

**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**

JANUARY 05, 2007

PREPARED FOR:

THE CITY OF WICHITA

BY:

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FOR
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N.W. 53RD STREET NORTH & N. MERIDIAN AVENUE
WICHITA, KANSAS**

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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, Fig. 1-Site Plan). The majority of the site was covered with tall grass and weeds at the time this study was conducted. Approximately 29.95 acres of the watershed including the site and a portion of the roadway right of way 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, Fig. 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.

A substantial portion of the watershed located north of the 53rd Street and west of the site drains south into an existing 4-4'x2' box culvert structure located approximately 500 feet west of the proposed Wal-Mart's west property line and is part of the proposed Northgate Addition development (Appendix-H). The proposed Northgate Addition and Northgate Commercial Addition plans show that the above culvert crossing at 53rd Street will be replaced with the new double barrel 8'x4' box culvert. In previous meetings with the

County and the City Officials, SMC Consulting Engineers, P.C., have been asked to divert the runoff west from the Wal-Mart's site to the proposed culvert crossing at 53rd Street as part of the City's Master Drainage Plans.

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 the data provided in Attachment-E of the above stated policy. However, the minimum time of concentration of 15 minute was used as recommended in the same policy. The Rainfall Intensity Table for Sedgwick County was used to develop the existing and the proposed hydrographs.

Precipitation for Sedgwick County, Kansas

2 year, 24 hour Rainfall	= 3.50 inches
5 year, 24 hour Rainfall	= 4.50 inches
10 year, 24 hour Rainfall	= 5.30 inches
25 year, 24 hour Rainfall	= 6.24 inches
50 year, 24 hour Rainfall	= 6.96 inches
100 year, 24 hour Rainfall	= 7.90 inches

The stage-discharge routing of the Detention Ponds is designed for the SCS Type II, 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 are 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 storm event less than 25-year

C=0.41 for storm event 25-year or more

Pavement, C = 0.95

Refer Table No. 5 thru 14 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. 15 thru 19 weighted Curve Numbers.

HISTORIC CONDITIONS (Appendix-A, Fig. 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 29.95 acres.

D.A. = 29.95 acres

Weighted CN=63

Time of Concentration, Tc = 23.65 minutes.

Computed Flood Hydrograph using SCS Type II, 100 year, 24 hour rainfall distribution:

Q₂=15.01 cfs (Appendix-C, Page 6)

Q₅=28.83 cfs (Appendix-C, Page 10)

Q₁₀₀=86.01 cfs (Appendix-C, Page 8)

Refer Appendix-C for existing flood hydrograph summary.

PROPOSED CONDITIONS (Appendix-A, Fig. 3-Proposed Drainage Plan)

On-site Conditions:

The proposed development consists of approximately 22.81 acres of watershed including building, parking, driveways, landscaping and detention ponds. Approximately 3.06 acres of the land consists of out parcels #2 and #3. These two areas are considered as 100% developed in this report. The rest of the 4.08 acres of land consists of public right of way. 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 three 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 PA1 thru PA8, PA10 and PA11. Refer Table 7 and 8 for drainage area summary.

The Supercenter building including the adjacent parking area will be flowing into the north detention pond (watershed PA12, PA13, PA14 and PA16 thru PA20). Refer Table 5 and 6 for drainage summary.

The west detention pond is relatively a smaller detention system and it will collect runoff from watersheds listed as PA9, PA15 and PA21 in Fig. 3, and summarized in Table 9 and 10.

Refer Appendix-E for storage-discharge curve of these three 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 the proposed 2-8'x4' box culvert less than pre-developed conditions (refer Fig. 5 thru 7 for Standpipe Weir Outlet Structure details and Appendix-F for rating curves). The overflow weir opening is provided at top of the outlet structure 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 are designed to convey runoff to both detention ponds. The detailed design of the storm sewer system is summarized in Project Pipe Reports provided in Appendix-G. The Project Pipe Reports are provided to show the hydrology and hydraulics of the proposed storm sewer systems for the both 100 year and the Base (10 year) storm frequency. Refer Fig. 4 for layout of the storm sewer system.

Hydrology Summary for North Detention Pond

D.A. = 9.95 acres

Weighted CN = 92

Time of Concentration, T_c = Minimum inlet time of 15 minute used in calculations.

Computed Flood Hydrograph using SCS Type II, 100 year, 24 hour rainfall distribution:

$Q_2=34.03$ cfs (Appendix-D, Page 18)

$Q_5=45.64$ cfs (Appendix-D, Page 26)

$Q_{100}=85.18$ cfs (Appendix-D, Page 20)

Hydrology Summary for South Detention Pond

D.A. = 12.72 acres

Weighted CN = 94

Time of Concentration, T_c = Minimum inlet time of 15 minutes used in calculations

Computed Flood Hydrograph using SCS Type II, 100 year, 24 hour rainfall distribution:

$Q_2=45.73$ cfs (Appendix-D, Page 22)

$Q_5=60.42$ cfs (Appendix-D, Page 34)

$Q_{100}=109.63$ cfs (Appendix-D, Page 24)

Hydrology Summary for West Detention Pond

D.A. = 2.55 acres

Weighted CN = 88

Time of Concentration, T_c = Minimum inlet time of 5 minutes used in calculations

Computed Flood Hydrograph using SCS Type II, 100 year, 24 hour rainfall distribution:

$Q_2=10.61$ cfs (Appendix-D, Page 28)

$Q_5=14.74$ cfs (Appendix-D, Page 30)

$Q_{100}=28.46$ cfs (Appendix-D, Page 32)

Refer Appendix-D for proposed flood hydrograph summary.

Off-Site Runoff

The drainage area located immediately north of the site is proposed to sheet flow east toward N. Meridian Avenue as part of the Northgate Addition watershed development. Therefore, the construction of the north detention pond would not restrict the flow of the offsite upstream runoff.

The drainage area located immediately west of the site is proposed to sheet flow west and northwest toward drainage ponds as part of the Northgate Addition and Northgate Commercial Addition. Therefore, the construction of the Wal-Mart's parking area and location of the west detention pond would not restrict the flow of the offsite runoff.

The curb inlets located along N. Meridian Avenue at frontage of the Wal-Mart will not be disturbed. It has been indicated by the County and the City Officials that approximately 100 feet to 150 feet wide strip of watershed (west of the section line) along N. Meridian Avenue was included in drainage basin for the existing 4'x4' RCB culvert running south along N. Meridian Avenue. Given that, a comparable amount of landscape & driveway areas are proposed to sheet flow to the existing curb inlets along N. Meridian Avenue.

It is anticipated that the widening or reconstruction of the 53rd Street may take place at some point in the future. Therefore, the proposed storm sewer system along 53rd Street (Fig. 3, Line 'L') has been sized to capture runoff from north half of the 53rd Street right of way (east of the new 2-8x4' RCB culverts). The Northgate Addition watershed (north of the 53rd street right of way) is supposed to flow to northwest to Northgate Addition Detention System in accordance with Northgate Commercial Addition plans. The 42" storm sewer is sized for Q10 with Q100 HGL lower than top of the manholes & top of inlet grates (refer Appendix-G, Project Pipe Report, Line 'L'). It is assumed that the 53rd street paving widening will not encroach over the proposed storm sewer system.

DETENTION SUMMARY

Table No. 1: Stage-Discharge Routing Summary of North, South and West Detention Ponds

Storm Freq. (year)	Proposed Routed Runoff From North Pond to 2-8'x4' RCB Culvert (Appendix-D) (cfs)	Proposed Routed Runoff From South Pond to 2-8'x4' RCB Culvert (Appendix-D) (cfs)	Proposed Routed Runoff from West Pond to 2-8'x4' RCB Culvert (Appendix-D) (cfs)	Proposed Bypass Runoff from the site including the public right of way to 2-8'x4' RCB Culvert (Appendix-D) (cfs)	Proposed Bypass Runoff from the site including the public right of way to 4'x4' RCB Culvert (Appendix-D) (cfs)	Total Proposed Routed Runoff to public drainage system (Sum of Column 2, 3, 4 & 5) (cfs)	Allowable Runoff to public drainage system (Appendix-C) (cfs)	Proposed Runoff Lower than Existing Runoff (Subtract Column 7 from 8) (cfs)
Q2	0.72 (Page 36)	2.18 (Page 42)	1.46 (Page 48)	6.52 (Page 54)	3.50 (Page 60)	14.38	15.01 (Page 6)	(0.63)
Q5	1.60 (Page 38)	3.47 (Page 44)	4.51 (Page 50)	9.50 (Page 58)	5.13 (Page 64)	24.21	28.83 (Page 10)	(4.62)
Q100	5.88 (Page 40)	18.84 (Page 46)	20.44 (Page 52)	19.87 (Page 56)	10.80 (Page 62)	75.83	86.10 (Page 8)	(10.27)

- Existing flow to the existing 4-4'x2' RCB culvert in accordance with Northgate Addition plans = 450 cfs for 100 year frequency.
- Proposed flow to a new 2-8'x4' RCB culvert in accordance with Northgate Addition plans = 370 cfs for 100 year frequency.
- Additional flows from the site including the 53rd street right way (sum of above column 2, 3, 4 and 5) = 65.03 cfs for 100 year frequency. Therefore, the sum of total proposed flows to the 2-8'x4' RCB culvert are less than existing flows.

Table No. 2: North Detention Pond Summary

Line No.	Description	At Q2	At Q5	At Q100
1	Detention Volume Required (cft) (refer Note 1)	66,348.51 at Peak Time of 998 minutes (Page 37)	85,290.74 at Peak Time of 852 minutes (Page 39)	157,400.49 at Peak Time of 771 minutes (Page 41)
2	Detention Volume Provided (cft) (refer Note 2)	216,118.00 (Page 3)	216,118.00 (Page 3)	216,118.00 (Page 3)
3	Peak Storage Elevation at Storm Interval (ft) (refer Note 1)	1333.81 (Page 36)	1334.30 (Page 38)	1335.90 (Page 40)
4	Berm Elevation (ft) (refer Note 2)	1337 (Page 2)	1337 (Page 2)	1337.00 (Page 2)
5	Freeboard Available (ft) (subtract line 3 from 4)	3.19	2.70	1.1
6	Peak Inflow to Pond (cfs) (refer Note 1)	34.03 (Page 18)	45.64 (Page 26)	85.18 (Page 20)
7	Peak Routed Outflow (cfs)	0.72 (Page 36)	1.60 (Page 38)	5.88 (Page 40)

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

Table No. 3: South Detention Pond Summary

Line No.	Description	At Q2	At Q5	At Q100
1	Detention Volume Required (cft) (refer Note 1)	78,720.28 at Peak Time of 810 minutes (Page 43)	105,251.14 at Peak Time of 789 minutes (Page 45)	176,232.76 at Peak Time of 735 minutes (Page 47)
2	Detention Volume Provided (cft) (refer Note 2)	231,994.50 (Page 7)	231,994.50 (Page 7)	231,994.50 (Page 7)
3	Peak Storage Elevation at Storm Interval (ft) (refer Note 1)	1330.84 (Page 42)	1331.44 (Page 44)	1332.93 (Page 46)
4	Berm Elevation (ft) (refer Note 2)	1334 (Page 6)	1334 (Page 6)	1334 (Page 6)
5	Freeboard Available (ft) (subtract line 3 from 4)	3.16	2.56	1.07
6	Peak Inflow to Pond (cfs) (refer Note 1)	45.73 (Page 22)	60.42 (Page 34)	109.63 (Page 24)
7	Peak Routed Outflow (cfs)	2.18 (Page 42)	3.47 (Page 44)	18.84 (Page 46)

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

Table No. 4: West Detention Pond Summary

Line No.	Description	At Q2	At Q5	At Q100
1	Detention Volume Required (cft) (refer Note 1)	7,900.11 at Peak Time of 725 minutes (Page 49)	10,850.89 at Peak Time of 723 minutes (Page 51)	15,538.33 at Peak Time of 718 minutes (Page 53)
2	Detention Volume Provided (cft) (refer Note 2)	29,241.75 (Page 5)	29,241.75 (Page 5)	29,241.75 (Page 5)
3	Peak Storage Elevation at Storm Interval (ft) (refer Note 1)	1331.23 (Page 48)	1331.56 (Page 50)	1332.00 (Page 52)
4	Berm Elevation (ft) (refer Note 2)	1333 (Page 4)	1333 (Page 4)	1333 (Page 4)
5	Freeboard Available (ft) (subtract line 3 from 4)	1.77	1.44	1.00
6	Peak Inflow to Pond (cfs) (refer Note 1)	10.61 (Page 28)	14.74 (Page 30)	28.46 (Page 32)
7	Peak Routed Outflow (cfs)	1.46 (Page 48)	4.51 (Page 50)	20.44 (Page 52)

Note 1: Refer Appendix D, Proposed Hydrographs for Stage-Storage Elevation Data at Time to Peak (Tp)

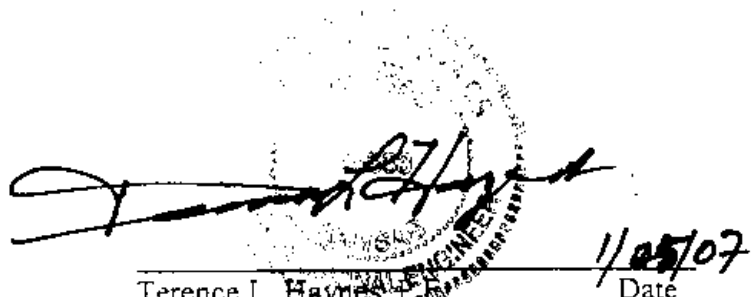
Note 2: Refer Appendix E, Detention Ponds for Maximum Storage Data

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 runoff from the Wal-Mart site to the new 2-8'x4' RCB culvert are not higher than historical runoff. Refer Table No. 1.
- The Outlet structures for detention ponds will perform as an emergency spillway for storm intervals higher than the 100-year event. Therefore, neither these detention ponds will overflow nor inundate the adjacent properties.
- The 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.

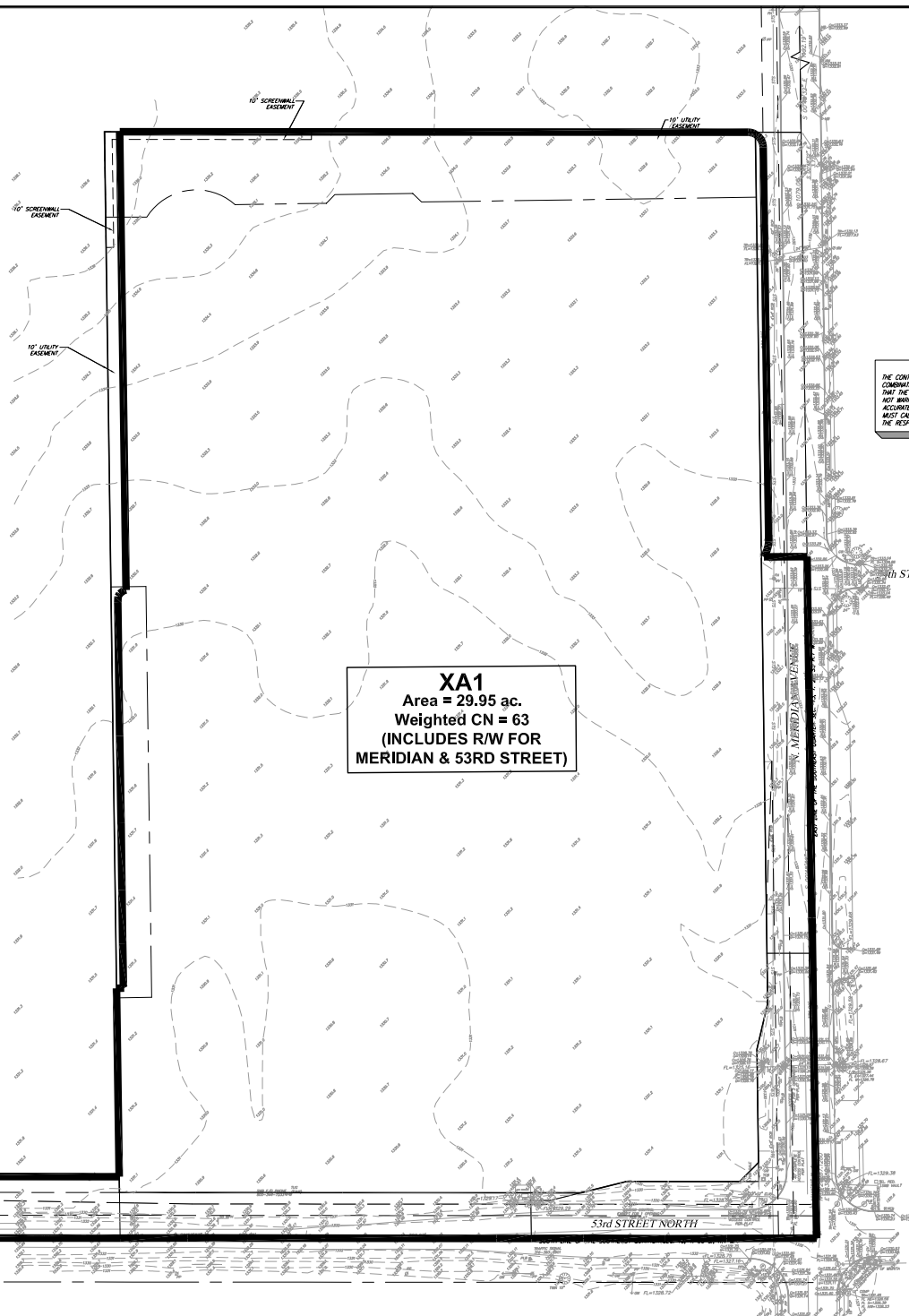


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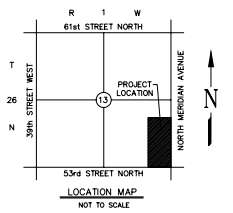
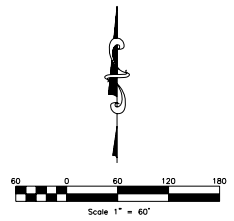
1/25/07
Date

APPENDIX A

FIGURES



XA1
 Area = 29.95 ac.
 Weighted CN = 63
 (INCLUDES R/W FOR
 MERIDIAN & 53RD STREET)



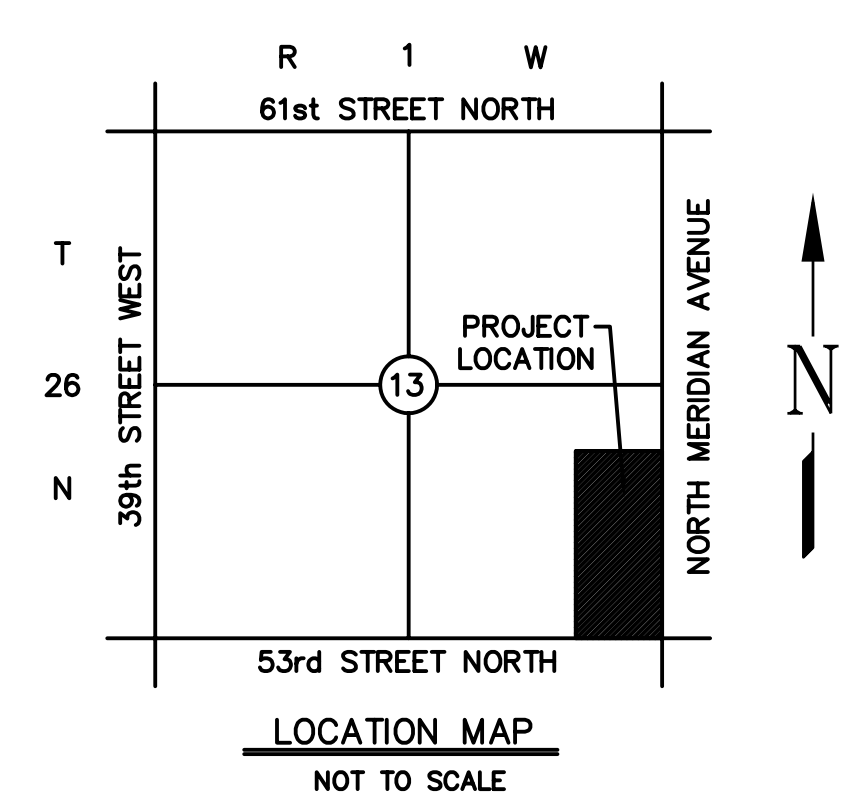
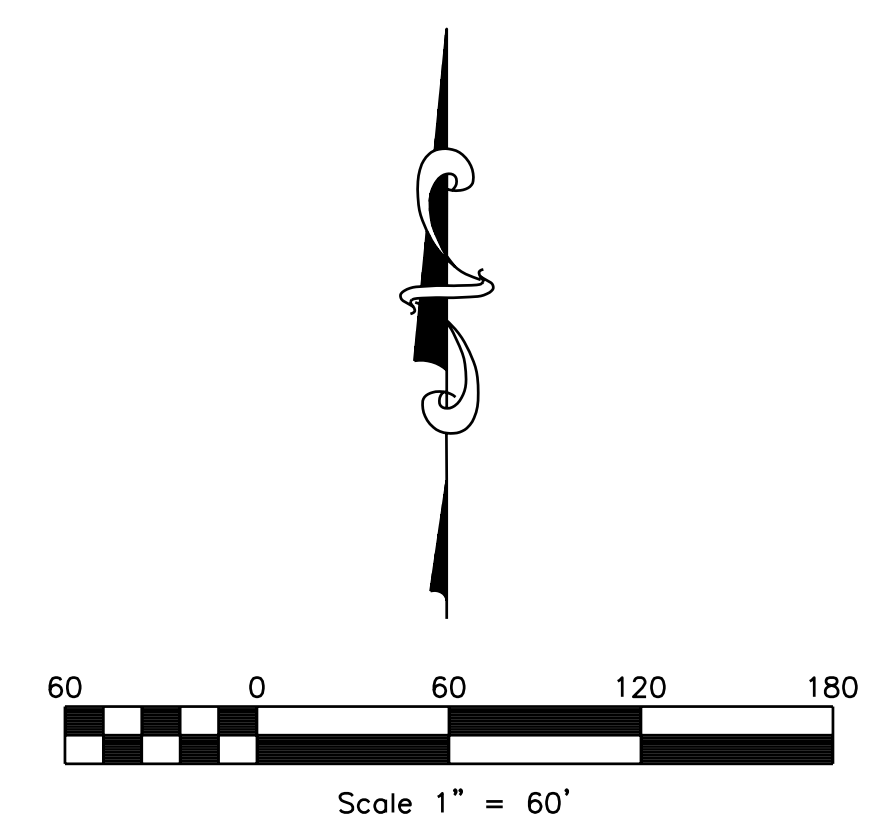
UTILITY STATEMENT & CAUTION:
 THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON A COMBINATION OF FIELD SURVEY INFORMATION, EXISTING DRAWINGS AND RECORDS OF THE VARIOUS UTILITY COMPANIES. THE ENGINEER MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA OTHER THAN 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.

LEGEND

- | | | | |
|---|---------------------------------------|---|---------------------------------------|
| — | SDM (A. STUMP, FIELD, etc.) | — | PROPOSED CONTOUR & ELEVATION |
| — | SPOT ELEVATION | — | STORM SEWER INLET |
| — | STORM SEWER INLET | — | STORM SEWER CHAIN PILE |
| — | STORM SEWER CHAIN PILE | — | STORM SEWER MANHOLE (S/S MAN) |
| — | STORM SEWER MANHOLE (S/S MAN) | — | S/S MANHOLE |
| — | S/S MANHOLE | — | S/S CLEANOUT |
| — | S/S CLEANOUT | — | FUTURE CURB & GUTTER BY STREET |
| — | FUTURE CURB & GUTTER BY STREET | — | POWER UNDERGROUND BY CONDUIT |
| — | POWER UNDERGROUND BY CONDUIT | — | TELEPHONE UNDERGROUND (PER CITY SPEC) |
| — | TELEPHONE UNDERGROUND (PER CITY SPEC) | — | POWER OVERHEAD |
| — | POWER OVERHEAD | — | GAS LINE |
| — | GAS LINE | — | ASSOCIATE MANHOLE |
| — | ASSOCIATE MANHOLE | — | WHITE COLOR |
| — | WHITE COLOR | — | SPOT ELEVATION |
| — | SPOT ELEVATION | — | FLOW DIRECTION |
| — | FLOW DIRECTION | — | STS |
| — | STS | — | STORM SEWER |
| — | STORM SEWER | — | LANDSCAPE |
| — | LANDSCAPE | — | |

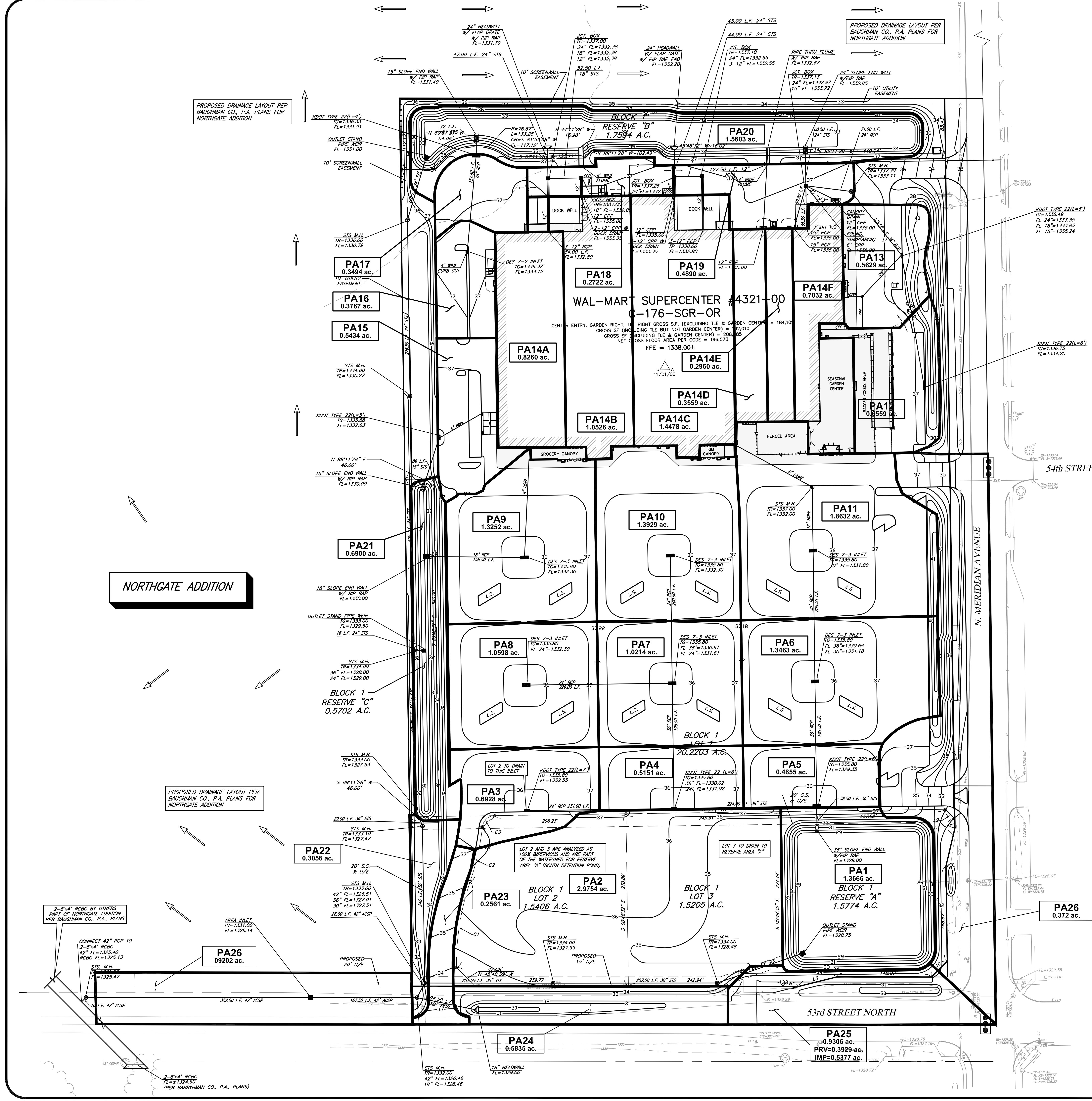
EXISTING DRAINAGE PLAN 1/C R/W FOR 53rd STREET & MERIDIAN AVENUE		
WAL-MART SUPERCENTER #4321-00		
N.W. 53rd ST. NORTH & N. MERIDIAN WICHITA, KANSAS		
SMC Consulting Engineers, P.C. 815 West 56th - OMAHA, NE 68106 PH: 405-232-7715 FAX: 405-232-7859		
SMC		
MERCIS SURVEYS OF ILLINOIS REG. NO. E-378 EXP. 06-30-2005		
NO.	DATE	BY
DATE: 01/20/07	SCALE: 1" = 60'	FIGURE NO. 2
DRAWN BY: MK		
PROJECT NO.: XA1-00		
ENGINEER:		

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.



