Cold Summit - Franklin
Drainage Report

SEC Graham Road & Earlywood Drive
Franklin, IN 46131

Original: November 3, 2022

Prepared For:
Cold Summit Development
333 South N Main St.
Ketchum, ID 83340

Prepared By:
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1.0. Project Summary

Project Name:	Cold Summit - Franklin
Location:	SEC Graham Road & Earlywood Drive, Franklin, IN 46131
Report Type:	Drainage Report
Reviewing Agency:	City of Franklin & Johnson County Surveyor's Office
Storm Sewer Sizing:	Rational Method – Hydraflow
Detention Basin Sizing:	SCS Method – Interconnected Channel and Pond Routing (ICPR)
Stormwater Quality:	Wet Pond & Extended Dry Detention Basins
Design Standards:	City of Franklin – Subdivision Control Ordinance – July 2013

2.0. Introduction

Kimley-Horn and Associates, Inc. has been retained by Cold Summit Development to prepare construction documents and provide civil engineering services for the "Cold Summit - Franklin" project, a speculative proposed cold storage warehousing building located at the southeast corner of Graham Road & Earlywood Drive in Franklin, IN 46131. In the existing condition, the project site is an undeveloped agricultural field.

This project includes the construction of a ±356,500 sf cold storage warehouse with associated loading docks, truck courts, and automobile and truck parking areas in addition to a public road extension of Graham Road from the southeast corner of the project site up to the northeast corner where it will arc into Earlywood Drive.

This drainage report documents the hydrologic and hydraulic calculations used to design the overall drainage network of the proposed onsite wet pond, extended dry detention basins (EDDB), and storm sewers that will serve the development. The onsite wet pond will ultimately discharge to an existing box culvert that crosses under Graham Road on the south side of the site that discharges to the south to Youngs Creek.

3.0. Existing Conditions

The property encompassed within the site is zoned "Industrial, Business Development" (IBD) and is predominately used for row crop agricultural farming in the existing condition. In the existing conditions the site is divided into three drainage areas: DA-1, DA-2, and DA-3. DA- 1 drains to the southeast corner of the site where runoff is conveyed under Graham Road through an existing box culvert that releases to the south to Young's Creek. DA-2 drains to the southwest where a 12" culvert conveys runoff under Graham Rd to the southwest where it eventually drains to Young's Creek. Lastly, DA-3 on the northwest corner of the site, drains to the west towards a row of single family homes that reside on the west side of the site.

Through conversations with the Johnson County Surveyor's Office, there are believed to be private field tiles that convey subsurface flow from the west side of the site to the south. These unidentified existing tiles may collect runoff from DA-3 and route flow to the southeast corner of the site where the existing box culvert under Graham Road resides.

The Vandivier-Paulish Regulated Drainage Tile, and its associated 150' legal drain easement, currently runs through the eastern portion of the side in a north to south direction. This legal drain tile originates on the subject property and conveys infiltrated runoff from the south to the south to the upstream end of the existing box culvert under Graham Road. The design team met with the Johnson County Surveyor on August 23, 2022 to discuss this project. Mr. Cantwell advised Cold Summit Development that the regulated tile and its associated 150' legal drainage easement be vacated through the property. A subsequent petition was formally filed by Cold Summit Development on September 28, 2022 and a Drainage Board hearing date has been set for December 6, 2022.

The Johnson Industrial Park (Park) resides to the east of the project site. Drainage from the adjacent Park and areas north of Earlywood Drive is conveyed through onsite swales and culverts to an existing wet detention pond located on the southwest corner of the Park, which releases to the south and eventually connects to the upstream side of the existing box culvert that crosses under Graham Road at the southeast corner of the project site. Excerpts from the Park Drainage Report, obtained from the City of Franklin, have been included in **Appendix H** for reference. Aerial imagery suggests that in the existing condition, the wet detention pond tops its banks and sheet flows in a southwestern direction across the southeast corner of the project site on route to the existing box culvert under Graham Road.

Refer to **Appendix D** for the Existing Drainage Area Map based on collected topographic survey. Refer to **Appendix A** for an aerial photograph of the site, which supports the land use and general drainage patterns.

FEMA

According to FEMA Flood Insurance Rate Map 18081C0143E dated January 29, 2021 (**Appendix B**), the entirety of the developed site resides within "Zone X" which corresponds to areas determined to be outside of the 0.2% annual chance floodplain.

Soil Characteristics

Per the United States Geological Survey's (USGS) Natural Resources Conservation Service (NRCS) Web Soil Survey, site soils are predominately Brookston silty clay loam, 0 to 2 percent slopes (Br), Crosby silt loam, New Castle Till Plain, 0 to 2 percent slopes (CrA), and Miami silt loam, 6 to 12 percent slopes, eroded (MnC2). The existing site is 30.6% Soil Group B and 69.4% Soil Group C. Refer to **Appendix C** for the NRCS Web Soil Survey.

4.0. Proposed Conditions

Cold Summit

This project encompasses the construction of an approximate ±356,500 SF speculative cold storage warehouse building on an approximate 35.93-acre property. Refer to the Proposed Drainage Area Map and the Catchment Area Map in **Appendix D** for onsite watersheds within the site. Refer to the Drainage Area and Inlet Capacity calculations in **Appendix F** for detailed Rational Method Composite C calculations for each onsite watershed. Onsite storm sewer sizing can be found in the Hydraflow Results in **Appendix G**.

Runoff from the developed site will drain via sheet flow into onsite storm structures and swales, which will convey runoff to Extended Dry Detention Basin (EDDB) 1, EDDB 2, and/or Wet Pond 1. EDDB 1 is located on the northeast corner of the site and discharges to the south to EDDB 2, which resides on the eastern side of the site, which discharges to Wet Pond 1 on the south side of the site. Wet Pond 1 discharges southward through an outlet control structure which releases to the upstream end of the existing box culvert that crosses under Graham Road. Per the City of Franklin – Subdivision Control Ordinance – July 2013 *(Drainage Manual)*, the allowable release rate for developed sites is 0.1 cfs/ac for the 10yr-24hr storm and 0.3 cfs/ac for the 100yr-24hr storm (SCS Method). In the proposed condition, approximately 31.33 acres will be routed to Wet Pond 1. Refer to the table below for allowable discharge rates for the site.

ICPR was used as the pond modeling software for this project to size the proposed detention pond system and interconnected culverts. Refer to **Appendix F** for data input and results from the ICPR model. See below for a summary of the results.

Allowable 10-Yr Release Rate (cfs)	3.17 cfs
Allowable 100-Yr Release Rate (cfs)	9.40 cfs
Proposed 10-Yr Release Rate (cfs)	2.42 cfs
Proposed 100-Yr Release Rate (cfs)	7.04 cfs

Note: City of Franklin Drainage Manual (Chapter 6, Page 3, B.1) allows a 0.1 cfs/acre release in the post developed 10-yr critical storm return period and 0.3 cfs/acre release in the post developed 100-yr critical storm

WET POND 1	
Normal Pool Elevation	754.00
Top of Bank Elevation	761.00
Spillway Weir Elevation	758.00
10-YR Water Surface Elevation	756.84
100-YR Water Surface Elevation	757.78

EDDB 1	
8" Perforated HDPE Underdrain Inv	754.33
Bottom	756.00
Top of Bank	760.00
10-YR Water Surface Elevation	756.84
100-YR Water Surface Elevation	757.78

EDDB 2	
8" Perforated HDPE Underdrain Inv	754.33
Bottom	756.00
Top of Bank	760.00
10-YR Water Surface Elevation	758.23
100-YR Water Surface Elevation	759.05

Stormwater Quality

According to the City of Franklin Subdivision Standards, "The developer shall be required to provide a water quality detention system that is designed to detain, for over 24 hours after peak run-off from a 24-hour storm, at least 20% of the run-off from either a 1-1/4-inch storm or 1/2 inch of direct runoff, whichever is greater." With this condition, it is required that Wet Pond 1 have a water quality design volume of nearly ~28,000 CF which matches the available volume for water quality storage, meeting the requirement. Refer to **Appendix E** for water quality calculations.

Emergency Overflow Weir

An emergency overflow weir has been proposed on the east side of Wet Pond 1 on the southeast corner of the site. The weir width and depth provide adequate capacity to convey 125% of the peak inflow into the Pond. Refer to **Appendix E** for emergency overflow weir calculations.

Box Culvert

Due to the proposed roadway work, it was necessary to design a box culvert to provide a drainage path from the existing box culvert on the south side of the site to the existing wet pond within the Johnson Industrial Park (Park) residing to the east. Refer to **Appendix E** for HY-8 calculations.

Conclusions

The proposed drainage design for this project has been designed to meet the intent of the City of Franklin Subdivision Control Ordinance. No adverse impacts are anticipated to affect any adjacent or downstream properties.

5.0 Appendices

Appendix A: Aerial Photography


Essex Dr
Blue Chip Ct
Graham Ditch
Canary Ditch
Canary Ditch
N Graham Rd
N Graham Rd
N Graham Rd
N Graham Rd
PROPOSED
COLD SUMMIT
Earlywood Dr
Earlywood Dr
R-J Pkwy
Hudson St
E 300 N
0
400
800
NORTH

Appendix B: FEMA Firmette

National Flood Hazard Layer FIRMette

FEMA

86°3'44"W 39°31'20"N

86°3'6"W 39°30'52"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/22/2022 at 4:28 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix C: NRCS Web Soil Survey

Map Scale: 1:3,290 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Johnson County, Indiana
Survey Area Data: Version 30, Sep 3, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 22, 2020—Nov 12, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Br	Brookston silty clay loam, 0 to 2 percent slopes	B/D	14.0	30.6%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	31.6	69.3%
MnC2	Miami silt loam, 6 to 12 percent slopes, eroded	C	0.0	0.1%
Totals for Area of Interest			**45.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix D: Drainage Exhibits

DA–ONSITE
35.98 ACRES

DA–OFFSITE
207.61 ACRES

761
761
760
759
759
762
763
764
765
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779

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OVERALL EXISTING DRAINAGE AREA MAP
FRANKLIN, IN
November 3, 2022

0' 200' 400'

NORTH

DA–2
3.53 ACRES

DA – 3
5.56 ACRES

DA–1
26.88 ACRES

EXISTING VANDIVIER-PAULISH
REGULATED LEGAL DRAINAGE
EASEMENT (TO BE VACATED)

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PROJECT SITE EXISTING DRAINAGE AREA MAP
FRANKLIN, IN
November 2, 2022

0' 60' 120'

NORTH

DA–1
18.58 ACRES

DA–2
2.98 ACRES

DA–3
9.77 ACRES

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PROPOSED DRAINAGE AREA MAP
FRANKLIN, IN
November 2, 2022

D10
Area: 1.16
c: 0.85
Tc: 5.0

D11
Area: 1.17
c: 0.85
Tc: 5.0

D18
Area: 1.03
c: 0.85
Tc: 5.0

D9
Area: 1.39
c: 0.85
Tc: 5.0

D12
Area: 1.18
c: 0.85
Tc: 5.0

D19
Area: 1.40
c: 0.85
Tc: 5.0

D20
Area: 0.84
c: 0.85
Tc: 5.0

D3
Area: 0.48
c: 0.81
Tc: 5.0

D4
Area: 0.49
c: 0.80
Tc: 5.0

D5
Area: 0.49
c: 0.81
Tc: 5.0

D6
Area: 0.48
c: 0.81
Tc: 5.0

D16
Area: 0.45
c: 0.81
Tc: 5.0

D15
Area: 0.45
c: 0.85
Tc: 5.0

D2
Area: 0.68
c: 0.76
Tc: 5.0

D7
Area: 0.46
c: 0.81
Tc: 5.0

D8
Area: 0.19
c: 0.59
Tc: 5.0

D17
Area: 0.18
c: 0.73
Tc: 5.0

D14
Area: 0.45
c: 0.85
Tc: 5.0

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CATCHMENT AREA MAP
FRANKLIN, IN
November 3, 2022

0' 60' 120'

NORTH

Appendix E: Existing and Proposed Drainage Calculations

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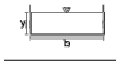
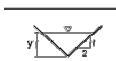
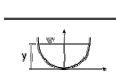
PROJECT:	**Cold Summit**
BY:	**NPK**
DATE:	**11/3/2022**

TIME OF CONCENTRATION CALCULATION
PRE-PROJECT WATERSHED CONDITIONS
TR-55 Methodology

	SHEET FLOW Tc = (0.007(nL)^0.8)/(P2^0.5)(s^0.4) 2-year/24-hr Rainfall Depth (in.) = 2.91						**SHALLOW CONCENTRATED FLOW** Tc = L / 60*V							**OPEN CHANNEL FLOW** Tc = L / 60*V V = (1.49/n)*R^(2/3)*s^(1/2)										**TOTAL**
Basin	Length (ft)	$Elev_1$	$Elev_2$	Slope (ft/ft)	Manning's "n"	T_{c1} (min)	Length (ft)	$Elev_2$	$Elev_3$	Slope (ft/ft)	Condition TR-55 Fig. 3-1	V_{avg} (ft/s)	T_{c2} (min)	Length (ft)	Manning's "n"	Area (ft^2)	Perimeter (ft)	Radius (ft)	$Elev_3$	$Elev_4$	Slope (ft/ft)	V_{avg} (ft/s)	T_{c3} (min)	T_{cTOTAL} * (min)
Existing																								
DA-Offsite	100	798.2	793.5	0.0475	0.170	8.0	4192	793.480	763.000	0.007	Unpaved	1.38	50.8	1432	0.045	13	30.30	2.24	763.0	756.5	0.0045	3.82	6.24	65.1

Channel type	Area A	Wetted perimeter P	Hydraulic radius R	Top width T	Hydraulic depth D
	by	$\frac{by}{b+2y}$	$\frac{by}{b+2y}$	b	y
	b+2y	$b+2y\sqrt{1+z^2}$	$\frac{(b+zy)y}{b+2y\sqrt{1+z^2}}$	b+2zy	$\frac{(b+zy)y}{b+2zy}$
	zy^2	$2y\sqrt{1+z^2}$	$\frac{zy}{2\sqrt{1+z^2}}$	2zy	$\frac{1}{2}y$
	$\frac{2}{3}Ty$	$T+\frac{8}{3}\frac{y^2}{T}$	$\frac{2T^2y}{3T^2+8y^2}$	$\frac{3}{4}\frac{A}{y}$	$\frac{2}{3}y$
	$\frac{1}{8}(\theta-\sin\theta)$	$\frac{1}{2}\theta d_0$	$\frac{1}{4}[1-\frac{\sin\theta}{\theta}]d_0$	$2\sqrt{y(d_0-y)}$	$\frac{1}{8}\left(\frac{\theta-\sin\theta}{\sin\frac{\theta}{2}}\right)d_0$

Trapezoidal #1	
Area, A =	13
Wetted Perimeter, P =	30.30
Hydraulic Radius, R =	2.24
Top Width, T =	29
Hydraulic Depth, D =	4
Slope, Z =	3
Bottom Width, b =	5
Depth, y =	4

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

Manning's n for Channels (Chow, 1959).

Type of Channel and Description	Minimum	Normal	Maximum
Natural streams - minor streams (top width at floodstage < 100 ft)			
1. Main Channels			
a. clean, straight, full stage, no rifts or deep pools	0.025	0.030	0.033
b. same as above, but more stones and weeds	0.030	0.035	0.040
c. clean, winding, some pools and shoals	0.033	0.040	0.045
d. same as above, but some weeds and stones	0.035	0.045	0.050
e. same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
f. same as "d" with more stones	0.045	0.050	0.060
g. sluggish reaches, weedy, deep pools	0.050	0.070	0.080
h. very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.100	0.150

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PROJECT:	**COLD SUMMIT**
BY:	**NPK**
DATE:	**11/3/2022**

Site Soil	
Hydrologic Group	%
A	0.0%
B	30.6%
C	69.4%
D	0.0%
Total	100.0%

Cover	Type	Condition	Soil Group Weighted	Soil Group Weighted CN	
			C	Actual Soil Group	Next Less Impervious Soil Group
Agricultural	Row Crop - Straight Row	Good	0.30	83	88
Fully Developed	Open Space	Good Condition (>75% Cover)	0.30	70	78
Fully Developed	Impervious	Paved	0.85	98	98
Fully Developed	Urban District	Commercial (85% Impervious)	0.79	93	95
Water	Pond or Lake	-	1.00	100	100

EXISTING BASINS	Area (ac)						Weighted CN	Weighted CN
	Row Crop - Straight Row - Good	Open Space - Good Condition (>75% Cover)	Impervious - Paved	Commercial District (85% Impervious)	Water	Total	Actual Soil Group	Next Less Impervious Soil Group
DA-1	26.68	0.00	0.20	0	0.00	26.88	83	88
DA-2	3.32	0.00	0.21	0	0.00	3.53	84	89
DA-3	5.45	0.00	0.11	0	0.00	5.56	83	88
DA - Offsite	146.61	25.00	1.00	35.00	0.00	207.61	83	88

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PROJECT:	**COLD SUMMIT**
BY:	**NPK**
DATE:	**11/3/2022**

Site Soil	
Hydrologic Group	%
A	0.0%
B	30.6%
C	69.4%
D	0.0%
Total	100.0%

Cover	Type	Condition	Soil Group Weighted	Soil Group Weighted CN	
			C	Actual Soil Group	Next Less Impervious Soil Group
Agricultural	Row Crop - Straight Row	Good	0.30	83	88
Fully Developed	Open Space	Good Condition (>75% Cover)	0.30	70	78
Fully Developed	Impervious	Paved	0.85	98	98
Water	Pond or Lake	-	1.00	100	100

PROPOSED BASINS	Area (ac)					Weighted CN	Weighted CN
	Row Crop - Straight Row - Good	Open Space - Good Condition (>75% Cover)	Impervious - Paved	Water	Total	Actual Soil Group	Next Less Impervious Soil Group
DA-1	0.00	4.78	12.04	1.76	18.58	91	93
DA-2	0.00	1.61	1.37	0.00	2.98	83	87
DA-3	0.00	2.81	6.96	0.00	9.77	90	92

170350000
COLD SUMMIT

Kimley»Horn
Expect More. Experience Better.

DATE: 11/3/2022

PROPOSED CONDITIONS ONSITE DRAINAGE AREA CALCULATIONS

Drainage Area	Total Area (ac)	Impervious Area (ac)	Pervious Area (ac)	Rational Coefficient	Area * C
D2	0.68	0.57	0.11	0.76	0.52
D3	0.48	0.45	0.03	0.81	0.39
D4	0.49	0.45	0.04	0.80	0.39
D5	0.49	0.45	0.04	0.81	0.40
D6	0.48	0.45	0.03	0.81	0.39
D7	0.46	0.43	0.03	0.81	0.37
D8	0.19	0.10	0.09	0.59	0.11
D14	0.45	0.45	0.00	0.85	0.38
D15	0.45	0.45	0.00	0.85	0.38
D16	0.45	0.42	0.03	0.81	0.36
D17	0.18	0.14	0.04	0.73	0.13

Notes

Runoff Coefficients:	
Pervious	0.30
Asphalt/ Concrete/ Roof	0.85

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INLET CAPACITY CALCULATIONS

Structure ID	Tributary Area A (ac)	C	10-YR Peak Discharge (cfs)	100-YR Peak Discharge (cfs)	Grate	Max Ponding Depth H (ft)	Entrance Grate Area A (sf)	Entrance Loss Coefficient C	Entrance Perimeter P (ft)	Grate Capacity Q (cfs)	50% Clogged (cfs)
D2	0.68	0.76	3.74	5.10	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D3	0.48	0.81	2.81	3.84	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D4	0.49	0.80	2.83	3.86	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D5	0.49	0.81	2.86	3.90	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D6	0.48	0.81	2.81	3.84	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D7	0.46	0.81	2.70	3.68	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D8	0.19	0.59	0.81	1.11	R-3287-15	0.50	3.20	0.61	7.50	8.75	4.4
D14	0.45	0.85	2.76	3.77	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D15	0.45	0.85	2.76	3.77	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D16	0.45	0.81	2.63	3.59	R-3455-C	0.50	2.60	0.61	10.00	8.85	4.4
D17	0.18	0.73	0.95	1.29	R-3287-15	0.50	3.20	0.61	7.50	8.75	4.4

Notes

1) Runoff = CIA
2) Assumed a 5 min inlet Time of Concentration
   Intensity 10-yr = 7.22 in/hr
   Intensity 100-yr = 9.85 in/hr
3) Grate Capacity
   Lesser of $Q=3.3*P*H^{3/2}$ & $Q=0.6*A*(2*32.2*H)^{1/2}$

4)

				Open Area* (sf)	Entrance Perimeter* (ft)
MH	CURB	Neenah	R-3287-15	3.20	7.50
MH	CURB	Neenah	R-3287-10V	2.10	5.50
MH	RECT	Neenah	R-3455-C	2.60	10.00
MH	CURB	Neenah	R-3010	1.00	4.60
MH	BEEHIVE	Neenah	R-4342	2.00	6.00
MH	BEEHIVE	Neenah	R-4215-C	3.30	11.30
Concrete End Section		CES		-	-

**Open Area & Entrance Perimeter values obtained from Neenah*

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Proposed Detention Calculations

Proposed 100-Yr Allowable Release Rate Calculations

Allowable 10-Yr Release Rate (cfs)	3.13 cfs
Allowable 100-Yr Release Rate (cfs)	9.40 cfs
Proposed 10-Yr Release Rate (cfs)	2.42 cfs
Proposed 100-Yr Release Rate (cfs)	7.04 cfs

Note: Hancock County Drainage Manual (Chapter 6, Page 4, B.1) allows a 0.1 cfs/acre release in the post developed 10-yr critical storm return period and 0.3 cfs/acre release in the post developed 100-yr critical storm

Proposed Curve Number Calculations

Contributing Drainage Areas	Total Area (ac)	Impervious Area (ac)	Pervious Area (ac)	CN	Area * CN	Notes
DA-1	*18.58*	*12.04*	*6.54*	*93*	*1729*	
DA-2	*2.98*	*1.37*	*1.61*	*87*	*260*	
DA-3	*9.77*	*6.96*	*2.81*	*92*	*901*	
TOTAL	*31.33*	*20.37*	*10.96*	*92*	*2890*	

Proposed Detention Volume Calculations

Proposed Detention Volume Calculations

WET POND 1			
Elevation	**Area**	**Volume**	**Notes**
754.00	1.76 ac	0.00 af	Normal Pool
759.00	2.61 ac	10.93 af	
761.00	3.05 ac	16.58 af	Top of Pond

WET POND 1	
10-YR Water Surface Elevation	756.84
100-YR Water Surface Elevation	757.78

DDB 1			
Elevation	**Area**	**Volume**	**Notes**
756.00	0.19 ac	0.00 af	Bottom of DDB
756.00	0.19 ac	0.00 af	Toe of Slope
760.00	0.55 ac	1.47 af	Top of DDB

DDB 1	
10-YR Water Surface Elevation	756.93
100-YR Water Surface Elevation	757.81

DDB 2			
Elevation	**Area**	**Volume**	**Notes**
756.00	0.38 ac	0.00 af	Bottom of DDB
756.00	0.38 ac	0.00 af	Toe of Slope
760.00	0.69 ac	2.14 af	Top of DDB

DDB 2	
10-YR Water Surface Elevation	758.23
100-YR Water Surface Elevation	759.05

Water Quality Summary*

Total Onsite Developed Area (DA-1, DA-2, DA-3) = 31.33 AC

Volume from 1.25-inch, 24-HR storm (See Appendix E) = ~140,000 CF

20% of that value = ~28,000 CF (Greater of the two)

0.5-inches of direct runoff: V = (31.33 AC) * (43,560 SF) * (0.5-in) * (1/12-inch) = ~57,000 CF

20% of that value = ~11,400 CF

Water Quality Design Volume = 28,432 CF

Time of Peak Runoff = 12.0 Hours

24-HR after Peak Runoff = Hour 36.0 of simulation

Volume Stored at Hour 36.0 (See Appendix E) = ~28,000 CF

The proposed site meets the water quality requirement.

