PRELIMINARY
DRAINAGE IMPACT ANALYSIS
FOR
WAL-MART SUPERCENTER #4321-00
N.W. 53RD STREET NORTH & N. MERIDIAN AVENUE
SW/4, SECTION 13, T26S, R1W
SEDGWICK COUNTY
WICHITA, KANSAS

SEPTEMBER 23, 2005

PREPARED FOR:

THE CITY OF WICHITA

BY:
SPEAR & McCALEB CO., P.C.
815 W. MAIN
OKLAHOMA CITY, OK 73106
(405) 232-7715
FAX: 232-7859

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(TO BE PROVIDED IN THE FINAL REPORT)

Preliminary Drainage Impact Analysis

For

Wal-Mart Supercenter #4321-00

N.W. 53RD Street North & N. Meridian Avenue

Wichita, Kansas

INTRODUCTION

The site is located on the northeast corner of N.W. 53rd Street North and N. Meridian Avenue intersection, in the southeast quarter of Section 13, Township 26 South, Range 1 West, Sedgwick County, Wichita, Kansas (refer Appendix-A, Figure 1- Site Plan). The majority of the site was covered with tall grass and weeds at the time this study was conducted. Approximately 26.721 acres of site will be developed to construct the proposed project.

The site is bounded on the south by N.W. 53rd Street, on the east by N. Meridian Avenue, on the north and west by undeveloped land. Running along the south frontage of the Wal-Mart property is an existing drainage swale. This drainage swale receives storm water runoff from the southwest portion of the site. There is an existing 4'x4' concrete box culvert running along the east frontage of the Wal-Mart property. This box culvert receives storm water runoff from a substantial portion of the site. The existing drainage swale along the south frontage of the Wal-Mart property drains into the same concrete box culvert (refer Appendix-A, Figure No. 2-Existing Drainage Map). The 4'x4' concrete box culvert continues south along the westside of the N. Meridian Avenue and drains into the Arkansas River thru a series of existing drainage systems.

The dominant native soil association to the area is:

- Elandco Silt Loam (Ea), nearly level, well drain soil on low terraces.

The Hydrologic Soil Group "B" is provided for Elandco Silt Loam (Ea) in the USDA 1979 General Soil Map of Sedgwick County, Kansas.

PROCEDURES

On-site Development

The City of Wichita Interim Drainage and Storm Sewer Policy for Design Criteria and Documentation was used to perform the site drainage impact analysis. The Rational Method was used to compute design runoff. The Time of Concentration for small drainage basins for the proposed stage-storage-discharge analysis of the detention ponds was calculated using Figure No. 3C-3-A provided in the Kansas Department of Transportation's Elements of Drainage and Culvert Design Manual (Vol. III); however, the minimum time of concentration of 15 minute was used as recommended in the above mentioned City of Wichita Interim Drainage Policy. The Rainfall Intensity Table for Sedgwick County was used to develop existing and proposed hydrographs.

Precipitation for Sedgwick County, Kansas

2 year, 24 hour Rainfall	= 3.60 inches	3.5
5 year, 24 hour Rainfall	= 4.56 inches	4.5
10 year, 24 hour Rainfall	= 5.28 inches	5.3
25 year, 24 hour Rainfall	= 6.24 inches	
50 year, 24 hour Rainfall	= 6.96 inches	
100 year, 24 hour Rainfall	~~= 7.68~~ inches	7.9

The stage-discharge routing of the Detention Ponds is designed for the 100 year, 24 hour storm frequency. The stage-discharge curve of the detention ponds was verified for storm intervals from 2-year to 100-year for existing and proposed conditions. The complete dewatering of the detention ponds for a 100-year storm event was not more than 24 hours.

The storm sewer systems for the Wal-Mart parking area are designed to carry 100-year event storm water runoff as per Manning's Formula and Bernoulli's Equation. The runoff from the 100-year storm event is retained within the Wal-Mart property. The standard head losses have been added at each inlet/junction box.

The runoff depth at area and curb inlets is calculated using Federal Highway Administration, Urban Drainage Design Manual, Hydraulic Engineering Circular, HEC-22 for a 100-year storm frequency.

The Erosion Mitigation Measures for proposed development will be completed using EPA Guidance Manual "Storm Water Management For Construction Activities (EPA 832-R-92-005) and the applicable state and local requirements.

COEFFICIENTS

The estimated values of Runoff Coefficients "C" in Rational Formula to calculate runoff amount is obtained from American Society of Civil Engineer's Manuals and Reports on Engineering Practice No. 37.

Existing Conditions: *C = 0.2 for 2-year storm event*

C=0.41 for 100-year storm event

Pavement, C = 0.95

Refer Table No. 7 and 8 for weighted Runoff Coefficients.

Manning's 'n' Values:

Smooth Asphalt Pavement = 0.016

Concrete Pavement = 0.012

Concrete Storm Pipe= 0.013

Short Grass Pasture, Sheet Flow=0.24

Short Grass Pasture, Shallow Flow=0.025

The Soil Conservation Service, Curve Numbers:

Pervious Area, Pasture with weeds, no mechanical treatment, grass cover in good condition, CN=61

Impervious Area, paved parking lots, roofs, driveways, etc. = 98

Refer Table No. 9 and 10 for weighted Curve Numbers.

HISTORIC CONDITIONS (Appendix-A, Figure No. 2-Existing Drainage Plan)

The limits of earth disturbance activities to construct the proposed project are delineated as Drainage Area XA1 with a total of 26.721 acres.

D.A. = 26.721 acres

Flow length, L = 2088 feet

Height, H = 8.24 feet

CN=61

Time of Concentration, $Tc = 0.0078(L^3/H)^{0.385}$

Tc = 23.65 minutes.

Intensity:

2-year=2.99 in/hr 100-year=6.07 in/hr

Computed Flood Hydrograph using SCS Type II rainfall distribution:

Q_2=12.26 cfs Q_{100}=68.90 cfs

Refer Appendix-C for existing flood hydrograph summary.

PROPOSED CONDITIONS (Appendix-A, Figure No. 3-Proposed Drainage Plan)

On-site Conditions:

The proposed development consists of approximately 4.8 acres of building space and approximately 13.936 acres of paved area for parking and driveways. Approximately 3.64 acres of the land consists of out parcels #2, #3 and the gas lease area. These areas are considered as 90% developed in this report. The rest of the 4.345 acres of land consists of detention ponds and landscape areas. The proposed development will increase impervious area. The reduction in pervious area results in storm water leaving the site at an increase rate of flow, and a higher volume of storm runoff generated by the site.

The on-site dry detention system will be provided to protect the downstream from this increased rate of flow and higher volume of runoff. There are two Dry Detention Ponds proposed to keep the post-developed runoffs less than pre-developed conditions. The proposed south detention pond will collect runoff from watersheds PA2 thru PA12.

The supercenter building including the adjacent parking area will be flowing into the north detention pond (watershed PA1).
Refer Appendix-E for storage-discharge curve of these two detention ponds.

The outlets of these ponds are designed using the Stand Pipe Weir Structures. The storage-discharge curve of these outlet structures is designed to keep the post-developed runoffs to an existing 4'x4' concrete box culvert less than pre-developed conditions (refer Figure No. 4 for Standpipe Weir Outlet Structure details and Appendix-F for rating curves). The downstream outlet pipe of Stand Pipe Weir Structures is designed to accommodate the overflow of runoffs in storm event higher than 100-year; therefore, a spillway is not suggested here.

The internal storm sewer system for the building and the parking area will be designed to convey runoff to both detention ponds. The detailed design of the storm sewer system will be provided in the final report.

Drainage Area PA1

D.A. = 10.673 acres

Flow Length, L = 484 feet

Height, H = 9.68 feet

Weighted CN = 90 → 20% OF BLDG IMPERV. ?

Time of Concentration, $Tc = 0.0078(L^3/H)^{0.385}$

Tc = 4.10 minutes (minimum inlet time of 15 minute used in calculations)

Intensity:

2-year = 3.77 in/hr 100-year = 7.38 in/hr

Computed Flood Hydrograph using SCS II rainfall distribution:

Q_2 = 35.71 cfs Q_{100} = 86.37 cfs

Drainage Area PA2 thru PA12

D.A. = 16.048 acres

Flow length, L = 223 feet

Height, H = 2.39 feet

Weighted CN = 93 → TOO LOW

Time of Concentration, $Tc = 0.0078(L^3/H)^{0.385}$

Tc = 2.875 minutes (minimum inlet time of 15 minutes used in calculations)

Intensity:

2-year = 3.77 in/hr 100-year = 7.38 in/hr

Computed Flood Hydrograph using SCS Type II rainfall distribution:

Q_2 = 58.20 cfs Q_{100} = 133.38 cfs

Refer Appendix-D for proposed flood hydrograph summary.

Off-Site Runoff BOTH NORTH & WEST OFFSITE FLOW

The drainage area located north of the site sheet flows southeast toward N. Meridian Avenue across northeast portion of the Wal-Mart property. It is proposed to intercept the offsite runoff via a storm sewer system located northeast of the north detention pond and convey it to an existing 4'x4' concrete box culvert.

DETENTION SUMMARY

Table No. 1: Stage-Discharge Routing Summary of South and North Detention Ponds (refer Appendix-D for Proposed Unit and Flood Hydrographs)

CAPACITY OF 4'x4' BOX COMPARE TO EXIST. OFFSITE

Storm Freq. (year)	Proposed Routed Runoff From South Pond to 4'x4' Box Culvert (cfs)	Proposed Routed Runoff From North Pond to 4'x4' Box Culvert (cfs)	Total Proposed Routed Runoff To 4'x4' Box Culvert (Sum of Column 2 & 3) (cfs)	*Allowable Runoff to 4'x4' Box Culvert (cfs)	Proposed Runoff Lower than Existing (Subtract Column 4 from 5) (cfs)
Q2	5.98 (Page D-24)	2.92 (Page D-15)	8.9	12.26 (Page C-7)	3.36
Q100	41.77 (Page D-28)	14.15 (Page D-20)	55.92	68.90 (Page C-8)	12.98

* Allowable runoff values obtained from existing flood hydrograph.

Table No. 2: North Detention Pond Summary

Line No.	Description	At Q2	At Q100
1	Detention Volume Required (cft) (refer Note 1)	47,512.77 (Page D-15)	118,680.84 (Page D-22)
2	Detention Volume Provided (cft) (refer Note 2)	182,848.50 (Page E-3)	182,848.50 (Page E-3)
3	Peak Storage Elevation at Storm Interval (ft) (refer Note 1)	1330.25 (Page D-15)	1331.82 (Page D-20)
4	Berm Elevation (ft) (refer Note 2)	1333.00 (Page E-2)	1333.00 (Page E-2)
5	Freeboard Available (ft) *(subtract line 3 from 4)*	2.74	1.18
6	Peak Routed Outflow (cfs)	2.92 (Page D-15)	14.15 (Page D-20)
7	Peak Inflow to Pond (cfs) (refer Note 1)	35.71 (Page D-11)	86.37 (Page D-12)
8	Outlet Capacity (cfs) (refer Note 3)	90.34 (Page F-5)	90.34 (Page F-5)

Note 1: Refer Appendix D, Proposed Hydrographs for Stage-Storage Elevation Data at Time to Peak (Tp)
Note 2: Refer Appendix E, Detention Ponds for Maximum Storage Data
Note 3: Refer Appendix F, Detention Pond Outlet Structures Data

Q5 for comm.

Table No. 3: South Detention Pond Summary

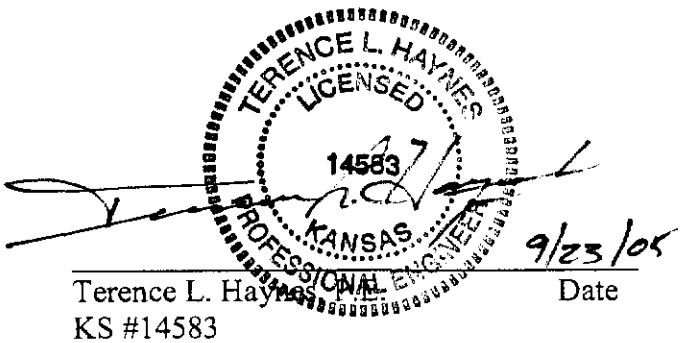
Line No.	Description	At Q2	At Q100
1	Detention Volume Required (cft) (refer Note 1)	84,414.87 (Page D-26)	179,379.84 (Page D-30)
2	Detention Volume Provided (cft) (refer Note 2)	233,659.05 (Page E-6)	233,659.05 (Page E-6)
3	Peak Storage Elevation at Storm Interval (ft) (refer Note 1)	1327.90 (Page D-24)	1330.33 (Page D-28)
4	Berm Elevation (ft) (refer Note 2)	1331.50 (Page E-4)	1331.50 (Page E-4)
5	Freeboard Available (ft) (subtract line 3 from 4)	3.6	1.17
6	Peak Routed outflow (cfs) (refer Table No. 2, Column 3)	5.98 (Page D-24)	41.77 (Page D-28)
7	Peak Inflow to Pond (cfs) (refer Note 1)	58.20 (Page D-13)	133.38 (Page D-14)
8	Outlet Capacity (cfs) (refer Note 3)	109.70 (Page F-11)	109.70 (Page F-11)

Note 1: Refer Appendix D, Proposed Hydrographs for Stage-Storage Elevation Data at Time to Peak (Tp)
Note 2: Refer Appendix E, Detention Ponds for Maximum Storage Data
Note 3: Refer Appendix F, Detention Pond Outlet Structures Data

CONCLUSION

- The Drainage Analysis of the project is completed using City and State Guidelines.
- Proposed runoffs, from the Wal-Mart site to an existing 4'x4' concrete box culvert, are not higher than historical runoffs. Refer Table No. 1.
- The Standpipe Weir Outlet structure for both detention ponds will perform as an emergency spillway for storm intervals higher than the 100-year event. Therefore, neither detention pond will overflow nor inundate the adjacent properties.
- The Standpipe Weir Outlet structures will be installed with trash screens to prevent clogging, remove floating debris and trash from storm water runoff and improve downstream water quality.
- The location of the Supercenter building is not in the effective floodplain.

The proposed development will not cause negative impact upstream or downstream of the project site.



Terence L. Haynes, P.E. Date
KS #14583

APPENDIX A

FIGURES

APPENDIX B

RAINFALL DATA

RAINFALL INTENSITY TABLES FOR COUNTIES IN KANSAS

KANSAS DEPARTMENT OF TRANSPORTATION

Revised, June 1997

RAINFALL INTENSITY TABLE

SEDGWICK COUNTY KANSAS
(revised June 1997)

This table contains average rainfall intensities in inches per hour.

DURATION, HR:MIN	RETURN PERIOD 1 YR	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
0:05	4.91	5.64	6.64	7.38	8.48	9.34	10.20
0:06	4.62	5.34	6.33	7.07	8.15	9.00	9.84
0:07	4.38	5.09	6.08	6.80	7.86	8.69	9.52
0:08	4.17	4.87	5.85	6.56	7.60	8.41	9.22
0:09	4.00	4.68	5.63	6.33	7.34	8.14	8.93
0:10	3.84	4.50	5.43	6.11	7.10	7.87	8.64
0:11	3.70	4.34	5.25	5.90	6.86	7.61	8.36
0:12	3.56	4.19	5.07	5.71	6.64	7.36	8.09
0:13	3.44	4.05	4.91	5.53	6.43	7.14	7.84
0:14	3.33	3.92	4.76	5.36	6.24	6.92	7.61
0:15	3.22	3.80	4.62	5.21	6.06	6.73	7.40
0:16	3.12	3.69	4.49	5.07	5.91	6.56	7.21
0:17	3.03	3.58	4.37	4.94	5.76	6.40	7.04
0:18	2.94	3.48	4.26	4.82	5.63	6.26	6.88
0:19	2.85	3.39	4.16	4.71	5.50	6.12	6.74
0:20	2.77	3.30	4.06	4.60	5.38	5.99	6.60
0:21	2.70	3.22	3.97	4.50	5.27	5.87	6.47
0:22	2.63	3.14	3.88	4.41	5.17	5.76	6.35
0:23	2.56	3.07	3.80	4.32	5.07	5.65	6.23
0:24	2.50	3.00	3.72	4.23	4.97	5.54	6.12
0:25	2.44	2.93	3.64	4.15	4.88	5.44	6.01
0:26	2.38	2.87	3.57	4.07	4.79	5.35	5.90
0:27	2.33	2.81	3.50	4.00	4.70	5.26	5.80
0:28	2.27	2.75	3.44	3.92	4.62	5.17	5.71
0:29	2.23	2.69	3.37	3.86	4.54	5.08	5.61
0:30	2.18	2.64	3.31	3.79	4.47	4.99	5.52
0:31	2.14	2.59	3.26	3.72	4.39	4.91	5.43
0:32	2.09	2.54	3.20	3.66	4.32	4.83	5.34
0:33	2.05	2.50	3.14	3.60	4.25	4.76	5.26
0:34	2.02	2.45	3.09	3.54	4.18	4.68	5.18
0:35	1.98	2.41	3.04	3.48	4.12	4.61	5.10
0:36	1.94	2.37	2.99	3.43	4.05	4.54	5.02
0:37	1.91	2.33	2.94	3.38	3.99	4.47	4.95
0:38	1.88	2.29	2.90	3.32	3.93	4.40	4.87
0:39	1.85	2.25	2.85	3.27	3.87	4.34	4.80
0:40	1.82	2.22	2.81	3.23	3.82	4.28	4.73
0:41	1.79	2.18	2.77	3.18	3.76	4.22	4.67
0:42	1.76	2.15	2.73	3.13	3.71	4.16	4.60
0:43	1.73	2.12	2.69	3.09	3.66	4.10	4.54
0:44	1.71	2.09	2.65	3.05	3.61	4.04	4.48
0:45	1.68	2.06	2.62	3.01	3.56	3.99	4.42
0:46	1.66	2.03	2.58	2.96	3.51	3.94	4.36
0:47	1.63	2.00	2.55	2.93	3.47	3.89	4.30
0:48	1.61	1.97	2.51	2.89	3.42	3.84	4.25
0:49	1.59	1.95	2.48	2.85	3.38	3.79	4.20
0:50	1.57	1.92	2.45	2.81	3.34	3.74	4.15

RAINFALL INTENSITY TABLE

SEDGWICK COUNTY KANSAS
(revised June 1997)

This table contains average rainfall intensities in inches per hour.