LEGEND

—	SIGN (i.e. STOP, YIELD, etc.)	—1521—	PROPOSED CONTOUR & CONTOUR ELEVATION
⊕	LIGHT POLE AND FIXTURE TYPE	■	STORM SEWER INLET
▨	HEAVY DUTY CONCRETE (H.D.C.)	⊖	STORM SEWER CURB INLET
▧	HEAVY DUTY REINFORCED CONCRETE DRIVEWAY	⊙	STORM SEWER MANHOLE (STS M.H.)
▩	HEAVY DUTY ASPHALT (H.D.A.)	○	S.S. MANHOLE
—	STANDARD DUTY ASPHALT (S.D.A.)	—	S.S. CLEANOUTS
—	CONCRETE BARRIER	—	FUTURE CURB & GUTTER BY OTHERS
→	STRAIGHT ARROW	—	POWER UNDERGROUND BY CONTRACTOR
↶	LEFT TURN ARROW	—	TELEPHONE UNDERGROUND (PER CITY STDS)
↷	RIGHT TURN ARROW	—	POWER OVERHEAD
⊕	3 WAY FIRE HYDRANT	—	GAS LINE
⊕	GATE VALVE	▨	ASSOCIATE PARKING, WHITE COLOR
⊕	CURT CORNERS	□	SPOT ELEVATION
TC	TOP OF CURB	—	FLOW DIRECTION
TP	TOP OF PAVEMENT	—	STS
TW	TOP OF WALK	—	LANDSCAPE
TG	TOP OF GUTTER		



PROPOSED DRAINAGE PLAN I/C R/W FOR 53rd STREET & MERIDIAN AVENUE
WAL-MART SUPERCENTER #4321-00
 N.W. 53rd ST. NORTH & N. MERIDIAN WICHITA, KANSAS
SMC Consulting Engineers, P.C.
 815 West Main - Oklahoma City, OK 73106
 PH: 405-232-7715 Fax: 405-232-7859
 KANSAS CERTIFICATE OF AUTHORIZATION NO. E-335 EXP. DEC. 2006

DATE: 01/03/07	SCALE: 1" = 60'	FIGURE NO. 3
DRAWN BY: MK		
PROJECT NO.: 444.00		
ENGINEER:		

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.

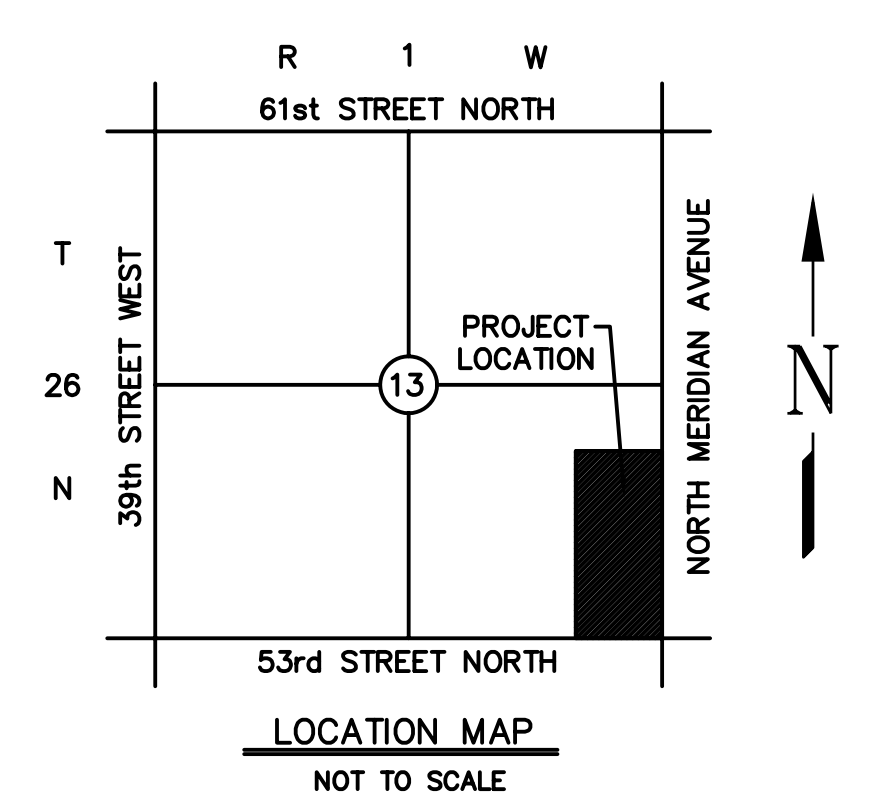
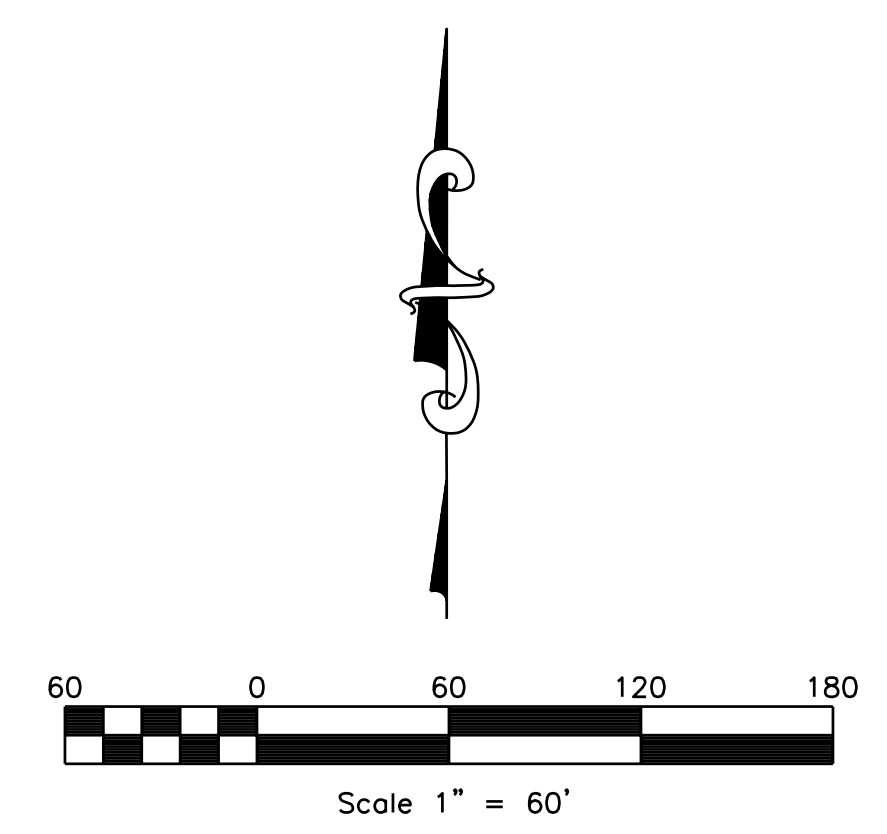
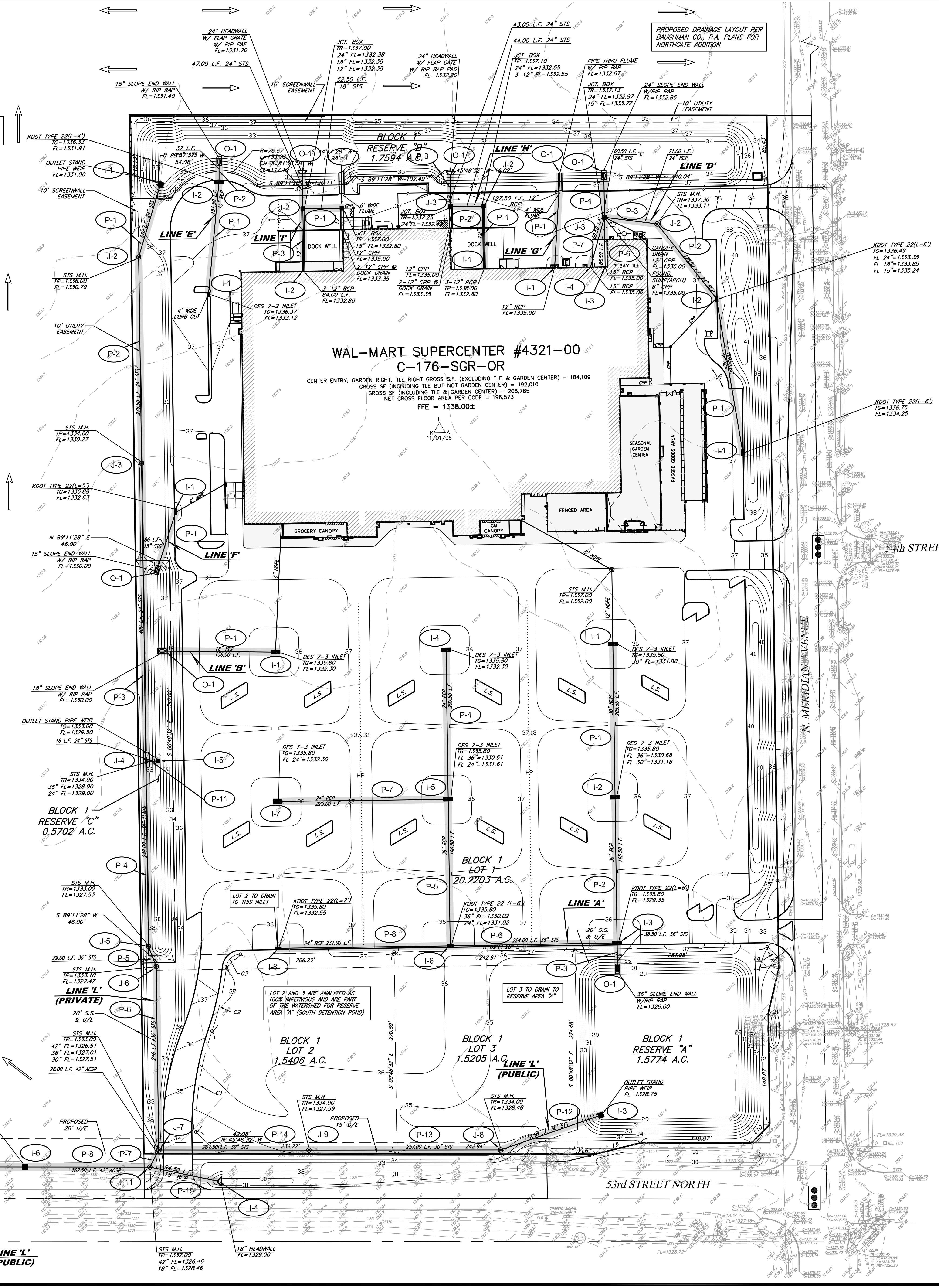
PROPOSED DRAINAGE LAYOUT PER BAUGHMAN CO., P.A. PLANS FOR NORTHGATE ADDITION

NORTHGATE ADDITION

PROPOSED DRAINAGE LAYOUT PER BAUGHMAN CO., P.A. PLANS FOR NORTHGATE ADDITION

PROPOSED DRAINAGE LAYOUT PER BAUGHMAN CO., P.A. PLANS FOR NORTHGATE ADDITION

PROPOSED DRAINAGE LAYOUT PER BAUGHMAN CO., P.A. PLANS FOR NORTHGATE ADDITION



- LEGEND**
- SIGN (e.g. STOP, YIELD, etc.)
 - AVAROD LIGHT POLE AND FIXTURE TYPE
 - HEAVY DUTY REINFORCED CONCRETE DRIVEWAY
 - HEAVY DUTY ASPHALT (H.D.A.)
 - STANDARD DUTY ASPHALT (S.D.A.)
 - CONCRETE BARRIER
 - STRAIGHT ARROW
 - LEFT TURN ARROW
 - RIGHT TURN ARROW
 - 3 WAY FIRE HYDRANT
 - TEE
 - GATE VALVE
 - CURT CURB/ISLAND
 - TC TOP OF CURB
 - TP TOP OF PAVEMENT
 - TW TOP OF WALK
 - TG TOP OF GUTTER
 - 1521 PROPOSED CONTOUR & CONTOUR ELEVATION
 - STORM SEWER INLET
 - STORM SEWER CURB INLET
 - STORM SEWER MANHOLE (STS M.H.)
 - S.S. MANHOLE
 - S.S. CLEANOUTS
 - FUTURE CURB & GUTTER BY OTHERS
 - POWER UNDERGROUND BY CONTRACTOR
 - TELEPHONE UNDERGROUND (PER CITY STDS)
 - POWER OVERHEAD
 - GAS LINE
 - ASSOCIATE PARKING, WHITE COLOR
 - SPOT ELEVATION
 - FLOW DIRECTION
 - STS STORM SEWER
 - L.S. LANDSCAPE

STORM SEWER PIPE/NODE PLAN

WAL-MART SUPERCENTER #4321-00

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

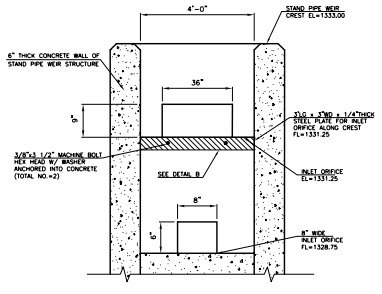
SPEAR & McCALEB CO., P.C. SMC
 815 West Main - Oklahoma City, OK 73106
 PH: 405-232-7715 Fax: 405-232-7859
 KANSAS CERTIFICATE OF AUTHORIZATION NO. E-335 EXP. DEC. 2006

No.	Revision	By	Date

DATE: 07/28/05 SCALE: 1" = 60' SHEET NO. 4

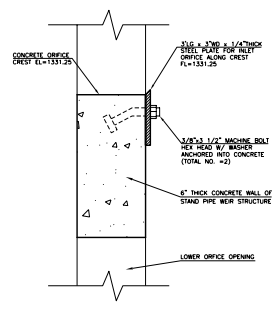
ENGINEER: TERENCE L. HAYNES, P.E. #14583

NOT VALID FOR CONSTRUCTION UNLESS SIGNED IN THIS BLOCK



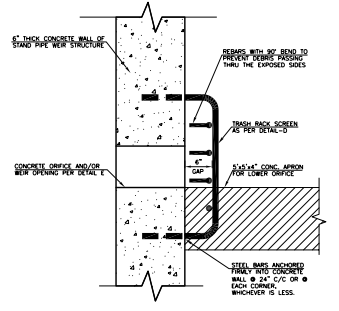
DETAIL-A
N.T.S.

NOTE:
1. REBAR AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.



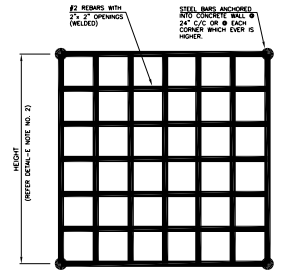
DETAIL-B
N.T.S.

NOTE:
1. REBAR AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.



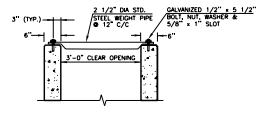
DETAIL-C
N.T.S.

NOTE:
1. REBAR AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.

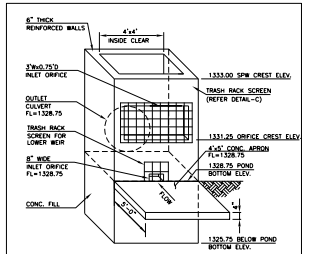


DETAIL-D
N.T.S.

TRASH RACK SCREEN
N.T.S.

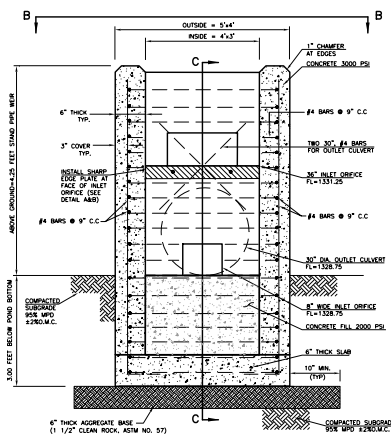


DETAIL-F
PIPE GRATE
N.T.S.



DETAIL-E
CONCRETE STAND PIPE WEIR (SPW)
FOR SOUTH DETENTION POND
N.T.S.

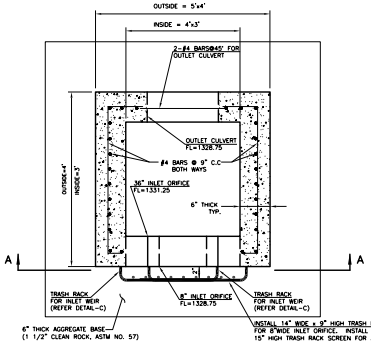
NOTE:
1. REBAR AND CONCRETE THICKNESS OF THE SPW IS NOT SHOWN HERE FOR CLARITY.
2. INSTALL 1/4" WIDE x 9" HIGH TRASH RACK SCREEN FOR SPW INLET OFFICE. INSTALL 1/2" WIDE x 15" HIGH TRASH RACK SCREEN FOR 18" WIDE INLET OFFICE. TRASH RACK SCREEN TO BE #2 REBAR WITH 2x2" OPENINGS (WELDED). ANCHOR TRASH RACK INTO STAND PIPE WEIR FACE WALL WITH ANCHORED BARS INTO CONCRETE WALL (REFER DETAIL-C).



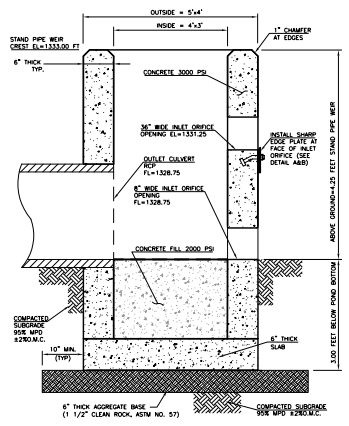
SECTION A-A
N.T.S.

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 REBAR 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 REBAR 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 HOOT SPEC.

**CONCRETE STAND PIPE WEIR
FOR SOUTH DETENTION POND**
N.T.S.



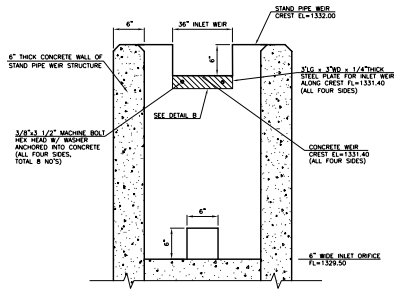
SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

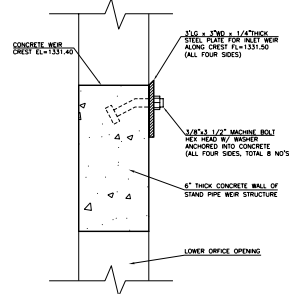
NOTE:
1. REBAR AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.

STAND PIPE WEIR FOR SOUTH DETENTION POND	
WAL-MART SUPERCENTER #4321-00	
N.W. 53rd ST. NORTH & N. MERIDIAN WICHITA, KANSAS	
SMC Consulting Engineers, P.C. 815 West Main - Oklahoma City, OK 73106 PH: 405-232-7715 FAX: 405-232-7809 KANSAS CERTIFICATE OF AUTHORIZATION NO. E-335 EXP. DEC. 31, 2006	
NO. / Revision	BY / Date
DATE: 12/12/06	SCALE: N.T.S.
DRAWN BY: MCS	PROJECT NO.: 4344.00
ENGINEER:	FIGURE NO. 6



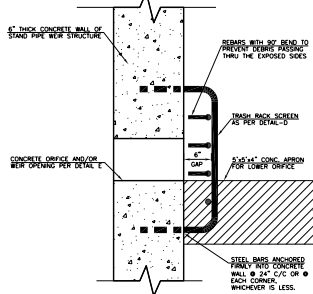
DETAIL-A
N.T.S.

NOTE:
1. REBARS AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.



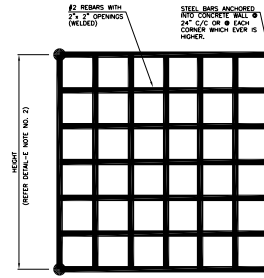
DETAIL-B
N.T.S.

NOTE:
1. REBARS AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.

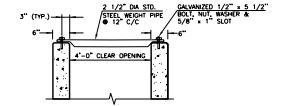


DETAIL-C
N.T.S.

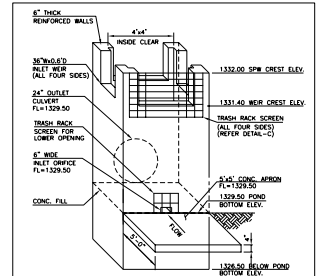
NOTE:
1. REBARS ARE NOT SHOWN HERE FOR CLARITY.



DETAIL-D
N.T.S.
TRASH RACK SCREEN

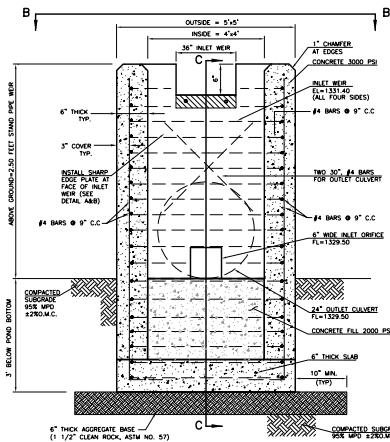


DETAIL-F
N.T.S.
PIPE GRATE



DETAIL-E
N.T.S.
CONCRETE STAND PIPE WEIR (SPW)
FOR WEST DETENTION POND

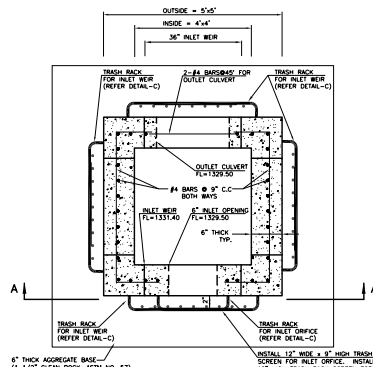
NOTE:
1. REBARS AND CONCRETE THICKNESS OF THE SPW IS NOT SHOWN HERE FOR CLARITY.
2. INSTALL 12" WIDE x 9" HIGH TRASH RACK SCREEN FOR INLET ORIFICE. INSTALL 42" WIDE x 12" HIGH TRASH RACK SCREEN FOR INLET WEIR ON FOUR SIDES. TRASH RACK SCREENS TO BE #2 REBARS WITH 2"x2" OPENINGS (WELDED). ANCHOR TRASH RACK INTO STAND PIPE WEIR FACE WITH ANCHORED BARS INTO CONCRETE WALL (REFER DETAIL-C).



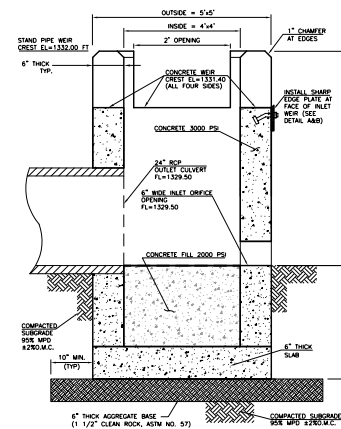
SECTION A-A
N.T.S.

- 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 PNE CAST.
 5. CONCRETE SHALL BE AIR ENTRAINED PER GOOD PRACTICE.

CONCRETE STAND PIPE WEIR
FOR WEST DETENTION POND
N.T.S.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

NOTE:
1. REBARS AND TRASH RACKS ARE NOT SHOWN HERE FOR CLARITY.

STAND PIPE WEIR FOR WEST DETENTION POND		
WAL-MART SUPERCENTER #4321-00		
NW 53rd ST. NORTH & N. MERIDIAN WICHITA, KANSAS		
SMC Consulting Engineers, P.C. 812 West 16th - Olathe, KS 66110 PH: 405-232-7715 FAX: 405-232-7859 AMERICAN SOCIETY OF SURVEYORS NO. E-336, EXP. 2005		
DATE: 12/12/06	SCALE:	FIGURE NO.
DRAWN BY: TR	NIS	7
PROJECT NO.: 4341-00		
ENGINEER:		

TABLE NO. 5:Weighted Runoff Coefficient, Storm Event less than 25 yr, North DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sf)	ACRES	IMP/PA	AREA (sf)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA12	82,933	1.904	22.69	0	0.000	0.00	1.904	0.20	0.95	0.95
PA13	24,520	0.563	6.71	0	0.000	0.00	0.563	0.20	0.95	0.95
PA14	193,233	4.436	52.87	0	0.000	0.00	4.436	0.20	0.95	0.95
PA16	16,409	0.377	4.49	0	0.000	0.00	0.377	0.20	0.95	0.95
PA17	15,220	0.349	4.16	0	0.000	0.00	0.349	0.20	0.95	0.95
PA18	11,857	0.272	3.24	0	0.000	0.00	0.272	0.20	0.95	0.95
PA19	21,300	0.489	5.83	0	0.000	0.00	0.489	0.20	0.95	0.95
PA20	0	0.000	0.00	67,967	1.560	100.00	1.560	0.20	0.95	0.20
TOTAL	365,472	8.390	100.00	67,967	1.560	100.00	9.950		"C" =	0.83

TABLE NO. 6: Weighted Runoff Coefficient, Storm Event 25 yr or more, North DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA12	82,933	1.904	22.69	0	0.000	0.00	1.904	0.41	0.95	0.95
PA13	24,520	0.563	6.71	0	0.000	0.00	0.563	0.41	0.95	0.95
PA14	193,233	4.436	52.87	0	0.000	0.00	4.436	0.41	0.95	0.95
PA16	16,409	0.377	4.49	0	0.000	0.00	0.377	0.41	0.95	0.95
PA17	15,220	0.349	4.16	0	0.000	0.00	0.349	0.41	0.95	0.95
PA18	11,857	0.272	3.24	0	0.000	0.00	0.272	0.41	0.95	0.95
PA19	21,300	0.489	5.83	0	0.000	0.00	0.489	0.41	0.95	0.95
PA20	0	0.000	0.00	67,967	1.560	100.00	1.560	0.41	0.95	0.41
TOTAL	365,472	8.390	100.00	67,967	1.560	100.00	9.950		"C" =	0.87

TABLE NO. 7: Weighted Runoff Coefficient, Storm Event less than 25 yr, South DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA1	0	0.000	0.00	59,530	1.367	100.00	1.367	0.20	0.95	0.20
PA2	129,609	2.975	26.21	0	0.000	0.00	2.975	0.20	0.95	0.95
PA3	30,179	0.693	6.10	0	0.000	0.00	0.693	0.20	0.95	0.95
PA4	22,438	0.515	4.54	0	0.000	0.00	0.515	0.20	0.95	0.95
PA5	21,149	0.486	4.28	0	0.000	0.00	0.486	0.20	0.95	0.95
PA6	58,645	1.346	11.86	0	0.000	0.00	1.346	0.20	0.95	0.95
PA7	44,493	1.021	9.00	0	0.000	0.00	1.021	0.20	0.95	0.95
PA8	46,165	1.060	9.34	0	0.000	0.00	1.060	0.20	0.95	0.95
PA10	60,675	1.393	12.27	0	0.000	0.00	1.393	0.20	0.95	0.95
PA11	81,161	1.863	16.41	0	0.000	0.00	1.863	0.20	0.95	0.95
TOTAL	494,514	11.352	100.00	59,530	1.367	100.00	12.719		"C" =	0.87

TABLE NO. 8: Weighted Runoff Coefficient, Storm Event 25 yr or more, South DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA1	0	0.000	0.00	59,530	1.367	100.00	1.367	0.41	0.95	0.41
PA2	129,609	2.975	26.21	0	0.000	0.00	2.975	0.41	0.95	0.95
PA3	30,179	0.693	6.10	0	0.000	0.00	0.693	0.41	0.95	0.95
PA4	22,438	0.515	4.54	0	0.000	0.00	0.515	0.41	0.95	0.95
PA5	21,149	0.486	4.28	0	0.000	0.00	0.486	0.41	0.95	0.95
PA6	58,645	1.346	11.86	0	0.000	0.00	1.346	0.41	0.95	0.95
PA7	44,493	1.021	9.00	0	0.000	0.00	1.021	0.41	0.95	0.95
PA8	46,165	1.060	9.34	0	0.000	0.00	1.060	0.41	0.95	0.95
PA10	60,675	1.393	12.27	0	0.000	0.00	1.393	0.41	0.95	0.95
PA11	81,161	1.863	16.41	0	0.000	0.00	1.863	0.41	0.95	0.95
TOTAL	494,514	11.352	100.00	59,530	1.367	100.00	12.719		"C" =	0.89

