DRAINAGE CONCEPT

FOR

HAMPTON SQUARE SECOND ADDITION
Wichita, Kansas

APRIL 2011
REVISED NOVEMBER 2011

City of Wichita/Sedgwick County
Subdivision Drainage Plan Checklist

Submit completed forms to:
City of Wichita Public Works & Utilities, 455 N. Main 8th Floor, Wichita KS 67202; or
Sedgwick County Stormwater Management, 1144 S. Seneca, Wichita KS 67213.

Project Name:	Hampton Square Second Addition				
Total Area of Project:	20.3 **acres**				
Development Type:	Commercial	**Other:**			
Developer Name:	Schellenberg Dev.	**Contact:**	Marv Schellenberg	**Phone:**	(316) 721-2153
Email:	marvs@premierwichita.com				
Engineer Name:	MKEC Eng Cons Inc.	**Contact:**	Kara Anderson	**Phone:**	(316) 684-9600
Email:	kanderson@mkec.com				

Directions:

(1) Fill-out this checklist completely and include it with the Drainage Plan submittal. This checklist should be included in the bound copy, behind the cover sheet for the submittal. Incomplete Drainage Plans and checklists will not be accepted.

*(2) Indicate whether a plan element is included or not included in the submittal by choosing "**Yes**" or "**No**" from the dropdown list in the **"Element Included?"** column. The question must be answered for every plan element for this checklist to be considered complete. An explanation must be provided for all **"No"** answers.*

Drainage Plan Checklist

#	Plan Element Description	Element Included?	Explanation/Notes
1.0	**General**		
1.1	Digital copy of drainage plan, including preliminary Master Grading Plan, preliminary plat and proposed plat, in PDF format and one half size, bound, paper copy.	yes	
1.2	Professional Engineer's seal, signature and date on plan cover.	yes	
1.3	Site location map, using color ortho-imagery and showing the project boundaries, a north arrow and an accurate scale.	yes	
1.4	Narrative of the development type, existing conditions and proposed impacts on stormwater runoff, wetlands, riparian zones and floodplains/floodways.	yes	
1.5	Discussion of off-site conditions surrounding the proposed development.	yes	
1.6	Summary table of runoff calculations (pre/post development).	yes	
1.7	Narrative description of the type and function of the permanent structural stormwater management facilities.	yes	
2.0	**Existing Conditions Information**		
2.1	**Existing Conditions Drainage Map**		
2.1.1	On-site and off-site topography: NAVD 88 datum, one-foot contours with spot elevations	yes	
2.1.2	On-site and off-site drainage features, including perennial and intermittent streams (with names labeled), conveyance systems such as open channels, ditches, swales and areas of overland flow. Flow direction must be indicated by arrows.	yes	
2.1.3	Storm sewer system components, including storm drains, inlets, catch basins, gutters, manholes, headwalls, pipes and culverts. Material and size must be noted for all pipes and culverts.	yes	
2.1.4	Location and boundaries of natural features such as wetlands, lakes, ponds with the normal water elevation noted, rock outcroppings, wooded areas and tree rows.	yes	
2.1.5	Location, dimensions and elevations of existing bridges and culvert crossings.	yes	
2.1.6	Location of existing utilities (e.g., water, sewer, gas, electric, cable, etc.) with labels and easement boundaries.	yes	
2.1.7	Groundwater elevations, if applicable.	yes	
2.1.8	Delineation of predominant soil based on USDA soil surveys and/or on-site soil borings; indicate NRCS soil name and Hydrologic Soil Group for undisturbed surface soils.	yes	
2.1.9	Land use types per NRCS nomenclature.	yes	
2.1.10	Footprint of existing impervious areas (labeled, area given in acres).	yes	
2.1.11	Internal drainage subbasin boundaries used for hydrologic calculations (labeled with ID, total area in acres, impervious area in acres and curve number).	yes	
2.1.12	Time of concentration flow paths. Indicate and label each segment separately (i.e., overland flow, shallow concentrated, channel1, channel2, etc.). For each segment, provide the appropriate data to calculate Tc (e.g., length, slope, cover type, paved/unpaved, roughness parameters, geometric properties, etc.).	no	Tcs were determined in previous reports
2.2	**Existing Conditions Hydrology and Hydraulics Analysis**		

Drainage Plan Checklist			
#	Plan Element Description	Element Included?	Explanation/Notes
2.2.1	Narrative of the hydrologic analysis methodology used (e.g., unit hydrograph or other approved methods).	yes	
2.2.2	A summary table of drainage subbasin hydrologic parameters (subbasin ID, area in acres, curve number, Tc, etc.).	yes	
2.2.3	Table of existing condition runoff curve numbers with supporting data and calculations.	yes	
2.2.4	Table of existing condition times of concentration with supporting data and calculations.	yes	
2.2.5	A summary table of rainfall data used in the hydrologic analysis, and a reference for the source of the data.	yes	
2.2.6	Cross-sections and other diagrams of existing open channels, bridge and culvert sections and other hydraulic features as required to illustrate the basis for hydraulic analysis.	yes	
2.2.7	Hydrologic and hydraulic analyses for runoff rates, volumes, velocities and elevations. Provide supporting data not specified above and identify assumptions. Include detailed calculations for the 2, 5, 10, 25 & 100-year, 24-hour storm events. Provide results in a tabular form. Provide digital copies of any computer files and models used.	yes	
3.0	**postdevelopment Conditions Information**		
3.1	**postdevelopment Conditions Drainage Map**		
3.1.1	Proposed project boundary.	yes	
3.1.2	on-site and off-site topography: NAVD 88 datum, one-foot contours with spot elevations.	yes	
3.1.3	Existing on-site and off-site drainage features that are to remain after development, including perennial and intermittent streams (with names labeled), conveyance systems such as open channels, ditches, swales and areas of overland flow. Flow direction must be indicated by arrows.	yes	
3.1.4	Location and description of off-site through-drainage conveyances which are confined to an easement, dedication and/or reserve.	yes	
3.1.5	Footprint of proposed impervious areas, including roads, parking lots, buildings and other structures.	yes	
3.1.6	Location of proposed utilities (e.g., water, sewer, gas, electric, cable, etc.) with labels and easement boundaries.	yes	
3.1.7	Delineation of predominant soils, based on anticipated soil textures and NRCS guidelines if different from predevelopment soil conditions; indicate NRCS soil name and Hydrologic Soil Group for surface soils.	yes	
3.1.8	Land use cover per NRCS nomenclature.	yes	
3.1.9	Internal drainage subbasin boundaries used for hydrologic calculations (labeled with ID, total area in acres, impervious area in acres and curve number).	yes	
3.1.10	Proposed limits of land disturbing activity (i.e., grading limits).	yes	
3.1.11	Time of concentration flow paths. Indicate and label each segment separately (i.e., overland flow, shallow concentrated, channel1, channel2, etc.). For each segment, provide the appropriate data to calculate Tc (e.g., length, slope, cover type, paved/unpaved, roughness parameters, geometric properties, etc.).	yes	
3.2	**Proposed Conveyances Map**		
3.2.1	on-site and off-site drainage features, including perennial and intermittent streams (with names labeled), proposed conveyance systems (such as open channels, ditches, swales and areas of overland flow, including backyard drainage). Flow direction must be indicated by arrows.	yes	
3.2.2	Storm sewer system components, including storm drains, inlets, catchbasins, gutters, manholes, headwalls, pipes and culverts. Material and size must be noted for all pipes and culverts.	yes	
3.2.3	For any subbasin or drainage area > 40 acres, show that the stormwater flow is confined to an open channel with required side benches and freeboard, or conformance to applicable policy and design requirements if partially enclosed.	yes	
3.2.4	Location(s) of stormwater management facilities and any associated drainage easements.	yes	
3.2.5	Proposed energy dissipaters and other channel protection devices.	yes	
3.2.6	Location(s) and dimension(s) of proposed channel, bridge and culvert crossings.	yes	
3.2.7	Normal pool and 100-year pool elevations for ponds and lakes.	yes	
3.2.8	Permanent concrete outfall control structure(s) for ponds.	yes	
3.2.9	Emergency overflow spillways and top of berm elevations for ponds and other volume/peak discharge control facilities.	yes	
3.2.10	Floodplains, ponds, and stormwater management facilities located in reserves.	yes	
3.3	**postdevelopment Conditions Hydrology & Hydraulics**		
3.3.1	Narrative of the hydrologic analysis methodology used (e.g., unit hydrograph or other approved methods).	yes	

Drainage Plan Checklist			
#	Plan Element Description	Element Included?	Explanation/Notes
3.3.2	A summary table of drainage subbasin hydrologic parameters (subbasin ID, area in acres, curve number, Tc, etc.).	yes	
3.3.3	Table of postdevelopment condition runoff curve numbers with supporting data and calculations.	yes	
3.3.4	Table of postdevelopment condition times of concentration with supporting data and calculations.	yes	
3.3.5	Cross-sections and other diagrams of existing open channels, bridge and culvert sections and other hydraulic features as	yes	
3.3.6	Hydrologic and hydraulic analyses for runoff rates, volumes, velocities and elevations. Provide supporting data not specified above and identify assumptions. Include detailed calculations for the 2, 5, 10, 25 & 100-year, 24-hour storm events. Provide results in a tabular form. Provide digital copies of any computer files and models used.	yes	
3.3.7	Downstream peak discharge assessment (10% Rule) results and supporting data and calculations. Provide digital copies of any computer files and models used.	yes	
3.3.8	Stage-storage-discharge or other outlet rating curves and inflow/outflow hydrographs for all ponds.	yes	
3.3.9	Demonstrate that the pond contours on the master grading plan and the stage-storage-discharge data are consistent for all ponds.	yes	
3.3.10	Demonstrate that all ponds have one foot of freeboard above the 100-year, 24-hour high water level.	yes	
3.3.11	Demonstrate that runoff from the proposed project site is discharged in the same manner as prior to development, using level spreaders, energy dissipaters, other devices or grading as required, or identify an appropriate flowage easement.	yes	
3.4	**Stormwater Quantity Control Sizing**		
3.4.1	Hydraulic sizing calculations for all stormwater management controls.	yes	
3.4.2	Table(s) listing all stormwater management controls. Present the types, sizes, elevations, flows, velocities and depths for each control, as applicable. Verify that velocities are self-cleaning and non-erosive.	yes	
3.4.3	Typical details (including cross-sections where applicable) for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc.	yes	
3.5	**Stormwater Quality Management Facilities**		
3.5.1	Table(s) listing all stormwater management facilities. Present the description, % TSS removal value, water quality volume handled, contributing drainage area in acres and contributing impervious area in acres.	yes	
3.5.2	Indicate the responsible party for maintenance, as shown in the plat text (i.e., Home Owners Association, Lot Owners Association, property owner, etc.).	yes	
3.5.3	Water quality volume (total and by facility), with supporting data and calculations.	yes	
3.5.4	% TSS removal value (total and by facility) with supporting data and calculation. Must be equal to or greater than 80%.	yes	
3.5.5	Channel protection volume with supporting data and calculations.	yes	
3.5.6	Water quality volume and channel protection volume orifice size calculations.	yes	
3.5.7	Other calculations required for each stormwater management facility as specified in the Wichita/Sedgwick County Stormwater Manual.	yes	
3.5.8	Typical details (including cross-sections where applicable) for outlet structures, embankments, internal grading, forebays and other siltation prefilters, filtration/infiltration media, vegetation, check dams, operational controls, etc.	yes	
4.0	**Floodplains**		
4.1	Reference the source of flood profile, floodplain, floodway and stream discharge information.	yes	
4.2	Delineation of nearest base flood elevations.	N/A	
4.3	Delineation of predevelopment regulatory floodplain/floodway limits using FEMA's current GIS database; limits to be per elevation and scaled location.	N/A	
4.4	Delineation of postdevelopment regulatory floodplain/floodway limits; limits to be per elevation and scaled location, with project limits shown.	N/A	
4.5	Floodway data table and discharges.	N/A	
4.6	Hydrologic and hydraulic study information for local floodplain analysis, unnumbered Zone A elevation determinations and floodplain map revisions or required permits.	N/A	
4.7	Regulatory floodway and four natural profile models (10, 50, 100 and 500-year) for existing and postdevelopment conditions.	N/A	
4.8	Floodplains and floodways located within a reserve, where necessary.	N/A	
4.9	Floodplain cut and fill calculations for volume sensitive basins.	N/A	

Drainage Plan Checklist			
#	Plan Element Description	Element Included?	Explanation/Notes
4.10	Demonstrate that floodway elevations and velocities do not increase due to construction in the floodway ("No Rise Certification").	N/A	
5.0	**Federal, State and Local Permits**		
5.1	US Army Corps of Engineers regulatory program permits (Section 404 permit)	N/A	
5.2	Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Floodplain Fill, Levee, Water Appropriations, Dam Safety permit, etc.).	N/A	
5.3	FEMA letters of map change/revision - LOMA, LOMR, LOMR-f, CLOMR, etc.; shall be included and approved when project modifies the limits of the floodplain/floodway.	N/A	
6.0	**Half Scale Preliminary Master Grading Plan**		
6.1	One set of plans and associated PDF of plans.	yes	
6.2	Professional Engineer's seal, signature and date.	no	
6.3	Title block including subdivision name and phase and dated revision documentation.	yes	
6.4	Future phases shown but cross-hatched as information only.	no	no future phases
6.5	Scale, not greater than 1-inch = 60 feet.	yes	
6.6	North arrow.	yes	
6.7	Index or legend key.	yes	
6.8	Benchmarks (minimum of 2) used for site control (NAVD 88 vertical datum).	yes	
6.9	Existing contours of entire site with contour interval of one foot.	yes	
6.10	Proposed contours for channels, ponds, and other permanent stormwater management facilities, with contour interval of one foot.	yes	
6.11	Spot elevations shown to the nearest tenth of a foot for critical locations, including lot and property boundaries.	yes	
6.12	Proposed lot and street layout.	yes	
6.13	Locations of underground storm drains.	yes	
6.14	Overflow locations for storms exceeding storm drain capacity, with elevations.	yes	
6.15	Top elevations of storm drains at all inlets, manholes, and flow line elevations for all outfalls.	yes	
6.16	Locations of open ditches and lakes.	yes	
6.17	Flow direction arrows.	yes	
6.18	Proposed flow line elevations of all open ditches at maximum 100 foot intervals, and 100-year flood elevations thereon.	N/A	
6.19	Ponds: Location, bottom elevation, normal pool elevation, 100-year flood elevation, emergency overflow elevation.	yes	
6.20	Proposed top-of-curb elevations at points where drainage will be required to flow over the curb.	yes	
6.21	Platted minimum building opening elevation for each lot, in table form for all lots (excluding basement floor elevations).	yes	
6.22	Standard foundation and elevation detail for slab on grade, full basement, view-out, partial view-out and/or walk-out construction.	no	Commercial
6.23	Top of foundation elevation for each lot.	no	Commercial
6.24	Notation for builders for each lot as to the type of structure that may be constructed and the view-out, walk-out or pad elevation, as applicable.	no	Commercial
6.25	Indicate that all lots are above the 100-year flood elevation.	yes	
6.26	Indicate that grading around structures conforms to perimeter drainage requirements.	yes	
6.27	Indicate that backyard drainage grading conforms to backyard drainage requirements.	yes	
6.28	Adjacent subdivision lot lines, with lot labels and subdivision names.	yes	
6.29	Boundaries and labels for all easements, rights-of-way and reserves.	yes	
6.30	Statement on proposed final plat: "*A drainage plan has been developed for the subdivision and all drainage easements, rights-of-way, or reserves shall remain at the established grades and remain unobstructed to allow for the conveyance of stormwater.*"	yes	
End of Checklist			

Tab 1. General

Location

The subject property is in the City of Wichita, Sedgwick County, Kansas. The proposed development is north of 37th Street North and West of North Maize Road. The site is the southeast quarter of Section 30, Township 26 South, Range 1 West of the 6th P.M. The plat area is 20.3 acres. The site is shown on the USGS Map, Appendix 1.1. The site is also shown on the aerial photograph, Appendix 1.2.

Discussion of Project

Existing

The site was previously platted for commercial land use as the Hampton Square Addition. The site was included as developed commercial in the Prairie Pointe Addition drainage report in Basin 5. As additional modeling was done upstream of the site for the Hampton Lakes and Hampton Lakes Commercial Additions the site was included as Basin 8 in the most recent report, Hampton Lakes Commercial Park 2nd Addition. The site is currently extremely flat with elevations varying from 1358 along the north property line to 1354. There is a slight ridge running north to the south through the site that directs runoff to the east and west. The previous plat intended for the entire site to be graded to drain to the west into a detention pond constructed with the Prairie Pointe Addition. This grading has not yet been done.

Proposed

Development Type

The proposed development is a commercial development with 14 lots. Lot sizes range from 0.7 acres to 2.5 acres in size. A proposed street will divide the site with access to Maize Road and 37th Street North. A pond will be constructed in Reserve "D." Although this pond will provide additional detention, it was not modeled as detention because additional detention was not needed. The site will continue to have the same land use and drainage patterns as previously platted. The site will need to be filled in order to shape it to drain to the Prairie Pointe Pond.

The basic site is shown on the preliminary plat, Appendix 1.3. The site is also shown on the final plat, Appendix 1.4. Preliminary site grading is shown on the Master Grading Plan, Appendix 1.5.

Impacts on Stormwater

The proposed project will not impact previously proposed conditions. The site will be graded to drain to the Prairie Pointe pond as originally planned.

Permanent Structural Stormwater Management Facilities

The existing weir on the pond in the Prairie Pointe Addition will be modified to provide extended water quality and channel protection volume.

Offsite

The site is bounded by the Prairie Pointe Addition to the west and the Hampton Lakes Commercial Addition to the North. Drainage from Hampton Lakes, Hampton Lakes Second, and Hampton Lakes Commercial Second Additions all flow from into the pond system constructed with Hampton Lakes and Prairie Pointe Additions. The pond systems are controlled by an existing weir at the south end of the Prairie Pointe Pond. The 2' weir opening outlets into a concrete flume and then into a roadside ditch along 37th Street and flows to the east to the intersection of 37th Street and Maize Road. The ditch along 37th Street is a v-bottom ditch with approximately 2.5:1 side slopes. The existing ditch is sized to convey the existing flow from the pond. Sizing calculations are in Appendix 1.6. The bottom of the existing ditch does not drain

properly, there are high points in the bottom that prevent it from having positive slope to the culverts under 37th Street. There is 0.14% of fall from the outlet of the concrete flume to the inlet of the pipes under 37th Street. From the ditch storm water flows under 37th Street through 3-18"x24" RCP's and continues to the south through the ditch along Maize Road. These culverts are sized to convey the runoff from the pond, Appendix 1.7. There is currently water flowing directly to the ditches and not through the pond, but this will be changed once the site is graded as planned.

Summary

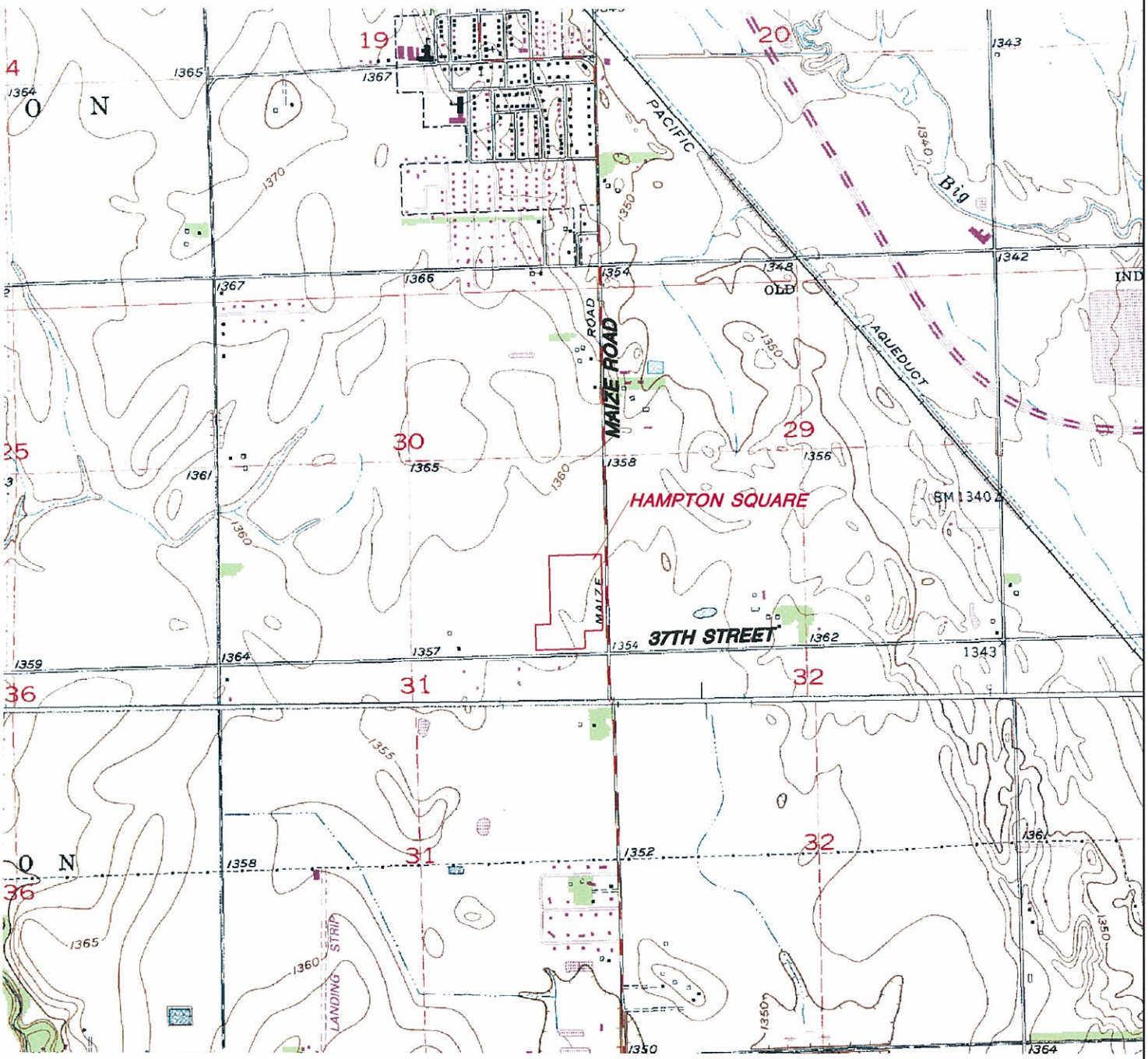
The basin development has decreased flow rates form pre-project conditions.