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EMERGENCY SPILLWAY CALCULATIONS

***Emergency spillway must carry the peak** **100** **yr flow rate to the pond**

Peak inflow to Pond 1 (Proposed Condition)	**121.31**	(From ICPR output)
125% of Peak inflow	151.64	

Weir Formula→ $Q=C_{weir}*(L)*H^{3/2}$

C_{weir} =	3.20
Q =	151.64
L =	**50.00**
H =	0.96
Spillway Elev. =	**758.00**
Overflow Elev. =	758.96
Berm Elevation =	**761.00**

***OVERFLOW SPILLWAY WIDTH OF 50 FEET HAS SUFFICIENT CAPACITY TO CARRY 125% OF THE 100 YR FLOW RATE**

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 1.00 cfs

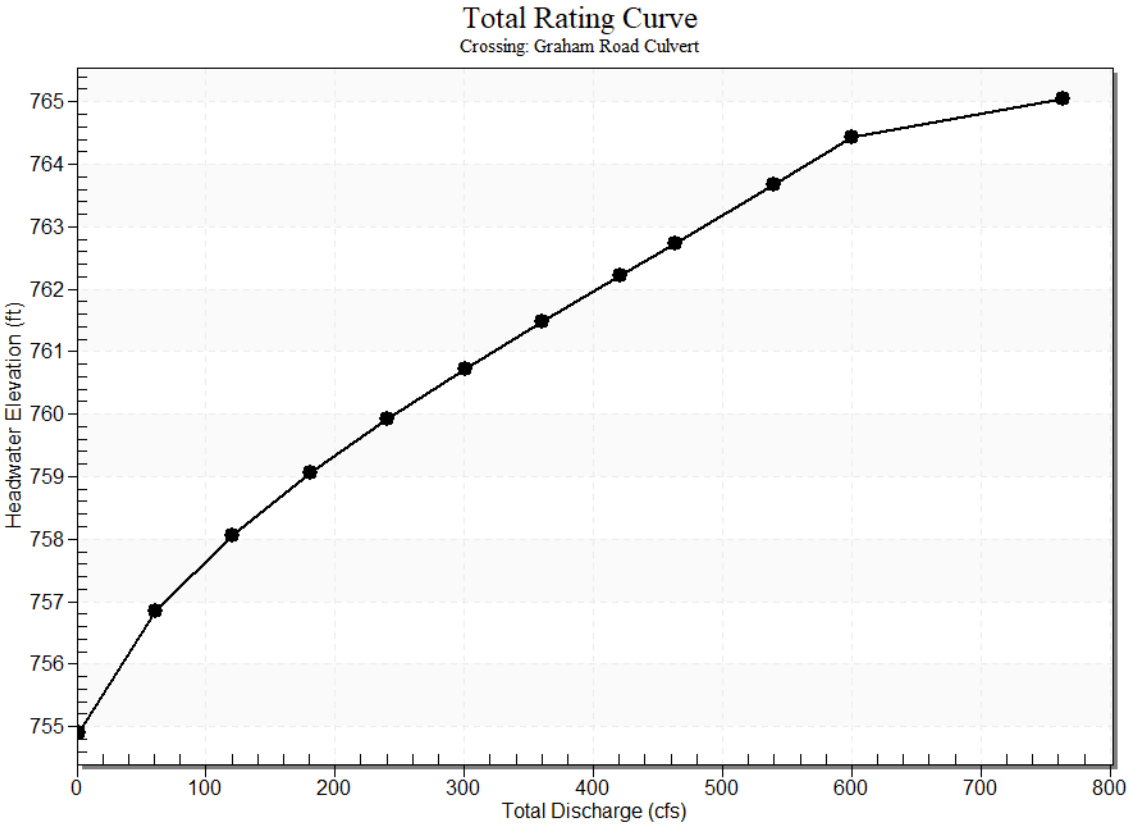
Design Flow: 462.83 cfs

Maximum Flow: 600.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: Graham Road Culvert

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
754.90	1.00	1.00	0.00	1
756.85	60.90	60.90	0.00	1
758.05	120.80	120.80	0.00	1
759.05	180.70	180.70	0.00	1
759.92	240.60	240.60	0.00	1
760.73	300.50	300.50	0.00	1
761.48	360.40	360.40	0.00	1
762.21	420.30	420.30	0.00	1
762.73	462.83	462.83	0.00	1
763.67	540.10	540.10	0.00	1
764.43	600.00	600.00	0.00	1
764.51	606.03	606.03	0.00	Overtopping

Rating Curve Plot for Crossing: Graham Road Culvert



Culvert Data: Culvert 1

Table 1 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
1.00 cfs	1.00 cfs	754.90	0.13	0.0*	1-S2n	0.04	0.08	0.04	0.11	2.95	0.75
60.90 cfs	60.90 cfs	756.85	2.08	0.700	1-S2n	1.00	1.22	1.02	0.98	7.49	2.53
120.80 cfs	120.80 cfs	758.05	3.28	1.473	1-S2n	1.58	1.92	1.62	1.33	9.30	3.02
180.70 cfs	180.70 cfs	759.05	4.28	2.179	1-S2n	2.09	2.51	2.16	1.59	10.48	3.34

240.60 cfs	240.60 cfs	759.92	5.15	2.868	1-S2n	2.55	3.04	2.64	1.80	11.37	3.60
300.50 cfs	300.50 cfs	760.73	5.96	3.560	1-S2n	2.99	3.53	3.11	1.98	12.09	3.81
360.40 cfs	360.40 cfs	761.48	6.71	4.266	1-S2n	3.42	3.98	3.54	2.14	12.72	3.99
420.30 cfs	420.30 cfs	762.21	7.44	4.994	1-S2n	3.83	4.41	3.96	2.29	13.26	4.14
462.83 cfs	462.83 cfs	762.73	7.96	5.525	1-S2n	4.11	4.70	4.25	2.38	13.61	4.25
540.10 cfs	540.10 cfs	763.67	8.90	6.528	5-S2n	4.63	5.21	4.76	2.54	14.18	4.42
600.00 cfs	600.00 cfs	764.43	9.66	7.342	5-S2n	5.01	5.59	5.15	2.66	14.57	4.53

* Full Flow Headwater elevation is below inlet invert.

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

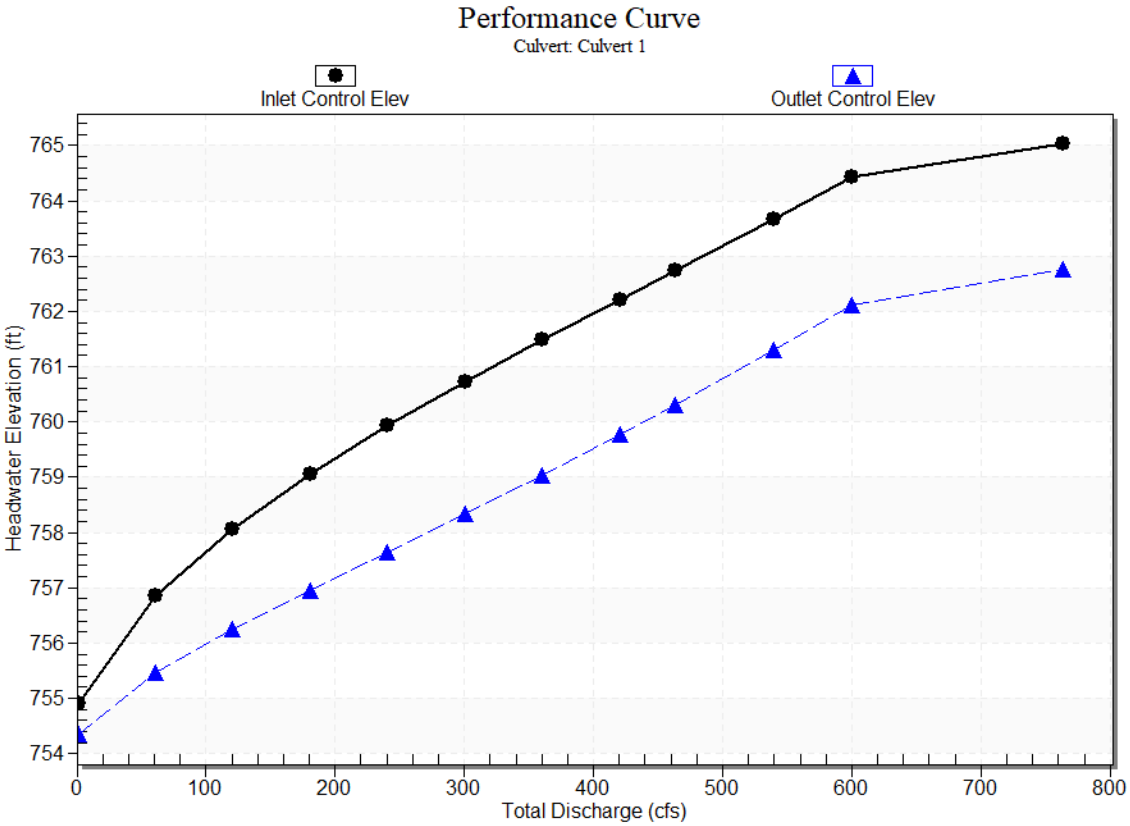
Inlet Elevation (invert): 754.77 ft,

Outlet Elevation (invert): 754.23 ft

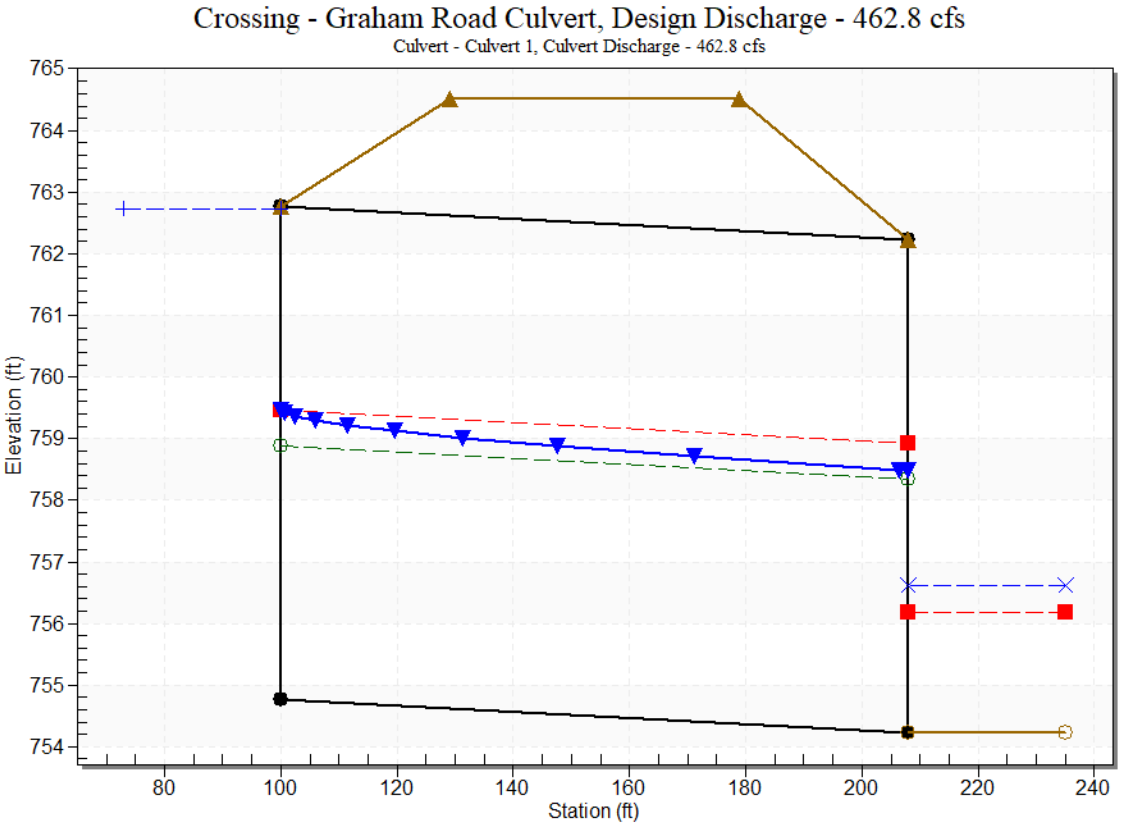
Culvert Length: 108.00 ft,

Culvert Slope: 0.0050

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: 754.77 ft

Outlet Station: 208.00 ft

Outlet Elevation: 754.23 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 8.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90º) Headwall (Ke=0.5)

Inlet Depression: None

Tailwater Data for Crossing: Graham Road Culvert

Table 2 - Downstream Channel Rating Curve (Crossing: Graham Road Culvert)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
1.00	754.34	0.11	0.75	0.04	0.42
60.90	755.21	0.98	2.53	0.31	0.57
120.80	755.56	1.33	3.02	0.42	0.59
180.70	755.82	1.59	3.34	0.50	0.61
240.60	756.03	1.80	3.60	0.56	0.62
300.50	756.21	1.98	3.81	0.62	0.63
360.40	756.37	2.14	3.99	0.67	0.64
420.30	756.52	2.29	4.14	0.71	0.64
462.83	756.61	2.38	4.25	0.74	0.65
540.10	756.77	2.54	4.42	0.79	0.65
600.00	756.89	2.66	4.53	0.83	0.66

Tailwater Channel Data - Graham Road Culvert

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 15.00 (_:1)

Channel Slope: 0.0050

Channel Manning's n: 0.0300

Channel Invert Elevation: 754.23 ft

Roadway Data for Crossing: Graham Road Culvert

Roadway Profile Shape: Constant Roadway Elevation

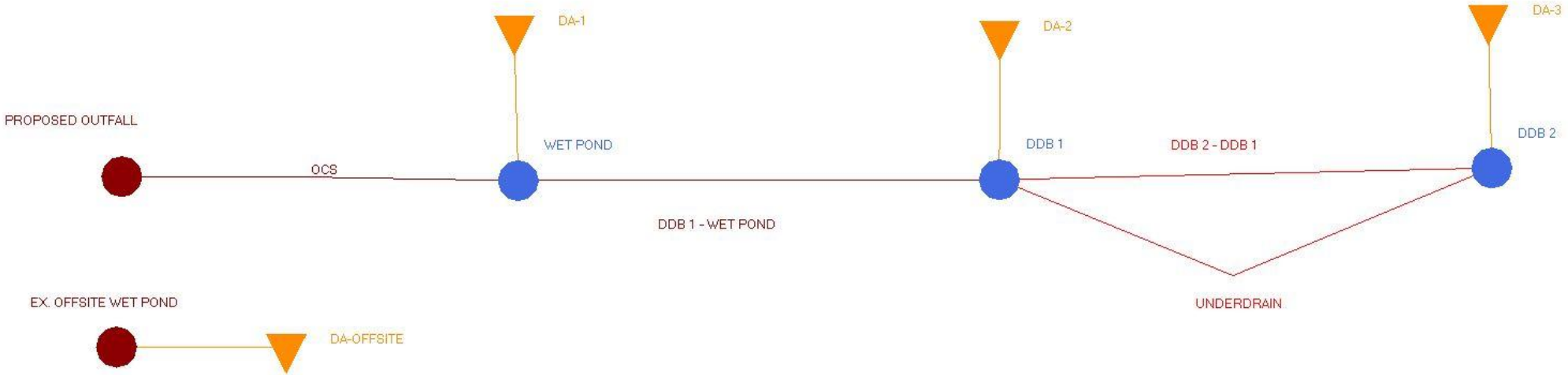
Crest Length: 100.00 ft

Crest Elevation: 764.51 ft

Roadway Surface: Paved

Roadway Top Width: 50.00 ft

Appendix F: ICPR Results

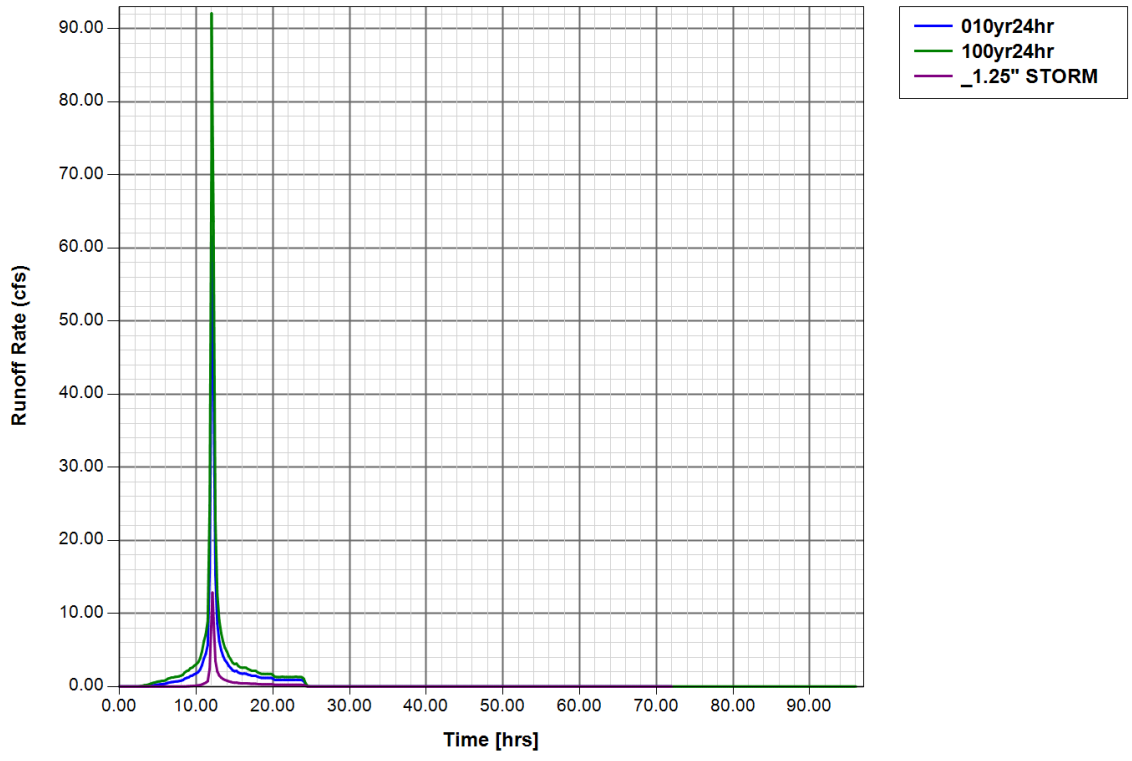

DA-1
DA-2
DA-3
PROPOSED OUTFALL
WET POND
DDB 1
DDB 2 - DDB 1
DDB 2
OCS
DDB 1 - WET POND
UNDERDRAIN
EX. OFFSITE WET POND
DA-OFFSITE

Simple Basin: DA-1

Scenario:	COLD SUMMIT
Node:	WET POND
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	20.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	18.5800 ac
Curve Number:	93.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin Runoff Rate: DA-1 [COLD SUMMIT]

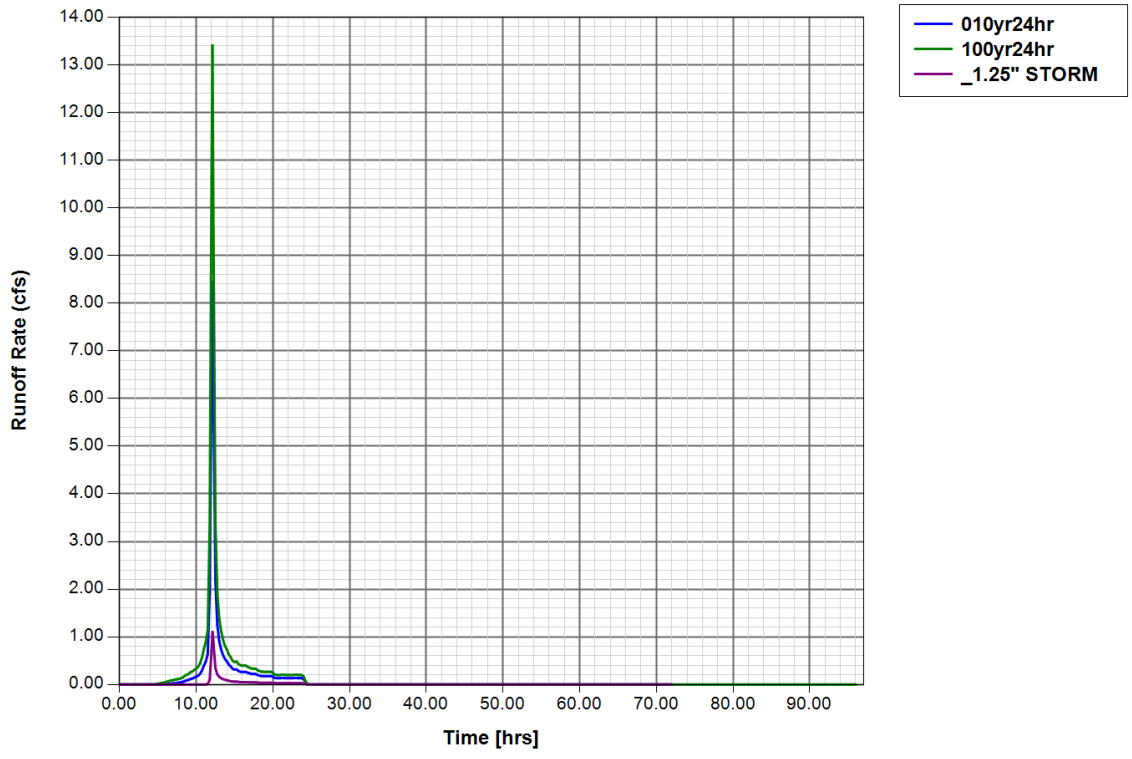


Simple Basin: DA-2

Scenario:	COLD SUMMIT
Node:	DDB 1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	20.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	2.9800 ac
Curve Number:	87.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin Runoff Rate: DA-2 [COLD SUMMIT]

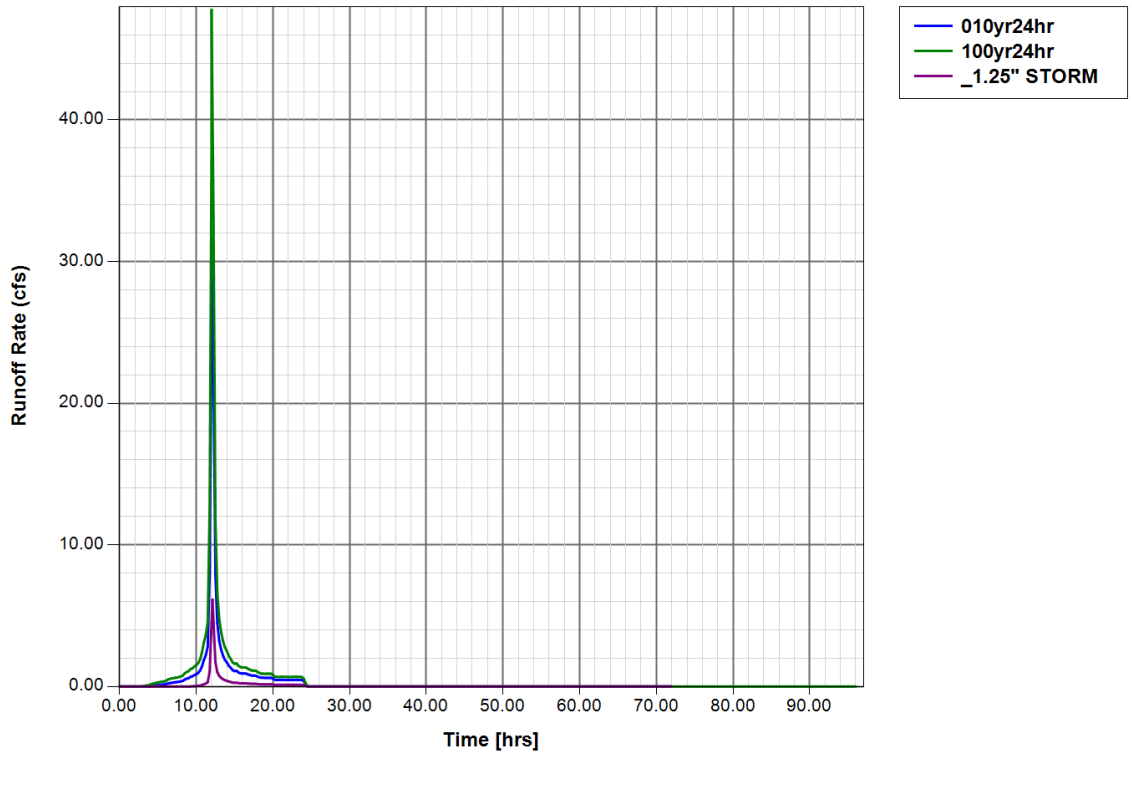


Simple Basin: DA-3

Scenario:	COLD SUMMIT
Node:	DDB 2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	20.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	9.7700 ac
Curve Number:	92.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin Runoff Rate: DA-3 [COLD SUMMIT]

