



Franklin IWI – Phase 7A Expansion Drainage Report

**700 Bartram Parkway
Franklin, IN 46131**

May 9th, 2019

Prepared For:

Tippmann Construction Group
9009 Coldwater Road
Fort Wayne, IN 46825

Prepared By:

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1.0. Project Summary

Project Name:	Franklin IWI Phase 7A Expansion
Location:	700 Bartham Parkway, Franklin, IN 46131
Report Type:	Drainage Report
Reviewing Agency:	City of Franklin Johnson County Surveyors Office
Storm Sewer Sizing:	SCS Method – ICPR Modeling
Detention Basin Sizing:	SCS Method – ICPR Modeling
Stormwater Quality:	Onsite Wet Pond 1 & Onsite Wet Pond 2
Design Standards:	City of Franklin – Subdivision Control Ordinance – July 2013

2.0. Introduction

Kimley-Horn and Associates, Inc. has been retained by Tippmann Construction Inc. to prepare construction documents and provide civil engineering services for the proposed Franklin IWI Phase 7A Expansion, a building addition located on the south side of the existing on-site building. The overall project site is approximately 79.2 acres in size. The project site is located on the east side of I-65 in Franklin, IN within the Franklin Tech Park. Site runoff will be routed through two onsite existing wet detention ponds before discharging into the Hougham Regulated Legal Drain near the southeast property corner boundary.

This drainage report documents the calculations used to design the onsite storm sewer system and the onsite wet detention ponds. This report references the “Interstate Warehousing Phases IV-VI Franklin, IN” (Schneider Drainage Report) completed by The Schneider Corporation, dated September 27, 2012.

3.0. Existing Conditions

The project site is zoned “Light Industrial (IL)” and is located at 700 Bartham Parkway in Franklin, IN. The existing site is currently developed with two onsite wet detention ponds. Pond 1 is located on the south side of the site and Pond 2 is located on the northeast side of the site. An aerial image of the project site has been included in Appendix A.

According to the “Interstate Warehousing Phases IV-VI Franklin, IN” Drainage Report (Schneider Drainage Report) completed by The Schneider Corporation (September 26, 2012), the existing site is divided into two onsite drainage areas. Basin PR1 discharges into Pond 1, while Basin PR2 discharges into Pond 2. STR 402 and STR 403 are offsite drainage basins that enter the site under I-65 and discharge into Pond 1. Offsite 1 is an offsite drainage basin to the north of the site and discharges into Pond 2. Pond 2 discharges into Pond 1, and Pond 1 discharges into the Hougham Regulated Legal Drain near the southeast property corner boundary. The allowable release rate provided in the Schneider Report for onsite flow during the 100-YR storm event is 22.34 cfs. Offsite flows are not required to be detained; however, overflow weirs are in place on Pond 1, and Pond 2 to provide a path through the site. Refer to Appendix G for more details regarding the existing onsite conditions. An Existing Drainage Area Map is included in the Appendix D.

FEMA

According to FEMA Flood Insurance Rate Map 18081C0232D and 18081C0234D dated August 2, 2007, the site resides within "Zone X" which corresponds to areas determined to be outside of the 0.2% annual chance floodplain. Refer to Appendix B for more information.

Soil Characteristics

Per the United States Geological Survey's (USGS) Natural Resources Conservation Service (NRCS) Web Soil Survey, the site soil consists of Brookston Silty Clay Loam (Br), Crosby Silt Loam (CrA), Crosby-Miami Silt Loams (CsB2), and Miami Silt Loam (MnB2) hydrologic soil group types ranging between a B and C soil rating. Refer to Appendix C for the NRCS Web Soil Survey.

4.0. Proposed Conditions

The proposed project includes a $\pm 112,790$ SF building expansion on the south side of the existing building. As a result of the expansion, the northern portion of Pond 1 will be filled in. Pond 2 will be expanded to the north, and a 48-inch equalizer pipe will be constructed between the two ponds to aid in routing site runoff and compensate for the loss in volume in Pond 1. The existing fire water loop and private sanitary sewer will be routed around the building addition to the south. The Hougham Regulated Legal Drain will not be disturbed during this project. Refer to the Proposed Drainage Area Map provided in Appendix D for more information.

In order to model the drainage for this site, the ICPR model from the Schneider Drainage Report (Appendix G) was recreated and analyzed. The existing model was modified to model proposed conditions. New CN values were calculated for Basin PR1 and Basin PR2, stage volumes of Pond 1 and Pond 2 were updated, a 48-inch pipe (Prop. Pipe) was added to connect Pond 1 and Pond 2, and the inverts of Ex Weir and EM Weir 1 for Pond 1 were raised. Refer to Appendix F for more information regarding updates to the ICPR model.

In the proposed conditions, the discharge rate for the overall site during the 100-YR storm event is 21.48 cfs, which is lower than the allowable 22.34 cfs defined within the Schneider Drainage Report. Results for the proposed site are listed below. Refer to Appendix F for all results from the ICPR model.

PROPOSED CONDITIONS RELEASE RATES PER ICPR ANALYSIS				
ICPR BOUNDARY NODE	2-YR (CFS)	10-YR (CFS)	100-YR (CFS)	Allowable 100-yr (CFS)
SE CORNER BOUNDARY (ONSITE)	0.46	4.20	21.48	22.34
SE CORNER BOUNDARY (ONSITE + OFFSITE)	1.63	17.24	58.89	N/A

EXISTING POND CONDITIONS				
POND #	NORMAL POOL	100-YR ELEV (ONSITE)	100-YR ELEV (ONSITE + OFFSITE)	TOP OF POND
POND 1	712.15	715.16	715.57	718.15
POND 2	713.25	715.66	716.09	718.70

PROPOSED POND RESULTS				
POND #	NORMAL POOL	100-YR ELEV (ONSITE)	100-YR ELEV (ONSITE + OFFSITE)	TOP OF POND
POND 1	712.15	715.84	716.01	718.50
POND 2	712.15	715.10	715.96	718.70

Due to the slight increase in the pond staging elevation, the top of bank of Pond 1 along the east and south edges will be raised by 0.35'.

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 Pond 1 and Pond 2 have the combined water quality design volume of nearly 30,000 CF. Pond 1 and Pond 2 have over 150,000 CF of available volume for water quality storage, meeting the 30,000 CF requirement. Refer to Appendix E for water quality calculations.

Storm Sewer Design

There was no storm sewer design required for this project since no new catchments were made onsite. Storm sewers that discharged into Pond 1 have been extended to the new limits of Pond 1. The proposed pipes match the existing pipe slopes. The size of the equalizer pipe (proposed at 0.0% slope) between Pond 1 and Pond 2 was determined by the ICPR model.

Emergency Overflow Weirs

The original emergency overflow weirs for Pond 1 and Pond 2 were designed by Schneider. The existing overflow weir for Pond 2 has the capacity to discharge the 100-YR design storm event runoff from the entire proposed Pond 2 watershed. The overflow weir for Pond 1 will be adjusted to have the capacity to discharge the 100-YR design storm event runoff from the entire proposed Pond 1 watershed. Refer to Appendix D for emergency overflow weir calculations.

Conclusions

The proposed drainage design for this expansion 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

Franklin IWI Phase 7A Expansion

700 Barthram Parkway
Franklin, IN 46131

PROJECT SITE

Barthram Pkwy

S 525 E

E 50 S

65



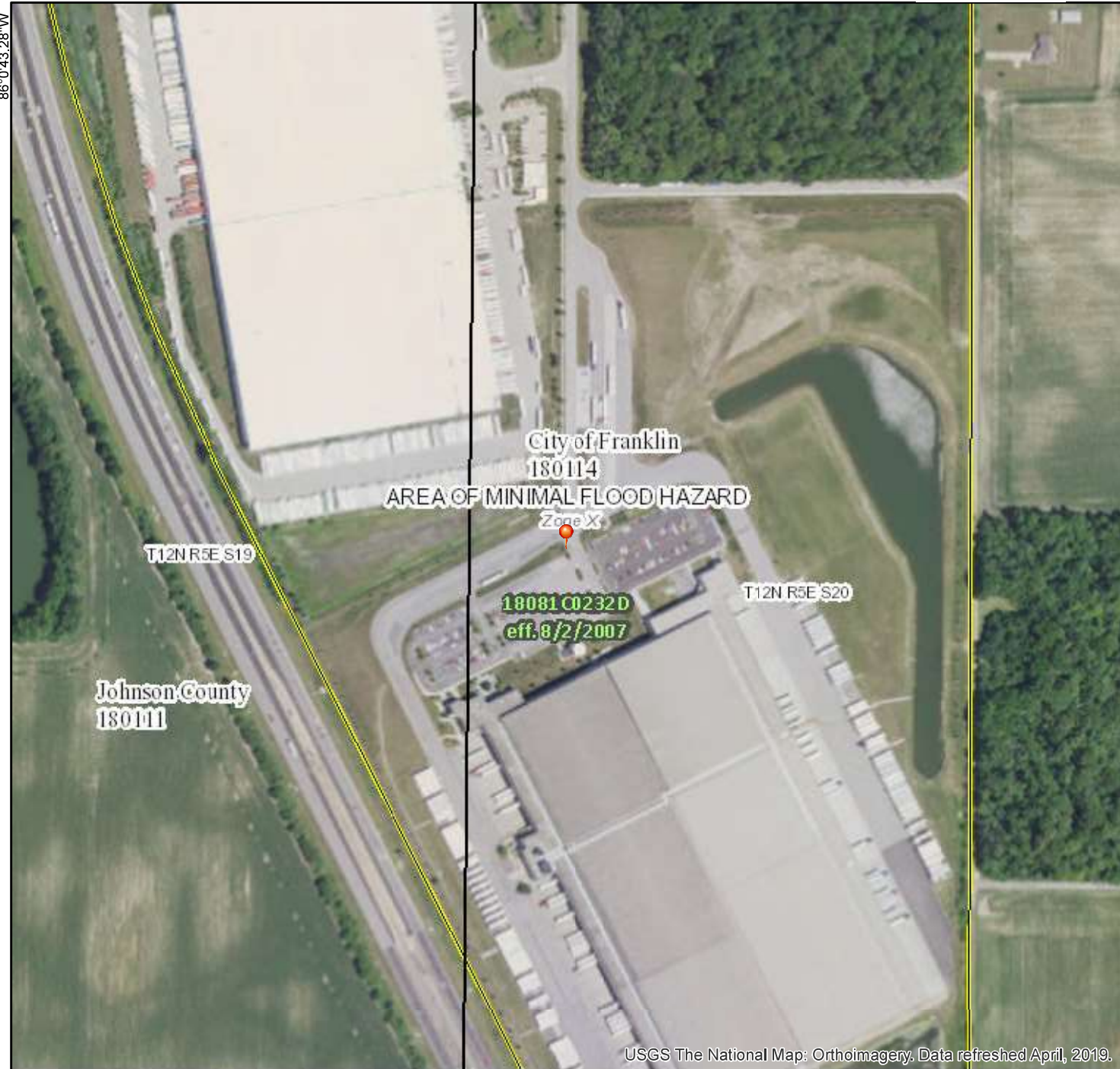
1000 ft

Appendix B: FEMA Firmette

National Flood Hazard Layer FIRMette



39°28'36.49"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

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

1:6,000

39°28'8.72"N

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		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		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



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 **5/6/2019 at 4:01:44 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.



National Flood Hazard Layer FIRMette



39°28'13.60"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

0 250 500 1,000 1,500 2,000 Feet 1:6,000

39°27'45.82"N

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 Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



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

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Appendix C: NRCS Web Soil Survey

Hydrologic Soil Group—Johnson County, Indiana



Soil Map may not be valid at this scale.



**Natural Resources
Conservation Service**









Web Soil Survey
National Cooperative Soil Survey

5/1/2019
Page 1 of 4

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 26, Sep 7, 2018

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

Date(s) aerial images were photographed: Sep 24, 2014—Mar 20, 2017

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	33.8	42.0%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	37.4	46.5%
CsB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	C/D	7.5	9.3%
MnB2	Miami silt loam, 2 to 6 percent slopes, eroded	C	1.8	2.2%
Totals for Area of Interest			80.4	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


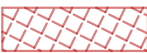
Component Percent Cutoff: None Specified

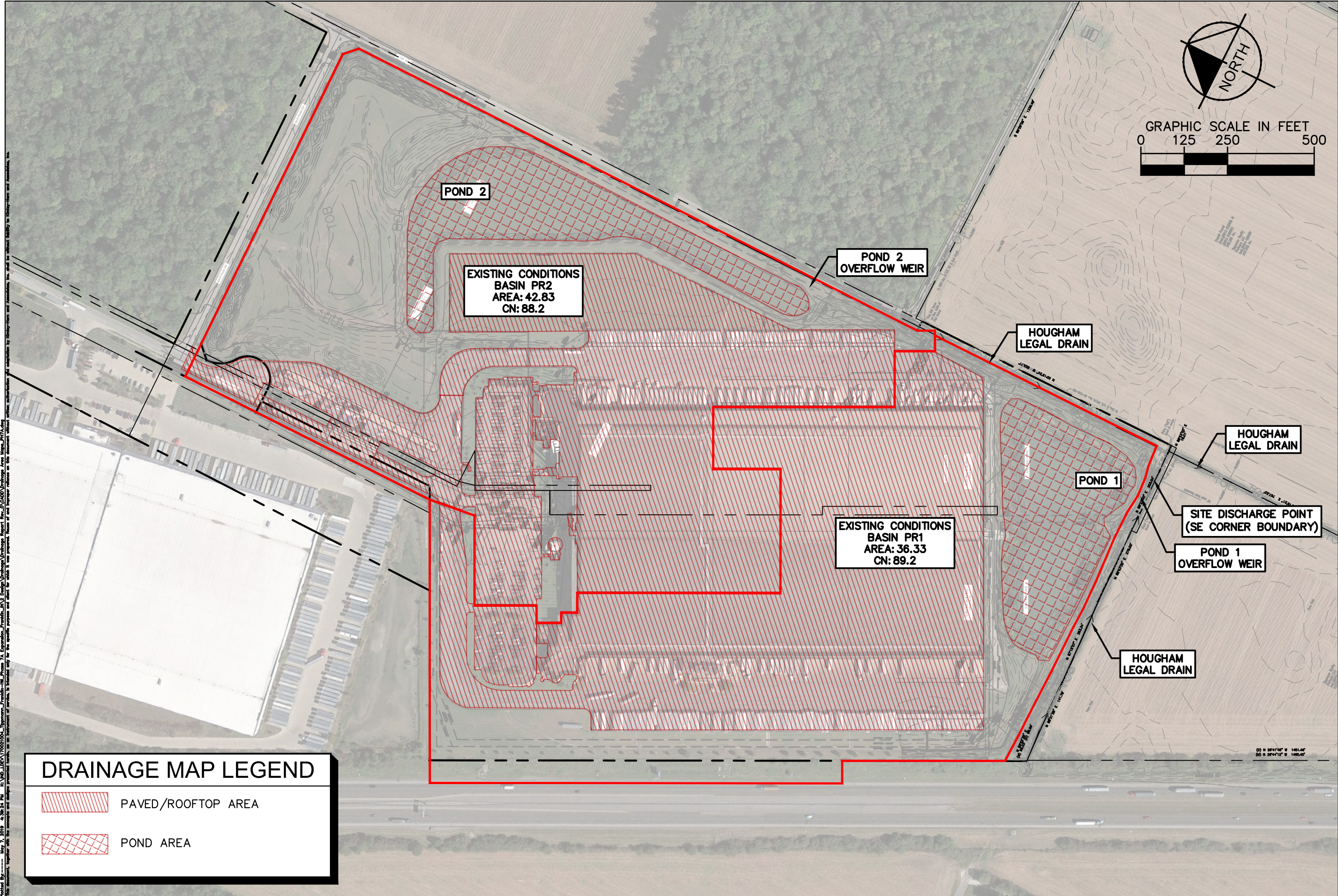
Tie-break Rule: Higher

Appendix D: Drainage Exhibits

Revised By: May 7, 2019 4:35:24 PM IS:\NOI_DRAW\10061004_Tippmann_Planets_M Phase 7A_Expansion_Planets_M V2_Drainage_Verifying_Verifying Report Rev. 01\DWG\Drainage Area Map.dwg
This document is prepared with the intent of providing information for the project and is not intended to be used for any other purpose. It is the responsibility of the user to ensure that the information is accurate and complete.


DRAINAGE MAP LEGEND

-  PAVED/ROOFTOP AREA
-  POND AREA



FRANKLIN IWI - PHASE 7A
EXISTING DRAINAGE AREA MAP


05-09-2019
SHEET NUMBER
EX. 1


 **TIPPMANN
CONSTRUCTION**
a Tippmann Group Company

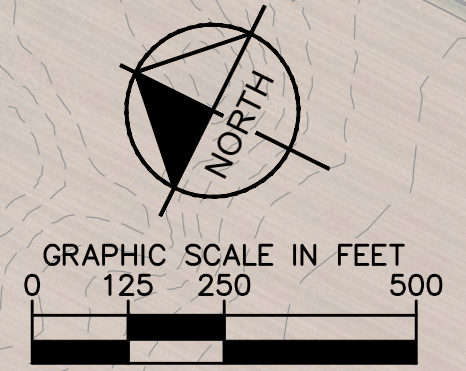
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 PAVED/ROOFTOP AREA

 POND AREA



**PROPOSED
POND 2
EXPANSION**

POND 2

PROPOSED CONDITIONS
BASIN PR2
AREA: 42.83
CN: 89

**POND 2
OVERFLOW WEIR**

**HOUGHAM
LEGAL DRAIN**

**HOUGHAM
LEGAL DRAIN**

**SITE DISCHARGE POINT
(SE CORNER BOUNDARY)**

**POND 1
OVERFLOW WEIR**

**HOUGHAM
LEGAL DRAIN**

POND 1

PROPOSED BUILDING EXPANSION
±112,790 SF
SNOW LOAD BAY F.F. = 726.15
ASRS F.F. = 722.90

PROPOSED CONDITIONS
BASIN PR1
AREA: 36.33
CN: 90

**PROPOSED MECHANICAL
ROOM EXPANSION
±4,151 SF**

Appendix E: Proposed Drainage and Water Quality Calculations



PROJECT:	FRANKLIN IWI MASTERPLAN
BY:	NEIL KIPPENBROCK
DATE:	5/9/2019

Site Soil	
Hydrologic Group	%
A	0.0%
B	42.0%
C	58.0%
D	0.0%
Total	100.0%

Cover	Type	Condition	Soil Group Weighted CN
			Actual Soil Group
Fully Developed	Open Space	Good Condition (>75% Cover)	69
Fully Developed	Impervious	Paved/Rooftop	98
Water	Pond or Lake	-	100

Basin	Proposed Condition Area (ac)				
	Open Space - Good Condition (>75% Cover)	Impervious - Paved/Rooftop	Pond or Lake	Total	Actual Soil Group
POND 1	9.71	24.88	1.76	36.35	90
POND 2	13.94	21.84	6.87	42.65	89

Water Quality Summary*

Total Onsite Developed Area (Basin PR-1 and Basin PR-2) = 79.16 AC

Volume from 1.25-inch, 24-HR storm (See Appendix E) = 141,208 CF

20% of that value = 28,242 CF

0.5-inches of direct runoff: $V = (79.16 \text{ AC}) * (43,560 \text{ SF}) * (0.5\text{-in}) * (1/12\text{-inch}) = 143,675 \text{ CF}$

20% of that value = 28,735 CF (Greater of the two)

Water Quality Design Volume = 28,735 CF

Time of Peak Runoff = 12.15 Hours

24-HR after Peak Runoff = Hour 36.15 of simulation

Volume Stored at Hour 36.15 (See Appendix E) = 155,832 CF

The proposed site meets the water quality requirement.

**Note: These calculations are a revision to the water quality calculations provided in the Schneider Drainage report located in Appendix G.*

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	0.00	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.08	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.26	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.34	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.42	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.50	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	0.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	1.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	2.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	3.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	4.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	5.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	6.85	0.0	0.0	0.0	0.0	0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	6.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	7.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	8.93	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.02	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.10	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.18	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.27	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.35	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.43	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.52	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.60	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.68	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.77	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.85	0.0	0.0	0.0	0.0	0.00
WQ-24_HR	9.93	0.0	0.0	0.0	-0.0	-0.00
WQ-24_HR	10.02	0.0	0.0	0.0	-0.0	-0.00
WQ-24_HR	10.10	0.4	0.0	0.4	0.0	0.00
WQ-24_HR	10.18	1.7	0.0	1.7	-0.0	-0.00
WQ-24_HR	10.27	5.1	0.0	5.1	-0.0	-0.00
WQ-24_HR	10.35	11.4	0.0	11.4	0.0	0.00
WQ-24_HR	10.43	21.6	0.0	21.6	0.0	0.00
WQ-24_HR	10.52	36.3	0.0	36.3	0.0	0.00
WQ-24_HR	10.60	56.8	0.0	56.8	-0.0	-0.00
WQ-24_HR	10.68	86.1	0.0	86.1	-0.0	-0.00
WQ-24_HR	10.77	128.7	0.0	128.7	-0.0	-0.00
WQ-24_HR	10.85	188.7	0.0	188.7	-0.0	-0.00
WQ-24_HR	10.93	270.1	0.0	270.1	-0.0	-0.00
WQ-24_HR	11.02	377.1	0.0	377.1	-0.0	-0.00
WQ-24_HR	11.10	512.1	0.0	512.1	-0.0	-0.00
WQ-24_HR	11.18	676.8	0.0	676.8	-0.0	-0.00
WQ-24_HR	11.27	872.2	0.0	872.2	-0.0	-0.00
WQ-24_HR	11.35	1101.1	0.0	1101.1	-0.0	-0.00
WQ-24_HR	11.43	1374.3	0.0	1374.3	-0.0	-0.00
WQ-24_HR	11.52	1707.8	0.0	1707.8	-0.0	-0.00
WQ-24_HR	11.60	2156.8	0.0	2156.8	-0.0	-0.00
WQ-24_HR	11.68	2904.2	0.0	2904.2	-0.0	-0.00
WQ-24_HR	11.77	4191.9	0.0	4191.9	-0.0	-0.00
WQ-24_HR	11.85	6334.3	0.0	6334.3	-0.0	-0.00
WQ-24_HR	11.92	9705.3	0.0	9705.3	-0.0	-0.00
WQ-24_HR	12.00	15560.8	0.0	15560.8	-0.0	-0.00
WQ-24_HR	12.09	25263.1	0.0	25263.1	-0.0	-0.00
WQ-24_HR	12.17	36733.9	0.0	36733.9	-0.0	-0.00
WQ-24_HR	12.25	47503.7	0.0	47503.7	-0.0	-0.00
WQ-24_HR	12.34	56133.2	0.0	56133.2	-0.0	-0.00
WQ-24_HR	12.42	62529.6	1.7	62527.9	-0.0	-0.00
WQ-24_HR	12.51	67741.7	7.2	67734.5	-0.0	-0.00
WQ-24_HR	12.59	71488.3	15.9	71472.4	-0.0	-0.00
WQ-24_HR	12.68	74831.2	28.8	74802.4	-0.0	-0.00
WQ-24_HR	12.76	77396.7	43.0	77353.7	-0.0	-0.00
WQ-24_HR	12.84	79699.8	59.0	79640.8	-0.0	-0.00
WQ-24_HR	12.93	82030.8	79.1	81951.7	-0.0	-0.00
WQ-24_HR	13.01	83955.9	99.3	83856.6	-0.0	-0.00
WQ-24_HR	13.09	85692.6	120.8	85571.8	-0.0	-0.00
WQ-24_HR	13.18	87297.0	143.5	87153.6	-0.0	-0.00
WQ-24_HR	13.26	88810.3	167.1	88643.1	-0.0	-0.00
WQ-24_HR	13.34	90253.1	191.7	90061.4	-0.0	-0.00
WQ-24_HR	13.43	91624.9	217.1	91407.8	-0.0	-0.00
WQ-24_HR	13.51	92915.6	243.2	92672.4	-0.0	-0.00
WQ-24_HR	13.59	94130.0	269.9	93860.0	-0.0	-0.00
WQ-24_HR	13.68	95283.6	297.2	94986.4	-0.0	-0.00
WQ-24_HR	13.76	96391.7	325.0	96066.8	-0.0	-0.00

FRANKLIN IWI - PHASE 7A EXPANSION - 170021004
 REPORT: WATER QUALITY
 NOTE: ALTERED MODEL FROM "INTERSTATE WAREHOUSING PHASES IV-VI FRANKLIN, IN"
 COMPLETED BY THE SCHNEIDER CORPORATION (APPROVED: 9/27/2012)

