	15	3.80	2.70	3.1
Offsite Drainage Area(5 yr.)	.35	15	4.62	2.70	4.4
Offsite Drainage Area(10 yr.)	.45	15	5.21	2.70	6.3
Offsite Drainage Area(25 yr.)	.50	15	6.06	2.70	8.2
Offsite Drainage Area(50 yr.)	.55	15	6.73	2.70	10.0
Offsite Drainage Area(100 yr.)	.65	15	7.40	2.70	13.0
Existing North SubArea(2 yr.)	.30	15	3.80	1.52	1.7
Existing North SubArea(5 yr.)	.35	15	4.62	1.52	2.5
Existing North SubArea(10 yr.)	.45	15	5.21	1.52	3.6
Existing North SubArea(25 yr.)	.50	15	6.06	1.52	4.6
Existing North SubArea(50 yr.)	.55	15	6.73	1.52	5.6
Existing North SubArea(100 yr.)	.65	15	7.40	1.52	7.3
Existing South SubArea(2 yr.)	.30	15	3.80	0.91	1.0
Existing South SubArea(5 yr.)	.35	15	4.62	0.91	1.5
Existing South SubArea(10 yr.)	.45	15	5.21	0.91	2.1
Existing South SubArea(25 yr.)	.50	15	6.06	0.91	2.8
Existing South SubArea(50 yr.)	.55	15	6.73	0.91	3.4
Existing South SubArea(100 yr.)	.65	15	7.40	0.91	4.4

The existing drainage system which collects the runoff from the drainage site is an existing storm sewer system along the south side of Harry Street. It is a 36" reinforced concrete pipe with an unknown slope. At the minimum design slope of 0.12% the 36" RCP would have a capacity of 23.1 cubic feet per second. The existing 5 year storm event peak discharge for the north subbasin of 1.52 acres is 2.5 cfs. The existing 5 year storm event peak discharge for the south subbasin of 1.52 acres is 1.5 cfs.

III. POST DEVELOPMENT HYDROLOGIC ANALYSIS

Design Storm Events Evaluated: 2, 5, 10, 25, 50 and 100 yr. storm events

The runoff calculations for the street, drainage channel design, drainage pipe design and detention pond storage have been completed utilizing the 5 year storm. A check of the drainage system has been made using the 100 year storm event.

Storm sewer was analyzed for full flow conditions was using "Flowmaster" by Haestad Methods Inc.

A detention analysis shall be performed in conjunction with design of the site grading plan during preparation of construction documents using the computer program by Hydraflow Hydrographs by Intellisolve.

The following tables summarize the peak discharges for developed conditions for the offsite drainage subbasin of 2.70 acres and the subbasins within Nguyen Addition which have a total area of 2.43 acres.

DEVELOPED PEAK RUNOFF					
Description	C	Tc	I	Area	Q(cfs)
Offsite Drainage Area(2 yr.)	.30	15	3.80	2.70	3.1
Offsite Drainage Area(5 yr.)	.35	15	4.62	2.70	4.4
Offsite Drainage Area(10 yr.)	.45	15	5.21	2.70	6.3
Offsite Drainage Area(25 yr.)	.50	15	6.06	2.70	8.2
Offsite Drainage Area(50 yr.)	.55	15	6.73	2.70	10.0
Offsite Drainage Area(100 yr.)	.65	15	7.40	2.70	13.0
Developed North SubArea(2 yr.)	.68	15	3.80	1.52	4.0
Developed North SubArea(5 yr.)	.69	15	4.62	1.52	4.8
Developed North SubArea(10 yr.)	.73	15	5.21	1.52	5.8
Developed North SubArea(25 yr.)	.75	15	6.06	1.52	6.9
Developed North SubArea(50 yr.)	.78	15	6.73	1.52	8.0
Developed North SubArea(100 yr.)	.80	15	7.40	1.52	9.0
Developed South SubArea(2 yr.)	.68	15	3.80	0.91	2.4
Developed South SubArea(5 yr.)	.69	15	4.62	0.91	2.9
Developed South SubArea(10 yr.)	.73	15	5.21	0.91	3.5
Developed South SubArea(25 yr.)	.75	15	6.06	0.91	4.1
Developed South SubArea(50 yr.)	.78	15	6.73	0.91	4.8
Developed South SubArea(100 yr.)	.80	15	7.40	0.91	5.4

The offsite drainage area which is located south of this site is currently unplatted. The general topography of the offsite property is from south to north and the sheet flow from this property would follow this same direction. A proposed storm sewer on the Nguyen Addition can be extended to the south line of Nguyen Addition in order to provide a drainage outlet for the unplatted property. The site development of Nguyen Addition is

Nguyen Addition Drainage Plan(Con't)

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proposed in two phases. The owner of Nguyen Addition will be extending a proposed storm sewer to within approximately 10 feet of the south line of Nguyen Addition. When the unplatted property is developed the owner of Nguyen Addition will allow the unplatted property to connect to the proposed storm sewer for drainage of the unplatted property. If the unplatted property should develop prior to Phase 2 of the Nguyen Addition being initiated the offsite property will be required to extend the storm sewer to the south end of the storm sewer extension installed for the Phase 1 improvements of Nguyen Addition.

The first phase of the development for this site is the north subbasin which consists of parking lot and the proposed 13,000 square foot building. The developed peak discharge for the 5 year storm event is 4.8 cubic feet per second. The second phase of the development is the south subbasin of 0.91 acres which consists of the parking lot and the 10,400 square foot building. The developed 5 year storm event peak discharge for the south subbasin is 2.9 cfs. The combined peak developed discharge from the north and south subbasins is as follows:

COMBINED DEVELOPED PEAK DISCHARGE					
Description	c	Tc	i	Area	Q(cfs)
Combined Developed SubArea(2 yr.)	.68	15	3.80	2.41	6.2
Combined Developed SubArea(5 yr.)	.69	15	4.62	2.41	7.7
Combined Developed SubArea(10 yr.)	.73	15	5.21	2.41	9.2
Combined Developed SubArea(25 yr.)	.75	15	6.06	2.41	11.0
Combined Developed SubArea(50 yr.)	.78	15	6.73	2.41	12.7
Combined Developed SubArea(100 yr.)	.80	15	7.40	2.41	14.2

A curb inlet drop inlet is proposed to be constructed in an island in the northeast parking area of the front subbasin in order to collect the runoff from the 1.52 acres within the first phase of construction. The proposed 15" storm sewer will be extended under the pavement to the south edge of phase 1 to be utilized for collection of storm drainage from phase 2. A 15" storm sewer is proposed to convey the runoff from the proposed curb inlet to an existing curb inlet located in the south curb of Harry Street. A 15" RCP storm sewer at slope of 0.38% has a full flow capacity of 4.0 cubic feet per second.

The combined 5 year existing peak discharge for Nguyen Addition is 2.77 cfs which is comprised of 1.73 cfs for the north subbasin and 1.04 cfs for the south subbasin. The existing 5 year peak discharge is 5.84 cfs for the offsite area and Nguyen Addition. The combined 5 year developed peak discharge for Nguyen Addition is 9.63 cfs which is 6.02 cfs for the north subbasin and 3.61 cfs for the south subbasin. The 5 year combined existing offsite peak discharge and the developed Nguyen peak discharge is 10.82 cfs. A detention analysis performed on the north parking lot area has determined that the 5 year peak discharge into the existing storm sewer is 4.63 cfs. The proposed 15" RCP storm sewer flowing out of the proposed curb inlet at a slope of 0.38% slope has a full flow capacity of 5.84 cfs. The storm sewer discharging from the proposed curb inlet must be restricted to a 10" opening in order to provide the required reduction in peak discharge of 4.63 cfs. A 2' section of 10" pipe will be grouted into the north opening of

Nguyen Addition Drainage Plan(Con't)

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the 15" storm sewer exiting the north side of the proposed curb inlet to provide the required hydraulic control for the detention storage system.

DEVELOPED PEAK RUNOFF RESTRICTED BY 15" RCP SWS				
	Exist.	Dev.	Restri	Max.
Description	Q(cfs)	Q(cfs)	Q(cfs)	Stage
Combined SubArea(5 yr.)	5.84	10.82	4.63	1360.03
Combined SubArea(100 yr.)	18.80	20.09	4.82	1360.50

The proposed 15" RCP storm sewer with 10" restricted opening will provide the required restriction to limit the developed peak discharge to existing peak discharge for the 5 year storm event. The required detention storage area for the 5 year storm shall be designed into the proposed parking lot to the north and south side parking lots with the proposed site grading plan. The proposed 15" RCP storm sewer with 10" restricted opening will also provide restriction for the 100 year storm event but adequate storage has not been provided to store the 100 year storm event. An overflow will be provided in the north curb of the proposed parking lot to allow ponding from the 100 year storm to overflow into the existing curb of Harry Street

IV. FLOODPLAIN SUBMITTAL – No FEMA floodplain is located on this plat.

V. FEDERAL, STATE AND LOCAL PERMITS

- A. US Army Corp of Engineers-Not Applicable
- B. Kansas Dept. of Agriculture-Not Applicable
- C. FEMA-Not Applicable
- D. Kansas Department of Transportation-Not Applicable
- E. Sedgwick County Right-of-Way Permit-Not Applicable

VII. APPENDIX I:

All charts, graphs, tables including a 1"=40' scale drainage plan map are included for review.

M I N N E H A

Copeland Landing Strip

Beech Factory Landing Field

Trailer Park

Linwood Acres

Seltzer Sch.

Fox Meadows Country Club

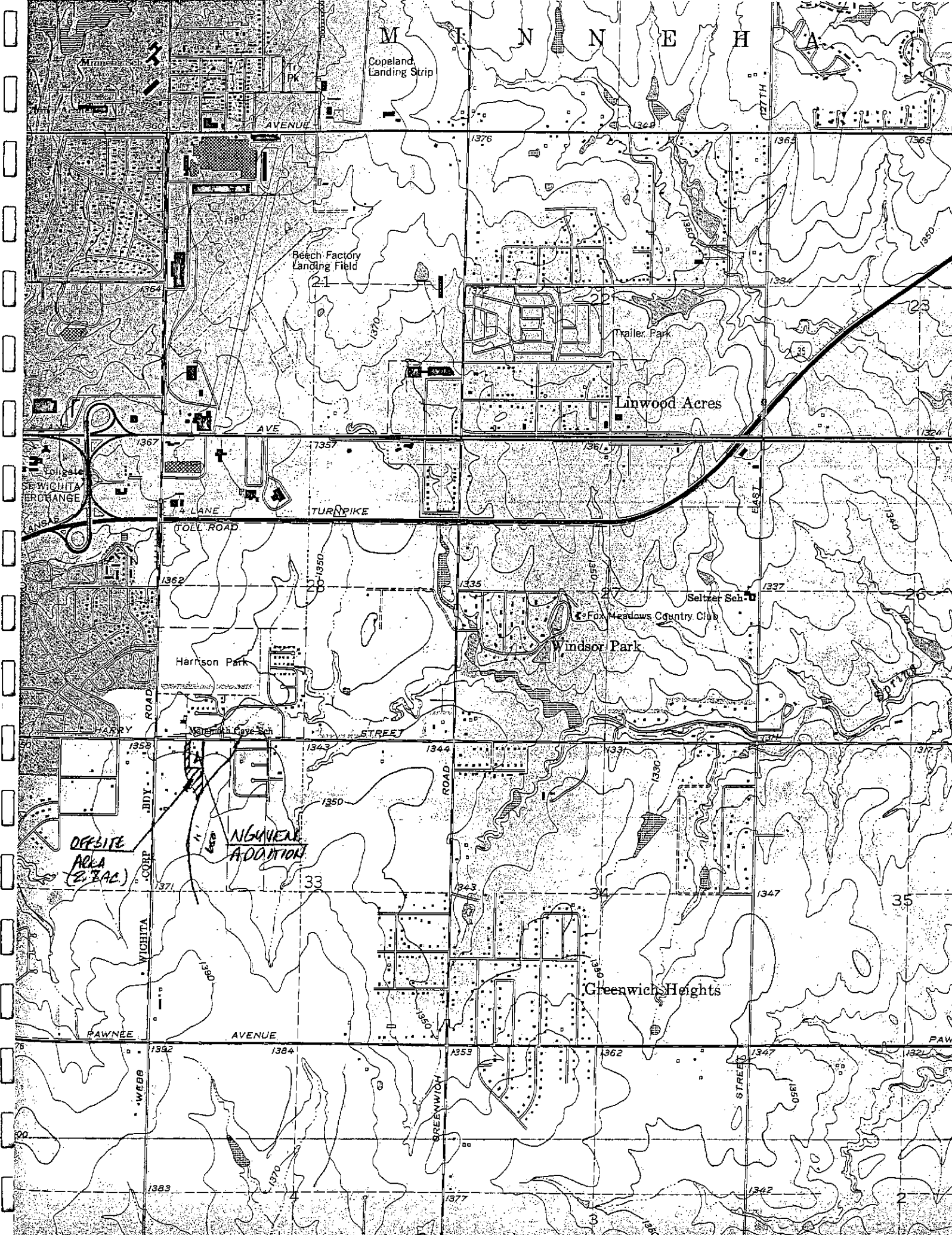
Windsor Park

Harrison Park

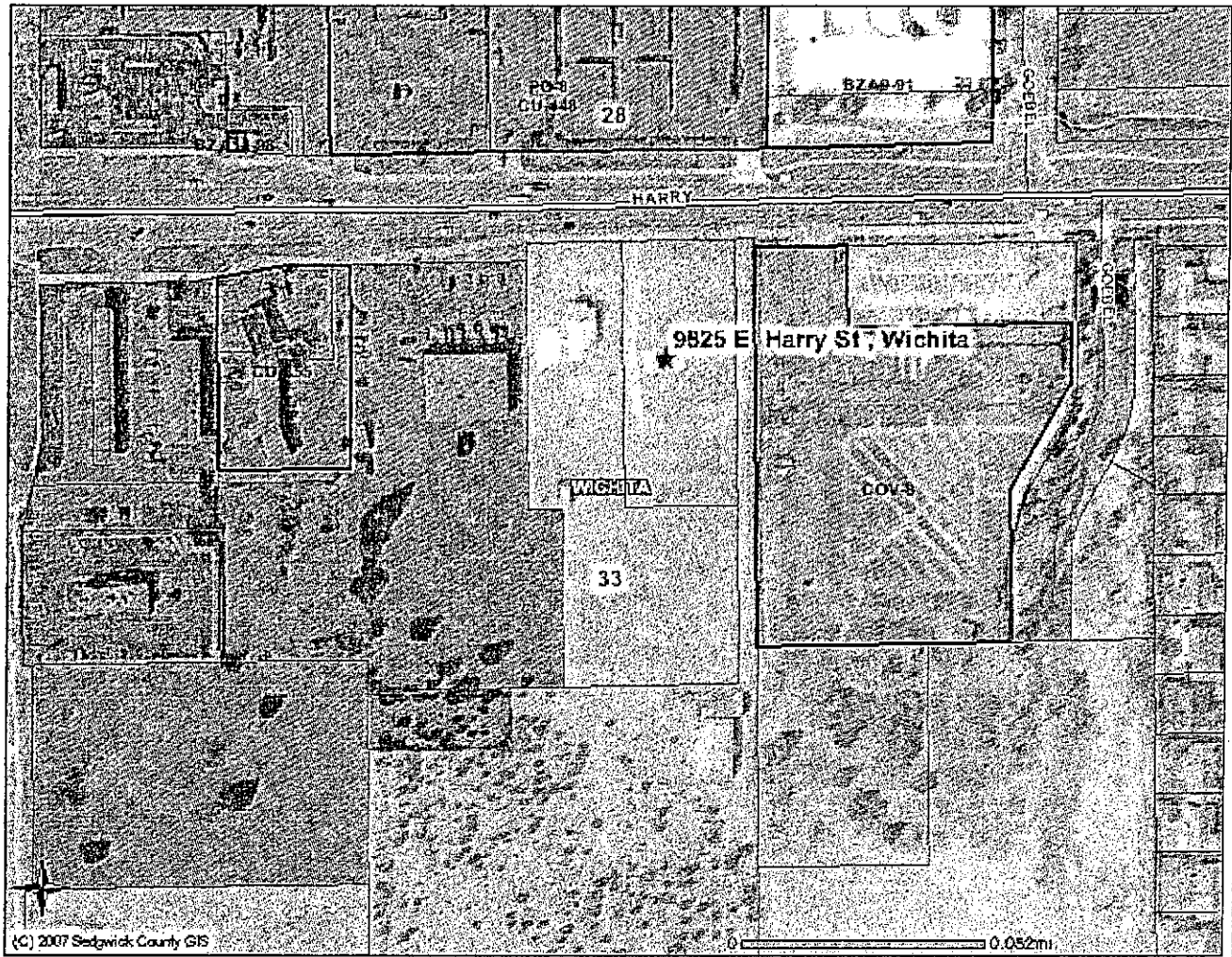
Greenwich Heights

OFFSITE AREA (Z. BAC.)

NEWER ADDITION



Sedgwick County Maps



(C) 2007 Sedgwick County GIS

<p>National Historic Site Buffers</p> <ul style="list-style-type: none"> 500 ft Local National Historic Site Buffers 1000 ft National Historic Site Buffers Other <p>Historic Zoning Districts</p> <ul style="list-style-type: none"> National Historic Sites Local Historic Sites <p>Roads</p> <ul style="list-style-type: none"> Highways Highway Ramps Main Roads Local Roads <p>City Boundaries</p> <ul style="list-style-type: none"> ANDALE SEAFORD SEWELL CHANDLER CLEARWATER (cont.) 		<p>Legend</p> <ul style="list-style-type: none"> Flowlines Rivers or Lakes Minor Rivers Square Mile Sections Zoning Use Cases Parcels Zoning Districts Unknown Not Labeled 3-Minute Tiling (250m) GD - General Business District GD - General Commercial GD - General Industrial GD - General Office IP - Industrial Park LD - Limited Commercial LD - Limited Residential MT-18 - Medium Density Residential MT-26 - Medium Density Residential Other 2003 Aerials 	
<ul style="list-style-type: none"> COVINGTON DERBY CANTONWOOD GARDEN PLAIN GOSDARD HAYVILLE KOCHI MADE MOUNT HOPE MULVANE PARK CITY SEDGWICK UNINCORPORATED VALLEY CENTER VIOLA WICHITA Other Roads Rivers or Lakes cont. 		<ul style="list-style-type: none"> MT - Manufactured Housing NO - Neighborhood Office NH - Neighborhood Retail OH - Office Warehouse PL - Planned Unit Developments RR - Rural Residential ST-10 - Single Family 10,000 ST-20 - Single Family 20,000 ST-5 - Single Family 5000 TR - Two-Family U - Unlabeled Other 2003 Aerials 	

Sedgwick County

Geographic Information Services
 Division of Information & Operations
www.sedgwickcounty.org/gis
 525 N. Main, Suite 212, Wichita, KS 67203
 Tel: 316.660.9290 Fax: 316.262.1174

DISCLAIMER: It is understood that Sedgwick County Geographic Information Services (GIS) City of Wichita GIS, for purposes of this map, is not intended to be used for legal purposes, and that the user assumes all responsibility for any use of the information provided. Sedgwick County GIS is not responsible for any errors or omissions in this map, and the user assumes all responsibility for any use of the information provided. Sedgwick County GIS is not responsible for any errors or omissions in this map, and the user assumes all responsibility for any use of the information provided.

TABLE I

INITIAL DESIGN STORM FREQUENCY

<u>Land Use</u>	<u>Initial Design Storm Return Period</u>
1. Residential and Public Park Areas	2 years
2. General Commercial Areas	5 years
3. Public Building Areas	5 years
4. Industrial Areas	5 years
5. High Value Downtown Business Areas	5 years
6. Major Airport Terminal Areas	5 years

TABLE II

ALLOWABLE PAVEMENT ENCROACHMENT FOR INITIAL DESIGN STORM

<u>Street Classification</u>	<u>Allowed Encroachment</u>
1. Local	No curb overtopping. Flow may spread across crown.
2. Collector	No curb overtopping. One 8' lane width must be free of water.
3. Arterial	No curb overtopping. One 8' through lane width in each direction must be free of water.
4. Expressways and Freeways	No curb overtopping. Encroachment permitted in not more than one through lane width in each direction. <i>was compatible</i>

An additional requirement to the initial system criteria is that the runoff from the 100-year frequency major storm for time of concentrations identical to the initial system design must be retained within public rights-of-way in all cases. This 100-year frequency major storm requirement must be evaluated for projects in existing developed areas and when identified as prohibitive because of estimated costs, the consultant shall provide criteria recommendations to the City Engineer for such projects which will provide a reasonable cost/benefit ratio for the project.

C. Chapter 2 Comments and Modifications ~~"Precipitation"~~

1. Precipitation intensity for the various durations and frequencies shall be as shown in the table attached to this document and identified as "Attachment A". ~~When intensities are required for durations not shown in the table in the range between 2-hour and 24-hour durations, such intensities shall be computed as straight line interpolations.~~

RECEIVED JUN 13 1988

ATTACHMENT D

DRAINAGE CRITERIA

CITY OF WICHITA, KANSAS

RECOMMENDED RUNOFF COEFFICIENTS FOR RATIONAL METHOD
AND PERCENT IMPERVIOUS FOR UNIT HYDROGRAPH METHOD

Land Use or Surface Characteristics	Percent Impervious	Frequency			
		2	5	10	100
1. Business:					
Downtown Areas	95	0.84	0.85	0.87	0.91
Neighborhood Areas	70	0.68	0.69	0.73	0.80
2. Residential:					
<u>Single Family (Soil Group D)</u>					
1/8 Acre	50	0.57	0.61	0.66	0.79
1/4 Acre	38	0.50	0.54	0.62	0.76
1/3 Acre	30	0.46	0.50	0.59	0.73
1/2 Acre	25	0.42	0.48	0.56	0.72
3/4 Acre	22	0.42	0.46	0.55	0.71
1 Acre	20	0.41	0.45	0.54	0.71
<u>Multi-Family (Soil Group D)</u>					
Multi-Unit (detached)	60	0.62	0.66	0.72	0.82
Multi-Unit (attached)	65	0.64	0.68	0.73	0.83
Apartments	75	0.70	0.73	0.79	0.86
<u>Single Family (Soil Group C)</u>					
1/8 Acre	50	0.55	0.58	0.64	0.73
1/4 Acre	38	0.48	0.51	0.57	0.68
1/3 Acre	30	0.43	0.46	0.53	0.65
1/2 Acre	25	0.40	0.43	0.50	0.63
3/4 Acre	22	0.39	0.42	0.49	0.62
1 Acre	20	0.37	0.40	0.48	0.61
<u>Multi-Family (Soil Group C)</u>					
Multi-Unit (detached)	60	0.60	0.63	0.69	0.77
Multi-Unit (attached)	65	0.63	0.66	0.71	0.79
Apartments	75	0.68	0.72	0.77	0.83
<u>Single-Family (Soil Group B)</u>					
1/8 Acre	50	0.52	0.54	0.59	0.67
1/4 Acre	38	0.44	0.46	0.52	0.61
1/3 Acre	30	0.39	0.41	0.47	0.57
1/2 Acre	25	0.36	0.38	0.44	0.54
3/4 Acre	22	0.34	0.36	0.42	0.52
1 Acre	20	0.33	0.35	0.40	0.51
<u>Multi-Family (Soil Group B)</u>					
Multi-Unit (detached)	60	0.58	0.60	0.65	0.72
Multi-Unit (attached)	65	0.61	0.64	0.68	0.75
Apartments	75	0.67	0.70	0.74	0.80

Land Use or face Characteristics	Percent Impervious	Frequency			
		<u>2</u>	<u>5</u>	<u>10</u>	<u>100</u>
<u>Single Family (Soil Group A)</u>					
1/8 Acre	50	0.47	0.50	0.54	0.60
1/4 Acre	38	0.39	0.41	0.45	0.52
1/3 Acre	30	0.33	0.35	0.39	0.47
1/2 Acre	25	0.30	0.31	0.35	0.44
3/4 Acre	22	0.28	0.29	0.33	0.42
1 Acre	20	0.26	0.28	0.32	0.40
<u>Multi-Family (Soil Group A)</u>					
Multi-Unit (detached)	60	0.55	0.57	0.61	0.67
Multi-Unit (attached)	65	0.58	0.60	0.64	0.70
Apartments	75	0.65	0.68	0.72	0.77
3. Industrial:					
Light Areas	70	0.68	0.69	0.73	0.80
Heavy Areas	80	0.74	0.76	0.79	0.84
4. Playgrounds:	15	0.33	0.35	0.42	0.55
5. Schools:	40	0.49	0.51	0.56	0.66
6. Railroad Yard Areas:	30	0.43	0.45	0.50	0.62
<u>Undeveloped Urban Areas:</u>					
Offsite Flow Analysis (when land use not defined)	45	0.52	0.54	0.59	0.68
8. Streets:					
Paved	99	0.87	0.88	0.90	0.93
Gravel	00	0.24	0.26	0.33	0.48
9. Drive, Parking Lots and Walks:	96	0.87	0.87	0.88	0.89
10. Roofs:	90	0.80	0.85	0.90	0.93
11. Urban Lawn Areas (See Note No. 1 below):					
<u>Soil Group A</u>					
Slope less than 1%	00	0.08	0.09	0.13	0.23
Slope 1% to 4%	00	0.12	0.13	0.17	0.27
Slope more than 4%	00	0.16	0.17	0.21	0.31
<u>Soil Group B</u>					
Slope less than 1%	00	0.16	0.18	0.24	0.37
Slope 1% to 4%	00	0.20	0.22	0.28	0.41
Slope more than 4%	00	0.24	0.26	0.32	0.45
<u>Soil Group C</u>					
Slope less than 1%	00	0.24	0.27	0.35	0.51
Slope 1% to 4%	00	0.26	0.29	0.37	0.53
Slope more than 4%	00	0.28	0.31	0.39	0.55

Land Use or face Characteristics	Percent Impervious	Frequency			
		<u>2</u>	<u>5</u>	<u>10</u>	<u>100</u>
<u>Soil Group D</u>					
Slope less than 1%	00	0.28	0.33	0.43	0.63
Slope 1% to 4%	00	0.30	0.35	0.45	0.65
Slope more than 4%	00	0.32	0.37	0.47	0.67

Note No. 1: Coefficients shown in the above table are for pervious open space areas with thick turf which includes pervious areas in parks and cemeteries. Coefficients shown above must be increased 0.02 for use with agricultural pasture areas. Coefficients shown above must be reduced by 0.04 for use with agricultural cultivated areas. Group A soils are well-drained, coarse textured sands with high infiltration rates. Group B soils are moderately well-drained, moderately coarse textured soils with moderate infiltration rates. Group C soils are moderately poor-drained, moderately fine textured soils with slow infiltration rates. Group D soils are poor-drained, fine textured soils with very slow infiltration rates.

GENERAL NOTE: These Rational Formula Coefficients may not be valid for basins 320 acres or larger.

Worksheet 3: Time of concentration (T_c) or travel time (T_t)

Project NOUWEN ADDITION By HOF Date _____

Location 2.7 ACRES OFFSHORE SOUTH Checked _____ Date _____

Circle one: Present Developed _____

Circle one: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to T_c only)	Segment ID	
1. Surface description (table 3-1)		General Culverts
2. Manning's roughness coeff., n (table 3-1) ..		0.24
3. Flow length, L (total L \leq 300 ft)	ft	300
4. Two-yr 24-hr rainfall, P_2	in	3.5
5. Land slope, s ... <u>10' / 650'</u>	ft/ft	.015
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute T_t	hr	0.61 + = 37

Shallow concentrated flow	Segment ID	
7. Surface description (paved or unpaved)		
8. Flow length, L	ft	200'
9. Watercourse slope, s	ft/ft	.015
10. Average velocity, V (figure 3-1)	ft/s	2
11. $T_t = \frac{L}{3600 V}$ Compute T_t	hr	.027 + = 2 min

Channel flow	Segment ID	
12. Cross sectional flow area, a	ft ²	
13. Wetted perimeter, p_w	ft	
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r	ft	
15. Channel slope, s	ft/ft	
16. Manning's roughness coeff., n		
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V	ft/s	
18. Flow length, L	ft	
19. $T_t = \frac{L}{3600 V}$ Compute T_t	hr	+ = 39 min
20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)	hr	

L_s = 3.19" / HR
L₁₀₀ = 5.53" / HR

$$t_0 = t_{SP \text{ flow}} + t_{L,0.1} + t_{0.1}$$

Sheet flow

Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. With sheet flow, the friction value (Manning's n) is an effective roughness coefficient that includes the effect of raindrop impact; drag over the plane surface; obstacles such as litter, crop ridges, and rocks; and erosion and transportation of sediment. These n values are for very shallow flow depths of about 0.1 foot or so. Table 3-1 gives Manning's n values for sheet flow for various surface conditions.