DURATION, HR:MIN	RETURN PERIOD 1 YR	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
0:51	1.55	1.90	2.42	2.78	3.30	3.70	4.10
0:52	1.53	1.87	2.39	2.75	3.26	3.65	4.05
0:53	1.51	1.85	2.36	2.71	3.22	3.61	4.00
0:54	1.49	1.83	2.33	2.68	3.18	3.57	3.95
0:55	1.47	1.80	2.30	2.65	3.14	3.53	3.91
0:56	1.45	1.78	2.28	2.62	3.11	3.49	3.86
0:57	1.43	1.76	2.25	2.59	3.07	3.45	3.82
0:58	1.41	1.74	2.22	2.56	3.04	3.41	3.78
0:59	1.40	1.72	2.20	2.53	3.01	3.37	3.74
1:00	1.38	1.70	2.17	2.50	2.97	3.34	3.70
1:05	1.30	1.61	2.06	2.38	2.82	3.17	3.52
1:10	1.23	1.53	1.96	2.26	2.69	3.02	3.35
1:15	1.17	1.45	1.87	2.16	2.57	2.89	3.20
1:20	1.11	1.38	1.79	2.06	2.46	2.77	3.07
1:25	1.06	1.32	1.71	1.98	2.36	2.65	2.95
1:30	1.01	1.27	1.64	1.90	2.27	2.55	2.83
1:35	0.97	1.21	1.58	1.83	2.18	2.46	2.73
1:40	0.93	1.16	1.52	1.76	2.10	2.37	2.63
1:45	0.89	1.12	1.46	1.70	2.03	2.29	2.54
1:50	0.86	1.08	1.41	1.64	1.96	2.21	2.46
1:55	0.82	1.04	1.36	1.58	1.89	2.13	2.38
2:00	0.79	1.00	1.31	1.53	1.83	2.07	2.30
2:05	0.76	0.97	1.27	1.48	1.77	2.00	2.23
2:10	0.74	0.93	1.23	1.43	1.72	1.94	2.16
2:15	0.71	0.90	1.19	1.39	1.67	1.88	2.10
2:20	0.69	0.87	1.15	1.35	1.62	1.83	2.04
2:25	0.66	0.85	1.12	1.31	1.57	1.78	1.98
2:30	0.64	0.82	1.09	1.27	1.53	1.73	1.93
2:35	0.62	0.80	1.06	1.24	1.49	1.68	1.88
2:40	0.61	0.78	1.03	1.21	1.45	1.64	1.83
2:45	0.59	0.75	1.01	1.18	1.42	1.60	1.79
2:50	0.57	0.74	0.98	1.15	1.38	1.56	1.74
2:55	0.56	0.72	0.96	1.12	1.35	1.53	1.70
3:00	0.55	0.70	0.94	1.10	1.32	1.49	1.67
3:15	0.51	0.66	0.88	1.03	1.24	1.40	1.57
3:30	0.48	0.62	0.83	0.97	1.17	1.32	1.48
3:45	0.45	0.59	0.78	0.92	1.11	1.26	1.40
4:00	0.43	0.56	0.75	0.88	1.06	1.20	1.34
4:15	0.41	0.53	0.71	0.84	1.01	1.14	1.28
4:30	0.40	0.51	0.68	0.80	0.97	1.10	1.22
4:45	0.38	0.49	0.66	0.77	0.93	1.05	1.17
5:00	0.37	0.47	0.63	0.74	0.89	1.01	1.13
5:15	0.36	0.46	0.61	0.72	0.86	0.98	1.09
5:30	0.35	0.44	0.59	0.69	0.83	0.94	1.05
5:45	0.34	0.43	0.57	0.67	0.81	0.91	1.02
6:00	0.33	0.42	0.55	0.65	0.78	0.88	0.98

RAINFALL INTENSITY TABLE

SEDGWICK COUNTY KANSAS
(revised June 1997)

This table contains average rainfall intensities in inches per hour.

DURATION, HR:MIN	RETURN PERIOD 1 YR	2 YR	5 YR	10 YR	25 YR	50 YR	100 YR
6:30	0.31	0.39	0.52	0.61	0.73	0.83	0.92
7:00	0.29	0.37	0.49	0.58	0.69	0.78	0.87
7:30	0.28	0.35	0.47	0.55	0.66	0.74	0.83
8:00	0.27	0.34	0.45	0.52	0.62	0.70	0.78
8:30	0.26	0.32	0.43	0.50	0.60	0.67	0.75
9:00	0.25	0.31	0.41	0.47	0.57	0.64	0.71
9:30	0.24	0.30	0.39	0.45	0.54	0.61	0.68
10:00	0.23	0.29	0.38	0.44	0.52	0.59	0.66
10:30	0.22	0.28	0.36	0.42	0.50	0.57	0.63
11:00	0.21	0.27	0.35	0.41	0.48	0.55	0.61
11:30	0.21	0.26	0.34	0.39	0.47	0.53	0.59
12:00	0.20	0.25	0.33	0.38	0.45	0.51	0.57
13:00	0.19	0.24	0.31	0.36	0.42	0.48	0.53
14:00	0.18	0.22	0.29	0.33	0.40	0.45	0.50
15:00	0.17	0.21	0.27	0.32	0.38	0.43	0.47
16:00	0.16	0.20	0.26	0.30	0.36	0.40	0.45
17:00	0.15	0.19	0.25	0.29	0.34	0.39	0.43
18:00	0.15	0.18	0.24	0.27	0.33	0.37	0.41
19:00	0.14	0.18	0.23	0.26	0.31	0.35	0.39
20:00	0.14	0.17	0.22	0.25	0.30	0.34	0.38
21:00	0.13	0.16	0.21	0.24	0.29	0.33	0.36
22:00	0.13	0.16	0.20	0.23	0.28	0.31	0.35
23:00	0.12	0.15	0.20	0.23	0.27	0.30	0.34
24:00	0.12	0.15	0.19	0.22	0.26	0.29	0.32

APPENDIX C

EXISTING HYDROGRAPHS

UNIT HYDROGRAPH REPORT

Number	Name	Type	Defined
1	XA1, UH, 2YR	Rational	Yes
2	XA1, UH, 100YR	Rational	Yes

UNIT HYDROGRAPH REPORT

Hydrograph Number:1
Name: XA1, UH, 2YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	68.36 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.23 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	23.65 (min)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	26.72	61	0.20

[TIME CONCENTRATION -- User Defined]
Time of Concentration (Tc) = 23.65 (min)

[Unit Hydrograph Flow Values: Time vs. Flow]
[The time interval is 1.00 min]

Time Interval	Time (min)	Flow (cfs)
1	1.00	2.89
2	2.00	5.78
3	3.00	8.67
4	4.00	11.56
5	5.00	14.45
6	6.00	17.34
7	7.00	20.23
8	8.00	23.12
9	9.00	26.01
10	10.00	28.90
11	11.00	31.79
12	12.00	34.68
13	13.00	37.57
14	14.00	40.46

UNIT HYDROGRAPH REPORT

15	15.00	43.35
16	16.00	46.25
17	17.00	49.14
18	18.00	52.03
19	19.00	54.92
20	20.00	57.81
21	21.00	60.70
22	22.00	63.59
23	23.00	66.48
24	24.00	67.34
25	25.00	64.45
26	26.00	61.56
27	27.00	58.67
28	28.00	55.78
29	29.00	52.89
30	30.00	50.00
31	31.00	47.11
32	32.00	44.22
33	33.00	41.33
34	34.00	38.44
35	35.00	35.55
36	36.00	32.66
37	37.00	29.77
38	38.00	26.88
39	39.00	23.99
40	40.00	21.10
41	41.00	18.21
42	42.00	15.32
43	43.00	12.43
44	44.00	9.54
45	45.00	6.65
46	46.00	3.76
47	47.00	0.87
48	47.30	0.00

UNIT HYDROGRAPH REPORT

Hydrograph Number: 2
Name: XA1, UH, 100YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	68.36 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.23 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	23.65 (min)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	26.72	61	0.41

[TIME CONCENTRATION -- User Defined]
Time of Concentration (Tc) = 23.65 (min)

[Unit Hydrograph Flow Values: Time vs. Flow]
[The time interval is 1.00 min]

Time Interval	Time (min)	Flow (cfs)
1	1.00	2.89
2	2.00	5.78
3	3.00	8.67
4	4.00	11.56
5	5.00	14.45
6	6.00	17.34
7	7.00	20.23
8	8.00	23.12
9	9.00	26.01
10	10.00	28.90
11	11.00	31.79
12	12.00	34.68
13	13.00	37.57
14	14.00	40.46

UNIT HYDROGRAPH REPORT

15	15.00	43.35
16	16.00	46.25
17	17.00	49.14
18	18.00	52.03
19	19.00	54.92
20	20.00	57.81
21	21.00	60.70
22	22.00	63.59
23	23.00	66.48
24	24.00	67.34
25	25.00	64.45
26	26.00	61.56
27	27.00	58.67
28	28.00	55.78
29	29.00	52.89
30	30.00	50.00
31	31.00	47.11
32	32.00	44.22
33	33.00	41.33
34	34.00	38.44
35	35.00	35.55
36	36.00	32.66
37	37.00	29.77
38	38.00	26.88
39	39.00	23.99
40	40.00	21.10
41	41.00	18.21
42	42.00	15.32
43	43.00	12.43
44	44.00	9.54
45	45.00	6.65
46	46.00	3.76
47	47.00	0.87
48	47.30	0.00

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 1
Name: XA1, CFH, 2 YEAR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	12.26 (cfs)
Time to Peak (Tp)	=	733.00 (min)
Time of Base (Tb)	=	1466.30 (min)
Volume	=	1.37 (ac-ft)
Time Step	=	1.00 (min)
Flow Multiplier	=	1.00

[UNIT HYDROGRAPH INFORMATION]

Number	=	1
Type	=	Rational
Peak Flow (Qp)	=	68.36 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.23 (ac-ft)
Shape Factor	=	484.00
Time Step:	=	1.00 (min)
Excess Rain	=	1.00 (in)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA]

Description	Area	CN
<None>		
Overall Approximation	26.72	61

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	23.65 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SCS II
Total Precipitation	=	3.60 (in)
Return Period	=	2 (yr)
Storm Duration	=	24.00 (hr)

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 2
Name: XA1, CFH, 100 YEAR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	68.90 (cfs)
Time to Peak (Tp)	=	733.00 (min)
Time of Base (Tb)	=	1466.30 (min)
Volume	=	7.10 (ac-ft)
Time Step	=	1.00 (min)
Flow Multiplier	=	1.00

[UNIT HYDROGRAPH INFORMATION]

Number	=	2
Type	=	Rational
Peak Flow (Qp)	=	68.36 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.23 (ac-ft)
Shape Factor	=	484.00
Time Step:	=	1.00 (min)
Excess Rain	=	1.00 (in)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA]

Description	Area	CN
<None>		
Overall Approximation	26.72	61

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	23.65 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SCS II
Total Precipitation	=	7.68 (in)
Return Period	=	100 (yr)
Storm Duration	=	24.00 (hr)

APPENDIX D

PROPOSED HYDROGRAPHS INCLUDING ROUTING HYDROGRAPHS

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED

Date: 09-23-05
Time: 08:43:07
Page: 1

UNIT HYDROGRAPH REPORT

Number	Name	Type	Defined
1	PA'S TO NORTH POND, UH, 2YR	Rational	Yes
2	PA'S TO NORTH POND, UH, 100YR	Rational	Yes
3	PA'S TO SOUTH POND, UH, 2YR	Rational	Yes
4	PA'S TO SOUTH POND, UH, 100YR	Rational	Yes

UNIT HYDROGRAPH REPORT

Hydrograph Number: 1
Name: PA'S TO NORTH POND, UH, 2YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	43.05 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.89 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	15.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	10.67	90	0.78

[TIME CONCENTRATION -- User Defined]
Time of Concentration (Tc) = 15.00 (min)

[Unit Hydrograph Flow Values: Time vs. Flow]
[The time interval is 1.00 min]

Time Interval	Time (min)	Flow (cfs)
1	1.00	2.87
2	2.00	5.74
3	3.00	8.61
4	4.00	11.48
5	5.00	14.35
6	6.00	17.22
7	7.00	20.09
8	8.00	22.96
9	9.00	25.83
10	10.00	28.70
11	11.00	31.57
12	12.00	34.44
13	13.00	37.31
14	14.00	40.18

UNIT HYDROGRAPH REPORT

15	15.00	43.05
16	16.00	40.18
17	17.00	37.31
18	18.00	34.44
19	19.00	31.57
20	20.00	28.70
21	21.00	25.83
22	22.00	22.96
23	23.00	20.09
24	24.00	17.22
25	25.00	14.35
26	26.00	11.48
27	27.00	8.61
28	28.00	5.74
29	29.00	2.87
30	30.00	0.00

UNIT HYDROGRAPH REPORT

Hydrograph Number: 2
Name: PA'S TO NORTH POND, UH, 100YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	43.05 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.89 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	15.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	10.67	90	0.83

[TIME CONCENTRATION -- User Defined]
Time of Concentration (Tc) = 15.00 (min)

[Unit Hydrograph Flow Values: Time vs. Flow]
[The time interval is 1.00 min]

Time Interval	Time (min)	Flow (cfs)
1	1.00	2.87
2	2.00	5.74
3	3.00	8.61
4	4.00	11.48
5	5.00	14.35
6	6.00	17.22
7	7.00	20.09
8	8.00	22.96
9	9.00	25.83
10	10.00	28.70
11	11.00	31.57
12	12.00	34.44
13	13.00	37.31
14	14.00	40.18

UNIT HYDROGRAPH REPORT

15	15.00	43.05
16	16.00	40.18
17	17.00	37.31
18	18.00	34.44
19	19.00	31.57
20	20.00	28.70
21	21.00	25.83
22	22.00	22.96
23	23.00	20.09
24	24.00	17.22
25	25.00	14.35
26	26.00	11.48
27	27.00	8.61
28	28.00	5.74
29	29.00	2.87
30	30.00	0.00

UNIT HYDROGRAPH REPORT

Hydrograph Number: 3
Name: PA'S TO SOUTH POND, UH, 2YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	64.73 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.34 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	15.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	16.05	93	0.85

[TIME CONCENTRATION -- User Defined]
Time of Concentration (Tc) = 15.00 (min)

[Unit Hydrograph Flow Values: Time vs. Flow]
[The time interval is 1.00 min]

Time Interval	Time (min)	Flow (cfs)
1	1.00	4.32
2	2.00	8.63
3	3.00	12.95
4	4.00	17.26
5	5.00	21.58
6	6.00	25.89
7	7.00	30.21
8	8.00	34.52
9	9.00	38.84
10	10.00	43.15
11	11.00	47.47
12	12.00	51.78
13	13.00	56.10
14	14.00	60.41

UNIT HYDROGRAPH REPORT

15	15.00	64.73
16	16.00	60.41
17	17.00	56.10
18	18.00	51.78
19	19.00	47.47
20	20.00	43.15
21	21.00	38.84
22	22.00	34.52
23	23.00	30.21
24	24.00	25.89
25	25.00	21.58
26	26.00	17.26
27	27.00	12.95
28	28.00	8.63
29	29.00	4.32
30	30.00	0.00

UNIT HYDROGRAPH REPORT

Hydrograph Number: 4
Name: PA'S TO SOUTH POND, UH, 100YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	64.73 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.34 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	15.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	16.05	93	0.88

[TIME CONCENTRATION -- User Defined]
Time of Concentration (Tc) = 15.00 (min)