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	13.84	97464.7	353.2	97111.5	-0.0	-0.00
WQ-24_HR	13.93	98506.8	381.7	98125.1	-0.0	-0.00
WQ-24_HR	14.01	99518.6	410.7	99107.9	-0.0	-0.00
WQ-24_HR	14.09	100499.8	440.0	100059.8	-0.0	-0.00
WQ-24_HR	14.18	101443.6	469.6	100974.0	-0.0	-0.00
WQ-24_HR	14.26	102342.5	499.5	101843.0	-0.0	-0.00
WQ-24_HR	14.34	103199.5	529.6	102669.9	-0.0	-0.00
WQ-24_HR	14.43	104025.8	559.9	103465.9	-0.0	-0.00
WQ-24_HR	14.51	104832.3	590.3	104242.0	-0.0	-0.00
WQ-24_HR	14.59	105622.7	620.8	105001.8	-0.0	-0.00
WQ-24_HR	14.67	106335.1	649.3	105685.8	-0.0	-0.00
WQ-24_HR	14.75	107049.8	679.3	106370.6	-0.0	-0.00
WQ-24_HR	14.83	107738.7	709.6	107029.1	-0.0	-0.00
WQ-24_HR	14.92	108461.6	742.5	107719.2	-0.0	-0.00
WQ-24_HR	15.00	109125.5	772.9	108352.6	0.0	0.00
WQ-24_HR	15.09	109786.5	802.8	108983.7	0.0	0.00
WQ-24_HR	15.17	110473.4	833.7	109639.7	0.0	0.00
WQ-24_HR	15.25	111174.1	864.9	110309.2	0.0	0.00
WQ-24_HR	15.34	111876.3	896.2	110980.2	-0.0	-0.00
WQ-24_HR	15.42	112537.9	926.1	111611.7	-0.0	-0.00
WQ-24_HR	15.50	113200.9	957.4	112243.4	0.0	0.00
WQ-24_HR	15.58	113833.9	988.7	112845.2	0.0	0.00
WQ-24_HR	15.67	114444.3	1019.8	113424.6	0.0	0.00
WQ-24_HR	15.75	115047.8	1050.6	113997.2	0.0	0.00
WQ-24_HR	15.83	115655.2	1081.3	114573.8	0.0	0.00
WQ-24_HR	15.92	116279.9	1112.9	115167.0	0.0	0.00
WQ-24_HR	16.00	116875.8	1143.2	115732.6	-0.0	-0.00
WQ-24_HR	16.08	117480.2	1174.3	116305.9	-0.0	-0.00
WQ-24_HR	16.17	118069.8	1204.8	116865.1	-0.0	-0.00
WQ-24_HR	16.25	118679.1	1235.8	117443.3	-0.0	-0.00
WQ-24_HR	16.33	119285.3	1266.1	118019.2	-0.0	-0.00
WQ-24_HR	16.42	119909.9	1297.0	118612.9	-0.0	-0.00
WQ-24_HR	16.50	120528.5	1327.8	119200.7	0.0	0.00
WQ-24_HR	16.58	121134.4	1358.3	119776.1	0.0	0.00
WQ-24_HR	16.67	121728.4	1388.5	120339.9	0.0	0.00
WQ-24_HR	16.75	122315.8	1419.0	120896.8	0.0	0.00
WQ-24_HR	16.84	122909.2	1450.4	121458.8	0.0	0.00
WQ-24_HR	16.92	123503.8	1482.2	122021.6	0.0	0.00
WQ-24_HR	17.00	124044.9	1511.5	122533.4	0.0	0.00
WQ-24_HR	17.09	124631.2	1543.3	123087.9	0.0	0.00
WQ-24_HR	17.17	125144.1	1571.4	123572.7	0.0	0.00
WQ-24_HR	17.26	125752.2	1605.3	124146.9	0.0	0.00
WQ-24_HR	17.34	126222.0	1631.9	124590.2	0.0	0.00
WQ-24_HR	17.42	126753.0	1662.0	125091.0	0.0	0.00
WQ-24_HR	17.50	127288.5	1692.1	125596.4	0.0	0.00
WQ-24_HR	17.59	127831.2	1722.2	126109.0	0.0	0.00
WQ-24_HR	17.67	128377.0	1752.2	126624.8	0.0	0.00
WQ-24_HR	17.75	128919.0	1782.2	127136.8	0.0	0.00
WQ-24_HR	17.84	129453.6	1812.1	127641.4	0.0	0.00
WQ-24_HR	17.92	129978.1	1842.0	128136.1	0.0	0.00
WQ-24_HR	18.00	130489.2	1871.8	128617.3	0.0	0.00
WQ-24_HR	18.09	130986.1	1901.6	129084.5	0.0	0.00
WQ-24_HR	18.17	131471.9	1931.3	129540.7	0.0	0.00
WQ-24_HR	18.25	131950.9	1960.8	129990.0	0.0	0.00
WQ-24_HR	18.34	132424.9	1990.3	130434.6	0.0	0.00
WQ-24_HR	18.42	132892.7	2019.7	130872.9	0.0	0.00
WQ-24_HR	18.50	133351.4	2049.0	131302.4	0.0	0.00
WQ-24_HR	18.59	133801.6	2078.2	131723.3	0.0	0.00
WQ-24_HR	18.67	134248.2	2107.3	132140.8	0.0	0.00
WQ-24_HR	18.75	134697.8	2136.3	132561.5	0.0	0.00
WQ-24_HR	18.84	135152.6	2165.2	132987.5	0.0	0.00
WQ-24_HR	18.92	135609.2	2193.9	133415.2	0.0	0.00
WQ-24_HR	19.00	136061.9	2222.6	133839.3	0.0	0.00
WQ-24_HR	19.09	136509.1	2251.2	134258.0	0.0	0.00
WQ-24_HR	19.17	136954.7	2279.6	134675.0	0.0	0.00
WQ-24_HR	19.25	137404.5	2308.0	135096.4	0.0	0.00
WQ-24_HR	19.34	137860.6	2336.3	135524.3	0.0	0.00
WQ-24_HR	19.42	138319.5	2364.5	135955.0	0.0	0.00
WQ-24_HR	19.50	138775.4	2392.6	136382.9	0.0	0.00
WQ-24_HR	19.59	139226.5	2420.6	136805.9	0.0	0.00
WQ-24_HR	19.67	139675.9	2448.5	137227.4	0.0	0.00
WQ-24_HR	19.75	140129.7	2476.3	137653.3	0.0	0.00
WQ-24_HR	19.84	140588.7	2504.1	138084.7	0.0	0.00
WQ-24_HR	19.92	141044.9	2531.8	138513.1	0.0	0.00
WQ-24_HR	20.00	141485.6	2559.4	138926.2	0.0	0.00
WQ-24_HR	20.09	141905.3	2586.9	139318.4	0.0	0.00
WQ-24_HR	20.17	142305.0	2614.2	139690.7	0.0	0.00
WQ-24_HR	20.25	142688.0	2641.5	140046.5	0.0	0.00
WQ-24_HR	20.34	143058.4	2668.6	140389.8	0.0	0.00
WQ-24_HR	20.42	143422.1	2695.6	140726.5	0.0	0.00
WQ-24_HR	20.50	143785.0	2722.4	141062.6	0.0	0.00
WQ-24_HR	20.59	144149.8	2749.1	141400.8	0.0	0.00
WQ-24_HR	20.67	144514.3	2775.6	141738.7	0.0	0.00

FRANKLIN IWI - PHASE 7A EXPANSION - 170021004
 REPORT: WATER QUALITY
 NOTE: ALTERED MODEL FROM "INTERSTATE WAREHOUSING PHASES IV-VI FRANKLIN, IN"
 COMPLETED BY THE SCHNEIDER CORPORATION (APPROVED: 9/27/2012)

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	20.75	144874.5	2802.0	142072.5	0.0	0.00
WQ-24_HR	20.84	145229.3	2828.2	142401.0	0.0	0.00
WQ-24_HR	20.92	145581.6	2854.3	142727.3	0.0	0.00
WQ-24_HR	21.00	145936.3	2880.3	143056.0	0.0	0.00
WQ-24_HR	21.09	146295.6	2906.1	143389.5	0.0	0.00
WQ-24_HR	21.17	146659.3	2931.8	143727.5	0.0	0.00
WQ-24_HR	21.25	147025.9	2957.4	144068.5	0.0	0.00
WQ-24_HR	21.34	147393.7	2982.8	144410.9	0.0	0.00
WQ-24_HR	21.42	147759.7	3008.1	144751.6	0.0	0.00
WQ-24_HR	21.50	148120.8	3033.3	145087.5	0.0	0.00
WQ-24_HR	21.59	148476.9	3058.4	145418.5	0.0	0.00
WQ-24_HR	21.67	148831.2	3083.3	145747.9	0.0	0.00
WQ-24_HR	21.75	149188.4	3108.1	146080.3	0.0	0.00
WQ-24_HR	21.84	149550.1	3132.8	146417.3	0.0	0.00
WQ-24_HR	21.92	149913.4	3157.4	146756.0	0.0	0.00
WQ-24_HR	22.00	150274.1	3181.9	147092.2	0.0	0.00
WQ-24_HR	22.09	150630.7	3206.2	147424.5	0.0	0.00
WQ-24_HR	22.17	150986.1	3230.5	147755.6	0.0	0.00
WQ-24_HR	22.25	151344.7	3254.6	148090.1	0.0	0.00
WQ-24_HR	22.34	151708.1	3278.6	148429.4	0.0	0.00
WQ-24_HR	22.42	152073.6	3302.6	148771.0	0.0	0.00
WQ-24_HR	22.50	152436.6	3326.4	149110.2	0.0	0.00
WQ-24_HR	22.59	152795.9	3350.1	149445.7	0.0	0.00
WQ-24_HR	22.67	153153.7	3373.8	149780.0	0.0	0.00
WQ-24_HR	22.75	153514.8	3397.3	150117.5	0.0	0.00
WQ-24_HR	22.84	153881.3	3420.8	150460.5	0.0	0.00
WQ-24_HR	22.92	154252.7	3444.2	150808.6	0.0	0.00
WQ-24_HR	23.00	154627.8	3467.5	151160.3	0.0	0.00
WQ-24_HR	23.09	155004.5	3490.7	151513.8	0.0	0.00
WQ-24_HR	23.17	155380.0	3513.9	151866.1	0.0	0.00
WQ-24_HR	23.25	155750.9	3537.0	152213.9	0.0	0.00
WQ-24_HR	23.34	156116.8	3560.1	152556.7	0.0	0.00
WQ-24_HR	23.42	156481.0	3583.0	152897.9	0.0	0.00
WQ-24_HR	23.50	156848.3	3605.9	153242.4	0.0	0.00
WQ-24_HR	23.59	157220.3	3628.8	153591.5	0.0	0.00
WQ-24_HR	23.67	157594.2	3651.6	153942.6	0.0	0.00
WQ-24_HR	23.75	157965.5	3674.4	154291.2	0.0	0.00
WQ-24_HR	23.84	158331.3	3697.1	154634.3	0.0	0.00
WQ-24_HR	23.92	158687.0	3719.7	154967.3	0.0	0.00
WQ-24_HR	24.00	159025.4	3742.3	155283.2	0.0	0.00
WQ-24_HR	24.09	159337.9	3764.8	155573.1	0.0	0.00
WQ-24_HR	24.17	159607.3	3787.2	155820.1	0.0	0.00
WQ-24_HR	24.25	159819.7	3809.4	156010.3	0.0	0.00
WQ-24_HR	24.34	159977.9	3831.4	156146.5	0.0	0.00
WQ-24_HR	24.42	160095.7	3853.1	156242.7	0.0	0.00
WQ-24_HR	24.50	160187.0	3874.5	156312.5	0.0	0.00
WQ-24_HR	24.59	160260.2	3895.6	156364.5	0.0	0.00
WQ-24_HR	24.67	160320.0	3916.4	156403.6	0.0	0.00
WQ-24_HR	24.75	160369.6	3936.9	156432.7	0.0	0.00
WQ-24_HR	24.84	160410.9	3957.0	156453.9	0.0	0.00
WQ-24_HR	24.92	160445.4	3976.8	156468.6	0.0	0.00
WQ-24_HR	25.00	160474.0	3996.2	156477.9	0.0	0.00
WQ-24_HR	25.09	160497.9	4015.2	156482.7	0.0	0.00
WQ-24_HR	25.17	160517.9	4033.9	156484.0	0.0	0.00
WQ-24_HR	25.25	160534.5	4052.2	156482.3	0.0	0.00
WQ-24_HR	25.34	160548.4	4070.1	156478.4	0.0	0.00
WQ-24_HR	25.42	160560.1	4087.6	156472.5	0.0	0.00
WQ-24_HR	25.50	160570.0	4104.8	156465.2	0.0	0.00
WQ-24_HR	25.59	160578.3	4121.5	156456.7	0.0	0.00
WQ-24_HR	25.67	160585.2	4137.9	156447.3	0.0	0.00
WQ-24_HR	25.75	160591.1	4154.0	156437.1	0.0	0.00
WQ-24_HR	25.84	160595.9	4169.6	156426.3	0.0	0.00
WQ-24_HR	25.92	160600.0	4184.9	156415.1	0.0	0.00
WQ-24_HR	26.00	160603.4	4199.8	156403.6	0.0	0.00
WQ-24_HR	26.09	160606.3	4214.3	156391.9	0.0	0.00
WQ-24_HR	26.17	160608.6	4228.6	156380.1	0.0	0.00
WQ-24_HR	26.25	160610.6	4242.4	156368.2	0.0	0.00
WQ-24_HR	26.34	160612.2	4255.8	156356.4	0.0	0.00
WQ-24_HR	26.42	160613.6	4268.9	156344.7	0.0	0.00
WQ-24_HR	26.50	160614.7	4281.6	156333.1	0.0	0.00
WQ-24_HR	26.59	160615.6	4293.9	156321.6	0.0	0.00
WQ-24_HR	26.67	160616.3	4305.9	156310.3	0.0	0.00
WQ-24_HR	26.75	160616.8	4317.6	156299.2	0.0	0.00
WQ-24_HR	26.84	160617.3	4329.0	156288.3	0.0	0.00
WQ-24_HR	26.92	160617.6	4340.0	156277.6	0.0	0.00
WQ-24_HR	27.00	160617.9	4350.7	156267.2	0.0	0.00
WQ-24_HR	27.09	160618.1	4361.2	156256.9	0.0	0.00
WQ-24_HR	27.17	160618.2	4371.3	156246.9	0.0	0.00
WQ-24_HR	27.25	160618.3	4381.2	156237.2	-0.0	-0.00
WQ-24_HR	27.34	160618.4	4390.8	156227.7	-0.0	-0.00
WQ-24_HR	27.42	160618.5	4400.1	156218.4	-0.0	-0.00
WQ-24_HR	27.50	160618.5	4409.1	156209.3	-0.0	-0.00
WQ-24_HR	27.59	160618.5	4417.9	156200.6	-0.0	-0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	27.67	160618.5	4426.5	156192.0	-0.0	-0.00
WQ-24_HR	27.75	160618.5	4434.8	156183.7	-0.0	-0.00
WQ-24_HR	27.84	160618.5	4442.9	156175.6	-0.0	-0.00
WQ-24_HR	27.92	160618.5	4450.8	156167.7	-0.0	-0.00
WQ-24_HR	28.00	160618.5	4458.4	156160.1	-0.0	-0.00
WQ-24_HR	28.09	160618.5	4465.8	156152.7	-0.0	-0.00
WQ-24_HR	28.17	160618.5	4473.1	156145.4	-0.0	-0.00
WQ-24_HR	28.25	160618.5	4480.1	156138.4	-0.0	-0.00
WQ-24_HR	28.34	160618.5	4486.9	156131.6	-0.0	-0.00
WQ-24_HR	28.42	160618.5	4493.6	156124.9	-0.0	-0.00
WQ-24_HR	28.50	160618.5	4500.0	156118.5	-0.0	-0.00
WQ-24_HR	28.59	160618.5	4506.3	156112.2	-0.0	-0.00
WQ-24_HR	28.67	160618.5	4512.5	156106.0	-0.0	-0.00
WQ-24_HR	28.75	160618.5	4518.4	156100.1	-0.0	-0.00
WQ-24_HR	28.84	160618.5	4524.2	156094.3	-0.0	-0.00
WQ-24_HR	28.92	160618.5	4529.9	156088.6	-0.0	-0.00
WQ-24_HR	29.00	160618.5	4535.4	156083.1	-0.0	-0.00
WQ-24_HR	29.09	160618.5	4540.7	156077.8	-0.0	-0.00
WQ-24_HR	29.17	160618.5	4545.9	156072.6	-0.0	-0.00
WQ-24_HR	29.25	160618.5	4551.0	156067.5	-0.0	-0.00
WQ-24_HR	29.34	160618.5	4556.0	156062.5	-0.0	-0.00
WQ-24_HR	29.42	160618.5	4560.8	156057.7	-0.0	-0.00
WQ-24_HR	29.50	160618.5	4565.5	156053.0	-0.0	-0.00
WQ-24_HR	29.59	160618.5	4570.1	156048.4	-0.0	-0.00
WQ-24_HR	29.67	160618.5	4574.6	156043.9	-0.0	-0.00
WQ-24_HR	29.75	160618.5	4579.0	156039.5	-0.0	-0.00
WQ-24_HR	29.84	160618.5	4583.2	156035.3	-0.0	-0.00
WQ-24_HR	29.92	160618.5	4587.4	156031.1	-0.0	-0.00
WQ-24_HR	30.00	160618.5	4591.4	156027.1	-0.0	-0.00
WQ-24_HR	30.09	160618.5	4595.4	156023.1	-0.0	-0.00
WQ-24_HR	30.17	160618.5	4599.3	156019.2	-0.0	-0.00
WQ-24_HR	30.25	160618.5	4603.1	156015.4	-0.0	-0.00
WQ-24_HR	30.34	160618.5	4606.8	156011.7	-0.0	-0.00
WQ-24_HR	30.42	160618.5	4610.4	156008.1	-0.0	-0.00
WQ-24_HR	30.50	160618.5	4613.9	156004.6	-0.0	-0.00
WQ-24_HR	30.59	160618.5	4617.4	156001.1	-0.0	-0.00
WQ-24_HR	30.67	160618.5	4620.8	155997.7	-0.0	-0.00
WQ-24_HR	30.75	160618.5	4624.1	155994.4	-0.0	-0.00
WQ-24_HR	30.84	160618.5	4627.4	155991.1	-0.0	-0.00
WQ-24_HR	30.92	160618.5	4630.6	155987.9	-0.0	-0.00
WQ-24_HR	31.00	160618.5	4633.7	155984.8	-0.0	-0.00
WQ-24_HR	31.09	160618.5	4636.8	155981.7	-0.0	-0.00
WQ-24_HR	31.17	160618.5	4639.8	155978.7	-0.0	-0.00
WQ-24_HR	31.25	160618.5	4642.8	155975.7	-0.0	-0.00
WQ-24_HR	31.34	160618.5	4645.7	155972.8	-0.0	-0.00
WQ-24_HR	31.42	160618.5	4648.5	155970.0	-0.0	-0.00
WQ-24_HR	31.50	160618.5	4651.3	155967.2	-0.0	-0.00
WQ-24_HR	31.59	160618.5	4654.1	155964.4	-0.0	-0.00
WQ-24_HR	31.67	160618.5	4656.8	155961.7	-0.0	-0.00
WQ-24_HR	31.75	160618.5	4659.5	155959.0	-0.0	-0.00
WQ-24_HR	31.84	160618.5	4662.2	155956.3	-0.0	-0.00
WQ-24_HR	31.92	160618.5	4664.8	155953.7	-0.0	-0.00
WQ-24_HR	32.00	160618.5	4667.4	155951.1	-0.0	-0.00
WQ-24_HR	32.09	160618.5	4670.0	155948.5	-0.0	-0.00
WQ-24_HR	32.17	160618.5	4672.5	155946.0	-0.0	-0.00
WQ-24_HR	32.25	160618.5	4675.0	155943.5	-0.0	-0.00
WQ-24_HR	32.34	160618.5	4677.5	155941.0	-0.0	-0.00
WQ-24_HR	32.42	160618.5	4680.0	155938.5	-0.0	-0.00
WQ-24_HR	32.50	160618.5	4682.4	155936.0	-0.0	-0.00
WQ-24_HR	32.59	160618.5	4684.9	155933.6	-0.0	-0.00
WQ-24_HR	32.67	160618.5	4687.3	155931.2	-0.0	-0.00
WQ-24_HR	32.75	160618.5	4689.7	155928.8	-0.0	-0.00
WQ-24_HR	32.84	160618.5	4692.1	155926.4	-0.0	-0.00
WQ-24_HR	32.92	160618.5	4694.5	155924.0	-0.0	-0.00
WQ-24_HR	33.00	160618.5	4696.8	155921.6	-0.0	-0.00
WQ-24_HR	33.09	160618.5	4699.2	155919.3	-0.0	-0.00
WQ-24_HR	33.17	160618.5	4701.6	155916.9	-0.0	-0.00
WQ-24_HR	33.25	160618.5	4704.0	155914.5	-0.0	-0.00
WQ-24_HR	33.34	160618.5	4706.3	155912.1	-0.0	-0.00
WQ-24_HR	33.42	160618.5	4708.7	155909.8	-0.0	-0.00
WQ-24_HR	33.50	160618.5	4711.1	155907.4	-0.0	-0.00
WQ-24_HR	33.59	160618.5	4713.5	155905.0	-0.0	-0.00
WQ-24_HR	33.67	160618.5	4715.8	155902.7	-0.0	-0.00
WQ-24_HR	33.75	160618.5	4718.2	155900.3	-0.0	-0.00
WQ-24_HR	33.84	160618.5	4720.6	155897.9	-0.0	-0.00
WQ-24_HR	33.92	160618.5	4722.9	155895.6	-0.0	-0.00
WQ-24_HR	34.00	160618.5	4725.3	155893.2	-0.0	-0.00
WQ-24_HR	34.09	160618.5	4727.7	155890.8	-0.0	-0.00
WQ-24_HR	34.17	160618.5	4730.0	155888.5	-0.0	-0.00
WQ-24_HR	34.25	160618.5	4732.4	155886.1	-0.0	-0.00
WQ-24_HR	34.34	160618.5	4734.8	155883.7	-0.0	-0.00
WQ-24_HR	34.42	160618.5	4737.1	155881.4	-0.0	-0.00
WQ-24_HR	34.50	160618.5	4739.5	155879.0	-0.0	-0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	34.59	160618.5	4741.9	155876.6	-0.0	-0.00
WQ-24_HR	34.67	160618.5	4744.2	155874.3	-0.0	-0.00
WQ-24_HR	34.75	160618.5	4746.6	155871.9	-0.0	-0.00
WQ-24_HR	34.84	160618.5	4748.9	155869.6	-0.0	-0.00
WQ-24_HR	34.92	160618.5	4751.3	155867.2	-0.0	-0.00
WQ-24_HR	35.00	160618.5	4753.7	155864.8	-0.0	-0.00
WQ-24_HR	35.09	160618.5	4756.0	155862.5	-0.0	-0.00
WQ-24_HR	35.17	160618.5	4758.4	155860.1	-0.0	-0.00
WQ-24_HR	35.25	160618.5	4760.7	155857.8	-0.0	-0.00
WQ-24_HR	35.34	160618.5	4763.1	155855.4	-0.0	-0.00
WQ-24_HR	35.42	160618.5	4765.5	155853.0	-0.0	-0.00
WQ-24_HR	35.50	160618.5	4767.8	155850.7	-0.0	-0.00
WQ-24_HR	35.59	160618.5	4770.2	155848.3	-0.0	-0.00
WQ-24_HR	35.67	160618.5	4772.5	155846.0	-0.0	-0.00
WQ-24_HR	35.75	160618.5	4774.9	155843.6	-0.0	-0.00
WQ-24_HR	35.84	160618.5	4777.2	155841.3	-0.0	-0.00
WQ-24_HR	35.92	160618.5	4779.6	155838.9	-0.0	-0.00
WQ-24_HR	36.00	160618.5	4781.9	155836.6	-0.0	-0.00
WQ-24_HR	36.09	160618.5	4784.3	155834.2	-0.0	-0.00
WQ-24_HR	36.17	160618.5	4786.6	155831.9	-0.0	-0.00
WQ-24_HR	36.25	160618.5	4789.0	155829.5	-0.0	-0.00
WQ-24_HR	36.34	160618.5	4791.3	155827.2	-0.0	-0.00
WQ-24_HR	36.42	160618.5	4793.7	155824.8	-0.0	-0.00
WQ-24_HR	36.50	160618.5	4796.0	155822.5	-0.0	-0.00
WQ-24_HR	36.59	160618.5	4798.4	155820.1	-0.0	-0.00
WQ-24_HR	36.67	160618.5	4800.7	155817.8	-0.0	-0.00
WQ-24_HR	36.75	160618.5	4803.1	155815.4	-0.0	-0.00
WQ-24_HR	36.84	160618.5	4805.4	155813.1	-0.0	-0.00
WQ-24_HR	36.92	160618.5	4807.8	155810.7	-0.0	-0.00
WQ-24_HR	37.00	160618.5	4810.1	155808.4	-0.0	-0.00
WQ-24_HR	37.09	160618.5	4812.5	155806.0	-0.0	-0.00
WQ-24_HR	37.17	160618.5	4814.8	155803.7	-0.0	-0.00
WQ-24_HR	37.25	160618.5	4817.2	155801.3	-0.0	-0.00
WQ-24_HR	37.34	160618.5	4819.5	155799.0	-0.0	-0.00
WQ-24_HR	37.42	160618.5	4821.8	155796.6	-0.0	-0.00
WQ-24_HR	37.50	160618.5	4824.2	155794.3	-0.0	-0.00
WQ-24_HR	37.59	160618.5	4826.5	155792.0	-0.0	-0.00
WQ-24_HR	37.67	160618.5	4828.9	155789.6	-0.0	-0.00
WQ-24_HR	37.75	160618.5	4831.2	155787.3	-0.0	-0.00
WQ-24_HR	37.84	160618.5	4833.6	155784.9	-0.0	-0.00
WQ-24_HR	37.92	160618.5	4835.9	155782.6	-0.0	-0.00
WQ-24_HR	38.00	160618.5	4838.2	155780.3	-0.0	-0.00
WQ-24_HR	38.09	160618.5	4840.6	155777.9	-0.0	-0.00
WQ-24_HR	38.17	160618.5	4842.9	155775.6	-0.0	-0.00
WQ-24_HR	38.25	160618.5	4845.2	155773.3	-0.0	-0.00
WQ-24_HR	38.34	160618.5	4847.6	155770.9	-0.0	-0.00
WQ-24_HR	38.42	160618.5	4849.9	155768.6	-0.0	-0.00
WQ-24_HR	38.50	160618.5	4852.2	155766.2	-0.0	-0.00
WQ-24_HR	38.59	160618.5	4854.6	155763.9	-0.0	-0.00
WQ-24_HR	38.67	160618.5	4856.9	155761.6	-0.0	-0.00
WQ-24_HR	38.75	160618.5	4859.2	155759.2	-0.0	-0.00
WQ-24_HR	38.84	160618.5	4861.6	155756.9	-0.0	-0.00
WQ-24_HR	38.92	160618.5	4863.9	155754.6	-0.0	-0.00
WQ-24_HR	39.00	160618.5	4866.2	155752.3	-0.0	-0.00
WQ-24_HR	39.09	160618.5	4868.6	155749.9	-0.0	-0.00
WQ-24_HR	39.17	160618.5	4870.9	155747.6	-0.0	-0.00
WQ-24_HR	39.25	160618.5	4873.2	155745.3	-0.0	-0.00
WQ-24_HR	39.34	160618.5	4875.6	155742.9	-0.0	-0.00
WQ-24_HR	39.42	160618.5	4877.9	155740.6	-0.0	-0.00
WQ-24_HR	39.50	160618.5	4880.2	155738.3	-0.0	-0.00
WQ-24_HR	39.59	160618.5	4882.5	155735.9	-0.0	-0.00
WQ-24_HR	39.67	160618.5	4884.9	155733.6	-0.0	-0.00
WQ-24_HR	39.75	160618.5	4887.2	155731.3	-0.0	-0.00
WQ-24_HR	39.84	160618.5	4889.5	155729.0	-0.0	-0.00
WQ-24_HR	39.92	160618.5	4891.9	155726.6	-0.0	-0.00
WQ-24_HR	40.00	160618.5	4894.2	155724.3	-0.0	-0.00
WQ-24_HR	40.09	160618.5	4896.5	155722.0	-0.0	-0.00
WQ-24_HR	40.17	160618.5	4898.8	155719.7	-0.0	-0.00
WQ-24_HR	40.25	160618.5	4901.1	155717.4	-0.0	-0.00
WQ-24_HR	40.34	160618.5	4903.5	155715.0	-0.0	-0.00
WQ-24_HR	40.42	160618.5	4905.8	155712.7	-0.0	-0.00
WQ-24_HR	40.50	160618.5	4908.1	155710.4	-0.0	-0.00
WQ-24_HR	40.59	160618.5	4910.4	155708.1	-0.0	-0.00
WQ-24_HR	40.67	160618.5	4912.7	155705.7	-0.0	-0.00
WQ-24_HR	40.75	160618.5	4915.1	155703.4	-0.0	-0.00
WQ-24_HR	40.84	160618.5	4917.4	155701.1	-0.0	-0.00
WQ-24_HR	40.92	160618.5	4919.7	155698.8	-0.0	-0.00
WQ-24_HR	41.00	160618.5	4922.0	155696.5	-0.0	-0.00
WQ-24_HR	41.09	160618.5	4924.3	155694.2	-0.0	-0.00
WQ-24_HR	41.17	160618.5	4926.7	155691.8	-0.0	-0.00
WQ-24_HR	41.25	160618.5	4929.0	155689.5	-0.0	-0.00
WQ-24_HR	41.34	160618.5	4931.3	155687.2	-0.0	-0.00
WQ-24_HR	41.42	160618.5	4933.6	155684.9	-0.0	-0.00