For sheet flow of less than 300 feet, use Manning's kinematic solution (Overton and Meadows 1976) to compute T_t :

$$T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}} \quad [\text{Eq. 3-3}]$$

Table 3-1.—Roughness coefficients (Manning's n) for sheet flow

Surface description	n ¹
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤ 20%	0.06
Residue cover > 20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses ²	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods: ³	
Light underbrush	0.40
Dense underbrush	0.80

¹The n values are a composite of information compiled by Engman (1986).

²Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.

³When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

where

- T_t = travel time (hr),
- n = Manning's roughness coefficient (table 3-1),
- L = flow length (ft),
- P_2 = 2-year, 24-hour rainfall (in), and
- s = slope of hydraulic grade line (land slope, ft/ft).

This simplified form of the Manning's kinematic solution is based on the following: (1) shallow steady uniform flow, (2) constant intensity of rainfall excess (that part of a rain available for runoff), (3) rainfall duration of 24 hours, and (4) minor effect of infiltration on travel time. Rainfall depth can be obtained from appendix B.

Shallow concentrated flow

After a maximum of 300 feet, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from figure 3-1, in which average velocity is a function of watercourse slope and type of channel. For slopes less than 0.005 ft/ft, use equations given in appendix F for figure 3-1. Tillage can affect the direction of shallow concentrated flow. Flow may not always be directly down the watershed slope if tillage runs across the slope.

After determining average velocity in figure 3-1, use equation 3-1 to estimate travel time for the shallow concentrated flow segment.

Open channels

Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets. Manning's equation or water surface profile information can be used to estimate average flow velocity. Average flow velocity is usually determined for bank-full elevation.

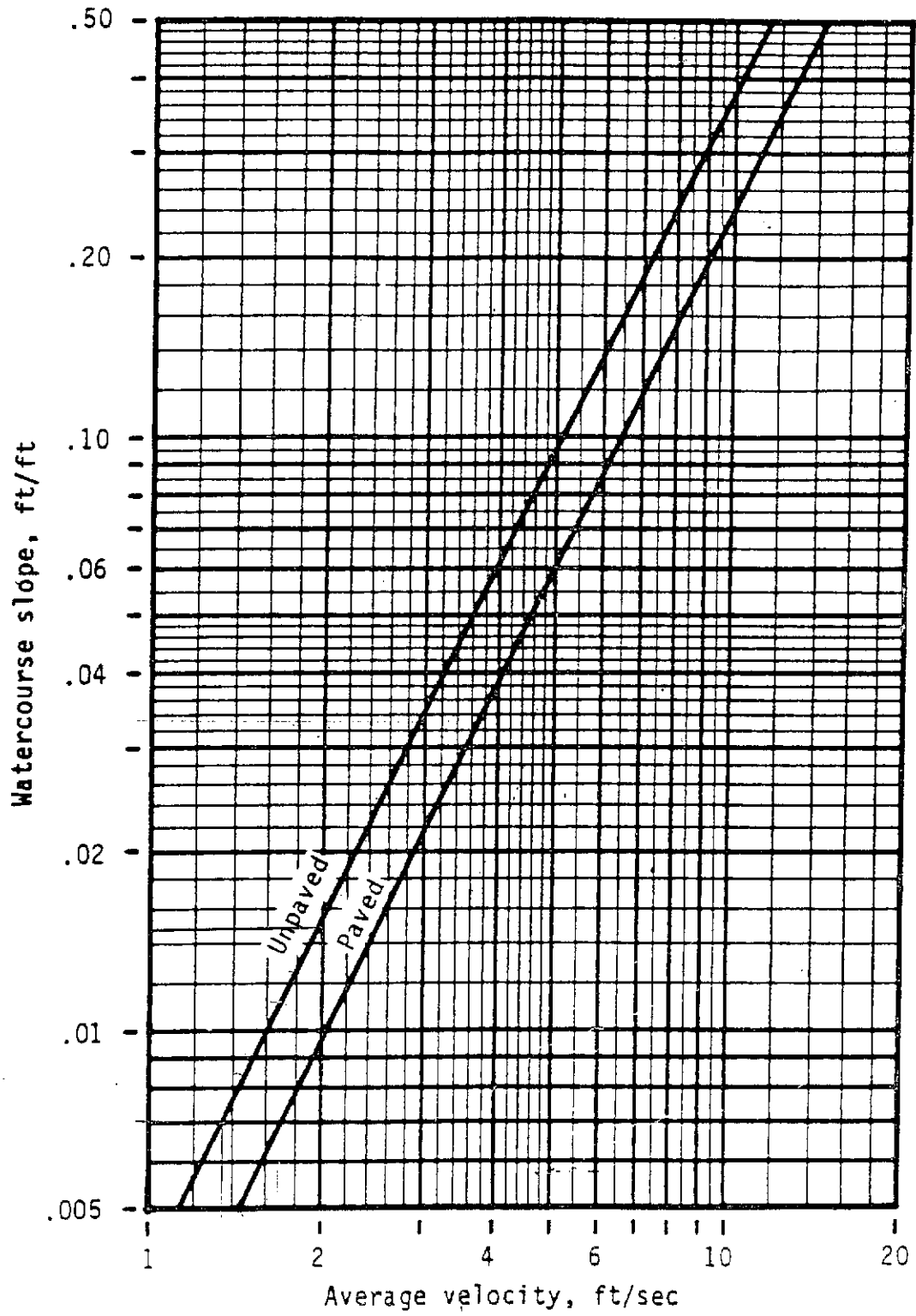


Figure 3-1.—Average velocities for estimating travel time for shallow concentrated flow.

Full Flow Capacity of 15" RCP Storm Sewer @ 0.38%
Worksheet for Circular Channel

Project Description	
Worksheet	Circular Channel
Flow Element	Circular Channel
Method	Manning's Formu
Solve For	Full Flow Capacit

Input Data	
Mannings Coeffic	0.013
Slope	003800 ft/ft
Diameter	15 in

Results	
Depth	1.25 ft
Discharge	3.98 cfs
Flow Area	1.2 ft ²
Wetted Perime	3.93 ft
Top Width	0.00 ft
Critical Depth	0.81 ft
Percent Full	100.0 %
Critical Slope	006758 ft/ft
Velocity	3.24 ft/s
Velocity Head	0.16 ft
Specific Energ	1.41 ft
Froude Numbe	0.00
Maximum Disc	4.28 cfs
Discharge Full	3.98 cfs
Slope Full	003800 ft/ft
Flow Type	N/A

FIGURE 5-3

RAINFALL INTENSITY TABLE for SEDGWICK COUNTY, KANSAS

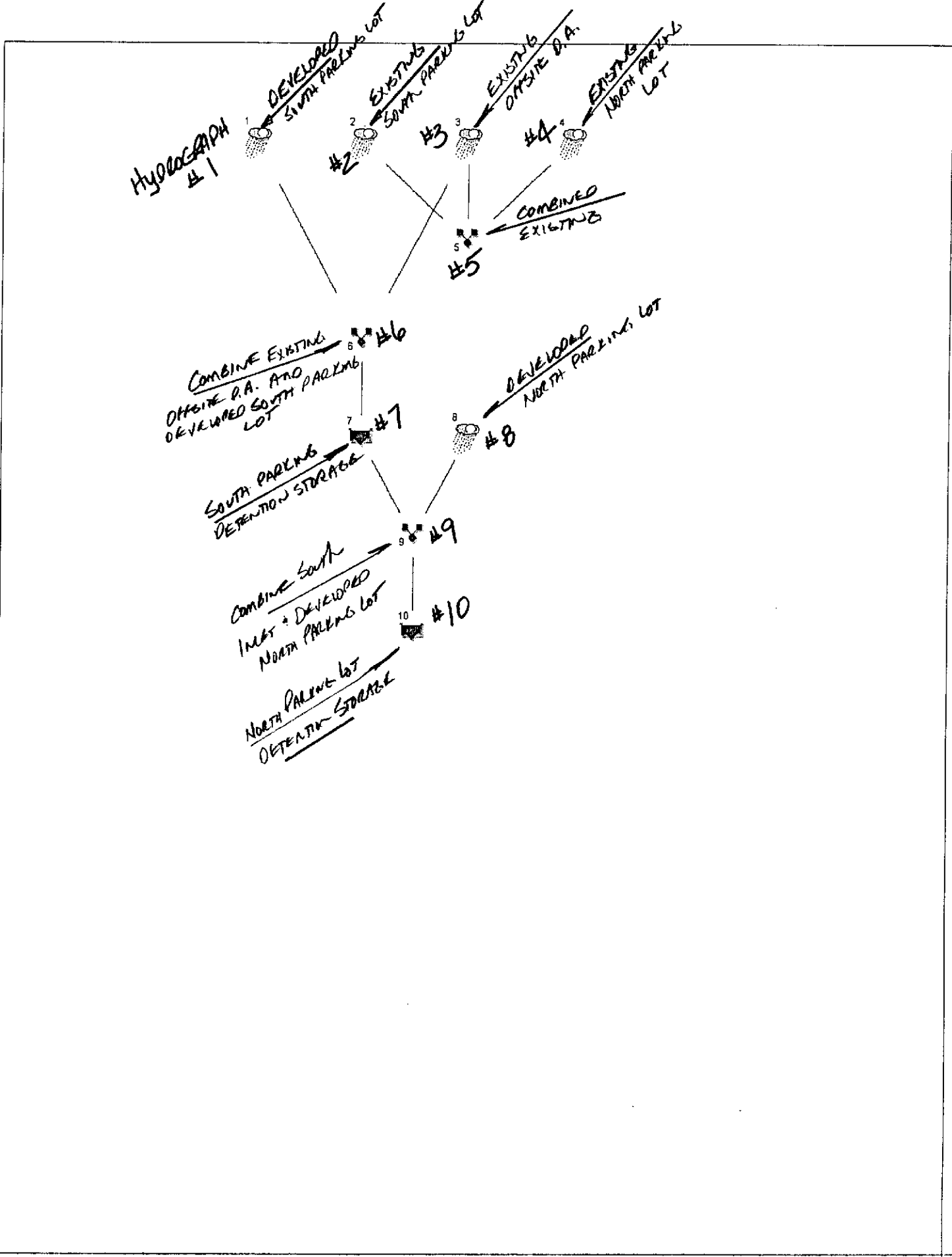
The following tabulation contains rainfall intensity in inches per hour as derived from ESSA Weather Bureau Technical Paper 40.

DURATION IN MINUTES	RETURN PERIODS OF						
	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5	4.67	6.23	8.00	9.34	10.67	12.23	13.79
6	4.35	5.80	7.45	8.70	9.94	11.39	12.84
7	4.09	5.46	7.02	8.19	9.36	10.72	12.09
8	3.88	5.18	6.66	7.77	8.89	10.18	11.48
9	3.71	4.95	6.36	7.43	8.49	9.72	10.96
10	3.56	4.75	6.11	7.13	8.15	9.33	10.52
11	3.43	4.58	5.89	6.87	7.85	8.99	10.14
12	3.32	4.40	5.69	6.64	7.59	8.69	9.80
13	3.21	4.29	5.51	6.43	7.35	8.42	9.50
14	3.12	4.17	5.36	6.25	7.14	8.18	9.23
15	3.04	4.06	5.21	6.08	6.95	7.97	8.98
16	2.96	3.96	5.09	5.93	6.78	7.77	8.76
17	2.90	3.86	4.97	5.79	6.62	7.59	8.55
18	2.83	3.78	4.86	5.67	6.48	7.42	8.37
19	2.77	3.70	4.76	5.55	6.34	7.27	8.19
20	2.72	3.63	4.66	5.44	6.22	7.12	8.03
21	2.67	3.56	4.57	5.34	6.10	6.99	7.88
22	2.62	3.49	4.49	5.24	5.99	6.86	7.74
23	2.57	3.43	4.41	5.15	5.89	6.74	7.60
24	2.53	3.38	4.34	5.07	5.79	6.63	7.48
25	2.49	3.32	4.27	4.99	5.70	6.53	7.36
26	2.45	3.23	4.21	4.91	5.61	6.43	7.25
27	2.42	3.18	4.15	4.84	5.53	6.33	7.14
28	2.38	3.05	4.09	4.77	5.45	6.25	7.04
29	2.35	2.97	4.02	4.68	5.38	6.16	6.95
30	2.32	2.89	3.92	4.56	5.31	6.08	6.79
31	2.29	2.82	3.82	4.44	5.19	6.00	6.62
32	2.26	2.75	3.73	4.33	5.07	5.87	6.45
33	2.24	2.68	3.64	4.23	4.95	5.73	6.30
34	2.19	2.62	3.55	4.13	4.83	5.60	6.16
35	2.14	2.57	3.47	4.04	4.73	5.47	6.02
36	2.09	2.51	3.40	3.95	4.62	5.35	5.89
37	2.05	2.46	3.33	3.87	4.52	5.23	5.76
38	2.00	2.41	3.26	3.79	4.43	5.13	5.64
39	1.96	2.36	3.19	3.71	4.34	5.02	5.53
40	1.92	2.32	3.13	3.64	4.26	4.92	5.42
41	1.89	2.27	3.07	3.57	4.18	4.83	5.32
42	1.85	2.23	3.01	3.51	4.10	4.74	5.22
43	1.82	2.19	2.96	3.44	4.02	4.65	5.13
44	1.78	2.15	2.91	3.38	3.95	4.56	5.03
45	1.75	2.11	2.86	3.32	3.88	4.48	4.95

RAINFALL INTENSITY TABLE
 SEDGWICK COUNTY
 KANSAS

THIS TABLE CONTAINS AVERAGE RAINFALL INTENSITIES
 IN INCHES PER HOUR.

DURATION, HR:MIN	RETURN PERIOD						
	1 YR	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
0:05	4.91	5.64	6.64	7.38	8.48	9.34	10.20
0:06	4.62	5.34	6.33	7.07	8.15	9.00	9.84
0:07	4.38	5.09	6.08	6.80	7.86	8.69	9.52
0:08	4.17	4.87	5.85	6.56	7.60	8.41	9.22
0:09	4.00	4.68	5.63	6.33	7.34	8.14	8.93
0:10	3.84	4.50	5.43	6.11	7.10	7.87	8.64
0:11	3.70	4.34	5.25	5.90	6.86	7.61	8.36
0:12	3.56	4.19	5.07	5.71	6.64	7.36	8.09
0:13	3.44	4.05	4.91	5.53	6.43	7.14	7.84
0:14	3.33	3.92	4.76	5.36	6.24	6.92	7.61
0:15	3.22	3.80	4.62	5.21	6.06	6.73	7.40
0:16	3.12	3.69	4.49	5.07	5.91	6.56	7.21
0:17	3.03	3.58	4.37	4.94	5.76	6.40	7.04
0:18	2.94	3.48	4.26	4.82	5.63	6.26	6.88
0:19	2.85	3.39	4.16	4.71	5.50	6.12	6.74
0:20	2.77	3.30	4.06	4.60	5.38	5.99	6.60
0:21	2.70	3.22	3.97	4.50	5.27	5.87	6.47
0:22	2.63	3.14	3.88	4.41	5.17	5.76	6.35
0:23	2.56	3.07	3.80	4.32	5.07	5.65	6.23
0:24	2.50	3.00	3.72	4.23	4.97	5.54	6.12
0:25	2.44	2.93	3.64	4.15	4.88	5.44	6.01
0:26	2.38	2.87	3.57	4.07	4.79	5.35	5.90
0:27	2.33	2.81	3.50	4.00	4.70	5.26	5.80
0:28	2.27	2.75	3.44	3.92	4.62	5.17	5.71
0:29	2.23	2.69	3.37	3.86	4.54	5.08	5.61
0:30	2.18	2.64	3.31	3.79	4.47	4.99	5.52
0:31	2.14	2.59	3.26	3.72	4.39	4.91	5.43
0:32	2.09	2.54	3.20	3.66	4.32	4.83	5.34
0:33	2.05	2.50	3.14	3.60	4.25	4.76	5.26
0:34	2.02	2.45	3.09	3.54	4.18	4.68	5.18
0:35	1.98	2.41	3.04	3.48	4.12	4.61	5.10
0:36	1.94	2.37	2.99	3.43	4.05	4.54	5.02
0:37	1.91	2.33	2.94	3.38	3.99	4.47	4.95
0:38	1.88	2.29	2.90	3.32	3.93	4.40	4.87
0:39	1.85	2.25	2.85	3.27	3.87	4.34	4.80
0:40	1.82	2.22	2.81	3.23	3.82	4.28	4.73
0:41	1.79	2.18	2.77	3.18	3.76	4.22	4.67
0:42	1.76	2.15	2.73	3.13	3.71	4.16	4.60
0:43	1.73	2.12	2.69	3.09	3.66	4.10	4.54
0:44	1.71	2.09	2.65	3.05	3.61	4.04	4.48
0:45	1.68	2.06	2.62	3.01	3.56	3.99	4.42



Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	Rational	3.61	1	15.00	3,246				Developed South Phase 2
2	Rational	1.04	1	39.00	2,425				Existing South Area
3	Rational	3.07	1	39.00	7,194				Existing Offsite Dr. Area
4	Rational	1.73	1	39.00	4,050				Existng North D.A.
5	Combine	5.84	1	39.00	13,669	2, 3, 4			Total Existing Discharge
6	Combine	4.79	1	15.00	10,440	1, 3			Flow to South Inlet
7	Reservoir	4.79	1	15.00	10,440	6	1356.68	11	Disch. Out S. Inlet
8	Rational	6.02	1	15.00	5,421				Developed North Inlet
9	Combine	10.82	1	15.00	15,861	7, 8			Flow Into N. Inlet
10	Reservoir	4.63	1	26.00	15,861	9	1360.03	3,838	Disch. Out N. Inlet
11									
12									
13									
14									
15									
16									
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Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	---	---	---	---	3.61	---	---	---	6.23	Developed South Phase 2
2	Rational	---	---	---	---	1.04	---	---	---	1.80	Existing South Area
3	Rational	---	---	---	---	3.07	---	---	---	5.33	Existing Offsite Dr. Area
4	Rational	---	---	---	---	1.73	---	---	---	3.00	Existng North D.A.
5	Combine	2, 3, 4	---	---	---	5.84	---	---	---	10.12	Total Existing Discharge
6	Combine	1, 3,	---	---	---	4.79	---	---	---	8.28	Flow to South Inlet
7	Reservoir	6	---	---	---	4.79	---	---	---	7.70	Disch. Out S. Inlet
8	Rational	---	---	---	---	6.02	---	---	---	10.41	Developed North Inlet
9	Combine	7, 8	---	---	---	10.82	---	---	---	18.08	Flow Into N. Inlet
10	Reservoir	9	---	---	---	4.63	---	---	---	4.80	Disch. Out N. Inlet

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description	
1	Rational	3.61	1	15	3,246	---	----	----	Developed South Phase 2	
2	Rational	1.04	1	39	2,425	---	----	----	Existing South Area	
3	Rational	3.07	1	39	7,194	---	----	----	Existing Offsite Dr. Area	
4	Rational	1.73	1	39	4,050	---	----	----	Existing North D.A.	
5	Combine	5.84	1	39	13,669	2, 3, 4	----	----	Total Existing Discharge	
6	Combine	4.79	1	15	10,440	1, 3,	----	----	Flow to South Inlet	
7	Reservoir	4.79	1	15	10,440	6	1356.68	11	Disch. Out S. Inlet	
8	Rational	6.02	1	15	5,421	---	----	----	Developed North Inlet	
9	Combine	10.82	1	15	15,861	7, 8	----	----	Flow Into N. Inlet	
10	Reservoir	4.63	1	26	15,861	9	1360.03	3,838	Disch. Out N. Inlet	
Proj. file: Nguyen.gpw				Return Period: 5 yr			Run date: 09-08-2007			

Hydrograph Report

Hyd. No. 3

Existing Offsite Dr. Area

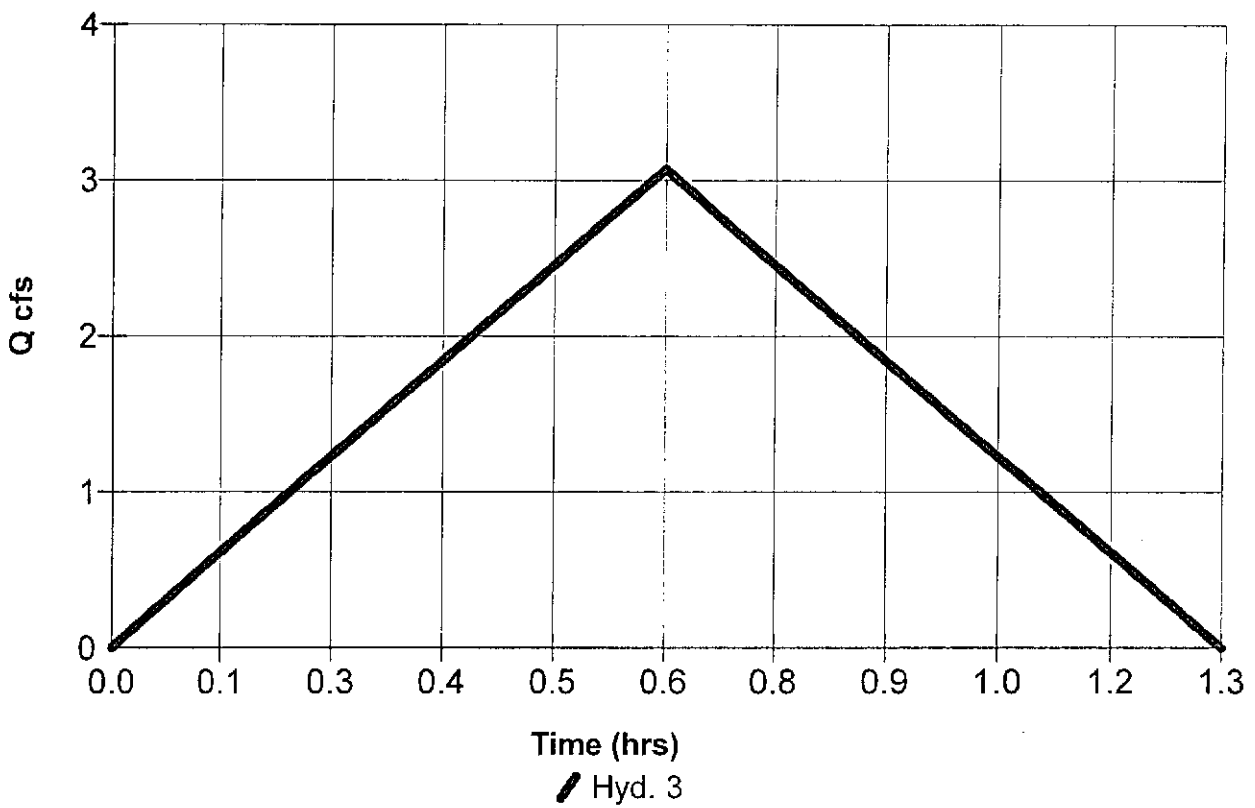
Hydrograph type	= Rational	Peak discharge	= 3.07 cfs
Storm frequency	= 5 yrs	Time interval	= 1 min
Drainage area	= 2.7 ac	Runoff coeff.	= 0.35
Intensity	= 3.253 in/hr	Time of conc. (Tc)	= 39 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 7,194 cuft

Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
0.02 0.08	0.58 2.76	1.15 0.71
0.03 0.16	0.60 2.84	1.17 0.63
0.05 0.24	0.62 2.92	1.18 0.55
0.07 0.32	0.63 3.00	1.20 0.47
0.08 0.39	0.65 3.07 <<	1.22 0.39
0.10 0.47	0.67 3.00	1.23 0.32
0.12 0.55	0.68 2.92	1.25 0.24
0.13 0.63	0.70 2.84	1.27 0.16
0.15 0.71	0.72 2.76	1.28 0.08
0.17 0.79	0.73 2.68	
0.18 0.87	0.75 2.60	
0.20 0.95	0.77 2.52	...End
0.22 1.02	0.78 2.44	
0.23 1.10	0.80 2.36	
0.25 1.18	0.82 2.29	
0.27 1.26	0.83 2.21	
0.28 1.34	0.85 2.13	
0.30 1.42	0.87 2.05	
0.32 1.50	0.88 1.97	
0.33 1.58	0.90 1.89	
0.35 1.66	0.92 1.81	
0.37 1.73	0.93 1.73	
0.38 1.81	0.95 1.66	
0.40 1.89	0.97 1.58	
0.42 1.97	0.98 1.50	
0.43 2.05	1.00 1.42	
0.45 2.13	1.02 1.34	
0.47 2.21	1.03 1.26	
0.48 2.29	1.05 1.18	
0.50 2.36	1.07 1.10	
0.52 2.44	1.08 1.02	
0.53 2.52	1.10 0.95	
0.55 2.60	1.12 0.87	
0.57 2.68	1.13 0.79	

Hyd. No. 3 - Rational - 5 Yr - Qp = 3.07 cfs - Existing Offsite Dr. Area



Hydrograph Report

Hyd. No. 2

Existing South Area

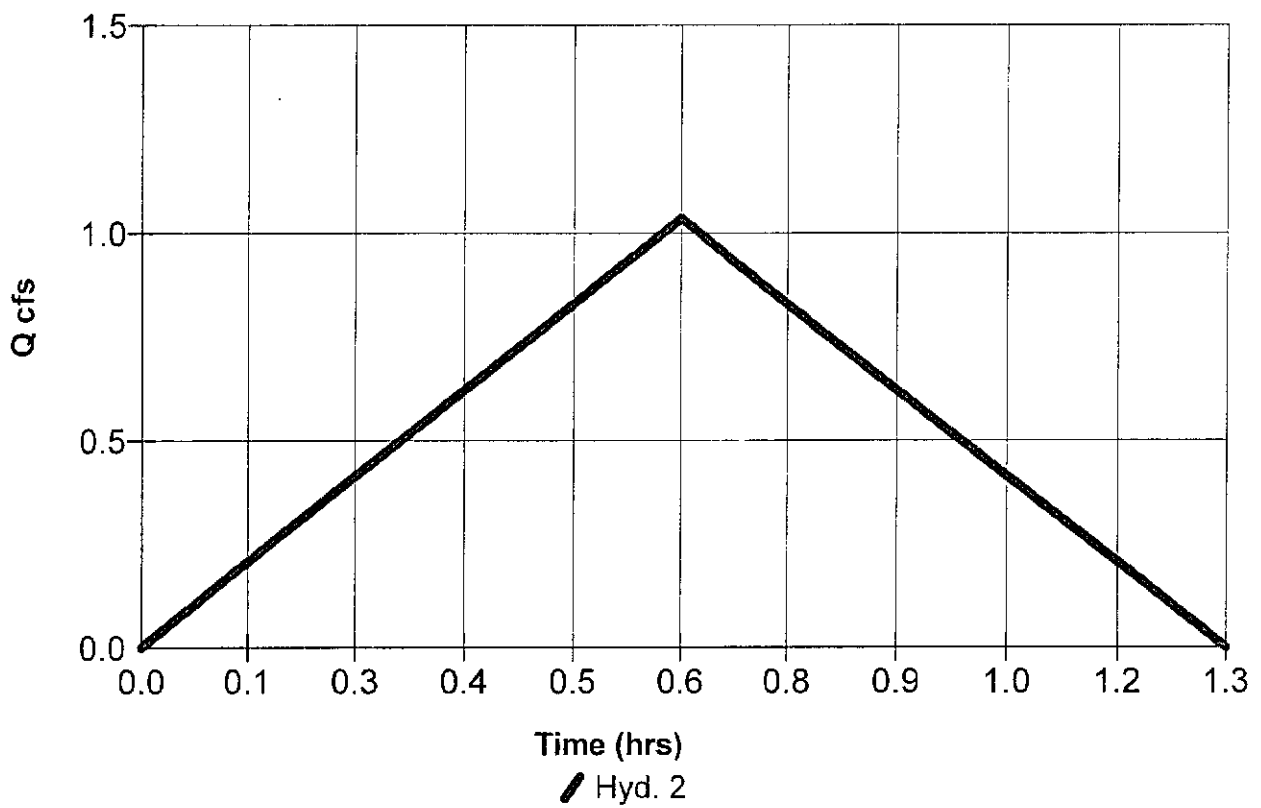
Hydrograph type	= Rational	Peak discharge	= 1.04 cfs
Storm frequency	= 5 yrs	Time interval	= 1 min
Drainage area	= 0.9 ac	Runoff coeff.	= 0.35
Intensity	= 3.253 in/hr	Time of conc. (Tc)	= 39 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 2,425 cuft

Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
0.02 0.03	0.58 0.93	1.15 0.24
0.03 0.05	0.60 0.96	1.17 0.21
0.05 0.08	0.62 0.98	1.18 0.19
0.07 0.11	0.63 1.01	1.20 0.16
0.08 0.13	0.65 1.04 <<	1.22 0.13
0.10 0.16	0.67 1.01	1.23 0.11
0.12 0.19	0.68 0.98	1.25 0.08
0.13 0.21	0.70 0.96	1.27 0.05
0.15 0.24	0.72 0.93	1.28 0.03
0.17 0.27	0.73 0.90	
0.18 0.29	0.75 0.88	
0.20 0.32	0.77 0.85	...End
0.22 0.35	0.78 0.82	
0.23 0.37	0.80 0.80	
0.25 0.40	0.82 0.77	
0.27 0.43	0.83 0.74	
0.28 0.45	0.85 0.72	
0.30 0.48	0.87 0.69	
0.32 0.50	0.88 0.66	
0.33 0.53	0.90 0.64	
0.35 0.56	0.92 0.61	
0.37 0.58	0.93 0.58	
0.38 0.61	0.95 0.56	
0.40 0.64	0.97 0.53	
0.42 0.66	0.98 0.50	
0.43 0.69	1.00 0.48	
0.45 0.72	1.02 0.45	
0.47 0.74	1.03 0.43	
0.48 0.77	1.05 0.40	
0.50 0.80	1.07 0.37	
0.52 0.82	1.08 0.35	
0.53 0.85	1.10 0.32	
0.55 0.88	1.12 0.29	
0.57 0.90	1.13 0.27	

Hyd. No. 2 - Rational - 5 Yr - Qp = 1.04 cfs - Existing South Area



Hydrograph Report

Hyd. No. 4

Existing North D.A.