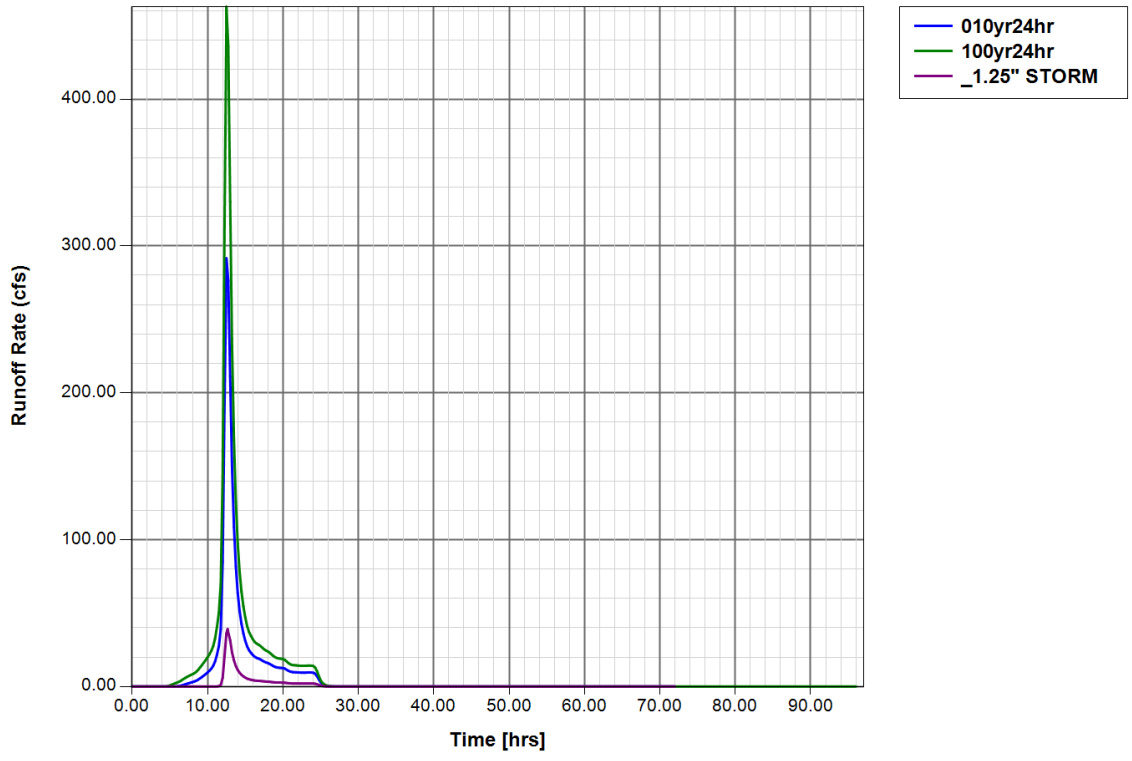


Simple Basin: DA-OFFSITE

Scenario:	COLD SUMMIT
Node:	EX. OFFSITE WET POND
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	65.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	207.6100 ac
Curve Number:	88.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin Runoff Rate: DA-OFFSITE [COLD SUMMIT]



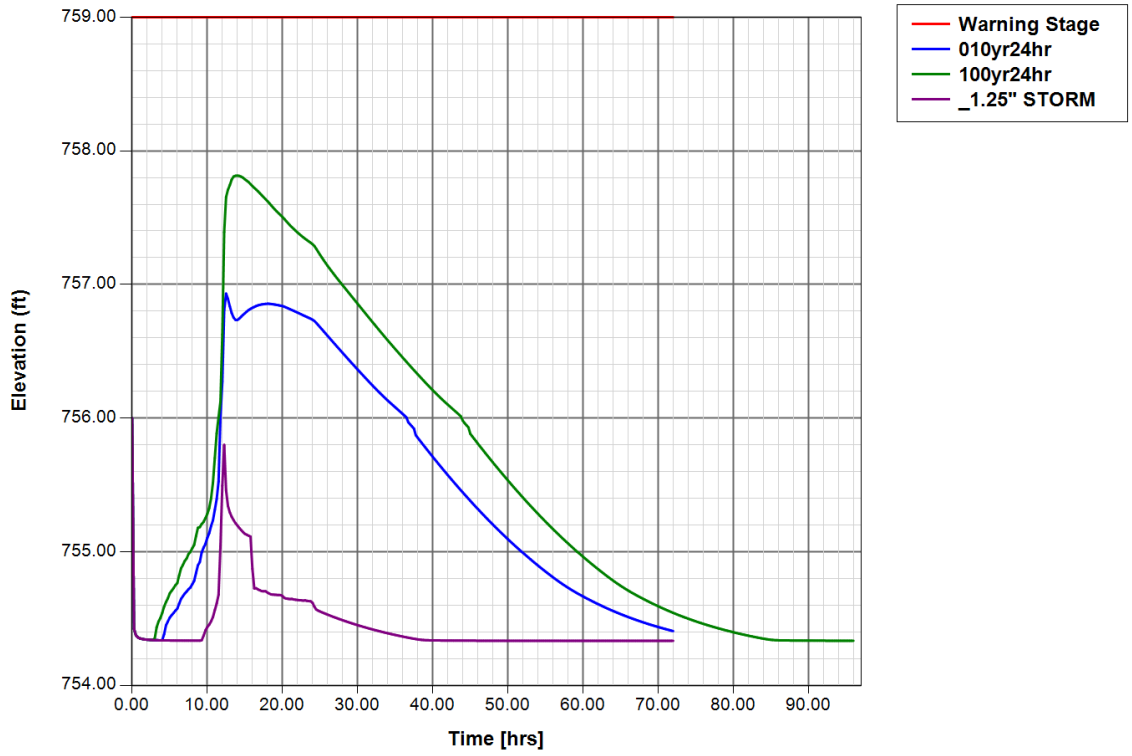
Node: DDB 1

Scenario: COLD SUMMIT
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 756.00 ft
Warning Stage: 759.00 ft

Stage [ft]	Area [ac]	Area [ft2]
756.00	0.1900	8276
760.00	0.5500	23958

Comment: 760 = Top of Bank

Node Stage w/Warning Stage: DDB 1 [COLD SUMMIT]



Node: DDB 2

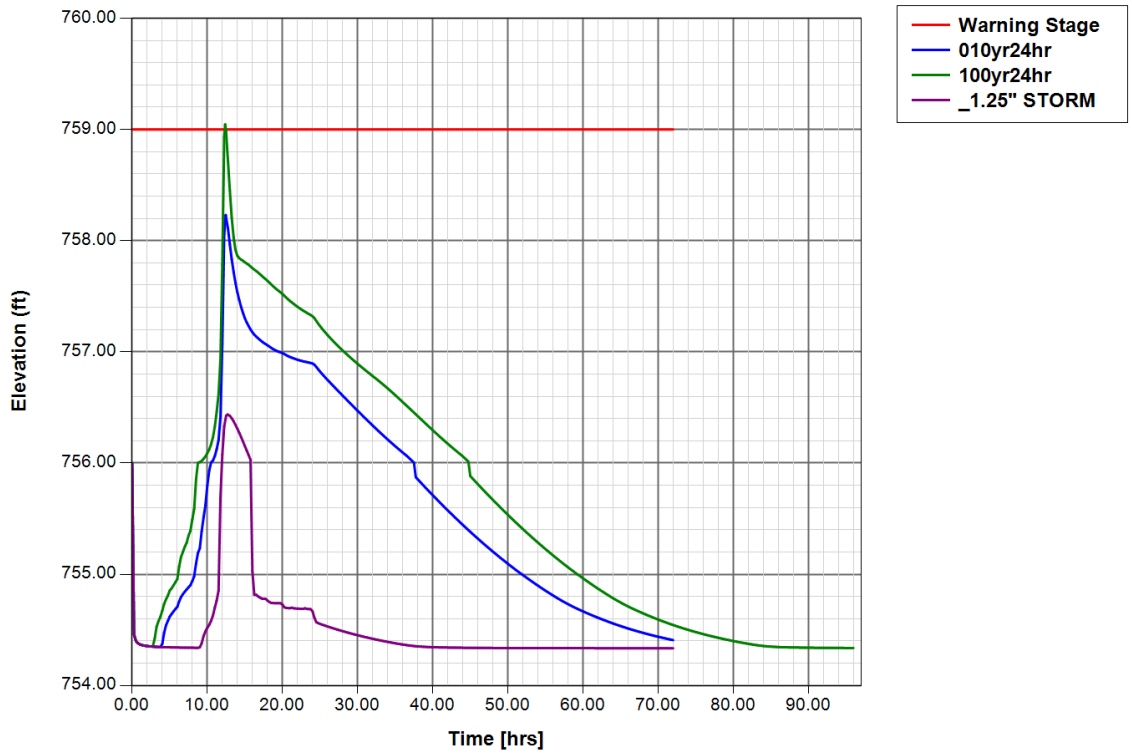
Scenario: COLD SUMMIT
Type: Stage/Area
Base Flow: 0.00 cfs

Initial Stage: 756.00 ft
Warning Stage: 759.00 ft

Stage [ft]	Area [ac]	Area [ft2]
756.00	0.3800	16553
760.00	0.6900	30056

Comment: 760 = Top of Bank

Node Stage w/Warning Stage: DDB 2 [COLD SUMMIT]



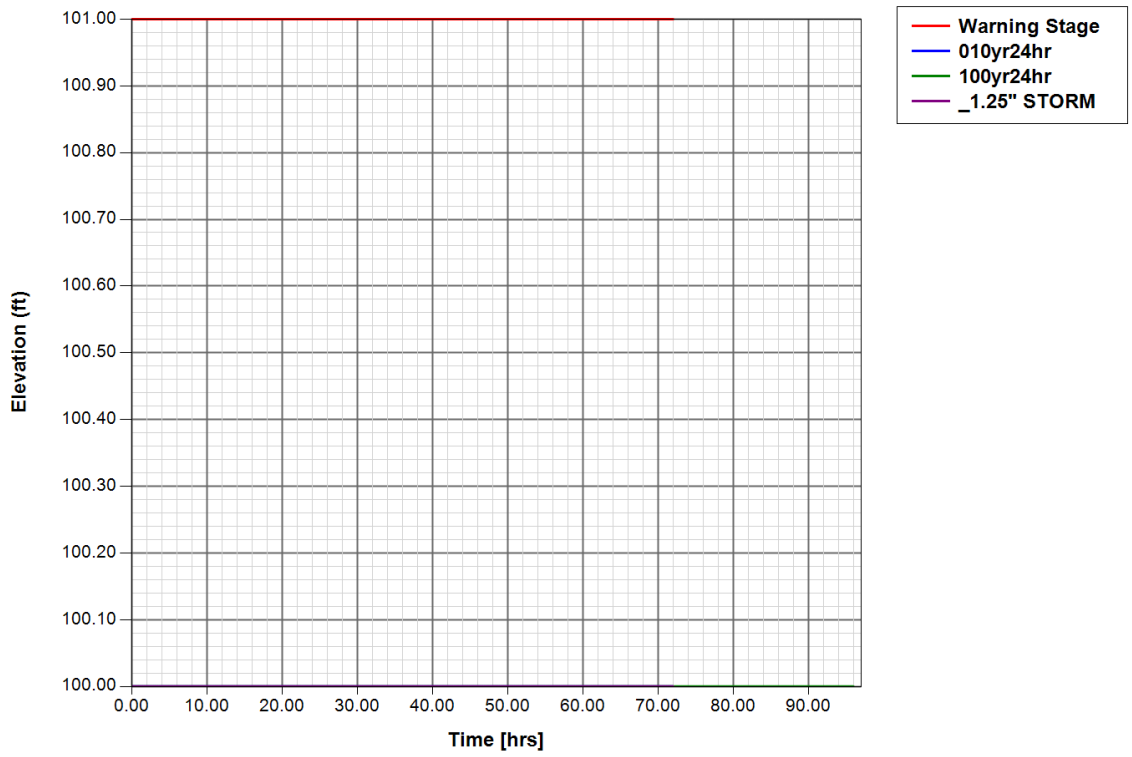
Node: EX. OFFSITE WET POND

Scenario: COLD SUMMIT
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 100.00 ft
Warning Stage: 101.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	100.00
0	0	0	100.0000	100.00

Comment:

Node Stage w/Warning Stage: EX. OFFSITE WET POND [COLD SUMMIT]



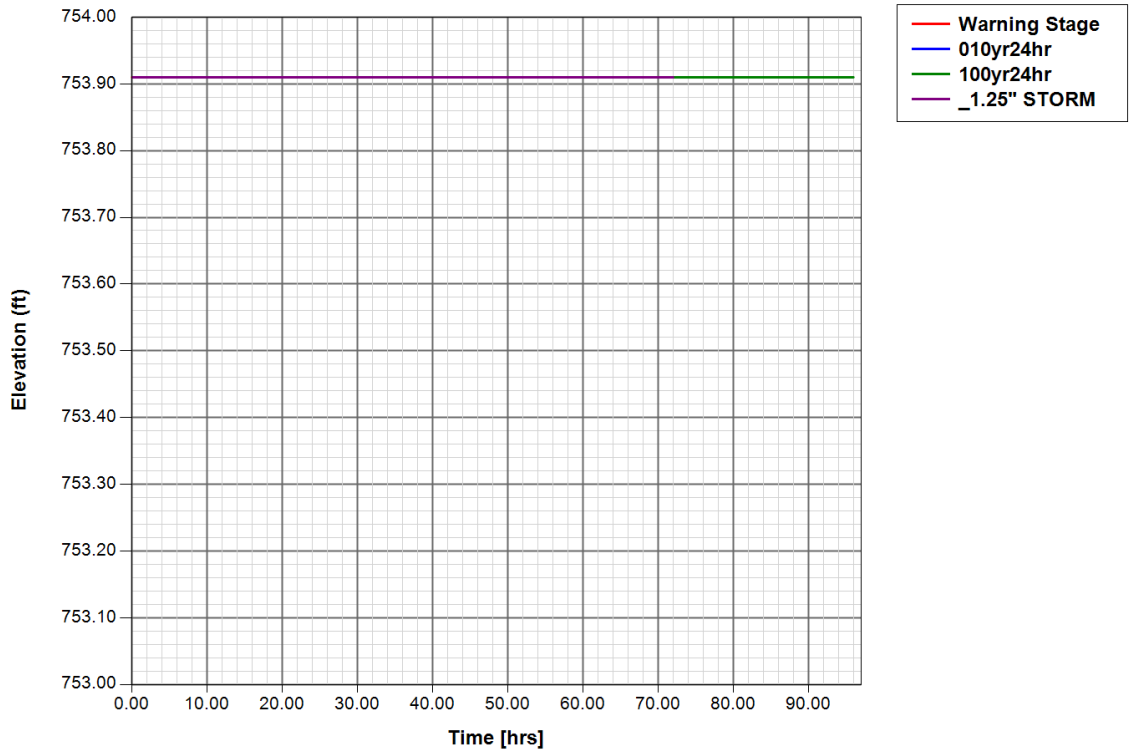
Node: PROPOSED OUTFALL

Scenario: COLD SUMMIT
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 753.91 ft
Warning Stage: 753.91 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	72.0000	753.91

Comment:

Node Stage w/Warning Stage: PROPOSED OUTFALL [COLD SUMMIT]



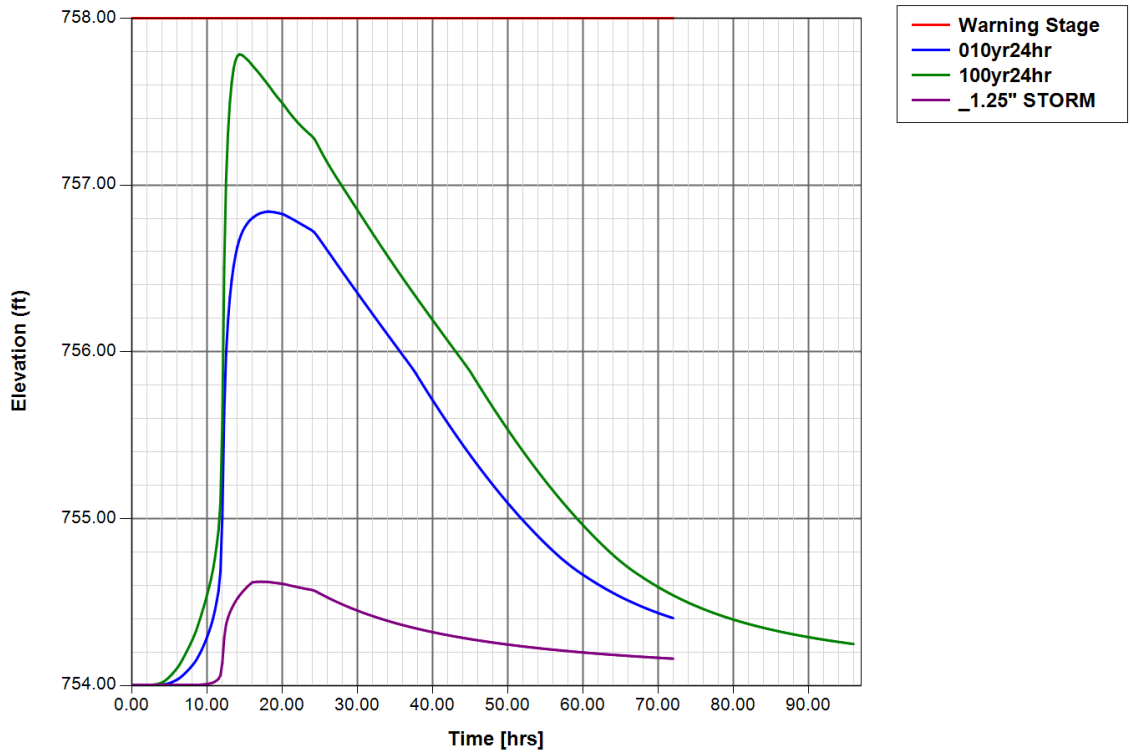
Node: WET POND

Scenario: COLD SUMMIT
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 754.00 ft
Warning Stage: 758.00 ft

Stage [ft]	Area [ac]	Area [ft2]
754.00	1.7600	76666
759.00	2.6100	113692
761.00	3.0500	132858

Comment: Overflow Weir: 758.00
TOP: 761.00

Node Stage w/Warning Stage: WET POND [COLD SUMMIT]



Drop Structure Link: DDB 1 - WET POND		Upstream Pipe		Downstream Pipe	
Scenario:	COLD SUMMIT	Invert:	754.20 ft	Invert:	754.00 ft
From Node:	DDB 1	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	WET POND	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0130	Manning's N:	0.0130
Length:	164.00 ft	Top Clip			
FHWA Code:	1	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.50	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0130	Manning's N:	0.0130
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	2
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	756.00 ft
Control Elevation:	0.00 ft
Max Depth:	3.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Circular
Invert:	754.33 ft
Control Elevation:	0.00 ft
Max Depth:	0.67 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Pipe Link: DDB 2 - DDB 1		Upstream		Downstream	
Scenario:	COLD SUMMIT	Invert:	756.71 ft	Invert:	756.62 ft
From Node:	DDB 2	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	DDB 1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	92.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0130	Manning's N:	0.0130
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	

Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0130	Manning's N:	0.0130

Comment:

Drop Structure Link: OCS		Upstream Pipe		Downstream Pipe	
Scenario:	COLD SUMMIT	Invert:	754.00 ft	Invert:	753.91 ft
From Node:	WET POND	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	PROPOSED	Geometry: Circular		Geometry: Circular	
	OUTFALL	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0130	Manning's N:	0.0130
Damping:	0.0000 ft	Top Clip			
Length:	53.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	1	Op Table:		Op Table:	
Entr Loss Coef:	0.50	Ref Node:		Ref Node:	
Exit Loss Coef:	1.00	Manning's N:	0.0130	Manning's N:	0.0130
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	754.00 ft	Ref Node:	
Control Elevation:	0.00 ft	Discharge Coefficients	
Max Depth:	0.67 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: WQ Orifice

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular		

Invert:	757.00 ft
Control Elevation:	0.00 ft
Max Depth:	1.00 ft
Max Width:	2.00 ft
Fillet:	0.00 ft

Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment: 100-YR Control Orifice

Drop Structure Comment:

Pipe Link: UNDERDRAIN		Upstream		Downstream	
Scenario:	COLD SUMMIT	Invert:	754.33 ft	Invert:	754.33 ft
From Node:	DDB 2	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	DDB 1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.67 ft	Max Depth:	0.67 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	107.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Simulation: 010yr24hr

Scenario:	COLD SUMMIT
Run Date/Time:	11/3/2022 11:13:09 AM
Program Version:	ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~SCSII-24
Rainfall Amount: 4.08 in
Storm Duration: 24.0000 hr

Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 100yr24hr

Scenario: COLD SUMMIT
Run Date/Time: 11/3/2022 11:13:40 AM
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Lookup Tables

Rainfall Folder:		Boundary Stage Set:	
Reference ET Folder:		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	
		Roughness Set:	
		Crop Coef Set:	
		Fillable Porosity Set:	
		Conductivity Set:	
		Leakage Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSII-24
		Rainfall Amount:	5.87 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: _1.25" STORM

Scenario:	COLD SUMMIT
Run Date/Time:	11/3/2022 11:14:49 AM
Program Version:	ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000

Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]

Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSII-24
		Rainfall Amount:	1.25 in

Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Node Max Conditions [COLD SUMMIT]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
DDB 1	010yr24hr	759.00	756.93	-0.0018	13.81	11.57	12061
DDB 1	100yr24hr	759.00	757.81	-0.0018	27.22	20.53	15525
DDB 1	_1.25" STORM	759.00	756.00	-0.0018	1.72	1.79	100
DDB 2	010yr24hr	759.00	758.23	0.0010	31.63	9.40	24220
DDB 2	100yr24hr	759.00	759.05	0.0010	47.78	18.96	26958
DDB 2	_1.25" STORM	759.00	756.44	-0.0010	6.14	1.11	18027
EX. OFFSITE WET POND	010yr24hr	101.00	100.00	0.0000	291.61	0.00	0
EX. OFFSITE WET POND	100yr24hr	101.00	100.00	0.0000	462.83	0.00	0
EX. OFFSITE WET POND	_1.25" STORM	101.00	100.00	0.0000	39.12	0.00	0
PROPOSED OUTFALL	010yr24hr	753.91	753.91	0.0000	2.42	0.00	0
PROPOSED OUTFALL	100yr24hr	753.91	753.91	0.0000	7.04	0.00	0
PROPOSED OUTFALL	_1.25" STORM	753.91	753.91	0.0000	0.64	0.00	0
WET POND	010yr24hr	758.00	756.84	0.0010	66.83	2.42	97701
WET POND	100yr24hr	758.00	757.78	0.0010	105.22	7.05	104677
WET POND	_1.25" STORM	758.00	754.62	0.0007	14.51	0.64	81272

Simple Basin Runoff Summary [COLD SUMMIT]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
DA-1	010yr24hr	61.51	12.1000	4.08	3.30	18.5800	93.0	0.00	0.00
DA-1	100yr24hr	92.07	12.1000	5.87	5.06	18.5800	93.0	0.00	0.00
DA-1	_1.25"	12.84	12.1167	1.25	0.65	18.5800	93.0	0.00	0.00

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
	STORM								
DA-2	010yr24hr	8.45	12.1167	4.08	2.72	2.9800	87.0	0.00	0.00
DA-2	100yr24hr	13.41	12.1167	5.87	4.40	2.9800	87.0	0.00	0.00
DA-2	_1.25" STORM	1.10	12.1333	1.25	0.37	2.9800	87.0	0.00	0.00
DA-3	010yr24hr	31.63	12.1000	4.08	3.20	9.7700	92.0	0.00	0.00
DA-3	100yr24hr	47.78	12.1000	5.87	4.95	9.7700	92.0	0.00	0.00
DA-3	_1.25" STORM	6.15	12.1167	1.25	0.60	9.7700	92.0	0.00	0.00
DA-OFFSITE	010yr24hr	291.61	12.6000	4.08	2.81	207.6100	88.0	0.00	0.00
DA-OFFSITE	100yr24hr	462.83	12.5833	5.87	4.51	207.6100	88.0	0.00	0.00
DA-OFFSITE	_1.25" STORM	39.13	12.6667	1.25	0.41	207.6100	88.0	0.00	0.00