Volume stored at hour 36.15

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24_HR	41.50	160618.5	4935.9	155682.6	-0.0	-0.00
WQ-24_HR	41.59	160618.5	4938.2	155680.3	-0.0	-0.00
WQ-24_HR	41.67	160618.5	4940.5	155678.0	-0.0	-0.00
WQ-24_HR	41.75	160618.5	4942.9	155675.6	-0.0	-0.00
WQ-24_HR	41.84	160618.5	4945.2	155673.3	-0.0	-0.00
WQ-24_HR	41.92	160618.5	4947.5	155671.0	-0.0	-0.00
WQ-24_HR	42.00	160618.5	4949.8	155668.7	-0.0	-0.00
WQ-24_HR	42.09	160618.5	4952.1	155666.4	-0.0	-0.00
WQ-24_HR	42.17	160618.5	4954.4	155664.1	-0.0	-0.00
WQ-24_HR	42.25	160618.5	4956.7	155661.8	-0.0	-0.00
WQ-24_HR	42.34	160618.5	4959.0	155659.5	-0.0	-0.00
WQ-24_HR	42.42	160618.5	4961.3	155657.2	-0.0	-0.00
WQ-24_HR	42.50	160618.5	4963.6	155654.9	-0.0	-0.00
WQ-24_HR	42.59	160618.5	4965.9	155652.6	-0.0	-0.00
WQ-24_HR	42.67	160618.5	4968.2	155650.2	-0.0	-0.00
WQ-24_HR	42.75	160618.5	4970.6	155647.9	-0.0	-0.00
WQ-24_HR	42.84	160618.5	4972.9	155645.6	-0.0	-0.00
WQ-24_HR	42.92	160618.5	4975.2	155643.3	-0.0	-0.00
WQ-24_HR	43.00	160618.5	4977.5	155641.0	-0.0	-0.00
WQ-24_HR	43.09	160618.5	4979.8	155638.7	-0.0	-0.00
WQ-24_HR	43.17	160618.5	4982.1	155636.4	-0.0	-0.00
WQ-24_HR	43.25	160618.5	4984.4	155634.1	-0.0	-0.00
WQ-24_HR	43.34	160618.5	4986.7	155631.8	-0.0	-0.00
WQ-24_HR	43.42	160618.5	4989.0	155629.5	-0.0	-0.00
WQ-24_HR	43.50	160618.5	4991.3	155627.2	-0.0	-0.00
WQ-24_HR	43.59	160618.5	4993.6	155624.9	-0.0	-0.00
WQ-24_HR	43.67	160618.5	4995.9	155622.6	-0.0	-0.00
WQ-24_HR	43.75	160618.5	4998.2	155620.3	-0.0	-0.00
WQ-24_HR	43.84	160618.5	5000.5	155618.0	-0.0	-0.00
WQ-24_HR	43.92	160618.5	5002.8	155615.7	-0.0	-0.00
WQ-24_HR	44.00	160618.5	5005.1	155613.4	-0.0	-0.00
WQ-24_HR	44.09	160618.5	5007.4	155611.1	-0.0	-0.00
WQ-24_HR	44.17	160618.5	5009.7	155608.8	-0.0	-0.00
WQ-24_HR	44.25	160618.5	5012.0	155606.5	-0.0	-0.00
WQ-24_HR	44.34	160618.5	5014.2	155604.2	-0.0	-0.00
WQ-24_HR	44.42	160618.5	5016.5	155602.0	-0.0	-0.00
WQ-24_HR	44.50	160618.5	5018.8	155599.7	-0.0	-0.00
WQ-24_HR	44.59	160618.5	5021.1	155597.4	-0.0	-0.00
WQ-24_HR	44.67	160618.5	5023.4	155595.1	-0.0	-0.00
WQ-24_HR	44.75	160618.5	5025.7	155592.8	-0.0	-0.00
WQ-24_HR	44.84	160618.5	5028.0	155590.5	-0.0	-0.00
WQ-24_HR	44.92	160618.5	5030.3	155588.2	-0.0	-0.00
WQ-24_HR	45.00	160618.5	5032.6	155585.9	-0.0	-0.00
WQ-24_HR	45.09	160618.5	5034.9	155583.6	-0.0	-0.00
WQ-24_HR	45.17	160618.5	5037.2	155581.3	-0.0	-0.00
WQ-24_HR	45.25	160618.5	5039.5	155579.0	-0.0	-0.00
WQ-24_HR	45.34	160618.5	5041.7	155576.8	-0.0	-0.00
WQ-24_HR	45.42	160618.5	5044.0	155574.5	-0.0	-0.00
WQ-24_HR	45.50	160618.5	5046.3	155572.2	-0.0	-0.00
WQ-24_HR	45.59	160618.5	5048.6	155569.9	-0.0	-0.00
WQ-24_HR	45.67	160618.5	5050.9	155567.6	-0.0	-0.00
WQ-24_HR	45.75	160618.5	5053.2	155565.3	-0.0	-0.00
WQ-24_HR	45.84	160618.5	5055.5	155563.0	-0.0	-0.00
WQ-24_HR	45.92	160618.5	5057.7	155560.8	-0.0	-0.00
WQ-24_HR	46.00	160618.5	5060.0	155558.5	-0.0	-0.00
WQ-24_HR	46.09	160618.5	5062.3	155556.2	-0.0	-0.00
WQ-24_HR	46.17	160618.5	5064.6	155553.9	-0.0	-0.00
WQ-24_HR	46.25	160618.5	5066.9	155551.6	-0.0	-0.00
WQ-24_HR	46.34	160618.5	5069.1	155549.4	-0.0	-0.00
WQ-24_HR	46.42	160618.5	5071.4	155547.1	-0.0	-0.00
WQ-24_HR	46.50	160618.5	5073.7	155544.8	-0.0	-0.00
WQ-24_HR	46.59	160618.5	5076.0	155542.5	-0.0	-0.00
WQ-24_HR	46.67	160618.5	5078.3	155540.2	-0.0	-0.00
WQ-24_HR	46.75	160618.5	5080.5	155538.0	-0.0	-0.00
WQ-24_HR	46.84	160618.5	5082.8	155535.7	-0.0	-0.00
WQ-24_HR	46.92	160618.5	5085.1	155533.4	-0.0	-0.00
WQ-24_HR	47.00	160618.5	5087.3	155531.2	-0.0	-0.00
WQ-24_HR	47.09	160618.5	5089.6	155528.9	-0.0	-0.00
WQ-24_HR	47.17	160618.5	5091.9	155526.6	-0.0	-0.00
WQ-24_HR	47.25	160618.5	5094.2	155524.3	-0.0	-0.00
WQ-24_HR	47.34	160618.5	5096.4	155522.1	-0.0	-0.00
WQ-24_HR	47.42	160618.5	5098.7	155519.8	-0.0	-0.00
WQ-24_HR	47.50	160618.5	5101.0	155517.5	-0.0	-0.00
WQ-24_HR	47.59	160618.5	5103.3	155515.2	-0.0	-0.00
WQ-24_HR	47.67	160618.5	5105.5	155513.0	-0.0	-0.00
WQ-24_HR	47.75	160618.5	5107.8	155510.7	-0.0	-0.00
WQ-24_HR	47.84	160618.5	5110.1	155508.4	-0.0	-0.00
WQ-24_HR	47.92	160618.5	5112.3	155506.2	-0.0	-0.00
WQ-24_HR	48.00	160618.5	5114.6	155503.9	-0.0	-0.00
WQ-24_HR	48.01	160618.5	5114.6	155503.9	-0.0	-0.00

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
WQ-24_HR	BASIN PR-1	BASE	12.14	17.63	0.493	65019
WQ-24_HR	BASIN PR-2	BASE	12.16	18.20	0.448	69711
WQ-24_HR	OFFSITE 1	BASE	12.18	3.57	0.244	18001
WQ-24_HR	STR 402	BASE	23.92	0.14	0.010	4245
WQ-24_HR	STR 403	BASE	18.08	0.11	0.015	3635

Time of Peak Runoff

=====

==== Basins =====

=====

Name: BASIN PR-1	Node: Pond 1	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 24.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 22.20	
Area(ac): 36.330	Time Shift(hrs): 0.00	
Curve Number: 90.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN PR-2	Node: Pond 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 23.00	
Area(ac): 42.830	Time Shift(hrs): 0.00	
Curve Number: 89.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: OFFSITE 1	Node: POND 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 27.00	
Area(ac): 20.310	Time Shift(hrs): 0.00	
Curve Number: 83.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: STR 402	Node: STR 402	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 75.00	
Area(ac): 119.100	Time Shift(hrs): 0.00	
Curve Number: 66.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: STR 403	Node: STR 403	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 64.80	
Area(ac): 66.400	Time Shift(hrs): 0.00	
Curve Number: 67.30	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

=====

==== Nodes =====

=====

Name: EX DITCH	Base Flow(cfs): 0.000	Init Stage(ft): 713.000
Group: BASE		Warn Stage(ft): 716.000
Type: Stage/Area		

Stage(ft)	Area(ac)
-----	-----
713.000	0.0001
716.000	0.0010

Station(ft)	Elevation(ft)	Manning's N
0.000	717.420	0.013000
6.000	717.360	0.013000
6.010	714.650	0.013000
10.990	714.650	0.013000
11.000	717.300	0.013000
17.000	717.240	0.013000

=====
 Operating Tables
 =====

Name: STR 402 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
720.200	0.00
723.800	0.00
724.000	0.76
725.000	11.17
726.000	27.74
727.000	40.54
728.000	50.65

Name: STR 403 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
720.200	0.00
721.000	4.65
722.000	15.70
723.000	23.26
724.000	29.26

=====
 Pipes
 =====

Name: POND 2 OUTLET	From Node: Pond 2	Length(ft): 880.00
Group: BASE	To Node: Pond 1	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.50
Invert(ft): 713.250	712.250	Exit Loss Coef: 1.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		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: PROP. PIPE	From Node: POND 2	Length(ft): 880.00
Group: BASE	To Node: POND 1	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 712.150	712.150	Exit Loss Coef: 1.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		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

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

Name: EX DITCH	From Node: EX DITCH	Length(ft): 970.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Trapezoidal	Trapezoidal	Solution Algorithm: Automatic
Invert(ft): 713.000	709.470	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N: 0.030000	0.030000	Expansion Coef: 0.300
Top Clip(ft): 0.000	0.000	Entrance Loss Coef: 0.000
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 dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft): 0.000	0.000	
LtSdSlp(h/v): 2.50	2.50	
RtSdSlp(h/v): 2.50	2.50	

=====
 === Drop Structures =====
 =====

Name: EX OUTLET STR	From Node: POND 1	Length(ft): 100.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 712.540	711.680	Exit Loss Coef: 1.000
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 dc
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 EX OUTLET STR ***

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): 4.00	Invert(ft): 712.150
Rise(in): 4.00	Control Elev(ft): 712.150

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

Name: EM WEIR 1	From Node: POND 1
Group: BASE	To Node: SE CORNER BDRY
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Trapezoidal

Bottom Width(ft): 80.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 715.850
Control Elevation(ft): 715.850
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

Name: EM. WEIR 2 From Node: POND 2
 Group: BASE To Node: EX DITCH
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 95.00
 Left Side Slope(h/v): 4.00
 Right Side Slope(h/v): 4.00
 Invert(ft): 715.800
 Control Elevation(ft): 715.800
 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

Name: EX WEIR From Node: POND 1
 Group: BASE To Node: SE CORNER BDRY
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Irregular

XSec: EX WEIR SECTION

Invert(ft): 714.650
 Control Elevation(ft): 714.650
 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

==== Rating Curves =====

Name: 402 OUTLET CMP From Node: STR 402 Count: 1
 Group: BASE To Node: POND 1 Flow: Both

TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 402 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

Name: 403 OUTLET CMP From Node: STR 403 Count: 1
 Group: BASE To Node: POND 1 Flow: Both

TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 403 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

==== Hydrology Simulations =====

Name: WQ-24_HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 1.25

1.25" 24-HR Storm

Time(hrs) Print Inc(min)

 48.000 1.00

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

Name: WQ-24_HR Hydrology Sim: WQ-24_HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 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): 48.00
 Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
 Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	5.000

Group	Run
BASE	Yes

Worksheet for Pond 1 Overflow Weir

Project Description

Solve For Discharge

Input Data

Headwater Elevation	0.65	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Weir Coefficient	3.30	US
Crest Length	100.00	ft

Results

Discharge	172.94	ft ³ /s
Headwater Height Above Crest	0.65	ft
Tailwater Height Above Crest	0.00	ft
Equal Side Slopes	0.25	ft/ft (H:V)
Flow Area	65.11	ft ²
Velocity	2.66	ft/s
Wetted Perimeter	101.34	ft
Top Width	100.33	ft

Max inflow to Pond 1 = 130.21 CFS

(1.25)(130.21 CFS) = 162.76 CFS

Pond 1 Spillway Capacity Requirement = 162.76 CFS

Worksheet for Pond 2 Overflow Weir

Project Description

Solve For Discharge

Input Data

Headwater Elevation	1.01	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Weir Coefficient	3.30	US
Crest Length	95.00	ft

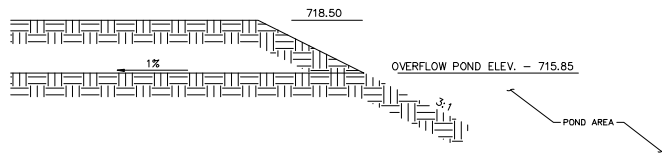
Results

Discharge	318.21	ft ³ /s
Headwater Height Above Crest	1.01	ft
Tailwater Height Above Crest	0.00	ft
Equal Side Slopes	0.25	ft/ft (H:V)
Flow Area	96.21	ft ²
Velocity	3.31	ft/s
Wetted Perimeter	97.08	ft
Top Width	95.51	ft

Max inflow to Pond 2 = 252.93 CFS

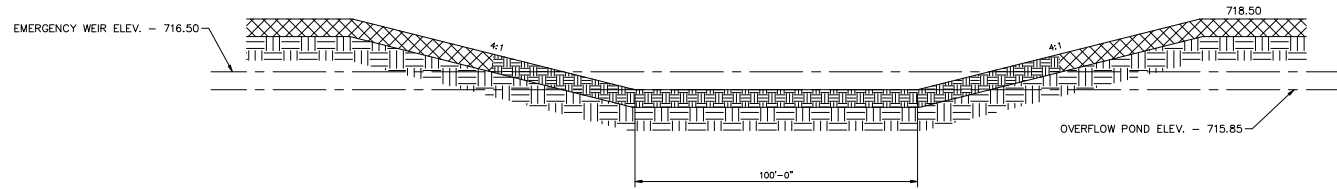
$(1.25)(252.93 \text{ CFS}) = 316.16 \text{ CFS}$

Pond 1 Spillway Capacity Requirement = 316.16 CFS



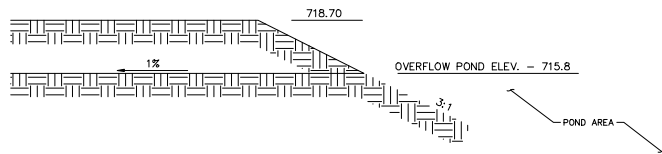
POND 1 OVERFLOW WEIR PROFILE VIEW

N.T.S.



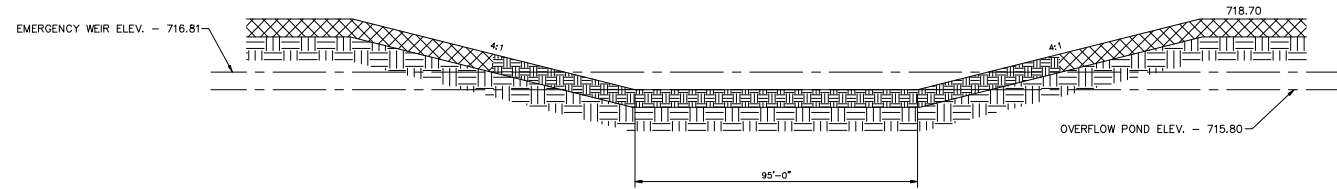
POND 1 OVERFLOW WEIR DETAIL

N.T.S.



POND 2 OVERFLOW WEIR PROFILE VIEW

N.T.S.



POND 2 OVERFLOW WEIR DETAIL

N.T.S.

NOTE: OVERFLOW WEIR 2 HAS BEEN CONSTRUCTED. THIS DETAIL IS FOR REFERENCE ONLY. CONTRACTOR IS NOT RESPONSIBLE FOR CONSTRUCTING THIS WEIR UNLESS THE EXISTING POND 2 OVERFLOW WEIR DOES NOT MATCH THE SPECIFICATIONS IN THIS DETAIL.

Appendix F: Overall Site Drainage – ICPR Model

FRANKLIN IWI - PHASE 7A EXPANSION - 170021004
 REPORT: ONSITE - 05/09/2019
 NOTE: ALTERED MODEL FROM "INTERSTATE WAREHOUSING PHASES IV-VI FRANKLIN, IN"
 COMPLETED BY THE SCHNEIDER CORPORATION (APPROVED: 9/27/2012)

Nodes

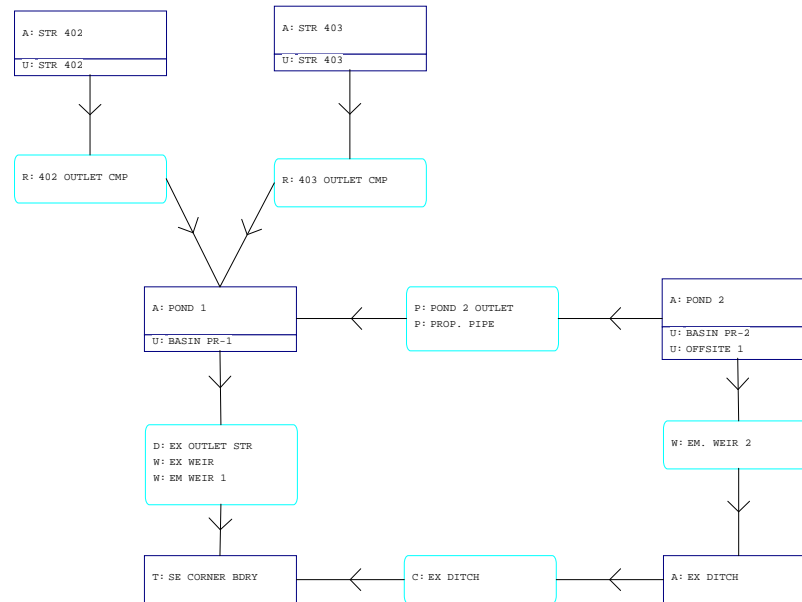
A Stage/Area
 V Stage/Volume
 T Time/Stage
 M Manhole

Basins

O Overland Flow
 U SCS Unit CN
 S SBUH CN
 Y SCS Unit GA
 Z SBUH GA

Links

P Pipe
 W Weir
 C Channel
 D Drop Structure
 B Bridge
 R Rating Curve
 H Breach
 E Percolation
 F Filter
 X Exfil Trench



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
EX DITCH	BASE	002YR-24HR	0.00	713.00	716.00	0.0000	113	0.00	0.00	0.00
EX DITCH	BASE	010YR-24HR	0.00	713.00	716.00	0.0000	113	0.00	0.00	0.00
EX DITCH	BASE	100YR-24HR	0.00	713.00	716.00	0.0000	113	0.00	0.00	0.00
POND 1	BASE	002YR-24HR	12.68	714.14	718.00	0.0050	74252	12.17	62.02	12.68
POND 1	BASE	010YR-24HR	12.51	715.02	718.00	0.0050	80536	12.17	88.97	12.51
POND 1	BASE	100YR-24HR	12.43	715.84	718.00	0.0050	88672	12.17	121.01	12.43
POND 2	BASE	002YR-24HR	24.43	713.62	718.00	0.0019	308561	12.17	77.22	25.20
POND 2	BASE	010YR-24HR	24.43	714.48	718.00	0.0023	317923	12.17	123.71	25.18
POND 2	BASE	100YR-24HR	23.78	715.10	718.00	0.0026	323985	12.17	180.84	24.60
SE CORNER BDRY	BASE	002YR-24HR	0.00	709.45	715.25	0.0000	0	12.68	0.46	0.00
SE CORNER BDRY	BASE	010YR-24HR	0.00	709.45	715.25	0.0000	0	12.51	4.20	0.00
SE CORNER BDRY	BASE	100YR-24HR	0.00	709.45	715.25	0.0000	0	12.43	21.48	0.00
STR 402	BASE	002YR-24HR	27.68	725.31	728.00	0.0057	379430	12.83	22.54	0.00
STR 402	BASE	010YR-24HR	27.68	725.93	728.00	0.0050	637876	12.83	61.69	0.00
STR 402	BASE	100YR-24HR	27.68	726.61	728.00	0.0050	747980	12.67	122.70	0.00
STR 403	BASE	002YR-24HR	27.18	722.44	724.00	0.0031	143985	12.67	15.51	0.00
STR 403	BASE	010YR-24HR	27.18	723.36	724.00	0.0031	279892	12.67	41.10	0.00
STR 403	BASE	100YR-24HR	27.18	724.11	724.00	0.0033	445719	12.67	79.48	0.00

100-YR pond elevations
for onsite flows

Discharge for onsite flows

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
002YR-24HR	BASIN PR-1	BASE	12.14	70.99	1.981	261240
010YR-24HR	BASIN PR-1	BASE	12.14	112.35	3.199	421943
100YR-24HR	BASIN PR-1	BASE	12.14	163.00	4.741	625238
002YR-24HR	BASIN PR-2	BASE	12.11	79.53	1.897	294876
010YR-24HR	BASIN PR-2	BASE	12.11	128.20	3.101	482054
100YR-24HR	BASIN PR-2	BASE	12.11	188.12	4.631	720001
002YR-24HR	OFFSITE 1	BASE	12.18	26.41	1.445	106506
010YR-24HR	OFFSITE 1	BASE	12.18	46.61	2.545	187644
100YR-24HR	OFFSITE 1	BASE	12.18	72.38	3.993	294408
002YR-24HR	STR 402	BASE	12.83	22.54	0.553	238984
010YR-24HR	STR 402	BASE	12.75	62.04	1.282	554393
100YR-24HR	STR 402	BASE	12.75	123.59	2.384	1030769
002YR-24HR	STR 403	BASE	12.67	15.51	0.598	144066
010YR-24HR	STR 403	BASE	12.67	41.10	1.354	326333
100YR-24HR	STR 403	BASE	12.58	80.25	2.483	598538

Unit Hydrograph: UH484	Peaking Factor: 484.0
Rainfall File:	Storm Duration(hrs): 24.00
Rainfall Amount(in): 0.000	Time of Conc(min): 22.20
Area(ac): 36.330	Time Shift(hrs): 0.00
Curve Number: 90.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

CN has been updated

Unit Hydrograph: Uh484	Peaking Factor: 484.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 23.00
Area(ac): 42.830	Time Shift(hrs): 0.00
Curve Number: 89.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

CN has been updated

Unit Hydrograph: UH484	Peaking Factor: 484.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 27.00
Area(ac): 20.310	Time Shift(hrs): 0.00
Curve Number: 83.00	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Unit Hydrograph: UH484	Peaking Factor: 484.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 75.00
Area(ac): 119.100	Time Shift(hrs): 0.00
Curve Number: 66.20	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