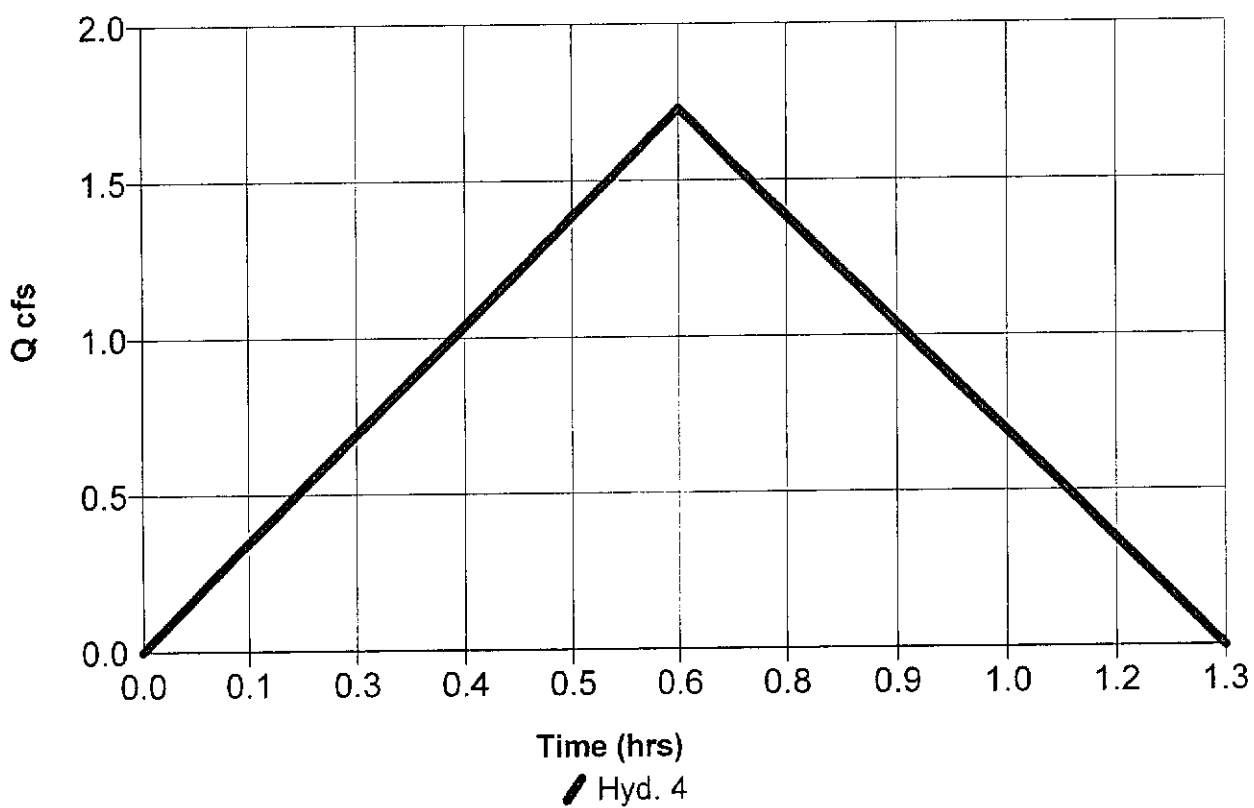
Hydrograph type	= Rational	Peak discharge	= 1.73 cfs
Storm frequency	= 5 yrs	Time interval	= 1 min
Drainage area	= 1.5 ac	Runoff coeff.	= 0.35
Intensity	= 3.253 in/hr	Time of conc. (Tc)	= 39 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 4,050 cuft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
0.02	0.04	0.58	1.55	1.15	0.40
0.03	0.09	0.60	1.60	1.17	0.36
0.05	0.13	0.62	1.64	1.18	0.31
0.07	0.18	0.63	1.69	1.20	0.27
0.08	0.22	0.65	1.73 <<	1.22	0.22
0.10	0.27	0.67	1.69	1.23	0.18
0.12	0.31	0.68	1.64	1.25	0.13
0.13	0.36	0.70	1.60	1.27	0.09
0.15	0.40	0.72	1.55	1.28	0.04
0.17	0.44	0.73	1.51		
0.18	0.49	0.75	1.46		
0.20	0.53	0.77	1.42	...End	
0.22	0.58	0.78	1.38		
0.23	0.62	0.80	1.33		
0.25	0.67	0.82	1.29		
0.27	0.71	0.83	1.24		
0.28	0.75	0.85	1.20		
0.30	0.80	0.87	1.15		
0.32	0.84	0.88	1.11		
0.33	0.89	0.90	1.07		
0.35	0.93	0.92	1.02		
0.37	0.98	0.93	0.98		
0.38	1.02	0.95	0.93		
0.40	1.07	0.97	0.89		
0.42	1.11	0.98	0.84		
0.43	1.15	1.00	0.80		
0.45	1.20	1.02	0.75		
0.47	1.24	1.03	0.71		
0.48	1.29	1.05	0.67		
0.50	1.33	1.07	0.62		
0.52	1.38	1.08	0.58		
0.53	1.42	1.10	0.53		
0.55	1.46	1.12	0.49		
0.57	1.51	1.13	0.44		

Hyd. No. 4 - Rational - 5 Yr - $Q_p = 1.73$ cfs - Existing North D.A.



Hydrograph Report

Hyd. No. 5

Total Existing Discharge

Hydrograph type = Combine
Storm frequency = 5 yrs
Inflow hyds. = 2, 3, 4

Peak discharge = 5.84 cfs
Time interval = 1 min

Hydrograph Volume = 13,669 cuft

Hydrograph Discharge Table

Time (hrs)	Hyd. 2 + (cfs)	Hyd. 3 + (cfs)	Hyd. 4 = (cfs)	Outflow (cfs)
0.02	0.03	0.08	0.04	0.15
0.03	0.05	0.16	0.09	0.30
0.05	0.08	0.24	0.13	0.45
0.07	0.11	0.32	0.18	0.60
0.08	0.13	0.39	0.22	0.75
0.10	0.16	0.47	0.27	0.90
0.12	0.19	0.55	0.31	1.05
0.13	0.21	0.63	0.36	1.20
0.15	0.24	0.71	0.40	1.35
0.17	0.27	0.79	0.44	1.50
0.18	0.29	0.87	0.49	1.65
0.20	0.32	0.95	0.53	1.80
0.22	0.35	1.02	0.58	1.95
0.23	0.37	1.10	0.62	2.10
0.25	0.40	1.18	0.67	2.25
0.27	0.43	1.26	0.71	2.40
0.28	0.45	1.34	0.75	2.55
0.30	0.48	1.42	0.80	2.70
0.32	0.50	1.50	0.84	2.85
0.33	0.53	1.58	0.89	3.00
0.35	0.56	1.66	0.93	3.15
0.37	0.58	1.73	0.98	3.30
0.38	0.61	1.81	1.02	3.44
0.40	0.64	1.89	1.07	3.59
0.42	0.66	1.97	1.11	3.74
0.43	0.69	2.05	1.15	3.89
0.45	0.72	2.13	1.20	4.04
0.47	0.74	2.21	1.24	4.19
0.48	0.77	2.29	1.29	4.34
0.50	0.80	2.36	1.33	4.49
0.52	0.82	2.44	1.38	4.64
0.53	0.85	2.52	1.42	4.79
0.55	0.88	2.60	1.46	4.94
0.57	0.90	2.68	1.51	5.09
0.58	0.93	2.76	1.55	5.24
0.60	0.96	2.84	1.60	5.39
0.62	0.98	2.92	1.64	5.54
0.63	1.01	3.00	1.69	5.69

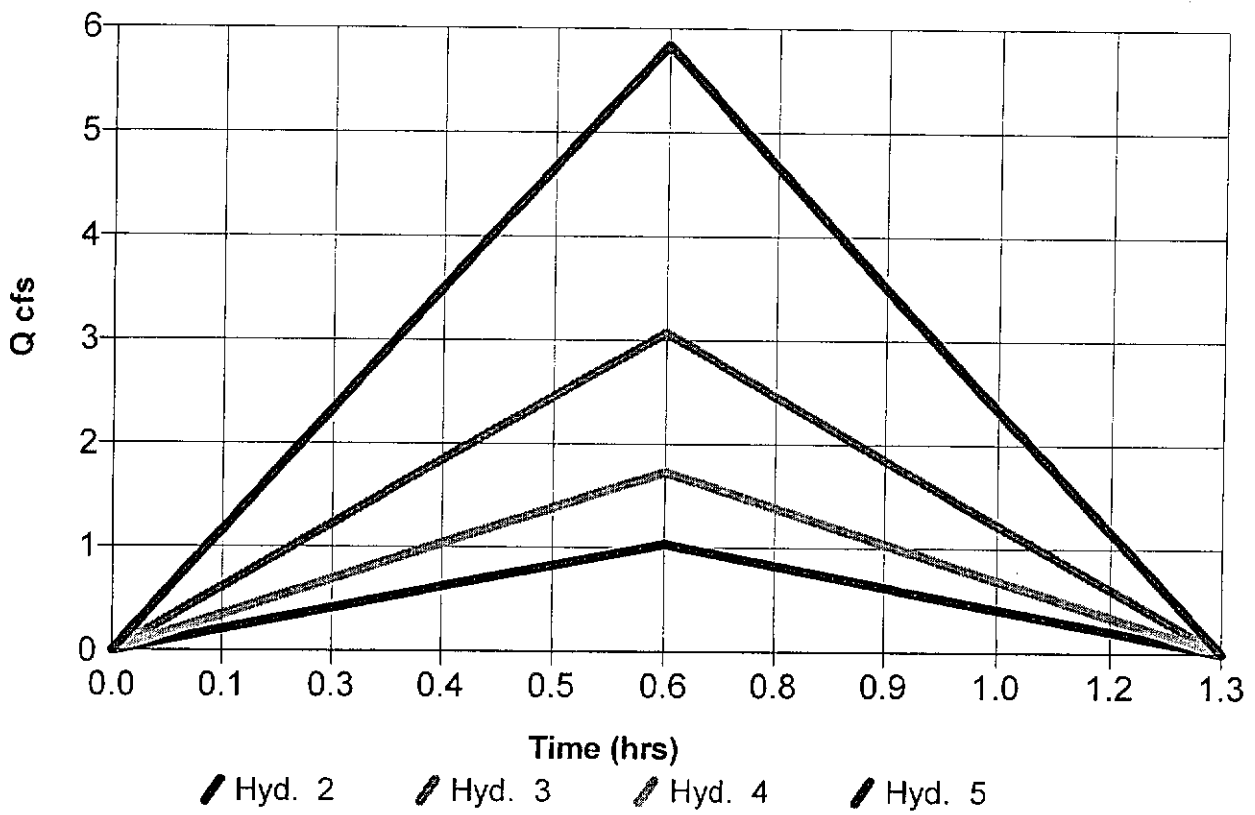
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Hydrograph Discharge Table

Time (hrs)	Hyd. 2 + (cfs)	Hyd. 3 + (cfs)	Hyd. 4 = (cfs)	Outflow (cfs)
0.65	1.04 <<	3.07 <<	1.73 <<	5.84 <<
0.67	1.01	3.00	1.69	5.69
0.68	0.98	2.92	1.64	5.54
0.70	0.96	2.84	1.60	5.39
0.72	0.93	2.76	1.55	5.24
0.73	0.90	2.68	1.51	5.09
0.75	0.88	2.60	1.46	4.94
0.77	0.85	2.52	1.42	4.79
0.78	0.82	2.44	1.38	4.64
0.80	0.80	2.36	1.33	4.49
0.82	0.77	2.29	1.29	4.34
0.83	0.74	2.21	1.24	4.19
0.85	0.72	2.13	1.20	4.04
0.87	0.69	2.05	1.15	3.89
0.88	0.66	1.97	1.11	3.74
0.90	0.64	1.89	1.07	3.59
0.92	0.61	1.81	1.02	3.44
0.93	0.58	1.73	0.98	3.30
0.95	0.56	1.66	0.93	3.15
0.97	0.53	1.58	0.89	3.00
0.98	0.50	1.50	0.84	2.85
1.00	0.48	1.42	0.80	2.70
1.02	0.45	1.34	0.75	2.55
1.03	0.43	1.26	0.71	2.40
1.05	0.40	1.18	0.67	2.25
1.07	0.37	1.10	0.62	2.10
1.08	0.35	1.02	0.58	1.95
1.10	0.32	0.95	0.53	1.80
1.12	0.29	0.87	0.49	1.65
1.13	0.27	0.79	0.44	1.50
1.15	0.24	0.71	0.40	1.35
1.17	0.21	0.63	0.36	1.20
1.18	0.19	0.55	0.31	1.05
1.20	0.16	0.47	0.27	0.90
1.22	0.13	0.39	0.22	0.75
1.23	0.11	0.32	0.18	0.60
1.25	0.08	0.24	0.13	0.45
1.27	0.05	0.16	0.09	0.30
1.28	0.03	0.08	0.04	0.15

...End

Hyd. No. 5 - Combine - 5 Yr - Qp = 5.84 cfs - Total Existing Discharge



Hydrograph Report

Hyd. No. 1

Developed South Phase 2

Hydrograph type	= Rational	Peak discharge	= 3.61 cfs
Storm frequency	= 5 yrs	Time interval	= 1 min
Drainage area	= 0.9 ac	Runoff coeff.	= 0.69
Intensity	= 5.743 in/hr	Time of conc. (Tc)	= 15 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 3,246 cuft

Hydrograph Discharge Table

Time -- Outflow
(hrs cfs)

0.02	0.24
0.03	0.48
0.05	0.72
0.07	0.96
0.08	1.20
0.10	1.44
0.12	1.68
0.13	1.92
0.15	2.16
0.17	2.40
0.18	2.64
0.20	2.89
0.22	3.13
0.23	3.37
0.25	3.61 <<
0.27	3.37
0.28	3.13
0.30	2.89
0.32	2.64
0.33	2.40
0.35	2.16
0.37	1.92
0.38	1.68
0.40	1.44
0.42	1.20
0.43	0.96
0.45	0.72
0.47	0.48
0.48	0.24

...End

Hydrograph Plot

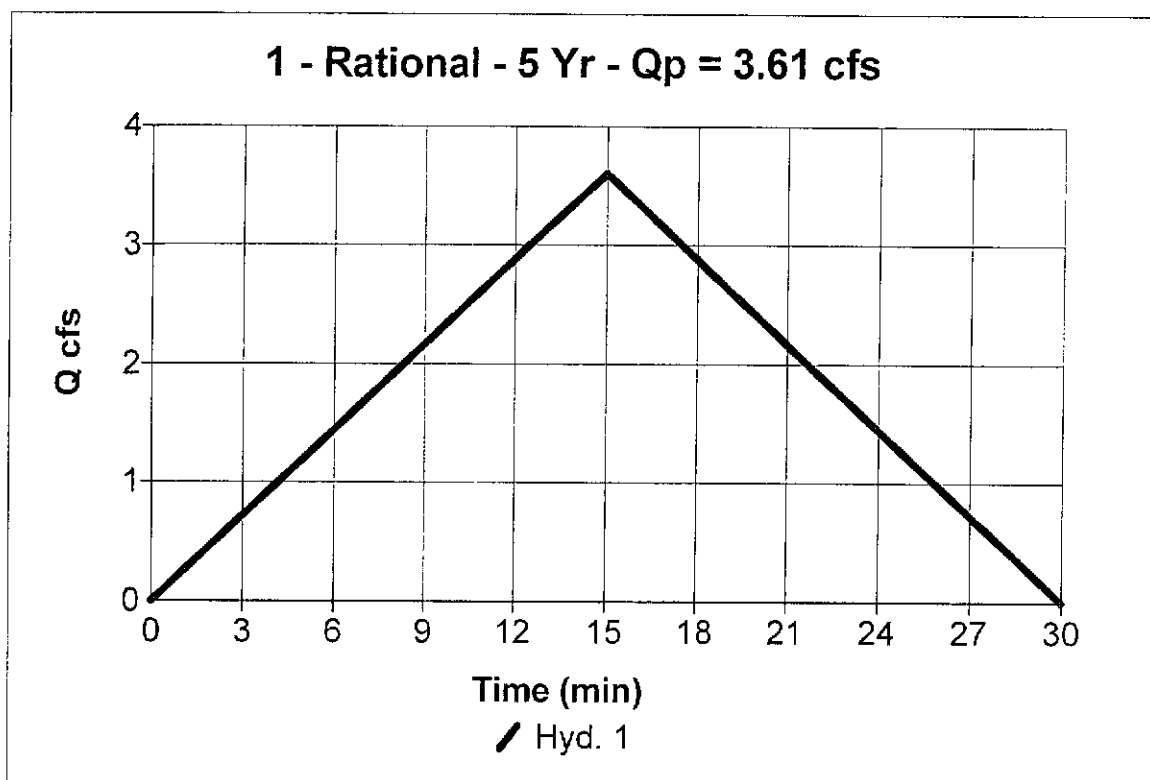
Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Developed South Phase 2

Hydrograph type	= Rational	Peak discharge	= 3.61 cfs
Storm frequency	= 5 yrs	Time interval	= 1 min
Drainage area	= 0.9 ac	Runoff coeff.	= 0.69
Intensity	= 5.743 in/hr	Time of conc. (Tc)	= 15 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 3,246 cuft



Hydrograph Report

Hyd. No. 6

Flow to South Inlet

Hydrograph type = Combine
Storm frequency = 5 yrs
Inflow hyds. = 1, 3

Peak discharge = 4.79 cfs
Time interval = 1 min

Hydrograph Volume = 10,440 cuft

Hydrograph Discharge Table

Time (hrs)	Hyd. 1 + (cfs)	Hyd. 3 + (cfs)	Outflow (cfs)
0.02	0.24	0.08	0.32
0.03	0.48	0.16	0.64
0.05	0.72	0.24	0.96
0.07	0.96	0.32	1.28
0.08	1.20	0.39	1.60
0.10	1.44	0.47	1.92
0.12	1.68	0.55	2.23
0.13	1.92	0.63	2.55
0.15	2.16	0.71	2.87
0.17	2.40	0.79	3.19
0.18	2.64	0.87	3.51
0.20	2.89	0.95	3.83
0.22	3.13	1.02	4.15
0.23	3.37	1.10	4.47
0.25	3.61 <<	1.18	4.79 <<
0.27	3.37	1.26	4.63
0.28	3.13	1.34	4.47
0.30	2.89	1.42	4.30
0.32	2.64	1.50	4.14
0.33	2.40	1.58	3.98
0.35	2.16	1.66	3.82
0.37	1.92	1.73	3.66
0.38	1.68	1.81	3.50
0.40	1.44	1.89	3.33
0.42	1.20	1.97	3.17
0.43	0.96	2.05	3.01
0.45	0.72	2.13	2.85
0.47	0.48	2.21	2.69
0.48	0.24	2.29	2.53
0.50	0.00	2.36	2.36
0.52	0.00	2.44	2.44
0.53	0.00	2.52	2.52
0.55	0.00	2.60	2.60
0.57	0.00	2.68	2.68
0.58	0.00	2.76	2.76
0.60	0.00	2.84	2.84
0.62	0.00	2.92	2.92
0.63	0.00	3.00	3.00

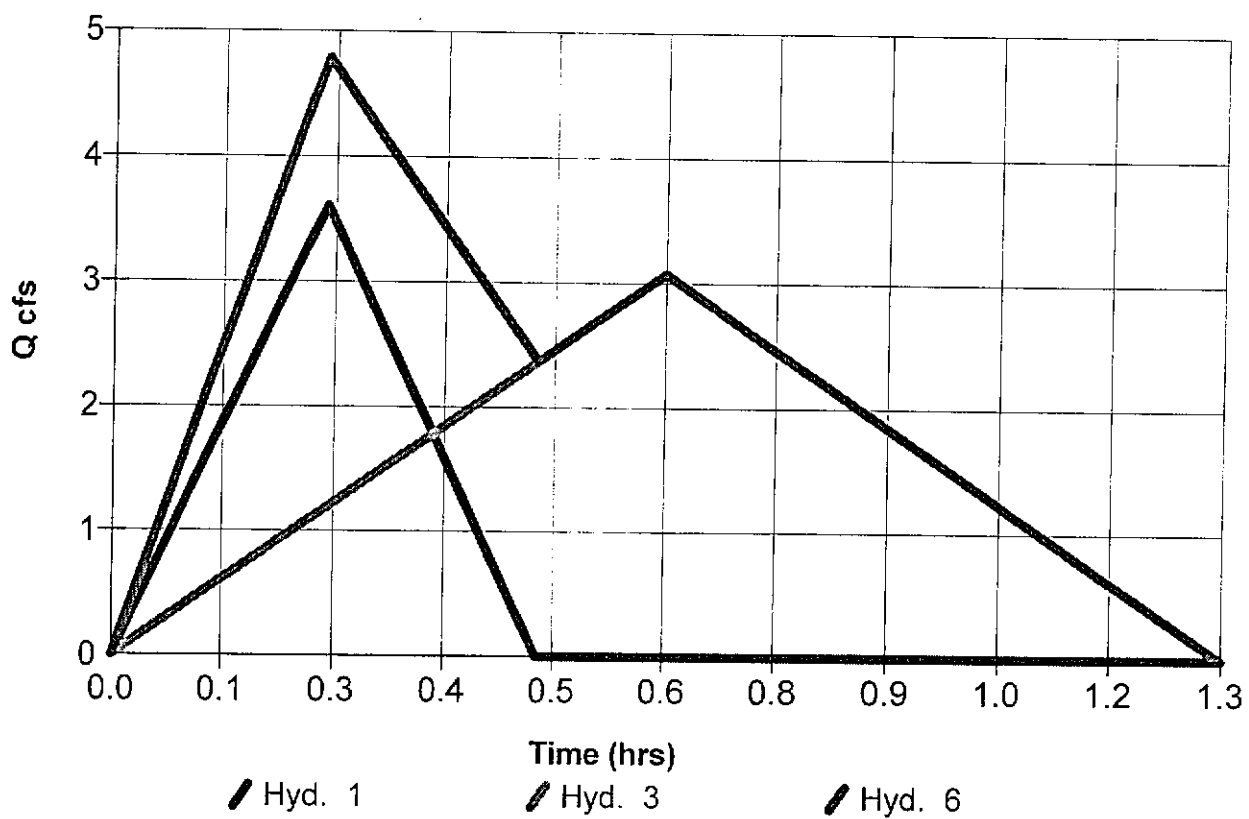
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Hydrograph Discharge Table

Time (hrs)	Hyd. 1 + (cfs)	Hyd. 3 + (cfs)	Outflow (cfs)
0.65	0.00	3.07 <<	3.07
0.67	0.00	3.00	3.00
0.68	0.00	2.92	2.92
0.70	0.00	2.84	2.84
0.72	0.00	2.76	2.76
0.73	0.00	2.68	2.68
0.75	0.00	2.60	2.60
0.77	0.00	2.52	2.52
0.78	0.00	2.44	2.44
0.80	0.00	2.36	2.36
0.82	0.00	2.29	2.29
0.83	0.00	2.21	2.21
0.85	0.00	2.13	2.13
0.87	0.00	2.05	2.05
0.88	0.00	1.97	1.97
0.90	0.00	1.89	1.89
0.92	0.00	1.81	1.81
0.93	0.00	1.73	1.73
0.95	0.00	1.66	1.66
0.97	0.00	1.58	1.58
0.98	0.00	1.50	1.50
1.00	0.00	1.42	1.42
1.02	0.00	1.34	1.34
1.03	0.00	1.26	1.26
1.05	0.00	1.18	1.18
1.07	0.00	1.10	1.10
1.08	0.00	1.02	1.02
1.10	0.00	0.95	0.95
1.12	0.00	0.87	0.87
1.13	0.00	0.79	0.79
1.15	0.00	0.71	0.71
1.17	0.00	0.63	0.63
1.18	0.00	0.55	0.55
1.20	0.00	0.47	0.47
1.22	0.00	0.39	0.39
1.23	0.00	0.32	0.32
1.25	0.00	0.24	0.24
1.27	0.00	0.16	0.16
1.28	0.00	0.08	0.08

...End

Hyd. No. 6 - Combine - 5 Yr - Qp = 4.79 cfs - Flow to South Inlet



Hydrograph Report

Hyd. No. 7

Disch. Out S. Inlet

Hydrograph type = Reservoir
 Storm frequency = 5 yrs
 Inflow hyd. No. = 6
 Max. Elevation = 1356.68 ft

Peak discharge = 4.79 cfs
 Time interval = 1 min
 Reservoir name = Det. at South Ar
 Max. Storage = 11 cuft

Storage Indication method used.