[Unit Hydrograph Flow Values: Time vs. Flow]
[The time interval is 1.00 min]

Time Interval	Time (min)	Flow (cfs)
1	1.00	4.32
2	2.00	8.63
3	3.00	12.95
4	4.00	17.26
5	5.00	21.58
6	6.00	25.89
7	7.00	30.21
8	8.00	34.52
9	9.00	38.84
10	10.00	43.15
11	11.00	47.47
12	12.00	51.78
13	13.00	56.10
14	14.00	60.41

UNIT HYDROGRAPH REPORT

15	15.00	64.73
16	16.00	60.41
17	17.00	56.10
18	18.00	51.78
19	19.00	47.47
20	20.00	43.15
21	21.00	38.84
22	22.00	34.52
23	23.00	30.21
24	24.00	25.89
25	25.00	21.58
26	26.00	17.26
27	27.00	12.95
28	28.00	8.63
29	29.00	4.32
30	30.00	0.00

FLOOD HYDROGRAPH REPORT

Number	Name	Type	Defined
1	PA'S TO NORTH POND, CFH, 2YR	Computed Flood	Yes
2	PA'S TO NORTH POND, CFH, 100YR	Computed Flood	Yes
3	PA'S TO SOUTH POND, CFH, 2YR	Computed Flood	Yes
4	PA'S TO SOUTH POND, CFH, 100YR	Computed Flood	Yes
5	PA'S TO NORTH POND, 2YR	Universal Rational	Yes
6	PA'S TO NORTH POND, 100YR	Universal Rational	Yes
7	ROUTE, NORTH DP, 2YR	Reservoir: Storage	Yes
8	ROUTE, NORTH DP, 100YR	Reservoir: Storage	Yes
9	ROUTE, SOUTH DP, 2YR	Reservoir: Storage	Yes
10	ROUTE, SOUTH DP, 100YR	Reservoir: Storage	Yes

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 1
Name: PA'S TO NORTH POND, CFH, 2YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	35.71 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	2.26 (ac-ft)
Time Step	=	1.00 (min)
Flow Multiplier	=	1.00

[UNIT HYDROGRAPH INFORMATION]

Number	=	1
Type	=	Rational
Peak Flow (Qp)	=	43.05 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.89 (ac-ft)
Shape Factor	=	484.00
Time Step:	=	1.00 (min)
Excess Rain	=	1.00 (in)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA]

Description	Area	CN
<None>		
Overall Approximation	10.67	90

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SCS II
Total Precipitation	=	3.60 (in)
Return Period	=	2 (yr)
Storm Duration	=	24.00 (hr)

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 2
Name: PA'S TO NORTH POND, CFH, 100YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	86.37 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	5.76 (ac-ft)
Time Step	=	1.00 (min)
Flow Multiplier	=	1.00

[UNIT HYDROGRAPH INFORMATION]

Number	=	2
Type	=	Rational
Peak Flow (Qp)	=	43.05 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.89 (ac-ft)
Shape Factor	=	484.00
Time Step:	=	1.00 (min)
Excess Rain	=	1.00 (in)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA]

Description	Area	CN
<None>		
Overall Approximation	10.67	90

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SCS II
Total Precipitation	=	7.68 (in)
Return Period	=	100 (yr)
Storm Duration	=	24.00 (hr)

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 3
Name: PA'S TO SOUTH POND, CFH, 2YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	58.20 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	3.78 (ac-ft)
Time Step	=	1.00 (min)
Flow Multiplier	=	1.00

[UNIT HYDROGRAPH INFORMATION]

Number	=	4
Type	=	Rational
Peak Flow (Qp)	=	64.73 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.34 (ac-ft)
Shape Factor	=	484.00
Time Step:	=	1.00 (min)
Excess Rain	=	1.00 (in)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA]

Description	Area	CN
<None>		
Overall Approximation	16.05	93

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SCS II
Total Precipitation	=	3.60 (in)
Return Period	=	2 (yr)
Storm Duration	=	24.00 (hr)

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 4
Name: PA'S TO SOUTH POND, CFH, 100YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	133.38 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	9.14 (ac-ft)
Time Step	=	1.00 (min)
Flow Multiplier	=	1.00

[UNIT HYDROGRAPH INFORMATION]

Number	=	4
Type	=	Rational
Peak Flow (Qp)	=	64.73 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.34 (ac-ft)
Shape Factor	=	484.00
Time Step:	=	1.00 (min)
Excess Rain	=	1.00 (in)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA]

Description	Area	CN
<None>		
Overall Approximation	16.05	93

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	SCS II
Total Precipitation	=	7.68 (in)
Return Period	=	100 (yr)
Storm Duration	=	24.00 (hr)

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 7
Name: ROUTE, NORTH DP, 2YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	2.92 (cfs)
Time to Peak (Tp)	=	764.00 (min)
Time of Base (Tb)	=	1440.00 (min)
Volume	=	2.23 (ac-ft)
Time Step	=	1.00 (min)
Peak Elevation	=	1330.26 (ft)
Detention Time	=	NA

[RESERVOIR STRUCTURE INFORMATION]

Number	=	1
Name	=	NORTH DETENTION POND
Storage Type	=	User-Defined Area
Maximum Storage	=	182848.50 (cu ft)
Maximum Discharge	=	90.34 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number	=	1
Name	=	PA'S TO NORTH POND, CFH, 2YR
Peak Flow (Qp)	=	35.71 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	2.26 (ac-ft)
Flow Multiplier	=	1.00

[EQUATION]

$0.5(I1+I2)dt + S1-0.5(O2)dt$

Where:
I1 = Previous Inflow
I2 = Current Inflow
dt = Time increment
S1 = Previous Storage
S2 = Current Storage
O1 = Previous Outflow
O2 = Current Outflow

$A = 0.5\ (I1+I2)\ dt$
$B = S1 - 0.5\ (O1)\ dt$
$C = S2 + 0.5\ (O2)\ dt$

FLOOD HYDROGRAPH REPORT

Computation of Reservoir Outflow Table of Storage Indication Method
[The time interval is 1.00 min]

Intv	Time (min)	Inflow (cfs)	A (cfs)	B (cfs)	C (cfs)	Outflow (cfs)	Storage (cu ft)	Elev (ft)
1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
2	2.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
3	3.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
4	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
5	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
6	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
7	7.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
8	8.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
9	9.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
10	10.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
11	11.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
12	12.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
13	13.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
14	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
15	15.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
16	16.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
17	17.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
18	18.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
19	19.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
20	20.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
21	21.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
22	22.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
23	23.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
24	24.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
25	25.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
26	26.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
27	27.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
28	28.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
29	29.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
30	30.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
31	31.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
32	32.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
33	33.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
34	34.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
35	35.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
36	36.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
37	37.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
38	38.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
39	39.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
40	40.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00

FLOOD HYDROGRAPH REPORT

713	713.00	24.43	47.26	31935.57	34517.36	2.14	17259.75	1329.39
714	714.00	26.04	50.48	34517.36	37285.89	2.19	18644.04	1329.44
715	715.00	27.65	53.70	37285.89	40241.15	2.25	20121.70	1329.49
716	716.00	29.27	56.92	40241.15	43383.18	2.30	21692.74	1329.55
717	717.00	30.88	60.14	43383.18	46712.00	2.36	23357.18	1329.60
718	718.00	32.49	63.36	46712.00	50227.66	2.41	25115.03	1329.66
719	719.00	34.10	66.58	50227.66	53930.24	2.46	26966.35	1329.72
720	720.00	35.71	69.81	53930.24	57819.75	2.52	28911.13	1329.78
721	721.00	33.72	69.43	57819.75	61680.78	2.57	30841.67	1329.83
722	722.00	31.74	65.46	61680.78	65298.12	2.61	32650.36	1329.88
723	723.00	29.76	61.50	65298.12	68672.38	2.65	34337.52	1329.93
724	724.00	27.77	57.53	68672.38	71804.13	2.68	35903.41	1329.97
725	725.00	25.79	53.56	71804.13	74693.80	2.72	37348.26	1330.01
726	726.00	23.80	49.59	74693.80	77341.81	2.74	38672.28	1330.04
727	727.00	21.82	45.63	77341.81	79748.58	2.77	39875.67	1330.07
728	728.00	19.84	41.66	79748.58	81914.41	2.79	40958.60	1330.10
729	729.00	17.85	37.69	81914.41	83839.65	2.81	41921.23	1330.12
730	730.00	15.87	33.72	83839.65	85524.65	2.83	42763.74	1330.14
731	731.00	13.88	29.75	85524.65	86969.70	2.84	43486.27	1330.16
732	732.00	11.90	25.79	86969.70	88175.08	2.85	44088.97	1330.18
733	733.00	9.92	21.82	88175.08	89141.10	2.86	44571.98	1330.19
734	734.00	7.93	17.85	89141.10	89868.02	2.87	44935.45	1330.20
735	735.00	5.95	13.88	89868.02	90356.15	2.88	45179.51	1330.20
736	736.00	5.82	11.77	90356.15	90717.04	2.88	45359.96	1330.21
737	737.00	5.69	11.51	90717.04	91062.08	2.88	45532.48	1330.21
738	738.00	5.56	11.25	91062.08	91391.29	2.89	45697.09	1330.22
739	739.00	5.43	11.00	91391.29	91704.70	2.89	45853.80	1330.22
740	740.00	5.31	10.74	91704.70	92002.33	2.89	46002.61	1330.22
741	741.00	5.18	10.48	92002.33	92284.18	2.89	46143.54	1330.23
742	742.00	5.05	10.23	92284.18	92550.28	2.90	46276.59	1330.23
743	743.00	4.92	9.97	92550.28	92800.64	2.90	46401.77	1330.23
744	744.00	4.79	9.71	92800.64	93035.29	2.90	46519.09	1330.24
745	745.00	4.66	9.45	93035.29	93254.24	2.90	46628.57	1330.24
746	746.00	4.53	9.20	93254.24	93457.51	2.91	46730.21	1330.24
747	747.00	4.41	8.94	93457.51	93645.12	2.91	46824.01	1330.24
748	748.00	4.28	8.68	93645.12	93817.08	2.91	46909.99	1330.25
749	749.00	4.15	8.42	93817.08	93973.42	2.91	46988.16	1330.25
750	750.00	4.02	8.17	93973.42	94114.15	2.91	47058.53	1330.25
751	751.00	3.94	7.96	94114.15	94242.19	2.91	47122.55	1330.25
752	752.00	3.86	7.80	94242.19	94360.48	2.91	47181.70	1330.25
753	753.00	3.78	7.64	94360.48	94469.02	2.91	47235.97	1330.25
754	754.00	3.70	7.48	94469.02	94567.81	2.92	47285.36	1330.26
755	755.00	3.62	7.32	94567.81	94656.88	2.92	47329.90	1330.26
756	756.00	3.54	7.16	94656.88	94736.24	2.92	47369.58	1330.26
757	757.00	3.46	7.00	94736.24	94805.88	2.92	47404.40	1330.26
758	758.00	3.38	6.84	94805.88	94865.84	2.92	47434.38	1330.26
759	759.00	3.30	6.68	94865.84	94916.11	2.92	47459.52	1330.26
760	760.00	3.22	6.52	94916.11	94956.71	2.92	47479.82	1330.26

FLOOD HYDROGRAPH REPORT

761	761.00	3.14	6.36	94956.71	94987.65	2.92	47495.29	1330.26
762	762.00	3.06	6.19	94987.65	95008.94	2.92	47505.93	1330.26
763	763.00	2.98	6.03	95008.94	95020.59	2.92	47511.76	1330.26
764	764.00	2.90	5.87	95020.59	95022.62	2.92	47512.77	1330.26
765	765.00	2.82	5.71	95022.62	95015.03	2.92	47508.97	1330.26
766	766.00	2.79	5.60	95015.03	95000.86	2.92	47501.89	1330.26
767	767.00	2.76	5.54	95000.86	94983.14	2.92	47493.03	1330.26
768	768.00	2.73	5.49	94983.14	94961.87	2.92	47482.40	1330.26
769	769.00	2.70	5.43	94961.87	94937.07	2.92	47470.00	1330.26
770	770.00	2.67	5.37	94937.07	94908.74	2.92	47455.83	1330.26
771	771.00	2.64	5.31	94908.74	94876.87	2.92	47439.89	1330.26
772	772.00	2.61	5.25	94876.87	94841.47	2.92	47422.20	1330.26
773	773.00	2.58	5.19	94841.47	94802.56	2.92	47402.74	1330.26
774	774.00	2.55	5.13	94802.56	94760.12	2.92	47381.52	1330.26
775	775.00	2.52	5.07	94760.12	94714.17	2.92	47358.54	1330.26
776	776.00	2.49	5.01	94714.17	94664.71	2.92	47333.81	1330.26
777	777.00	2.46	4.95	94664.71	94611.74	2.92	47307.33	1330.26
778	778.00	2.43	4.89	94611.74	94555.27	2.92	47279.09	1330.26
779	779.00	2.40	4.83	94555.27	94495.30	2.92	47249.11	1330.25
780	780.00	2.37	4.77	94495.30	94431.84	2.91	47217.37	1330.25
781	781.00	2.35	4.72	94431.84	94365.28	2.91	47184.10	1330.25
782	782.00	2.33	4.67	94365.28	94296.05	2.91	47149.48	1330.25
783	783.00	2.30	4.63	94296.05	94224.13	2.91	47113.52	1330.25
784	784.00	2.28	4.58	94224.13	94149.55	2.91	47076.23	1330.25
785	785.00	2.26	4.54	94149.55	94072.28	2.91	47037.60	1330.25
786	786.00	2.23	4.49	94072.28	93992.35	2.91	46997.63	1330.25
787	787.00	2.21	4.44	93992.35	93909.75	2.91	46956.33	1330.25
788	788.00	2.19	4.40	93909.75	93824.49	2.91	46913.70	1330.25
789	789.00	2.16	4.35	93824.49	93736.57	2.91	46869.74	1330.25
790	790.00	2.14	4.31	93736.57	93645.99	2.91	46824.45	1330.24
791	791.00	2.12	4.26	93645.99	93552.76	2.91	46777.83	1330.24
792	792.00	2.10	4.21	93552.76	93456.87	2.91	46729.89	1330.24
793	793.00	2.07	4.17	93456.87	93358.34	2.90	46680.62	1330.24
794	794.00	2.05	4.12	93358.34	93257.16	2.90	46630.03	1330.24
795	795.00	2.03	4.08	93257.16	93153.34	2.90	46578.12	1330.24
796	796.00	2.01	4.04	93153.34	93047.29	2.90	46525.09	1330.24
797	797.00	1.99	4.00	93047.29	92939.42	2.90	46471.16	1330.24
798	798.00	1.98	3.97	92939.42	92829.75	2.90	46416.32	1330.23
799	799.00	1.96	3.94	92829.75	92718.27	2.90	46360.58	1330.23
800	800.00	1.95	3.91	92718.27	92604.97	2.90	46303.94	1330.23
801	801.00	1.93	3.87	92604.97	92489.88	2.90	46246.39	1330.23
802	802.00	1.91	3.84	92489.88	92372.98	2.89	46187.94	1330.23
803	803.00	1.90	3.81	92372.98	92254.27	2.89	46128.58	1330.23
804	804.00	1.88	3.78	92254.27	92133.77	2.89	46068.33	1330.23
805	805.00	1.86	3.75	92133.77	92011.47	2.89	46007.18	1330.22
806	806.00	1.85	3.71	92011.47	91887.38	2.89	45945.13	1330.22
807	807.00	1.83	3.68	91887.38	91761.49	2.89	45882.19	1330.22
808	808.00	1.82	3.65	91761.49	91633.81	2.89	45818.35	1330.22

FLOOD HYDROGRAPH REPORT

1433	1433.00	0.40	0.81	2659.90	2649.84	0.49	1325.16	1328.39
1434	1434.00	0.40	0.81	2649.84	2639.95	0.49	1320.22	1328.39
1435	1435.00	0.40	0.81	2639.95	2630.22	0.48	1315.35	1328.38
1436	1436.00	0.40	0.81	2630.22	2620.65	0.48	1310.57	1328.38
1437	1437.00	0.40	0.81	2620.65	2611.23	0.48	1305.86	1328.38
1438	1438.00	0.40	0.81	2611.23	2601.97	0.48	1301.23	1328.38
1439	1439.00	0.40	0.81	2601.97	2592.87	0.48	1296.67	1328.38
1440	1440.00	0.40	0.80	2592.87	2583.91	0.48	1292.19	1328.38

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 8
Name: ROUTE, NORTH DP, 100YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	14.15 (cfs)
Time to Peak (Tp)	=	735.00 (min)
Time of Base (Tb)	=	1440.00 (min)
Volume	=	5.30 (ac-ft)
Time Step	=	1.00 (min)
Peak Elevation	=	1331.82 (ft)
Detention Time	=	NA

[RESERVOIR STRUCTURE INFORMATION]

