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FILE: SHOE CARNIVAL DISTRIBUTION CENTER

DRAINAGE COMPUTATIONS

NE Corner of SR 57 and Ruston Lane
Vanderburgh County, Indiana

Prepared by:

American Consulting, Inc.
7260 Shadeland Station
Indianapolis, IN 46256-3397

February 27, 2006
Revised: October 4, 2006

Submitted By: Tony Halsey, PE

RECEIVED BY THE
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10/6/06 am BF

DRAINAGE COMPUTATIONS
SHOE CARNIVAL DISTRIBUTION CENTER
TABLE OF CONTENTS

DRAINAGE COMPUTATIONS
SHOE CARNIVAL DISTRIBUTION CENTER

Project Description

Woodward Commercial Realty proposes to construct a 400,000-sft warehouse at the northeast corner of State Road 57 and Ruston Lane near Daylight, in Vanderburgh County, Indiana. The site is bounded on the west by SR 57, on the south by Ruston Lane, and on the east by a railroad right-of-way and I-164 right-of-way. The warehouse will also contain more than 8,000-sft of office space and will employ a maximum of 200 people. Accordingly, parking facilities will be provided for 200 employees. The main entrance for the facility will be off of Ruston Lane. Ruston Lane will be widened to three lanes from SR 57 approximately 150' east to the site entrance as part of this project.

A portion of this property lies in a 100-year floodplain, as delineated on FIRM Map Number 180256 0015 C, revised August 5, 1991. However, the floodplain is north of the limits of this project. No portion of the current project lies within the FEMA delineated 100-year flood area. The northern edge of the truck parking lot lies below elevation 395.0 feet, which is the flood elevation established by the Vanderburgh County Building Commissioner.

Existing Conditions

The site is an abandoned coal processing facility. Existing infrastructure on the site includes an asphalt driveway, some concrete pads, an old shed, some chain link fence, and three small ponds. The ponds range in size from 0.15 to 1.4 acres. A larger pond, roughly six acres in size, is located at the north end of the site. Existing transformers, buried electric/telephone lines, and overhead electrical/telephone lines are located throughout the southern half of the site. A large underground petroleum line crosses east and west through the site just south of the largest pond.

Existing groundcover is a mixture of native grasses, trees, and agriculture. Generally, the southern portion of the site is covered with grass, the middle section with a mixture of trees and grass, and the northern portion with a mixture of grass and agriculture. About 850' north of Ruston Lane, a 48-inch box culvert daylights from under SR 57 into an open swale. The swale enters a 72" CMP and flows east across the site into a large swale along the railroad right-of-way.

There are four main drainage areas on site. Approximately 2.5 acres drain via overland flow south to Ruston Lane, 9.8 acres drain via overland flow north and east into the six acre pond and/or the pond's outfall in the I-164 right-of-way, and 12.8 acres drain through the existing swale/72" CMP into large swale along the railroad right-of-way. The remainder of the site is contained in depressional storage in one of the three smaller ponds. If the ponds overflow, the overflow would go into the I-164 right-of-way.

For the purposes of meeting Vanderburgh County's ordinance, the 12.8-acre watershed draining to the railroad and the 9.8-acre watersheds draining north were used for existing conditions. The final drainage outlets after construction will be to these two points. ICPR was used to calculate an existing 10-year discharge to both points. ICPR is a computer stormwater modeling program that uses hydrograph routing methods, similar to TR-20 or HEC-HMS. Huff third-quartile (50 percent) distributions were used for hydrograph routing. Results show the existing peak 10-year discharge to the railroad right-of-way is 9.02 cfs, and the existing peak 10-year discharge to the north is 6.98 cfs. These numbers will be used as the allowable post-construction peak 25-year discharges.

Table 1–Existing 10-Year Peak Stormwater Discharges

Basin/Discharge Point	Peak Q (cfs)
Railroad R/W	9.02 cfs
6-Acre Pond	6.98 cfs

There are also several identified wetlands on this property Mitigation of these wetlands, as well as relocation of the open swale across the property, has been coordinated through the Army Corps of Engineers. Wetlands south of the existing fence north of the 1.4-acre pond have been mitigated, while all wetlands north of the fence are not mitigated. These wetlands will remain after completion of the project.

Proposed Conditions

The proposed site will be divided into two basic drainage basins. The first basin will be approximately 27.3 acres and ultimately drain to the same open swale to which the existing 12.8-acre watershed drains. Offsite drainage from under SR 57 will be piped through the site and will also outlet to this swale, as in existing conditions.

South Basin

All areas south of the proposed building, including the access drive off of Ruston Lane and the employee parking lot, will sheet drain into a dry detention basin south of the parking lot. After being detained, stormwater will reconnect with offsite bypass flow and be piped around the southeast corner of the building into the existing swale.

The proposed building and the truck dock area will drain via a combination of ditch flow and sheet flow into a detention pond northeast of the building. The proposed detention pond will be constructed out of the 1.4 acre existing pond (the biggest of the three small ponds). The southwest corner of the existing pond will be filled in, and a linear "finger" will be constructed off the northwest corner to create the new pond. The outlet structure for the detention pond will be a 24" RCP with a 12" orifice pipe grouted into place.

The emergency overflow will be on the north bank of the pond, which is where the existing pond overflows. If the emergency overflow is used, the overflow will drain into I-164 right-of-way, then south into the swale along the railroad.

North Basin

The northernmost 10.5 acres of the site, including all truck parking areas north of the proposed building, will drain north into the existing 6-acre pond and/or its outfall in the I-164 right-of-way. Runoff from the truck parking lot will be detained in a small detention pond off the northeast corner of the parking lot prior to discharging into the larger 6-acre pond. The outfall from the detention pond will be a 12" RCP culvert.

This pond will be constructed adjacent to a delineated FEMA floodplain and will discharge into that floodplain. Although FEMA has not published a 100-year flood elevation, the Vanderburgh County Building Commissioner established a 100-year flood elevation of 395.0 feet. However, no 25-year flood elevation was established. To determine the 25-year flood elevation, an ICPR model was developed analyzing offsite flow through the 6-acre pond and its outfall. Results from that model estimate the 25-year flood elevation is 391.65 feet, which is 3.35 feet lower than the 100-year flood elevation set by the Building Commissioner. Calculations for the 25-year flood can be found in the appendix.

To ensure the pond functions effectively during the 25-year storm, a 10-wide berm with a top elevation of 392.5 will be built around the pond. The northern bank will be six inches lower than the banks around the rest of the pond. The entire northern bank of the pond will serve as the emergency spillway. Overflow capacity calculations can be found in the appendix of this report.

Results

ICPR was used to analyze inflow/outflow rates and maximum stages in each detention basin, as well as combined runoff from each basin to the respective discharge points. Results show during a 25-year storm event, the peak runoff rate is maintained well below the existing 10-year runoff rate for each basin.

The tables below provide a summary of the detention ponds and total runoff.

Table 2 – Individual Detention Basin Summary

Basin	Outlet Point	Initial Stage (ft)	Max. Stage (ft)	Max. 25-year Q (cfs)	Time to Max. Stage/Q (hrs)
Dry Pond	Railroad R/W	389.63 (dry)	392.82	3.69	1.87
Pond	Railroad R/W	389.5 (wet)	392.45	4.91	6.05
Far North Pond	6-Acre Pond	389.0 (wet)	390.99	5.55	1.89