Table 1.1. Comparison of Pre and Post-Development Flow Rates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-Project	6.3	-	-	-	20.5
Post-Project	5.7	7.8	10.1	13.0	18.1

Appendix 1.1

USGS Quadrangle Map



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SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

SECTION 30
TOWNSHIP 26S
RANGE 1W

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

HAMPTON SQUARE 2ND
PROJECT NAME

QUAD MAP
SHEET TITLE

KLA	CMJ	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
APRIL 2011	10582	1 / 1
DATE	JOB NO.	SHEET/OF

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Appendix 1.2

Aerial Photograph

SCALE: 1" = 1000'

1000 0 1000 2000

N

SECTION 30
TOWNSHIP 26S
RANGE 1W

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
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Appendix 1.3

Preliminary Plat

LEGEND

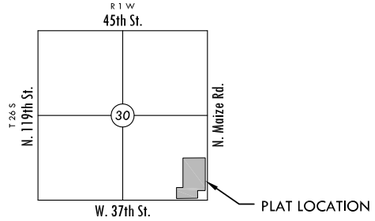
- 6IN - CONIFEROUS TREE & DIAMETER
- 3IN - DECIDUOUS TREE & DIAMETER
- SN - SIGN
- PP - POWER POLE AND GUY ANCHOR
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UGT - UNDERGROUND ELECTRIC LINE
- OHE - OVERHEAD ELECTRIC
- FOC - FIBER OPTIC CABLE !

LEGAL DESCRIPTION

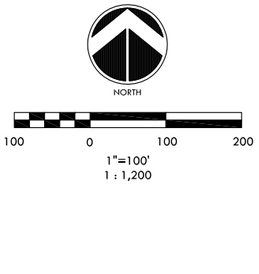
Lots 1, 2, 3, 4, 5, 7, 8, 9, Block 1, Hampton Square Addition, an addition to Wichita, Sedgwick County, Kansas.

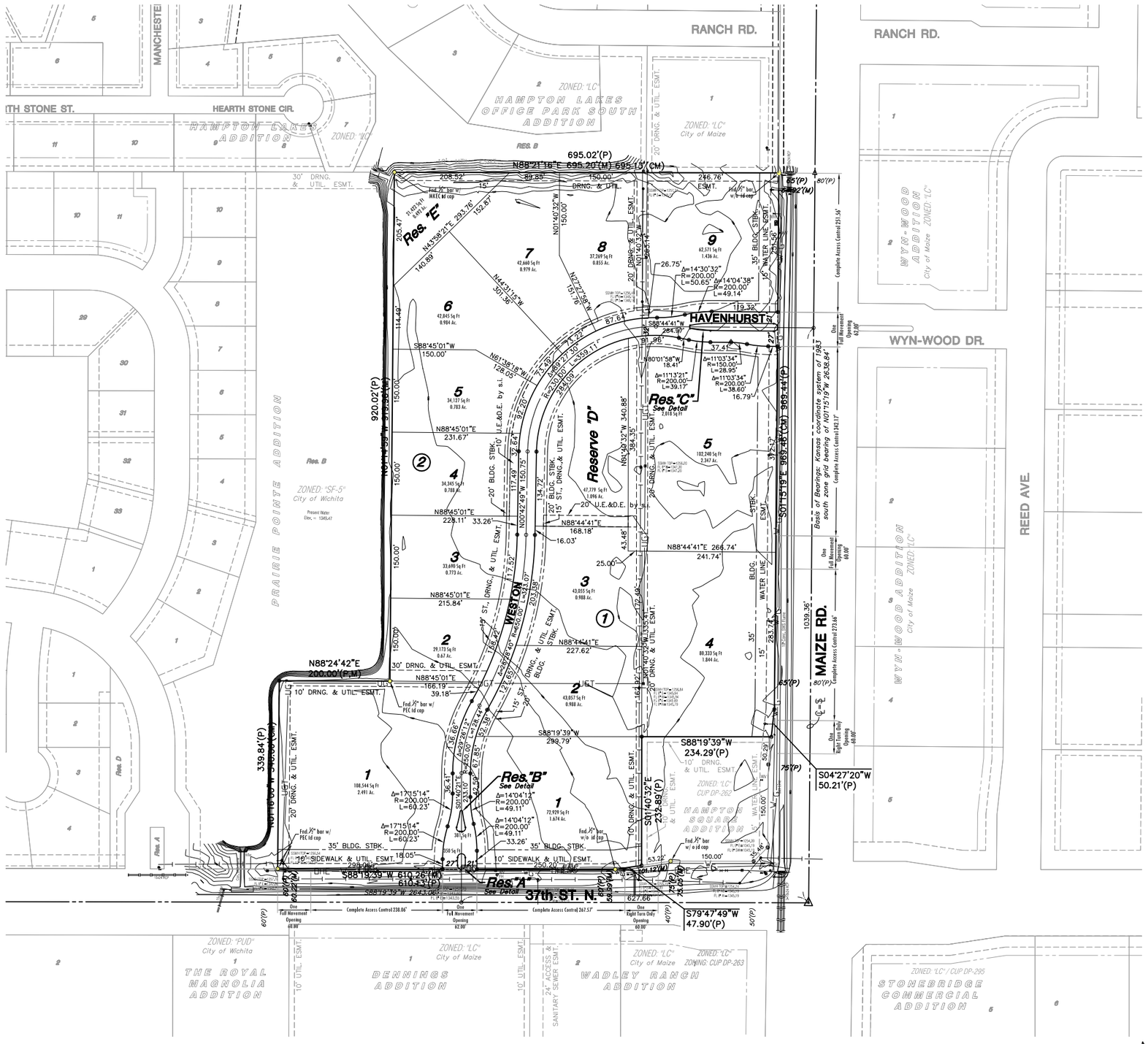
NOTES

1. LOCATION: In the Northwest portion of the City of Wichita in an area adjoining the City of Maize The property has access to K-96 via Maize Rd. and or Ridge Road. Existing surrounding land uses include newly constructed WSU campus and restaurants, suburban residential, commercial, office, and senior housing to the northwest, agricultural production.
2. LOT TOTAL - 15 Commercial Lots
3. ANNEXATION: Lies within the City of Wichita and adjoins the City of Maize to the north, south, and east.
4. EXISTING USE: Agricultural
5. ZONING: Existing / proposed - "LC" w/ CUP DP 262 overlay THIS PLAT SHALL CONFORM TO THE RECITALS OF CUP DP 262.
6. PLAT AREA: Gross - 20.34 Ac.
   Net - 18.95 Ac.
7. SURVEY DATE: April 8th, 2011 (by MKEC)
8. PUBLIC UTILITIES: Municipal sanitary sewer shall be extended to the western lots. Municipal water installed in streets.
9. LEGAL DESCRIPTION: See hereon
10. ACCESS CONTROLS: As shown hereon
11. RESERVES: Reserves "A", "B", "C", "D", and "E" are platted for landscaping, irrigation, berming, monuments, signs, water features, and utilities confined by easement(s) or rights-of- way. Reserve "F" is platted for landscaping, irrigation, drainage pond, and monuments. The Reserves shall be owned and maintained by the owner(s)/developer, and/or their successors, assigns, and/or a Lot Owner's Association.
12. FLOOD: According to FEMA FIRM Community Unit Panel 20173C0190E, Effective Date Feb. 2nd, 2007; this property lies within flood zone "X", *"Areas determined to be outside the 0.2 % annual chance floodplain."*
13. DRAINAGE: A drainage report shall accompany this plat.



VICINITY MAP





PRELIMINARY PLAT

A portion of the SE. ¼, Sec. 30, T26S, R1W, 6th P.M.

HAMPTON SQUARE SECOND ADDITION

OWNER / DEVELOPER: HAMPTON SQUARE LLC, Attn: Marvin L. Schellenberg 7926 W. 21st ST. Wichita, KS 67205 316.721.2153

Date submitted: April 11th, 2011
Subdivision Hearing: April 28th, 2011

MAPC Hearing: May 12th, 2011

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

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Appendix 1.4

Final Plat

FINAL PLAT

HAMPTON SQUARE SECOND ADDITION

AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

CERTIFICATE OF SURVEY

I, Gregory J. Allison, a registered land surveyor in Kansas, do hereby certify that I have been in responsible charge of surveying and platting of "HAMPTON SQUARE SECOND ADDITION", an addition to Wichita, Sedgwick County, Kansas, into Lots, Blocks, Reserves, and Streets, the same being accurately set forth in the accompanying plat and described herein:

A replat of Lots 1, 2, 3, 4, 5, 7, 8, and 9, Block 1, Hampton Square Addition, Wichita, Sedgwick County, Kansas.

All easements, rights-of-ways, building setbacks, and access controls, together with all other public dedications within the above described property, are hereby vacated and replatted by virtue of K.S.A. 12-512(b).

I hereby certify that the details of this plat are correct to the best of my knowledge and belief this___day of _____, 2011.

GREGORY J. ALLISON LICENSED LS-1257 KANSAS LAND SURVEYOR

Gregory J. Allison, PE, LS #1257
MKEC Engineering Consultants, Inc.
411 North Webb Road
Wichita, Kansas 67206

OWNER'S CERTIFICATE

Know all men by these presents that the undersigned property owner of the land above set forth in the Registered Land Surveyor's Certificate, has caused the same to be surveyed and platted into Lots, Blocks, Reserves, and Streets the same to be known as "HAMPTON SQUARE SECOND ADDITION," an addition to Wichita, Sedgwick County, Kansas.

Easements for the construction and maintenance of public sidewalks, utilities and drainage, as indicated on the accompanying plat are hereby granted to the public.

The streets are hereby dedicated to and for the use of the public.

All abutters rights of access to or from Maize Road over and across the east line of "HAMPTON SQUARE SECOND ADDITION," are hereby granted to the appropriate governing body, as indicated hereon. All abutters rights of access to or from 37th Street over and across the south line of "HAMPTON SQUARE SECOND ADDITION," are hereby granted to the appropriate governing body, as indicated hereon.

Reserves "A", "B", "C", "D", and "E" are platted for landscaping, irrigation, berming, monuments, signs, water features, and utilities confined by easement(s) or rights-of-way. Reserves "D" and "E" are also platted for the drainage. The Reserves shall be owned and maintained by the owner(s)/developer, and/or their successors, assigns, and/or a Lot Owner's Association.

A drainage plan has been developed for this plat. All drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of stormwater. Lots 3 and 5, Block 1, Lots 1, 2, 3, 4, 5, 6, 7, 8, and 9, Block 2, are required to adhere to the minimum pad elevations as depicted hereon the "Minimum Pad Elevations" table.

This plat shall conform to the recitals of Community Unit Plan DP-262.

Hampton Square, LLC, a Kansas limited liability company

_____, manager
Marvin L. Schellenberg, manager
Hampton Square LLC, a Kansas limited liability company

STATE OF KANSAS, SEDGWICK COUNTY} ss:

This instrument was acknowledged before me on ____ day of _____, 2011, by Marvin L. Schellenberg, manager of, Hampton Square LLC, a Kansas limited liability company.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year last above written.

_____ Notary Public
Notary Public:
My Term Expires: _____

MORTGAGE CERTIFICATE

LEGACY Bank, holder of a mortgage on a portion of the above described property, does hereby consent to the plat of "HAMPTON SQUARE SECOND ADDITION."

Legacy Bank

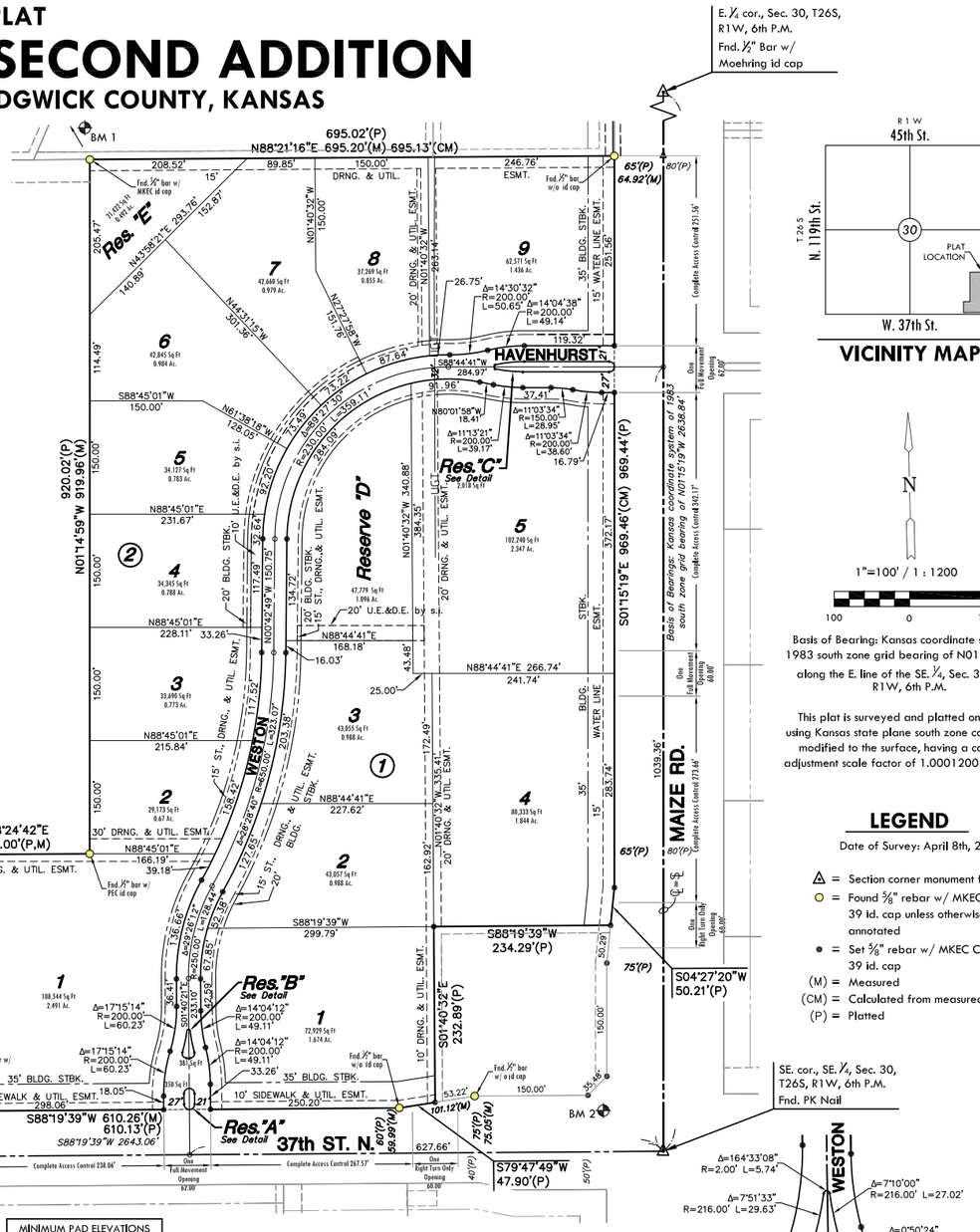
_____, Executive Vice President
Brad Yaeger, Executive Vice President

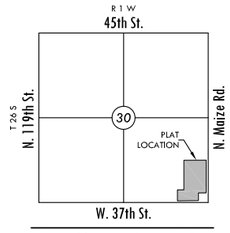
This instrument was acknowledged before me on this ____ day of _____, 2011, by Brad Yaeger, Executive Vice President, Legacy Bank.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year last above written.

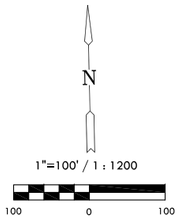
_____Notary Public
Notary Public:

My Term Expires: _____.





VICINITY MAP



Basis of Bearing: Kansas coordinate system of 1983 south zone grid bearing of N01°15'19"W along the E. line of the SE. ¼, Sec. 30, T26S, R1W, 6th P.M.

This plat is surveyed and platted on NAD83 using Kansas state plane south zone coordinates, modified to the surface, having a combined adjustment scale factor of 1.000120014401728

LEGEND

Date of Survey: April 8th, 2011

- △ = Section corner monument found
- ○ = Found ⅝" rebar w/ MKEC CLS 39 id. cap unless otherwise annotated
- ● = Set ⅝" rebar w/ MKEC CLS 39 id. cap
- (M) = Measured
- (CM) = Calculated from measured
- (P) = Platted

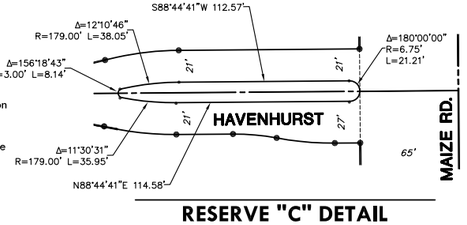
MINIMUM PAD ELEVATIONS LOWEST OPENINGS		
LOTS (inclusive)	BLOCK	ELEVATION NAVD 88
3 & 5	1	1359.5
1 - 9	2	1359.5

BENCH MARKS

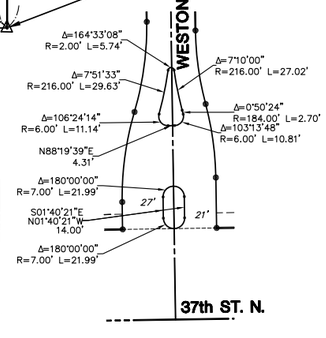
BM 21-0 — Chiseled square on concrete base of brick fence post on south side of 37th St. 1573 feet west of Maize Rd.
Elev. = 1356.01 NAVD 88

BM 1 — Chiseled square on top of curb at south end of entrance island at Hampton Lakes St. and Manchester St.
Elev. = 1357.69 NAVD 88

BM 2 — Chiseled square at northwest corner of pad of traffic signal manhole at northwest corner of Maize Rd. and 37th St.
Elev. = 1354.49 NAVD 88



RESERVE "C" DETAIL
1"=50'



RESERVES "A" & "B" DETAIL
1"=50'

PLANNING COMMISSION CERTIFICATE

This plat of "HAMPTON SQUARE SECOND ADDITION" has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this ____ day of _____, 2011

WICHITA-SEDGWICK COUNTY METROPOLITAN AREA PLANNING COMMISSION

_____, Chair
Debra Miller Stevens, Chair

Attest: _____, Secretary
John L. Schlegel, Secretary

Affix MAPC Seal

GOVERNING BODY CERTIFICATE

The dedications shown on this plat are hereby accepted and this plat is hereby approved by the governing body of the City of Wichita, Kansas.

Dated this ____ day of _____, 2011

At the direction of the City Council.

_____, Mayor
Carl Brewer, Mayor

Attest: _____, City Clerk
Karen Sublett, City Clerk

Affix City Seal

TRANSFER RECORD

STATE OF KANSAS, SEDGWICK COUNTY} ss:

Entered on transfer record this ____ day of _____, 2011

_____, County Clerk
Kelly B. Arnold, County Clerk

Affix County Clerk Seal

REGISTER OF DEEDS CERTIFICATE

STATE OF KANSAS, SEDGWICK COUNTY} ss:

This is to certify that this instrument was filed for record in the Register of Deeds office this day of _____, 2011, at _____ o'dock _M; and is duly recorded.

_____, Register of Deeds
Bill Meek, Register of Deeds

Attest: _____, Deputy
Tonya E. Buckingham, Deputy

Affix Register of Deeds Seal

COUNTY SURVEYOR

STATE OF KANSAS, SEDGWICK COUNTY} ss:

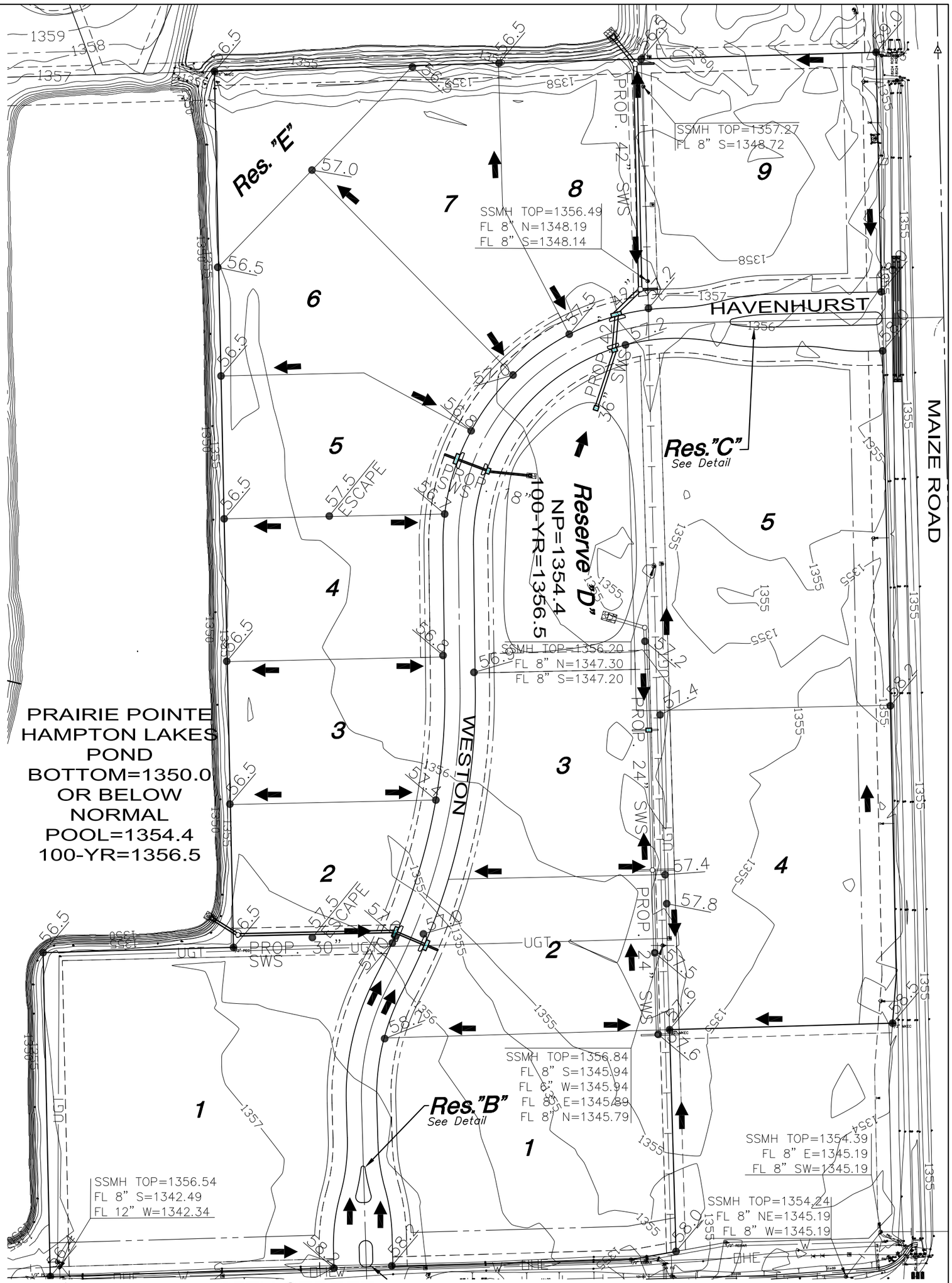
Reviewed in accordance with K.S.A. 58-2005 on this ____ day of _____, 2011.