Number	=	1
Name	=	NORTH DETENTION POND
Storage Type	=	User-Defined Area
Maximum Storage	=	182848.50 (cu ft)
Maximum Discharge	=	90.34 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number	=	2
Name	=	PA'S TO NORTH POND, CFH, 100YR
Peak Flow (Qp)	=	86.37 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	5.76 (ac-ft)
Flow Multiplier	=	1.00

[EQUATION]

$0.5(I1+I2)dt + S1-0.5(O2)dt$

Where:
I1 = Previous Inflow
I2 = Current Inflow
dt = Time increment
S1 = Previous Storage
S2 = Current Storage
O1 = Previous Outflow
O2 = Current Outflow

$A = 0.5\ (I1+I2)\ dt$
$B = S1 - 0.5\ (O1)\ dt$
$C = S2 + 0.5\ (O2)\ dt$

FLOOD HYDROGRAPH REPORT

Computation of Reservoir Outflow Table of Storage Indication Method
[The time interval is 1.00 min]

Intv	Time (min)	Inflow (cfs)	A (cfs)	B (cfs)	C (cfs)	Outflow (cfs)	Storage (cu ft)	Elev (ft)
1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
2	2.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
3	3.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
4	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
5	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
6	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
7	7.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
8	8.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
9	9.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
10	10.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
11	11.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
12	12.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
13	13.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
14	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
15	15.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
16	16.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
17	17.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
18	18.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
19	19.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
20	20.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
21	21.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
22	22.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
23	23.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
24	24.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
25	25.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
26	26.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
27	27.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
28	28.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
29	29.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
30	30.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
31	31.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
32	32.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
33	33.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
34	34.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
35	35.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
36	36.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
37	37.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
38	38.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
39	39.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00
40	40.00	0.00	0.00	0.00	0.00	0.00	0.00	1328.00

FLOOD HYDROGRAPH REPORT

713	713.00	60.43	117.16	103320.10	109986.46	3.06	54994.76	1330.44
714	714.00	64.14	124.57	109986.46	117086.59	3.18	58544.88	1330.53
715	715.00	67.84	131.98	117086.59	124607.37	3.45	62305.41	1330.62
716	716.00	71.55	139.39	124607.37	132530.38	3.88	66267.13	1330.71
717	717.00	75.25	146.80	132530.38	140839.81	4.42	70422.12	1330.80
718	718.00	78.96	154.21	140839.81	149522.61	5.07	74763.84	1330.90
719	719.00	82.66	161.62	149522.61	158566.86	5.81	79286.33	1331.00
720	720.00	86.37	169.03	158566.86	167961.35	6.64	83983.99	1331.10
721	721.00	81.53	167.90	167961.35	177185.89	7.51	88596.70	1331.20
722	722.00	76.69	158.22	177185.89	185727.13	8.35	92867.74	1331.29
723	723.00	71.85	148.55	185727.13	193588.56	9.16	96798.86	1331.38
724	724.00	67.01	138.87	193588.56	200775.14	9.92	100392.53	1331.45
725	725.00	62.18	129.19	200775.14	207293.10	10.63	103651.86	1331.52
726	726.00	57.34	119.51	207293.10	213149.20	11.28	106580.24	1331.58
727	727.00	52.50	109.84	213149.20	218350.58	11.86	109181.22	1331.63
728	728.00	47.66	100.16	218350.58	222905.02	12.38	111458.70	1331.68
729	729.00	42.82	90.48	222905.02	226820.60	12.83	113416.72	1331.72
730	730.00	37.98	80.81	226820.60	230105.42	13.22	115059.32	1331.75
731	731.00	33.15	71.13	230105.42	232767.91	13.53	116390.72	1331.78
732	732.00	28.31	61.45	232767.91	234816.74	13.77	117415.26	1331.80
733	733.00	23.47	51.77	234816.74	236257.91	13.98	118135.94	1331.81
734	734.00	18.63	42.10	236257.91	237098.05	14.11	118556.08	1331.82
735	735.00	13.79	32.42	237098.05	237347.54	14.15	118680.84	1331.82
736	736.00	13.49	27.28	237347.54	237286.89	14.14	118650.51	1331.82
737	737.00	13.19	26.68	237286.89	237191.44	14.13	118602.79	1331.82
738	738.00	12.89	26.07	237191.44	237061.85	14.11	118537.98	1331.82
739	739.00	12.58	25.47	237061.85	236898.74	14.08	118456.41	1331.82
740	740.00	12.28	24.86	236898.74	236702.72	14.05	118358.39	1331.82
741	741.00	11.98	24.26	236702.72	236474.40	14.02	118244.21	1331.81
742	742.00	11.68	23.66	236474.40	236214.38	13.97	118114.18	1331.81
743	743.00	11.37	23.05	236214.38	235923.23	13.93	117968.58	1331.81
744	744.00	11.07	22.45	235923.23	235601.54	13.88	117807.71	1331.80
745	745.00	10.77	21.84	235601.54	235249.85	13.83	117631.84	1331.80
746	746.00	10.47	21.24	235249.85	234868.14	13.78	117440.96	1331.80
747	747.00	10.17	20.64	234868.14	234456.04	13.73	117234.88	1331.79
748	748.00	9.86	20.03	234456.04	234013.70	13.68	117013.69	1331.79
749	749.00	9.56	19.43	234013.70	233541.54	13.62	116777.58	1331.78
750	750.00	9.26	18.82	233541.54	233039.98	13.56	116526.77	1331.78
751	751.00	9.07	18.33	233039.98	232516.32	13.50	116264.91	1331.77
752	752.00	8.89	17.96	232516.32	231977.77	13.44	115995.61	1331.77
753	753.00	8.70	17.59	231977.77	231424.54	13.37	115718.95	1331.76
754	754.00	8.52	17.22	231424.54	230856.82	13.31	115435.06	1331.76
755	755.00	8.33	16.84	230856.82	230274.82	13.24	115144.03	1331.75
756	756.00	8.14	16.47	230274.82	229678.74	13.17	114845.95	1331.75
757	757.00	7.96	16.10	229678.74	229068.77	13.10	114540.93	1331.74
758	758.00	7.77	15.73	229068.77	228445.11	13.02	114229.07	1331.73
759	759.00	7.58	15.35	228445.11	227807.96	12.95	113910.45	1331.73
760	760.00	7.40	14.98	227807.96	227157.49	12.87	113585.18	1331.72

FLOOD HYDROGRAPH REPORT

1433	1433.00	0.90	1.81	41940.08	41775.32	2.28	20888.80	1329.52
1434	1434.00	0.90	1.81	41775.32	41610.81	2.27	20806.54	1329.52
1435	1435.00	0.90	1.81	41610.81	41446.55	2.27	20724.41	1329.52
1436	1436.00	0.90	1.80	41446.55	41282.54	2.27	20642.41	1329.51
1437	1437.00	0.90	1.80	41282.54	41118.78	2.26	20560.52	1329.51
1438	1438.00	0.90	1.80	41118.78	40955.27	2.26	20478.76	1329.51
1439	1439.00	0.90	1.80	40955.27	40792.00	2.26	20397.13	1329.50
1440	1440.00	0.90	1.80	40792.00	40628.97	2.26	20315.62	1329.50

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 9
Name: ROUTE, SOUTH DP, 2YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	5.98 (cfs)
Time to Peak (Tp)	=	753.00 (min)
Time of Base (Tb)	=	1440.00 (min)
Volume	=	3.55 (ac-ft)
Time Step	=	1.00 (min)
Peak Elevation	=	1327.90 (ft)
Detention Time	=	NA

[RESERVOIR STRUCTURE INFORMATION]

Number	=	2
Name	=	SOUTH DETENTION POND
Storage Type	=	User-Defined Area
Maximum Storage	=	233659.05 (cu ft)
Maximum Discharge	=	109.70 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number	=	3
Name	=	PA'S TO SOUTH POND, CFH, 2YR
Peak Flow (Qp)	=	58.20 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	3.78 (ac-ft)
Flow Multiplier	=	1.00

[EQUATION]

$0.5(I1+I2)dt + S1-0.5(O2)dt$

Where:
I1 = Previous Inflow
I2 = Current Inflow
dt = Time increment
S1 = Previous Storage
S2 = Current Storage
O1 = Previous Outflow
O2 = Current Outflow

$A = 0.5\ (I1+I2)\ dt$
$B = S1 - 0.5\ (O1)\ dt$
$C = S2 + 0.5\ (O2)\ dt$

FLOOD HYDROGRAPH REPORT

Computation of Reservoir Outflow Table of Storage Indication Method
[The time interval is 1.00 min]

Intv	Time (min)	Inflow (cfs)	A (cfs)	B (cfs)	C (cfs)	Outflow (cfs)	Storage (cu ft)	Elev (ft)
1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
2	2.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
3	3.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
4	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
5	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
6	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
7	7.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
8	8.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
9	9.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
10	10.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
11	11.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
12	12.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
13	13.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
14	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
15	15.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
16	16.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
17	17.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
18	18.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
19	19.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
20	20.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
21	21.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
22	22.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
23	23.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
24	24.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
25	25.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
26	26.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
27	27.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
28	28.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
29	29.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
30	30.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
31	31.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
32	32.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
33	33.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
34	34.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
35	35.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
36	36.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
37	37.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
38	38.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
39	39.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
40	40.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90

FLOOD HYDROGRAPH REPORT

733	733.00	15.94	35.14	162228.14	163631.40	5.89	81818.65	1327.83
734	734.00	12.69	28.64	163631.40	164642.02	5.91	82323.97	1327.84
735	735.00	9.44	22.14	164642.02	165260.83	5.92	82633.37	1327.85
736	736.00	9.24	18.68	165260.83	165671.15	5.92	82838.54	1327.86
737	737.00	9.03	18.27	165671.15	166055.93	5.93	83030.93	1327.86
738	738.00	8.83	17.86	166055.93	166415.20	5.94	83210.57	1327.87
739	739.00	8.62	17.45	166415.20	166749.04	5.94	83377.49	1327.87
740	740.00	8.41	17.03	166749.04	167057.49	5.95	83531.72	1327.88
741	741.00	8.21	16.62	167057.49	167340.60	5.95	83673.28	1327.88
742	742.00	8.00	16.21	167340.60	167598.43	5.96	83802.20	1327.88
743	743.00	7.80	15.80	167598.43	167831.04	5.96	83918.50	1327.89
744	744.00	7.59	15.39	167831.04	168038.48	5.97	84022.22	1327.89
745	745.00	7.38	14.97	168038.48	168220.80	5.97	84113.38	1327.89
746	746.00	7.18	14.56	168220.80	168378.05	5.97	84192.01	1327.90
747	747.00	6.97	14.15	168378.05	168510.30	5.97	84258.14	1327.90
748	748.00	6.77	13.74	168510.30	168617.58	5.98	84311.78	1327.90
749	749.00	6.56	13.33	168617.58	168699.96	5.98	84352.97	1327.90
750	750.00	6.36	12.92	168699.96	168757.49	5.98	84381.74	1327.90
751	751.00	6.23	12.58	168757.49	168794.93	5.98	84400.45	1327.90
752	752.00	6.10	12.33	168794.93	168817.01	5.98	84411.49	1327.90
753	753.00	5.97	12.07	168817.01	168823.76	5.98	84414.87	1327.90
754	754.00	5.85	11.82	168823.76	168815.22	5.98	84410.60	1327.90
755	755.00	5.72	11.56	168815.22	168791.42	5.98	84398.70	1327.90
756	756.00	5.59	11.31	168791.42	168752.39	5.98	84379.18	1327.90
757	757.00	5.46	11.05	168752.39	168698.15	5.98	84352.07	1327.90
758	758.00	5.34	10.80	168698.15	168628.75	5.98	84317.36	1327.90
759	759.00	5.21	10.54	168628.75	168544.22	5.98	84275.10	1327.90
760	760.00	5.08	10.29	168544.22	168444.59	5.97	84225.28	1327.90

FLOOD HYDROGRAPH REPORT

Hydrograph Number: 10
Name: ROUTE, SOUTH DP, 100YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	41.77 (cfs)
Time to Peak (Tp)	=	732.00 (min)
Time of Base (Tb)	=	1440.00 (min)
Volume	=	8.66 (ac-ft)
Time Step	=	1.00 (min)
Peak Elevation	=	1330.33 (ft)
Detention Time	=	NA

[RESERVOIR STRUCTURE INFORMATION]

Number	=	2
Name	=	SOUTH DETENTION POND
Storage Type	=	User-Defined Area
Maximum Storage	=	233659.05 (cu ft)
Maximum Discharge	=	109.70 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number	=	4
Name	=	PA'S TO SOUTH POND, CFH, 100YR
Peak Flow (Qp)	=	133.38 (cfs)
Time to Peak (Tp)	=	720.00 (min)
Time of Base (Tb)	=	1455.00 (min)
Volume	=	9.14 (ac-ft)
Flow Multiplier	=	1.00

[EQUATION]

$0.5(I1+I2)dt + S1-0.5(O2)dt$

Where:
I1 = Previous Inflow
I2 = Current Inflow
dt = Time increment
S1 = Previous Storage
S2 = Current Storage
O1 = Previous Outflow
O2 = Current Outflow

$A = 0.5\ (I1+I2)\ dt$
$B = S1 - 0.5\ (O1)\ dt$
$C = S2 + 0.5\ (O2)\ dt$

FLOOD HYDROGRAPH REPORT

Computation of Reservoir Outflow Table of Storage Indication Method
[The time interval is 1.00 min]

Intv	Time (min)	Inflow (cfs)	A (cfs)	B (cfs)	C (cfs)	Outflow (cfs)	Storage (cu ft)	Elev (ft)
1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
2	2.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
3	3.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
4	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
5	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
6	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
7	7.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
8	8.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
9	9.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
10	10.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
11	11.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
12	12.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
13	13.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
14	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
15	15.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
16	16.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
17	17.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
18	18.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
19	19.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
20	20.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
21	21.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
22	22.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
23	23.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
24	24.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
25	25.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
26	26.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
27	27.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
28	28.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
29	29.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
30	30.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
31	31.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
32	32.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
33	33.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
34	34.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
35	35.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
36	36.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
37	37.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
38	38.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
39	39.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90
40	40.00	0.00	0.00	0.00	0.00	0.00	0.00	1324.90

FLOOD HYDROGRAPH REPORT

713	713.00	93.88	182.13	183053.67	193224.88	6.38	96615.63	1328.25
714	714.00	99.53	193.41	193224.88	204053.35	6.55	102029.95	1328.40
715	715.00	105.17	204.70	204053.35	215523.29	6.97	107765.13	1328.56
716	716.00	110.81	215.98	215523.29	227564.21	8.30	113786.26	1328.72
717	717.00	116.45	227.27	227564.21	240082.68	10.29	120046.48	1328.89
718	718.00	122.10	238.55	240082.68	253009.96	12.77	126511.37	1329.06
719	719.00	127.74	249.84	253009.96	266292.80	15.64	133154.22	1329.23
720	720.00	133.38	261.12	266292.80	279886.49	18.86	139952.68	1329.40
721	721.00	125.89	259.28	279886.49	292975.01	22.21	146498.61	1329.56
722	722.00	118.41	244.30	292975.01	304774.27	25.38	152399.82	1329.70
723	723.00	110.92	229.33	304774.27	315307.71	28.34	157668.02	1329.83
724	724.00	103.44	214.36	315307.71	324604.16	31.03	162317.60	1329.94
725	725.00	95.95	199.38	324604.16	332697.36	33.43	166365.39	1330.03
726	726.00	88.46	184.41	332697.36	339623.37	35.52	169829.44	1330.11
727	727.00	80.98	169.44	339623.37	345419.40	37.29	172728.35	1330.18
728	728.00	73.49	154.46	345419.40	350123.19	38.75	175080.97	1330.23
729	729.00	66.00	139.49	350123.19	353772.96	39.89	176906.43	1330.28
730	730.00	58.52	124.52	353772.96	356402.93	40.78	178221.86	1330.31
731	731.00	51.03	109.55	356402.93	358039.24	41.48	179040.36	1330.33
732	732.00	43.54	94.57	358039.24	358717.90	41.77	179379.84	1330.33
733	733.00	36.06	79.60	358717.90	358487.04	41.67	179264.36	1330.33
734	734.00	28.57	64.63	358487.04	357392.33	41.20	178716.77	1330.32
735	735.00	21.08	49.65	357392.33	355474.68	40.42	177757.55	1330.30
736	736.00	20.62	41.70	355474.68	353170.07	39.70	176604.89	1330.27
737	737.00	20.16	40.78	353170.07	350895.70	38.99	175467.34	1330.24
738	738.00	19.69	39.85	350895.70	348650.43	38.29	174344.36	1330.22
739	739.00	19.23	38.93	348650.43	346432.99	37.60	173235.29	1330.19
740	740.00	18.77	38.00	346432.99	344241.59	36.93	172139.26	1330.17
741	741.00	18.31	37.07	344241.59	342074.79	36.27	171055.53	1330.14
742	742.00	17.84	36.15	342074.79	339931.69	35.61	169983.65	1330.12
743	743.00	17.38	35.22	339931.69	337811.21	34.96	168923.08	1330.09
744	744.00	16.92	34.30	337811.21	335711.76	34.33	167873.05	1330.07
745	745.00	16.45	33.37	335711.76	333632.09	33.71	166832.90	1330.04
746	746.00	15.99	32.44	333632.09	331571.48	33.09	165802.29	1330.02
747	747.00	15.53	31.52	331571.48	329529.13	32.48	164780.81	1330.00
748	748.00	15.06	30.59	329529.13	327503.60	31.88	163767.74	1329.97
749	749.00	14.60	29.66	327503.60	325493.66	31.29	162762.48	1329.95
750	750.00	14.14	28.74	325493.66	323498.76	30.71	161764.73	1329.92
751	751.00	13.85	27.99	323498.76	321528.89	30.13	160779.51	1329.90
752	752.00	13.57	27.42	321528.89	319592.90	29.57	159811.23	1329.88
753	753.00	13.28	26.85	319592.90	317688.84	29.02	158858.93	1329.86
754	754.00	13.00	26.28	317688.84	315815.57	28.49	157922.03	1329.83
755	755.00	12.71	25.71	315815.57	313972.05	27.96	157000.00	1329.81
756	756.00	12.43	25.14	313972.05	312156.90	27.44	156092.17	1329.79
757	757.00	12.14	24.57	312156.90	310368.36	26.94	155197.65	1329.77
758	758.00	11.86	24.00	310368.36	308605.11	26.45	154315.78	1329.75
759	759.00	11.57	23.43	308605.11	306866.33	25.97	153446.15	1329.73
760	760.00	11.29	22.86	306866.33	305151.19	25.49	152588.34	1329.71