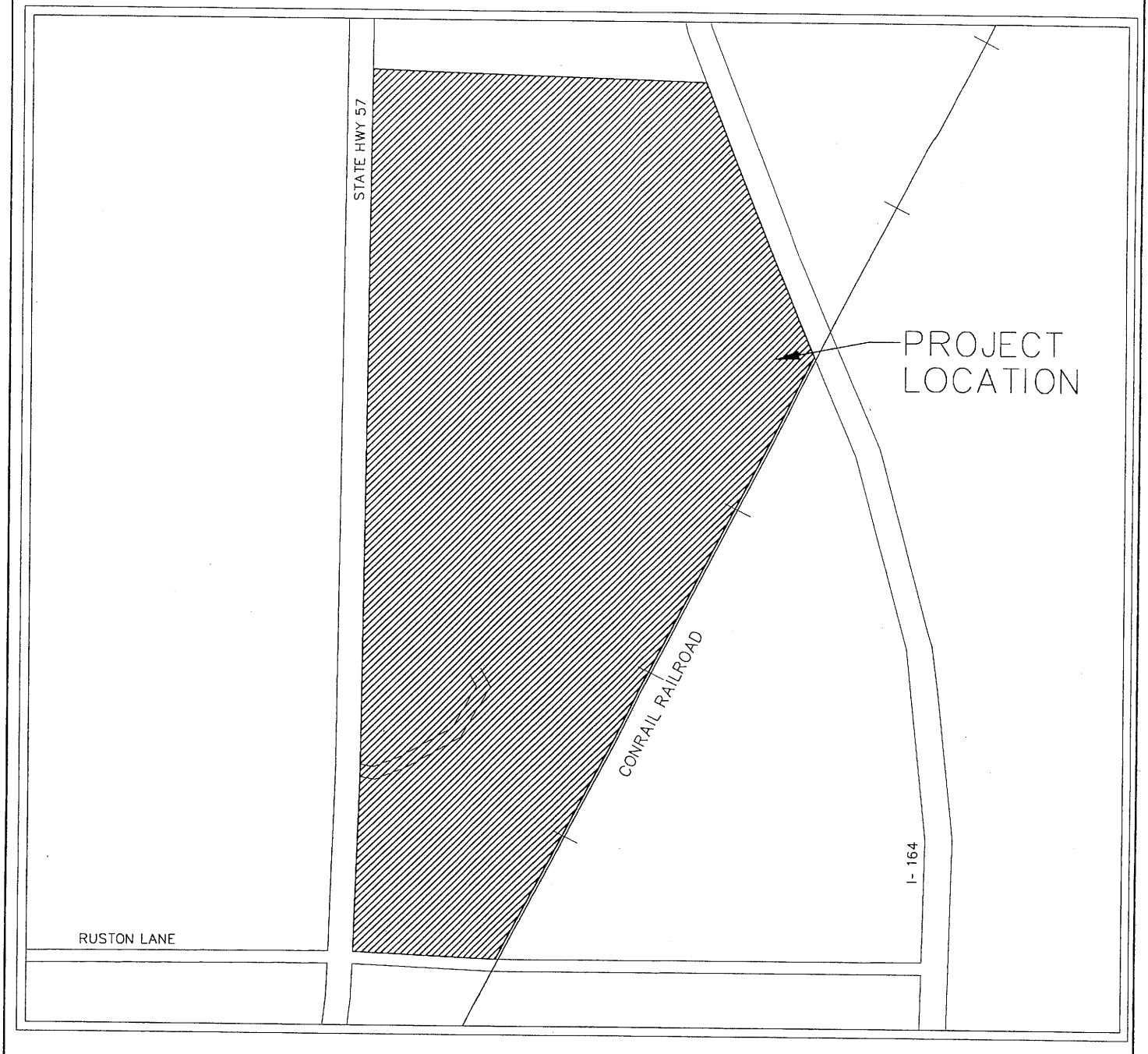
Table 3 –Allowable/Actual Stormwater Discharge

Outlet Point	Allowable 25-year Q (cfs)	Proposed 25-year Q (cfs)
Railroad R/W	9.02	8.16
6-Acre Pond	6.98	5.55

Conclusion

No adverse impacts are anticipated from this project.

APPENDIX A:
VICINITY MAP



VICINITY MAP

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SCALE: N.T.S	SHEET NO.
DATE: 02/27/2006	
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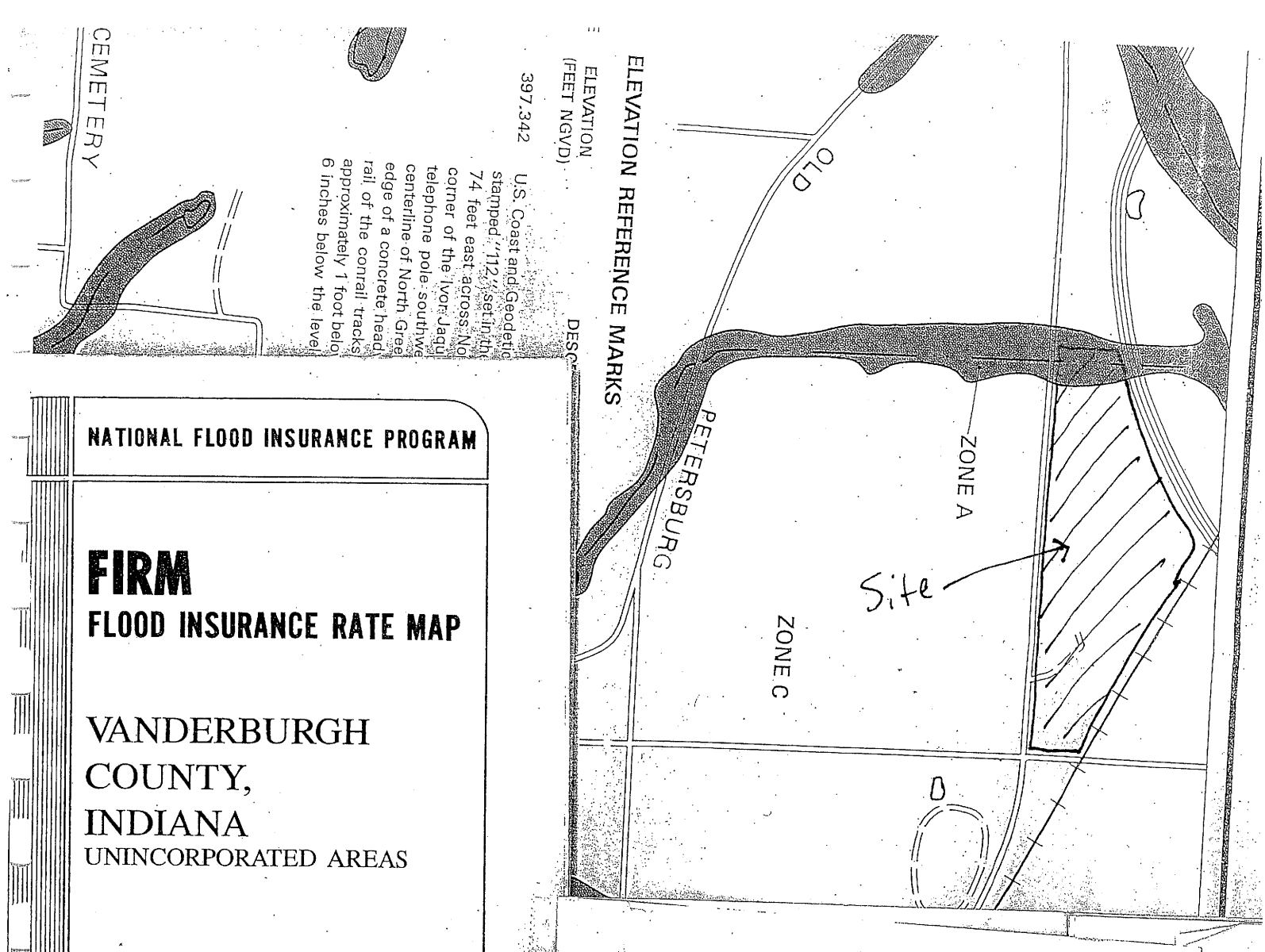
CHK'D. BY: TH	
JOB NO. IN2005.0589	OF

APPENDIX B:
FLOOD INSURANCE RATE MAP



ELEVATION REFERENCE MARKS

DESC	ELEVATION (FEET NGVD)
U.S. Coast and Geodetic stamped "112" set in the 74 feet east across No corner of the Ivor Jaqu telephone pole southwe centerline of North Gre edge of a concrete head rail of the conrail tracks approximately 1 foot belo 6 inches below the leve	397.342

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

VANDERBURGH COUNTY, INDIANA
UNINCORPORATED AREAS

PANEL 15 OF 100

COMMUNITY-PANEL NUMBER
180256 0015 C

MAP REVISED:
AUGUST 5, 1991

Federal Emergency Management Agency

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Floodway
100-Year Flood Boundary
500-Year Flood Boundary
Base Flood Elevation Line With Elevation In Feet**
Base Flood Elevation in Feet Where Uniform Within Zone**
Elevation Reference Mark
Zone D Boundary
River Mile

ZONE B
ZONE A5
ZONE B
513
(EL 987)
RM7×
•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

