Phase One
Kingsbury

DRAINAGE PLAN
For
Kingsbury Park
Phase I

Wichita, Kansas

Submitted To:
City of Wichita

Prepared By:
Cook, Flatt & Strobel Engineers, P.A.

Date: January 27, 2012
CF&S Proj. No. 08-565

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Tab 1. Project Narrative:

A. Site Location Map: The project site includes the south half of Section 23 and the northwest quadrant of Section 26, Township 26 South, Range 1 East. It is bounded on the west by Hoover Road, on the south by K-96 Highway, the East by the Arkansas River and Brooks Landfill, and the north by private property and proposed 49th St. The north boundary is currently undeveloped. A clip from the USGS Topographic Map is included in the Appendix B.

B. The existing site is undeveloped. The terrain is flat with a general slope of less than 1% in any direction. Cornejo Materials, Inc. is currently mining for sands and gravels on the property. The remaining area is being leased for agricultural use. The northeast portion of the site is west of the Arkansas River Levee with 2 flood structures penetrating the levee along the east property line with one to the northeast and one to southeast. Off-site runoff enters the site from the west and typically drains to an existing pond on the southeast side of the site. This pond appears to overtop into the ditch along K-96 Highway. There are existing monitoring wells on the west side of the Brooks Landfill and a water quality pond on the north side of the Brooks landfill that was placed to capture sediment from the closure of the landfill until seeding is established. There are also smaller water quality ponds to capture and treat landfill contact runoff while the landfill is active.

The property is currently outside of the floodplain as it is protected by a levee system. It does lie within designated Zone X (See FIRM map in the Appendix B).

The proposed park development consists of a 223 acre recreational groundwater lake constructed by Cornejo Materials, Inc. during the mining operations for sand and gravel. A network of trails, roads, parking lots, and access trails will serve the park.

Also shelters and buildings are being proposed along with a nature center near the Arkansas River.

The City plans to manage the stormwater through a series of Best Management Practices (BMPs) and "treatment trains." Off-site runoff will be routed through a sediment basin, wetland, and micropool before entering into the lake. This will facilitate the removal of pollutants during more frequent "first flush" rainfall events and is also being requested by the Groundwater Management District #2. Higher flows from infrequent rainfall events will bypass the treatment train to prevent flooding and damage to the treatment train. Other proposed Best Management Practices (BMPs) incorporated into the site include vegetated swales, sediment basins, micropools, Bio-swales, infiltration trenches, grassed channels, enhanced swales, vegetative filter strips, and stormwater wetlands. Along with these proposed BMPs, the area is planned to be restored with native vegetation. The City plans to start implementation during mining operations so that the BMPs can be useful both during the mining operations and once the mining of the area is complete.

On-site stormwater is planned to be routed, retained, and dissipated in the proposed groundwater lake including runoff from the offsite areas.

C. Off-site runoff enters Kingsbury Park from the west through 2 - 30" pipe culverts under Hoover Rd. The approximate off-site drainage area is 403 acres and is currently undeveloped, private property. The majority of this area lies west of Hoover Road. The area adjacent to the west is part of the Edgewater Addition Subdivision. This subdivision, south of 45th Street, is currently being developed into a single family residential subdivision. Plans show that this area will contain the 100-year runoff event in the on-site groundwater lakes so this runoff was not included in the off-site drainage analysis. The areas north of 45th Street in the proposed Edgewater Addition

Subdivision are also planned to retain the 100-year runoff event however this area has not been platted so it is included in the analysis of off-site runoff for Kingsbury Park.

As these off-site areas develop, additional peak runoff will be detained on site to meet the City storm water requirements. Therefore, the existing peak runoff will not be increased by future development. Also to further manage runoff from these off-site areas as they develop, Best Management Practices will need to be installed to meet the City storm water requirements. In conclusion, the Kingsbury Park drainage system can be designed for existing peak flows that will not increase with development of the off-site drainage areas routed to Kingsbury Park.

Additional runoff from approximately 50 acres from the west side of the Brooks Landfill is planned to enter the site and groundwater lake once grading operations are complete. This area has been added to the on-site area for the drainage analysis. A minor revision to the closure plan of the Brooks Landfill will be required to place fill on the existing landfill cap as shown on the grading plan in the Appendix C.

D. The runoff from the proposed Kingsbury Park is also planned to enter the groundwater lake. Only minimal runoff from back sloping will be directed to the Highway K-96 ditch and the detention pond north of the Brooks Landfill. Currently runoff from this site along with off-site runoff entering the site from the west is directed to the Highway K-96 ditch south of the site and/or towards the 2 flood structures in the Arkansas River levee on the east side of the site. Although the proposed park development will increase overall runoff, this increased runoff along with current runoff volumes will remain on site and dissipated and/or stored in the 223 acre proposed lake. Therefore the amount of runoff leaving the site will be drastically reduced if not mostly eliminated when the park is completed. Analysis of on-site flow will only be pertinent to the capacity of on-site storm water conveyance systems and finished floor elevations of buildings and structures.

E. The City plans to manage the stormwater through a series of Best Management Practices (BMPs) and "treatment trains." Off-site runoff will be routed through a sediment basin, wetland, and micropool before entering into the lake. This will facilitate the removal of pollutants during more frequent "first flush" rainfall events and is also being requested by the Groundwater Management District #2. Higher flows from infrequent rainfall events will bypass the treatment train to prevent flooding and damage to the treatment train. Other proposed Best Management Practices (BMPs) incorporated into the site include vegetated swales, sediment basins, micropools, Bio-swales, infiltration trenches, grassed channels, enhanced swales, vegetative filter strips, and stormwater wetlands. Along with these proposed BMPs, the area is planned to be restored with native vegetation. The City plans to start implementation during mining operations so that the BMPs can be useful both during the mining operations and permanently once the mining of the area is complete.

F. The plat is not complete at this time.

G. A copy of the preliminary grading plan is included in the Appendix C.

Tab 2. Existing Conditions Runoff Calculations:

A. See Orthophoto in the Appendix B.

B. Future runoff will be retained on site in the proposed groundwater lake.

C. Existing Topography is shown on the Survey Map in the Appendix B.

D. The total site area is 515 acres (including approximately 50 acres from the Brooks Landfill) and was originally agriculture land and/or grassland. However, the mining operations are currently proceeding that will increase the impervious area however rainfall on the lake and the proposed site will be retained on-site.

The off-site area contributing to drainage onto the site is approximately 403 acres. There is minimal impervious area contributing (less than 3 acres) with only 2 farmsteads located in this drainage area. The remaining impervious area is from Hoover Rd. which totals about 5 acres.

E. Benchmarks for site control are included in the Appendix B.

F. All streams, creeks and waterways are labeled on existing survey map in the Appendix B.

G. The predominant soils for the site are a sandy loam (Carwile Fine Sandy Loam and Canadian fine Sandy Loam) with additional loam soils (Nalim Loam). A Soil Map is included in the Appendix B.

H. The locations and boundaries of wetlands, lakes and ponds are noted on the existing survey map in the Appendix B.

I. Before mining operations began in approximately 2008, there was no significant amount of impervious area within the boundary of this site.

J. The existing utilities are noted on the existing survey map in the Appendix B.

K. The conveyance systems are noted on the existing survey map in the Appendix B.

L. Existing flow paths are difficult to determine since the area is so flat. However, the existing survey map is included in the Appendix B showing existing contours.

M. Existing channels and bridges and culverts are on the existing survey map in the Appendix B.

N. - Q. Existing Drainage Calculations are not applicable since proposed drainage patterns will retain flow on site as runoff drains into the groundwater lake created by the mining operations.

R. All existing topography and pipes are shown on the existing survey map in the Appendix B.

S. Not applicable see item N.

T. Groundwater lake elevations are noted as shown on the existing survey map in the Appendix B.

Tab 3. Post-Development Hydrologic Analysis:

A. The NRCS (SCS) Method was utilized to analyze both off-site runoff volume and proposed on-site runoff volume runoff entering the groundwater lake during the 100 year rainfall event. Retention will be accomplished on-site since all runoff is planned to enter the groundwater lake. However, runoff will be routed through stormwater management facilities and ponds prior to entering the groundwater lake.

B. The critical time of concentration for the 100-year rainfall event was calculated at approximately 2.5 hours. This time of concentration is based on the off-site runoff hydrograph contributing to the peak amount of runoff entering the lake.

C. On-site impervious area is planned at approximately 48 acres with about 223 acres of groundwater lake. With area from the Brooks Landfill, a total of 515 acres is contributing to the on-site drainage area. The curve number was calculated at 90 based on proposed development.

D. The groundwater lake will be the functioning as a detention/retention facility. See drainage and grading plan in the Appendix C.

E. NRCS (SCS) runoff volume calculations are included in the Appendix D.

F. The groundwater lake does not have an outflow structure. Runoff will be routed to and dissipated in the aquifer.

G. The proposed on-site runoff will be routed to the groundwater lake reducing flow and effects on the downstream system.

H. Existing structures are included on the existing survey map and drainage plan in the Appendix B.

I. Normal pool elevations for the wetland and pool areas will be 1330.50 with the overflow weir elevations at 1332.50. Maximum water surface elevations during the 100-year rainfall event will be 1334.50.

J. Typical outlet structures are included in the drainage plan and off-site runoff treatment facility plan included in the Appendix C.

K. The entire site is planned to be cleared and regraded. The grading and drainage plan is included in the Appendix C.

L. The Site Plan is included in the Appendix C.

M. Easements and utilities will be positioned based on the final design and final placement of future buildings, structures, and other improvements.

N. The Drainage plan is included in the Appendix C.
O. The Drainage Plan and site plan are included in the Appendix C.
P. The Drainage plan is included in the Appendix C.
Q. The Drainage plan is included in the Appendix C.
R. The Drainage plan is included in the Appendix C.

S. The 100-year rainfall event would result in an approximate 1.9’ rise in the groundwater lake if seepage of runoff into the underground portion of the aquifer is not considered – which results in a conservative estimate. The groundwater lake water elevation (normal pool) was measured at approximately 1324.00 in May of 2008. Groundwater elevations typically fluctuate within 2’ of the normal pool based

on existing groundwater monitoring data. To accommodate this fluctuation the 1.9' rise in water surface elevation was added to a pool elevation of 1326.00; thus resulting in a calculated elevation of 1328.00 for the 100-year lake elevation. However, historical monitoring well records have shown a 6.3' rise in groundwater elevation during a major event (Flood of 1993); therefore the 100-year flood elevations for the lake are being placed at 1330.30.

T. The Lowest opening elevation will be set at 1' above the 100-year elevation at 1331.30. Opening elevations close to storm water management ponds and swales will need to be determined based on final designs.

U. A plan and profile of the off-site runoff treatment facility is included in the Appendix C. The drainage plan (also included in the Appendix C) includes rock weirs and rock level spreaders to control outlet flows from BMP pools and wetland areas. This type of outlet control is intended to serve the park during and immediately following the mass grading operations. Permanent outlet structures can be designed and installed as the park develops and funds become available. Additional BMP's will be integrated into the park as the infrastructure is constructed.

V. The City will maintain the Park and stormwater management facilities

W. Off-site drainage easements are not anticipated for this development.

Tab 4. Floodplain Submittal

The Kingsbury Park site does not lie within a floodplain as it is currently protected by levees.

See the FEMA FIRM map in the Appendix B.

Tab 5. Federal, State and Local Permits

All applicable permitting will be submitted through the appropriate governmental agencies prior to construction. Currently the site activities are covered under the mining permits held by Cornejo Materials, Inc.

Adopted: February 23, 2007

CITY OF WICHITA

Public Works, Engineering Division
Final Drainage Plan Submittal Checklist

Reviewer:_____ Date:_____

Subdivision Name:_____ Location:_____

Total Land Area Of Ownership:_____ Acres

Type: _____Residential _____Commercial _____Industrial _____Recreation _____Municipal _____Other

Applicant: CITY OF WICHITA Contact: LARRY HOETMER Phone #: 268-4179

Engineer: COOK, FLATT & STROBEL, ENG. Contact: DAN HOLLOWAY Phone # 785-272-4706

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development
(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	✓				
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	✓				
C. Discussion of offsite conditions	✓				
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	✓				
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design	✓				
F. Copy of the plat		R			
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	✓				
H. Professional Engineer seal, signature and date on cover of report					
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover					

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)	✓				
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)		✓			
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	✓				
D. Total Site Area and Total Impervious Area (acres)	✓				
E. Benchmarks used for site control	✓				
F. Streams, creeks, and waterway labeled	✓				
G. Predominant soils from USDA soil surveys, and/or on site soil borings	✓				
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted	✓				
I. Location of existing roads, buildings, parking lots and other impervious areas.	✓				

Consulting Engineer Initials _____

J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	✓				
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✓				
L. Flow paths	✓				
M. Location and dimensions of existing channels, bridges or culvert crossings	✓				
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration		✓			
O. Assumed pre-developed runoff curve numbers		✓			
P. Existing time of concentrations used in calculations		✓			
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site		✓			
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)	✓				
S. Cross-section data for open channels		✓			
T. Ground water elevations, if applicable	✓				

	Applicant			Engr	
Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	✓				
B. Proposed time of concentrations used in calculations	✓				
C. Assumed post-developed runoff curve numbers	✓				
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)	✓				
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration	✓				
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities		✓			
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary	✓				
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)	✓				
I. Design water surface elevations and normal pool elevation for ponds.	✓				
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.	✓				
K. Proposed limits of clearing and grading	✓				
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	✓				
M. Location of existing and proposed utilities (e.g., water, sewer) and easements	R				
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✓				
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings	✓				

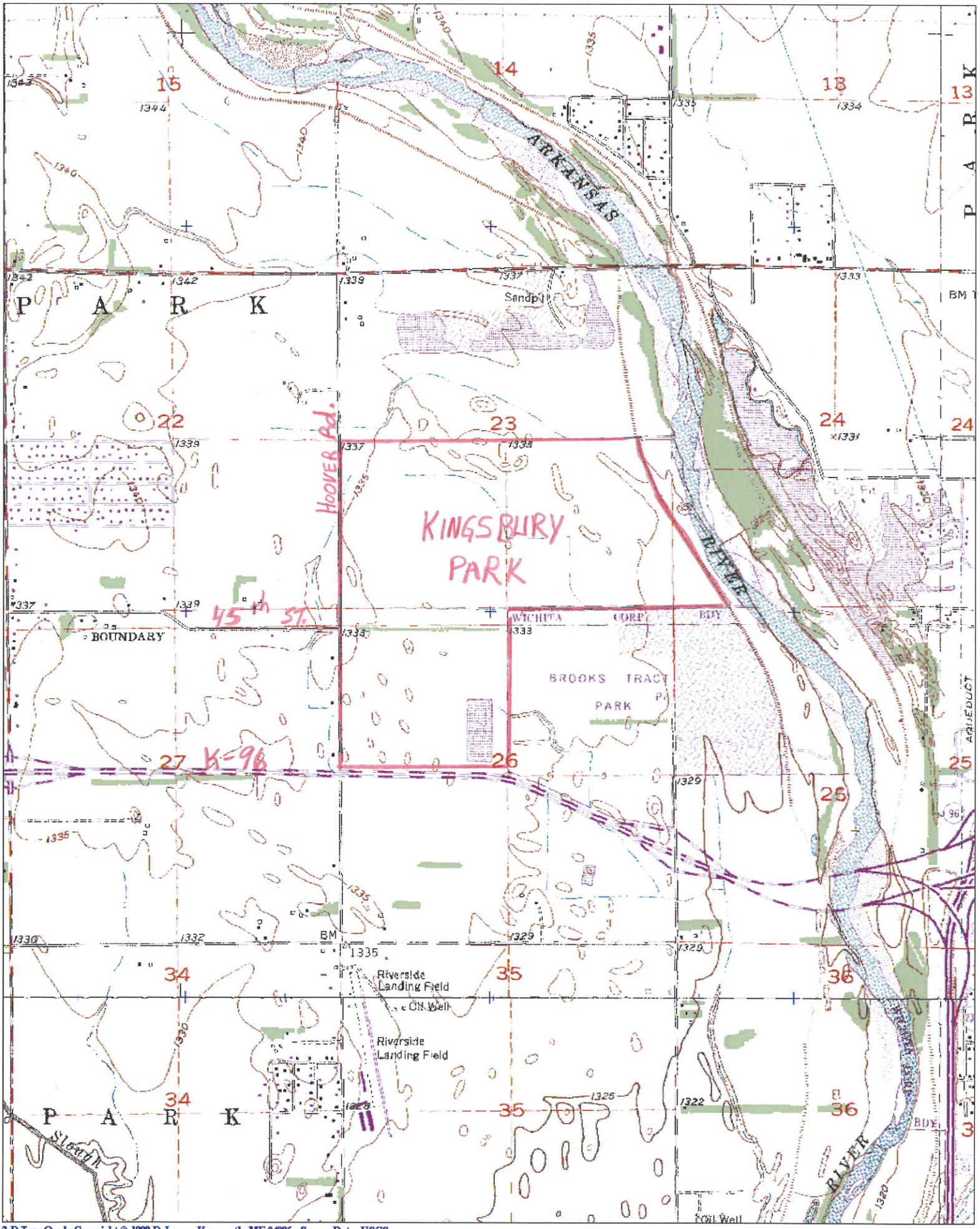
Consulting Engineer Initials _____

P. Preliminary selection and location of stormwater controls	✓				
Q. Emergency overflow structure's flow path	✓				
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)	✓				
S. The 100-year 24-hour HWL delineated on the plan for detention pond	✓				
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds	✓				
U. Stormwater Management Facilities located within a Reserve	✓				
V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot)	✓				
W. Off-site drainage easements or agreements required, where necessary		✓			

	Applicant			Engr	
Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile		✓			
B. Nearest base flood elevations		✓			
C. Delineation of pre-developed regulatory floodplain/floodway limits		✓			
D. Delineation of post-developed regulatory floodplain and floodway limits		✓			
E. Floodplain boundary determination per elevation (project limits shown)		✓			
F. Provide source of floodway data table and discharges		✓			
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits		✓			
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions		✓			
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)		✓			
J. Flood plains and floodways located within a Reserve, where necessary		✓			

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)	R				
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)	R				
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		✓			
D. Kansas Department of Transportation		✓			
E. Sedgwick County Right-of-way Permit		✓			

Consulting Engineer Initials _____



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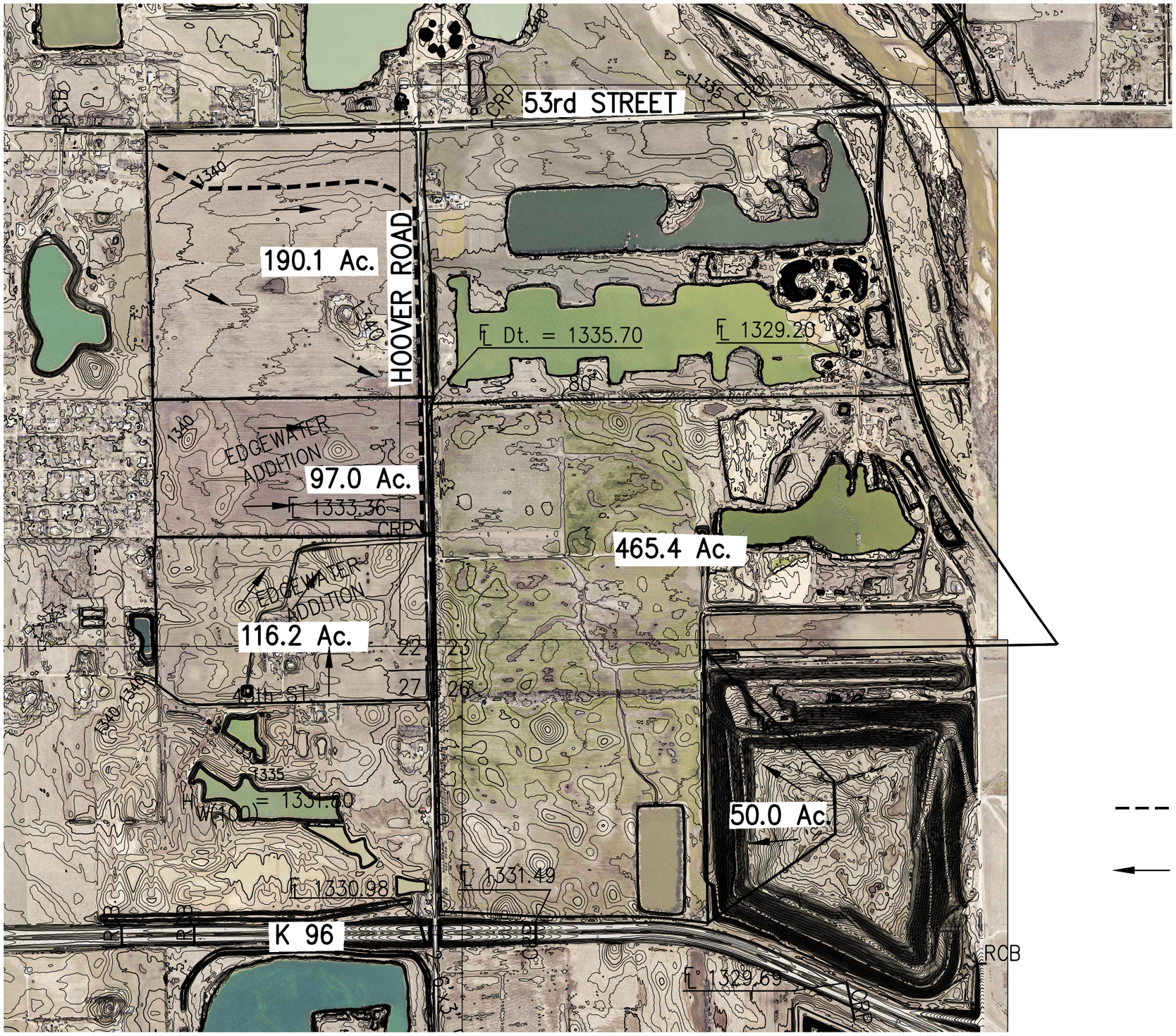

KINGSBURY
OFF-SITE DRAINAGE AREAS

DESIGNER:

Cook, Flatt & Strobel ENGINEERS, P.A.
2900 SW WANAMAKER DR.
TOPEKA, KANSAS 66614
(785)272-1766

CFS PROJECT NO:
08-565

J:\2008Proj\08565\DWGS\offsite drainage.dwg, 1/24/2012 3:24:41 PM

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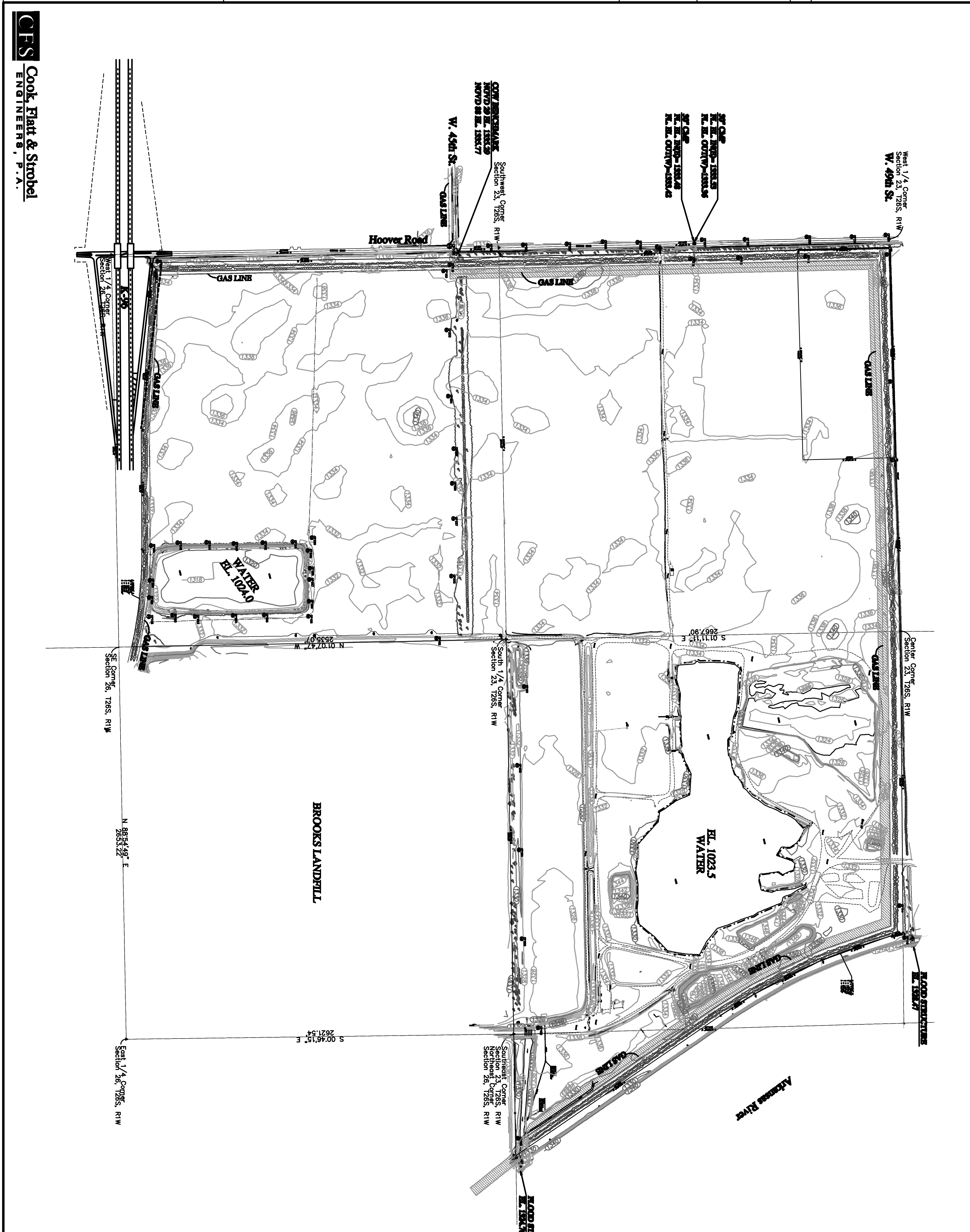
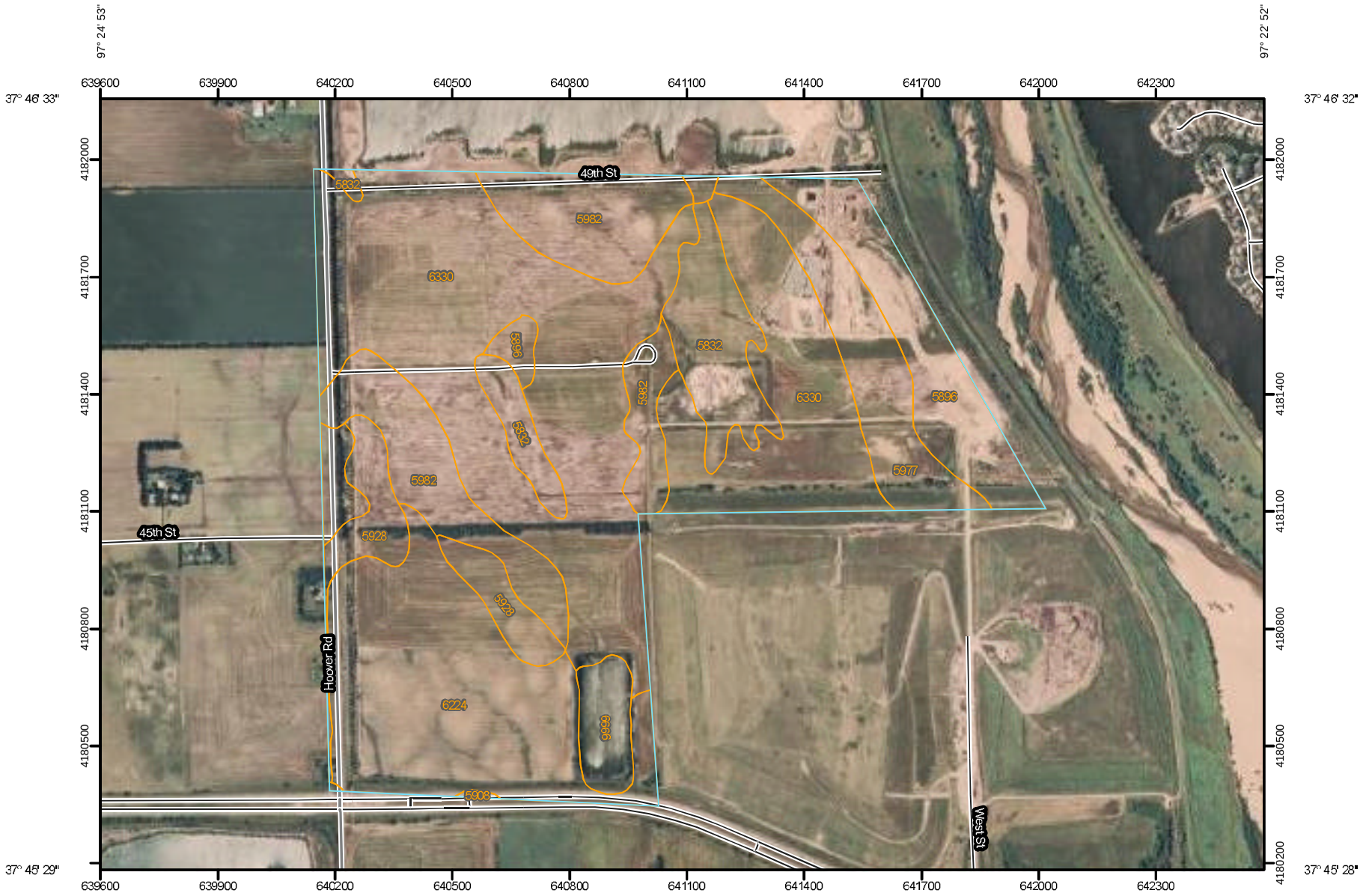
File:		SCALE

	BY	DATE
REFERENCE NOTED		
REFERENCE CHECKED		



CFS
Cook, Flatt & Strobel
ENGINEERS, P.A.
W. 43rd St.
W. 49th St.
Hoover Road
GAS LINE
K-96
West 1/4 Corner Section 26, T26S, R1W
Southwest Corner Section 23, T26S, R1W
West 1/4 Corner Section 23, T26S, R1W
Center Corner Section 23, T26S, R1W
South 1/4 Corner Section 23, T26S, R1W
SE Corner Section 26, T26S, R1W
East 1/4 Corner Section 26, T26S, R1W
Southeast Corner Section 23, T26S, R1W
Northeast Corner Section 26, T26S, R1W
WATER
EL. 1024.0
WATER
EL. 1023.5
BROOKS LANDFILL
N 01°07'47" W 2535.07'
S 01°11'11" E 2667.90'
N 88°54'49" E 2653.22'
S 00°46'15" E 2621.54'
Arkansas River
FLOOD STRUCTURE
SCALE: 1" = 300'
300 0 300 600
LEGEND

EXISTING SURVEY—MAY, 2008
KINGSBURY PARK
CITY OF WICHITA, KANSAS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37° 46' 32"
4182000
4181700
4181400
4181100
4180800
4180500
4180200
49th St
45th St
Hoover Rd
West St
5832
5982
6330
5896
5832
5982
6330
5896
5977
5982
5928
5928
6224
6999
5908
37° 45' 29"
37° 45' 28"
97° 24' 54"
97° 22' 53"
N
Map Scale: 1:14,100 if printed on A size (8.5" x 11") sheet.
Meters
0 150 300 600 900
Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

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

MAP INFORMATION

Map Scale: 1:14,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N NAD83

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

Soil Survey Area: Sedgwick County, Kansas
Survey Area Data: Version 7, Nov 30, 2010

Date(s) aerial images were photographed: 6/20/2006

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

Map Unit Legend

Sedgwick County, Kansas (KS173)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
5832	Punkin-Taver complex, 0 to 1 percent slopes	34.0	6.9%
5896	Nalim-Shellabarger sandy loams, 0 to 1 percent slopes	39.3	7.9%
5908	Nalim loam, 0 to 1 percent slopes	0.4	0.1%
5928	Pratt loamy fine sand, 1 to 5 percent slopes	21.4	4.3%
5977	Vanoss silt loam, 1 to 3 percent slopes	32.4	6.5%
5982	Nalim loam, 1 to 3 percent slopes	65.8	13.3%
6224	Canadian fine sandy loam, rarely flooded	87.0	17.6%
6330	Carwile fine sandy loam, 0 to 1 percent slopes	203.6	41.2%
9999	Water	10.9	2.2%
Totals for Area of Interest		**494.7**	**100.0%**