FLOOD HYDROGRAPH REPORT

1433	1433.00	1.37	2.74	43015.02	42884.82	2.45	21443.64	1325.82
1434	1434.00	1.37	2.74	42884.82	42755.30	2.45	21378.87	1325.82
1435	1435.00	1.37	2.74	42755.30	42626.45	2.44	21314.44	1325.81
1436	1436.00	1.37	2.74	42626.45	42498.26	2.43	21250.35	1325.81
1437	1437.00	1.37	2.73	42498.26	42370.73	2.43	21186.58	1325.81
1438	1438.00	1.37	2.73	42370.73	42243.85	2.42	21123.14	1325.81
1439	1439.00	1.36	2.73	42243.85	42117.63	2.41	21060.02	1325.80
1440	1440.00	1.36	2.73	42117.63	41992.05	2.41	20997.23	1325.80

APPENDIX E

DETENTION POND DATA

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED

Date: 09-23-05
Time: 08:43:41
Page: 1

RESERVOIR LISTING

Number	Name	Type	Defined
1	NORTH DETENTION POND	User-Defined Storage	Yes
2	SOUTH DETENTION POND	User-Defined Storage	Yes

RESERVOIR REPORT

Reservoir Number: 1
Name: NORTH DETENTION POND

[RATING CURVE LIMIT]

Minimum Elevation	=	1328.00 (ft)
Maximum Elevation	=	1333.00 (ft)
Elevation Increment	=	0.10 (ft)

[STAGE STORAGE INFORMATION]
Storage Method: User-Defined Storage

Input Method: Area

Number	Elevation (ft)	Area (sq ft)	Ave Area (sq ft)	Volume (cu ft)	Cumulative Volume (cu ft)
1	1328.00	0.00	0.00	0.00	0.00
2	1329.00	17612.00	8806.00	8806.00	8806.00
3	1330.00	38973.00	28292.50	28292.50	37098.50
4	1331.00	45324.00	42148.50	42148.50	79247.00
5	1332.00	51776.00	48550.00	48550.00	127797.00
6	1333.00	58327.00	55051.50	55051.50	182848.50

[DISCHARGE INFORMATION]
Structure Number: 1
Type:
Name: SPW for North DP

[RESERVOIR STAGE STORAGE/DISCHARGE]

Elevation (ft)	Stage (ft)	Area (sq ft)	Storage (cu ft)	Discharge (cfs)
1328.00	0.00	0.00	0.00	0.00
1328.10	0.10	1761.20	88.06	0.04
1328.20	0.20	3522.40	352.24	0.14
1328.30	0.30	5283.60	792.54	0.31
1328.40	0.40	7044.80	1408.96	0.52
1328.50	0.50	8806.00	2201.50	0.75
1328.60	0.60	10567.20	3170.16	1.00
1328.70	0.70	12328.40	4314.94	1.22
1328.80	0.80	14089.60	5635.84	1.39
1328.90	0.90	15850.80	7132.86	1.54
1329.00	1.00	17612.00	8806.00	1.68
1329.10	1.10	19748.10	10674.00	1.81
1329.20	1.20	21884.20	12755.62	1.93
1329.30	1.30	24020.30	15050.84	2.05

RESERVOIR REPORT

1329.40	1.40	26156.40	17559.68	2.15
1329.50	1.50	28292.50	20282.12	2.26
1329.60	1.60	30428.60	23218.18	2.35
1329.70	1.70	32564.70	26367.84	2.45
1329.80	1.80	34700.80	29731.12	2.54
1329.90	1.90	36836.90	33308.00	2.63
1330.00	2.00	38973.00	37098.50	2.71
1330.10	2.10	39608.10	41027.55	2.79
1330.20	2.20	40243.20	45020.12	2.87
1330.30	2.30	40878.30	49076.19	2.95
1330.40	2.40	41513.40	53195.78	3.03
1330.50	2.50	42148.50	57378.87	3.10
1330.60	2.60	42783.60	61625.48	3.38
1330.70	2.70	43418.70	65935.59	3.84
1330.80	2.80	44053.80	70309.22	4.41
1330.90	2.90	44688.90	74746.35	5.06
1331.00	3.00	45324.00	79247.00	5.80
1331.10	3.10	45969.20	83811.66	6.61
1331.20	3.20	46614.40	88440.84	7.47
1331.30	3.30	47259.60	93134.54	8.40
1331.40	3.40	47904.80	97892.76	9.38
1331.50	3.50	48550.00	102715.50	10.42
1331.60	3.60	49195.20	107602.76	11.50
1331.70	3.70	49840.40	112554.54	12.63
1331.80	3.80	50485.60	117570.84	13.81
1331.90	3.90	51130.80	122651.66	15.38
1332.00	4.00	51776.00	127797.00	19.48
1332.10	4.10	52431.10	133007.35	25.11
1332.20	4.20	53086.20	138283.22	31.86
1332.30	4.30	53741.30	143624.59	39.54
1332.40	4.40	54396.40	149031.48	48.05
1332.50	4.50	55051.50	154503.87	57.29
1332.60	4.60	55706.60	160041.78	67.22
1332.70	4.70	56361.70	165645.19	77.77
1332.80	4.80	57016.80	171314.12	87.61
1332.90	4.90	57671.90	177048.55	88.98
1333.00	5.00	58327.00	182848.50	90.34

Maximum Storage = 182848.50 (cu ft)
Maximum Discharge = 90.34 (cfs)

RESERVOIR REPORT

Reservoir Number: 2
Name: SOUTH DETENTION POND

[RATING CURVE LIMIT]

Minimum Elevation	=	1324.90 (ft)
Maximum Elevation	=	1331.50 (ft)
Elevation Increment	=	0.10 (ft)

[STAGE STORAGE INFORMATION]
Storage Method: User-Defined Storage

Input Method: Area

Number	Elevation (ft)	Area (sq ft)	Ave Area (sq ft)	Volume (cu ft)	Cumulative Volume (cu ft)
1	1324.90	0.00	0.00	0.00	0.00
2	1325.00	23286.00	11643.00	1164.30	1164.30
3	1326.00	26944.00	25115.00	25115.00	26279.30
4	1327.00	30712.00	28828.00	28828.00	55107.30
5	1328.00	34591.00	32651.50	32651.50	87758.80
6	1329.00	38570.00	36580.50	36580.50	124339.30
7	1330.00	42655.00	40612.50	40612.50	164951.80
8	1331.00	46846.00	44750.50	44750.50	209702.30
9	1331.50	48981.00	47913.50	23956.75	233659.05

[DISCHARGE INFORMATION]
Structure Number: 1
Type:
Name: SPW for South DP

[RESERVOIR STAGE STORAGE/DISCHARGE]

Elevation (ft)	Stage (ft)	Area (sq ft)	Storage (cu ft)	Discharge (cfs)
1324.90	0.00	0.00	0.00	0.00
1325.00	0.10	23286.00	1164.30	0.04
1325.10	0.20	23651.80	3511.19	0.17
1325.20	0.30	24017.60	5894.66	0.37
1325.30	0.40	24383.40	8314.71	0.63
1325.40	0.50	24749.20	10771.34	0.95
1325.50	0.60	25115.00	13264.55	1.30
1325.60	0.70	25480.80	15794.34	1.67
1325.70	0.80	25846.60	18360.71	2.05
1325.80	0.90	26212.40	20963.66	2.40
1325.90	1.00	26578.20	23603.19	2.67

RESERVOIR REPORT

1326.00	1.10	26944.00	26279.30	2.93
1326.10	1.20	27320.80	28992.54	3.16
1326.20	1.30	27697.60	31743.46	3.38
1326.30	1.40	28074.40	34532.06	3.59
1326.40	1.50	28451.20	37358.34	3.78
1326.50	1.60	28828.00	40222.30	3.96
1326.60	1.70	29204.80	43123.94	4.14
1326.70	1.80	29581.60	46063.26	4.31
1326.80	1.90	29958.40	49040.26	4.47
1326.90	2.00	30335.20	52054.94	4.63
1327.00	2.10	30712.00	55107.30	4.78
1327.10	2.20	31099.90	58197.90	4.93
1327.20	2.30	31487.80	61327.28	5.07
1327.30	2.40	31875.70	64495.46	5.21
1327.40	2.50	32263.60	67702.42	5.35
1327.50	2.60	32651.50	70948.18	5.48
1327.60	2.70	33039.40	74232.72	5.61
1327.70	2.80	33427.30	77556.06	5.73
1327.80	2.90	33815.20	80918.18	5.86
1327.90	3.00	34203.10	84319.10	5.98
1328.00	3.10	34591.00	87758.80	6.10
1328.10	3.20	34988.90	91237.80	6.21
1328.20	3.30	35386.80	94756.58	6.33
1328.30	3.40	35784.70	98315.16	6.44
1328.40	3.50	36182.60	101913.52	6.55
1328.50	3.60	36580.50	105551.68	6.66
1328.60	3.70	36978.40	109229.62	7.18
1328.70	3.80	37376.30	112947.36	8.06
1328.80	3.90	37774.20	116704.88	9.16
1328.90	4.00	38172.10	120502.20	10.44
1329.00	4.10	38570.00	124339.30	11.88
1329.10	4.20	38978.50	128216.73	13.46
1329.20	4.30	39387.00	132135.00	15.17
1329.30	4.40	39795.50	136094.13	17.00
1329.40	4.50	40204.00	140094.10	18.93
1329.50	4.60	40612.50	144134.93	20.97
1329.60	4.70	41021.00	148216.60	23.11
1329.70	4.80	41429.50	152339.13	25.35
1329.80	4.90	41838.00	156502.50	27.67
1329.90	5.00	42246.50	160706.73	30.08
1330.00	5.10	42655.00	164951.80	32.58
1330.10	5.20	43074.10	169238.26	35.15
1330.20	5.30	43493.20	173566.62	37.81
1330.30	5.40	43912.30	177936.90	40.53
1330.40	5.50	44331.40	182349.08	44.32
1330.50	5.60	44750.50	186803.18	49.95
1330.60	5.70	45169.60	191299.18	56.63
1330.70	5.80	45588.70	195837.10	64.16

RESERVOIR REPORT

1330.80	5.90	46007.80	200416.92	72.41
1330.90	6.00	46426.90	205038.66	81.32
1331.00	6.10	46846.00	209702.30	90.82
1331.10	6.20	47273.00	214408.25	100.87
1331.20	6.30	47700.00	219156.90	106.34
1331.30	6.40	48127.00	223948.25	107.47
1331.40	6.50	48554.00	228782.30	108.60
1331.50	6.60	48981.00	233659.05	109.70

Maximum Storage = 233659.05 (cu ft)
Maximum Discharge = 109.70 (cfs)

APPENDIX F

DETENTION POND OUTLET STRUCTURE DATA

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED

Date: 09-23-05
Time: 08:44:39
Page: 1

OUTLET STRUCTURE LISTING

Number	Name	Type	Defined
5	SPW for North DP	Stand Pipe	Yes
6	SPW for South DP	Stand Pipe	Yes

OUTLET STRUCTURE REPORT

Structure Number : 5
Type : Stand Pipe
Name : SPW for North DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1328.00	(ft)
Maximum Elevation	=	1333.00	(ft)
Elevation Increment	=	0.10	(ft)

[STAND PIPE INFORMATION]

[ORIFICE INFORMATION]

Height	=	7.25	(ft)
Width	=	4.00	(ft)
Crest Length	=	22.50	(ft)
Effective Crest Length	=	20.50	(ft)
Orifice Coefficient	=	0.60	
Fractional Open Area	=	1.00	

[ORIFICE EQUATION]

$Q = Co*A((2gh)/k)^{0.5}$

[DEFINITIONS]

Co = Orifice Coefficient
A = Wetted Area, (sq ft)

[WEIR INFORMATION]

Crest Elevation	=	1331.87	(ft)
Weir Coefficient	=	3.33	
Exponential	=	1.50	

[WEIR EQUATION]

$Q = Cw * L * H^{exp}$

[DEFINITIONS]

Cw = Weir Coefficient
H = Headwater depth above inlet control section invert ft
L = Crest lenght ft

[OPTIONAL WEIR INFORMATION]

Structure Number : 1
Type : Rectangular Weir Suppressed

[WEIR INFORMATION]

Crest Length	=	2.00	(ft)

OUTLET STRUCTURE REPORT

Crest Elevation	=	1330.50	(ft)
Weir Coefficient	=	3.33	
Exponential	=	1.50	

[RECTANGULAR SUPRESSED EQUATION]
Q = Cw * L * H^exp

[DEFINITIONS]
Cw = Weir Coefficient
H = Headwater depth above inlet control section invert
L = Crest lenght

[OPTIONAL ORIFICE INFORMATION]

Structure Number : 1
Type : Circular Orifice

[OPTIONAL ORIFICE INFORMATION]

Diameter	=	0.75	(ft)
Invert Elevation	=	1328.00	(ft)
Orifice Coefficient	=	0.60	
Number of Openings	=	1	

[ORIFICE EQUATION]
Q = Co*A((2gh)/k)^0.5

[DEFINITIONS]
Co = Orifice Coefficient
A = Wetted Area, (cfs)
k = 1

[CULVERT INFORMATION]

Type : Circular Concrete - Square Edge with Headwall

[OUTLET STRUCTURE INFORMATION]

Diameter	=	30.00	(in)
Invert Elevation	=	1328.00	(ft)
Pipe Length	=	36.00	(ft)
Slope	=	0.04	
Manning's n Value	=	0.01	
Orifice Coefficient	=	0.60	
Tailwater Elevation	=	1325.96	(ft)
Number of Barrels	=	2	

OUTLET STRUCTURE REPORT

[UNSUBMERGED EQUATION]
H/Diam = Hc/Diam+K*(Q/(A*Diam^0.5))^M-0.5*S

Coefficient K	=	0.01
Coefficient M	=	2.00
Q Maximum	=	27.16

[SUBMERGED EQUATION]
H/Diam = c*(Q/(A*Diam^0.5))^2+Y-0.5*S

Coefficient c	=	0.04
Coefficient Y	=	0.67
Q Minimum	=	31.05

[DEFINITIONS]

H	= Headwater depth above inlet control section invert, (ft)
Diam	= Interior height of culvert barrel, (ft)
Hc	= Specific head at critical depth (dc+Vc^2/2g), (ft)
Q	= Discharge, (cfs)
A	= Full cross sectional area of culvert barrel, (sq ft)
S	= Culvert barrel slope, (ft/ft)

[STAND PIPE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Weirs (cfs)	Orifices (cfs)	Stand Pipe (cfs)	Culvert (cfs)	Total (cfs)
1328.00	0.00	0.00	0.00	0.00	0.00	0.00
1328.10	0.10	0.00	0.04	0.00	0.24	0.04
1328.20	0.20	0.00	0.14	0.00	0.64	0.14
1328.30	0.30	0.00	0.31	0.00	1.27	0.31
1328.40	0.40	0.00	0.52	0.00	2.07	0.52
1328.50	0.50	0.00	0.75	0.00	3.08	0.75
1328.60	0.60	0.00	1.00	0.00	4.24	1.00
1328.70	0.70	0.00	1.22	0.00	5.62	1.22
1328.80	0.80	0.00	1.39	0.00	7.11	1.39
1328.90	0.90	0.00	1.54	0.00	8.81	1.54
1329.00	1.00	0.00	1.68	0.00	10.61	1.68
1329.10	1.10	0.00	1.81	0.00	12.52	1.81
1329.20	1.20	0.00	1.93	0.00	14.54	1.93
1329.30	1.30	0.00	2.05	0.00	16.66	2.05
1329.40	1.40	0.00	2.15	0.00	18.78	2.15
1329.50	1.50	0.00	2.26	0.00	21.12	2.26
1329.60	1.60	0.00	2.35	0.00	23.45	2.35
1329.70	1.70	0.00	2.45	0.00	25.79	2.45
1329.80	1.80	0.00	2.54	0.00	28.23	2.54
1329.90	1.90	0.00	2.63	0.00	30.67	2.63
1330.00	2.00	0.00	2.71	0.00	33.11	2.71
1330.10	2.10	0.00	2.79	0.00	35.65	2.79
1330.20	2.20	0.00	2.87	0.00	38.09	2.87
1330.30	2.30	0.00	2.95	0.00	40.64	2.95