Outflow hydrograph volume = 10,440 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.02	0.32	1355.25	0.29	----	----	----	----	----	----	----	----	0.29
0.03	0.64	1355.38	0.65	----	----	----	----	----	----	----	----	0.65
0.05	0.96	1355.46	0.93	----	----	----	----	----	----	----	----	0.93
0.07	1.28	1355.54	1.29	----	----	----	----	----	----	----	----	1.29
0.08	1.60	1355.61	1.57	----	----	----	----	----	----	----	----	1.57
0.10	1.92	1355.68	1.92	----	----	----	----	----	----	----	----	1.92
0.12	2.23	1355.74	2.21	----	----	----	----	----	----	----	----	2.21
0.13	2.55	1355.81	2.56	----	----	----	----	----	----	----	----	2.56
0.15	2.87	1355.86	2.86	----	----	----	----	----	----	----	----	2.85
0.17	3.19	1355.93	3.19	----	----	----	----	----	----	----	----	3.19
0.18	3.51	1355.98	3.50	----	----	----	----	----	----	----	----	3.50
0.20	3.83	1356.05	3.83	----	----	----	----	----	----	----	----	3.83
0.22	4.15	1356.12	4.13	----	----	----	----	----	----	----	----	4.13
0.23	4.47	1356.44	4.40	----	----	----	----	----	----	----	----	4.40
0.25	4.79 <<	1356.68 <<	4.79	----	----	----	----	----	----	----	----	4.79 <<
0.27	4.63	1356.59	4.65	----	----	----	----	----	----	----	----	4.65
0.28	4.47	1356.49	4.47	----	----	----	----	----	----	----	----	4.47
0.30	4.30	1356.40	4.32	----	----	----	----	----	----	----	----	4.32
0.32	4.14	1356.14	4.20	----	----	----	----	----	----	----	----	4.20
0.33	3.98	1356.07	3.95	----	----	----	----	----	----	----	----	3.95
0.35	3.82	1356.05	3.86	----	----	----	----	----	----	----	----	3.86
0.37	3.66	1356.01	3.63	----	----	----	----	----	----	----	----	3.63
0.38	3.50	1355.99	3.53	----	----	----	----	----	----	----	----	3.53
0.40	3.33	1355.95	3.31	----	----	----	----	----	----	----	----	3.31
0.42	3.17	1355.93	3.20	----	----	----	----	----	----	----	----	3.20
0.43	3.01	1355.89	2.99	----	----	----	----	----	----	----	----	2.99
0.45	2.85	1355.87	2.87	----	----	----	----	----	----	----	----	2.87
0.47	2.69	1355.83	2.67	----	----	----	----	----	----	----	----	2.67
0.48	2.53	1355.80	2.55	----	----	----	----	----	----	----	----	2.55
0.50	2.36	1355.77	2.35	----	----	----	----	----	----	----	----	2.35
0.52	2.44	1355.79	2.45	----	----	----	----	----	----	----	----	2.45
0.53	2.52	1355.80	2.51	----	----	----	----	----	----	----	----	2.51
0.55	2.60	1355.82	2.61	----	----	----	----	----	----	----	----	2.61
0.57	2.68	1355.83	2.67	----	----	----	----	----	----	----	----	2.67
0.58	2.76	1355.85	2.76	----	----	----	----	----	----	----	----	2.76
0.60	2.84	1355.86	2.83	----	----	----	----	----	----	----	----	2.83
0.62	2.92	1355.87	2.92	----	----	----	----	----	----	----	----	2.92
0.63	3.00	1355.89	2.99	----	----	----	----	----	----	----	----	2.99

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.65	3.07	1355.90	3.08	----	----	----	----	----	----	----	----	3.08
0.67	3.00	1355.89	3.00	----	----	----	----	----	----	----	----	3.00
0.68	2.92	1355.87	2.92	----	----	----	----	----	----	----	----	2.92
0.70	2.84	1355.86	2.84	----	----	----	----	----	----	----	----	2.84
0.72	2.76	1355.84	2.76	----	----	----	----	----	----	----	----	2.76
0.73	2.68	1355.83	2.68	----	----	----	----	----	----	----	----	2.68
0.75	2.60	1355.82	2.60	----	----	----	----	----	----	----	----	2.60
0.77	2.52	1355.80	2.52	----	----	----	----	----	----	----	----	2.52
0.78	2.44	1355.78	2.45	----	----	----	----	----	----	----	----	2.45
0.80	2.36	1355.77	2.37	----	----	----	----	----	----	----	----	2.37
0.82	2.29	1355.75	2.29	----	----	----	----	----	----	----	----	2.29
0.83	2.21	1355.74	2.21	----	----	----	----	----	----	----	----	2.21
0.85	2.13	1355.72	2.13	----	----	----	----	----	----	----	----	2.13
0.87	2.05	1355.71	2.05	----	----	----	----	----	----	----	----	2.05
0.88	1.97	1355.69	1.97	----	----	----	----	----	----	----	----	1.97
0.90	1.89	1355.68	1.89	----	----	----	----	----	----	----	----	1.89
0.92	1.81	1355.66	1.82	----	----	----	----	----	----	----	----	1.82
0.93	1.73	1355.64	1.74	----	----	----	----	----	----	----	----	1.74
0.95	1.66	1355.63	1.66	----	----	----	----	----	----	----	----	1.66
0.97	1.58	1355.61	1.58	----	----	----	----	----	----	----	----	1.58
0.98	1.50	1355.59	1.50	----	----	----	----	----	----	----	----	1.50
1.00	1.42	1355.57	1.42	----	----	----	----	----	----	----	----	1.42
1.02	1.34	1355.56	1.34	----	----	----	----	----	----	----	----	1.34
1.03	1.26	1355.54	1.26	----	----	----	----	----	----	----	----	1.26
1.05	1.18	1355.52	1.18	----	----	----	----	----	----	----	----	1.18
1.07	1.10	1355.50	1.11	----	----	----	----	----	----	----	----	1.11
1.08	1.02	1355.48	1.02	----	----	----	----	----	----	----	----	1.03
1.10	0.95	1355.46	0.95	----	----	----	----	----	----	----	----	0.95
1.12	0.87	1355.44	0.87	----	----	----	----	----	----	----	----	0.87
1.13	0.79	1355.42	0.79	----	----	----	----	----	----	----	----	0.79
1.15	0.71	1355.39	0.71	----	----	----	----	----	----	----	----	0.71
1.17	0.63	1355.37	0.63	----	----	----	----	----	----	----	----	0.63
1.18	0.55	1355.35	0.55	----	----	----	----	----	----	----	----	0.55
1.20	0.47	1355.32	0.48	----	----	----	----	----	----	----	----	0.48
1.22	0.39	1355.29	0.40	----	----	----	----	----	----	----	----	0.40
1.23	0.32	1355.26	0.32	----	----	----	----	----	----	----	----	0.32
1.25	0.24	1355.22	0.24	----	----	----	----	----	----	----	----	0.24
1.27	0.16	1355.18	0.16	----	----	----	----	----	----	----	----	0.16
1.28	0.08	1355.13	0.08	----	----	----	----	----	----	----	----	0.08

...End

Reservoir Report

Reservoir No. 1 - Det. at South Area Inlet

Hydraflow Hydrographs by Intelisolve

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1355.00	00	0	0
0.50	1355.50	08	2	2
1.00	1356.00	08	4	6
1.50	1356.50	08	4	10
2.00	1357.00	08	4	14
2.50	1357.50	08	4	18
3.00	1358.00	08	4	22
3.50	1358.50	08	4	26
4.00	1359.00	08	4	30
4.50	1359.50	2,321	582	612
5.00	1360.00	8,557	2,720	3,332
5.50	1360.50	19,011	6,892	10,224

Culvert / Orifice Structures

Weir Structures

	[A]	[B]	[C]	[D]
Rise in	= 15.0	0.0	0.0	0.0
Span in	= 15.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1355.00	0.00	0.00	0.00
Length ft	= 210.0	0.0	0.0	0.0
Slope %	= 0.51	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	Civ D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0	1355.00	0.00	---	---	---	---	---	---	---	---	0.00
0.05	0	1355.05	0.01	---	---	---	---	---	---	---	---	0.01
0.10	0	1355.10	0.05	---	---	---	---	---	---	---	---	0.05
0.15	1	1355.15	0.11	---	---	---	---	---	---	---	---	0.11
0.20	1	1355.20	0.19	---	---	---	---	---	---	---	---	0.19
0.25	1	1355.25	0.30	---	---	---	---	---	---	---	---	0.30
0.30	1	1355.30	0.42	---	---	---	---	---	---	---	---	0.42
0.35	1	1355.35	0.57	---	---	---	---	---	---	---	---	0.57
0.40	2	1355.40	0.73	---	---	---	---	---	---	---	---	0.73
0.45	2	1355.45	0.91	---	---	---	---	---	---	---	---	0.91
0.50	2	1355.50	1.10	---	---	---	---	---	---	---	---	1.10
0.55	2	1355.55	1.31	---	---	---	---	---	---	---	---	1.31
0.60	3	1355.60	1.54	---	---	---	---	---	---	---	---	1.54
0.65	3	1355.65	1.77	---	---	---	---	---	---	---	---	1.77
0.70	4	1355.70	2.02	---	---	---	---	---	---	---	---	2.02
0.75	4	1355.75	2.27	---	---	---	---	---	---	---	---	2.27
0.80	4	1355.80	2.53	---	---	---	---	---	---	---	---	2.53
0.85	5	1355.85	2.79	---	---	---	---	---	---	---	---	2.79
0.90	5	1355.90	3.06	---	---	---	---	---	---	---	---	3.06
0.95	6	1355.95	3.32	---	---	---	---	---	---	---	---	3.32
1.00	6	1356.00	3.58	---	---	---	---	---	---	---	---	3.58
1.05	6	1356.05	3.84	---	---	---	---	---	---	---	---	3.84
1.10	7	1356.10	4.09	---	---	---	---	---	---	---	---	4.09
1.15	7	1356.15	4.23	---	---	---	---	---	---	---	---	4.23
1.20	8	1356.20	4.25	---	---	---	---	---	---	---	---	4.25
1.25	8	1356.25	4.05	---	---	---	---	---	---	---	---	4.05

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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
1.30	8	1356.30	4.14	---	---	---	---	---	---	---	---	4.14
1.35	9	1356.35	4.23	---	---	---	---	---	---	---	---	4.23
1.40	9	1356.40	4.32	---	---	---	---	---	---	---	---	4.32
1.45	10	1356.45	4.41	---	---	---	---	---	---	---	---	4.41
1.50	10	1356.50	4.50	---	---	---	---	---	---	---	---	4.50
1.55	10	1356.55	4.58	---	---	---	---	---	---	---	---	4.58
1.60	11	1356.60	4.66	---	---	---	---	---	---	---	---	4.66
1.65	11	1356.65	4.75	---	---	---	---	---	---	---	---	4.75
1.70	12	1356.70	4.83	---	---	---	---	---	---	---	---	4.83
1.75	12	1356.75	4.90	---	---	---	---	---	---	---	---	4.90
1.80	12	1356.80	4.98	---	---	---	---	---	---	---	---	4.98
1.85	13	1356.85	5.06	---	---	---	---	---	---	---	---	5.06
1.90	13	1356.90	5.13	---	---	---	---	---	---	---	---	5.13
1.95	14	1356.95	5.21	---	---	---	---	---	---	---	---	5.21
2.00	14	1357.00	5.28	---	---	---	---	---	---	---	---	5.28
2.05	14	1357.05	5.35	---	---	---	---	---	---	---	---	5.35
2.10	15	1357.10	5.42	---	---	---	---	---	---	---	---	5.42
2.15	15	1357.15	5.49	---	---	---	---	---	---	---	---	5.49
2.20	16	1357.20	5.56	---	---	---	---	---	---	---	---	5.56
2.25	16	1357.25	5.63	---	---	---	---	---	---	---	---	5.63
2.30	16	1357.30	5.70	---	---	---	---	---	---	---	---	5.70
2.35	17	1357.35	5.76	---	---	---	---	---	---	---	---	5.76
2.40	17	1357.40	5.83	---	---	---	---	---	---	---	---	5.83
2.45	18	1357.45	5.90	---	---	---	---	---	---	---	---	5.90
2.50	18	1357.50	5.96	---	---	---	---	---	---	---	---	5.96
2.55	18	1357.55	6.02	---	---	---	---	---	---	---	---	6.02
2.60	19	1357.60	6.09	---	---	---	---	---	---	---	---	6.09
2.65	19	1357.65	6.15	---	---	---	---	---	---	---	---	6.15
2.70	20	1357.70	6.21	---	---	---	---	---	---	---	---	6.21
2.75	20	1357.75	6.27	---	---	---	---	---	---	---	---	6.27
2.80	20	1357.80	6.33	---	---	---	---	---	---	---	---	6.33
2.85	21	1357.85	6.39	---	---	---	---	---	---	---	---	6.39
2.90	21	1357.90	6.45	---	---	---	---	---	---	---	---	6.45
2.95	22	1357.95	6.51	---	---	---	---	---	---	---	---	6.51
3.00	22	1358.00	6.57	---	---	---	---	---	---	---	---	6.57
3.05	22	1358.05	6.63	---	---	---	---	---	---	---	---	6.63
3.10	23	1358.10	6.69	---	---	---	---	---	---	---	---	6.69
3.15	23	1358.15	6.74	---	---	---	---	---	---	---	---	6.74
3.20	24	1358.20	6.80	---	---	---	---	---	---	---	---	6.80
3.25	24	1358.25	6.86	---	---	---	---	---	---	---	---	6.86
3.30	24	1358.30	6.91	---	---	---	---	---	---	---	---	6.91
3.35	25	1358.35	6.97	---	---	---	---	---	---	---	---	6.97
3.40	25	1358.40	7.02	---	---	---	---	---	---	---	---	7.02
3.45	26	1358.45	7.08	---	---	---	---	---	---	---	---	7.08
3.50	26	1358.50	7.13	---	---	---	---	---	---	---	---	7.13
3.55	26	1358.55	7.18	---	---	---	---	---	---	---	---	7.18
3.60	27	1358.60	7.24	---	---	---	---	---	---	---	---	7.24
3.65	27	1358.65	7.29	---	---	---	---	---	---	---	---	7.29
3.70	28	1358.70	7.34	---	---	---	---	---	---	---	---	7.34
3.75	28	1358.75	7.39	---	---	---	---	---	---	---	---	7.39
3.80	28	1358.80	7.44	---	---	---	---	---	---	---	---	7.44
3.85	29	1358.85	7.50	---	---	---	---	---	---	---	---	7.50
3.90	29	1358.90	7.55	---	---	---	---	---	---	---	---	7.55
3.95	30	1358.95	7.60	---	---	---	---	---	---	---	---	7.60
4.00	30	1359.00	7.65	---	---	---	---	---	---	---	---	7.65
4.05	88	1359.05	7.70	---	---	---	---	---	---	---	---	7.70
4.10	146	1359.10	7.75	---	---	---	---	---	---	---	---	7.75
4.15	205	1359.15	7.80	---	---	---	---	---	---	---	---	7.80
4.20	263	1359.20	7.85	---	---	---	---	---	---	---	---	7.85
4.25	321	1359.25	7.89	---	---	---	---	---	---	---	---	7.89
4.30	379	1359.30	7.94	---	---	---	---	---	---	---	---	7.94
4.35	438	1359.35	7.99	---	---	---	---	---	---	---	---	7.99
4.40	496	1359.40	8.04	---	---	---	---	---	---	---	---	8.04
4.45	554	1359.45	8.09	---	---	---	---	---	---	---	---	8.09
4.50	612	1359.50	8.13	---	---	---	---	---	---	---	---	8.13
4.55	884	1359.55	8.18	---	---	---	---	---	---	---	---	8.18
4.60	1,156	1359.60	8.23	---	---	---	---	---	---	---	---	8.23
4.65	1,428	1359.65	8.27	---	---	---	---	---	---	---	---	8.27
4.70	1,700	1359.70	8.32	---	---	---	---	---	---	---	---	8.32
4.75	1,972	1359.75	8.36	---	---	---	---	---	---	---	---	8.36

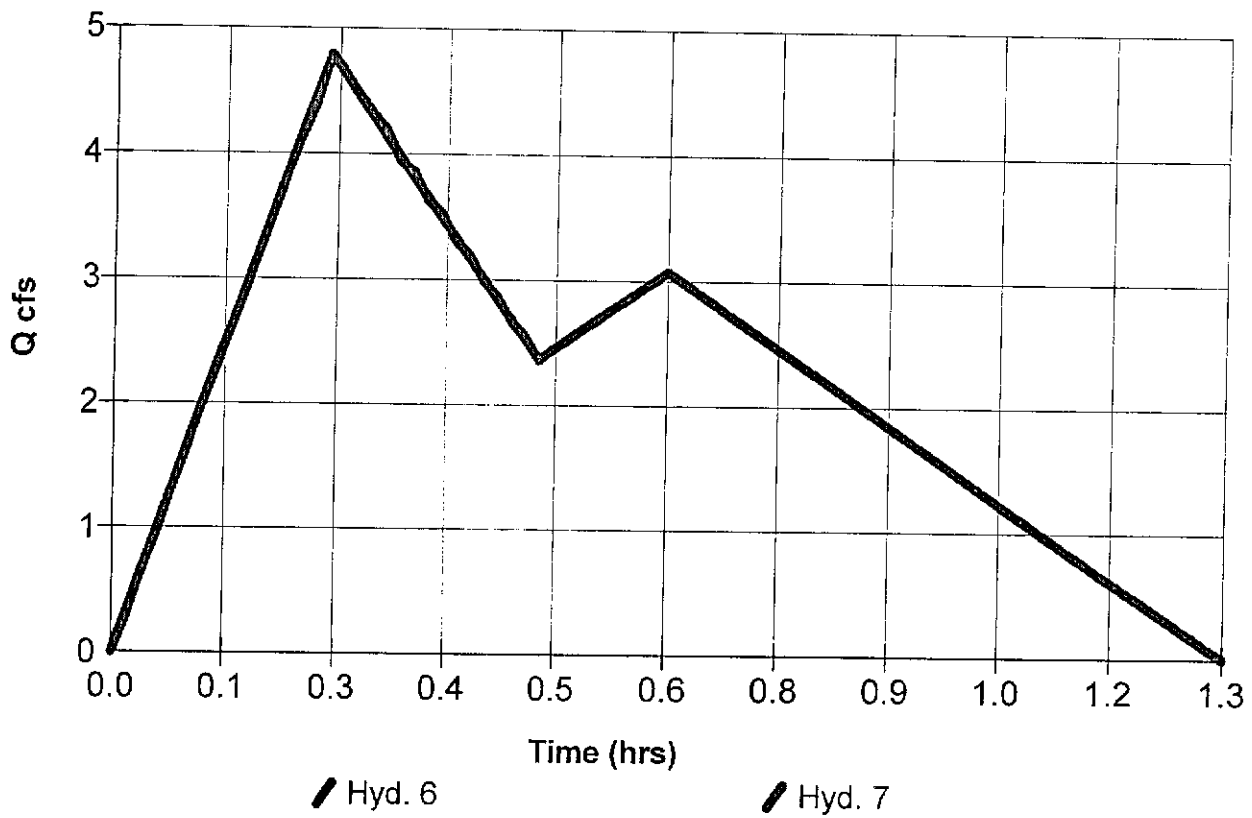
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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
4.80	2,244	1359.80	8.41	---	---	---	---	---	---	---	---	8.41
4.85	2,516	1359.85	8.46	---	---	---	---	---	---	---	---	8.46
4.90	2,788	1359.90	8.50	---	---	---	---	---	---	---	---	8.50
4.95	3,060	1359.95	8.55	---	---	---	---	---	---	---	---	8.55
5.00	3,332	1360.00	8.59	---	---	---	---	---	---	---	---	8.59
5.05	4,021	1360.05	8.63	---	---	---	---	---	---	---	---	8.63
5.10	4,710	1360.10	8.68	---	---	---	---	---	---	---	---	8.68
5.15	5,399	1360.15	8.72	---	---	---	---	---	---	---	---	8.72
5.20	6,089	1360.20	8.77	---	---	---	---	---	---	---	---	8.77
5.25	6,778	1360.25	8.81	---	---	---	---	---	---	---	---	8.81
5.30	7,467	1360.30	8.85	---	---	---	---	---	---	---	---	8.85
5.35	8,156	1360.35	8.90	---	---	---	---	---	---	---	---	8.90
5.40	8,845	1360.40	8.94	---	---	---	---	---	---	---	---	8.94
5.45	9,535	1360.45	8.98	---	---	---	---	---	---	---	---	8.98
5.50	10,224	1360.50	9.02	---	---	---	---	---	---	---	---	9.02

...End

Hyd. No. 7 - Reservoir - 5 Yr - Qp = 4.79 cfs - Disch. Out S. Inlet



Hydrograph Report

Hyd. No. 8

Developed North Inlet

Hydrograph type	= Rational	Peak discharge	= 6.02 cfs
Storm frequency	= 5 yrs	Time interval	= 1 min
Drainage area	= 1.5 ac	Runoff coeff.	= 0.69
Intensity	= 5.743 in/hr	Time of conc. (Tc)	= 15 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 5,421 cuft

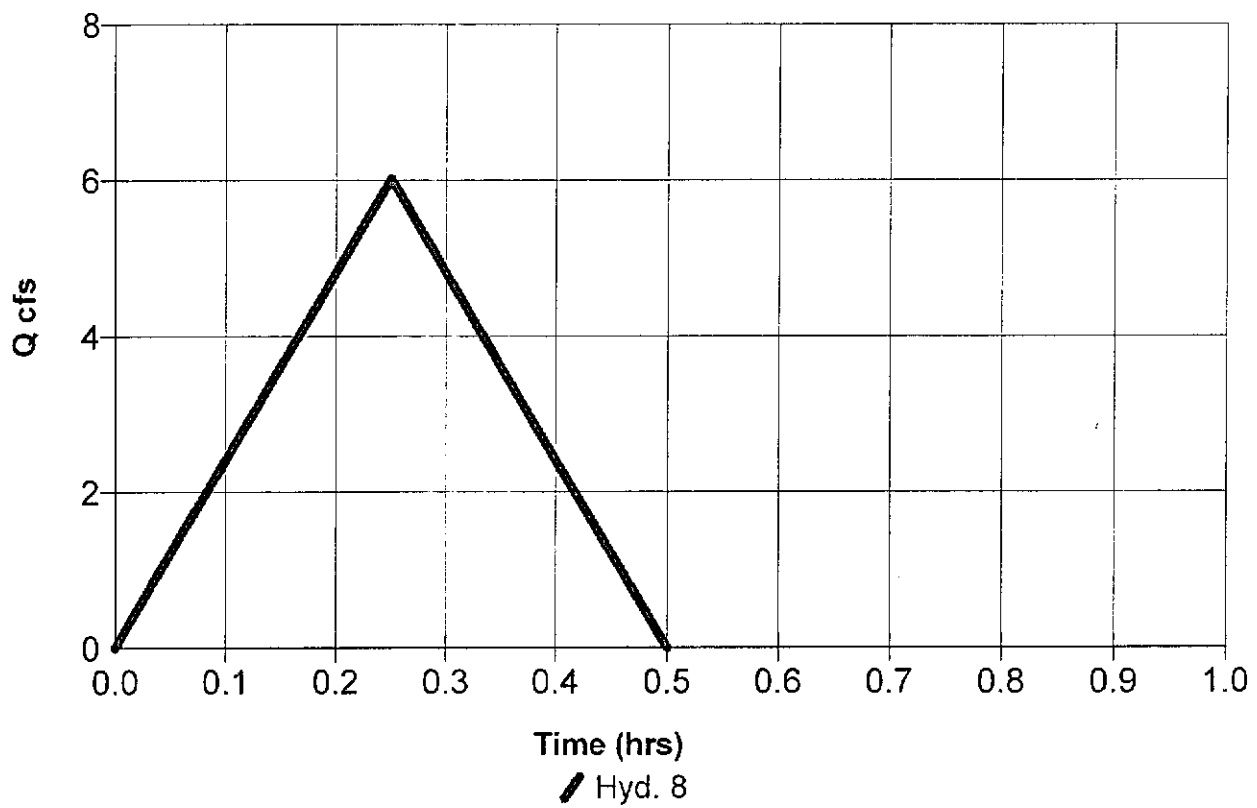
Hydrograph Discharge Table

Time -- Outflow
(hrs cfs)

0.02	0.40
0.03	0.80
0.05	1.20
0.07	1.61
0.08	2.01
0.10	2.41
0.12	2.81
0.13	3.21
0.15	3.61
0.17	4.02
0.18	4.42
0.20	4.82
0.22	5.22
0.23	5.62
0.25	6.02 <<
0.27	5.62
0.28	5.22
0.30	4.82
0.32	4.42
0.33	4.02
0.35	3.61
0.37	3.21
0.38	2.81
0.40	2.41
0.42	2.01
0.43	1.61
0.45	1.20
0.47	0.80
0.48	0.40

...End

Hyd. No. 8 - Rational - 5 Yr - $Q_p = 6.02$ cfs - Developed North Inlet



Hydrograph Report

Hyd. No. 9

Flow Into N. Inlet

Hydrograph type = Combine
Storm frequency = 5 yrs
Inflow hyds. = 7, 8

Peak discharge = 10.82 cfs
Time interval = 1 min

Hydrograph Volume = 15,861 cuft

Hydrograph Discharge Table

Time (hrs)	Hyd. 7 + (cfs)	Hyd. 8 = (cfs)	Outflow (cfs)
0.02	0.29	0.40	0.69
0.03	0.65	0.80	1.46
0.05	0.93	1.20	2.14
0.07	1.29	1.61	2.89
0.08	1.57	2.01	3.58
0.10	1.92	2.41	4.33
0.12	2.21	2.81	5.02
0.13	2.56	3.21	5.77
0.15	2.85	3.61	6.47
0.17	3.19	4.02	7.21
0.18	3.50	4.42	7.91
0.20	3.83	4.82	8.65
0.22	4.13	5.22	9.35
0.23	4.40	5.62	10.02
0.25	4.79 <<	6.02 <<	10.82 <<
0.27	4.65	5.62	10.27
0.28	4.47	5.22	9.69
0.30	4.32	4.82	9.14
0.32	4.20	4.42	8.61
0.33	3.95	4.02	7.96
0.35	3.86	3.61	7.47
0.37	3.63	3.21	6.84
0.38	3.53	2.81	6.34
0.40	3.31	2.41	5.72
0.42	3.20	2.01	5.21
0.43	2.99	1.61	4.60
0.45	2.87	1.20	4.08
0.47	2.67	0.80	3.48
0.48	2.55	0.40	2.95
0.50	2.35	0.00	2.35
0.52	2.45	0.00	2.45
0.53	2.51	0.00	2.51
0.55	2.61	0.00	2.61
0.57	2.67	0.00	2.67
0.58	2.76	0.00	2.76
0.60	2.83	0.00	2.83
0.62	2.92	0.00	2.92
0.63	2.99	0.00	2.99

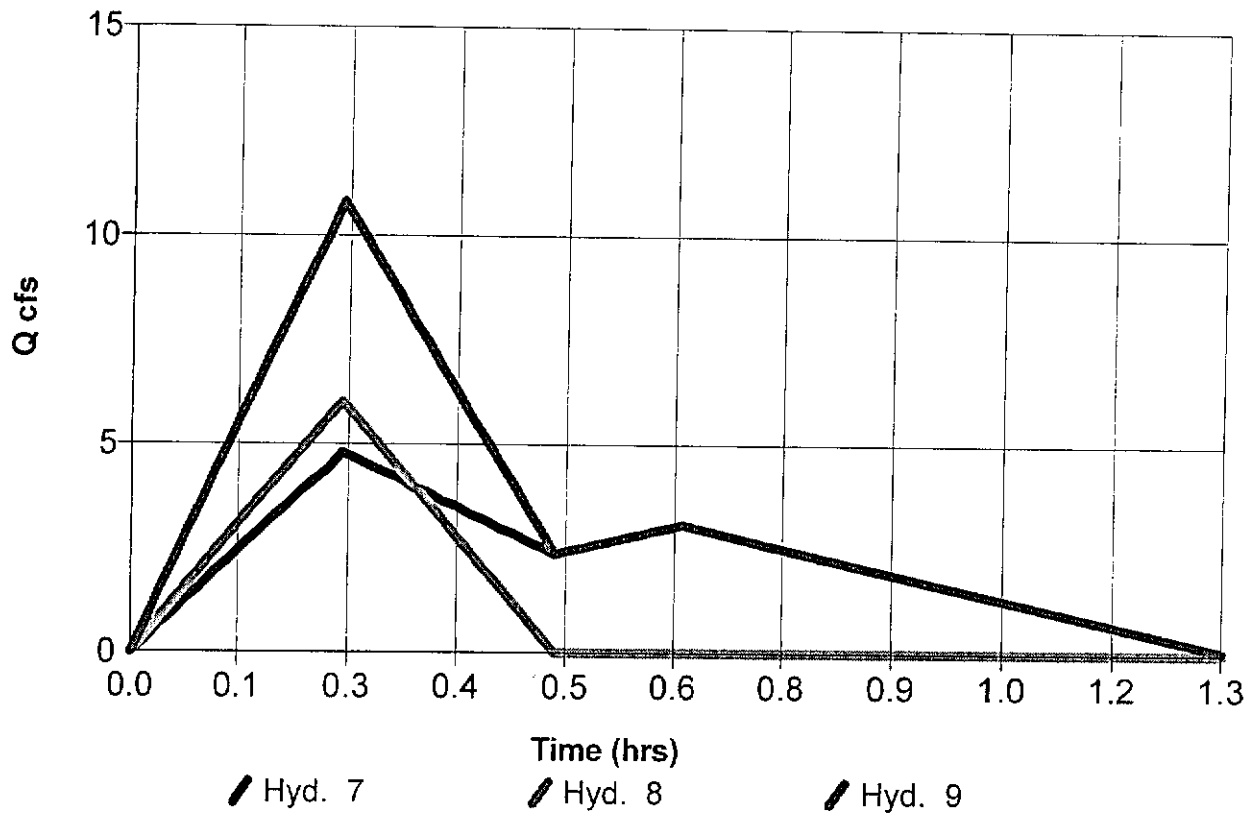
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Hydrograph Discharge Table

Time (hrs)	Hyd. 7 + (cfs)	Hyd. 8 = (cfs)	Outflow (cfs)
0.65	3.08	0.00	3.08
0.67	3.00	0.00	3.00
0.68	2.92	0.00	2.92
0.70	2.84	0.00	2.84
0.72	2.76	0.00	2.76
0.73	2.68	0.00	2.68
0.75	2.60	0.00	2.60
0.77	2.52	0.00	2.52
0.78	2.45	0.00	2.45
0.80	2.37	0.00	2.37
0.82	2.29	0.00	2.29
0.83	2.21	0.00	2.21
0.85	2.13	0.00	2.13
0.87	2.05	0.00	2.05
0.88	1.97	0.00	1.97
0.90	1.89	0.00	1.89
0.92	1.82	0.00	1.82
0.93	1.74	0.00	1.74
0.95	1.66	0.00	1.66
0.97	1.58	0.00	1.58
0.98	1.50	0.00	1.50
1.00	1.42	0.00	1.42
1.02	1.34	0.00	1.34
1.03	1.26	0.00	1.26
1.05	1.18	0.00	1.18
1.07	1.11	0.00	1.11
1.08	1.03	0.00	1.03
1.10	0.95	0.00	0.95
1.12	0.87	0.00	0.87
1.13	0.79	0.00	0.79
1.15	0.71	0.00	0.71
1.17	0.63	0.00	0.63
1.18	0.55	0.00	0.55
1.20	0.48	0.00	0.48
1.22	0.40	0.00	0.40
1.23	0.32	0.00	0.32
1.25	0.24	0.00	0.24
1.27	0.16	0.00	0.16

...End

Hyd. No. 9 - Combine - 5 Yr - $Q_p = 10.82$ cfs - Flow Into N. Inlet



Hydrograph Report

Hyd. No. 10

Disch. Out N. Inlet

Hydrograph type = Reservoir
 Storm frequency = 5 yrs
 Inflow hyd. No. = 9
 Max. Elevation = 1360.03 ft

Peak discharge = 4.63 cfs
 Time interval = 1 min
 Reservoir name = Det. at North Are
 Max. Storage = 3,838 cuft

Storage Indication method used.