Link Min/Max Conditions [COLD SUMMIT]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DDB 1 - WET POND - Pipe	010yr24hr	11.57	0.00	1.79	0.00	0.00	0.00
DDB 1 - WET POND - Weir: 1	010yr24hr	10.11	0.00	-0.01	2.71	2.71	2.71
DDB 1 - WET POND - Weir: 2	010yr24hr	1.83	0.00	-0.15	5.23	5.23	5.23
DDB 1 - WET POND - Pipe	100yr24hr	20.53	0.00	1.79	0.00	0.00	0.00
DDB 1 - WET POND - Weir: 1	100yr24hr	19.45	0.00	-0.02	2.83	2.83	2.83
DDB 1 - WET POND - Weir: 2	100yr24hr	1.79	0.00	-0.15	5.13	5.13	5.13
DDB 1 - WET POND - Pipe	_1.25" STORM	1.79	0.00	1.79	0.00	0.00	0.00
DDB 1 - WET POND - Weir: 1	_1.25" STORM	0.00	0.00	0.00	0.00	0.00	0.00
DDB 1 - WET POND - Weir: 2	_1.25" STORM	1.79	0.00	-0.15	5.13	5.13	5.13

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DDB 2 - DDB 1	010yr24hr	8.22	0.00	-0.02	2.29	4.59	3.44
DDB 2 - DDB 1	100yr24hr	17.70	0.00	-0.06	3.00	5.74	4.37
DDB 2 - DDB 1	_1.25" STORM	0.00	0.00	0.00	0.00	0.00	0.00
OCS - Pipe	010yr24hr	2.42	0.00	0.00	0.00	0.00	0.00
OCS - Weir: 1	010yr24hr	2.42	0.00	0.00	6.93	6.93	6.93
OCS - Weir: 2	010yr24hr	0.00	0.00	0.00	0.00	0.00	0.00
OCS - Pipe	100yr24hr	7.04	0.00	0.01	0.00	0.00	0.00
OCS - Weir: 1	100yr24hr	2.62	0.00	0.00	7.49	7.49	7.49
OCS - Weir: 2	100yr24hr	4.43	0.00	0.00	2.83	2.83	2.83
OCS - Pipe	_1.25" STORM	0.64	0.00	0.00	0.00	0.00	0.00
OCS - Weir: 1	_1.25" STORM	0.64	0.00	0.00	1.87	1.87	1.87
OCS - Weir: 2	_1.25" STORM	0.00	0.00	0.00	0.00	0.00	0.00
UNDERDRAIN	010yr24hr	1.19	0.00	0.02	3.40	3.40	3.40
UNDERDRAIN	100yr24hr	1.29	0.00	0.02	3.70	3.70	3.70
UNDERDRAIN	_1.25" STORM	1.11	0.00	0.02	3.18	3.18	3.18

Sim	Relative Time [hrs]	Total Inflow Volume [ft3]
_1.25" STORM	0.0000	0
_1.25" STORM	0.2667	327
_1.25" STORM	0.5167	734
_1.25" STORM	0.7500	1147
_1.25" STORM	1.0000	1551
_1.25" STORM	1.2500	1993
_1.25" STORM	1.5167	2427
_1.25" STORM	1.7667	2869
_1.25" STORM	2.0167	3310
_1.25" STORM	2.2667	3716
_1.25" STORM	2.5167	4156
_1.25" STORM	2.7667	4562
_1.25" STORM	3.0167	5005
_1.25" STORM	3.2667	5445
_1.25" STORM	3.5167	5852
_1.25" STORM	3.7667	6304
_1.25" STORM	4.0167	6846
_1.25" STORM	4.2667	7433
_1.25" STORM	4.5167	7974
_1.25" STORM	4.7667	8564
_1.25" STORM	5.0167	9151
_1.25" STORM	5.2667	9693
_1.25" STORM	5.5167	10280
_1.25" STORM	5.7667	10822
_1.25" STORM	6.0167	11422
_1.25" STORM	6.2667	12155
_1.25" STORM	6.5167	12833
_1.25" STORM	6.7667	13566
_1.25" STORM	7.0167	14243
_1.25" STORM	7.2667	14977
_1.25" STORM	7.5167	15654
_1.25" STORM	7.7667	16392
_1.25" STORM	8.0167	17139
_1.25" STORM	8.2667	17961
_1.25" STORM	8.5000	18922
_1.25" STORM	8.7500	19865
_1.25" STORM	9.0000	20898
_1.25" STORM	9.2500	22078
_1.25" STORM	9.5000	23155
_1.25" STORM	9.7500	24481
_1.25" STORM	10.0000	25692
_1.25" STORM	10.2500	27165

Sim	Relative Time [hrs]	Total Inflow Volume [ft3]
_1.25" STORM	10.5000	28781
_1.25" STORM	10.7500	30973
_1.25" STORM	11.0000	33640
_1.25" STORM	11.2500	36467
_1.25" STORM	11.5000	40455
_1.25" STORM	11.7500	54456
_1.25" STORM	12.0000	94252
_1.25" STORM	12.2500	100658
_1.25" STORM	12.5000	104427
_1.25" STORM	12.7500	107815
_1.25" STORM	13.0000	110239
_1.25" STORM	13.2500	112462
_1.25" STORM	13.5000	114213
_1.25" STORM	13.7500	115847
_1.25" STORM	14.0000	117321
_1.25" STORM	14.2500	118532
_1.25" STORM	14.5000	119714
_1.25" STORM	14.7500	120656
_1.25" STORM	15.0000	121689
_1.25" STORM	15.2500	122716
_1.25" STORM	15.5000	123524
_1.25" STORM	15.7500	124409
_1.25" STORM	16.0000	125217
_1.25" STORM	16.2500	126102
_1.25" STORM	16.5000	126910
_1.25" STORM	16.7500	127654
_1.25" STORM	17.0000	128392
_1.25" STORM	17.2500	129065
_1.25" STORM	17.5000	129803
_1.25" STORM	17.7500	130476
_1.25" STORM	18.0000	131071
_1.25" STORM	18.2500	131662
_1.25" STORM	18.5000	132200
_1.25" STORM	18.7500	132790
_1.25" STORM	19.0000	133329
_1.25" STORM	19.2500	133919
_1.25" STORM	19.5000	134457
_1.25" STORM	19.7500	135047
_1.25" STORM	20.0000	135491
_1.25" STORM	20.2500	135895
_1.25" STORM	20.5000	136338
_1.25" STORM	20.7500	136742

Sim	Relative Time [hrs]	Total Inflow Volume [ft3]
_1.25" STORM	21.0000	137184
_1.25" STORM	21.2500	137627
_1.25" STORM	21.5000	138031
_1.25" STORM	21.7500	138473
_1.25" STORM	22.0000	138877
_1.25" STORM	22.2500	139320
_1.25" STORM	22.5000	139724
_1.25" STORM	22.7667	140196
_1.25" STORM	23.0167	140636
_1.25" STORM	23.2667	141042
_1.25" STORM	23.5167	141483
_1.25" STORM	23.7667	141880
_1.25" STORM	24.0167	142160
_1.25" STORM	24.2667	142160
_1.25" STORM	24.5167	142160
_1.25" STORM	24.7667	142160
_1.25" STORM	25.0167	142160
_1.25" STORM	25.2667	142160
_1.25" STORM	25.5167	142160
_1.25" STORM	25.7667	142160
_1.25" STORM	26.0167	142160
_1.25" STORM	26.2667	142160
_1.25" STORM	26.5167	142160
_1.25" STORM	26.7667	142160
_1.25" STORM	27.0167	142160
_1.25" STORM	27.2667	142160
_1.25" STORM	27.5167	142160
_1.25" STORM	27.7667	142160
_1.25" STORM	28.0167	142160
_1.25" STORM	28.2667	142160
_1.25" STORM	28.5167	142160
_1.25" STORM	28.7667	142160
_1.25" STORM	29.0167	142160
_1.25" STORM	29.2667	142160
_1.25" STORM	29.5167	142160
_1.25" STORM	29.7667	142160
_1.25" STORM	30.0167	142160
_1.25" STORM	30.2667	142160
_1.25" STORM	30.5167	142160
_1.25" STORM	30.7667	142160
_1.25" STORM	31.0167	142160
_1.25" STORM	31.2667	142160

Sim	Relative Time [hrs]	Total Inflow Volume [ft3]
_1.25" STORM	31.5167	142160
_1.25" STORM	31.7667	142160
_1.25" STORM	32.0167	142160
_1.25" STORM	32.2667	142160
_1.25" STORM	32.5167	142160
_1.25" STORM	32.7667	142160
_1.25" STORM	33.0167	142160
_1.25" STORM	33.2667	142160
_1.25" STORM	33.5167	142160
_1.25" STORM	33.7667	142160
_1.25" STORM	34.0167	142160
_1.25" STORM	34.2667	142160
_1.25" STORM	34.5167	142160
_1.25" STORM	34.7667	142160
_1.25" STORM	35.0167	142160
_1.25" STORM	35.2667	142160
_1.25" STORM	35.5167	142160
_1.25" STORM	35.7667	142160
_1.25" STORM	36.0167	142160
_1.25" STORM	36.2667	142160
_1.25" STORM	36.5167	142160
_1.25" STORM	36.7667	142160
_1.25" STORM	37.0167	142160
_1.25" STORM	37.2667	142160
_1.25" STORM	37.5167	142160
_1.25" STORM	37.7667	142160
_1.25" STORM	38.0167	142160
_1.25" STORM	38.2667	142160
_1.25" STORM	38.5167	142160
_1.25" STORM	38.7667	142160
_1.25" STORM	39.0167	142160
_1.25" STORM	39.2667	142160
_1.25" STORM	39.5167	142160
_1.25" STORM	39.7667	142160
_1.25" STORM	40.0167	142160
_1.25" STORM	40.2667	142160
_1.25" STORM	40.5167	142160
_1.25" STORM	40.7667	142160
_1.25" STORM	41.0167	142160
_1.25" STORM	41.2667	142160
_1.25" STORM	41.5167	142160
_1.25" STORM	41.7667	142160

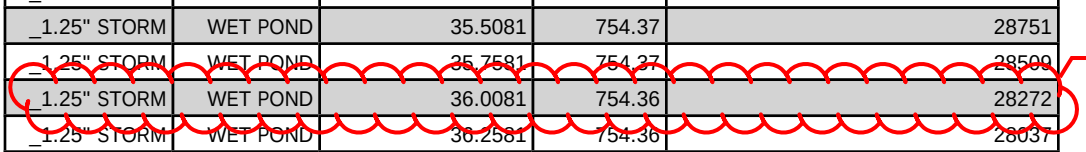
Sim	Relative Time [hrs]	Total Inflow Volume [ft3]
_1.25" STORM	42.0167	142160
_1.25" STORM	42.2667	142160
_1.25" STORM	42.5167	142160
_1.25" STORM	42.7667	142160
_1.25" STORM	43.0167	142160
_1.25" STORM	43.2667	142160
_1.25" STORM	43.5167	142160
_1.25" STORM	43.7667	142160
_1.25" STORM	44.0167	142160
_1.25" STORM	44.2667	142160
_1.25" STORM	44.5167	142160
_1.25" STORM	44.7667	142160
_1.25" STORM	45.0167	142160
_1.25" STORM	45.2667	142160
_1.25" STORM	45.5167	142160
_1.25" STORM	45.7667	142160
_1.25" STORM	46.0167	142160
_1.25" STORM	46.2667	142160
_1.25" STORM	46.5167	142160
_1.25" STORM	46.7667	142160
_1.25" STORM	47.0167	142160
_1.25" STORM	47.2667	142160
_1.25" STORM	47.5167	142160
_1.25" STORM	47.7667	142160

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	0.0000	754.00	0
_1.25" STORM	WET POND	0.2504	754.00	313
_1.25" STORM	WET POND	0.5015	754.00	323
_1.25" STORM	WET POND	0.7540	754.00	327
_1.25" STORM	WET POND	1.0009	754.00	329
_1.25" STORM	WET POND	1.2509	754.00	330
_1.25" STORM	WET POND	1.5009	754.00	330
_1.25" STORM	WET POND	1.7509	754.00	331
_1.25" STORM	WET POND	2.0009	754.00	331
_1.25" STORM	WET POND	2.2509	754.00	332
_1.25" STORM	WET POND	2.5009	754.00	332
_1.25" STORM	WET POND	2.7509	754.00	332
_1.25" STORM	WET POND	3.0009	754.00	332
_1.25" STORM	WET POND	3.2509	754.00	332
_1.25" STORM	WET POND	3.5009	754.00	333
_1.25" STORM	WET POND	3.7509	754.00	333
_1.25" STORM	WET POND	4.0009	754.00	333
_1.25" STORM	WET POND	4.2509	754.00	333
_1.25" STORM	WET POND	4.5009	754.00	333
_1.25" STORM	WET POND	4.7509	754.00	333
_1.25" STORM	WET POND	5.0009	754.00	333
_1.25" STORM	WET POND	5.2509	754.00	333
_1.25" STORM	WET POND	5.5009	754.00	333
_1.25" STORM	WET POND	5.7509	754.00	333
_1.25" STORM	WET POND	6.0009	754.00	333
_1.25" STORM	WET POND	6.2509	754.00	333
_1.25" STORM	WET POND	6.5009	754.00	333
_1.25" STORM	WET POND	6.7509	754.00	333
_1.25" STORM	WET POND	7.0009	754.00	333
_1.25" STORM	WET POND	7.2509	754.00	333
_1.25" STORM	WET POND	7.5009	754.00	333
_1.25" STORM	WET POND	7.7509	754.00	333
_1.25" STORM	WET POND	8.0009	754.00	333
_1.25" STORM	WET POND	8.2509	754.00	334
_1.25" STORM	WET POND	8.5009	754.00	339
_1.25" STORM	WET POND	8.7509	754.00	355
_1.25" STORM	WET POND	9.0009	754.01	383
_1.25" STORM	WET POND	9.2531	754.01	427
_1.25" STORM	WET POND	9.5011	754.01	490
_1.25" STORM	WET POND	9.7555	754.01	580
_1.25" STORM	WET POND	10.0020	754.01	704
_1.25" STORM	WET POND	10.2555	754.01	862

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	10.5038	754.01	1068
_1.25" STORM	WET POND	10.7505	754.02	1341
_1.25" STORM	WET POND	11.0018	754.02	1754
_1.25" STORM	WET POND	11.2533	754.03	2337
_1.25" STORM	WET POND	11.5012	754.04	3094
_1.25" STORM	WET POND	11.7500	754.06	4717
_1.25" STORM	WET POND	12.0000	754.13	10359
_1.25" STORM	WET POND	12.2505	754.29	22156
_1.25" STORM	WET POND	12.5008	754.37	28534
_1.25" STORM	WET POND	12.7513	754.41	31805
_1.25" STORM	WET POND	13.0013	754.44	34250
_1.25" STORM	WET POND	13.2505	754.46	36228
_1.25" STORM	WET POND	13.5010	754.48	37987
_1.25" STORM	WET POND	13.7507	754.50	39526
_1.25" STORM	WET POND	14.0016	754.52	40944
_1.25" STORM	WET POND	14.2531	754.54	42245
_1.25" STORM	WET POND	14.5036	754.55	43409
_1.25" STORM	WET POND	14.7520	754.56	44477
_1.25" STORM	WET POND	15.0020	754.58	45451
_1.25" STORM	WET POND	15.2544	754.59	46409
_1.25" STORM	WET POND	15.5005	754.60	47299
_1.25" STORM	WET POND	15.7525	754.61	48119
_1.25" STORM	WET POND	16.0001	754.62	48834
_1.25" STORM	WET POND	16.2525	754.62	48947
_1.25" STORM	WET POND	16.5025	754.62	49040
_1.25" STORM	WET POND	16.7558	754.62	49102
_1.25" STORM	WET POND	17.0058	754.62	49122
_1.25" STORM	WET POND	17.2558	754.62	49121
_1.25" STORM	WET POND	17.5058	754.62	49094
_1.25" STORM	WET POND	17.7558	754.62	49080
_1.25" STORM	WET POND	18.0058	754.62	49039
_1.25" STORM	WET POND	18.2558	754.62	48953
_1.25" STORM	WET POND	18.5058	754.62	48845
_1.25" STORM	WET POND	18.7558	754.62	48718
_1.25" STORM	WET POND	19.0058	754.62	48603
_1.25" STORM	WET POND	19.2558	754.61	48478
_1.25" STORM	WET POND	19.5058	754.61	48367
_1.25" STORM	WET POND	19.7558	754.61	48248
_1.25" STORM	WET POND	20.0041	754.61	48132
_1.25" STORM	WET POND	20.2558	754.61	47950
_1.25" STORM	WET POND	20.5058	754.61	47734
_1.25" STORM	WET POND	20.7558	754.60	47525

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	21.0058	754.60	47310
_1.25" STORM	WET POND	21.2558	754.60	47111
_1.25" STORM	WET POND	21.5058	754.59	46917
_1.25" STORM	WET POND	21.7558	754.59	46713
_1.25" STORM	WET POND	22.0058	754.59	46520
_1.25" STORM	WET POND	22.2558	754.59	46321
_1.25" STORM	WET POND	22.5058	754.59	46135
_1.25" STORM	WET POND	22.7558	754.58	45943
_1.25" STORM	WET POND	23.0058	754.58	45768
_1.25" STORM	WET POND	23.2558	754.58	45597
_1.25" STORM	WET POND	23.5058	754.58	45415
_1.25" STORM	WET POND	23.7558	754.57	45245
_1.25" STORM	WET POND	24.0058	754.57	45053
_1.25" STORM	WET POND	24.2511	754.57	44780
_1.25" STORM	WET POND	24.5046	754.56	44335
_1.25" STORM	WET POND	24.7505	754.56	43857
_1.25" STORM	WET POND	25.0081	754.55	43357
_1.25" STORM	WET POND	25.2581	754.54	42878
_1.25" STORM	WET POND	25.5081	754.54	42407
_1.25" STORM	WET POND	25.7581	754.53	41944
_1.25" STORM	WET POND	26.0081	754.53	41489
_1.25" STORM	WET POND	26.2581	754.52	41041
_1.25" STORM	WET POND	26.5081	754.52	40601
_1.25" STORM	WET POND	26.7581	754.51	40168
_1.25" STORM	WET POND	27.0081	754.51	39742
_1.25" STORM	WET POND	27.2581	754.50	39323
_1.25" STORM	WET POND	27.5081	754.50	38911
_1.25" STORM	WET POND	27.7581	754.49	38506
_1.25" STORM	WET POND	28.0081	754.49	38107
_1.25" STORM	WET POND	28.2581	754.48	37715
_1.25" STORM	WET POND	28.5081	754.48	37329
_1.25" STORM	WET POND	28.7581	754.47	36950
_1.25" STORM	WET POND	29.0081	754.47	36576
_1.25" STORM	WET POND	29.2581	754.46	36210
_1.25" STORM	WET POND	29.5081	754.46	35849
_1.25" STORM	WET POND	29.7581	754.45	35494
_1.25" STORM	WET POND	30.0081	754.45	35145
_1.25" STORM	WET POND	30.2581	754.44	34802
_1.25" STORM	WET POND	30.5081	754.44	34465
_1.25" STORM	WET POND	30.7581	754.44	34133
_1.25" STORM	WET POND	31.0081	754.43	33807
_1.25" STORM	WET POND	31.2581	754.43	33486

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	31.5081	754.42	33170
_1.25" STORM	WET POND	31.7581	754.42	32860
_1.25" STORM	WET POND	32.0081	754.42	32554
_1.25" STORM	WET POND	32.2581	754.41	32254
_1.25" STORM	WET POND	32.5081	754.41	31958
_1.25" STORM	WET POND	32.7581	754.41	31667
_1.25" STORM	WET POND	33.0081	754.40	31381
_1.25" STORM	WET POND	33.2581	754.40	31099
_1.25" STORM	WET POND	33.5081	754.39	30821
_1.25" STORM	WET POND	33.7581	754.39	30548
_1.25" STORM	WET POND	34.0081	754.39	30279
_1.25" STORM	WET POND	34.2581	754.38	30014
_1.25" STORM	WET POND	34.5081	754.38	29754
_1.25" STORM	WET POND	34.7581	754.38	29497
_1.25" STORM	WET POND	35.0081	754.37	29245
_1.25" STORM	WET POND	35.2581	754.37	28996
_1.25" STORM	WET POND	35.5081	754.37	28751
_1.25" STORM	WET POND	35.7581	754.37	28509
_1.25" STORM	WET POND	36.0081	754.36	28272
_1.25" STORM	WET POND	36.2581	754.36	28037
_1.25" STORM	WET POND	36.5081	754.36	27807
_1.25" STORM	WET POND	36.7581	754.35	27579
_1.25" STORM	WET POND	37.0081	754.35	27355
_1.25" STORM	WET POND	37.2581	754.35	27135
_1.25" STORM	WET POND	37.5081	754.35	26917
_1.25" STORM	WET POND	37.7581	754.34	26703
_1.25" STORM	WET POND	38.0081	754.34	26491
_1.25" STORM	WET POND	38.2581	754.34	26283
_1.25" STORM	WET POND	38.5081	754.33	26077
_1.25" STORM	WET POND	38.7581	754.33	25875
_1.25" STORM	WET POND	39.0081	754.33	25675
_1.25" STORM	WET POND	39.2581	754.33	25478
_1.25" STORM	WET POND	39.5081	754.32	25284
_1.25" STORM	WET POND	39.7581	754.32	25092
_1.25" STORM	WET POND	40.0081	754.32	24903
_1.25" STORM	WET POND	40.2581	754.32	24717
_1.25" STORM	WET POND	40.5081	754.32	24533
_1.25" STORM	WET POND	40.7581	754.31	24351
_1.25" STORM	WET POND	41.0081	754.31	24172
_1.25" STORM	WET POND	41.2581	754.31	23996
_1.25" STORM	WET POND	41.5081	754.31	23822
_1.25" STORM	WET POND	41.7581	754.30	23650



STORED VOLUME
@ HOUR 36.0

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	42.0081	754.30	23481
_1.25" STORM	WET POND	42.2581	754.30	23313
_1.25" STORM	WET POND	42.5081	754.30	23148
_1.25" STORM	WET POND	42.7581	754.30	22985
_1.25" STORM	WET POND	43.0081	754.29	22825
_1.25" STORM	WET POND	43.2581	754.29	22666
_1.25" STORM	WET POND	43.5081	754.29	22509
_1.25" STORM	WET POND	43.7581	754.29	22355
_1.25" STORM	WET POND	44.0081	754.29	22202
_1.25" STORM	WET POND	44.2581	754.28	22051
_1.25" STORM	WET POND	44.5081	754.28	21902
_1.25" STORM	WET POND	44.7581	754.28	21756
_1.25" STORM	WET POND	45.0081	754.28	21611
_1.25" STORM	WET POND	45.2581	754.28	21467
_1.25" STORM	WET POND	45.5081	754.27	21326
_1.25" STORM	WET POND	45.7581	754.27	21186
_1.25" STORM	WET POND	46.0081	754.27	21048
_1.25" STORM	WET POND	46.2581	754.27	20912
_1.25" STORM	WET POND	46.5081	754.27	20777
_1.25" STORM	WET POND	46.7581	754.27	20644
_1.25" STORM	WET POND	47.0081	754.26	20513
_1.25" STORM	WET POND	47.2581	754.26	20383
_1.25" STORM	WET POND	47.5081	754.26	20255
_1.25" STORM	WET POND	47.7581	754.26	20128
_1.25" STORM	WET POND	48.0081	754.26	20003
_1.25" STORM	WET POND	48.2581	754.26	19879
_1.25" STORM	WET POND	48.5081	754.25	19757
_1.25" STORM	WET POND	48.7581	754.25	19636
_1.25" STORM	WET POND	49.0081	754.25	19516
_1.25" STORM	WET POND	49.2581	754.25	19398
_1.25" STORM	WET POND	49.5081	754.25	19281
_1.25" STORM	WET POND	49.7581	754.25	19165
_1.25" STORM	WET POND	50.0081	754.25	19051
_1.25" STORM	WET POND	50.2581	754.24	18938
_1.25" STORM	WET POND	50.5081	754.24	18826
_1.25" STORM	WET POND	50.7581	754.24	18715
_1.25" STORM	WET POND	51.0081	754.24	18606
_1.25" STORM	WET POND	51.2581	754.24	18498
_1.25" STORM	WET POND	51.5081	754.24	18391
_1.25" STORM	WET POND	51.7581	754.24	18285
_1.25" STORM	WET POND	52.0081	754.23	18180
_1.25" STORM	WET POND	52.2581	754.23	18077