OUTLET STRUCTURE REPORT

1330.40	2.40	0.00	3.03	0.00	43.08	3.03
1330.50	2.50	0.00	3.10	0.00	45.63	3.10
1330.60	2.60	0.21	3.17	0.00	48.07	3.38
1330.70	2.70	0.60	3.24	0.00	50.51	3.84
1330.80	2.80	1.09	3.31	0.00	52.95	4.41
1330.90	2.90	1.68	3.38	0.00	54.33	5.06
1331.00	3.00	2.35	3.45	0.00	56.92	5.80
1331.10	3.10	3.10	3.51	0.00	59.50	6.61
1331.20	3.20	3.90	3.57	0.00	62.09	7.47
1331.30	3.30	4.77	3.64	0.00	63.59	8.40
1331.40	3.40	5.69	3.70	0.00	65.47	9.38
1331.50	3.50	6.66	3.76	0.00	67.29	10.42
1331.60	3.60	7.68	3.82	0.00	69.07	11.50
1331.70	3.70	8.75	3.88	0.00	70.80	12.63
1331.80	3.80	9.87	3.94	0.00	72.49	13.81
1331.90	3.90	11.03	3.99	0.35	74.14	15.38
1332.00	4.00	12.24	4.05	3.20	75.75	19.48
1332.10	4.10	13.48	4.10	7.53	77.34	25.11
1332.20	4.20	14.76	4.16	12.94	78.89	31.86
1332.30	4.30	16.08	4.21	19.25	80.41	39.54
1332.40	4.40	17.44	4.27	26.34	81.90	48.05
1332.50	4.50	18.84	4.32	34.14	83.36	57.29
1332.60	4.60	20.27	4.37	42.58	84.80	67.22
1332.70	4.70	21.73	4.42	51.62	86.22	77.77
1332.80	4.80	23.23	4.47	61.22	87.61	87.61
1332.90	4.90	24.76	4.52	76.26	88.98	88.98
1333.00	5.00	26.33	4.57	97.18	90.34	90.34

[WEIR STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Weir 1 (cfs)	Weir 2 (cfs)	Weir 3 (cfs)	Weir 4 (cfs)	Total (cfs)
1328.00	0.00	0.00	0.00	0.00	0.00	0.00
1328.10	0.10	0.00	0.00	0.00	0.00	0.00
1328.20	0.20	0.00	0.00	0.00	0.00	0.00
1328.30	0.30	0.00	0.00	0.00	0.00	0.00
1328.40	0.40	0.00	0.00	0.00	0.00	0.00
1328.50	0.50	0.00	0.00	0.00	0.00	0.00
1328.60	0.60	0.00	0.00	0.00	0.00	0.00
1328.70	0.70	0.00	0.00	0.00	0.00	0.00
1328.80	0.80	0.00	0.00	0.00	0.00	0.00
1328.90	0.90	0.00	0.00	0.00	0.00	0.00
1329.00	1.00	0.00	0.00	0.00	0.00	0.00
1329.10	1.10	0.00	0.00	0.00	0.00	0.00
1329.20	1.20	0.00	0.00	0.00	0.00	0.00
1329.30	1.30	0.00	0.00	0.00	0.00	0.00
1329.40	1.40	0.00	0.00	0.00	0.00	0.00

OUTLET STRUCTURE REPORT

1329.50	1.50	0.00	0.00	0.00	0.00	0.00
1329.60	1.60	0.00	0.00	0.00	0.00	0.00
1329.70	1.70	0.00	0.00	0.00	0.00	0.00
1329.80	1.80	0.00	0.00	0.00	0.00	0.00
1329.90	1.90	0.00	0.00	0.00	0.00	0.00
1330.00	2.00	0.00	0.00	0.00	0.00	0.00
1330.10	2.10	0.00	0.00	0.00	0.00	0.00
1330.20	2.20	0.00	0.00	0.00	0.00	0.00
1330.30	2.30	0.00	0.00	0.00	0.00	0.00
1330.40	2.40	0.00	0.00	0.00	0.00	0.00
1330.50	2.50	0.00	0.00	0.00	0.00	0.00
1330.60	2.60	0.21	0.00	0.00	0.00	0.21
1330.70	2.70	0.60	0.00	0.00	0.00	0.60
1330.80	2.80	1.09	0.00	0.00	0.00	1.09
1330.90	2.90	1.68	0.00	0.00	0.00	1.68
1331.00	3.00	2.35	0.00	0.00	0.00	2.35
1331.10	3.10	3.10	0.00	0.00	0.00	3.10
1331.20	3.20	3.90	0.00	0.00	0.00	3.90
1331.30	3.30	4.77	0.00	0.00	0.00	4.77
1331.40	3.40	5.69	0.00	0.00	0.00	5.69
1331.50	3.50	6.66	0.00	0.00	0.00	6.66
1331.60	3.60	7.68	0.00	0.00	0.00	7.68
1331.70	3.70	8.75	0.00	0.00	0.00	8.75
1331.80	3.80	9.87	0.00	0.00	0.00	9.87
1331.90	3.90	11.03	0.00	0.00	0.00	11.03
1332.00	4.00	12.24	0.00	0.00	0.00	12.24
1332.10	4.10	13.48	0.00	0.00	0.00	13.48
1332.20	4.20	14.76	0.00	0.00	0.00	14.76
1332.30	4.30	16.08	0.00	0.00	0.00	16.08
1332.40	4.40	17.44	0.00	0.00	0.00	17.44
1332.50	4.50	18.84	0.00	0.00	0.00	18.84
1332.60	4.60	20.27	0.00	0.00	0.00	20.27
1332.70	4.70	21.73	0.00	0.00	0.00	21.73
1332.80	4.80	23.23	0.00	0.00	0.00	23.23
1332.90	4.90	24.76	0.00	0.00	0.00	24.76
1333.00	5.00	26.33	0.00	0.00	0.00	26.33

[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Orifice 1 (cfs)	Orifice 2 (cfs)	Orifice 3 (cfs)	Orifice 4 (cfs)	Total (cfs)
1328.00	0.00	0.00	0.00	0.00	0.00	0.00
1328.10	0.10	0.04	0.00	0.00	0.00	0.04
1328.20	0.20	0.14	0.00	0.00	0.00	0.14
1328.30	0.30	0.31	0.00	0.00	0.00	0.31
1328.40	0.40	0.52	0.00	0.00	0.00	0.52
1328.50	0.50	0.75	0.00	0.00	0.00	0.75

OUTLET STRUCTURE REPORT

1328.60	0.60	1.00	0.00	0.00	0.00	1.00
1328.70	0.70	1.22	0.00	0.00	0.00	1.22
1328.80	0.80	1.39	0.00	0.00	0.00	1.39
1328.90	0.90	1.54	0.00	0.00	0.00	1.54
1329.00	1.00	1.68	0.00	0.00	0.00	1.68
1329.10	1.10	1.81	0.00	0.00	0.00	1.81
1329.20	1.20	1.93	0.00	0.00	0.00	1.93
1329.30	1.30	2.05	0.00	0.00	0.00	2.05
1329.40	1.40	2.15	0.00	0.00	0.00	2.15
1329.50	1.50	2.26	0.00	0.00	0.00	2.26
1329.60	1.60	2.35	0.00	0.00	0.00	2.35
1329.70	1.70	2.45	0.00	0.00	0.00	2.45
1329.80	1.80	2.54	0.00	0.00	0.00	2.54
1329.90	1.90	2.63	0.00	0.00	0.00	2.63
1330.00	2.00	2.71	0.00	0.00	0.00	2.71
1330.10	2.10	2.79	0.00	0.00	0.00	2.79
1330.20	2.20	2.87	0.00	0.00	0.00	2.87
1330.30	2.30	2.95	0.00	0.00	0.00	2.95
1330.40	2.40	3.03	0.00	0.00	0.00	3.03
1330.50	2.50	3.10	0.00	0.00	0.00	3.10
1330.60	2.60	3.17	0.00	0.00	0.00	3.17
1330.70	2.70	3.24	0.00	0.00	0.00	3.24
1330.80	2.80	3.31	0.00	0.00	0.00	3.31
1330.90	2.90	3.38	0.00	0.00	0.00	3.38
1331.00	3.00	3.45	0.00	0.00	0.00	3.45
1331.10	3.10	3.51	0.00	0.00	0.00	3.51
1331.20	3.20	3.57	0.00	0.00	0.00	3.57
1331.30	3.30	3.64	0.00	0.00	0.00	3.64
1331.40	3.40	3.70	0.00	0.00	0.00	3.70
1331.50	3.50	3.76	0.00	0.00	0.00	3.76
1331.60	3.60	3.82	0.00	0.00	0.00	3.82
1331.70	3.70	3.88	0.00	0.00	0.00	3.88
1331.80	3.80	3.94	0.00	0.00	0.00	3.94
1331.90	3.90	3.99	0.00	0.00	0.00	3.99
1332.00	4.00	4.05	0.00	0.00	0.00	4.05
1332.10	4.10	4.10	0.00	0.00	0.00	4.10
1332.20	4.20	4.16	0.00	0.00	0.00	4.16
1332.30	4.30	4.21	0.00	0.00	0.00	4.21
1332.40	4.40	4.27	0.00	0.00	0.00	4.27
1332.50	4.50	4.32	0.00	0.00	0.00	4.32
1332.60	4.60	4.37	0.00	0.00	0.00	4.37
1332.70	4.70	4.42	0.00	0.00	0.00	4.42
1332.80	4.80	4.47	0.00	0.00	0.00	4.47
1332.90	4.90	4.52	0.00	0.00	0.00	4.52
1333.00	5.00	4.57	0.00	0.00	0.00	4.57

OUTLET STRUCTURE REPORT

Structure Number : 6
Type : Stand Pipe
Name : SPW for South DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1324.90	(ft)
Maximum Elevation	=	1331.50	(ft)
Elevation Increment	=	0.10	(ft)

[STAND PIPE INFORMATION]

[ORIFICE INFORMATION]

Height	=	5.00	(ft)
Width	=	5.00	(ft)
Crest Length	=	20.00	(ft)
Effective Crest Length	=	16.00	(ft)
Orifice Coefficient	=	0.60	
Fractional Open Area	=	1.00	

[ORIFICE EQUATION]

Q = Co*A((2gh)/k)^0.5

[DEFINITIONS]

Co = Orifice Coefficient
A = Wetted Area, (sq ft)

[WEIR INFORMATION]

Crest Elevation	=	1330.33	(ft)
Weir Coefficient	=	3.33	
Exponential	=	1.50	

[WEIR EQUATION]

Q = Cw * L * H^exp

[DEFINITIONS]

Cw = Weir Coefficient
H = Headwater depth above inlet control section invert ft
L = Crest lenght ft

[OPTIONAL WEIR INFORMATION]

Structure Number : 1
Type : Rectangular Weir Suppressed

[WEIR INFORMATION]

Crest Length	=	4.00	(ft)

OUTLET STRUCTURE REPORT

Crest Elevation	=	1328.50	(ft)
Weir Coefficient	=	3.33	
Exponential	=	1.50	

[RECTANGULAR SUPRESSED EQUATION]
Q = Cw * L * H^exp

[DEFINITIONS]
Cw = Weir Coefficient
H = Headwater depth above inlet control section invert
L = Crest lenght

[OPTIONAL ORIFICE INFORMATION]

Structure Number : 1
Type : Circular Orifice

[OPTIONAL ORIFICE INFORMATION]

Diameter	=	1.00	(ft)
Invert Elevation	=	1324.90	(ft)
Orifice Coefficient	=	0.60	
Number of Openings	=	1	

[ORIFICE EQUATION]
Q = Co*A((2gh)/k)^0.5

[DEFINITIONS]
Co = Orifice Coefficient
A = Wetted Area, (cfs)
k = 1

[CULVERT INFORMATION]

Type : Circular Concrete - Square Edge with Headwall

[OUTLET STRUCTURE INFORMATION]

Diameter	=	30.00	(in)
Invert Elevation	=	1324.90	(ft)
Pipe Length	=	36.00	(ft)
Slope	=	0.04	
Manning's n Value	=	0.01	
Orifice Coefficient	=	0.60	
Tailwater Elevation	=	1323.50	(ft)
Number of Barrels	=	2	

[UNSUBMERGED EQUATION]

OUTLET STRUCTURE REPORT

H/Diam = Hc/Diam+K*(Q/(A*Diam^0.5))^M-0.5*S

Coefficient K	=	0.01
Coefficient M	=	2.00
Q Maximum	=	27.16

[SUBMERGED EQUATION]

H/Diam = c*(Q/(A*Diam^0.5))^2+Y-0.5*S

Coefficient c	=	0.04
Coefficient Y	=	0.67
Q Minimum	=	31.05

[DEFINITIONS]

H	= Headwater depth above inlet control section invert, (ft)
Diam	= Interior height of culvert barrel, (ft)
Hc	= Specific head at critical depth (dc+Vc^2/2g), (ft)
Q	= Discharge, (cfs)
A	= Full cross sectional area of culvert barrel, (sq ft)
S	= Culvert barrel slope, (ft/ft)

[STAND PIPE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Weirs (cfs)	Orifices (cfs)	Stand Pipe (cfs)	Culvert (cfs)	Total (cfs)
1324.90	0.00	0.00	0.00	0.00	0.00	0.00
1325.00	0.10	0.00	0.04	0.00	0.24	0.04
1325.10	0.20	0.00	0.17	0.00	0.64	0.17
1325.20	0.30	0.00	0.37	0.00	1.27	0.37
1325.30	0.40	0.00	0.63	0.00	2.07	0.63
1325.40	0.50	0.00	0.95	0.00	3.08	0.95
1325.50	0.60	0.00	1.30	0.00	4.24	1.30
1325.60	0.70	0.00	1.67	0.00	5.62	1.67
1325.70	0.80	0.00	2.05	0.00	7.11	2.05
1325.80	0.90	0.00	2.40	0.00	8.81	2.40
1325.90	1.00	0.00	2.67	0.00	10.61	2.67
1326.00	1.10	0.00	2.93	0.00	12.52	2.93
1326.10	1.20	0.00	3.16	0.00	14.54	3.16
1326.20	1.30	0.00	3.38	0.00	16.66	3.38
1326.30	1.40	0.00	3.59	0.00	18.78	3.59
1326.40	1.50	0.00	3.78	0.00	21.12	3.78
1326.50	1.60	0.00	3.96	0.00	23.45	3.96
1326.60	1.70	0.00	4.14	0.00	25.79	4.14
1326.70	1.80	0.00	4.31	0.00	28.23	4.31
1326.80	1.90	0.00	4.47	0.00	30.67	4.47
1326.90	2.00	0.00	4.63	0.00	33.11	4.63
1327.00	2.10	0.00	4.78	0.00	35.65	4.78
1327.10	2.20	0.00	4.93	0.00	38.09	4.93
1327.20	2.30	0.00	5.07	0.00	40.64	5.07