Soil Map– Sedgwick County, Kansas

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

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

MAP INFORMATION

Map Scale: 1:9,400 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Source of Map: Natural Resources Conservation Service
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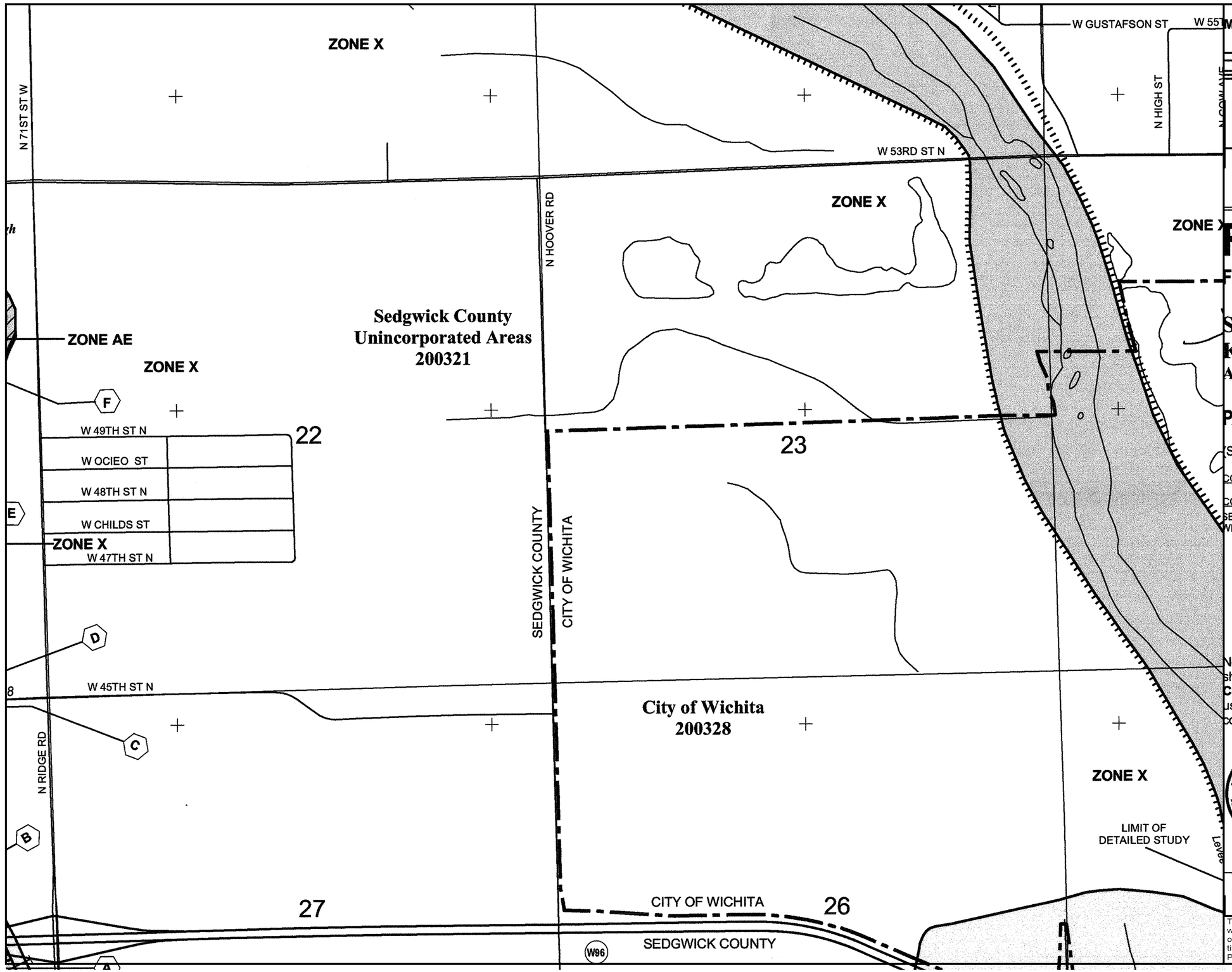
Survey Area Data: Version 7, Nov 30, 2010

Date(s) aerial images were photographed: 6/20/2006

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

Map Unit Legend

Sedgwick County, Kansas (KS173)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
5832	Punkin-Taver complex, 0 to 1 percent slopes	5.3	1.6%
5896	Nalim-Shellabarger sandy loams, 0 to 1 percent slopes	8.2	2.4%
5928	Pratt loamy fine sand, 1 to 5 percent slopes	40.4	11.8%
5943	Saltcreek and Naron fine sandy loams, 0 to 1 percent slopes	10.0	2.9%
5967	Tabler silty clay loam, 0 to 1 percent slopes	19.6	5.7%
5982	Nalim loam, 1 to 3 percent slopes	65.5	19.1%
6244	Elandco silt loam, rarely flooded	92.3	26.9%
6330	Carwile fine sandy loam, 0 to 1 percent slopes	101.9	29.7%
Totals for Area of Interest		**343.1**	**100.0%**



MAP SCALE 1" = 1000'

1000 2000 FEET

0 300 600 METERS

PANEL 0195E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 195 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

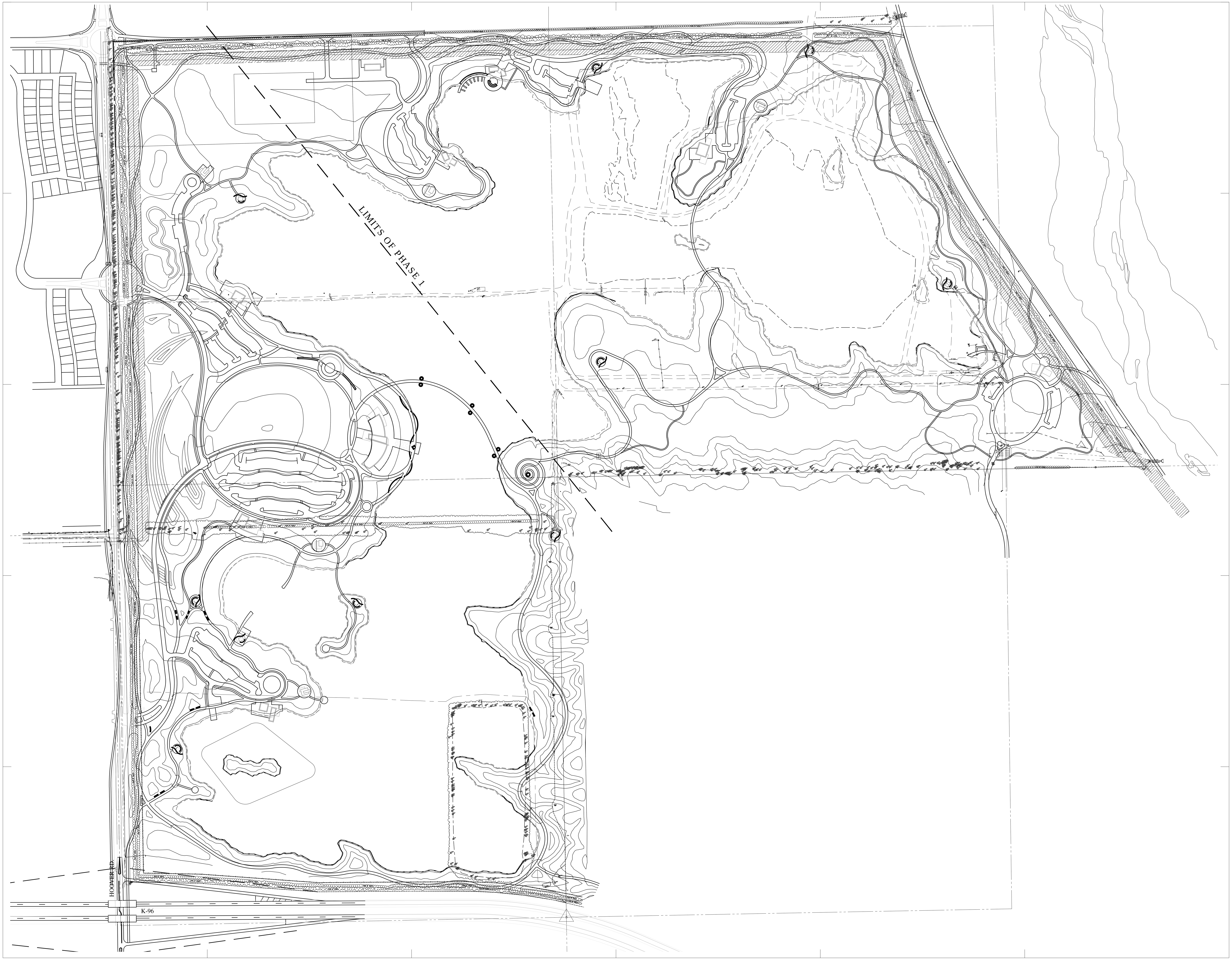
COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0195	E
WICHITA, CITY OF	200328	0195	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
20173C0195E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency



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PRELIMINARY - NOT FOR CONSTRUCTION

Kingsbury Park: Site Layout: Phase One

SITE PLAN

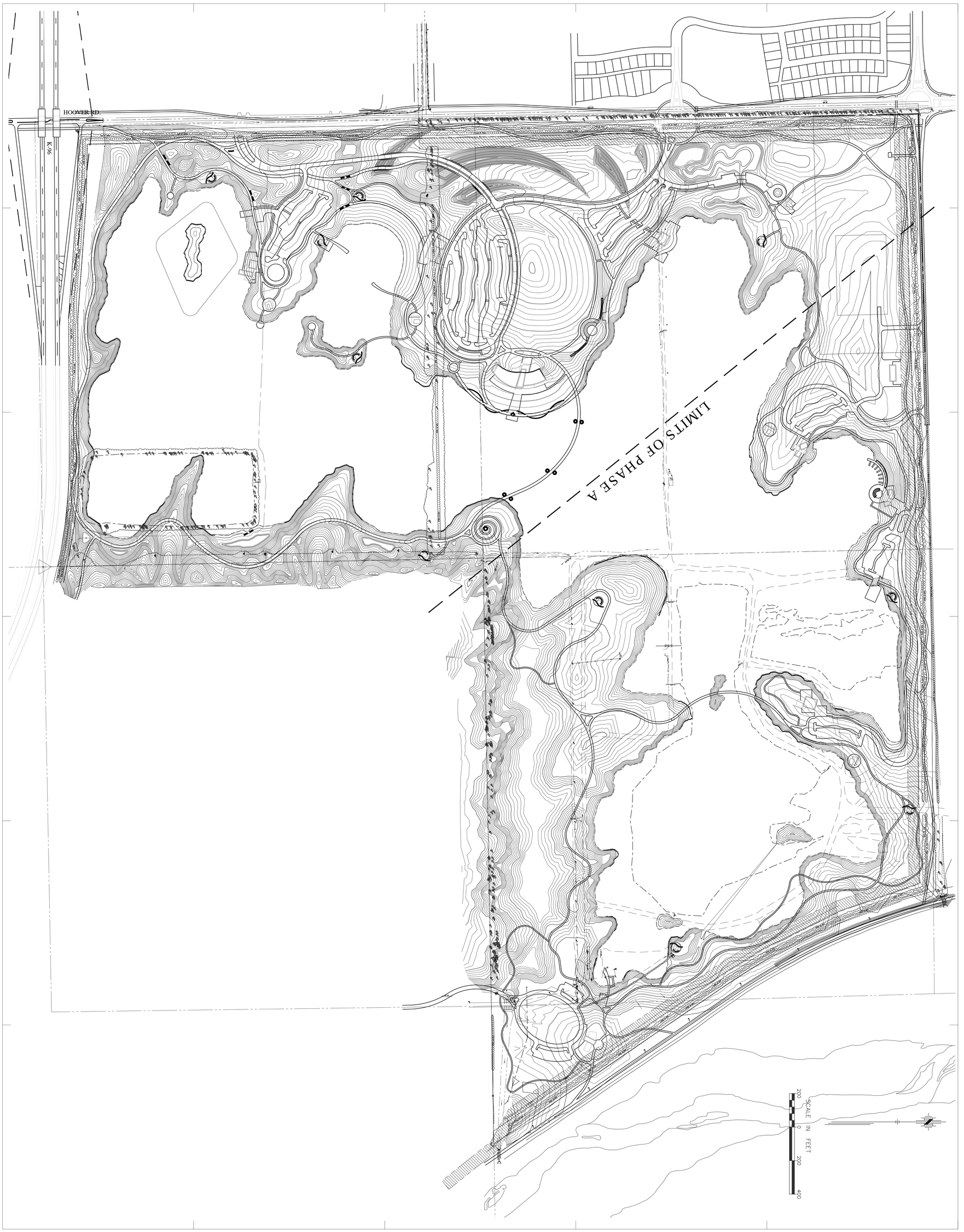
City of Wichita
Wichita, Kansas

Revision Schedule		
Rev	Date	Description

ISSUED: **JANUARY 27, 2012**

PROJECT NO: **28258.01**

PROJECT FILE: **Const. Documents**



Kingsbury Park: Site Layout: Phase One

SITE GRADING PLAN

City of Wichita
Wichita, Kansas

PRELIMMINARY - NOT FOR CONSTRUCTION

Rev	Revision Schedule Date	Description

ISSUED: JANUARY 27, 2012
PROJECT NO: 20256.01
PROJECT FILE: Cook Documents

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Kingsbury Park: Site Layout: Phase One

DRAINAGE INDEX MAP

City of Wichita
Wichita, Kansas

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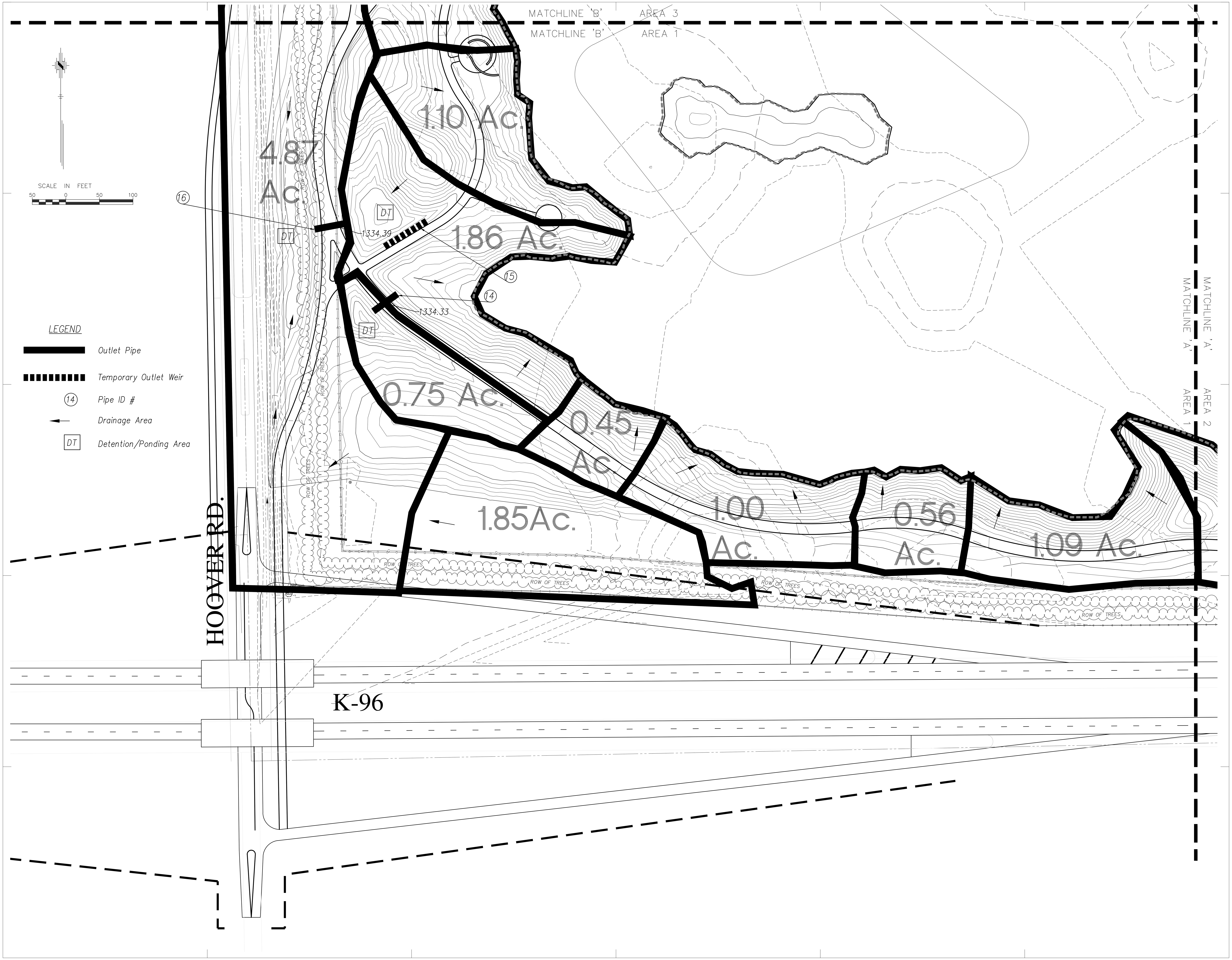
Rev | Revision Schedule | Date | Description

ISSUED: JANUARY 27, 2012
PROJECT NO: 20258.01
PROJECT FILE: Cook Documents



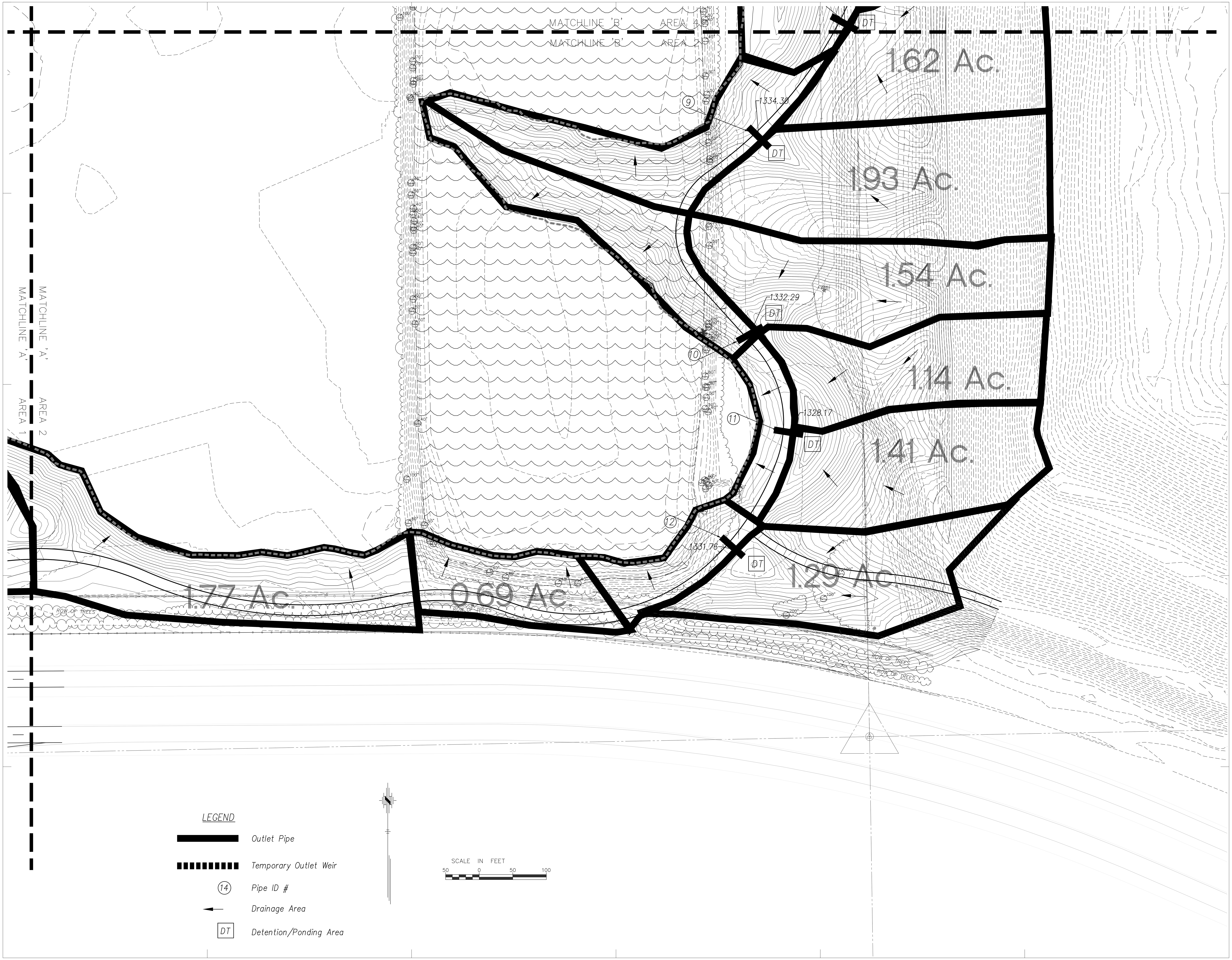
PRELIMINARY - NOT FOR CONSTRUCTION

Kingsbury Park: Site Layout: Phase One

DRAINAGE MAP AREA "1"

City of Wichita
Wichita, Kansas

ISSUED: JANUARY 27, 2012
PROJECT NO: 28258.01
PROJECT FILE: Const. Documents



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PRELIMINARY - NOT FOR CONSTRUCTION

Kingsbury Park: Site Layout: Phase One

DRAINAGE MAP AREA "2"

City of Wichita
Wichita, Kansas

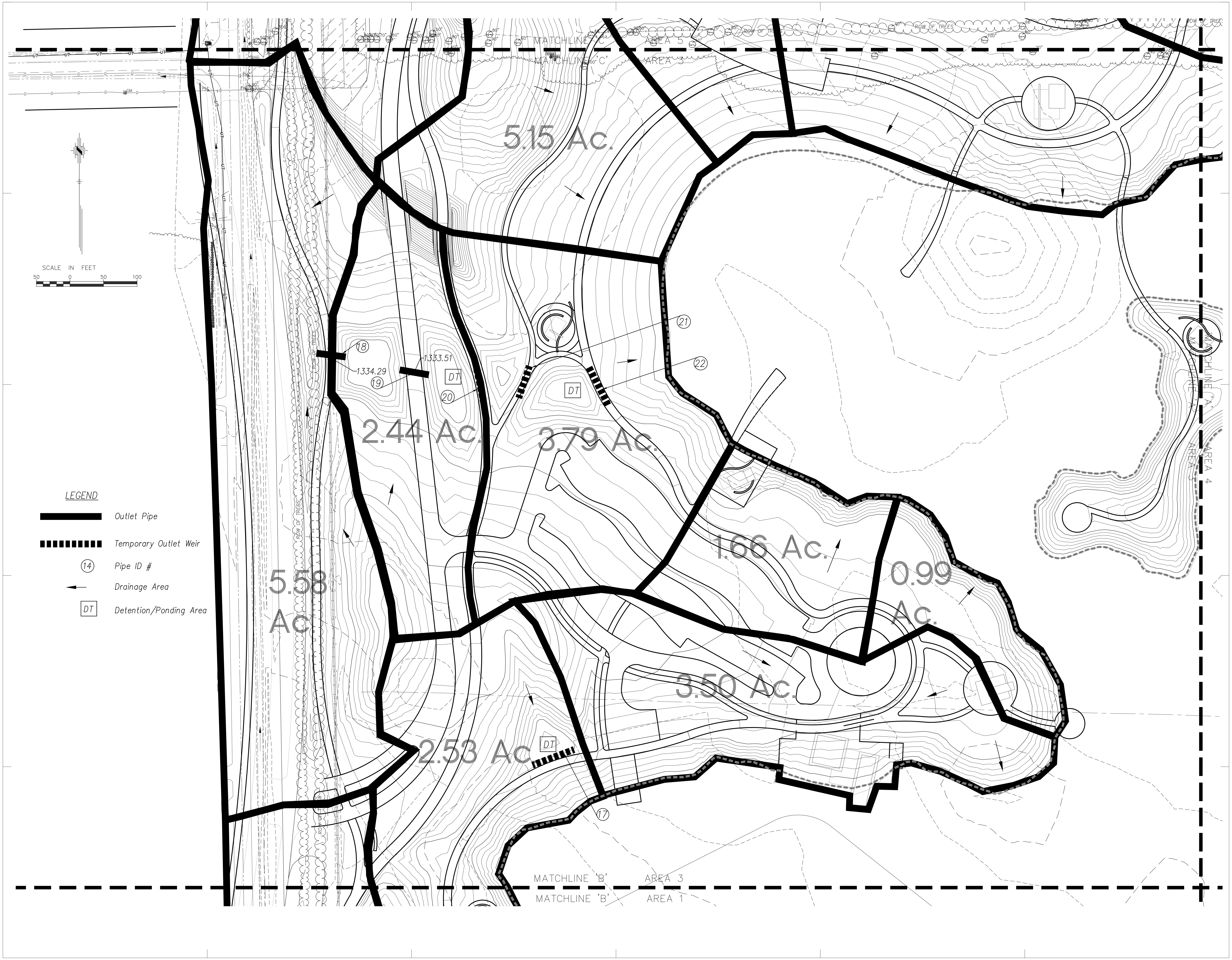
Revision Schedule

Rev	Date	Description

ISSUED: **JANUARY 27, 2012**

PROJECT NO: **28258.01**

PROJECT FILE: **Const. Documents**



Kingsbury Park: Site Layout: Phase One

DRAINAGE MAP AREA "3"

City of Wichita
Wichita, Kansas

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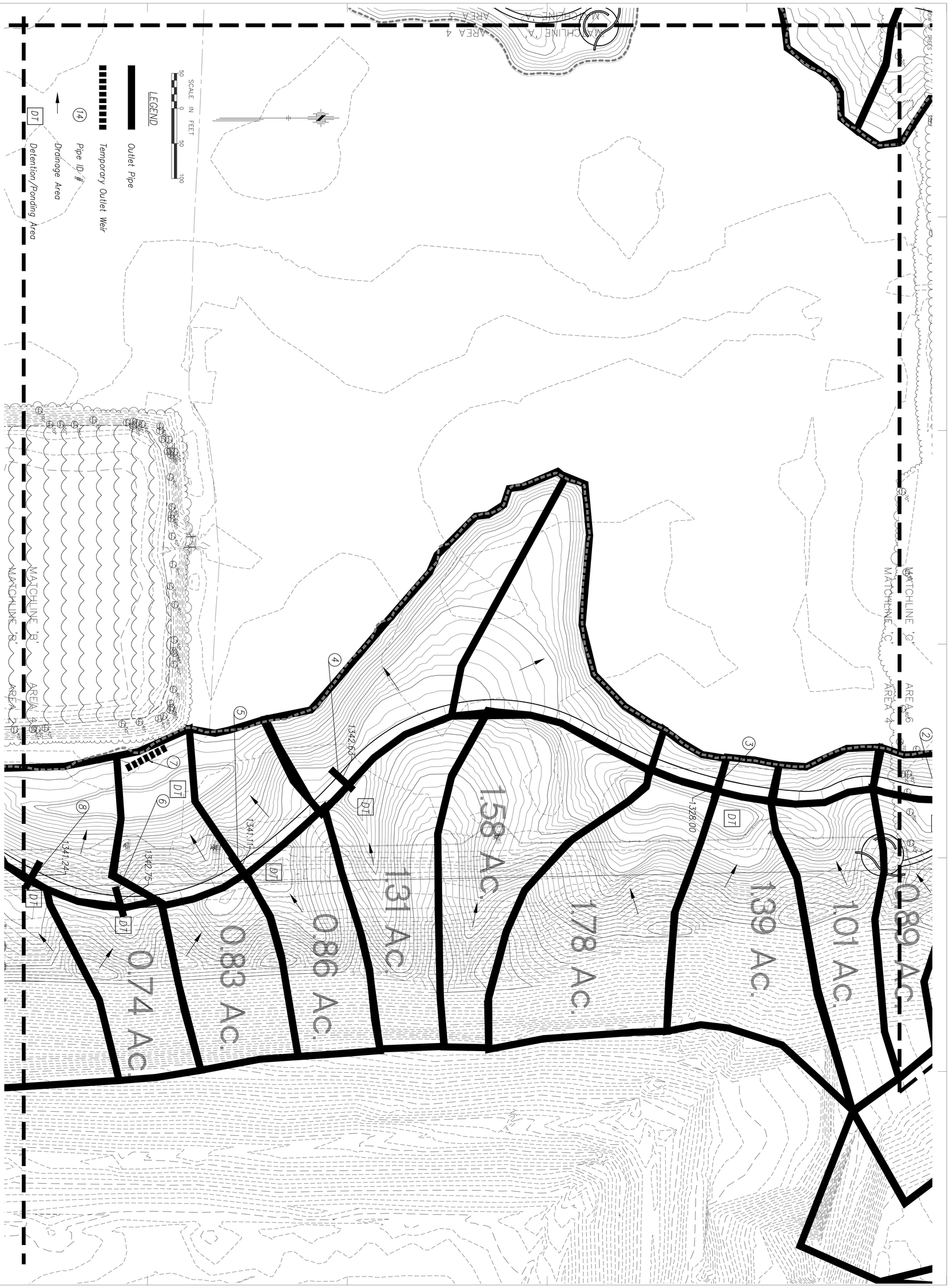
Revision Schedule

Rev	Date	Description

ISSUED: **JANUARY 27, 2012**

PROJECT NO: **28258.01**

PROJECT FILE: **Const. Documents**



ISSUED: JANUARY 27, 2012

PROJECT NO: 28268.01

PROJECT FILE: Const. Documents

Rev | Revision Schedule | Date | Description

Kingsbury Park: Site Layout: Phase One

DRAINAGE MAP AREA "4"

City of Wichita
Wichita, Kansas

PRELIMINARY - NOT FOR CONSTRUCTION

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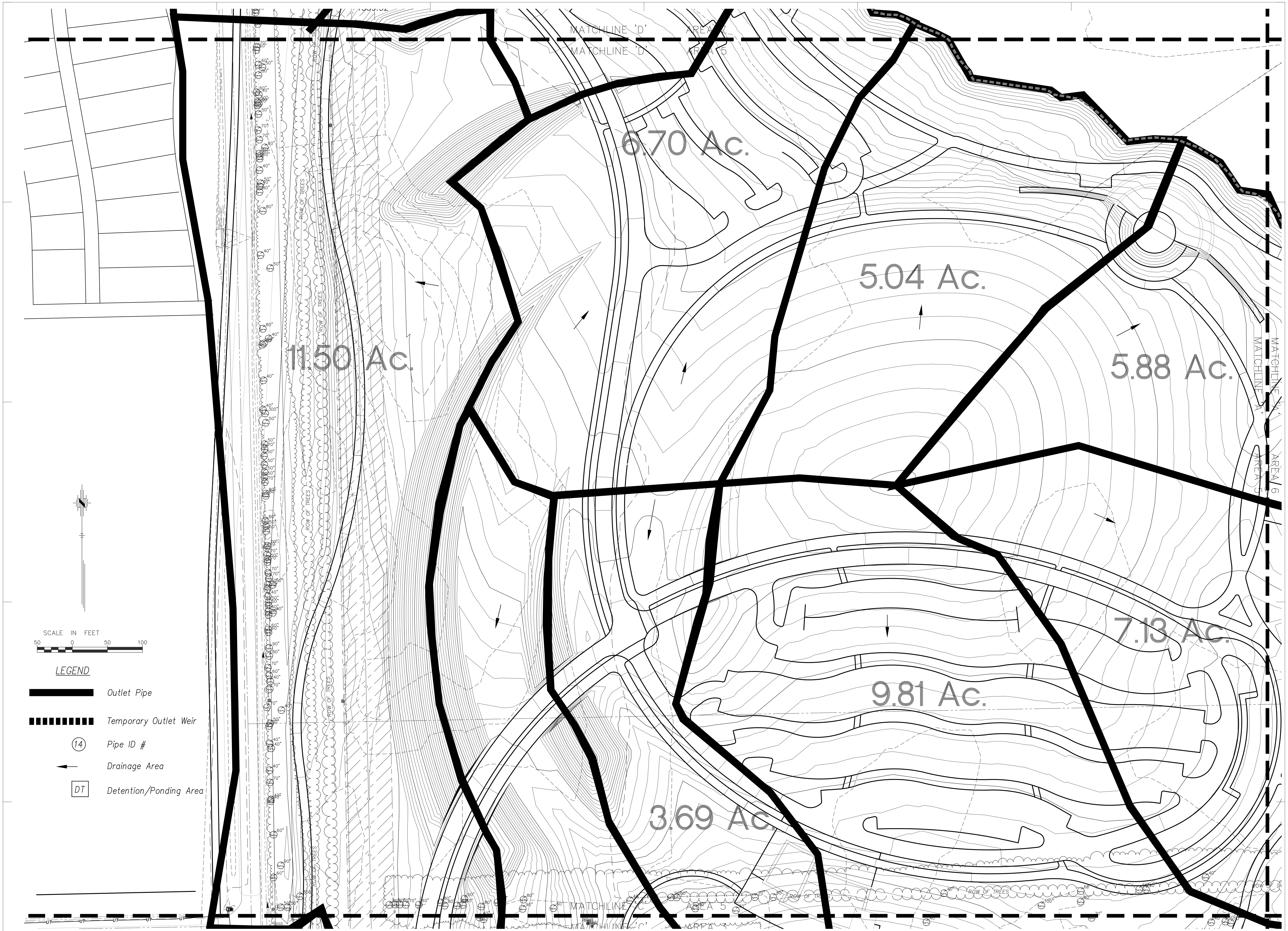

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PRELIMINARY - NOT FOR CONSTRUCTION

Kingsbury Park: Site Layout: Phase One

DRAINAGE MAP AREA "5"