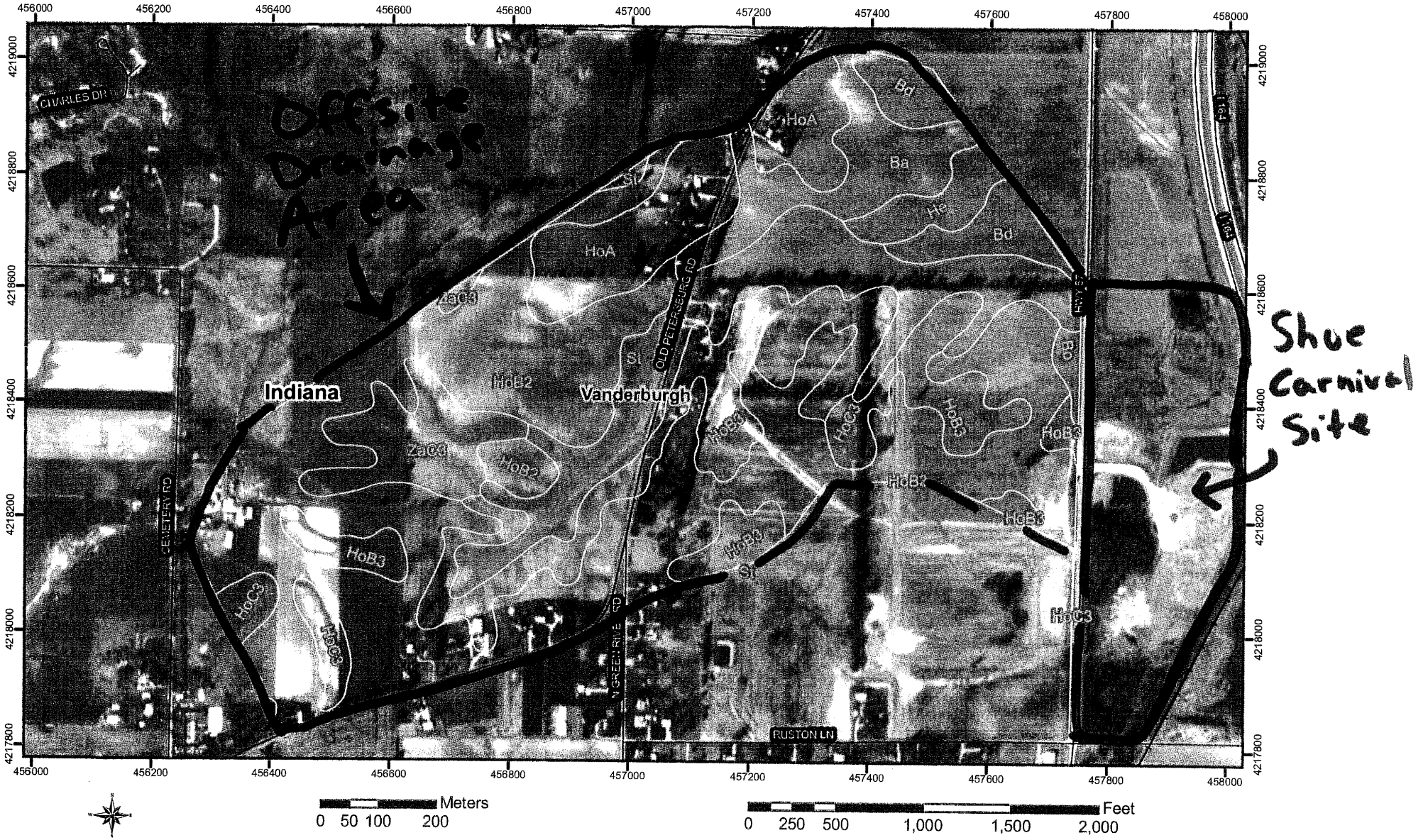
*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average d... of inundation are sh...

APPENDIX C:
SOILS TYPE MAP

SOIL SURVEY OF VANDERBURGH COUNTY, INDIANA

Shoe Carnival Offsite Area



Shoe Carnival Offsite Area

MAP LEGEND

- Soil Map Units
- Cities
- Detailed Counties
- Detailed States
- Interstate Highways
- Roads
- Rails
- Water
- Hydrography
- Oceans
- Escarpment, bedrock
- Escarpment, non-bedrock
- Gulley
- Levee
- Slope
- Blowout
- Borrow Pit
- Clay Spot
- Depression, closed
- Eroded Spot
- Gravel Pit
- Gravelly Spot
- Gulley
- Lava Flow
- Landfill
- Marsh or Swamp
- Miscellaneous Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Slide or Slip
- Sinkhole
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Perennial Water
- Wet Spot

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov

Coordinate System: UTM Zone 16

Soil Survey Area: Vanderburgh County, Indiana
Spatial Version of Data: 1
Soil Map Compilation Scale: 1:15840

Map comprised of aerial images photographed on these dates:
1998

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.

Map Unit Legend Summary

Vanderburgh County, Indiana

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ba	Bartle silt loam	14.3	5.7
Bd	Birds silt loam	9.3	3.7
Bo	Bonnie silt loam	1.2	0.5
He	Henshaw silt loam	5.0	2.0
HoA	Hosmer silt loam, 0 to 2 percent slopes	20.8	8.2
HoB2	Hosmer silt loam, 2 to 6 percent slopes, eroded	110.0	43.7
HoB3	Hosmer silt loam, 2 to 6 percent slopes, severely eroded	40.1	15.9
HoC3	Hosmer silt loam, 6 to 12 percent slopes, severely eroded	7.7	3.0
St	Stendal silt loam	31.8	12.6
ZaC3	Zanesville silt loam, 6 to 12 percent slopes, severely eroded	11.8	4.7

Runoff Curve Number (CN)

Project: Shoe Carnival Warehouse
Location: Offsite

By: TH
Checked:

Date: 8/10/2006
Date:

Check one: _____

Soil Symbol	Soil Name	Hydrologic Group	Area ____ acres ____ sq.mi. __x__ %	Area Acreage
Ba	Bartle Silt Loam	D	5.7	14.4
Bd	Birds Silt Loam	C	3.7	9.3
Bo	Bonnie Silt Loam	C	0.5	1.3
He	Henshaw Silt Loam	C	2.0	5.0
HoA	Hosmer Silt Loam, 0-2% slopes	C	8.2	20.7
HoB2	Hosmer Silt Loam, 2-6% slopes, eroded	C	43.7	110.1
HoB3	Hosmer Silt Loam, 2-6% slopes, severely eroded	C	15.9	40.1
HoC3	Hosmer Silt Loam, 6-12% slopes, severely eroded	C	3.0	7.6
St	Stendal Silt Loam	C	12.6	31.8
ZaC3	Zanesville Silt Loam, 5-12% slopes, severely eroded	C	4.7	11.8
			100.00	252

Soil Group	% of Site
A	0
B	0
C	94.3
D	5.7

USGS 17 km NE of Evansville, Indiana, United States 24 Feb 1998

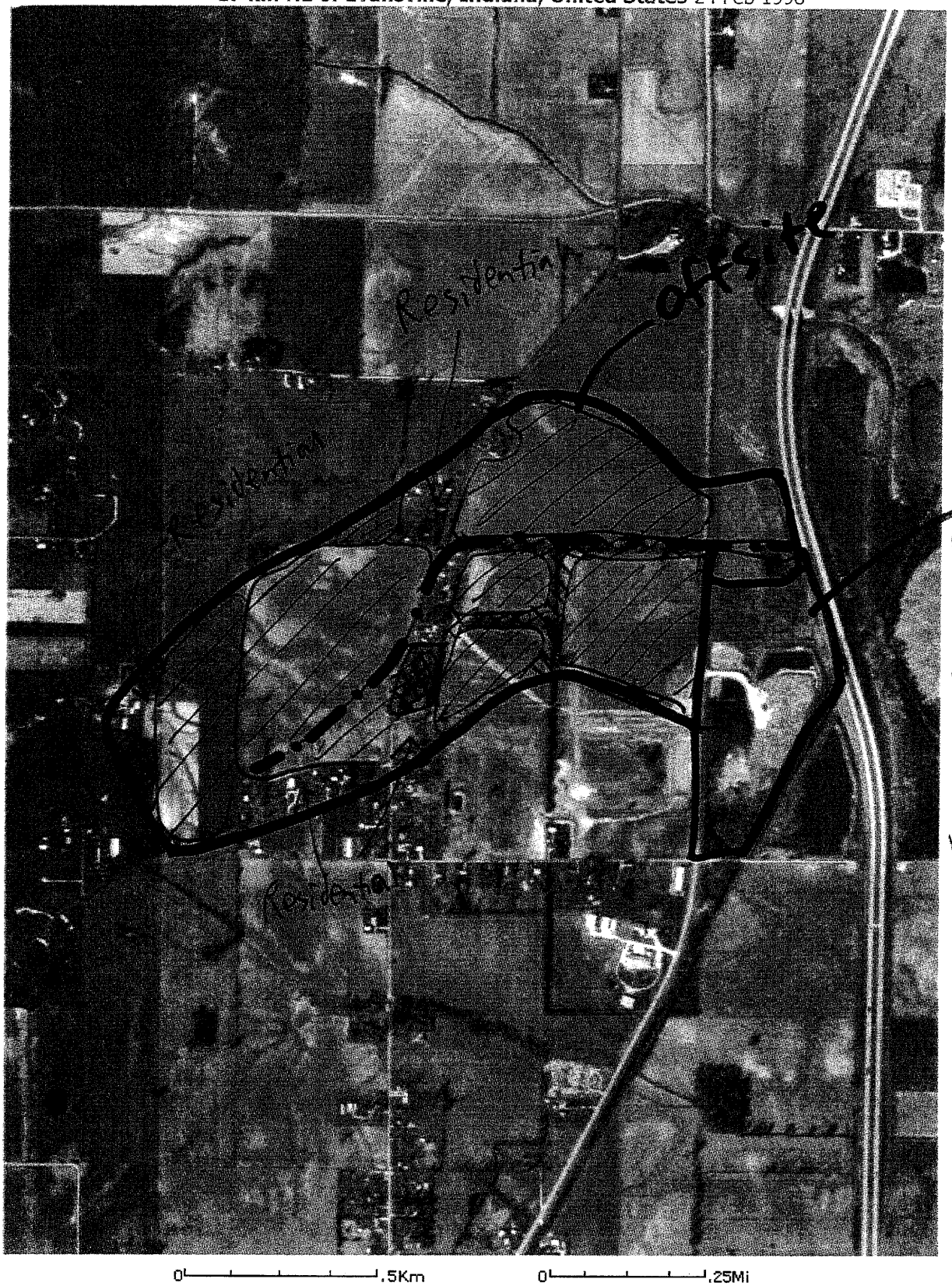


Image courtesy of the U.S. Geological Survey
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Runoff Curve Number (CN)