TABLE NO. 9: Weighted Runoff Coefficient, Storm Event less than 25yr, West DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA9	57,726	1.325	70.92	0	0.000	0.00	1.325	0.20	0.95	0.95
PA15	23,671	0.543	29.08	0	0.000	0.00	0.543	0.20	0.95	0.95
PA21	0	0.000	0.00	30,057	0.690	100.00	0.690	0.20	0.95	0.20
TOTAL	81,397	1.869	100.00	30,057	0.690	100.00	2.559		"C" =	0.75

TABLE NO. 10: Weighted Runoff Coefficient, Storm Event 25 yr or more, West DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA9	57,726	1.325	70.92	0	0.000	0.00	1.325	0.41	0.95	0.95
PA15	23,671	0.543	29.08	0	0.000	0.00	0.543	0.41	0.95	0.95
PA21	0	0.000	0.00	30,057	0.690	100.00	0.690	0.41	0.95	0.41
TOTAL	81,397	1.869	100.00	30,057	0.690	100.00	2.559		"C" =	0.80

TABLE NO. 11: Weighted Runoff Coefficient, Storm Event less than 25yr, Bypass East, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA25	15,191	0.349	22.59	16,877	0.387	29.99	0.736	0.20	0.95	0.56
PA26	52,070	1.195	77.41	39,391	0.904	70.01	2.100	0.20	0.95	0.63
TOTAL	67,261	1.544	100.00	56,268	1.292	100.00	2.836		"C" =	0.61

TABLE NO. 12: Weighted Runoff Coefficient, Storm Event 25 yr or more, Bypass East, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA25	15,191	0.349	22.59	16,877	0.387	29.99	0.736	0.41	0.95	0.67
PA26	52,070	1.195	77.41	39,391	0.904	70.01	2.100	0.41	0.95	0.72
TOTAL	67,261	1.544	100.00	56,268	1.292	100.00	2.836		"C" =	0.70

TABLE NO. 13, Weighted Runoff Coefficient, Storm Event less than 25 yr, Bypass West, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA22	0	0.000	0.00	13,312	0.306	67.69	0.306	0.20	0.95	0.20
PA23	11,156	0.256	36.92	0	0.000	0.00	0.256	0.20	0.95	0.95
PA24	19,062	0.438	63.08	6,355	0.146	32.31	0.583	0.20	0.95	0.76
TOTAL	30,218	0.694	100.00	19,667	0.451	100.00	1.145		"C" =	0.65

TABLE NO. 14: Weighted Runoff Coefficient, Storm Event 25 yr or more, Bypass West, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	"C"	"C"	"C"
PA22	0	0.000	0.00	13,312	0.306	67.69	0.306	0.41	0.95	0.41
PA23	11,156	0.256	36.92	0	0.000	0.00	0.256	0.41	0.95	0.95
PA24	19,062	0.438	63.08	6,355	0.146	32.31	0.583	0.41	0.95	0.81
TOTAL	30,218	0.694	100.00	19,667	0.451	100.00	1.145		"C" =	0.74

TABLE NO. 15: Weighted Curve Number, North DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	CN	CN	CN
PA12	82,933	1.904	22.69	0	0.000	0.00	1.904	61	98	98
PA13	24,520	0.563	6.71	0	0.000	0.00	0.563	61	98	98
PA14	193,233	4.436	52.87	0	0.000	0.00	4.436	61	98	98
PA16	16,409	0.377	4.49	0	0.000	0.00	0.377	61	98	98
PA17	15,220	0.349	4.16	0	0.000	0.00	0.349	61	98	98
PA18	11,857	0.272	3.24	0	0.000	0.00	0.272	61	98	98
PA19	21,300	0.489	5.83	0	0.000	0.00	0.489	61	98	98
PA20	0	0.000	0.00	67,967	1.560	100.00	1.560	61	98	61
TOTAL	365,472	8.390	100.00	67,967	1.560	100.00	9.950		CN	92

TABLE NO. 16: Weighted Curve Number, South DP, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	CN	CN	CN
PA1	0	0.000	0.00	59,530	1.367	100.00	1.367	61	98	61
PA2	129,609	2.975	26.21	0	0.000	0.00	2.975	61	98	98
PA3	30,179	0.693	6.10	0	0.000	0.00	0.693	61	98	98
PA4	22,438	0.515	4.54	0	0.000	0.00	0.515	61	98	98
PA5	21,149	0.486	4.28	0	0.000	0.00	0.486	61	98	98
PA6	58,645	1.346	11.86	0	0.000	0.00	1.346	61	98	98
PA7	44,493	1.021	9.00	0	0.000	0.00	1.021	61	98	98
PA8	46,165	1.060	9.34	0	0.000	0.00	1.060	61	98	98
PA10	60,675	1.393	12.27	0	0.000	0.00	1.393	61	98	98
PA11	81,161	1.863	16.41	0	0.000	0.00	1.863	61	98	98
TOTAL	494,514	11.352	100.00	59,530	1.367	100.00	12.719		CN	94

TABLE NO. 17: Weighted Curve Number, West DP, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	CN	CN	CN
PA9	57,726	1.325	70.92	0	0.000	0.00	1.325	61	98	98
PA15	23,671	0.543	29.08	0	0.000	0.00	0.543	61	98	98
PA21	0	0.000	0.00	30,057	0.690	100.00	0.690	61	98	61
TOTAL	81,397	1.869	100.00	30,057	0.690	100.00	2.559		"C" =	88

TABLE NO. 18: Weighted Curve Number, Bypass East, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	CN	CN	CN
PA25	15,191	0.349	22.59	16,877	0.387	29.99	0.736	61	98	79
PA26	52,070	1.195	77.41	39,391	0.904	70.01	2.100	61	98	82
TOTAL	67,261	1.544	100.00	56,268	1.292	100.00	2.836		CN	81

TABLE NO. 19: Weighted Cuver Number, Bypass West, Wichita, KS

DA	IMPERVIOUS	IMPERV.	%	PERVIOUS	PERVIOUS	%	TOTAL	PERVIOUS	IMPERV.	WGHT
NO.	AREA (sft)	ACRES	IMP/PA	AREA (sft)	ACRES	PER/PA	ACRES	CN	CN	CN
PA22	0	0.000	0.00	13,312	0.306	67.69	0.306	61	98	61
PA23	11,156	0.256	36.92	0	0.000	0.00	0.256	61	98	98
PA24	19,062	0.438	63.08	6,355	0.146	32.31	0.583	61	98	89
TOTAL	30,218	0.694	100.00	19,667	0.451	100.00	1.145		CN	83

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	10.21
0:06	4.62	5.34	6.33	7.07	8.15	9.00	9.84
0:07	4.33	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	4.63	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	5.28	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	4.75	5.36	6.24	6.92	7.61
0:15	3.22	3.80	4.62	5.21	6.06	6.73	7.42
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	6.43	7.04
0:18	2.94	3.48	4.26	4.82	5.61	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	5.75	6.35
0:23	2.56	3.07	3.80	4.32	5.07	5.63	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	3.85	4.54	5.08	5.61
0:30	2.18	2.64	3.31	3.78	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	1.99	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	4.29	4.73
0:41	1.79	2.18	2.77	3.18	3.76	4.23	4.67
0:42	1.75	2.15	2.73	3.13	3.71	4.18	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 1937)

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	3.23	3.61	4.00
0:54	1.49	1.83	2.33	2.68	3.19	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	2.23	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	2.35	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	2.19	2.46	2.72
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	2.15
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	1.29
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	0.33	0.35	0.36	0.37	0.38	0.39
7:00	0.29	0.31	0.33	0.34	0.35	0.36	0.37
7:30	0.28	0.30	0.32	0.33	0.34	0.35	0.36
8:00	0.27	0.29	0.31	0.32	0.33	0.34	0.35
8:30	0.26	0.28	0.30	0.31	0.32	0.33	0.34
9:00	0.25	0.27	0.29	0.30	0.31	0.32	0.33
9:30	0.24	0.26	0.28	0.29	0.30	0.31	0.32
10:00	0.23	0.25	0.27	0.28	0.29	0.30	0.31
10:30	0.23	0.25	0.27	0.28	0.29	0.30	0.31
11:00	0.22	0.24	0.26	0.27	0.28	0.29	0.30
11:30	0.21	0.23	0.25	0.26	0.27	0.28	0.29
12:00	0.20	0.22	0.24	0.25	0.26	0.27	0.28
13:00	0.19	0.21	0.23	0.24	0.25	0.26	0.27
14:00	0.18	0.20	0.22	0.23	0.24	0.25	0.26
15:00	0.17	0.19	0.21	0.22	0.23	0.24	0.25
16:00	0.16	0.18	0.20	0.21	0.22	0.23	0.24
17:00	0.15	0.17	0.19	0.20	0.21	0.22	0.23
18:00	0.15	0.17	0.19	0.20	0.21	0.22	0.23
19:00	0.14	0.16	0.18	0.19	0.20	0.21	0.22
20:00	0.14	0.16	0.18	0.19	0.20	0.21	0.22
21:00	0.13	0.15	0.17	0.18	0.19	0.20	0.21
22:00	0.13	0.15	0.17	0.18	0.19	0.20	0.21
23:00	0.12	0.14	0.16	0.17	0.18	0.19	0.20
24:00	0.12	0.14	0.16	0.17	0.18	0.19	0.20

APPENDIX C

EXISTING HYDROGRAPHS

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: EXISTING 176PROTO

Date: 01-03-07
Time: 13:31:38
Page: 1

UNIT HYDROGRAPH REPORT

Number	Name	Type	Defined
1	XA1, UH, 2YR	Rational	Yes
2	XA1, UH, 100YR	Rational	Yes
4	XA1, UH, 5YR	Rational	Yes

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: EXISTING 176PROTO

Date: 01-03-07
Time: 13:31:38
Page: 2

UNIT HYDROGRAPH REPORT

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

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	76.62 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.50 (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	29.95	63	0.23

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	23.65 (min)
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User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: EXISTING 176PROTO

Date: 01-03-07
Time: 13:31:38
Page: 4

UNIT HYDROGRAPH REPORT

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

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	76.62 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.50 (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	29.95	63	0.43

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	23.65 (min)
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User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: EXISTING 176PROTO

Date: 01-03-07
Time: 13:31:38
Page: 8

UNIT HYDROGRAPH REPORT

Hydrograph Number:4
Name: XA1, UH, 5YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	76.62 (cfs)
Time to Peak (Tp)	=	23.65 (min)
Time of Base (Tb)	=	47.30 (min)
Volume	=	2.50 (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	29.95	63	0.23

[TIME CONCENTRATION User Defined]

Time of Concentration (Tc)	=	23.65 (min)
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User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
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FLOOD HYDROGRAPH REPORT

=====

Number	Name	Type	Defined
1	XA1, CFH, 2 YEAR	Computed Flood	Yes
2	XA1, CFH, 100 YEAR	Computed Flood	Yes
4	XA1, CFH, 5 YEAR	Computed Flood	Yes

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FLOOD HYDROGRAPH REPORT

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

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 15.01 (cfs)
Time to Peak (Tp) = 733.00 (min)
Time of Base (Tb) = 1466.30 (min)
Volume = 1.64 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 1
Type = Rational
Peak Flow (Qp) = 76.62 (cfs)
Time to Peak (Tp) = 23.65 (min)
Time of Base (Tb) = 47.30 (min)
Volume = 2.50 (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	29.95	63

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 23.65 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 3.50 (in)
Return Period = 2 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION = 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
724	724.00	0.00	3.50	0.55	10.26
725	725.00	0.00	3.50	0.55	10.81
726	726.00	0.00	3.50	0.55	11.37
727	727.00	0.00	3.50	0.55	11.92
728	728.00	0.00	3.50	0.55	12.47
729	729.00	0.00	3.50	0.55	13.02
730	730.00	0.00	3.50	0.55	13.57
731	731.00	0.00	3.50	0.55	14.13
732	732.00	0.00	3.50	0.55	14.68
733	733.00	0.00	3.50	0.34	15.01
734	734.00	0.00	3.50	-0.11	14.90
735	735.00	0.00	3.50	-0.48	14.42
736	736.00	0.00	3.50	-0.48	13.94
737	737.00	0.00	3.50	-0.48	13.46
738	738.00	0.00	3.50	-0.48	12.97
739	739.00	0.00	3.50	-0.48	12.49
740	740.00	0.00	3.50	0.48	12.01
741	741.00	0.00	3.50	-0.48	11.53
742	742.00	0.00	3.50	-0.48	11.05
743	743.00	0.00	3.50	-0.48	10.56
744	744.00	0.00	3.50	-0.48	10.08
745	745.00	0.00	3.50	0.48	9.60
746	746.00	0.00	3.50	-0.48	9.12
747	747.00	0.00	3.50	0.48	8.64
748	748.00	0.00	3.50	-0.48	8.16
749	749.00	0.00	3.50	-0.48	7.67
750	750.00	0.00	3.50	0.48	7.19
751	751.00	0.00	3.50	-0.48	6.71
752	752.00	0.00	3.50	-0.48	6.23
753	753.00	0.00	3.50	-0.48	5.75
754	754.00	0.00	3.50	-0.48	5.26
755	755.00	0.00	3.50	-0.48	4.78
756	756.00	0.00	3.50	-0.48	4.30
757	757.00	0.00	3.50	-0.43	3.87
758	758.00	0.00	3.50	-0.02	3.85
759	759.00	0.00	3.50	0.05	3.80
760	760.00	0.00	3.50	-0.05	3.75
761	761.00	0.00	3.50	-0.05	3.70
762	762.00	0.00	3.50	0.05	3.65
763	763.00	0.00	3.50	-0.05	3.60
764	764.00	0.00	3.50	-0.05	3.55
765	765.00	0.00	3.50	-0.05	3.50
766	766.00	0.00	3.50	-0.05	3.45
767	767.00	0.00	3.50	-0.05	3.40
768	768.00	0.00	3.50	-0.05	3.35
769	769.00	0.00	3.50	-0.05	3.29
770	770.00	0.00	3.50	-0.05	3.24
771	771.00	0.00	3.50	-0.05	3.19

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FLOOD HYDROGRAPH REPORT

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

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 86.10 (cfs)
Time to Peak (Tp) = 733.00 (min)
Time of Base (Tb) = 1466.30 (min)
Volume = 8.92 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 2
Type = Rational
Peak Flow (Qp) = 76.62 (cfs)
Time to Peak (Tp) = 23.65 (min)
Time of Base (Tb) = 47.30 (min)
Volume = 2.50 (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	29.95	63

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 23.65 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 7.90 (in)
Return Period = 100 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION = 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
727	727.00	0.00	7.90	1.83	76.21
728	728.00	0.00	7.90	1.83	78.04
729	729.00	0.00	7.90	1.83	79.87
730	730.00	0.00	7.90	1.83	81.71
731	731.00	0.00	7.90	1.83	83.54
732	732.00	0.00	7.90	1.83	85.37
733	733.00	0.00	7.90	0.73	86.10
734	734.00	0.00	7.90	-1.13	84.97
735	735.00	0.00	7.90	-2.95	82.02
736	736.00	0.00	7.90	-2.95	79.07
737	737.00	0.00	7.90	-2.95	76.12
738	738.00	0.00	7.90	-2.95	73.17
739	739.00	0.00	7.90	-2.95	70.22
740	740.00	0.00	7.90	-2.95	67.27
741	741.00	0.00	7.90	-2.95	64.32
742	742.00	0.00	7.90	-2.95	61.37
743	743.00	0.00	7.90	-2.95	58.42
744	744.00	0.00	7.90	-2.95	55.47
745	745.00	0.00	7.90	-2.95	52.52
746	746.00	0.00	7.90	-2.95	49.57
747	747.00	0.00	7.90	-2.95	46.62
748	748.00	0.00	7.90	2.95	43.68
749	749.00	0.00	7.90	2.95	40.73
750	750.00	0.00	7.90	-2.95	37.78
751	751.00	0.00	7.90	-2.95	34.83
752	752.00	0.00	7.90	-2.95	31.88
753	753.00	0.00	7.90	-2.95	28.93
754	754.00	0.00	7.90	-2.95	25.98
755	755.00	0.00	7.90	-2.95	23.03
756	756.00	0.00	7.90	-2.95	20.08
757	757.00	0.00	7.90	-2.56	17.52
758	758.00	0.00	7.90	-0.10	17.42
759	759.00	0.00	7.90	-0.25	17.17
760	760.00	0.00	7.90	-0.25	16.92
761	761.00	0.00	7.90	-0.25	16.67
762	762.00	0.00	7.90	-0.25	16.42
763	763.00	0.00	7.90	-0.25	16.17
764	764.00	0.00	7.90	-0.25	15.92
765	765.00	0.00	7.90	-0.25	15.67
766	766.00	0.00	7.90	-0.25	15.42
767	767.00	0.00	7.90	-0.25	15.17
768	768.00	0.00	7.90	-0.25	14.92
769	769.00	0.00	7.90	-0.25	14.67
770	770.00	0.00	7.90	0.25	14.42
771	771.00	0.00	7.90	-0.25	14.17
772	772.00	0.00	7.90	-0.25	13.92
773	773.00	0.00	7.90	-0.25	13.67
774	774.00	0.00	7.90	-0.25	13.42

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 4
 Name: XA1, CFH, 5 YEAR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 28.83 (cfs)
 Time to Peak (Tp) = 733.00 (min)
 Time of Base (Tb) = 1466.30 (min)
 Volume = 2.98 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 4
 Type = Rational
 Peak Flow (Qp) = 76.62 (cfs)
 Time to Peak (Tp) = 23.65 (min)
 Time of Base (Tb) = 47.30 (min)
 Volume = 2.50 (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	29.95	63

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 23.65 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 4.50 (in)
 Return Period = 2 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
703	703.00	0.00	4.50	0.38	6.49
704	704.00	0.00	4.50	0.38	6.86
705	705.00	0.00	4.50	0.38	7.24
706	706.00	0.00	4.50	0.38	7.61
707	707.00	0.00	4.50	0.38	7.99
708	708.00	0.00	4.50	0.38	8.36
709	709.00	0.00	4.50	0.34	8.70
710	710.00	0.00	4.50	0.66	9.36
711	711.00	0.00	4.50	0.86	10.22
712	712.00	0.00	4.50	0.86	11.08
713	713.00	0.00	4.50	0.86	11.95
714	714.00	0.00	4.50	0.86	12.81
715	715.00	0.00	4.50	0.86	13.68
716	716.00	0.00	4.50	0.86	14.54
717	717.00	0.00	4.50	0.86	15.40
718	718.00	0.00	4.50	0.86	16.27
719	719.00	0.00	4.50	0.86	17.13
720	720.00	0.00	4.50	0.86	18.00
721	721.00	0.00	4.50	0.86	18.86
722	722.00	0.00	4.50	0.86	19.72
723	723.00	0.00	4.50	0.86	20.59
724	724.00	0.00	4.50	0.86	21.45
725	725.00	0.00	4.50	0.86	22.32
726	726.00	0.00	4.50	0.86	23.18
727	727.00	0.00	4.50	0.86	24.04
728	728.00	0.00	4.50	0.86	24.91
729	729.00	0.00	4.50	0.86	25.77
730	730.00	0.00	4.50	0.86	26.64
731	731.00	0.00	4.50	0.86	27.50
732	732.00	0.00	4.50	0.86	28.36
733	733.00	0.00	4.50	0.47	28.83
734	734.00	0.00	4.50	-0.29	28.54
735	735.00	0.00	4.50	-0.96	27.59
736	736.00	0.00	4.50	-0.96	26.63
737	737.00	0.00	4.50	-0.96	25.67
738	738.00	0.00	4.50	-0.96	24.72
739	739.00	0.00	4.50	-0.96	23.76
740	740.00	0.00	4.50	-0.96	22.80
741	741.00	0.00	4.50	-0.96	21.85
742	742.00	0.00	4.50	-0.96	20.89
743	743.00	0.00	4.50	-0.96	19.93
744	744.00	0.00	4.50	-0.96	18.98
745	745.00	0.00	4.50	-0.96	18.02
746	746.00	0.00	4.50	-0.96	17.06
747	747.00	0.00	4.50	-0.96	16.11
748	748.00	0.00	4.50	-0.96	15.15
749	749.00	0.00	4.50	-0.96	14.19
750	750.00	0.00	4.50	-0.96	13.24

APPENDIX D

**PROPOSED HYDROGRAPHS
INCLUDING ROUTING
HYDROGRAPHS**

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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
5	PA'S TO NORTH POND, UH, 5YR	Rational	Yes
6	PA'S TO SOUTH POND, UH, 5YR	Rational	Yes
7	PA'S TO WEST POND, UH, 5YR	Rational	Yes
8	PA'S TO WEST POND, UH, 2YR	Rational	Yes
9	PA'S TO WEST POND, UH, 100YR	Rational	Yes
10	PA'S BYPASS EAST, UH, 2YR	Rational	Yes
11	PA'S BYPASS EAST, UH, 100YR	Rational	Yes
12	PA'S BYPASS EAST, UH, 5YR	Rational	Yes
13	PA'S BYPASS WEST, UH, 2YR	Rational	Yes
14	PA'S BYPASS WEST, UH, 100YR	Rational	Yes
15	PA'S BYPASS WEST, UH, 5YR	Rational	Yes

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UNIT HYDROGRAPH REPORT

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

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	40.13 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.83 (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	9.95	92	0.83

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)
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UNIT HYDROGRAPH REPORT

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

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	40.13 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.83 (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	9.95	93	0.87

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)
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UNIT HYDROGRAPH REPORT

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

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	51.30 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.06 (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	12.72	94	0.87

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)
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UNIT HYDROGRAPH REPORT

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

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	51.30 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.06 (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	12.72	94	0.89

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number: 5
Name: PA'S TO NORTH POND, UH, 5YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	40.13 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	0.83 (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	9.95	92	0.83

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number: 6
Name: PA'S TO SOUTH POND, UH, 5YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	51.30 (cfs)
Time to Peak (Tp)	=	15.00 (min)
Time of Base (Tb)	=	30.00 (min)
Volume	=	1.06 (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	12.72	94	0.87

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	15.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number: 7
Name: PA'S TO WEST POND, UH, 5YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	30.96 (cfs)
Time to Peak (Tp)	=	5.00 (min)
Time of Base (Tb)	=	10.00 (min)
Volume	=	0.21 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	5.00 (min)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	2.56	88	0.75

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	5.00 (min)
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User Name: MKhan
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UNIT HYDROGRAPH REPORT

Hydrograph Number: 8
Name: PA'S TO WEST POND, UH, 2YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	30.87 (cfs)
Time to Peak (Tp)	=	5.00 (min)
Time of Base (Tb)	=	10.00 (min)
Volume	=	0.21 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	5.00 (min)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	2.55	88	0.75

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	5.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number: 9
Name: PA'S TO WEST POND, UH, 100YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	30.87 (cfs)
Time to Peak (Tp)	=	5.00 (min)
Time of Base (Tb)	=	10.00 (min)
Volume	=	0.21 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	5.00 (min)
Lag Time	=	0.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	2.55	88	0.80

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	5.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number:10
Name: PA'S BYPASS EAST, UH, 2YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	19.28 (cfs)
Time to Peak (Tp)	=	8.90 (min)
Time of Base (Tb)	=	17.80 (min)
Volume	=	0.24 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	8.90 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	2.84	81	0.61

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	8.90 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number:11

Name: PA'S BYPASS EAST, UH, 100YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	19.28 (cfs)
Time to Peak (Tp)	=	8.90 (min)
Time of Base (Tb)	=	17.80 (min)
Volume	=	0.24 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	8.90 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	2.84	81	0.70

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	8.90 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number:12
Name: PA'S BYPASS EAST, UH, 5YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	19.28 (cfs)
Time to Peak (Tp)	=	8.90 (min)
Time of Base (Tb)	=	17.80 (min)
Volume	=	0.24 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	8.90 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	2.84	81	0.61

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	8.90 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number:13
Name: PA'S BYPASS WEST, UH, 2YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	11.55 (cfs)
Time to Peak (Tp)	=	6.00 (min)
Time of Base (Tb)	=	12.00 (min)
Volume	=	0.10 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	6.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	1.15	83	0.65

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	6.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number:14
Name: PA'S BYPASS WEST, UH, 100YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	11.55 (cfs)
Time to Peak (Tp)	=	6.00 (min)
Time of Base (Tb)	=	12.00 (min)
Volume	=	0.10 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	6.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	1.15	83	0.74

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	6.00 (min)
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UNIT HYDROGRAPH REPORT

Hydrograph Number:15
Name: PA'S BYPASS WEST, UH, 5YR
Type: Rational

[UNIT HYDROGRAPH INFORMATION]

Peak Flow (Qp)	=	11.55 (cfs)
Time to Peak (Tp)	=	6.00 (min)
Time of Base (Tb)	=	12.00 (min)
Volume	=	0.10 (ac-ft)
Shape Factor	=	484.00
Time Step	=	1.00 (min)
Excess Rain	=	1.00 (in)
Storm Duration	=	6.00 (min)
Lag Time	=	3.00 (min)

[BASIN INFORMATION]

[WEIGHTED WATERSHED AREA/RUNOFF]

Description	Area	CN	Runoff Coef
<None>			
Overall Approximation	1.15	83	0.65

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc)	=	6.00 (min)
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FLOOD HYDROGRAPH REPORT

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=====
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
7           PA'S TO NORTH POND, CFH, 5YR                Computed Flood      Yes
8           PA'S TO WEST POND, CFH, 2YR                 Computed Flood      Yes
9           PA'S TO WEST POND, CFH, 5YR                 Computed Flood      Yes
10          PA'S TO WEST POND, CFH, 100YR              Computed Flood      Yes
11          PA'S TO SOUTH POND, CFH, 5YR                Computed Flood      Yes
12          ROUTE NORTH DP, 2YR                          Reservoir: Storage  Yes
13          ROUTE NORTH DP, 5YR                          Reservoir: Storage  Yes
14          ROUTE NORTH DP, 100YR                        Reservoir: Storage  Yes
15          ROUTE SOUTH DP, 2YR                          Reservoir: Storage  Yes
16          ROUTE SOUTH DP, 5YR                          Reservoir: Storage  Yes
17          ROUTE SOUTH DP, 100YR                       Reservoir: Storage  Yes
18          ROUTE WEST DP, 2YR                           Reservoir: Storage  Yes
19          ROUTE WEST DP, 5YR                           Reservoir: Storage  Yes
20          ROUTE WEST DP, 100YR                        Reservoir: Storage  Yes
21          PA'S BYPASS EAST, CFH, 2YR                  Computed Flood      Yes
22          PA'S BYPASS EAST, CFH, 100YR                Computed Flood      Yes
23          PA'S BYPASS EAST, CFH, 5YR                  Computed Flood      Yes
24          PA'S BYPASS WEST, CFH, 2YR                  Computed Flood      Yes
25          PA'S BYPASS WEST, CFH, 100YR                Computed Flood      Yes
26          PA'S BYPASS WEST, CFH, 5YR                  Computed Flood      Yes
  
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FLOOD HYDROGRAPH REPORT

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

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 34.03 (cfs)
 Time to Peak (Tp) = 720.00 (min)
 Time of Base (Tb) = 1455.00 (min)
 Volume = 2.18 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 1
 Type = Rational
 Peak Flow (Qp) = 40.13 (cfs)
 Time to Peak (Tp) = 15.00 (min)
 Time of Base (Tb) = 30.00 (min)
 Volume = 0.83 (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	9.95	92

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 3.50 (in)
 Return Period = 2 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION = 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
699	699.00	0.00	3.50	0.58	7.94
700	700.00	0.00	3.50	0.58	8.52
701	701.00	0.00	3.50	0.58	9.10
702	702.00	0.00	3.50	0.58	9.67
703	703.00	0.00	3.50	0.58	10.25
704	704.00	0.00	3.50	0.58	10.83
705	705.00	0.00	3.50	0.58	11.41
706	706.00	0.00	3.50	1.51	12.92
707	707.00	0.00	3.50	1.51	14.43
708	708.00	0.00	3.50	1.51	15.94
709	709.00	0.00	3.50	1.51	17.44
710	710.00	0.00	3.50	1.51	18.95
711	711.00	0.00	3.50	1.51	20.46
712	712.00	0.00	3.50	1.51	21.97
713	713.00	0.00	3.50	1.51	23.47
714	714.00	0.00	3.50	1.51	24.98
715	715.00	0.00	3.50	1.51	26.49
716	716.00	0.00	3.50	1.51	28.00
717	717.00	0.00	3.50	1.51	29.50
718	718.00	0.00	3.50	1.51	31.01
719	719.00	0.00	3.50	1.51	32.52
720	720.00	0.00	3.50	1.51	34.03
721	721.00	0.00	3.50	-1.90	32.13
722	722.00	0.00	3.50	-1.90	30.23
723	723.00	0.00	3.50	-1.90	28.34
724	724.00	0.00	3.50	-1.90	26.44
725	725.00	0.00	3.50	-1.90	24.54
726	726.00	0.00	3.50	-1.90	22.65
727	727.00	0.00	3.50	-1.90	20.75
728	728.00	0.00	3.50	-1.90	18.85
729	729.00	0.00	3.50	-1.90	16.96
730	730.00	0.00	3.50	-1.90	15.06
731	731.00	0.00	3.50	-1.90	13.16
732	732.00	0.00	3.50	-1.90	11.27
733	733.00	0.00	3.50	-1.90	9.37
734	734.00	0.00	3.50	-1.90	7.47
735	735.00	0.00	3.50	-1.90	5.58
736	736.00	0.00	3.50	-0.12	5.46
737	737.00	0.00	3.50	-0.12	5.34
738	738.00	0.00	3.50	-0.12	5.21
739	739.00	0.00	3.50	-0.12	5.09
740	740.00	0.00	3.50	-0.12	4.97
741	741.00	0.00	3.50	-0.12	4.85
742	742.00	0.00	3.50	-0.12	4.73
743	743.00	0.00	3.50	-0.12	4.61
744	744.00	0.00	3.50	-0.12	4.49
745	745.00	0.00	3.50	-0.12	4.37
746	746.00	0.00	3.50	-0.12	4.24