City of Wichita
Wichita, Kansas

Revision Schedule

Rev	Date	Description

ISSUED: JANUARY 27, 2012
PROJECT NO: 28258.01
PROJECT FILE: Const. Documents

MATCHLINE "D" AREA 6

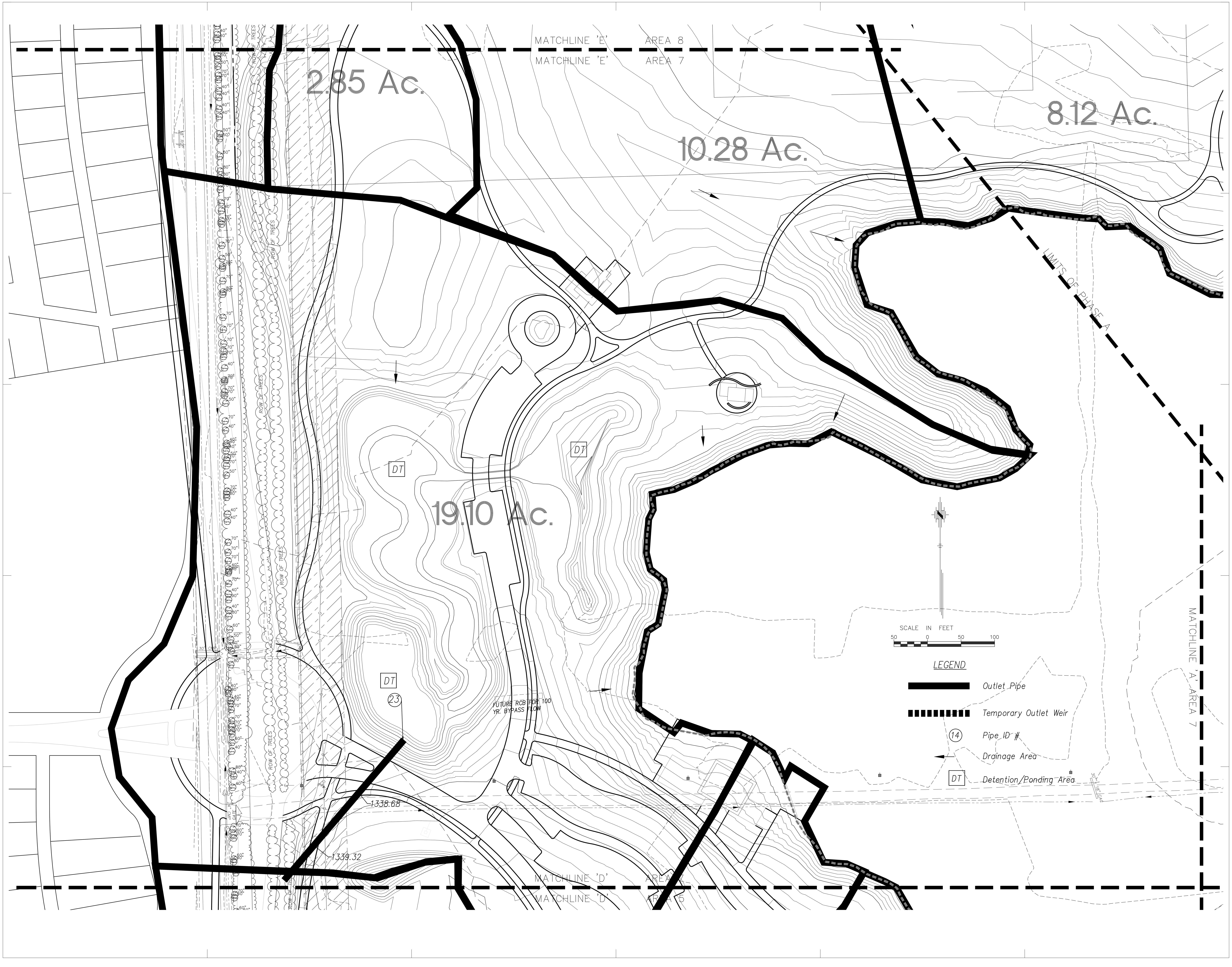
MATCHLINE "C" AREA 4

MATCHLINE "C" AREA 6

MATCHLINE "C"

MATCHLINE "C"

MATCHLINE "C"



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PRELIMINARY - NOT FOR CONSTRUCTION

Kingsbury Park: Site Layout: Phase One

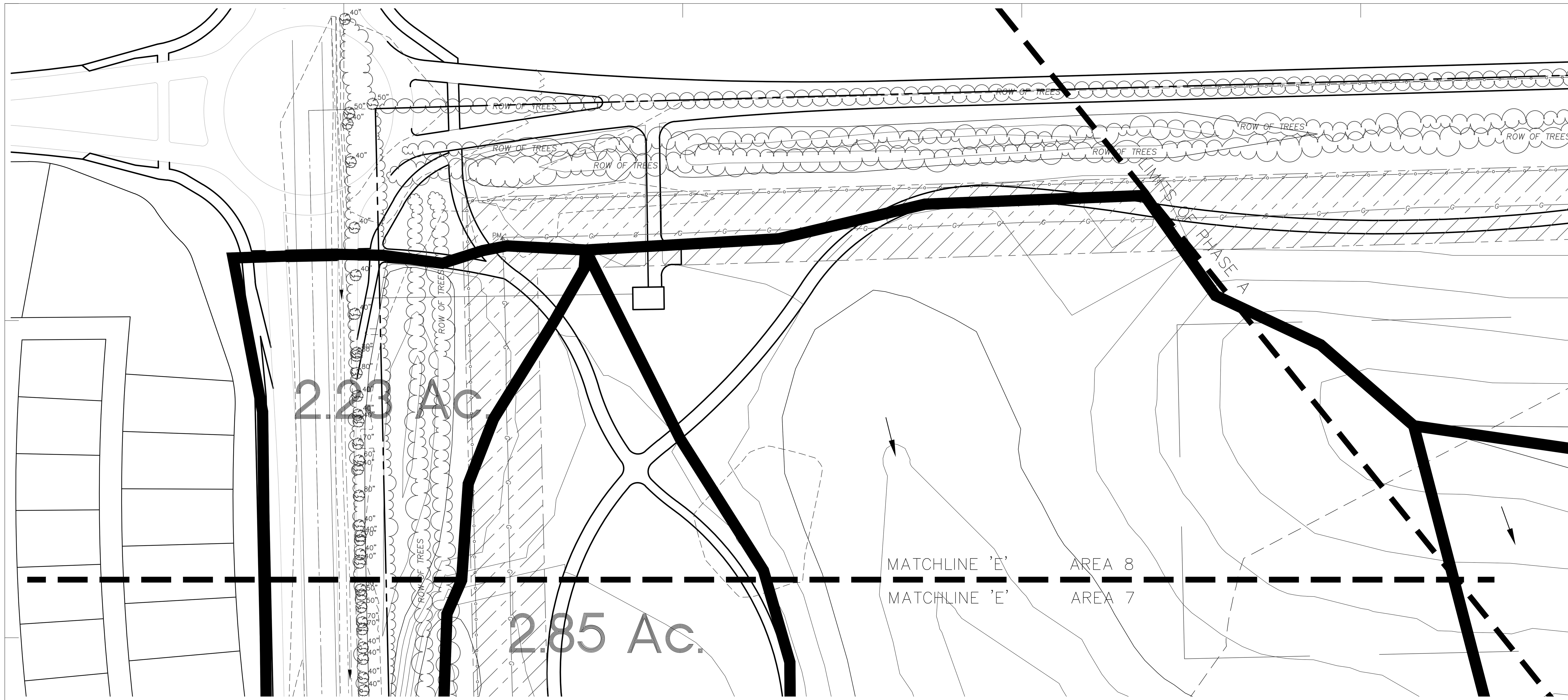
DRAINAGE MAP AREA "7"

City of Wichita
Wichita, Kansas

Revision Schedule

Rev	Date	Description

ISSUED: JANUARY 27, 2012
PROJECT NO: 28258.01
PROJECT FILE: Const. Documents



SCALE IN FEET
50 0 50 100

LEGEND

(thick solid line)	Outlet Pipe
(thick dashed line)	Temporary Outlet Weir
(14)	Pipe ID #
(arrow)	Drainage Area
DT	Detention/Ponding Area

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Kingsbury Park: Site Layout: Phase One

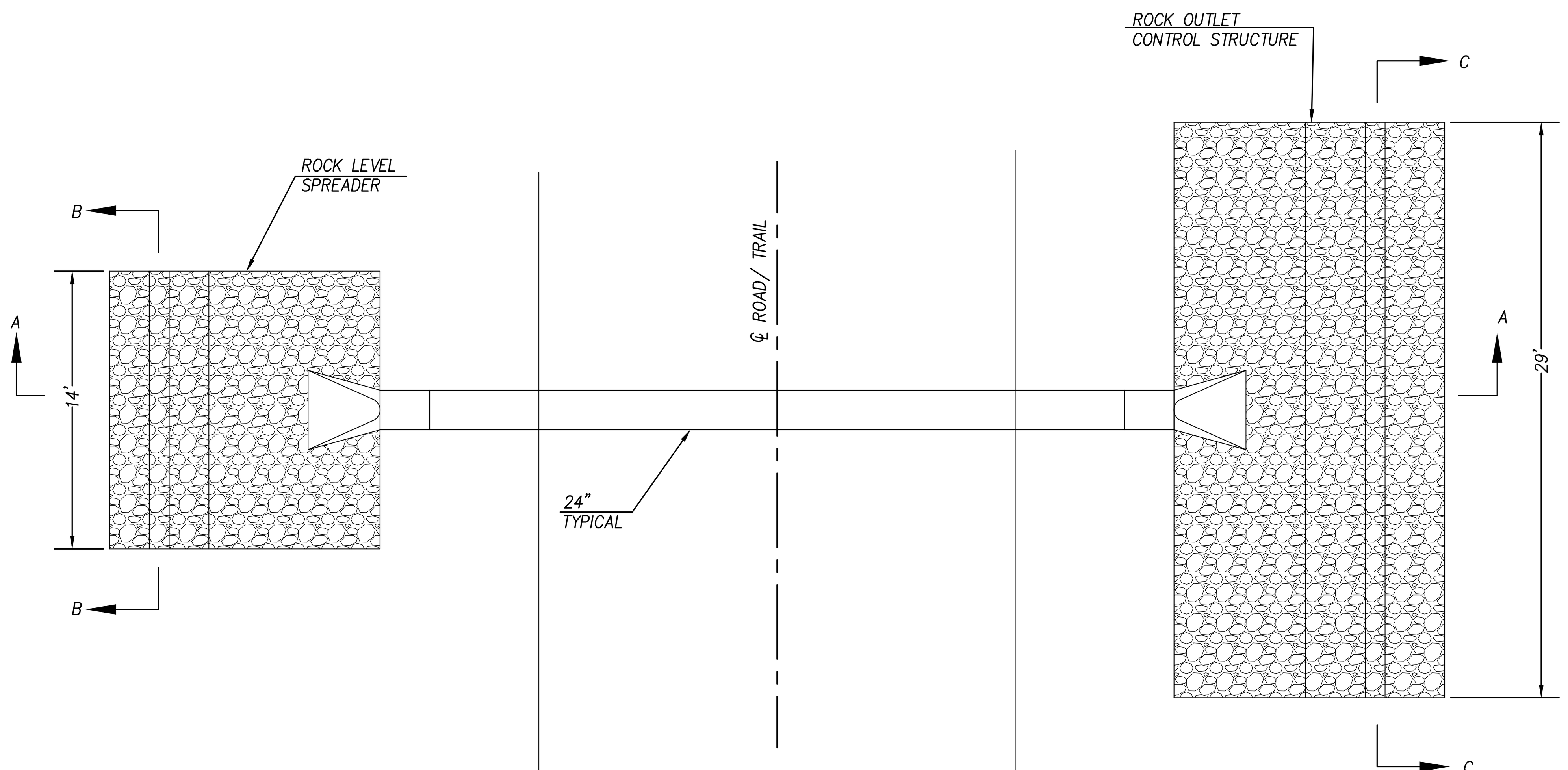
DRAINAGE MAP AREA "8"

City of Wichita
Wichita, Kansas

Revision Schedule

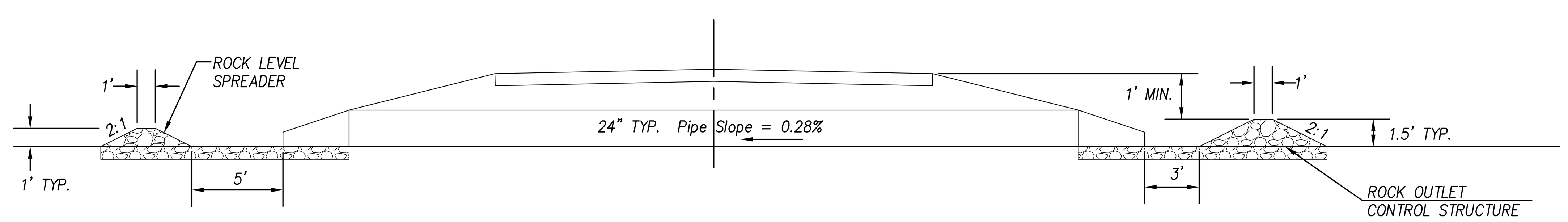
Rev	Date	Description

ISSUED: JANUARY 27, 2012
PROJECT NO: 28258.01
PROJECT FILE: Const. Documents

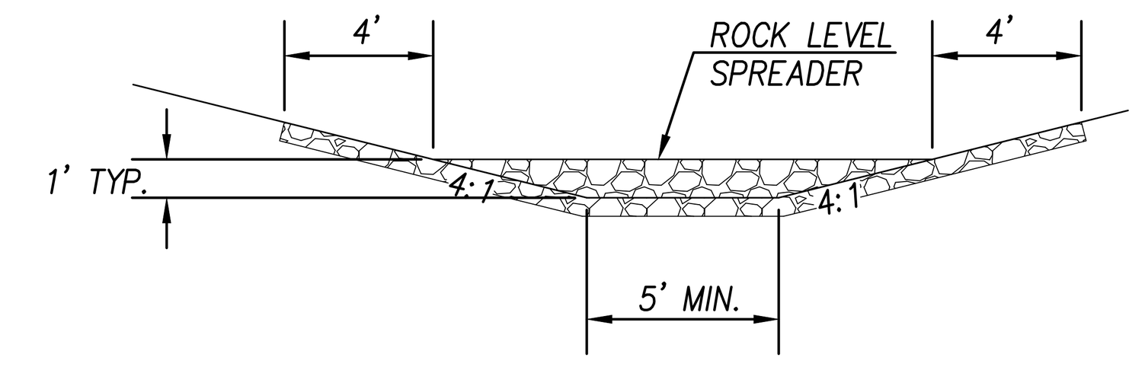


TYPICAL TREATMENT POND OUTLET WITH PIPE

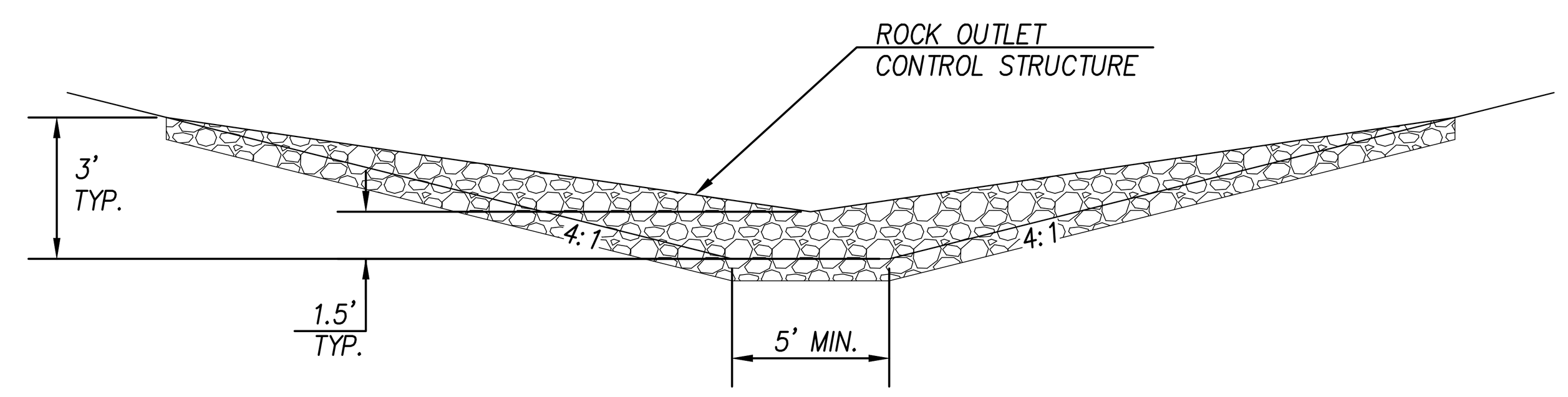
NOTE:
1. ANCHOR RIPRAP LEVEL ROCK SPREADER AND ROCK OUTLET STRUCTURE 2' (MIN) BELOW CHANNEL SECTION.
2. SEE KDOT SPECIFICATIONS FOR AGGREGATE DITCH LINING D(50)=6".
3. PIPE NO. 19 & 23 IS 30".



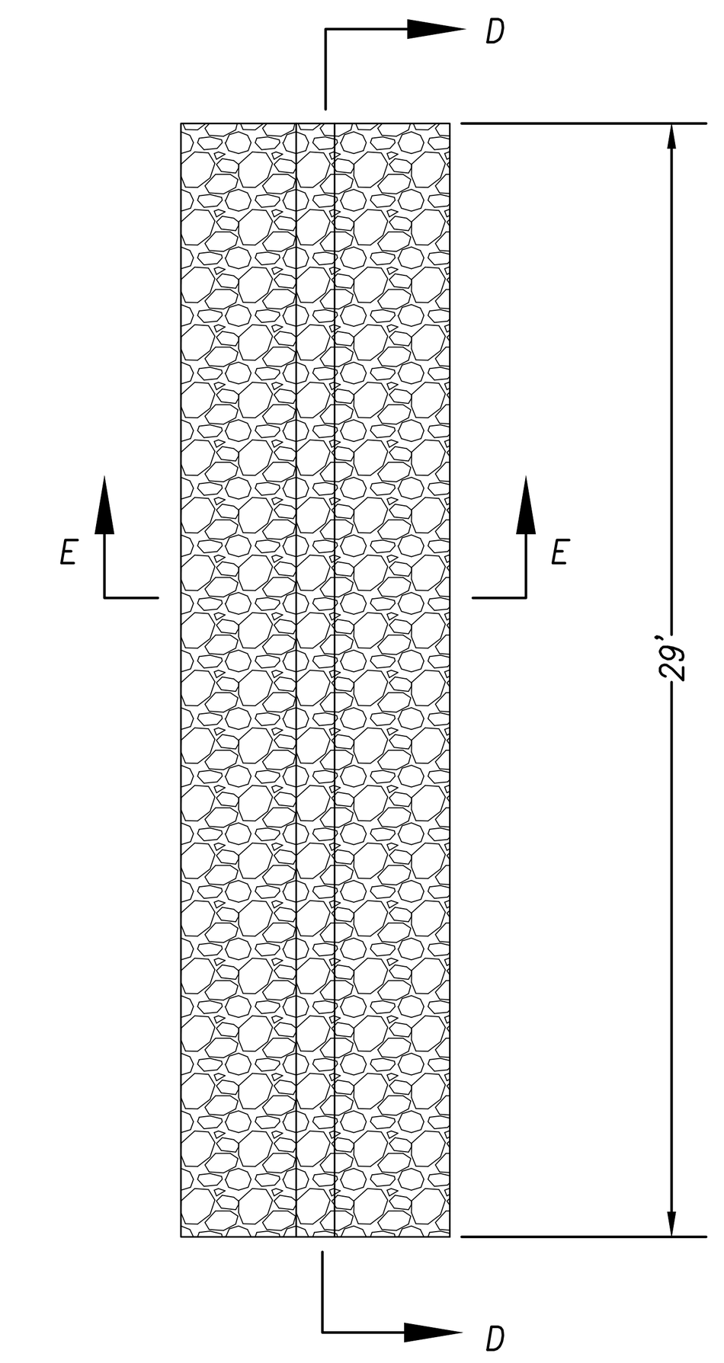
SECTION A–A



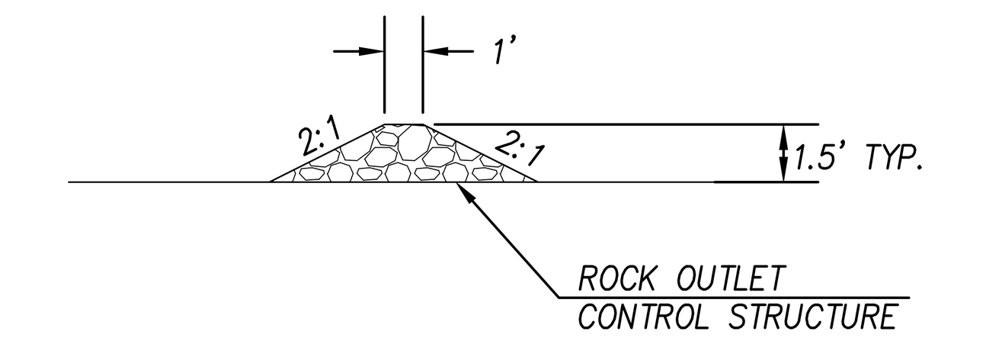
SECTION B–B



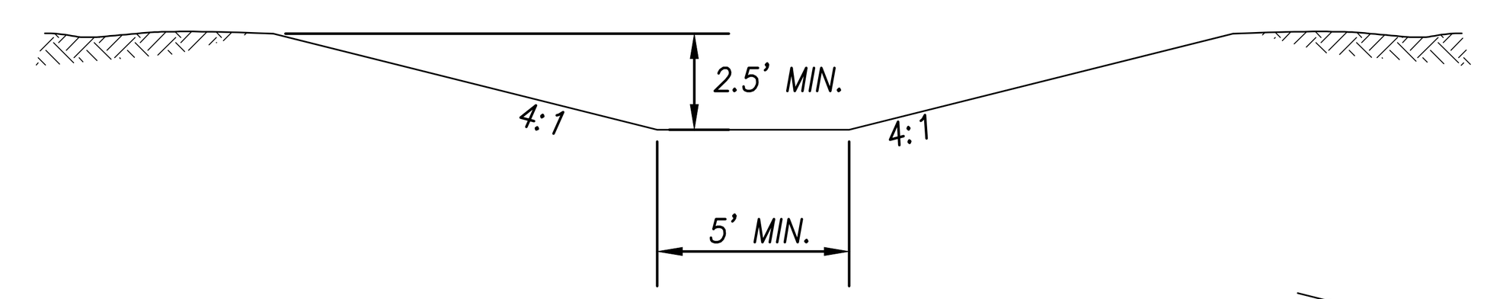
SECTION C–C



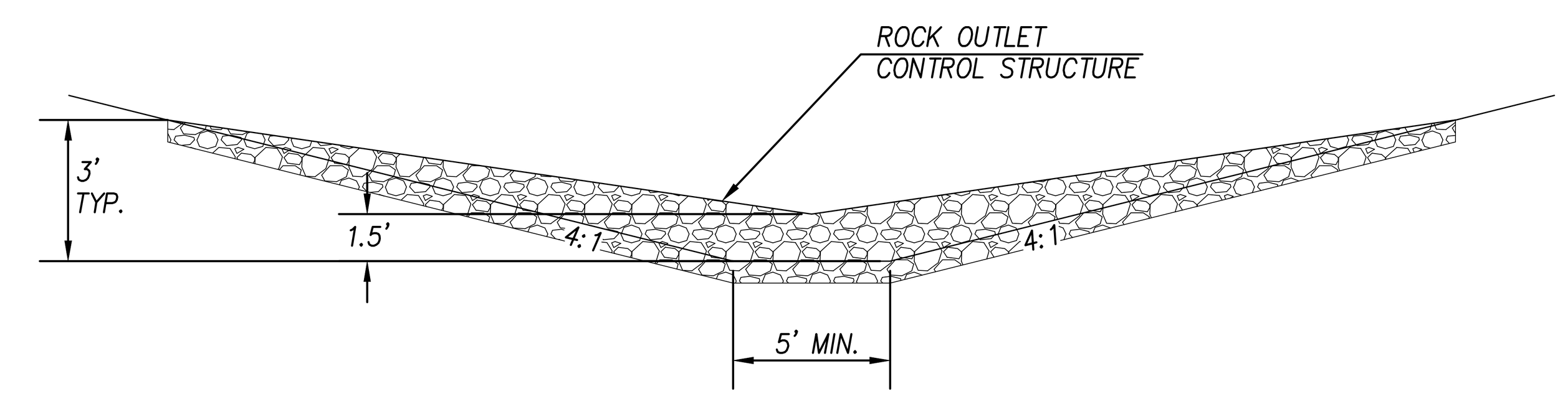
TYPICAL TREATMENT POND OUTLET WEIR



SECTION E–E



TYPICAL GRASS LINED CHANNEL



SECTION D–D

DRAINAGE CHART

D.A. No.	Area (ac.)	Time (min.)	C(10) (cf)	Eq. A (10) (CxA)	I (10) (in./hr.)	Q (10) (cfs)	C(100) (cf)	Eq. A (100) (CxA)	I (100) (in./hr.)	Q (100) (cfs)	FL. Elev. US. (ft)	FL. Elev. DS. (ft)	Top of Trail (ft)	Pipe Length (ft)	Pipe Size (in)	Capacity (cfs)
1A	0.70	15	0.32	0.22	5.22	1.2	0.45	0.32	7.37	2.3	1332.04	1331.92	1336.04	44	24	19.0
1	1.49	15	0.32	0.48	5.22	2.5	0.45	0.67	7.37	4.9	1329.00	1328.88	1332.97	44	24	19.0
2	0.89	15	0.32	0.28	5.22	1.5	0.45	0.40	7.37	3.0	1329.00	1328.88	1333.00	44	24	19.0
3	5.76	20	0.32	1.84	4.60	8.5	0.45	2.59	6.53	16.9	1324.00	1323.88	1328.00	44	24	19.0
4	1.31	15	0.32	0.42	5.22	2.2	0.45	0.59	7.37	4.3	1338.63	1338.51	1342.63	44	24	19.0
5	1.69	15	0.32	0.54	5.22	2.8	0.45	0.76	7.37	5.6	1337.11	1336.99	1341.11	44	24	19.0
6	0.74	10	0.32	0.24	6.09	1.4	0.45	0.33	8.54	2.8	1338.75	1338.63	1342.75	44	24	19.0
8	1.62	15	0.32	0.52	5.22	2.7	0.45	0.73	7.37	5.4	1337.24	1337.12	1341.24	44	24	19.0
9	1.93	15	0.32	0.62	5.22	3.2	0.45	0.87	7.37	6.4	1330.30	1330.18	1334.30	44	24	19.0
10	1.54	15	0.32	0.49	5.22	2.6	0.45	0.69	7.37	5.1	1328.29	1328.17	1332.29	44	24	19.0
11	2.55	15	0.32	0.82	5.22	4.3	0.45	1.15	7.37	8.5	1324.17	1324.05	1328.17	44	24	19.0
12	1.29	15	0.32	0.41	5.22	2.2	0.45	0.58	7.37	4.3	1327.76	1327.64	1331.76	44	24	19.0
14	0.75	15	0.32	0.24	5.22	1.3	0.45	0.34	7.37	2.5	1329.83	1329.71	1334.33	44	24	19.0
16	6.72	20	0.32	2.15	4.60	9.9	0.45	3.02	6.53	19.7	1329.89	1329.74	1334.39	54	24	19.0
18	5.58	20	0.32	1.79	4.60	8.2	0.45	2.51	6.53	16.4	1330.29	1330.17	1334.29	44	24	19.0
19	8.02	20	0.32	2.57	4.60	11.8	0.45	3.61	6.53	23.6	1329.51	1329.31	1333.51	70	30	30.0
23	11.50	30	0.32	3.68	3.76	13.8	0.45	5.18	5.4	27.9	1335.00	1334.16	1339.00	275	30	30.0

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PRELIMINARY - NOT FOR CONSTRUCTION

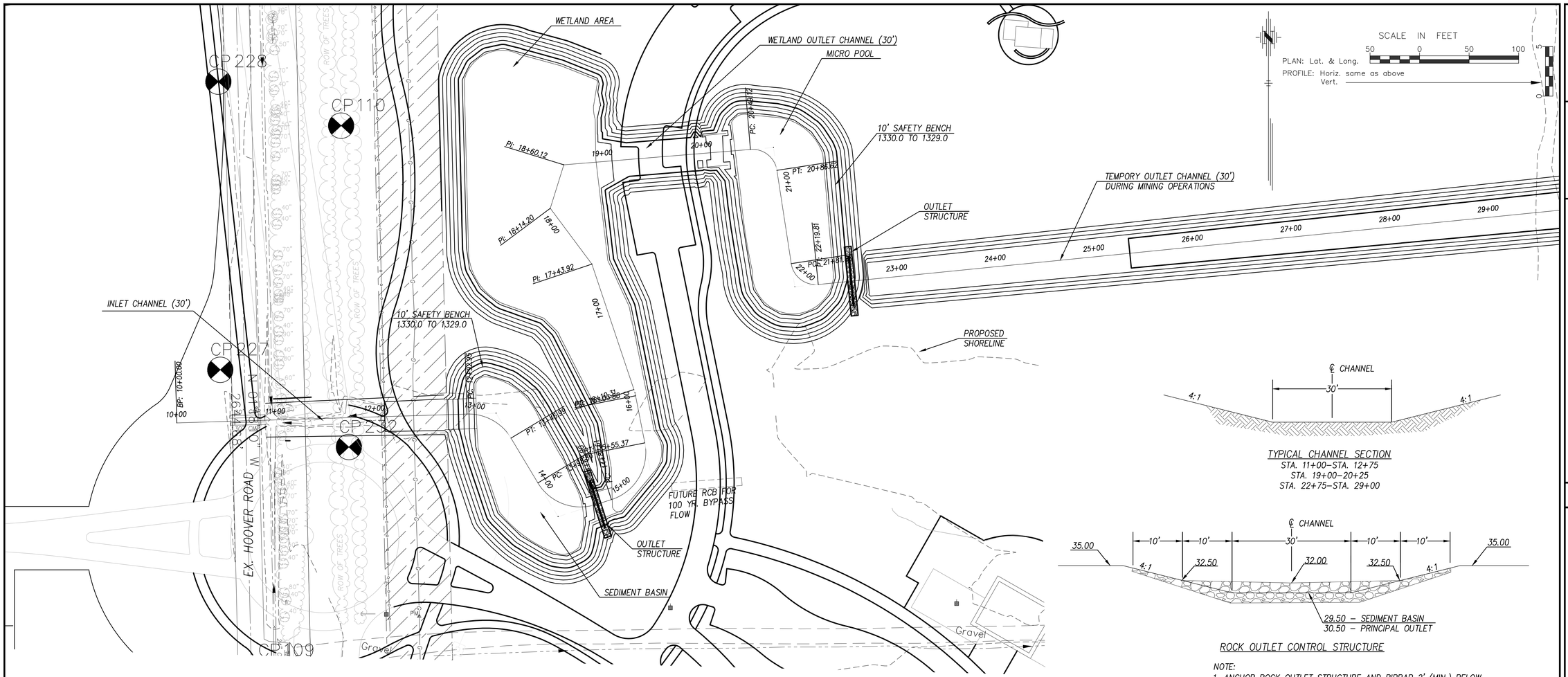
Kingsbury Park: Site Layout: Phase One

DRAINAGE DETAILS

City of Wichita
Wichita, Kansas

Rev	Revision Schedule Date	Description

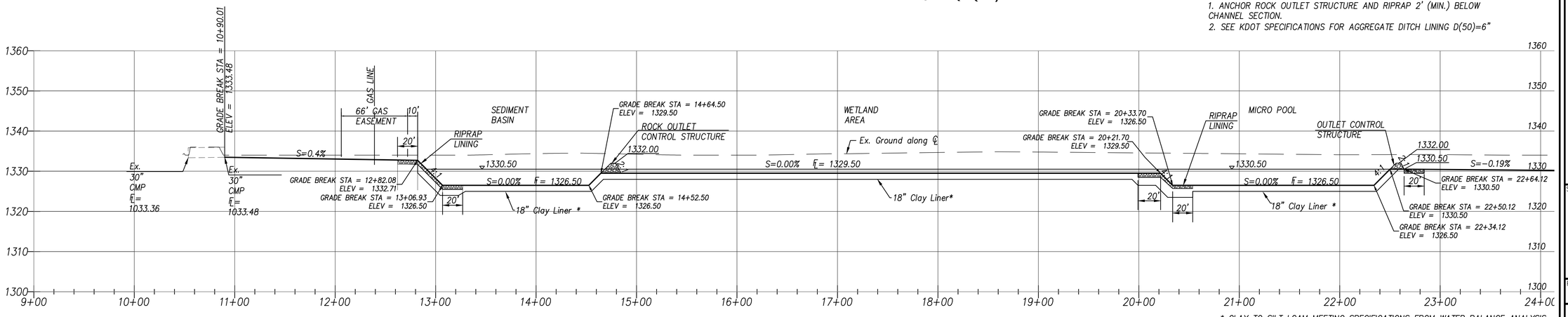
ISSUED: JANUARY 27, 2012
PROJECT NO: 28258.01
PROJECT FILE: Const. Documents



TYPICAL CHANNEL SECTION
STA. 11+00–STA. 12+75
STA. 19+00–20+25
STA. 22+75–STA. 29+00

ROCK OUTLET CONTROL STRUCTURE

NOTE:
1. ANCHOR ROCK OUTLET STRUCTURE AND RIPRAP 2' (MIN.) BELOW CHANNEL SECTION.
2. SEE KDOT SPECIFICATIONS FOR AGGREGATE DITCH LINING D(50)=6"



* CLAY TO SILT LOAM MEETING SPECIFICATIONS FROM WATER BALANCE ANALYSIS. THIS SOIL TYPE HAS NOT CURRENTLY BEEN IDENTIFIED ON SITE.