Project: Shoe Carnival Warehouse
Location: **Offsite**

By: TH
Checked: ____

Date: 8/10/2006
Date: ____

Check one: Present x Developed ____

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	CN Figure 2-3	CN Figure 2-4	Area ____ acres ____ sq.mi. __x__ %	Product of CN x area
C	Residential, 1/2 acres lots	80			10	800
C	Row crops & crop residue	85			74.3	6315.5
D	Row crops & crop residue	89			5.7	507.3
C	Woods	72			10	720
				Totals =	100.00	8342.8

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = 83.43 Use CN = **83**

*Notes

Time of Concentration (T_c) or Travel Time (T_t)

Project: Shoe Carnival Warehouse By: TH Date: 1/26/2006
Location: Off site Checked: Date:

Check one: Present x Developed
Check one: Tc x Tt through subarea

Sheet Flow

		Segment ID							
1.	Surface description (Table 3-1)		Range						
2.	Manning's roughness coeff., n (Table 3-1)		0.13						
3.	Flow Length, L (L < 300 ft)	ft	300						
4.	Two-year 24-hr rainfall, P2	in	2.64						
5.	Land slope, s	ft/ft	0.017						
6.	$Tt = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.42	+				=	0.42

Shallow Concentrated Flow

		Segment ID							
7.	Surface description, (paved or unpaved)		unpaved		unpaved				
8.	Flow length, L	ft	800		700				
9.	Watercourse slope, s	ft/ft	0.038		0.014				
10.	Average velocity, V (Figure 3-1)	ft/s	3.1		1.9				
11.	$Tt = \frac{L}{3600\,V}$	hr	0.07	+	0.10	+		=	0.17

Channel Flow

		Segment ID							
12.	Cross sectional flow area, a	ft^2							
13.	Wetted perimeter, Pw	ft^2							
14.	Hydraulic radius, r = a/Pw	ft^2							
15.	Channel slope, s	ft/ft							
16.	Mannings roughness coeff., n								
17.	$V = \frac{1.49\ r2/3\ s1/2}{n}$	ft/s	3						
18.	Flow length, L	ft	4000						
19.	$Tt = \frac{L}{3600\,V}$	hr	0.37	+		+		=	0.37

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.96 min 57.6

APPENDIX D:
EXISTING CONDITIONS MAP

APPENDIX E:
EXISTING CN AND TC CALCULATIONS

Runoff Curve Number (CN)

Project: Shoe Carnival Warehouse
Location: Onsite

By: TH
Checked:

Date: 2/27/2006
Date:

Check one: Present x Developed

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN			Area __x__ acres ____ sq.mi. ____ %	Product of CN x area
		Table 2-2	Figure 2-3	Figure 2-4		
C	Yard	74			12.46	922.04
	Impervious	98			0.38	37.24
				Totals =	12.84	959.28

CN (weighted) = total product / total area = 74.71

Use CN = 75

*Notes

Time of Concentration (T_c) or Travel Time (T_t)

Project: Shoe Carnival Warehouse By: TH Date: 2/23/2006
Location: On site Checked: ____ Date: ____

Check one: Present x ___ Developed ___
Check one: Tc x ___ Tt ___ through subarea

Sheet Flow

1. Surface description (Table 3-1)
2. Manning's roughness coeff., n (Table 3-1)
3. Flow Length, L (L < 300 ft)
4. Two-year 24-hr rainfall, P2
5. Land slope, s
6. $Tt = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$

Segment ID						
	Range					
	0.13		0.13			
ft	255		45			
in	2.64		2.64			
ft/ft	0.014		0.067			
hr	0.39	+	0.05		=	0.45

Shallow Concentrated Flow

7. Surface description, (paved or unpaved)
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V (Figure 3-1)
11. $Tt = \frac{L}{3600\, V}$

Segment ID						
	unpaved					
ft	460					
ft/ft	0.015					
ft/s	2					
hr	0.06	+		+	=	0.06

Channel Flow

12. Cross sectional flow area, a
13. Wetted perimeter, Pw
14. Hydraulic radius, r = a/Pw
15. Channel slope, s
16. Mannings roughness coeff., n
17. $V = \frac{1.49\ r2/3\ s1/2}{n}$
18. Flow length, L
19. $Tt = \frac{L}{3600\, V}$

Segment ID						
ft^2	12					
ft^2	12.65					
ft^2	0.95					
ft/ft	0.004					
	0.03					
ft/s	2.95					
ft	525					
hr	0.05	+		+	=	0.05

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)

hr	0.56
min	33.6

Time of Concentration (T_c) or Travel Time (T_t)

Project: Shoe Carnival Warehouse By: TH Date: 4/24/2006
Location: Far North Checked: _____ Date: _____

Check one: Present x Developed ___
Check one: Tc x Tt ___ through subarea

Sheet Flow

		Segment ID							
1.	Surface description (Table 3-1)		Range						
2.	Manning's roughness coeff., n (Table 3-1)		0.13						
3.	Flow Length, L (L < 300 ft)	ft	300						
4.	Two-year 24-hr rainfall, P2	in	2.64						
5.	Land slope, s	ft/ft	0.025						
6.	$Tt = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.35	+				=	0.35

Shallow Concentrated Flow

		Segment ID							
7.	Surface description, (paved or unpaved)		unpaved						
8.	Flow length, L	ft	435						
9.	Watercourse slope, s	ft/ft	0.006						
10.	Average velocity, V (Figure 3-1)	ft/s	1.2						
11.	$Tt = \frac{L}{3600\,V}$	hr	0.10	+		+		=	0.10

Channel Flow

		Segment ID							
12.	Cross sectional flow area, a	ft^2							
13.	Wetted perimeter, Pw	ft^2							
14.	Hydraulic radius, r = a/Pw	ft^2							
15.	Channel slope, s	ft/ft							
16.	Mannings roughness coeff., n								
17.	$V = \frac{1.49\ r2/3\ s1/2}{n}$	ft/s							
18.	Flow length, L	ft							
19.	$Tt = \frac{L}{3600\,V}$	hr		+		+		=	0.00

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.45 min 27.2

APPENDIX F:
PROPOSED CONDITIONS MAP

APPENDIX G:
PROPOSED CN AND TC CALCULATIONS

Runoff Curve Number (CN)

Project: Shoe Carnival Warehouse By: TH Date: 2/23/2006
Location: **Onsite South** Checked: ____ Date: ____

Check one: Present ___ Developed x

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	CN Figure 2-3	CN Figure 2-4	Area ___x___ acres ____ sq.mi. ____ %	Product of CN x area
C	Yard	74			2.98	220.52
	Impervious	98			2.38	233.24
				Totals =	5.36	453.76

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = 84.66 Use CN = **85**

*Notes

Runoff Curve Number (CN)

Project: Shoe Carnival Warehouse By: TH Date: 2/23/2006
Location: **Onsite North** Checked: Date:

Check one: Present ___ Developed x

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	CN Figure 2-3	CN Figure 2-4	Area __x__ acres ____ sq.mi. ____ %	Product of CN x area
C	Yard	74			7.01	518.74
	Impervious	98			14.01	1372.98
				Totals =	21.02	1891.72

CN (weighted) = total product / total area = 90.00 Use CN = **90**

*Notes

Runoff Curve Number (CN)

Project: Shoe Carnival Warehouse
Location: **Onsite Far North**

By: TH
Checked: _____

Date: 9/6/2006
Date: _____

Check one: Present ___ Developed x

Soil Name and Hydrologic Group (Appendix A)	Cover Description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN Table 2-2	CN Figure 2-3	CN Figure 2-4	Area __x__ acres ____ sq.mi. ____ %	Product of CN x area
C	Yard	74			7.28	538.942
	Impervious	98			3.18	311.248
				Totals =	10.46	850.19

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = 81.29

Use CN = **81**

*Notes

Time of Concentration (T_c) or Travel Time (T_t)

Project: Shoe Carnival Warehouse By: TH Date: 2/23/2006
Location: **South** Checked: _____ Date: _____