Outflow hydrograph volume = 15,861 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.02	0.69	1354.43	0.63	----	----	----	----	----	----	----	----	0.63
0.03	1.46	1354.89	1.40	----	----	----	----	----	----	----	----	1.40
0.05	2.14	1355.47	2.04	----	----	----	----	----	----	----	----	2.04
0.07	2.89	1356.37	2.75	----	----	----	----	----	----	----	----	2.75
0.08	3.58	1357.47	3.43	----	----	----	----	----	----	----	----	3.43
0.10	4.33	1358.85	4.12	----	----	----	----	----	----	----	----	4.12
0.12	5.02	1359.03	4.20	----	----	----	----	----	----	----	----	4.20
0.13	5.77	1359.09	4.23	----	----	----	----	----	----	----	----	4.23
0.15	6.47	1359.18	4.27	----	----	----	----	----	----	----	----	4.27
0.17	7.21	1359.31	4.33	----	----	----	----	----	----	----	----	4.33
0.18	7.91	1359.48	4.40	----	----	----	----	----	----	----	----	4.40
0.20	8.65	1359.54	4.42	----	----	----	----	----	----	----	----	4.42
0.22	9.35	1359.59	4.45	----	----	----	----	----	----	----	----	4.45
0.23	10.02	1359.65	4.47	----	----	----	----	----	----	----	----	4.47
0.25	10.82 <<	1359.71	4.50	----	----	----	----	----	----	----	----	4.50
0.27	10.27	1359.78	4.53	----	----	----	----	----	----	----	----	4.53
0.28	9.69	1359.84	4.55	----	----	----	----	----	----	----	----	4.55
0.30	9.14	1359.89	4.57	----	----	----	----	----	----	----	----	4.57
0.32	8.61	1359.94	4.59	----	----	----	----	----	----	----	----	4.59
0.33	7.96	1359.98	4.61	----	----	----	----	----	----	----	----	4.61
0.35	7.47	1360.01	4.62	----	----	----	----	----	----	----	----	4.62
0.37	6.84	1360.01	4.62	----	----	----	----	----	----	----	----	4.62
0.38	6.34	1360.02	4.63	----	----	----	----	----	----	----	----	4.63
0.40	5.72	1360.03	4.63	----	----	----	----	----	----	----	----	4.63
0.42	5.21	1360.03	4.63	----	----	----	----	----	----	----	----	4.63
0.43	4.60	1360.03 <<	4.63	----	----	----	----	----	----	----	----	4.63 <<
0.45	4.08	1360.03	4.63	----	----	----	----	----	----	----	----	4.63
0.47	3.48	1360.03	4.63	----	----	----	----	----	----	----	----	4.63
0.48	2.95	1360.02	4.63	----	----	----	----	----	----	----	----	4.63
0.50	2.35	1360.01	4.62	----	----	----	----	----	----	----	----	4.62
0.52	2.45	1360.01	4.62	----	----	----	----	----	----	----	----	4.62
0.53	2.51	1359.99	4.61	----	----	----	----	----	----	----	----	4.61
0.55	2.61	1359.97	4.61	----	----	----	----	----	----	----	----	4.61
0.57	2.67	1359.95	4.60	----	----	----	----	----	----	----	----	4.60
0.58	2.76	1359.93	4.59	----	----	----	----	----	----	----	----	4.59
0.60	2.83	1359.91	4.58	----	----	----	----	----	----	----	----	4.58
0.62	2.92	1359.89	4.57	----	----	----	----	----	----	----	----	4.57
0.63	2.99	1359.87	4.56	----	----	----	----	----	----	----	----	4.56

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.65	3.08	1359.86	4.56	----	----	----	----	----	----	----	----	4.56
0.67	3.00	1359.84	4.55	----	----	----	----	----	----	----	----	4.55
0.68	2.92	1359.82	4.54	----	----	----	----	----	----	----	----	4.54
0.70	2.84	1359.80	4.54	----	----	----	----	----	----	----	----	4.54
0.72	2.76	1359.78	4.53	----	----	----	----	----	----	----	----	4.53
0.73	2.68	1359.76	4.52	----	----	----	----	----	----	----	----	4.52
0.75	2.60	1359.74	4.51	----	----	----	----	----	----	----	----	4.51
0.77	2.52	1359.72	4.50	----	----	----	----	----	----	----	----	4.50
0.78	2.45	1359.70	4.49	----	----	----	----	----	----	----	----	4.49
0.80	2.37	1359.68	4.48	----	----	----	----	----	----	----	----	4.48
0.82	2.29	1359.65	4.47	----	----	----	----	----	----	----	----	4.47
0.83	2.21	1359.63	4.46	----	----	----	----	----	----	----	----	4.46
0.85	2.13	1359.60	4.45	----	----	----	----	----	----	----	----	4.45
0.87	2.05	1359.58	4.44	----	----	----	----	----	----	----	----	4.44
0.88	1.97	1359.55	4.43	----	----	----	----	----	----	----	----	4.43
0.90	1.89	1359.52	4.42	----	----	----	----	----	----	----	----	4.42
0.92	1.82	1359.48	4.40	----	----	----	----	----	----	----	----	4.40
0.93	1.74	1359.34	4.34	----	----	----	----	----	----	----	----	4.34
0.95	1.66	1359.21	4.28	----	----	----	----	----	----	----	----	4.28
0.97	1.58	1359.07	4.22	----	----	----	----	----	----	----	----	4.22
0.98	1.50	1355.99	2.47	----	----	----	----	----	----	----	----	2.47
1.00	1.42	1354.51	0.85	----	----	----	----	----	----	----	----	0.84
1.02	1.34	1355.17	1.74	----	----	----	----	----	----	----	----	1.74
1.03	1.26	1354.57	1.03	----	----	----	----	----	----	----	----	1.03
1.05	1.18	1354.78	1.37	----	----	----	----	----	----	----	----	1.37
1.07	1.11	1354.56	0.98	----	----	----	----	----	----	----	----	0.98
1.08	1.03	1354.62	1.13	----	----	----	----	----	----	----	----	1.13
1.10	0.95	1354.52	0.87	----	----	----	----	----	----	----	----	0.87
1.12	0.87	1354.54	0.94	----	----	----	----	----	----	----	----	0.94
1.13	0.79	1354.47	0.73	----	----	----	----	----	----	----	----	0.73
1.15	0.71	1354.48	0.77	----	----	----	----	----	----	----	----	0.77
1.17	0.63	1354.41	0.59	----	----	----	----	----	----	----	----	0.59
1.18	0.55	1354.42	0.60	----	----	----	----	----	----	----	----	0.60
1.20	0.48	1354.35	0.44	----	----	----	----	----	----	----	----	0.44
1.22	0.40	1354.35	0.43	----	----	----	----	----	----	----	----	0.43
1.23	0.32	1354.28	0.29	----	----	----	----	----	----	----	----	0.29
1.25	0.24	1354.27	0.27	----	----	----	----	----	----	----	----	0.27
1.27	0.16	1354.19	0.14	----	----	----	----	----	----	----	----	0.14
1.28	0.08	1354.16	0.11	----	----	----	----	----	----	----	----	0.11

...End

Reservoir Report

Reservoir No. 2 - Det. at North Area Inlet

Hydraflow Hydrographs by Intelisolve

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1354.00	00	0	0
0.50	1354.50	08	2	2
1.00	1355.00	08	4	6
1.50	1355.50	08	4	10
2.00	1356.00	08	4	14
2.50	1356.50	08	4	18
3.00	1357.00	08	4	22
3.50	1357.50	08	4	26
4.00	1358.00	08	4	30
4.50	1358.50	08	4	34
5.00	1359.00	08	4	38
5.50	1359.50	2,321	582	620
6.00	1360.00	8,557	2,720	3,340
6.50	1360.50	24,517	8,269	11,608

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 10.0	0.0	0.0	0.0
Span in	= 10.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1354.00	0.00	0.00	0.00
Length ft	= 90.0	0.0	0.0	0.0
Slope %	= 0.51	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Stage / Storage / Discharge Table

Note: All outflows have been analyzed under inlet and outlet control.

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	Civ D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0	1354.00	0.00	---	---	---	---	---	---	---	---	0.00
0.05	0	1354.05	0.01	---	---	---	---	---	---	---	---	0.01
0.10	0	1354.10	0.04	---	---	---	---	---	---	---	---	0.04
0.15	1	1354.15	0.09	---	---	---	---	---	---	---	---	0.09
0.20	1	1354.20	0.15	---	---	---	---	---	---	---	---	0.15
0.25	1	1354.25	0.24	---	---	---	---	---	---	---	---	0.24
0.30	1	1354.30	0.33	---	---	---	---	---	---	---	---	0.33
0.35	1	1354.35	0.44	---	---	---	---	---	---	---	---	0.44
0.40	2	1354.40	0.56	---	---	---	---	---	---	---	---	0.56
0.45	2	1354.45	0.69	---	---	---	---	---	---	---	---	0.69
0.50	2	1354.50	0.82	---	---	---	---	---	---	---	---	0.82
0.55	2	1354.55	0.97	---	---	---	---	---	---	---	---	0.97
0.60	3	1354.60	1.10	---	---	---	---	---	---	---	---	1.10
0.65	3	1354.65	1.21	---	---	---	---	---	---	---	---	1.21
0.70	4	1354.70	1.29	---	---	---	---	---	---	---	---	1.29
0.75	4	1354.75	1.35	---	---	---	---	---	---	---	---	1.35
0.80	4	1354.80	1.38	---	---	---	---	---	---	---	---	1.38
0.85	5	1354.85	1.34	---	---	---	---	---	---	---	---	1.34
0.90	5	1354.90	1.41	---	---	---	---	---	---	---	---	1.41
0.95	6	1354.95	1.48	---	---	---	---	---	---	---	---	1.48
1.00	6	1355.00	1.54	---	---	---	---	---	---	---	---	1.54
1.05	6	1355.05	1.60	---	---	---	---	---	---	---	---	1.60
1.10	7	1355.10	1.66	---	---	---	---	---	---	---	---	1.66
1.15	7	1355.15	1.71	---	---	---	---	---	---	---	---	1.71

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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
1.20	8	1355.20	1.77	---	---	---	---	---	---	---	---	1.77
1.25	8	1355.25	1.82	---	---	---	---	---	---	---	---	1.82
1.30	8	1355.30	1.87	---	---	---	---	---	---	---	---	1.87
1.35	9	1355.35	1.92	---	---	---	---	---	---	---	---	1.92
1.40	9	1355.40	1.97	---	---	---	---	---	---	---	---	1.97
1.45	10	1355.45	2.02	---	---	---	---	---	---	---	---	2.02
1.50	10	1355.50	2.07	---	---	---	---	---	---	---	---	2.07
1.55	10	1355.55	2.11	---	---	---	---	---	---	---	---	2.11
1.60	11	1355.60	2.16	---	---	---	---	---	---	---	---	2.16
1.65	11	1355.65	2.20	---	---	---	---	---	---	---	---	2.20
1.70	12	1355.70	2.24	---	---	---	---	---	---	---	---	2.24
1.75	12	1355.75	2.28	---	---	---	---	---	---	---	---	2.28
1.80	12	1355.80	2.32	---	---	---	---	---	---	---	---	2.32
1.85	13	1355.85	2.37	---	---	---	---	---	---	---	---	2.37
1.90	13	1355.90	2.40	---	---	---	---	---	---	---	---	2.40
1.95	14	1355.95	2.44	---	---	---	---	---	---	---	---	2.44
2.00	14	1356.00	2.48	---	---	---	---	---	---	---	---	2.48
2.05	14	1356.05	2.52	---	---	---	---	---	---	---	---	2.52
2.10	15	1356.10	2.56	---	---	---	---	---	---	---	---	2.56
2.15	15	1356.15	2.59	---	---	---	---	---	---	---	---	2.59
2.20	16	1356.20	2.63	---	---	---	---	---	---	---	---	2.63
2.25	16	1356.25	2.67	---	---	---	---	---	---	---	---	2.67
2.30	16	1356.30	2.70	---	---	---	---	---	---	---	---	2.70
2.35	17	1356.35	2.74	---	---	---	---	---	---	---	---	2.74
2.40	17	1356.40	2.77	---	---	---	---	---	---	---	---	2.77
2.45	18	1356.45	2.81	---	---	---	---	---	---	---	---	2.81
2.50	18	1356.50	2.84	---	---	---	---	---	---	---	---	2.84
2.55	18	1356.55	2.87	---	---	---	---	---	---	---	---	2.87
2.60	19	1356.60	2.90	---	---	---	---	---	---	---	---	2.90
2.65	19	1356.65	2.94	---	---	---	---	---	---	---	---	2.94
2.70	20	1356.70	2.97	---	---	---	---	---	---	---	---	2.97
2.75	20	1356.75	3.00	---	---	---	---	---	---	---	---	3.00
2.80	20	1356.80	3.03	---	---	---	---	---	---	---	---	3.03
2.85	21	1356.85	3.06	---	---	---	---	---	---	---	---	3.06
2.90	21	1356.90	3.09	---	---	---	---	---	---	---	---	3.09
2.95	22	1356.95	3.12	---	---	---	---	---	---	---	---	3.12
3.00	22	1357.00	3.15	---	---	---	---	---	---	---	---	3.15
3.05	22	1357.05	3.18	---	---	---	---	---	---	---	---	3.18
3.10	23	1357.10	3.21	---	---	---	---	---	---	---	---	3.21
3.15	23	1357.15	3.24	---	---	---	---	---	---	---	---	3.24
3.20	24	1357.20	3.27	---	---	---	---	---	---	---	---	3.27
3.25	24	1357.25	3.30	---	---	---	---	---	---	---	---	3.30
3.30	24	1357.30	3.33	---	---	---	---	---	---	---	---	3.33
3.35	25	1357.35	3.36	---	---	---	---	---	---	---	---	3.36
3.40	25	1357.40	3.39	---	---	---	---	---	---	---	---	3.39
3.45	26	1357.45	3.41	---	---	---	---	---	---	---	---	3.41
3.50	26	1357.50	3.44	---	---	---	---	---	---	---	---	3.44
3.55	26	1357.55	3.47	---	---	---	---	---	---	---	---	3.47
3.60	27	1357.60	3.50	---	---	---	---	---	---	---	---	3.50
3.65	27	1357.65	3.52	---	---	---	---	---	---	---	---	3.52
3.70	28	1357.70	3.55	---	---	---	---	---	---	---	---	3.55
3.75	28	1357.75	3.58	---	---	---	---	---	---	---	---	3.58
3.80	28	1357.80	3.60	---	---	---	---	---	---	---	---	3.60
3.85	29	1357.85	3.63	---	---	---	---	---	---	---	---	3.63
3.90	29	1357.90	3.66	---	---	---	---	---	---	---	---	3.66
3.95	30	1357.95	3.68	---	---	---	---	---	---	---	---	3.68
4.00	30	1358.00	3.71	---	---	---	---	---	---	---	---	3.71
4.05	30	1358.05	3.73	---	---	---	---	---	---	---	---	3.73
4.10	31	1358.10	3.76	---	---	---	---	---	---	---	---	3.76
4.15	31	1358.15	3.78	---	---	---	---	---	---	---	---	3.78
4.20	32	1358.20	3.81	---	---	---	---	---	---	---	---	3.81
4.25	32	1358.25	3.83	---	---	---	---	---	---	---	---	3.83
4.30	32	1358.30	3.86	---	---	---	---	---	---	---	---	3.86
4.35	33	1358.35	3.88	---	---	---	---	---	---	---	---	3.88
4.40	33	1358.40	3.91	---	---	---	---	---	---	---	---	3.91
4.45	34	1358.45	3.93	---	---	---	---	---	---	---	---	3.93
4.50	34	1358.50	3.95	---	---	---	---	---	---	---	---	3.95
4.55	34	1358.55	3.98	---	---	---	---	---	---	---	---	3.98
4.60	35	1358.60	4.00	---	---	---	---	---	---	---	---	4.00
4.65	35	1358.65	4.03	---	---	---	---	---	---	---	---	4.03

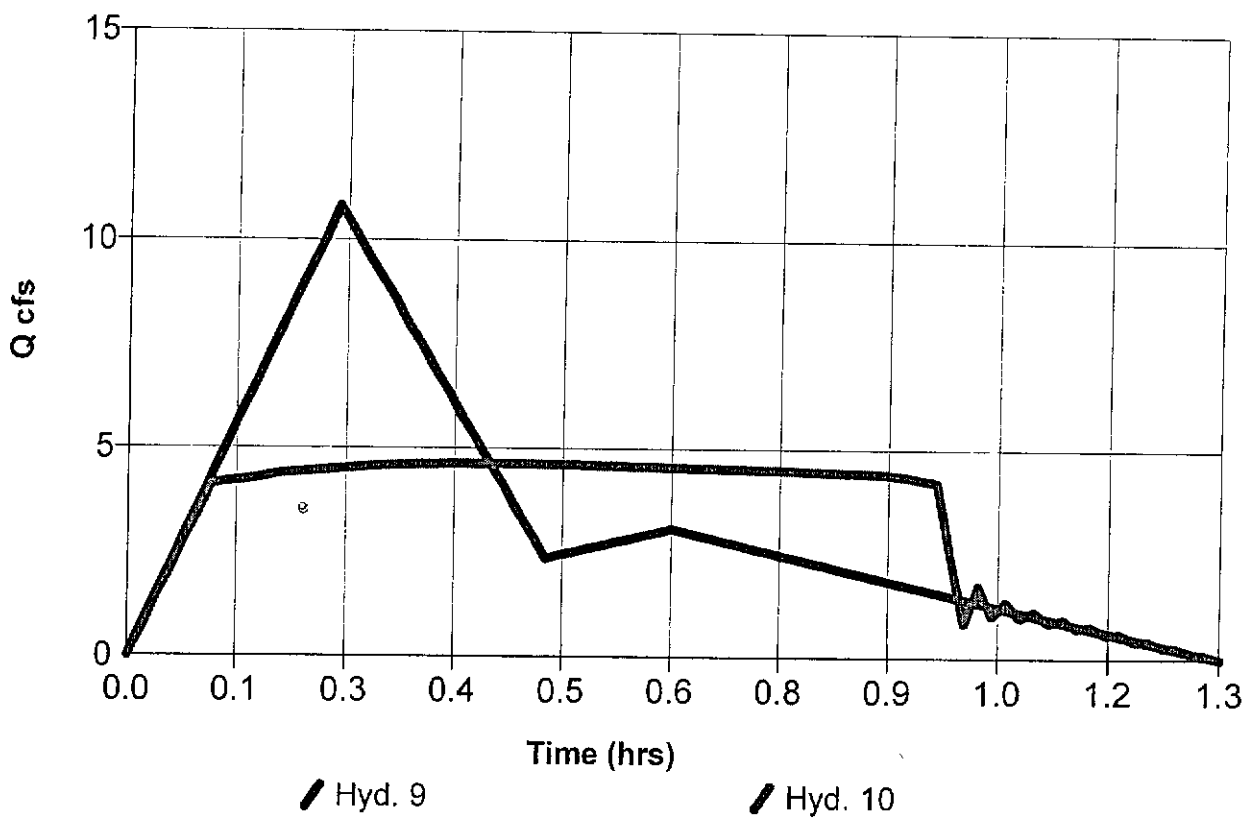
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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	Civ D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
4.70	36	1358.70	4.05	---	---	---	---	---	---	---	---	4.05
4.75	36	1358.75	4.07	---	---	---	---	---	---	---	---	4.07
4.80	36	1358.80	4.10	---	---	---	---	---	---	---	---	4.10
4.85	37	1358.85	4.12	---	---	---	---	---	---	---	---	4.12
4.90	37	1358.90	4.14	---	---	---	---	---	---	---	---	4.14
4.95	38	1358.95	4.16	---	---	---	---	---	---	---	---	4.16
5.00	38	1359.00	4.19	---	---	---	---	---	---	---	---	4.19
5.05	96	1359.05	4.21	---	---	---	---	---	---	---	---	4.21
5.10	154	1359.10	4.23	---	---	---	---	---	---	---	---	4.23
5.15	213	1359.15	4.25	---	---	---	---	---	---	---	---	4.25
5.20	271	1359.20	4.28	---	---	---	---	---	---	---	---	4.28
5.25	329	1359.25	4.30	---	---	---	---	---	---	---	---	4.30
5.30	387	1359.30	4.32	---	---	---	---	---	---	---	---	4.32
5.35	446	1359.35	4.34	---	---	---	---	---	---	---	---	4.34
5.40	504	1359.40	4.36	---	---	---	---	---	---	---	---	4.36
5.45	562	1359.45	4.39	---	---	---	---	---	---	---	---	4.39
5.50	620	1359.50	4.41	---	---	---	---	---	---	---	---	4.41
5.55	892	1359.55	4.43	---	---	---	---	---	---	---	---	4.43
5.60	1,164	1359.60	4.45	---	---	---	---	---	---	---	---	4.45
5.65	1,436	1359.65	4.47	---	---	---	---	---	---	---	---	4.47
5.70	1,708	1359.70	4.49	---	---	---	---	---	---	---	---	4.49
5.75	1,980	1359.75	4.51	---	---	---	---	---	---	---	---	4.51
5.80	2,252	1359.80	4.53	---	---	---	---	---	---	---	---	4.53
5.85	2,524	1359.85	4.56	---	---	---	---	---	---	---	---	4.56
5.90	2,796	1359.90	4.58	---	---	---	---	---	---	---	---	4.58
5.95	3,068	1359.95	4.60	---	---	---	---	---	---	---	---	4.60
6.00	3,340	1360.00	4.62	---	---	---	---	---	---	---	---	4.62
6.05	4,167	1360.05	4.64	---	---	---	---	---	---	---	---	4.64
6.10	4,993	1360.10	4.66	---	---	---	---	---	---	---	---	4.66
6.15	5,820	1360.15	4.68	---	---	---	---	---	---	---	---	4.68
6.20	6,647	1360.20	4.70	---	---	---	---	---	---	---	---	4.70
6.25	7,474	1360.25	4.72	---	---	---	---	---	---	---	---	4.72
6.30	8,301	1360.30	4.74	---	---	---	---	---	---	---	---	4.74
6.35	9,128	1360.35	4.76	---	---	---	---	---	---	---	---	4.76
6.40	9,955	1360.40	4.78	---	---	---	---	---	---	---	---	4.78
6.45	10,781	1360.45	4.80	---	---	---	---	---	---	---	---	4.80
6.50	11,608	1360.50	4.82	---	---	---	---	---	---	---	---	4.82

...End

Hyd. No. 10 - Reservoir - 5 Yr - $Q_p = 4.63$ cfs - Disch. Out N. Inlet



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (cuft)	Hydrograph description
1	Rational	7.23	1	15	6,506	---	---	---	Developed South Phase 2
2	Rational	3.33	1	39	7,803	---	---	---	Existing South Area
3	Rational	9.89	1	39	23,151	---	---	---	Existing Offsite Dr. Area
4	Rational	5.57	1	39	13,033	---	---	---	Existing North D.A.
5	Combine	18.80	1	39	43,987	2, 3, 4	---	---	Total Existing Discharge
6	Combine	11.03	1	15	29,657	1, 3,	---	---	Flow to South Inlet
7	Reservoir	8.37	1	45	29,662	6	1359.75	1,982	Disch. Out S. Inlet
8	Rational	12.07	1	15	10,866	---	---	---	Developed North Inlet
9	Combine	20.09	1	15	40,528	7, 8	---	---	Flow Into N. Inlet
10	Reservoir	4.82	1	62	40,548	9	1360.50	21,545	Disch. Out N. Inlet

Hydrograph Report

Hyd. No. 3

Existing Offsite Dr. Area

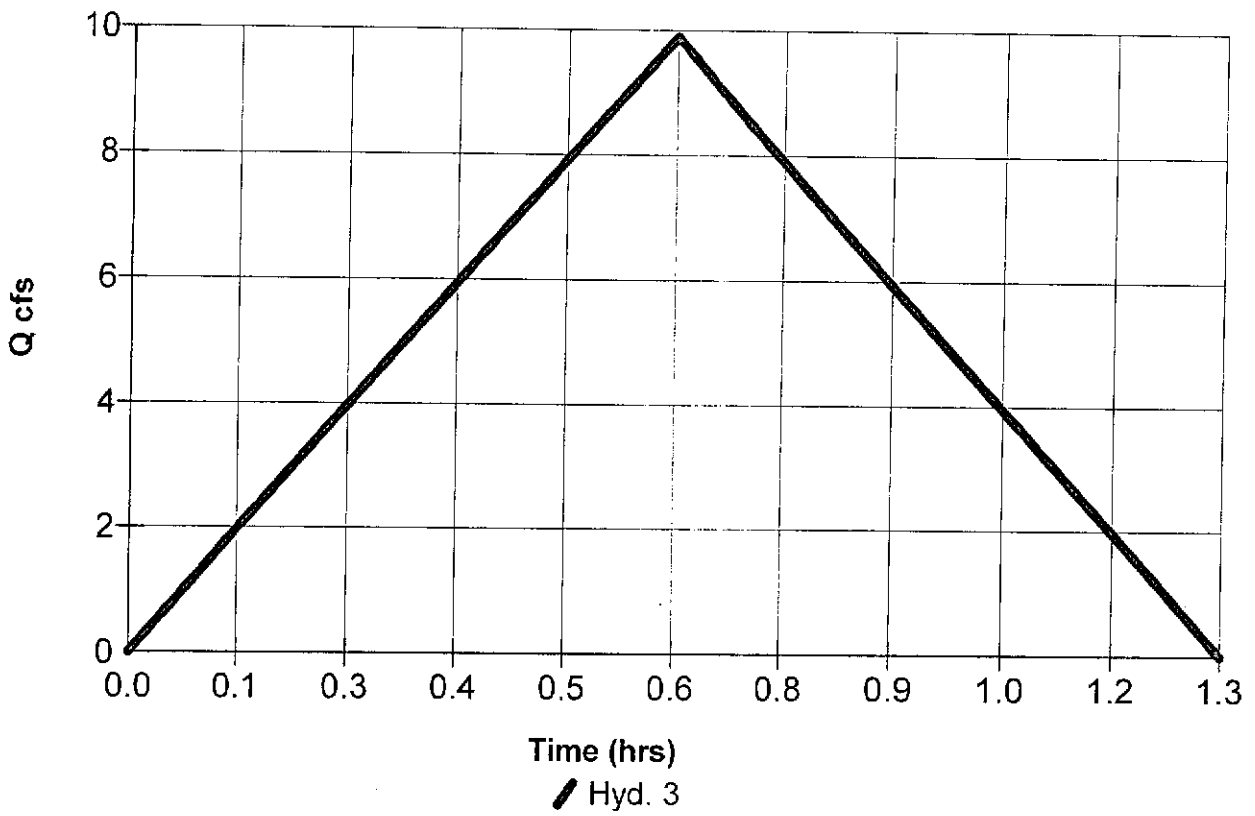
Hydrograph type	= Rational	Peak discharge	= 9.89 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 2.7 ac	Runoff coeff.	= 0.65
Intensity	= 5.637 in/hr	Time of conc. (Tc)	= 39 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 23,151 cuft

Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
0.02 0.25	0.58 8.88	1.15 2.28
0.03 0.51	0.60 9.13	1.17 2.03
0.05 0.76	0.62 9.39	1.18 1.78
0.07 1.01	0.63 9.64	1.20 1.52
0.08 1.27	0.65 9.89 <<	1.22 1.27
0.10 1.52	0.67 9.64	1.23 1.01
0.12 1.78	0.68 9.39	1.25 0.76
0.13 2.03	0.70 9.13	1.27 0.51
0.15 2.28	0.72 8.88	1.28 0.25
0.17 2.54	0.73 8.63	
0.18 2.79	0.75 8.37	
0.20 3.04	0.77 8.12	...End
0.22 3.30	0.78 7.86	
0.23 3.55	0.80 7.61	
0.25 3.81	0.82 7.36	
0.27 4.06	0.83 7.10	
0.28 4.31	0.85 6.85	
0.30 4.57	0.87 6.60	
0.32 4.82	0.88 6.34	
0.33 5.07	0.90 6.09	
0.35 5.33	0.92 5.83	
0.37 5.58	0.93 5.58	
0.38 5.83	0.95 5.33	
0.40 6.09	0.97 5.07	
0.42 6.34	0.98 4.82	
0.43 6.60	1.00 4.57	
0.45 6.85	1.02 4.31	
0.47 7.10	1.03 4.06	
0.48 7.36	1.05 3.81	
0.50 7.61	1.07 3.55	
0.52 7.86	1.08 3.30	
0.53 8.12	1.10 3.04	
0.55 8.37	1.12 2.79	
0.57 8.63	1.13 2.54	