REVISED

SEAL:

Cook, Flatt & Strobel ENGINEERS, P.A.

CFS PROJECT NO: 08-565

OFFSITE RUNOFF TREATMENT FACILITY
KINGSBURY

DATE: 1/27/2012 DESIGNED BY: DWH DRAWN BY: KW CHECKED BY: KB

SHEET TITLE:
OFFSITE RUNOFF TREATMENT FACILITY

PROJECT NUMBER 08-565

FINAL SUBMITTAL

SHEET NUMBER: C.01

J:\2008\Proj\08565\DWG\WETLANDS PROFILE @ 30 SCALE.dwg, 1/25/2012 8:09:04 AM

420.02

SCALE IN FEET

50 0 50 100

PLAN: Lat. & Long.

PROFILE: Horiz. same as above

Vert.

TEMPORY OUTLET CHANNEL (30')
DURING MINING OPERATIONS

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00

PVI 38+13.11

1360 1350 1340 1330 1320 1310 1300

Ex. Ground along ℄

Proposed Ground along ℄

S=-0.19%

+64.12

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00

REVISED

SEAL:

CFS Cook, Flatt & Strobel ENGINEERS, P.A.

CFS PROJECT NO: 08-565

OFFSITE RUNOFF TREATMENT FACILITY

KINGSBURY

DATE: 1/27/2012 DESIGNED BY: DWH DRAWN BY: KW CHECKED BY: KB

SHEET TITLE:

OFFSITE RUNOFF TREATMENT FACILITY

PROJECT NUMBER 08-565

FINAL SUBMITTAL

SHEET NUMBER: C.02

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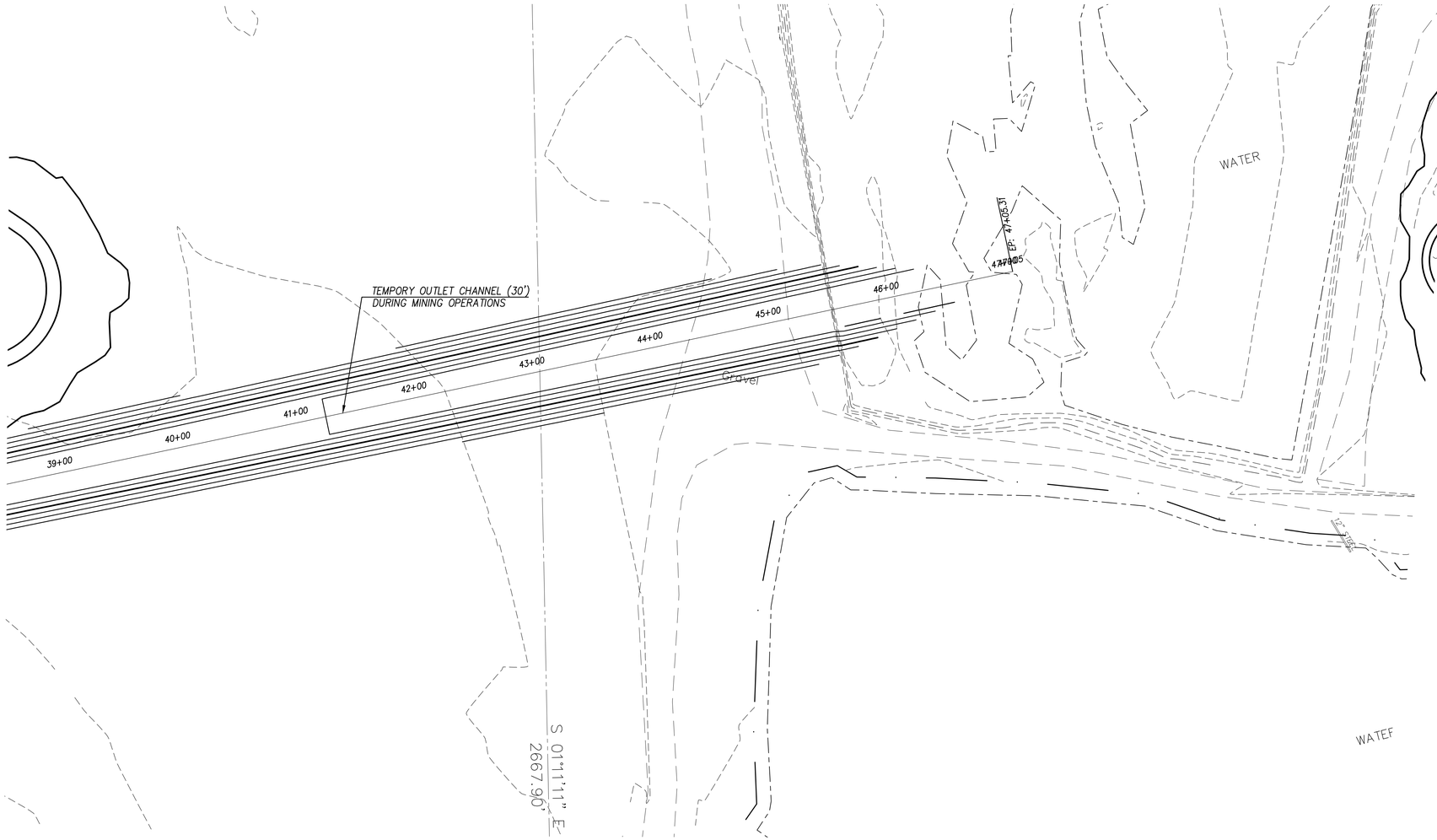

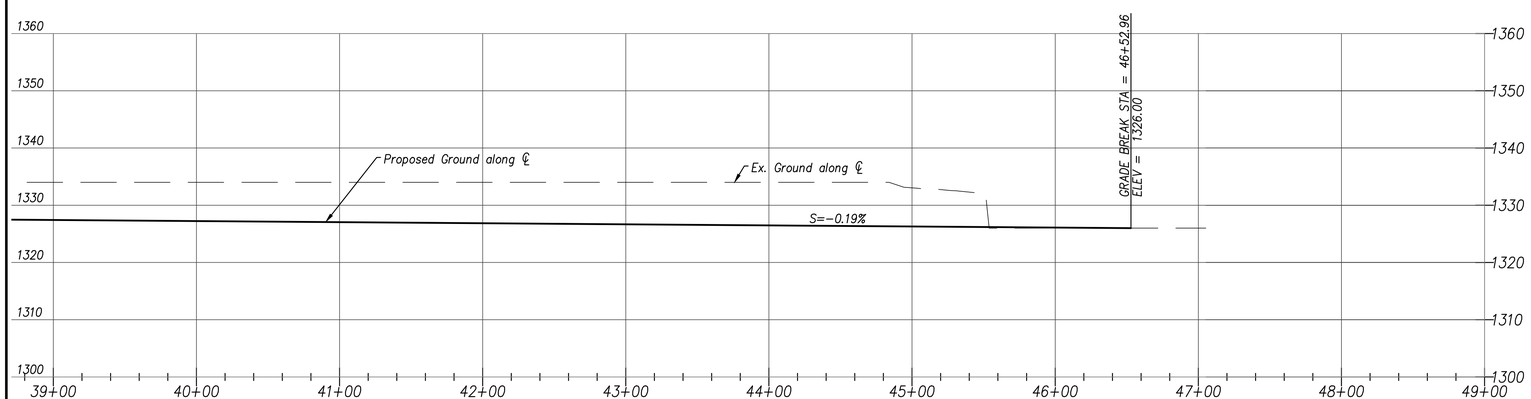

REVISED

SEAL:

Cook, Flatt & Strobel ENGINEERS, P.A.

CFS PROJECT NO: 08-565

OFFSITE RUNOFF TREATMENT FACILITY
KINGSBURY

DATE: 1/27/2012 DESIGNED BY: DWH DRAWN BY: KW CHECKED BY: KB

SHEET TITLE:
OFFSITE RUNOFF TREATMENT FACILITY

PROJECT NUMBER 08-565

FINAL SUBMITTAL

SHEET NUMBER: C.03

100-Year Runoff Analysis
Kingsbury Park
City of Wichita
NRCS/SCS Curve Number Method

P=	7.8	in.	100 Yr.
CN=	88		
S=	1.36		
Ia=	0.27		
(P-.02S)^2	56.66		
(P+.08S)	8.89		
Q=	6.37	in.	
Area=	515	Acres	
Total Volume=	273.50	Ac-ft	On-site
Total Volume=	147.97	Ac-ft	Off-site*
Total for Lake	**421.47**	**Ac-ft**	100 Yr.
Lake Area	223	Ac.	
Total Elev. Rise	1.89	Ft.	
Normal WSEL	1024	Ft.	
100 yr. WSEL	1025.89	Ft.	
High WSEL	1026	Ft.	
100 yr. WSEL	**1027.89**	**Ft.**	

*See next Page

Off-site 100-Year Runoff Analysis
Kingsbury Park
City of Wichita
NRCS/SCS Curve Number Method

P(100)=	7.8	in.	
P(50=	6.9	in.	
P(25)=	6.1	in.	
P(10)=	5.2	in.	
P(5)=	4.5	in.	
P(2)=	3.5	in.	
P(1)=	2.8	in.	
CN=	71		
S=	4.08		
Ia=	0.817		
(P-.02S)^2	48.76		
(P+.08S)	11.07		
Q(100)=	4.41	in.	
Area=	403	Acres	
Total Volume=	**147.97**	**Ac-ft**	**100 Yr.**

Water Quality
Treatment Facility for
Off-site Runoff

Volume

P=	1.2	in.	
Rvu=	0.03	357	acre
Rvd=	0.20	30	acre
Rvi=	0.95	10	acre
Rv=	0.0660		
Area=	403.2	Acres	
Total Volume(Qwv)=	2.66	Ac-ft	
Total Volume(Qwv)=	0.08	in	

Runoff Peak

P=	1.2	in.	
(Qwv^2+1.25Qwv*P)	0.13		
10*(Qwv^2+1.25Qwv*P)^(1/2)	3.54		
10+5P+10Qwv	16.79		
CN=	75.44		
S=	3.26		
Ia=	0.65		
Ia/P=	0.54		
qu=	95.00	cfs/mi^2-in	
A=	0.6300	mi^2	
Tc=	2.5	hrs	
Fp=	100.0%		
Q(peak)=	4.7	cfs	

Water Balance Worksheet

Kingsbury Park

5/13/2011 Year 1

1	Months of Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2	Days per month	31	28	31	30	31	30	31	31	30	31	30	31
3	Monthly Precipitation (in.)	0.90	1.09	2.85	2.69	4.38	4.48	3.49	3.10	3.10	2.59	1.92	1.41
4	Monthly Evaporation (in.)	1.16	1.47	2.90	4.12	5.25	6.13	6.76	6.42	4.20	3.28	1.84	1.39
5	Monthly Evapotranspiration (in.)	0.00	0.12	0.79	1.93	3.57	5.69	6.71	6.09	4.03	2.04	0.56	0.02
6	Runoff (ac-ft)	1.77	2.14	5.60	5.29	8.61	8.80	6.86	6.09	6.09	5.09	3.77	2.77
7	Precipitation (ac-ft)	0.19	0.23	0.59	0.56	0.91	0.93	0.73	0.65	0.65	0.54	0.40	0.29
8	Evaporation (ac-ft)	0.24	0.31	0.60	0.86	1.09	1.28	1.41	1.34	0.88	0.68	0.38	0.29
9	Infiltration (ac-ft)	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
10	Evapotranspiration (ac-ft)	0.00	0.02	0.16	0.40	0.74	1.19	1.40	1.27	0.84	0.42	0.12	0.00
11	Balance (ac-ft)	0.36	0.69	4.08	3.24	6.33	5.92	3.43	2.78	3.67	3.17	2.32	1.42
12	Running Balance (ac-ft)	0.36	1.05	5.13	8.37	11.53	11.12	8.63	7.98	8.87	8.37	7.52	6.62
13	Max. Running Balance (ac-ft)	0.36	1.05	5.13	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20

Water Balance Worksheet

Kingsbury Park

5/13/2011 Year 2

1	Months of Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2	Days per month	31	28	31	30	31	30	31	31	30	31	30	31
3	Monthly Precipitation (in.)	0.90	1.09	2.85	2.69	4.38	4.48	3.49	3.10	3.10	2.59	1.92	1.41
4	Monthly Evaporation (in.)	1.16	1.47	2.9	4.12	5.25	6.13	6.76	6.42	4.2	3.28	1.84	1.39
5	Monthly Evapotranspiration (in.)	0.00	0.12	0.79	1.93	3.57	5.69	6.71	6.09	4.03	2.04	0.56	0.02
6	Runoff (ac-ft)	1.77	2.14	5.60	5.29	8.61	8.80	6.86	6.09	6.09	5.09	3.77	2.77
7	Precipitation (ac-ft)	0.19	0.23	0.59	0.56	0.91	0.93	0.73	0.65	0.65	0.54	0.40	0.29
8	Evaporation (ac-ft)	0.24	0.31	0.60	0.86	1.09	1.28	1.41	1.34	0.88	0.68	0.38	0.29
9	Infiltration (ac-ft)	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
10	Evapotranspiration (ac-ft)	0.00	0.02	0.16	0.40	0.74	1.19	1.40	1.27	0.84	0.42	0.12	0.00
11	Balance (ac-ft)	0.36	0.69	4.08	3.24	6.33	5.92	3.43	2.78	3.67	3.17	2.32	1.42
12	Running Balance (ac-ft)	5.56	5.89	9.28	8.44	11.53	11.12	8.63	7.98	8.87	8.37	7.52	6.62
13	Max. Running Balance (ac-ft)	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20

Water Balance Worksheet

Kingsbury Park

5/13/2011 Year 3

	Months of Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2	Days per month	31	28	31	30	31	30	31	31	30	31	30	31
3	Monthly Precipitation (in.)	0.90	1.09	2.85	2.69	4.38	4.48	3.49	3.10	3.10	2.59	1.92	1.41
4	Monthly Evaporation (in.)	1.16	1.47	2.9	4.12	5.25	6.13	6.76	6.42	4.2	3.28	1.84	1.39
5	Monthly Evapotranspiration (in.)	0.00	0.12	0.79	1.93	3.57	5.69	6.71	6.09	4.03	2.04	0.56	0.02
6	Runoff (ac-ft)	1.77	2.14	5.60	5.29	8.61	8.80	6.86	6.09	6.09	5.09	3.77	2.77
7	Precipitation (ac-ft)	0.19	0.23	0.59	0.56	0.91	0.93	0.73	0.65	0.65	0.54	0.40	0.29
8	Evaporation (ac-ft)	0.24	0.31	0.60	0.86	1.09	1.28	1.41	1.34	0.88	0.68	0.38	0.29
9	Infiltration (ac-ft)	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
10	Evapotranspiration (ac-ft)	0.00	0.02	0.16	0.40	0.74	1.19	1.40	1.27	0.84	0.42	0.12	0.00
11	Balance (ac-ft)	0.36	0.69	4.08	3.24	6.33	5.92	3.43	2.78	3.67	3.17	2.32	1.42
12	Running Balance (ac-ft)	5.56	5.89	9.28	8.44	11.53	11.12	8.63	7.98	8.87	8.37	7.52	6.62
13	Max. Running Balance (ac-ft)	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20

Water Balance Worksheet

Kingsbury Park

Input Data

Runoff		
Drainage Area =	397.0	acres
Wetland/pond area=	2.5	acres
Rv=	0.066	
Infiltration		
Area=	2.5	acres
Silt loam Kh=	0.54	ft/day
Gh=	1.0	
Pond Volume=	5.2	(ac-ft)

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Kingsbury Park Wichita

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Kingsbury On-site	24_HR_Type_II - , 1 yrs	1	70.449	13.300	228.12
Kingsbury On-site	24_HR_Type_II - , 2 yrs	2	97.364	13.300	317.21
Kingsbury On-site	24_HR_Type_II - , 5 yrs	5	137.171	13.300	447.17
Kingsbury On-site	24_HR_Type_II - , 10 yrs	10	165.624	13.300	538.88
Kingsbury On-site	24_HR_Type_II - , 25 yrs	25	202.661	13.300	657.00
Kingsbury On-site	24_HR_Type_II - , 50 yrs	50	235.883	13.300	761.94
Kingsbury On-site	24_HR_Type_II - , 100 yrs	100	273.497	13.300	879.76
Kingsbury On-site	24_HR_Type_II - , 500 yrs	500	349.236	13.300	1,114.44

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
O-1	24_HR_Type_II - , 1 yrs	1	70.449	13.300	228.12
O-1	24_HR_Type_II - , 2 yrs	2	97.364	13.300	317.21
O-1	24_HR_Type_II - , 5 yrs	5	137.171	13.300	447.17
O-1	24_HR_Type_II - , 10 yrs	10	165.624	13.300	538.88
O-1	24_HR_Type_II - , 25 yrs	25	202.661	13.300	657.00
O-1	24_HR_Type_II - , 50 yrs	50	235.883	13.300	761.94
O-1	24_HR_Type_II - , 100 yrs	100	273.497	13.300	879.76
O-1	24_HR_Type_II - , 500 yrs	500	349.236	13.300	1,114.44

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Time-Depth Curve: TypeII 24hr (2.8 in)	
Label	TypeII 24hr (2.8 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.2	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.3	0.3	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.4	0.4
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.5	0.6
10.500	0.6	0.6	0.6	0.6	0.6
11.000	0.7	0.7	0.7	0.7	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	1.9	2.0	2.0	2.0
12.500	2.1	2.1	2.1	2.1	2.1
13.000	2.2	2.2	2.2	2.2	2.2
13.500	2.2	2.3	2.3	2.3	2.3
14.000	2.3	2.3	2.3	2.3	2.3
14.500	2.3	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.4	2.4	2.4
15.500	2.4	2.4	2.4	2.5	2.5
16.000	2.5	2.5	2.5	2.5	2.5

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	2.5	2.5	2.5	2.5	2.5
17.000	2.5	2.5	2.5	2.5	2.5
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.6	2.6	2.6	2.6	2.6
18.500	2.6	2.6	2.6	2.6	2.6
19.000	2.6	2.6	2.6	2.6	2.6
19.500	2.6	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.7	2.7
20.500	2.7	2.7	2.7	2.7	2.7
21.000	2.7	2.7	2.7	2.7	2.7
21.500	2.7	2.7	2.7	2.7	2.7
22.000	2.7	2.7	2.7	2.7	2.7
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.8	2.8	2.8	2.8
23.500	2.8	2.8	2.8	2.8	2.8
24.000	2.8	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

Time-Depth Curve: TypeII 24hr (3.5 in)	
Label	TypeII 24hr (3.5 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.3	0.3	0.3	0.3
6.000	0.3	0.3	0.3	0.3	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.4	0.4	0.4	0.4
7.500	0.4	0.4	0.4	0.4	0.4
8.000	0.4	0.4	0.4	0.4	0.5
8.500	0.5	0.5	0.5	0.5	0.5
9.000	0.5	0.5	0.5	0.5	0.6
9.500	0.6	0.6	0.6	0.6	0.6
10.000	0.6	0.6	0.7	0.7	0.7
10.500	0.7	0.7	0.8	0.8	0.8
11.000	0.8	0.8	0.9	0.9	1.0
11.500	1.0	1.1	1.2	1.5	2.0
12.000	2.3	2.4	2.4	2.5	2.5
12.500	2.6	2.6	2.6	2.7	2.7
13.000	2.7	2.7	2.7	2.8	2.8
13.500	2.8	2.8	2.8	2.8	2.9
14.000	2.9	2.9	2.9	2.9	2.9
14.500	2.9	2.9	3.0	3.0	3.0
15.000	3.0	3.0	3.0	3.0	3.0
15.500	3.0	3.0	3.1	3.1	3.1
16.000	3.1	3.1	3.1	3.1	3.1

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	3.1	3.1	3.1	3.1	3.1
17.000	3.2	3.2	3.2	3.2	3.2
17.500	3.2	3.2	3.2	3.2	3.2
18.000	3.2	3.2	3.2	3.2	3.2
18.500	3.3	3.3	3.3	3.3	3.3
19.000	3.3	3.3	3.3	3.3	3.3
19.500	3.3	3.3	3.3	3.3	3.3
20.000	3.3	3.3	3.3	3.3	3.4
20.500	3.4	3.4	3.4	3.4	3.4
21.000	3.4	3.4	3.4	3.4	3.4
21.500	3.4	3.4	3.4	3.4	3.4
22.000	3.4	3.4	3.4	3.4	3.4
22.500	3.4	3.4	3.4	3.5	3.5
23.000	3.5	3.5	3.5	3.5	3.5
23.500	3.5	3.5	3.5	3.5	3.5
24.000	3.5	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

Time-Depth Curve: TypeII 24hr (4.5 in)	
Label	TypeII 24hr (4.5 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	5 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.4	0.5	0.5	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.6	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.6	0.6
9.000	0.7	0.7	0.7	0.7	0.7
9.500	0.7	0.7	0.8	0.8	0.8
10.000	0.8	0.8	0.9	0.9	0.9
10.500	0.9	0.9	1.0	1.0	1.0
11.000	1.1	1.1	1.1	1.2	1.2
11.500	1.3	1.4	1.6	1.9	2.6
12.000	3.0	3.1	3.1	3.2	3.3
12.500	3.3	3.3	3.4	3.4	3.4
13.000	3.5	3.5	3.5	3.6	3.6
13.500	3.6	3.6	3.6	3.7	3.7
14.000	3.7	3.7	3.7	3.7	3.8
14.500	3.8	3.8	3.8	3.8	3.8
15.000	3.8	3.9	3.9	3.9	3.9
15.500	3.9	3.9	3.9	3.9	3.9
16.000	4.0	4.0	4.0	4.0	4.0

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	4.0	4.0	4.0	4.0	4.0
17.000	4.1	4.1	4.1	4.1	4.1
17.500	4.1	4.1	4.1	4.1	4.1
18.000	4.1	4.2	4.2	4.2	4.2
18.500	4.2	4.2	4.2	4.2	4.2
19.000	4.2	4.2	4.2	4.2	4.2
19.500	4.3	4.3	4.3	4.3	4.3
20.000	4.3	4.3	4.3	4.3	4.3
20.500	4.3	4.3	4.3	4.3	4.3
21.000	4.3	4.3	4.4	4.4	4.4
21.500	4.4	4.4	4.4	4.4	4.4
22.000	4.4	4.4	4.4	4.4	4.4
22.500	4.4	4.4	4.4	4.4	4.4
23.000	4.4	4.5	4.5	4.5	4.5
23.500	4.5	4.5	4.5	4.5	4.5
24.000	4.5	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

Time-Depth Curve: TypeII 24hr (5.2 in)	
Label	TypeII 24hr (5.2 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.4	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.5
6.500	0.5	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.6
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.7	0.7
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.8	0.8	0.8	0.8	0.8
9.500	0.8	0.9	0.9	0.9	0.9
10.000	0.9	1.0	1.0	1.0	1.0
10.500	1.1	1.1	1.1	1.2	1.2
11.000	1.2	1.3	1.3	1.4	1.4
11.500	1.5	1.6	1.8	2.2	3.0
12.000	3.4	3.5	3.6	3.7	3.8
12.500	3.8	3.9	3.9	3.9	4.0
13.000	4.0	4.0	4.1	4.1	4.1
13.500	4.2	4.2	4.2	4.2	4.2
14.000	4.3	4.3	4.3	4.3	4.3
14.500	4.4	4.4	4.4	4.4	4.4
15.000	4.4	4.5	4.5	4.5	4.5
15.500	4.5	4.5	4.5	4.6	4.6
16.000	4.6	4.6	4.6	4.6	4.6

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	4.6	4.6	4.7	4.7	4.7
17.000	4.7	4.7	4.7	4.7	4.7
17.500	4.7	4.8	4.8	4.8	4.8
18.000	4.8	4.8	4.8	4.8	4.8
18.500	4.8	4.8	4.9	4.9	4.9
19.000	4.9	4.9	4.9	4.9	4.9
19.500	4.9	4.9	4.9	4.9	4.9
20.000	5.0	5.0	5.0	5.0	5.0
20.500	5.0	5.0	5.0	5.0	5.0
21.000	5.0	5.0	5.0	5.0	5.0
21.500	5.0	5.1	5.1	5.1	5.1
22.000	5.1	5.1	5.1	5.1	5.1
22.500	5.1	5.1	5.1	5.1	5.1
23.000	5.1	5.1	5.2	5.2	5.2
23.500	5.2	5.2	5.2	5.2	5.2
24.000	5.2	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Time-Depth Curve: TypeII 24hr (6.1 in)	
Label	TypeII 24hr (6.1 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.4	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.4
5.500	0.4	0.4	0.5	0.5	0.5
6.000	0.5	0.5	0.5	0.5	0.5
6.500	0.5	0.6	0.6	0.6	0.6
7.000	0.6	0.6	0.6	0.6	0.7
7.500	0.7	0.7	0.7	0.7	0.7
8.000	0.7	0.7	0.8	0.8	0.8
8.500	0.8	0.8	0.8	0.9	0.9
9.000	0.9	0.9	0.9	1.0	1.0
9.500	1.0	1.0	1.0	1.1	1.1
10.000	1.1	1.1	1.2	1.2	1.2
10.500	1.2	1.3	1.3	1.4	1.4
11.000	1.4	1.5	1.5	1.6	1.7
11.500	1.7	1.9	2.2	2.6	3.5
12.000	4.0	4.2	4.3	4.3	4.4
12.500	4.5	4.5	4.6	4.6	4.7
13.000	4.7	4.7	4.8	4.8	4.8
13.500	4.9	4.9	4.9	5.0	5.0
14.000	5.0	5.0	5.0	5.1	5.1
14.500	5.1	5.1	5.1	5.2	5.2
15.000	5.2	5.2	5.2	5.3	5.3
15.500	5.3	5.3	5.3	5.3	5.4
16.000	5.4	5.4	5.4	5.4	5.4

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	5.4	5.4	5.5	5.5	5.5
17.000	5.5	5.5	5.5	5.5	5.5
17.500	5.6	5.6	5.6	5.6	5.6
18.000	5.6	5.6	5.6	5.7	5.7
18.500	5.7	5.7	5.7	5.7	5.7
19.000	5.7	5.7	5.7	5.7	5.8
19.500	5.8	5.8	5.8	5.8	5.8
20.000	5.8	5.8	5.8	5.8	5.8
20.500	5.8	5.9	5.9	5.9	5.9
21.000	5.9	5.9	5.9	5.9	5.9
21.500	5.9	5.9	5.9	5.9	6.0
22.000	6.0	6.0	6.0	6.0	6.0
22.500	6.0	6.0	6.0	6.0	6.0
23.000	6.0	6.0	6.0	6.1	6.1
23.500	6.1	6.1	6.1	6.1	6.1
24.000	6.1	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Time-Depth Curve: TypeII 24hr (6.9 in)	
Label	TypeII 24hr (6.9 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	50 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.4	0.4
5.000	0.4	0.4	0.5	0.5	0.5
5.500	0.5	0.5	0.5	0.5	0.5
6.000	0.6	0.6	0.6	0.6	0.6
6.500	0.6	0.6	0.6	0.7	0.7
7.000	0.7	0.7	0.7	0.7	0.7
7.500	0.8	0.8	0.8	0.8	0.8
8.000	0.8	0.8	0.9	0.9	0.9
8.500	0.9	0.9	1.0	1.0	1.0
9.000	1.0	1.0	1.1	1.1	1.1
9.500	1.1	1.1	1.2	1.2	1.2
10.000	1.2	1.3	1.3	1.3	1.4
10.500	1.4	1.4	1.5	1.5	1.6
11.000	1.6	1.7	1.7	1.8	1.9
11.500	2.0	2.1	2.4	3.0	3.9
12.000	4.6	4.7	4.8	4.9	5.0
12.500	5.1	5.1	5.2	5.2	5.3
13.000	5.3	5.4	5.4	5.4	5.5
13.500	5.5	5.5	5.6	5.6	5.6
14.000	5.7	5.7	5.7	5.7	5.8
14.500	5.8	5.8	5.8	5.8	5.9
15.000	5.9	5.9	5.9	5.9	6.0
15.500	6.0	6.0	6.0	6.0	6.1
16.000	6.1	6.1	6.1	6.1	6.1

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	6.1	6.2	6.2	6.2	6.2
17.000	6.2	6.2	6.3	6.3	6.3
17.500	6.3	6.3	6.3	6.3	6.3
18.000	6.4	6.4	6.4	6.4	6.4
18.500	6.4	6.4	6.4	6.4	6.5
19.000	6.5	6.5	6.5	6.5	6.5
19.500	6.5	6.5	6.5	6.6	6.6
20.000	6.6	6.6	6.6	6.6	6.6
20.500	6.6	6.6	6.6	6.6	6.6
21.000	6.7	6.7	6.7	6.7	6.7
21.500	6.7	6.7	6.7	6.7	6.7
22.000	6.7	6.7	6.8	6.8	6.8
22.500	6.8	6.8	6.8	6.8	6.8
23.000	6.8	6.8	6.8	6.8	6.9
23.500	6.9	6.9	6.9	6.9	6.9
24.000	6.9	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

Time-Depth Curve: TypeII 24hr (7.8 in)	
Label	TypeII 24hr (7.8 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.4	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.5	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.6	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.7	0.7	0.7
6.500	0.7	0.7	0.7	0.7	0.8
7.000	0.8	0.8	0.8	0.8	0.8
7.500	0.9	0.9	0.9	0.9	0.9
8.000	0.9	1.0	1.0	1.0	1.0
8.500	1.0	1.1	1.1	1.1	1.1
9.000	1.1	1.2	1.2	1.2	1.2
9.500	1.3	1.3	1.3	1.4	1.4
10.000	1.4	1.4	1.5	1.5	1.6
10.500	1.6	1.6	1.7	1.7	1.8
11.000	1.8	1.9	2.0	2.0	2.1
11.500	2.2	2.4	2.8	3.4	4.4
12.000	5.2	5.3	5.4	5.6	5.7
12.500	5.7	5.8	5.9	5.9	6.0
13.000	6.0	6.1	6.1	6.2	6.2
13.500	6.2	6.3	6.3	6.3	6.4
14.000	6.4	6.4	6.5	6.5	6.5
14.500	6.5	6.6	6.6	6.6	6.6
15.000	6.7	6.7	6.7	6.7	6.7
15.500	6.8	6.8	6.8	6.8	6.8
16.000	6.9	6.9	6.9	6.9	6.9

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	7.0	7.0	7.0	7.0	7.0
17.000	7.0	7.0	7.1	7.1	7.1
17.500	7.1	7.1	7.1	7.2	7.2
18.000	7.2	7.2	7.2	7.2	7.2
18.500	7.3	7.3	7.3	7.3	7.3
19.000	7.3	7.3	7.3	7.3	7.4
19.500	7.4	7.4	7.4	7.4	7.4
20.000	7.4	7.4	7.4	7.5	7.5
20.500	7.5	7.5	7.5	7.5	7.5
21.000	7.5	7.5	7.5	7.6	7.6
21.500	7.6	7.6	7.6	7.6	7.6
22.000	7.6	7.6	7.6	7.6	7.7
22.500	7.7	7.7	7.7	7.7	7.7
23.000	7.7	7.7	7.7	7.7	7.7
23.500	7.8	7.8	7.8	7.8	7.8
24.000	7.8	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

Time-Depth Curve: TypeII 24hr (9.6 in)	
Label	TypeII 24hr (9.6 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	500 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.2	0.2	0.2	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.3
2.500	0.3	0.3	0.3	0.3	0.3
3.000	0.3	0.3	0.4	0.4	0.4
3.500	0.4	0.4	0.4	0.4	0.4
4.000	0.5	0.5	0.5	0.5	0.5
4.500	0.5	0.5	0.6	0.6	0.6
5.000	0.6	0.6	0.6	0.7	0.7
5.500	0.7	0.7	0.7	0.7	0.8
6.000	0.8	0.8	0.8	0.8	0.8
6.500	0.9	0.9	0.9	0.9	0.9
7.000	1.0	1.0	1.0	1.0	1.0
7.500	1.0	1.1	1.1	1.1	1.1
8.000	1.2	1.2	1.2	1.2	1.2
8.500	1.3	1.3	1.3	1.4	1.4
9.000	1.4	1.4	1.5	1.5	1.5
9.500	1.6	1.6	1.6	1.7	1.7
10.000	1.7	1.8	1.8	1.9	1.9
10.500	2.0	2.0	2.1	2.1	2.2
11.000	2.3	2.3	2.4	2.5	2.6
11.500	2.7	2.9	3.4	4.1	5.5
12.000	6.4	6.5	6.7	6.8	7.0
12.500	7.1	7.1	7.2	7.3	7.4
13.000	7.4	7.5	7.5	7.6	7.6
13.500	7.7	7.7	7.8	7.8	7.8
14.000	7.9	7.9	7.9	8.0	8.0
14.500	8.0	8.1	8.1	8.1	8.2
15.000	8.2	8.2	8.2	8.3	8.3
15.500	8.3	8.4	8.4	8.4	8.4
16.000	8.4	8.5	8.5	8.5	8.5

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	8.6	8.6	8.6	8.6	8.6
17.000	8.7	8.7	8.7	8.7	8.7
17.500	8.8	8.8	8.8	8.8	8.8
18.000	8.8	8.9	8.9	8.9	8.9
18.500	8.9	8.9	9.0	9.0	9.0
19.000	9.0	9.0	9.0	9.0	9.1
19.500	9.1	9.1	9.1	9.1	9.1
20.000	9.1	9.2	9.2	9.2	9.2
20.500	9.2	9.2	9.2	9.2	9.2
21.000	9.3	9.3	9.3	9.3	9.3
21.500	9.3	9.3	9.3	9.4	9.4
22.000	9.4	9.4	9.4	9.4	9.4
22.500	9.4	9.4	9.5	9.5	9.5
23.000	9.5	9.5	9.5	9.5	9.5
23.500	9.5	9.6	9.6	9.6	9.6
24.000	9.6	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time of Concentration Calculations
Label: Kingsbury On-site

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Kingsbury Park Wichita

Subsection: Time of Concentration Calculations
Label: Kingsbury On-site

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft^2
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Kingsbury Park Wichita

Subsection: Time of Concentration Calculations
Label: Kingsbury On-site

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Kingsbury Park Wichita

Subsection: Time of Concentration Calculations
Label: Kingsbury On-site

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Kingsbury On-site

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Developed or Disturbed Pervious Area	80.000	84.000	0.0	0.0	80.000
Brooks Landfill Area	80.000	50.000	0.0	0.0	80.000
Lake area	98.000	223.000	0.0	0.0	98.000
Impervious area - Buildings, Parking lots, Road, Trails	98.000	48.000	0.0	0.0	98.000
Native Grass restoration areas	71.000	110.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	515.000	(N/A)	(N/A)	87.550

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): At = Ai+Ap
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate (time^-1)
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of 0.1333Tc, rtm, and th (Smallest dt is then adjusted to match up with Tp)
UDdt	User specified override computational main time increment (only used if UDdt is => .1333Tc)
D(t)	Point on distribution curve (fraction of P) for time step t
K	2 / (1 + (Tr/Tp)): default K = 0.75: (for Tr/Tp = 1.67)
Ks	Hydrograph shape factor = Unit Conversions * K: = ((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K Default Ks = 645.333 * 0.75 = 484
Lag	Lag time from center of excess runoff (dt) to Tp: Lag = 0.6Tc
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = (Ks * A * Q) / Tp (where Q = 1in. runoff, A=sq.mi.)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: Si = (1000/CNi) - 10
Sp	S for pervious area: Sp = (1000/CNp) - 10
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: Tb = Tp + Tr
Tp	Time (hrs) to peak of a unit hydrograph: Tp = (dt/2) + Lag
Tr	Time (hrs) of receding limb of unit hydrograph: Tr = ratio of Tp

Kingsbury Park Wichita

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method
Computational Notes
Precipitation

Column (1)	Time for time step t
Column (2)	D(t) = Point on distribution curve for time step t
Column (3)	Pi(t) = Pa(t) - Pa(t-1): Col.(4) - Preceding Col.(4)
Column (4)	Pa(t) = D(t) x P: Col.(2) x P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5)	Rap(t) = Accumulated pervious runoff for time step t
	If (Pa(t) is <= 0.2Sp) then use: Rap(t) = 0.0
	If (Pa(t) is > 0.2Sp) then use:
	
	Rap(t) = (Col.(4)-0.2Sp)**2 / (Col.(4)+0.8Sp)

Column (6)	Rip(t) = Incremental pervious runoff for time step t Rip(t) = Rap(t) - Rap(t-1) Rip(t) = Col.(5) for current row - Col.(5) for preceding row.