_____, Deputy County Surveyor
Tricia L. Robello, LS #1246
Deputy County Surveyor
Sedgwick County, Kansas

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

Appendix 1.5

Master Grading Plan



MINIMUM PAD ELEVATIONS LOWEST OPENINGS	
LOTS (inclusive)	BLOCK	ELEVATION NAVD88
1 - 7	3	1360.1

LEGEND

- CON - CONIFEROUS TREE
- DEC - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- EB - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SC - SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE
- SPOT ELEVATIONS

VICINITY MAP

T 26 S
N. 119th St.
W. 37th St.
45th St.
30
PLAT LOCATION
R 1 W
N. Maize Rd.

SCALE: 1" = 50'

J:\Projects\2010\1001010582_Premier Hampton Square 2nd\5-Civil\CAD\Drainage\Drawing\10582_LGP.dwg

SHEET NUMBER 1

DESIGN BY KLA
DRAWN BY CMJ
CHECKED BY GJA

DATE November 11
REVISED

HAMPTON SQUARE 2ND

MAIZE, KANSAS

LOT GRADING PLAN

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

Appendix 1.6

37th Street Ditch Calculations

Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Tuesday, Apr 19 2011

37th Street Ditch

Triangular

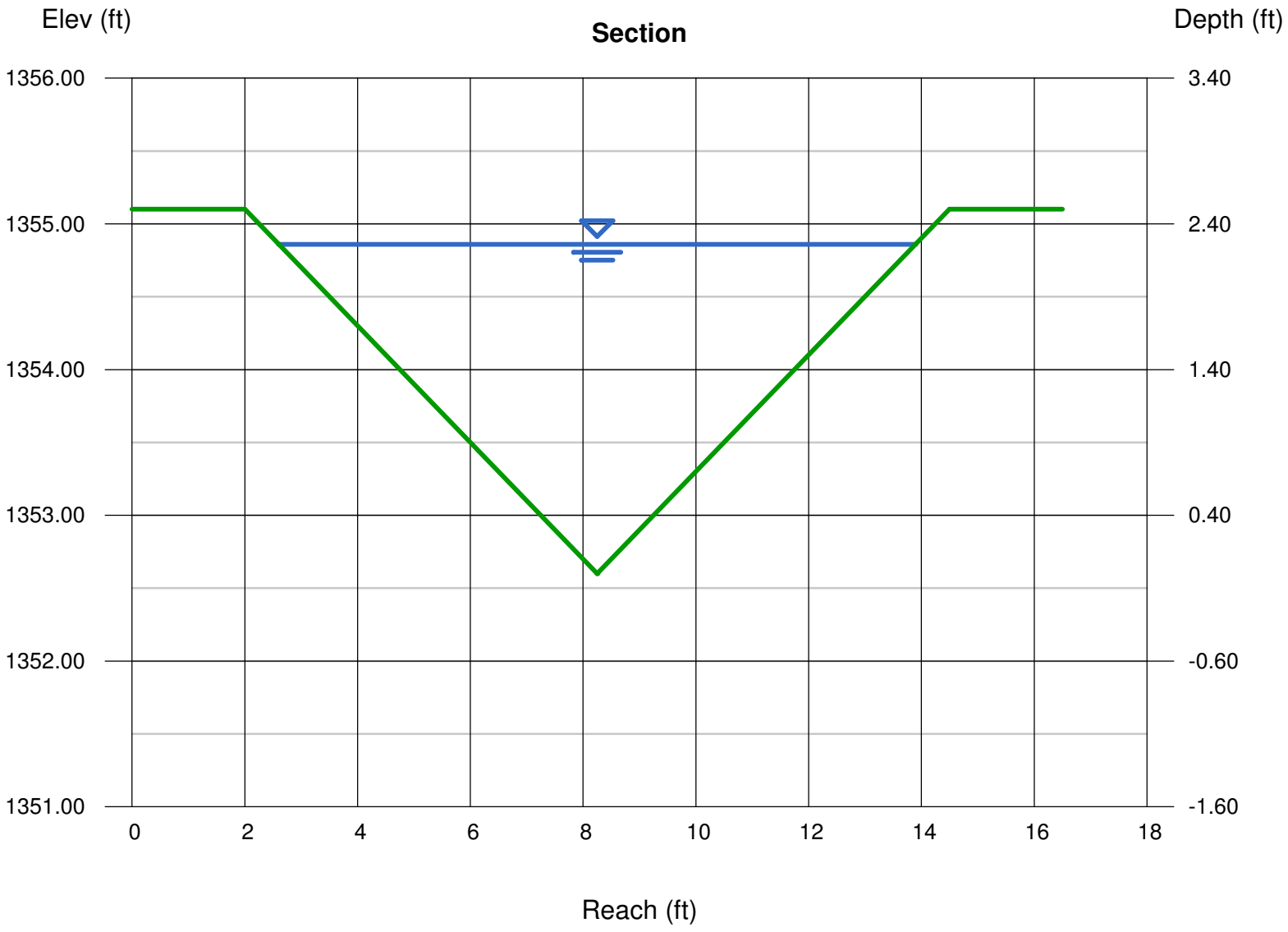
Side Slopes (z:1)	= 2.50, 2.50
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 1352.60
Slope (%)	= 0.10
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 20.50

Highlighted

Depth (ft)	= 2.26
Q (cfs)	= 20.50
Area (sqft)	= 12.77
Velocity (ft/s)	= 1.61
Wetted Perim (ft)	= 12.17
Crit Depth, Yc (ft)	= 1.34
Top Width (ft)	= 11.30
EGL (ft)	= 2.30



Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
2.26	20.50	12.77	1.61	12.17	1.34	11.30	2.30

Appendix 1.7

37th Street Culvert Calculations

Culvert Report

Existing 37th Stret Culverts

Invert Elev Dn (ft)	=	1352.67
Pipe Length (ft)	=	110.00
Slope (%)	=	0.04
Invert Elev Up (ft)	=	1352.71
Rise (in)	=	18.0
Shape	=	Ell
Span (in)	=	24.0
No. Barrels	=	3
n-Value	=	0.013
Inlet Edge	=	Projecting
Coeff. K,M,c,Y,k	=	0.0045, 2, 0.0317, 0.69, 0.5

Embankment

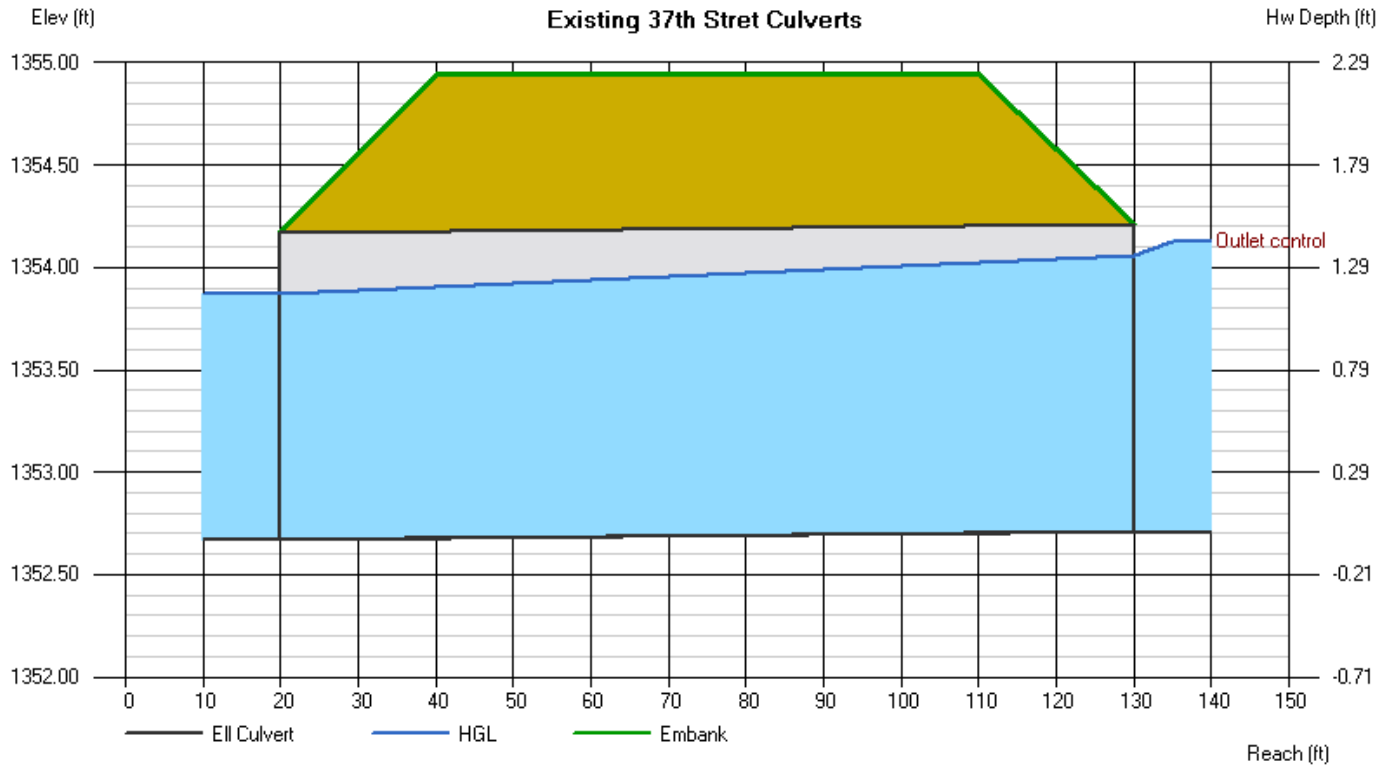
Top Elevation (ft)	=	1354.94
Top Width (ft)	=	70.00
Crest Width (ft)	=	100.00

Calculations

Qmin (cfs)	=	0.00
Qmax (cfs)	=	20.50
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	20.00
Qpipe (cfs)	=	20.00
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	3.32
Veloc Up (ft/s)	=	2.99
HGL Dn (ft)	=	1353.87
HGL Up (ft)	=	1354.06
Hw Elev (ft)	=	1354.13
Hw/D (ft)	=	0.95
Flow Regime	=	Outlet Control



Q			Veloc		Depth		HGL	
Total	Pipe	Over	Dn	Up	Dn	Up	Dn	Up
(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(in)	(in)	(ft)	(ft)
2.00	2.00	0.00	0.45	0.45	10.80	10.80	1353.57	1353.61
4.00	4.00	0.00	0.83	0.83	11.70	11.70	1353.65	1353.69
6.00	6.00	0.00	1.15	1.24	12.15	11.70	1353.68	1353.69
8.00	8.00	0.00	1.53	1.53	12.60	12.60	1353.72	1353.76
10.00	10.00	0.00	1.77	1.77	13.05	13.50	1353.76	1353.84
12.00	12.00	0.00	2.13	2.13	13.05	13.50	1353.76	1353.84
14.00	14.00	0.00	2.48	2.32	13.50	14.40	1353.80	1353.91
16.00	16.00	0.00	2.66	2.51	13.95	15.30	1353.83	1353.99
18.00	18.00	0.00	2.99	2.82	13.95	15.30	1353.83	1353.99
20.00	20.00	0.00	3.32	2.99	14.40	16.20	1353.87	1354.06

HGL	
Hw	Hw/D
(ft)	
1353.61	0.60
1353.69	0.65
1353.70	0.66
1353.78	0.71
1353.86	0.77
1353.87	0.77
1353.95	0.83
1354.03	0.88
1354.05	0.89
1354.13	0.95

Tab 2. Existing Conditions

Datum

The site is shown in NAVD 88 datum.

Drainage Patterns

The site is currently extremely flat with elevations varying from 1358 along the north property line to 1354 along the southeast corner of the site and 1355.7 along the west property line. There is a slight ridge running north to the south through the site that directs runoff to the east and west. The previous plat intended for the entire site to be graded to drain to the west into a detention pond constructed with the Prairie Pointe Addition. This grading has not yet been done.

An existing pond was constructed with the Prairie Pointe Addition west of the main pond. This pond outlets into the main Prairie Pointe Pond through a 15" RCP. There are multiple ponds on the Hampton Lakes and Hampton Lakes Commercial properties that flow to the south into a pond on Hampton Lakes. The Hampton Lakes pond has been connected to a pond in Prairie Pointe Addition. Hydraulically these ponds act as one and are modeled as such. Flow from the existing pond system in Prairie Pointe Addition flows to the south through a 2' wide concrete weir and into a concrete flume. The runoff from the entire system reaches a ditch along 37th Street and then flows to the east to 3-18-24" RCP's under 37th Street. The runoff then goes south through a ditch along Maize Road.

The existing conditions are shown on the Existing Conditions Drainage Map, Appendix 2.1.

Groundwater Elevations

Existing groundwater elevations are approximately 20 feet deep in this area according to the Kansas Geological Survey Water Well Records.

Utilities

Water

Existing water lines run along the west side of maize road and along the north side of 37th Street North.

Sanitary Sewer

An existing 8" sanitary sewer line flows through the line from north to south. It ties into an existing line that runs from east to west along the North side of 37th Street North.

Stormwater

Existing stormwater sewer lines route surrounding drainage to the existing detention ponds. After it exits the pond, an existing storm water sewer line conveys runoff under 37th Street and to the south.

Others

There is existing underground telephone line that crosses the site.

Hydrologic Analysis

This site was included in previous models for the Prairie Pointe Addition and Hampton Lakes Additions. This site was included in Basin 2 of the Prairie Pointe existing conditions model. This basin was modeled using the Rational Method.

Soil Type

- Blanket Silt loam, 0 to 3 percent slopes, HSG "C"
- Farnum loam, 0 to 1 percent slopes, HSG "B"
- Vanoss silt loam, 1 to 3 percent slopes, HSG "B"

The site is shown on the soil survey, Appendix 2.2.

Land Use

The site is currently undeveloped land with grass covering the site.

Impervious Areas

Under existing conditions, there is no impervious area on site. The site is currently covered in grass.

Rational Coefficient

The rational coefficient used 0.76 for a 2-year event and 0.86 for a 100-yer event. These numbers correspond to a commercial area with 80% impervious area.

Time of Concentration

The time of concentration was calculated to be 35 minutes in the Prairie Pointe Drainage Report.

Basin Summary

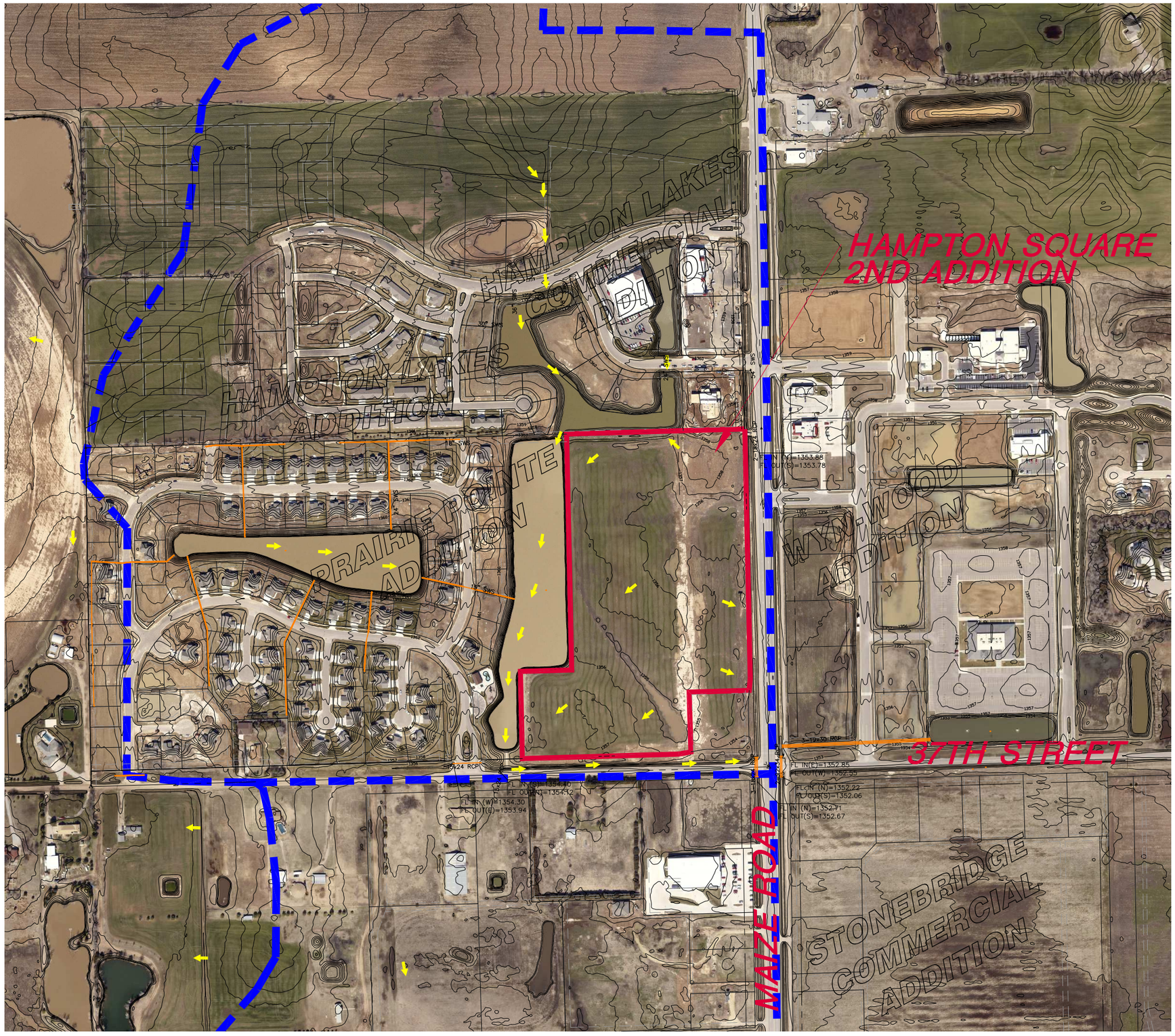
The pre-project flow rates were determined in the Prairie Pointe Drainage Report. The flow rates that we have maintained are shown in Table 1.1.

Table 2.1. Pre-Project Flow Rates.

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-Project	6.3	-	-	-	20.5

Appendix 2.1

Existing Conditions Drainage Map



R 1 W

45th St.

T 26 S

N. 119th St.

30

PLAT LOCATION

N. Maize Rd.

W. 37th St.

VICINITY MAP

LEGEND

- CIN - CONIFEROUS TREE
- DIN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE
- XXX -SPOT ELEVATOINS

N

SCALE: 1" = 400'

400 0 400 800

J:\Projects\2010\1001010582_Premier Hampton Square 2nd\5-Civil\CAD\Drainage\Drawing\10582_existing conditions.dwg

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

HAMPTON SQUARE 2ND

MAIZE, KANSAS

EXISTING CONDITIONS

DATE
April 11

REVISED

DESIGN BY
KLA

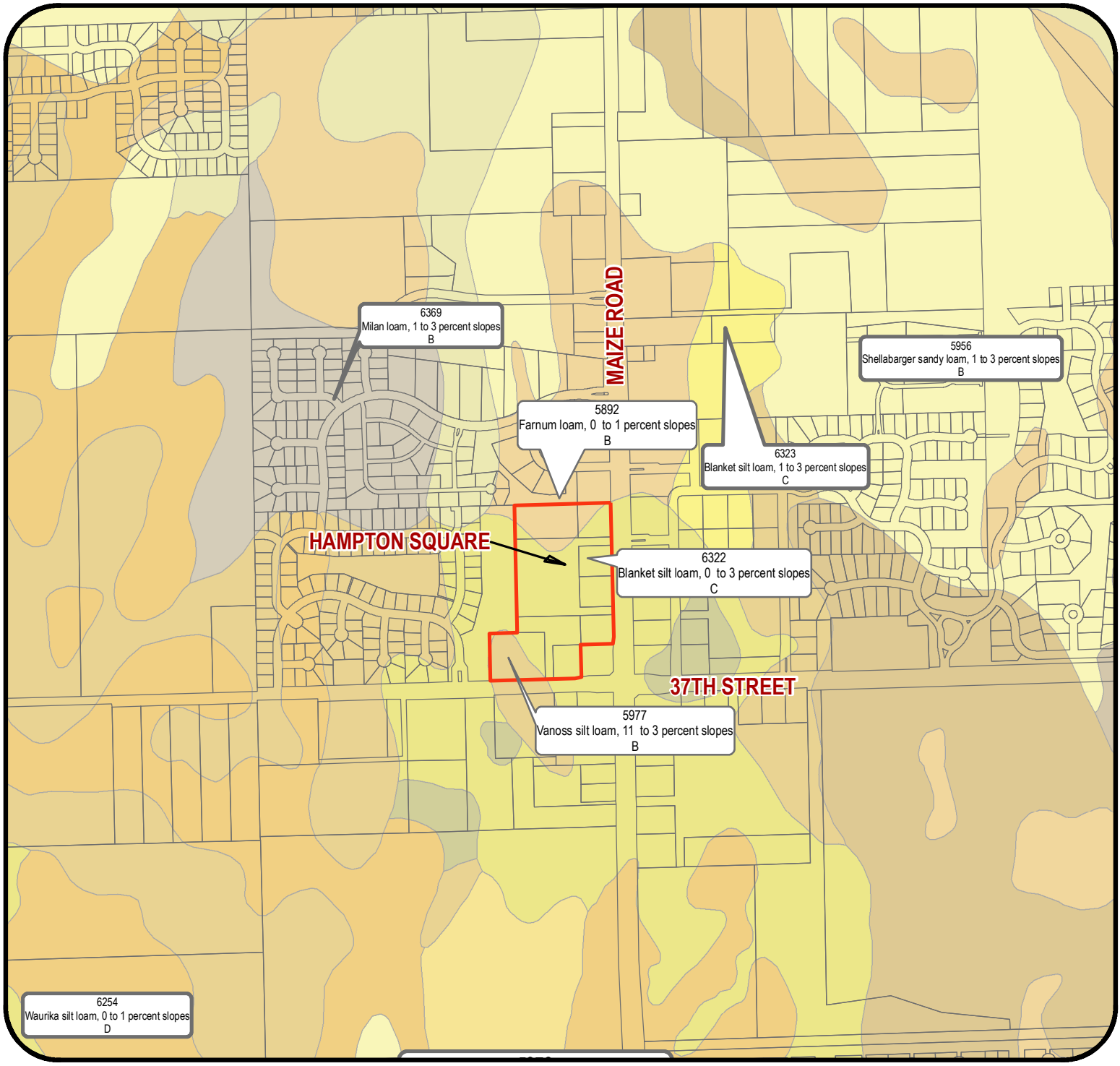
DRAWN BY
CMJ

CHECKED BY
GJA

SHEET NUMBER
1

Appendix 2.2

Soil Survey



1 0.5 0 Miles

1,000 500 0 1,000 2,000 3,000 Feet

1 0.5 0 Kilometers

N W E S

J:\Civil\04312\Hampton Square\Drng\DRNG-NRCS-USGS.mxd

HAMPTON SQUARE 2ND

Project Name:

USGS - Sedgwick County, KS

Sheet Title:

MKEC ENGINEERING CONSULTANTS, INC.