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FLOOD HYDROGRAPH REPORT

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

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 85.18 (cfs)
 Time to Peak (Tp) = 720.00 (min)
 Time of Base (Tb) = 1455.00 (min)
 Volume = 5.85 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 2
 Type = Rational
 Peak Flow (Qp) = 40.13 (cfs)
 Time to Peak (Tp) = 15.00 (min)
 Time of Base (Tb) = 30.00 (min)
 Volume = 0.83 (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	9.95	93

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 7.90 (in)
 Return Period = 100 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
711	711.00	0.00	7.90	3.60	52.78
712	712.00	0.00	7.90	3.60	56.38
713	713.00	0.00	7.90	3.60	59.98
714	714.00	0.00	7.90	3.60	63.58
715	715.00	0.00	7.90	3.60	67.18
716	716.00	0.00	7.90	3.60	70.78
717	717.00	0.00	7.90	3.60	74.38
718	718.00	0.00	7.90	3.60	77.98
719	719.00	0.00	7.90	3.60	81.58
720	720.00	0.00	7.90	3.60	85.18
721	721.00	0.00	7.90	-4.78	80.40
722	722.00	0.00	7.90	-4.78	75.62
723	723.00	0.00	7.90	-4.78	70.84
724	724.00	0.00	7.90	-4.78	66.06
725	725.00	0.00	7.90	-4.78	61.27
726	726.00	0.00	7.90	-4.78	56.49
727	727.00	0.00	7.90	-4.78	51.71
728	728.00	0.00	7.90	-4.78	46.93
729	729.00	0.00	7.90	-4.78	42.15
730	730.00	0.00	7.90	-4.78	37.37
731	731.00	0.00	7.90	-4.78	32.58
732	732.00	0.00	7.90	-4.78	27.80
733	733.00	0.00	7.90	-4.78	23.02
734	734.00	0.00	7.90	-4.78	18.24
735	735.00	0.00	7.90	-4.78	13.46
736	736.00	0.00	7.90	-0.30	13.16
737	737.00	0.00	7.90	-0.30	12.87
738	738.00	0.00	7.90	-0.30	12.57
739	739.00	0.00	7.90	-0.30	12.28

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FLOOD HYDROGRAPH REPORT

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

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 45.73 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 3.00 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 3
Type = Rational
Peak Flow (Qp) = 51.30 (cfs)
Time to Peak (Tp) = 15.00 (min)
Time of Base (Tb) = 30.00 (min)
Volume = 1.06 (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	12.72	94

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 3.50 (in)
Return Period = 2 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
707	707.00	0.00	3.50	1.99	19.93
708	708.00	0.00	3.50	1.99	21.91
709	709.00	0.00	3.50	1.99	23.90
710	710.00	0.00	3.50	1.99	25.88
711	711.00	0.00	3.50	1.99	27.87
712	712.00	0.00	3.50	1.99	29.85
713	713.00	0.00	3.50	1.99	31.84
714	714.00	0.00	3.50	1.99	33.82
715	715.00	0.00	3.50	1.99	35.81
716	716.00	0.00	3.50	1.99	37.79
717	717.00	0.00	3.50	1.99	39.78
718	718.00	0.00	3.50	1.99	41.76
719	719.00	0.00	3.50	1.99	43.75
720	720.00	0.00	3.50	1.99	45.73
721	721.00	0.00	3.50	-2.56	43.17
722	722.00	0.00	3.50	-2.56	40.62
723	723.00	0.00	3.50	-2.56	38.06
724	724.00	0.00	3.50	-2.56	35.50
725	725.00	0.00	3.50	-2.56	32.94
726	726.00	0.00	3.50	-2.56	30.39
727	727.00	0.00	3.50	-2.56	27.83
728	728.00	0.00	3.50	-2.56	25.27
729	729.00	0.00	3.50	-2.56	22.71
730	730.00	0.00	3.50	-2.56	20.16
731	731.00	0.00	3.50	-2.56	17.60
732	732.00	0.00	3.50	-2.56	15.04
733	733.00	0.00	3.50	-2.56	12.48
734	734.00	0.00	3.50	-2.56	9.93
735	735.00	0.00	3.50	-2.56	7.37
736	736.00	0.00	3.50	-0.16	7.21
737	737.00	0.00	3.50	-0.16	7.05
738	738.00	0.00	3.50	-0.16	6.89
739	739.00	0.00	3.50	-0.16	6.73
740	740.00	0.00	3.50	-0.16	6.56
741	741.00	0.00	3.50	-0.16	6.40
742	742.00	0.00	3.50	-0.16	6.24
743	743.00	0.00	3.50	-0.16	6.08
744	744.00	0.00	3.50	-0.16	5.92
745	745.00	0.00	3.50	-0.16	5.76
746	746.00	0.00	3.50	-0.16	5.60
747	747.00	0.00	3.50	-0.16	5.44
748	748.00	0.00	3.50	-0.16	5.28
749	749.00	0.00	3.50	-0.16	5.12
750	750.00	0.00	3.50	-0.16	4.95
751	751.00	0.00	3.50	-0.10	4.86
752	752.00	0.00	3.50	-0.10	4.76
753	753.00	0.00	3.50	-0.10	4.66
754	754.00	0.00	3.50	0.10	4.56
755	755.00	0.00	3.50	0.10	4.46
756	756.00	0.00	3.50	-0.10	4.36

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FLOOD HYDROGRAPH REPORT

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

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 109.63 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 7.60 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 4
Type = Rational
Peak Flow (Qp) = 51.30 (cfs)
Time to Peak (Tp) = 15.00 (min)
Time of Base (Tb) = 30.00 (min)
Volume = 1.06 (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 12.72 94

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 7.90 (in)
Return Period = 100 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
695	695.00	0.00	7.90	2.01	20.33
696	696.00	0.00	7.90	2.01	22.34
697	697.00	0.00	7.90	2.01	24.35
698	698.00	0.00	7.90	2.01	26.35
699	699.00	0.00	7.90	2.01	28.36
700	700.00	0.00	7.90	2.01	30.36
701	701.00	0.00	7.90	2.01	32.37
702	702.00	0.00	7.90	2.01	34.38
703	703.00	0.00	7.90	2.01	36.38
704	704.00	0.00	7.90	2.01	38.39
705	705.00	0.00	7.90	2.01	40.40
706	706.00	0.00	7.90	4.62	45.01
707	707.00	0.00	7.90	4.62	49.63
708	708.00	0.00	7.90	4.62	54.24
709	709.00	0.00	7.90	4.62	58.86
710	710.00	0.00	7.90	4.62	63.47
711	711.00	0.00	7.90	4.62	68.09
712	712.00	0.00	7.90	4.62	72.71
713	713.00	0.00	7.90	4.62	77.32
714	714.00	0.00	7.90	4.62	81.94
715	715.00	0.00	7.90	4.62	86.55
716	716.00	0.00	7.90	4.62	91.17
717	717.00	0.00	7.90	4.62	95.79
718	718.00	0.00	7.90	4.62	100.40
719	719.00	0.00	7.90	4.62	105.02
720	720.00	0.00	7.90	4.62	109.63
721	721.00	0.00	7.90	-6.16	103.48
722	722.00	0.00	7.90	-6.16	97.32
723	723.00	0.00	7.90	-6.16	91.16
724	724.00	0.00	7.90	-6.16	85.00
725	725.00	0.00	7.90	-6.16	78.85
726	726.00	0.00	7.90	-6.16	72.69
727	727.00	0.00	7.90	-6.16	66.53
728	728.00	0.00	7.90	-6.16	60.37
729	729.00	0.00	7.90	-6.16	54.22
730	730.00	0.00	7.90	-6.16	48.06
731	731.00	0.00	7.90	-6.16	41.90
732	732.00	0.00	7.90	-6.16	35.75
733	733.00	0.00	7.90	-6.16	29.59
734	734.00	0.00	7.90	-6.16	23.43
735	735.00	0.00	7.90	-6.16	17.27
736	736.00	0.00	7.90	-0.38	16.89
737	737.00	0.00	7.90	-0.38	16.51
738	738.00	0.00	7.90	-0.38	16.13
739	739.00	0.00	7.90	-0.38	15.75
740	740.00	0.00	7.90	-0.38	15.38
741	741.00	0.00	7.90	0.38	15.00
742	742.00	0.00	7.90	-0.38	14.62
743	743.00	0.00	7.90	-0.38	14.24
744	744.00	0.00	7.90	-0.38	13.86

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 7
 Name: PA'S TO NORTH POND, CFH, 5YR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 45.64 (cfs)
 Time to Peak (Tp) = 720.00 (min)
 Time of Base (Tb) = 1455.00 (min)
 Volume = 2.98 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 5
 Type = Rational
 Peak Flow (Qp) = 40.13 (cfs)
 Time to Peak (Tp) = 15.00 (min)
 Time of Base (Tb) = 30.00 (min)
 Volume = 0.83 (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	9.95	92

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 4.50 (in)
 Return Period = 2 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
[TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
697	697.00	0.00	4.50	0.80	9.44
698	698.00	0.00	4.50	0.80	10.24
699	699.00	0.00	4.50	0.80	11.04
700	700.00	0.00	4.50	0.80	11.84
701	701.00	0.00	4.50	0.80	12.63
702	702.00	0.00	4.50	0.80	13.43
703	703.00	0.00	4.50	0.80	14.23
704	704.00	0.00	4.50	0.80	15.03
705	705.00	0.00	4.50	0.80	15.82
706	706.00	0.00	4.50	1.99	17.81
707	707.00	0.00	4.50	1.99	19.80
708	708.00	0.00	4.50	1.99	21.79
709	709.00	0.00	4.50	1.99	23.77
710	710.00	0.00	4.50	1.99	25.76
711	711.00	0.00	4.50	1.99	27.75
712	712.00	0.00	4.50	1.99	29.74
713	713.00	0.00	4.50	1.99	31.73
714	714.00	0.00	4.50	1.99	33.71
715	715.00	0.00	4.50	1.99	35.70
716	716.00	0.00	4.50	1.99	37.69
717	717.00	0.00	4.50	1.99	39.68
718	718.00	0.00	4.50	1.99	41.66
719	719.00	0.00	4.50	1.99	43.65
720	720.00	0.00	4.50	1.99	45.64
721	721.00	0.00	4.50	-2.55	43.09
722	722.00	0.00	4.50	-2.55	40.54
723	723.00	0.00	4.50	-2.55	37.99
724	724.00	0.00	4.50	-2.55	35.44
725	725.00	0.00	4.50	-2.55	32.89
726	726.00	0.00	4.50	-2.55	30.33
727	727.00	0.00	4.50	-2.55	27.78
728	728.00	0.00	4.50	-2.55	25.23
729	729.00	0.00	4.50	-2.55	22.68
730	730.00	0.00	4.50	2.55	20.13
731	731.00	0.00	4.50	-2.55	17.58
732	732.00	0.00	4.50	-2.55	15.03
733	733.00	0.00	4.50	-2.55	12.48
734	734.00	0.00	4.50	-2.55	9.93
735	735.00	0.00	4.50	-2.55	7.37
736	736.00	0.00	4.50	-0.16	7.21
737	737.00	0.00	4.50	-0.16	7.05
738	738.00	0.00	4.50	-0.16	6.89
739	739.00	0.00	4.50	-0.16	6.73
740	740.00	0.00	4.50	-0.16	6.57
741	741.00	0.00	4.50	-0.16	6.41
742	742.00	0.00	4.50	-0.16	6.25
743	743.00	0.00	4.50	0.16	6.09
744	744.00	0.00	4.50	-0.16	5.93
745	745.00	0.00	4.50	-0.16	5.77
746	746.00	0.00	4.50	-0.16	5.60

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 8
Name: PA'S TO WEST POND, CFH, 2YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 10.61 (cfs)
Time to Peak (Tp) = 715.00 (min)
Time of Base (Tb) = 1445.00 (min)
Volume = 0.48 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 8
Type = Rational
Peak Flow (Qp) = 30.87 (cfs)
Time to Peak (Tp) = 5.00 (min)
Time of Base (Tb) = 10.00 (min)
Volume = 0.21 (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	2.55	88

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 5.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 3.50 (in)
Return Period = 2 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
697	697.00	0.00	3.50	0.23	1.61
698	698.00	0.00	3.50	0.23	1.85
699	699.00	0.00	3.50	0.23	2.08
700	700.00	0.00	3.50	0.23	2.31
701	701.00	0.00	3.50	0.27	2.58
702	702.00	0.00	3.50	0.27	2.86
703	703.00	0.00	3.50	0.27	3.13
704	704.00	0.00	3.50	0.27	3.40
705	705.00	0.00	3.50	0.27	3.67
706	706.00	0.00	3.50	0.55	4.22
707	707.00	0.00	3.50	0.55	4.76
708	708.00	0.00	3.50	0.55	5.31
709	709.00	0.00	3.50	0.55	5.86
710	710.00	0.00	3.50	0.55	6.40
711	711.00	0.00	3.50	0.84	7.24
712	712.00	0.00	3.50	0.84	8.09
713	713.00	0.00	3.50	0.84	8.93
714	714.00	0.00	3.50	0.84	9.77
715	715.00	0.00	3.50	0.84	10.61
716	716.00	0.00	3.50	-0.89	9.72
717	717.00	0.00	3.50	-0.89	8.83
718	718.00	0.00	3.50	-0.89	7.94
719	719.00	0.00	3.50	-0.89	7.05
720	720.00	0.00	3.50	-0.89	6.15
721	721.00	0.00	3.50	-0.94	5.21
722	722.00	0.00	3.50	-0.94	4.27
723	723.00	0.00	3.50	-0.94	3.33
724	724.00	0.00	3.50	-0.94	2.39
725	725.00	0.00	3.50	-0.94	1.45
726	726.00	0.00	3.50	-0.03	1.43
727	727.00	0.00	3.50	-0.03	1.40
728	728.00	0.00	3.50	-0.03	1.37
729	729.00	0.00	3.50	-0.03	1.34
730	730.00	0.00	3.50	-0.03	1.32
731	731.00	0.00	3.50	-0.03	1.29
732	732.00	0.00	3.50	-0.03	1.26
733	733.00	0.00	3.50	-0.03	1.23
734	734.00	0.00	3.50	-0.03	1.20
735	735.00	0.00	3.50	-0.03	1.18
736	736.00	0.00	3.50	0.03	1.15
737	737.00	0.00	3.50	-0.03	1.12
738	738.00	0.00	3.50	-0.03	1.09
739	739.00	0.00	3.50	-0.03	1.06
740	740.00	0.00	3.50	-0.03	1.04
741	741.00	0.00	3.50	-0.03	1.01
742	742.00	0.00	3.50	-0.03	0.98
743	743.00	0.00	3.50	-0.03	0.95
744	744.00	0.00	3.50	0.03	0.92
745	745.00	0.00	3.50	-0.03	0.89
746	746.00	0.00	3.50	-0.03	0.86

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 9
 Name: PA'S TO WEST POND, CFH, 5YR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 14.74 (cfs)
 Time to Peak (Tp) = 715.00 (min)
 Time of Base (Tb) = 1445.00 (min)
 Volume = 0.68 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 7
 Type = Rational
 Peak Flow (Qp) = 30.96 (cfs)
 Time to Peak (Tp) = 5.00 (min)
 Time of Base (Tb) = 10.00 (min)
 Volume = 0.21 (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	2.56	88

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 5.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 4.50 (in)
 Return Period = 2 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
688	688.00	0.00	4.50	0.02	0.86
689	689.00	0.00	4.50	0.02	0.88
690	690.00	0.00	4.50	0.02	0.89
691	691.00	0.00	4.50	0.17	1.06
692	692.00	0.00	4.50	0.17	1.22
693	693.00	0.00	4.50	0.17	1.39
694	694.00	0.00	4.50	0.17	1.56
695	695.00	0.00	4.50	0.17	1.72
696	696.00	0.00	4.50	0.34	2.06
697	697.00	0.00	4.50	0.34	2.40
698	698.00	0.00	4.50	0.34	2.74
699	699.00	0.00	4.50	0.34	3.08
700	700.00	0.00	4.50	0.34	3.42
701	701.00	0.00	4.50	0.38	3.80
702	702.00	0.00	4.50	0.38	4.18
703	703.00	0.00	4.50	0.38	4.56
704	704.00	0.00	4.50	0.38	4.94
705	705.00	0.00	4.50	0.38	5.33
706	706.00	0.00	4.50	0.75	6.08
707	707.00	0.00	4.50	0.75	6.83
708	708.00	0.00	4.50	0.75	7.59
709	709.00	0.00	4.50	0.75	8.34
710	710.00	0.00	4.50	0.75	9.09
711	711.00	0.00	4.50	1.13	10.22
712	712.00	0.00	4.50	1.13	11.35
713	713.00	0.00	4.50	1.13	12.48
714	714.00	0.00	4.50	1.13	13.61
715	715.00	0.00	4.50	1.13	14.74
716	716.00	0.00	4.50	-1.26	13.48
717	717.00	0.00	4.50	-1.26	12.22
718	718.00	0.00	4.50	-1.26	10.95
719	719.00	0.00	4.50	-1.26	9.69
720	720.00	0.00	4.50	-1.26	8.42
721	721.00	0.00	4.50	-1.29	7.14
722	722.00	0.00	4.50	-1.29	5.85
723	723.00	0.00	4.50	1.29	4.56
724	724.00	0.00	4.50	-1.29	3.27
725	725.00	0.00	4.50	-1.29	1.98
726	726.00	0.00	4.50	-0.04	1.94
727	727.00	0.00	4.50	-0.04	1.90
728	728.00	0.00	4.50	-0.04	1.87
729	729.00	0.00	4.50	-0.04	1.83
730	730.00	0.00	4.50	-0.04	1.79
731	731.00	0.00	4.50	-0.04	1.75
732	732.00	0.00	4.50	-0.04	1.71
733	733.00	0.00	4.50	-0.04	1.67
734	734.00	0.00	4.50	-0.04	1.64
735	735.00	0.00	4.50	-0.04	1.60
736	736.00	0.00	4.50	-0.04	1.56
737	737.00	0.00	4.50	-0.04	1.52

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 10
 Name: PA'S TO WEST POND, CFH, 100YR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 28.46 (cfs)
 Time to Peak (Tp) = 715.00 (min)
 Time of Base (Tb) = 1445.00 (min)
 Volume = 1.37 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 9
 Type = Rational
 Peak Flow (Qp) = 30.87 (cfs)
 Time to Peak (Tp) = 5.00 (min)
 Time of Base (Tb) = 10.00 (min)
 Volume = 0.21 (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	2.55	88

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 5.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 7.90 (in)
 Return Period = 100 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
[TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
690	690.00	0.00	7.90	0.03	1.95
691	691.00	0.00	7.90	0.36	2.31
692	692.00	0.00	7.90	0.36	2.66
693	693.00	0.00	7.90	0.36	3.02
694	694.00	0.00	7.90	0.36	3.37
695	695.00	0.00	7.90	0.36	3.73
696	696.00	0.00	7.90	0.70	4.43
697	697.00	0.00	7.90	0.70	5.13
698	698.00	0.00	7.90	0.70	5.84
699	699.00	0.00	7.90	0.70	6.54
700	700.00	0.00	7.90	0.70	7.24
701	701.00	0.00	7.90	0.75	7.99
702	702.00	0.00	7.90	0.75	8.73
703	703.00	0.00	7.90	0.75	9.48
704	704.00	0.00	7.90	0.75	10.23
705	705.00	0.00	7.90	0.75	10.97
706	706.00	0.00	7.90	1.44	12.41
707	707.00	0.00	7.90	1.44	13.84
708	708.00	0.00	7.90	1.44	15.28
709	709.00	0.00	7.90	1.44	16.71
710	710.00	0.00	7.90	1.44	18.15
711	711.00	0.00	7.90	2.06	20.21
712	712.00	0.00	7.90	2.06	22.27
713	713.00	0.00	7.90	2.06	24.34
714	714.00	0.00	7.90	2.06	26.40
715	715.00	0.00	7.90	2.06	28.46
716	716.00	0.00	7.90	-2.51	25.95
717	717.00	0.00	7.90	-2.51	23.45
718	718.00	0.00	7.90	-2.51	20.94
719	719.00	0.00	7.90	-2.51	18.43
720	720.00	0.00	7.90	-2.51	15.92
721	721.00	0.00	7.90	-2.44	13.48
722	722.00	0.00	7.90	-2.44	11.04
723	723.00	0.00	7.90	-2.44	8.60
724	724.00	0.00	7.90	-2.44	6.16
725	725.00	0.00	7.90	2.44	3.71
726	726.00	0.00	7.90	-0.07	3.64
727	727.00	0.00	7.90	-0.07	3.57
728	728.00	0.00	7.90	-0.07	3.50
729	729.00	0.00	7.90	-0.07	3.42
730	730.00	0.00	7.90	-0.07	3.35
731	731.00	0.00	7.90	-0.07	3.28
732	732.00	0.00	7.90	-0.07	3.21
733	733.00	0.00	7.90	-0.07	3.13
734	734.00	0.00	7.90	-0.07	3.06
735	735.00	0.00	7.90	-0.07	2.99
736	736.00	0.00	7.90	-0.07	2.91
737	737.00	0.00	7.90	-0.07	2.84
738	738.00	0.00	7.90	-0.07	2.77
739	739.00	0.00	7.90	-0.07	2.69

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 11
Name: PA'S TO SOUTH POND, CFH, 5YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 60.42 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 4.04 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 6
Type = Rational
Peak Flow (Qp) = 51.30 (cfs)
Time to Peak (Tp) = 15.00 (min)
Time of Base (Tb) = 30.00 (min)
Volume = 1.06 (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	12.72	94

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 15.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 4.50 (in)
Return Period = 2 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
[TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
680	680.00	0.00	4.50	0.09	4.52
681	681.00	0.00	4.50	0.09	4.60
682	682.00	0.00	4.50	0.09	4.69
683	683.00	0.00	4.50	0.09	4.78
684	684.00	0.00	4.50	0.09	4.86
685	685.00	0.00	4.50	0.09	4.95
686	686.00	0.00	4.50	0.09	5.03
687	687.00	0.00	4.50	0.09	5.12
688	688.00	0.00	4.50	0.09	5.21
689	689.00	0.00	4.50	0.09	5.29
690	690.00	0.00	4.50	0.09	5.38
691	691.00	0.00	4.50	1.08	6.46
692	692.00	0.00	4.50	1.08	7.54
693	693.00	0.00	4.50	1.08	8.62
694	694.00	0.00	4.50	1.08	9.70
695	695.00	0.00	4.50	1.08	10.78
696	696.00	0.00	4.50	1.08	11.86
697	697.00	0.00	4.50	1.08	12.94
698	698.00	0.00	4.50	1.08	14.02
699	699.00	0.00	4.50	1.08	15.10
700	700.00	0.00	4.50	1.08	16.17
701	701.00	0.00	4.50	1.08	17.25
702	702.00	0.00	4.50	1.08	18.33
703	703.00	0.00	4.50	1.08	19.41
704	704.00	0.00	4.50	1.08	20.49
705	705.00	0.00	4.50	1.08	21.57
706	706.00	0.00	4.50	2.59	24.16
707	707.00	0.00	4.50	2.59	26.75
708	708.00	0.00	4.50	2.59	29.34
709	709.00	0.00	4.50	2.59	31.93
710	710.00	0.00	4.50	2.59	34.52
711	711.00	0.00	4.50	2.59	37.11
712	712.00	0.00	4.50	2.59	39.70
713	713.00	0.00	4.50	2.59	42.29
714	714.00	0.00	4.50	2.59	44.88
715	715.00	0.00	4.50	2.59	47.47
716	716.00	0.00	4.50	2.59	50.06
717	717.00	0.00	4.50	2.59	52.65
718	718.00	0.00	4.50	2.59	55.24
719	719.00	0.00	4.50	2.59	57.83
720	720.00	0.00	4.50	2.59	60.42
721	721.00	0.00	4.50	-3.39	57.03
722	722.00	0.00	4.50	-3.39	53.65
723	723.00	0.00	4.50	-3.39	50.26
724	724.00	0.00	4.50	-3.39	46.88
725	725.00	0.00	4.50	-3.39	43.49
726	726.00	0.00	4.50	-3.39	40.11
727	727.00	0.00	4.50	-3.39	36.72
728	728.00	0.00	4.50	-3.39	33.34
729	729.00	0.00	4.50	-3.39	29.95

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 12
Name: ROUTE NORTH DP, 2YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 0.72 (cfs)
Time to Peak (Tp) = 998.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 0.78 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1333.81 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 1
Name = NORTH POND
Storage Type = User-Defined Area
Maximum Storage = 216118.00 (cu ft)
Maximum Discharge = 11.66 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 1
Name = PA'S TO NORTH POND, CFH,
2YR
Peak Flow (Qp) = 34.03 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 2.18 (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)
982	982.00	0.75	1.49	132671.21	132674.02	0.72	66337.37	1333.81
983	983.00	0.74	1.49	132674.02	132676.66	0.72	66338.69	1333.81
984	984.00	0.74	1.49	132676.66	132679.13	0.72	66339.93	1333.81
985	985.00	0.74	1.48	132679.13	132681.44	0.72	66341.08	1333.81
986	986.00	0.74	1.48	132681.44	132683.58	0.72	66342.15	1333.81
987	987.00	0.74	1.48	132683.58	132685.55	0.72	66343.14	1333.81
988	988.00	0.74	1.48	132685.55	132687.36	0.72	66344.04	1333.81
989	989.00	0.74	1.47	132687.36	132689.00	0.72	66344.86	1333.81
990	990.00	0.73	1.47	132689.00	132690.48	0.72	66345.60	1333.81
991	991.00	0.73	1.47	132690.48	132691.79	0.72	66346.26	1333.81
992	992.00	0.73	1.46	132691.79	132692.94	0.72	66346.83	1333.81
993	993.00	0.73	1.46	132692.94	132693.92	0.72	66347.32	1333.81
994	994.00	0.73	1.46	132693.92	132694.74	0.72	66347.73	1333.81
995	995.00	0.73	1.46	132694.74	132695.39	0.72	66348.06	1333.81
996	996.00	0.73	1.45	132695.39	132695.88	0.72	66348.30	1333.81
997	997.00	0.72	1.45	132695.88	132696.20	0.72	66348.46	1333.81
998	998.00	0.72	1.45	132696.20	132696.36	0.72	66348.54	1333.81
999	999.00	0.72	1.45	132696.36	132696.36	0.72	66348.54	1333.81
1000	1000.00	0.72	1.44	132696.36	132696.19	0.72	66348.46	1333.81
1001	1001.00	0.72	1.44	132696.19	132695.86	0.72	66348.29	1333.81
1002	1002.00	0.72	1.44	132695.86	132695.37	0.72	66348.05	1333.81
1003	1003.00	0.72	1.43	132695.37	132694.71	0.72	66347.72	1333.81
1004	1004.00	0.72	1.43	132694.71	132693.90	0.72	66347.31	1333.81
1005	1005.00	0.71	1.43	132693.90	132692.92	0.72	66346.82	1333.81
1006	1006.00	0.71	1.43	132692.92	132691.78	0.72	66346.25	1333.81
1007	1007.00	0.71	1.42	132691.78	132690.48	0.72	66345.60	1333.81
1008	1008.00	0.71	1.42	132690.48	132689.02	0.72	66344.87	1333.81
1009	1009.00	0.71	1.42	132689.02	132687.39	0.72	66344.06	1333.81
1010	1010.00	0.71	1.42	132687.39	132685.61	0.72	66343.16	1333.81
1011	1011.00	0.71	1.41	132685.61	132683.66	0.72	66342.19	1333.81
1012	1012.00	0.70	1.41	132683.66	132681.56	0.72	66341.14	1333.81
1013	1013.00	0.70	1.41	132681.56	132679.29	0.72	66340.01	1333.81
1014	1014.00	0.70	1.40	132679.29	132676.86	0.72	66338.79	1333.81
1015	1015.00	0.70	1.40	132676.86	132674.28	0.72	66337.50	1333.81
1016	1016.00	0.70	1.40	132674.28	132671.53	0.72	66336.13	1333.81
1017	1017.00	0.70	1.40	132671.53	132668.63	0.72	66334.68	1333.81
1018	1018.00	0.70	1.39	132668.63	132665.57	0.72	66333.15	1333.81
1019	1019.00	0.69	1.39	132665.57	132662.35	0.72	66331.53	1333.81
1020	1020.00	0.69	1.39	132662.35	132658.97	0.72	66329.84	1333.81
1021	1021.00	0.69	1.39	132658.97	132655.43	0.72	66328.08	1333.81
1022	1022.00	0.69	1.38	132655.43	132651.73	0.72	66326.23	1333.81
1023	1023.00	0.69	1.38	132651.73	132647.88	0.72	66324.30	1333.81
1024	1024.00	0.69	1.38	132647.88	132643.87	0.72	66322.30	1333.81