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	52.5081	754.23	17974
_1.25" STORM	WET POND	52.7581	754.23	17873
_1.25" STORM	WET POND	53.0081	754.23	17772
_1.25" STORM	WET POND	53.2581	754.23	17672
_1.25" STORM	WET POND	53.5081	754.23	17574
_1.25" STORM	WET POND	53.7581	754.23	17476
_1.25" STORM	WET POND	54.0081	754.22	17380
_1.25" STORM	WET POND	54.2581	754.22	17284
_1.25" STORM	WET POND	54.5081	754.22	17190
_1.25" STORM	WET POND	54.7581	754.22	17096
_1.25" STORM	WET POND	55.0081	754.22	17004
_1.25" STORM	WET POND	55.2581	754.22	16912
_1.25" STORM	WET POND	55.5081	754.22	16822
_1.25" STORM	WET POND	55.7581	754.22	16733
_1.25" STORM	WET POND	56.0081	754.21	16646
_1.25" STORM	WET POND	56.2581	754.21	16559
_1.25" STORM	WET POND	56.5081	754.21	16473
_1.25" STORM	WET POND	56.7581	754.21	16388
_1.25" STORM	WET POND	57.0081	754.21	16303
_1.25" STORM	WET POND	57.2581	754.21	16220
_1.25" STORM	WET POND	57.5081	754.21	16137
_1.25" STORM	WET POND	57.7581	754.21	16054
_1.25" STORM	WET POND	58.0081	754.21	15972
_1.25" STORM	WET POND	58.2581	754.21	15891
_1.25" STORM	WET POND	58.5081	754.20	15812
_1.25" STORM	WET POND	58.7581	754.20	15733
_1.25" STORM	WET POND	59.0081	754.20	15655
_1.25" STORM	WET POND	59.2581	754.20	15578
_1.25" STORM	WET POND	59.5081	754.20	15501
_1.25" STORM	WET POND	59.7581	754.20	15425
_1.25" STORM	WET POND	60.0081	754.20	15350
_1.25" STORM	WET POND	60.2581	754.20	15276
_1.25" STORM	WET POND	60.5081	754.20	15202
_1.25" STORM	WET POND	60.7581	754.20	15129
_1.25" STORM	WET POND	61.0081	754.19	15057
_1.25" STORM	WET POND	61.2581	754.19	14985
_1.25" STORM	WET POND	61.5081	754.19	14914
_1.25" STORM	WET POND	61.7581	754.19	14843
_1.25" STORM	WET POND	62.0081	754.19	14774
_1.25" STORM	WET POND	62.2581	754.19	14705
_1.25" STORM	WET POND	62.5081	754.19	14636
_1.25" STORM	WET POND	62.7581	754.19	14568

Sim	Node Name	Relative Time [hrs]	Stage [ft]	Stored Volume (Geometry Based) [ft3]
_1.25" STORM	WET POND	63.0081	754.19	14501
_1.25" STORM	WET POND	63.2581	754.19	14434
_1.25" STORM	WET POND	63.5081	754.19	14368
_1.25" STORM	WET POND	63.7581	754.18	14303
_1.25" STORM	WET POND	64.0081	754.18	14238
_1.25" STORM	WET POND	64.2581	754.18	14173
_1.25" STORM	WET POND	64.5081	754.18	14110
_1.25" STORM	WET POND	64.7581	754.18	14046
_1.25" STORM	WET POND	65.0081	754.18	13984
_1.25" STORM	WET POND	65.2581	754.18	13922
_1.25" STORM	WET POND	65.5081	754.18	13861
_1.25" STORM	WET POND	65.7581	754.18	13801
_1.25" STORM	WET POND	66.0081	754.18	13741
_1.25" STORM	WET POND	66.2581	754.18	13682
_1.25" STORM	WET POND	66.5081	754.18	13623
_1.25" STORM	WET POND	66.7581	754.18	13565
_1.25" STORM	WET POND	67.0081	754.17	13508
_1.25" STORM	WET POND	67.2581	754.17	13450
_1.25" STORM	WET POND	67.5081	754.17	13394
_1.25" STORM	WET POND	67.7581	754.17	13337
_1.25" STORM	WET POND	68.0081	754.17	13282
_1.25" STORM	WET POND	68.2581	754.17	13226
_1.25" STORM	WET POND	68.5081	754.17	13171
_1.25" STORM	WET POND	68.7581	754.17	13117
_1.25" STORM	WET POND	69.0081	754.17	13063
_1.25" STORM	WET POND	69.2581	754.17	13009
_1.25" STORM	WET POND	69.5081	754.17	12956
_1.25" STORM	WET POND	69.7581	754.17	12904
_1.25" STORM	WET POND	70.0081	754.17	12851
_1.25" STORM	WET POND	70.2581	754.17	12800
_1.25" STORM	WET POND	70.5081	754.17	12748
_1.25" STORM	WET POND	70.7581	754.16	12697
_1.25" STORM	WET POND	71.0081	754.16	12646
_1.25" STORM	WET POND	71.2581	754.16	12596
_1.25" STORM	WET POND	71.5081	754.16	12546
_1.25" STORM	WET POND	71.7581	754.16	12497
_1.25" STORM	WET POND	72.0081	754.16	12448

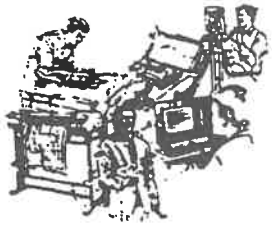
Appendix G: Hydraflow

Date:	11/3/2022		Project:	COLD SUMMIT							Storm:	10-YR	By:	KGP	Program: Hydraflow									
Line	To Line	Line Length	Incr.Area	Total Area	Runoff Coeff.	IncrC x A	TotalC x A	Inlet Time	Time Conc	Rnfal Int	Total Runoff	Adnl Flow	Total Flow	Capac Full	Full Flow Velocity	Mannings "n" Value	Pipe Size	Pipe Slope	Inv Elev Dn	Inv Elev Up	HGL Dn	HGL Up	Grnd/Rim Dn	Grnd/Rim Up	Line ID
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(cfs)	(cfs)	(ft/s)		(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	Outfall	172	0.45	4.79	0.85	0.38	4.03	5	7.6	6.3	25.36	0	25.36	36.53	5.17	0.013	36	0.3	756	756.52	757.62	758.46	759.18	762.58	D13 TO D14
2	1	85	1.03	3.27	0.85	0.87	2.78	5	6.4	6.7	18.55	0	18.55	29	5.91	0.013	30	0.5	757.02	757.44	758.88	758.9	762.58	763.93	D18 TO D14
3	2	71.017	0.84	0.84	0.85	0.72	0.72	5	5	7.2	5.16	0	5.16	10.5	5.94	0.013	18	1	758.44	759.15	759.18	760.02	763.93	763.93	D20 TO D18
4	1	100	0.45	1.08	0.85	0.38	0.88	5	6.7	6.6	5.76	0	5.76	12.39	3.94	0.013	24	0.3	757.52	757.82	758.94	759.01	762.58	762.58	D15 TO D14
5	4	100	0.45	0.63	0.81	0.36	0.5	5	6.1	6.8	3.36	0	3.36	3.54	2.88	0.013	15	0.3	757.82	758.12	759.03	759.26	762.58	762.58	D16 TO D15
6	5	80	0.18	0.18	0.73	0.13	0.13	5	5	7.2	0.95	0	0.95	1.95	2.48	0.013	12	0.3	758.12	758.36	759.28	759.33	762.58	762.82	D17 TO D16
7	2	225.316	1.4	1.4	0.85	1.19	1.19	5	5	7.2	8.56	0	8.56	15.99	5.09	0.013	24	0.5	757.44	758.57	758.9	759.61	763.93	763.93	D19 TO D18
8	Outfall	200.321	0.68	8.18	0.76	0.52	6.74	5	8.9	5.9	39.9	0	39.9	44.73	6.33	0.013	36	0.45	754	754.9	756.06	757.2	757.18	762.58	D2 TO D1
9	8	100	0.48	2.6	0.81	0.39	2.06	5	8.4	6	12.43	0	12.43	15.99	5.09	0.013	24	0.5	755.4	755.9	757.85	758.16	762.58	762.58	D3 TO D2
10	9	100	0.49	2.12	0.8	0.39	1.67	5	7.9	6.2	10.31	0	10.31	15.99	5.09	0.013	24	0.5	755.9	756.4	758.19	758.4	762.58	762.58	D4 TO D3
11	10	100	0.49	1.63	0.81	0.39	1.27	5	7.3	6.4	8.12	0	8.12	15.99	5.09	0.013	24	0.5	756.4	756.9	758.42	758.52	762.58	762.58	D5 TO D4
12	11	100	0.48	1.14	0.81	0.39	0.88	5	6.8	6.5	5.75	0	5.75	7.43	4.20	0.013	18	0.5	756.9	757.4	758.54	758.81	762.58	762.58	D6 TO D5
13	12	100	0.46	0.66	0.81	0.38	0.49	5	6.2	6.7	3.3	0	3.3	4.57	3.72	0.013	15	0.5	757.4	757.9	758.83	759.07	762.58	762.58	D7 TO D6
14	13	76.448	0.19	0.19	0.59	0.11	0.11	5	5	7.2	0.82	0	0.82	2.52	3.21	0.013	12	0.5	757.9	758.28	759.09	759.13	762.58	762.82	D8 TO D7
15	8	85	1.39	4.9	0.85	1.19	4.16	5	7.7	6.2	25.98	0	25.98	29	5.91	0.013	30	0.5	754.9	755.33	757.85	758.19	762.58	763.93	D9 TO D2
16	15	175	1.16	3.5	0.85	0.99	2.98	5	7	6.5	19.29	0	19.29	29	5.91	0.013	30	0.5	755.33	756.2	758.63	759.02	763.93	763.93	D10 TO D9
17	16	175	1.17	2.34	0.85	0.99	1.99	5	6.3	6.7	13.36	0	13.36	15.99	5.09	0.013	24	0.5	756.2	757.08	759.05	759.66	763.93	763.93	D11 TO D10
18	17	176.478	1.18	1.18	0.85	1	1	5	5	7.2	7.2	0	7.2	15.99	5.09	0.013	24	0.5	757.08	757.96	759.71	759.87	763.93	763.93	D12 TO D11

Appendix H: Johnson Industrial Park Drainage Report

Franklin Engineering Company

151 W. Jefferson Street
Franklin, Indiana 46131



February 21, 1997

Mr. Michael Buening
Johnson County Plan Commission
Courthouse Annex
86 West Court Street
Franklin, IN 46131

NEED "NEW" DRAINAGE PLAN IN FILE

Re: Johnson Industrial Park
Comment Letter of February 21, 1997

Dear Sir:

Please consider the following answers to enumerated comments:

1. *We have added a 55 foot radius temporary stone turnaround at the end of the street and designated the 50 foot Building Setback Lines as Drainage and Utility Easements and Roadway Easements.*

2. *Buffer zone letter is forthcoming.*

3. *We will propose a vacation hearing and final drainage approval at the April 1st Drainage Board hearing. Preliminary approval is scheduled for the March 4th meeting.*

4. *A sewer service agreement has been executed for this property with the City of Franklin and the tap on fee paid.*

5. *The revised Preliminary Plat reflects possible future development east which will be limited to 10 year predeveloped discharges per ordinance.*

6. A. *We have changed developed Cn values to 8.9. In actuality today's developments do not achieve 72% lot coverage.*

   B. *Time of concentration has been reduced back to predevelopment 45 minutes. Even though paved surfaces decrease time, longer grass swales increase time.*

   C. *We have added 3.15 cfs from the existing 12" VCP north.*

D. We now propose to construct a parallel 18" solid PVC outlet for the lake leaving the existing tile to help drain the farm to the south.

E. The mean water level area is 0.8 acres and the high water level is 1.2 acres for an average of 1 acre.

F. A 20 foot maintenance strip is shown around the pond.

G. Hydrographs have been printed on 10 minute intervals instead of 20 minute intervals.

H. The onsite 27 acre predevelopment 10 year storm discharge rate is 21.79 cfs and the post development discharge rate subtracting the 48 acre pass through is 20.79 cfs.

Revised plans and drainage report are attached.

Sincerely,

Steven B. Williams

SBW/rc

Enclosures

cc: Doug Lechner

PRELIMINARY DRAINAGE REPORT
JOHNSON INDUSTRIAL PARK
FEBRUARY 21, 1997

Existing Conditions:

The existing 27 acre site along with 48 acres offsite flow from the east drains southwesterly to the Paulish-Vandiver Legal Drain and southerly to Canary Ditch. The approximately 50% Crosby and 50% Brookston soils were evaluated with a Cn of 65 (for meadows) and a Time of Concentration of 45 minutes. The existing ten year, SCS II, 24 hour, 4.3 inch rain produces a predevelopment runoff of 50.33 cfs from the total site and 21.79 cfs from the onsite 27 acres. The existing two year runoff is 16.85 cfs for the total site.

Future Conditions:

We will assume 72% impervious surfaces in the 27 acre industrial park in the future for a net Cn of 89. With offsite flows, this becomes 74 for the overall basin. Time increases on grassed surfaces to 55 minutes. The legal drain is proposed to be abandoned and intercepted by an open paved ditch system to a one acre pond in the southwest corner of the site. A new 18" PVC tile laid beside the existing 18" VCP tile will be used as a ten year outlet pipe and a 6" PVC as a low flow pipe. The overflow weir will be at a level of 763.7 for five feet of peak storage before topping the weir by 0.46 feet. Mean water level area is 0.8 acres with a high water level area of 1.2 acres. Future conditions are as follows:

	Discharge	High Water Level	Storage Volume (Ac/Ft.)
100 Year:	100.22 *	763.16	5.35
10 Year:	13.95	762.20	4.50
2 Year:	1.86	761.61	3.91
0.5" Direct Runoff:	1.26	759.67	1.97

* Subtracting offsite 100 year pass through flow of 79.43 cfs, this reduces to a 100 year post development discharge from our site of 20.79 cfs.

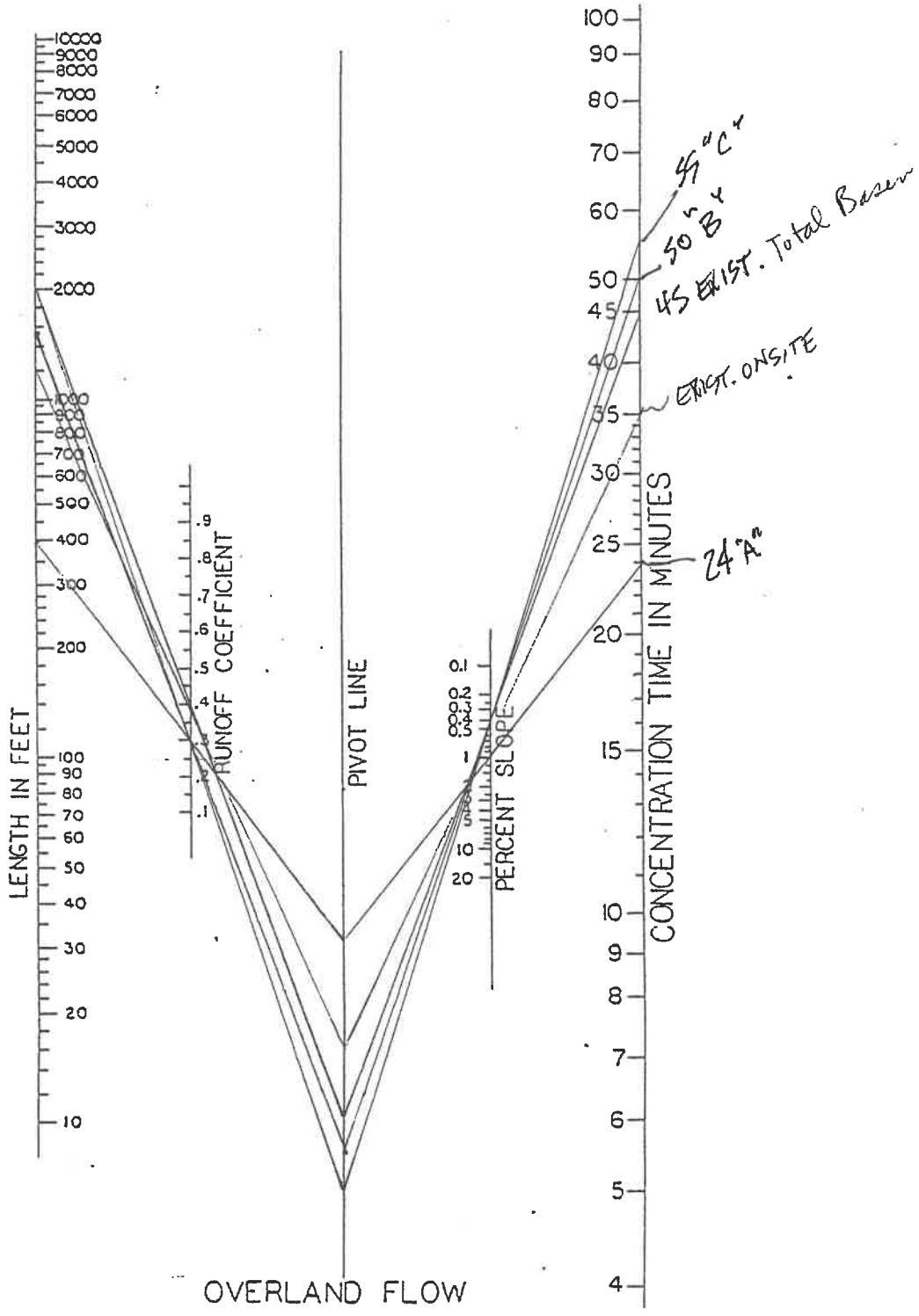
Prepared by:

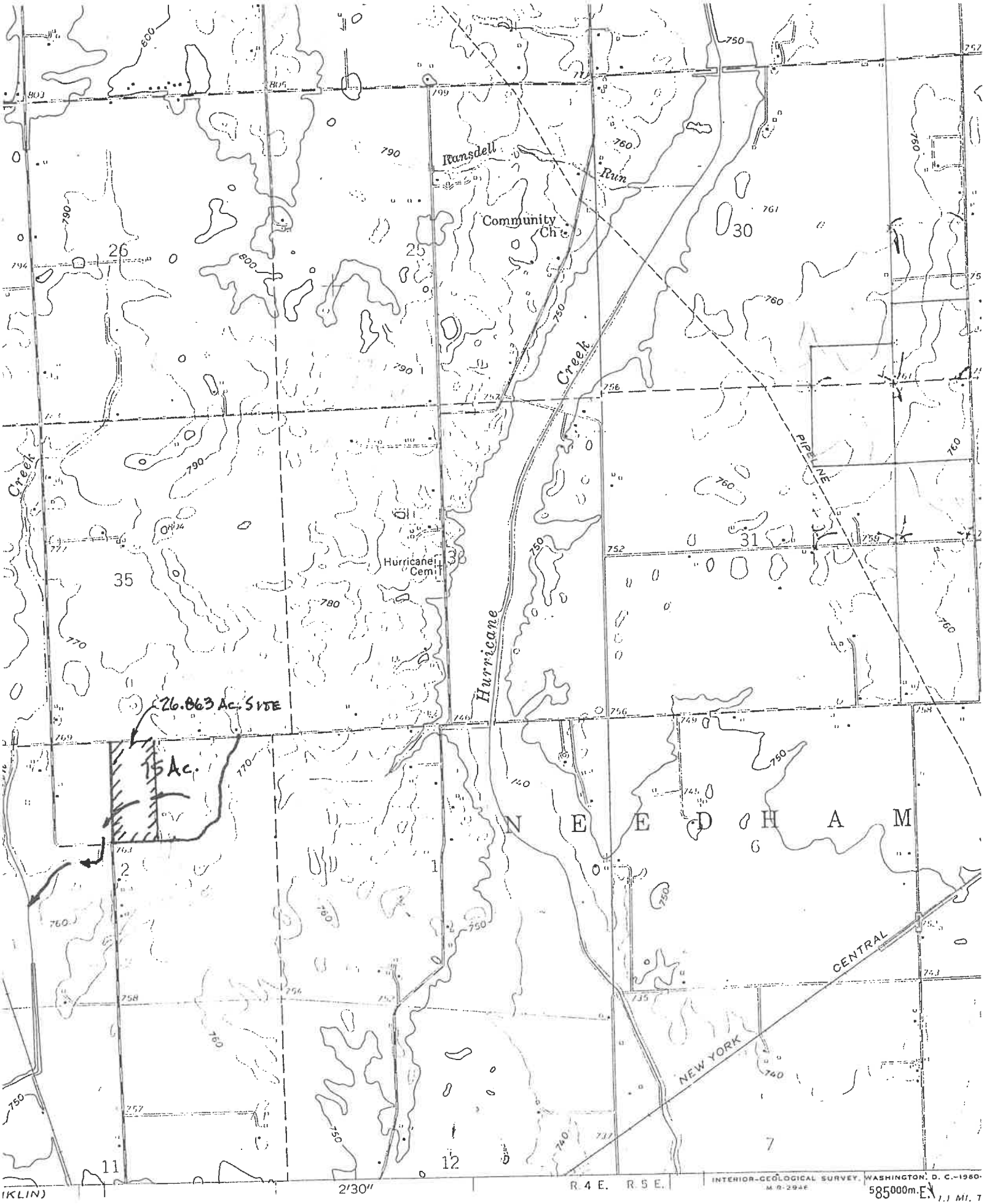
Steven B. Williams

STEVEN B. WILLIAMS
REGISTERED
No.
17207
STATE OF
INDIANA
PROFESSIONAL ENGINEER

OVERLAND FLOW AND RUN-OFF COEFFICIENT

FIGURE 5.3




Ransdell Run
Community Ch
Creek
PIPELINE
Hurricane Cem
Hurricane Creek
26.863 Ac. SITE
15 Ac.
NEEDHAM
CENTRAL
NEW YORK
26
25
30
35
31
2
1
6
11
12
7
R. 4 E.
R. 5 E.
2'30"
INTERIOR-GEOLOGICAL SURVEY, WASHINGTON, D. C.-1960-
585000m.E.
1:24 000
1 MILE
4000
5000
6000
7000 FEET
ROAD CLASSIFICATION
Heavy-duty
Light-duty

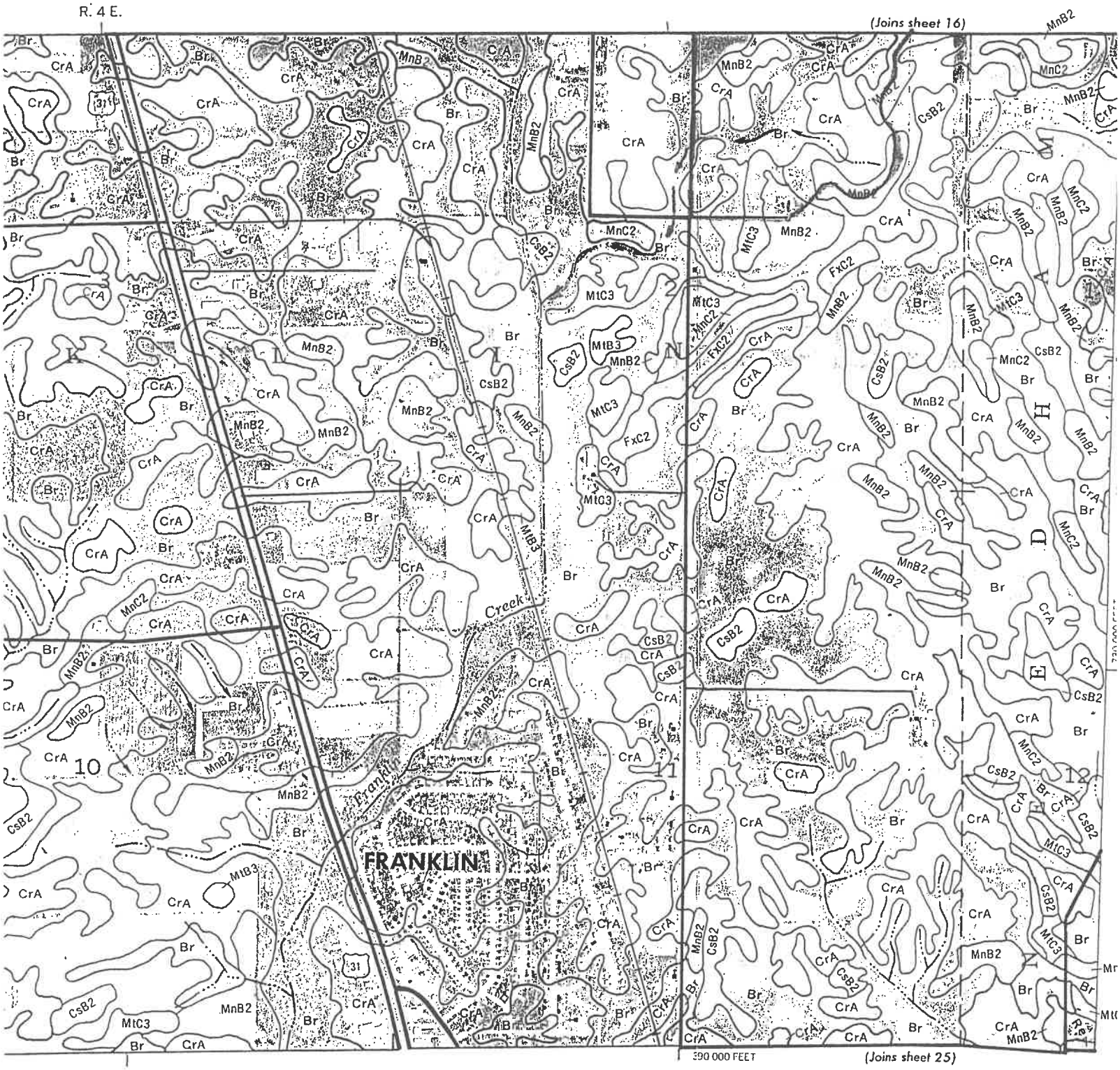

R. 4 E.
(Joins sheet 16)
FRANKLIN
Creek
10
11
12
31
390 000 FEET
(Joins sheet 25)

Table 3.9 Curve Numbers for Various Cover and Soil Types [AMC=II] (NEH-4)

LAND USE DESCRIPTION		HYDROLOGIC SOIL GROUP A	B	C	D
Cultivated land:	without conservation treatment	72	81	88	91
:	with conservation treatment	62	71	78	81
Pasture or range land:	poor condition	68	79	86	89
:	good condition	39	61	74	80
Meadow: good condition		30	58	65	71	78
Wood or Forest land:	thin stand, poor cover, no mulch	45	66	77	83
:	good cover	25	55	70	77
Open spaces: lawns, parks, golf courses, cemeteries, etc.					
good condition:	grass cover on 75% or more of the area	39	61	74	80
fair condition:	grass cover on 50% to 75% of the area	49	69	79	84
Commercial and business areas (85% impervious)		89	92	94	95
Industrial districts (72% impervious)		81	88	91	93
Residential:[1]	Average % Impervious[2]				
Average lot size					
1/8 acre or less	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
Paved parking lots, roofs, driveways, etc.[3]		98	98	98	98
Streets and roads:					
paved with curbs and storm sewers[3]		98	98	98	98
gravel		76	85	89	91
dirt		72	82	87	89
Urban areas:					
Low density (15-18% impervious surfaces)		69-71	75-78	82-84	86
Medium density (21-27% impervious surfaces)		71-73	77-80	84-86	88
High density (50-75% impervious surfaces)		73-75	79-82	86-88	90

[1]Curve numbers are computed assuming the runoff from the house and driveway is directed towards the street with a minimum of roof water directed to lawns where additional infiltration could occur.