Unit Hydrograph: UH484	Peaking Factor: 484.0
Rainfall File:	Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000	Time of Conc(min): 64.80
Area(ac): 66.400	Time Shift(hrs): 0.00
Curve Number: 67.30	Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00	

```

Name: EX DITCH          Base Flow(cfs): 0.000          Init Stage(ft): 713.000
Group: BASE              Warn Stage(ft): 716.000
Type: Stage/Area

```

Stage(ft)	Area(ac)
713.000	0.0001
716.000	0.0010

Name: POND 1 Base Flow(cfs): 0.000 Init Stage(ft): 712.150
 Group: BASE Warn Stage(ft): 718.000
 Type: Stage/Area

Stage(ft)	Area(ac)
712.150	1.4200
713.000	1.5100
714.000	1.6200
715.000	1.8000
716.000	2.0400
717.000	2.3100
718.000	2.5800

Stage elevations and
areas have been
updated

Name: POND 2 Base Flow(cfs): 0.000 Init Stage(ft): 712.150
 Group: BASE Warn Stage(ft): 718.000
 Type: Stage/Area

Stage(ft)	Area(ac)
712.150	6.6700
713.000	6.8700
714.000	7.1200
715.000	7.3600
716.000	7.6100
717.000	7.8600
718.000	8.1100

Stage elevations and
areas have been
updated

Name: SE CORNER BDRY Base Flow(cfs): 0.000 Init Stage(ft): 709.450
 Group: BASE Warn Stage(ft): 715.250
 Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	709.450
99.00	709.450

Name: STR 402 Base Flow(cfs): 0.000 Init Stage(ft): 720.200
 Group: BASE Warn Stage(ft): 728.000
 Type: Stage/Area

Stage(ft)	Area(ac)
720.200	0.0000
723.800	0.0000
724.000	0.6100
725.000	5.7390
726.000	15.3030
727.000	18.3650
728.000	22.9620

Name: STR 403 Base Flow(cfs): 0.000 Init Stage(ft): 720.200
 Group: BASE Warn Stage(ft): 724.000
 Type: Stage/Area

Stage(ft)	Area(ac)
720.200	0.0000
721.000	1.0330
722.000	2.2770
723.000	4.5910
724.000	9.6630

==== Cross Sections =====

Name: EX WEIR SECTION Group: BASE
 Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	717.420	0.013000
6.000	717.360	0.013000
6.010	714.650	0.013000
10.990	714.650	0.013000
11.000	717.300	0.013000
17.000	717.240	0.013000

=====
 Operating Tables
 =====

This cross section has been raised and updated

Name: STR 402 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
720.200	0.00
723.800	0.00
724.000	0.76
725.000	11.17
726.000	27.74
727.000	40.54
728.000	50.65

Name: STR 403 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
720.200	0.00
721.000	4.65
722.000	15.70
723.000	23.26
724.000	29.26

Pipe extended to reach new extents of Pond 1

=====
 Pipes
 =====

Name: POND 2 OUTLET Group: BASE	From Node: Pond 2 To Node: Pond 1	Length(ft): 880.00 Count: 1	Friction Equation: Automatic Solution Algorithm: Most Restrictive Flow: Both Entrance Loss Coef: 0.50 Exit Loss Coef: 1.00 Bend Loss Coef: 0.00 Outlet Ctrl Spec: Use dc or tw Inlet Ctrl Spec: Use dc Stabilizer Option: None
UPSTREAM	DOWNSTREAM		
Geometry: Circular	Circular		
Span(in): 30.00	30.00		
Rise(in): 30.00	30.00		
Invert(ft): 713.250	712.250		
Manning's N: 0.013000	0.013000		
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

48" pipe connecting Pond 1 and Pond 2 has been added

Name: PROP. PIPE Group: BASE	From Node: POND 2 To Node: POND 1	Length(ft): 880.00 Count: 1	Friction Equation: Automatic Solution Algorithm: Most Restrictive Flow: Both Entrance Loss Coef: 0.50 Exit Loss Coef: 1.00 Bend Loss Coef: 0.00 Outlet Ctrl Spec: Use dc or tw Inlet Ctrl Spec: Use dc Stabilizer Option: None
UPSTREAM	DOWNSTREAM		
Geometry: Circular	Circular		
Span(in): 48.00	48.00		
Rise(in): 48.00	48.00		
Invert(ft): 712.150	712.150		
Manning's N: 0.013000	0.013000		
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

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

Name: EX DITCH	From Node: EX DITCH	Length(ft): 970.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Trapezoidal	Trapezoidal	Solution Algorithm: Automatic
Invert(ft): 713.000	709.470	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N: 0.030000	0.030000	Expansion Coef: 0.300
Top Clip(ft): 0.000	0.000	Entrance Loss Coef: 0.000
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 dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft): 0.000	0.000	
LtSdSlp(h/v): 2.50	2.50	
RtSdSlp(h/v): 2.50	2.50	

=====
 === Drop Structures =====
 =====

Name: EX OUTLET STR	From Node: POND 1	Length(ft): 100.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 712.540	711.680	Exit Loss Coef: 1.000
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 dc
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 EX OUTLET STR ***

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): 4.00	Invert(ft): 712.150
Rise(in): 4.00	Control Elev(ft): 712.150

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

Name: EM WEIR 1	From Node: POND 1
Group: BASE	To Node: SE CORNER BDRY
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Trapezoidal

Bottom Width(ft): 80.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 715.850
Control Elevation(ft): 715.850
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

Name: EM. WEIR 2 From Node: POND 2
 Group: BASE To Node: EX DITCH
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 95.00
 Left Side Slope(h/v): 4.00
 Right Side Slope(h/v): 4.00
 Invert(ft): 715.800
 Control Elevation(ft): 715.800
 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

Name: EX WEIR From Node: POND 1
 Group: BASE To Node: SE CORNER BDRY
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Irregular

XSec: EX WEIR SECTION
 Invert(ft): 714.650
 Control Elevation(ft): 714.650
 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

This weir has been raised
and updated

==== Rating Curves =====

Name: 402 OUTLET CMP From Node: STR 402 Count: 1
 Group: BASE To Node: POND 1 Flow: None

TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 402 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

Name: 403 OUTLET CMP From Node: STR 403 Count: 1
 Group: BASE To Node: POND 1 Flow: None

TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 403 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

==== Hydrology Simulations =====

Name: 002YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 3.00

Time(hrs) Print Inc(min)

 30.000 10.00

 Name: 010YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 4.30

Time(hrs)	Print Inc(min)
30.000	10.00

 Name: 100YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 5.90

Time(hrs)	Print Inc(min)
30.000	10.00

==== Routing Simulations =====

Name: 002YR-24HR Hydrology Sim: 002YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 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)
30.000	10.000

Group	Run
BASE	Yes

 Name: 010YR-24HR Hydrology Sim: 010YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 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)
30.000	10.000

Group	Run
BASE	Yes

 Name: 100YR-24HR Hydrology Sim: 100YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Execute: Yes Restart: No Patch: No
 Alternative: No
 Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500

FRANKLIN IWI - PHASE 7A EXPANSION - 170021004
REPORT: ONSITE
NOTE: ALTERED MODEL FROM "INTERSTATE WAREHOUSING PHASES IV-VI FRANKLIN, IN"
COMPLETED BY THE SCHNEIDER CORPORATION (APPROVED: 9/27/2012)

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)
30.000	10.000

Group	Run
BASE	Yes

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
EX DITCH	BASE	002YR-24HR	0.00	713.00	716.00	0.0000	113	0.00	0.00	0.00
EX DITCH	BASE	010YR-24HR	0.00	713.00	716.00	0.0000	113	0.00	0.00	0.00
EX DITCH	BASE	100YR-24HR	15.76	714.89	716.00	0.0050	4338	15.71	19.25	15.76
POND 1	BASE	002YR-24HR	25.42	714.81	718.00	0.0050	78918	12.17	63.89	25.42
POND 1	BASE	010YR-24HR	20.89	715.68	718.00	0.0050	86741	12.17	93.82	20.89
POND 1	BASE	100YR-24HR	12.42	716.01	718.00	0.0050	90198	12.17	130.21	12.42
POND 2	BASE	002YR-24HR	25.52	714.81	718.00	0.0031	321131	12.17	103.41	28.20
POND 2	BASE	010YR-24HR	21.18	715.68	718.00	0.0031	329414	12.17	170.00	26.29
POND 2	BASE	100YR-24HR	15.71	715.96	718.00	0.0031	331826	12.17	252.93	16.58
SE CORNER BDRY	BASE	002YR-24HR	0.00	709.45	715.25	0.0000	0	25.42	1.63	0.00
SE CORNER BDRY	BASE	010YR-24HR	0.00	709.45	715.25	0.0000	0	20.89	17.24	0.00
SE CORNER BDRY	BASE	100YR-24HR	0.00	709.45	715.25	0.0000	0	15.60	58.89	0.00
STR 402	BASE	002YR-24HR	14.44	724.69	728.00	0.0056	180640	12.83	22.54	14.44
STR 402	BASE	010YR-24HR	14.54	725.28	728.00	0.0050	368561	12.83	61.69	14.54
STR 402	BASE	100YR-24HR	14.69	725.83	728.00	0.0050	596581	12.67	122.69	14.69
STR 403	BASE	002YR-24HR	13.56	721.28	724.00	-0.0034	60246	12.67	15.51	13.56
STR 403	BASE	010YR-24HR	13.62	722.09	724.00	-0.0049	108145	12.67	41.09	13.62
STR 403	BASE	100YR-24HR	13.86	722.95	724.00	-0.0038	195405	12.67	79.48	13.86

100-YR pond elevations
for onsite and offsite flows

Discharge for onsite
and offsite flows

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
002YR-24HR	BASIN PR-1	BASE	12.14	70.99	1.981	261240
010YR-24HR	BASIN PR-1	BASE	12.14	112.35	3.199	421943
100YR-24HR	BASIN PR-1	BASE	12.14	163.00	4.741	625238
002YR-24HR	BASIN PR-2	BASE	12.11	79.53	1.897	294876
010YR-24HR	BASIN PR-2	BASE	12.11	128.20	3.101	482054
100YR-24HR	BASIN PR-2	BASE	12.11	188.12	4.631	720001
002YR-24HR	OFFSITE 1	BASE	12.18	26.41	1.445	106506
010YR-24HR	OFFSITE 1	BASE	12.18	46.61	2.545	187644
100YR-24HR	OFFSITE 1	BASE	12.18	72.38	3.993	294408
002YR-24HR	STR 402	BASE	12.83	22.54	0.553	238984
010YR-24HR	STR 402	BASE	12.75	62.04	1.282	554393
100YR-24HR	STR 402	BASE	12.75	123.59	2.384	1030769
002YR-24HR	STR 403	BASE	12.67	15.51	0.598	144066
010YR-24HR	STR 403	BASE	12.67	41.10	1.354	326333
100YR-24HR	STR 403	BASE	12.58	80.25	2.483	598538

=====

Basins =====

=====

Name: BASIN PR-1	Node: Pond 1	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 24.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 22.20	
Area(ac): 36.330	Time Shift(hrs): 0.00	
Curve Number: 90.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: BASIN PR-2	Node: Pond 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 23.00	
Area(ac): 42.830	Time Shift(hrs): 0.00	
Curve Number: 89.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: OFFSITE 1	Node: POND 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 27.00	
Area(ac): 20.310	Time Shift(hrs): 0.00	
Curve Number: 83.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: STR 402	Node: STR 402	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 75.00	
Area(ac): 119.100	Time Shift(hrs): 0.00	
Curve Number: 66.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: STR 403	Node: STR 403	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 64.80	
Area(ac): 66.400	Time Shift(hrs): 0.00	
Curve Number: 67.30	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

=====

Nodes =====

=====

Name: EX DITCH	Base Flow(cfs): 0.000	Init Stage(ft): 713.000
Group: BASE		Warn Stage(ft): 716.000
Type: Stage/Area		

Stage(ft)	Area(ac)
713.000	0.0001
716.000	0.0010

Station(ft)	Elevation(ft)	Manning's N
0.000	717.420	0.013000
6.000	717.360	0.013000
6.010	714.650	0.013000
10.990	714.650	0.013000
11.000	717.300	0.013000
17.000	717.240	0.013000

==== Operating Tables =====

Name: STR 402 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
720.200	0.00
723.800	0.00
724.000	0.76
725.000	11.17
726.000	27.74
727.000	40.54
728.000	50.65

Name: STR 403 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
720.200	0.00
721.000	4.65
722.000	15.70
723.000	23.26
724.000	29.26

==== Pipes =====

Name: POND 2 OUTLET	From Node: Pond 2	Length(ft): 880.00
Group: BASE	To Node: Pond 1	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.50
Invert(ft): 713.250	712.250	Exit Loss Coef: 1.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		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: PROP. PIPE	From Node: POND 2	Length(ft): 880.00
Group: BASE	To Node: POND 1	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 48.00	48.00	Flow: Both
Rise(in): 48.00	48.00	Entrance Loss Coef: 0.50
Invert(ft): 712.150	712.150	Exit Loss Coef: 1.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		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

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

Name: EX DITCH	From Node: EX DITCH	Length(ft): 970.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Trapezoidal	Trapezoidal	Solution Algorithm: Automatic
Invert(ft): 713.000	709.470	Flow: Both
TClpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N: 0.030000	0.030000	Expansion Coef: 0.300
Top Clip(ft): 0.000	0.000	Entrance Loss Coef: 0.000
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 dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft): 0.000	0.000	
LtSdSlp(h/v): 2.50	2.50	
RtSdSlp(h/v): 2.50	2.50	

=====
 === Drop Structures =====
 =====

Name: EX OUTLET STR	From Node: POND 1	Length(ft): 100.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 712.540	711.680	Exit Loss Coef: 1.000
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 dc
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 EX OUTLET STR ***

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): 4.00	Invert(ft): 712.150
Rise(in): 4.00	Control Elev(ft): 712.150

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

Name: EM WEIR 1	From Node: POND 1
Group: BASE	To Node: SE CORNER BDRY
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Trapezoidal

Bottom Width(ft): 80.00
Left Side Slope(h/v): 4.00
Right Side Slope(h/v): 4.00
Invert(ft): 715.850
Control Elevation(ft): 715.850
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

Name: EM. WEIR 2 From Node: POND 2
 Group: BASE To Node: EX DITCH
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 95.00
 Left Side Slope(h/v): 4.00
 Right Side Slope(h/v): 4.00
 Invert(ft): 715.800
 Control Elevation(ft): 715.800
 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

Name: EX WEIR From Node: POND 1
 Group: BASE To Node: SE CORNER BDRY
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Irregular

XSec: EX WEIR SECTION

Invert(ft): 714.650
 Control Elevation(ft): 714.650
 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

==== Rating Curves =====

Name: 402 OUTLET CMP From Node: STR 402 Count: 1
 Group: BASE To Node: POND 1 Flow: Both

	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 402 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

Name: 403 OUTLET CMP From Node: STR 403 Count: 1
 Group: BASE To Node: POND 1 Flow: Both

	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 403 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

==== Hydrology Simulations =====

Name: 002YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 3.00

Time(hrs)	Print Inc(min)
30.000	10.00

 Name: 010YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 4.30

Time(hrs)	Print Inc(min)
30.000	10.00

 Name: 100YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 5.90

Time(hrs)	Print Inc(min)
30.000	10.00

==== Routing Simulations =====

Name: 002YR-24HR Hydrology Sim: 002YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 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)
30.000	10.000

Group	Run
BASE	Yes

 Name: 010YR-24HR Hydrology Sim: 010YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 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)
30.000	10.000

Group	Run
BASE	Yes

 Name: 100YR-24HR Hydrology Sim: 100YR-24HR
 Filename: K:\IND_LDEV\170021004_Tippmann_Franklin-IWI_Phase 7A Expansion_Franklin_IN\2 Design\Drainage\Drainage Report Rev_
 Execute: Yes Restart: No Patch: No
 Alternative: No
 Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500

FRANKLIN IWI - PHASE 7A EXPANSION - 170021004
REPORT: ONSITE + OFFSITE
NOTE: ALTERED MODEL FROM "INTERSTATE WAREHOUSING PHASES IV-VI FRANKLIN, IN"
COMPLETED BY THE SCHNEIDER CORPORATION (APPROVED: 9/27/2012)

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)
30.000	10.000

Group	Run
BASE	Yes

Appendix G: Schneider Drainage Report

DRAINAGE CALCULATIONS

INTERSTATE WAREHOUSING PHASES IV-VI FRANKLIN, INDIANA

CLIENT:

**TIPPMAN CONSTRUCTION INC.
9099 COLDWATER ROAD
FORT WAYNE, IN 46825**



**THE SCHNEIDER CORPORATION
Historic Fort Harrison
8901 Otis Avenue
Indianapolis, IN 46216-1037
317-826-7100
317-826-7300 Fax**

**December 16, 2010
Revised: November 14, 2011
Revised: December 13, 2011
Revised: January 3, 2012
Revised: September 26, 2012**

FILE COPY



APPROVED

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NODE MAX COMPARISON REPORT – *ONSITE ONLY*

BASIN MAX COMPARISON REPORT – *ONSITE ONLY*

INPUT REPORT – *ONSITE ONLY*

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NODE MAX COMPARISON REPORT – *ONSITE + OFFSITE*

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DRAINAGE NARRATIVE

Phases IV-VI of the Interstate Warehousing Project includes the construction of the phases IV-VI of the building, expansion of the trailer staging lot north of phase IV, and expansion of the truck lot along the east side of the building. In phase 1 of the project, all necessary water quality and detention facilities were designed and built to accommodate phase II and III expansions, which have been constructed. Please refer to the "Hydrological Study for Franklin Tech Park Lot 2", dated October 29, 2004, prepared by KOE Engineering and Surveying, Inc. for more information regarding the overall site detention and water quality plan for phase I-III.

Phases IV-VI, are additional phases that Tippmann Construction has added to this project. These expansions will go along the east side of the current building and be similar to the size and use of Phases I-III. The existing water quality detention pond will need to be revised and a second pond constructed to account for the additional phases IV – VI. These ponds will be connected with a 24" RCP outlet. As-built information for the existing water quality and weir structures for the existing pond have been collected and modeled in this report. The Schneider Corporation has reviewed the latest drainage report from KOE Engineering and Surveying, Inc. call "Hydrological Study for Franklin Tech Park Block E Southeast Water Quality and Detention Serving a Part of Bartram Parkway and a Part of Block E" dated December 24, 2007. The following information was provided in this report:

114.3 acre parcel of land that drains to the northwest corner of the intersection of County Road 525 and County Road 75 has an allowable release rate of 29.3cfs during a 100 year event.

Tippmann Construction has already developed 30.5 acres (Phases I-III) and the area has a release rate of 12.7cfs. The remaining area is $114.3\text{AC} - 30.5\text{AC} = 83.8\text{ AC}$. The remaining release rate is $29.3\text{cfs} - 12.7\text{cfs} = 16.6\text{cfs}$.

Therefore the allowable release rate per acre is $16.6\text{cfs} / 83.8\text{ AC} = 0.1981\text{cfs/acre}$.

Phases IV-VI will add an additional 48.66 acres to the project. The allowable release rate per acre for the addition is $48.66\text{ AC} \times 0.1981\text{cfs/ac} = 9.64\text{ cfs}$. Therefore the allowable release rate for this project is $12.7\text{cfs} + 9.64\text{cfs} = 22.34\text{ cfs}$.

The proposed conditions were modeled using Interconnected Channel and Pond Routing (ICPR) software to determine the 2 year, 10 year and 100 year release rates. However, the latest drainage report from KOE Engineering and Surveying, Inc. called "Hydrological Study for Franklin Tech Park Block E Southeast Water Quality and Detention Serving a Part of Bartram Parkway and a Part of Block E" dated December 24, 2007 only gives restraints to the 100 year release rate. The 2 year and 10 year storms were modeled but there was no information to compare the release rates. The proposed model was built to calculate two different scenarios in order to determine the allowable release rate, the overall release rate, and the 100-year high water elevation. The *Onsite Only* model only calculates the release rates for the two onsite basins, Basin Pr-1 and Basin PR-2. This release is then compared to the allowable release rate for the project which is 20.27cfs. The *Onsite + Offsite* model calculates the release rates for the overall watershed to the two connected ponds and provides the high water elevations for each pond.

There are three offsite areas that drain into the proposed pond system. These basins are Offsite 1, and Structures 402 and 403. Structures 402 and 403 are basins that are on the west side of Interstate 65 that drain under the interstate, into the existing channel on the west side of the proposed site and then into the existing Pond 1. This information was taken from the KOE Engineering and Surveying, Inc. drainage report called "Hydrological Study for Franklin Tech Park Block E Southeast Water Quality and Detention Serving a Part of Bartram Parkway and a Part of Block E" dated December 24, 2007. These areas have a release rate of 46.7cfs for the 100 year event. The Offsite 1 basin is located in the northwest corner of the site. This area drains under Bartram Parkway and into Pond 2. All three offsite areas will not be detained and future detention ponds will need to be constructed for these areas. A third ICPR model was setup to calculate the peak release rate for each pond which was then used to size the emergency spillways for both ponds.

Below is a summary of the release rates:

Proposed Conditions Release Rates Per ICPR Analysis			
ICPR Boundary Node	2-yr (cfs)	10-yr (cfs)	100-yr (cfs)
SE CORNER BDRY – <i>Onsite Only</i>	2.41	8.92	19.51
SE CORNER BDRY – <i>Onsite + Offsite</i>	11.49	38.75	87.42

CONCLUSIONS

From the results above, the 100-year proposed release rate for Phases IV-VI is less than the 100-year allowable release rate and therefore meets the given requirements.

REFERENCES

Design methods and data are based on the following references:

1. *City of Franklin Subdivivsion Control Ordinance* (April 11, 2005)
2. ICPR pond routing and modeling software
3. "Hydrological Study for Franklin Tech Park Block E Southeast Water Quality and Detention Serving a Part of Bartram Parkway and a Part of Block E" dated December 24, 2007 by KOE Engineering and Surveying, Inc.