Hyd. No. 3 - Rational - 100 Yr - $Q_p = 9.89$ cfs - Existing Offsite Dr. Area



Hydrograph Report

Hyd. No. 2

Existing South Area

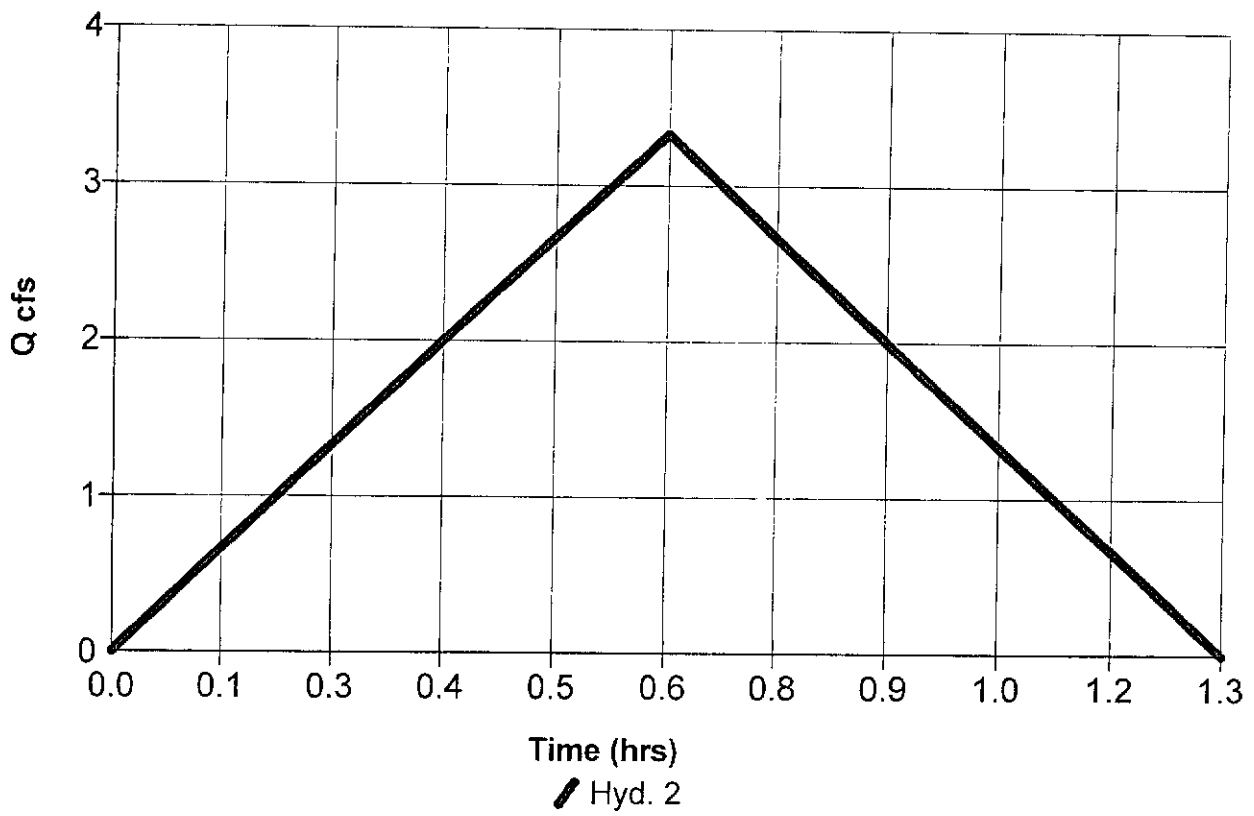
Hydrograph type	= Rational	Peak discharge	= 3.33 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 0.9 ac	Runoff coeff.	= 0.65
Intensity	= 5.637 in/hr	Time of conc. (Tc)	= 39 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 7,803 cuft

Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
0.02 0.09	0.58 2.99	1.15 0.77
0.03 0.17	0.60 3.08	1.17 0.68
0.05 0.26	0.62 3.16	1.18 0.60
0.07 0.34	0.63 3.25	1.20 0.51
0.08 0.43	0.65 3.33 <<	1.22 0.43
0.10 0.51	0.67 3.25	1.23 0.34
0.12 0.60	0.68 3.16	1.25 0.26
0.13 0.68	0.70 3.08	1.27 0.17
0.15 0.77	0.72 2.99	1.28 0.09
0.17 0.86	0.73 2.91	
0.18 0.94	0.75 2.82	
0.20 1.03	0.77 2.74	...End
0.22 1.11	0.78 2.65	
0.23 1.20	0.80 2.57	
0.25 1.28	0.82 2.48	
0.27 1.37	0.83 2.39	
0.28 1.45	0.85 2.31	
0.30 1.54	0.87 2.22	
0.32 1.62	0.88 2.14	
0.33 1.71	0.90 2.05	
0.35 1.80	0.92 1.97	
0.37 1.88	0.93 1.88	
0.38 1.97	0.95 1.80	
0.40 2.05	0.97 1.71	
0.42 2.14	0.98 1.62	
0.43 2.22	1.00 1.54	
0.45 2.31	1.02 1.45	
0.47 2.39	1.03 1.37	
0.48 2.48	1.05 1.28	
0.50 2.57	1.07 1.20	
0.52 2.65	1.08 1.11	
0.53 2.74	1.10 1.03	
0.55 2.82	1.12 0.94	
0.57 2.91	1.13 0.86	

Hyd. No. 2 - Rational - 100 Yr - $Q_p = 3.33$ cfs - Existing South Area



Hydrograph Report

Hyd. No. 4

Existing North D.A.

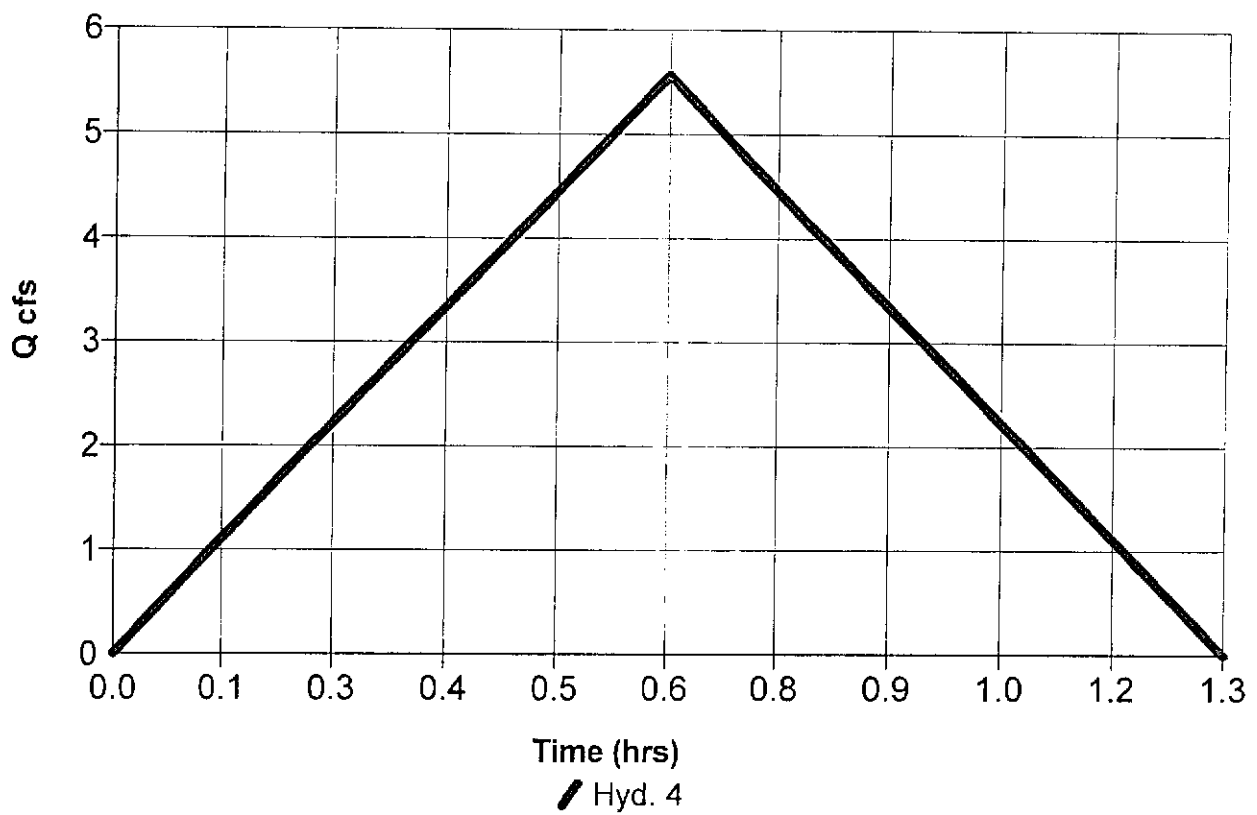
Hydrograph type	= Rational	Peak discharge	= 5.57 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 1.5 ac	Runoff coeff.	= 0.65
Intensity	= 5.637 in/hr	Time of conc. (Tc)	= 39 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 13,033 cuft

Hydrograph Discharge Table

Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)	Time -- Outflow (hrs cfs)
0.02 0.14	0.58 5.00	1.15 1.29
0.03 0.29	0.60 5.14	1.17 1.14
0.05 0.43	0.62 5.28	1.18 1.00
0.07 0.57	0.63 5.43	1.20 0.86
0.08 0.71	0.65 5.57 <<	1.22 0.71
0.10 0.86	0.67 5.43	1.23 0.57
0.12 1.00	0.68 5.28	1.25 0.43
0.13 1.14	0.70 5.14	1.27 0.29
0.15 1.29	0.72 5.00	1.28 0.14
0.17 1.43	0.73 4.86	
0.18 1.57	0.75 4.71	
0.20 1.71	0.77 4.57	...End
0.22 1.86	0.78 4.43	
0.23 2.00	0.80 4.28	
0.25 2.14	0.82 4.14	
0.27 2.29	0.83 4.00	
0.28 2.43	0.85 3.86	
0.30 2.57	0.87 3.71	
0.32 2.71	0.88 3.57	
0.33 2.86	0.90 3.43	
0.35 3.00	0.92 3.28	
0.37 3.14	0.93 3.14	
0.38 3.28	0.95 3.00	
0.40 3.43	0.97 2.86	
0.42 3.57	0.98 2.71	
0.43 3.71	1.00 2.57	
0.45 3.86	1.02 2.43	
0.47 4.00	1.03 2.29	
0.48 4.14	1.05 2.14	
0.50 4.28	1.07 2.00	
0.52 4.43	1.08 1.86	
0.53 4.57	1.10 1.71	
0.55 4.71	1.12 1.57	
0.57 4.86	1.13 1.43	

Hyd. No. 4 - Rational - 100 Yr - $Q_p = 5.57$ cfs - Existing North D.A.



Hydrograph Report

Hyd. No. 5

Total Existing Discharge

Hydrograph type = Combine
Storm frequency = 100 yrs
Inflow hyds. = 2, 3, 4

Peak discharge = 18.80 cfs
Time interval = 1 min

Hydrograph Volume = 43,987 cuft

Hydrograph Discharge Table

Time (hrs)	Hyd. 2 + (cfs)	Hyd. 3 + (cfs)	Hyd. 4 = (cfs)	Outflow (cfs)
0.02	0.09	0.25	0.14	0.48
0.03	0.17	0.51	0.29	0.96
0.05	0.26	0.76	0.43	1.45
0.07	0.34	1.01	0.57	1.93
0.08	0.43	1.27	0.71	2.41
0.10	0.51	1.52	0.86	2.89
0.12	0.60	1.78	1.00	3.37
0.13	0.68	2.03	1.14	3.86
0.15	0.77	2.28	1.29	4.34
0.17	0.86	2.54	1.43	4.82
0.18	0.94	2.79	1.57	5.30
0.20	1.03	3.04	1.71	5.78
0.22	1.11	3.30	1.86	6.27
0.23	1.20	3.55	2.00	6.75
0.25	1.28	3.81	2.14	7.23
0.27	1.37	4.06	2.29	7.71
0.28	1.45	4.31	2.43	8.19
0.30	1.54	4.57	2.57	8.68
0.32	1.62	4.82	2.71	9.16
0.33	1.71	5.07	2.86	9.64
0.35	1.80	5.33	3.00	10.12
0.37	1.88	5.58	3.14	10.60
0.38	1.97	5.83	3.28	11.09
0.40	2.05	6.09	3.43	11.57
0.42	2.14	6.34	3.57	12.05
0.43	2.22	6.60	3.71	12.53
0.45	2.31	6.85	3.86	13.01
0.47	2.39	7.10	4.00	13.50
0.48	2.48	7.36	4.14	13.98
0.50	2.57	7.61	4.28	14.46
0.52	2.65	7.86	4.43	14.94
0.53	2.74	8.12	4.57	15.42
0.55	2.82	8.37	4.71	15.91
0.57	2.91	8.63	4.86	16.39
0.58	2.99	8.88	5.00	16.87
0.60	3.08	9.13	5.14	17.35
0.62	3.16	9.39	5.28	17.83
0.63	3.25	9.64	5.43	18.32

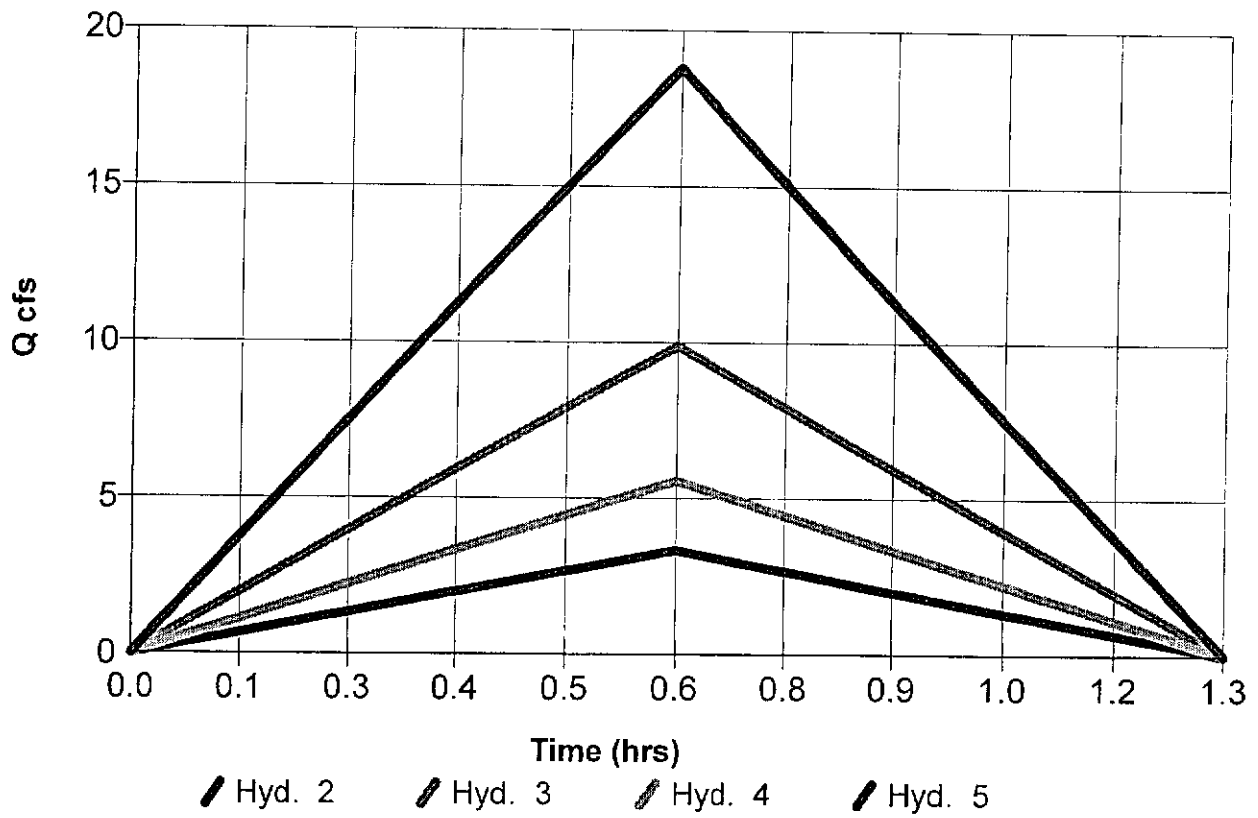
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Hydrograph Discharge Table

Time (hrs)	Hyd. 2 + (cfs)	Hyd. 3 + (cfs)	Hyd. 4 = (cfs)	Outflow (cfs)
0.65	3.33 <<	9.89 <<	5.57 <<	18.80 <<
0.67	3.25	9.64	5.43	18.32
0.68	3.16	9.39	5.28	17.83
0.70	3.08	9.13	5.14	17.35
0.72	2.99	8.88	5.00	16.87
0.73	2.91	8.63	4.86	16.39
0.75	2.82	8.37	4.71	15.91
0.77	2.74	8.12	4.57	15.42
0.78	2.65	7.86	4.43	14.94
0.80	2.57	7.61	4.28	14.46
0.82	2.48	7.36	4.14	13.98
0.83	2.39	7.10	4.00	13.50
0.85	2.31	6.85	3.86	13.01
0.87	2.22	6.60	3.71	12.53
0.88	2.14	6.34	3.57	12.05
0.90	2.05	6.09	3.43	11.57
0.92	1.97	5.83	3.28	11.09
0.93	1.88	5.58	3.14	10.60
0.95	1.80	5.33	3.00	10.12
0.97	1.71	5.07	2.86	9.64
0.98	1.62	4.82	2.71	9.16
1.00	1.54	4.57	2.57	8.68
1.02	1.45	4.31	2.43	8.19
1.03	1.37	4.06	2.29	7.71
1.05	1.28	3.81	2.14	7.23
1.07	1.20	3.55	2.00	6.75
1.08	1.11	3.30	1.86	6.27
1.10	1.03	3.04	1.71	5.78
1.12	0.94	2.79	1.57	5.30
1.13	0.86	2.54	1.43	4.82
1.15	0.77	2.28	1.29	4.34
1.17	0.68	2.03	1.14	3.86
1.18	0.60	1.78	1.00	3.37
1.20	0.51	1.52	0.86	2.89
1.22	0.43	1.27	0.71	2.41
1.23	0.34	1.01	0.57	1.93
1.25	0.26	0.76	0.43	1.45
1.27	0.17	0.51	0.29	0.96
1.28	0.09	0.25	0.14	0.48

...End

Hyd. No. 5 - Combine - 100 Yr - Qp = 18.80 cfs - Total Existing Discharge



Hydrograph Report

Hyd. No. 1

Developed South Phase 2

Hydrograph type	= Rational	Peak discharge	= 7.23 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 0.9 ac	Runoff coeff.	= 0.8
Intensity	= 9.929 in/hr	Time of conc. (Tc)	= 15 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 6,506 cuft

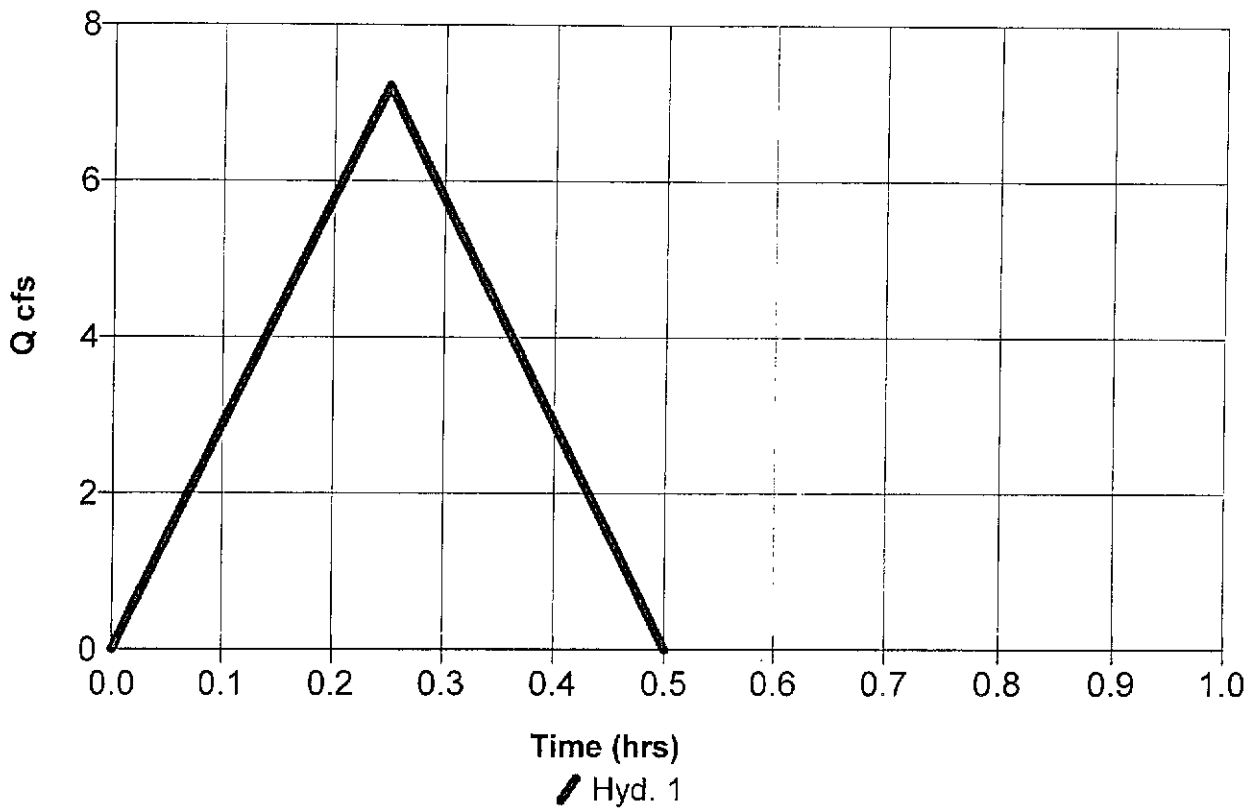
Hydrograph Discharge Table

Time -- Outflow
(hrs cfs)

0.02	0.48
0.03	0.96
0.05	1.45
0.07	1.93
0.08	2.41
0.10	2.89
0.12	3.37
0.13	3.86
0.15	4.34
0.17	4.82
0.18	5.30
0.20	5.78
0.22	6.26
0.23	6.75
0.25	7.23 <<
0.27	6.75
0.28	6.26
0.30	5.78
0.32	5.30
0.33	4.82
0.35	4.34
0.37	3.86
0.38	3.37
0.40	2.89
0.42	2.41
0.43	1.93
0.45	1.45
0.47	0.96
0.48	0.48

...End

Hyd. No. 1 - Rational - 100 Yr - Qp = 7.23 cfs - Developed South Phase 2



Hydrograph Report

Hyd. No. 6

Flow to South Inlet

Hydrograph type = Combine
Storm frequency = 100 yrs
Inflow hyds. = 1, 3

Peak discharge = 11.03 cfs
Time interval = 1 min

Hydrograph Volume = 29,657 cuft

Hydrograph Discharge Table

Time (hrs)	Hyd. 1 + (cfs)	Hyd. 3 + (cfs)	Outflow (cfs)
0.02	0.48	0.25	0.74
0.03	0.96	0.51	1.47
0.05	1.45	0.76	2.21
0.07	1.93	1.01	2.94
0.08	2.41	1.27	3.68
0.10	2.89	1.52	4.41
0.12	3.37	1.78	5.15
0.13	3.86	2.03	5.88
0.15	4.34	2.28	6.62
0.17	4.82	2.54	7.36
0.18	5.30	2.79	8.09
0.20	5.78	3.04	8.83
0.22	6.26	3.30	9.56
0.23	6.75	3.55	10.30
0.25	7.23 <<	3.81	11.03 <<
0.27	6.75	4.06	10.81
0.28	6.26	4.31	10.58
0.30	5.78	4.57	10.35
0.32	5.30	4.82	10.12
0.33	4.82	5.07	9.89
0.35	4.34	5.33	9.66
0.37	3.86	5.58	9.44
0.38	3.37	5.83	9.21
0.40	2.89	6.09	8.98
0.42	2.41	6.34	8.75
0.43	1.93	6.60	8.52
0.45	1.45	6.85	8.30
0.47	0.96	7.10	8.07
0.48	0.48	7.36	7.84
0.50	0.00	7.61	7.61
0.52	0.00	7.86	7.86
0.53	0.00	8.12	8.12
0.55	0.00	8.37	8.37
0.57	0.00	8.63	8.63
0.58	0.00	8.88	8.88
0.60	0.00	9.13	9.13
0.62	0.00	9.39	9.39
0.63	0.00	9.64	9.64

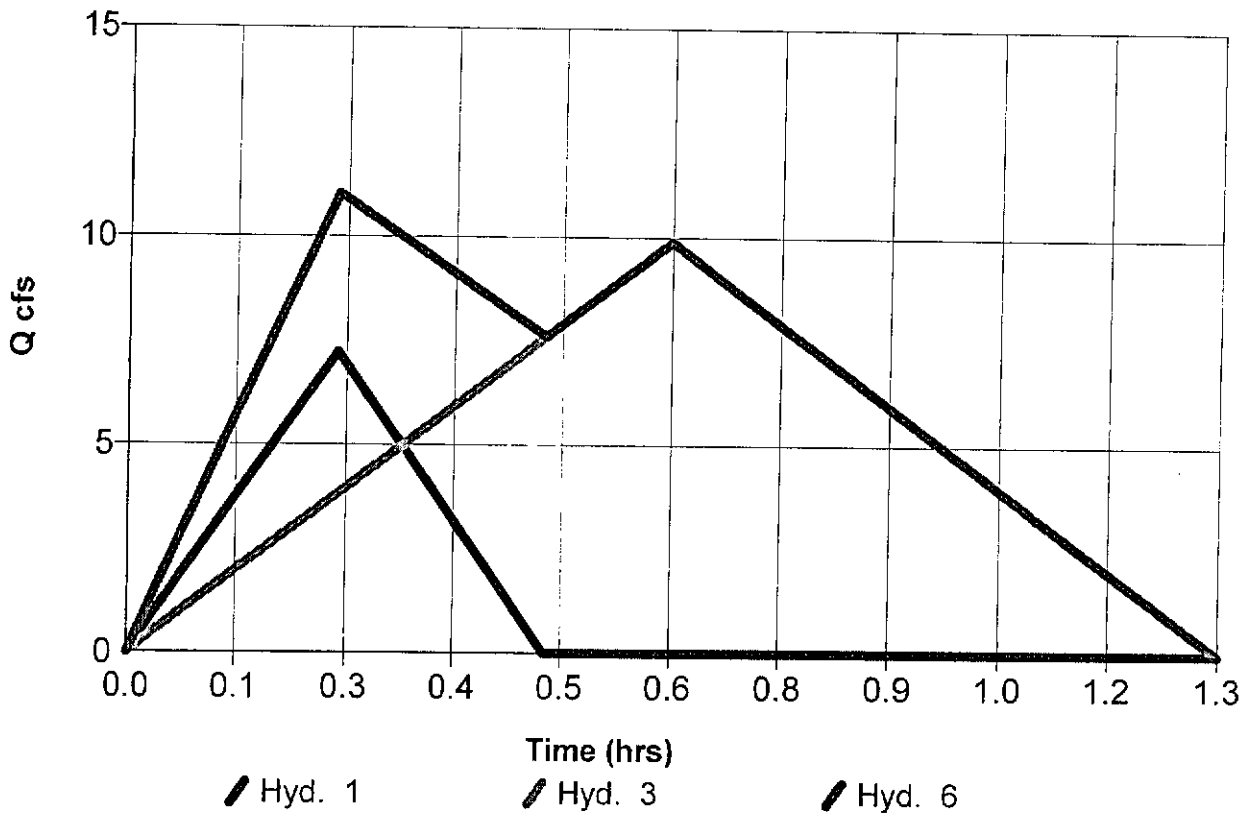
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Hydrograph Discharge Table

Time (hrs)	Hyd. 1 + (cfs)	Hyd. 3 + (cfs)	Outflow (cfs)
0.65	0.00	9.89 <<	9.89
0.67	0.00	9.64	9.64
0.68	0.00	9.39	9.39
0.70	0.00	9.13	9.13
0.72	0.00	8.88	8.88
0.73	0.00	8.63	8.63
0.75	0.00	8.37	8.37
0.77	0.00	8.12	8.12
0.78	0.00	7.86	7.86
0.80	0.00	7.61	7.61
0.82	0.00	7.36	7.36
0.83	0.00	7.10	7.10
0.85	0.00	6.85	6.85
0.87	0.00	6.60	6.60
0.88	0.00	6.34	6.34
0.90	0.00	6.09	6.09
0.92	0.00	5.83	5.83
0.93	0.00	5.58	5.58
0.95	0.00	5.33	5.33
0.97	0.00	5.07	5.07
0.98	0.00	4.82	4.82
1.00	0.00	4.57	4.57
1.02	0.00	4.31	4.31
1.03	0.00	4.06	4.06
1.05	0.00	3.81	3.81
1.07	0.00	3.55	3.55
1.08	0.00	3.30	3.30
1.10	0.00	3.04	3.04
1.12	0.00	2.79	2.79
1.13	0.00	2.54	2.54
1.15	0.00	2.28	2.28
1.17	0.00	2.03	2.03
1.18	0.00	1.78	1.78
1.20	0.00	1.52	1.52
1.22	0.00	1.27	1.27
1.23	0.00	1.01	1.01
1.25	0.00	0.76	0.76
1.27	0.00	0.51	0.51
1.28	0.00	0.25	0.25

...End

Hyd. No. 6 - Combine - 100 Yr - Qp = 11.03 cfs - Flow to South Inlet



Hydrograph Report

Hyd. No. 7

Disch. Out S. Inlet

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Inflow hyd. No. = 6
 Max. Elevation = 1359.75 ft

Peak discharge = 8.37 cfs
 Time interval = 1 min
 Reservoir name = Det. at South Ar
 Max. Storage = 1,982 cuft

Storage Indication method used.