Impervious Area Runoff

Column (7 & 8)...	Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9)	R(t) = (Ap/At) x Rip(t) + (Ai/At) x Rii(t) R(t) = (Ap/At) x Col.(6) + (Ai/At) x Col.(8)

SCS Unit Hydrograph Method

Column (10)	Q(t) is computed with the SCS unit hydrograph method using R(t) and Qu(t).

Storm Event	TypeII 24hr (2.8 in)
Return Event	1 years
Duration	35.000 hours
Depth	2.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	228.27 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	228.12 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	70.450 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	70.449 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (2.8 in)
Return Event	1 years
Duration	35.000 hours
Depth	2.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
6.900	0.00	0.00	0.00	0.00	0.00
7.150	0.00	0.01	0.01	0.01	0.02
7.400	0.02	0.02	0.03	0.04	0.05
7.650	0.06	0.07	0.08	0.09	0.12
7.900	0.14	0.16	0.19	0.21	0.23
8.150	0.27	0.31	0.36	0.40	0.44
8.400	0.48	0.54	0.60	0.67	0.73
8.650	0.80	0.86	0.93	1.02	1.11
8.900	1.21	1.30	1.39	1.49	1.60
9.150	1.72	1.85	1.97	2.10	2.22
9.400	2.35	2.51	2.66	2.82	2.98
9.650	3.14	3.29	3.47	3.66	3.85
9.900	4.04	4.23	4.42	4.62	4.85
10.150	5.08	5.30	5.53	5.76	5.99
10.400	6.26	6.54	6.83	7.12	7.40
10.650	7.69	7.99	8.37	8.74	9.12
10.900	9.50	9.87	10.25	10.73	11.26
11.150	11.78	12.31	12.83	13.36	13.98
11.400	14.93	15.89	16.85	17.80	18.76
11.650	19.71	22.58	26.09	29.61	33.12
11.900	36.63	40.15	44.50	51.15	57.79
12.150	64.44	71.09	77.74	84.39	93.62
12.400	103.55	113.47	123.40	133.33	143.25
12.650	152.71	161.11	169.51	177.91	186.31
12.900	194.71	203.11	207.58	211.24	214.90
13.150	218.56	222.22	225.88	228.12	227.69
13.400	227.26	226.84	226.41	225.98	225.55
13.650	222.66	219.40	216.14	212.87	209.61
13.900	206.35	202.25	196.84	191.43	186.02
14.150	180.62	175.21	169.80	164.85	159.95
14.400	155.04	150.14	145.24	140.33	135.95
14.650	132.24	128.53	124.82	121.11	117.40

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
14.900	113.69	110.85	108.06	105.26	102.47
15.150	99.68	96.88	94.31	91.99	89.68
15.400	87.36	85.04	82.72	80.41	78.63
15.650	76.86	75.09	73.33	71.56	69.79
15.900	68.20	66.79	65.37	63.95	62.54
16.150	61.12	59.72	58.58	57.44	56.30
16.400	55.17	54.03	52.89	51.88	50.98
16.650	50.07	49.17	48.26	47.36	46.46
16.900	45.73	44.99	44.25	43.51	42.77
17.150	42.04	41.38	40.78	40.18	39.58
17.400	38.98	38.38	37.79	37.30	36.81
17.650	36.32	35.83	35.34	34.85	34.42
17.900	34.02	33.63	33.24	32.84	32.45
18.150	32.07	31.74	31.41	31.08	30.76
18.400	30.43	30.10	29.81	29.53	29.26
18.650	28.98	28.70	28.43	28.16	27.90
18.900	27.65	27.39	27.14	26.88	26.63
19.150	26.38	26.14	25.90	25.66	25.42
19.400	25.18	24.94	24.71	24.48	24.25
19.650	24.03	23.80	23.57	23.38	23.20
19.900	23.02	22.84	22.66	22.48	22.30
20.150	22.14	21.97	21.80	21.63	21.47
20.400	21.30	21.14	20.99	20.83	20.67
20.650	20.52	20.36	20.21	20.07	19.92
20.900	19.78	19.64	19.49	19.35	19.22
21.150	19.10	18.98	18.85	18.73	18.60
21.400	18.48	18.38	18.27	18.17	18.06
21.650	17.96	17.85	17.77	17.68	17.59
21.900	17.51	17.42	17.33	17.25	17.18
22.150	17.11	17.04	16.97	16.90	16.83
22.400	16.77	16.71	16.65	16.59	16.53
22.650	16.47	16.42	16.37	16.32	16.27
22.900	16.22	16.17	16.12	16.07	16.03
23.150	15.98	15.94	15.89	15.85	15.80
23.400	15.76	15.72	15.68	15.64	15.60
23.650	15.56	15.52	15.49	15.45	15.41
23.900	15.37	15.34	15.29	15.22	15.16
24.150	15.09	15.03	14.96	14.89	14.76
24.400	14.64	14.51	14.38	14.25	14.12
24.650	13.94	13.70	13.47	13.23	13.00
24.900	12.76	12.52	12.20	11.88	11.56
25.150	11.24	10.92	10.60	10.26	9.92

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (2.8 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
25.400	9.58	9.23	8.89	8.55	8.21
25.650	7.89	7.57	7.25	6.93	6.61
25.900	6.29	6.00	5.73	5.47	5.20
26.150	4.93	4.66	4.40	4.21	4.01
26.400	3.82	3.62	3.42	3.23	3.07
26.650	2.94	2.80	2.66	2.53	2.39
26.900	2.26	2.16	2.06	1.97	1.87
27.150	1.77	1.67	1.59	1.52	1.45
27.400	1.38	1.30	1.23	1.17	1.11
27.650	1.06	1.01	0.96	0.91	0.86
27.900	0.82	0.78	0.74	0.71	0.67
28.150	0.63	0.60	0.57	0.54	0.52
28.400	0.49	0.46	0.44	0.41	0.40
28.650	0.38	0.36	0.34	0.32	0.30
28.900	0.29	0.27	0.26	0.25	0.23
29.150	0.22	0.21	0.20	0.19	0.18
29.400	0.17	0.16	0.15	0.14	0.13
29.650	0.13	0.12	0.11	0.10	0.10
29.900	0.09	0.09	0.08	0.08	0.07
30.150	0.07	0.06	0.06	0.06	0.05
30.400	0.05	0.05	0.04	0.04	0.04
30.650	0.03	0.03	0.03	0.03	0.02
30.900	0.02	0.02	0.02	0.02	0.01
31.150	0.01	0.01	0.01	0.01	0.01
31.400	0.01	0.00	0.00	0.00	0.00
31.650	0.00	0.00	(N/A)	(N/A)	(N/A)

Storm Event	TypeII 24hr (3.5 in)
Return Event	2 years
Duration	35.000 hours
Depth	3.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	317.52 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	317.21 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.3 in
Runoff Volume (Pervious)	97.364 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	97.364 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (3.5 in)
Return Event	2 years
Duration	35.000 hours
Depth	3.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
5.850	0.00	0.00	0.00	0.00	0.00
6.100	0.00	0.01	0.01	0.01	0.02
6.350	0.02	0.03	0.03	0.04	0.06
6.600	0.07	0.09	0.10	0.12	0.13
6.850	0.16	0.20	0.23	0.26	0.29
7.100	0.33	0.37	0.43	0.48	0.54
7.350	0.59	0.65	0.71	0.79	0.87
7.600	0.95	1.03	1.11	1.20	1.29
7.850	1.39	1.50	1.61	1.71	1.82
8.100	1.92	2.05	2.18	2.31	2.44
8.350	2.57	2.70	2.84	3.00	3.15
8.600	3.30	3.46	3.61	3.77	3.95
8.850	4.14	4.32	4.51	4.70	4.88
9.100	5.09	5.32	5.54	5.77	5.99
9.350	6.22	6.44	6.71	6.98	7.24
9.600	7.51	7.78	8.04	8.33	8.64
9.850	8.95	9.26	9.57	9.88	10.19
10.100	10.55	10.91	11.27	11.63	11.99
10.350	12.35	12.76	13.20	13.64	14.08
10.600	14.52	14.96	15.42	15.99	16.56
10.850	17.13	17.70	18.27	18.84	19.56
11.100	20.35	21.13	21.92	22.70	23.49
11.350	24.42	25.83	27.24	28.65	30.07
11.600	31.48	32.89	36.94	41.89	46.84
11.850	51.79	56.74	61.69	67.78	77.01
12.100	86.24	95.47	104.71	113.94	123.17
12.350	135.85	149.47	163.08	176.70	190.31
12.600	203.93	216.85	228.19	239.53	250.88
12.850	262.22	273.56	284.91	290.78	295.51
13.100	300.24	304.97	309.71	314.44	317.21
13.350	316.32	315.42	314.53	313.64	312.74
13.600	311.85	307.60	302.85	298.09	293.34

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (3.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
13.850	288.59	283.83	277.96	270.34	262.72
14.100	255.10	247.47	239.85	232.23	225.32
14.350	218.48	211.64	204.80	197.96	191.12
14.600	185.01	179.86	174.71	169.57	164.42
14.850	159.27	154.12	150.19	146.33	142.46
15.100	138.59	134.73	130.86	127.31	124.11
15.350	120.91	117.72	114.52	111.32	108.12
15.600	105.69	103.25	100.82	98.39	95.96
15.850	93.52	91.35	89.40	87.46	85.52
16.100	83.58	81.64	79.72	78.16	76.61
16.350	75.05	73.50	71.94	70.39	69.01
16.600	67.78	66.55	65.32	64.08	62.85
16.850	61.64	60.64	59.64	58.63	57.63
17.100	56.63	55.63	54.74	53.93	53.12
17.350	52.31	51.49	50.68	49.89	49.22
17.600	48.56	47.90	47.24	46.57	45.91
17.850	45.33	44.80	44.27	43.74	43.21
18.100	42.68	42.17	41.73	41.29	40.85
18.350	40.41	39.97	39.53	39.14	38.77
18.600	38.40	38.03	37.65	37.28	36.92
18.850	36.58	36.24	35.90	35.55	35.21
19.100	34.87	34.54	34.22	33.90	33.58
19.350	33.25	32.93	32.61	32.31	32.01
19.600	31.70	31.40	31.10	30.79	30.54
19.850	30.30	30.07	29.83	29.59	29.35
20.100	29.12	28.90	28.68	28.46	28.24
20.350	28.02	27.80	27.59	27.39	27.18
20.600	26.98	26.77	26.56	26.36	26.18
20.850	25.99	25.80	25.61	25.43	25.24
21.100	25.07	24.91	24.74	24.58	24.42
21.350	24.25	24.10	23.96	23.82	23.69
21.600	23.55	23.41	23.27	23.16	23.04
21.850	22.93	22.81	22.70	22.59	22.48
22.100	22.39	22.30	22.20	22.11	22.02
22.350	21.92	21.84	21.77	21.69	21.61
22.600	21.53	21.46	21.38	21.32	21.25
22.850	21.18	21.12	21.05	20.98	20.92
23.100	20.86	20.81	20.75	20.69	20.63
23.350	20.57	20.52	20.47	20.41	20.36
23.600	20.30	20.25	20.20	20.15	20.10
23.850	20.05	20.00	19.95	19.89	19.80
24.100	19.72	19.63	19.55	19.46	19.37

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (3.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
24.350	19.20	19.04	18.87	18.70	18.54
24.600	18.37	18.12	17.82	17.51	17.21
24.850	16.90	16.60	16.28	15.86	15.45
25.100	15.03	14.61	14.20	13.78	13.35
25.350	12.90	12.45	12.01	11.56	11.11
25.600	10.67	10.26	9.84	9.42	9.01
25.850	8.59	8.18	7.81	7.46	7.11
26.100	6.76	6.41	6.06	5.73	5.47
26.350	5.22	4.96	4.71	4.45	4.20
26.600	4.00	3.82	3.64	3.46	3.28
26.850	3.11	2.94	2.81	2.68	2.56
27.100	2.43	2.30	2.17	2.07	1.98
27.350	1.88	1.79	1.70	1.60	1.52
27.600	1.45	1.38	1.32	1.25	1.18
27.850	1.11	1.06	1.01	0.97	0.92
28.100	0.87	0.82	0.78	0.74	0.71
28.350	0.67	0.64	0.60	0.57	0.54
28.600	0.51	0.49	0.46	0.44	0.41
28.850	0.39	0.37	0.36	0.34	0.32
29.100	0.30	0.28	0.27	0.26	0.24
29.350	0.23	0.22	0.20	0.19	0.18
29.600	0.17	0.16	0.15	0.14	0.14
29.850	0.13	0.12	0.11	0.11	0.10
30.100	0.09	0.09	0.08	0.08	0.07
30.350	0.07	0.06	0.06	0.05	0.05
30.600	0.05	0.04	0.04	0.04	0.03
30.850	0.03	0.03	0.03	0.02	0.02
31.100	0.02	0.02	0.01	0.01	0.01
31.350	0.01	0.01	0.01	0.01	0.00
31.600	0.00	0.00	0.00	0.00	(N/A)

Storm Event	TypeII 24hr (4.5 in)
Return Event	5 years
Duration	35.000 hours
Depth	4.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	447.74 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	447.17 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.2 in
Runoff Volume (Pervious)	137.172 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	137.171 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (4.5 in)
Return Event	5 years
Duration	35.000 hours
Depth	4.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
4.850	0.00	0.00	0.00	0.00	0.01
5.100	0.01	0.01	0.01	0.02	0.03
5.350	0.04	0.04	0.05	0.06	0.08
5.600	0.10	0.13	0.15	0.17	0.20
5.850	0.23	0.28	0.32	0.37	0.42
6.100	0.47	0.52	0.59	0.67	0.75
6.350	0.83	0.91	0.99	1.09	1.20
6.600	1.31	1.42	1.54	1.65	1.76
6.850	1.90	2.05	2.19	2.34	2.48
7.100	2.63	2.78	2.95	3.12	3.30
7.350	3.47	3.64	3.81	4.00	4.20
7.600	4.39	4.58	4.78	4.97	5.17
7.850	5.39	5.60	5.81	6.02	6.24
8.100	6.45	6.68	6.91	7.15	7.38
8.350	7.61	7.84	8.09	8.35	8.61
8.600	8.87	9.13	9.39	9.65	9.96
8.850	10.26	10.56	10.87	11.17	11.48
9.100	11.81	12.18	12.54	12.90	13.26
9.350	13.62	13.99	14.41	14.83	15.26
9.600	15.68	16.10	16.52	16.98	17.46
9.850	17.94	18.42	18.90	19.38	19.87
10.100	20.42	20.97	21.52	22.07	22.62
10.350	23.18	23.80	24.47	25.13	25.80
10.600	26.46	27.13	27.83	28.69	29.54
10.850	30.40	31.26	32.11	32.97	34.05
11.100	35.23	36.40	37.58	38.75	39.92
11.350	41.30	43.40	45.49	47.58	49.67
11.600	51.76	53.85	59.63	66.68	73.73
11.850	80.77	87.82	94.87	103.49	116.47
12.100	129.45	142.43	155.40	168.38	181.36
12.350	199.02	217.95	236.88	255.81	274.74
12.600	293.67	311.56	327.10	342.65	358.20

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 5 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (4.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
12.850	373.74	389.29	404.83	412.65	418.86
13.100	425.07	431.27	437.48	443.69	447.17
13.350	445.53	443.89	442.25	440.61	438.98
13.600	437.34	431.06	424.09	417.12	410.15
13.850	403.18	396.21	387.72	376.85	365.99
14.100	355.12	344.26	333.39	322.53	312.76
14.350	303.10	293.43	283.77	274.10	264.44
14.600	255.82	248.58	241.34	234.10	226.86
14.850	219.62	212.38	206.86	201.44	196.01
15.100	190.59	185.16	179.73	174.76	170.28
15.350	165.81	161.34	156.86	152.39	147.91
15.600	144.51	141.12	137.73	134.33	130.94
15.850	127.55	124.51	121.81	119.11	116.41
16.100	113.71	111.01	108.33	106.17	104.01
16.350	101.86	99.70	97.54	95.39	93.48
16.600	91.78	90.08	88.37	86.67	84.97
16.850	83.29	81.91	80.53	79.15	77.77
17.100	76.39	75.01	73.78	72.67	71.55
17.350	70.43	69.31	68.20	67.10	66.19
17.600	65.28	64.38	63.47	62.56	61.65
17.850	60.86	60.13	59.40	58.68	57.95
18.100	57.23	56.52	55.92	55.32	54.72
18.350	54.12	53.52	52.92	52.38	51.88
18.600	51.37	50.86	50.36	49.85	49.36
18.850	48.89	48.43	47.96	47.50	47.03
19.100	46.57	46.12	45.68	45.24	44.80
19.350	44.37	43.93	43.49	43.08	42.67
19.600	42.26	41.85	41.44	41.03	40.69
19.850	40.37	40.05	39.73	39.41	39.10
20.100	38.78	38.49	38.19	37.90	37.61
20.350	37.31	37.02	36.74	36.46	36.19
20.600	35.91	35.63	35.36	35.09	34.84
20.850	34.59	34.34	34.09	33.83	33.58
21.100	33.36	33.14	32.92	32.70	32.48
21.350	32.26	32.06	31.87	31.69	31.50
21.600	31.32	31.13	30.95	30.79	30.64
21.850	30.49	30.34	30.18	30.03	29.89
22.100	29.76	29.64	29.51	29.39	29.26
22.350	29.14	29.03	28.93	28.83	28.72
22.600	28.62	28.51	28.42	28.33	28.24
22.850	28.15	28.06	27.97	27.88	27.80
23.100	27.72	27.64	27.56	27.48	27.40

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 5 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (4.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
23.350	27.33	27.25	27.18	27.11	27.04
23.600	26.97	26.89	26.83	26.76	26.69
23.850	26.63	26.56	26.50	26.40	26.29
24.100	26.18	26.06	25.95	25.83	25.72
24.350	25.49	25.27	25.05	24.83	24.60
24.600	24.38	24.06	23.65	23.24	22.84
24.850	22.43	22.03	21.61	21.05	20.50
25.100	19.95	19.39	18.84	18.29	17.71
25.350	17.12	16.52	15.93	15.34	14.75
25.600	14.16	13.61	13.06	12.51	11.95
25.850	11.40	10.85	10.36	9.89	9.43
26.100	8.97	8.50	8.04	7.60	7.26
26.350	6.92	6.58	6.25	5.91	5.57
26.600	5.30	5.07	4.83	4.59	4.36
26.850	4.12	3.90	3.73	3.56	3.39
27.100	3.22	3.05	2.88	2.75	2.62
27.350	2.50	2.38	2.25	2.13	2.01
27.600	1.92	1.83	1.75	1.66	1.57
27.850	1.48	1.41	1.35	1.28	1.22
28.100	1.15	1.09	1.03	0.98	0.94
28.350	0.89	0.84	0.80	0.75	0.72
28.600	0.68	0.65	0.62	0.58	0.55
28.850	0.52	0.50	0.47	0.45	0.42
29.100	0.40	0.38	0.36	0.34	0.32
29.350	0.31	0.29	0.27	0.25	0.24
29.600	0.23	0.22	0.20	0.19	0.18
29.850	0.17	0.16	0.15	0.14	0.13
30.100	0.13	0.12	0.11	0.10	0.10
30.350	0.09	0.08	0.08	0.07	0.07
30.600	0.06	0.06	0.05	0.05	0.05
30.850	0.04	0.04	0.03	0.03	0.03
31.100	0.02	0.02	0.02	0.02	0.01
31.350	0.01	0.01	0.01	0.01	0.01
31.600	0.00	0.00	0.00	0.00	(N/A)

Storm Event	TypeII 24hr (5.2 in)
Return Event	10 years
Duration	35.000 hours
Depth	5.2 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	539.64 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	538.88 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.9 in
Runoff Volume (Pervious)	165.625 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	165.624 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (5.2 in)
Return Event	10 years
Duration	35.000 hours
Depth	5.2 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
4.250	0.00	0.00	0.00	0.00	0.00
4.500	0.00	0.01	0.01	0.02	0.02
4.750	0.03	0.04	0.04	0.06	0.08
5.000	0.10	0.12	0.14	0.16	0.18
5.250	0.23	0.27	0.32	0.36	0.41
5.500	0.45	0.53	0.61	0.69	0.77
5.750	0.85	0.93	1.02	1.14	1.26
6.000	1.38	1.50	1.61	1.73	1.89
6.250	2.04	2.20	2.35	2.51	2.67
6.500	2.84	3.03	3.22	3.41	3.60
6.750	3.79	3.98	4.20	4.42	4.63
7.000	4.85	5.07	5.29	5.52	5.76
7.250	6.00	6.24	6.49	6.73	6.97
7.500	7.23	7.49	7.75	8.02	8.28
7.750	8.54	8.81	9.09	9.37	9.64
8.000	9.92	10.20	10.48	10.78	11.08
8.250	11.38	11.68	11.98	12.28	12.59
8.500	12.92	13.25	13.59	13.92	14.25
8.750	14.58	14.97	15.35	15.74	16.12
9.000	16.51	16.90	17.32	17.78	18.24
9.250	18.70	19.15	19.61	20.08	20.61
9.500	21.14	21.67	22.21	22.74	23.27
9.750	23.85	24.45	25.05	25.66	26.26
10.000	26.86	27.48	28.16	28.85	29.54
10.250	30.22	30.91	31.60	32.38	33.20
10.500	34.03	34.86	35.68	36.51	37.38
10.750	38.44	39.50	40.56	41.62	42.68
11.000	43.75	45.08	46.53	47.98	49.44
11.250	50.89	52.34	54.04	56.61	59.19
11.500	61.76	64.33	66.91	69.48	76.49
11.750	85.02	93.54	102.07	110.59	119.12
12.000	129.53	145.14	160.75	176.35	191.96

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (5.2 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
12.250	207.57	223.18	244.33	266.97	289.62
12.500	312.27	334.91	357.56	378.92	397.39
12.750	415.86	434.33	452.79	471.26	489.73
13.000	498.88	506.09	513.30	520.52	527.73
13.250	534.94	538.88	536.69	534.49	532.30
13.500	530.11	527.92	525.73	518.01	509.45
13.750	500.90	492.35	483.79	475.24	464.89
14.000	451.73	438.57	425.41	412.26	399.10
14.250	385.94	374.15	362.50	350.84	339.19
14.500	327.53	315.88	305.49	296.78	288.06
14.750	279.34	270.63	261.91	253.20	246.57
15.000	240.04	233.52	227.00	220.47	213.95
15.250	207.97	202.60	197.23	191.86	186.49
15.500	181.11	175.74	171.67	167.60	163.53
15.750	159.46	155.39	151.32	147.68	144.45
16.000	141.21	137.98	134.75	131.51	128.30
16.250	125.72	123.14	120.56	117.98	115.40
16.500	112.82	110.55	108.52	106.48	104.45
16.750	102.42	100.38	98.38	96.73	95.09
17.000	93.44	91.80	90.15	88.50	87.05
17.250	85.71	84.38	83.05	81.72	80.39
17.500	79.09	78.01	76.93	75.85	74.76
17.750	73.68	72.60	71.66	70.80	69.94
18.000	69.07	68.21	67.35	66.51	65.79
18.250	65.08	64.37	63.65	62.94	62.23
18.500	61.59	60.99	60.39	59.79	59.19
18.750	58.59	58.01	57.45	56.90	56.35
19.000	55.80	55.25	54.70	54.17	53.65
19.250	53.13	52.61	52.09	51.57	51.06
19.500	50.57	50.09	49.60	49.11	48.63
19.750	48.14	47.74	47.37	46.99	46.61
20.000	46.24	45.86	45.50	45.15	44.80
20.250	44.46	44.11	43.76	43.42	43.09
20.500	42.76	42.44	42.12	41.79	41.47
20.750	41.15	40.86	40.56	40.27	39.97
21.000	39.68	39.38	39.12	38.86	38.60
21.250	38.34	38.09	37.83	37.58	37.37
21.500	37.15	36.93	36.72	36.50	36.28
21.750	36.10	35.92	35.74	35.56	35.38
22.000	35.20	35.04	34.89	34.74	34.59
22.250	34.45	34.30	34.15	34.03	33.91
22.500	33.78	33.66	33.54	33.42	33.30

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (5.2 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
22.750	33.20	33.09	32.98	32.88	32.77
23.000	32.67	32.57	32.48	32.39	32.29
23.250	32.20	32.11	32.02	31.93	31.85
23.500	31.76	31.68	31.59	31.51	31.43
23.750	31.35	31.27	31.20	31.12	31.04
24.000	30.93	30.80	30.66	30.53	30.40
24.250	30.26	30.12	29.86	29.60	29.34
24.500	29.08	28.82	28.56	28.18	27.70
24.750	27.23	26.75	26.27	25.80	25.31
25.000	24.66	24.01	23.36	22.71	22.07
25.250	21.42	20.74	20.05	19.35	18.66
25.500	17.97	17.27	16.58	15.94	15.29
25.750	14.65	14.00	13.35	12.71	12.13
26.000	11.59	11.04	10.50	9.96	9.41
26.250	8.90	8.50	8.11	7.71	7.31
26.500	6.92	6.52	6.21	5.93	5.66
26.750	5.38	5.10	4.83	4.57	4.37
27.000	4.17	3.97	3.77	3.58	3.38
27.250	3.22	3.07	2.93	2.78	2.64
27.500	2.49	2.36	2.25	2.15	2.04
27.750	1.94	1.84	1.73	1.65	1.58
28.000	1.50	1.42	1.35	1.27	1.21
28.250	1.15	1.10	1.04	0.99	0.93
28.500	0.88	0.84	0.80	0.76	0.72
28.750	0.68	0.64	0.61	0.58	0.55
29.000	0.52	0.50	0.47	0.44	0.42
29.250	0.40	0.38	0.36	0.34	0.32
29.500	0.30	0.28	0.27	0.25	0.24
29.750	0.22	0.21	0.20	0.19	0.18
30.000	0.17	0.16	0.15	0.14	0.13
30.250	0.12	0.11	0.11	0.10	0.09
30.500	0.09	0.08	0.07	0.07	0.06
30.750	0.06	0.05	0.05	0.04	0.04
31.000	0.04	0.03	0.03	0.03	0.02
31.250	0.02	0.02	0.01	0.01	0.01
31.500	0.01	0.01	0.00	0.00	0.00
31.750	0.00	(N/A)	(N/A)	(N/A)	(N/A)

Storm Event	TypeII 24hr (6.1 in)
Return Event	25 years
Duration	35.000 hours
Depth	6.1 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	658.02 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	657.00 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.7 in
Runoff Volume (Pervious)	202.662 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	202.661 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 25 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (6.1 in)

Storm Event	TypeII 24hr (6.1 in)
Return Event	25 years
Duration	35.000 hours
Depth	6.1 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
3.700	0.00	0.00	0.00	0.00	0.00
3.950	0.01	0.01	0.02	0.02	0.02
4.200	0.03	0.04	0.06	0.08	0.09
4.450	0.11	0.12	0.15	0.19	0.23
4.700	0.28	0.32	0.36	0.40	0.48
4.950	0.56	0.64	0.72	0.80	0.89
5.200	0.98	1.11	1.24	1.36	1.49
5.450	1.62	1.74	1.91	2.08	2.25
5.700	2.43	2.60	2.77	2.96	3.17
5.950	3.39	3.60	3.82	4.03	4.25
6.200	4.50	4.75	5.00	5.25	5.50
6.450	5.75	6.01	6.29	6.57	6.85
6.700	7.14	7.42	7.70	8.00	8.30
6.950	8.61	8.92	9.22	9.53	9.84
7.200	10.17	10.49	10.82	11.15	11.47
7.450	11.80	12.14	12.49	12.83	13.18
7.700	13.52	13.87	14.22	14.58	14.95
7.950	15.31	15.67	16.03	16.39	16.77
8.200	17.16	17.54	17.92	18.30	18.69
8.450	19.09	19.51	19.93	20.35	20.77
8.700	21.20	21.62	22.11	22.60	23.09
8.950	23.58	24.07	24.56	25.10	25.68
9.200	26.27	26.85	27.43	28.01	28.60
9.450	29.28	29.95	30.63	31.31	31.98
9.700	32.66	33.39	34.15	34.91	35.67
9.950	36.43	37.19	37.97	38.83	39.69
10.200	40.55	41.42	42.28	43.14	44.12
10.450	45.15	46.19	47.22	48.25	49.29
10.700	50.38	51.70	53.02	54.35	55.67
10.950	57.00	58.32	59.99	61.79	63.60
11.200	65.41	67.22	69.03	71.15	74.34
11.450	77.54	80.73	83.93	87.13	90.32

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 25 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (6.1 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.700	98.91	109.33	119.76	130.19	140.61
11.950	151.04	163.74	182.72	201.71	220.69
12.200	239.68	258.66	277.65	303.26	330.66
12.450	358.07	385.48	412.89	440.29	466.10
12.700	488.30	510.49	532.69	554.89	577.08
12.950	599.28	610.12	618.59	627.07	635.55
13.200	644.03	652.50	657.00	654.08	651.15
13.450	648.23	645.30	642.38	639.45	629.85
13.700	619.25	608.65	598.04	587.44	576.84
13.950	564.08	547.97	531.85	515.74	499.63
14.200	483.51	467.40	453.01	438.79	424.58
14.450	410.36	396.14	381.92	369.26	358.65
14.700	348.03	337.42	326.81	316.20	305.58
14.950	297.52	289.58	281.65	273.71	265.78
15.200	257.84	250.57	244.05	237.52	231.00
15.450	224.47	217.95	211.42	206.47	201.54
15.700	196.60	191.66	186.73	181.79	177.38
15.950	173.46	169.54	165.62	161.70	157.78
16.200	153.89	150.77	147.64	144.52	141.40
16.450	138.28	135.16	132.40	129.95	127.49
16.700	125.03	122.58	120.12	117.70	115.71
16.950	113.72	111.74	109.75	107.76	105.78
17.200	104.02	102.41	100.81	99.21	97.60
17.450	96.00	94.43	93.13	91.82	90.52
17.700	89.22	87.92	86.61	85.48	84.44
17.950	83.40	82.37	81.33	80.29	79.28
18.200	78.42	77.57	76.71	75.85	74.99
18.450	74.13	73.37	72.65	71.93	71.21
18.700	70.49	69.77	69.06	68.40	67.74
18.950	67.08	66.42	65.75	65.09	64.46
19.200	63.84	63.21	62.59	61.96	61.34
19.450	60.73	60.14	59.56	58.98	58.40
19.700	57.82	57.24	56.76	56.31	55.86
19.950	55.41	54.97	54.52	54.08	53.67
20.200	53.25	52.84	52.43	52.02	51.60
20.450	51.21	50.82	50.44	50.05	49.66
20.700	49.28	48.90	48.55	48.20	47.85
20.950	47.50	47.14	46.79	46.48	46.17
21.200	45.86	45.56	45.25	44.94	44.65
21.450	44.39	44.14	43.88	43.62	43.36
21.700	43.10	42.88	42.67	42.45	42.24
21.950	42.03	41.81	41.62	41.44	41.26