Check one: Present ___ Developed x
Check one: Tc x Tt ___ through subarea

Sheet Flow	Segment ID	Road								
1. Surface description (Table 3-1)		Range								
2. Manning's roughness coeff., n (Table 3-1)		0.013								
3. Flow Length, L (L < 300 ft)	ft	270								
4. Two-year 24-hr rainfall, P2	in	2.88								
5. Land slope, s	ft/ft	0.012								
6. $Tt = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.07	+				=	0.07		
Shallow Concentrated Flow	Segment ID									
7. Surface description, (paved or unpaved)										
8. Flow length, L	ft									
9. Watercourse slope, s	ft/ft									
10. Average velocity, V (Figure 3-1)	ft/s									
11. $Tt = \frac{L}{3600\,V}$	hr						=	0.00		
Channel and Pipe Flow	Segment ID	Ditch 1		Pipe						
12. Cross sectional flow area, a	ft^2	8		0.7854						
13. Wetted perimeter, Pw	ft^2	16.12		3.1416						
14. Hydraulic radius, r = a/Pw	ft^2	0.496		0.250						
15. Channel slope, s	ft/ft	0.010		0.003						
16. Mannings roughness coeff., n		0.03		0.013						
17. $V = \frac{1.49\ r2/3\ s1/2}{n}$	ft/s	3.10		2.53						
18. Flow length, L	ft	265		100						
19. $Tt = \frac{L}{3600\,V}$	hr	0.02	+	0.01	+		=	0.03		

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.10
min 6.1

Time of Concentration (T_c) or Travel Time (T_t)

Project: Shoe Carnival Warehouse By: TH Date: 2/23/2006
Location: **North** Checked: _____ Date: _____

Check one: Present ___ Developed x
Check one: Tc x Tt ___ through subarea

Sheet Flow

		Segment ID						
1.	Surface description (Table 3-1)		Range					
2.	Manning's roughness coeff., n (Table 3-1)		0.13					
3.	Flow Length, L (L < 300 ft)	ft	150					
4.	Two-year 24-hr rainfall, P2	in	2.88					
5.	Land slope, s	ft/ft	0.080					
6.	$Tt = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$	hr	0.12	+			=	0.12

Shallow Concentrated Flow

		Segment ID							
7.	Surface description, (paved or unpaved)		unpaved		unpaved		paved		
8.	Flow length, L	ft	150		335		720		
9.	Watercourse slope, s	ft/ft	0.0033		0.013		0.0025		
10.	Average velocity, V (Figure 3-1)	ft/s	0.93		1.87		1.02		
11.	$Tt = \frac{L}{3600\, V}$	hr	0.04	+	0.05	+	0.20	=	0.29

Channel Flow

		Segment ID							
12.	Cross sectional flow area, a	ft^2	12						
13.	Wetted perimeter, Pw	ft^2	12.65						
14.	Hydraulic radius, r = a/Pw	ft^2	0.95						
15.	Channel slope, s	ft/ft	0.005						
16.	Mannings roughness coeff., n		0.03						
17.	$V = \frac{1.49\, r2/3\, s1/2}{n}$	ft/s	3.38						
18.	Flow length, L	ft	750						
19.	$Tt = \frac{L}{3600\, V}$	hr	0.06	+		+		=	0.06

20. Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19) hr 0.47 min 28.5

APPENDIX H:
STORM SEWER CAPACITY CALCULATIONS

APPENDIX I:
ICPR INPUT AND RESULTS

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Pond N	BASE	25-24hr	16.80	389.908	391.500	0.0026	14191	16.74	3.34	16.80	3.20
Pond N	BASE	25-2hr	1.89	390.994	391.500	0.0038	16978	1.42	18.54	1.89	5.55
Pond N	BASE	25-3hr	2.70	390.989	391.500	0.0039	16963	2.08	14.40	2.70	5.54
Pond N	BASE	25-6hr	4.80	390.781	391.500	0.0048	16421	4.17	9.04	4.80	5.16
Proposed	BASE	10-12hr	0.00	380.000	381.000	0.0000	7	8.74	6.10	0.00	0.00
Proposed	BASE	10-1hr	0.00	380.000	381.000	0.0000	7	1.29	5.24	0.00	0.00
Proposed	BASE	10-24hr	0.00	380.000	381.000	0.0000	7	16.83	5.47	0.00	0.00
Proposed	BASE	10-2hr	0.00	380.000	381.000	0.0000	7	2.15	6.95	0.00	0.00
Proposed	BASE	10-3hr	0.00	380.000	381.000	0.0000	7	3.02	7.12	0.00	0.00
Proposed	BASE	10-6hr	0.00	380.000	381.000	0.0000	7	5.08	6.88	0.00	0.00
Proposed	BASE	25-12hr	0.00	380.000	381.000	0.0000	7	9.18	6.95	0.00	0.00
Proposed	BASE	25-1hr	0.00	380.000	381.000	0.0000	7	1.31	6.10	0.00	0.00
Proposed	BASE	25-24hr	0.00	380.000	381.000	0.0000	7	16.85	6.08	0.00	0.00
Proposed	BASE	25-2hr	0.00	380.000	381.000	0.0000	7	2.17	7.84	0.00	0.00
Proposed	BASE	25-3hr	0.00	380.000	381.000	0.0000	7	3.00	8.16	0.00	0.00
Proposed	BASE	25-6hr	0.00	380.000	381.000	0.0000	7	5.00	7.86	0.00	0.00
Proposed N	BASE	10-12hr	0.00	380.000	381.000	0.0000	1	8.37	3.74	0.00	0.00
Proposed N	BASE	10-1hr	0.00	380.000	381.000	0.0000	1	1.04	3.61	0.00	0.00
Proposed N	BASE	10-24hr	0.00	380.000	381.000	0.0000	1	16.55	3.03	0.00	0.00
Proposed N	BASE	10-2hr	0.00	380.000	381.000	0.0000	1	1.89	4.79	0.00	0.00
Proposed N	BASE	10-3hr	0.00	380.000	381.000	0.0000	1	2.69	4.81	0.00	0.00
Proposed N	BASE	10-6hr	0.00	380.000	381.000	0.0000	1	4.34	4.50	0.00	0.00
Proposed N	BASE	25-12hr	0.00	380.000	381.000	0.0000	1	8.38	4.27	0.00	0.00
Proposed N	BASE	25-1hr	0.00	380.000	381.000	0.0000	1	1.04	4.38	0.00	0.00
Proposed N	BASE	25-24hr	0.00	380.000	381.000	0.0000	1	16.80	3.20	0.00	0.00
Proposed N	BASE	25-2hr	0.00	380.000	381.000	0.0000	1	1.89	5.55	0.00	0.00
Proposed N	BASE	25-3hr	0.00	380.000	381.000	0.0000	1	2.70	5.54	0.00	0.00
Proposed N	BASE	25-6hr	0.00	380.000	381.000	0.0000	1	4.80	5.16	0.00	0.00