CMJ	APRIL 2011
Drawn By:	Date:
KLA	10582
Design / Review:	Job No.:

Tab 3. Proposed Conditions

Datum

The site is shown in NAVD 88 datum. The proposed conditions Hydraflow Model was converted from NGVD 29 to NAVD 88.

Drainage Patterns

The proposed drainage patterns remain the same as were originally intended. The site will be filled to direct drainage from the east to the west into the existing pond constructed with the Prairie Pointe Addition. The basin drainage patterns will remain the same. The site will be filled to an elevation of approximately 1358 on the east side and will drain to the west into the existing pond in Prairie Pointe Addition.

The pond will maintain a normal pool of 1354.5 and the outlet structure will be modified to provide channel protection and water quality. The existing structure is a 2' wide weir with an elevation of 1354.5. The outlet will be modified to provide a 0.6' wide weir at an elevation of 1354.5 and a 2' wide opening at 1355.0. Blocks, concrete, or an approved equal will be used to constrict the weir to the opening needed. The pond located in Reserve "D" will be interconnected with this pond and have the same normal pool and 100-year water surface elevation.

The proposed conditions are shown on the Proposed Conditions Drainage Map, Appendix 3.1.

Groundwater Elevations

Existing groundwater elevations are approximately 20 feet deep in this area according to the Kansas Geological Survey Water Well Records.

Utilities

Water

A proposed water line will run along Havenhurst/Weston and connect to the water lines along North Maize Road and 37th Street. Proposed utilities are shown on the Drainage and Utility Plan, Appendix 3.2.

Sanitary Sewer

A proposed sanitary sewer line will connect into the existing line and provide service to lots 1-6, of Block 2.

Stormwater

Proposed stormwater sewer systems will convey runoff from the east portion of the site to the existing detention pond. The proposed systems will provide a storm water connection to all of the lots or the lots are adjacent to an existing pond. The proposed storm water sewer system is sized for a 5-year design event. Any overflow in larger events will be designed to overflow through the drainage easements into the pond. Proposed storm water sewer has been modeled in Hydraflow Storm Sewers, Appendix 3.3. The ditch along Maize Road will be graded to provide positive slope of 0.14% to the existing culverts under 37th Street North.

Hydrologic Analysis

This site was included in previous models for the Prairie Pointe Addition and Hampton Lakes Additions. This basin was modeled using the Rational Method. Hydraflow Hydrographs output for this project is in Appendix 3.4.

Soil Type

- Blanket Silt loam, 0 to 3 percent slopes, HSG "C"
- Farnum loam, 0 to 1 percent slopes, HSG "B"
- Vanoss silt loam, 1 to 3 percent slopes, HSG "B"

The site is shown on the soil survey, Appendix 2.2.

Land Use

The land use of the site will be commercial development.

Impervious Areas

Under proposed conditions approximately 80% of the site will be impervious area. The lot layouts and impervious areas have not yet been determined.

Rational Coefficient

The rational coefficient used 0.76 for a 2-year event and 0.86 for a 100-yer event. These numbers correspond to a commercial area with 80% impervious area.

Time of Concentration

A minimum time of concentration was assumed for all basins in the model. Fifteen minutes was used for all basins.

Basin Summary

The basin will continue to drain as planned under previous developments in this basin. The site will drain to the west into a pond on Prairie Pointe Addition that will continue to accept flow from the north and west and will continue to flow to the south to a ditch along 37th Street that flows to the east and will then flow to the south along Maize Road. Post-Project flow rates discharging into 37th Street are shown in Table 3.1

Table 3.1. Post-Development Flow Rates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Post-Project	5.7	7.8	10.1	13.0	18.1

Drainage Feature Summary

The Prairie Pointe/Hampton Lakes Detention Pond were designed to provide detention for the Hampton Lakes Second Addition. The pond outlet structure will be modified to provide extended detention for water quality and channel protection.

Table 3.1. Prairie Pointe and Hampton Lakes Pond.

Basin	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Peak Flow In (cfs)	122.0	141.0	157.7	177.8	210.2
Peak Flow Out (cfs)	5.7	7.8	10.1	13.0	18.1
Velocity Out (fps)	4.4	4.6	4.8	5.2	5.5
Water Surface Elevation (ft)	1355.5	1355.7	1355.9	1356.1	1356.5
Volume of Detention (ac-ft)	8.2	9.9	11.5	13.3	16.0
Normal Pool Elevation (ft)	1354.4				
Freeboard Elevation (ft)	1357.5				
Outlet Structure	Rectangular weir with 0.6' wide notch at 1354.5 and a 2' wide notch at 1355.0				

Downstream Peak Discharge Assessment (10% Rule)

A calculation was included to evaluate the downstream peak discharge. Flow from the site flows under 37th Street to a roadside ditch along Maize Road. Approximately ½ mile south of the site this drainage area flows to equalizing pipes under Maize Road. The drainage area to these pipes is 313 acres, Overall Basins Appendix 3.4. The site is less than 10% of the total area of this basin. Calculations were done in Hydraflow Hydrographs and the pre-and post-project flows to this point are shown in Table 3.2 below.

Table 3.2. Comparison of Pre and Post-Development Downstream Discharge

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-Project	155.6	210.3	251.2	298.6	381.8
Post-Project	151.8	187.2	218.5	256.1	317.4

Stormwater Quality Management

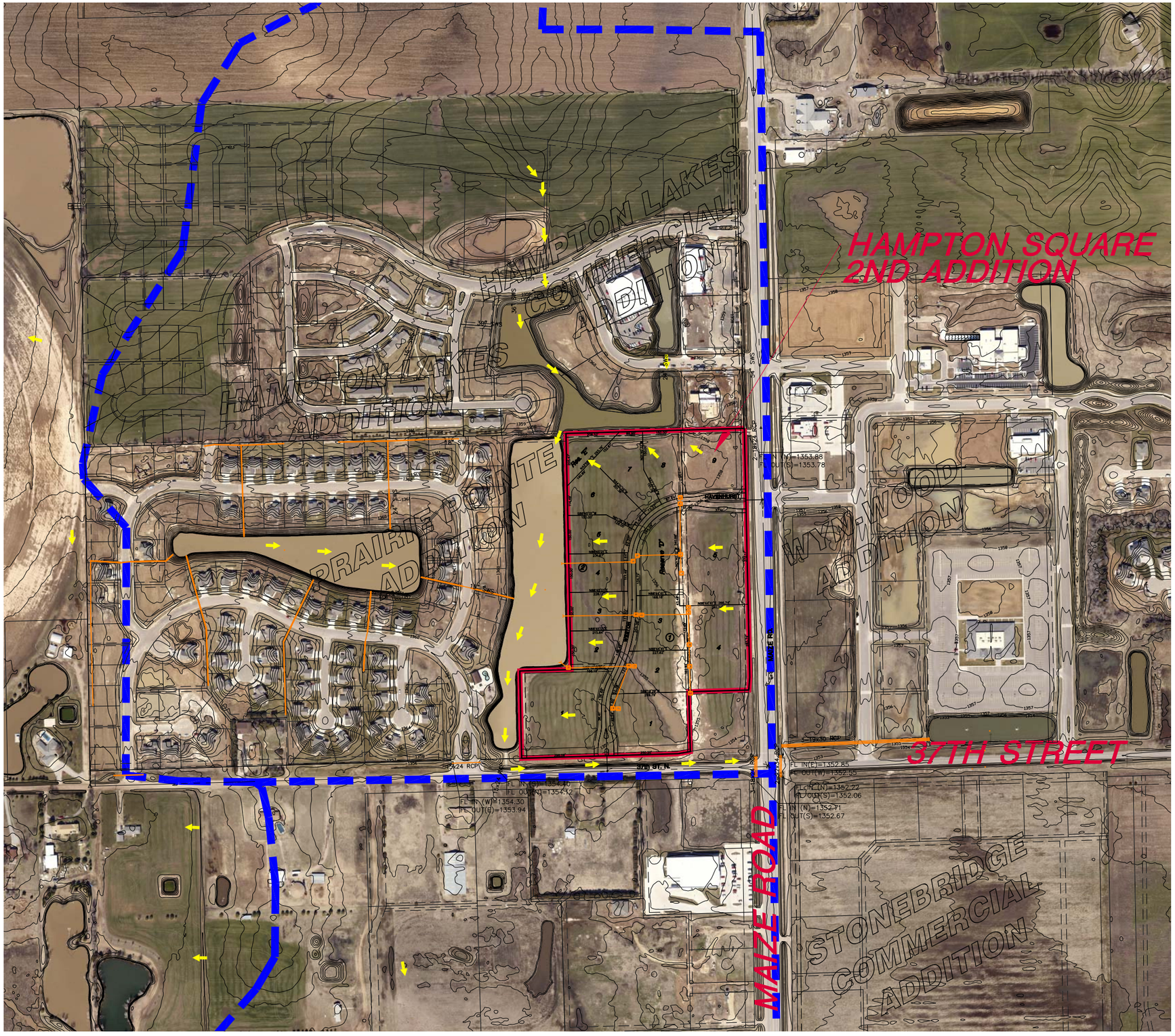
The entire site and offsite areas drain into an existing pond system. The pond system has a surface area of 17.4 acres. A wet pond will remove 80% of the Total Suspended Solids (TSS). The volume of water quality needed was calculated in a spreadsheet, Appendix 3.6. The total volume of water quality required for the entire developed basin is 8.1 acre-feet. Half of this water quality can occur below the normal pool elevation of the detention ponds, therefore 4.1 acre-feet of water quality volume is needed. The existing structure of the Prairie Pointe/Hampton Lakes detention pond will be modified to provide the extended detention. The 4.1 acre-feet of detention will be provided over the pond with a surface area of 10.4 acres. The depth of water quality required is 0.4' or less than 5" of depth. The outlet structure will be modified to have a 0.6' wide opening at the elevation of the normal pool and 0.5' above the normal pool the weir will be 2' wide. The 0.6' notched weir will release 0.7 cfs which will extend the detention by more than 24 hours.

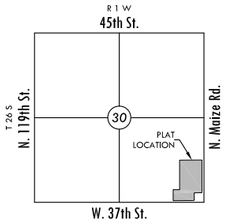
Channel Protection Volume

The channel protection is required for the 20.3 acre site. The channel protection volume was calculated using a spreadsheet, Appendix 3.7. In order to calculate the channel protection volume, the time of concentration of just this site was calculated, Appendix 3.8. The channel protection volume required for the site is 1.6 acre-feet. Since the pond was modified to provide water quality for the entire basin 4.1 acre-feet of extended detention was provided. This volume will also provide the channel protection volume for the Hampton Lakes Second site.

Appendix 3.1

Proposed Conditions Drainage Map





VICINITY MAP

LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE
- -SPOT ELEVATOINS

N

SCALE: 1" = 400'

400 0 400 800

J:\Projects\2010\1001010582_Premier Hampton Square 2nd\5-Civil\CAD\Drainage\Drawing\10582_proposed conditions.dwg

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

HAMPTON SQUARE 2ND

MAIZE, KANSAS

PROPOSED CONDITIONS

DATE
November 11

REVISED

DESIGN BY
KLA

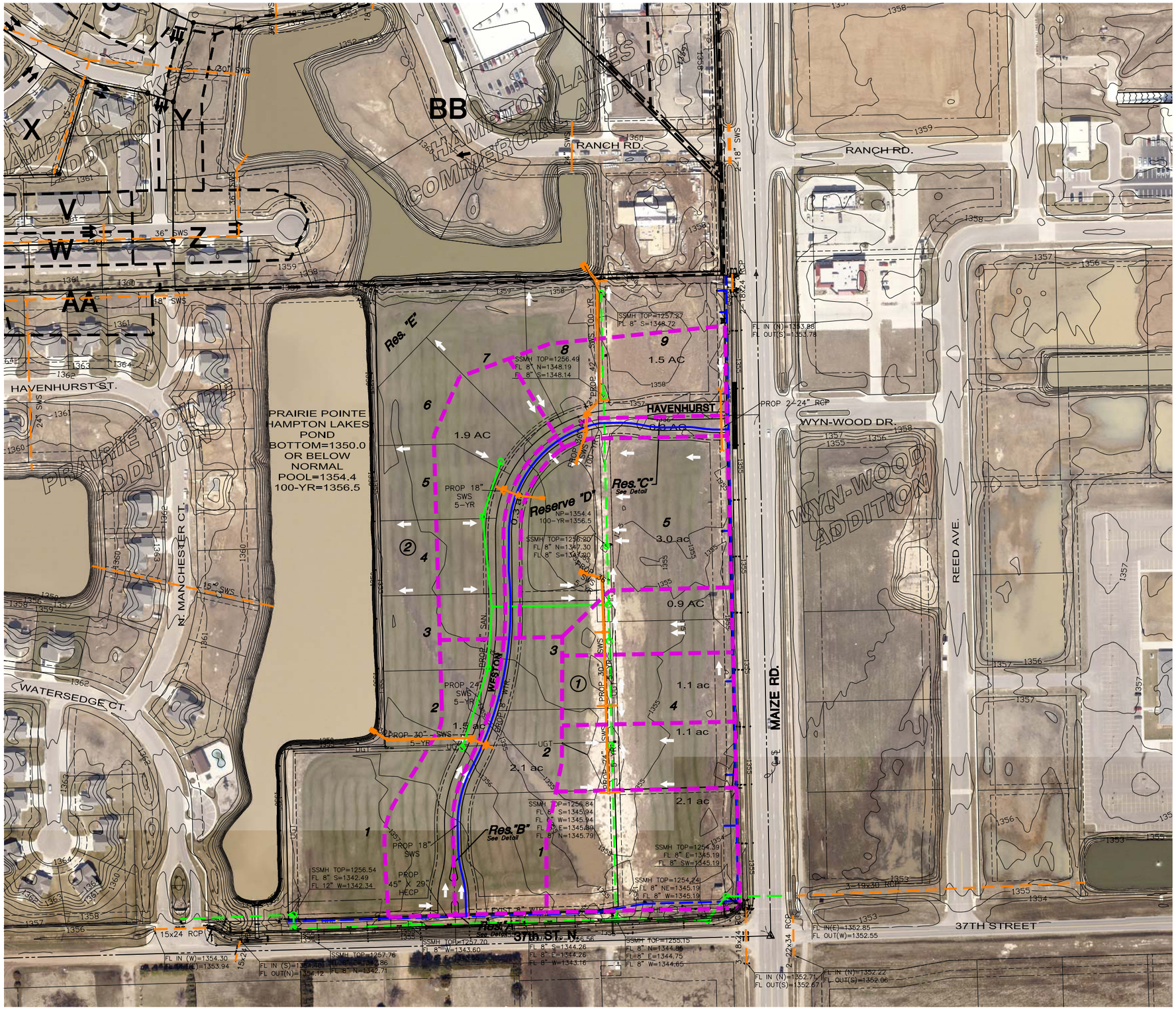
DRAWN BY
CMJ

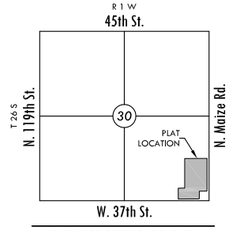
CHECKED BY
GJA

SHEET NUMBER
1

Appendix 3.2

Drainage and Utility Plan





VICINITY MAP

LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- x—x— FENCE
- EXISTING STORM SEWER PIPE
- EXISTING WATER LINE
- EXISTING SANITARY SEWER LINE
- PROPOSED STORM SEWER PIPE
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER LINE
- G— GAS LINE
- P— GAS PIPELINE
- UGT— TELEPHONE LINE
- UGE— UNDERGROUND ELEC.
- OHE— OVERHEAD ELECTRIC
- FOC— FIBER OPTIC CABLE
- DRAINAGE SUB BASIN
- DRAINAGE BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING

N

SCALE: 1" = 100'

100 0 100 200

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411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

HAMPTON SQUARE 2ND

MAIZE, KANSAS

DRAINAGE & UTILITY PLAN

DATE
November 11

REVISED

DESIGN BY
KLA

DRAWN BY
CMJ

CHECKED BY
GJA

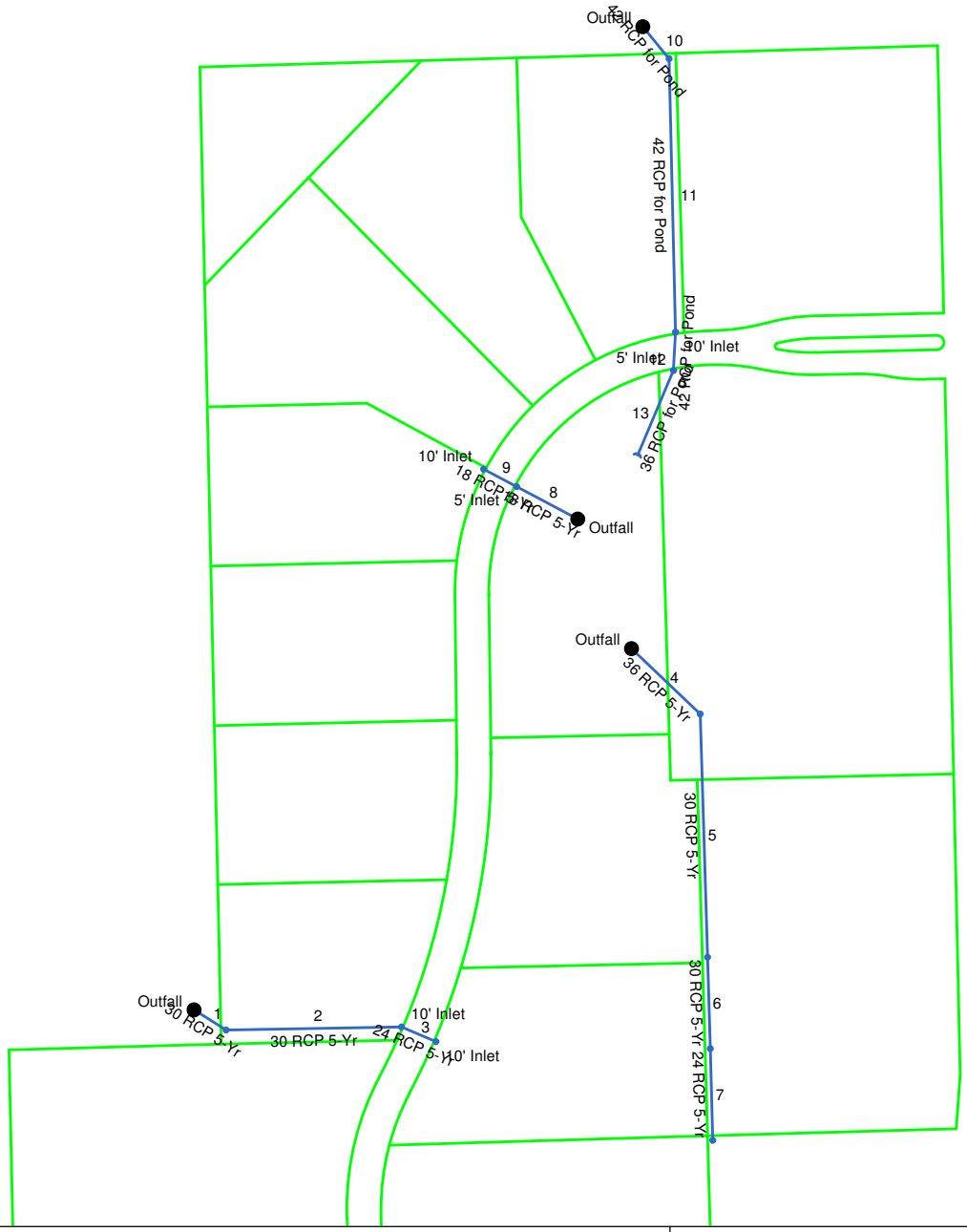
SHEET NUMBER
1

J:\Projects\2010\1001010582_Premier Hampton Square 2nd\5-Civil\CAD\Drainage\Drawing\10582_DUP.dwg

Appendix 3.3

Storm Sewer Sizing – Hydraflow Hydrographs

Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2009 Plan



Project File: Hampton Square 2nd SWS Sizing_9-2011.stm	Number of lines: 13	Date: 11-16-2011