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 13
Name: ROUTE NORTH DP, 5YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 1.60 (cfs)
Time to Peak (Tp) = 852.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 1.36 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1334.30 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 1
Name = NORTH POND
Storage Type = User-Defined Area
Maximum Storage = 216118.00 (cu ft)
Maximum Discharge = 11.66 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 7
Name = PA'S TO NORTH POND, CFH,
5YR
Peak Flow (Qp) = 45.64 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 2.98 (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)
843	843.00	1.68	3.38	170519.73	170531.09	1.59	85266.34	1334.30
844	844.00	1.67	3.36	170531.09	170541.24	1.59	85271.42	1334.30
845	845.00	1.66	3.34	170541.24	170550.21	1.59	85275.90	1334.30
846	846.00	1.65	3.32	170550.21	170557.98	1.59	85279.79	1334.30
847	847.00	1.64	3.30	170557.98	170564.57	1.59	85283.08	1334.30
848	848.00	1.64	3.28	170564.57	170569.98	1.59	85285.79	1334.30
849	849.00	1.63	3.26	170569.98	170574.21	1.60	85287.90	1334.30
850	850.00	1.62	3.24	170574.21	170577.27	1.60	85289.43	1334.30
851	851.00	1.61	3.22	170577.27	170579.16	1.60	85290.38	1334.30
852	852.00	1.60	3.20	170579.16	170579.88	1.60	85290.74	1334.30
853	853.00	1.59	3.18	170579.88	170579.44	1.60	85290.52	1334.30
854	854.00	1.58	3.16	170579.44	170577.85	1.60	85289.72	1334.30
855	855.00	1.57	3.14	170577.85	170575.10	1.60	85288.35	1334.30
856	856.00	1.56	3.13	170575.10	170571.49	1.60	85286.54	1334.30
857	857.00	1.56	3.12	170571.49	170567.28	1.59	85284.44	1334.30
858	858.00	1.55	3.11	170567.28	170562.50	1.59	85282.05	1334.30
859	859.00	1.55	3.10	170562.50	170557.13	1.59	85279.36	1334.30
860	860.00	1.54	3.09	170557.13	170551.19	1.59	85276.39	1334.30
861	861.00	1.54	3.08	170551.19	170544.66	1.59	85273.13	1334.30
862	862.00	1.53	3.07	170544.66	170537.56	1.59	85269.58	1334.30
863	863.00	1.53	3.06	170537.56	170529.89	1.59	85265.74	1334.30
864	864.00	1.52	3.05	170529.89	170521.65	1.59	85261.62	1334.30
865	865.00	1.52	3.04	170521.65	170512.83	1.59	85257.21	1334.30
866	866.00	1.51	3.03	170512.83	170503.45	1.59	85252.52	1334.30
867	867.00	1.51	3.02	170503.45	170493.50	1.59	85247.55	1334.30
868	868.00	1.50	3.01	170493.50	170482.99	1.59	85242.29	1334.30
869	869.00	1.50	3.00	170482.99	170471.92	1.59	85236.75	1334.30
870	870.00	1.49	2.99	170471.92	170460.28	1.59	85230.94	1334.30
871	871.00	1.49	2.98	170460.28	170448.09	1.59	85224.84	1334.30
872	872.00	1.48	2.97	170448.09	170435.34	1.59	85218.47	1334.30
873	873.00	1.48	2.96	170435.34	170422.03	1.59	85211.81	1334.30
874	874.00	1.47	2.95	170422.03	170408.17	1.59	85204.88	1334.30
875	875.00	1.47	2.94	170408.17	170393.76	1.59	85197.68	1334.30
876	876.00	1.46	2.93	170393.76	170378.80	1.59	85190.20	1334.30
877	877.00	1.46	2.92	170378.80	170363.29	1.59	85182.44	1334.30
878	878.00	1.45	2.91	170363.29	170347.23	1.59	85174.41	1334.30
879	879.00	1.45	2.90	170347.23	170330.63	1.59	85166.11	1334.30
880	880.00	1.44	2.89	170330.63	170313.49	1.59	85157.54	1334.30
881	881.00	1.44	2.88	170313.49	170295.81	1.59	85148.70	1334.30
882	882.00	1.43	2.87	170295.81	170277.58	1.59	85139.58	1334.30
883	883.00	1.43	2.86	170277.58	170258.82	1.59	85130.20	1334.30
884	884.00	1.42	2.85	170258.82	170239.53	1.59	85120.56	1334.30
885	885.00	1.42	2.84	170239.53	170219.70	1.59	85110.64	1334.30

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 14
Name: ROUTE NORTH DP, 100YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 5.88 (cfs)
Time to Peak (Tp) = 771.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 3.77 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1335.90 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 1
Name = NORTH POND
Storage Type = User-Defined Area
Maximum Storage = 216118.00 (cu ft)
Maximum Discharge = 11.66 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 2
Name = PA'S TO NORTH POND, CFH,
100YR
Peak Flow (Qp) = 85.18 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 5.85 (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)
761	761.00	7.02	14.23	314113.32	314264.16	5.86	157135.01	1335.90
762	762.00	6.84	13.86	314264.16	314392.43	5.87	157199.15	1335.90
763	763.00	6.66	13.50	314392.43	314498.26	5.87	157252.06	1335.90
764	764.00	6.48	13.13	314498.26	314581.75	5.87	157293.81	1335.90
765	765.00	6.29	12.77	314581.75	314643.02	5.88	157324.45	1335.90
766	766.00	6.23	12.52	314643.02	314689.04	5.88	157347.46	1335.90
767	767.00	6.16	12.39	314689.04	314726.74	5.88	157366.31	1335.90
768	768.00	6.09	12.25	314726.74	314756.15	5.88	157381.01	1335.90
769	769.00	6.02	12.12	314756.15	314777.32	5.88	157391.60	1335.90
770	770.00	5.96	11.98	314777.32	314790.29	5.88	157398.09	1335.90
771	771.00	5.89	11.85	314790.29	314795.11	5.88	157400.49	1335.90
772	772.00	5.82	11.71	314795.11	314791.81	5.88	157398.85	1335.90
773	773.00	5.75	11.58	314791.81	314780.45	5.88	157393.17	1335.90
774	774.00	5.69	11.44	314780.45	314761.07	5.88	157383.47	1335.90
775	775.00	5.62	11.31	314761.07	314733.70	5.88	157369.79	1335.90
776	776.00	5.55	11.17	314733.70	314698.39	5.88	157352.13	1335.90
777	777.00	5.48	11.04	314698.39	314655.18	5.88	157330.53	1335.90
778	778.00	5.42	10.90	314655.18	314604.12	5.87	157305.00	1335.90
779	779.00	5.35	10.77	314604.12	314545.24	5.87	157275.55	1335.90
780	780.00	5.28	10.63	314545.24	314478.58	5.87	157242.23	1335.90
781	781.00	5.23	10.51	314478.58	314405.13	5.87	157205.50	1335.90
782	782.00	5.18	10.41	314405.13	314325.83	5.86	157165.85	1335.90
783	783.00	5.13	10.30	314325.83	314240.73	5.86	157123.29	1335.90
784	784.00	5.07	10.20	314240.73	314149.85	5.85	157077.85	1335.90
785	785.00	5.02	10.09	314149.85	314053.23	5.85	157029.54	1335.89
786	786.00	4.97	9.99	314053.23	313950.89	5.85	156978.37	1335.89
787	787.00	4.92	9.89	313950.89	313842.87	5.84	156924.35	1335.89
788	788.00	4.87	9.78	313842.87	313729.19	5.84	156867.51	1335.89
789	789.00	4.81	9.68	313729.19	313609.89	5.83	156807.86	1335.89
790	790.00	4.76	9.57	313609.89	313484.99	5.83	156745.41	1335.89
791	791.00	4.71	9.47	313484.99	313354.53	5.82	156680.17	1335.89
792	792.00	4.66	9.37	313354.53	313218.53	5.81	156612.17	1335.89
793	793.00	4.60	9.26	313218.53	313077.02	5.81	156541.41	1335.88
794	794.00	4.55	9.16	313077.02	312930.03	5.80	156467.92	1335.88
795	795.00	4.50	9.05	312930.03	312777.60	5.79	156391.70	1335.88
796	796.00	4.46	8.97	312777.60	312620.68	5.79	156313.23	1335.88
797	797.00	4.43	8.89	312620.68	312460.23	5.78	156233.00	1335.88
798	798.00	4.39	8.82	312460.23	312296.26	5.77	156151.02	1335.88
799	799.00	4.36	8.75	312296.26	312128.80	5.77	156067.28	1335.88
800	800.00	4.32	8.67	312128.80	311957.87	5.76	155981.81	1335.87
801	801.00	4.28	8.60	311957.87	311783.48	5.75	155894.62	1335.87
802	802.00	4.25	8.53	311783.48	311605.65	5.74	155805.70	1335.87
803	803.00	4.21	8.46	311605.65	311424.41	5.73	155715.07	1335.87

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 15
Name: ROUTE SOUTH DP, 2YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 2.18 (cfs)
Time to Peak (Tp) = 810.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 2.10 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1330.84 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 3
Name = SOUTH POND
Storage Type = User-Defined Area
Maximum Storage = 231994.50 (cu ft)
Maximum Discharge = 25.26 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 3
Name = PA'S TO SOUTH POND, CFH,
2YR
Peak Flow (Qp) = 45.73 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 3.00 (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)
796	796.00	2.46	4.94	157172.49	157207.11	2.18	78604.65	1330.83
797	797.00	2.44	4.90	157207.11	157239.32	2.18	78620.75	1330.83
798	798.00	2.42	4.86	157239.32	157269.10	2.18	78635.64	1330.83
799	799.00	2.40	4.82	157269.10	157296.47	2.18	78649.33	1330.83
800	800.00	2.38	4.78	157296.47	157321.42	2.18	78661.80	1330.84
801	801.00	2.36	4.74	157321.42	157343.95	2.18	78673.07	1330.84
802	802.00	2.34	4.70	157343.95	157364.07	2.18	78683.13	1330.84
803	803.00	2.32	4.66	157364.07	157381.78	2.18	78691.98	1330.84
804	804.00	2.30	4.62	157381.78	157397.07	2.18	78699.63	1330.84
805	805.00	2.28	4.58	157397.07	157409.97	2.18	78706.07	1330.84
806	806.00	2.26	4.54	157409.97	157420.45	2.18	78711.32	1330.84
807	807.00	2.24	4.50	157420.45	157428.53	2.18	78715.36	1330.84
808	808.00	2.22	4.46	157428.53	157434.22	2.18	78718.20	1330.84
809	809.00	2.20	4.42	157434.22	157437.50	2.18	78719.84	1330.84
810	810.00	2.18	4.38	157437.50	157438.38	2.18	78720.28	1330.84
811	811.00	2.16	4.35	157438.38	157437.04	2.18	78719.61	1330.84
812	812.00	2.15	4.31	157437.04	157433.64	2.18	78717.91	1330.84
813	813.00	2.13	4.28	157433.64	157428.19	2.18	78715.18	1330.84
814	814.00	2.11	4.24	157428.19	157420.68	2.18	78711.43	1330.84
815	815.00	2.10	4.21	157420.68	157411.12	2.18	78706.65	1330.84
816	816.00	2.08	4.17	157411.12	157399.51	2.18	78700.85	1330.84
817	817.00	2.06	4.14	157399.51	157385.86	2.18	78694.02	1330.84
818	818.00	2.04	4.11	157385.86	157370.16	2.18	78686.17	1330.84
819	819.00	2.03	4.07	157370.16	157352.41	2.18	78677.30	1330.84
820	820.00	2.01	4.04	157352.41	157332.62	2.18	78667.40	1330.84
821	821.00	1.99	4.00	157332.62	157310.79	2.18	78656.49	1330.83
822	822.00	1.98	3.97	157310.79	157286.92	2.18	78644.55	1330.83
823	823.00	1.96	3.93	157286.92	157261.01	2.18	78631.60	1330.83
824	824.00	1.94	3.90	157261.01	157233.07	2.18	78617.62	1330.83
825	825.00	1.92	3.87	157233.07	157203.09	2.18	78602.63	1330.83
826	826.00	1.91	3.83	157203.09	157171.25	2.18	78586.71	1330.83
827	827.00	1.90	3.80	157171.25	157137.71	2.18	78569.95	1330.83
828	828.00	1.88	3.78	157137.71	157102.49	2.18	78552.34	1330.83
829	829.00	1.87	3.75	157102.49	157065.58	2.18	78533.88	1330.83
830	830.00	1.85	3.72	157065.58	157026.98	2.18	78514.58	1330.83
831	831.00	1.84	3.69	157026.98	156986.69	2.18	78494.44	1330.83
832	832.00	1.82	3.66	156986.69	156944.72	2.18	78473.45	1330.83
833	833.00	1.81	3.63	156944.72	156901.07	2.18	78451.63	1330.83
834	834.00	1.80	3.60	156901.07	156855.74	2.18	78428.96	1330.83
835	835.00	1.78	3.58	156855.74	156808.72	2.18	78405.45	1330.83
836	836.00	1.77	3.55	156808.72	156760.03	2.18	78381.10	1330.83
837	837.00	1.75	3.52	156760.03	156709.66	2.18	78355.92	1330.83
838	838.00	1.74	3.49	156709.66	156657.61	2.18	78329.89	1330.83

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 16
Name: ROUTE SOUTH DP, 5YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 3.47 (cfs)
Time to Peak (Tp) = 789.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 2.70 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1331.44 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 3
Name = SOUTH POND
Storage Type = User-Defined Area
Maximum Storage = 231994.50 (cu ft)
Maximum Discharge = 25.26 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 11
Name = PA'S TO SOUTH POND, CFH,
5YR
Peak Flow (Qp) = 60.42 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 4.04 (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)
770	770.00	4.28	8.60	209509.38	209616.00	3.42	104809.71	1331.43
771	771.00	4.23	8.51	209616.00	209716.03	3.42	104859.73	1331.43
772	772.00	4.18	8.41	209716.03	209809.54	3.43	104906.48	1331.43
773	773.00	4.13	8.31	209809.54	209896.56	3.43	104950.00	1331.43
774	774.00	4.08	8.22	209896.56	209977.16	3.44	104990.30	1331.43
775	775.00	4.04	8.12	209977.16	210051.37	3.44	105027.40	1331.43
776	776.00	3.99	8.02	210051.37	210119.24	3.45	105061.34	1331.43
777	777.00	3.94	7.93	210119.24	210180.82	3.45	105092.14	1331.43
778	778.00	3.89	7.83	210180.82	210236.17	3.46	105119.81	1331.43
779	779.00	3.84	7.73	210236.17	210285.32	3.46	105144.39	1331.43
780	780.00	3.79	7.64	210285.32	210328.32	3.46	105165.89	1331.44
781	781.00	3.76	7.55	210328.32	210365.88	3.46	105184.67	1331.44
782	782.00	3.72	7.48	210365.88	210398.70	3.47	105201.08	1331.44
783	783.00	3.68	7.40	210398.70	210426.83	3.47	105215.15	1331.44
784	784.00	3.64	7.33	210426.83	210450.28	3.47	105226.88	1331.44
785	785.00	3.61	7.25	210450.28	210469.11	3.47	105236.29	1331.44
786	786.00	3.57	7.18	210469.11	210483.34	3.47	105243.41	1331.44
787	787.00	3.53	7.10	210483.34	210493.01	3.47	105248.24	1331.44
788	788.00	3.50	7.03	210493.01	210498.16	3.47	105250.81	1331.44
789	789.00	3.46	6.95	210498.16	210498.81	3.47	105251.14	1331.44
790	790.00	3.42	6.88	210498.81	210494.99	3.47	105249.23	1331.44
791	791.00	3.38	6.80	210494.99	210486.76	3.47	105245.11	1331.44
792	792.00	3.35	6.73	210486.76	210474.13	3.47	105238.80	1331.44
793	793.00	3.31	6.66	210474.13	210457.13	3.47	105230.30	1331.44
794	794.00	3.27	6.58	210457.13	210435.81	3.47	105219.64	1331.44
795	795.00	3.23	6.51	210435.81	210410.20	3.47	105206.83	1331.44
796	796.00	3.21	6.44	210410.20	210380.99	3.46	105192.23	1331.44
797	797.00	3.18	6.39	210380.99	210348.87	3.46	105176.17	1331.44
798	798.00	3.16	6.34	210348.87	210313.88	3.46	105158.67	1331.44
799	799.00	3.13	6.29	210313.88	210276.03	3.46	105139.74	1331.43
800	800.00	3.10	6.23	210276.03	210235.34	3.46	105119.40	1331.43
801	801.00	3.08	6.18	210235.34	210191.83	3.45	105097.64	1331.43
802	802.00	3.05	6.13	210191.83	210145.53	3.45	105074.49	1331.43
803	803.00	3.03	6.08	210145.53	210096.45	3.45	105049.95	1331.43
804	804.00	3.00	6.03	210096.45	210044.62	3.44	105024.03	1331.43
805	805.00	2.97	5.97	210044.62	209990.05	3.44	104996.75	1331.43
806	806.00	2.95	5.92	209990.05	209932.78	3.44	104968.11	1331.43
807	807.00	2.92	5.87	209932.78	209872.81	3.43	104938.12	1331.43
808	808.00	2.90	5.82	209872.81	209810.17	3.43	104906.80	1331.43
809	809.00	2.87	5.76	209810.17	209744.88	3.42	104874.15	1331.43
810	810.00	2.84	5.71	209744.88	209676.95	3.42	104840.19	1331.43
811	811.00	2.82	5.66	209676.95	209606.63	3.42	104805.02	1331.43
812	812.00	2.80	5.62	209606.63	209534.16	3.41	104768.79	1331.43

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 17
Name: ROUTE SOUTH DP, 100YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 18.84 (cfs)
Time to Peak (Tp) = 735.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 5.81 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1332.93 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 3
Name = SOUTH POND
Storage Type = User-Defined Area
Maximum Storage = 231994.50 (cu ft)
Maximum Discharge = 25.26 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 4
Name = PA'S TO SOUTH POND, CFH,
100YR
Peak Flow (Qp) = 109.63 (cfs)
Time to Peak (Tp) = 720.00 (min)
Time of Base (Tb) = 1455.00 (min)
Volume = 7.60 (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)
720	720.00	109.63	214.65	256292.56	268034.46	10.31	134022.39	1332.06
721	721.00	103.48	213.11	268034.46	279474.75	12.09	139743.42	1332.18
722	722.00	97.32	200.79	279474.75	289984.70	13.51	144999.10	1332.29
723	723.00	91.16	188.48	289984.70	299613.75	14.47	149814.11	1332.39
724	724.00	85.00	176.16	299613.75	308393.97	15.34	154204.65	1332.48
725	725.00	78.85	163.85	308393.97	316341.63	16.03	158178.83	1332.56
726	726.00	72.69	151.54	316341.63	323473.58	16.63	161745.10	1332.64
727	727.00	66.53	139.22	323473.58	329799.63	17.15	164908.39	1332.70
728	728.00	60.37	126.91	329799.63	335328.18	17.60	167672.89	1332.76
729	729.00	54.22	114.59	335328.18	340070.21	17.95	170044.08	1332.80
730	730.00	48.06	102.28	340070.21	344035.65	18.23	172026.94	1332.84
731	731.00	41.90	89.96	344035.65	347231.20	18.47	173624.83	1332.88
732	732.00	35.75	77.65	347231.20	349663.51	18.64	174841.07	1332.90
733	733.00	29.59	65.33	349663.51	351339.17	18.76	175678.97	1332.92
734	734.00	23.43	53.02	351339.17	352264.74	18.83	176141.79	1332.93
735	735.00	17.27	40.70	352264.74	352446.69	18.84	176232.76	1332.93
736	736.00	16.89	34.17	352446.69	352236.56	18.83	176127.70	1332.93
737	737.00	16.51	33.41	352236.56	351982.89	18.81	176000.85	1332.92
738	738.00	16.13	32.65	351982.89	351686.05	18.79	175852.42	1332.92
739	739.00	15.75	31.89	351686.05	351346.41	18.76	175682.58	1332.92
740	740.00	15.38	31.13	351346.41	350964.33	18.74	175491.53	1332.91
741	741.00	15.00	30.37	350964.33	350540.20	18.70	175279.45	1332.91
742	742.00	14.62	29.61	350540.20	350074.36	18.67	175046.52	1332.90
743	743.00	14.24	28.85	350074.36	349567.18	18.63	174792.91	1332.90
744	744.00	13.86	28.09	349567.18	349019.03	18.59	174518.81	1332.89
745	745.00	13.48	27.33	349019.03	348430.24	18.55	174224.40	1332.89
746	746.00	13.10	26.57	348430.24	347801.18	18.51	173909.84	1332.88
747	747.00	12.72	25.81	347801.18	347132.19	18.46	173575.32	1332.87
748	748.00	12.34	25.05	347132.19	346423.61	18.41	173221.01	1332.87
749	749.00	11.96	24.30	346423.61	345675.79	18.35	172847.07	1332.86
750	750.00	11.58	23.54	345675.79	344889.07	18.30	172453.68	1332.85
751	751.00	11.34	22.92	344889.07	344072.51	18.24	172045.38	1332.84
752	752.00	11.11	22.46	344072.51	343235.11	18.18	171626.64	1332.84
753	753.00	10.88	21.99	343235.11	342377.03	18.11	171197.57	1332.83
754	754.00	10.64	21.52	342377.03	341498.47	18.05	170758.26	1332.82
755	755.00	10.41	21.05	341498.47	340599.60	17.99	170308.79	1332.81
756	756.00	10.18	20.59	340599.60	339680.58	17.92	169849.25	1332.80
757	757.00	9.94	20.12	339680.58	338741.61	17.85	169379.73	1332.79
758	758.00	9.71	19.65	338741.61	337782.84	17.78	168900.31	1332.78
759	759.00	9.48	19.19	337782.84	336804.46	17.71	168411.09	1332.77
760	760.00	9.24	18.72	336804.46	335806.63	17.64	167912.13	1332.76
761	761.00	9.01	18.25	335806.63	334789.51	17.57	167403.54	1332.75
762	762.00	8.78	17.78	334789.51	333753.92	17.48	166885.70	1332.74

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Project: DRAINAGE WM WICHITA(N)
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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 18
Name: ROUTE WEST DP, 2YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 1.46 (cfs)
Time to Peak (Tp) = 725.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 0.48 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1331.23 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 2
Name = WEST POND
Storage Type = User-Defined Area
Maximum Storage = 29241.75 (cu ft)
Maximum Discharge = 83.04 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 8
Name = PA'S TO WEST POND, CFH,
2YR
Peak Flow (Qp) = 10.61 (cfs)
Time to Peak (Tp) = 715.00 (min)
Time of Base (Tb) = 1445.00 (min)
Volume = 0.48 (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)
710	710.00	6.40	12.26	5135.25	5749.46	1.03	2875.25	1330.49
711	711.00	7.24	13.65	5749.46	6441.61	1.08	3221.34	1330.55
712	712.00	8.09	15.33	6441.61	7229.79	1.12	3615.45	1330.62
713	713.00	8.93	17.02	7229.79	8113.49	1.17	4057.33	1330.70
714	714.00	9.77	18.70	8113.49	9092.39	1.22	4546.81	1330.78
715	715.00	10.61	20.39	9092.39	10166.76	1.26	5084.01	1330.85
716	716.00	9.72	20.34	10166.76	11232.81	1.31	5617.06	1330.93
717	717.00	8.83	18.55	11232.81	12186.80	1.35	6094.08	1331.00
718	718.00	7.94	16.77	12186.80	13029.75	1.37	6515.56	1331.06
719	719.00	7.05	14.99	13029.75	13762.56	1.40	6881.98	1331.10
720	720.00	6.15	13.20	13762.56	14385.68	1.42	7193.55	1331.14
721	721.00	5.21	11.37	14385.68	14896.64	1.43	7449.04	1331.17
722	722.00	4.27	9.49	14896.64	15292.98	1.45	7647.21	1331.20
723	723.00	3.33	7.61	15292.98	15575.14	1.46	7788.30	1331.22
724	724.00	2.39	5.73	15575.14	15743.59	1.46	7872.53	1331.23
725	725.00	1.45	3.85	15743.59	15798.76	1.46	7900.11	1331.23
726	726.00	1.43	2.88	15798.76	15795.76	1.46	7898.61	1331.23
727	727.00	1.40	2.82	15795.76	15789.50	1.46	7895.48	1331.23
728	728.00	1.37	2.77	15789.50	15779.99	1.46	7890.73	1331.23
729	729.00	1.34	2.71	15779.99	15767.24	1.46	7884.35	1331.23
730	730.00	1.32	2.66	15767.24	15751.26	1.46	7876.36	1331.23
731	731.00	1.29	2.60	15751.26	15732.03	1.46	7866.75	1331.23
732	732.00	1.26	2.55	15732.03	15709.55	1.46	7855.51	1331.23
733	733.00	1.23	2.49	15709.55	15683.81	1.46	7842.64	1331.22
734	734.00	1.20	2.44	15683.81	15654.84	1.46	7828.15	1331.22
735	735.00	1.18	2.38	15654.84	15622.64	1.46	7812.05	1331.22
736	736.00	1.15	2.33	15622.64	15587.21	1.46	7794.33	1331.22
737	737.00	1.12	2.27	15587.21	15548.52	1.46	7774.99	1331.22
738	738.00	1.09	2.21	15548.52	15506.60	1.45	7754.03	1331.21
739	739.00	1.06	2.16	15506.60	15461.45	1.45	7731.45	1331.21
740	740.00	1.04	2.10	15461.45	15413.09	1.45	7707.27	1331.21
741	741.00	1.01	2.04	15413.09	15361.51	1.45	7681.48	1331.20
742	742.00	0.98	1.98	15361.51	15306.70	1.45	7654.08	1331.20
743	743.00	0.95	1.93	15306.70	15248.68	1.45	7625.06	1331.20
744	744.00	0.92	1.87	15248.68	15187.45	1.44	7594.45	1331.19
745	745.00	0.89	1.81	15187.45	15123.03	1.44	7562.23	1331.19
746	746.00	0.86	1.76	15123.03	15055.41	1.44	7528.42	1331.18
747	747.00	0.83	1.70	15055.41	14984.59	1.44	7493.01	1331.18
748	748.00	0.81	1.64	14984.59	14910.58	1.44	7456.01	1331.18
749	749.00	0.78	1.58	14910.58	14833.40	1.43	7417.42	1331.17
750	750.00	0.75	1.52	14833.40	14753.06	1.43	7377.24	1331.17
751	751.00	0.73	1.48	14753.06	14670.23	1.43	7335.83	1331.16
752	752.00	0.71	1.44	14670.23	14585.59	1.42	7293.51	1331.15