Outflow hydrograph volume = 29,662 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.02	0.74	1355.39	0.68	----	----	----	----	----	----	----	----	0.68
0.03	1.47	1355.59	1.48	----	----	----	----	----	----	----	----	1.48
0.05	2.21	1355.73	2.16	----	----	----	----	----	----	----	----	2.16
0.07	2.94	1355.88	2.95	----	----	----	----	----	----	----	----	2.95
0.08	3.68	1356.01	3.63	----	----	----	----	----	----	----	----	3.63
0.10	4.41	1356.42	4.35	----	----	----	----	----	----	----	----	4.35
0.12	5.15	1356.87	5.09	----	----	----	----	----	----	----	----	5.09
0.13	5.88	1357.38	5.81	----	----	----	----	----	----	----	----	5.81
0.15	6.62	1357.97	6.54	----	----	----	----	----	----	----	----	6.54
0.17	7.36	1358.63	7.26	----	----	----	----	----	----	----	----	7.26
0.18	8.09	1359.01	7.66	----	----	----	----	----	----	----	----	7.66
0.20	8.83	1359.05	7.70	----	----	----	----	----	----	----	----	7.70
0.22	9.56	1359.13	7.77	----	----	----	----	----	----	----	----	7.77
0.23	10.30	1359.24	7.88	----	----	----	----	----	----	----	----	7.88
0.25	11.03 <<	1359.38	8.01	----	----	----	----	----	----	----	----	8.01
0.27	10.81	1359.51	8.14	----	----	----	----	----	----	----	----	8.14
0.28	10.58	1359.53	8.16	----	----	----	----	----	----	----	----	8.16
0.30	10.35	1359.56	8.19	----	----	----	----	----	----	----	----	8.19
0.32	10.12	1359.58	8.21	----	----	----	----	----	----	----	----	8.21
0.33	9.89	1359.60	8.23	----	----	----	----	----	----	----	----	8.23
0.35	9.66	1359.62	8.24	----	----	----	----	----	----	----	----	8.24
0.37	9.44	1359.63	8.26	----	----	----	----	----	----	----	----	8.26
0.38	9.21	1359.64	8.27	----	----	----	----	----	----	----	----	8.27
0.40	8.98	1359.65	8.27	----	----	----	----	----	----	----	----	8.27
0.42	8.75	1359.66	8.28	----	----	----	----	----	----	----	----	8.28
0.43	8.52	1359.66	8.28	----	----	----	----	----	----	----	----	8.28
0.45	8.30	1359.66	8.29	----	----	----	----	----	----	----	----	8.29
0.47	8.07	1359.66	8.28	----	----	----	----	----	----	----	----	8.28
0.48	7.84	1359.66	8.28	----	----	----	----	----	----	----	----	8.28
0.50	7.61	1359.65	8.28	----	----	----	----	----	----	----	----	8.28
0.52	7.86	1359.65	8.27	----	----	----	----	----	----	----	----	8.27
0.53	8.12	1359.64	8.27	----	----	----	----	----	----	----	----	8.27
0.55	8.37	1359.64	8.27	----	----	----	----	----	----	----	----	8.27
0.57	8.63	1359.65	8.27	----	----	----	----	----	----	----	----	8.27
0.58	8.88	1359.65	8.27	----	----	----	----	----	----	----	----	8.27
0.60	9.13	1359.66	8.28	----	----	----	----	----	----	----	----	8.28
0.62	9.39	1359.67	8.29	----	----	----	----	----	----	----	----	8.29
0.63	9.64	1359.68	8.30	----	----	----	----	----	----	----	----	8.30

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.65	9.89	1359.70	8.32	----	----	----	----	----	----	----	----	8.32
0.67	9.64	1359.72	8.33	----	----	----	----	----	----	----	----	8.33
0.68	9.39	1359.73	8.35	----	----	----	----	----	----	----	----	8.35
0.70	9.13	1359.74	8.35	----	----	----	----	----	----	----	----	8.35
0.72	8.88	1359.75	8.36	----	----	----	----	----	----	----	----	8.36
0.73	8.63	1359.75	8.36	----	----	----	----	----	----	----	----	8.36
0.75	8.37	1359.75 <<	8.37	----	----	----	----	----	----	----	----	8.37 <<
0.77	8.12	1359.75	8.36	----	----	----	----	----	----	----	----	8.36
0.78	7.86	1359.75	8.36	----	----	----	----	----	----	----	----	8.36
0.80	7.61	1359.74	8.35	----	----	----	----	----	----	----	----	8.36
0.82	7.36	1359.73	8.35	----	----	----	----	----	----	----	----	8.35
0.83	7.10	1359.72	8.33	----	----	----	----	----	----	----	----	8.35
0.85	6.85	1359.70	8.32	----	----	----	----	----	----	----	----	8.33
0.87	6.60	1359.69	8.30	----	----	----	----	----	----	----	----	8.32
0.88	6.34	1359.67	8.29	----	----	----	----	----	----	----	----	8.30
0.90	6.09	1359.64	8.27	----	----	----	----	----	----	----	----	8.29
0.92	5.83	1359.62	8.24	----	----	----	----	----	----	----	----	8.27
0.93	5.58	1359.59	8.22	----	----	----	----	----	----	----	----	8.24
0.95	5.33	1359.56	8.19	----	----	----	----	----	----	----	----	8.22
0.97	5.07	1359.53	8.16	----	----	----	----	----	----	----	----	8.19
0.98	4.82	1359.46	8.09	----	----	----	----	----	----	----	----	8.16
1.00	4.57	1359.29	7.93	----	----	----	----	----	----	----	----	8.09
1.02	4.31	1359.11	7.76	----	----	----	----	----	----	----	----	7.93
1.03	4.06	1357.14	5.47	----	----	----	----	----	----	----	----	7.76
1.05	3.81	1355.84	2.74	----	----	----	----	----	----	----	----	5.47
1.07	3.55	1356.47	4.45	----	----	----	----	----	----	----	----	2.74
1.08	3.30	1355.81	2.58	----	----	----	----	----	----	----	----	4.45
1.10	3.04	1356.02	3.71	----	----	----	----	----	----	----	----	2.58
1.12	2.79	1355.74	2.20	----	----	----	----	----	----	----	----	3.71
1.13	2.54	1355.90	3.08	----	----	----	----	----	----	----	----	2.20
1.15	2.28	1355.66	1.81	----	----	----	----	----	----	----	----	3.08
1.17	2.03	1355.79	2.47	----	----	----	----	----	----	----	----	1.81
1.18	1.78	1355.57	1.39	----	----	----	----	----	----	----	----	2.47
1.20	1.52	1355.67	1.88	----	----	----	----	----	----	----	----	1.39
1.22	1.27	1355.46	0.96	----	----	----	----	----	----	----	----	1.88
1.23	1.01	1355.55	1.30	----	----	----	----	----	----	----	----	0.96
1.25	0.76	1355.33	0.51	----	----	----	----	----	----	----	----	1.30
1.27	0.51	1355.41	0.75	----	----	----	----	----	----	----	----	0.51
1.30	0.00	1355.20	0.19	----	----	----	----	----	----	----	----	0.75
												0.19

...End

Reservoir Report

Reservoir No. 1 - Det. at South Area Inlet

Hydraflow Hydrographs by Intelisolve

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1355.00	00	0	0
0.50	1355.50	08	2	2
1.00	1356.00	08	4	6
1.50	1356.50	08	4	10
2.00	1357.00	08	4	14
2.50	1357.50	08	4	18
3.00	1358.00	08	4	22
3.50	1358.50	08	4	26
4.00	1359.00	08	4	30
4.50	1359.50	2,321	582	612
5.00	1360.00	8,557	2,720	3,332
5.50	1360.50	19,011	6,892	10,224

Culvert / Orifice Structures

Weir Structures

	[A]	[B]	[C]	[D]
Rise in	= 15.0	0.0	0.0	0.0
Span in	= 15.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1355.00	0.00	0.00	0.00
Length ft	= 210.0	0.0	0.0	0.0
Slope %	= 0.51	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Stage / Storage / Discharge Table

Note: All outflows have been analyzed under inlet and outlet control.

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0	1355.00	0.00	---	---	---	---	---	---	---	---	0.00
0.05	0	1355.05	0.01	---	---	---	---	---	---	---	---	0.01
0.10	0	1355.10	0.05	---	---	---	---	---	---	---	---	0.05
0.15	1	1355.15	0.11	---	---	---	---	---	---	---	---	0.11
0.20	1	1355.20	0.19	---	---	---	---	---	---	---	---	0.19
0.25	1	1355.25	0.30	---	---	---	---	---	---	---	---	0.30
0.30	1	1355.30	0.42	---	---	---	---	---	---	---	---	0.42
0.35	1	1355.35	0.57	---	---	---	---	---	---	---	---	0.57
0.40	2	1355.40	0.73	---	---	---	---	---	---	---	---	0.73
0.45	2	1355.45	0.91	---	---	---	---	---	---	---	---	0.91
0.50	2	1355.50	1.10	---	---	---	---	---	---	---	---	1.10
0.55	2	1355.55	1.31	---	---	---	---	---	---	---	---	1.31
0.60	3	1355.60	1.54	---	---	---	---	---	---	---	---	1.54
0.65	3	1355.65	1.77	---	---	---	---	---	---	---	---	1.77
0.70	4	1355.70	2.02	---	---	---	---	---	---	---	---	2.02
0.75	4	1355.75	2.27	---	---	---	---	---	---	---	---	2.27
0.80	4	1355.80	2.53	---	---	---	---	---	---	---	---	2.53
0.85	5	1355.85	2.79	---	---	---	---	---	---	---	---	2.79
0.90	5	1355.90	3.06	---	---	---	---	---	---	---	---	3.06
0.95	6	1355.95	3.32	---	---	---	---	---	---	---	---	3.32
1.00	6	1356.00	3.58	---	---	---	---	---	---	---	---	3.58
1.05	6	1356.05	3.84	---	---	---	---	---	---	---	---	3.84
1.10	7	1356.10	4.09	---	---	---	---	---	---	---	---	4.09
1.15	7	1356.15	4.23	---	---	---	---	---	---	---	---	4.23
1.20	8	1356.20	4.25	---	---	---	---	---	---	---	---	4.25
1.25	8	1356.25	4.05	---	---	---	---	---	---	---	---	4.05

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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
1.30	8	1356.30	4.14	---	---	---	---	---	---	---	---	4.14
1.35	9	1356.35	4.23	---	---	---	---	---	---	---	---	4.23
1.40	9	1356.40	4.32	---	---	---	---	---	---	---	---	4.32
1.45	10	1356.45	4.41	---	---	---	---	---	---	---	---	4.41
1.50	10	1356.50	4.50	---	---	---	---	---	---	---	---	4.50
1.55	10	1356.55	4.58	---	---	---	---	---	---	---	---	4.58
1.60	11	1356.60	4.66	---	---	---	---	---	---	---	---	4.66
1.65	11	1356.65	4.75	---	---	---	---	---	---	---	---	4.75
1.70	12	1356.70	4.83	---	---	---	---	---	---	---	---	4.83
1.75	12	1356.75	4.90	---	---	---	---	---	---	---	---	4.90
1.80	12	1356.80	4.98	---	---	---	---	---	---	---	---	4.98
1.85	13	1356.85	5.06	---	---	---	---	---	---	---	---	5.06
1.90	13	1356.90	5.13	---	---	---	---	---	---	---	---	5.13
1.95	14	1356.95	5.21	---	---	---	---	---	---	---	---	5.21
2.00	14	1357.00	5.28	---	---	---	---	---	---	---	---	5.28
2.05	14	1357.05	5.35	---	---	---	---	---	---	---	---	5.35
2.10	15	1357.10	5.42	---	---	---	---	---	---	---	---	5.42
2.15	15	1357.15	5.49	---	---	---	---	---	---	---	---	5.49
2.20	16	1357.20	5.56	---	---	---	---	---	---	---	---	5.56
2.25	16	1357.25	5.63	---	---	---	---	---	---	---	---	5.63
2.30	16	1357.30	5.70	---	---	---	---	---	---	---	---	5.70
2.35	17	1357.35	5.76	---	---	---	---	---	---	---	---	5.76
2.40	17	1357.40	5.83	---	---	---	---	---	---	---	---	5.83
2.45	18	1357.45	5.90	---	---	---	---	---	---	---	---	5.90
2.50	18	1357.50	5.96	---	---	---	---	---	---	---	---	5.96
2.55	18	1357.55	6.02	---	---	---	---	---	---	---	---	6.02
2.60	19	1357.60	6.09	---	---	---	---	---	---	---	---	6.09
2.65	19	1357.65	6.15	---	---	---	---	---	---	---	---	6.15
2.70	20	1357.70	6.21	---	---	---	---	---	---	---	---	6.21
2.75	20	1357.75	6.27	---	---	---	---	---	---	---	---	6.27
2.80	20	1357.80	6.33	---	---	---	---	---	---	---	---	6.33
2.85	21	1357.85	6.39	---	---	---	---	---	---	---	---	6.39
2.90	21	1357.90	6.45	---	---	---	---	---	---	---	---	6.45
2.95	22	1357.95	6.51	---	---	---	---	---	---	---	---	6.51
3.00	22	1358.00	6.57	---	---	---	---	---	---	---	---	6.57
3.05	22	1358.05	6.63	---	---	---	---	---	---	---	---	6.63
3.10	23	1358.10	6.69	---	---	---	---	---	---	---	---	6.69
3.15	23	1358.15	6.74	---	---	---	---	---	---	---	---	6.74
3.20	24	1358.20	6.80	---	---	---	---	---	---	---	---	6.80
3.25	24	1358.25	6.86	---	---	---	---	---	---	---	---	6.86
3.30	24	1358.30	6.91	---	---	---	---	---	---	---	---	6.91
3.35	25	1358.35	6.97	---	---	---	---	---	---	---	---	6.97
3.40	25	1358.40	7.02	---	---	---	---	---	---	---	---	7.02
3.45	26	1358.45	7.08	---	---	---	---	---	---	---	---	7.08
3.50	26	1358.50	7.13	---	---	---	---	---	---	---	---	7.13
3.55	26	1358.55	7.18	---	---	---	---	---	---	---	---	7.18
3.60	27	1358.60	7.24	---	---	---	---	---	---	---	---	7.24
3.65	27	1358.65	7.29	---	---	---	---	---	---	---	---	7.29
3.70	28	1358.70	7.34	---	---	---	---	---	---	---	---	7.34
3.75	28	1358.75	7.39	---	---	---	---	---	---	---	---	7.39
3.80	28	1358.80	7.44	---	---	---	---	---	---	---	---	7.44
3.85	29	1358.85	7.50	---	---	---	---	---	---	---	---	7.50
3.90	29	1358.90	7.55	---	---	---	---	---	---	---	---	7.55
3.95	30	1358.95	7.60	---	---	---	---	---	---	---	---	7.60
4.00	30	1359.00	7.65	---	---	---	---	---	---	---	---	7.65
4.05	88	1359.05	7.70	---	---	---	---	---	---	---	---	7.70
4.10	146	1359.10	7.75	---	---	---	---	---	---	---	---	7.75
4.15	205	1359.15	7.80	---	---	---	---	---	---	---	---	7.80
4.20	263	1359.20	7.85	---	---	---	---	---	---	---	---	7.85
4.25	321	1359.25	7.89	---	---	---	---	---	---	---	---	7.89
4.30	379	1359.30	7.94	---	---	---	---	---	---	---	---	7.94
4.35	438	1359.35	7.99	---	---	---	---	---	---	---	---	7.99
4.40	496	1359.40	8.04	---	---	---	---	---	---	---	---	8.04
4.45	554	1359.45	8.09	---	---	---	---	---	---	---	---	8.09
4.50	612	1359.50	8.13	---	---	---	---	---	---	---	---	8.13
4.55	884	1359.55	8.18	---	---	---	---	---	---	---	---	8.18
4.60	1,156	1359.60	8.23	---	---	---	---	---	---	---	---	8.23
4.65	1,428	1359.65	8.27	---	---	---	---	---	---	---	---	8.27
4.70	1,700	1359.70	8.32	---	---	---	---	---	---	---	---	8.32
4.75	1,972	1359.75	8.36	---	---	---	---	---	---	---	---	8.36

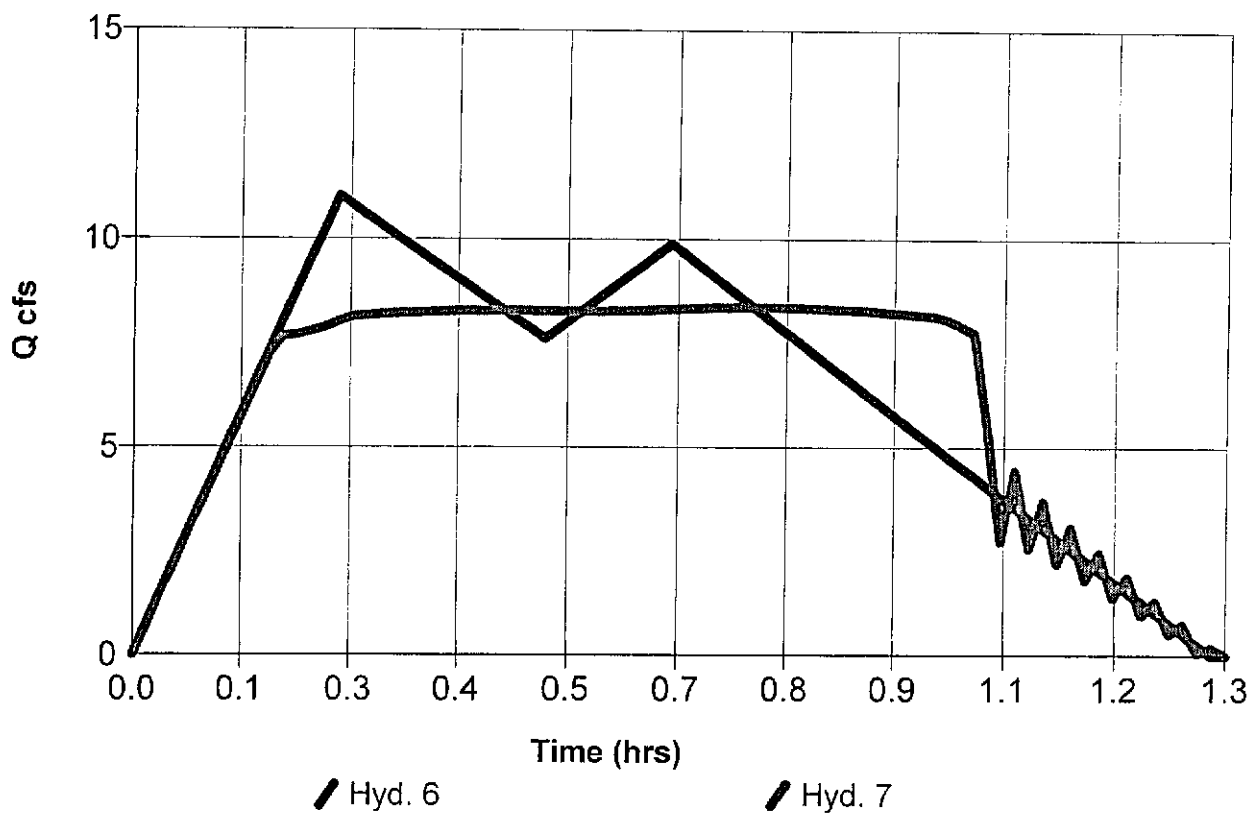
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Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
4.80	2,244	1359.80	8.41	---	---	---	---	---	---	---	---	8.41
4.85	2,516	1359.85	8.46	---	---	---	---	---	---	---	---	8.46
4.90	2,788	1359.90	8.50	---	---	---	---	---	---	---	---	8.50
4.95	3,060	1359.95	8.55	---	---	---	---	---	---	---	---	8.55
5.00	3,332	1360.00	8.59	---	---	---	---	---	---	---	---	8.59
5.05	4,021	1360.05	8.63	---	---	---	---	---	---	---	---	8.63
5.10	4,710	1360.10	8.68	---	---	---	---	---	---	---	---	8.68
5.15	5,399	1360.15	8.72	---	---	---	---	---	---	---	---	8.72
5.20	6,089	1360.20	8.77	---	---	---	---	---	---	---	---	8.77
5.25	6,778	1360.25	8.81	---	---	---	---	---	---	---	---	8.81
5.30	7,467	1360.30	8.85	---	---	---	---	---	---	---	---	8.85
5.35	8,156	1360.35	8.90	---	---	---	---	---	---	---	---	8.90
5.40	8,845	1360.40	8.94	---	---	---	---	---	---	---	---	8.94
5.45	9,535	1360.45	8.98	---	---	---	---	---	---	---	---	8.98
5.50	10,224	1360.50	9.02	---	---	---	---	---	---	---	---	9.02

...End

Hyd. No. 7 - Reservoir - 100 Yr - $Q_p = 8.37$ cfs - Disch. Out S. Inlet



Hydrograph Report

Hyd. No. 8

Developed North Inlet

Hydrograph type	= Rational	Peak discharge	= 12.07 cfs
Storm frequency	= 100 yrs	Time interval	= 1 min
Drainage area	= 1.5 ac	Runoff coeff.	= 0.8
Intensity	= 9.929 in/hr	Time of conc. (Tc)	= 15 min
IDF Curve	= SedgwickCounty.idf	Asc/Rec limb fact	= 1/1

Hydrograph Volume = 10,866 cuft

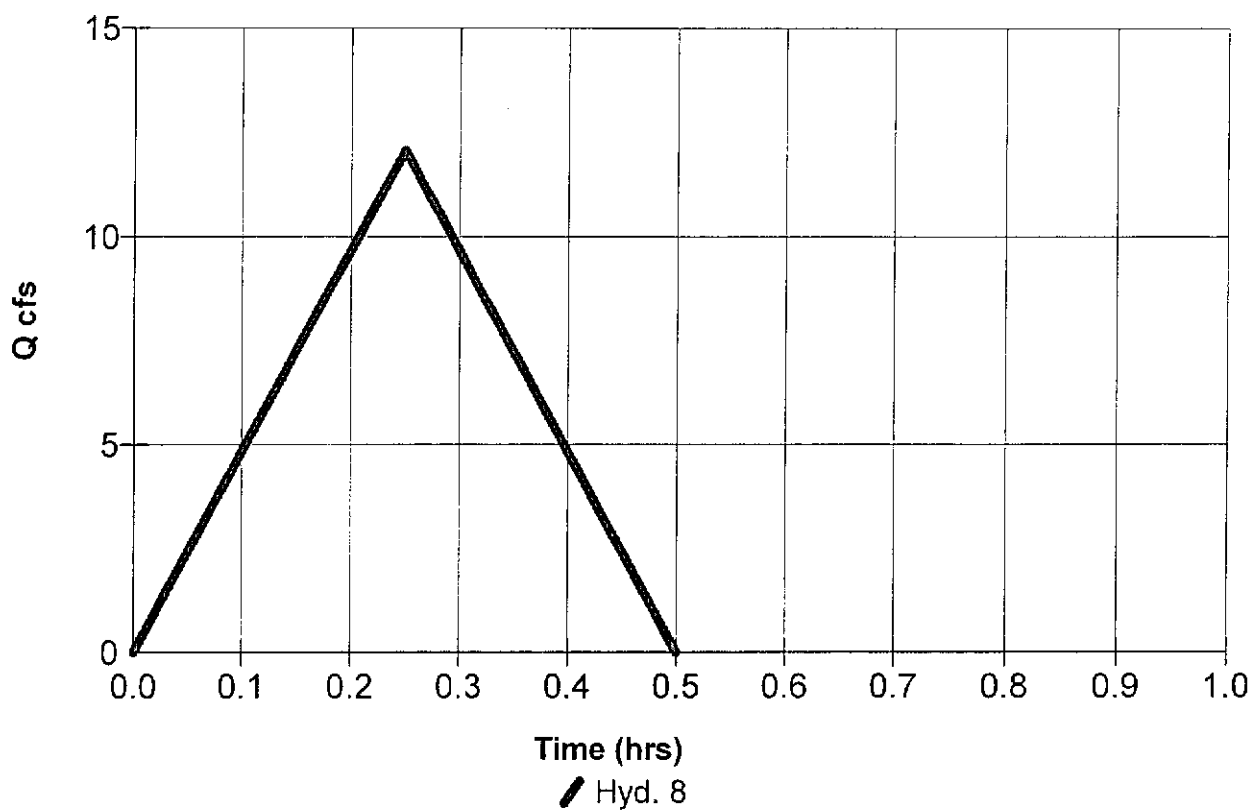
Hydrograph Discharge Table

Time -- Outflow
(hrs cfs)

0.02	0.80
0.03	1.61
0.05	2.41
0.07	3.22
0.08	4.02
0.10	4.83
0.12	5.63
0.13	6.44
0.15	7.24
0.17	8.05
0.18	8.85
0.20	9.66
0.22	10.46
0.23	11.27
0.25	12.07 <<
0.27	11.27
0.28	10.46
0.30	9.66
0.32	8.85
0.33	8.05
0.35	7.24
0.37	6.44
0.38	5.63
0.40	4.83
0.42	4.02
0.43	3.22
0.45	2.41
0.47	1.61
0.48	0.80

...End

Hyd. No. 8 - Rational - 100 Yr - Qp = 12.07 cfs - Developed North Inlet



Hydrograph Report

Hyd. No. 9

Flow Into N. Inlet

Hydrograph type = Combine
Storm frequency = 100 yrs
Inflow hyds. = 7, 8

Peak discharge = 20.09 cfs
Time interval = 1 min

Hydrograph Volume = 40,528 cuft

Hydrograph Discharge Table

Time (hrs)	Hyd. 7 + (cfs)	Hyd. 8 = (cfs)	Outflow (cfs)
0.02	0.68	0.80	1.49
0.03	1.48	1.61	3.09
0.05	2.16	2.41	4.57
0.07	2.95	3.22	6.17
0.08	3.63	4.02	7.66
0.10	4.35	4.83	9.18
0.12	5.09	5.63	10.73
0.13	5.81	6.44	12.25
0.15	6.54	7.24	13.78
0.17	7.26	8.05	15.31
0.18	7.66	8.85	16.51
0.20	7.70	9.66	17.36
0.22	7.77	10.46	18.24
0.23	7.88	11.27	19.15
0.25	8.01	12.07 <<	20.09 <<
0.27	8.14	11.27	19.41
0.28	8.16	10.46	18.63
0.30	8.19	9.66	17.85
0.32	8.21	8.85	17.06
0.33	8.23	8.05	16.28
0.35	8.24	7.24	15.49
0.37	8.26	6.44	14.69
0.38	8.27	5.63	13.90
0.40	8.27	4.83	13.10
0.42	8.28	4.02	12.31
0.43	8.28	3.22	11.50
0.45	8.29	2.41	10.70
0.47	8.28	1.61	9.89
0.48	8.28	0.80	9.09
0.50	8.28	0.00	8.28
0.52	8.27	0.00	8.27
0.53	8.27	0.00	8.27
0.55	8.27	0.00	8.27
0.57	8.27	0.00	8.27
0.58	8.27	0.00	8.27
0.60	8.28	0.00	8.28
0.62	8.29	0.00	8.29
0.63	8.30	0.00	8.30

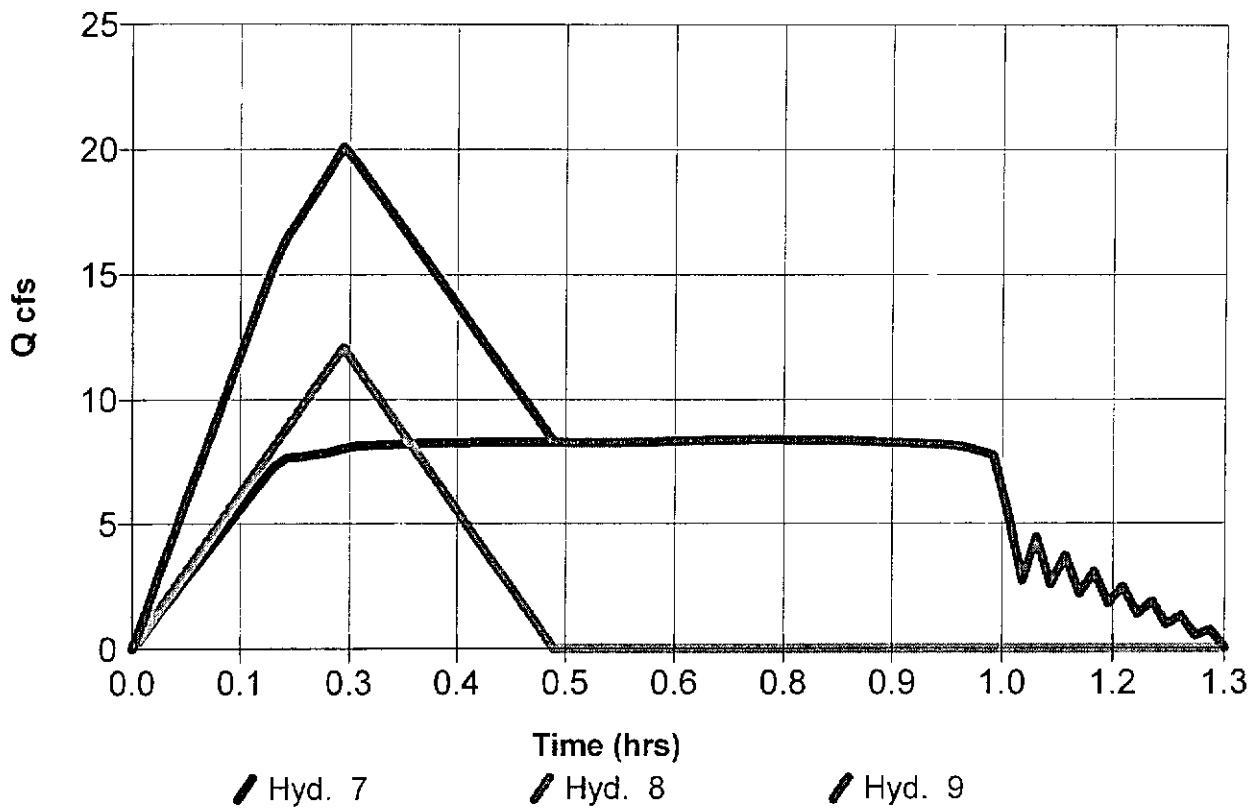
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Hydrograph Discharge Table

Time (hrs)	Hyd. 7 + (cfs)	Hyd. 8 = (cfs)	Outflow (cfs)
0.65	8.32	0.00	8.32
0.67	8.33	0.00	8.33
0.68	8.35	0.00	8.35
0.70	8.35	0.00	8.35
0.72	8.36	0.00	8.36
0.73	8.36	0.00	8.36
0.75	8.37 <<	0.00	8.37
0.77	8.36	0.00	8.36
0.78	8.36	0.00	8.36
0.80	8.35	0.00	8.35
0.82	8.35	0.00	8.35
0.83	8.33	0.00	8.33
0.85	8.32	0.00	8.32
0.87	8.30	0.00	8.30
0.88	8.29	0.00	8.29
0.90	8.27	0.00	8.27
0.92	8.24	0.00	8.24
0.93	8.22	0.00	8.22
0.95	8.19	0.00	8.19
0.97	8.16	0.00	8.16
0.98	8.09	0.00	8.09
1.00	7.93	0.00	7.93
1.02	7.76	0.00	7.76
1.03	5.47	0.00	5.47
1.05	2.74	0.00	2.74
1.07	4.45	0.00	4.45
1.08	2.58	0.00	2.58
1.10	3.71	0.00	3.71
1.12	2.20	0.00	2.20
1.13	3.08	0.00	3.08
1.15	1.81	0.00	1.81
1.17	2.47	0.00	2.47
1.18	1.39	0.00	1.39
1.20	1.88	0.00	1.88
1.22	0.96	0.00	0.96
1.23	1.30	0.00	1.30
1.25	0.51	0.00	0.51
1.27	0.75	0.00	0.75

...End

Hyd. No. 9 - Combine - 100 Yr - Qp = 20.09 cfs - Flow Into N. Inlet



Hydrograph Report

Hyd. No. 10

Disch. Out N. Inlet

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Inflow hyd. No. = 9
 Max. Elevation = 1360.50 ft

Peak discharge = 4.82 cfs
 Time interval = 1 min
 Reservoir name = Det. at North Are
 Max. Storage = 21,545 cuft

Storage Indication method used.