PROPOSED CONDITIONS

Interstate Warehousing

7124.002

12/13/2011

Onsite[illegible]

Time of Concentration Worksheet

Based on TR-55

PROJECT: Interstate Warehousing

JOB #: 7124.002

Typical values for Manning's n

Overland Flow		Channel Flow	
Pavement	0.011	Grass	0.03
Dense Grass	0.24	Concrete	0.013
Cult. Soil	0.17	Rip-Rap	0.035

2 year, 24 hour rainfall = 2.66 inches
minimum T_c = 5 minutes

Basin name	Overland flow				seg. 2				Shallow Concentrated Flow				Pipe Flow (General)				T _c (min)
	Length (ft)	S %	n	T _t (min)	Length (ft)	S %	n	T _t (min)	Length (ft)	S %	Paved/Un (P or U)	Vel (ft/s)	Length (ft)	Vel (ft/s)	T _t (min)	T _c (min)	
BASIN PR 1																	22.2
BASIN PR 2	100	1.00	0.24	21									690	5.00	2		23
Offsite 1	100	1.00	0.17	16					921	1.00	U	1.61	489	4.74	2		27

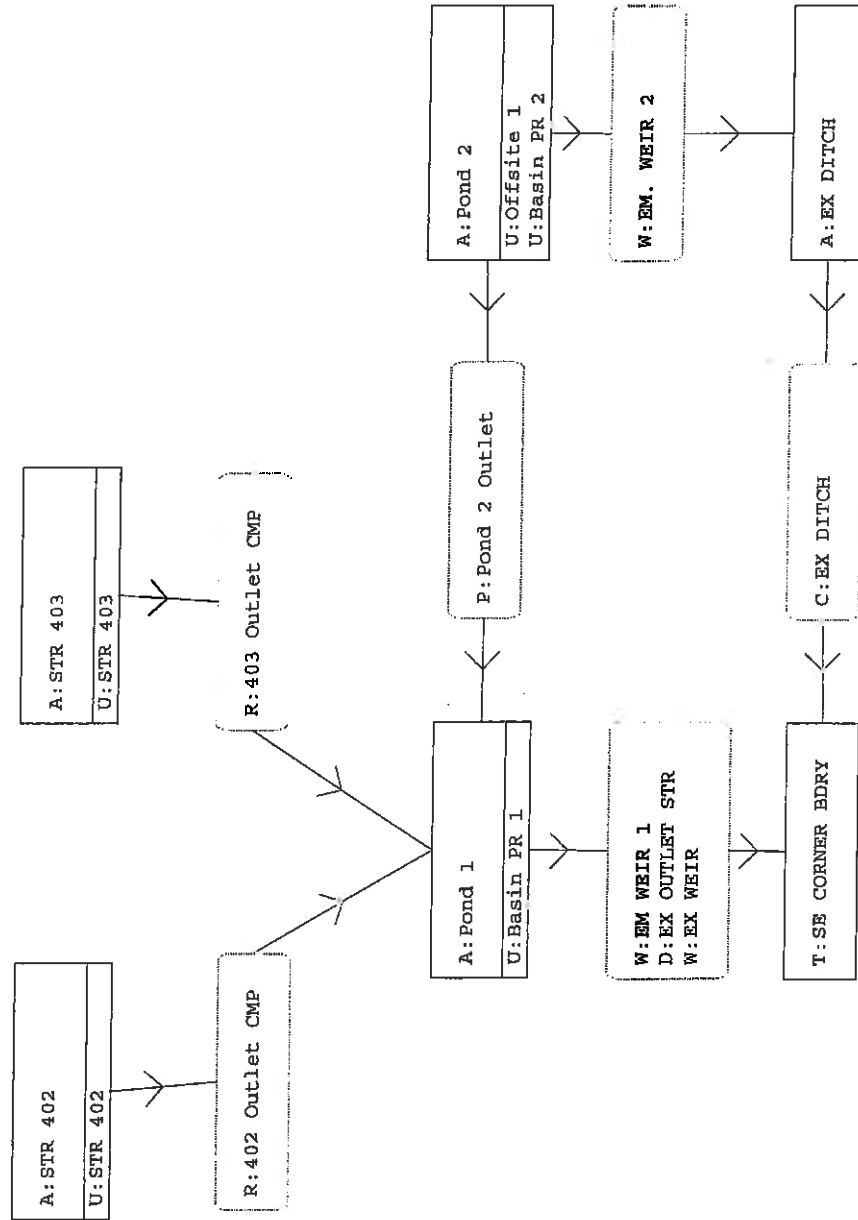
* From KOE Report

Nodes

A Stage/Area
 V Stage/Volume
 T Time/Stage
 M Manhole

Basins
 O Overland Flow
 U SCS Unit CN
 S SBUH CN
 Y SCS Unit GA
 Z SBUH GA

Links
 P Pipe
 W Weir
 C Channel
 D Drop Structure
 B Bridge
 R Rating Curve
 H Breach
 E Percolation
 F Filter
 X Exfil Trench



Interstate Warehousing Phase IV - VI Expansion and Existing KOZ 2004 Model Replies
 Report: ICPR Node Report - Onsite Only
 Completed By: KAC 12/15/2011
 File: T:\7h\124\002\drainage\ICPR\7124002PR-r.ICP

Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
EX DITCH	002YR-24HR	713.00	716.00	0.0000	113	0.00	0.00
EX DITCH	010YR-24HR	713.00	716.00	0.0000	113	0.00	0.00
EX DITCH	100YR-24HR	713.00	716.00	0.0000	113	0.00	0.00
Pond 1	002YR-24HR	714.29	717.00	0.0050	183918	67.29	2.41
Pond 1	010YR-24HR	714.70	717.00	0.0050	194333	109.52	8.92
Pond 1	100YR-24HR	715.16	717.00	0.0050	221109	160.97	19.51
Pond 2	002YR-24HR	714.31	717.00	0.0040	190250	74.81	4.58
Pond 2	010YR-24HR	714.87	717.00	0.0039	197216	121.17	7.85
Pond 2	100YR-24HR	715.66	717.00	0.0038	206764	178.30	16.57
SE CORNER BDRY	002YR-24HR	709.45	715.25	0.0000	0	2.41	0.00
SE CORNER BDRY	010YR-24HR	709.45	715.25	0.0000	0	8.92	0.00
SE CORNER BDRY	100YR-24HR	709.45	715.25	0.0000	0	19.51	0.00
STR 402	002YR-24HR	720.20	728.00	0.0000	113	0.00	0.00
STR 402	010YR-24HR	720.20	728.00	0.0000	113	0.00	0.00
STR 402	100YR-24HR	720.20	728.00	0.0000	113	0.00	0.00
STR 403	002YR-24HR	720.20	724.00	0.0000	113	0.00	0.00
STR 403	010YR-24HR	720.20	724.00	0.0000	113	0.00	0.00
STR 403	100YR-24HR	720.20	724.00	0.0000	113	0.00	0.00

→ ALLOWABLE = 22.34 cfs ✓

→ 100-YR POND ELEVATION FOR ONSITE ONLY

Interstate Warehousing Phase IV - VI Expansion and Existing KOE 2004 Model Replica
 Report: ICPR Basin Report - Onsite Only
 Completed By: KKC 12/13/2011
 File: T:\7k\7124\002\drainage\ICPR\7124002PR-r.ICP

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
002YR-24HR	Basin PR 1	BASE	12.14	68.832	1.91	252330.83
010YR-24HR	Basin PR 1	BASE	12.14	110.161	3.12	411503.94
100YR-24HR	Basin PR 1	BASE	12.14	160.924	4.65	613647.60
002YR-24HR	Basin PR 2	BASE	12.11	76.913	1.83	284703.40
010YR-24HR	Basin PR 2	BASE	12.11	125.463	3.02	469969.73
100YR-24HR	Basin PR 2	BASE	12.11	185.452	4.54	706454.07
002YR-24HR	Offsite 1	BASE	12.18	26.410	1.44	106505.89
010YR-24HR	Offsite 1	BASE	12.18	46.608	2.55	187644.18
100YR-24HR	Offsite 1	BASE	12.18	72.376	3.99	294408.26
002YR-24HR	STR 402	BASE	12.83	22.542	0.55	238983.63
010YR-24HR	STR 402	BASE	12.75	62.042	1.28	554393.41
100YR-24HR	STR 402	BASE	12.75	123.589	2.38	1030768.97
002YR-24HR	STR 403	BASE	12.67	15.510	0.60	144066.47
010YR-24HR	STR 403	BASE	12.67	41.102	1.35	326332.92
100YR-24HR	STR 403	BASE	12.58	80.249	2.48	598538.17

=====

Basins

=====

Name: Basin PR 1	Node: Pond 1	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 22.20	
Area(ac): 36.330	Time Shift(hrs): 0.00	
Curve Number: 89.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Basin Data of overall onsite pond drainage area

Name: Basin PR 2	Node: Pond 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 23.00	
Area(ac): 42.830	Time Shift(hrs): 0.00	
Curve Number: 88.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: Offsite 1	Node: Pond 2	Status: Inactive
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 27.00	
Area(ac): 20.310	Time Shift(hrs): 0.00	
Curve Number: 83.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Offsite basin located north of the site.

Name: STR 402	Node: STR 402	Status: Inactive
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 75.00	
Area(ac): 119.100	Time Shift(hrs): 0.00	
Curve Number: 66.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

KOE Drainage Report Page 5

Name: STR 403	Node: STR 403	Status: Inactive
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 64.80	
Area(ac): 66.400	Time Shift(hrs): 0.00	
Curve Number: 67.30	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

KOE Drainage Report Page 26

=====

Nodes

=====

Name: EX DITCH	Base Flow(cfs): 0.000	Init Stage(ft): 713.000
Group: BASE		Warn Stage(ft): 716.000
Type: Stage/Area		

Stage(ft)	Area(ac)
713.000	0.0001
716.000	0.0010

Name: Pond 1 Base Flow(cfs): 0.000 Init Stage(ft): 712.150
 Group: BASE Warn Stage(ft): 717.000
 Type: Stage/Area

Pond Depth and Storage Relationship of expanded pond

Stage(ft)	Area(ac)
712.150	1.8100
713.000	3.0400
714.000	3.2500
715.000	4.9800
716.000	5.5500
717.000	5.9900
718.000	6.5400

Name: Pond 2 Base Flow(cfs): 0.000 Init Stage(ft): 713.250
 Group: BASE Warn Stage(ft): 717.000
 Type: Stage/Area

Stage(ft)	Area(ac)
713.250	4.0500
714.000	4.2600
715.000	4.5500
716.000	4.8400
717.000	5.1400
718.000	5.4400

Name: SE CORNER BDRY Base Flow(cfs): 0.000 Init Stage(ft): 709.450
 Group: BASE Warn Stage(ft): 715.250
 Type: Time/Stage

Northwest Corner of Country Road 75 South and Country Road 525 East

Time(hrs)	Stage(ft)
0.00	709.450
99.00	709.450

Name: STR 402 Base Flow(cfs): 0.000 Init Stage(ft): 720.200
 Group: BASE Warn Stage(ft): 728.000
 Type: Stage/Area

KOE Drainage Report Page 7

Stage(ft)	Area(ac)
720.200	0.0000
723.800	0.0000
724.000	0.6100
725.000	5.7390
726.000	15.3030
727.000	18.3650
728.000	22.9620

Name: STR 403 Base Flow(cfs): 0.000 Init Stage(ft): 720.200
 Group: BASE Warn Stage(ft): 724.000
 Type: Stage/Area

KOE Drainage Report Page 28

Stage(ft)	Area(ac)
720.200	0.0000
721.000	1.0330
722.000	2.2770
723.000	4.5910
724.000	9.6630

==== Cross Sections =====

Name: EX WEIR SECTION Group: BASE
 Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	717.420	0.013000
6.000	717.360	0.013000
6.010	714.100	0.013000
10.990	713.990	0.013000
11.000	717.300	0.013000
17.000	717.240	0.013000

==== Operating Tables =====

Name: STR 402 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

Rating Curve KOE Page 8

US Stage(ft)	Discharge(cfs)
720.200	0.00
723.800	0.00
724.000	0.76
725.000	11.17
726.000	27.74
727.000	40.54
728.000	50.65

Name: STR 403 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

Rating Curve KOE Page 29

US Stage(ft)	Discharge(cfs)
720.200	0.00
721.000	4.65
722.000	15.70
723.000	23.25
724.000	29.26

==== Pipes =====

Name: Pond 2 Outlet From Node: Pond 2 Length(ft): 630.00
 Group: BASE To Node: Pond 1 Count: 1

UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 30.00	30.00	Flow: Both
Rise(in): 30.00	30.00	Entrance Loss Coef: 0.50
Invert(ft): 713.250	712.250	Exit Loss Coef: 1.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		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

==== Channels =====

Name: EX DITCH From Node: EX DITCH Length(ft): 970.00

Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Trapezoidal	Trapezoidal	Solution Algorithm: Automatic
Invert(ft): 713.000	709.470	Flow: Both
TClipInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N: 0.030000	0.030000	Expansion Coef: 0.300
Top Clip(ft): 0.000	0.000	Entrance Loss Coef: 0.000
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 dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft): 0.000	0.000	
LtSdSlp(h/v): 2.50	2.50	
RtSdSlp(h/v): 2.50	2.50	

===== Drop Structures =====

Name: EX OUTLET STR	From Node: Pond 1	Length(ft): 100.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 712.540	711.680	Exit Loss Coef: 1.000
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 dc
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 EX OUTLET STR ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Circular	Orifice Disc Coef: 0.600	
Span(in): 4.00	Invert(ft): 712.150	
Rise(in): 4.00	Control Elev(ft): 712.150	

===== Weirs =====

Name: EM WEIR 1	From Node: Pond 1
Group: BASE	To Node: SE CORNER BDRY
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Trapezoidal
Bottom Width(ft): 80.00	
Left Side Slope(h/v): 4.00	
Right Side Slope(h/v): 4.00	
Invert(ft): 715.250	
Control Elevation(ft): 715.250	
Struct Opening Dim(ft): 9999.00	
Bottom Clip(ft): 0.000	TABLE
Top Clip(ft): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

Name: EM WEIR 2	From Node: Pond 2
Group: BASE	To Node: EX DITCH

Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 95.00
 Left Side Slope(h/v): 4.00
 Right Side Slope(h/v): 4.00
 Invert(ft): 715.800
 Control Elevation(ft): 715.800
 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

Name: EX WEIR From Node: Pond 1
 Group: BASE To Node: SE CORNER BDRY
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Irregular

XSec: EX WEIR SECTION

Invert(ft): 713.990
 Control Elevation(ft): 713.990
 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

Rating Curves

Name: 402 Outlet CMP From Node: STR 402 Count: 1
 Group: BASE To Node: Pond 1 Flow: Both

TABLE

	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 402 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

KOE Drainage Report Page 8

Name: 403 Outlet CMP From Node: STR 403 Count: 1
 Group: BASE To Node: Pond 1 Flow: Both

TABLE

	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 403 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

KOE Drainage Report Page 29

Hydrology Simulations

Name: 002YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\002YR-24HR.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 3.00

Time(hrs)	Print Inc(min)
30.000	10.00

Name: 010YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\010YR-24HR.R32

Override Defaults: Yes

Storm Duration(hrs): 24.00
Rainfall File: Scsii-24
Rainfall Amount(in): 4.30

Time(hrs)	Print Inc(min)
30.000	10.00

Name: 100YR-24HR
Filename: T:\7k\7124\002\drainage\ICPR\100YR-24HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Scsii-24
Rainfall Amount(in): 5.90

Time(hrs)	Print Inc(min)
30.000	10.00

==== Routing Simulations =====

Name: 002YR-24HR Hydrology Sim: 002YR-24HR
Filename: T:\7k\7124\002\drainage\ICPR\002YR-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)
30.000	10.000

Group	Run
BASE	Yes

Name: 010YR-24HR Hydrology Sim: 010YR-24HR
Filename: T:\7k\7124\002\drainage\ICPR\010YR-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)
30.000	10.000

Group	Run
BASE	Yes

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
Filename: T:\7k\7124\002\drainage\ICPR\100YR-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

Interstate Warehousing Phase IV - VI Expansion and Existing KOE 2004 Model Replica
Report: ICPR Input Report - Onsite Only
Completed By: KKC 12/13/2011
File: T:\7k\7124\002\drainage\ICPR\7124002PP-r.ICP

Boundary Stages:

Boundary Flows:

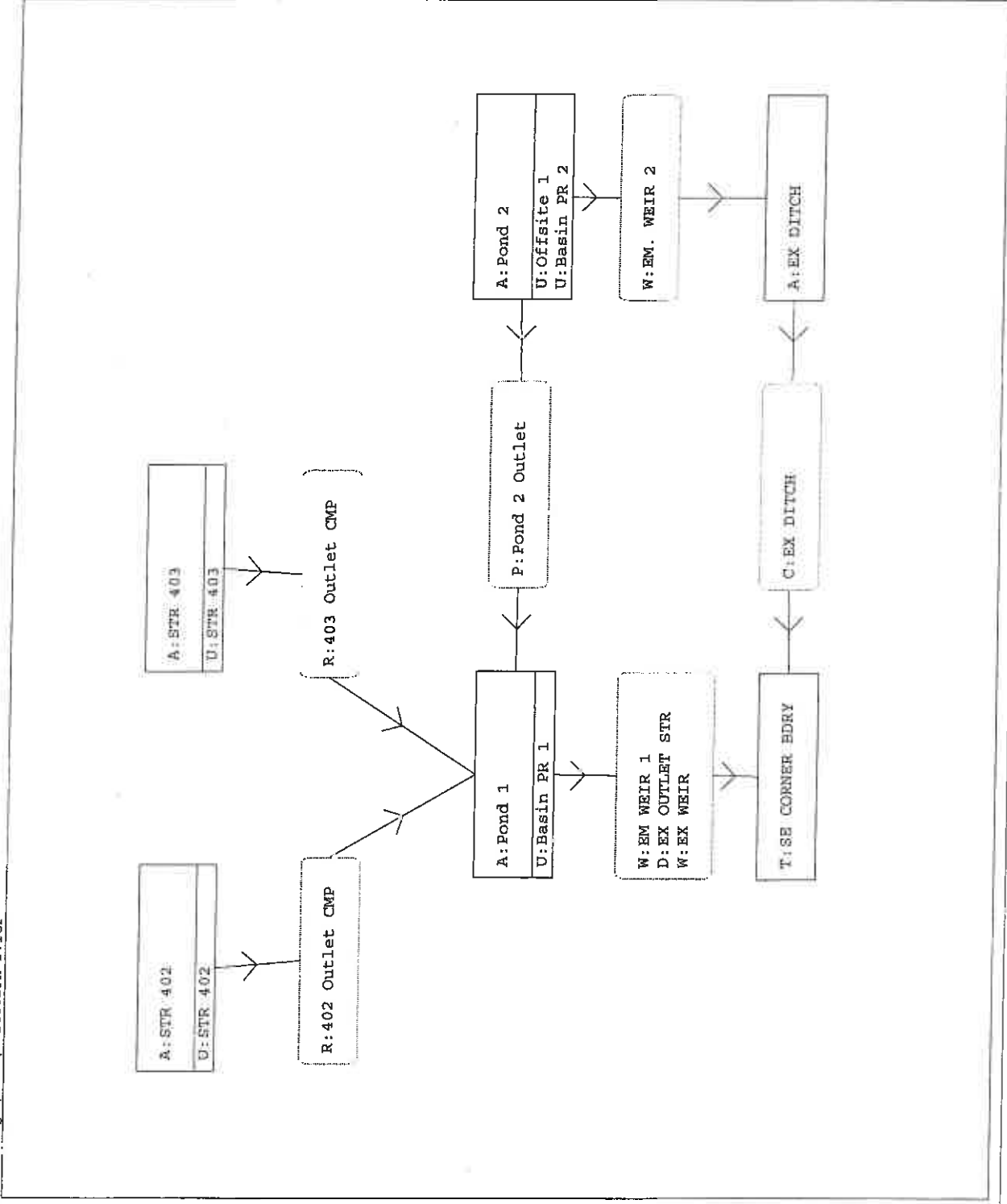
Time(hrs)	Print Inc(min)
30.000	10.000
Group	Run
BASE	Yes

Notes

A Stage/Area.
 V Stage/Volume
 T Time/Stage
 M Manhole

Basing
 O Overland Flow
 U SCS Unit CN
 S SBUH CN
 Y SCS Unit GA
 Z SBUH GA

Links
 P Pipe
 W Weir
 C Channel
 D Drop Structure
 B Bridge
 R Rating Curve
 H Breach
 E Percolation
 F Filter
 X Exfil Trench



Name	Simulation	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Inflow cfs	Max Outflow cfs
EX DITCH	002YR-24HR	713.00	716.00	0.0000	113	0.00	0.00
EX DITCH	010YR-24HR	713.00	716.00	0.0000	113	0.00	0.00
EX DITCH	100YR-24HR	715.62	716.00	0.0050	5990	47.10	46.57
Pond 1	002YR-24HR	714.82	717.00	0.0050	203720	70.31	11.49
Pond 1	010YR-24HR	715.39	717.00	0.0050	205720	118.08	38.75
Pond 1	100YR-24HR	715.52	717.00	0.0050	229926	177.56	65.97
Pond 2	002YR-24HR	714.85	717.00	0.0055	196902	100.98	7.15
Pond 2	010YR-24HR	715.52	717.00	0.0048	205168	167.52	13.51
Pond 2	100YR-24HR	716.09	717.00	0.0040	212502	250.32	60.28
SE CORNER BDRY	002YR-24HR	709.45	715.25	0.0000	0	11.45	0.00
SE CORNER BDRY	010YR-24HR	709.45	715.25	0.0000	0	33.75	0.00
SE CORNER BDRY	100YR-24HR	709.45	715.25	0.0000	0	87.42	0.00
STR 402	002YR-24HR	724.69	728.00	0.0056	180611	22.54	7.94
STR 402	010YR-24HR	725.83	728.00	0.0050	368551	61.60	15.89
STR 402	100YR-24HR	725.83	728.00	0.0050	500565	122.69	24.95
STR 403	002YR-24HR	721.28	724.00	-0.0036	50243	15.51	7.76
STR 403	010YR-24HR	722.09	724.00	-0.0039	109157	41.09	16.37
STR 403	100YR-24HR	722.95	724.00	-0.0050	195402	79.48	22.92

USE FOR EMERGENCY
WEIR CALCS.

ONSITE + OFFSITE
RELEASE RATES

100-YR POND ELEVATION FOR ONSITE & OFFSITE

Interstate Warehousing Phase IV - VI Expansion and Existing KOE 2004 Model Replica
 Report: ICPR Basin Report - Onsite + Offsite
 Completed By: KKC 12/13/2011
 File: T:\7k\7124\002\drainage\ICPR\7124002PR-r.ICP

Simulation	Basin	Group	Time Max hrs	Flow Max cfs	Volume in	Volume ft3
002YR-24HR	Basin PR 1	BASE	12.14	68.832	1.91	252330.83
010YR-24HR	Basin PR 1	BASE	12.14	110.161	3.12	411503.94
100YR-24HR	Basin PR 1	BASE	12.14	160.924	4.65	613647.60
002YR-24HR	Basin PR 2	BASE	12.11	76.918	1.83	284703.40
010YR-24HR	Basin PR 2	BASE	12.11	125.463	3.02	469969.73
100YR-24HR	Basin PR 2	BASE	12.11	185.452	4.54	706454.07
002YR-24HR	Offsite 1	BASE	12.18	26.410	1.44	106505.89
010YR-24HR	Offsite 1	BASE	12.18	46.608	2.55	187644.18
100YR-24HR	Offsite 1	BASE	12.18	72.376	3.99	294408.26
002YR-24HR	STR 402	BASE	12.83	22.542	0.55	238983.63
010YR-24HR	STR 402	BASE	12.75	62.042	1.28	554393.41
100YR-24HR	STR 402	BASE	12.75	123.589	2.38	1030768.97
002YR-24HR	STR 403	BASE	12.67	15.510	0.60	144066.47
010YR-24HR	STR 403	BASE	12.67	41.102	1.35	326332.92
100YR-24HR	STR 403	BASE	12.58	80.249	2.48	598538.17

==== Basins =====

Name: Basin PR 1	Node: Pond 1	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 22.20	
Area(ac): 36.330	Time Shift(hrs): 0.00	
Curve Number: 89.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Basin Data of overall onsite pond drainage area

Name: Basin PR 2	Node: Pond 2	Status: Onsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 23.00	
Area(ac): 42.830	Time Shift(hrs): 0.00	
Curve Number: 88.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Name: Offsite 1	Node: Pond 2	Status: Offsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 27.00	
Area(ac): 20.310	Time Shift(hrs): 0.00	
Curve Number: 83.00	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

Offsite basin located north of the site.

Name: STR 402	Node: STR 402	Status: Offsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 75.00	
Area(ac): 119.100	Time Shift(hrs): 0.00	
Curve Number: 66.20	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

KOE Drainage Report Page 5

Name: STR 403	Node: STR 403	Status: Offsite
Group: BASE	Type: SCS Unit Hydrograph CN	
Unit Hydrograph: Uh484	Peaking Factor: 484.0	
Rainfall File:	Storm Duration(hrs): 0.00	
Rainfall Amount(in): 0.000	Time of Conc(min): 64.80	
Area(ac): 66.400	Time Shift(hrs): 0.00	
Curve Number: 67.30	Max Allowable Q(cfs): 999999.000	
DCIA(%): 0.00		

KOE Drainage Report Page 26

==== Nodes =====

Name: EX DITCH	Base Flow(cfs): 0.000	Init Stage(ft): 713.000
Group: BASE		Warn Stage(ft): 716.000
Type: Stage/Area		

Stage(ft)	Area(ac)
713.000	0.0001
716.000	0.0010

Name: Pond 1 Base Flow(cfs): 0.000 Init Stage(ft): 712.150
 Group: BASE Warn Stage(ft): 717.000
 Type: Stage/Area

Pond Depth and Storage Relationship of expanded pond

Stage(ft)	Area(ac)
712.150	1.8100
713.000	3.0400
714.000	3.2500
715.000	4.9800
716.000	5.5500
717.000	5.9900
718.000	6.5400

Name: Pond 2 Base Flow(cfs): 0.000 Init Stage(ft): 713.250
 Group: BASE Warn Stage(ft): 717.000
 Type: Stage/Area

Stage(ft)	Area(ac)
713.250	4.0500
714.000	4.2600
715.000	4.5500
716.000	4.8400
717.000	5.1400
718.000	5.4100

Name: SE CORNER BDRY Base Flow(cfs): 0.000 Init Stage(ft): 709.450
 Group: BASE Warn Stage(ft): 715.250
 Type: Time/Stage

Northwest Corner of Country Road 75 South and Country Road 525 East

Time(hrs)	Stage(ft)
0.00	709.450
99.00	709.450

Name: STR 402 Base Flow(cfs): 0.000 Init Stage(ft): 720.200
 Group: BASE Warn Stage(ft): 728.000
 Type: Stage/Area

KOE Drainage Report Page 7

Stage(ft)	Area(ac)
720.200	0.0000
723.800	0.0000
724.000	0.6100
725.000	5.7390
726.000	15.3030
727.000	18.3650
728.000	22.9620

Name: STR 403 Base Flow(cfs): 0.000 Init Stage(ft): 720.200
 Group: BASE Warn Stage(ft): 724.000
 Type: Stage/Area

KOE Drainage Report Page 28

Stage(ft)	Area(ac)
720.200	0.0000
721.000	1.0330
722.000	2.2770
723.000	4.5910
724.000	9.6630

==== Cross Sections =====

Name: EX WEIR SECTION Group: BASE
 Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	717.420	0.013000
6.000	717.360	0.013000
6.010	714.100	0.013000
10.990	713.990	0.013000
11.000	717.300	0.013000
17.000	717.240	0.013000

==== Operating Tables =====

Name: STR 402 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

Rating Curve KOE Page 8

US Stage(ft)	Discharge(cfs)
720.200	0.00
723.800	0.00
724.000	0.76
725.000	11.17
726.000	27.74
727.000	40.54
728.000	50.65

Name: STR 403 Outlet Group: BASE
 Type: Rating Curve
 Function: US Stage vs. Discharge

Rating Curve KOE Page 29

US Stage(ft)	Discharge(cfs)
720.200	0.00
721.000	4.65
722.000	15.70
723.000	23.26
724.000	29.26

==== Pipes =====

Name: Pond 2 Outlet From Node: Pond 2 Length(ft): 630.00
 Group: BASE To Node: Pond 1 Count: 1
 Friction Equation: Automatic
 Solution Algorithm: Most Restrictive
 Flow: Both
 Entrance Loss Coef: 0.50
 Exit Loss Coef: 1.00
 Bend Loss Coef: 0.00
 Outlet Ctrl Spec: Use dc or tw
 Inlet Ctrl Spec: Use dc
 Stabilizer Option: None

UPSTREAM	DOWNSTREAM
Geometry: Circular	Circular
Span(in): 30.00	30.00
Rise(in): 30.00	30.00
Invert(ft): 713.250	712.250
Manning's N: 0.013000	0.013000
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

==== Channels =====

Name: EX DITCH From Node: EX DITCH Length(ft): 970.00

Group: BASE	To Node: SE CORNER BDPY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Trapezoidal	Trapezoidal	Solution Algorithm: Automatic
Invert(ft): 713.000	709.470	Flow: Both
TCIpInitZ(ft): 9999.000	9999.000	Contraction Coef: 0.100
Manning's N: 0.030000	0.030000	Expansion Coef: 0.300
Top Clip(ft): 0.000	0.000	Entrance Loss Coef: 0.000
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 dc
Aux XSec1:		Stabilizer Option: None
AuxElev2(ft):		
Aux XSec2:		
Top Width(ft):		
Depth(ft):		
Bot Width(ft): 0.000	0.000	
LtSdSlp(h/v): 2.50	2.50	
RtSdSlp(h/v): 2.50	2.50	