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 19
Name: ROUTE WEST DP, 5YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 4.51 (cfs)
Time to Peak (Tp) = 723.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 0.68 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1331.56 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 2
Name = WEST POND
Storage Type = User-Defined Area
Maximum Storage = 29241.75 (cu ft)
Maximum Discharge = 83.04 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 9
Name = PA'S TO WEST POND, CPH,
5YR
Peak Flow (Qp) = 14.74 (cfs)
Time to Peak (Tp) = 715.00 (min)
Time of Base (Tb) = 1445.00 (min)
Volume = 0.68 (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)
710	710.00	9.09	17.43	7976.11	8879.93	1.21	4440.57	1330.76
711	711.00	10.22	19.32	8879.93	9891.33	1.25	4946.29	1330.83
712	712.00	11.35	21.58	9891.33	11032.91	1.30	5517.10	1330.92
713	713.00	12.48	23.84	11032.91	12304.11	1.35	6152.73	1331.01
714	714.00	13.61	26.10	12304.11	13705.05	1.40	6853.22	1331.10
715	715.00	14.74	28.36	13705.05	15235.81	1.45	7618.63	1331.20
716	716.00	13.48	28.22	15235.81	16741.47	1.68	8371.57	1331.29
717	717.00	12.22	25.69	16741.47	18056.96	2.09	9029.52	1331.36
718	718.00	10.95	23.17	18056.96	19175.61	2.43	9589.02	1331.42
719	719.00	9.69	20.64	19175.61	20104.58	2.72	10053.65	1331.48
720	720.00	8.42	18.11	20104.58	20831.42	3.27	10417.35	1331.51
721	721.00	7.14	15.56	20831.42	21329.27	3.98	10666.63	1331.54
722	722.00	5.85	12.98	21329.27	21606.27	4.38	10805.32	1331.55
723	723.00	4.56	10.40	21606.27	21697.27	4.51	10850.89	1331.56
724	724.00	3.27	7.82	21697.27	21631.63	4.41	10818.02	1331.55
725	725.00	1.98	5.25	21631.63	21434.08	4.13	10719.10	1331.54
726	726.00	1.94	3.92	21434.08	21194.48	3.79	10599.13	1331.53
727	727.00	1.90	3.84	21194.48	20988.51	3.49	10496.00	1331.52
728	728.00	1.87	3.77	20988.51	20810.87	3.24	10407.06	1331.51
729	729.00	1.83	3.69	20810.87	20657.10	3.02	10330.06	1331.51
730	730.00	1.79	3.62	20657.10	20522.16	2.85	10262.50	1331.50
731	731.00	1.75	3.54	20522.16	20395.11	2.81	10198.96	1331.49
732	732.00	1.71	3.46	20395.11	20268.19	2.77	10135.48	1331.48
733	733.00	1.67	3.39	20268.19	20141.38	2.73	10072.06	1331.48
734	734.00	1.64	3.31	20141.38	20014.69	2.69	10008.69	1331.47
735	735.00	1.60	3.23	20014.69	19888.11	2.65	9945.38	1331.46
736	736.00	1.56	3.16	19888.11	19761.61	2.61	9882.11	1331.46
737	737.00	1.52	3.08	19761.61	19635.17	2.57	9818.87	1331.45
738	738.00	1.48	3.00	19635.17	19508.77	2.54	9755.65	1331.44
739	739.00	1.44	2.92	19508.77	19382.43	2.50	9692.46	1331.43
740	740.00	1.40	2.85	19382.43	19256.14	2.46	9629.30	1331.43
741	741.00	1.37	2.77	19256.14	19129.87	2.42	9566.14	1331.42
742	742.00	1.33	2.69	19129.87	19003.61	2.38	9502.99	1331.41
743	743.00	1.29	2.61	19003.61	18877.35	2.34	9439.84	1331.41
744	744.00	1.25	2.53	18877.35	18751.10	2.30	9376.70	1331.40
745	745.00	1.21	2.46	18751.10	18624.85	2.26	9313.55	1331.39
746	746.00	1.17	2.38	18624.85	18498.59	2.22	9250.41	1331.39
747	747.00	1.13	2.30	18498.59	18372.30	2.18	9187.24	1331.38
748	748.00	1.09	2.22	18372.30	18245.99	2.14	9124.07	1331.37
749	749.00	1.05	2.14	18245.99	18119.65	2.10	9060.88	1331.36
750	750.00	1.01	2.06	18119.65	17993.29	2.07	8997.68	1331.36
751	751.00	0.99	2.00	17993.29	17867.80	2.03	8934.91	1331.35
752	752.00	0.96	1.95	17867.80	17744.04	1.99	8873.01	1331.34

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 20
Name: ROUTE WEST DP, 100YR
Type: Reservoir: Storage Indication

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 20.44 (cfs)
Time to Peak (Tp) = 718.00 (min)
Time of Base (Tb) = 1440.00 (min)
Volume = 1.37 (ac-ft)
Time Step = 1.00 (min)
Peak Elevation = 1332.00 (ft)
Detention Time = NA

[RESERVOIR STRUCTURE INFORMATION]

Number = 2
Name = WEST POND
Storage Type = User-Defined Area
Maximum Storage = 29241.75 (cu ft)
Maximum Discharge = 83.04 (cfs)

[INFLOW HYDROGRAPH INFORMATION]

Number = 10
Name = PA'S TO WEST POND, CPH,
100YR
Peak Flow (Qp) = 28.46 (cfs)
Time to Peak (Tp) = 715.00 (min)
Time of Base (Tb) = 1445.00 (min)
Volume = 1.37 (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)
700	700.00	7.24	13.78	8035.95	8721.03	1.20	4361.11	1330.75
701	701.00	7.99	15.23	8721.03	9488.81	1.23	4745.02	1330.80
702	702.00	8.73	16.72	9488.81	10341.98	1.27	5171.62	1330.87
703	703.00	9.48	18.22	10341.98	11280.13	1.31	5640.72	1330.94
704	704.00	10.23	19.71	11280.13	12302.92	1.35	6152.13	1331.01
705	705.00	10.97	21.20	12302.92	13410.52	1.39	6705.95	1331.08
706	706.00	12.41	23.38	13410.52	14644.40	1.43	7322.91	1331.16
707	707.00	13.84	26.25	14644.40	16045.36	1.47	8023.42	1331.25
708	708.00	15.28	29.12	16045.36	17587.38	1.94	8794.66	1331.33
709	709.00	16.71	31.99	17587.38	19242.80	2.45	9622.63	1331.43
710	710.00	18.15	34.86	19242.80	20977.65	3.48	10490.56	1331.52
711	711.00	20.21	38.36	20977.65	22710.72	5.96	11358.34	1331.61
712	712.00	22.27	42.49	22710.72	24397.95	8.37	12203.16	1331.69
713	713.00	24.34	46.61	24397.95	26033.36	10.94	13022.15	1331.77
714	714.00	26.40	50.74	26033.36	27585.55	13.88	13799.71	1331.84
715	715.00	28.46	54.86	27585.55	29044.10	16.63	14530.36	1331.91
716	716.00	25.95	54.42	29044.10	30182.17	18.78	15100.47	1331.96
717	717.00	23.45	49.40	30182.17	30819.04	19.99	15419.51	1331.99
718	718.00	20.94	44.39	30819.04	31056.23	20.44	15538.33	1332.00
719	719.00	18.43	39.37	31056.23	30975.40	20.28	15497.84	1332.00
720	720.00	15.92	34.36	30975.40	30641.57	19.65	15330.61	1331.98
721	721.00	13.48	29.41	30641.57	30109.34	18.64	15063.99	1331.96
722	722.00	11.04	24.52	30109.34	29422.56	17.35	14719.95	1331.93
723	723.00	8.60	19.64	29422.56	28612.65	15.82	14314.23	1331.89
724	724.00	6.16	14.75	28612.65	27704.66	14.10	13859.38	1331.85
725	725.00	3.71	9.87	27704.66	26718.51	12.24	13365.37	1331.80
726	726.00	3.64	7.36	26718.51	25797.59	10.50	12904.04	1331.76
727	727.00	3.57	7.21	25797.59	25044.08	9.29	12526.69	1331.73
728	728.00	3.50	7.07	25044.08	24408.36	8.38	12208.37	1331.69
729	729.00	3.42	6.92	24408.36	23864.97	7.61	11936.29	1331.67
730	730.00	3.35	6.78	23864.97	23399.33	6.94	11703.13	1331.64
731	731.00	3.28	6.63	23399.33	22999.14	6.37	11502.76	1331.62
732	732.00	3.21	6.48	22999.14	22654.07	5.88	11329.97	1331.61
733	733.00	3.13	6.34	22654.07	22355.40	5.45	11180.42	1331.59
734	734.00	3.06	6.19	22355.40	22095.81	5.08	11050.44	1331.58
735	735.00	2.99	6.05	22095.81	21869.14	4.75	10936.95	1331.57
736	736.00	2.91	5.90	21869.14	21670.18	4.47	10837.32	1331.56
737	737.00	2.84	5.75	21670.18	21494.52	4.22	10749.37	1331.55
738	738.00	2.77	5.61	21494.52	21338.50	3.99	10671.25	1331.54
739	739.00	2.69	5.46	21338.50	21199.01	3.79	10601.40	1331.53
740	740.00	2.62	5.31	21199.01	21073.45	3.62	10538.53	1331.53
741	741.00	2.55	5.17	21073.45	20959.60	3.45	10481.53	1331.52
742	742.00	2.47	5.02	20959.60	20855.60	3.30	10429.45	1331.52
743	743.00	2.40	4.87	20855.60	20759.89	3.17	10381.53	1331.51
744	744.00	2.33	4.73	20759.89	20671.17	3.04	10337.10	1331.51

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 21
Name: PA'S BYPASS EAST, CFH, 2YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 6.52 (cfs)
Time to Peak (Tp) = 721.00 (min)
Time of Base (Tb) = 1450.70 (min)
Volume = 0.40 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 10
Type = Rational
Peak Flow (Qp) = 19.28 (cfs)
Time to Peak (Tp) = 8.90 (min)
Time of Base (Tb) = 17.80 (min)
Volume = 0.24 (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	2.84	81

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 8.90 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 3.50 (in)
Return Period = 2 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
710	710.00	0.00	3.50	0.39	4.52
711	711.00	0.00	3.50	0.39	4.91
712	712.00	0.00	3.50	0.31	5.22
713	713.00	0.00	3.50	0.22	5.44
714	714.00	0.00	3.50	0.14	5.58
715	715.00	0.00	3.50	0.14	5.73
716	716.00	0.00	3.50	0.14	5.87
717	717.00	0.00	3.50	0.14	6.01
718	718.00	0.00	3.50	0.14	6.16
719	719.00	0.00	3.50	0.14	6.30
720	720.00	0.00	3.50	0.14	6.45
721	721.00	0.00	3.50	0.07	6.52
722	722.00	0.00	3.50	-0.60	5.92
723	723.00	0.00	3.50	-0.60	5.32
724	724.00	0.00	3.50	-0.60	4.72
725	725.00	0.00	3.50	-0.60	4.13
726	726.00	0.00	3.50	-0.60	3.53
727	727.00	0.00	3.50	-0.60	2.93
728	728.00	0.00	3.50	0.60	2.33
729	729.00	0.00	3.50	-0.60	1.73
730	730.00	0.00	3.50	-0.48	1.25
731	731.00	0.00	3.50	-0.02	1.23
732	732.00	0.00	3.50	-0.02	1.20
733	733.00	0.00	3.50	-0.02	1.18
734	734.00	0.00	3.50	-0.02	1.16
735	735.00	0.00	3.50	-0.02	1.13
736	736.00	0.00	3.50	-0.02	1.11
737	737.00	0.00	3.50	-0.02	1.08
738	738.00	0.00	3.50	-0.03	1.06
739	739.00	0.00	3.50	-0.02	1.03
740	740.00	0.00	3.50	-0.03	1.01
741	741.00	0.00	3.50	-0.03	0.98
742	742.00	0.00	3.50	-0.03	0.96
743	743.00	0.00	3.50	-0.03	0.93

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FLOOD HYDROGRAPH REPORT

 Hydrograph Number: 22
 Name: PA'S BYPASS EAST, CFH, 100YR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 19.87 (cfs)
 Time to Peak (Tp) = 720.00 (min)
 Time of Base (Tb) = 1450.70 (min)
 Volume = 1.33 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 11
 Type = Rational
 Peak Flow (Qp) = 19.28 (cfs)
 Time to Peak (Tp) = 8.90 (min)
 Time of Base (Tb) = 17.80 (min)
 Volume = 0.24 (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	2.84	81

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 8.90 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 7.90 (in)
 Return Period = 100 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
710	710.00	0.00	7.90	1.21	15.89
711	711.00	0.00	7.90	1.21	17.10
712	712.00	0.00	7.90	0.97	18.07
713	713.00	0.00	7.90	0.43	18.50
714	714.00	0.00	7.90	0.20	18.69
715	715.00	0.00	7.90	0.20	18.89
716	716.00	0.00	7.90	0.20	19.08
717	717.00	0.00	7.90	0.20	19.28
718	718.00	0.00	7.90	0.20	19.47
719	719.00	0.00	7.90	0.20	19.67
720	720.00	0.00	7.90	0.20	19.87
721	721.00	0.00	7.90	-0.01	19.86
722	722.00	0.00	7.90	-1.84	18.02
723	723.00	0.00	7.90	-1.84	16.17
724	724.00	0.00	7.90	-1.84	14.33
725	725.00	0.00	7.90	-1.84	12.49
726	726.00	0.00	7.90	-1.84	10.65
727	727.00	0.00	7.90	-1.84	8.81
728	728.00	0.00	7.90	-1.84	6.97
729	729.00	0.00	7.90	-1.85	5.12
730	730.00	0.00	7.90	-1.48	3.64
731	731.00	0.00	7.90	-0.07	3.56
732	732.00	0.00	7.90	-0.07	3.49
733	733.00	0.00	7.90	-0.07	3.41
734	734.00	0.00	7.90	-0.07	3.34
735	735.00	0.00	7.90	-0.07	3.26
736	736.00	0.00	7.90	-0.07	3.19
737	737.00	0.00	7.90	-0.07	3.11
738	738.00	0.00	7.90	-0.08	3.03
739	739.00	0.00	7.90	-0.07	2.96
740	740.00	0.00	7.90	-0.08	2.89
741	741.00	0.00	7.90	-0.08	2.81
742	742.00	0.00	7.90	-0.08	2.74
743	743.00	0.00	7.90	-0.08	2.66
744	744.00	0.00	7.90	-0.08	2.58
745	745.00	0.00	7.90	-0.08	2.51
746	746.00	0.00	7.90	-0.08	2.43
747	747.00	0.00	7.90	-0.08	2.35
748	748.00	0.00	7.90	-0.07	2.29
749	749.00	0.00	7.90	-0.06	2.22
750	750.00	0.00	7.90	-0.06	2.16
751	751.00	0.00	7.90	-0.06	2.10

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 23
 Name: PA'S BYPASS EAST, CFH, 5YR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 9.50 (cfs)
 Time to Peak (Tp) = 721.00 (min)
 Time of Base (Tb) = 1450.70 (min)
 Volume = 0.60 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 12
 Type = Rational
 Peak Flow (Qp) = 19.28 (cfs)
 Time to Peak (Tp) = 8.90 (min)
 Time of Base (Tb) = 17.80 (min)
 Volume = 0.24 (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	2.84	81

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 8.90 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 4.50 (in)
 Return Period = 2 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
[TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
710	710.00	0.00	4.50	0.57	6.98
711	711.00	0.00	4.50	0.57	7.55
712	712.00	0.00	4.50	0.46	8.01
713	713.00	0.00	4.50	0.27	8.28
714	714.00	0.00	4.50	0.16	8.45
715	715.00	0.00	4.50	0.16	8.61
716	716.00	0.00	4.50	0.16	8.78
717	717.00	0.00	4.50	0.16	8.94
718	718.00	0.00	4.50	0.16	9.11
719	719.00	0.00	4.50	0.16	9.27
720	720.00	0.00	4.50	0.16	9.44
721	721.00	0.00	4.50	0.06	9.50
722	722.00	0.00	4.50	-0.87	8.62
723	723.00	0.00	4.50	-0.87	7.75
724	724.00	0.00	4.50	-0.87	6.87
725	725.00	0.00	4.50	-0.87	6.00
726	726.00	0.00	4.50	-0.87	5.12
727	727.00	0.00	4.50	-0.87	4.25
728	728.00	0.00	4.50	-0.87	3.37
729	729.00	0.00	4.50	-0.88	2.50
730	730.00	0.00	4.50	-0.70	1.79
731	731.00	0.00	4.50	-0.04	1.76
732	732.00	0.00	4.50	-0.04	1.72
733	733.00	0.00	4.50	-0.04	1.68
734	734.00	0.00	4.50	-0.04	1.65
735	735.00	0.00	4.50	-0.04	1.61
736	736.00	0.00	4.50	-0.04	1.58
737	737.00	0.00	4.50	-0.04	1.54
738	738.00	0.00	4.50	-0.04	1.50
739	739.00	0.00	4.50	-0.03	1.47
740	740.00	0.00	4.50	-0.04	1.43
741	741.00	0.00	4.50	-0.04	1.40
742	742.00	0.00	4.50	-0.04	1.36
743	743.00	0.00	4.50	-0.04	1.32
744	744.00	0.00	4.50	-0.04	1.28
745	745.00	0.00	4.50	-0.04	1.25
746	746.00	0.00	4.50	-0.04	1.21
747	747.00	0.00	4.50	-0.04	1.17
748	748.00	0.00	4.50	-0.03	1.14
749	749.00	0.00	4.50	-0.03	1.11
750	750.00	0.00	4.50	-0.03	1.08
751	751.00	0.00	4.50	-0.03	1.05
752	752.00	0.00	4.50	-0.03	1.02
753	753.00	0.00	4.50	-0.03	0.99
754	754.00	0.00	4.50	0.03	0.96
755	755.00	0.00	4.50	0.03	0.93
756	756.00	0.00	4.50	-0.03	0.90
757	757.00	0.00	4.50	-0.02	0.88
758	758.00	0.00	4.50	-0.01	0.87
759	759.00	0.00	4.50	-0.01	0.86

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 24
 Name: PA'S BYPASS WEST, CFH, 2YR
 Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 3.50 (cfs)
 Time to Peak (Tp) = 714.00 (min)
 Time of Base (Tb) = 1446.00 (min)
 Volume = 0.18 (ac-ft)
 Time Step = 1.00 (min)
 Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 13
 Type = Rational
 Peak Flow (Qp) = 11.55 (cfs)
 Time to Peak (Tp) = 6.00 (min)
 Time of Base (Tb) = 12.00 (min)
 Volume = 0.10 (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	1.15	83

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 6.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
 Total Precipitation = 3.50 (in)
 Return Period = 2 (yr)
 Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
 [TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
710	710.00	0.00	3.50	0.31	2.27
711	711.00	0.00	3.50	0.31	2.58
712	712.00	0.00	3.50	0.31	2.89
713	713.00	0.00	3.50	0.31	3.19
714	714.00	0.00	3.50	0.31	3.50
715	715.00	0.00	3.50	-0.13	3.37
716	716.00	0.00	3.50	-0.13	3.24
717	717.00	0.00	3.50	-0.13	3.11
718	718.00	0.00	3.50	-0.13	2.98
719	719.00	0.00	3.50	-0.13	2.85
720	720.00	0.00	3.50	-0.13	2.72
721	721.00	0.00	3.50	-0.36	2.36
722	722.00	0.00	3.50	-0.36	2.00
723	723.00	0.00	3.50	-0.36	1.64
724	724.00	0.00	3.50	-0.36	1.28
725	725.00	0.00	3.50	-0.36	0.92
726	726.00	0.00	3.50	-0.36	0.56
727	727.00	0.00	3.50	-0.01	0.55
728	728.00	0.00	3.50	-0.01	0.54
729	729.00	0.00	3.50	-0.01	0.53
730	730.00	0.00	3.50	-0.01	0.52
731	731.00	0.00	3.50	-0.01	0.51
732	732.00	0.00	3.50	-0.01	0.50
733	733.00	0.00	3.50	0.01	0.49
734	734.00	0.00	3.50	-0.01	0.48
735	735.00	0.00	3.50	-0.01	0.47
736	736.00	0.00	3.50	-0.01	0.46
737	737.00	0.00	3.50	-0.01	0.45
738	738.00	0.00	3.50	-0.01	0.44
739	739.00	0.00	3.50	-0.01	0.43
740	740.00	0.00	3.50	-0.01	0.42
741	741.00	0.00	3.50	-0.01	0.40
742	742.00	0.00	3.50	-0.01	0.39
743	743.00	0.00	3.50	-0.01	0.38
744	744.00	0.00	3.50	-0.01	0.37
745	745.00	0.00	3.50	-0.01	0.36
746	746.00	0.00	3.50	-0.01	0.35
747	747.00	0.00	3.50	-0.01	0.34
748	748.00	0.00	3.50	-0.01	0.33
749	749.00	0.00	3.50	-0.01	0.31
750	750.00	0.00	3.50	-0.01	0.30
751	751.00	0.00	3.50	-0.01	0.30
752	752.00	0.00	3.50	-0.01	0.29
753	753.00	0.00	3.50	-0.01	0.28
754	754.00	0.00	3.50	-0.01	0.27
755	755.00	0.00	3.50	0.01	0.27
756	756.00	0.00	3.50	-0.01	0.26
757	757.00	0.00	3.50	-0.00	0.26
758	758.00	0.00	3.50	-0.00	0.26
759	759.00	0.00	3.50	-0.00	0.25

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 25
Name: PA'S BYPASS WEST, CFH, 100YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 10.80 (cfs)
Time to Peak (Tp) = 714.00 (min)
Time of Base (Tb) = 1446.00 (min)
Volume = 0.56 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 14
Type = Rational
Peak Flow (Qp) = 11.55 (cfs)
Time to Peak (Tp) = 6.00 (min)
Time of Base (Tb) = 12.00 (min)
Volume = 0.10 (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	1.15	83

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 6.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 7.90 (in)
Return Period = 100 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
[TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
690	690.00	0.00	7.90	0.01	0.75
691	691.00	0.00	7.90	0.14	0.89
692	692.00	0.00	7.90	0.14	1.03
693	693.00	0.00	7.90	0.14	1.17
694	694.00	0.00	7.90	0.14	1.31
695	695.00	0.00	7.90	0.14	1.45
696	696.00	0.00	7.90	0.14	1.59
697	697.00	0.00	7.90	0.29	1.88
698	698.00	0.00	7.90	0.29	2.17
699	699.00	0.00	7.90	0.29	2.46
700	700.00	0.00	7.90	0.29	2.75
701	701.00	0.00	7.90	0.29	3.04
702	702.00	0.00	7.90	0.29	3.33
703	703.00	0.00	7.90	0.39	3.71
704	704.00	0.00	7.90	0.39	4.10
705	705.00	0.00	7.90	0.39	4.49
706	706.00	0.00	7.90	0.39	4.88
707	707.00	0.00	7.90	0.39	5.27
708	708.00	0.00	7.90	0.39	5.66
709	709.00	0.00	7.90	0.86	6.52
710	710.00	0.00	7.90	0.86	7.37
711	711.00	0.00	7.90	0.86	8.23
712	712.00	0.00	7.90	0.86	9.09
713	713.00	0.00	7.90	0.86	9.95
714	714.00	0.00	7.90	0.86	10.80
715	715.00	0.00	7.90	-0.50	10.31
716	716.00	0.00	7.90	-0.50	9.81
717	717.00	0.00	7.90	-0.50	9.31
718	718.00	0.00	7.90	-0.50	8.81
719	719.00	0.00	7.90	-0.50	8.32
720	720.00	0.00	7.90	-0.50	7.82
721	721.00	0.00	7.90	-1.04	6.78
722	722.00	0.00	7.90	-1.04	5.74
723	723.00	0.00	7.90	-1.04	4.70
724	724.00	0.00	7.90	-1.04	3.66
725	725.00	0.00	7.90	-1.04	2.62
726	726.00	0.00	7.90	-1.04	1.58
727	727.00	0.00	7.90	-0.03	1.55
728	728.00	0.00	7.90	-0.03	1.52
729	729.00	0.00	7.90	-0.03	1.49
730	730.00	0.00	7.90	-0.03	1.46
731	731.00	0.00	7.90	-0.03	1.43
732	732.00	0.00	7.90	-0.03	1.39
733	733.00	0.00	7.90	-0.03	1.36
734	734.00	0.00	7.90	-0.03	1.33
735	735.00	0.00	7.90	-0.03	1.30
736	736.00	0.00	7.90	-0.03	1.27
737	737.00	0.00	7.90	-0.03	1.24
738	738.00	0.00	7.90	-0.03	1.21
739	739.00	0.00	7.90	0.03	1.18

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FLOOD HYDROGRAPH REPORT

Hydrograph Number: 26
Name: PA'S BYPASS WEST, CFH, 5YR
Type: Computed Flood

[HYDROGRAPH INFORMATION]

Peak Flow (Qp) = 5.13 (cfs)
Time to Peak (Tp) = 714.00 (min)
Time of Base (Tb) = 1446.00 (min)
Volume = 0.26 (ac-ft)
Time Step = 1.00 (min)
Flow Multiplier = 1.00

[UNIT HYDROGRAPH INFORMATION]

Number = 15
Type = Rational
Peak Flow (Qp) = 11.55 (cfs)
Time to Peak (Tp) = 6.00 (min)
Time of Base (Tb) = 12.00 (min)
Volume = 0.10 (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	1.15	83

[TIME CONCENTRATION -- User Defined]

Time of Concentration (Tc) = 6.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type = SCS II
Total Precipitation = 4.50 (in)
Return Period = 2 (yr)
Storm Duration = 24.00 (hr)

[Hydrograph Flow Values: Time vs. Flow]
[TIME CONCENTRATION -- 1.00]

Time Interval	Time (min)	Incremental Rainfall (in)	Cumulative Rainfall (in)	Incremental Outflow (cfs)	Design Outflow (cfs)
700	700.00	0.00	4.50	0.13	1.15
701	701.00	0.00	4.50	0.13	1.28
702	702.00	0.00	4.50	0.13	1.41
703	703.00	0.00	4.50	0.19	1.59
704	704.00	0.00	4.50	0.19	1.78
705	705.00	0.00	4.50	0.19	1.97
706	706.00	0.00	4.50	0.19	2.15
707	707.00	0.00	4.50	0.19	2.34
708	708.00	0.00	4.50	0.19	2.53
709	709.00	0.00	4.50	0.43	2.96
710	710.00	0.00	4.50	0.43	3.40
711	711.00	0.00	4.50	0.43	3.83
712	712.00	0.00	4.50	0.43	4.26
713	713.00	0.00	4.50	0.43	4.70
714	714.00	0.00	4.50	0.43	5.13
715	715.00	0.00	4.50	-0.21	4.92
716	716.00	0.00	4.50	-0.21	4.71
717	717.00	0.00	4.50	-0.21	4.50
718	718.00	0.00	4.50	0.21	4.29
719	719.00	0.00	4.50	-0.21	4.08
720	720.00	0.00	4.50	-0.21	3.88
721	721.00	0.00	4.50	-0.51	3.36
722	722.00	0.00	4.50	-0.51	2.85
723	723.00	0.00	4.50	-0.51	2.34
724	724.00	0.00	4.50	-0.51	1.82
725	725.00	0.00	4.50	-0.51	1.31
726	726.00	0.00	4.50	-0.51	0.80
727	727.00	0.00	4.50	-0.02	0.78
728	728.00	0.00	4.50	0.02	0.77
729	729.00	0.00	4.50	-0.02	0.75
730	730.00	0.00	4.50	-0.02	0.74
731	731.00	0.00	4.50	-0.02	0.72
732	732.00	0.00	4.50	-0.02	0.71
733	733.00	0.00	4.50	-0.02	0.69
734	734.00	0.00	4.50	-0.02	0.67
735	735.00	0.00	4.50	0.02	0.66
736	736.00	0.00	4.50	-0.02	0.64
737	737.00	0.00	4.50	-0.02	0.63
738	738.00	0.00	4.50	-0.02	0.61
739	739.00	0.00	4.50	0.02	0.60
740	740.00	0.00	4.50	-0.02	0.58
741	741.00	0.00	4.50	0.02	0.57
742	742.00	0.00	4.50	0.02	0.55
743	743.00	0.00	4.50	-0.02	0.53
744	744.00	0.00	4.50	-0.02	0.52
745	745.00	0.00	4.50	-0.02	0.50
746	746.00	0.00	4.50	-0.02	0.49
747	747.00	0.00	4.50	-0.02	0.47
748	748.00	0.00	4.50	-0.02	0.45
749	749.00	0.00	4.50	-0.02	0.44

APPENDIX E

DETENTION POND DATA

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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RESERVOIR LISTING

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

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

Date: 01-03-07
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RESERVOIR REPORT

Reservoir Number: 1
Name: NORTH POND

[RATING CURVE LIMIT]

Minimum Elevation = 1331.00 (ft)
Maximum Elevation = 1337.00 (ft)
Elevation Increment = 0.25 (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	1331.00	0.00	0.00	0.00	0.00
2	1332.00	22222.00	11111.00	11111.00	11111.00
3	1333.00	32096.00	27159.00	27159.00	38270.00
4	1334.00	38250.00	35173.00	35173.00	73443.00
5	1335.00	44403.00	41326.50	41326.50	114769.50
6	1336.00	50633.00	47518.00	47518.00	162287.50
7	1337.00	57028.00	53830.50	53830.50	216118.00

[DISCHARGE INFORMATION]