OUTLET STRUCTURE REPORT

1327.30	2.40	0.00	5.21	0.00	43.08	5.21
1327.40	2.50	0.00	5.35	0.00	45.63	5.35
1327.50	2.60	0.00	5.48	0.00	48.07	5.48
1327.60	2.70	0.00	5.61	0.00	50.51	5.61
1327.70	2.80	0.00	5.73	0.00	52.95	5.73
1327.80	2.90	0.00	5.86	0.00	54.33	5.86
1327.90	3.00	0.00	5.98	0.00	56.92	5.98
1328.00	3.10	0.00	6.10	0.00	59.50	6.10
1328.10	3.20	0.00	6.21	0.00	62.09	6.21
1328.20	3.30	0.00	6.33	0.00	63.59	6.33
1328.30	3.40	0.00	6.44	0.00	65.47	6.44
1328.40	3.50	0.00	6.55	0.00	67.29	6.55
1328.50	3.60	0.00	6.66	0.00	69.07	6.66
1328.60	3.70	0.42	6.76	0.00	70.80	7.18
1328.70	3.80	1.19	6.87	0.00	72.49	8.06
1328.80	3.90	2.19	6.97	0.00	74.14	9.16
1328.90	4.00	3.37	7.07	0.00	75.75	10.44
1329.00	4.10	4.71	7.17	0.00	77.34	11.88
1329.10	4.20	6.19	7.27	0.00	78.89	13.46
1329.20	4.30	7.80	7.37	0.00	80.41	15.17
1329.30	4.40	9.53	7.47	0.00	81.90	17.00
1329.40	4.50	11.37	7.56	0.00	83.36	18.93
1329.50	4.60	13.32	7.65	0.00	84.80	20.97
1329.60	4.70	15.37	7.75	0.00	86.22	23.11
1329.70	4.80	17.51	7.84	0.00	87.61	25.35
1329.80	4.90	19.74	7.93	0.00	88.98	27.67
1329.90	5.00	22.06	8.02	0.00	90.34	30.08
1330.00	5.10	24.47	8.11	0.00	91.67	32.58
1330.10	5.20	26.96	8.20	0.00	92.98	35.15
1330.20	5.30	29.52	8.28	0.00	94.27	37.81
1330.30	5.40	32.17	8.37	0.00	95.55	40.53
1330.40	5.50	34.88	8.45	0.99	96.81	44.32
1330.50	5.60	37.67	8.54	3.73	98.05	49.95
1330.60	5.70	40.54	8.62	7.47	99.28	56.63
1330.70	5.80	43.46	8.70	11.99	100.49	64.16
1330.80	5.90	46.46	8.78	17.17	101.69	72.41
1330.90	6.00	49.52	8.87	22.93	102.87	81.32
1331.00	6.10	52.65	8.95	29.22	104.04	90.82
1331.10	6.20	55.84	9.02	36.00	105.20	100.87
1331.20	6.30	59.09	9.10	43.24	106.34	106.34
1331.30	6.40	62.41	9.18	50.90	107.47	107.47
1331.40	6.50	65.78	9.26	64.55	108.60	108.60
1331.50	6.60	69.21	9.34	83.05	109.70	109.70

[WEIR STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Weir 1 (cfs)	Weir 2 (cfs)	Weir 3 (cfs)	Weir 4 (cfs)	Total (cfs)

OUTLET STRUCTURE REPORT

1324.90	0.00	0.00	0.00	0.00	0.00	0.00
1325.00	0.10	0.00	0.00	0.00	0.00	0.00
1325.10	0.20	0.00	0.00	0.00	0.00	0.00
1325.20	0.30	0.00	0.00	0.00	0.00	0.00
1325.30	0.40	0.00	0.00	0.00	0.00	0.00
1325.40	0.50	0.00	0.00	0.00	0.00	0.00
1325.50	0.60	0.00	0.00	0.00	0.00	0.00
1325.60	0.70	0.00	0.00	0.00	0.00	0.00
1325.70	0.80	0.00	0.00	0.00	0.00	0.00
1325.80	0.90	0.00	0.00	0.00	0.00	0.00
1325.90	1.00	0.00	0.00	0.00	0.00	0.00
1326.00	1.10	0.00	0.00	0.00	0.00	0.00
1326.10	1.20	0.00	0.00	0.00	0.00	0.00
1326.20	1.30	0.00	0.00	0.00	0.00	0.00
1326.30	1.40	0.00	0.00	0.00	0.00	0.00
1326.40	1.50	0.00	0.00	0.00	0.00	0.00
1326.50	1.60	0.00	0.00	0.00	0.00	0.00
1326.60	1.70	0.00	0.00	0.00	0.00	0.00
1326.70	1.80	0.00	0.00	0.00	0.00	0.00
1326.80	1.90	0.00	0.00	0.00	0.00	0.00
1326.90	2.00	0.00	0.00	0.00	0.00	0.00
1327.00	2.10	0.00	0.00	0.00	0.00	0.00
1327.10	2.20	0.00	0.00	0.00	0.00	0.00
1327.20	2.30	0.00	0.00	0.00	0.00	0.00
1327.30	2.40	0.00	0.00	0.00	0.00	0.00
1327.40	2.50	0.00	0.00	0.00	0.00	0.00
1327.50	2.60	0.00	0.00	0.00	0.00	0.00
1327.60	2.70	0.00	0.00	0.00	0.00	0.00
1327.70	2.80	0.00	0.00	0.00	0.00	0.00
1327.80	2.90	0.00	0.00	0.00	0.00	0.00
1327.90	3.00	0.00	0.00	0.00	0.00	0.00
1328.00	3.10	0.00	0.00	0.00	0.00	0.00
1328.10	3.20	0.00	0.00	0.00	0.00	0.00
1328.20	3.30	0.00	0.00	0.00	0.00	0.00
1328.30	3.40	0.00	0.00	0.00	0.00	0.00
1328.40	3.50	0.00	0.00	0.00	0.00	0.00
1328.50	3.60	0.00	0.00	0.00	0.00	0.00
1328.60	3.70	0.42	0.00	0.00	0.00	0.42
1328.70	3.80	1.19	0.00	0.00	0.00	1.19
1328.80	3.90	2.19	0.00	0.00	0.00	2.19
1328.90	4.00	3.37	0.00	0.00	0.00	3.37
1329.00	4.10	4.71	0.00	0.00	0.00	4.71
1329.10	4.20	6.19	0.00	0.00	0.00	6.19
1329.20	4.30	7.80	0.00	0.00	0.00	7.80
1329.30	4.40	9.53	0.00	0.00	0.00	9.53
1329.40	4.50	11.37	0.00	0.00	0.00	11.37
1329.50	4.60	13.32	0.00	0.00	0.00	13.32

OUTLET STRUCTURE REPORT

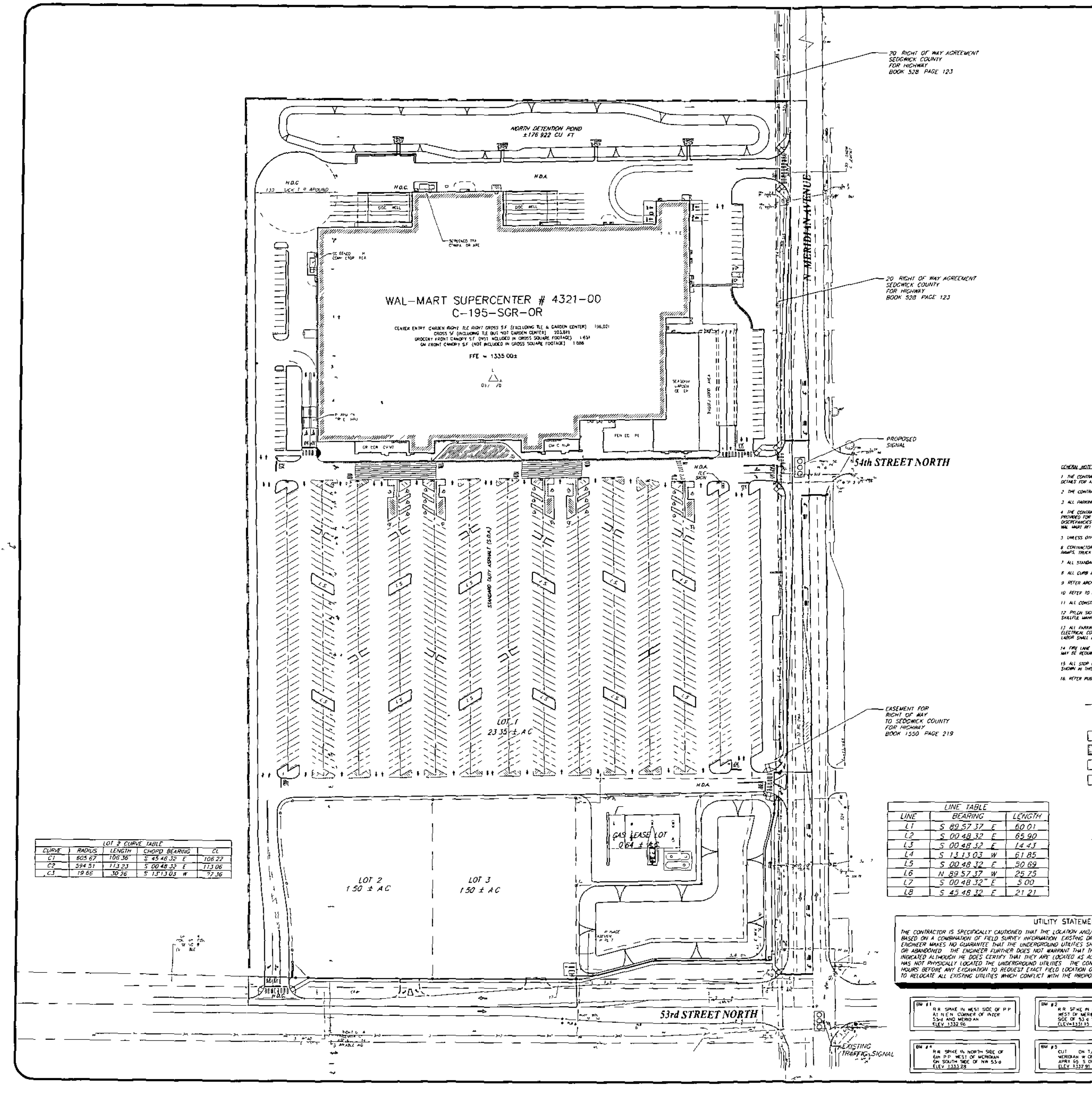
1329.60	4.70	15.37	0.00	0.00	0.00	15.37
1329.70	4.80	17.51	0.00	0.00	0.00	17.51
1329.80	4.90	19.74	0.00	0.00	0.00	19.74
1329.90	5.00	22.06	0.00	0.00	0.00	22.06
1330.00	5.10	24.47	0.00	0.00	0.00	24.47
1330.10	5.20	26.96	0.00	0.00	0.00	26.96
1330.20	5.30	29.52	0.00	0.00	0.00	29.52
1330.30	5.40	32.17	0.00	0.00	0.00	32.17
1330.40	5.50	34.88	0.00	0.00	0.00	34.88
1330.50	5.60	37.67	0.00	0.00	0.00	37.67
1330.60	5.70	40.54	0.00	0.00	0.00	40.54
1330.70	5.80	43.46	0.00	0.00	0.00	43.46
1330.80	5.90	46.46	0.00	0.00	0.00	46.46
1330.90	6.00	49.52	0.00	0.00	0.00	49.52
1331.00	6.10	52.65	0.00	0.00	0.00	52.65
1331.10	6.20	55.84	0.00	0.00	0.00	55.84
1331.20	6.30	59.09	0.00	0.00	0.00	59.09
1331.30	6.40	62.41	0.00	0.00	0.00	62.41
1331.40	6.50	65.78	0.00	0.00	0.00	65.78
1331.50	6.60	69.21	0.00	0.00	0.00	69.21

[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Orifice 1 (cfs)	Orifice 2 (cfs)	Orifice 3 (cfs)	Orifice 4 (cfs)	Total (cfs)
1324.90	0.00	0.00	0.00	0.00	0.00	0.00
1325.00	0.10	0.04	0.00	0.00	0.00	0.04
1325.10	0.20	0.17	0.00	0.00	0.00	0.17
1325.20	0.30	0.37	0.00	0.00	0.00	0.37
1325.30	0.40	0.63	0.00	0.00	0.00	0.63
1325.40	0.50	0.95	0.00	0.00	0.00	0.95
1325.50	0.60	1.30	0.00	0.00	0.00	1.30
1325.60	0.70	1.67	0.00	0.00	0.00	1.67
1325.70	0.80	2.05	0.00	0.00	0.00	2.05
1325.80	0.90	2.40	0.00	0.00	0.00	2.40
1325.90	1.00	2.67	0.00	0.00	0.00	2.67
1326.00	1.10	2.93	0.00	0.00	0.00	2.93
1326.10	1.20	3.16	0.00	0.00	0.00	3.16
1326.20	1.30	3.38	0.00	0.00	0.00	3.38
1326.30	1.40	3.59	0.00	0.00	0.00	3.59
1326.40	1.50	3.78	0.00	0.00	0.00	3.78
1326.50	1.60	3.96	0.00	0.00	0.00	3.96
1326.60	1.70	4.14	0.00	0.00	0.00	4.14
1326.70	1.80	4.31	0.00	0.00	0.00	4.31
1326.80	1.90	4.47	0.00	0.00	0.00	4.47
1326.90	2.00	4.63	0.00	0.00	0.00	4.63
1327.00	2.10	4.78	0.00	0.00	0.00	4.78

OUTLET STRUCTURE REPORT

1327.10	2.20	4.93	0.00	0.00	0.00	4.93
1327.20	2.30	5.07	0.00	0.00	0.00	5.07
1327.30	2.40	5.21	0.00	0.00	0.00	5.21
1327.40	2.50	5.35	0.00	0.00	0.00	5.35
1327.50	2.60	5.48	0.00	0.00	0.00	5.48
1327.60	2.70	5.61	0.00	0.00	0.00	5.61
1327.70	2.80	5.73	0.00	0.00	0.00	5.73
1327.80	2.90	5.86	0.00	0.00	0.00	5.86
1327.90	3.00	5.98	0.00	0.00	0.00	5.98
1328.00	3.10	6.10	0.00	0.00	0.00	6.10
1328.10	3.20	6.21	0.00	0.00	0.00	6.21
1328.20	3.30	6.33	0.00	0.00	0.00	6.33
1328.30	3.40	6.44	0.00	0.00	0.00	6.44
1328.40	3.50	6.55	0.00	0.00	0.00	6.55
1328.50	3.60	6.66	0.00	0.00	0.00	6.66
1328.60	3.70	6.76	0.00	0.00	0.00	6.76
1328.70	3.80	6.87	0.00	0.00	0.00	6.87
1328.80	3.90	6.97	0.00	0.00	0.00	6.97
1328.90	4.00	7.07	0.00	0.00	0.00	7.07
1329.00	4.10	7.17	0.00	0.00	0.00	7.17
1329.10	4.20	7.27	0.00	0.00	0.00	7.27
1329.20	4.30	7.37	0.00	0.00	0.00	7.37
1329.30	4.40	7.47	0.00	0.00	0.00	7.47
1329.40	4.50	7.56	0.00	0.00	0.00	7.56
1329.50	4.60	7.65	0.00	0.00	0.00	7.65
1329.60	4.70	7.75	0.00	0.00	0.00	7.75
1329.70	4.80	7.84	0.00	0.00	0.00	7.84
1329.80	4.90	7.93	0.00	0.00	0.00	7.93
1329.90	5.00	8.02	0.00	0.00	0.00	8.02
1330.00	5.10	8.11	0.00	0.00	0.00	8.11
1330.10	5.20	8.20	0.00	0.00	0.00	8.20
1330.20	5.30	8.28	0.00	0.00	0.00	8.28
1330.30	5.40	8.37	0.00	0.00	0.00	8.37
1330.40	5.50	8.45	0.00	0.00	0.00	8.45
1330.50	5.60	8.54	0.00	0.00	0.00	8.54
1330.60	5.70	8.62	0.00	0.00	0.00	8.62
1330.70	5.80	8.70	0.00	0.00	0.00	8.70
1330.80	5.90	8.78	0.00	0.00	0.00	8.78
1330.90	6.00	8.87	0.00	0.00	0.00	8.87
1331.00	6.10	8.95	0.00	0.00	0.00	8.95
1331.10	6.20	9.02	0.00	0.00	0.00	9.02
1331.20	6.30	9.10	0.00	0.00	0.00	9.10
1331.30	6.40	9.18	0.00	0.00	0.00	9.18
1331.40	6.50	9.26	0.00	0.00	0.00	9.26
1331.50	6.60	9.34	0.00	0.00	0.00	9.34



Scale 1" = 60'

LOCATION MAP
NOT TO SCALE

LOT SUMMARY

WAL-MART LOT	±23.35 ACRES
GAS LEASE LOT	±0.64 ACRES
LOT 2	±1.50 ACRES
LOT 3	±1.50 ACRES
TOTAL PROPERTY AREA	±26.99 ACRES

NOTE: THE LOT AREA DOES NOT INCLUDE STREET RIGHTS OF WAY

PARKING DATA

WAL-MART GLA	203,819 S.F.
BUILDING GROSS FLOOR AREA	230,358 S.F.
TOTAL NET BUILDING AREA	200,319 S.F.
CART CORRAL	20 SPACES
ACCESSIBLE SPACES	27 SPACES
VAN ACCESSIBLE SPACES (INCLUDED ABOVE)	6 SPACES
TOTAL PARKING	1075 SPACES
PARKING RATIO	4.67

PARKING DATA NOTES

1. ALL CALCULATIONS BASED ON TOTAL GROSS SQ. FT. OF BUILDING
2. CLIENT PREFERRED PARKING (4.0 SP/1,000 S.F. = 1019 SPACES)
3. PARKING LAYOUT DOES MEET CLIENT STANDARDS
4. PARKING SHOWN CONTAINS 60 AND 90 PARKING SPACES
5. TYPICAL DIMENSIONS: WIDTH 9.5', DEPTH 18', ONE WAY AISLES 20', TWO WAY AISLES 24' MIN

GENERAL NOTES

1. THE CONTRACTOR SHALL PROVIDE NUMBERED AISLES SIGNS AS DIRECTED BY THE WAL-MART CONSTRUCTION MANAGER. REFER TO MISCELLANEOUS DETAILS FOR ASSIGNMENT.
2. THE CONTRACTOR SHALL COORDINATE THE LOCATIONS OF CART CORRAL WITH WAL-MART CONSTRUCTION MANAGER.
3. ALL PARKING STALLS ADJACENT TO PROPOSED CURBS SHALL INCLUDE A 2' STRIPED AREA FOR ADDITIONAL ACCESS SPACE.
4. THE CONTRACTOR SHALL REFER TO THE SURVEY COORDINATE SHEET FOR CONSTRUCTION STAKING. THE SURVEYOR COORDINATE SHEET IS PROVIDED FOR INFORMATION ONLY. THE USER OF THIS SHEET SHALL VERIFY THE COORDINATE POINTS PRIOR TO CONSTRUCTION STAKING. DISCREPANCIES SHALL BE REPORTED BY GENERAL CONTRACTOR TO THE WAL-MART CONSTRUCTION MANAGER AND SPEAR & McCALEB CO. P.C. VIA WAL-MART RFI PROCESS.
5. UNLESS OTHERWISE NOTED, ALL RADII ON PARKING ISLANDS AND CURB CUTS SHALL BE ?
6. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULE, SLOPED PAVING, EXIT PORCHES, RAMPS, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.