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
1	30 RCP 5-Yr	14.41	30	Cir	35.900	1349.50	1349.54	0.112	1355.80*	1355.84*	0.08	1355.93	End	Manhole
2	30 RCP 5-Yr	14.76	30	Cir	165.123	1350.14	1350.34	0.121	1355.93*	1356.14*	0.10	1356.24	1	Curb-Horiz
3	24 RCP 5-Yr	8.66	24	Cir	35.336	1350.44	1350.48	0.113	1356.26*	1356.31*	0.12	1356.43	2	Curb-Horiz
4	36 RCP 5-Yr	20.28	36	Cir	89.426	1350.00	1350.09	0.101	1355.80*	1355.88*	0.10	1355.98	End	Manhole
5	30 RCP 5-Yr	17.24	30	Cir	229.226	1350.20	1350.43	0.100	1355.98*	1356.38*	0.10	1356.48	4	DropGrate
6	30 RCP 5-Yr	13.01	30	Cir	86.000	1350.53	1350.62	0.105	1356.56*	1356.65*	0.05	1356.70	5	DropGrate
7	24 RCP 5-Yr	8.66	24	Cir	86.463	1350.72	1350.81	0.104	1356.70*	1356.83*	0.12	1356.95	6	DropGrate
8	18 RCP 5-Yr	9.04	18	Cir	65.053	1350.00	1350.07	0.108	1355.80*	1356.28*	0.20	1356.49	End	Curb-Horiz
9	18 RCP 5-Yr	7.83	18	Cir	35.333	1350.17	1350.21	0.113	1356.59*	1356.78*	0.31	1357.09	8	Curb-Horiz
10	42 RCP for Pond	40.14	42	Cir	38.964	1350.00	1350.04	0.103	1355.80*	1355.86*	0.18	1356.04	End	Manhole
11	42 RCP for Pond	40.33	42	Cir	257.429	1350.14	1350.40	0.101	1356.04*	1356.46*	0.14	1356.59	10	Curb-Horiz
12	42 RCP for Pond	34.23	42	Cir	36.239	1350.50	1350.54	0.110	1356.67*	1356.71*	0.12	1356.83	11	Curb-Horiz
13	36 RCP for Pond	33.00	36	Cir	85.728	1350.64	1350.73	0.105	1356.83*	1357.04*	0.34	1357.38	12	OpenHeadwall

Project File: Hampton Square 2nd SWS Sizing_9-2011.stm | Number of lines: 13 | Run Date: 11-16-2011

NOTES: Return period = 5 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	35.900	32.100	MH	0.00	0.00	0.87	15.0	1349.50	0.11	1349.54	30	Cir	0.013	0.60	1357.00	30 RCP 5-Yr
2	1	165.123	-33.136	Curb	0.00	1.50	0.87	15.0	1350.14	0.12	1350.34	30	Cir	0.013	0.70	1357.00	30 RCP 5-Yr
3	2	35.336	24.088	Curb	0.00	2.10	0.87	15.0	1350.44	0.11	1350.48	24	Cir	0.013	1.00	1357.00	24 RCP 5-Yr
4	End	89.426	43.596	MH	0.00	0.90	0.87	15.0	1350.00	0.10	1350.09	36	Cir	0.013	0.75	1357.00	36 RCP 5-Yr
5	4	229.226	44.728	DrGrt	0.00	1.10	0.87	15.0	1350.20	0.10	1350.43	30	Cir	0.013	0.50	1357.00	30 RCP 5-Yr
6	5	86.000	0.000	DrGrt	0.00	1.10	0.87	15.0	1350.53	0.10	1350.62	30	Cir	0.013	0.50	1357.00	30 RCP 5-Yr
7	6	86.463	0.000	DrGrt	0.00	2.10	0.87	15.0	1350.72	0.10	1350.81	24	Cir	0.013	1.00	1357.00	24 RCP 5-Yr
8	End	65.053	-152.111	Curb	0.00	0.30	0.87	15.0	1350.00	0.11	1350.07	18	Cir	0.013	0.50	1357.40	18 RCP 5-Yr
9	8	35.333	-0.045	Curb	0.00	1.90	0.87	15.0	1350.17	0.11	1350.21	18	Cir	0.013	1.00	1357.40	18 RCP 5-Yr
10	End	38.964	50.771	MH	0.00	0.00	0.87	15.0	1350.00	0.10	1350.04	42	Cir	0.013	0.66	1357.00	42 RCP for Pond
11	10	257.429	37.902	Curb	0.00	1.50	0.87	15.0	1350.14	0.10	1350.40	42	Cir	0.013	0.50	1357.00	42 RCP for Pond
12	11	36.239	4.175	Curb	0.00	0.30	0.87	15.0	1350.50	0.11	1350.54	42	Cir	0.013	0.60	1357.00	42 RCP for Pond
13	12	85.728	20.153	Hdwl	33.00	0.00	0.87	15.0	1350.64	0.10	1350.73	36	Cir	0.013	1.00	1357.00	36 RCP for Pond

Project File: Hampton Square 2nd SWS Sizing_9-2011.stm | Number of lines: 13 | Date: 11-16-2011

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	35.900	0.00	3.60	0.87	0.00	3.13	15.0	16.1	4.6	14.41	13.70	2.94	30	0.11	1349.50	1349.54	1355.80	1355.84	0.00	1357.00	30 RCP 5-Yr
2	1	165.123	1.50	3.60	0.87	1.31	3.13	15.0	15.2	4.7	14.76	14.27	3.01	30	0.12	1350.14	1350.34	1355.93	1356.14	1357.00	1357.00	30 RCP 5-Yr
3	2	35.336	2.10	2.10	0.87	1.83	1.83	15.0	15.0	4.7	8.66	7.61	2.76	24	0.11	1350.44	1350.48	1356.26	1356.31	1357.00	1357.00	24 RCP 5-Yr
4	End	89.426	0.90	5.20	0.87	0.78	4.52	15.0	17.1	4.5	20.28	21.15	2.87	36	0.10	1350.00	1350.09	1355.80	1355.88	0.00	1357.00	36 RCP 5-Yr
5	4	229.226	1.10	4.30	0.87	0.96	3.74	15.0	16.1	4.6	17.24	12.99	3.51	30	0.10	1350.20	1350.43	1355.98	1356.38	1357.00	1357.00	30 RCP 5-Yr
6	5	86.000	1.10	3.20	0.87	0.96	2.78	15.0	15.5	4.7	13.01	13.26	2.65	30	0.10	1350.53	1350.62	1356.56	1356.65	1357.00	1357.00	30 RCP 5-Yr
7	6	86.463	2.10	2.10	0.87	1.83	1.83	15.0	15.0	4.7	8.66	7.30	2.76	24	0.10	1350.72	1350.81	1356.70	1356.83	1357.00	1357.00	24 RCP 5-Yr
8	End	65.053	0.30	2.20	0.87	0.26	1.91	15.0	15.1	4.7	9.04	3.44	5.11	18	0.11	1350.00	1350.07	1355.80	1356.28	0.00	1357.40	18 RCP 5-Yr
9	8	35.333	1.90	1.90	0.87	1.65	1.65	15.0	15.0	4.7	7.83	3.53	4.43	18	0.11	1350.17	1350.21	1356.59	1356.78	1357.40	1357.40	18 RCP 5-Yr
10	End	38.964	0.00	1.80	0.87	0.00	1.57	15.0	16.5	4.6	40.14	32.25	4.17	42	0.10	1350.00	1350.04	1355.80	1355.86	0.00	1357.00	42 RCP for Pond
11	10	257.429	1.50	1.80	0.87	1.31	1.57	15.0	15.5	4.7	40.33	31.97	4.19	42	0.10	1350.14	1350.40	1356.04	1356.46	1357.00	1357.00	42 RCP for Pond
12	11	36.239	0.30	0.30	0.87	0.26	0.26	15.0	15.3	4.7	34.23	33.44	3.56	42	0.11	1350.50	1350.54	1356.67	1356.71	1357.00	1357.00	42 RCP for Pond
13	12	85.728	0.00	0.00	0.87	0.00	0.00	15.0	15.0	0.0	33.00	21.61	4.67	36	0.10	1350.64	1350.73	1356.83	1357.04	1357.00	1357.00	36 RCP for Pond

Project File: Hampton Square 2nd SWS Sizing_9-2011.stm

Number of lines: 13

Run Date: 11-16-2011

NOTES: Intensity = 72.00 / (Inlet time + 15.00) ^ 0.80; Return period = 5 Yrs. ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2	10' Inlet	6.18	0.00	6.18	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.34	10.89	0.50	10.89	2.0	Off
3	10' Inlet	8.66	0.00	8.66	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.42	13.64	0.59	13.64	2.0	Off
4		3.71	0.00	0.00	3.71	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
5		4.53	0.00	4.53	0.00	DrGrt	0.0	0.00	2.57	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.33	34.91	0.33	34.91	0.0	Off
6		4.53	0.00	4.53	0.00	DrGrt	0.0	0.00	2.57	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.33	34.91	0.33	34.91	0.0	Off
7		8.66	0.00	8.66	0.00	DrGrt	0.0	0.00	4.90	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.51	52.66	0.51	52.66	0.0	Off
8	5' Inlet	1.24	0.00	1.24	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.16	5.03	0.32	5.03	2.0	Off
9	10' Inlet	7.83	0.00	7.83	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.40	12.76	0.56	12.76	2.0	Off
10		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
11	10' Inlet	6.18	0.00	6.18	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.34	10.89	0.50	10.89	2.0	Off
12	5' Inlet	1.24	0.00	1.24	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.16	5.03	0.32	5.03	2.0	Off
13		33.00*	0.00	33.00	0.00	Hdwl	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off

Project File: Hampton Square 2nd SWS Sizing_9-2011.stm | Number of lines: 13 | Run Date: 11-30-2011

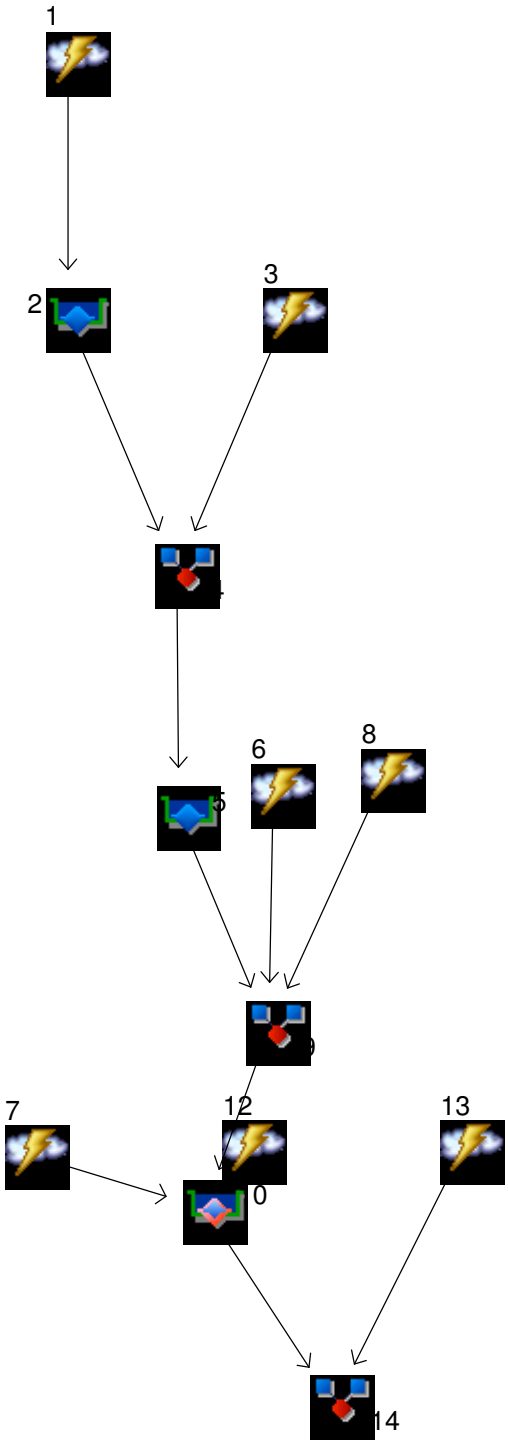
NOTES: Inlet N-Values = 0.016 ; Intensity = 72.00 / (Inlet time + 15.00) ^ 0.80; Return period = 5 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Appendix 3.4

Hydraflow Hydrographs Output

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066



Legend

Hyd.	Origin	Description
1	Rational	To North Pond
2	Reservoir	North Pond
3	Rational	To Middle Pond
4	Combine	Into Middle Pond
5	Reservoir	Middle Pond
6	Rational	To South Pond
7	Rational	Prarie Pointe Site
8	Rational	Prairie Pointe Commercial
9	Combine	Into South Pond
10	Reservoir(i)	Prarie Pointe Pond
12	Rational	Existing Conditions to 10% Point
13	Rational	Proposed Conditions South of Site to 10% Point
14	Combine	Proposed to 10% Point

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	------	-------	52.99	-------	64.08	74.27	86.64	-------	106.43	To North Pond
2	Reservoir	1	-------	16.44	-------	20.60	24.45	29.16	-------	36.72	North Pond
3	Rational	------	-------	90.36	-------	108.67	125.71	146.47	-------	179.54	To Middle Pond
4	Combine	2, 3	-------	96.38	-------	116.58	135.48	158.65	-------	195.82	Into Middle Pond
5	Reservoir	4	-------	42.33	-------	42.82	43.21	43.70	-------	44.43	Middle Pond
6	Rational	------	-------	62.77	-------	77.48	90.41	105.93	-------	131.14	To South Pond
7	Rational	------	-------	19.38	-------	26.21	31.30	37.21	-------	47.58	Prarie Pointe Site
8	Rational	------	-------	19.78	-------	24.22	28.19	32.97	-------	40.69	Prairie Pointe Commercial
9	Combine	5, 6, 8	-------	122.04	-------	141.01	157.71	177.75	-------	210.20	Into South Pond
10	Reservoir(i)	7, 9	-------	5.748	-------	7.836	10.05	13.04	-------	18.11	Prarie Pointe Pond
12	Rational	------	-------	155.55	-------	210.32	251.20	298.61	-------	381.83	Existing Conditions to 10% Point
13	Rational	------	-------	151.26	-------	186.41	217.41	254.64	-------	315.06	Proposed Conditions South of Site to
14	Combine	10, 13	-------	151.83	-------	187.17	218.45	256.13	-------	317.42	Proposed to 10% Point

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	52.99	1	28	2.044	------	------	------	To North Pond
2	Reservoir	16.44	1	47	2.043	1	1365.22	1.50	North Pond
3	Rational	90.36	1	25	3.112	------	------	------	To Middle Pond
4	Combine	96.38	1	25	5.155	2, 3	------	------	Into Middle Pond
5	Reservoir	42.33	1	43	5.155	4	1357.17	1.92	Middle Pond
6	Rational	62.77	1	40	3.458	------	------	------	To South Pond
7	Rational	19.38	1	115	3.070	------	------	------	Prarie Pointe Site
8	Rational	19.78	1	35	0.954	------	------	------	Prairie Pointe Commercial
9	Combine	122.04	1	40	9.567	5, 6, 8	------	------	Into South Pond
10	Reservoir(i)	5.748	1	321	9.116	7, 9	1355.64	11.2	Prarie Pointe Pond
12	Rational	155.55	1	115	24.640	------	------	------	Existing Conditions to 10% Point
13	Rational	151.26	1	39	8.126	------	------	------	Proposed Conditions South of Site to
14	Combine	151.83	1	39	17.241	10, 13	------	------	Proposed to 10% Point

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	64.08	1	28	2.471	------	------	------	To North Pond
2	Reservoir	20.60	1	47	2.471	1	1365.35	1.78	North Pond
3	Rational	108.67	1	25	3.742	------	------	------	To Middle Pond
4	Combine	116.58	1	25	6.213	2, 3	------	------	Into Middle Pond
5	Reservoir	42.82	1	45	6.213	4	1357.46	2.52	Middle Pond
6	Rational	77.48	1	40	4.269	------	------	------	To South Pond
7	Rational	26.21	1	115	4.151	------	------	------	Prarie Pointe Site
8	Rational	24.22	1	35	1.168	------	------	------	Prairie Pointe Commercial
9	Combine	141.01	1	40	11.649	5, 6, 8	------	------	Into South Pond
10	Reservoir(i)	7.836	1	220	12.100	7, 9	1355.82	13.7	Prarie Pointe Pond
12	Rational	210.32	1	115	33.315	------	------	------	Existing Conditions to 10% Point
13	Rational	186.41	1	39	10.014	------	------	------	Proposed Conditions South of Site to
14	Combine	187.17	1	39	22.114	10, 13	------	------	Proposed to 10% Point

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	74.27	1	28	2.864	------	------	------	To North Pond
2	Reservoir	24.45	1	47	2.864	1	1365.47	2.03	North Pond
3	Rational	125.71	1	25	4.329	------	------	------	To Middle Pond
4	Combine	135.48	1	25	7.193	2, 3	------	------	Into Middle Pond
5	Reservoir	43.21	1	46	7.193	4	1357.75	3.13	Middle Pond
6	Rational	90.41	1	40	4.981	------	------	------	To South Pond
7	Rational	31.30	1	115	4.958	------	------	------	Prarie Pointe Site
8	Rational	28.19	1	35	1.359	------	------	------	Prairie Pointe Commercial
9	Combine	157.71	1	40	13.533	5, 6, 8	------	------	Into South Pond
10	Reservoir(i)	10.05	1	183	14.668	7, 9	1356.00	15.9	Prarie Pointe Pond
12	Rational	251.20	1	115	39.791	------	------	------	Existing Conditions to 10% Point
13	Rational	217.41	1	39	11.679	------	------	------	Proposed Conditions South of Site to
14	Combine	218.45	1	39	26.347	10, 13	------	------	Proposed to 10% Point

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	86.64	1	28	3.342	------	------	------	To North Pond
2	Reservoir	29.16	1	47	3.341	1	1365.61	2.34	North Pond
3	Rational	146.47	1	25	5.044	------	------	------	To Middle Pond
4	Combine	158.65	1	25	8.385	2, 3	------	------	Into Middle Pond
5	Reservoir	43.70	1	48	8.385	4	1358.11	3.90	Middle Pond
6	Rational	105.93	1	40	5.836	------	------	------	To South Pond
7	Rational	37.21	1	115	5.894	------	------	------	Prarie Pointe Site
8	Rational	32.97	1	35	1.589	------	------	------	Prairie Pointe Commercial
9	Combine	177.75	1	40	15.810	5, 6, 8	------	------	Into South Pond
10	Reservoir(i)	13.04	1	171	17.755	7, 9	1356.21	18.6	Prarie Pointe Pond
12	Rational	298.61	1	115	47.301	------	------	------	Existing Conditions to 10% Point
13	Rational	254.64	1	39	13.679	------	------	------	Proposed Conditions South of Site to
14	Combine	256.13	1	39	31.434	10, 13	------	------	Proposed to 10% Point

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	106.43	1	28	4.105	------	------	------	To North Pond
2	Reservoir	36.72	1	46	4.104	1	1365.84	2.83	North Pond
3	Rational	179.54	1	25	6.183	------	------	------	To Middle Pond
4	Combine	195.82	1	25	10.287	2, 3	------	------	Into Middle Pond
5	Reservoir	44.43	1	47	10.287	4	1358.70	5.18	Middle Pond
6	Rational	131.14	1	40	7.225	------	------	------	To South Pond
7	Rational	47.58	1	115	7.536	------	------	------	Prarie Pointe Site
8	Rational	40.69	1	35	1.962	------	------	------	Prairie Pointe Commercial
9	Combine	210.20	1	40	19.474	5, 6, 8	------	------	Into South Pond
10	Reservoir(i)	18.11	1	180	22.855	7, 9	1356.54	23.0	Prarie Pointe Pond
12	Rational	381.83	1	115	60.483	------	------	------	Existing Conditions to 10% Point
13	Rational	315.06	1	39	16.925	------	------	------	Proposed Conditions South of Site to
14	Combine	317.42	1	39	39.780	10, 13	------	------	Proposed to 10% Point

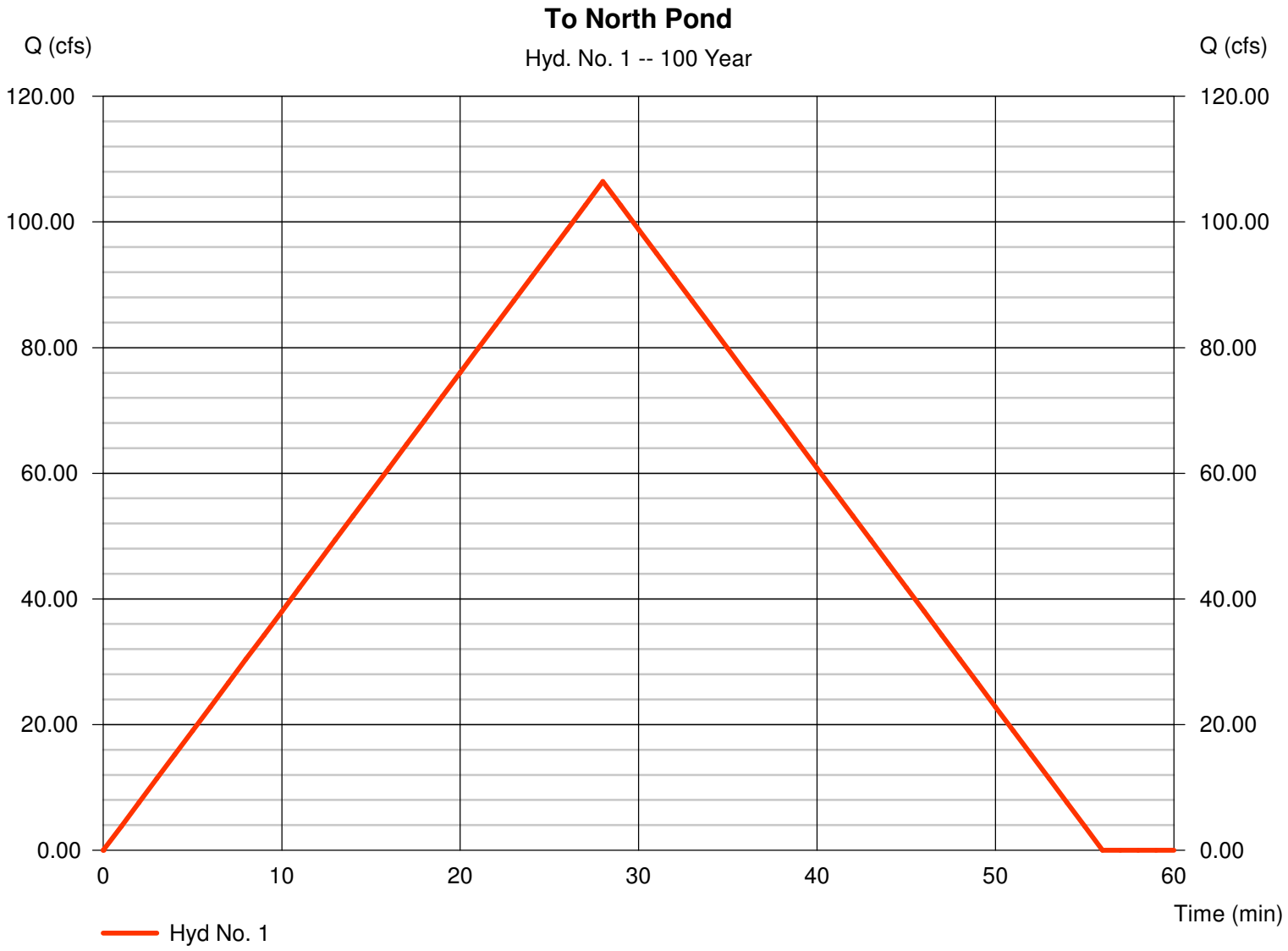
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Apr 14, 2011