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 25 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (6.1 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
22.200	41.09	40.91	40.74	40.56	40.42
22.450	40.27	40.12	39.98	39.83	39.68
22.700	39.55	39.42	39.30	39.17	39.04
22.950	38.92	38.79	38.68	38.57	38.46
23.200	38.35	38.23	38.12	38.02	37.92
23.450	37.81	37.71	37.61	37.51	37.41
23.700	37.32	37.22	37.13	37.04	36.94
23.950	36.85	36.72	36.56	36.40	36.24
24.200	36.09	35.93	35.76	35.45	35.14
24.450	34.83	34.52	34.21	33.90	33.45
24.700	32.88	32.32	31.75	31.19	30.62
24.950	30.04	29.27	28.50	27.73	26.96
25.200	26.19	25.42	24.62	23.80	22.97
25.450	22.15	21.32	20.50	19.68	18.92
25.700	18.15	17.38	16.62	15.85	15.08
25.950	14.40	13.75	13.11	12.46	11.82
26.200	11.17	10.56	10.09	9.62	9.15
26.450	8.68	8.21	7.74	7.37	7.04
26.700	6.71	6.39	6.06	5.73	5.42
26.950	5.19	4.95	4.72	4.48	4.24
27.200	4.01	3.82	3.65	3.47	3.30
27.450	3.13	2.96	2.80	2.67	2.55
27.700	2.43	2.30	2.18	2.06	1.96
27.950	1.87	1.78	1.69	1.60	1.51
28.200	1.43	1.37	1.30	1.24	1.17
28.450	1.11	1.04	0.99	0.95	0.90
28.700	0.86	0.81	0.76	0.72	0.69
28.950	0.66	0.62	0.59	0.56	0.52
29.200	0.50	0.47	0.45	0.42	0.40
29.450	0.38	0.35	0.34	0.32	0.30
29.700	0.28	0.27	0.25	0.24	0.22
29.950	0.21	0.20	0.19	0.17	0.16
30.200	0.15	0.14	0.14	0.13	0.12
30.450	0.11	0.10	0.09	0.09	0.08
30.700	0.07	0.07	0.06	0.06	0.05
30.950	0.05	0.04	0.04	0.03	0.03
31.200	0.03	0.02	0.02	0.02	0.01
31.450	0.01	0.01	0.01	0.01	0.00
31.700	0.00	0.00	(N/A)	(N/A)	(N/A)

Storm Event	TypeII 24hr (6.9 in)
Return Event	50 years
Duration	35.000 hours
Depth	6.9 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	763.19 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	761.94 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.5 in
Runoff Volume (Pervious)	235.885 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	235.883 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 50 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (6.9 in)

Storm Event	TypeII 24hr (6.9 in)
Return Event	50 years
Duration	35.000 hours
Depth	6.9 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
3.300	0.00	0.00	0.00	0.00	0.00
3.550	0.00	0.01	0.02	0.02	0.03
3.800	0.04	0.04	0.06	0.08	0.10
4.050	0.13	0.15	0.17	0.20	0.25
4.300	0.30	0.36	0.42	0.48	0.53
4.550	0.60	0.71	0.81	0.92	1.02
4.800	1.12	1.23	1.37	1.53	1.69
5.050	1.84	2.00	2.15	2.33	2.54
5.300	2.75	2.95	3.16	3.37	3.58
5.550	3.83	4.08	4.34	4.59	4.85
5.800	5.11	5.38	5.67	5.97	6.26
6.050	6.56	6.85	7.15	7.47	7.80
6.300	8.13	8.46	8.78	9.11	9.45
6.550	9.81	10.16	10.52	10.87	11.23
6.800	11.59	11.96	12.34	12.72	13.10
7.050	13.48	13.86	14.25	14.65	15.05
7.300	15.45	15.85	16.25	16.65	17.07
7.550	17.48	17.90	18.32	18.74	19.15
7.800	19.58	20.01	20.44	20.88	21.31
8.050	21.74	22.18	22.63	23.09	23.54
8.300	24.00	24.45	24.91	25.39	25.89
8.550	26.39	26.89	27.39	27.89	28.39
8.800	28.97	29.55	30.13	30.72	31.30
9.050	31.88	32.52	33.22	33.91	34.60
9.300	35.29	35.98	36.69	37.49	38.29
9.550	39.09	39.89	40.70	41.50	42.36
9.800	43.26	44.17	45.07	45.97	46.87
10.050	47.79	48.81	49.82	50.84	51.86
10.300	52.88	53.90	55.05	56.26	57.48
10.550	58.70	59.92	61.13	62.41	63.97
10.800	65.53	67.09	68.64	70.20	71.76
11.050	73.71	75.84	77.96	80.09	82.21

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 50 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (6.9 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.300	84.33	86.82	90.57	94.32	98.07
11.550	101.82	105.57	109.32	119.30	131.41
11.800	143.52	155.63	167.74	179.85	194.58
12.050	216.55	238.53	260.50	282.47	304.45
12.300	326.42	355.98	387.60	419.21	450.83
12.550	482.45	514.06	543.80	569.28	594.77
12.800	620.26	645.75	671.23	696.72	709.04
13.050	718.62	728.20	737.79	747.37	756.95
13.300	761.94	758.35	754.76	751.17	747.58
13.550	743.99	740.40	729.13	716.70	704.26
13.800	691.83	679.40	666.97	652.08	633.34
14.050	614.60	595.85	577.11	558.37	539.63
14.300	522.94	506.44	489.95	473.46	456.96
14.550	440.47	425.79	413.49	401.20	388.90
14.800	376.60	364.31	352.01	342.67	333.49
15.050	324.30	315.11	305.92	296.73	288.32
15.300	280.77	273.22	265.67	258.12	250.57
15.550	243.02	237.31	231.60	225.89	220.18
15.800	214.48	208.77	203.67	199.14	194.62
16.050	190.09	185.56	181.04	176.54	172.94
16.300	169.34	165.73	162.13	158.53	154.93
16.550	151.75	148.92	146.09	143.25	140.42
16.800	137.59	134.80	132.51	130.22	127.93
17.050	125.64	123.35	121.06	119.04	117.19
17.300	115.35	113.50	111.65	109.81	108.00
17.550	106.50	105.00	103.50	102.01	100.51
17.800	99.01	97.71	96.51	95.32	94.13
18.050	92.93	91.74	90.58	89.59	88.61
18.300	87.62	86.64	85.65	84.67	83.79
18.550	82.96	82.14	81.31	80.48	79.66
18.800	78.84	78.09	77.33	76.57	75.81
19.050	75.05	74.29	73.56	72.84	72.13
19.300	71.41	70.70	69.98	69.28	68.61
19.550	67.94	67.28	66.61	65.94	65.28
19.800	64.73	64.22	63.71	63.20	62.68
20.050	62.17	61.67	61.20	60.73	60.26
20.300	59.78	59.31	58.84	58.39	57.95
20.550	57.51	57.07	56.63	56.19	55.76
20.800	55.36	54.95	54.55	54.15	53.75
21.050	53.35	52.99	52.64	52.29	51.94
21.300	51.59	51.24	50.90	50.61	50.31
21.550	50.02	49.72	49.43	49.13	48.88

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
21.800	48.64	48.39	48.15	47.91	47.66
22.050	47.44	47.24	47.04	46.84	46.64
22.300	46.44	46.24	46.07	45.90	45.73
22.550	45.56	45.40	45.23	45.07	44.93
22.800	44.79	44.64	44.50	44.35	44.21
23.050	44.08	43.95	43.83	43.70	43.57
23.300	43.44	43.32	43.21	43.09	42.98
23.550	42.86	42.75	42.63	42.52	42.42
23.800	42.31	42.20	42.10	41.99	41.84
24.050	41.66	41.48	41.30	41.12	40.94
24.300	40.75	40.39	40.04	39.69	39.33
24.550	38.98	38.63	38.11	37.47	36.82
24.800	36.18	35.53	34.89	34.22	33.35
25.050	32.47	31.60	30.72	29.84	28.97
25.300	28.05	27.11	26.17	25.23	24.30
25.550	23.36	22.43	21.55	20.68	19.81
25.800	18.93	18.06	17.19	16.40	15.67
26.050	14.94	14.20	13.47	12.73	12.03
26.300	11.50	10.96	10.43	9.89	9.36
26.550	8.82	8.40	8.02	7.65	7.28
26.800	6.90	6.53	6.18	5.91	5.64
27.050	5.37	5.10	4.84	4.57	4.35
27.300	4.16	3.96	3.76	3.57	3.37
27.550	3.19	3.05	2.90	2.76	2.62
27.800	2.48	2.34	2.23	2.13	2.03
28.050	1.93	1.82	1.72	1.63	1.56
28.300	1.48	1.41	1.34	1.26	1.19
28.550	1.13	1.08	1.03	0.98	0.92
28.800	0.87	0.82	0.79	0.75	0.71
29.050	0.67	0.63	0.59	0.57	0.54
29.300	0.51	0.48	0.46	0.43	0.40
29.550	0.38	0.36	0.34	0.32	0.30
29.800	0.28	0.27	0.25	0.24	0.23
30.050	0.21	0.20	0.19	0.17	0.16
30.300	0.15	0.14	0.13	0.12	0.12
30.550	0.11	0.10	0.09	0.09	0.08
30.800	0.07	0.07	0.06	0.05	0.05
31.050	0.04	0.04	0.03	0.03	0.03
31.300	0.02	0.02	0.02	0.01	0.01
31.550	0.01	0.01	0.00	0.00	0.00

Storm Event	TypeII 24hr (7.8 in)
Return Event	100 years
Duration	35.000 hours
Depth	7.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	881.27 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	879.76 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.4 in
Runoff Volume (Pervious)	273.499 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	273.497 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (7.8 in)

Storm Event	TypeII 24hr (7.8 in)
Return Event	100 years
Duration	35.000 hours
Depth	7.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
2.950	0.00	0.00	0.00	0.00	0.01
3.200	0.01	0.01	0.02	0.03	0.04
3.450	0.05	0.06	0.06	0.09	0.12
3.700	0.15	0.18	0.21	0.24	0.28
3.950	0.36	0.43	0.50	0.57	0.64
4.200	0.71	0.83	0.95	1.08	1.21
4.450	1.34	1.46	1.61	1.79	1.98
4.700	2.17	2.36	2.54	2.73	2.97
4.950	3.21	3.46	3.71	3.95	4.20
5.200	4.46	4.76	5.06	5.36	5.66
5.450	5.96	6.26	6.60	6.94	7.29
5.700	7.63	7.97	8.32	8.68	9.06
5.950	9.44	9.82	10.20	10.58	10.96
6.200	11.36	11.78	12.19	12.60	13.01
6.450	13.42	13.85	14.28	14.72	15.16
6.700	15.60	16.04	16.48	16.93	17.40
6.950	17.86	18.32	18.78	19.24	19.71
7.200	20.19	20.67	21.15	21.63	22.11
7.450	22.59	23.09	23.59	24.08	24.58
7.700	25.08	25.58	26.08	26.59	27.10
7.950	27.62	28.13	28.64	29.15	29.69
8.200	30.22	30.76	31.29	31.83	32.36
8.450	32.93	33.51	34.10	34.69	35.27
8.700	35.86	36.45	37.13	37.82	38.50
8.950	39.18	39.87	40.55	41.31	42.12
9.200	42.94	43.75	44.56	45.38	46.20
9.450	47.15	48.09	49.04	49.98	50.92
9.700	51.87	52.88	53.94	55.00	56.06
9.950	57.12	58.17	59.25	60.44	61.63
10.200	62.82	64.02	65.21	66.40	67.74
10.450	69.16	70.59	72.01	73.43	74.85
10.700	76.34	78.16	79.98	81.80	83.61

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (7.8 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
10.950	85.43	87.25	89.53	92.01	94.48
11.200	96.96	99.44	101.92	104.82	109.19
11.450	113.55	117.92	122.29	126.66	131.02
11.700	142.57	156.57	170.56	184.56	198.56
11.950	212.55	229.56	254.88	280.20	305.52
12.200	330.84	356.16	381.48	415.46	451.79
12.450	488.11	524.44	560.77	597.10	631.22
12.700	660.39	689.55	718.72	747.89	777.05
12.950	806.22	820.18	830.99	841.80	852.61
13.200	863.42	874.23	879.76	875.41	871.07
13.450	866.73	862.38	858.04	853.70	840.53
13.700	826.05	811.56	797.07	782.58	768.09
13.950	750.80	729.11	707.42	685.73	664.04
14.200	642.35	620.66	601.37	582.32	563.28
14.450	544.23	525.18	506.13	489.19	475.00
14.700	460.82	446.63	432.45	418.26	404.08
14.950	393.31	382.71	372.12	361.53	350.93
15.200	340.34	330.64	321.94	313.24	304.55
15.450	295.85	287.15	278.46	271.87	265.30
15.700	258.73	252.16	245.59	239.02	233.15
15.950	227.94	222.73	217.52	212.32	207.11
16.200	201.94	197.79	193.65	189.51	185.37
16.450	181.23	177.08	173.44	170.18	166.93
16.700	163.67	160.42	157.17	153.96	151.33
16.950	148.71	146.08	143.45	140.82	138.20
17.200	135.87	133.75	131.64	129.52	127.40
17.450	125.28	123.21	121.49	119.77	118.05
17.700	116.34	114.62	112.90	111.41	110.04
17.950	108.67	107.31	105.94	104.57	103.24
18.200	102.11	100.99	99.86	98.73	97.60
18.450	96.47	95.47	94.52	93.58	92.63
18.700	91.68	90.74	89.81	88.94	88.07
18.950	87.20	86.33	85.46	84.59	83.76
19.200	82.94	82.12	81.30	80.49	79.67
19.450	78.86	78.10	77.34	76.58	75.81
19.700	75.05	74.29	73.67	73.08	72.50
19.950	71.92	71.33	70.75	70.18	69.64
20.200	69.10	68.57	68.03	67.49	66.95
20.450	66.44	65.94	65.44	64.94	64.43
20.700	63.93	63.44	62.98	62.53	62.07
20.950	61.61	61.15	60.69	60.29	59.89
21.200	59.49	59.09	58.69	58.29	57.91

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (7.8 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
21.450	57.58	57.24	56.90	56.57	56.23
21.700	55.89	55.61	55.33	55.05	54.77
21.950	54.50	54.22	53.96	53.73	53.50
22.200	53.28	53.05	52.82	52.59	52.40
22.450	52.21	52.02	51.83	51.64	51.45
22.700	51.27	51.10	50.94	50.77	50.61
22.950	50.45	50.28	50.14	49.99	49.85
23.200	49.70	49.56	49.41	49.27	49.14
23.450	49.01	48.88	48.75	48.61	48.48
23.700	48.36	48.24	48.12	48.00	47.87
23.950	47.75	47.59	47.38	47.17	46.97
24.200	46.76	46.55	46.33	45.93	45.53
24.450	45.13	44.73	44.33	43.93	43.34
24.700	42.60	41.87	41.14	40.41	39.67
24.950	38.92	37.92	36.92	35.93	34.93
25.200	33.93	32.94	31.90	30.83	29.76
25.450	28.69	27.63	26.56	25.50	24.51
25.700	23.52	22.52	21.53	20.54	19.54
25.950	18.65	17.82	16.98	16.15	15.31
26.200	14.48	13.68	13.07	12.47	11.86
26.450	11.25	10.64	10.03	9.55	9.12
26.700	8.70	8.27	7.85	7.42	7.02
26.950	6.72	6.41	6.11	5.80	5.50
27.200	5.19	4.95	4.73	4.50	4.28
27.450	4.05	3.83	3.62	3.46	3.30
27.700	3.14	2.98	2.82	2.66	2.54
27.950	2.42	2.31	2.19	2.07	1.96
28.200	1.85	1.77	1.69	1.60	1.52
28.450	1.44	1.35	1.29	1.23	1.17
28.700	1.11	1.05	0.99	0.94	0.89
28.950	0.85	0.81	0.76	0.72	0.68
29.200	0.64	0.61	0.58	0.55	0.52
29.450	0.49	0.46	0.44	0.41	0.39
29.700	0.37	0.35	0.32	0.31	0.29
29.950	0.27	0.26	0.24	0.23	0.21
30.200	0.20	0.19	0.18	0.16	0.15
30.450	0.14	0.13	0.12	0.11	0.11
30.700	0.10	0.09	0.08	0.07	0.07
30.950	0.06	0.06	0.05	0.04	0.04
31.200	0.03	0.03	0.03	0.02	0.02
31.450	0.01	0.01	0.01	0.01	0.01
31.700	0.00	0.00	0.00	(N/A)	(N/A)

Storm Event	TypeII 24hr (9.6 in)
Return Event	500 years
Duration	35.000 hours
Depth	9.6 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	1,116.49 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	1,114.44 ft³/s

Drainage Area	
SCS CN (Composite)	88.000
Area (User Defined)	515.000 acres
Maximum Retention (Pervious)	1.4 in
Maximum Retention (Pervious, 20 percent)	0.3 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	8.1 in
Runoff Volume (Pervious)	349.237 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	349.236 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Kingsbury On-site

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	240.16 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 500 years

Label: Kingsbury On-site Storm Event: TypeII 24hr (9.6 in)

Storm Event	TypeII 24hr (9.6 in)
Return Event	500 years
Duration	35.000 hours
Depth	9.6 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	515.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
2.500	0.00	0.00	0.00	0.01	0.01
2.750	0.02	0.03	0.03	0.04	0.06
3.000	0.09	0.11	0.14	0.17	0.20
3.250	0.23	0.30	0.38	0.45	0.52
3.500	0.60	0.67	0.79	0.93	1.07
3.750	1.22	1.36	1.50	1.66	1.88
4.000	2.10	2.32	2.54	2.76	2.98
4.250	3.26	3.56	3.86	4.16	4.45
4.500	4.75	5.07	5.44	5.80	6.17
4.750	6.54	6.90	7.27	7.68	8.10
5.000	8.53	8.95	9.37	9.80	10.24
5.250	10.71	11.18	11.64	12.11	12.58
5.500	13.05	13.56	14.07	14.58	15.08
5.750	15.59	16.10	16.62	17.17	17.71
6.000	18.26	18.80	19.34	19.89	20.46
6.250	21.03	21.60	22.18	22.75	23.32
6.500	23.91	24.51	25.11	25.70	26.30
6.750	26.90	27.50	28.12	28.74	29.36
7.000	29.98	30.60	31.22	31.84	32.48
7.250	33.12	33.76	34.39	35.03	35.67
7.500	36.32	36.97	37.62	38.27	38.92
7.750	39.57	40.23	40.89	41.56	42.22
8.000	42.88	43.55	44.21	44.90	45.59
8.250	46.28	46.97	47.66	48.35	49.07
8.500	49.82	50.58	51.33	52.08	52.84
8.750	53.60	54.48	55.36	56.24	57.12
9.000	58.00	58.88	59.86	60.91	61.97
9.250	63.02	64.07	65.13	66.20	67.42
9.500	68.64	69.86	71.08	72.31	73.53
9.750	74.84	76.20	77.57	78.94	80.30
10.000	81.67	83.06	84.59	86.12	87.65
10.250	89.18	90.71	92.24	93.97	95.79

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 500 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (9.6 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
10.500	97.61	99.43	101.26	103.08	105.00
10.750	107.32	109.65	111.98	114.31	116.64
11.000	118.97	121.89	125.07	128.24	131.42
11.250	134.59	137.77	141.48	147.08	152.67
11.500	158.27	163.86	169.45	175.05	189.70
11.750	207.44	225.18	242.92	260.66	278.41
12.000	299.93	331.90	363.86	395.83	427.79
12.250	459.76	491.72	534.48	580.16	625.84
12.500	671.52	717.20	762.88	805.73	842.19
12.750	878.65	915.11	951.57	988.03	1,024.49
13.000	1,041.71	1,054.94	1,068.18	1,081.41	1,094.64
13.250	1,107.87	1,114.44	1,108.59	1,102.73	1,096.87
13.500	1,091.01	1,085.15	1,079.29	1,062.36	1,043.77
13.750	1,025.18	1,006.59	988.00	969.41	947.32
14.000	919.75	892.19	864.62	837.06	809.50
14.250	781.93	757.50	733.37	709.23	685.10
14.500	660.97	636.84	615.38	597.43	579.49
14.750	561.54	543.59	525.65	507.70	494.09
15.000	480.70	467.30	453.91	440.52	427.12
15.250	414.87	403.89	392.90	381.92	370.94
15.500	359.96	348.97	340.67	332.38	324.09
15.750	315.80	307.51	299.22	291.82	285.25
16.000	278.69	272.12	265.56	258.99	252.47
16.250	247.26	242.04	236.83	231.61	226.40
16.500	221.18	216.59	212.50	208.41	204.32
16.750	200.22	196.13	192.10	188.80	185.50
17.000	182.20	178.90	175.60	172.29	169.38
17.250	166.72	164.06	161.40	158.74	156.08
17.500	153.48	151.32	149.17	147.01	144.86
17.750	142.71	140.55	138.68	136.97	135.25
18.000	133.54	131.83	130.11	128.45	127.03
18.250	125.62	124.21	122.79	121.38	119.97
18.500	118.71	117.53	116.34	115.16	113.97
18.750	112.79	111.63	110.54	109.45	108.36
19.000	107.28	106.19	105.10	104.06	103.04
19.250	102.02	100.99	99.97	98.95	97.94
19.500	96.99	96.04	95.09	94.14	93.19
19.750	92.24	91.46	90.73	90.01	89.28
20.000	88.55	87.83	87.12	86.45	85.78
20.250	85.11	84.44	83.78	83.11	82.47
20.500	81.85	81.22	80.60	79.97	79.35
20.750	78.74	78.17	77.60	77.03	76.46

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 500 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (9.6 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
21.000	75.89	75.33	74.82	74.32	73.82
21.250	73.33	72.83	72.33	71.87	71.45
21.500	71.03	70.61	70.19	69.77	69.35
21.750	69.00	68.65	68.31	67.96	67.62
22.000	67.27	66.95	66.67	66.38	66.10
22.250	65.82	65.53	65.25	65.01	64.77
22.500	64.54	64.30	64.06	63.82	63.60
22.750	63.40	63.19	62.99	62.78	62.58
23.000	62.38	62.20	62.01	61.83	61.65
23.250	61.47	61.29	61.12	60.96	60.79
23.500	60.63	60.46	60.30	60.14	59.99
23.750	59.83	59.68	59.53	59.38	59.23
24.000	59.02	58.76	58.51	58.25	57.99
24.250	57.74	57.47	56.97	56.47	55.97
24.500	55.47	54.97	54.48	53.74	52.84
24.750	51.93	51.02	50.11	49.20	48.26
25.000	47.03	45.79	44.56	43.32	42.08
25.250	40.85	39.56	38.23	36.91	35.58
25.500	34.26	32.94	31.62	30.39	29.16
25.750	27.93	26.70	25.47	24.23	23.13
26.000	22.10	21.06	20.02	18.99	17.95
26.250	16.97	16.21	15.46	14.70	13.95
26.500	13.19	12.44	11.84	11.31	10.79
26.750	10.26	9.73	9.20	8.71	8.33
27.000	7.95	7.57	7.20	6.82	6.44
27.250	6.14	5.86	5.58	5.30	5.03
27.500	4.75	4.49	4.29	4.10	3.90
27.750	3.70	3.50	3.30	3.15	3.00
28.000	2.86	2.72	2.57	2.43	2.30
28.250	2.19	2.09	1.99	1.88	1.78
28.500	1.68	1.60	1.52	1.45	1.38
28.750	1.30	1.23	1.16	1.11	1.05
29.000	1.00	0.95	0.89	0.84	0.80
29.250	0.76	0.72	0.68	0.64	0.60
29.500	0.57	0.54	0.51	0.48	0.46
29.750	0.43	0.40	0.38	0.36	0.34
30.000	0.32	0.30	0.28	0.26	0.25
30.250	0.23	0.22	0.20	0.19	0.17
30.500	0.16	0.15	0.14	0.13	0.12
30.750	0.11	0.10	0.09	0.08	0.08
31.000	0.07	0.06	0.05	0.05	0.04
31.250	0.04	0.03	0.03	0.02	0.02

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 500 years
Label: Kingsbury On-site Storm Event: TypeII 24hr (9.6 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
31.500	0.01	0.01	0.01	0.01	0.00
31.750	0.00	0.00	0.00	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Kingsbury On-site

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Kingsbury On-site	70.449	13.300	228.12
Flow (In)	O-1	70.449	13.300	228.12

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Kingsbury On-site

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Kingsbury On-site	97.364	13.300	317.21
Flow (In)	O-1	97.364	13.300	317.21

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Kingsbury On-site

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Kingsbury On-site	137.171	13.300	447.17
Flow (In)	O-1	137.171	13.300	447.17

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Kingsbury On-site

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Kingsbury On-site	165.624	13.300	538.88
Flow (In)	O-1	165.624	13.300	538.88

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Kingsbury On-site

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Kingsbury On-site	202.661	13.300	657.00
Flow (In)	O-1	202.661	13.300	657.00

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Kingsbury On-site

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Kingsbury On-site	235.883	13.300	761.94
Flow (In)	O-1	235.883	13.300	761.94

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Kingsbury Park Wichita

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Off-Site Runoff	24_HR_Type_II - , 1 yrs	1	21.767	13.600	58.73
Off-Site Runoff	24_HR_Type_II - , 2 yrs	2	35.724	13.600	104.11
Off-Site Runoff	24_HR_Type_II - , 5 yrs	5	58.649	13.600	179.95
Off-Site Runoff	24_HR_Type_II - , 10 yrs	10	76.195	13.600	238.02
Off-Site Runoff	24_HR_Type_II - , 25 yrs	25	100.062	13.300	316.86
Off-Site Runoff	24_HR_Type_II - , 50 yrs	50	122.223	13.300	391.30
Off-Site Runoff	24_HR_Type_II - , 100 yrs	100	147.967	13.300	477.47
Off-Site Runoff	24_HR_Type_II - , 500 yrs	500	201.335	13.300	654.84

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
O-1	24_HR_Type_II - , 1 yrs	1	21.767	13.600	58.73
O-1	24_HR_Type_II - , 2 yrs	2	35.724	13.600	104.11
O-1	24_HR_Type_II - , 5 yrs	5	58.649	13.600	179.95
O-1	24_HR_Type_II - , 10 yrs	10	76.195	13.600	238.02
O-1	24_HR_Type_II - , 25 yrs	25	100.062	13.300	316.86
O-1	24_HR_Type_II - , 50 yrs	50	122.223	13.300	391.30
O-1	24_HR_Type_II - , 100 yrs	100	147.967	13.300	477.47
O-1	24_HR_Type_II - , 500 yrs	500	201.335	13.300	654.84

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Time-Depth Curve: TypeII 24hr (2.8 in)	
Label	TypeII 24hr (2.8 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.0
1.500	0.0	0.0	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.1	0.1	0.1
4.000	0.1	0.1	0.1	0.1	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.2	0.2	0.2	0.2
6.000	0.2	0.2	0.2	0.2	0.2
6.500	0.2	0.3	0.3	0.3	0.3
7.000	0.3	0.3	0.3	0.3	0.3
7.500	0.3	0.3	0.3	0.3	0.3
8.000	0.3	0.3	0.3	0.4	0.4
8.500	0.4	0.4	0.4	0.4	0.4
9.000	0.4	0.4	0.4	0.4	0.4
9.500	0.5	0.5	0.5	0.5	0.5
10.000	0.5	0.5	0.5	0.5	0.6
10.500	0.6	0.6	0.6	0.6	0.6
11.000	0.7	0.7	0.7	0.7	0.8
11.500	0.8	0.9	1.0	1.2	1.6
12.000	1.9	1.9	2.0	2.0	2.0
12.500	2.1	2.1	2.1	2.1	2.1
13.000	2.2	2.2	2.2	2.2	2.2
13.500	2.2	2.3	2.3	2.3	2.3
14.000	2.3	2.3	2.3	2.3	2.3
14.500	2.3	2.4	2.4	2.4	2.4
15.000	2.4	2.4	2.4	2.4	2.4
15.500	2.4	2.4	2.4	2.5	2.5
16.000	2.5	2.5	2.5	2.5	2.5

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	2.5	2.5	2.5	2.5	2.5
17.000	2.5	2.5	2.5	2.5	2.5
17.500	2.6	2.6	2.6	2.6	2.6
18.000	2.6	2.6	2.6	2.6	2.6
18.500	2.6	2.6	2.6	2.6	2.6
19.000	2.6	2.6	2.6	2.6	2.6
19.500	2.6	2.7	2.7	2.7	2.7
20.000	2.7	2.7	2.7	2.7	2.7
20.500	2.7	2.7	2.7	2.7	2.7
21.000	2.7	2.7	2.7	2.7	2.7
21.500	2.7	2.7	2.7	2.7	2.7
22.000	2.7	2.7	2.7	2.7	2.7
22.500	2.8	2.8	2.8	2.8	2.8
23.000	2.8	2.8	2.8	2.8	2.8
23.500	2.8	2.8	2.8	2.8	2.8
24.000	2.8	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

Time-Depth Curve: TypeII 24hr (3.5 in)	
Label	TypeII 24hr (3.5 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.3	0.3	0.3	0.3
6.000	0.3	0.3	0.3	0.3	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.4	0.4	0.4	0.4
7.500	0.4	0.4	0.4	0.4	0.4
8.000	0.4	0.4	0.4	0.4	0.5
8.500	0.5	0.5	0.5	0.5	0.5
9.000	0.5	0.5	0.5	0.5	0.6
9.500	0.6	0.6	0.6	0.6	0.6
10.000	0.6	0.6	0.7	0.7	0.7
10.500	0.7	0.7	0.8	0.8	0.8
11.000	0.8	0.8	0.9	0.9	1.0
11.500	1.0	1.1	1.2	1.5	2.0
12.000	2.3	2.4	2.4	2.5	2.5
12.500	2.6	2.6	2.6	2.7	2.7
13.000	2.7	2.7	2.7	2.8	2.8
13.500	2.8	2.8	2.8	2.8	2.9
14.000	2.9	2.9	2.9	2.9	2.9
14.500	2.9	2.9	3.0	3.0	3.0
15.000	3.0	3.0	3.0	3.0	3.0
15.500	3.0	3.0	3.1	3.1	3.1
16.000	3.1	3.1	3.1	3.1	3.1

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	3.1	3.1	3.1	3.1	3.1
17.000	3.2	3.2	3.2	3.2	3.2
17.500	3.2	3.2	3.2	3.2	3.2
18.000	3.2	3.2	3.2	3.2	3.2
18.500	3.3	3.3	3.3	3.3	3.3
19.000	3.3	3.3	3.3	3.3	3.3
19.500	3.3	3.3	3.3	3.3	3.3
20.000	3.3	3.3	3.3	3.3	3.4
20.500	3.4	3.4	3.4	3.4	3.4
21.000	3.4	3.4	3.4	3.4	3.4
21.500	3.4	3.4	3.4	3.4	3.4
22.000	3.4	3.4	3.4	3.4	3.4
22.500	3.4	3.4	3.4	3.5	3.5
23.000	3.5	3.5	3.5	3.5	3.5
23.500	3.5	3.5	3.5	3.5	3.5
24.000	3.5	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

Time-Depth Curve: TypeII 24hr (4.5 in)	
Label	TypeII 24hr (4.5 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	5 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.4
7.000	0.4	0.5	0.5	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.5	0.6	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.6	0.6
9.000	0.7	0.7	0.7	0.7	0.7
9.500	0.7	0.7	0.8	0.8	0.8
10.000	0.8	0.8	0.9	0.9	0.9
10.500	0.9	0.9	1.0	1.0	1.0
11.000	1.1	1.1	1.1	1.2	1.2
11.500	1.3	1.4	1.6	1.9	2.6
12.000	3.0	3.1	3.1	3.2	3.3
12.500	3.3	3.3	3.4	3.4	3.4
13.000	3.5	3.5	3.5	3.6	3.6
13.500	3.6	3.6	3.6	3.7	3.7
14.000	3.7	3.7	3.7	3.7	3.8
14.500	3.8	3.8	3.8	3.8	3.8
15.000	3.8	3.9	3.9	3.9	3.9
15.500	3.9	3.9	3.9	3.9	3.9
16.000	4.0	4.0	4.0	4.0	4.0