[2]The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.

[3]In some warmer climates of the country a curve number of 95 may be used.

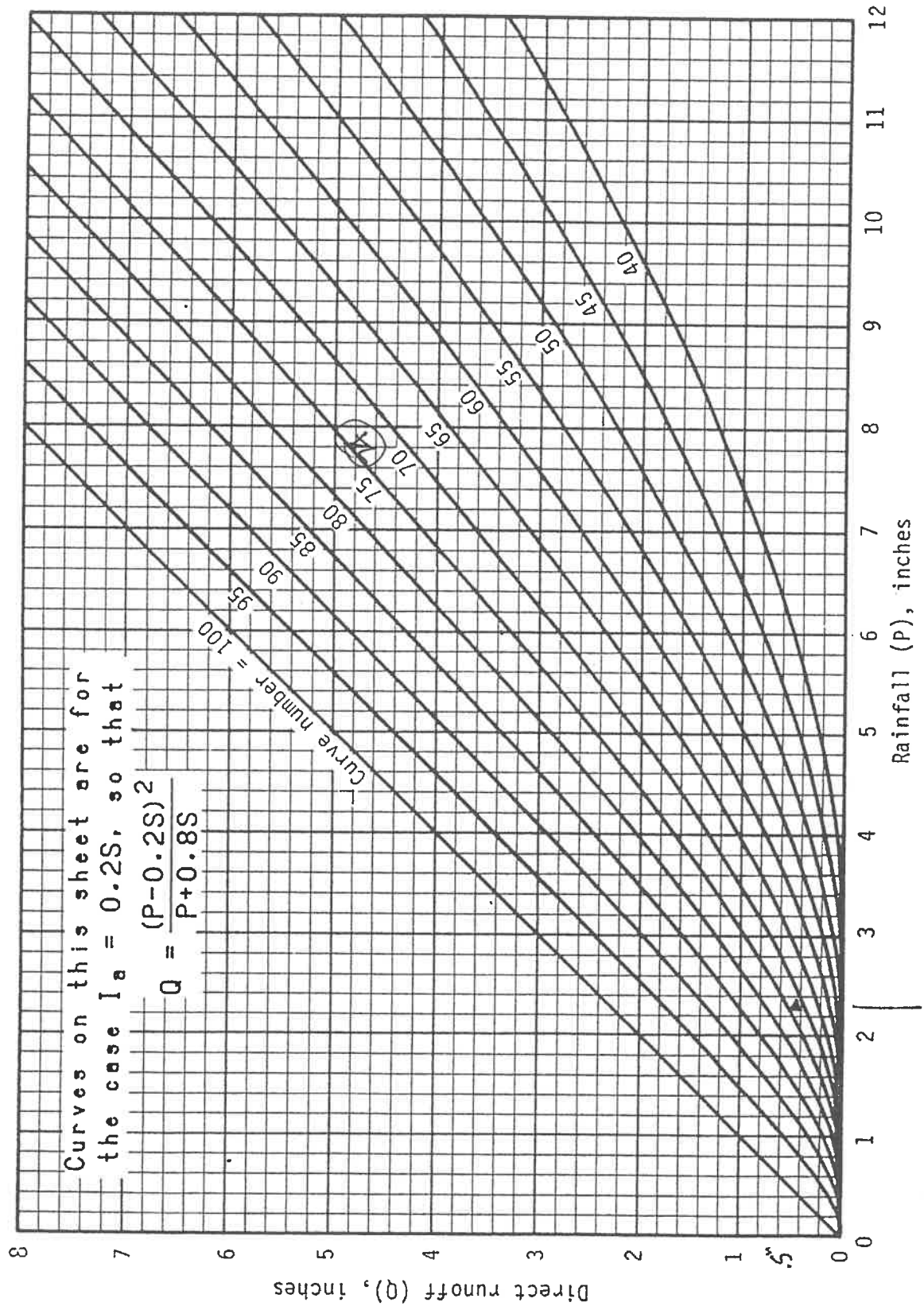


Figure 2-1.—Solution of runoff equation.

PROJECT SUMMARY

PROJECT NAME : BRW

[UNIT HYDROGRAPH]

1 EXIST BASIN
Type TRIANGULAR UH Peak flow 113.438 cfs Peak time 30.000 min

2 BASIN A FUTURE
Type TRIANGULAR UH Peak flow 6.239 cfs Peak time 16.000 min

3 BASIN B FUTURE
Type TRIANGULAR UH Peak flow 75.958 cfs Peak time 33.333 min

4 AREA TO EAST POND FUTURE
Type TRIANGULAR UH Peak flow 79.973 cfs Peak time 26.667 min

5 OFFSITE 48AC 100YR PASS THROUGH
Type TRIANGULAR UH Peak flow 93.343 cfs Peak time 23.333 min

6 BASIN C
Type TRIANGULAR UH Peak flow 25.712 cfs Peak time 30.000 min

7 TOTAL BASIN FUTURE
Type TRIANGULAR UH Peak flow 113.438 cfs Peak time 30.000 min

8 EXIST ONSITE 10YR
Type TRIANGULAR UH Peak flow 52.505 cfs Peak time 23.333 min

9 OFFSITE TILE CONTRIBUTION
Type TRIANGULAR UH Peak flow 7.563 cfs Peak time 30.000 min

[HYDROGRAPH]

1 EXIST BASIN 10YR
Type COMPUTED FLOOD Peak flow 50.327 cfs Peak time 742.000 min

Unit hydrograph
1 EXIST BASIN

2 BASIN A FUTURE 10YR
Type COMPUTED FLOOD Peak flow 6.622 cfs Peak time 728.000 min

Unit hydrograph
2 BASIN A FUTURE

[HYDROGRAPH]

3 BASIN A FUTURE 100YR
Type COMPUTED FLOOD Peak flow 9.719 cfs Peak time 728.000 min

Unit hydrograph
2 BASIN A FUTURE

4 BASIN B FUTURE 10YR
Type COMPUTED FLOOD Peak flow 101.506 cfs Peak time 744.000 min

Unit hydrograph
3 BASIN B FUTURE

5 BASIN B FUTURE 100YR
Type COMPUTED FLOOD Peak flow 149.546 cfs Peak time 744.000 min

Unit hydrograph
3 BASIN B FUTURE

6 AREA TO EAST POND 10YR
Type COMPUTED FLOOD Peak flow 39.055 cfs Peak time 738.000 min

Unit hydrograph
4 AREA TO EAST POND FUTURE

7 AREA TO EAST POND 100YR
Type COMPUTED FLOOD Peak flow 76.733 cfs Peak time 738.000 min

Unit hydrograph
4 AREA TO EAST POND FUTURE

8 EAST POND 100YR STORAGE
Type RESER STOR. IND Peak flow 70.169 cfs Peak time 744.000 min

Inflow hydrograph
7 AREA TO EAST POND 100YR

Reservoir
1 EAST POND

9 OFFSITE 100YR 48 AC PASS THROUGH
Type COMPUTED FLOOD Peak flow 79.425 cfs Peak time 735.000 min

Unit hydrograph
5 OFFSITE 48AC 100YR PASS THROUGH

[HYDROGRAPH]

10 EXIST 2 YR
Type COMPUTED FLOOD Peak flow 16.853 cfs Peak time 749.000 min

Unit hydrograph
1 EXIST BASIN

11 BASIN C 10YR FUTURE
Type COMPUTED FLOOD Peak flow 32.913 cfs Peak time 742.000 min

Unit hydrograph
6 BASIN C

12 BASIN C 100YR FUTURE
Type COMPUTED FLOOD Peak flow 48.447 cfs Peak time 742.000 min

Unit hydrograph
6 BASIN C

13 BASIN A 2YR FUTURE
Type COMPUTED FLOOD Peak flow 4.107 cfs Peak time 728.000 min

Unit hydrograph
2 BASIN A FUTURE

14 BASIN B 2YR FUTURE
Type COMPUTED FLOOD Peak flow 62.612 cfs Peak time 744.000 min

Unit hydrograph
3 BASIN B FUTURE

15 BASIN C 2YR FUTURE
Type COMPUTED FLOOD Peak flow 20.327 cfs Peak time 742.000 min

Unit hydrograph
6 BASIN C

16 FUTURE TOTAL BASIN 0.5"RUNOFF
Type COMPUTED FLOOD Peak flow 18.718 cfs Peak time 742.000 min

Unit hydrograph
7 TOTAL BASIN FUTURE

[HYDROGRAPH]
17 WEST POND 100YR DETENTION
Type RESER STOR. IND Peak flow 100.225 cfs Peak time 762.000 min

Inflow hydrograph
25 COMBINED EAST POND DISCHAGE & ONSITE 100YR

Reservoir
2 WEST POND

18 TOTAL BASIN 100YR FUTURE
Type COMPUTED FLOOD Peak flow 145.832 cfs Peak time 742.000 min

Unit hydrograph
7 TOTAL BASIN FUTURE

19 TOTAL FUTURE BASIN 10YR
Type COMPUTED FLOOD Peak flow 63.408 cfs Peak time 747.000 min

Unit hydrograph
7 TOTAL BASIN FUTURE

20 WEST POND 10YR DETENTION
Type RESER STOR. IND Peak flow 13.952 cfs Peak time 819.000 min

Inflow hydrograph
19 TOTAL FUTURE BASIN 10YR

Reservoir
2 WEST POND

21 WEST POND 0.5"RUNOFF DETENTION
Type RESER STOR. IND Peak flow 1.259 cfs Peak time 1197.000 min

Inflow hydrograph
16 FUTURE TOTAL BASIN 0.5"RUNOFF

Reservoir
3 WEST POND

22 TOTAL BASIN 2YR FUTURE
Type COMPUTED FLOOD Peak flow 38.816 cfs Peak time 742.000 min

Unit hydrograph
7 TOTAL BASIN FUTURE

[HYDROGRAPH]
23 WEST POND 2YR DETENTION
Type RESER STOR. IND Peak flow 1.861 cfs Peak time 1225.000 min

Inflow hydrograph
22 TOTAL BASIN 2YR FUTURE

Reservoir
3 WEST POND

24 EXIST ONSITE 10YR
Type COMPUTED FLOOD Peak flow 21.790 cfs Peak time 735.000 min

Unit hydrograph
8 EXIST ONSITE 10YR

25 COMBINED EAST POND DISCHAGE & ONSITE 100YR
Type COMBINE Peak flow 124.239 cfs Peak time 744.000 min

Combined Hydrographs
8 EAST POND 100YR STORAGE

12 BASIN C 100YR FUTURE

26 OFFSITE TILE 100YR CONTRIBUTION

26 OFFSITE TILE 100YR CONTRIBUTION
Type COMPUTED FLOOD Peak flow 6.881 cfs Peak time 742.000 min

Unit hydrograph
9 OFFSITE TILE CONTRIBUTION

[RESERVOIR]

[RESERVOIR]

1 EAST POND
Storage type MAN STAGE/STOR Max storage 75301.398 cuft
Discharge type COMP STAGE/DISC Max discharge 92.163 cfs

Connecting Structures
2 6" EAST POND OUTLET

4 EAST POND OVERFLOW

2 WEST POND
Storage type MAN STAGE/STOR Max storage 258010.000 cuft
Discharge type COMP STAGE/DISC Max discharge 387.715 cfs

Connecting Structures
1 6" WEST OUTLET PIPE LOW FLOW

5 18"PVC OUTLET PIPE

3 WEST POND OVERFLOW

3 WEST POND
Storage type MAN STAGE/STOR Max storage 258010.000 cuft
Discharge type COMP STAGE/DISC Max discharge 2.384 cfs

Connecting Structures
1 6" WEST OUTLET PIPE LOW FLOW

4 NORTH FARM DETENTION
Storage type MAN STAGE/STOR Max storage 193333.000 cuft
Discharge type COMP STAGE/DISC Max discharge 3.154 cfs

Connecting Structures
6 OFFSITE TILE 12"VCP

[OUTLET STRUCTURE]

1 6" WEST OUTLET PIPE LOW FLOW
Type CIRCULAR CONCRETE w/ square edge w/ headwall
Max discharge 2.384 cfs

2 6" EAST POND OUTLET
Type CIRCULAR CONCRETE w/ square edge w/ headwall
Max discharge 0.916 cfs

3 WEST POND OVERFLOW
Type TRAPEZOIDAL WEIR
Max discharge 368.201 cfs

[OUTLET STRUCTURE]

4 EAST POND OVERFLOW
Type TRAPEZOIDAL WEIR
Max discharge 91.009 cfs

5 18"PVC OUTLET PIPE
Type CIRCULAR CONCRETE w/ square edge w/ headwall
Max discharge 17.131 cfs

6 OFFSITE TILE 12"VCP
Type CIRCULAR CONCRETE w/ square edge w/ headwall
Max discharge 3.154 cfs

HYDROGRAPH REPORT

RECORD NUMBER : 8
TYPE : RESER STOR. IND
DESCRIPTION : EAST POND 100YR STORAGE

[HYDROGRAPH INFORMATION]

Peak Discharge	=	70.17 (cfs)
Volume	=	9.48 (acft)
Time Interval	=	6 (min)
Time to Peak	=	744.00 (min)
Time of Base	=	3870.00 (min)
Peak Elevation	=	764.83 (ft)

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	7
Hydrograph Description	=	AREA TO EAST POND 100YR

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 60 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
112	672.0	1.93	635.87	+	2386.81	=	3022.68	0.00	3022.47	763.40
113	678.0	2.32	764.81	+	3022.27	=	3787.08	0.04	3780.03	763.43
123	738.0	76.73	26492.02	+	48041.19	=	74533.22	60.32	63676.43	764.80
133	798.0	13.52	5104.80	+	41134.45	=	46239.25	17.47	43094.65	764.62
143	858.0	7.83	2879.79	+	35518.37	=	38398.15	9.00	36777.46	764.57
153	918.0	6.07	2207.08	+	33143.43	=	35350.51	6.48	34183.28	764.55
163	978.0	4.81	1753.06	+	32002.59	=	33755.64	5.17	32825.71	764.54
173	1038.0	4.17	1510.65	+	31225.12	=	32735.76	4.32	31957.58	764.53
183	1098.0	3.71	1344.99	+	30813.59	=	32158.57	3.85	31466.26	764.53
193	1158.0	3.24	1173.98	+	30413.26	=	31587.25	3.37	30979.96	764.52
203	1218.0	2.76	1001.26	+	30003.25	=	31004.52	2.89	30483.93	764.52
213	1278.0	2.58	931.40	+	29741.31	=	30672.70	2.62	30201.48	764.51
223	1338.0	2.49	899.29	+	29654.35	=	30553.64	2.52	30100.13	764.51
233	1398.0	2.40	866.49	+	29577.14	=	30443.63	2.43	30006.49	764.51
243	1458.0	1.44	581.40	+	29362.56	=	29943.97	2.02	29581.18	764.51
253	1518.0	0.00	0.00	+	26773.83	=	26773.83	0.93	26607.31	764.42
263	1578.0	0.00	0.00	+	23565.40	=	23565.40	0.85	23412.45	764.28
273	1638.0	0.00	0.00	+	20628.33	=	20628.33	0.77	20488.96	764.15
283	1698.0	0.00	0.00	+	17983.24	=	17983.24	0.67	17862.00	764.04
293	1758.0	0.00	0.00	+	15720.20	=	15720.20	0.59	15614.67	763.94
303	1818.0	0.00	0.00	+	13716.84	=	13716.84	0.52	13623.35	763.86
313	1878.0	0.00	0.00	+	11951.77	=	11951.77	0.45	11870.19	763.78

HYDROGRAPH REPORT

RECORD NUMBER : 8
TYPE : RESER STOR. IND
DESCRIPTION : EAST POND 100YR STORAGE

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 60 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
323	1938.0	0.00	0.00	+	10433.23	=	10433.23	0.39	10363.84	763.72
333	1998.0	0.00	0.00	+	9141.45	=	9141.45	0.33	9082.42	763.66
343	2058.0	0.00	0.00	+	8042.58	=	8042.58	0.28	7992.37	763.62
353	2118.0	0.00	0.00	+	7117.69	=	7117.69	0.23	7076.73	763.58
363	2178.0	0.00	0.00	+	6376.60	=	6376.60	0.18	6343.97	763.54
373	2238.0	0.00	0.00	+	5786.40	=	5786.40	0.14	5760.42	763.52
383	2298.0	0.00	0.00	+	5316.38	=	5316.38	0.12	5295.63	763.50
393	2358.0	0.00	0.00	+	4933.40	=	4933.40	0.10	4916.09	763.48
403	2418.0	0.00	0.00	+	4613.73	=	4613.73	0.08	4599.28	763.47
413	2478.0	0.00	0.00	+	4346.91	=	4346.91	0.07	4334.85	763.46
423	2538.0	0.00	0.00	+	4124.20	=	4124.20	0.06	4114.13	763.45
433	2598.0	0.00	0.00	+	3938.30	=	3938.30	0.05	3929.89	763.44
443	2658.0	0.00	0.00	+	3783.13	=	3783.13	0.04	3776.11	763.43
453	2718.0	0.00	0.00	+	3653.61	=	3653.61	0.03	3647.76	763.43
463	2778.0	0.00	0.00	+	3545.50	=	3545.50	0.03	3540.62	763.42
473	2838.0	0.00	0.00	+	3455.27	=	3455.27	0.02	3451.19	763.42
483	2898.0	0.00	0.00	+	3379.95	=	3379.95	0.02	3376.54	763.42
493	2958.0	0.00	0.00	+	3317.08	=	3317.08	0.02	3314.24	763.41
503	3018.0	0.00	0.00	+	3264.60	=	3264.60	0.01	3262.23	763.41
513	3078.0	0.00	0.00	+	3220.80	=	3220.80	0.01	3218.82	763.41
523	3138.0	0.00	0.00	+	3184.24	=	3184.24	0.01	3182.59	763.41
533	3198.0	0.00	0.00	+	3153.72	=	3153.72	0.01	3152.34	763.41
543	3258.0	0.00	0.00	+	3128.25	=	3128.25	0.01	3127.10	763.41
553	3318.0	0.00	0.00	+	3106.99	=	3106.99	0.01	3106.03	763.40
563	3378.0	0.00	0.00	+	3089.24	=	3089.24	0.00	3088.44	763.40
573	3438.0	0.00	0.00	+	3074.43	=	3074.43	0.00	3073.76	763.40
583	3498.0	0.00	0.00	+	3062.06	=	3062.06	0.00	3061.51	763.40
593	3558.0	0.00	0.00	+	3051.74	=	3051.74	0.00	3051.28	763.40
603	3618.0	0.00	0.00	+	3043.13	=	3043.13	0.00	3042.74	763.40
613	3678.0	0.00	0.00	+	3035.94	=	3035.94	0.00	3035.61	763.40
623	3738.0	0.00	0.00	+	3029.94	=	3029.94	0.00	3029.67	763.40
633	3798.0	0.00	0.00	+	3024.93	=	3024.93	0.00	3024.70	763.40
643	3858.0	0.00	0.00	+	3020.75	=	3020.75	0.00	3020.56	763.40

HYDROGRAPH REPORT

RECORD NUMBER : 17
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 100YR DETENTION

[HYDROGRAPH INFORMATION]

Peak Discharge	=	100.22 (cfs)
Volume	=	16.01 (acft)
Time Interval	=	6 (min)
Time to Peak	=	762.00 (min)
Time of Base	=	8640.00 (min)
Peak Elevation	=	763.16 (ft)

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	25
Hydrograph Description	=	COMBINED EAST POND DISCHAGE & ONSITE 100YR

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 60 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
47	282.0	0.11	35.36	+	100.49	=	135.85	0.00	135.62	757.70
48	288.0	0.13	41.95	+	135.40	=	177.35	0.00	177.06	757.70
58	348.0	0.34	117.39	+	868.06	=	985.46	0.01	983.83	757.72
68	408.0	0.58	203.18	+	2366.82	=	2570.00	0.02	2565.75	757.76
78	468.0	0.84	296.26	+	4693.35	=	4989.61	0.05	4980.14	757.81
88	528.0	1.23	430.70	+	7830.09	=	8260.80	0.14	8235.48	757.88
98	588.0	1.87	661.61	+	12339.87	=	13001.48	0.43	12924.98	757.98
108	648.0	3.15	1095.35	+	18112.57	=	19196.64	0.96	19023.84	758.11
118	708.0	13.74	4169.17	+	29514.18	=	33409.57	2.60	32942.34	758.44
128	768.0	80.86	31754.02	+	215107.00	=	245136.52	80.29	230684.63	763.08
138	828.0	17.72	6543.22	+	216019.02	=	222177.45	17.76	218981.08	762.74
148	888.0	11.53	4216.36	+	210900.85	=	214863.61	14.52	212249.75	762.57
158	948.0	9.10	3314.93	+	194891.20	=	198001.44	13.93	195493.22	762.19
168	1008.0	7.28	2643.74	+	174719.04	=	177197.86	12.31	174982.11	761.72
178	1068.0	6.41	2322.43	+	154976.61	=	157152.00	11.51	155080.34	761.26
188	1128.0	5.66	2050.56	+	135504.48	=	137425.06	10.67	135505.20	760.81
198	1188.0	4.89	1774.17	+	116566.24	=	118228.03	9.78	116466.85	760.37
208	1248.0	4.24	1532.77	+	98324.88	=	99759.68	8.86	98165.27	759.95
218	1308.0	4.03	1453.95	+	81867.06	=	83226.95	7.95	81795.88	759.58
228	1368.0	3.88	1400.48	+	68338.59	=	69648.28	6.86	68413.88	759.27
238	1428.0	3.73	1346.93	+	58077.07	=	59336.55	5.94	58267.02	759.04
248	1488.0	1.06	401.65	+	47928.77	=	48321.81	4.70	47475.60	758.79