Hyd. No. 1

To North Pond

Hydrograph type	=	Rational	Peak discharge	=	106.43 cfs
Storm frequency	=	100 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	4.105 acft
Drainage area	=	26.100 ac	Runoff coeff.	=	0.73
Intensity	=	5.586 in/hr	Tc by User	=	28.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1



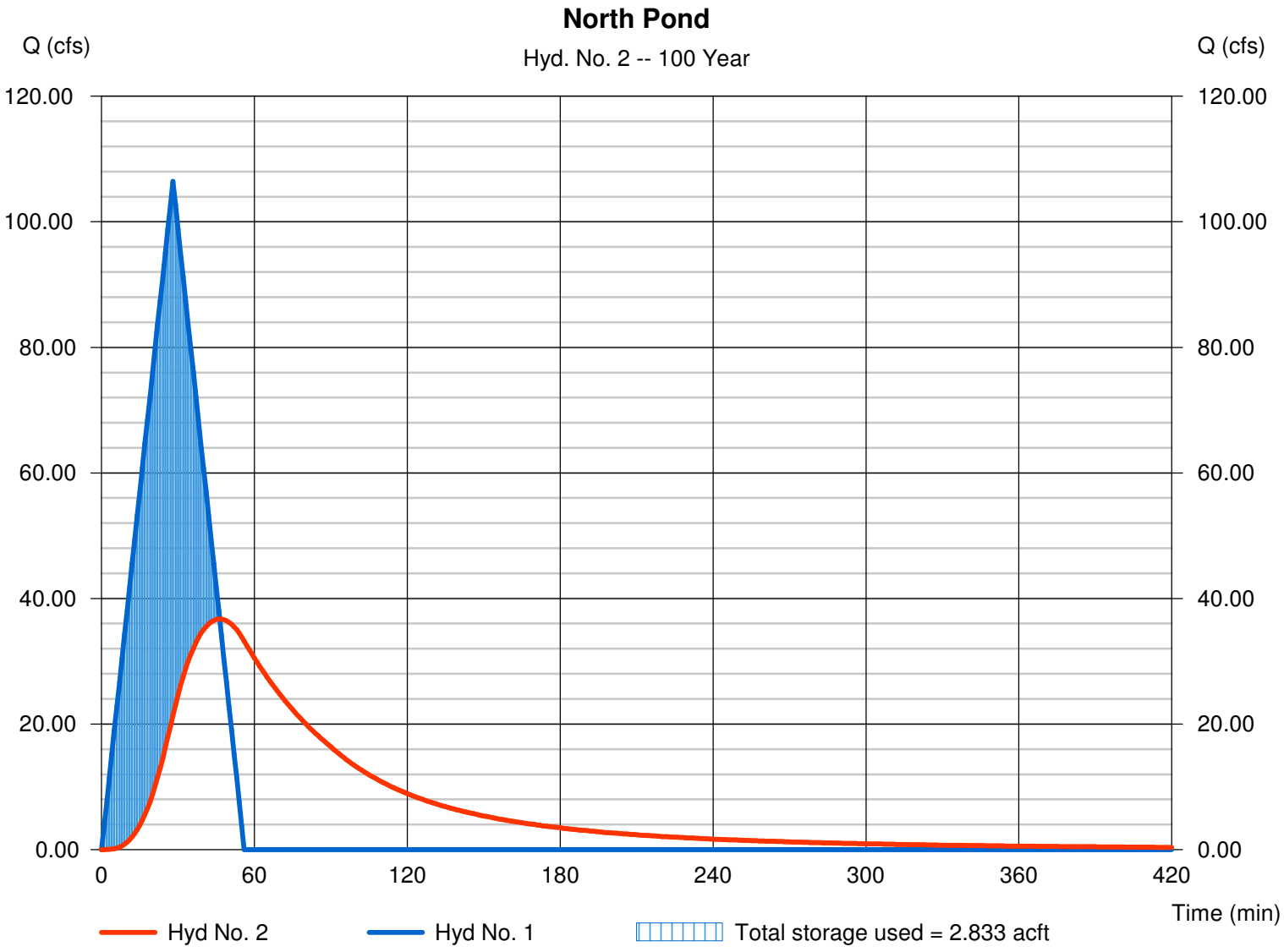
Hydrograph Report

Hyd. No. 2

North Pond

Hydrograph type	=	Reservoir	Peak discharge	=	36.72 cfs
Storm frequency	=	100 yrs	Time to peak	=	46 min
Time interval	=	1 min	Hyd. volume	=	4.104 acft
Inflow hyd. No.	=	1 - To North Pond	Max. Elevation	=	1365.84 ft
Reservoir name	=	North Pond	Max. Storage	=	2.833 acft

Storage Indication method used.



Pond Report

Pond No. 1 - North Pond

Pond Data

Trapezoid - Bottom L x W = 300.0 x 300.0 ft, Side slope = 3.00:1, Bottom elev. = 1364.50 ft, Depth = 3.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1364.50	90,000	0.000	0.000
0.30	1364.80	91,083	0.624	0.624
0.60	1365.10	92,173	0.631	1.255
0.90	1365.40	93,269	0.639	1.893
1.20	1365.70	94,372	0.646	2.539
1.50	1366.00	95,481	0.654	3.193
1.80	1366.30	96,597	0.661	3.854
2.10	1366.60	97,719	0.669	4.524
2.40	1366.90	98,847	0.677	5.201
2.70	1367.20	99,982	0.685	5.885
3.00	1367.50	101,124	0.693	6.578

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 72.00	0.00	0.00	0.00
Span (in)	= 96.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1364.50	0.00	0.00	0.00
Length (ft)	= 250.00	0.00	0.00	0.00
Slope (%)	= 0.20	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	1364.50	0.00	---	---	---	---	---	---	---	---	---	0.000
0.03	0.062	1364.53	0.12 oc	---	---	---	---	---	---	---	---	---	0.118
0.06	0.125	1364.56	0.37 oc	---	---	---	---	---	---	---	---	---	0.371
0.09	0.187	1364.59	0.72 oc	---	---	---	---	---	---	---	---	---	0.717
0.12	0.249	1364.62	1.13 ic	---	---	---	---	---	---	---	---	---	1.134
0.15	0.312	1364.65	1.58 ic	---	---	---	---	---	---	---	---	---	1.585
0.18	0.374	1364.68	2.08 ic	---	---	---	---	---	---	---	---	---	2.083
0.21	0.436	1364.71	2.63 ic	---	---	---	---	---	---	---	---	---	2.625
0.24	0.499	1364.74	3.21 ic	---	---	---	---	---	---	---	---	---	3.207
0.27	0.561	1364.77	3.83 ic	---	---	---	---	---	---	---	---	---	3.827
0.30	0.624	1364.80	4.48 ic	---	---	---	---	---	---	---	---	---	4.477
0.33	0.687	1364.83	5.17 ic	---	---	---	---	---	---	---	---	---	5.165
0.36	0.750	1364.86	5.89 ic	---	---	---	---	---	---	---	---	---	5.886
0.39	0.813	1364.89	6.64 ic	---	---	---	---	---	---	---	---	---	6.637
0.42	0.876	1364.92	7.42 ic	---	---	---	---	---	---	---	---	---	7.418
0.45	0.939	1364.95	8.23 ic	---	---	---	---	---	---	---	---	---	8.228
0.48	1.002	1364.98	9.06 ic	---	---	---	---	---	---	---	---	---	9.064
0.51	1.065	1365.01	9.93 ic	---	---	---	---	---	---	---	---	---	9.928
0.54	1.128	1365.04	10.82 ic	---	---	---	---	---	---	---	---	---	10.82
0.57	1.192	1365.07	11.73 ic	---	---	---	---	---	---	---	---	---	11.73
0.60	1.255	1365.10	12.66 ic	---	---	---	---	---	---	---	---	---	12.66
0.63	1.318	1365.13	13.62 ic	---	---	---	---	---	---	---	---	---	13.62
0.66	1.382	1365.16	14.61 ic	---	---	---	---	---	---	---	---	---	14.61
0.69	1.446	1365.19	15.61 ic	---	---	---	---	---	---	---	---	---	15.61
0.72	1.510	1365.22	16.63 oc	---	---	---	---	---	---	---	---	---	16.63
0.75	1.574	1365.25	17.57 oc	---	---	---	---	---	---	---	---	---	17.57
0.78	1.638	1365.28	18.51 oc	---	---	---	---	---	---	---	---	---	18.51
0.81	1.702	1365.31	19.46 oc	---	---	---	---	---	---	---	---	---	19.46
0.84	1.765	1365.34	20.42 oc	---	---	---	---	---	---	---	---	---	20.42
0.87	1.829	1365.37	21.38 oc	---	---	---	---	---	---	---	---	---	21.38
0.90	1.893	1365.40	22.34 oc	---	---	---	---	---	---	---	---	---	22.34
0.93	1.958	1365.43	23.31 oc	---	---	---	---	---	---	---	---	---	23.31
0.96	2.022	1365.46	24.28 oc	---	---	---	---	---	---	---	---	---	24.28

Continues on next page...

North Pond

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.99	2.087	1365.49	25.26 oc	---	---	---	---	---	---	---	---	---	25.26
1.02	2.152	1365.52	26.24 oc	---	---	---	---	---	---	---	---	---	26.24
1.05	2.216	1365.55	27.23 oc	---	---	---	---	---	---	---	---	---	27.23
1.08	2.281	1365.58	28.22 oc	---	---	---	---	---	---	---	---	---	28.22
1.11	2.345	1365.61	29.21 oc	---	---	---	---	---	---	---	---	---	29.21
1.14	2.410	1365.64	30.21 oc	---	---	---	---	---	---	---	---	---	30.21
1.17	2.475	1365.67	31.21 oc	---	---	---	---	---	---	---	---	---	31.21
1.20	2.539	1365.70	32.19 oc	---	---	---	---	---	---	---	---	---	32.19
1.23	2.605	1365.73	33.20 oc	---	---	---	---	---	---	---	---	---	33.20
1.26	2.670	1365.76	34.20 oc	---	---	---	---	---	---	---	---	---	34.20
1.29	2.735	1365.79	35.21 oc	---	---	---	---	---	---	---	---	---	35.21
1.32	2.801	1365.82	36.22 oc	---	---	---	---	---	---	---	---	---	36.22
1.35	2.866	1365.85	37.23 oc	---	---	---	---	---	---	---	---	---	37.23
1.38	2.932	1365.88	38.24 oc	---	---	---	---	---	---	---	---	---	38.24
1.41	2.997	1365.91	39.26 oc	---	---	---	---	---	---	---	---	---	39.26
1.44	3.062	1365.94	40.27 oc	---	---	---	---	---	---	---	---	---	40.27
1.47	3.128	1365.97	41.29 oc	---	---	---	---	---	---	---	---	---	41.29
1.50	3.193	1366.00	42.30 oc	---	---	---	---	---	---	---	---	---	42.30
1.53	3.259	1366.03	43.32 oc	---	---	---	---	---	---	---	---	---	43.32
1.56	3.325	1366.06	44.34 oc	---	---	---	---	---	---	---	---	---	44.34
1.59	3.392	1366.09	45.36 oc	---	---	---	---	---	---	---	---	---	45.36
1.62	3.458	1366.12	46.39 oc	---	---	---	---	---	---	---	---	---	46.39
1.65	3.524	1366.15	47.41 oc	---	---	---	---	---	---	---	---	---	47.41
1.68	3.590	1366.18	48.44 oc	---	---	---	---	---	---	---	---	---	48.44
1.71	3.656	1366.21	49.46 oc	---	---	---	---	---	---	---	---	---	49.46
1.74	3.722	1366.24	50.49 oc	---	---	---	---	---	---	---	---	---	50.49
1.77	3.788	1366.27	51.52 oc	---	---	---	---	---	---	---	---	---	51.52
1.80	3.854	1366.30	52.54 oc	---	---	---	---	---	---	---	---	---	52.54
1.83	3.921	1366.33	53.57 oc	---	---	---	---	---	---	---	---	---	53.57
1.86	3.988	1366.36	54.60 oc	---	---	---	---	---	---	---	---	---	54.60
1.89	4.055	1366.39	55.63 oc	---	---	---	---	---	---	---	---	---	55.63
1.92	4.122	1366.42	56.66 oc	---	---	---	---	---	---	---	---	---	56.66
1.95	4.189	1366.45	57.69 oc	---	---	---	---	---	---	---	---	---	57.69
1.98	4.256	1366.48	58.73 oc	---	---	---	---	---	---	---	---	---	58.73
2.01	4.323	1366.51	59.76 oc	---	---	---	---	---	---	---	---	---	59.76
2.04	4.390	1366.54	60.79 oc	---	---	---	---	---	---	---	---	---	60.79
2.07	4.457	1366.57	61.83 oc	---	---	---	---	---	---	---	---	---	61.83
2.10	4.524	1366.60	62.85 oc	---	---	---	---	---	---	---	---	---	62.85
2.13	4.591	1366.63	63.89 oc	---	---	---	---	---	---	---	---	---	63.89
2.16	4.659	1366.66	64.92 oc	---	---	---	---	---	---	---	---	---	64.92
2.19	4.727	1366.69	65.96 oc	---	---	---	---	---	---	---	---	---	65.96
2.22	4.794	1366.72	66.99 oc	---	---	---	---	---	---	---	---	---	66.99
2.25	4.862	1366.75	68.03 oc	---	---	---	---	---	---	---	---	---	68.03
2.28	4.930	1366.78	69.07 oc	---	---	---	---	---	---	---	---	---	69.07
2.31	4.997	1366.81	70.11 oc	---	---	---	---	---	---	---	---	---	70.11
2.34	5.065	1366.84	71.15 oc	---	---	---	---	---	---	---	---	---	71.15
2.37	5.133	1366.87	72.18 oc	---	---	---	---	---	---	---	---	---	72.18
2.40	5.201	1366.90	73.21 oc	---	---	---	---	---	---	---	---	---	73.21
2.43	5.269	1366.93	74.25 oc	---	---	---	---	---	---	---	---	---	74.25
2.46	5.337	1366.96	75.29 oc	---	---	---	---	---	---	---	---	---	75.29
2.49	5.406	1366.99	76.33 oc	---	---	---	---	---	---	---	---	---	76.33
2.52	5.474	1367.02	77.37 oc	---	---	---	---	---	---	---	---	---	77.37
2.55	5.543	1367.05	78.41 oc	---	---	---	---	---	---	---	---	---	78.41
2.58	5.611	1367.08	79.45 oc	---	---	---	---	---	---	---	---	---	79.45
2.61	5.680	1367.11	80.49 oc	---	---	---	---	---	---	---	---	---	80.49
2.64	5.748	1367.14	81.53 oc	---	---	---	---	---	---	---	---	---	81.53
2.67	5.817	1367.17	82.57 oc	---	---	---	---	---	---	---	---	---	82.57
2.70	5.885	1367.20	83.60 oc	---	---	---	---	---	---	---	---	---	83.60
2.73	5.954	1367.23	84.64 oc	---	---	---	---	---	---	---	---	---	84.64
2.76	6.024	1367.26	85.69 oc	---	---	---	---	---	---	---	---	---	85.69
2.79	6.093	1367.29	86.73 oc	---	---	---	---	---	---	---	---	---	86.73
2.82	6.162	1367.32	87.77 oc	---	---	---	---	---	---	---	---	---	87.77
2.85	6.231	1367.35	88.81 oc	---	---	---	---	---	---	---	---	---	88.81
2.88	6.301	1367.38	89.85 oc	---	---	---	---	---	---	---	---	---	89.85
2.91	6.370	1367.41	90.90 oc	---	---	---	---	---	---	---	---	---	90.90
2.94	6.439	1367.44	91.94 oc	---	---	---	---	---	---	---	---	---	91.94
2.97	6.508	1367.47	92.98 oc	---	---	---	---	---	---	---	---	---	92.98
3.00	6.578	1367.50	94.02 oc	---	---	---	---	---	---	---	---	---	94.02

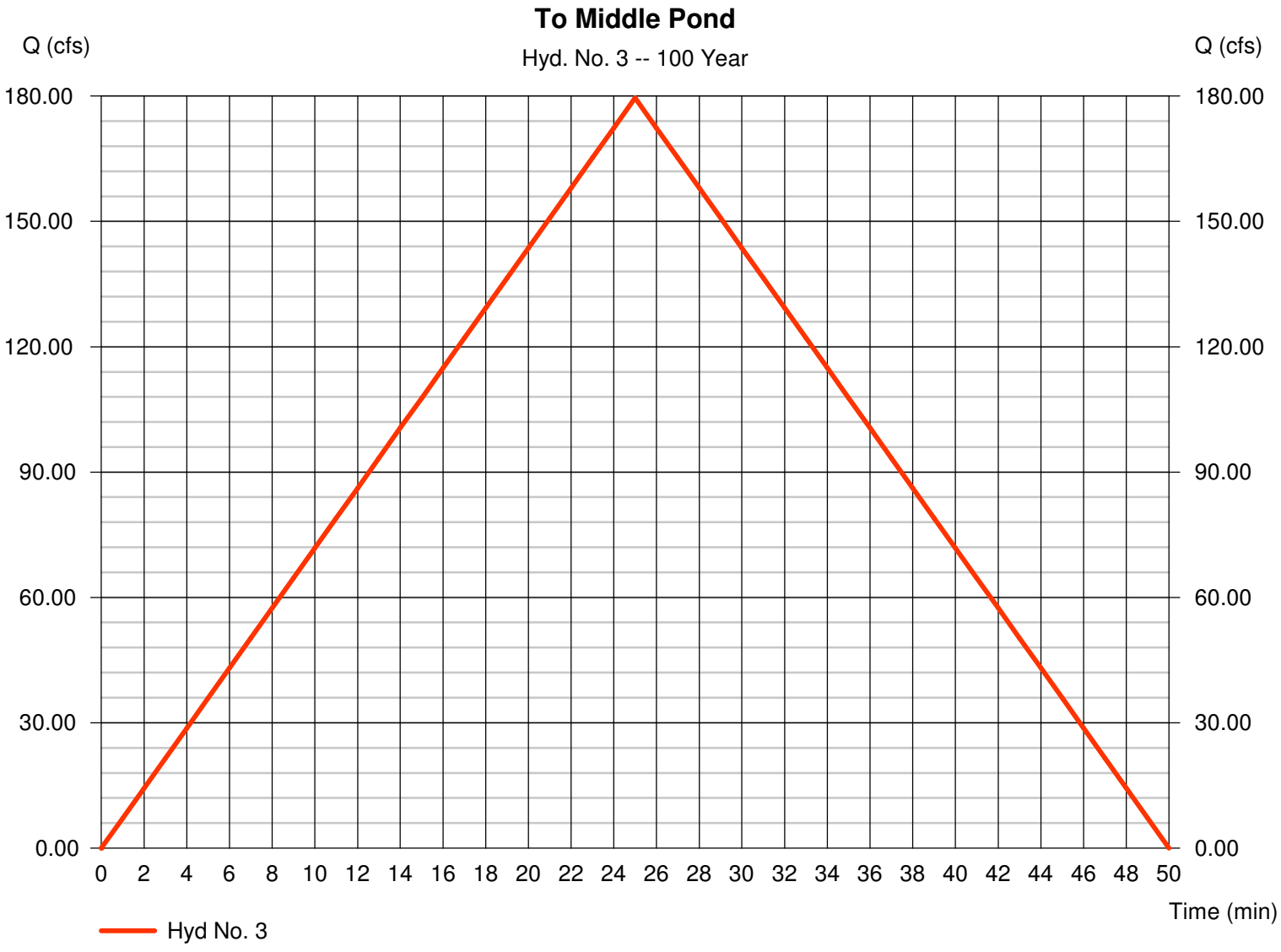
...End

Hydrograph Report

Hyd. No. 3

To Middle Pond

Hydrograph type	=	Rational	Peak discharge	=	179.54 cfs
Storm frequency	=	100 yrs	Time to peak	=	25 min
Time interval	=	1 min	Hyd. volume	=	6.183 acft
Drainage area	=	41.700 ac	Runoff coeff.	=	0.73
Intensity	=	5.898 in/hr	Tc by User	=	25.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1