Peak 25yr runoff into RR R/W

Peak 25 yr runoff into 6-acre pond to north

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Dry Pond	BASE	10-12hr	8.35	391.072	394.000	0.0050	4955	8.25	2.59	8.35	2.25
Dry Pond	BASE	10-1hr	1.02	391.882	394.000	0.0050	6364	0.73	10.21	1.02	2.97
Dry Pond	BASE	10-24hr	16.77	390.421	394.000	0.0050	2388	16.74	1.61	16.77	1.60
Dry Pond	BASE	10-2hr	1.85	392.329	394.000	0.0050	7141	1.42	9.01	1.85	3.33
Dry Pond	BASE	10-3hr	2.50	392.200	394.000	0.0050	6916	2.08	6.99	2.50	3.23
Dry Pond	BASE	10-6hr	4.32	391.772	394.000	0.0050	6173	4.17	4.37	4.32	2.88
Dry Pond	BASE	25-12hr	8.37	391.378	394.000	0.0050	5487	8.25	2.99	8.37	2.53
Dry Pond	BASE	25-1hr	1.03	392.307	394.000	0.0050	7103	0.73	12.82	1.03	3.32
Dry Pond	BASE	25-24hr	16.78	390.530	394.000	-0.0050	2840	16.74	1.84	16.78	1.82
Dry Pond	BASE	25-2hr	1.87	392.817	394.000	0.0050	7989	1.42	10.89	1.87	3.69
Dry Pond	BASE	25-3hr	2.54	392.662	394.000	-0.0050	7720	2.08	8.35	2.54	3.58
Dry Pond	BASE	25-6hr	4.33	392.166	394.000	-0.0050	6857	4.17	5.13	4.33	3.20
Existing	BASE	10-12hr	0.00	380.000	381.000	0.0000	0	8.50	4.45	0.00	0.00
Existing	BASE	10-1hr	0.00	380.000	381.000	0.0000	0	1.10	6.22	0.00	0.00
Existing	BASE	10-24hr	0.00	380.000	381.000	0.0000	0	16.83	2.99	0.00	0.00
Existing	BASE	10-2hr	0.00	380.000	381.000	0.0000	0	1.75	9.02	0.00	0.00
Existing	BASE	10-3hr	0.00	380.000	381.000	0.0000	0	2.33	8.38	0.00	0.00
Existing	BASE	10-6hr	0.00	380.000	381.000	0.0000	0	4.33	6.64	0.00	0.00
Existing	BASE	25-12hr	0.00	380.000	381.000	0.0000	0	8.50	5.35	0.00	0.00
Existing	BASE	25-1hr	0.00	380.000	381.000	0.0000	0	1.07	8.75	0.00	0.00
Existing	BASE	25-24hr	0.00	380.000	381.000	0.0000	0	16.83	3.53	0.00	0.00
Existing	BASE	25-2hr	0.00	380.000	381.000	0.0000	0	1.75	11.79	0.00	0.00
Existing	BASE	25-3hr	0.00	380.000	381.000	0.0000	0	2.33	10.78	0.00	0.00
Existing	BASE	25-6hr	0.00	380.000	381.000	0.0000	0	4.33	8.24	0.00	0.00
Existing N	BASE	10-12hr	0.00	380.000	381.000	0.0000	0	8.50	3.32	0.00	0.00
Existing N	BASE	10-1hr	0.00	380.000	381.000	0.0000	0	1.03	4.99	0.00	0.00
Existing N	BASE	10-24hr	0.00	380.000	381.000	0.0000	0	16.83	2.24	0.00	0.00
Existing N	BASE	10-2hr	0.00	380.000	381.000	0.0000	0	1.67	6.98	0.00	0.00
Existing N	BASE	10-3hr	0.00	380.000	381.000	0.0000	0	2.25	6.43	0.00	0.00
Existing N	BASE	10-6hr	0.00	380.000	381.000	0.0000	0	4.33	4.98	0.00	0.00
Existing N	BASE	25-12hr	0.00	380.000	381.000	0.0000	0	8.50	3.99	0.00	0.00
Existing N	BASE	25-1hr	0.00	380.000	381.000	0.0000	0	1.03	7.06	0.00	0.00
Existing N	BASE	25-24hr	0.00	380.000	381.000	0.0000	0	16.83	2.64	0.00	0.00
Existing N	BASE	25-2hr	0.00	380.000	381.000	0.0000	0	1.67	9.21	0.00	0.00
Existing N	BASE	25-3hr	0.00	380.000	381.000	0.0000	0	2.25	8.33	0.00	0.00
Existing N	BASE	25-6hr	0.00	380.000	381.000	0.0000	0	4.25	6.21	0.00	0.00
Pond	BASE	10-12hr	10.87	391.952	395.000	0.0033	56335	8.25	11.64	10.87	4.29
Pond	BASE	10-1hr	1.61	390.917	395.000	0.0030	50023	0.97	34.45	1.61	2.76
Pond	BASE	10-24hr	19.26	391.719	395.000	0.0032	54913	16.75	7.12	19.24	3.98
Pond	BASE	10-2hr	2.46	391.657	395.000	-0.0031	54536	1.58	35.59	2.46	3.90
Pond	BASE	10-3hr	3.36	391.863	395.000	0.0036	55795	2.25	29.63	3.36	4.18
Pond	BASE	10-6hr	6.05	392.056	395.000	0.0037	57042	4.25	19.64	6.05	4.42
Pond	BASE	25-12hr	10.88	392.295	395.000	0.0038	58815	8.25	13.27	10.88	4.85
Pond	BASE	25-1hr	1.61	391.217	395.000	0.0030	51855	0.97	42.09	1.61	3.25
Pond	BASE	25-24hr	19.29	392.031	395.000	0.0034	56861	16.74	8.04	19.31	4.39
Pond	BASE	25-2hr	2.46	392.046	395.000	0.0033	56966	1.58	42.36	2.46	4.41
Pond	BASE	25-3hr	3.36	392.257	395.000	0.0032	58534	2.25	34.81	3.36	4.81
Pond	BASE	25-6hr	6.05	392.448	395.000	0.0043	59945	4.25	22.73	6.05	4.99
Pond N	BASE	10-12hr	8.37	390.148	391.500	0.0035	14768	8.25	4.55	8.37	3.74
Pond N	BASE	10-1hr	1.04	390.099	391.500	0.0036	14639	0.73	15.81	1.04	3.61
Pond N	BASE	10-24hr	16.55	389.853	391.500	0.0025	14074	16.74	2.89	16.55	3.03
Pond N	BASE	10-2hr	1.89	390.599	391.500	0.0040	15946	1.42	15.00	1.89	4.79
Pond N	BASE	10-3hr	2.69	390.607	391.500	0.0039	15966	2.08	11.82	2.69	4.81
Pond N	BASE	10-6hr	4.34	390.465	391.500	0.0045	15594	4.17	7.57	4.34	4.50
Pond N	BASE	25-12hr	8.38	390.364	391.500	0.0036	15331	8.25	5.32	8.38	4.27
Pond N	BASE	25-1hr	1.04	390.412	391.500	0.0036	15456	0.73	20.46	1.04	4.38

Existing 10-yr runoff into RR R/W

Existing 10-yr runoff into 6-acre pond to north

==========
==== Basins ==========
==========

Name: Ex Far North | Node: Existing N | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph

Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	27.20
Area(ac):	9.840	Time Shift(hrs):	0.00
Curve Number:	74.00	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: Existing | Node: Existing | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph

Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	33.60
Area(ac):	12.840	Time Shift(hrs):	0.00
Curve Number:	75.00	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: Pro Far N | Node: Pond N | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph

Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	5.00
Area(ac):	10.460	Time Shift(hrs):	0.00
Curve Number:	81.00	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: Pro N | Node: Pond | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph

Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	28.50
Area(ac):	21.960	Time Shift(hrs):	0.00
Curve Number:	90.00	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name: Pro S | Node: Dry Pond | Status: Onsite
Group: BASE | Type: SCS Unit Hydrograph

Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:		Storm Duration(hrs):	0.00
Rainfall Amount(in):	0.000	Time of Conc(min):	6.10
Area(ac):	5.360	Time Shift(hrs):	0.00
Curve Number:	85.00	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

==========
==== Nodes ==========
==========

Name: Dry Pond | Base Flow(cfs): 0.000 | Init Stage(ft): 389.630
Group: BASE | Warn Stage(ft): 394.000
Type: Stage/Area

Stage(ft)	Area(ac)
389.630	0.0000
390.000	0.0100
391.000	0.1100
392.000	0.1500
393.000	0.1900

394.000	0.2600

Name: Existing | Base Flow(cfs): 0.000 | Init Stage(ft): 380.000
Group: BASE | Warn Stage(ft): 381.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	380.000
99999.00	380.000

Name: Existing N | Base Flow(cfs): 0.000 | Init Stage(ft): 380.000
Group: BASE | Warn Stage(ft): 381.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	380.000
99999.00	380.000

Name: Pond | Base Flow(cfs): 0.000 | Init Stage(ft): 389.500
Group: BASE | Warn Stage(ft): 395.000
Type: Stage/Area

Stage(ft)	Area(ac)
389.500	0.9700
390.000	1.0200
391.000	1.1600
392.000	1.3000
393.000	1.4700

Name: Pond N | Base Flow(cfs): 0.000 | Init Stage(ft): 389.000
Group: BASE | Warn Stage(ft): 391.500
Type: Stage/Area

Stage(ft)	Area(ac)
388.500	0.2600
389.000	0.2800
390.000	0.3300
391.000	0.3900
392.000	0.5500

Name: Proposed | Base Flow(cfs): 0.000 | Init Stage(ft): 380.000
Group: BASE | Warn Stage(ft): 381.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	380.000
99999.00	380.000

Name: Proposed N | Base Flow(cfs): 0.000 | Init Stage(ft): 380.000
Group: BASE | Warn Stage(ft): 381.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	380.000
99999.00	380.000

==========
==== Cross Sections ==========
==========

Name: | Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N

==== Pipes ====

Name:	Outlet-dry	From Node:	Dry Pond	Length(ft):	275.00
Group:	BASE	To Node:	Proposed	Count:	1
				Friction Equation:	Average Conveyance
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	12.00	12.00		Entrance Loss Coef:	0.50
Rise(in):	12.00	12.00		Exit Loss Coef:	0.00
Invert(ft):	389.630	388.770		Bend Loss Coef:	0.00
Manning's N:	0.013000	0.013000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dn
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	Outlet-N	From Node:	Pond N	Length(ft):	50.00
Group:	BASE	To Node:	Proposed N	Count:	1
				Friction Equation:	Average Conveyance
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	12.00	12.00		Entrance Loss Coef:	0.50
Rise(in):	12.00	12.00		Exit Loss Coef:	0.00
Invert(ft):	389.000	388.500		Bend Loss Coef:	0.00
Manning's N:	0.013000	0.013000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dn
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==== Drop Structures ====

Name:	Oultet	From Node:	Pond	Length(ft):	50.00
Group:	BASE	To Node:	Proposed	Count:	1
				Friction Equation:	Average Conveyance
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	18.00	18.00		Entrance Loss Coef:	0.000
Rise(in):	18.00	18.00		Exit Loss Coef:	0.000
Invert(ft):	389.500	389.000		Outlet Ctrl Spec:	Use dc or tw
Manning's N:	0.013000	0.013000		Inlet Ctrl Spec:	Use dn
Top Clip(in):	0.000	0.000		Solution Incs:	10
Bot Clip(in):	0.000	0.000			