HYDROGRAPH REPORT

RECORD NUMBER : 17
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 100YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 60 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
258	1548.0	0.89	320.79	+	37121.24	=	37442.03	3.15	36874.59	758.54
268	1608.0	0.81	293.72	+	30477.83	=	30771.55	2.25	30365.65	758.38
278	1668.0	0.74	266.37	+	26129.73	=	26396.11	1.71	26087.80	758.28
288	1728.0	0.62	224.74	+	23057.25	=	23281.99	1.35	23039.42	758.20
298	1788.0	0.55	200.51	+	20722.56	=	20923.07	1.12	20720.86	758.15
308	1848.0	0.49	176.49	+	18872.15	=	19048.64	0.95	18878.36	758.11
318	1908.0	0.42	151.70	+	17358.42	=	17510.12	0.81	17364.90	758.08
328	1968.0	0.36	129.04	+	16060.96	=	16190.00	0.69	16065.85	758.05
338	2028.0	0.30	109.77	+	14946.39	=	15056.17	0.59	14950.10	758.03
348	2088.0	0.26	92.86	+	13990.32	=	14083.18	0.50	13992.64	758.00
358	2148.0	0.20	73.96	+	13129.77	=	13203.73	0.44	13124.74	757.99
368	2208.0	0.16	58.90	+	12312.39	=	12371.29	0.38	12302.56	757.97
378	2268.0	0.13	46.91	+	11557.09	=	11603.99	0.33	11544.72	757.95
388	2328.0	0.11	38.25	+	10876.09	=	10914.34	0.28	10863.57	757.94
398	2388.0	0.09	31.92	+	10282.06	=	10313.98	0.24	10270.61	757.92
408	2448.0	0.07	26.65	+	9768.42	=	9795.07	0.21	9758.09	757.91
418	2508.0	0.06	22.24	+	9325.83	=	9348.07	0.17	9316.60	757.90
428	2568.0	0.05	18.57	+	8933.42	=	8951.99	0.16	8923.32	757.89
438	2628.0	0.04	15.50	+	8548.48	=	8563.98	0.15	8537.19	757.89
448	2688.0	0.04	12.93	+	8172.43	=	8185.37	0.14	8160.42	757.88
458	2748.0	0.03	10.80	+	7808.89	=	7819.68	0.13	7796.51	757.87
468	2808.0	0.02	9.01	+	7460.39	=	7469.40	0.12	7447.92	757.86
478	2868.0	0.02	7.52	+	7128.62	=	7136.15	0.11	7116.28	757.85
488	2928.0	0.02	6.28	+	6814.62	=	6820.90	0.10	6802.56	757.85
498	2988.0	0.01	5.24	+	6518.89	=	6524.13	0.09	6507.23	757.84
508	3048.0	0.01	4.37	+	6241.53	=	6245.90	0.09	6230.35	757.84
518	3108.0	0.01	3.65	+	5982.33	=	5985.98	0.08	5971.69	757.83
528	3168.0	0.01	3.05	+	5740.86	=	5743.91	0.07	5730.79	757.82
538	3228.0	0.01	2.54	+	5516.52	=	5519.07	0.07	5507.03	757.82
548	3288.0	0.01	2.12	+	5308.60	=	5310.72	0.06	5299.70	757.82
558	3348.0	0.00	1.77	+	5116.29	=	5118.06	0.06	5107.97	757.81
568	3408.0	0.00	1.48	+	4938.76	=	4940.24	0.05	4931.01	757.81
578	3468.0	0.00	1.23	+	4775.14	=	4776.37	0.05	4767.94	757.80
588	3528.0	0.00	1.03	+	4624.56	=	4625.59	0.04	4617.89	757.80
598	3588.0	0.00	0.86	+	4483.17	=	4484.03	0.04	4476.62	757.80
608	3648.0	0.00	0.72	+	4344.96	=	4345.68	0.04	4338.50	757.79
618	3708.0	0.00	0.60	+	4209.97	=	4210.57	0.04	4203.61	757.79
628	3768.0	0.00	0.50	+	4078.30	=	4078.80	0.04	4072.06	757.79
638	3828.0	0.00	0.42	+	3950.02	=	3950.44	0.04	3943.91	757.79

HYDROGRAPH REPORT

RECORD NUMBER : 17
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 100YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 60 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt					OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
648	3888.0	0.00	0.00	+	3824.64	=	3824.64	0.04	3818.32	757.78
658	3948.0	0.00	0.00	+	3700.09	=	3700.09	0.03	3693.97	757.78
668	4008.0	0.00	0.00	+	3579.59	=	3579.59	0.03	3573.68	757.78
678	4068.0	0.00	0.00	+	3463.02	=	3463.02	0.03	3457.30	757.78
688	4128.0	0.00	0.00	+	3350.25	=	3350.25	0.03	3344.71	757.77
698	4188.0	0.00	0.00	+	3241.14	=	3241.14	0.03	3235.79	757.77
708	4248.0	0.00	0.00	+	3135.59	=	3135.59	0.03	3130.41	757.77
718	4308.0	0.00	0.00	+	3033.48	=	3033.48	0.03	3028.47	757.77
728	4368.0	0.00	0.00	+	2934.70	=	2934.70	0.03	2929.85	757.76
738	4428.0	0.00	0.00	+	2839.13	=	2839.13	0.03	2834.43	757.76
748	4488.0	0.00	0.00	+	2746.67	=	2746.67	0.03	2742.13	757.76
758	4548.0	0.00	0.00	+	2657.22	=	2657.22	0.02	2652.83	757.76
768	4608.0	0.00	0.00	+	2570.69	=	2570.69	0.02	2566.44	757.76
778	4668.0	0.00	0.00	+	2486.97	=	2486.97	0.02	2482.86	757.75
788	4728.0	0.00	0.00	+	2405.98	=	2405.98	0.02	2402.01	757.75
798	4788.0	0.00	0.00	+	2327.63	=	2327.63	0.02	2323.78	757.75
808	4848.0	0.00	0.00	+	2251.83	=	2251.83	0.02	2248.11	757.75
818	4908.0	0.00	0.00	+	2178.50	=	2178.50	0.02	2174.90	757.75
828	4968.0	0.00	0.00	+	2107.55	=	2107.55	0.02	2104.07	757.75
838	5028.0	0.00	0.00	+	2038.92	=	2038.92	0.02	2035.55	757.74
848	5088.0	0.00	0.00	+	1972.52	=	1972.52	0.02	1969.26	757.74
858	5148.0	0.00	0.00	+	1908.29	=	1908.29	0.02	1905.13	757.74
868	5208.0	0.00	0.00	+	1846.14	=	1846.14	0.02	1843.09	757.74
878	5268.0	0.00	0.00	+	1786.02	=	1786.02	0.02	1783.07	757.74
888	5328.0	0.00	0.00	+	1727.86	=	1727.86	0.02	1725.00	757.74
898	5388.0	0.00	0.00	+	1671.59	=	1671.59	0.02	1668.83	757.74
908	5448.0	0.00	0.00	+	1617.15	=	1617.15	0.01	1614.48	757.74
918	5508.0	0.00	0.00	+	1564.49	=	1564.49	0.01	1561.90	757.73
928	5568.0	0.00	0.00	+	1513.54	=	1513.54	0.01	1511.04	757.73
938	5628.0	0.00	0.00	+	1464.25	=	1464.25	0.01	1461.83	757.73
948	5688.0	0.00	0.00	+	1416.57	=	1416.57	0.01	1414.23	757.73
958	5748.0	0.00	0.00	+	1370.44	=	1370.44	0.01	1368.17	757.73
968	5808.0	0.00	0.00	+	1325.81	=	1325.81	0.01	1323.62	757.73
978	5868.0	0.00	0.00	+	1282.63	=	1282.63	0.01	1280.51	757.73
988	5928.0	0.00	0.00	+	1240.86	=	1240.86	0.01	1238.81	757.73
998	5988.0	0.00	0.00	+	1200.45	=	1200.45	0.01	1198.47	757.73
1008	6048.0	0.00	0.00	+	1161.36	=	1161.36	0.01	1159.44	757.73
1018	6108.0	0.00	0.00	+	1123.54	=	1123.54	0.01	1121.68	757.72
1028	6168.0	0.00	0.00	+	1086.95	=	1086.95	0.01	1085.15	757.72

HYDROGRAPH REPORT

RECORD NUMBER : 17
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 100YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 60 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt				OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
1038	6228.0	0.00	0.00	+	1051.55	=	1051.55	0.01	1049.81	757.72
1048	6288.0	0.00	0.00	+	1017.31	=	1017.31	0.01	1015.63	757.72
1058	6348.0	0.00	0.00	+	984.18	=	984.18	0.01	982.55	757.72
1068	6408.0	0.00	0.00	+	952.13	=	952.13	0.01	950.56	757.72
1078	6468.0	0.00	0.00	+	921.12	=	921.12	0.01	919.60	757.72
1088	6528.0	0.00	0.00	+	891.12	=	891.12	0.01	889.65	757.72
1098	6588.0	0.00	0.00	+	862.11	=	862.10	0.01	860.68	757.72
1108	6648.0	0.00	0.00	+	834.03	=	834.03	0.01	832.65	757.72
1118	6708.0	0.00	0.00	+	806.87	=	806.87	0.01	805.54	757.72
1128	6768.0	0.00	0.00	+	780.59	=	780.59	0.01	779.30	757.72
1138	6828.0	0.00	0.00	+	755.17	=	755.17	0.01	753.92	757.72
1148	6888.0	0.00	0.00	+	730.58	=	730.58	0.01	729.37	757.72
1158	6948.0	0.00	0.00	+	706.79	=	706.79	0.01	705.62	757.72
1168	7008.0	0.00	0.00	+	683.77	=	683.77	0.01	682.64	757.71
1178	7068.0	0.00	0.00	+	661.50	=	661.50	0.01	660.41	757.71
1188	7128.0	0.00	0.00	+	639.96	=	639.96	0.01	638.90	757.71
1198	7188.0	0.00	0.00	+	619.12	=	619.12	0.01	618.10	757.71
1208	7248.0	0.00	0.00	+	598.96	=	598.96	0.01	597.97	757.71
1218	7308.0	0.00	0.00	+	579.45	=	579.45	0.01	578.50	757.71
1228	7368.0	0.00	0.00	+	560.58	=	560.58	0.01	559.66	757.71
1238	7428.0	0.00	0.00	+	542.33	=	542.33	0.00	541.43	757.71
1248	7488.0	0.00	0.00	+	524.67	=	524.67	0.00	523.80	757.71
1258	7548.0	0.00	0.00	+	507.58	=	507.58	0.00	506.74	757.71
1268	7608.0	0.00	0.00	+	491.05	=	491.05	0.00	490.24	757.71
1278	7668.0	0.00	0.00	+	475.06	=	475.06	0.00	474.27	757.71
1288	7728.0	0.00	0.00	+	459.59	=	459.59	0.00	458.83	757.71
1298	7788.0	0.00	0.00	+	444.62	=	444.62	0.00	443.89	757.71
1308	7848.0	0.00	0.00	+	430.14	=	430.14	0.00	429.43	757.71
1318	7908.0	0.00	0.00	+	416.13	=	416.13	0.00	415.45	757.71
1328	7968.0	0.00	0.00	+	402.58	=	402.58	0.00	401.92	757.71
1338	8028.0	0.00	0.00	+	389.47	=	389.47	0.00	388.83	757.71
1348	8088.0	0.00	0.00	+	376.79	=	376.79	0.00	376.17	757.71
1358	8148.0	0.00	0.00	+	364.52	=	364.52	0.00	363.92	757.71
1368	8208.0	0.00	0.00	+	352.65	=	352.65	0.00	352.07	757.71
1378	8268.0	0.00	0.00	+	341.16	=	341.16	0.00	340.60	757.71
1388	8328.0	0.00	0.00	+	330.05	=	330.05	0.00	329.51	757.71
1398	8388.0	0.00	0.00	+	319.31	=	319.31	0.00	318.78	757.71
1408	8448.0	0.00	0.00	+	308.91	=	308.91	0.00	308.40	757.71
1418	8508.0	0.00	0.00	+	298.85	=	298.85	0.00	298.35	757.71

HYDROGRAPH REPORT

RECORD NUMBER : 20
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 10YR DETENTION

[HYDROGRAPH INFORMATION]

Peak Discharge	=	13.95 (cfs)
Volume	=	9.99 (acft)
Time Interval	=	9 (min)
Time to Peak	=	819.00 (min)
Time of Base	=	9657.00 (min)
Peak Elevation	=	762.20 (ft)

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #..... = 19
Hydrograph Description..... = TOTAL FUTURE BASIN 10YR

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 90 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
73	657.0	0.34	137.50	+	101.88	=	239.38	0.00	238.79	757.71
74	666.0	0.58	246.81	+	238.20	=	485.01	0.00	483.80	757.71
84	756.0	59.83	33272.82	+	83330.44	=	116603.25	9.66	113993.89	760.32
94	846.0	10.22	5738.51	+	190310.50	=	196049.01	13.82	192317.50	762.12
104	936.0	6.46	3544.42	+	165045.82	=	168590.23	11.93	165369.41	761.50
114	1026.0	4.78	2607.27	+	134436.44	=	137043.69	10.61	134179.84	760.78
124	1116.0	4.02	2189.96	+	104749.53	=	106939.49	9.19	104458.51	760.10
134	1206.0	3.23	1766.85	+	78642.62	=	80409.48	7.74	78318.87	759.50
144	1296.0	2.84	1535.39	+	57886.81	=	59422.20	5.90	57828.64	759.03
154	1386.0	2.69	1456.97	+	44779.36	=	46236.33	4.36	45059.29	758.73
164	1476.0	1.00	651.85	+	37217.95	=	37869.80	3.17	37012.91	758.54
174	1566.0	0.00	0.00	+	25844.06	=	25844.06	1.63	25403.72	758.26
184	1656.0	0.00	0.00	+	18997.38	=	18997.38	0.93	18745.42	758.11
194	1746.0	0.00	0.00	+	14917.56	=	14917.56	0.57	14763.01	758.02
204	1836.0	0.00	0.00	+	12363.72	=	12363.72	0.38	12261.39	757.97
214	1926.0	0.00	0.00	+	10624.50	=	10624.50	0.26	10554.14	757.93
224	2016.0	0.00	0.00	+	9428.49	=	9428.49	0.18	9380.10	757.90
234	2106.0	0.00	0.00	+	8554.43	=	8554.43	0.15	8514.42	757.89
244	2196.0	0.00	0.00	+	7804.45	=	7804.45	0.13	7769.88	757.87
254	2286.0	0.00	0.00	+	7156.40	=	7156.40	0.11	7126.52	757.85
264	2376.0	0.00	0.00	+	6596.42	=	6596.42	0.10	6570.61	757.84
274	2466.0	0.00	0.00	+	6112.55	=	6112.55	0.08	6090.24	757.83

HYDROGRAPH REPORT

RECORD NUMBER : 20
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 10YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 90 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt					OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
284	2556.0	0.00	0.00	+	5694.44	=	5694.44	0.07	5675.16	757.82
294	2646.0	0.00	0.00	+	5333.15	=	5333.15	0.06	5316.49	757.82
304	2736.0	0.00	0.00	+	5020.96	=	5020.96	0.05	5006.57	757.81
314	2826.0	0.00	0.00	+	4751.20	=	4751.20	0.05	4738.77	757.80
324	2916.0	0.00	0.00	+	4516.66	=	4516.66	0.04	4505.47	757.80
334	3006.0	0.00	0.00	+	4297.83	=	4297.83	0.04	4287.19	757.79
344	3096.0	0.00	0.00	+	4089.61	=	4089.61	0.04	4079.48	757.79
354	3186.0	0.00	0.00	+	3891.47	=	3891.47	0.04	3881.83	757.78
364	3276.0	0.00	0.00	+	3702.93	=	3702.93	0.03	3693.76	757.78
374	3366.0	0.00	0.00	+	3523.53	=	3523.53	0.03	3514.80	757.78
384	3456.0	0.00	0.00	+	3352.82	=	3352.82	0.03	3344.51	757.77
394	3546.0	0.00	0.00	+	3190.38	=	3190.38	0.03	3182.47	757.77
404	3636.0	0.00	0.00	+	3035.81	=	3035.81	0.03	3028.29	757.77
414	3726.0	0.00	0.00	+	2888.72	=	2888.72	0.03	2881.57	757.76
424	3816.0	0.00	0.00	+	2748.77	=	2748.77	0.03	2741.96	757.76
434	3906.0	0.00	0.00	+	2615.59	=	2615.59	0.02	2609.11	757.76
444	3996.0	0.00	0.00	+	2488.87	=	2488.87	0.02	2482.70	757.75
454	4086.0	0.00	0.00	+	2368.29	=	2368.29	0.02	2362.42	757.75
464	4176.0	0.00	0.00	+	2253.54	=	2253.54	0.02	2247.96	757.75
474	4266.0	0.00	0.00	+	2144.36	=	2144.36	0.02	2139.05	757.75
484	4356.0	0.00	0.00	+	2040.47	=	2040.47	0.02	2035.42	757.74
494	4446.0	0.00	0.00	+	1941.61	=	1941.61	0.02	1936.80	757.74
504	4536.0	0.00	0.00	+	1847.54	=	1847.54	0.02	1842.96	757.74
514	4626.0	0.00	0.00	+	1758.03	=	1758.03	0.02	1753.67	757.74
524	4716.0	0.00	0.00	+	1672.85	=	1672.85	0.02	1668.71	757.74
534	4806.0	0.00	0.00	+	1591.81	=	1591.81	0.01	1587.86	757.73
544	4896.0	0.00	0.00	+	1514.68	=	1514.68	0.01	1510.93	757.73
554	4986.0	0.00	0.00	+	1441.30	=	1441.30	0.01	1437.73	757.73
564	5076.0	0.00	0.00	+	1371.47	=	1371.47	0.01	1368.07	757.73
574	5166.0	0.00	0.00	+	1305.02	=	1305.02	0.01	1301.79	757.73
584	5256.0	0.00	0.00	+	1241.80	=	1241.80	0.01	1238.72	757.73
594	5346.0	0.00	0.00	+	1181.63	=	1181.63	0.01	1178.70	757.73
604	5436.0	0.00	0.00	+	1124.38	=	1124.38	0.01	1121.60	757.72
614	5526.0	0.00	0.00	+	1069.91	=	1069.91	0.01	1067.26	757.72
624	5616.0	0.00	0.00	+	1018.07	=	1018.07	0.01	1015.55	757.72
634	5706.0	0.00	0.00	+	968.75	=	968.75	0.01	966.35	757.72
644	5796.0	0.00	0.00	+	921.81	=	921.81	0.01	919.53	757.72
654	5886.0	0.00	0.00	+	877.15	=	877.15	0.01	874.98	757.72
664	5976.0	0.00	0.00	+	834.65	=	834.65	0.01	832.59	757.72

HYDROGRAPH REPORT

RECORD NUMBER : 20
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 10YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 90 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt					OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
674	6066.0	0.00	0.00	+	794.22	=	794.22	0.01	792.25	757.72
684	6156.0	0.00	0.00	+	755.74	=	755.74	0.01	753.86	757.72
694	6246.0	0.00	0.00	+	719.12	=	719.12	0.01	717.34	757.72
704	6336.0	0.00	0.00	+	684.28	=	684.28	0.01	682.59	757.71
714	6426.0	0.00	0.00	+	651.13	=	651.13	0.01	649.52	757.71
724	6516.0	0.00	0.00	+	619.58	=	619.58	0.01	618.05	757.71
734	6606.0	0.00	0.00	+	589.56	=	589.56	0.01	588.10	757.71
744	6696.0	0.00	0.00	+	561.00	=	561.00	0.01	559.61	757.71
754	6786.0	0.00	0.00	+	533.82	=	533.82	0.00	532.50	757.71
764	6876.0	0.00	0.00	+	507.96	=	507.96	0.00	506.70	757.71
774	6966.0	0.00	0.00	+	483.35	=	483.35	0.00	482.15	757.71
784	7056.0	0.00	0.00	+	459.93	=	459.93	0.00	458.79	757.71
794	7146.0	0.00	0.00	+	437.65	=	437.65	0.00	436.56	757.71
804	7236.0	0.00	0.00	+	416.44	=	416.44	0.00	415.41	757.71
814	7326.0	0.00	0.00	+	396.27	=	396.27	0.00	395.28	757.71
824	7416.0	0.00	0.00	+	377.07	=	377.07	0.00	376.13	757.71
834	7506.0	0.00	0.00	+	358.80	=	358.80	0.00	357.91	757.71
844	7596.0	0.00	0.00	+	341.42	=	341.42	0.00	340.57	757.71
854	7686.0	0.00	0.00	+	324.87	=	324.87	0.00	324.07	757.71
864	7776.0	0.00	0.00	+	309.13	=	309.13	0.00	308.37	757.71
874	7866.0	0.00	0.00	+	294.16	=	294.16	0.00	293.43	757.71
884	7956.0	0.00	0.00	+	279.91	=	279.91	0.00	279.21	757.71
894	8046.0	0.00	0.00	+	266.34	=	266.34	0.00	265.68	757.71
904	8136.0	0.00	0.00	+	253.44	=	253.44	0.00	252.81	757.71
914	8226.0	0.00	0.00	+	241.16	=	241.16	0.00	240.56	757.71
924	8316.0	0.00	0.00	+	229.48	=	229.48	0.00	228.91	757.70
934	8406.0	0.00	0.00	+	218.36	=	218.36	0.00	217.82	757.70
944	8496.0	0.00	0.00	+	207.78	=	207.78	0.00	207.27	757.70
954	8586.0	0.00	0.00	+	197.71	=	197.71	0.00	197.22	757.70
964	8676.0	0.00	0.00	+	188.13	=	188.13	0.00	187.67	757.70
974	8766.0	0.00	0.00	+	179.02	=	179.02	0.00	178.58	757.70
984	8856.0	0.00	0.00	+	170.35	=	170.35	0.00	169.92	757.70
994	8946.0	0.00	0.00	+	162.09	=	162.09	0.00	161.69	757.70
1004	9036.0	0.00	0.00	+	154.24	=	154.24	0.00	153.86	757.70
1014	9126.0	0.00	0.00	+	146.77	=	146.77	0.00	146.40	757.70
1024	9216.0	0.00	0.00	+	139.66	=	139.66	0.00	139.31	757.70
1034	9306.0	0.00	0.00	+	132.89	=	132.89	0.00	132.56	757.70
1044	9396.0	0.00	0.00	+	126.45	=	126.45	0.00	126.14	757.70
1054	9486.0	0.00	0.00	+	120.33	=	120.33	0.00	120.03	757.70

HYDROGRAPH REPORT

RECORD NUMBER : 20
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 10YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 90 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt				OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
1064	9576.0	0.00	0.00	+	114.50	=	114.50	0.00	114.21	757.70

HYDROGRAPH REPORT

RECORD NUMBER : 21
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 0.5"RUNOFF DETENTION

[HYDROGRAPH INFORMATION]

Peak Discharge	=	1.26 (cfs)
Volume	=	2.88 (acft)
Time Interval	=	7 (min)
Time to Peak	=	1197.00 (min)
Time of Base	=	6496.00 (min)
Peak Elevation	=	759.67 (ft)

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph # = 16
Hydrograph Description = FUTURE TOTAL BASIN 0.5"RUNOFF

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 70 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
105	735.0	16.18	5839.00	+	6785.17	=	12624.17	0.09	12605.92	757.97
106	742.0	18.72	7327.68	+	12587.67	=	19915.35	0.30	19853.21	758.13
116	812.0	4.64	2031.04	+	61959.87	=	63990.91	1.05	63771.34	759.16
126	882.0	2.82	1202.69	+	73050.42	=	74253.11	1.15	74011.63	759.40
136	952.0	2.23	948.66	+	78912.08	=	79860.75	1.20	79608.25	759.53
146	1022.0	1.80	762.70	+	82306.28	=	83068.99	1.23	82810.33	759.60
156	1092.0	1.60	676.24	+	84336.08	=	85012.33	1.25	84750.05	759.65
166	1162.0	1.38	584.00	+	85423.52	=	86007.52	1.26	85743.38	759.67
176	1232.0	1.16	491.63	+	85544.43	=	86036.06	1.26	85771.88	759.67
186	1302.0	1.10	464.66	+	85027.88	=	85492.54	1.25	85229.37	759.66
196	1372.0	1.07	448.32	+	84349.41	=	84797.72	1.25	84535.84	759.64
206	1442.0	0.90	396.35	+	83523.11	=	83919.46	1.24	83659.22	759.62
216	1512.0	0.00	0.00	+	79999.57	=	79999.57	1.20	79746.80	759.53
226	1582.0	0.00	0.00	+	75032.04	=	75032.04	1.16	74789.02	759.42
236	1652.0	0.00	0.00	+	70260.53	=	70260.54	1.11	70027.40	759.31
246	1722.0	0.00	0.00	+	65686.46	=	65686.46	1.06	65463.12	759.20
256	1792.0	0.00	0.00	+	61308.04	=	61308.04	1.02	61094.45	759.10
266	1862.0	0.00	0.00	+	57125.03	=	57125.03	0.97	56921.23	759.01
276	1932.0	0.00	0.00	+	53138.24	=	53138.24	0.92	52944.30	758.92
286	2002.0	0.00	0.00	+	49347.57	=	49347.57	0.88	49163.40	758.83
296	2072.0	0.00	0.00	+	45751.97	=	45751.97	0.83	45577.66	758.75
306	2142.0	0.00	0.00	+	42354.46	=	42354.46	0.78	42190.21	758.67