=====
 *** Drop Structures =====
 =====

Name: EX OUTLET STR	From Node: Pond 1	Length(ft): 100.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 712.540	711.680	Exit Loss Coef: 1.000
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 dc
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 EX OUTLET STR ***

Count: 1	Bottom Clip(in): 0.000	TABLE
Type: Vertical: Mavis	Top Clip(in): 0.000	
Flow: Both	Weir Disc Coef: 3.200	
Geometry: Circular	Orifice Disc Coef: 0.600	
Span(in): 4.00	Invert(ft): 712.150	
Rise(in): 4.00	Control Elev(ft): 712.150	

=====
 *** Weirs =====
 =====

Name: EM WEIR 1	From Node: Pond 1
Group: BASE	To Node: SE CORNER BDRY
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Trapezoidal
Bottom Width(ft): 80.00	
Left Side Slope(h/v): 4.00	
Right Side Slope(h/v): 4.00	
Invert(ft): 715.250	
Control Elevation(ft): 715.250	
Struct Opening Dim(ft): 9999.00	
Bottom Clip(ft): 0.000	TABLE
Top Clip(ft): 0.000	
Weir Discharge Coef: 3.200	
Orifice Discharge Coef: 0.600	

Name: EM WEIR 2	From Node: Pond 2
Group: BASE	To Node: EX DITCH

Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Trapezoidal

Bottom Width(ft): 95.00
 Left Side Slope(h/v): 4.00
 Right Side Slope(h/v): 4.00
 Invert(ft): 715.800
 Control Elevation(ft): 715.800
 Struct Opening Dim(ft): 9999.00

Bottom Clip(ft): 0.000
 Top Clip(ft): 0.000
 Weir Discharge Coef: 3.200
 Orifice Discharge Coef: 0.600

TABLE

Name: EX WEIR From Node: Pond 1
 Group: BASE To Node: SE CORNER BDRY
 Flow: Both Count: 1
 Type: Vertical: Mavis Geometry: Irregular

XSec: EX WEIR SECTION
 Invert(ft): 713.990
 Control Elevation(ft): 713.990
 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

==== Rating Curves =====

Name: 402 Outlet CMP From Node: STR 402 Count: 1
 Group: BASE To Node: Pond 1 Flow: Both

	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 402 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

KOE Drainage Report Page 8

Name: 403 Outlet CMP From Node: STR 403 Count: 1
 Group: BASE To Node: Pond 1 Flow: Both

	ELEV ON(ft)	ELEV OFF(ft)
#1: STR 403 Outlet	0.000	0.000
#2:	0.000	0.000
#3:	0.000	0.000
#4:	0.000	0.000

KOE Drainage Report Page 29

==== Hydrology Simulations =====

Name: 002YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\002YR-24HR.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scs11-24
 Rainfall Amount(in): 3.00

Time(hrs)	Print	Inc(min)
10.000		10.00

Name: 010YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\010YR-24HR.R32

Override Defaults: Yes

Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 4.30

Time(hrs)	Print Inc(min)
30.000	10.00

Name: 100YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\100YR-24HR.I32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scsii-24
 Rainfall Amount(in): 5.90

Time(hrs)	Print Inc(min)
30.000	10.00

==== Routing Simulations =====

Name: 002YR-24HR Hydrology Sim: 002YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\002YR-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)
30.000	10.000

Group	Run
BASE	Yes

Name: 010YR-24HR Hydrology Sim: 010YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\010YR-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)
30.000	10.000

Group	Run
BASE	Yes

Name: 100YR-24HR Hydrology Sim: 100YR-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\100YR-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

Interstate Warehousing Phase IV - VI Expansion and Existing KOE 2004 Model Replica
Report: ICPR Input Report - Onsite + Offsite
Completed By: KKC 12/13/2011
File: T:\7k\7124\002\drainage\ICPR\7124002PR-r.ICP

Boundary Stages:

Boundary Flows:

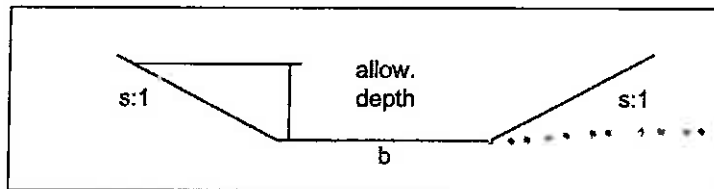
Time (hrs)	Print Inc (min)
30.000	10.000
Group	Run
BASE	Yes

Weir1

PROJECT NAME Interstate Warehouse
DESIGNER: KKC

JOB No.: 7124.002
DATE: 12/13/11

Purpose: To compute the maximum discharge for a weir section and compare it to the required design discharge.



TRAPEZOIDAL DITCH

W/ MIN. 2' FREEBOARD

MIN. TOP BANK = 718.15'

INPUT:

Enter Weir Location:	Pond 1
Enter Bottom Width, b:	30.0 feet
Enter Side Slopes, s:	4.0 : 1
Enter Allowable Depth:	0.90 feet
Enter Weir Slope:	0.00%
Enter Manning's Coef:	0.03

OUTPUT CALCULATIONS:

Area:	75.240 sq ft	
Wetted Perimeter:	87.422 feet	
Hydraulic Radius:	0.861 feet	$Q = 3.3 * b * H^{1.5}$
Maximum Velocity:	0.000 fps	(Cipoletti Weir Equation)
Top Width:	87.200 feet	where 3.3 = Spillway Coeff.
Maximum Discharge:	225.407 cfs	

SUMMARY:

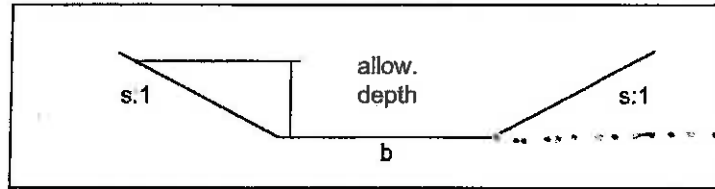
Design Discharge:	221.95 cfs (177.56 X 1.25)	Design is: SATISFACTORY
Maximum Discharge:	225.41 cfs.	

Weir2

PROJECT NAME Interstate Warehouse
DESIGNER: KKC

JOB No.: 7124.002
DATE: 12/13/11

Purpose: To compute the maximum discharge for a weir section and compare it to the required design discharge.



TRAPEZOIDAL DITCH

W/ MIN 2' FREEBOARD
MIN. TOP OF BANK = 718.70

INPUT:

Enter Weir Location:	Pond 2
Enter Bottom Width, b :	95.0 feet
Enter Side Slopes, s :	4.0 : 1
Enter Allowable Depth :	1.00 feet
Enter Weir Slope :	0.00%
Enter Manning's Coef. :	0.03

OUTPUT CALCULATIONS:

Area :	99.000 sq ft	
Wetted Perimeter :	103.246 feet	
Hydraulic Radius :	0.959 feet	$Q = 3.3 * b * H^{1.5}$
Maximum Velocity :	0.000 fps	(Cipoletti Weir Equation)
Top Width :	103.000 feet	where 3.3 = Spillway Coeff.
Maximum Discharge :	313.500 cfs	

SUMMARY:

Design Discharge :	312.90 cfs. (250.32 X 1.25)	Design is: SATISFACTORY
Maximum Discharge :	313.50 cfs.	

WATER QUALITY SUMMARY

Per Section 6.19H of 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 ½ inch of direct runoff, which is greater".

Total Onsite Developed Area (Basin PR-1 and Basin PR-2) = **79.16 Ac**

Volume from 1.25-inch, 24-hour storm (see ICPR calcs, this appendix) = **126,335 ft³**

20% of that value = **25,267 ft³**

0.5-inches of direct runoff $V = 79.16 \times (43,560 \text{ ft}^3/\text{Ac}) \times 0.5 \text{ in} \times (1 \text{ ft}/12 \text{ in}) = 143,675 \text{ ft}^3$

20% of that value = **28,735 ft³**

Water Quality Design Volume (Greater of the two) = **28,735 ft³**

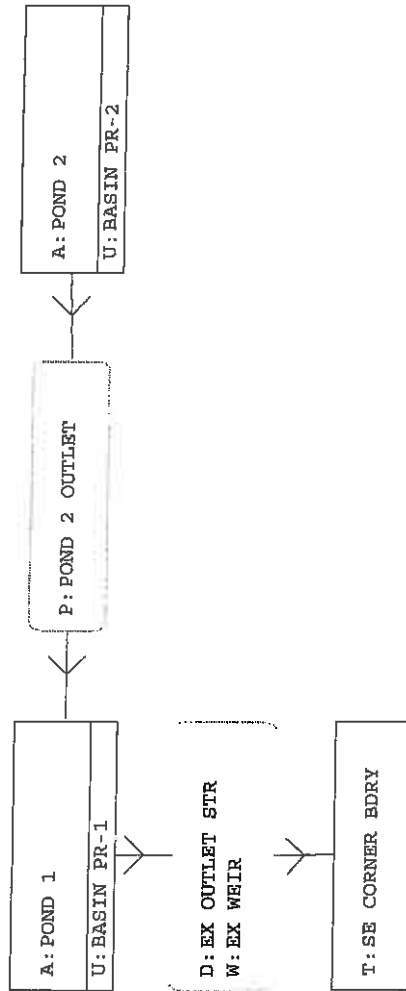
Time of Peak Runoff = **12.1 Hours**

24-Hours after Peak Runoff = **Hour 36.1 of simulation**

Volume Stored at Hour 24.0 (see mass balance ICPR report, this appendix) = **115,403 ft³**

The water quality criteria have been met.

- Nodes**
 A Stage/Area
 V Stage/Volume
 T Time/Stage
 M Manhole
- Basins**
 O Overland Flow
 U SCS Unit CN
 S SBUH CN
 Y SCS Unit GA
 Z SBUH GA
- Links**
 P Pipe
 W Weir
 C Channel
 D Drop Structure
 B Bridge
 R Rating Curve
 H Breach
 E Percolation
 F Filter
 X Exfil Trench



Interstate Warehousing Phase IV-VI Expansion
Report: ICPR Basin Summary Report - Water Quality Calculations
Completed By: KKC 12/13/2011
File: T:\7k\7124\002\drainage\ICPR\7124002WQ-r.ICP

Name: BASIN PR-1	BASIN PR-2
Group: BASE	BASE
Simulation: WQ-24HR	WQ-24HR
Node: POND 1	POND 2
Type: SCS	SCS
Unit Hydrograph: Un484	Un484
Peaking Factor: 484.0	484.0
Spec Time Inc(min): 2.96	3.07
Comp Time Inc(min): 2.96	3.07
Rain File: Scsii-24	Scsii-24
Rain Amount(in): 1.250	1.250
Duration(hrs): 24.00	24.00
Status: Onsite	Onsite
TC(min): 22.20	23.00
Time Shift(hrs): 0.00	0.00
Area(ac): 36.330	43.830
Vol of Unit Hyd(in): 1.00	1.00
Curve Num: 89.200	88.200
DCIA(%): 0.000	0.000
Time Max(hrs): 12.14	12.16
Flow Max(cfs): 16.201	17.068
Runoff Volume(in): 0.46	0.42
Runoff Volume(ft3): 60274.37	66060.73

Interstate Warehousing Phase IV-VI Expansion
 Report: ICPR Mass Balance Report - Water Quality Calculations
 Completed By: KKC 12/13/2011
 File: T:\7k\7124\002\drainage\ICPR\7124002WQ-r.ICP

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	0.00	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.08	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.26	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.34	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.42	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.50	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	0.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	1.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	2.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	3.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	4.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	5.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.60	0.0	0.0	0.0	0.0	0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	6.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	6.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	7.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	8.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.27	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.35	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.43	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.52	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.60	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.68	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.77	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.85	0.0	0.0	0.0	0.0	0.00
WQ-24HR	9.93	0.0	0.0	0.0	0.0	0.00
WQ-24HR	10.02	0.0	0.0	0.0	0.0	0.00
WQ-24HR	10.10	0.0	0.0	0.0	0.0	0.00
WQ-24HR	10.18	0.0	0.0	0.0	0.0	0.00
WQ-24HR	10.27	0.0	0.0	0.0	0.0	0.03
WQ-24HR	10.35	0.0	0.0	0.0	-0.0	-0.00
WQ-24HR	10.43	0.1	0.0	0.1	-0.0	-0.00
WQ-24HR	10.52	0.9	0.0	0.9	0.0	0.00
WQ-24HR	10.60	3.3	0.0	3.3	0.0	0.00
WQ-24HR	10.68	9.3	0.0	9.3	0.0	0.00
WQ-24HR	10.77	20.9	0.0	20.9	0.0	0.00
WQ-24HR	10.85	40.3	0.0	40.3	0.0	0.00
WQ-24HR	10.93	71.3	0.0	71.3	0.0	0.00
WQ-24HR	11.02	118.9	0.0	118.9	0.0	0.00
WQ-24HR	11.10	187.3	0.0	187.3	0.0	0.00
WQ-24HR	11.18	280.1	0.0	280.1	0.0	0.00
WQ-24HR	11.27	399.6	0.0	399.6	0.0	0.00
WQ-24HR	11.35	549.0	0.0	549.0	0.0	0.00
WQ-24HR	11.43	737.4	0.0	737.4	0.0	0.00
WQ-24HR	11.52	978.0	0.0	978.0	-0.0	-0.00
WQ-24HR	11.60	1317.2	0.0	1317.2	0.0	0.00
WQ-24HR	11.68	1910.2	0.0	1910.2	0.0	0.00
WQ-24HR	11.77	2967.4	0.0	2967.4	0.0	0.00
WQ-24HR	11.85	4765.9	0.0	4765.9	0.0	0.00
WQ-24HR	11.93	7869.6	0.0	7869.6	0.0	0.00
WQ-24HR	12.01	13118.8	0.0	13118.8	0.0	0.00
WQ-24HR	12.08	20733.2	0.0	20733.2	0.0	0.00
WQ-24HR	12.17	31144.0	0.0	31144.0	0.0	0.00
WQ-24HR	12.25	40014.6	0.0	40014.6	0.0	0.00
WQ-24HR	12.34	47027.4	0.0	47027.4	0.0	0.00
WQ-24HR	12.42	52341.1	0.0	52341.1	0.0	0.00
WQ-24HR	12.51	56416.2	0.0	56416.2	0.0	0.00
WQ-24HR	12.59	59585.4	0.0	59585.4	0.0	0.00
WQ-24HR	12.68	62173.6	0.0	62173.6	0.0	0.00
WQ-24HR	12.76	64272.2	0.0	64272.2	0.0	0.00
WQ-24HR	12.84	66159.7	0.0	66159.7	0.0	0.00
WQ-24HR	12.92	67937.2	0.0	67937.2	0.0	0.00
WQ-24HR	13.00	69528.0	0.0	69528.0	0.0	0.00
WQ-24HR	13.09	70960.3	0.0	70960.3	0.0	0.00
WQ-24HR	13.17	72282.7	0.0	72282.7	0.0	0.00
WQ-24HR	13.25	73532.3	0.0	73532.3	0.0	0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	13.34	74725.6	0.2	74725.4	0.0	0.00
WQ-24HR	13.42	75861.4	0.6	75860.8	0.0	0.00
WQ-24HR	13.50	76929.7	1.4	76928.3	0.0	0.00
WQ-24HR	13.59	77933.3	2.5	77930.8	0.0	0.00
WQ-24HR	13.67	78885.4	4.0	78881.3	0.0	0.00
WQ-24HR	13.75	79798.8	5.9	79792.9	0.0	0.00
WQ-24HR	13.84	80682.3	8.3	80674.0	0.0	0.00
WQ-24HR	13.92	81539.5	11.1	81528.4	0.0	0.00
WQ-24HR	14.00	82370.5	14.3	82356.2	0.0	0.00
WQ-24HR	14.09	83175.0	18.1	83156.9	0.0	0.00
WQ-24HR	14.17	83947.7	22.4	83925.2	0.0	0.00
WQ-24HR	14.25	84681.4	27.3	84654.1	0.0	0.00
WQ-24HR	14.34	85378.3	32.6	85345.7	0.0	0.00
WQ-24HR	14.42	86047.7	38.5	86009.2	0.0	0.00
WQ-24HR	14.50	86699.4	44.9	86654.4	0.0	0.00
WQ-24HR	14.59	87336.7	51.9	87284.8	0.0	0.00
WQ-24HR	14.67	87953.5	59.5	87894.0	0.0	0.00
WQ-24HR	14.75	88539.6	67.5	88472.0	0.0	0.00
WQ-24HR	14.84	89095.2	76.2	89019.0	0.0	0.00
WQ-24HR	14.92	89632.1	85.4	89546.7	0.0	0.00
WQ-24HR	15.00	90165.6	95.1	90070.5	-0.0	-0.00
WQ-24HR	15.09	90703.6	105.3	90598.3	-0.0	-0.00
WQ-24HR	15.17	91247.3	116.2	91131.1	-0.0	-0.00
WQ-24HR	15.25	91794.9	127.6	91667.3	-0.0	-0.00
WQ-24HR	15.34	92342.0	139.5	92202.4	-0.0	-0.00
WQ-24HR	15.42	92876.7	152.1	92724.6	-0.0	-0.00
WQ-24HR	15.50	93386.1	165.3	93220.8	-0.0	-0.00
WQ-24HR	15.59	93869.2	179.1	93690.2	-0.0	-0.00
WQ-24HR	15.67	94336.6	193.4	94143.3	-0.0	-0.00
WQ-24HR	15.75	94801.4	208.1	94593.3	-0.0	-0.00
WQ-24HR	15.84	95269.1	223.4	95045.6	-0.0	-0.00
WQ-24HR	15.92	95736.4	239.2	95497.1	-0.0	-0.00
WQ-24HR	16.00	96197.3	255.5	95941.8	-0.0	-0.00
WQ-24HR	16.09	96650.7	272.2	96378.5	-0.0	-0.00
WQ-24HR	16.17	97102.1	289.5	96812.6	-0.0	-0.00
WQ-24HR	16.25	97558.8	307.2	97251.5	-0.0	-0.00
WQ-24HR	16.34	98023.1	325.4	97697.6	-0.0	-0.00
WQ-24HR	16.42	98490.3	344.2	98146.2	-0.0	-0.00
WQ-24HR	16.50	98953.2	363.4	98589.8	-0.0	-0.00
WQ-24HR	16.59	99408.3	383.1	99025.3	-0.0	-0.00
WQ-24HR	16.67	99854.4	403.2	99451.2	-0.0	-0.00
WQ-24HR	16.75	100289.9	423.9	99866.0	-0.0	-0.00
WQ-24HR	16.84	100715.0	445.0	100270.0	-0.0	-0.00
WQ-24HR	16.92	101132.3	466.6	100665.8	-0.0	-0.00
WQ-24HR	17.00	101545.0	488.6	101056.4	-0.0	-0.00
WQ-24HR	17.09	101954.4	511.1	101443.3	-0.0	-0.00
WQ-24HR	17.17	102358.2	534.0	101824.2	-0.0	-0.00
WQ-24HR	17.25	102753.5	557.3	102196.1	-0.0	-0.00
WQ-24HR	17.34	103140.8	581.1	102559.6	-0.0	-0.00
WQ-24HR	17.42	103525.3	605.3	102919.9	-0.0	-0.00
WQ-24HR	17.50	103913.7	630.0	103283.7	-0.0	-0.00
WQ-24HR	17.59	104308.1	655.0	103653.1	-0.0	-0.00
WQ-24HR	17.67	104704.5	680.5	104024.0	-0.0	-0.00
WQ-24HR	17.75	105096.7	706.4	104390.4	-0.0	-0.00
WQ-24HR	17.84	105482.1	732.6	104749.4	-0.0	-0.00
WQ-24HR	17.92	105858.4	759.3	105099.1	-0.0	-0.00
WQ-24HR	18.00	106222.8	786.3	105436.4	-0.0	-0.00
WQ-24HR	18.09	106575.1	813.8	105761.3	-0.0	-0.00
WQ-24HR	18.17	106918.2	841.6	106076.6	-0.0	-0.00
WQ-24HR	18.25	107255.7	869.7	106386.0	-0.0	-0.00
WQ-24HR	18.34	107589.5	898.2	106691.2	-0.0	-0.00
WQ-24HR	18.42	107918.0	927.1	106990.9	-0.0	-0.00
WQ-24HR	18.50	108239.1	956.3	107282.8	-0.0	-0.00
WQ-24HR	18.59	108553.4	985.9	107567.5	-0.0	-0.00
WQ-24HR	18.67	108865.3	1015.8	107849.6	-0.0	-0.00
WQ-24HR	18.75	109180.5	1046.0	108134.5	-0.0	-0.00
WQ-24HR	18.84	109500.5	1076.6	108423.9	-0.0	-0.00
WQ-24HR	18.92	109821.9	1107.5	108714.4	-0.0	-0.00
WQ-24HR	19.00	110139.7	1138.7	109001.0	-0.0	-0.00
WQ-24HR	19.09	110452.9	1170.3	109282.5	-0.0	-0.00
WQ-24HR	19.17	110764.7	1202.2	109562.5	-0.0	-0.00
WQ-24HR	19.25	111080.2	1234.4	109845.8	-0.0	-0.00
WQ-24HR	19.34	111401.0	1267.0	110134.0	0.0	0.00
WQ-24HR	19.42	111723.6	1299.9	110423.7	-0.0	-0.00
WQ-24HR	19.50	112043.1	1333.1	110710.0	0.0	0.00
WQ-24HR	19.59	112357.9	1366.6	110991.3	0.0	0.00
WQ-24HR	19.67	112671.2	1400.4	111270.7	0.0	0.00
WQ-24HR	19.75	112987.9	1434.6	111555.3	0.0	0.00
WQ-24HR	19.84	113308.8	1469.1	111839.8	0.0	0.00
WQ-24HR	19.92	113626.4	1503.8	112122.6	0.0	0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	20.00	113930.0	1538.9	112391.1	0.0	0.00
WQ-24HR	20.09	114215.5	1574.3	112641.2	0.0	0.00
WQ-24HR	20.17	114484.3	1610.0	112874.3	0.0	0.00
WQ-24HR	20.25	114739.8	1645.9	113093.8	0.0	0.00
WQ-24HR	20.34	114985.5	1682.2	113303.4	0.0	0.00
WQ-24HR	20.42	115226.8	1718.6	113508.1	0.0	0.00
WQ-24HR	20.50	115468.8	1755.4	113713.4	0.0	0.00
WQ-24HR	20.59	115713.5	1792.4	113921.1	0.0	0.00
WQ-24HR	20.67	115958.7	1829.6	114129.0	0.0	0.00
WQ-24HR	20.75	116200.9	1867.2	114333.7	0.0	0.00
WQ-24HR	20.84	116439.2	1904.9	114534.3	0.0	0.00
WQ-24HR	20.92	116676.4	1942.9	114733.5	0.0	0.00
WQ-24HR	21.00	116916.3	1981.2	114935.1	0.0	0.00
WQ-24HR	21.09	117160.6	2019.7	115140.9	0.0	0.00
WQ-24HR	21.17	117408.7	2058.5	115350.3	0.0	0.00
WQ-24HR	21.25	117659.2	2097.5	115561.8	0.0	0.00
WQ-24HR	21.34	117910.6	2136.7	115773.9	0.0	0.00
WQ-24HR	21.42	118160.1	2176.2	115983.9	0.0	0.00
WQ-24HR	21.50	118405.2	2216.0	116189.2	0.0	0.00
WQ-24HR	21.59	118645.8	2255.9	116389.9	0.0	0.00
WQ-24HR	21.67	118885.1	2296.2	116588.9	0.0	0.00
WQ-24HR	21.75	119126.9	2336.6	116790.3	0.0	0.00
WQ-24HR	21.84	119372.4	2377.3	116995.1	0.0	0.00
WQ-24HR	21.92	119619.0	2418.2	117200.8	0.0	0.00
WQ-24HR	22.00	119862.9	2459.4	117403.5	0.0	0.00
WQ-24HR	22.09	120103.1	2500.8	117602.3	0.0	0.00
WQ-24HR	22.17	120342.3	2542.4	117799.9	0.0	0.00
WQ-24HR	22.25	120584.3	2584.3	118000.0	0.0	0.00
WQ-24HR	22.34	120830.2	2626.4	118203.8	0.0	0.00
WQ-24HR	22.42	121077.5	2668.7	118408.8	0.0	0.00
WQ-24HR	22.50	121322.3	2711.2	118611.0	0.0	0.00
WQ-24HR	22.59	121563.4	2754.0	118809.4	0.0	0.00
WQ-24HR	22.67	121803.3	2797.0	119006.3	0.0	0.00
WQ-24HR	22.75	122045.9	2840.2	119205.6	0.0	0.00
WQ-24HR	22.84	122292.8	2883.7	119409.2	0.0	0.00
WQ-24HR	22.92	122543.7	2927.3	119616.4	0.0	0.00
WQ-24HR	23.00	122797.0	2971.2	119825.8	0.0	0.00
WQ-24HR	23.09	123051.3	3015.3	120035.9	0.0	0.00
WQ-24HR	23.17	123303.8	3059.7	120244.1	0.0	0.00
WQ-24HR	23.25	123551.8	3104.2	120447.5	0.0	0.00
WQ-24HR	23.34	123795.1	3149.0	120646.1	0.0	0.00
WQ-24HR	23.42	124037.0	3194.0	120843.0	0.0	0.00
WQ-24HR	23.50	124281.4	3239.2	121042.2	0.0	0.00
WQ-24HR	23.59	124529.6	3284.6	121245.0	0.0	0.00
WQ-24HR	23.67	124779.0	3330.2	121448.8	0.0	0.00
WQ-24HR	23.75	125025.6	3376.0	121649.6	0.0	0.00
WQ-24HR	23.84	125267.3	3422.1	121845.2	0.0	0.00
WQ-24HR	23.92	125500.0	3468.3	122031.7	0.0	0.00
WQ-24HR	24.00	125718.0	3514.8	122203.2	0.0	0.00
WQ-24HR	24.09	125913.8	3561.4	122352.4	0.0	0.00
WQ-24HR	24.17	126072.8	3608.2	122464.6	0.0	0.00
WQ-24HR	24.25	126184.5	3655.2	122529.3	0.0	0.00
WQ-24HR	24.34	126253.2	3702.3	122550.9	0.0	0.00
WQ-24HR	24.42	126292.7	3749.5	122543.1	0.0	0.00
WQ-24HR	24.50	126315.3	3796.9	122518.5	0.0	0.00
WQ-24HR	24.59	126328.2	3844.3	122484.0	0.0	0.00
WQ-24HR	24.67	126335.5	3891.8	122443.7	0.0	0.00
WQ-24HR	24.75	126339.4	3939.4	122400.0	0.0	0.00
WQ-24HR	24.84	126341.4	3987.1	122354.3	0.0	0.00
WQ-24HR	24.92	126342.3	4034.9	122307.4	0.0	0.00
WQ-24HR	25.00	126342.7	4082.8	122259.9	0.0	0.00
WQ-24HR	25.09	126342.7	4130.8	122212.0	0.0	0.00
WQ-24HR	25.17	126342.7	4178.8	122163.9	0.0	0.00
WQ-24HR	25.25	126342.7	4226.9	122115.8	-0.0	-0.00
WQ-24HR	25.34	126342.7	4275.2	122067.6	-0.0	-0.00
WQ-24HR	25.42	126342.7	4323.5	122019.3	-0.0	-0.00
WQ-24HR	25.50	126342.7	4371.8	121970.9	-0.0	-0.00
WQ-24HR	25.59	126342.7	4420.3	121922.4	-0.0	-0.00
WQ-24HR	25.67	126342.7	4468.8	121873.9	-0.0	-0.00
WQ-24HR	25.75	126342.7	4517.5	121825.3	-0.0	-0.00
WQ-24HR	25.84	126342.7	4566.2	121776.6	-0.0	-0.00
WQ-24HR	25.92	126342.7	4614.9	121727.8	-0.0	-0.00
WQ-24HR	26.00	126342.7	4663.8	121679.0	-0.0	-0.00
WQ-24HR	26.09	126342.7	4712.7	121630.0	-0.0	-0.00
WQ-24HR	26.17	126342.7	4761.7	121581.0	-0.0	-0.00
WQ-24HR	26.25	126342.7	4810.8	121532.0	-0.0	-0.00
WQ-24HR	26.34	126342.7	4859.9	121482.8	-0.0	-0.00
WQ-24HR	26.42	126342.7	4909.1	121433.6	-0.0	-0.00
WQ-24HR	26.50	126342.7	4958.4	121384.3	-0.0	-0.00
WQ-24HR	26.59	126342.7	5007.8	121335.0	-0.0	-0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	26.67	126342.7	5057.2	121285.5	-0.0	-0.00
WQ-24HR	26.75	126342.7	5106.7	121236.0	-0.0	-0.00
WQ-24HR	26.84	126342.7	5156.3	121186.5	-0.0	-0.00
WQ-24HR	26.92	126342.7	5205.9	121136.9	-0.0	-0.00
WQ-24HR	27.00	126342.7	5255.6	121087.2	-0.0	-0.00
WQ-24HR	27.09	126342.7	5305.3	121037.4	-0.0	-0.00
WQ-24HR	27.17	126342.7	5355.2	120987.6	-0.0	-0.00
WQ-24HR	27.25	126342.7	5405.1	120937.7	-0.0	-0.00
WQ-24HR	27.34	126342.7	5455.0	120887.7	-0.0	-0.00
WQ-24HR	27.42	126342.7	5505.0	120837.7	-0.0	-0.00
WQ-24HR	27.50	126342.7	5555.1	120787.6	-0.0	-0.00
WQ-24HR	27.53	126342.7	5605.2	120737.5	-0.0	-0.00
WQ-24HR	27.67	126342.7	5655.4	120687.3	-0.0	-0.00
WQ-24HR	27.75	126342.7	5705.7	120637.0	-0.0	-0.00
WQ-24HR	27.84	126342.7	5756.0	120586.7	-0.0	-0.00
WQ-24HR	27.92	126342.7	5806.4	120536.4	-0.0	-0.00
WQ-24HR	28.00	126342.7	5856.8	120486.9	-0.0	-0.00
WQ-24HR	28.09	126342.7	5907.3	120435.4	-0.0	-0.00
WQ-24HR	28.17	126342.7	5957.9	120384.9	-0.0	-0.00
WQ-24HR	28.25	126342.7	6008.5	120334.3	-0.0	-0.00
WQ-24HR	28.34	126342.7	6059.1	120283.6	-0.0	-0.00
WQ-24HR	28.42	126342.7	6109.8	120232.9	-0.0	-0.00
WQ-24HR	28.50	126342.7	6160.6	120182.1	-0.0	-0.00
WQ-24HR	28.59	126342.7	6211.4	120131.3	-0.0	-0.00
WQ-24HR	28.67	126342.7	6262.3	120080.4	-0.0	-0.00
WQ-24HR	28.75	126342.7	6313.2	120029.5	-0.0	-0.00
WQ-24HR	28.84	126342.7	6364.2	119978.5	-0.0	-0.00
WQ-24HR	28.92	126342.7	6415.2	119927.5	-0.0	-0.00
WQ-24HR	29.00	126342.7	6466.3	119876.4	-0.0	-0.00
WQ-24HR	29.09	126342.7	6517.5	119825.3	-0.0	-0.00
WQ-24HR	29.17	126342.7	6568.6	119774.1	-0.0	-0.00
WQ-24HR	29.25	126342.7	6619.9	119722.9	-0.0	-0.00
WQ-24HR	29.34	126342.7	6671.1	119671.6	-0.0	-0.00
WQ-24HR	29.42	126342.7	6722.4	119620.3	-0.0	-0.00
WQ-24HR	29.50	126342.7	6773.8	119568.9	-0.0	-0.00
WQ-24HR	29.59	126342.7	6825.2	119517.5	-0.0	-0.00
WQ-24HR	29.67	126342.7	6876.7	119466.1	-0.0	-0.00
WQ-24HR	29.75	126342.7	6928.2	119414.5	-0.0	-0.00
WQ-24HR	29.84	126342.7	6979.7	119363.0	-0.0	-0.00
WQ-24HR	29.92	126342.7	7031.3	119311.4	-0.0	-0.00
WQ-24HR	30.00	126342.7	7083.0	119259.8	-0.0	-0.00
WQ-24HR	30.09	126342.7	7134.7	119208.1	-0.0	-0.00
WQ-24HR	30.17	126342.7	7186.4	119156.4	-0.0	-0.00
WQ-24HR	30.25	126342.7	7238.1	119104.6	-0.0	-0.00
WQ-24HR	30.34	126342.7	7289.9	119052.8	-0.0	-0.00
WQ-24HR	30.42	126342.7	7341.8	119000.9	-0.0	-0.00
WQ-24HR	30.50	126342.7	7393.7	118949.1	-0.0	-0.00
WQ-24HR	30.59	126342.7	7445.6	118897.1	-0.0	-0.00
WQ-24HR	30.67	126342.7	7497.6	118845.2	-0.0	-0.00
WQ-24HR	30.75	126342.7	7549.6	118793.2	-0.0	-0.00
WQ-24HR	30.84	126342.7	7601.6	118741.1	-0.0	-0.00
WQ-24HR	30.92	126342.7	7653.7	118689.0	-0.0	-0.00
WQ-24HR	31.00	126342.7	7705.8	118636.9	-0.0	-0.00
WQ-24HR	31.09	126342.7	7758.0	118584.8	-0.0	-0.00
WQ-24HR	31.17	126342.7	7810.2	118532.6	-0.0	-0.00
WQ-24HR	31.25	126342.7	7862.4	118480.3	-0.0	-0.00
WQ-24HR	31.34	126342.7	7914.7	118428.1	-0.0	-0.00
WQ-24HR	31.42	126342.7	7967.0	118375.8	-0.0	-0.00
WQ-24HR	31.50	126342.7	8019.3	118323.5	-0.0	-0.00
WQ-24HR	31.59	126342.7	8071.7	118271.1	-0.0	-0.00
WQ-24HR	31.67	126342.7	8124.1	118218.7	-0.0	-0.00
WQ-24HR	31.75	126342.7	8176.5	118166.2	-0.0	-0.00
WQ-24HR	31.84	126342.7	8229.0	118113.8	-0.0	-0.00
WQ-24HR	31.92	126342.7	8281.5	118061.3	-0.0	-0.00
WQ-24HR	32.00	126342.7	8334.0	118008.7	-0.0	-0.00
WQ-24HR	32.09	126342.7	8386.6	117956.2	-0.0	-0.00
WQ-24HR	32.17	126342.7	8439.2	117903.6	-0.0	-0.00
WQ-24HR	32.25	126342.7	8491.8	117850.9	-0.0	-0.00
WQ-24HR	32.34	126342.7	8544.5	117798.3	-0.0	-0.00
WQ-24HR	32.42	126342.7	8597.2	117745.6	-0.0	-0.00
WQ-24HR	32.50	126342.7	8649.9	117692.9	-0.0	-0.00
WQ-24HR	32.59	126342.7	8702.6	117640.1	-0.0	-0.00
WQ-24HR	32.67	126342.7	8755.4	117587.3	-0.0	-0.00
WQ-24HR	32.75	126342.7	8808.2	117534.5	-0.0	-0.00
WQ-24HR	32.84	126342.7	8861.0	117481.7	-0.0	-0.00
WQ-24HR	32.92	126342.7	8913.9	117428.8	-0.0	-0.00
WQ-24HR	33.00	126342.7	8966.8	117375.9	-0.0	-0.00
WQ-24HR	33.09	126342.7	9019.7	117323.0	-0.0	-0.00
WQ-24HR	33.17	126342.7	9072.7	117270.1	-0.0	-0.00
WQ-24HR	33.25	126342.7	9125.6	117217.1	-0.0	-0.00