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure Oultet ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Both	Weir Disc Coef:	3.200
Geometry:	Circular	Orifice Disc Coef:	0.600

```
              Span(in): 12.00                    Invert(ft): 389.500
              Rise(in): 12.00                 Control Elev(ft): 389.500


-------------------------------------------------------------------------------------------------------
         Name: Oultet N            From Node: Pond N             Length(ft): 50.00
        Group: BASE                  To Node: Proposed N             Count: 1

               UPSTREAM       DOWNSTREAM                Friction Equation: Average Conveyance
     Geometry: Circular       Circular                 Solution Algorithm: Automatic
     Span(in): 18.00          18.00                                Flow: None
     Rise(in): 18.00          18.00                 Entrance Loss Coef: 0.000
   Invert(ft): 388.500        388.000                   Exit Loss Coef: 0.000
  Manning's N: 0.013000       0.013000                Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                    Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000          0.000                      Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure Oultet N ***
                                                                                TABLE
                  Count: 1                        Bottom Clip(in): 0.000
                   Type: Vertical: Mavis             Top Clip(in): 0.000
                   Flow: Both                     Weir Disc Coef: 3.200
               Geometry: Circular                Orifice Disc Coef: 0.600

               Span(in): 12.00                        Invert(ft): 388.500
               Rise(in): 12.00                     Control Elev(ft): 388.500


===============================================================================================
==== Weirs ====================================================================================
===============================================================================================

         Name:                        From Node:
        Group: BASE                     To Node:
         Flow: Both                        Count: 1
         Type: Horizontal             Geometry: Circular

                    Span(in): 0.00
                    Rise(in): 0.00
                  Invert(ft): 0.000
       Control Elevation(ft): 0.000
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
       Orifice Discharge Coef: 0.600



===============================================================================================
==== Hydrology Simulations ====================================================================
===============================================================================================

         Name: 10-12hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-12hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 12.00
          Rainfall File: Huff 3
    Rainfall Amount(in): 3.55

Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           15.00
8.000           5.00
15.000          15.00

-------------------------------------------------------------------------------------------------------
         Name: 10-1hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-1hr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: Huff 3
    Rainfall Amount(in): 1.82

Time(hrs)       Print Inc(min)
--------------- ---------------
```

1.500 2.00
2.000 5.00

Name: 10-24hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Huff 3
Rainfall Amount(in): 4.18

Time(hrs)	Print Inc(min)
8.000	15.00
18.000	5.00
30.000	15.00

Name: 10-2hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Huff 3
Rainfall Amount(in): 2.46

Time(hrs)	Print Inc(min)
2.000	5.00
4.000	15.00

Name: 10-3hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Huff 3
Rainfall Amount(in): 2.70

Time(hrs)	Print Inc(min)
1.000	15.00
3.000	5.00
5.000	15.00

Name: 10-6hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-6hr.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.13

Time(hrs)	Print Inc(min)
2.000	15.00
6.000	5.00
9.000	15.00

Name: 100-12hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\100-12hr.R32

Override Defaults: Yes
Storm Duration(hrs): 12.00
Rainfall File: Huff 3
Rainfall Amount(in): 4.92

Time(hrs)	Print Inc(min)
3.000	15.00
8.000	5.00
15.000	15.00

Name: 100-1hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\100-1hr.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Huff 3
Rainfall Amount(in): 2.41

Time(hrs)	Print Inc(min)
1.500	2.00
2.000	5.00

Name: 100-24hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\100-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Huff 3
Rainfall Amount(in): 5.52

Time(hrs)	Print Inc(min)
8.000	15.00
18.000	5.00
30.000	15.00

Name: 100-2hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\100-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.57

Time(hrs)	Print Inc(min)
2.000	5.00
4.000	15.00

Name: 100-3hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\100-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.87

Time(hrs)	Print Inc(min)
1.000	15.00
3.000	5.00
5.000	15.00

Name: 100-6hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\100-6hr.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Huff 3
Rainfall Amount(in): 4.45

Time(hrs)	Print Inc(min)
2.000	15.00
6.000	5.00
9.000	15.00

Name: 25-12hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-12hr.R32

Override Defaults: Yes
Storm Duration(hrs): 12.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.97

Time(hrs)	Print Inc(min)
3.000	15.00
8.000	5.00
15.000	15.00

Name: 25-1hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-1hr.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Huff 3

Rainfall Amount(in): 2.08

Time(hrs)	Print Inc(min)
1.500	2.00
2.000	5.00

Name: 25-24hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-24hr.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Huff 3
Rainfall Amount(in): 4.66

Time(hrs)	Print Inc(min)
8.000	15.00
18.000	5.00
30.000	15.00

Name: 25-2hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-2hr.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Huff 3
Rainfall Amount(in): 2.80

Time(hrs)	Print Inc(min)
2.000	5.00
4.000	15.00

Name: 25-3hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-3hr.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.06

Time(hrs)	Print Inc(min)
1.000	15.00
3.000	5.00
5.000	15.00

Name: 25-6hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-6hr.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.53

Time(hrs)	Print Inc(min)
2.000	15.00
6.000	5.00
9.000	15.00

==========

==== Routing Simulations ==========

==========

Name: 10-12hr Hydrology Sim: 10-12hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-12hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 15.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)

```
3.000           15.000
8.000           5.000
15.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 10-1hr              Hydrology Sim: 10-1hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-1hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 2.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
1.500           2.000
2.000           5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 10-24hr             Hydrology Sim: 10-24hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-24hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           15.000
18.000          5.000
30.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 10-2hr              Hydrology Sim: 10-2hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-2hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.000
4.000           15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
```

```
        Name: 10-3hr              Hydrology Sim: 10-3hr
    Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-3hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
  Time Step Optimizer: 10.000
      Start Time(hrs): 0.000                     End Time(hrs): 5.00
   Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
      Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           15.000
3.000           5.000
5.000           15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
        Name: 10-6hr              Hydrology Sim: 10-6hr
    Filename: D:\IN2005\0985-Shoe Carnival\ICPR\10-6hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
  Time Step Optimizer: 10.000
      Start Time(hrs): 0.000                     End Time(hrs): 9.00
   Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
      Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           15.000
6.000           5.000
9.000           15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
        Name: 25-12hr             Hydrology Sim: 25-12hr
    Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-12hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
  Time Step Optimizer: 10.000
      Start Time(hrs): 0.000                     End Time(hrs): 15.00
   Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
      Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
3.000           15.000
8.000           5.000
15.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
        Name: 25-1hr              Hydrology Sim: 25-1hr
    Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-1hr.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
  Time Step Optimizer: 10.000
```

```
        Start Time(hrs): 0.000                    End Time(hrs): 2.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
1.500           2.000
2.000           5.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 25-24hr             Hydrology Sim: 25-24hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-24hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 30.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
8.000           15.000
18.000          5.000
30.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 25-2hr              Hydrology Sim: 25-2hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-2hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 4.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
2.000           5.000
4.000           15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------------
         Name: 25-3hr              Hydrology Sim: 25-3hr
     Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-3hr.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 5.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
1.000           15.000
3.000           5.000
```

5.000	15.000

Group	Run
BASE	Yes

Name: 25-6hr Hydrology Sim: 25-6hr
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-6hr.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 9.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
2.000	15.000
6.000	5.000
9.000	15.000

Group	Run
BASE	Yes

==== Boundary Conditions ====

APPENDIX J:
EMERGENCY SPILLWAY CALCULATIONS

EMERGENCY SPILLWAY, POND NORTH OF BUILDING
SHOE CARNIVAL DISTRIBUTION CENTER
JOB NUMBER IN2005-0985
2/24/2006

WEIR FLOW CALCULATIONS

width=	20	feet
Side Slope =	3	horiz. feet/ vert. feet
Inv. elev. =	392.75	ft

$Q = CAh^{0.5}$

C =	3.2	
g =	32.2	ft/s^2

20-feet wide spillway

Elevation, (ft)	h, (ft)	A (ft^2)	Q, (cfs)
392.75	0.00	0.00	0.00
393.50	0.75	15.84	43.91
394.00	1.25	27.34	97.83
395.00	2.25	52.59	252.45
396.00	3.25	80.84	466.38

EMERGENCY SPILLWAY, NORTHERNMOST POND
SHOE CARNIVAL DISTRIBUTION CENTER
JOB NUMBER IN2005-0985
9/5/2006

WEIR FLOW CALCULATIONS

width=	165	feet
Side Slope =	3	horiz. feet/ vert. feet
Inv. elev. =	392.00	ft

$Q = CAh^{0.5}$

C = 3.2

g = 32.2 ft/s^2

165-feet wide spillway

Elevation, (ft)	h, (ft)	A (ft^2)	Q, (cfs)
392.00	0.00	0.00	0.00
392.50	0.50	82.88	187.52

APPENDIX K:
25-YEAR FLOOD ELEVATION CALCULATIONS

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Existing Pond	BASE	25-12off	8.91	391.46	389.00	0.0019	873340	8.50	127.69	8.93	114.68
Existing Pond	BASE	25-1off	1.99	391.24	389.00	0.0019	787848	1.27	190.68	1.98	47.02
Existing Pond	BASE	25-24off	17.06	391.34	389.00	0.0019	824766	16.83	81.70	17.04	79.91
Existing Pond	BASE	25-2off	2.52	391.56	389.00	0.0019	910619	1.92	273.34	2.52	138.09
Existing Pond	BASE	25-3off	3.22	391.65	389.00	0.0019	946069	2.59	251.91	3.22	159.12
Existing Pond	BASE	25-6off	5.12	391.61	389.00	0.0019	930921	4.50	194.95	5.12	150.26