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	4.0	4.0	4.0	4.0	4.0
17.000	4.1	4.1	4.1	4.1	4.1
17.500	4.1	4.1	4.1	4.1	4.1
18.000	4.1	4.2	4.2	4.2	4.2
18.500	4.2	4.2	4.2	4.2	4.2
19.000	4.2	4.2	4.2	4.2	4.2
19.500	4.3	4.3	4.3	4.3	4.3
20.000	4.3	4.3	4.3	4.3	4.3
20.500	4.3	4.3	4.3	4.3	4.3
21.000	4.3	4.3	4.4	4.4	4.4
21.500	4.4	4.4	4.4	4.4	4.4
22.000	4.4	4.4	4.4	4.4	4.4
22.500	4.4	4.4	4.4	4.4	4.4
23.000	4.4	4.5	4.5	4.5	4.5
23.500	4.5	4.5	4.5	4.5	4.5
24.000	4.5	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

Time-Depth Curve: TypeII 24hr (5.2 in)	
Label	TypeII 24hr (5.2 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.4	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.5
6.500	0.5	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.5	0.6
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.6	0.7	0.7
8.500	0.7	0.7	0.7	0.7	0.7
9.000	0.8	0.8	0.8	0.8	0.8
9.500	0.8	0.9	0.9	0.9	0.9
10.000	0.9	1.0	1.0	1.0	1.0
10.500	1.1	1.1	1.1	1.2	1.2
11.000	1.2	1.3	1.3	1.4	1.4
11.500	1.5	1.6	1.8	2.2	3.0
12.000	3.4	3.5	3.6	3.7	3.8
12.500	3.8	3.9	3.9	3.9	4.0
13.000	4.0	4.0	4.1	4.1	4.1
13.500	4.2	4.2	4.2	4.2	4.2
14.000	4.3	4.3	4.3	4.3	4.3
14.500	4.4	4.4	4.4	4.4	4.4
15.000	4.4	4.5	4.5	4.5	4.5
15.500	4.5	4.5	4.5	4.6	4.6
16.000	4.6	4.6	4.6	4.6	4.6

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	4.6	4.6	4.7	4.7	4.7
17.000	4.7	4.7	4.7	4.7	4.7
17.500	4.7	4.8	4.8	4.8	4.8
18.000	4.8	4.8	4.8	4.8	4.8
18.500	4.8	4.8	4.9	4.9	4.9
19.000	4.9	4.9	4.9	4.9	4.9
19.500	4.9	4.9	4.9	4.9	4.9
20.000	5.0	5.0	5.0	5.0	5.0
20.500	5.0	5.0	5.0	5.0	5.0
21.000	5.0	5.0	5.0	5.0	5.0
21.500	5.0	5.1	5.1	5.1	5.1
22.000	5.1	5.1	5.1	5.1	5.1
22.500	5.1	5.1	5.1	5.1	5.1
23.000	5.1	5.1	5.2	5.2	5.2
23.500	5.2	5.2	5.2	5.2	5.2
24.000	5.2	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Time-Depth Curve: TypeII 24hr (6.1 in)	
Label	TypeII 24hr (6.1 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.4	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.4
5.500	0.4	0.4	0.5	0.5	0.5
6.000	0.5	0.5	0.5	0.5	0.5
6.500	0.5	0.6	0.6	0.6	0.6
7.000	0.6	0.6	0.6	0.6	0.7
7.500	0.7	0.7	0.7	0.7	0.7
8.000	0.7	0.7	0.8	0.8	0.8
8.500	0.8	0.8	0.8	0.9	0.9
9.000	0.9	0.9	0.9	1.0	1.0
9.500	1.0	1.0	1.0	1.1	1.1
10.000	1.1	1.1	1.2	1.2	1.2
10.500	1.2	1.3	1.3	1.4	1.4
11.000	1.4	1.5	1.5	1.6	1.7
11.500	1.7	1.9	2.2	2.6	3.5
12.000	4.0	4.2	4.3	4.3	4.4
12.500	4.5	4.5	4.6	4.6	4.7
13.000	4.7	4.7	4.8	4.8	4.8
13.500	4.9	4.9	4.9	5.0	5.0
14.000	5.0	5.0	5.0	5.1	5.1
14.500	5.1	5.1	5.1	5.2	5.2
15.000	5.2	5.2	5.2	5.3	5.3
15.500	5.3	5.3	5.3	5.3	5.4
16.000	5.4	5.4	5.4	5.4	5.4

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	5.4	5.4	5.5	5.5	5.5
17.000	5.5	5.5	5.5	5.5	5.5
17.500	5.6	5.6	5.6	5.6	5.6
18.000	5.6	5.6	5.6	5.7	5.7
18.500	5.7	5.7	5.7	5.7	5.7
19.000	5.7	5.7	5.7	5.7	5.8
19.500	5.8	5.8	5.8	5.8	5.8
20.000	5.8	5.8	5.8	5.8	5.8
20.500	5.8	5.9	5.9	5.9	5.9
21.000	5.9	5.9	5.9	5.9	5.9
21.500	5.9	5.9	5.9	5.9	6.0
22.000	6.0	6.0	6.0	6.0	6.0
22.500	6.0	6.0	6.0	6.0	6.0
23.000	6.0	6.0	6.0	6.1	6.1
23.500	6.1	6.1	6.1	6.1	6.1
24.000	6.1	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Time-Depth Curve: TypeII 24hr (6.9 in)	
Label	TypeII 24hr (6.9 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	50 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.4	0.4
5.000	0.4	0.4	0.5	0.5	0.5
5.500	0.5	0.5	0.5	0.5	0.5
6.000	0.6	0.6	0.6	0.6	0.6
6.500	0.6	0.6	0.6	0.7	0.7
7.000	0.7	0.7	0.7	0.7	0.7
7.500	0.8	0.8	0.8	0.8	0.8
8.000	0.8	0.8	0.9	0.9	0.9
8.500	0.9	0.9	1.0	1.0	1.0
9.000	1.0	1.0	1.1	1.1	1.1
9.500	1.1	1.1	1.2	1.2	1.2
10.000	1.2	1.3	1.3	1.3	1.4
10.500	1.4	1.4	1.5	1.5	1.6
11.000	1.6	1.7	1.7	1.8	1.9
11.500	2.0	2.1	2.4	3.0	3.9
12.000	4.6	4.7	4.8	4.9	5.0
12.500	5.1	5.1	5.2	5.2	5.3
13.000	5.3	5.4	5.4	5.4	5.5
13.500	5.5	5.5	5.6	5.6	5.6
14.000	5.7	5.7	5.7	5.7	5.8
14.500	5.8	5.8	5.8	5.8	5.9
15.000	5.9	5.9	5.9	5.9	6.0
15.500	6.0	6.0	6.0	6.0	6.1
16.000	6.1	6.1	6.1	6.1	6.1

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	6.1	6.2	6.2	6.2	6.2
17.000	6.2	6.2	6.3	6.3	6.3
17.500	6.3	6.3	6.3	6.3	6.3
18.000	6.4	6.4	6.4	6.4	6.4
18.500	6.4	6.4	6.4	6.4	6.5
19.000	6.5	6.5	6.5	6.5	6.5
19.500	6.5	6.5	6.5	6.6	6.6
20.000	6.6	6.6	6.6	6.6	6.6
20.500	6.6	6.6	6.6	6.6	6.6
21.000	6.7	6.7	6.7	6.7	6.7
21.500	6.7	6.7	6.7	6.7	6.7
22.000	6.7	6.7	6.8	6.8	6.8
22.500	6.8	6.8	6.8	6.8	6.8
23.000	6.8	6.8	6.8	6.8	6.9
23.500	6.9	6.9	6.9	6.9	6.9
24.000	6.9	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

Time-Depth Curve: TypeII 24hr (7.8 in)	
Label	TypeII 24hr (7.8 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.4	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.5	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.5
5.500	0.6	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.7	0.7	0.7
6.500	0.7	0.7	0.7	0.7	0.8
7.000	0.8	0.8	0.8	0.8	0.8
7.500	0.9	0.9	0.9	0.9	0.9
8.000	0.9	1.0	1.0	1.0	1.0
8.500	1.0	1.1	1.1	1.1	1.1
9.000	1.1	1.2	1.2	1.2	1.2
9.500	1.3	1.3	1.3	1.4	1.4
10.000	1.4	1.4	1.5	1.5	1.6
10.500	1.6	1.6	1.7	1.7	1.8
11.000	1.8	1.9	2.0	2.0	2.1
11.500	2.2	2.4	2.8	3.4	4.4
12.000	5.2	5.3	5.4	5.6	5.7
12.500	5.7	5.8	5.9	5.9	6.0
13.000	6.0	6.1	6.1	6.2	6.2
13.500	6.2	6.3	6.3	6.3	6.4
14.000	6.4	6.4	6.5	6.5	6.5
14.500	6.5	6.6	6.6	6.6	6.6
15.000	6.7	6.7	6.7	6.7	6.7
15.500	6.8	6.8	6.8	6.8	6.8
16.000	6.9	6.9	6.9	6.9	6.9

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	7.0	7.0	7.0	7.0	7.0
17.000	7.0	7.0	7.1	7.1	7.1
17.500	7.1	7.1	7.1	7.2	7.2
18.000	7.2	7.2	7.2	7.2	7.2
18.500	7.3	7.3	7.3	7.3	7.3
19.000	7.3	7.3	7.3	7.3	7.4
19.500	7.4	7.4	7.4	7.4	7.4
20.000	7.4	7.4	7.4	7.5	7.5
20.500	7.5	7.5	7.5	7.5	7.5
21.000	7.5	7.5	7.5	7.6	7.6
21.500	7.6	7.6	7.6	7.6	7.6
22.000	7.6	7.6	7.6	7.6	7.7
22.500	7.7	7.7	7.7	7.7	7.7
23.000	7.7	7.7	7.7	7.7	7.7
23.500	7.8	7.8	7.8	7.8	7.8
24.000	7.8	(N/A)	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

Time-Depth Curve: TypeII 24hr (9.6 in)	
Label	TypeII 24hr (9.6 in)
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	500 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.1	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.2	0.2	0.2	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.3
2.500	0.3	0.3	0.3	0.3	0.3
3.000	0.3	0.3	0.4	0.4	0.4
3.500	0.4	0.4	0.4	0.4	0.4
4.000	0.5	0.5	0.5	0.5	0.5
4.500	0.5	0.5	0.6	0.6	0.6
5.000	0.6	0.6	0.6	0.7	0.7
5.500	0.7	0.7	0.7	0.7	0.8
6.000	0.8	0.8	0.8	0.8	0.8
6.500	0.9	0.9	0.9	0.9	0.9
7.000	1.0	1.0	1.0	1.0	1.0
7.500	1.0	1.1	1.1	1.1	1.1
8.000	1.2	1.2	1.2	1.2	1.2
8.500	1.3	1.3	1.3	1.4	1.4
9.000	1.4	1.4	1.5	1.5	1.5
9.500	1.6	1.6	1.6	1.7	1.7
10.000	1.7	1.8	1.8	1.9	1.9
10.500	2.0	2.0	2.1	2.1	2.2
11.000	2.3	2.3	2.4	2.5	2.6
11.500	2.7	2.9	3.4	4.1	5.5
12.000	6.4	6.5	6.7	6.8	7.0
12.500	7.1	7.1	7.2	7.3	7.4
13.000	7.4	7.5	7.5	7.6	7.6
13.500	7.7	7.7	7.8	7.8	7.8
14.000	7.9	7.9	7.9	8.0	8.0
14.500	8.0	8.1	8.1	8.1	8.2
15.000	8.2	8.2	8.2	8.3	8.3
15.500	8.3	8.4	8.4	8.4	8.4
16.000	8.4	8.5	8.5	8.5	8.5

Kingsbury Park Wichita

Subsection: Time-Depth Curve
Label: 24_HR_Type_II

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.100 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
16.500	8.6	8.6	8.6	8.6	8.6
17.000	8.7	8.7	8.7	8.7	8.7
17.500	8.8	8.8	8.8	8.8	8.8
18.000	8.8	8.9	8.9	8.9	8.9
18.500	8.9	8.9	9.0	9.0	9.0
19.000	9.0	9.0	9.0	9.0	9.1
19.500	9.1	9.1	9.1	9.1	9.1
20.000	9.1	9.2	9.2	9.2	9.2
20.500	9.2	9.2	9.2	9.2	9.2
21.000	9.3	9.3	9.3	9.3	9.3
21.500	9.3	9.3	9.3	9.4	9.4
22.000	9.4	9.4	9.4	9.4	9.4
22.500	9.4	9.4	9.5	9.5	9.5
23.000	9.5	9.5	9.5	9.5	9.5
23.500	9.5	9.6	9.6	9.6	9.6
24.000	9.6	(N/A)	(N/A)	(N/A)	(N/A)

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft^2
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.170
Slope	0.001 ft/ft
2 Year 24 Hour Depth	3.5 in
Average Velocity	0.05 ft/s
Segment Time of Concentration	0.572 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	1,000.00 ft
Is Paved?	False
Slope	0.001 ft/ft
Average Velocity	0.51 ft/s
Segment Time of Concentration	0.544 hours

Segment #3: TR-55 Channel Flow	
Flow Area	50.0 ft²
Hydraulic Length	3,400.00 ft
Manning's n	0.050
Slope	0.001 ft/ft
Wetted Perimeter	75.00 ft
Average Velocity	0.72 ft/s
Segment Time of Concentration	1.313 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	2.430 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc = (0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))

Where:

Tc= Time of concentration, hours
n= Manning's n
Lf= Flow length, feet
P= 2yr, 24hr Rain depth, inches
Sf= Slope, %

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Kingsbury Park Wichita

Subsection: Runoff CN-Area
Label: Off-Site Runoff

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Small grain - C&T + Crop residue, good	71.000	403.000	0.0	0.0	71.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	403.000	(N/A)	(N/A)	71.000

Unit Hydrograph Method (Computational Notes)

Definition of Terms

At	Total area (acres): At = Ai+Ap
Ai	Impervious area (acres)
Ap	Pervious area (acres)
CNi	Runoff curve number for impervious area
CNp	Runoff curve number for pervious area
fLoss	f loss constant infiltration (depth/time)
gKs	Saturated Hydraulic Conductivity (depth/time)
Md	Volumetric Moisture Deficit
Psi	Capillary Suction (length)
hK	Horton Infiltration Decay Rate (time^-1)
fo	Initial Infiltration Rate (depth/time)
fc	Ultimate(capacity)Infiltration Rate (depth/time)
Ia	Initial Abstraction (length)
dt	Computational increment (duration of unit excess rainfall) Default dt is smallest value of 0.1333Tc, rtm, and th (Smallest dt is then adjusted to match up with Tp)
UDdt	User specified override computational main time increment (only used if UDdt is => .1333Tc)
D(t)	Point on distribution curve (fraction of P) for time step t
K	2 / (1 + (Tr/Tp)): default K = 0.75: (for Tr/Tp = 1.67)
Ks	Hydrograph shape factor = Unit Conversions * K: = ((1hr/3600sec) * (1ft/12in) * ((5280ft)**2/sq.mi)) * K Default Ks = 645.333 * 0.75 = 484
Lag	Lag time from center of excess runoff (dt) to Tp: Lag = 0.6Tc
P	Total precipitation depth, inches
Pa(t)	Accumulated rainfall at time step t
Pi(t)	Incremental rainfall at time step t
qp	Peak discharge (cfs) for 1in. runoff, for 1hr, for 1 sq.mi. = (Ks * A * Q) / Tp (where Q = 1in. runoff, A=sq.mi.)
Qu(t)	Unit hydrograph ordinate (cfs) at time step t
Q(t)	Final hydrograph ordinate (cfs) at time step t
Rai(t)	Accumulated runoff (inches) at time step t for impervious area
Rap(t)	Accumulated runoff (inches) at time step t for pervious area
Rii(t)	Incremental runoff (inches) at time step t for impervious area
Rip(t)	Incremental runoff (inches) at time step t for pervious area
R(t)	Incremental weighted total runoff (inches)
Rtm	Time increment for rainfall table
Si	S for impervious area: Si = (1000/CNi) - 10
Sp	S for pervious area: Sp = (1000/CNp) - 10
t	Time step (row) number
Tc	Time of concentration
Tb	Time (hrs) of entire unit hydrograph: Tb = Tp + Tr
Tp	Time (hrs) to peak of a unit hydrograph: Tp = (dt/2) + Lag
Tr	Time (hrs) of receding limb of unit hydrograph: Tr = ratio of Tp

Kingsbury Park Wichita

Subsection: Unit Hydrograph Equations

Unit Hydrograph Method
Computational Notes
Precipitation

Column (1)	Time for time step t
Column (2)	D(t) = Point on distribution curve for time step t
Column (3)	Pi(t) = Pa(t) - Pa(t-1): Col.(4) - Preceding Col.(4)
Column (4)	Pa(t) = D(t) x P: Col.(2) x P

Pervious Area Runoff (using SCS Runoff CN Method)

Column (5)	Rap(t) = Accumulated pervious runoff for time step t
	If (Pa(t) is <= 0.2Sp) then use: Rap(t) = 0.0
	If (Pa(t) is > 0.2Sp) then use:
	
	Rap(t) = (Col.(4)-0.2Sp)**2 / (Col.(4)+0.8Sp)

Column (6)	Rip(t) = Incremental pervious runoff for time step t Rip(t) = Rap(t) - Rap(t-1) Rip(t) = Col.(5) for current row - Col.(5) for preceding row.

Impervious Area Runoff

Column (7 & 8)...	Did not specify to use impervious areas.

Incremental Weighted Runoff

Column (9)	R(t) = (Ap/At) x Rip(t) + (Ai/At) x Rii(t) R(t) = (Ap/At) x Col.(6) + (Ai/At) x Col.(8)

SCS Unit Hydrograph Method

Column (10)	Q(t) is computed with the SCS unit hydrograph method using R(t) and Qu(t).

Storm Event	TypeII 24hr (2.8 in)
Return Event	1 years
Duration	35.000 hours
Depth	2.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.607 hours
Flow (Peak, Computed)	58.79 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.600 hours
Flow (Peak Interpolated Output)	58.73 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	0.6 in
Runoff Volume (Pervious)	21.767 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	21.767 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (2.8 in)
Return Event	1 years
Duration	35.000 hours
Depth	2.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.300	0.00	0.00	0.01	0.02	0.04
11.550	0.05	0.06	0.07	0.51	1.10
11.800	1.68	2.27	2.86	3.44	4.25
12.050	5.67	7.09	8.51	9.93	11.35
12.300	12.77	15.06	17.58	20.10	22.62
12.550	25.15	27.67	30.19	32.71	35.23
12.800	37.75	40.27	42.79	45.31	47.01
13.050	48.53	50.06	51.58	53.10	54.62
13.300	55.79	56.28	56.77	57.26	57.75
13.550	58.24	58.73	58.52	58.21	57.89
13.800	57.58	57.27	56.95	56.36	55.31
14.050	54.27	53.23	52.19	51.15	50.10
14.300	49.00	47.90	46.79	45.69	44.58
14.550	43.47	42.45	41.55	40.65	39.74
14.800	38.84	37.94	37.03	36.32	35.61
15.050	34.90	34.19	33.49	32.78	32.12
15.300	31.51	30.90	30.29	29.68	29.07
15.550	28.46	27.97	27.49	27.00	26.52
15.800	26.03	25.55	25.10	24.70	24.30
16.050	23.90	23.50	23.10	22.70	22.36
16.300	22.02	21.69	21.35	21.02	20.68
16.550	20.37	20.09	19.82	19.54	19.26
16.800	18.98	18.70	18.47	18.23	18.00
17.050	17.76	17.52	17.29	17.08	16.88
17.300	16.68	16.49	16.29	16.09	15.90
17.550	15.73	15.57	15.40	15.24	15.07
17.800	14.91	14.76	14.63	14.49	14.36
18.050	14.22	14.08	13.95	13.84	13.72
18.300	13.61	13.49	13.38	13.26	13.16
18.550	13.06	12.96	12.86	12.76	12.66
18.800	12.56	12.47	12.38	12.29	12.19
19.050	12.10	12.01	11.92	11.83	11.74

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
19.300	11.65	11.57	11.48	11.39	11.30
19.550	11.21	11.13	11.04	10.95	10.87
19.800	10.79	10.71	10.64	10.56	10.49
20.050	10.41	10.34	10.27	10.20	10.13
20.300	10.06	9.98	9.91	9.85	9.78
20.550	9.71	9.64	9.58	9.51	9.44
20.800	9.38	9.32	9.26	9.20	9.14
21.050	9.07	9.02	8.96	8.91	8.86
21.300	8.80	8.75	8.70	8.65	8.61
21.550	8.56	8.52	8.47	8.43	8.39
21.800	8.35	8.32	8.28	8.24	8.20
22.050	8.17	8.14	8.11	8.08	8.05
22.300	8.02	7.99	7.97	7.94	7.92
22.550	7.89	7.87	7.84	7.82	7.80
22.800	7.78	7.76	7.74	7.72	7.70
23.050	7.68	7.66	7.64	7.62	7.60
23.300	7.59	7.57	7.55	7.54	7.52
23.550	7.50	7.49	7.47	7.45	7.44
23.800	7.42	7.41	7.39	7.38	7.36
24.050	7.33	7.30	7.27	7.24	7.21
24.300	7.18	7.12	7.06	7.00	6.94
24.550	6.88	6.82	6.73	6.62	6.51
24.800	6.40	6.28	6.17	6.06	5.90
25.050	5.75	5.59	5.44	5.29	5.13
25.300	4.97	4.80	4.64	4.47	4.31
25.550	4.14	3.98	3.82	3.67	3.51
25.800	3.36	3.20	3.05	2.91	2.78
26.050	2.65	2.52	2.39	2.26	2.13
26.300	2.04	1.94	1.85	1.75	1.66
26.550	1.56	1.49	1.42	1.36	1.29
26.800	1.22	1.16	1.10	1.05	1.00
27.050	0.95	0.91	0.86	0.81	0.77
27.300	0.74	0.70	0.67	0.63	0.60
27.550	0.57	0.54	0.52	0.49	0.47
27.800	0.44	0.42	0.40	0.38	0.36
28.050	0.34	0.32	0.31	0.29	0.28
28.300	0.26	0.25	0.24	0.22	0.21
28.550	0.20	0.19	0.18	0.17	0.16
28.800	0.15	0.15	0.14	0.13	0.13
29.050	0.12	0.11	0.11	0.10	0.10
29.300	0.09	0.09	0.08	0.08	0.07
29.550	0.07	0.06	0.06	0.06	0.05

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 1 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (2.8 in)

HYDROGRAPH ORDINATES (ft^3/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)	Flow (ft^3/s)
29.800	0.05	0.05	0.05	0.04	0.04
30.050	0.04	0.04	0.03	0.03	0.03
30.300	0.03	0.03	0.02	0.02	0.02
30.550	0.02	0.02	0.02	0.02	0.01
30.800	0.01	0.01	0.01	0.01	0.01
31.050	0.01	0.01	0.01	0.01	0.00
31.300	0.00	0.00	0.00	0.00	0.00
31.550	0.00	0.00	0.00	(N/A)	(N/A)

Storm Event	TypeII 24hr (3.5 in)
Return Event	2 years
Duration	35.000 hours
Depth	3.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.607 hours
Flow (Peak, Computed)	104.18 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.600 hours
Flow (Peak Interpolated Output)	104.11 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.1 in
Runoff Volume (Pervious)	35.724 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	35.724 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 2 years
Storm Event: TypeII 24hr (3.5 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (3.5 in)
Return Event	2 years
Duration	35.000 hours
Depth	3.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
11.000	0.00	0.01	0.01	0.02	0.03
11.250	0.04	0.05	0.08	0.17	0.27
11.500	0.36	0.46	0.55	0.65	1.58
11.750	2.80	4.02	5.24	6.46	7.68
12.000	9.31	12.08	14.84	17.61	20.37
12.250	23.14	25.90	30.14	34.78	39.41
12.500	44.04	48.68	53.31	57.87	62.26
12.750	66.64	71.03	75.41	79.80	84.18
13.000	86.95	89.38	91.81	94.24	96.67
13.250	99.10	100.87	101.41	101.95	102.49
13.500	103.03	103.57	104.11	103.42	102.53
13.750	101.65	100.77	99.89	99.01	97.65
14.000	95.56	93.47	91.37	89.28	87.19
14.250	85.09	83.01	80.93	78.84	76.76
14.500	74.68	72.60	70.70	69.06	67.41
14.750	65.76	64.11	62.47	60.82	59.53
15.000	58.26	56.99	55.71	54.44	53.17
15.250	51.99	50.91	49.83	48.75	47.67
15.500	46.59	45.51	44.66	43.81	42.96
15.750	42.12	41.27	40.42	39.66	38.96
16.000	38.27	37.58	36.89	36.19	35.50
16.250	34.93	34.36	33.79	33.22	32.64
16.500	32.07	31.56	31.09	30.62	30.16
16.750	29.69	29.22	28.76	28.37	27.98
17.000	27.59	27.20	26.81	26.42	26.07
17.250	25.74	25.42	25.10	24.77	24.45
17.500	24.13	23.87	23.60	23.33	23.06
17.750	22.79	22.52	22.29	22.07	21.85
18.000	21.63	21.41	21.19	20.98	20.79
18.250	20.61	20.42	20.24	20.05	19.87
18.500	19.70	19.54	19.39	19.23	19.07
18.750	18.91	18.75	18.61	18.46	18.31

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (3.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
19.000	18.17	18.02	17.87	17.73	17.59
19.250	17.45	17.31	17.17	17.03	16.89
19.500	16.75	16.61	16.48	16.34	16.20
19.750	16.07	15.95	15.83	15.72	15.60
20.000	15.49	15.37	15.26	15.15	15.05
20.250	14.94	14.83	14.72	14.62	14.51
20.500	14.41	14.31	14.21	14.11	14.00
20.750	13.91	13.81	13.72	13.63	13.53
21.000	13.44	13.35	13.26	13.18	13.10
21.250	13.02	12.94	12.86	12.78	12.71
21.500	12.64	12.58	12.51	12.44	12.37
21.750	12.31	12.26	12.20	12.15	12.09
22.000	12.03	11.98	11.94	11.89	11.85
22.250	11.80	11.76	11.71	11.67	11.63
22.500	11.60	11.56	11.52	11.48	11.45
22.750	11.42	11.38	11.35	11.32	11.29
23.000	11.26	11.23	11.20	11.17	11.14
23.250	11.12	11.09	11.06	11.04	11.01
23.500	10.98	10.96	10.93	10.91	10.89
23.750	10.86	10.84	10.81	10.79	10.77
24.000	10.73	10.69	10.65	10.60	10.56
24.250	10.52	10.47	10.38	10.30	10.21
24.500	10.12	10.03	9.94	9.81	9.65
24.750	9.49	9.32	9.16	8.99	8.82
25.000	8.60	8.37	8.15	7.92	7.70
25.250	7.47	7.24	7.00	6.75	6.51
25.500	6.27	6.03	5.79	5.56	5.34
25.750	5.11	4.89	4.66	4.44	4.24
26.000	4.05	3.86	3.67	3.48	3.29
26.250	3.11	2.97	2.83	2.69	2.55
26.500	2.42	2.28	2.17	2.07	1.98
26.750	1.88	1.78	1.69	1.60	1.53
27.000	1.46	1.39	1.32	1.25	1.18
27.250	1.12	1.07	1.02	0.97	0.92
27.500	0.87	0.82	0.79	0.75	0.71
27.750	0.68	0.64	0.61	0.58	0.55
28.000	0.52	0.50	0.47	0.45	0.42
28.250	0.40	0.38	0.36	0.35	0.33
28.500	0.31	0.29	0.28	0.27	0.25
28.750	0.24	0.23	0.21	0.20	0.19
29.000	0.18	0.17	0.16	0.15	0.15
29.250	0.14	0.13	0.12	0.12	0.11

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 2 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (3.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
29.500	0.10	0.10	0.09	0.09	0.08
29.750	0.08	0.07	0.07	0.07	0.06
30.000	0.06	0.05	0.05	0.05	0.05
30.250	0.04	0.04	0.04	0.03	0.03
30.500	0.03	0.03	0.03	0.02	0.02
30.750	0.02	0.02	0.02	0.02	0.01
31.000	0.01	0.01	0.01	0.01	0.01
31.250	0.01	0.01	0.00	0.00	0.00
31.500	0.00	0.00	0.00	0.00	0.00

Storm Event	TypeII 24hr (4.5 in)
Return Event	5 years
Duration	35.000 hours
Depth	4.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.607 hours
Flow (Peak, Computed)	180.01 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.600 hours
Flow (Peak Interpolated Output)	179.95 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.7 in
Runoff Volume (Pervious)	58.649 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	58.649 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (4.5 in)
Return Event	5 years
Duration	35.000 hours
Depth	4.5 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
10.050	0.00	0.00	0.01	0.01	0.01
10.300	0.02	0.02	0.04	0.05	0.07
10.550	0.09	0.11	0.13	0.16	0.22
10.800	0.28	0.35	0.41	0.47	0.53
11.050	0.66	0.81	0.97	1.12	1.28
11.300	1.43	1.65	2.08	2.52	2.95
11.550	3.39	3.82	4.26	6.21	8.68
11.800	11.15	13.62	16.10	18.57	21.74
12.050	26.84	31.95	37.05	42.16	47.26
12.300	52.36	59.82	67.91	75.99	84.08
12.550	92.17	100.26	108.11	115.41	122.72
12.800	130.02	137.32	144.63	151.93	156.27
13.050	159.98	163.70	167.42	171.13	174.85
13.300	177.42	177.84	178.26	178.68	179.11
13.550	179.53	179.95	178.29	176.32	174.34
13.800	172.37	170.40	168.43	165.69	161.77
14.050	157.86	153.94	150.02	146.10	142.18
14.300	138.43	134.69	130.95	127.21	123.48
14.550	119.74	116.36	113.47	110.57	107.67
14.800	104.77	101.87	98.97	96.73	94.51
15.050	92.30	90.09	87.87	85.66	83.61
15.300	81.75	79.89	78.03	76.16	74.30
15.550	72.44	70.99	69.55	68.11	66.66
15.800	65.22	63.78	62.47	61.30	60.13
16.050	58.96	57.80	56.63	55.46	54.51
16.300	53.55	52.60	51.64	50.69	49.73
16.550	48.88	48.11	47.33	46.56	45.79
16.800	45.02	44.25	43.62	42.98	42.34
17.050	41.70	41.06	40.42	39.85	39.33
17.300	38.80	38.28	37.75	37.23	36.71
17.550	36.28	35.85	35.41	34.98	34.54
17.800	34.11	33.73	33.38	33.03	32.68

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 5 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (4.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
18.050	32.32	31.97	31.63	31.34	31.04
18.300	30.75	30.45	30.16	29.86	29.60
18.550	29.35	29.09	28.84	28.59	28.34
18.800	28.09	27.86	27.63	27.40	27.16
19.050	26.93	26.70	26.47	26.25	26.03
19.300	25.81	25.58	25.36	25.14	24.93
19.550	24.72	24.50	24.29	24.08	23.87
19.800	23.68	23.51	23.33	23.16	22.98
20.050	22.81	22.63	22.47	22.31	22.14
20.300	21.98	21.82	21.65	21.50	21.35
20.550	21.19	21.04	20.88	20.73	20.58
20.800	20.44	20.30	20.16	20.02	19.88
21.050	19.74	19.61	19.49	19.36	19.24
21.300	19.12	19.00	18.88	18.78	18.67
21.550	18.57	18.47	18.36	18.26	18.17
21.800	18.09	18.00	17.92	17.83	17.75
22.050	17.67	17.60	17.53	17.46	17.39
22.300	17.33	17.26	17.20	17.14	17.08
22.550	17.03	16.97	16.91	16.86	16.81
22.800	16.76	16.71	16.66	16.61	16.56
23.050	16.52	16.48	16.43	16.39	16.35
23.300	16.31	16.26	16.23	16.19	16.15
23.550	16.11	16.07	16.03	15.99	15.96
23.800	15.92	15.89	15.85	15.81	15.76
24.050	15.70	15.63	15.57	15.50	15.44
24.300	15.37	15.24	15.11	14.98	14.85
24.550	14.72	14.59	14.40	14.15	13.91
24.800	13.67	13.43	13.19	12.94	12.61
25.050	12.28	11.95	11.62	11.29	10.96
25.300	10.61	10.26	9.90	9.55	9.19
25.550	8.84	8.49	8.16	7.83	7.50
25.800	7.17	6.84	6.51	6.21	5.93
26.050	5.65	5.38	5.10	4.82	4.55
26.300	4.35	4.15	3.95	3.74	3.54
26.550	3.34	3.18	3.04	2.90	2.75
26.800	2.61	2.47	2.34	2.24	2.14
27.050	2.03	1.93	1.83	1.73	1.65
27.300	1.57	1.50	1.42	1.35	1.28
27.550	1.21	1.15	1.10	1.05	0.99
27.800	0.94	0.89	0.85	0.81	0.77
28.050	0.73	0.69	0.65	0.62	0.59
28.300	0.56	0.53	0.51	0.48	0.45

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 5 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (4.5 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
28.550	0.43	0.41	0.39	0.37	0.35
28.800	0.33	0.31	0.30	0.28	0.27
29.050	0.25	0.24	0.23	0.21	0.20
29.300	0.19	0.18	0.17	0.16	0.15
29.550	0.15	0.14	0.13	0.12	0.12
29.800	0.11	0.10	0.10	0.09	0.09
30.050	0.08	0.08	0.07	0.07	0.06
30.300	0.06	0.05	0.05	0.05	0.04
30.550	0.04	0.04	0.04	0.03	0.03
30.800	0.03	0.02	0.02	0.02	0.02
31.050	0.02	0.01	0.01	0.01	0.01
31.300	0.01	0.01	0.01	0.00	0.00
31.550	0.00	0.00	0.00	0.00	0.00