Interstate Warehousing Phase IV-VI Expansion
 Report: ICPR Mass Balance Report - Water Quality Calculations
 Completed By: KKC 12/13/2011
 File: T:\7k\7124\002\drainage\ICPR\7124002WQ-r.ICP

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	33.34	126342.7	9178.6	117164.1	-0.0	-0.00
WQ-24HR	33.42	126342.7	9231.6	117111.1	-0.0	-0.00
WQ-24HR	33.50	126342.7	9284.7	117058.0	-0.0	-0.00
WQ-24HR	33.59	126342.7	9337.8	117005.0	-0.0	-0.00
WQ-24HR	33.67	126342.7	9390.9	116951.9	-0.0	-0.00
WQ-24HR	33.75	126342.7	9444.0	116898.8	-0.0	-0.00
WQ-24HR	33.84	126342.7	9497.1	116845.6	-0.0	-0.00
WQ-24HR	33.92	126342.7	9550.3	116792.4	-0.0	-0.00
WQ-24HR	34.00	126342.7	9603.5	116739.3	-0.0	-0.00
WQ-24HR	34.09	126342.7	9656.7	116686.0	-0.0	-0.00
WQ-24HR	34.17	126342.7	9709.9	116632.8	-0.0	-0.00
WQ-24HR	34.25	126342.7	9763.2	116579.6	-0.0	-0.00
WQ-24HR	34.34	126342.7	9816.5	116526.3	-0.0	-0.00
WQ-24HR	34.42	126342.7	9869.8	116473.0	-0.0	-0.00
WQ-24HR	34.50	126342.7	9923.1	116419.7	-0.0	-0.00
WQ-24HR	34.59	126342.7	9976.4	116366.3	-0.0	-0.00
WQ-24HR	34.67	126342.7	10029.8	116312.9	-0.0	-0.00
WQ-24HR	34.75	126342.7	10083.2	116259.6	-0.0	-0.00
WQ-24HR	34.84	126342.7	10136.6	116206.2	-0.0	-0.00
WQ-24HR	34.92	126342.7	10190.0	116152.7	-0.0	-0.00
WQ-24HR	35.00	126342.7	10243.4	116099.3	-0.0	-0.00
WQ-24HR	35.09	126342.7	10296.9	116045.8	-0.0	-0.00
WQ-24HR	35.17	126342.7	10350.4	115992.4	-0.0	-0.00
WQ-24HR	35.25	126342.7	10403.9	115938.9	-0.0	-0.00
WQ-24HR	35.34	126342.7	10457.4	115885.4	-0.0	-0.00
WQ-24HR	35.42	126342.7	10510.9	115831.8	-0.0	-0.00
WQ-24HR	35.50	126342.7	10564.5	115778.3	-0.0	-0.00
WQ-24HR	35.59	126342.7	10618.0	115724.7	-0.0	-0.00
WQ-24HR	35.67	126342.7	10671.6	115671.1	-0.0	-0.00
WQ-24HR	35.75	126342.7	10725.2	115617.5	-0.0	-0.00
WQ-24HR	35.84	126342.7	10778.8	115563.9	-0.0	-0.00
WQ-24HR	35.92	126342.7	10832.4	115510.3	-0.0	-0.00
WQ-24HR	36.00	126342.7	10886.1	115456.6	-0.0	-0.00
WQ-24HR	36.09	126342.7	10939.8	115403.0	-0.0	-0.00
WQ-24HR	36.17	126342.7	10993.4	115349.3	-0.0	-0.00
WQ-24HR	36.25	126342.7	11047.1	115295.6	-0.0	-0.00
WQ-24HR	36.34	126342.7	11100.8	115241.9	-0.0	-0.00
WQ-24HR	36.42	126342.7	11154.5	115188.2	-0.0	-0.00
WQ-24HR	36.50	126342.7	11208.3	115134.5	-0.0	-0.00
WQ-24HR	36.59	126342.7	11262.0	115080.7	-0.0	-0.00
WQ-24HR	36.67	126342.7	11315.8	115027.0	-0.0	-0.00
WQ-24HR	36.75	126342.7	11369.6	114973.2	-0.0	-0.00
WQ-24HR	36.84	126342.7	11423.3	114919.4	-0.0	-0.00
WQ-24HR	36.92	126342.7	11477.1	114865.6	-0.0	-0.00
WQ-24HR	37.00	126342.7	11531.0	114811.8	-0.0	-0.00
WQ-24HR	37.09	126342.7	11584.8	114758.0	-0.0	-0.00
WQ-24HR	37.17	126342.7	11638.6	114704.1	-0.0	-0.00
WQ-24HR	37.25	126342.7	11692.4	114650.3	-0.0	-0.00
WQ-24HR	37.34	126342.7	11746.3	114596.4	-0.0	-0.00
WQ-24HR	37.42	126342.7	11800.2	114542.6	-0.0	-0.00
WQ-24HR	37.50	126342.7	11854.0	114488.7	-0.0	-0.00
WQ-24HR	37.59	126342.7	11907.9	114434.8	-0.0	-0.00
WQ-24HR	37.67	126342.7	11961.8	114380.9	-0.0	-0.00
WQ-24HR	37.75	126342.7	12015.7	114327.0	-0.0	-0.00
WQ-24HR	37.84	126342.7	12069.7	114273.1	-0.0	-0.00
WQ-24HR	37.92	126342.7	12123.6	114219.2	-0.0	-0.00
WQ-24HR	38.00	126342.7	12177.5	114165.2	-0.0	-0.00
WQ-24HR	38.09	126342.7	12231.5	114111.3	-0.0	-0.00
WQ-24HR	38.17	126342.7	12285.4	114057.3	-0.0	-0.00
WQ-24HR	38.25	126342.7	12339.4	114003.4	-0.0	-0.00
WQ-24HR	38.34	126342.7	12393.4	113949.4	-0.0	-0.00
WQ-24HR	38.42	126342.7	12447.3	113895.4	-0.0	-0.00
WQ-24HR	38.50	126342.7	12501.3	113841.4	-0.0	-0.00
WQ-24HR	38.59	126342.7	12555.3	113787.4	-0.0	-0.00
WQ-24HR	38.67	126342.7	12609.3	113733.4	-0.0	-0.00
WQ-24HR	38.75	126342.7	12663.3	113679.4	-0.0	-0.00
WQ-24HR	38.84	126342.7	12717.3	113625.4	-0.0	-0.00
WQ-24HR	38.92	126342.7	12771.3	113571.4	-0.0	-0.00
WQ-24HR	39.00	126342.7	12825.4	113517.4	-0.0	-0.00
WQ-24HR	39.09	126342.7	12879.4	113463.3	-0.0	-0.00
WQ-24HR	39.17	126342.7	12933.5	113409.3	-0.0	-0.00
WQ-24HR	39.25	126342.7	12987.5	113355.2	-0.0	-0.00
WQ-24HR	39.34	126342.7	13041.6	113301.2	-0.0	-0.00
WQ-24HR	39.42	126342.7	13095.6	113247.1	-0.0	-0.00
WQ-24HR	39.50	126342.7	13149.7	113193.1	-0.0	-0.00
WQ-24HR	39.59	126342.7	13203.7	113139.0	-0.0	-0.00
WQ-24HR	39.67	126342.7	13257.8	113084.9	-0.0	-0.00
WQ-24HR	39.75	126342.7	13311.9	113030.8	-0.0	-0.00
WQ-24HR	39.84	126342.7	13366.0	112976.8	-0.0	-0.00
WQ-24HR	39.92	126342.7	13420.1	112922.7	-0.0	-0.00

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	40.00	126342.7	13474.1	112868.6	-0.0	-0.00
WQ-24HR	40.09	126342.7	13528.2	112814.5	-0.0	-0.00
WQ-24HR	40.17	126342.7	13582.3	112760.4	-0.0	-0.00
WQ-24HR	40.25	126342.7	13636.4	112706.3	-0.0	-0.00
WQ-24HR	40.34	126342.7	13690.6	112652.2	-0.0	-0.00
WQ-24HR	40.42	126342.7	13744.7	112598.1	-0.0	-0.00
WQ-24HR	40.50	126342.7	13798.8	112544.0	-0.0	-0.00
WQ-24HR	40.59	126342.7	13852.9	112489.8	-0.0	-0.00
WQ-24HR	40.67	126342.7	13907.0	112435.7	-0.0	-0.00
WQ-24HR	40.75	126342.7	13961.1	112381.6	-0.0	-0.00
WQ-24HR	40.84	126342.7	14015.3	112327.5	-0.0	-0.00
WQ-24HR	40.92	126342.7	14069.4	112273.4	-0.0	-0.00
WQ-24HR	41.00	126342.7	14123.5	112219.2	-0.0	-0.00
WQ-24HR	41.09	126342.7	14177.6	112165.1	-0.0	-0.00
WQ-24HR	41.17	126342.7	14231.8	112111.0	-0.0	-0.00
WQ-24HR	41.25	126342.7	14285.9	112056.9	-0.0	-0.00
WQ-24HR	41.34	126342.7	14340.0	112002.7	-0.0	-0.00
WQ-24HR	41.42	126342.7	14394.1	111948.6	-0.0	-0.00
WQ-24HR	41.50	126342.7	14448.3	111894.5	-0.0	-0.00
WQ-24HR	41.59	126342.7	14502.4	111840.3	-0.0	-0.00
WQ-24HR	41.67	126342.7	14556.5	111786.2	-0.0	-0.00
WQ-24HR	41.75	126342.7	14610.6	111732.1	-0.0	-0.00
WQ-24HR	41.84	126342.7	14664.8	111678.0	-0.0	-0.00
WQ-24HR	41.92	126342.7	14718.9	111623.8	-0.0	-0.00
WQ-24HR	42.00	126342.7	14773.0	111569.7	-0.0	-0.00
WQ-24HR	42.09	126342.7	14827.2	111515.6	-0.0	-0.00
WQ-24HR	42.17	126342.7	14881.3	111461.5	-0.0	-0.00
WQ-24HR	42.25	126342.7	14935.4	111407.3	-0.0	-0.00
WQ-24HR	42.34	126342.7	14989.5	111353.2	-0.0	-0.00
WQ-24HR	42.42	126342.7	15043.7	111299.1	-0.0	-0.00
WQ-24HR	42.50	126342.7	15097.8	111245.0	-0.0	-0.00
WQ-24HR	42.59	126342.7	15151.9	111190.8	-0.0	-0.00
WQ-24HR	42.67	126342.7	15206.0	111136.7	-0.0	-0.00
WQ-24HR	42.75	126342.7	15260.2	111082.6	-0.0	-0.00
WQ-24HR	42.84	126342.7	15314.3	111028.5	-0.0	-0.00
WQ-24HR	42.92	126342.7	15368.4	110974.4	-0.0	-0.00
WQ-24HR	43.00	126342.7	15422.5	110920.2	-0.0	-0.00
WQ-24HR	43.09	126342.7	15476.6	110866.1	-0.0	-0.00
WQ-24HR	43.17	126342.7	15530.7	110812.0	-0.0	-0.00
WQ-24HR	43.25	126342.7	15584.8	110757.9	-0.0	-0.00
WQ-24HR	43.34	126342.7	15638.9	110703.8	-0.0	-0.00
WQ-24HR	43.42	126342.7	15693.0	110649.7	-0.0	-0.00
WQ-24HR	43.50	126342.7	15747.1	110595.6	-0.0	-0.00
WQ-24HR	43.59	126342.7	15801.2	110541.5	-0.0	-0.00
WQ-24HR	43.67	126342.7	15855.3	110487.4	-0.0	-0.00
WQ-24HR	43.75	126342.7	15909.4	110433.3	-0.0	-0.00
WQ-24HR	43.84	126342.7	15963.5	110379.3	-0.0	-0.00
WQ-24HR	43.92	126342.7	16017.5	110325.2	-0.0	-0.00
WQ-24HR	44.00	126342.7	16071.6	110271.1	-0.0	-0.00
WQ-24HR	44.09	126342.7	16125.7	110217.1	-0.0	-0.00
WQ-24HR	44.17	126342.7	16179.7	110163.0	-0.0	-0.00
WQ-24HR	44.25	126342.7	16233.8	110108.9	-0.0	-0.00
WQ-24HR	44.34	126342.7	16287.9	110054.9	-0.0	-0.00
WQ-24HR	44.42	126342.7	16341.9	110000.8	-0.0	-0.00
WQ-24HR	44.50	126342.7	16395.9	109946.8	-0.0	-0.00
WQ-24HR	44.59	126342.7	16450.0	109892.8	-0.0	-0.00
WQ-24HR	44.67	126342.7	16504.0	109838.7	-0.0	-0.00
WQ-24HR	44.75	126342.7	16558.0	109784.7	-0.0	-0.00
WQ-24HR	44.84	126342.7	16612.1	109730.7	-0.0	-0.00
WQ-24HR	44.92	126342.7	16666.1	109676.7	-0.0	-0.00
WQ-24HR	45.00	126342.7	16720.1	109622.7	-0.0	-0.00
WQ-24HR	45.09	126342.7	16774.1	109568.7	-0.0	-0.00
WQ-24HR	45.17	126342.7	16828.1	109514.7	-0.0	-0.00
WQ-24HR	45.25	126342.7	16882.1	109460.7	-0.0	-0.00
WQ-24HR	45.34	126342.7	16936.0	109406.7	-0.0	-0.00
WQ-24HR	45.42	126342.7	16990.0	109352.7	-0.0	-0.00
WQ-24HR	45.50	126342.7	17044.0	109298.7	-0.0	-0.00
WQ-24HR	45.59	126342.7	17098.0	109244.8	-0.0	-0.00
WQ-24HR	45.67	126342.7	17151.9	109190.8	-0.0	-0.00
WQ-24HR	45.75	126342.7	17205.9	109136.9	-0.0	-0.00
WQ-24HR	45.84	126342.7	17259.8	109082.9	-0.0	-0.00
WQ-24HR	45.92	126342.7	17313.7	109029.0	-0.0	-0.00
WQ-24HR	46.00	126342.7	17367.7	108975.1	-0.0	-0.00
WQ-24HR	46.09	126342.7	17421.6	108921.2	-0.0	-0.00
WQ-24HR	46.17	126342.7	17475.5	108867.3	-0.0	-0.00
WQ-24HR	46.25	126342.7	17529.4	108813.4	-0.0	-0.00
WQ-24HR	46.34	126342.7	17583.3	108759.5	-0.0	-0.00
WQ-24HR	46.42	126342.7	17637.2	108705.6	-0.0	-0.00
WQ-24HR	46.50	126342.7	17691.1	108651.7	-0.0	-0.00
WQ-24HR	46.59	126342.7	17744.9	108597.8	-0.0	-0.00

Interstate Warehousing Phase IV-VI Expansion
 Report: ICPR Mass Balance Report - Water Quality Calculations
 Completed By: KKC 12/13/2011
 File: T:\7k\7124\002\drainage\ICPR\7124002WQ-r.ICP

Simulation	Time hrs	Inflow Volume ft3	Outflow Volume ft3	Change in Sys Storage ft3	Difference ft3	Error %
WQ-24HR	46.67	126342.7	17798.8	108544.0	-0.0	-0.00
WQ-24HR	46.75	126342.7	17852.6	108490.1	-0.0	-0.00
WQ-24HR	46.84	126342.7	17906.5	108436.3	-0.0	-0.00
WQ-24HR	46.92	126342.7	17960.3	108382.4	-0.0	-0.00
WQ-24HR	47.00	126342.7	18014.1	108328.6	-0.0	-0.00
WQ-24HR	47.09	126342.7	18067.9	108274.8	-0.0	-0.00
WQ-24HR	47.17	126342.7	18121.7	108221.0	-0.0	-0.00
WQ-24HR	47.25	126342.7	18175.5	108167.2	-0.0	-0.00
WQ-24HR	47.34	126342.7	18229.3	108113.4	-0.0	-0.00
WQ-24HR	47.42	126342.7	18283.1	108059.7	-0.0	-0.00
WQ-24HR	47.50	126342.7	18336.8	108005.9	-0.0	-0.00
WQ-24HR	47.59	126342.7	18390.6	107952.1	-0.0	-0.00
WQ-24HR	47.67	126342.7	18444.4	107898.4	-0.0	-0.00
WQ-24HR	47.75	126342.7	18498.1	107844.7	-0.0	-0.00
WQ-24HR	47.84	126342.7	18551.8	107790.9	-0.0	-0.00
WQ-24HR	47.92	126342.7	18605.5	107737.2	-0.0	-0.00
WQ-24HR	48.00	126342.7	18659.2	107683.5	-0.0	-0.00
WQ-24HR	48.01	126342.7	18659.2	107683.5	-0.0	-0.00

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Basins

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Name: BASIN PR-1 Node: POND 1 Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Storm Duration(hrs): 0.00
 Rainfall Amount(in): 0.000 Time of Conc(min): 22.20
 Area(ac): 36.330 Time Shift(hrs): 0.00
 Curve Number: 89.20 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

Basin Data of overall onsite pond drainage area

Name: BASIN PR-2 Node: POND 2 Status: Onsite
 Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh484 Peaking Factor: 484.0
 Rainfall File: Storm Duration(hrs): 0.00
 Rainfall Amount(in): 0.000 Time of Conc(min): 23.00
 Area(ac): 43.830 Time Shift(hrs): 0.00
 Curve Number: 88.20 Max Allowable Q(cfs): 999999.000
 DCIA(%): 0.00

=====

Nodes

Name: POND 1 Base Flow(cfs): 0.000 Init Stage(ft): 712.150
 Group: BASE Warn Stage(ft): 717.000
 Type: Stage/Area

Pond Depth and Storage Relationship of expanded pond

Stage(ft)	Area(ac)
712.150	1.8100
713.000	3.0400
714.000	3.2500
715.000	4.9800
716.000	5.5500
717.000	5.9900
718.000	6.5400

Name: POND 2 Base Flow(cfs): 0.000 Init Stage(ft): 713.250
 Group: BASE Warn Stage(ft): 717.000
 Type: Stage/Area

Stage(ft)	Area(ac)
713.250	3.2800
714.000	3.4700
715.000	3.7300
716.000	4.2600

Name: SE CORNER BDRY Base Flow(cfs): 0.000 Init Stage(ft): 709.450
 Group: BASE Warn Stage(ft): 709.450
 Type: Time/Stage

Northwest corner of County Road 75 South and County Road 525 East.