Structure Number: 1
Type: Circular Orifice
Name: 4" DIA ORIFICE, NORTH DP

Structure Number: 2
Type: Circular Orifice
Name: 9" DIA ORIFICE, NORTH DP

Structure Number: 3
Type: Rectangular Weir Suppressed
Name: 9" WIDE RECT. WEIR NORTH DP

[RESERVOIR STAGE STORAGE/DISCHARGE]

Elevation (ft)	Stage (ft)	Area (sq ft)	Storage (cu ft)	Discharge (cfs)
1331.00	0.00	0.00	0.00	0.00
1331.25	0.25	5555.50	694.44	0.12
1331.50	0.50	11111.00	2777.75	0.24
1331.75	0.75	16666.50	6249.94	0.31
1332.00	1.00	22222.00	11111.00	0.38
1332.25	1.25	24690.50	16975.06	0.43
1332.50	1.50	27159.00	23456.25	0.48
1332.75	1.75	29627.50	30554.56	0.52
1333.00	2.00	32096.00	38270.00	0.56
1333.25	2.25	33634.50	46486.31	0.59
1333.50	2.50	35173.00	55087.25	0.63
1333.75	2.75	36711.50	64072.81	0.66
1334.00	3.00	38250.00	73443.00	0.91
1334.25	3.25	39788.25	83197.78	1.48
1334.50	3.50	41326.50	93337.12	2.05
1334.75	3.75	42864.75	103861.03	2.46
1335.00	4.00	44403.00	114769.50	2.80
1335.25	4.25	45960.50	126064.94	3.40
1335.50	4.50	47518.00	137749.75	4.23
1335.75	4.75	49075.50	149823.94	5.21
1336.00	5.00	50633.00	162287.50	6.31
1336.25	5.25	52231.75	175145.59	7.52
1336.50	5.50	53830.50	188403.37	8.82
1336.75	5.75	55429.25	202060.84	10.20
1337.00	6.00	57028.00	216118.00	11.66

Maximum Storage = 216118.00 (cu ft)
 Maximum Discharge = 11.66 (cfs)

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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RESERVOIR REPORT

Reservoir Number: 2
Name: WEST POND

[RATING CURVE LIMIT]

Minimum Elevation = 1329.50 (ft)
Maximum Elevation = 1333.00 (ft)
Elevation Increment = 0.25 (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	1329.50	0.00	0.00	0.00	0.00
2	1330.00	3213.00	1606.50	803.25	803.25
3	1331.00	7335.00	5274.00	5274.00	6077.25
4	1332.00	11557.00	9446.00	9446.00	15523.25
5	1333.00	15880.00	13718.50	13718.50	29241.75

[DISCHARGE INFORMATION]

Structure Number: 1
Type: Rectangular Orifice
Name: 6" WIDE RECT. ORIFICE, WEST DP

Structure Number: 2
Type: Rectangular Weir Suppressed
Name: RECT WEIR, WEST DP

[RESERVOIR STAGE STORAGE/DISCHARGE]

Elevation (ft)	Stage (ft)	Area (sq ft)	Storage (cu ft)	Discharge (cfs)
1329.50	0.00	0.00	0.00	0.00
1329.75	0.25	1606.50	200.81	0.21
1330.00	0.50	3213.00	803.25	0.60
1330.25	0.75	4243.50	1735.31	0.85
1330.50	1.00	5274.00	2925.00	1.04
1330.75	1.25	6304.50	4372.31	1.20
1331.00	1.50	7335.00	6077.25	1.35
1331.25	1.75	8390.50	8042.94	1.47
1331.50	2.00	9446.00	10272.50	2.86
1331.75	2.25	10501.50	12765.94	9.98
1332.00	2.50	11557.00	15523.25	20.38
1332.25	2.75	12637.75	18547.59	33.22
1332.50	3.00	13718.50	21842.12	48.10
1332.75	3.25	14799.25	25406.84	64.76
1333.00	3.50	15880.00	29241.75	83.04

Maximum Storage = 29241.75 (cu ft)
 Maximum Discharge = 83.04 (cfs)

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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RESERVOIR REPORT

Reservoir Number: 3
Name: SOUTH POND

[RATING CURVE LIMIT]

Minimum Elevation = 1328.75 (ft)
Maximum Elevation = 1334.00 (ft)
Elevation Increment = 0.25 (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	1328.75	0.00	0.00	0.00	0.00
2	1329.00	37456.00	18728.00	4682.00	4682.00
3	1330.00	40538.00	38997.00	38997.00	43679.00
4	1331.00	43721.00	42129.50	42129.50	85808.50
5	1332.00	47003.00	45362.00	45362.00	131170.50
6	1333.00	50387.00	48695.00	48695.00	179865.50
7	1334.00	53871.00	52129.00	52129.00	231994.50

[DISCHARGE INFORMATION]

Structure Number: 1
Type: Rectangular Orifice
Name: 8" WIDE RECT. ORIFICE, SOUTH DP

Structure Number: 2
Type: Rectangular Orifice
Name: 36" WIDE RECT. ORIFICE, SOUTH DP

[RESERVOIR STAGE STORAGE/DISCHARGE]

Elevation (ft)	Stage (ft)	Area (sq ft)	Storage (cu ft)	Discharge (cfs)
1328.75	0.00	0.00	0.00	0.00
1329.00	0.25	37456.00	4682.00	0.29
1329.25	0.50	38226.50	14142.31	0.81
1329.50	0.75	38997.00	23795.25	1.14
1329.75	1.00	39767.50	33640.81	1.40
1330.00	1.25	40538.00	43679.00	1.61
1330.25	1.50	41333.75	53912.97	1.80
1330.50	1.75	42129.50	64345.87	1.97
1330.75	2.00	42925.25	74977.72	2.13
1331.00	2.25	43721.00	85808.50	2.28
1331.25	2.50	44541.50	96841.31	2.42
1331.50	2.75	45362.00	108079.25	3.83
1331.75	3.00	46182.50	119522.31	6.28
1332.00	3.25	47003.00	131170.50	9.42
1332.25	3.50	47849.00	143027.00	13.12
1332.50	3.75	48695.00	155095.00	15.52
1332.75	4.00	49541.00	167374.50	17.56
1333.00	4.25	50387.00	179865.50	19.37
1333.25	4.50	51258.00	192571.12	21.01
1333.50	4.75	52129.00	205494.50	22.52
1333.75	5.00	53000.00	218635.62	23.93
1334.00	5.25	53871.00	231994.50	25.26

Maximum Storage = 231994.50 (cu ft)
 Maximum Discharge = 25.26 (cfs)

APPENDIX F

**DETENTION POND OUTLET
STRUCTURE DATA**

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

Date: 01-03-07
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OUTLET STRUCTURE LISTING

Number	Name	Type	Defined
1	4" DIA ORIFICE, NORTH DP	Orifice	Yes
2	9" DIA ORIFICE, NORTH DP	Orifice	Yes
3	9" WIDE RECT. WEIR NORTH DP	Weir	Yes
4	8" WIDE RECT. ORIFICE, SOUTH DP	Orifice	Yes
5	36" WIDE RECT. ORIFICE, SOUTH DP	Orifice	Yes
6	6" WIDE RECT. ORIFICE, WEST DP	Orifice	Yes
7	RECT WEIR, WEST DP	Weir	Yes

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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OUTLET STRUCTURE REPORT

Structure Number : 1
Type : Circular Orifice
Name : 4" DIA ORIFICE, NORTH DP

[RATING CURVE LIMIT]

Minimum Elevation = 1331.00 (ft)
Maximum Elevation = 1337.00 (ft)
Elevation Increment = 0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Diameter = 0.33 (ft)
Orifice Coefficient = 0.60
Invert Elevation = 1331.00 (ft)
Number of Openings = 1

[CIRCULAR ORIFICE EQUATION]

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

[DEFINITIONS]

C_o = Orifice Coefficient
A = Wetted Area, (cfs)
k = 1

[MAXIMUM DISCHARGE]

Q = 0.99 (cfs)

[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1331.00	0.00	0.00
1331.25	0.25	0.12
1331.50	0.50	0.24
1331.75	0.75	0.31
1332.00	1.00	0.38
1332.25	1.25	0.43
1332.50	1.50	0.48
1332.75	1.75	0.52
1333.00	2.00	0.56
1333.25	2.25	0.59
1333.50	2.50	0.63
1333.75	2.75	0.66
1334.00	3.00	0.69
1334.25	3.25	0.72
1334.50	3.50	0.75
1334.75	3.75	0.78
1335.00	4.00	0.81
1335.25	4.25	0.83
1335.50	4.50	0.86
1335.75	4.75	0.88
1336.00	5.00	0.91
1336.25	5.25	0.93
1336.50	5.50	0.95
1336.75	5.75	0.97
1337.00	6.00	0.99

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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OUTLET STRUCTURE REPORT

=====
Structure Number : 2
Type : Circular Orifice
Name : 9" DIA ORIFICE, NORTH DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1331.00	(ft)
Maximum Elevation	=	1337.00	(ft)
Elevation Increment	=	0.25	(ft)

[OUTLET STRUCTURE INFORMATION]

Diameter	=	0.75	(ft)
Orifice Coefficient	=	0.60	
Invert Elevation	=	1333.75	(ft)
Number of Openings	=	1	

[CIRCULAR ORIFICE EQUATION]

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

[DEFINITIONS]

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

[MAXIMUM DISCHARGE]

Q	=	3.61	(cfs)
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[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1331.00	0.00	0.00
1331.25	0.25	0.00
1331.50	0.50	0.00
1331.75	0.75	0.00
1332.00	1.00	0.00
1332.25	1.25	0.00
1332.50	1.50	0.00
1332.75	1.75	0.00
1333.00	2.00	0.00
1333.25	2.25	0.00
1333.50	2.50	0.00
1333.75	2.75	0.00
1334.00	3.00	0.22
1334.25	3.25	0.75
1334.50	3.50	1.30
1334.75	3.75	1.68
1335.00	4.00	1.99
1335.25	4.25	2.26
1335.50	4.50	2.49
1335.75	4.75	2.71
1336.00	5.00	2.91
1336.25	5.25	3.10
1336.50	5.50	3.28
1336.75	5.75	3.45
1337.00	6.00	3.61

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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OUTLET STRUCTURE REPORT

Structure Number : 3
Type : Rectangular Weir Suppressed
Name : 9" WIDE RECT. WEIR NORTH DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1331.00	(ft)
Maximum Elevation	=	1337.00	(ft)
Elevation Increment	=	0.25	(ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	0.75	(ft)
Crest Elevation	=	1335.00	(ft)
Weir Coefficient	=	3.33	
Exponential	=	1.50	

[RECTANGULAR SUPRESSED EQUATION]

$$Q = C_w * L * H^{\text{exp}}$$

[DEFINITIONS]

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

[MAXIMUM DISCHARGE]

Q	=	7.06	(cfs)
---	---	------	-------

[WEIR STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1331.00	0.00	0.00
1331.25	0.25	0.00
1331.50	0.50	0.00
1331.75	0.75	0.00
1332.00	1.00	0.00
1332.25	1.25	0.00
1332.50	1.50	0.00
1332.75	1.75	0.00
1333.00	2.00	0.00
1333.25	2.25	0.00
1333.50	2.50	0.00
1333.75	2.75	0.00
1334.00	3.00	0.00
1334.25	3.25	0.00
1334.50	3.50	0.00
1334.75	3.75	0.00
1335.00	4.00	0.00
1335.25	4.25	0.31
1335.50	4.50	0.88
1335.75	4.75	1.62
1336.00	5.00	2.50
1336.25	5.25	3.49
1336.50	5.50	4.59
1336.75	5.75	5.78
1337.00	6.00	7.06

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
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OUTLET STRUCTURE REPORT

=====

Structure Number : 4
Type : Rectangular Orifice
Name : 8" WIDE RECT. ORIFICE, SOUTH DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1328.75	(ft)
Maximum Elevation	=	1334.00	(ft)
Elevation Increment	=	0.25	(ft)

[OUTLET STRUCTURE INFORMATION]

Height	=	0.50	(ft)
Width	=	0.67	(ft)
Orifice Coefficient	=	0.60	
Invert Elevation	=	1328.75	(ft)
Number of Openings	=	1	

[RECTANGULAR ORIFICE EQUATION]

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

[DEFINITIONS]

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

[MAXIMUM DISCHARGE]

Q	=	3.61	(cfs)
---	---	------	-------

[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1328.75	0.00	0.00
1329.00	0.25	0.29
1329.25	0.50	0.81
1329.50	0.75	1.14
1329.75	1.00	1.40
1330.00	1.25	1.61
1330.25	1.50	1.80
1330.50	1.75	1.97
1330.75	2.00	2.13
1331.00	2.25	2.28
1331.25	2.50	2.42
1331.50	2.75	2.55
1331.75	3.00	2.67
1332.00	3.25	2.79
1332.25	3.50	2.91
1332.50	3.75	3.02
1332.75	4.00	3.12
1333.00	4.25	3.22
1333.25	4.50	3.32
1333.50	4.75	3.42
1333.75	5.00	3.51
1334.00	5.25	3.61

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
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OUTLET STRUCTURE REPORT

=====
Structure Number : 5
Type : Rectangular Orifice
Name : 36" WIDE RECT. ORIFCE, SOUTH DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1328.75	(ft)
Maximum Elevation	=	1334.00	(ft)
Elevation Increment	=	0.25	(ft)

[OUTLET STRUCTURE INFORMATION]

Height	=	1.00	(ft)
Width	=	3.00	(ft)
Orifice Coefficient	=	0.60	
Invert Elevation	=	1331.25	(ft)
Number of Openings	=	1	

[RECTANGULAR ORIFICE EQUATION]

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

[DEFINITIONS]

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

[MAXIMUM DISCHARGE]

Q	=	21.66	(cfs)
---	---	-------	-------

[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1328.75	0.00	0.00
1329.00	0.25	0.00
1329.25	0.50	0.00
1329.50	0.75	0.00
1329.75	1.00	0.00
1330.00	1.25	0.00
1330.25	1.50	0.00
1330.50	1.75	0.00
1330.75	2.00	0.00
1331.00	2.25	0.00
1331.25	2.50	0.00
1331.50	2.75	1.28
1331.75	3.00	3.61
1332.00	3.25	6.63
1332.25	3.50	10.21
1332.50	3.75	12.50
1332.75	4.00	14.44
1333.00	4.25	16.14
1333.25	4.50	17.68
1333.50	4.75	19.10
1333.75	5.00	20.42
1334.00	5.25	21.66

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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OUTLET STRUCTURE REPORT

=====
Structure Number : 6
Type : Rectangular Orifice
Name : 6" WIDE RECT. ORIFICE, WEST DP

[RATING CURVE LIMIT]

Minimum Elevation	=	1329.50	(ft)
Maximum Elevation	=	1333.00	(ft)
Elevation Increment	=	0.25	(ft)

[OUTLET STRUCTURE INFORMATION]

Height	=	0.50	(ft)
Width	=	0.50	(ft)
Orifice Coefficient	=	0.60	
Invert Elevation	=	1329.50	(ft)
Number of Openings	=	1	

[RECTANGULAR ORIFICE EQUATION]

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

[DEFINITIONS]

C _o	=	Orifice Coefficient
A	=	Wetted Area, (cfs)
k	=	1

[MAXIMUM DISCHARGE]

Q	=	2.17	(cfs)
---	---	------	-------

[ORIFICE STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1329.50	0.00	0.00
1329.75	0.25	0.21
1330.00	0.50	0.60
1330.25	0.75	0.85
1330.50	1.00	1.04
1330.75	1.25	1.20
1331.00	1.50	1.35
1331.25	1.75	1.47
1331.50	2.00	1.59
1331.75	2.25	1.70
1332.00	2.50	1.80
1332.25	2.75	1.90
1332.50	3.00	2.00
1332.75	3.25	2.08
1333.00	3.50	2.17

User Name: MKhan
Project: DRAINAGE WM WICHITA(N)
Scenario: PROPOSED 176PROTO

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OUTLET STRUCTURE REPORT

Structure Number : 7
Type : Rectangular Weir Suppressed
Name : RECT WEIR, WEST DP

[RATING CURVE LIMIT]

Minimum Elevation = 1329.50 (ft)
Maximum Elevation = 1333.00 (ft)
Elevation Increment = 0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length = 12.00 (ft)
Crest Elevation = 1331.40 (ft)
Weir Coefficient = 3.33
Exponential = 1.50

[RECTANGULAR SUPRESSED EQUATION]

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

[DEFINITIONS]

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

[MAXIMUM DISCHARGE]

Q = 80.87 (cfs)

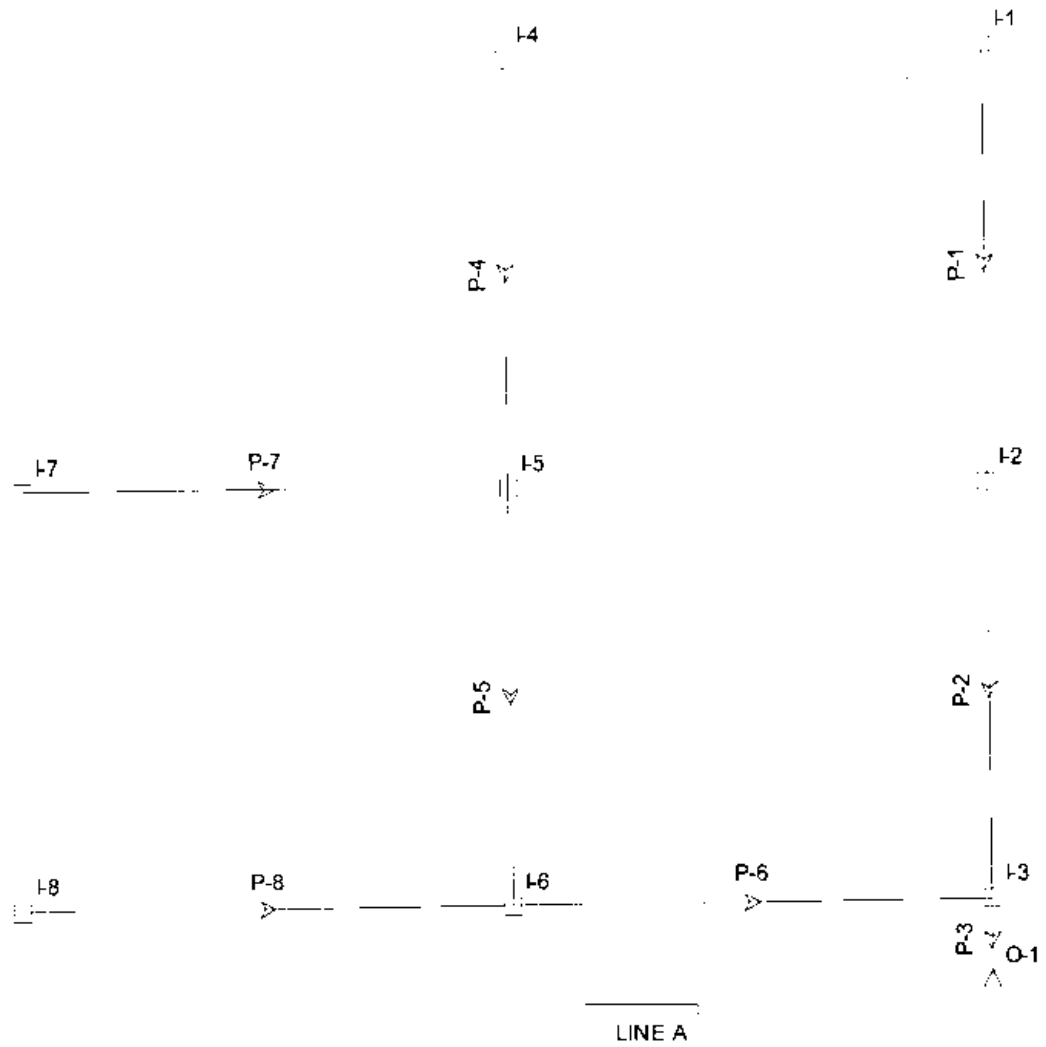
[WEIR STAGE VS. DISCHARGE]

Elevation (ft)	Stage (ft)	Discharge (cfs)
1329.50	0.00	0.00
1329.75	0.25	0.00
1330.00	0.50	0.00
1330.25	0.75	0.00
1330.50	1.00	0.00
1330.75	1.25	0.00
1331.00	1.50	0.00
1331.25	1.75	0.00
1331.50	2.00	1.26
1331.75	2.25	8.27
1332.00	2.50	18.57
1332.25	2.75	31.32
1332.50	3.00	46.10
1332.75	3.25	62.68
1333.00	3.50	80.87

APPENDIX G

**STORM SEWER DATA
COMBINED PIPE/NODE
ANALYSIS FOR Q10 AND Q100**

Scenario: 100 YEAR



Scenario: Base

PROJECT PIPE REPORT

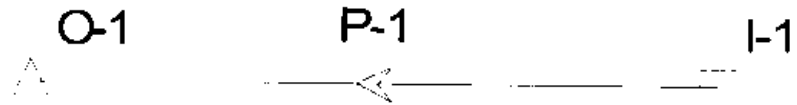
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	30 inch	0.013	I-1	I-2	2.04	15.17	22.46	4.91	205.50	0.0030	1,331.80	1,331.18	1,335.80	1,335.80	1,333.41	1,333.11	1,333.73	1,333.33
P-2	36 inch	0.013	I-2	I-3	2.74	25.24	55.05	7.62	195.50	0.0068	1,330.68	1,329.35	1,335.80	1,335.80	1,332.96	1,332.79	1,333.26	1,332.99
P-3	36 inch	0.013	I-3	O-1	5.32	58.62	63.73	10.23	38.50	0.0091	1,329.35	1,329.00	1,335.80	1,336.00	1,331.83	1,331.31	1,333.20	1,332.88
P-4	24 inch	0.013	I-4	I-5	2.04	11.34	13.24	3.61	200.50	0.0034	1,332.30	1,331.61	1,335.80	1,335.80	1,334.51	1,334.01	1,334.72	1,334.21
P-5	36 inch	0.013	I-5	I-6	3.65	26.16	36.53	3.70	196.50	0.0030	1,330.61	1,330.02	1,335.80	1,335.80	1,333.88	1,333.58	1,334.10	1,333.79
P-6	36 inch	0.013	I-6	I-3	4.54	33.88	36.53	4.79	224.00	0.0030	1,330.02	1,329.35	1,335.80	1,335.80	1,333.37	1,332.79	1,333.72	1,333.15
P-7	24 inch	0.013	I-7	I-5	2.25	8.54	12.39	2.72	229.00	0.0030	1,332.30	1,331.61	1,335.80	1,335.80	1,334.34	1,334.01	1,334.45	1,334.13
P-8	24 inch	0.012	I-8	I-6	2.25	5.58	19.94	5.44	231.00	0.0066	1,332.55	1,331.02	1,335.80	1,335.80	1,333.61	1,333.58	1,333.78	1,333.63

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	30 inch	0.013	I-1	I-2	2.04	20.34	22.46	4.14	205.50	0.0030	1,331.80	1,331.18	1,335.80	1,335.80	1,335.16	1,334.65	1,335.42	1,334.92
P-2	36 inch	0.013	I-2	I-3	2.87	33.78	55.05	4.78	195.50	0.0068	1,330.68	1,329.35	1,335.80	1,335.80	1,334.47	1,333.97	1,334.83	1,334.33
P-3	36 inch	0.013	I-3	O-1	4.50	82.42	63.73	11.66	38.50	0.0091	1,329.35	1,329.00	1,335.80	1,336.00	1,332.49	1,331.79	1,334.61	1,334.04
P-4	24 inch	0.013	I-4	I-5	2.04	15.20	13.24	4.84	200.50	0.0034	1,332.30	1,331.61	1,335.80	1,335.80	1,336.71	1,335.80	1,337.07	1,336.16
P-5	36 inch	0.013	I-5	I-6	3.30	35.90	36.53	5.08	196.50	0.0030	1,330.61	1,330.02	1,335.80	1,335.80	1,336.07	1,335.50	1,336.47	1,335.90
P-6	36 inch	0.013	I-6	I-3	3.94	47.11	36.53	6.66	224.00	0.0030	1,330.02	1,329.35	1,335.80	1,335.80	1,335.09	1,333.97	1,335.78	1,334.66
P-7	24 inch	0.013	I-7	I-5	2.25	11.46	12.39	3.65	229.00	0.0030	1,332.30	1,331.61	1,335.80	1,335.80	1,336.39	1,335.80	1,336.59	1,336.01
P-8	24 inch	0.012	I-8	I-6	2.25	7.49	19.94	2.38	231.00	0.0066	1,332.55	1,331.02	1,335.80	1,335.80	1,335.72	1,335.50	1,335.81	1,335.59

Scenario: 100 YEAR



LINE B

Scenario: Base

PROJECT PIPE REPORT

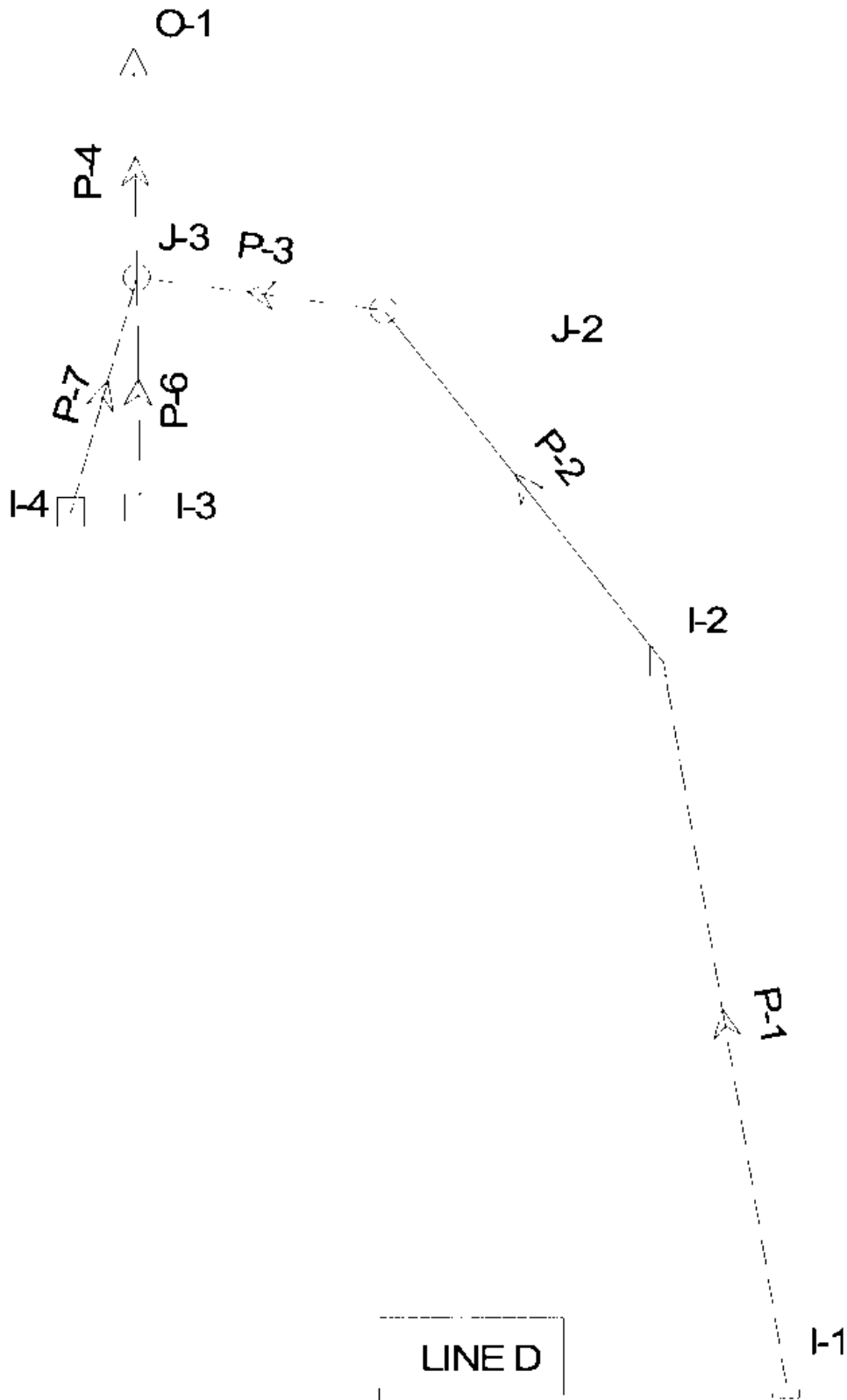
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	18 inch	0.012	I-1	O-1	2.04	10.79	13.79	8.64	156.50	0.0147	1,332.30	1,330.00	1,335.80	1,336.00	1,333.56	1,331.00	1,334.28	1,332.16