LEGEND

LINE TABLE		
LINE	BEARING	LENGTH
L1	S 89 57 37 E	60 01
L2	S 00 48 32 E	65 90
L3	S 00 48 32 E	14 43
L4	S 13 13 03 W	61 85
L5	S 00 48 32 E	50 69
L6	N 89 57 37 W	25 75
L7	S 00 48 32" E	5 00
L8	S 45 48 32 E	21 21

UTILITY STATEMENT & CAUTION

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON A COMBINATION OF FIELD SURVEY INFORMATION, EXISTING DRAWINGS AND RECORDS OF THE VARIOUS UTILITY COMPANIES. THE ENGINEER MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE ENGINEER FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE ENGINEER HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL SIGNED AND SEALED DOCUMENT

NOT VALID FOR CONSTRUCTION UNLESS SIGNED IN THIS BLOCK

SITE PLAN

WAL-MART SUPERCENTER #4321-00

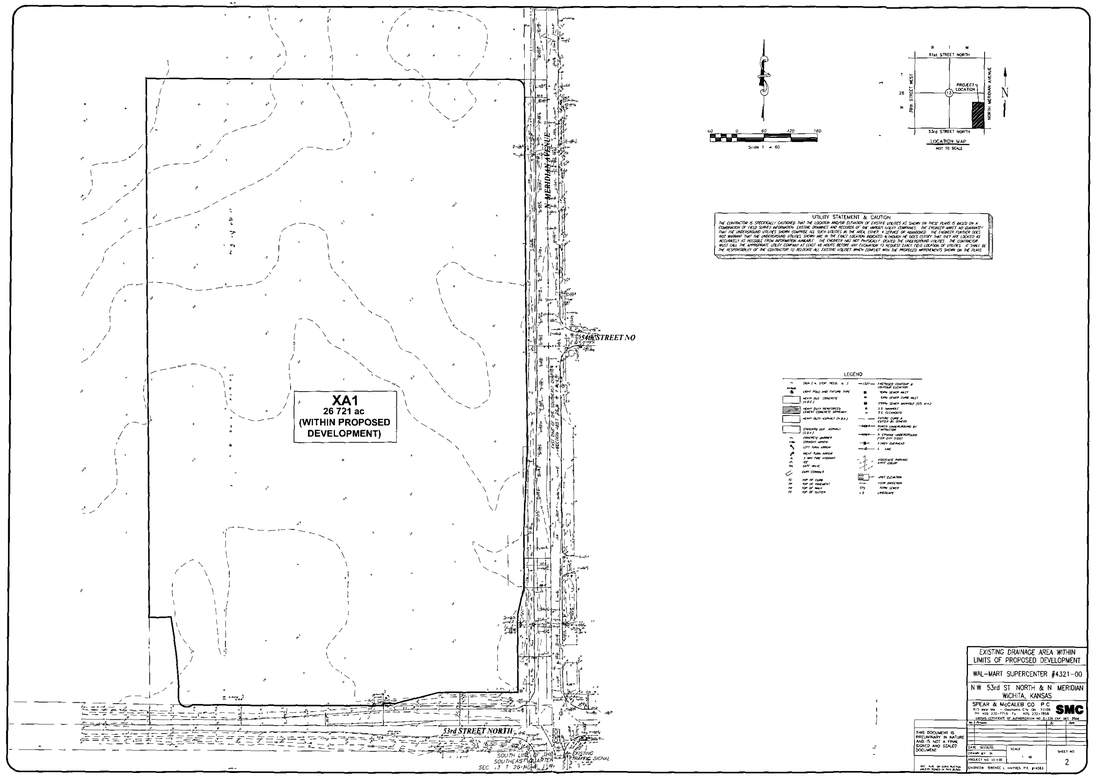
N W 53rd ST NORTH & N MERIDIAN
WICHITA, KANSAS

SPEAR & McCALEB CO P C
815 West Main – Oklahoma City OK 73106
PH 405 232 7715 Fax 405-232 7659
KANSAS CERTIFICATE OF AUTHORIZATION NO E-335 EXP DEC 2006

SMC

No.	Revision	By	Date

DATE 07/27/05
DRAWN BY TN
PROJECT NO 431 00
SCALE 1" = 60'
SHEET NO 1
ENGINEER TERENCE L. HAYNES P.E. #14583



UTILITY STATEMENT & CAUTION

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON A COMBINATION OF FIELD SURVEYS AND ARCHITECTS, CIVIL ENGINEERS AND THE RECORDS OF THE VARIOUS UTILITY COMPANIES. THE PRESENCE HEREOF AND GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THE ARCHITECT AND ENGINEER DO BELIEVE THAT THEY ARE REASONABLY ACCURATE, THEY DO NOT ASSUME RESPONSIBILITY THEREFOR AND DO NOT GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES BELIEVE THAT THEY ARE APPROXIMATELY CORRECT. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATIONS MAY BE DIFFERENT THAN SHOWN ON THE PLANS AND THAT ADDITIONAL UTILITIES, NOT SHOWN ON THE PLANS, MAY BE ENCOUNTERED. HE FURTHER MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.

LEGEND

EXISTING DRAINAGE AREA WITHIN LIMITS OF PROPOSED DEVELOPMENT

WAL-MART SUPERCENTER #4321-00

N.W. 53rd ST. NORTH & N. MERIDIAN
WICHITA, KANSAS

SPEAR & McCALEB CO. P.C.
CIVIL ENGINEERS & LAND SURVEYORS
SMC

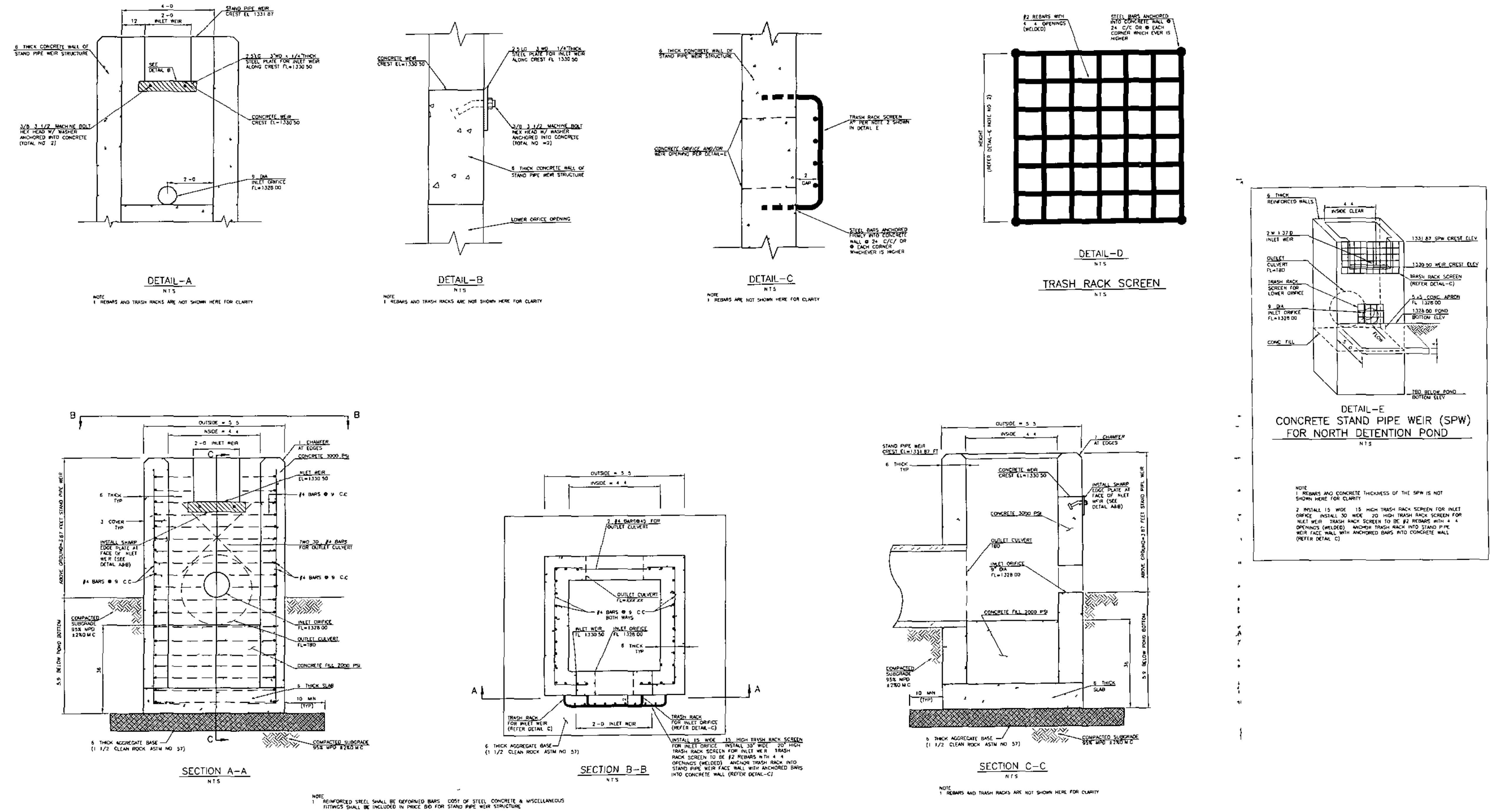
THIS DOCUMENT IS RELEASED FOR REVIEW AND IS NOT A FINAL BIDDED AND SEALED DOCUMENT

NO.	REVISIONS	DATE	BY

DATE: 9/27/05
SCALE:
DRAWN BY: M
PROJECT NO: 43-4-00
DRAWING: DRAINAGE - EXISTING PH. #1.DWG

SHEET NO.
2

G:\4344\DNG\4344FIGURE 3 EXISTING DNG.dwg, 9/26/2005 9:19:09 AM



NOTE
1. REINFORCED STEEL SHALL BE DEFORMED BARS. COST OF STEEL, CONCRETE & MISCELLANEOUS FITTINGS SHALL BE INCLUDED IN PRICE BID FOR STAND PIPE WEIR STRUCTURE
2. SOME OF THE REBARS IN SECTION A-A OR B-B VIEW MAY NOT BE SHOWN FOR CLARITY PURPOSES. HOWEVER, CONTRACTOR SHALL READ SECTION A-A AND B-B TOGETHER TO CALCULATE THE REBARS QUANTITIES
3. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT APPLICABLE STANDARDS OR SUPPLEMENTAL SPECIFICATIONS
4. CONCRETE STAND PIPE WEIR STRUCTURE SHALL BE PRE CAST
5. CONCRETE SHALL BE AIR ENTRAINED PER KDOT SPECS

CONCRETE STAND PIPE WEIR FOR NORTH DETENTION POND

NTS

THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL SIGNED AND SEALED DOCUMENT

NORTH STAND PIPE WEIR DETAIL

WAL-MART SUPERCENTER #4321-00

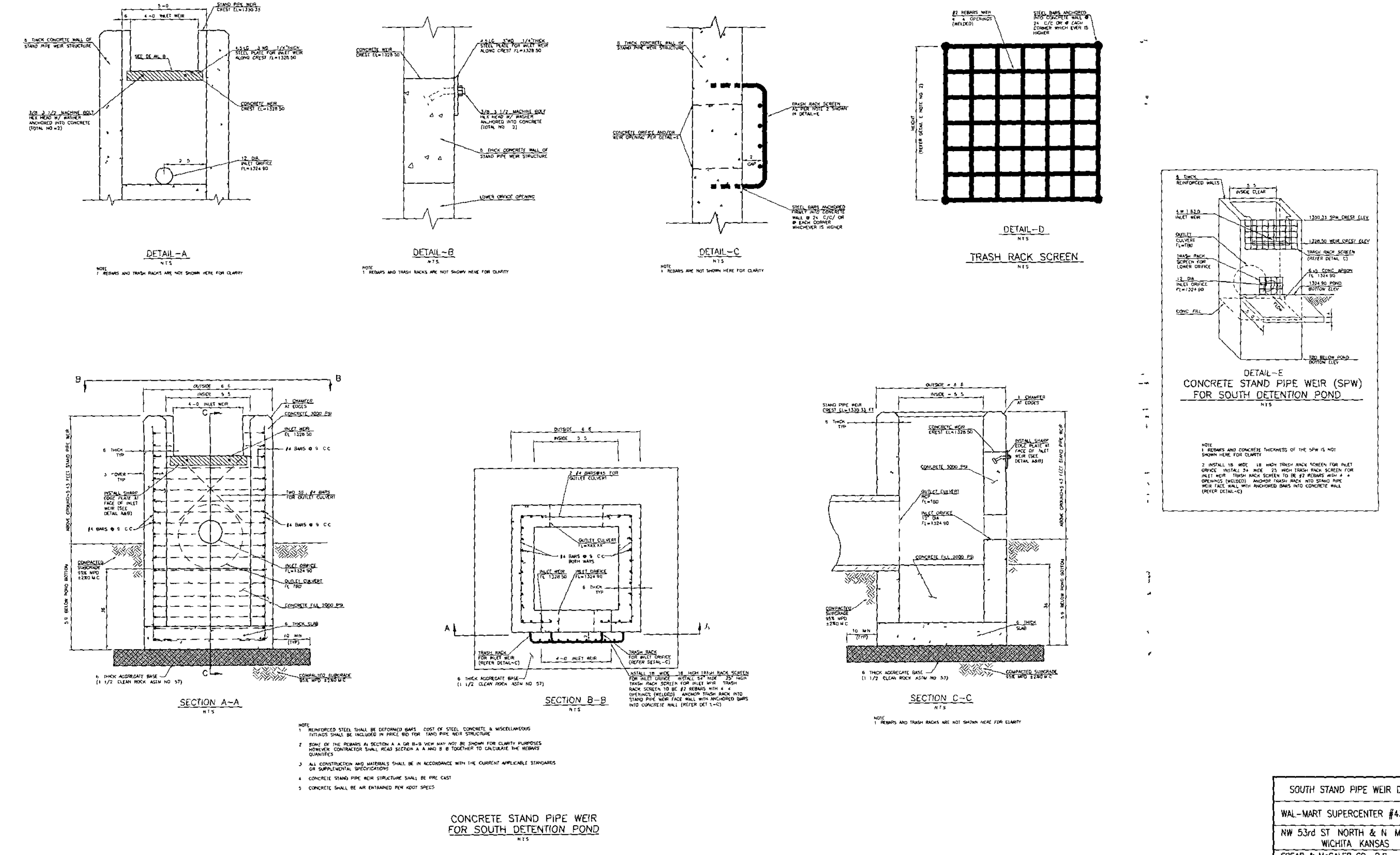
NW 53rd ST NORTH & N MERIDIAN
WICHITA, KANSAS

SPEAR & McCALEB CO P C
815 West Main Oklahoma City OK 73106
PH 405-232-7715 F 405-232-7859
KANSAS CERTIFICATE OF AUTHORIZATION NO E 335 EXP DEC 2006

SMC

No.	Revision	By	Date

DATE 0/0/00
DRAWN BY TN
PROJECT NO. 4344.00
SCALE NTS
SHEET NO 5A
ENGINEER TERENCE L HAYNES P E #14583



SOUTH STAND PIPE WEIR DETAIL

WAL-MART SUPERCENTER #4321-00

NW 53rd ST NORTH & N MERIDIAN
WICHITA KANSAS

SPEAR & McCALEB CO P C
SMC
KANSAS CERTIFICATE OF AUTHORIZATION NO E-335 EXP DEC 20

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No.	Revision	By	Date

DATE 0/0/00
DRAWN BY
PROJECT NO 4344.00
SCALE NTS
SHEET NO 58
ENGINEER TERENCE L HAYNES P E #14583

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