Time(hrs)	Stage(ft)
0.00	709.450
99.00	709.450

=====

Cross Sections

Name: EX WEIR Group: BASE

Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	717.420	0.013000
6.000	717.360	0.013000
6.010	714.100	0.013000
10.990	713.990	0.013000
11.000	713.300	0.013000
17.000	717.240	0.013000

==== Pipes =====

Name: POND 2 OUTLET	From Node: POND 2	Length(ft): 540.00
Group: BASE	To Node: POND 1	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 24.00	24.00	Flow: Both
Rise(in): 24.00	24.00	Entrance Loss Coef: 0.50
Invert(ft): 713.250	712.250	Exit Loss Coef: 1.00
Manning's N: 0.013000	0.013000	Bend Loss Coef: 0.00
Top Clip(in): 0.000	0.000	Outlet Ctrl Spec: Use dc or tw
Bot Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc
		Stabilizer Option: Nonc

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: EX OUTLET STR	From Node: POND 1	Length(ft): 100.00
Group: BASE	To Node: SE CORNER BDRY	Count: 1
UPSTREAM	DOWNSTREAM	Friction Equation: Automatic
Geometry: Circular	Circular	Solution Algorithm: Most Restrictive
Span(in): 12.00	12.00	Flow: Both
Rise(in): 12.00	12.00	Entrance Loss Coef: 0.000
Invert(ft): 712.540	711.680	Exit Loss Coef: 1.000
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 dc
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 EX OUTLET STR ***

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): 4.00	Invert(ft): 712.150
Rise(in): 4.00	Control Elev(ft): 712.450

TABLE

==== Weirs =====

Name: EX WEIR	From Node: POND 1
Group: BASE	To Node: SE CORNER BDRY
Flow: Both	Count: 1
Type: Vertical: Mavis	Geometry: Irregular

XSec: EX WEIR
 Invert(ft): 713.990
 Control Elevation(ft): 713.990
 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: WQ-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\WQ-24HR.R32

Override Defaults: Yes
 Storm Duration(hrs): 24.00
 Rainfall File: Scs11-24
 Rainfall Amount(in): 1.25

Time(hrs)	Print Inc(min)
30.000	1.00

==== Routing Simulations =====

Name: WQ-24HR Hydrology Sim: WQ-24HR
 Filename: T:\7k\7124\002\drainage\ICPR\WQ-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): 48.00
Min Calc Time(sec): 0.5000	Max Calc Time(sec): 60.0000
Boundary Stages:	Boundary Flows:

Time(hrs)	Print Inc(min)
48.000	5.000

Group	Run
BASE	Yes

STORM SEWER DESIGN

Time of Concentration Worksheet

Based on TR-55

PROJECT: Interstate Warehousing

JOB #: 7124.001

Date: 12/13/11

Typical values for Manning's n			
Overland Flow		Channel Flow	
short grass	0.15	grass	0.03
farm, > 20% cover	0.17	concrete	0.015
dense grass	0.24	rip-rap	0.035
pavement	0.011		

2 year, 24 hour rainfall = 2.64 inches
minimum T_c = 5.00 minutes

T:\N\7124\002\drainage\7124002-ST-1.xls\Time of Conc

T:\N\K\7124\002\drainage\7124002-ST-r.xls\Time of Conc

Basin name	Overland flow			Shallow Concentrated Flow			Channel Flow			T _c (min)			
	Length (ft)	S %	n	Length (ft)	S %	Vel (ft/s)	Length (ft)	a (sq ft)	Pw (ft)		T _c (min)	Vel (ft/s)	T _c (min)
633													5
632													5
631													5
637	ICPR		0										5
636	ICPR		0										5
616													5
615													5
612													5
611													5
610													5
609													5
608													5
607													5
602	40	2.00	0.24	8									8
603	SEE PROPOSED TIME OF CONCENTRATION I												28

PROJECT: Interstate Warehousing
JOB #: 7124.001 Date: 12/13/11

Typical values for Manning's n	
Overland Flow	Channel Flow
short grass	0.15
farm, > 20% cover	0.17
dense grass	0.24
pavement	0.011
	0.03
	0.015
	0.035

2 year, 24 hour rainfall = 2.64 inches
minimum T c = 5.00 minutes

T:\7k\7124\002\drainage\7124002-ST-r.xls\Time of Conc

[illegible]

STORM SEWER DESIGN CALCULATIONS **-RATIONAL METHOD-**

PROJECT: Interstate Warehouse	STORM: 10	Year
JOB #: 7124.002	COMPUTED BY: KKC	
DATE: 9/26/12	SHEET NO.:	

T:\7K17124\002\drainage\7124002-ST-rev073112.xlsx|Rational

STRUCTURE		BASINS					COMPOSITE BASINS					TRAVEL TIME (min)	
FROM	TO	BASIN #	c	A (acres)	c*A	Tc (min)	I (in/hr)	Q (cfs)	SUM (c*A)	Tc (min)	I (in/hr)	Q (cfs)	
633	632	633	0.95	0.93	0.88	5	6.98	6.17	0.88	5	6.98	6.17	
632	631	632	0.95	1.73	1.64	5	6.98	11.48	2.53	7	6.28	15.87	2.14
631	630	631	0.95	0.80	0.76	5	6.98	5.31	3.29	9	5.72	18.80	1.48
													0.98
637	636	637	0.00	0.00	0.00	0	0.00	0.00	0.00	0	9.93	0.00	1.97
636	635	636	0.00	0.00	0.00	0	0.00	0.00	0.00	2	8.46	0.00	1.53
616	615	616	0.95	0.93	0.88	5	6.98	6.17	0.88	5	6.98	6.17	1.79
615	614	615	0.95	0.93	0.88	5	6.98	6.17	1.77	7	6.28	11.10	2.16
1008	608	1008	0.95	1.81	1.72	5	6.98	12.01	1.72	5	6.98	12.01	0.24
612	608	612	0.80	0.29	0.23	5	6.98	1.62	0.23	5	6.98	1.62	0.47
611	609	611	0.80	0.80	0.64	5	6.98	4.47	1.94	5	6.98	13.58	0.19
610	611	610	0.80	1.63	1.30	5	6.98	9.11	1.30	5	6.98	9.11	0.24
609	608	609	0.95	4.24	4.03	5	6.98	28.14	5.97	5	6.98	41.71	0.89
608	607	608	0.40	0.29	0.12	5	6.98	0.81	8.04	6	6.61	53.16	0.82
607	602	607	0.40	0.18	0.07	5	6.98	0.50	8.11	7	6.28	50.95	0.99
602	601	602	0.40	0.11	0.04	8	5.99	0.26	20.71	28	3.22	66.77	2.07
603	602	603	0.60	20.92	12.55	28	3.22	40.48	12.55	28	3.22	40.48	0.64

PROJECT:	Interstate Warehouse	STORM:	10	Year
JOB #:	7124.002	COMPUTED BY:	KKC	
DATE:	9/26/12	SHEET NO.:		

9/26/2012 9:02 AM

STORM SEWER DESIGN CALCULATIONS **-PIPE DESIGN-**

PROJECT: Interstate Warehouse

JOB #: 7124.002

DATE: 9/26/12

STORM: 10 Year

COMPUTED BY: KKC

SHEET NO.:

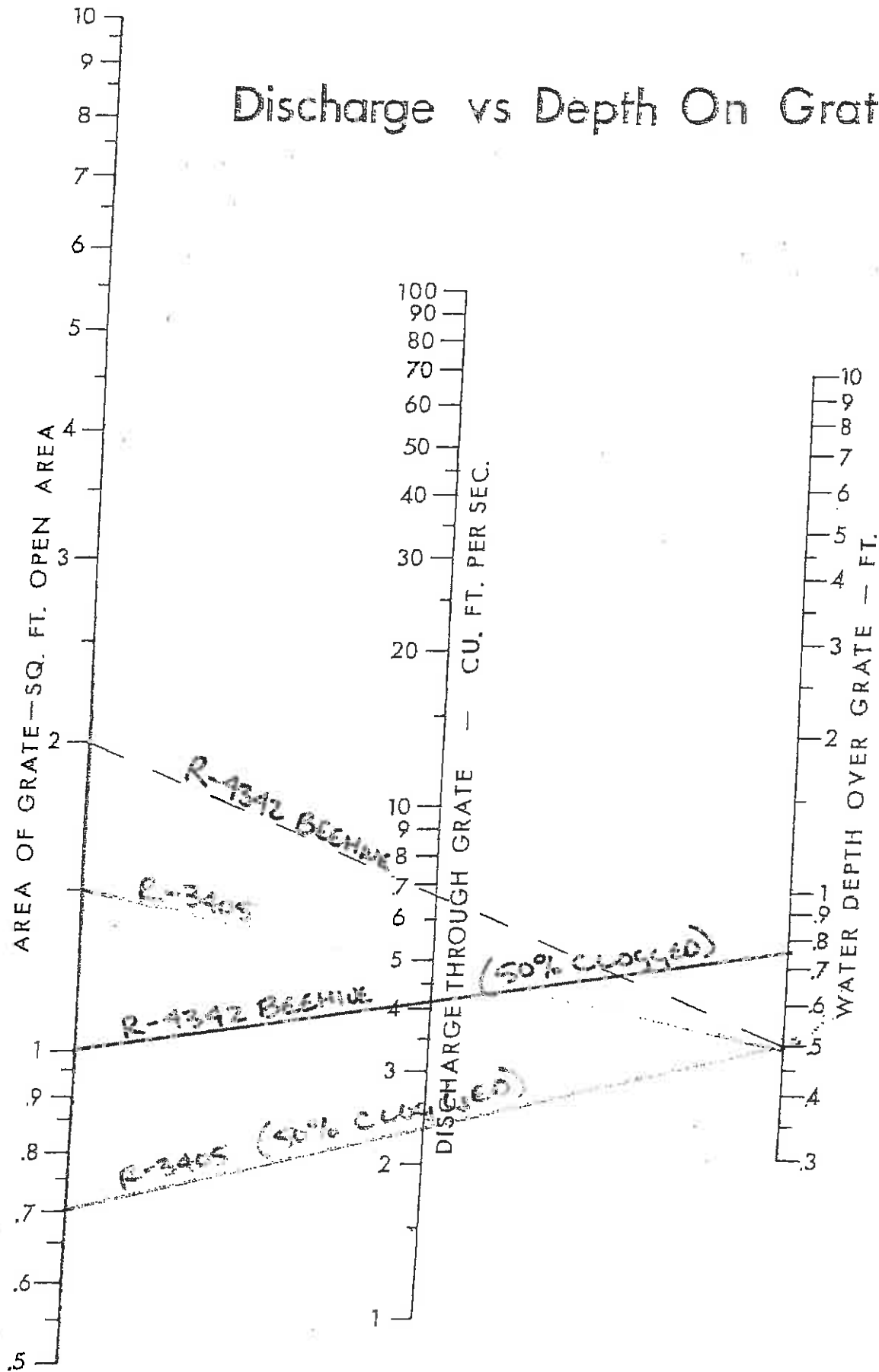
T:\V\7124\002\drainage\7124002-ST-rev073112.xlsx|Pipe Design

STRUCTURE FROM TO	DESIGN Q (cfs)	L (ft)	DIA (in)	SLOPE %	CAP. Q (cfs)	VEL. (ft/s)	RIM ELEV.		INVERT ELEV.		COVER (ft)	
							UP	DOWN	UP	DOWN	UP	DOWN
633	6.17	386	21	0.18	6.76	2.81	721.73	721.73	715.50	714.81	4.27	4.96
632	15.87	266	30	0.15	15.99	3.26	721.73	721.73	714.06	713.66	4.88	5.28
631	18.80	177	30	0.21	18.92	3.85	721.73		713.61	713.24	5.33	
637	ICPR	355	30	0.15	15.99	3.26		719.50	713.25	712.72	3.99	
636	ICPR	275	30	0.17	17.02	3.47	719.50		712.72	712.25	3.99	
616	6.17	322	18	0.47	7.25	4.10	721.73	721.73	716.10	714.59	3.94	5.45
615	11.10	388	24	0.24	11.15	3.55	721.73		714.19	713.26	5.31	
1008	12.01	43	24	0.32	12.88	4.10	719.60	720.06	716.20	716.06	1.17	1.77
612	1.62	84	24	0.67	18.63	5.93	718.92	720.06	716.12	715.56	0.57	2.27
611	13.58	34	18	3.50	19.77	11.19		721.56	717.75	716.56	3.31	
610	9.11	44	24	0.18	9.66	3.07	721.00	0.00	717.33	717.25	1.44	#####
609	41.71	160	42	0.27	52.62	5.47	721.56	720.06	715.86	715.43	1.82	0.75
608	53.16	148	42	0.52	73.02	7.59	720.06	721.26	715.43	714.66	0.75	2.72
607	50.95	179	42	0.42	65.63	6.82	721.26	723.60	714.66	713.91	2.72	5.81
602	66.77	373	60	0.07	69.36	3.53	723.60		713.91	713.65	4.31	
603	40.48	116	36	0.68	55.36	7.83	723.60		719.48	718.69	1.58	

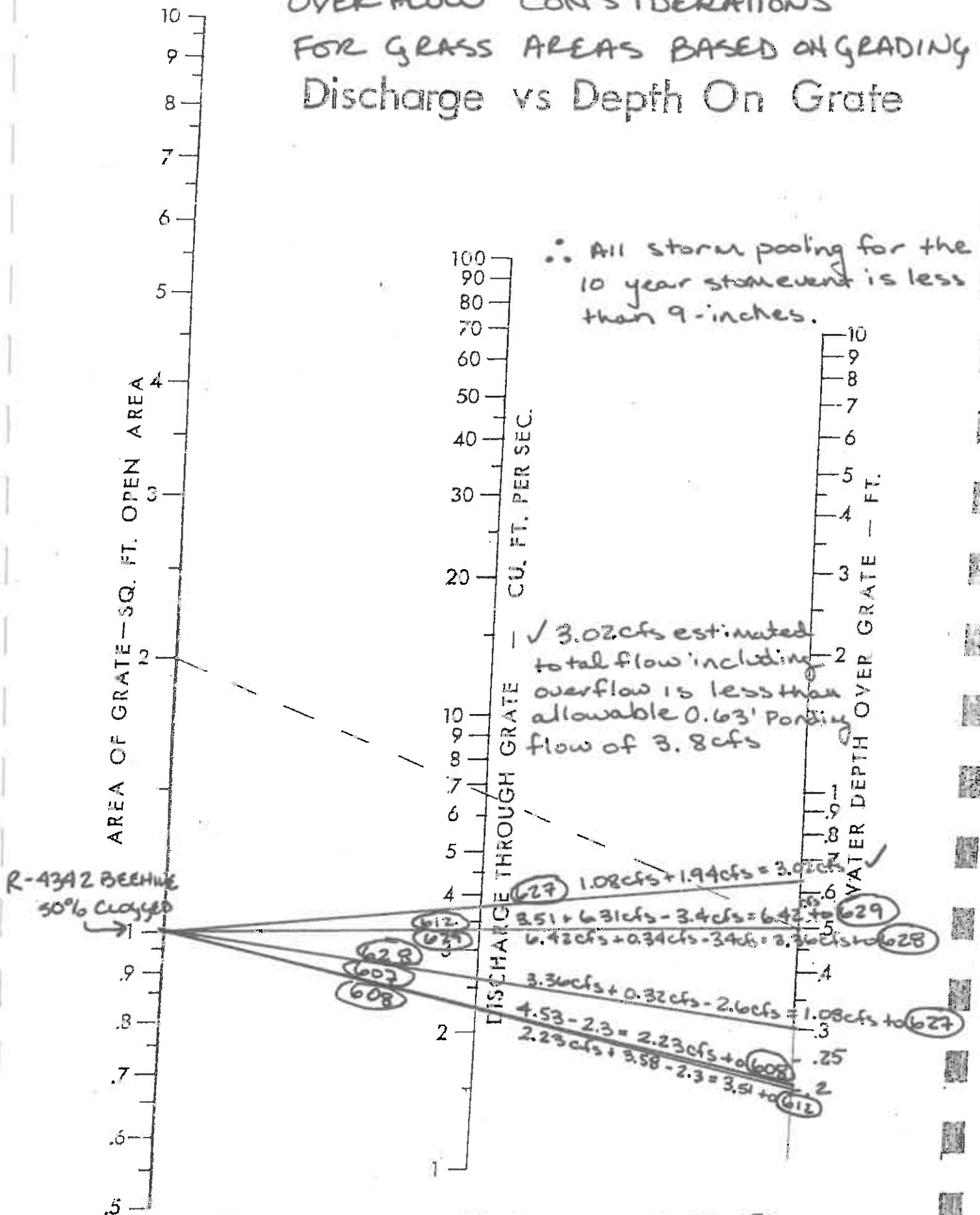
PROJECT:	Interstate Warehouse	
JOB #:	7124.002	
DATE:	9/26/12	
	STORM:	10 Year
	COMPUTED BY:	KKC
	SHEET NO.	

9/26/2012 9:03 AM

Discharge vs Depth On Grate



OVERFLOW CONSIDERATIONS FOR GRASS AREAS BASED ON GRADING Discharge vs Depth On Grate



EMERGENCY FLOOD ROUTE DESIGN CALCULATIONS **-RATIONAL METHOD-**

PROJECT: Interstate Warehouse - Emergency Route	STORM: 100 Year
JOB #: 7124.002	COMPUTED BY: KKC
DATE: 9/26/12	SHEET NO.:

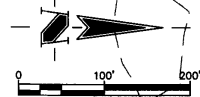
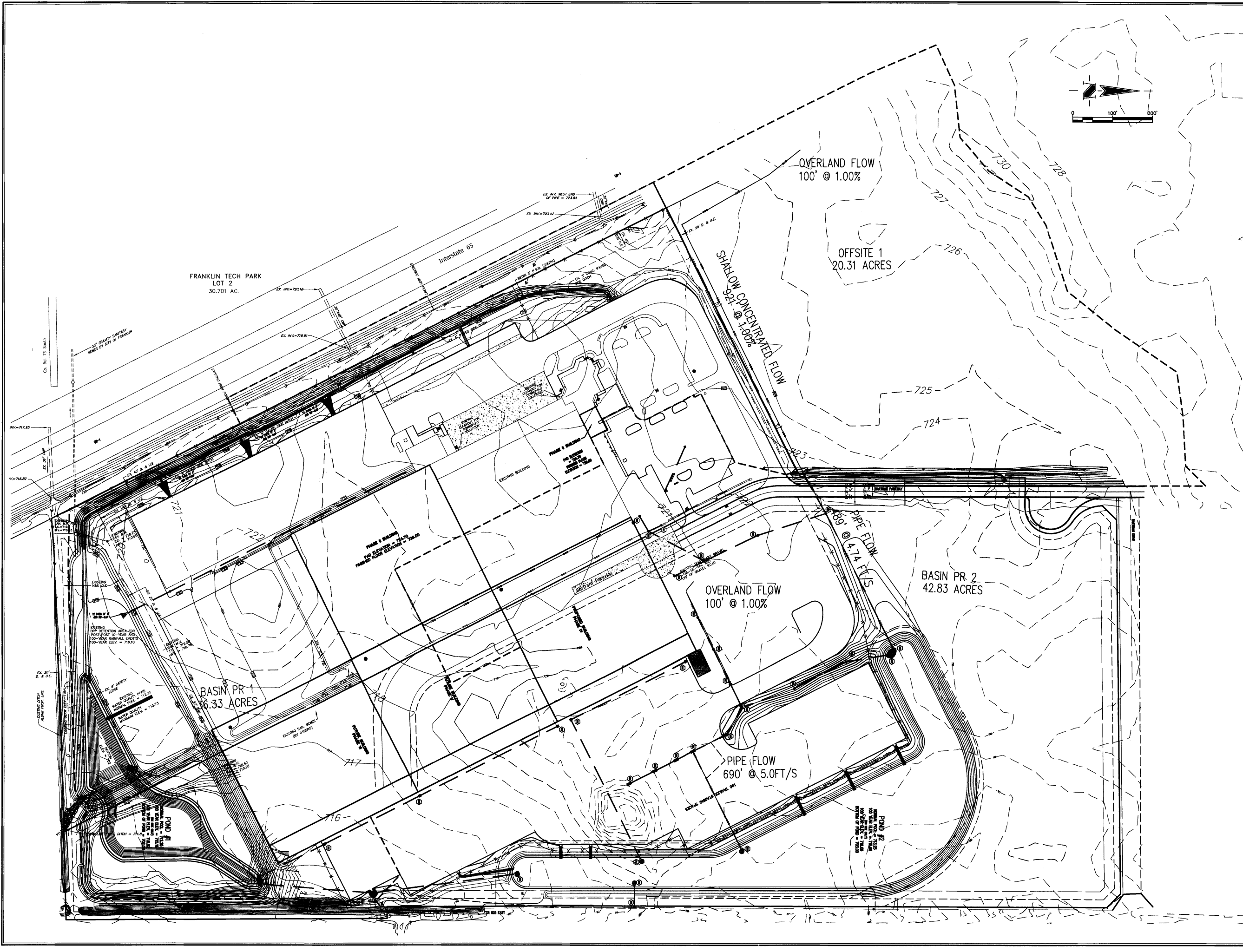
\\KAT1241002\drainage\7124002-emergency routing.xlsx(Ration

STRUCTURE		BASINS				COMPOSITE BASINS			TRAVEL TIME (min)
FROM	TO	BASIN #	c	A (acres)	c*A	Tc (min)	I (in/hr)	Q (cfs)	Q (cfs)
612	608	612	0.80	1.13	0.90	5	9.69	8.76	8.76
611	609	611	0.80	0.80	0.64	5	9.69	6.20	6.20
610	609	610	0.80	1.63	1.30	5	9.69	12.64	12.64
609	608	609	0.95	0.00	0.00	5	9.69	0.00	18.84
608	607	608	0.40	0.29	0.12	5	9.69	1.12	27.34
607	606	607	0.40	0.18	0.07	5	9.69	0.70	26.73
629	628	629	0.40	0.22	0.09	21	5.51	0.48	0.48
628	EM route	628	0.60	0.12	0.07	16	6.33	0.46	38.93
Flood Route Q = 48.66 cfs									Total Flow * 1.25

STORM LINES UNDER SIDEWALK FOR EMERGENCY FLOOD ROUTE

Diameter= 24 in
 n= 0.013
 Slope= 1.2 %
 Capacity= 24.77 cfs
 V= 7.89 ft/s
 Two 24" RCP pipes required to meet the Flood Route Q of 48.66 cfs.

Plot Date: Dec 13, 2011 Plot Time: 12:13pm File Name: T:\K\7124\002\drainage\7124-drainage.dwg, Layout: D101 By: kkc



REVISIONS:
1. REC 12/17/11: REVISED LAYOUT PER CLIENT REQUEST



DATE: 10/14/11
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TIPPMANN CONSTRUCTION GROUP
9009 COLDWATER ROAD, FT. WAYNE, IN 46825

DATE: 12/16/10	PROJECT NO.: 7124.002
DRAWN BY: ARG	CHECKED BY: DAS
SHEET TITLE: PROPOSED DRAINAGE CONDITIONS	
DRAWING FILES: T:\K\7124\002\drainage\7124-drainage.dwg REF: T:\K\7124\001\drainage\7124001.dwg REF: T:\K\7124\002\drainage\7124002.dwg REF: T:\K\7124\002\drainage\7124003.dwg REF: T:\K\7124\002\drainage\7124004.dwg REF: T:\K\7124\002\drainage\7124005.dwg REF: T:\K\7124\002\drainage\7124006.dwg REF: T:\K\7124\002\drainage\7124007.dwg	

SHEET NO.: D101