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	18 inch	0.012	I-1	O-1	2.04	14.46	13.79	8.85	156.50	0.0147	1,332.30	1,330.00	1,335.80	1,336.00	1,333.69	1,331.31	1,334.80	1,332.52

Scenario: 100 YEAR



Scenario: Base

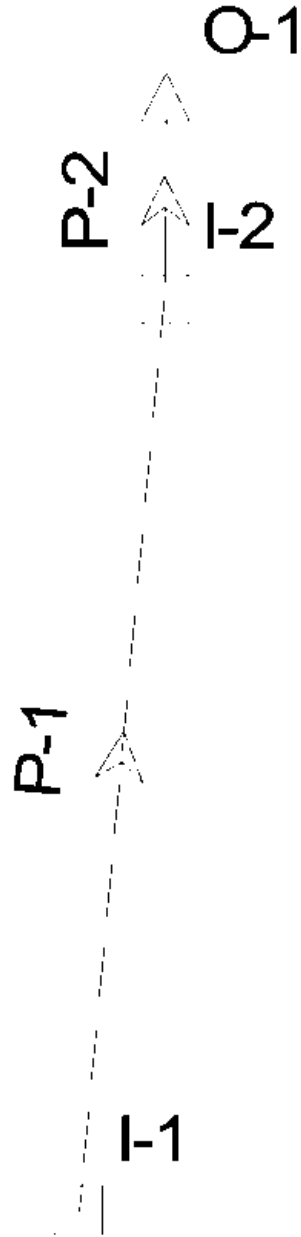
PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	18 inch	0.012	I-1	I-2	1.75	3.70	4.96	3.08	209.50	0.0019	1,334.25	1,333.85	1,336.75	1,336.49	1,335.24	1,334.93	1,335.38	1,335.05
P-2	24 inch	0.012	I-2	J-2	2.88	7.43	10.68	3.67	128.50	0.0019	1,333.35	1,333.11	1,336.49	1,337.30	1,334.85	1,334.74	1,334.98	1,334.86
P-3	24 inch	0.012	J-2	J-3	3.47	7.22	10.68	3.65	71.00	0.0019	1,333.11	1,332.97	1,337.30	1,337.13	1,334.74	1,334.69	1,334.85	1,334.79
P-4	24 inch	0.012	J-3	O-1	3.79	14.59	11.05	4.65	60.50	0.0020	1,332.97	1,332.85	1,337.13	1,337.00	1,334.69	1,334.23	1,335.09	1,334.85
P-6	15 inch	0.012	I-3	J-3	3.25	5.40	9.77	8.16	65.50	0.0195	1,335.00	1,333.72	1,338.00	1,337.13	1,335.94	1,334.69	1,336.40	1,335.13
P-7	15 inch	0.012	I-4	J-3	2.82	2.32	9.49	6.39	69.50	0.0184	1,335.00	1,333.72	1,338.00	1,337.13	1,335.61	1,334.69	1,335.85	1,334.77

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	18 inch	0.012	I-1	I-2	1.75	4.95	4.96	2.80	209.50	0.0019	1,334.25	1,333.85	1,336.75	1,336.49	1,335.84	1,335.45	1,335.96	1,335.57
P-2	24 inch	0.012	I-2	J-2	3.00	9.95	10.68	3.17	128.50	0.0019	1,333.35	1,333.11	1,336.49	1,337.30	1,335.35	1,335.14	1,335.51	1,335.30
P-3	24 inch	0.012	J-2	J-3	3.67	9.67	10.68	3.09	71.00	0.0019	1,333.11	1,332.97	1,337.30	1,337.13	1,335.14	1,335.03	1,335.29	1,335.18
P-4	24 inch	0.012	J-3	O-1	4.06	19.53	11.05	6.25	60.50	0.0020	1,332.97	1,332.85	1,337.13	1,337.00	1,335.03	1,334.44	1,335.63	1,335.27
P-6	15 inch	0.012	I-3	J-3	3.25	7.28	9.77	8.73	65.50	0.0195	1,335.00	1,333.72	1,338.00	1,337.13	1,336.08	1,335.03	1,336.73	1,335.58
P-7	15 inch	0.012	I-4	J-3	2.82	3.12	9.49	6.93	69.50	0.0184	1,335.00	1,333.72	1,338.00	1,337.13	1,335.71	1,335.03	1,336.00	1,335.13



LINE E

Scenario: Base

PROJECT PIPE REPORT

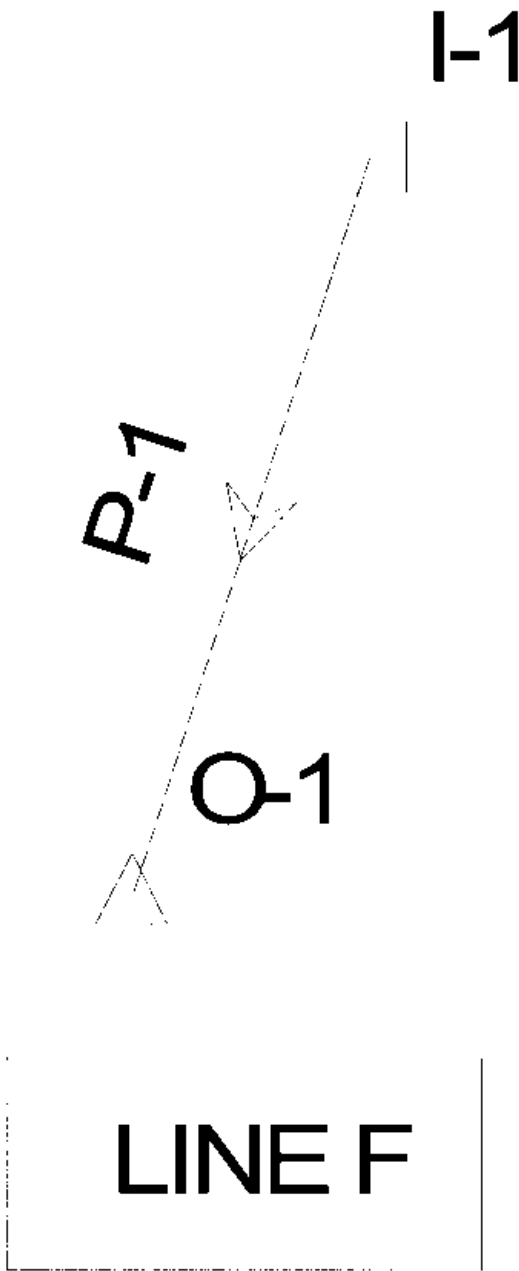
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	15 inch	0.012	I-1	I-2	1.72	3.12	6.26	3.97	151.50	0.0080	1,333.12	1,331.91	1,336.37	1,336.33	1,334.70	1,333.71	1,334.94	1,333.95
P-2	15 inch	0.012	I-2	O-1	2.36	5.82	8.82	7.41	32.00	0.0159	1,331.91	1,331.40	1,336.33	1,337.00	1,333.20	1,332.35	1,334.05	1,333.24

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	15 inch	0.012	I-1	I-2	1.72	4.18	6.26	5.46	151.50	0.0080	1,333.12	1,331.91	1,336.37	1,336.33	1,333.95	1,333.45	1,334.31	1,333.63
P-2	15 inch	0.012	I-2	O-1	2.18	7.87	8.82	8.12	32.00	0.0159	1,331.91	1,331.40	1,336.33	1,337.00	1,333.02	1,332.35	1,333.74	1,333.31

Scenario: 100 YEAR



Scenario: Base

PROJECT PIPE REPORT

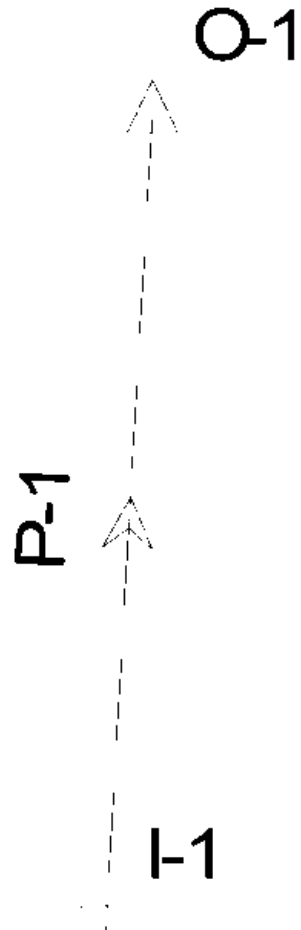
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	15 inch	0.012	I-1	O-1	2.56	4.31	12.24	9.10	86.00	0.0306	1,332.63	1,330.00	1,335.88	1,337.00	1,333.47	1,330.51	1,333.85	1,331.80

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	15 inch	0.012	1-1	O-1	2.55	5.79	12.24	9.84	86.00	0.0306	1,332.63	1,330.00	1,335.68	1,337.00	1,333.60	1,330.61	1,334.10	1,332.11

Scenario: 100 YEAR



LINE G

Scenario: Base

PROJECT PIPE REPORT

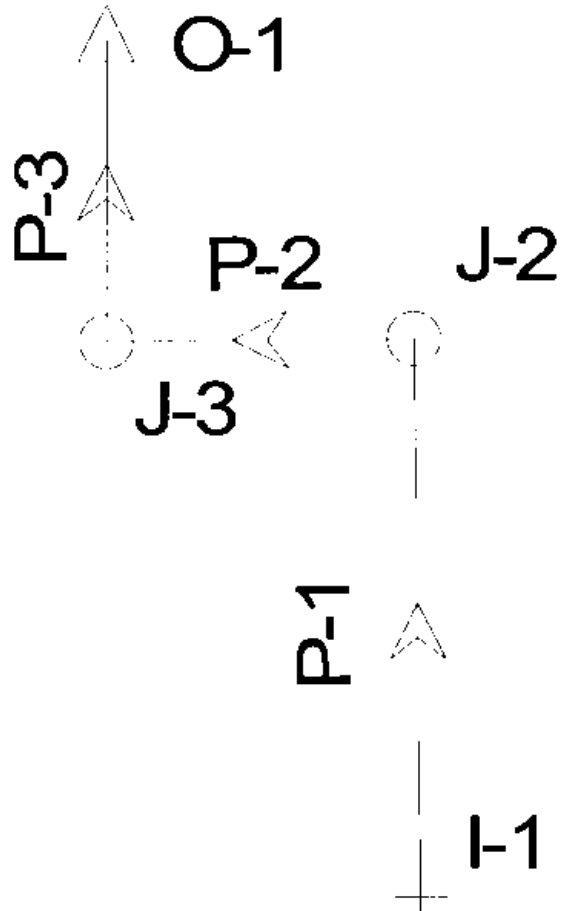
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	12 inch	0.012	I-1	O-1	2.82	2.79	5.22	6.67	127.50	0.0183	1,335.00	1,332.67	1,338.00	1,337.00	1,335.72	1,333.19	1,336.05	1,333.89

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	12 inch	0.012	I-1	O-1	2.82	3.75	5.22	7.23	127.50	0.0183	1,335.00	1,332.67	1,338.00	1,337.00	1,335.82	1,333.30	1,336.28	1,334.11

Scenario: Base



LINE H

Scenario: Base

PROJECT PIPE REPORT

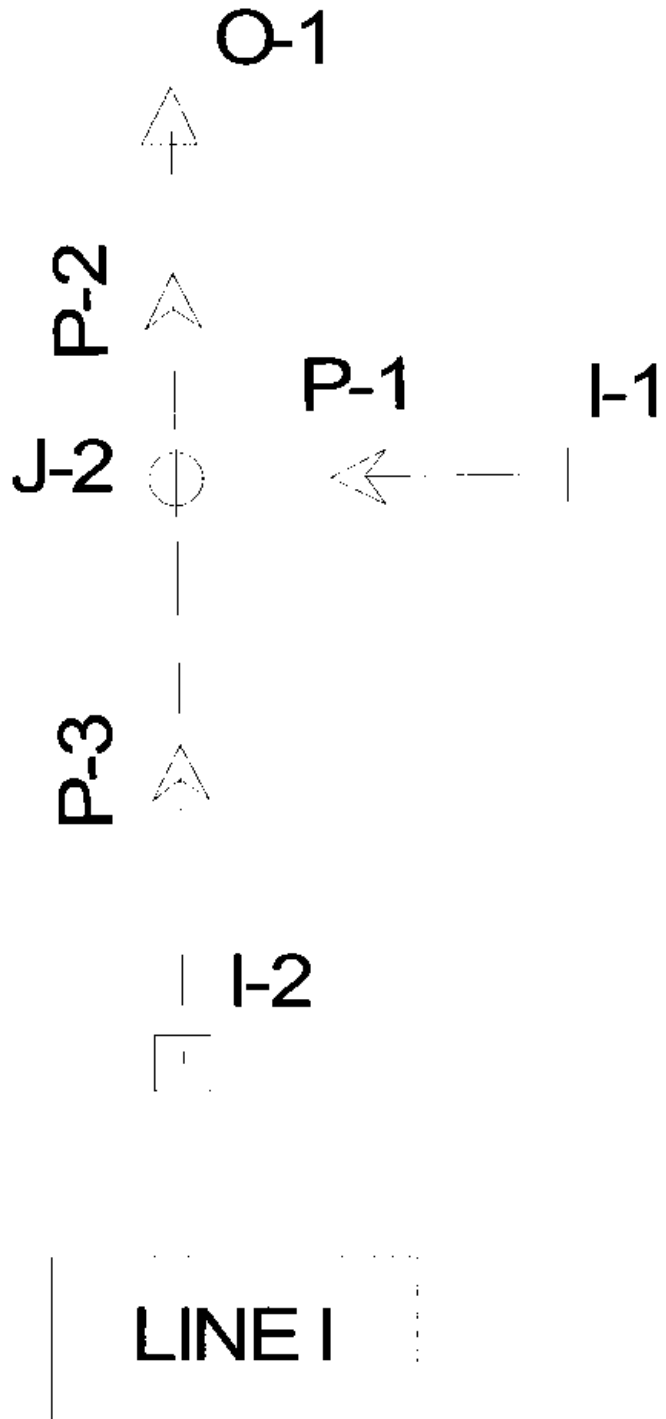
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	12 inch	0.012	I-1	J-2	3.44	11.01	6.34	4.67	84.00	0.0030	1,332.80	1,332.65	1,338.00	1,337.10	1,335.05	1,334.29	1,335.39	1,334.63
P-2	24 inch	0.012	J-2	J-3	3.74	10.86	13.42	4.76	44.00	0.0030	1,332.55	1,332.42	1,337.10	1,337.25	1,334.06	1,333.98	1,334.34	1,334.25
P-3	24 inch	0.012	J-3	O-1	3.89	10.78	17.37	5.82	43.00	0.0050	1,332.42	1,332.20	1,337.25	1,337.00	1,333.59	1,333.34	1,334.08	1,333.87

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	12 inch	0.012	I-1	J-2	3.44	14.87	6.34	6.31	84.00	0.0030	1,332.80	1,332.55	1,338.00	1,337.10	1,338.28	1,336.89	1,338.90	1,337.51
P-2	24 inch	0.012	J-2	J-3	3.66	14.73	13.42	8.34	44.00	0.0030	1,332.55	1,332.42	1,337.10	1,337.25	1,336.03	1,335.29	1,337.11	1,336.37
P-3	24 inch	0.012	J-3	O-1	3.75	14.68	17.37	8.31	43.00	0.0050	1,332.42	1,332.20	1,337.25	1,337.00	1,334.43	1,333.60	1,335.51	1,334.74

Scenario: Base



Scenario: Base

PROJECT PIPE REPORT

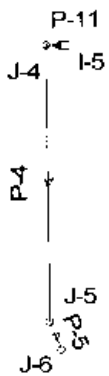
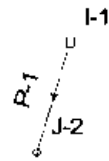
Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	18 inch	0.012	I-1	J-2	3.44	8.00	12.37	7.44	52.50	0.0118	1,333.00	1,332.38	1,337.00	1,336.75	1,334.48	1,334.22	1,334.80	1,334.54
P-2	24 inch	0.012	J-2	O-1	3.56	14.21	28.30	9.02	51.00	0.0133	1,332.38	1,331.70	1,336.75	1,337.00	1,333.74	1,332.75	1,334.35	1,333.87
P-3	12 inch	0.012	I-2	J-2	2.82	6.47	8.19	2.75	84.00	0.0050	1,332.80	1,332.38	1,338.00	1,336.75	1,334.49	1,334.22	1,334.60	1,334.34

Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	18 inch	0.012	I-1	J-2	3.44	10.81	12.37	6.12	52.50	0.0118	1,333.00	1,332.38	1,337.00	1,336.75	1,334.20	1,333.72	1,334.78	1,334.31
P-2	24 inch	0.012	J-2	O-1	3.58	19.18	28.30	10.31	51.00	0.0133	1,332.38	1,331.70	1,336.75	1,337.00	1,333.08	1,331.92	1,333.89	1,333.34
P-3	12 inch	0.012	I-2	J-2	2.82	8.71	8.19	3.70	84.00	0.0050	1,332.80	1,332.38	1,338.00	1,336.75	1,334.20	1,333.72	1,334.41	1,333.94

Scenario: Base



Q-P-10
J-12

P-9

I-6

P-8

J-11

P-15

I-4

LINEL

J-7

P-14

J-9

P-13

J-8

P-12

I-3

Scenario: Base

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	24 inch	0.012	I-1	J-2	0.00	5.88	11.12	3.59	101.50	0.0021	1,331.00	1,330.79	1,337.00	1,336.00	1,332.87	1,332.82	1,332.93	1,332.88
P-2	24 inch	0.012	J-2	J-3	0.47	5.88	10.68	3.48	276.50	0.0019	1,330.79	1,330.27	1,336.00	1,335.00	1,332.79	1,332.63	1,332.84	1,332.68
P-3	24 inch	0.012	J-3	J-4	1.79	5.88	13.78	1.87	400.00	0.0032	1,330.27	1,329.00	1,335.00	1,334.00	1,332.60	1,332.37	1,332.66	1,332.43
P-4	36 inch	0.012	J-4	J-5	5.36	26.32	31.49	3.72	248.00	0.0019	1,328.00	1,327.53	1,334.00	1,334.00	1,332.22	1,331.89	1,332.44	1,332.11
P-5	36 inch	0.012	J-5	J-6	6.47	26.32	31.49	3.72	29.00	0.0019	1,327.53	1,327.47	1,334.00	1,334.00	1,331.76	1,331.72	1,331.98	1,331.94
P-6	36 inch	0.012	J-6	J-7	6.60	26.32	31.49	3.72	246.00	0.0019	1,327.47	1,327.01	1,334.00	1,333.00	1,331.60	1,331.27	1,331.81	1,331.48
P-7	42 inch	0.012	J-7	J-11	7.70	45.16	47.51	4.69	26.00	0.0019	1,326.51	1,326.46	1,333.00	1,331.00	1,330.98	1,330.93	1,331.32	1,331.28
P-8	42 inch	0.012	J-11	I-6	7.79	48.32	47.51	5.02	167.50	0.0019	1,326.46	1,326.14	1,331.00	1,331.00	1,330.58	1,330.25	1,330.97	1,330.64
P-9	42 inch	0.012	I-6	J-12	10.00	52.64	47.51	5.47	352.00	0.0019	1,326.14	1,325.47	1,331.00	1,333.00	1,330.02	1,329.20	1,330.48	1,329.66
P-10	42 inch	0.012	J-12	O-1	11.07	52.39	91.09	9.80	10.00	0.0070	1,325.47	1,325.40	1,333.00	1,332.00	1,328.92	1,328.90	1,329.38	1,329.36
P-11	24 inch	0.012	I-5	J-4	0.00	20.44	43.32	6.51	16.00	0.0313	1,329.50	1,329.00	1,333.00	1,334.00	1,332.48	1,332.37	1,333.14	1,333.03
P-12	30 inch	0.012	I-3	J-8	0.00	18.84	19.37	3.84	142.50	0.0019	1,328.75	1,328.48	1,334.00	1,334.00	1,332.60	1,332.34	1,332.83	1,332.57
P-13	30 inch	0.012	J-8	J-9	0.62	18.84	19.37	3.84	257.00	0.0019	1,328.48	1,327.99	1,334.00	1,334.00	1,332.21	1,331.75	1,332.44	1,331.97
P-14	30 inch	0.012	J-9	J-7	1.73	18.84	21.79	3.84	201.50	0.0024	1,327.99	1,327.51	1,334.00	1,333.00	1,331.63	1,331.27	1,331.86	1,331.50
P-15	18 inch	0.013	I-4	J-11	5.00	3.53	7.96	2.00	94.50	0.0057	1,329.00	1,328.46	1,333.00	1,331.00	1,331.04	1,330.93	1,331.10	1,331.00

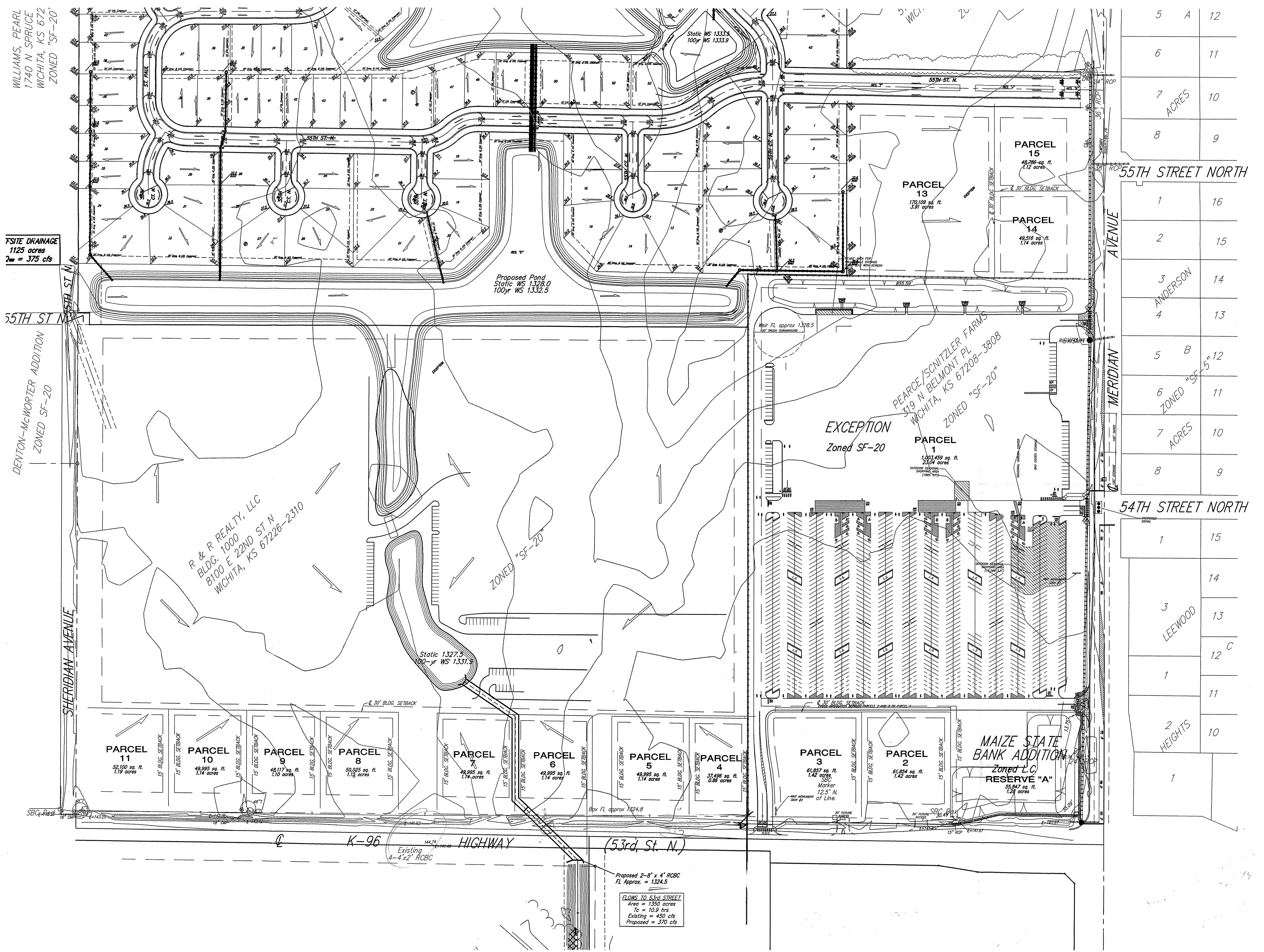
Scenario: 100 YEAR

PROJECT PIPE REPORT

Pipe ID	Pipe Size	Mann 'n'	Up Node	Dn Node	Sys Flow Time (min)	Total Sys Flow (cfs)	Cap (cfs)	Av Vel (ft/s)	Length (ft)	Const Slope (ft/ft)	Up Invert Elev (ft)	Dn Invert Elev (ft)	Up Ground Elev (ft)	Dn Ground Elev (ft)	HGL In (ft)	HGL Out (ft)	EGL In (ft)	EGL Out (ft)
P-1	24 inch	0.012	I-1	J-2	0.00	5.88	11.12	3.59	101.50	0.0021	1,331.00	1,330.79	1,337.00	1,336.00	1,332.94	1,332.89	1,333.00	1,332.94
P-2	24 inch	0.012	J-2	J-3	0.47	5.88	10.68	1.87	276.50	0.0019	1,330.79	1,330.27	1,336.00	1,335.00	1,332.86	1,332.70	1,332.91	1,332.75
P-3	24 inch	0.012	J-3	J-4	2.93	5.88	13.78	1.87	400.00	0.0032	1,330.27	1,329.00	1,335.00	1,334.00	1,332.67	1,332.44	1,332.72	1,332.49
P-4	36 inch	0.012	J-4	J-5	6.50	26.32	31.49	3.72	248.00	0.0019	1,328.00	1,327.53	1,334.00	1,334.00	1,332.29	1,331.96	1,332.50	1,332.17
P-5	36 inch	0.012	J-5	J-6	7.61	26.32	31.49	3.72	29.00	0.0019	1,327.53	1,327.47	1,334.00	1,334.00	1,331.83	1,331.79	1,332.05	1,332.01
P-6	36 inch	0.012	J-6	J-7	7.74	26.32	31.49	3.72	246.00	0.0019	1,327.47	1,327.01	1,334.00	1,333.00	1,331.66	1,331.34	1,331.88	1,331.55
P-7	42 inch	0.012	J-7	J-11	8.84	45.16	47.51	4.69	26.00	0.0019	1,326.51	1,326.46	1,333.00	1,331.00	1,331.04	1,331.00	1,331.39	1,331.34
P-8	42 inch	0.012	J-11	I-6	8.93	49.34	47.51	5.13	167.50	0.0019	1,326.46	1,326.14	1,331.00	1,331.00	1,330.75	1,330.40	1,331.15	1,330.81
P-9	42 inch	0.012	I-6	J-12	10.00	55.51	47.51	5.77	352.00	0.0019	1,326.14	1,325.47	1,331.00	1,333.00	1,330.14	1,329.23	1,330.66	1,329.75
P-10	42 inch	0.012	J-12	O-1	11.02	55.20	91.09	9.92	10.00	0.0070	1,325.47	1,325.40	1,333.00	1,332.00	1,328.92	1,328.90	1,329.44	1,329.41
P-11	24 inch	0.012	I-5	J-4	0.00	20.44	43.32	6.51	16.00	0.0313	1,329.50	1,329.00	1,333.00	1,334.00	1,332.55	1,332.44	1,333.21	1,333.10
P-12	30 inch	0.012	I-3	J-8	0.00	18.84	19.37	3.84	142.50	0.0019	1,328.75	1,328.48	1,334.00	1,334.00	1,332.67	1,332.41	1,332.90	1,332.64
P-13	30 inch	0.012	J-8	J-9	0.62	18.84	19.37	3.84	257.00	0.0019	1,328.48	1,327.99	1,334.00	1,334.00	1,332.27	1,331.81	1,332.50	1,332.04
P-14	30 inch	0.012	J-9	J-7	1.73	18.84	21.79	3.84	201.50	0.0024	1,327.99	1,327.51	1,334.00	1,333.00	1,331.70	1,331.34	1,331.93	1,331.56
P-15	18 inch	0.013	I-4	J-11	5.00	4.80	7.96	2.72	94.50	0.0057	1,329.00	1,328.46	1,333.00	1,331.00	1,331.20	1,331.00	1,331.31	1,331.11

APPENDIX H

**NORTHGATE ADDITION AND
NORTHGATE COMMERCIAL
ADDITION PLANS**



5	A	12
6		11
7	ACRES	10
8		9

55TH STREET NORTH		
1		16
2		15
3	ANDERSON	14
4		13

5	B	12
6	ZONED "SF-20"	11
7	ACRES	10
8		9

54TH STREET NORTH		
1		15
		14
3	LEEWOOD	13
		12 ^C
1		11
2	HEIGHTS	10

1		
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Scale 1"=100'