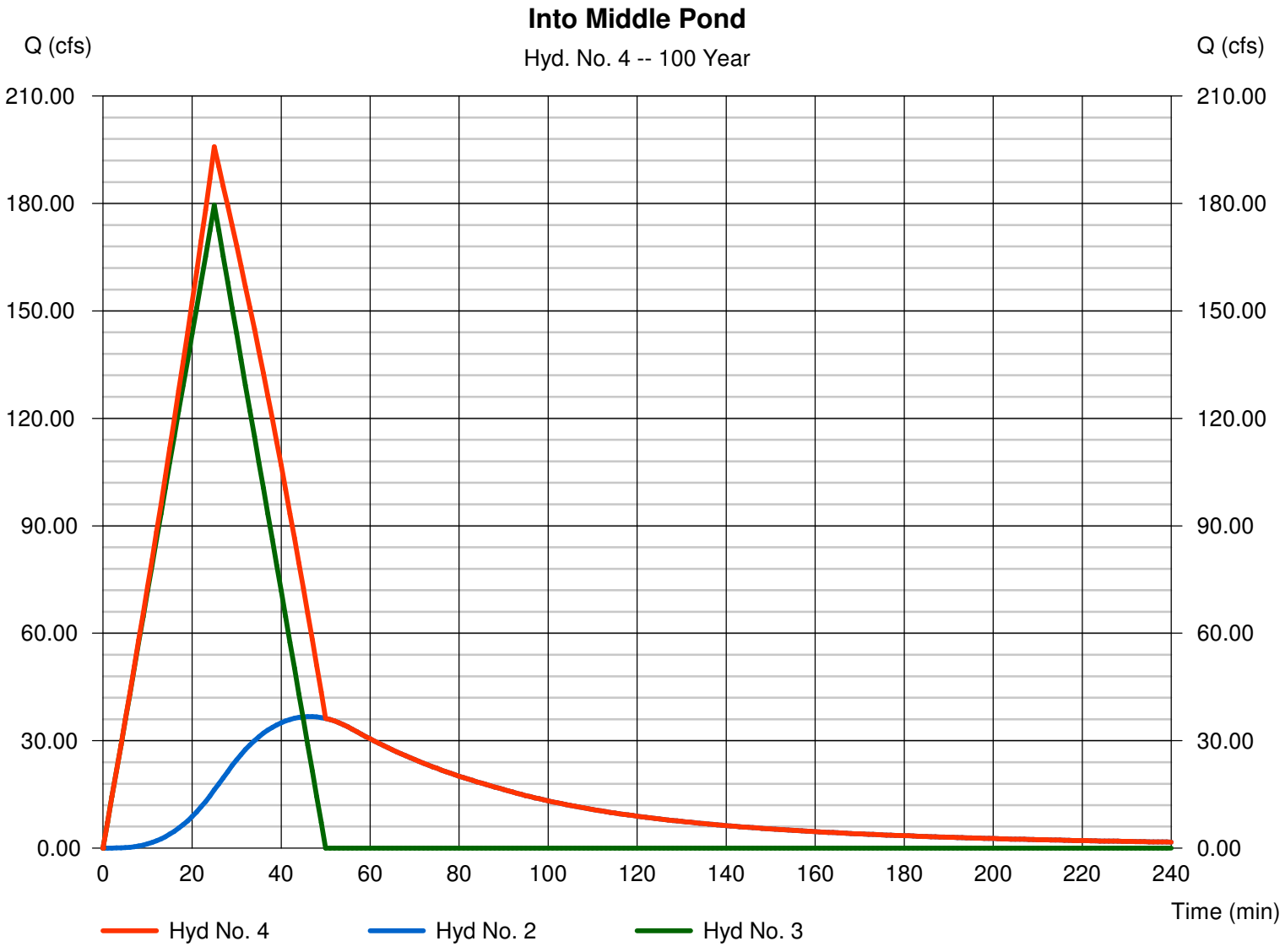


Hydrograph Report

Hyd. No. 4

Into Middle Pond

Hydrograph type	= Combine	Peak discharge	= 195.82 cfs
Storm frequency	= 100 yrs	Time to peak	= 25 min
Time interval	= 1 min	Hyd. volume	= 10.287 acft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 41.700 ac



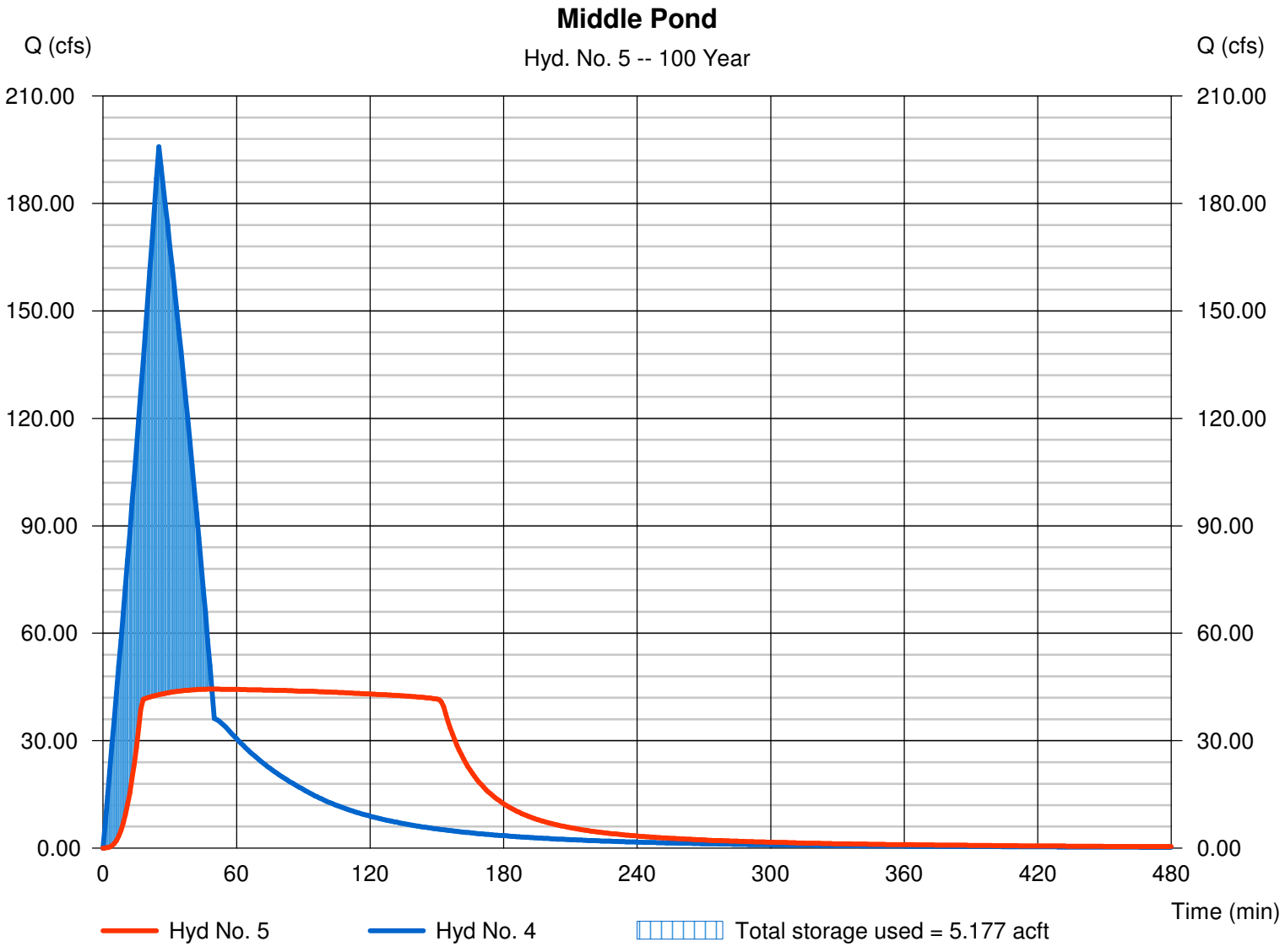
Hydrograph Report

Hyd. No. 5

Middle Pond

Hydrograph type	=	Reservoir	Peak discharge	=	44.43 cfs
Storm frequency	=	100 yrs	Time to peak	=	47 min
Time interval	=	1 min	Hyd. volume	=	10.287 acft
Inflow hyd. No.	=	4 - Into Middle Pond	Max. Elevation	=	1358.70 ft
Reservoir name	=	Middle Pond	Max. Storage	=	5.177 acft

Storage Indication method used.



Pond No. 2 - Middle Pond

Pond Data

Trapezoid - Bottom L x W = 700.0 x 120.0 ft, Side slope = 3.00:1, Bottom elev. = 1356.20 ft, Depth = 3.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1356.20	84,000	0.000	0.000
0.30	1356.50	85,479	0.584	0.584
0.60	1356.80	86,965	0.594	1.177
0.90	1357.10	88,457	0.604	1.781
1.20	1357.40	89,956	0.614	2.396
1.50	1357.70	91,461	0.625	3.021
1.80	1358.00	92,973	0.635	3.656
2.10	1358.30	94,491	0.646	4.301
2.40	1358.60	96,015	0.656	4.957
2.70	1358.90	97,546	0.667	5.624
3.00	1359.20	99,084	0.677	6.301

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	0.00	0.00	0.00
Span (in)	= 30.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1352.00	0.00	0.00	0.00
Length (ft)	= 1351.50	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 24.00	0.00	0.00	0.00
Crest El. (ft)	= 1356.20	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	1356.20	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.03	0.058	1356.23	40.59 ic	---	---	---	0.42	---	---	---	---	---	0.416
0.06	0.117	1356.26	40.59 ic	---	---	---	1.18	---	---	---	---	---	1.176
0.09	0.175	1356.29	40.59 ic	---	---	---	2.16	---	---	---	---	---	2.161
0.12	0.233	1356.32	40.59 ic	---	---	---	3.33	---	---	---	---	---	3.327
0.15	0.292	1356.35	40.59 ic	---	---	---	4.65	---	---	---	---	---	4.650
0.18	0.350	1356.38	40.59 ic	---	---	---	6.11	---	---	---	---	---	6.112
0.21	0.409	1356.41	40.59 ic	---	---	---	7.70	---	---	---	---	---	7.702
0.24	0.467	1356.44	40.59 ic	---	---	---	9.41	---	---	---	---	---	9.410
0.27	0.525	1356.47	40.59 ic	---	---	---	11.23	---	---	---	---	---	11.23
0.30	0.584	1356.50	40.59 ic	---	---	---	13.14	---	---	---	---	---	13.14
0.33	0.643	1356.53	40.59 ic	---	---	---	15.16	---	---	---	---	---	15.16
0.36	0.702	1356.56	40.59 ic	---	---	---	17.27	---	---	---	---	---	17.27
0.39	0.762	1356.59	40.59 ic	---	---	---	19.48	---	---	---	---	---	19.48
0.42	0.821	1356.62	40.59 ic	---	---	---	21.77	---	---	---	---	---	21.77
0.45	0.881	1356.65	40.59 ic	---	---	---	24.14	---	---	---	---	---	24.14
0.48	0.940	1356.68	40.59 ic	---	---	---	26.60	---	---	---	---	---	26.60
0.51	0.999	1356.71	40.59 ic	---	---	---	29.13	---	---	---	---	---	29.13
0.54	1.059	1356.74	40.59 ic	---	---	---	31.74	---	---	---	---	---	31.74
0.57	1.118	1356.77	40.59 ic	---	---	---	34.42	---	---	---	---	---	34.42
0.60	1.177	1356.80	40.59 ic	---	---	---	37.14	---	---	---	---	---	37.14
0.63	1.238	1356.83	40.59 ic	---	---	---	39.96	---	---	---	---	---	39.96
0.66	1.298	1356.86	41.41 oc	---	---	---	41.41 s	---	---	---	---	---	41.41
0.69	1.359	1356.89	41.58 oc	---	---	---	41.58 s	---	---	---	---	---	41.58
0.72	1.419	1356.92	41.71 oc	---	---	---	41.71 s	---	---	---	---	---	41.71
0.75	1.479	1356.95	41.82 oc	---	---	---	41.81 s	---	---	---	---	---	41.81
0.78	1.540	1356.98	41.91 oc	---	---	---	41.91 s	---	---	---	---	---	41.91
0.81	1.600	1357.01	41.99 oc	---	---	---	41.99 s	---	---	---	---	---	41.99
0.84	1.661	1357.04	42.07 oc	---	---	---	42.07 s	---	---	---	---	---	42.07
0.87	1.721	1357.07	42.14 oc	---	---	---	42.13 s	---	---	---	---	---	42.13
0.90	1.781	1357.10	42.20 oc	---	---	---	42.20 s	---	---	---	---	---	42.20
0.93	1.843	1357.13	42.27 oc	---	---	---	42.26 s	---	---	---	---	---	42.26
0.96	1.904	1357.16	42.32 oc	---	---	---	42.32 s	---	---	---	---	---	42.32

Continues on next page...

Middle Pond

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.99	1.966	1357.19	42.38 oc	---	---	---	42.38 s	---	---	---	---	---	42.38
1.02	2.027	1357.22	42.44 oc	---	---	---	42.43 s	---	---	---	---	---	42.43
1.05	2.089	1357.25	42.49 oc	---	---	---	42.49 s	---	---	---	---	---	42.49
1.08	2.150	1357.28	42.54 oc	---	---	---	42.54 s	---	---	---	---	---	42.54
1.11	2.212	1357.31	42.59 oc	---	---	---	42.59 s	---	---	---	---	---	42.59
1.14	2.273	1357.34	42.64 oc	---	---	---	42.64 s	---	---	---	---	---	42.64
1.17	2.334	1357.37	42.69 oc	---	---	---	42.68 s	---	---	---	---	---	42.68
1.20	2.396	1357.40	42.73 oc	---	---	---	42.73 s	---	---	---	---	---	42.73
1.23	2.458	1357.43	42.78 oc	---	---	---	42.77 s	---	---	---	---	---	42.77
1.26	2.521	1357.46	42.83 oc	---	---	---	42.82 s	---	---	---	---	---	42.82
1.29	2.583	1357.49	42.87 oc	---	---	---	42.87 s	---	---	---	---	---	42.87
1.32	2.646	1357.52	42.91 oc	---	---	---	42.91 s	---	---	---	---	---	42.91
1.35	2.708	1357.55	42.96 oc	---	---	---	42.94 s	---	---	---	---	---	42.94
1.38	2.771	1357.58	43.00 oc	---	---	---	43.00 s	---	---	---	---	---	43.00
1.41	2.833	1357.61	43.05 oc	---	---	---	43.03 s	---	---	---	---	---	43.03
1.44	2.896	1357.64	43.09 oc	---	---	---	43.07 s	---	---	---	---	---	43.07
1.47	2.958	1357.67	43.13 oc	---	---	---	43.11 s	---	---	---	---	---	43.11
1.50	3.021	1357.70	43.17 oc	---	---	---	43.16 s	---	---	---	---	---	43.16
1.53	3.084	1357.73	43.21 oc	---	---	---	43.20 s	---	---	---	---	---	43.20
1.56	3.148	1357.76	43.26 oc	---	---	---	43.21 s	---	---	---	---	---	43.21
1.59	3.211	1357.79	43.30 oc	---	---	---	43.30 s	---	---	---	---	---	43.30
1.62	3.275	1357.82	43.34 oc	---	---	---	43.32 s	---	---	---	---	---	43.32
1.65	3.338	1357.85	43.38 oc	---	---	---	43.36 s	---	---	---	---	---	43.36
1.68	3.402	1357.88	43.42 oc	---	---	---	43.41 s	---	---	---	---	---	43.41
1.71	3.465	1357.91	43.46 oc	---	---	---	43.45 s	---	---	---	---	---	43.45
1.74	3.529	1357.94	43.50 oc	---	---	---	43.49 s	---	---	---	---	---	43.49
1.77	3.592	1357.97	43.54 oc	---	---	---	43.54 s	---	---	---	---	---	43.54
1.80	3.656	1358.00	43.58 oc	---	---	---	43.56 s	---	---	---	---	---	43.56
1.83	3.720	1358.03	43.62 oc	---	---	---	43.56 s	---	---	---	---	---	43.56
1.86	3.785	1358.06	43.66 oc	---	---	---	43.66 s	---	---	---	---	---	43.66
1.89	3.849	1358.09	43.70 oc	---	---	---	43.64 s	---	---	---	---	---	43.64
1.92	3.914	1358.12	43.74 oc	---	---	---	43.72 s	---	---	---	---	---	43.72
1.95	3.978	1358.15	43.78 oc	---	---	---	43.77 s	---	---	---	---	---	43.77
1.98	4.043	1358.18	43.82 oc	---	---	---	43.77 s	---	---	---	---	---	43.77
2.01	4.108	1358.21	43.86 oc	---	---	---	43.82 s	---	---	---	---	---	43.82
2.04	4.172	1358.24	43.90 oc	---	---	---	43.82 s	---	---	---	---	---	43.82
2.07	4.237	1358.27	43.94 oc	---	---	---	43.88 s	---	---	---	---	---	43.88
2.10	4.301	1358.30	43.97 oc	---	---	---	43.91 s	---	---	---	---	---	43.91
2.13	4.367	1358.33	44.01 oc	---	---	---	43.98 s	---	---	---	---	---	43.98
2.16	4.432	1358.36	44.05 oc	---	---	---	44.04 s	---	---	---	---	---	44.04
2.19	4.498	1358.39	44.09 oc	---	---	---	44.07 s	---	---	---	---	---	44.07
2.22	4.564	1358.42	44.13 oc	---	---	---	44.03 s	---	---	---	---	---	44.03
2.25	4.629	1358.45	44.17 oc	---	---	---	44.11 s	---	---	---	---	---	44.11
2.28	4.695	1358.48	44.21 oc	---	---	---	44.13 s	---	---	---	---	---	44.13
2.31	4.760	1358.51	44.25 oc	---	---	---	44.14 s	---	---	---	---	---	44.14
2.34	4.826	1358.54	44.28 oc	---	---	---	44.23 s	---	---	---	---	---	44.23
2.37	4.892	1358.57	44.32 oc	---	---	---	44.19 s	---	---	---	---	---	44.19
2.40	4.957	1358.60	44.36 oc	---	---	---	44.30 s	---	---	---	---	---	44.30
2.43	5.024	1358.63	44.40 oc	---	---	---	44.30 s	---	---	---	---	---	44.30
2.46	5.091	1358.66	44.44 oc	---	---	---	44.32 s	---	---	---	---	---	44.32
2.49	5.157	1358.69	44.48 oc	---	---	---	44.43 s	---	---	---	---	---	44.43
2.52	5.224	1358.72	44.51 oc	---	---	---	44.35 s	---	---	---	---	---	44.35
2.55	5.290	1358.75	44.55 oc	---	---	---	44.46 s	---	---	---	---	---	44.46
2.58	5.357	1358.78	44.59 oc	---	---	---	44.50 s	---	---	---	---	---	44.50
2.61	5.424	1358.81	44.63 oc	---	---	---	44.51 s	---	---	---	---	---	44.51
2.64	5.490	1358.84	44.67 oc	---	---	---	44.51 s	---	---	---	---	---	44.51
2.67	5.557	1358.87	44.70 oc	---	---	---	44.52 s	---	---	---	---	---	44.52
2.70	5.624	1358.90	44.74 oc	---	---	---	44.73 s	---	---	---	---	---	44.73
2.73	5.691	1358.93	44.78 oc	---	---	---	44.65 s	---	---	---	---	---	44.65
2.76	5.759	1358.96	44.82 oc	---	---	---	44.76 s	---	---	---	---	---	44.76
2.79	5.827	1358.99	44.85 oc	---	---	---	44.63 s	---	---	---	---	---	44.63
2.82	5.895	1359.02	44.89 oc	---	---	---	44.75 s	---	---	---	---	---	44.75
2.85	5.962	1359.05	44.93 oc	---	---	---	44.81 s	---	---	---	---	---	44.81
2.88	6.030	1359.08	44.97 oc	---	---	---	44.84 s	---	---	---	---	---	44.84
2.91	6.098	1359.11	45.00 oc	---	---	---	44.85 s	---	---	---	---	---	44.85
2.94	6.165	1359.14	45.04 oc	---	---	---	44.85 s	---	---	---	---	---	44.85
2.97	6.233	1359.17	45.08 oc	---	---	---	44.89 s	---	---	---	---	---	44.89
3.00	6.301	1359.20	45.12 oc	---	---	---	44.92 s	---	---	---	---	---	44.92

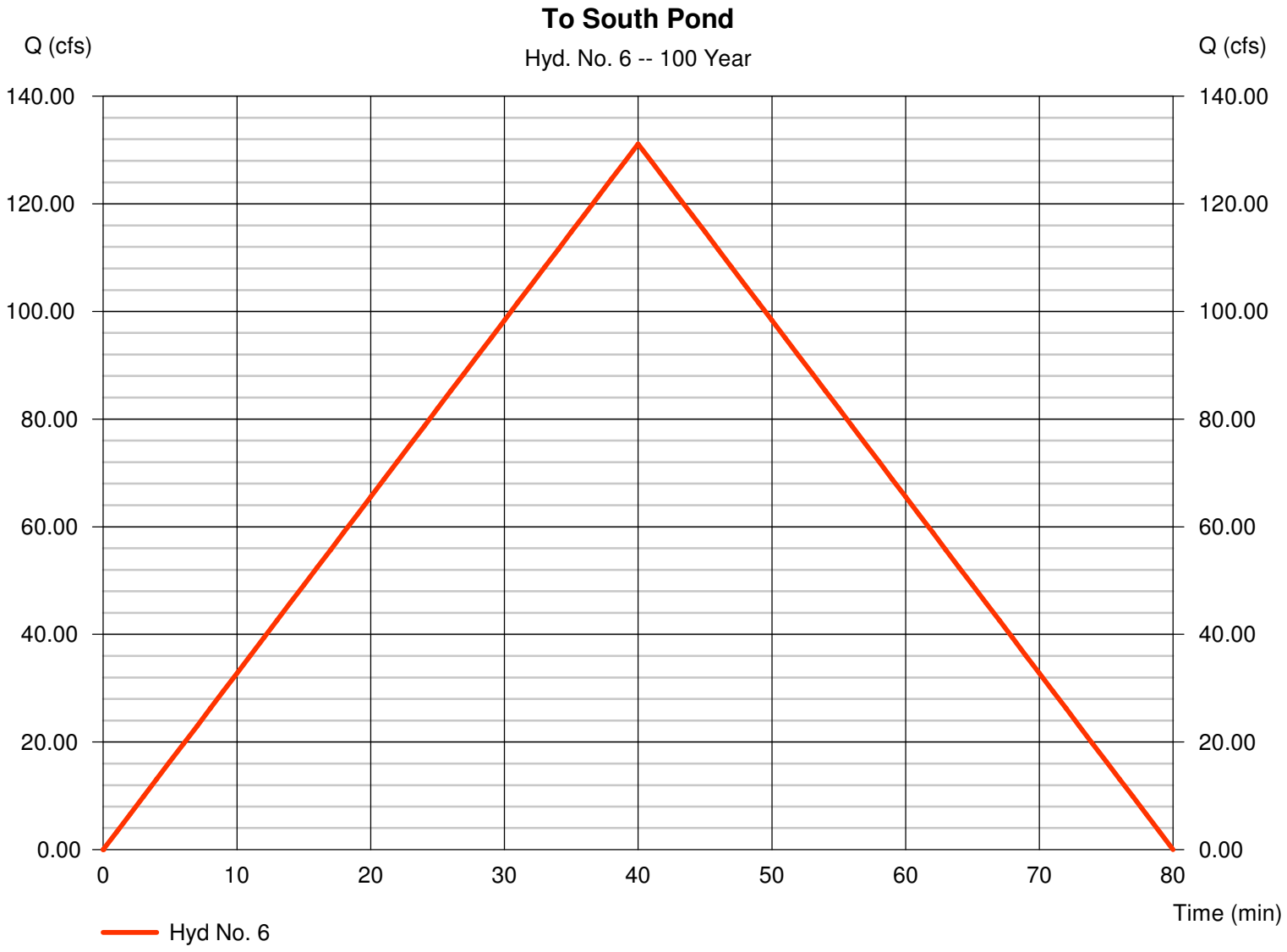
...End

Hydrograph Report

Hyd. No. 6

To South Pond

Hydrograph type	=	Rational	Peak discharge	=	131.14 cfs
Storm frequency	=	100 yrs	Time to peak	=	40 min
Time interval	=	1 min	Hyd. volume	=	7.225 acft
Drainage area	=	43.300 ac	Runoff coeff.	=	0.65
Intensity	=	4.660 in/hr	Tc by	=	40.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1