Estimated 25 year Flood Elevation

Basins

Name: Offsite (Ex) Node: West of 57 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 57.60
Area(ac): 252.000 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Nodes

Name: East 164 Base Flow(cfs): 0.000 Init Stage(ft): 391.160
Group: BASE Warn Stage(ft): 392.000
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	391.160
999999.00	391.160

Name: East of 57 Base Flow(cfs): 0.000 Init Stage(ft): 389.900
Group: BASE Warn Stage(ft): 398.940
Type: Stage/Area

Stage(ft)	Area(ac)

Name: Existing Pond Base Flow(cfs): 0.000 Init Stage(ft): 388.100
Group: BASE Warn Stage(ft): 389.000
Type: Stage/Area

Stage(ft)	Area(ac)
388.100	6.0600
389.000	6.1400
390.000	6.8500
391.000	15.8000

Name: West 164-a Base Flow(cfs): 0.000 Init Stage(ft): 387.000
Group: BASE Warn Stage(ft): 389.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: West 164-b Base Flow(cfs): 0.000 Init Stage(ft): 386.000
Group: BASE Warn Stage(ft): 389.000
Type: Stage/Area

Stage(ft)	Area(ac)

Name: West of 57 Base Flow(cfs): 0.000 Init Stage(ft): 390.650
Group: BASE Warn Stage(ft): 398.940
Type: Stage/Area

Stage(ft)	Area(ac)

==========
==== Cross Sections ====
==========

Name: SR 57 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	399.220	0.035000
230.000	399.000	0.035000
265.000	398.940	0.035000
287.000	399.000	0.035000
310.000	400.000	0.030000

==========
==== Pipes ====
==========

Name: Pipe Out From Node: West 164-b Length(ft): 301.00
Group: BASE To Node: East 164 Count: 1
Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 0.50
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Circular	Circular
Span(in):	144.00	144.00
Rise(in):	144.00	144.00
Invert(ft):	380.010	379.160
Manning's N:	0.025000	0.025000
Top Clip(in):	0.000	0.000
Bot Clip(in):	0.000	0.000

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: SR 57 Culvert From Node: West of 57 Length(ft): 52.00
Group: BASE To Node: East of 57 Count: 1
Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Entrance Loss Coef: 0.50
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Rectangular	Rectangular
Span(in):	48.00	48.00
Rise(in):	60.00	60.00
Invert(ft):	390.650	389.900
Manning's N:	0.025000	0.025000
Top Clip(in):	0.000	0.000
Bot Clip(in):	6.000	6.000

Upstream FHWA Inlet Edge Description:
Rectangular Box: 45° wingwall flare d=.043D

Downstream FHWA Inlet Edge Description:
Rectangular Box: 45° wingwall flare d=.043D

==========
==== Channels ====
==========

Name: Ditch 57-Pond From Node: East of 57 Length(ft): 90.00
Group: BASE To Node: Existing Pond Count: 1
Friction Equation: Average Conveyance
Solution Algorithm: Automatic
Flow: Both
Contraction Coef: 0.000
Expansion Coef: 0.000
Entrance Loss Coef: 0.500
Exit Loss Coef: 0.000
Outlet Ctrl Spec: Use dc or tw
Inlet Ctrl Spec: Use dn
Stabilizer Option: None

	UPSTREAM	DOWNSTREAM
Geometry:	Trapezoidal	Trapezoidal
Invert(ft):	389.900	388.100
TClpInitZ(ft):	9999.000	9999.000
Manning's N:	0.030000	0.030000
Top Clip(ft):	0.000	0.000
Bot Clip(ft):	0.000	0.000
Main XSec:		
AuxElev1(ft):		
Aux XSec1:		
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		

```
     Depth(ft):
 Bot Width(ft): 2.000          2.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00


---------------------------------------------------------------------------------------------
          Name: Ditch East-Out      From Node: West 164-a         Length(ft): 33.00
         Group: BASE                  To Node: West 164-b              Count: 1

                UPSTREAM       DOWNSTREAM              Friction Equation: Average Conveyance
      Geometry: Trapezoidal    Trapezoidal           Solution Algorithm: Automatic
    Invert(ft): 387.000        380.010                           Flow: Both
 TClpInitZ(ft): 9999.000       9999.000            Contraction Coef: 0.000
   Manning's N: 0.030000       0.030000              Expansion Coef: 0.000
  Top Clip(ft): 0.000          0.000               Entrance Loss Coef: 0.500
  Bot Clip(ft): 0.000          0.000                   Exit Loss Coef: 0.000
     Main XSec:                                     Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                      Inlet Ctrl Spec: Use dn
     Aux XSec1:                                   Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 5.000          5.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00


---------------------------------------------------------------------------------------------
          Name: Ditch Pond-East     From Node: Existing Pond      Length(ft): 275.00
         Group: BASE                  To Node: West 164-a              Count: 1

                UPSTREAM       DOWNSTREAM              Friction Equation: Average Conveyance
      Geometry: Trapezoidal    Trapezoidal           Solution Algorithm: Automatic
    Invert(ft): 388.100        387.000                           Flow: Both
 TClpInitZ(ft): 9999.000       9999.000            Contraction Coef: 0.000
   Manning's N: 0.030000       0.030000              Expansion Coef: 0.000
  Top Clip(ft): 0.000          0.000               Entrance Loss Coef: 0.500
  Bot Clip(ft): 0.000          0.000                   Exit Loss Coef: 0.000
     Main XSec:                                     Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                      Inlet Ctrl Spec: Use dn
     Aux XSec1:                                   Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 5.000          5.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00


=============================================================================================
==== Weirs ==================================================================================
=============================================================================================

         Name: SR 57 Roadway       From Node: West of 57
        Group: BASE                  To Node: East of 57
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Irregular

                        XSec: SR 57
                  Invert(ft): 398.940
       Control Elevation(ft): 398.940
      Struct Opening Dim(ft): 9999.00
                                       TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
          Weir Discharge Coef: 3.200
       Orifice Discharge Coef: 0.600


=============================================================================================
==== Hydrology Simulations ==================================================================
=============================================================================================

          Name: 25-12off
      Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-12off.R32

       Override Defaults: Yes
     Storm Duration(hrs): 12.00
           Rainfall File: Huff 3
```

Rainfall Amount(in): 3.97

Time(hrs)	Print Inc(min)
3.000	15.00
8.000	5.00
15.000	15.00

Name: 25-1off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-1off.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Huff 3
Rainfall Amount(in): 2.08

Time(hrs)	Print Inc(min)
1.500	2.00
2.000	5.00

Name: 25-24off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-24off.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Huff 3
Rainfall Amount(in): 4.66

Time(hrs)	Print Inc(min)
8.000	15.00
18.000	5.00
30.000	15.00

Name: 25-2off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-2off.R32

Override Defaults: Yes
Storm Duration(hrs): 2.00
Rainfall File: Huff 3
Rainfall Amount(in): 2.80

Time(hrs)	Print Inc(min)
2.000	5.00
4.000	15.00

Name: 25-3off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-3off.R32

Override Defaults: Yes
Storm Duration(hrs): 3.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.06

Time(hrs)	Print Inc(min)
1.000	15.00
3.000	5.00
5.000	15.00

Name: 25-6off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-6off.R32

Override Defaults: Yes
Storm Duration(hrs): 6.00
Rainfall File: Huff 3
Rainfall Amount(in): 3.53

Time(hrs)	Print Inc(min)
2.000	15.00
6.000	5.00
9.000	15.00

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==== Routing Simulations ==========

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Name: 25-12off Hydrology Sim: 25-12off

Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-12off.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 15.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
3.000	15.000
8.000	5.000
15.000	15.000

Group	Run
BASE	Yes

Name: 25-1off Hydrology Sim: 25-1off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-1off.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 2.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
1.500	2.000
2.000	5.000

Group	Run
BASE	Yes

Name: 25-24off Hydrology Sim: 25-24off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-24off.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 30.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
8.000	15.000
18.000	5.000
30.000	15.000

Group	Run
BASE	Yes

Name: 25-2off Hydrology Sim: 25-2off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-2off.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 4.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000

Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
2.000	5.000
4.000	15.000

Group	Run
BASE	Yes

Name: 25-3off Hydrology Sim: 25-3off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-3off.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 5.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
1.000	15.000
3.000	5.000
5.000	15.000

Group	Run
BASE	Yes

Name: 25-6off Hydrology Sim: 25-6off
Filename: D:\IN2005\0985-Shoe Carnival\ICPR\25-6off.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 9.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
2.000	15.000
6.000	5.000
9.000	15.000

Group	Run
BASE	Yes

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==== Boundary Conditions ====
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