Outflow hydrograph volume = 40,548 cuft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.02	1.49	1354.75	1.36	----	----	----	----	----	----	----	----	1.36
0.03	3.09	1356.42	2.78	----	----	----	----	----	----	----	----	2.78
0.05	4.57	1359.00	4.19	----	----	----	----	----	----	----	----	4.19
0.07	6.17	1359.06	4.21	----	----	----	----	----	----	----	----	4.21
0.08	7.66	1359.20	4.28	----	----	----	----	----	----	----	----	4.28
0.10	9.18	1359.41	4.37	----	----	----	----	----	----	----	----	4.37
0.12	10.73	1359.54	4.43	----	----	----	----	----	----	----	----	4.43
0.13	12.25	1359.62	4.46	----	----	----	----	----	----	----	----	4.46
0.15	13.78	1359.71	4.50	----	----	----	----	----	----	----	----	4.50
0.17	15.31	1359.83	4.54	----	----	----	----	----	----	----	----	4.54
0.18	16.51	1359.95	4.60	----	----	----	----	----	----	----	----	4.60
0.20	17.36	1360.01	4.62	----	----	----	----	----	----	----	----	4.62
0.22	18.24	1360.03	4.63	----	----	----	----	----	----	----	----	4.63
0.23	19.15	1360.06	4.64	----	----	----	----	----	----	----	----	4.64
0.25	20.09 <<	1360.08	4.65	----	----	----	----	----	----	----	----	4.65
0.27	19.41	1360.11	4.66	----	----	----	----	----	----	----	----	4.66
0.28	18.63	1360.13	4.67	----	----	----	----	----	----	----	----	4.67
0.30	17.85	1360.15	4.68	----	----	----	----	----	----	----	----	4.68
0.32	17.06	1360.17	4.69	----	----	----	----	----	----	----	----	4.69
0.33	16.28	1360.19	4.70	----	----	----	----	----	----	----	----	4.70
0.35	15.49	1360.21	4.70	----	----	----	----	----	----	----	----	4.70
0.37	14.69	1360.23	4.71	----	----	----	----	----	----	----	----	4.71
0.38	13.90	1360.24	4.72	----	----	----	----	----	----	----	----	4.72
0.40	13.10	1360.26	4.72	----	----	----	----	----	----	----	----	4.72
0.42	12.31	1360.27	4.73	----	----	----	----	----	----	----	----	4.73
0.43	11.50	1360.28	4.73	----	----	----	----	----	----	----	----	4.73
0.45	10.70	1360.29	4.74	----	----	----	----	----	----	----	----	4.74
0.47	9.89	1360.30	4.74	----	----	----	----	----	----	----	----	4.74
0.48	9.09	1360.31	4.74	----	----	----	----	----	----	----	----	4.74
0.50	8.28	1360.32	4.75	----	----	----	----	----	----	----	----	4.75
0.52	8.27	1360.32	4.75	----	----	----	----	----	----	----	----	4.75
0.53	8.27	1360.33	4.75	----	----	----	----	----	----	----	----	4.75
0.55	8.27	1360.33	4.75	----	----	----	----	----	----	----	----	4.75
0.57	8.27	1360.34	4.75	----	----	----	----	----	----	----	----	4.75
0.58	8.27	1360.34	4.76	----	----	----	----	----	----	----	----	4.76
0.60	8.28	1360.35	4.76	----	----	----	----	----	----	----	----	4.76
0.62	8.29	1360.36	4.76	----	----	----	----	----	----	----	----	4.76
0.63	8.30	1360.36	4.76	----	----	----	----	----	----	----	----	4.76

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
0.65	8.32	1360.37	4.77	----	----	----	----	----	----	----	----	4.77
0.67	8.33	1360.37	4.77	----	----	----	----	----	----	----	----	4.77
0.68	8.35	1360.38	4.77	----	----	----	----	----	----	----	----	4.77
0.70	8.35	1360.39	4.77	----	----	----	----	----	----	----	----	4.77
0.72	8.36	1360.39	4.78	----	----	----	----	----	----	----	----	4.78
0.73	8.36	1360.40	4.78	----	----	----	----	----	----	----	----	4.78
0.75	8.37	1360.40	4.78	----	----	----	----	----	----	----	----	4.78
0.77	8.36	1360.41	4.78	----	----	----	----	----	----	----	----	4.78
0.78	8.36	1360.41	4.78	----	----	----	----	----	----	----	----	4.78
0.80	8.35	1360.42	4.79	----	----	----	----	----	----	----	----	4.79
0.82	8.35	1360.43	4.79	----	----	----	----	----	----	----	----	4.79
0.83	8.33	1360.43	4.79	----	----	----	----	----	----	----	----	4.79
0.85	8.32	1360.44	4.79	----	----	----	----	----	----	----	----	4.79
0.87	8.30	1360.44	4.80	----	----	----	----	----	----	----	----	4.80
0.88	8.29	1360.45	4.80	----	----	----	----	----	----	----	----	4.80
0.90	8.27	1360.46	4.80	----	----	----	----	----	----	----	----	4.80
0.92	8.24	1360.46	4.80	----	----	----	----	----	----	----	----	4.80
0.93	8.22	1360.47	4.80	----	----	----	----	----	----	----	----	4.80
0.95	8.19	1360.47	4.81	----	----	----	----	----	----	----	----	4.81
0.97	8.16	1360.48	4.81	----	----	----	----	----	----	----	----	4.81
0.98	8.09	1360.48	4.81	----	----	----	----	----	----	----	----	4.81
1.00	7.93	1360.49	4.81	----	----	----	----	----	----	----	----	4.81
1.02	7.76	1360.49	4.82	----	----	----	----	----	----	----	----	4.82
1.03	5.47	1360.50 <<	4.82	----	----	----	----	----	----	----	----	4.82 <<
1.05	2.74	1360.49	4.82	----	----	----	----	----	----	----	----	4.82
1.07	4.45	1360.49	4.82	----	----	----	----	----	----	----	----	4.82
1.08	2.58	1360.49	4.81	----	----	----	----	----	----	----	----	4.81
1.10	3.71	1360.49	4.81	----	----	----	----	----	----	----	----	4.81
1.12	2.20	1360.48	4.81	----	----	----	----	----	----	----	----	4.81
1.13	3.08	1360.48	4.81	----	----	----	----	----	----	----	----	4.81
1.15	1.81	1360.48	4.81	----	----	----	----	----	----	----	----	4.81
1.17	2.47	1360.47	4.81	----	----	----	----	----	----	----	----	4.81
1.18	1.39	1360.47	4.81	----	----	----	----	----	----	----	----	4.81
1.20	1.88	1360.46	4.80	----	----	----	----	----	----	----	----	4.80
1.22	0.96	1360.46	4.80	----	----	----	----	----	----	----	----	4.80
1.23	1.30	1360.45	4.80	----	----	----	----	----	----	----	----	4.80
1.25	0.51	1360.45	4.80	----	----	----	----	----	----	----	----	4.80
1.27	0.75	1360.44	4.79	----	----	----	----	----	----	----	----	4.79
1.28	0.05	1360.43	4.79	----	----	----	----	----	----	----	----	4.79
1.30	0.19	1360.42	4.79	----	----	----	----	----	----	----	----	4.79
1.32	0.00	1360.42	4.79	----	----	----	----	----	----	----	----	4.79
1.33	0.00	1360.41	4.78	----	----	----	----	----	----	----	----	4.78
1.35	0.00	1360.40	4.78	----	----	----	----	----	----	----	----	4.78
1.37	0.00	1360.39	4.78	----	----	----	----	----	----	----	----	4.78
1.38	0.00	1360.39	4.77	----	----	----	----	----	----	----	----	4.77
1.40	0.00	1360.38	4.77	----	----	----	----	----	----	----	----	4.77
1.42	0.00	1360.37	4.77	----	----	----	----	----	----	----	----	4.77
1.43	0.00	1360.36	4.76	----	----	----	----	----	----	----	----	4.76
1.45	0.00	1360.35	4.76	----	----	----	----	----	----	----	----	4.76
1.47	0.00	1360.35	4.76	----	----	----	----	----	----	----	----	4.76
1.48	0.00	1360.34	4.75	----	----	----	----	----	----	----	----	4.75

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Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
1.50	0.00	1360.33	4.75	----	----	----	----	----	----	----	----	4.75
1.52	0.00	1360.32	4.75	----	----	----	----	----	----	----	----	4.75
1.53	0.00	1360.32	4.74	----	----	----	----	----	----	----	----	4.74
1.55	0.00	1360.31	4.74	----	----	----	----	----	----	----	----	4.74
1.57	0.00	1360.30	4.74	----	----	----	----	----	----	----	----	4.74
1.58	0.00	1360.29	4.74	----	----	----	----	----	----	----	----	4.74
1.60	0.00	1360.28	4.73	----	----	----	----	----	----	----	----	4.73
1.62	0.00	1360.28	4.73	----	----	----	----	----	----	----	----	4.73
1.63	0.00	1360.27	4.73	----	----	----	----	----	----	----	----	4.73
1.65	0.00	1360.26	4.72	----	----	----	----	----	----	----	----	4.72
1.67	0.00	1360.25	4.72	----	----	----	----	----	----	----	----	4.72
1.68	0.00	1360.25	4.72	----	----	----	----	----	----	----	----	4.72
1.70	0.00	1360.24	4.71	----	----	----	----	----	----	----	----	4.71
1.72	0.00	1360.23	4.71	----	----	----	----	----	----	----	----	4.71
1.73	0.00	1360.22	4.71	----	----	----	----	----	----	----	----	4.71
1.75	0.00	1360.21	4.70	----	----	----	----	----	----	----	----	4.70
1.77	0.00	1360.21	4.70	----	----	----	----	----	----	----	----	4.70
1.78	0.00	1360.20	4.70	----	----	----	----	----	----	----	----	4.70
1.80	0.00	1360.19	4.70	----	----	----	----	----	----	----	----	4.70
1.82	0.00	1360.18	4.69	----	----	----	----	----	----	----	----	4.69
1.83	0.00	1360.18	4.69	----	----	----	----	----	----	----	----	4.69
1.85	0.00	1360.17	4.69	----	----	----	----	----	----	----	----	4.69
1.87	0.00	1360.16	4.68	----	----	----	----	----	----	----	----	4.68
1.88	0.00	1360.15	4.68	----	----	----	----	----	----	----	----	4.68
1.90	0.00	1360.15	4.68	----	----	----	----	----	----	----	----	4.68
1.92	0.00	1360.14	4.67	----	----	----	----	----	----	----	----	4.67
1.93	0.00	1360.13	4.67	----	----	----	----	----	----	----	----	4.67
1.95	0.00	1360.12	4.67	----	----	----	----	----	----	----	----	4.67
1.97	0.00	1360.12	4.66	----	----	----	----	----	----	----	----	4.66
1.98	0.00	1360.11	4.66	----	----	----	----	----	----	----	----	4.66
2.00	0.00	1360.10	4.66	----	----	----	----	----	----	----	----	4.66
2.02	0.00	1360.09	4.66	----	----	----	----	----	----	----	----	4.66
2.03	0.00	1360.08	4.65	----	----	----	----	----	----	----	----	4.65
2.05	0.00	1360.08	4.65	----	----	----	----	----	----	----	----	4.65
2.07	0.00	1360.07	4.65	----	----	----	----	----	----	----	----	4.65
2.08	0.00	1360.06	4.64	----	----	----	----	----	----	----	----	4.64
2.10	0.00	1360.05	4.64	----	----	----	----	----	----	----	----	4.64
2.12	0.00	1360.05	4.64	----	----	----	----	----	----	----	----	4.64
2.13	0.00	1360.04	4.63	----	----	----	----	----	----	----	----	4.63
2.15	0.00	1360.03	4.63	----	----	----	----	----	----	----	----	4.63
2.17	0.00	1360.02	4.63	----	----	----	----	----	----	----	----	4.63
2.18	0.00	1360.02	4.62	----	----	----	----	----	----	----	----	4.62
2.20	0.00	1360.01	4.62	----	----	----	----	----	----	----	----	4.62
2.22	0.00	1360.00	4.62	----	----	----	----	----	----	----	----	4.62
2.23	0.00	1359.96	4.60	----	----	----	----	----	----	----	----	4.60
2.25	0.00	1359.91	4.58	----	----	----	----	----	----	----	----	4.58
2.27	0.00	1359.86	4.56	----	----	----	----	----	----	----	----	4.56
2.28	0.00	1359.81	4.54	----	----	----	----	----	----	----	----	4.54
2.30	0.00	1359.76	4.52	----	----	----	----	----	----	----	----	4.52
2.32	0.00	1359.71	4.50	----	----	----	----	----	----	----	----	4.50
2.33	0.00	1359.66	4.47	----	----	----	----	----	----	----	----	4.47

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
2.35	0.00	1359.61	4.45	----	----	----	----	----	----	----	----	4.45
2.37	0.00	1359.56	4.43	----	----	----	----	----	----	----	----	4.43
2.38	0.00	1359.51	4.41	----	----	----	----	----	----	----	----	4.41
2.40	0.00	1359.32	4.33	----	----	----	----	----	----	----	----	4.33
2.42	0.00	1359.10	4.23	----	----	----	----	----	----	----	----	4.23
2.43	0.00	1354.47	0.75	----	----	----	----	----	----	----	----	0.75

...End

Reservoir Report

Reservoir No. 2 - Det. at North Area Inlet

Hydraflow Hydrographs by Intelisolve

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1354.00	00	0	0
0.50	1354.50	08	2	2
1.00	1355.00	08	4	6
1.50	1355.50	08	4	10
2.00	1356.00	08	4	14
2.50	1356.50	08	4	18
3.00	1357.00	08	4	22
3.50	1357.50	08	4	26
4.00	1358.00	08	4	30
4.50	1358.50	08	4	34
5.00	1359.00	08	4	38
5.50	1359.50	2,321	582	620
6.00	1360.00	8,557	2,720	3,340
6.50	1360.50	65,000	18,389	21,729

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 10.0	0.0	0.0	0.0
Span in	= 10.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1354.00	0.00	0.00	0.00
Length ft	= 90.0	0.0	0.0	0.0
Slope %	= 0.51	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0	1354.00	0.00	---	---	---	---	---	---	---	---	0.00
0.05	0	1354.05	0.01	---	---	---	---	---	---	---	---	0.01
0.10	0	1354.10	0.04	---	---	---	---	---	---	---	---	0.04
0.15	1	1354.15	0.09	---	---	---	---	---	---	---	---	0.09
0.20	1	1354.20	0.15	---	---	---	---	---	---	---	---	0.15
0.25	1	1354.25	0.24	---	---	---	---	---	---	---	---	0.24
0.30	1	1354.30	0.33	---	---	---	---	---	---	---	---	0.33
0.35	1	1354.35	0.44	---	---	---	---	---	---	---	---	0.44
0.40	2	1354.40	0.56	---	---	---	---	---	---	---	---	0.56
0.45	2	1354.45	0.69	---	---	---	---	---	---	---	---	0.69
0.50	2	1354.50	0.82	---	---	---	---	---	---	---	---	0.82
0.55	2	1354.55	0.97	---	---	---	---	---	---	---	---	0.97
0.60	3	1354.60	1.10	---	---	---	---	---	---	---	---	1.10
0.65	3	1354.65	1.21	---	---	---	---	---	---	---	---	1.21
0.70	4	1354.70	1.29	---	---	---	---	---	---	---	---	1.29
0.75	4	1354.75	1.35	---	---	---	---	---	---	---	---	1.35
0.80	4	1354.80	1.38	---	---	---	---	---	---	---	---	1.38
0.85	5	1354.85	1.34	---	---	---	---	---	---	---	---	1.34
0.90	5	1354.90	1.41	---	---	---	---	---	---	---	---	1.41
0.95	6	1354.95	1.48	---	---	---	---	---	---	---	---	1.48
1.00	6	1355.00	1.54	---	---	---	---	---	---	---	---	1.54
1.05	6	1355.05	1.60	---	---	---	---	---	---	---	---	1.60
1.10	7	1355.10	1.66	---	---	---	---	---	---	---	---	1.66
1.15	7	1355.15	1.71	---	---	---	---	---	---	---	---	1.71

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
1.20	8	1355.20	1.77	---	---	---	---	---	---	---	---	1.77
1.25	8	1355.25	1.82	---	---	---	---	---	---	---	---	1.82
1.30	8	1355.30	1.87	---	---	---	---	---	---	---	---	1.87
1.35	9	1355.35	1.92	---	---	---	---	---	---	---	---	1.92
1.40	9	1355.40	1.97	---	---	---	---	---	---	---	---	1.97
1.45	10	1355.45	2.02	---	---	---	---	---	---	---	---	2.02
1.50	10	1355.50	2.07	---	---	---	---	---	---	---	---	2.07
1.55	10	1355.55	2.11	---	---	---	---	---	---	---	---	2.11
1.60	11	1355.60	2.16	---	---	---	---	---	---	---	---	2.16
1.65	11	1355.65	2.20	---	---	---	---	---	---	---	---	2.20
1.70	12	1355.70	2.24	---	---	---	---	---	---	---	---	2.24
1.75	12	1355.75	2.28	---	---	---	---	---	---	---	---	2.28
1.80	12	1355.80	2.32	---	---	---	---	---	---	---	---	2.32
1.85	13	1355.85	2.37	---	---	---	---	---	---	---	---	2.37
1.90	13	1355.90	2.40	---	---	---	---	---	---	---	---	2.40
1.95	14	1355.95	2.44	---	---	---	---	---	---	---	---	2.44
2.00	14	1356.00	2.48	---	---	---	---	---	---	---	---	2.48
2.05	14	1356.05	2.52	---	---	---	---	---	---	---	---	2.52
2.10	15	1356.10	2.56	---	---	---	---	---	---	---	---	2.56
2.15	15	1356.15	2.59	---	---	---	---	---	---	---	---	2.59
2.20	16	1356.20	2.63	---	---	---	---	---	---	---	---	2.63
2.25	16	1356.25	2.67	---	---	---	---	---	---	---	---	2.67
2.30	16	1356.30	2.70	---	---	---	---	---	---	---	---	2.70
2.35	17	1356.35	2.74	---	---	---	---	---	---	---	---	2.74
2.40	17	1356.40	2.77	---	---	---	---	---	---	---	---	2.77
2.45	18	1356.45	2.81	---	---	---	---	---	---	---	---	2.81
2.50	18	1356.50	2.84	---	---	---	---	---	---	---	---	2.84
2.55	18	1356.55	2.87	---	---	---	---	---	---	---	---	2.87
2.60	19	1356.60	2.90	---	---	---	---	---	---	---	---	2.90
2.65	19	1356.65	2.94	---	---	---	---	---	---	---	---	2.94
2.70	20	1356.70	2.97	---	---	---	---	---	---	---	---	2.97
2.75	20	1356.75	3.00	---	---	---	---	---	---	---	---	3.00
2.80	20	1356.80	3.03	---	---	---	---	---	---	---	---	3.03
2.85	21	1356.85	3.06	---	---	---	---	---	---	---	---	3.06
2.90	21	1356.90	3.09	---	---	---	---	---	---	---	---	3.09
2.95	22	1356.95	3.12	---	---	---	---	---	---	---	---	3.12
3.00	22	1357.00	3.15	---	---	---	---	---	---	---	---	3.15
3.05	22	1357.05	3.18	---	---	---	---	---	---	---	---	3.18
3.10	23	1357.10	3.21	---	---	---	---	---	---	---	---	3.21
3.15	23	1357.15	3.24	---	---	---	---	---	---	---	---	3.24
3.20	24	1357.20	3.27	---	---	---	---	---	---	---	---	3.27
3.25	24	1357.25	3.30	---	---	---	---	---	---	---	---	3.30
3.30	24	1357.30	3.33	---	---	---	---	---	---	---	---	3.33
3.35	25	1357.35	3.36	---	---	---	---	---	---	---	---	3.36
3.40	25	1357.40	3.39	---	---	---	---	---	---	---	---	3.39
3.45	26	1357.45	3.41	---	---	---	---	---	---	---	---	3.41
3.50	26	1357.50	3.44	---	---	---	---	---	---	---	---	3.44
3.55	26	1357.55	3.47	---	---	---	---	---	---	---	---	3.47
3.60	27	1357.60	3.50	---	---	---	---	---	---	---	---	3.50
3.65	27	1357.65	3.52	---	---	---	---	---	---	---	---	3.52
3.70	28	1357.70	3.55	---	---	---	---	---	---	---	---	3.55
3.75	28	1357.75	3.58	---	---	---	---	---	---	---	---	3.58
3.80	28	1357.80	3.60	---	---	---	---	---	---	---	---	3.60
3.85	29	1357.85	3.63	---	---	---	---	---	---	---	---	3.63
3.90	29	1357.90	3.66	---	---	---	---	---	---	---	---	3.66
3.95	30	1357.95	3.68	---	---	---	---	---	---	---	---	3.68
4.00	30	1358.00	3.71	---	---	---	---	---	---	---	---	3.71
4.05	30	1358.05	3.73	---	---	---	---	---	---	---	---	3.73
4.10	31	1358.10	3.76	---	---	---	---	---	---	---	---	3.76
4.15	31	1358.15	3.78	---	---	---	---	---	---	---	---	3.78
4.20	32	1358.20	3.81	---	---	---	---	---	---	---	---	3.81
4.25	32	1358.25	3.83	---	---	---	---	---	---	---	---	3.83
4.30	32	1358.30	3.86	---	---	---	---	---	---	---	---	3.86
4.35	33	1358.35	3.88	---	---	---	---	---	---	---	---	3.88
4.40	33	1358.40	3.91	---	---	---	---	---	---	---	---	3.91
4.45	34	1358.45	3.93	---	---	---	---	---	---	---	---	3.93
4.50	34	1358.50	3.95	---	---	---	---	---	---	---	---	3.95
4.55	34	1358.55	3.98	---	---	---	---	---	---	---	---	3.98
4.60	35	1358.60	4.00	---	---	---	---	---	---	---	---	4.00
4.65	35	1358.65	4.03	---	---	---	---	---	---	---	---	4.03

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	Civ D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
4.70	36	1358.70	4.05	---	---	---	---	---	---	---	---	4.05
4.75	36	1358.75	4.07	---	---	---	---	---	---	---	---	4.07
4.80	36	1358.80	4.10	---	---	---	---	---	---	---	---	4.10
4.85	37	1358.85	4.12	---	---	---	---	---	---	---	---	4.12
4.90	37	1358.90	4.14	---	---	---	---	---	---	---	---	4.14
4.95	38	1358.95	4.16	---	---	---	---	---	---	---	---	4.16
5.00	38	1359.00	4.19	---	---	---	---	---	---	---	---	4.19
5.05	96	1359.05	4.21	---	---	---	---	---	---	---	---	4.21
5.10	154	1359.10	4.23	---	---	---	---	---	---	---	---	4.23
5.15	213	1359.15	4.25	---	---	---	---	---	---	---	---	4.25
5.20	271	1359.20	4.28	---	---	---	---	---	---	---	---	4.28
5.25	329	1359.25	4.30	---	---	---	---	---	---	---	---	4.30
5.30	387	1359.30	4.32	---	---	---	---	---	---	---	---	4.32
5.35	446	1359.35	4.34	---	---	---	---	---	---	---	---	4.34
5.40	504	1359.40	4.36	---	---	---	---	---	---	---	---	4.36
5.45	562	1359.45	4.39	---	---	---	---	---	---	---	---	4.39
5.50	620	1359.50	4.41	---	---	---	---	---	---	---	---	4.41
5.55	892	1359.55	4.43	---	---	---	---	---	---	---	---	4.43
5.60	1,164	1359.60	4.45	---	---	---	---	---	---	---	---	4.45
5.65	1,436	1359.65	4.47	---	---	---	---	---	---	---	---	4.47
5.70	1,708	1359.70	4.49	---	---	---	---	---	---	---	---	4.49
5.75	1,980	1359.75	4.51	---	---	---	---	---	---	---	---	4.51
5.80	2,252	1359.80	4.53	---	---	---	---	---	---	---	---	4.53
5.85	2,524	1359.85	4.56	---	---	---	---	---	---	---	---	4.56
5.90	2,796	1359.90	4.58	---	---	---	---	---	---	---	---	4.58
5.95	3,068	1359.95	4.60	---	---	---	---	---	---	---	---	4.60
6.00	3,340	1360.00	4.62	---	---	---	---	---	---	---	---	4.62
6.05	5,179	1360.05	4.64	---	---	---	---	---	---	---	---	4.64
6.10	7,018	1360.10	4.66	---	---	---	---	---	---	---	---	4.66
6.15	8,857	1360.15	4.68	---	---	---	---	---	---	---	---	4.68
6.20	10,695	1360.20	4.70	---	---	---	---	---	---	---	---	4.70
6.25	12,534	1360.25	4.72	---	---	---	---	---	---	---	---	4.72
6.30	14,373	1360.30	4.74	---	---	---	---	---	---	---	---	4.74
6.35	16,212	1360.35	4.76	---	---	---	---	---	---	---	---	4.76
6.40	18,051	1360.40	4.78	---	---	---	---	---	---	---	---	4.78
6.45	19,890	1360.45	4.80	---	---	---	---	---	---	---	---	4.80
6.50	21,729	1360.50	4.82	---	---	---	---	---	---	---	---	4.82

...End

Hyd. No. 10 - Reservoir - 100 Yr - $Q_p = 4.82$ cfs - Disch. Out N. Inlet