HYDROGRAPH REPORT

RECORD NUMBER : 21
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 0.5"RUNOFF DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 70 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt					OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
316	2212.0	0.00	0.00	+	39162.21	=	39162.21	0.73	39009.23	758.59
326	2282.0	0.00	0.00	+	36256.86	=	36256.86	0.65	36120.67	758.52
336	2352.0	0.00	0.00	+	33647.71	=	33647.71	0.59	33522.82	758.46
346	2422.0	0.00	0.00	+	31231.54	=	31231.54	0.55	31115.65	758.40
356	2492.0	0.00	0.00	+	28998.99	=	28998.99	0.51	28892.43	758.34
366	2562.0	0.00	0.00	+	26946.31	=	26946.31	0.47	26848.63	758.29
376	2632.0	0.00	0.00	+	25083.34	=	25083.34	0.42	24995.54	758.25
386	2702.0	0.00	0.00	+	23408.92	=	23408.92	0.38	23330.01	758.21
396	2772.0	0.00	0.00	+	21899.45	=	21899.45	0.34	21827.89	758.17
406	2842.0	0.00	0.00	+	20527.85	=	20527.85	0.31	20462.80	758.14
416	2912.0	0.00	0.00	+	19281.04	=	19281.04	0.28	19221.91	758.12
426	2982.0	0.00	0.00	+	18148.72	=	18148.72	0.25	18095.53	758.09
436	3052.0	0.00	0.00	+	17145.94	=	17145.94	0.22	17099.37	758.07
446	3122.0	0.00	0.00	+	16267.95	=	16267.95	0.19	16227.17	758.05
456	3192.0	0.00	0.00	+	15499.21	=	15499.21	0.17	15463.50	758.04
466	3262.0	0.00	0.00	+	14826.12	=	14826.12	0.15	14794.86	758.02
476	3332.0	0.00	0.00	+	14236.79	=	14236.79	0.13	14209.42	758.01
486	3402.0	0.00	0.00	+	13720.64	=	13720.64	0.11	13696.54	758.00
496	3472.0	0.00	0.00	+	13261.21	=	13261.21	0.10	13239.56	757.99
506	3542.0	0.00	0.00	+	12848.47	=	12848.47	0.09	12829.02	757.98
516	3612.0	0.00	0.00	+	12477.67	=	12477.67	0.08	12460.20	757.97
526	3682.0	0.00	0.00	+	12144.55	=	12144.55	0.07	12128.86	757.96
536	3752.0	0.00	0.00	+	11845.29	=	11845.29	0.07	11831.19	757.96
546	3822.0	0.00	0.00	+	11576.43	=	11576.43	0.06	11563.76	757.95
556	3892.0	0.00	0.00	+	11334.90	=	11334.90	0.05	11323.52	757.95
566	3962.0	0.00	0.00	+	11117.91	=	11117.91	0.05	11107.68	757.94
576	4032.0	0.00	0.00	+	10922.97	=	10922.97	0.04	10913.79	757.94
586	4102.0	0.00	0.00	+	10747.84	=	10747.84	0.04	10739.59	757.93
596	4172.0	0.00	0.00	+	10590.51	=	10590.51	0.04	10583.10	757.93
606	4242.0	0.00	0.00	+	10449.17	=	10449.17	0.03	10442.51	757.93
616	4312.0	0.00	0.00	+	10322.19	=	10322.19	0.03	10316.21	757.92
626	4382.0	0.00	0.00	+	10208.11	=	10208.11	0.03	10202.74	757.92
636	4452.0	0.00	0.00	+	10105.63	=	10105.63	0.02	10100.80	757.92
646	4522.0	0.00	0.00	+	10013.56	=	10013.56	0.02	10009.22	757.92
656	4592.0	0.00	0.00	+	9930.85	=	9930.85	0.02	9926.95	757.92
666	4662.0	0.00	0.00	+	9856.54	=	9856.54	0.02	9853.04	757.91
676	4732.0	0.00	0.00	+	9789.79	=	9789.79	0.01	9786.64	757.91
686	4802.0	0.00	0.00	+	9729.82	=	9729.82	0.01	9726.99	757.91
696	4872.0	0.00	0.00	+	9675.94	=	9675.94	0.01	9673.40	757.91

HYDROGRAPH REPORT

RECORD NUMBER : 21
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 0.5"RUNOFF DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 70 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt					OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
706	4942.0	0.00	0.00	+	9627.53	=	9627.54	0.01	9625.25	757.91
716	5012.0	0.00	0.00	+	9584.05	=	9584.05	0.01	9582.00	757.91
726	5082.0	0.00	0.00	+	9544.99	=	9544.99	0.01	9543.15	757.91
736	5152.0	0.00	0.00	+	9509.89	=	9509.89	0.01	9508.24	757.91
746	5222.0	0.00	0.00	+	9478.36	=	9478.36	0.01	9476.88	757.91
756	5292.0	0.00	0.00	+	9450.04	=	9450.04	0.01	9448.70	757.91
766	5362.0	0.00	0.00	+	9424.59	=	9424.59	0.01	9423.39	757.90
776	5432.0	0.00	0.00	+	9401.73	=	9401.73	0.01	9400.66	757.90
786	5502.0	0.00	0.00	+	9381.20	=	9381.20	0.00	9380.23	757.90
796	5572.0	0.00	0.00	+	9362.75	=	9362.75	0.00	9361.88	757.90
806	5642.0	0.00	0.00	+	9346.17	=	9346.17	0.00	9345.39	757.90
816	5712.0	0.00	0.00	+	9331.28	=	9331.28	0.00	9330.58	757.90
826	5782.0	0.00	0.00	+	9317.90	=	9317.90	0.00	9317.27	757.90
836	5852.0	0.00	0.00	+	9305.88	=	9305.88	0.00	9305.32	757.90
846	5922.0	0.00	0.00	+	9295.08	=	9295.08	0.00	9294.58	757.90
856	5992.0	0.00	0.00	+	9285.38	=	9285.38	0.00	9284.93	757.90
866	6062.0	0.00	0.00	+	9276.67	=	9276.67	0.00	9276.26	757.90
876	6132.0	0.00	0.00	+	9268.84	=	9268.84	0.00	9268.47	757.90
886	6202.0	0.00	0.00	+	9261.81	=	9261.81	0.00	9261.48	757.90
896	6272.0	0.00	0.00	+	9255.49	=	9255.49	0.00	9255.19	757.90
906	6342.0	0.00	0.00	+	9249.82	=	9249.82	0.00	9249.55	757.90
916	6412.0	0.00	0.00	+	9244.72	=	9244.72	0.00	9244.48	757.90
926	6482.0	0.00	0.00	+	9240.14	=	9240.13	0.00	9239.92	757.90

HYDROGRAPH REPORT

RECORD NUMBER : 23
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 2YR DETENTION

[HYDROGRAPH INFORMATION]

Peak Discharge.....	=	1.86 (cfs)
Volume.....	=	5.42 (acft)
Time Interval.....	=	7 (min)
Time to Peak.....	=	1225.00 (min)
Time of Base.....	=	7413.00 (min)
Peak Elevation.....	=	761.61 (ft)

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #.....	=	22
Hydrograph Description.....	=	TOTAL BASIN 2YR FUTURE

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 70 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt	+	S1-0.5(O1)dt	=	S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
104	728.0	26.74	9296.74	+	9197.24	=	18493.99	0.26	18438.59	758.10
105	735.0	35.03	12973.09	+	18383.20	=	31356.29	0.55	31239.88	758.40
115	805.0	8.49	3753.23	+	123992.99	=	127746.22	1.58	127413.58	760.63
125	875.0	4.79	2049.60	+	144905.66	=	146955.26	1.71	146595.45	761.07
135	945.0	3.72	1581.84	+	155704.91	=	157286.75	1.78	156913.13	761.30
145	1015.0	2.95	1246.51	+	162256.61	=	163503.10	1.82	163121.39	761.44
155	1085.0	2.60	1097.65	+	166353.73	=	167451.37	1.84	167064.64	761.54
165	1155.0	2.23	945.89	+	168888.56	=	169834.45	1.86	169444.69	761.59
175	1225.0	1.87	791.46	+	169832.44	=	170623.90	1.86	170233.14	761.61
185	1295.0	1.75	737.31	+	169610.72	=	170348.02	1.86	169957.61	761.60
195	1365.0	1.69	709.32	+	169056.47	=	169765.78	1.86	169376.11	761.59
205	1435.0	1.55	666.64	+	168235.48	=	168902.12	1.85	168513.55	761.57
215	1505.0	0.00	3.53	+	163726.20	=	163729.72	1.82	163347.72	761.45
225	1575.0	0.00	0.00	+	156177.93	=	156177.94	1.77	155805.77	761.28
235	1645.0	0.00	0.00	+	148822.71	=	148822.71	1.73	148460.38	761.11
245	1715.0	0.00	0.00	+	141663.95	=	141663.95	1.68	141311.39	760.94
255	1785.0	0.00	0.00	+	134700.91	=	134700.91	1.63	134358.16	760.78
265	1855.0	0.00	0.00	+	127934.29	=	127934.29	1.59	127601.37	760.63
275	1925.0	0.00	0.00	+	121364.32	=	121364.32	1.54	121041.23	760.48
285	1995.0	0.00	0.00	+	114990.77	=	114990.76	1.49	114677.48	760.33
295	2065.0	0.00	0.00	+	108812.81	=	108812.81	1.45	108509.27	760.19
305	2135.0	0.00	0.00	+	102831.09	=	102831.08	1.40	102537.41	760.05

HYDROGRAPH REPORT

RECORD NUMBER : 23
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 2YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 70 min)

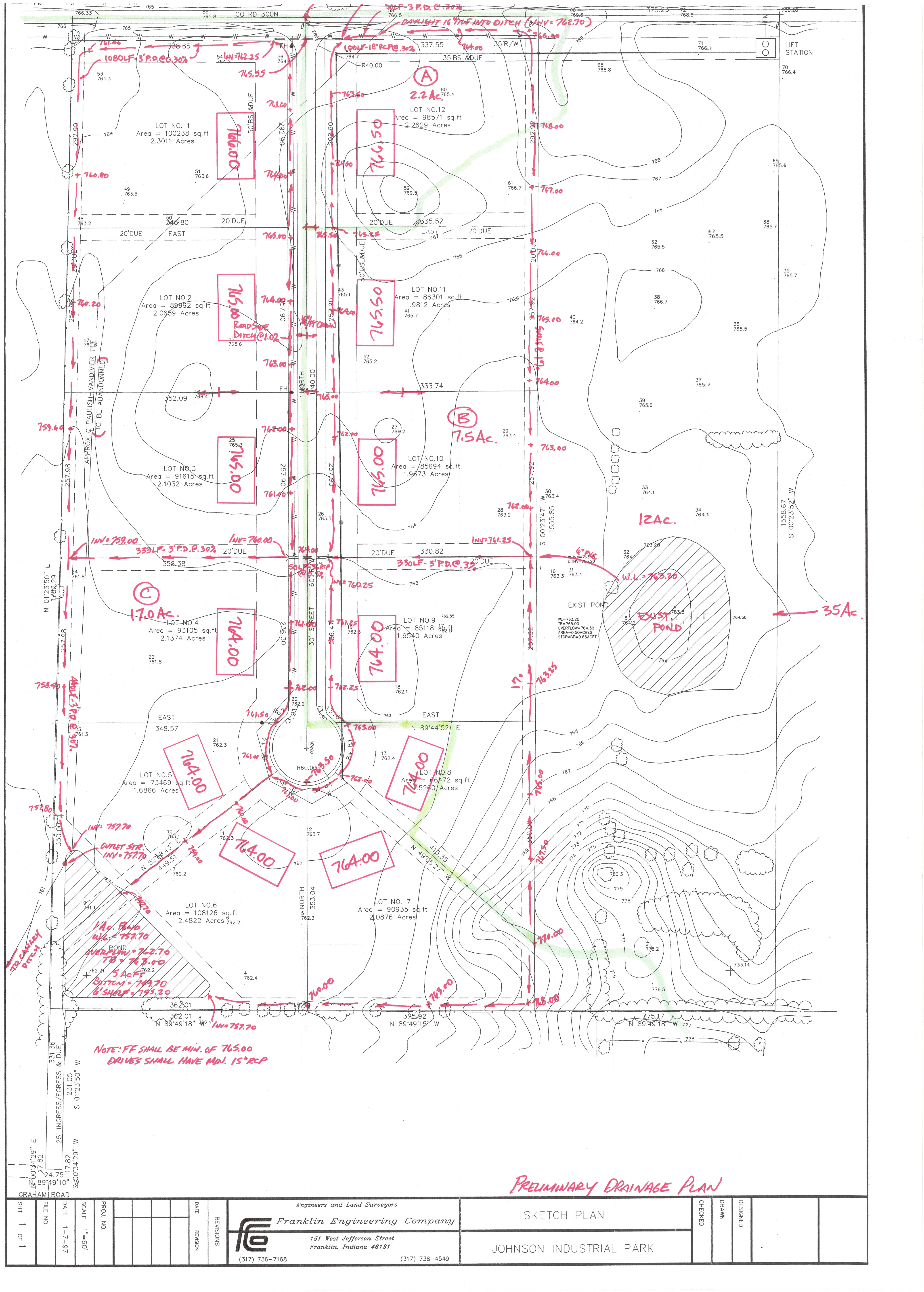
INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt	OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
315	2205.0	0.00	0.00 + 97045.91 = 97045.92	1.35	96762.08	759.92
325	2275.0	0.00	0.00 + 91457.30 = 91457.30	1.31	91183.23	759.79
335	2345.0	0.00	0.00 + 86064.48 = 86064.48	1.26	85800.24	759.67
345	2415.0	0.00	0.00 + 80867.83 = 80867.83	1.21	80613.40	759.55
355	2485.0	0.00	0.00 + 75866.97 = 75866.97	1.17	75622.30	759.44
365	2555.0	0.00	0.00 + 71061.76 = 71061.76	1.12	70826.95	759.33
375	2625.0	0.00	0.00 + 66454.15 = 66454.15	1.07	66229.16	759.22
385	2695.0	0.00	0.00 + 62042.38 = 62042.38	1.02	61827.15	759.12
395	2765.0	0.00	0.00 + 57825.94 = 57825.94	0.98	57620.50	759.02
405	2835.0	0.00	0.00 + 53805.49 = 53805.49	0.93	53609.90	758.93
415	2905.0	0.00	0.00 + 49981.42 = 49981.42	0.88	49795.60	758.84
425	2975.0	0.00	0.00 + 46352.23 = 46352.23	0.84	46176.23	758.76
435	3045.0	0.00	0.00 + 42920.64 = 42920.64	0.79	42754.59	758.68
445	3115.0	0.00	0.00 + 39692.85 = 39692.85	0.74	39537.03	758.60
455	3185.0	0.00	0.00 + 36729.66 = 36729.66	0.66	36590.73	758.53
465	3255.0	0.00	0.00 + 34078.73 = 34078.73	0.60	33952.25	758.47
475	3325.0	0.00	0.00 + 31631.69 = 31631.69	0.56	31514.26	758.41
485	3395.0	0.00	0.00 + 29367.23 = 29367.22	0.51	29259.13	758.35
495	3465.0	0.00	0.00 + 27284.74 = 27284.75	0.47	27185.35	758.30
505	3535.0	0.00	0.00 + 25387.66 = 25387.67	0.43	25298.25	758.26
515	3605.0	0.00	0.00 + 23682.44 = 23682.45	0.38	23602.08	758.21
525	3675.0	0.00	0.00 + 22147.12 = 22147.12	0.35	22074.38	758.18
535	3745.0	0.00	0.00 + 20752.98 = 20752.98	0.31	20686.87	758.15
545	3815.0	0.00	0.00 + 19485.69 = 19485.69	0.29	19425.58	758.12
555	3885.0	0.00	0.00 + 18333.72 = 18333.73	0.26	18279.31	758.10
565	3955.0	0.00	0.00 + 17307.93 = 17307.93	0.23	17260.29	758.08
575	4025.0	0.00	0.00 + 16409.78 = 16409.78	0.20	16368.07	758.06
585	4095.0	0.00	0.00 + 15623.39 = 15623.39	0.17	15586.87	758.04
595	4165.0	0.00	0.00 + 14934.85 = 14934.85	0.15	14902.88	758.02
605	4235.0	0.00	0.00 + 14332.00 = 14332.00	0.13	14304.00	758.01
615	4305.0	0.00	0.00 + 13804.16 = 13804.16	0.12	13779.62	758.00
625	4375.0	0.00	0.00 + 13336.24 = 13336.24	0.10	13314.19	757.99
635	4445.0	0.00	0.00 + 12915.88 = 12915.88	0.09	12896.07	757.98
645	4515.0	0.00	0.00 + 12538.23 = 12538.23	0.08	12520.43	757.97
655	4585.0	0.00	0.00 + 12198.95 = 12198.95	0.08	12182.97	757.96
665	4655.0	0.00	0.00 + 11894.16 = 11894.16	0.07	11879.80	757.96
675	4725.0	0.00	0.00 + 11620.34 = 11620.34	0.06	11607.43	757.95
685	4795.0	0.00	0.00 + 11374.34 = 11374.34	0.06	11362.75	757.95
695	4865.0	0.00	0.00 + 11153.35 = 11153.35	0.05	11142.94	757.94

HYDROGRAPH REPORT

RECORD NUMBER : 23
TYPE : RESER STOR. IND
DESCRIPTION : WEST POND 2YR DETENTION

[Computation of Reservoir Outflow Table of Storage Indication Method]
(The time interval is 70 min)

INTV#	TIME (min)	INFLOW (cfs)	EQUATION 0.5(I1+I2)dt + S1-0.5(O1)dt = S2+0.5(O2)dt					OUTFLOW O2(cfs)	STORAGE (cuft)	ELEVATION (ft)
705	4935.0	0.00	0.00	+	10954.81	=	10954.81	0.04	10945.46	757.94
715	5005.0	0.00	0.00	+	10776.45	=	10776.45	0.04	10768.04	757.93
725	5075.0	0.00	0.00	+	10616.21	=	10616.21	0.04	10608.66	757.93
735	5145.0	0.00	0.00	+	10472.26	=	10472.26	0.03	10465.48	757.93
745	5215.0	0.00	0.00	+	10342.93	=	10342.93	0.03	10336.84	757.92
755	5285.0	0.00	0.00	+	10226.75	=	10226.75	0.03	10221.28	757.92
765	5355.0	0.00	0.00	+	10122.37	=	10122.37	0.02	10117.46	757.92
775	5425.0	0.00	0.00	+	10028.60	=	10028.60	0.02	10024.19	757.92
785	5495.0	0.00	0.00	+	9944.37	=	9944.36	0.02	9940.40	757.92
795	5565.0	0.00	0.00	+	9868.68	=	9868.68	0.02	9865.12	757.91
805	5635.0	0.00	0.00	+	9800.69	=	9800.69	0.02	9797.49	757.91
815	5705.0	0.00	0.00	+	9739.62	=	9739.62	0.01	9736.74	757.91
825	5775.0	0.00	0.00	+	9684.74	=	9684.74	0.01	9682.16	757.91
835	5845.0	0.00	0.00	+	9635.44	=	9635.44	0.01	9633.12	757.91
845	5915.0	0.00	0.00	+	9591.16	=	9591.16	0.01	9589.07	757.91
855	5985.0	0.00	0.00	+	9551.37	=	9551.37	0.01	9549.49	757.91
865	6055.0	0.00	0.00	+	9515.63	=	9515.63	0.01	9513.94	757.91
875	6125.0	0.00	0.00	+	9483.51	=	9483.51	0.01	9482.00	757.91
885	6195.0	0.00	0.00	+	9454.66	=	9454.66	0.01	9453.30	757.91
895	6265.0	0.00	0.00	+	9428.75	=	9428.75	0.01	9427.53	757.90
905	6335.0	0.00	0.00	+	9405.47	=	9405.47	0.01	9404.37	757.90
915	6405.0	0.00	0.00	+	9384.55	=	9384.55	0.00	9383.56	757.90
925	6475.0	0.00	0.00	+	9365.76	=	9365.76	0.00	9364.87	757.90
935	6545.0	0.00	0.00	+	9348.87	=	9348.87	0.00	9348.08	757.90
945	6615.0	0.00	0.00	+	9333.71	=	9333.71	0.00	9332.99	757.90
955	6685.0	0.00	0.00	+	9320.09	=	9320.09	0.00	9319.44	757.90
965	6755.0	0.00	0.00	+	9307.85	=	9307.85	0.00	9307.27	757.90
975	6825.0	0.00	0.00	+	9296.85	=	9296.85	0.00	9296.33	757.90
985	6895.0	0.00	0.00	+	9286.97	=	9286.97	0.00	9286.51	757.90
995	6965.0	0.00	0.00	+	9278.09	=	9278.09	0.00	9277.68	757.90
1005	7035.0	0.00	0.00	+	9270.12	=	9270.12	0.00	9269.75	757.90
1015	7105.0	0.00	0.00	+	9262.96	=	9262.96	0.00	9262.62	757.90
1025	7175.0	0.00	0.00	+	9256.52	=	9256.52	0.00	9256.22	757.90
1035	7245.0	0.00	0.00	+	9250.74	=	9250.74	0.00	9250.47	757.90
1045	7315.0	0.00	0.00	+	9245.55	=	9245.55	0.00	9245.30	757.90
1055	7385.0	0.00	0.00	+	9240.88	=	9240.88	0.00	9240.66	757.90


LIFT STATION
CO RD 300N
GRAHAM ROAD
25' INGRESS/EGRESS & DUE
APPROX. C PAULISH-VANDIVIER TILE (TO BE ABANDONED)
60' R/W 30' STREET
EXIST POND
LOT NO. 1 Area = 100238 sq.ft 2.3011 Acres
LOT NO.2 Area = 89992 sq.ft 2.0659 Acres
LOT NO.3 Area = 91615 sq.ft 2.1032 Acres
LOT NO.4 Area = 93105 sq.ft 2.1374 Acres
LOT NO.5 Area = 73469 sq.ft 1.6866 Acres
LOT NO.6 Area = 108126 sq.ft 2.4822 Acres
LOT NO. 7 Area = 90935 sq.ft 2.0876 Acres
LOT NO.8 Area = 66472 sq.ft 1.5260 Acres
LOT NO.9 Area = 85118 sq.ft 1.9540 Acres
LOT NO.10 Area = 85694 sq.ft 1.9673 Acres
LOT NO.11 Area = 86301 sq.ft 1.9812 Acres
LOT NO.12 Area = 98571 sq.ft 2.2629 Acres
35 Ac.
12 Ac.
(A) 2.2 Ac.
(B) 7.5 Ac.
(C) 17.0 Ac.
1 Ac. POND W.L. = 757.70 OVERFLOW = 762.70 TB = 763.00 5 Ac.Ft. BOTTOM = 749.70 6' SHELF = 755.20
NOTE: FF SHALL BE MIN. OF 765.00
DRIVES SHALL HAVE MIN. 15" RCP
PRELIMINARY DRAINAGE PLAN
Engineers and Land Surveyors
Franklin Engineering Company
151 West Jefferson Street
Franklin, Indiana 46131
(317) 736-7168
(317) 738-4549
SKETCH PLAN
JOHNSON INDUSTRIAL PARK
DESIGNED
DRAWN
CHECKED
REVISIONS
DATE
REVISION
PROJ. NO.
SCALE 1"=60'
DATE 1-7-97
FILE NO.
SHT 1 OF 1