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

Storm Event	TypeII 24hr (5.2 in)
Return Event	10 years
Duration	35.000 hours
Depth	5.2 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.607 hours
Flow (Peak, Computed)	238.05 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.600 hours
Flow (Peak Interpolated Output)	238.02 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.3 in
Runoff Volume (Pervious)	76.195 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	76.195 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 10 years
Storm Event: TypeII 24hr (5.2 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft^3/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (5.2 in)

Storm Event	TypeII 24hr (5.2 in)
Return Event	10 years
Duration	35.000 hours
Depth	5.2 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
9.350	0.00	0.00	0.00	0.01	0.01
9.600	0.02	0.02	0.02	0.03	0.05
9.850	0.07	0.08	0.10	0.11	0.13
10.100	0.18	0.23	0.28	0.33	0.37
10.350	0.42	0.51	0.61	0.72	0.83
10.600	0.93	1.04	1.16	1.36	1.56
10.850	1.76	1.96	2.16	2.36	2.66
11.100	3.01	3.35	3.70	4.05	4.39
11.350	4.83	5.58	6.32	7.07	7.82
11.600	8.56	9.31	12.07	15.51	18.95
11.850	22.39	25.84	29.28	33.63	40.50
12.100	47.37	54.23	61.10	67.97	74.83
12.350	84.69	95.35	106.01	116.67	127.33
12.600	138.00	148.28	157.72	167.16	176.60
12.850	186.04	195.48	204.92	210.36	214.97
13.100	219.58	224.18	228.79	233.40	236.49
13.350	236.74	237.00	237.25	237.51	237.76
13.600	238.02	235.56	232.70	229.83	226.97
13.850	224.11	221.24	217.41	212.06	206.72
14.100	201.37	196.02	190.68	185.33	180.28
14.350	175.27	170.25	165.23	160.22	155.20
14.600	150.68	146.82	142.96	139.10	135.24
14.850	131.38	127.52	124.54	121.60	118.67
15.100	115.73	112.80	109.87	107.16	104.70
15.350	102.24	99.78	97.32	94.86	92.40
15.600	90.50	88.60	86.71	84.81	82.91
15.850	81.02	79.31	77.78	76.25	74.72
16.100	73.18	71.65	70.13	68.89	67.64
16.350	66.40	65.15	63.91	62.66	61.55
16.600	60.55	59.55	58.55	57.55	56.55
16.850	55.56	54.74	53.91	53.09	52.26
17.100	51.44	50.62	49.88	49.20	48.53

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (5.2 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
17.350	47.85	47.18	46.50	45.84	45.28
17.600	44.73	44.17	43.61	43.06	42.50
17.850	42.01	41.56	41.11	40.66	40.21
18.100	39.76	39.32	38.95	38.57	38.20
18.350	37.82	37.44	37.07	36.73	36.41
18.600	36.09	35.77	35.45	35.13	34.82
18.850	34.52	34.22	33.93	33.63	33.34
19.100	33.04	32.76	32.47	32.19	31.91
19.350	31.63	31.35	31.07	30.80	30.53
19.600	30.26	29.99	29.72	29.45	29.22
19.850	29.01	28.79	28.57	28.35	28.13
20.100	27.92	27.71	27.51	27.31	27.10
20.350	26.90	26.70	26.50	26.31	26.12
20.600	25.93	25.73	25.54	25.36	25.18
20.850	25.01	24.83	24.66	24.48	24.31
21.100	24.15	24.00	23.84	23.69	23.54
21.350	23.39	23.24	23.11	22.99	22.86
21.600	22.73	22.60	22.47	22.36	22.26
21.850	22.15	22.05	21.94	21.83	21.74
22.100	21.65	21.56	21.48	21.39	21.31
22.350	21.22	21.15	21.08	21.00	20.93
22.600	20.86	20.79	20.72	20.66	20.60
22.850	20.54	20.48	20.42	20.36	20.30
23.100	20.25	20.19	20.14	20.08	20.03
23.350	19.98	19.93	19.88	19.83	19.78
23.600	19.73	19.69	19.64	19.60	19.55
23.850	19.51	19.46	19.41	19.35	19.27
24.100	19.19	19.11	19.03	18.95	18.86
24.350	18.70	18.54	18.38	18.22	18.06
24.600	17.90	17.66	17.37	17.07	16.77
24.850	16.48	16.18	15.87	15.47	15.06
25.100	14.66	14.25	13.85	13.44	13.02
25.350	12.58	12.15	11.71	11.28	10.84
25.600	10.41	10.01	9.60	9.20	8.79
25.850	8.38	7.98	7.62	7.28	6.93
26.100	6.59	6.25	5.91	5.59	5.34
26.350	5.09	4.84	4.59	4.34	4.10
26.600	3.90	3.73	3.55	3.38	3.20
26.850	3.03	2.87	2.74	2.62	2.49
27.100	2.37	2.25	2.12	2.02	1.93
27.350	1.84	1.75	1.66	1.56	1.48
27.600	1.41	1.35	1.28	1.22	1.15

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 10 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (5.2 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
27.850	1.09	1.04	0.99	0.94	0.89
28.100	0.85	0.80	0.76	0.72	0.69
28.350	0.65	0.62	0.59	0.55	0.53
28.600	0.50	0.48	0.45	0.43	0.40
28.850	0.38	0.36	0.35	0.33	0.31
29.100	0.29	0.28	0.26	0.25	0.24
29.350	0.22	0.21	0.20	0.19	0.18
29.600	0.17	0.16	0.15	0.14	0.13
29.850	0.13	0.12	0.11	0.11	0.10
30.100	0.09	0.09	0.08	0.08	0.07
30.350	0.07	0.06	0.06	0.05	0.05
30.600	0.05	0.04	0.04	0.04	0.03
30.850	0.03	0.03	0.03	0.02	0.02
31.100	0.02	0.02	0.01	0.01	0.01
31.350	0.01	0.01	0.01	0.00	0.00
31.600	0.00	0.00	0.00	0.00	(N/A)

Storm Event	TypeII 24hr (6.1 in)
Return Event	25 years
Duration	35.000 hours
Depth	6.1 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	316.87 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	316.86 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.0 in
Runoff Volume (Pervious)	100.063 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	100.062 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft^3/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (6.1 in)
Return Event	25 years
Duration	35.000 hours
Depth	6.1 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
8.450	0.00	0.00	0.00	0.00	0.00
8.700	0.00	0.01	0.01	0.02	0.03
8.950	0.03	0.04	0.05	0.06	0.09
9.200	0.11	0.14	0.16	0.19	0.21
9.450	0.27	0.33	0.39	0.45	0.51
9.700	0.57	0.67	0.78	0.89	1.01
9.950	1.12	1.23	1.35	1.53	1.72
10.200	1.90	2.08	2.26	2.44	2.69
10.450	2.96	3.23	3.51	3.78	4.05
10.700	4.35	4.75	5.16	5.56	5.96
10.950	6.36	6.76	7.31	7.90	8.50
11.200	9.10	9.70	10.30	11.03	12.18
11.450	13.33	14.49	15.64	16.79	17.95
11.700	21.77	26.51	31.25	35.99	40.73
11.950	45.46	51.40	60.63	69.86	79.09
12.200	88.32	97.56	106.79	119.85	133.96
12.450	148.06	162.17	176.27	190.37	203.92
12.700	216.19	228.46	240.73	253.00	265.27
12.950	277.54	284.40	290.15	295.89	301.64
13.200	307.38	313.13	316.86	316.83	316.80
13.450	316.77	316.74	316.71	316.68	313.10
13.700	308.98	304.86	300.75	296.63	292.52
13.950	287.15	279.85	272.54	265.24	257.93
14.200	250.62	243.32	236.51	229.75	222.99
14.450	216.23	209.46	202.70	196.63	191.47
14.700	186.30	181.13	175.97	170.80	165.63
14.950	161.66	157.75	153.84	149.92	146.01
15.200	142.10	138.49	135.23	131.96	128.69
15.450	125.43	122.16	118.90	116.38	113.88
15.700	111.37	108.86	106.35	103.84	101.59
15.950	99.57	97.55	95.54	93.52	91.50
16.200	89.50	87.86	86.23	84.60	82.96

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 25 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (6.1 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
16.450	81.33	79.70	78.24	76.94	75.63
16.700	74.32	73.01	71.71	70.42	69.34
16.950	68.27	67.20	66.13	65.05	63.98
17.200	63.02	62.15	61.27	60.39	59.52
17.450	58.64	57.78	57.06	56.34	55.62
17.700	54.90	54.18	53.46	52.83	52.25
17.950	51.67	51.09	50.51	49.93	49.36
18.200	48.88	48.40	47.91	47.43	46.94
18.450	46.46	46.03	45.62	45.20	44.79
18.700	44.38	43.97	43.57	43.19	42.81
18.950	42.43	42.05	41.67	41.29	40.93
19.200	40.57	40.21	39.85	39.49	39.13
19.450	38.77	38.43	38.08	37.74	37.40
19.700	37.06	36.71	36.42	36.15	35.87
19.950	35.60	35.32	35.04	34.77	34.52
20.200	34.26	34.01	33.75	33.49	33.24
20.450	32.99	32.75	32.51	32.27	32.03
20.700	31.79	31.56	31.34	31.12	30.90
20.950	30.68	30.46	30.24	30.04	29.85
21.200	29.66	29.46	29.27	29.08	28.90
21.450	28.74	28.58	28.42	28.25	28.09
21.700	27.93	27.80	27.66	27.53	27.40
21.950	27.26	27.13	27.01	26.90	26.79
22.200	26.68	26.57	26.47	26.36	26.27
22.450	26.18	26.09	26.00	25.91	25.81
22.700	25.73	25.65	25.58	25.50	25.42
22.950	25.34	25.27	25.20	25.13	25.06
23.200	24.99	24.92	24.86	24.79	24.73
23.450	24.67	24.61	24.54	24.48	24.42
23.700	24.36	24.31	24.25	24.19	24.14
23.950	24.08	24.00	23.90	23.80	23.70
24.200	23.60	23.50	23.39	23.19	22.99
24.450	22.79	22.59	22.39	22.19	21.90
24.700	21.53	21.16	20.79	20.42	20.06
24.950	19.67	19.17	18.67	18.17	17.66
25.200	17.16	16.66	16.13	15.59	15.05
25.450	14.51	13.97	13.44	12.90	12.40
25.700	11.90	11.39	10.89	10.39	9.89
25.950	9.44	9.01	8.59	8.17	7.75
26.200	7.32	6.92	6.61	6.31	6.00
26.450	5.69	5.38	5.08	4.83	4.62
26.700	4.40	4.19	3.97	3.76	3.55

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 25 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (6.1 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
26.950	3.40	3.24	3.09	2.94	2.78
27.200	2.63	2.50	2.39	2.28	2.16
27.450	2.05	1.94	1.83	1.75	1.67
27.700	1.59	1.51	1.43	1.35	1.28
27.950	1.23	1.17	1.11	1.05	0.99
28.200	0.94	0.90	0.85	0.81	0.77
28.450	0.73	0.68	0.65	0.62	0.59
28.700	0.56	0.53	0.50	0.47	0.45
28.950	0.43	0.41	0.39	0.36	0.34
29.200	0.33	0.31	0.29	0.28	0.26
29.450	0.25	0.23	0.22	0.21	0.20
29.700	0.19	0.17	0.16	0.15	0.15
29.950	0.14	0.13	0.12	0.11	0.11
30.200	0.10	0.09	0.09	0.08	0.08
30.450	0.07	0.07	0.06	0.06	0.05
30.700	0.05	0.04	0.04	0.04	0.03
30.950	0.03	0.03	0.02	0.02	0.02
31.200	0.02	0.02	0.01	0.01	0.01
31.450	0.01	0.01	0.00	0.00	0.00
31.700	0.00	0.00	(N/A)	(N/A)	(N/A)

Storm Event	TypeII 24hr (6.9 in)
Return Event	50 years
Duration	35.000 hours
Depth	6.9 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	391.42 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	391.30 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.6 in
Runoff Volume (Pervious)	122.224 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	122.223 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (6.9 in)
Return Event	50 years
Duration	35.000 hours
Depth	6.9 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
7.850	0.00	0.00	0.00	0.00	0.00
8.100	0.00	0.01	0.01	0.02	0.02
8.350	0.03	0.03	0.05	0.07	0.09
8.600	0.11	0.13	0.15	0.17	0.22
8.850	0.27	0.33	0.38	0.43	0.48
9.100	0.57	0.67	0.77	0.87	0.98
9.350	1.08	1.19	1.35	1.52	1.68
9.600	1.85	2.01	2.18	2.39	2.62
9.850	2.85	3.09	3.32	3.56	3.80
10.100	4.12	4.43	4.75	5.06	5.38
10.350	5.69	6.08	6.49	6.91	7.33
10.600	7.75	8.17	8.62	9.19	9.76
10.850	10.33	10.91	11.48	12.05	12.79
11.100	13.61	14.43	15.24	16.06	16.88
11.350	17.85	19.38	20.90	22.42	23.94
11.600	25.47	26.99	31.80	37.73	43.67
11.850	49.60	55.53	61.46	68.85	80.26
12.100	91.67	103.08	114.49	125.90	137.31
12.350	153.32	170.58	187.83	205.09	222.35
12.600	239.61	256.12	270.96	285.80	300.64
12.850	315.48	330.32	345.15	353.29	360.04
13.100	366.79	373.53	380.28	387.03	391.30
13.350	390.97	390.63	390.30	389.96	389.63
13.600	389.29	384.63	379.33	374.02	368.72
13.850	363.42	358.11	351.31	342.18	333.04
14.100	323.91	314.78	305.64	296.51	288.06
14.350	279.69	271.31	262.93	254.55	246.18
14.600	238.66	232.29	225.92	219.54	213.17
14.850	206.79	200.42	195.53	190.71	185.90
15.100	181.08	176.27	171.45	167.02	163.01
15.350	159.00	154.99	150.98	146.97	142.97
15.600	139.89	136.82	133.75	130.68	127.61

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 50 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (6.9 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
15.850	124.54	121.78	119.31	116.85	114.39
16.100	111.92	109.46	107.01	105.02	103.03
16.350	101.04	99.05	97.06	95.07	93.31
16.600	91.72	90.13	88.54	86.96	85.37
16.850	83.80	82.50	81.20	79.90	78.60
17.100	77.30	76.01	74.85	73.79	72.73
17.350	71.67	70.61	69.55	68.51	67.64
17.600	66.77	65.90	65.04	64.17	63.30
17.850	62.54	61.84	61.14	60.44	59.74
18.100	59.04	58.36	57.78	57.20	56.62
18.350	56.04	55.45	54.87	54.35	53.86
18.600	53.36	52.87	52.38	51.89	51.40
18.850	50.95	50.49	50.04	49.58	49.13
19.100	48.67	48.23	47.80	47.37	46.94
19.350	46.51	46.08	45.65	45.24	44.83
19.600	44.42	44.01	43.60	43.19	42.85
19.850	42.52	42.19	41.87	41.54	41.22
20.100	40.90	40.59	40.29	39.99	39.68
20.350	39.38	39.08	38.79	38.50	38.22
20.600	37.93	37.65	37.36	37.09	36.83
20.850	36.57	36.31	36.05	35.79	35.53
21.100	35.29	35.07	34.84	34.61	34.39
21.350	34.16	33.95	33.76	33.57	33.37
21.600	33.18	32.99	32.80	32.64	32.48
21.850	32.33	32.17	32.01	31.85	31.71
22.100	31.58	31.45	31.32	31.20	31.07
22.350	30.94	30.83	30.72	30.62	30.51
22.600	30.40	30.29	30.19	30.10	30.01
22.850	29.92	29.83	29.74	29.64	29.56
23.100	29.48	29.40	29.32	29.24	29.16
23.350	29.08	29.01	28.93	28.86	28.79
23.600	28.71	28.64	28.57	28.51	28.44
23.850	28.37	28.30	28.23	28.14	28.02
24.100	27.90	27.78	27.66	27.55	27.42
24.350	27.19	26.95	26.72	26.48	26.25
24.600	26.01	25.67	25.23	24.80	24.37
24.850	23.94	23.51	23.06	22.47	21.88
25.100	21.29	20.70	20.11	19.52	18.91
25.350	18.28	17.64	17.01	16.38	15.75
25.600	15.12	14.53	13.94	13.35	12.76
25.850	12.18	11.59	11.06	10.56	10.07
26.100	9.57	9.08	8.58	8.11	7.75

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 50 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (6.9 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
26.350	7.39	7.03	6.67	6.31	5.95
26.600	5.66	5.41	5.16	4.91	4.65
26.850	4.40	4.16	3.98	3.80	3.62
27.100	3.44	3.26	3.08	2.94	2.80
27.350	2.67	2.54	2.40	2.27	2.15
27.600	2.05	1.96	1.86	1.77	1.67
27.850	1.58	1.51	1.44	1.37	1.30
28.100	1.23	1.16	1.10	1.05	1.00
28.350	0.95	0.90	0.85	0.80	0.76
28.600	0.73	0.69	0.66	0.62	0.59
28.850	0.56	0.53	0.50	0.48	0.45
29.100	0.43	0.40	0.38	0.36	0.34
29.350	0.33	0.31	0.29	0.27	0.26
29.600	0.25	0.23	0.22	0.21	0.19
29.850	0.18	0.17	0.16	0.15	0.14
30.100	0.13	0.13	0.12	0.11	0.10
30.350	0.10	0.09	0.08	0.08	0.07
30.600	0.07	0.06	0.06	0.05	0.05
30.850	0.04	0.04	0.04	0.03	0.03
31.100	0.03	0.02	0.02	0.02	0.02
31.350	0.01	0.01	0.01	0.01	0.01
31.600	0.00	0.00	0.00	0.00	(N/A)

Storm Event	TypeII 24hr (7.8 in)
Return Event	100 years
Duration	35.000 hours
Depth	7.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	477.72 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	477.47 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.4 in
Runoff Volume (Pervious)	147.968 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	147.967 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 100 years
Storm Event: TypeII 24hr (7.8 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft^3/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (7.8 in)

Storm Event	TypeII 24hr (7.8 in)
Return Event	100 years
Duration	35.000 hours
Depth	7.8 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
7.200	0.00	0.00	0.00	0.00	0.00
7.450	0.00	0.01	0.01	0.02	0.02
7.700	0.03	0.03	0.05	0.06	0.08
7.950	0.10	0.12	0.14	0.16	0.20
8.200	0.25	0.30	0.35	0.39	0.44
8.450	0.51	0.60	0.69	0.78	0.87
8.700	0.96	1.06	1.21	1.36	1.51
8.950	1.66	1.81	1.96	2.15	2.36
9.200	2.58	2.80	3.02	3.24	3.47
9.450	3.76	4.05	4.34	4.63	4.93
9.700	5.22	5.56	5.92	6.29	6.65
9.950	7.02	7.39	7.76	8.22	8.67
10.200	9.12	9.57	10.02	10.47	11.00
10.450	11.57	12.15	12.72	13.29	13.86
10.700	14.47	15.23	15.99	16.74	17.50
10.950	18.26	19.02	20.00	21.06	22.13
11.200	23.19	24.26	25.32	26.59	28.54
11.450	30.49	32.44	34.40	36.35	38.30
11.700	44.25	51.57	58.89	66.20	73.52
11.950	80.84	89.91	103.83	117.75	131.67
12.200	145.59	159.51	173.43	192.83	213.71
12.450	234.58	255.46	276.34	297.22	317.14
12.700	334.91	352.67	370.44	388.20	405.97
12.950	423.73	433.30	441.16	449.02	456.88
13.200	464.74	472.60	477.47	476.74	476.02
13.450	475.29	474.56	473.84	473.11	467.19
13.700	460.48	453.78	447.07	440.37	433.66
13.950	425.18	413.92	402.66	391.40	380.14
14.200	368.88	357.62	347.28	337.03	326.78
14.450	316.53	306.28	296.03	286.85	279.08
14.700	271.31	263.55	255.78	248.01	240.24
14.950	234.29	228.43	222.57	216.72	210.86

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (7.8 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
15.200	205.00	199.61	194.75	189.88	185.01
15.450	180.15	175.28	170.42	166.69	162.97
15.700	159.26	155.54	151.82	148.10	144.76
15.950	141.79	138.81	135.83	132.85	129.88
16.200	126.92	124.52	122.12	119.72	117.33
16.450	114.93	112.53	110.40	108.49	106.58
16.700	104.68	102.77	100.86	98.97	97.42
16.950	95.86	94.30	92.74	91.18	89.62
17.200	88.24	86.97	85.70	84.43	83.16
17.450	81.89	80.65	79.61	78.57	77.53
17.700	76.49	75.45	74.42	73.51	72.67
17.950	71.84	71.01	70.17	69.34	68.53
18.200	67.83	67.14	66.44	65.75	65.06
18.450	64.36	63.74	63.16	62.57	61.98
18.700	61.40	60.81	60.23	59.69	59.15
18.950	58.61	58.07	57.53	56.99	56.47
19.200	55.96	55.44	54.93	54.42	53.91
19.450	53.40	52.91	52.43	51.95	51.46
19.700	50.98	50.49	50.08	49.70	49.31
19.950	48.93	48.55	48.16	47.79	47.43
20.200	47.07	46.72	46.36	46.00	45.65
20.450	45.31	44.97	44.64	44.30	43.97
20.700	43.64	43.31	43.01	42.70	42.40
20.950	42.09	41.79	41.48	41.21	40.94
21.200	40.68	40.41	40.14	39.88	39.63
21.450	39.40	39.18	38.95	38.73	38.50
21.700	38.28	38.09	37.91	37.72	37.54
21.950	37.35	37.17	37.00	36.85	36.70
22.200	36.54	36.39	36.24	36.09	35.96
22.450	35.84	35.71	35.59	35.46	35.33
22.700	35.22	35.11	35.00	34.89	34.78
22.950	34.68	34.57	34.47	34.38	34.28
23.200	34.19	34.09	34.00	33.90	33.82
23.450	33.73	33.65	33.56	33.47	33.39
23.700	33.31	33.23	33.15	33.07	32.99
23.950	32.91	32.80	32.66	32.52	32.38
24.200	32.24	32.10	31.95	31.68	31.41
24.450	31.13	30.86	30.58	30.31	29.90
24.700	29.40	28.90	28.39	27.89	27.39
24.950	26.87	26.18	25.49	24.81	24.12
25.200	23.43	22.74	22.03	21.29	20.55
25.450	19.82	19.08	18.34	17.61	16.93

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 100 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (7.8 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
25.700	16.24	15.56	14.87	14.18	13.50
25.950	12.88	12.31	11.73	11.15	10.58
26.200	10.00	9.45	9.03	8.61	8.19
26.450	7.77	7.35	6.93	6.60	6.30
26.700	6.01	5.71	5.42	5.13	4.85
26.950	4.64	4.43	4.22	4.01	3.80
27.200	3.59	3.42	3.26	3.11	2.96
27.450	2.80	2.65	2.50	2.39	2.28
27.700	2.17	2.06	1.95	1.84	1.75
27.950	1.67	1.59	1.51	1.43	1.35
28.200	1.28	1.22	1.16	1.11	1.05
28.450	0.99	0.93	0.89	0.85	0.81
28.700	0.77	0.73	0.68	0.65	0.62
28.950	0.59	0.56	0.53	0.50	0.47
29.200	0.44	0.42	0.40	0.38	0.36
29.450	0.34	0.32	0.30	0.29	0.27
29.700	0.25	0.24	0.22	0.21	0.20
29.950	0.19	0.18	0.17	0.16	0.15
30.200	0.14	0.13	0.12	0.11	0.10
30.450	0.10	0.09	0.08	0.08	0.07
30.700	0.07	0.06	0.06	0.05	0.05
30.950	0.04	0.04	0.03	0.03	0.03
31.200	0.02	0.02	0.02	0.01	0.01
31.450	0.01	0.01	0.01	0.01	0.00
31.700	0.00	0.00	(N/A)	(N/A)	(N/A)

Storm Event	TypeII 24hr (9.6 in)
Return Event	500 years
Duration	35.000 hours
Depth	9.6 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

Computational Time Increment	0.324 hours
Time to Peak (Computed)	13.283 hours
Flow (Peak, Computed)	655.40 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	13.300 hours
Flow (Peak Interpolated Output)	654.84 ft³/s

Drainage Area	
SCS CN (Composite)	71.000
Area (User Defined)	403.000 acres
Maximum Retention (Pervious)	4.1 in
Maximum Retention (Pervious, 20 percent)	0.8 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	6.0 in
Runoff Volume (Pervious)	201.336 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	201.335 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	2.430 hours
Computational Time Increment	0.324 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Kingsbury Park Wichita

Subsection: Unit Hydrograph Summary
Label: Off-Site Runoff

Return Event: 500 years
Storm Event: TypeII 24hr (9.6 in)

SCS Unit Hydrograph Parameters	
Unit peak, qp	187.93 ft³/s
Unit peak time, Tp	1.620 hours
Unit receding limb, Tr	6.479 hours
Total unit time, Tb	8.099 hours

Storm Event	TypeII 24hr (9.6 in)
Return Event	500 years
Duration	35.000 hours
Depth	9.6 in
Time of Concentration (Composite)	2.430 hours
Area (User Defined)	403.000 acres

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
6.200	0.00	0.00	0.00	0.00	0.00
6.450	0.01	0.01	0.02	0.02	0.03
6.700	0.04	0.05	0.05	0.08	0.10
6.950	0.13	0.15	0.18	0.21	0.25
7.200	0.31	0.37	0.43	0.49	0.55
7.450	0.61	0.72	0.82	0.93	1.04
7.700	1.15	1.26	1.39	1.56	1.72
7.950	1.88	2.04	2.21	2.37	2.59
8.200	2.81	3.03	3.24	3.46	3.68
8.450	3.93	4.21	4.49	4.77	5.05
8.700	5.33	5.61	5.96	6.31	6.66
8.950	7.01	7.36	7.71	8.11	8.54
9.200	8.97	9.40	9.83	10.26	10.70
9.450	11.22	11.74	12.26	12.77	13.29
9.700	13.81	14.38	14.99	15.59	16.20
9.950	16.80	17.41	18.03	18.74	19.46
10.200	20.17	20.88	21.60	22.31	23.13
10.450	24.01	24.88	25.76	26.64	27.51
10.700	28.44	29.58	30.72	31.87	33.01
10.950	34.15	35.29	36.74	38.32	39.91
11.200	41.49	43.07	44.65	46.52	49.37
11.450	52.22	55.08	57.93	60.78	63.63
11.700	71.94	82.12	92.29	102.46	112.63
11.950	122.81	135.35	154.42	173.49	192.56
12.200	211.63	230.70	249.78	276.07	304.33
12.450	332.58	360.84	389.09	417.35	444.20
12.700	467.87	491.55	515.23	538.91	562.58
12.950	586.26	598.65	608.69	618.73	628.78
13.200	638.82	648.86	654.84	653.22	651.61
13.450	649.99	648.38	646.76	645.15	636.54
13.700	626.90	617.25	607.60	597.95	588.30
13.950	576.30	560.65	544.99	529.33	513.67

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 500 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (9.6 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
14.200	498.01	482.36	468.11	454.01	439.90
14.450	425.80	411.69	397.59	384.98	374.34
14.700	363.71	353.07	342.43	331.80	321.16
14.950	313.04	305.04	297.05	289.05	281.05
15.200	273.06	265.71	259.09	252.47	245.85
15.450	239.23	232.61	225.99	220.93	215.89
15.700	210.85	205.81	200.76	195.72	191.20
15.950	187.18	183.15	179.12	175.09	171.07
16.200	167.07	163.84	160.61	157.38	154.14
16.450	150.91	147.68	144.82	142.26	139.70
16.700	137.13	134.57	132.01	129.48	127.39
16.950	125.31	123.22	121.14	119.05	116.96
17.200	115.11	113.42	111.72	110.03	108.34
17.450	106.64	104.98	103.60	102.22	100.84
17.700	99.45	98.07	96.69	95.48	94.38
17.950	93.27	92.16	91.05	89.94	88.87
18.200	87.95	87.03	86.11	85.19	84.27
18.450	83.35	82.53	81.76	80.98	80.20
18.700	79.43	78.65	77.89	77.18	76.46
18.950	75.75	75.03	74.32	73.61	72.92
19.200	72.24	71.57	70.89	70.21	69.54
19.450	68.87	68.24	67.60	66.96	66.33
19.700	65.69	65.05	64.52	64.02	63.52
19.950	63.02	62.52	62.02	61.53	61.07
20.200	60.61	60.15	59.68	59.22	58.76
20.450	58.32	57.88	57.45	57.02	56.58
20.700	56.15	55.73	55.33	54.94	54.54
20.950	54.15	53.75	53.36	53.00	52.66
21.200	52.31	51.97	51.62	51.28	50.95
21.450	50.66	50.37	50.08	49.79	49.50
21.700	49.21	48.96	48.72	48.48	48.24
21.950	48.00	47.76	47.54	47.35	47.15
22.200	46.95	46.76	46.56	46.36	46.20
22.450	46.04	45.87	45.71	45.54	45.38
22.700	45.23	45.09	44.95	44.81	44.67
22.950	44.52	44.38	44.26	44.14	44.01
23.200	43.89	43.76	43.64	43.52	43.41
23.450	43.30	43.18	43.07	42.96	42.85
23.700	42.74	42.64	42.53	42.43	42.32
23.950	42.22	42.08	41.90	41.72	41.54
24.200	41.36	41.18	40.99	40.64	40.28
24.450	39.93	39.58	39.23	38.87	38.35

Kingsbury Park Wichita

Subsection: Unit Hydrograph (Hydrograph Table) Return Event: 500 years
Label: Off-Site Runoff Storm Event: TypeII 24hr (9.6 in)

HYDROGRAPH ORDINATES (ft³/s)
Output Time Increment = 0.050 hours
Time on left represents time for first value in each row.

Time (hours)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)	Flow (ft³/s)
24.700	37.71	37.06	36.41	35.77	35.12
24.950	34.45	33.57	32.69	31.81	30.93
25.200	30.04	29.16	28.24	27.30	26.35
25.450	25.41	24.46	23.52	22.58	21.70
25.700	20.82	19.94	19.06	18.19	17.31
25.950	16.52	15.78	15.04	14.30	13.56
26.200	12.82	12.12	11.58	11.04	10.50
26.450	9.96	9.42	8.88	8.46	8.08
26.700	7.70	7.33	6.95	6.57	6.22
26.950	5.95	5.68	5.41	5.14	4.87
27.200	4.60	4.38	4.19	3.99	3.79
27.450	3.59	3.39	3.21	3.07	2.93
27.700	2.78	2.64	2.50	2.36	2.25
27.950	2.15	2.04	1.94	1.84	1.74
28.200	1.64	1.57	1.49	1.42	1.35
28.450	1.27	1.20	1.14	1.09	1.04
28.700	0.98	0.93	0.88	0.83	0.79
28.950	0.75	0.71	0.68	0.64	0.60
29.200	0.57	0.54	0.51	0.49	0.46
29.450	0.43	0.41	0.39	0.37	0.35
29.700	0.33	0.31	0.29	0.27	0.26
29.950	0.24	0.23	0.21	0.20	0.19
30.200	0.18	0.17	0.16	0.14	0.13
30.450	0.12	0.12	0.11	0.10	0.09
30.700	0.09	0.08	0.07	0.07	0.06
30.950	0.05	0.05	0.04	0.04	0.03
31.200	0.03	0.03	0.02	0.02	0.02
31.450	0.01	0.01	0.01	0.01	0.00
31.700	0.00	0.00	(N/A)	(N/A)	(N/A)

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 1 years
Storm Event: TypeII 24hr (2.8 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Off-Site Runoff

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Off-Site Runoff	21.767	13.600	58.73
Flow (In)	O-1	21.767	13.600	58.73

Kingsbury Park Wichita

Subsection: Addition Summary | Return Event: 2 years
Label: O-1 | Storm Event: TypeII 24hr (3.5 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Off-Site Runoff

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Off-Site Runoff	35.724	13.600	104.11
Flow (In)	O-1	35.724	13.600	104.11

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 5 years
Storm Event: TypeII 24hr (4.5 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Off-Site Runoff

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Off-Site Runoff	58.649	13.600	179.95
Flow (In)	O-1	58.649	13.600	179.95

Kingsbury Park Wichita

Subsection: Addition Summary | Return Event: 10 years
Label: O-1 | Storm Event: TypeII 24hr (5.2 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Off-Site Runoff

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Off-Site Runoff	76.195	13.600	238.02
Flow (In)	O-1	76.195	13.600	238.02

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 25 years
Storm Event: TypeII 24hr (6.1 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Off-Site Runoff

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Off-Site Runoff	100.062	13.300	316.86
Flow (In)	O-1	100.062	13.300	316.86

Kingsbury Park Wichita

Subsection: Addition Summary
Label: O-1

Return Event: 50 years
Storm Event: TypeII 24hr (6.9 in)

Summary for Hydrograph Addition at 'O-1'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	Off-Site Runoff

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	Off-Site Runoff	122.223	13.300	391.30
Flow (In)	O-1	122.223	13.300	391.30