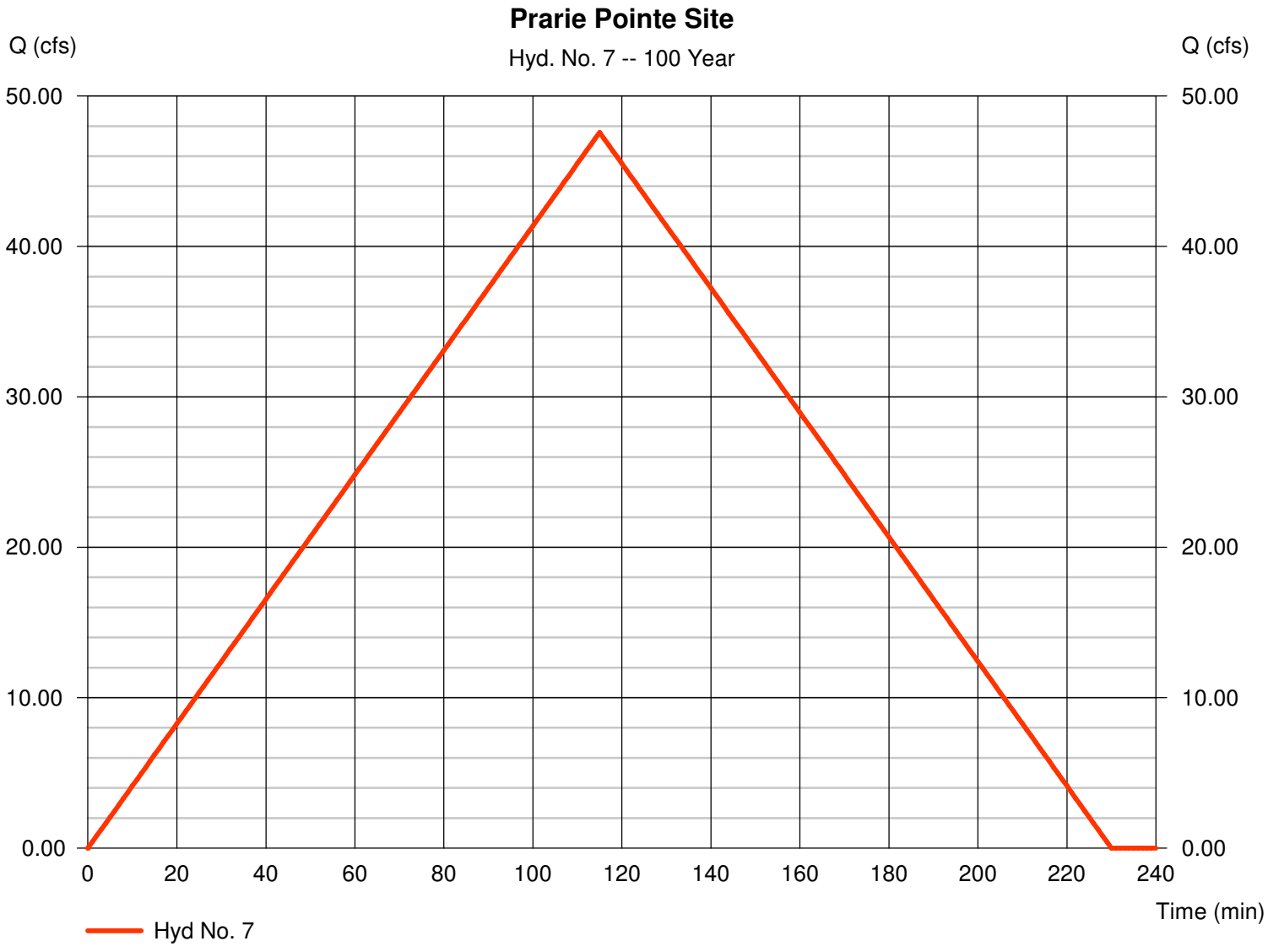


Hydrograph Report

Hyd. No. 7

Prarie Pointe Site

Hydrograph type	=	Rational	Peak discharge	=	47.58 cfs
Storm frequency	=	100 yrs	Time to peak	=	115 min
Time interval	=	1 min	Hyd. volume	=	7.536 acft
Drainage area	=	41.600 ac	Runoff coeff.	=	0.45
Intensity	=	2.541 in/hr	Tc by User	=	115.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1

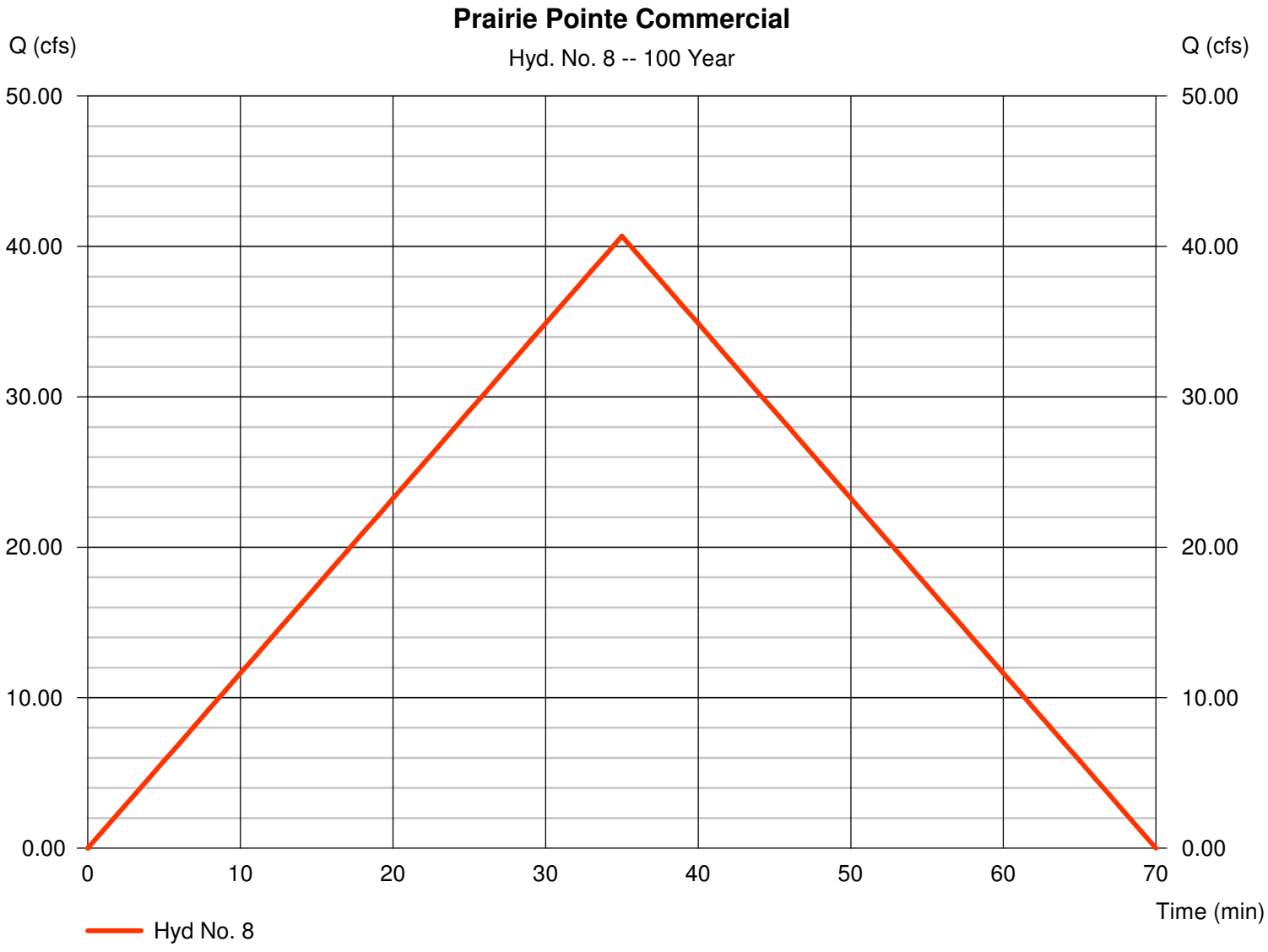


Hydrograph Report

Hyd. No. 8

Prairie Pointe Commercial

Hydrograph type	=	Rational	Peak discharge	=	40.69 cfs
Storm frequency	=	100 yrs	Time to peak	=	35 min
Time interval	=	1 min	Hyd. volume	=	1.962 acft
Drainage area	=	18.100 ac	Runoff coeff.	=	0.45
Intensity	=	4.996 in/hr	Tc by User	=	35.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1

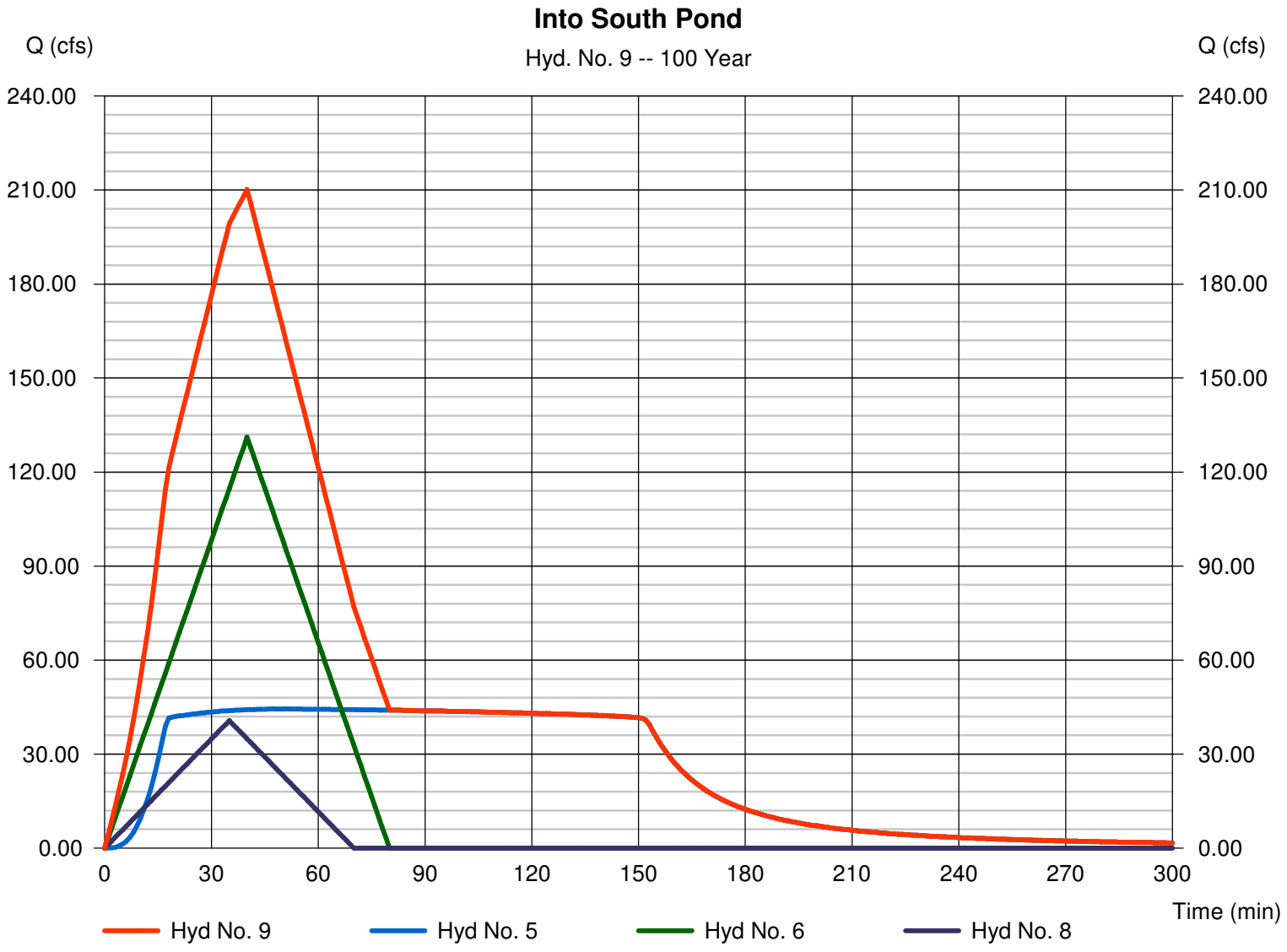


Hydrograph Report

Hyd. No. 9

Into South Pond

Hydrograph type	= Combine	Peak discharge	= 210.20 cfs
Storm frequency	= 100 yrs	Time to peak	= 40 min
Time interval	= 1 min	Hyd. volume	= 19.474 acft
Inflow hyds.	= 5, 6, 8	Contrib. drain. area	= 61.400 ac



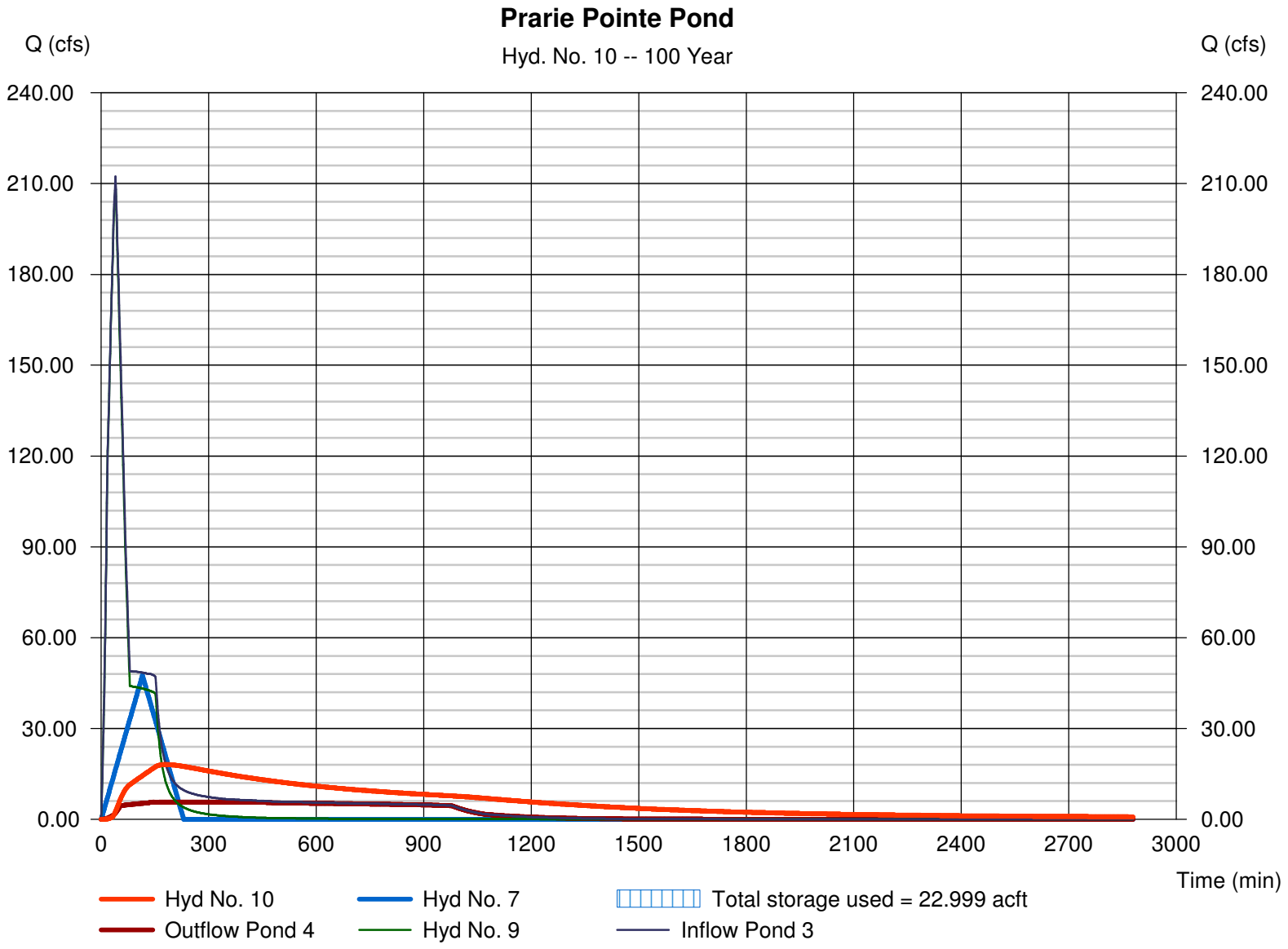
Hydrograph Report

Hyd. No. 10

Prarie Pointe Pond

Hydrograph type	=	Reservoir (Interconnected)	Peak discharge	=	18.11 cfs
Storm frequency	=	100 yrs	Time to peak	=	180 min
Time interval	=	1 min	Hyd. volume	=	22.855 acft
Upper Pond			**Lower Pond**		
Pond name	=	West Prairie Pointe Pond	Pond name	=	South Pond/Prairie Po
Inflow hyd.	=	7 - Prarie Pointe Site	Other Inflow hyd.	=	9 - Into South
Max. Elevation	=	1356.18 ft	Max. Elevation	=	1356.54 ft
Max. Storage	=	6.186 acft	Max. Storage	=	16.813 acft

Interconnected Pond Routing. Storage Indication method used.



Pond No. 4 - West Prairie Pointe Pond

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1354.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1354.50	152,415	0.000	0.000
1.00	1355.50	161,685	3.605	3.605
2.00	1356.50	171,055	3.819	7.425
3.00	1357.50	180,532	4.036	11.460
4.00	1358.50	196,965	4.333	15.793
5.00	1359.50	241,375	5.031	20.825

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.00	0.00	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1351.25	0.00	0.00	0.00
Length (ft)	= 370.00	0.00	0.00	0.00
Slope (%)	= 0.01	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 1354.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	1354.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.10	0.361	1354.60	4.44 oc	---	---	---	1.68	---	---	---	---	---	1.684
0.20	0.721	1354.70	4.50 oc	---	---	---	4.50 s	---	---	---	---	---	4.497
0.30	1.082	1354.80	4.71 oc	---	---	---	4.71 s	---	---	---	---	---	4.710
0.40	1.442	1354.90	4.84 oc	---	---	---	4.83 s	---	---	---	---	---	4.831
0.50	1.803	1355.00	4.94 oc	---	---	---	4.94 s	---	---	---	---	---	4.940
0.60	2.163	1355.10	5.05 oc	---	---	---	5.04 s	---	---	---	---	---	5.044
0.70	2.524	1355.20	5.14 oc	---	---	---	5.12 s	---	---	---	---	---	5.123
0.80	2.884	1355.30	5.24 oc	---	---	---	5.19 s	---	---	---	---	---	5.189
0.90	3.245	1355.40	5.33 oc	---	---	---	5.27 s	---	---	---	---	---	5.275
1.00	3.605	1355.50	5.42 oc	---	---	---	5.34 s	---	---	---	---	---	5.342
1.10	3.987	1355.60	5.51 oc	---	---	---	5.36 s	---	---	---	---	---	5.358
1.20	4.369	1355.70	5.60 oc	---	---	---	5.58 s	---	---	---	---	---	5.580
1.30	4.751	1355.80	5.68 oc	---	---	---	5.66 s	---	---	---	---	---	5.656
1.40	5.133	1355.90	5.77 oc	---	---	---	5.59 s	---	---	---	---	---	5.591
1.50	5.515	1356.00	5.85 oc	---	---	---	5.70 s	---	---	---	---	---	5.700
1.60	5.897	1356.10	5.93 oc	---	---	---	5.73 s	---	---	---	---	---	5.725
1.70	6.279	1356.20	6.01 oc	---	---	---	5.64 s	---	---	---	---	---	5.643
1.80	6.661	1356.30	6.09 oc	---	---	---	6.01 s	---	---	---	---	---	6.014
1.90	7.043	1356.40	6.17 oc	---	---	---	5.75 s	---	---	---	---	---	5.754
2.00	7.425	1356.50	6.25 oc	---	---	---	5.85 s	---	---	---	---	---	5.848
2.10	7.828	1356.60	6.33 oc	---	---	---	6.17 s	---	---	---	---	---	6.175
2.20	8.232	1356.70	6.40 oc	---	---	---	5.52 s	---	---	---	---	---	5.521
2.30	8.635	1356.80	6.48 oc	---	---	---	5.80 s	---	---	---	---	---	5.801
2.40	9.039	1356.90	6.55 oc	---	---	---	6.08 s	---	---	---	---	---	6.083
2.50	9.443	1357.00	6.63 oc	---	---	---	6.37 s	---	---	---	---	---	6.366
2.60	9.846	1357.10	6.70 oc	---	---	---	6.65 s	---	---	---	---	---	6.651
2.70	10.250	1357.20	6.77 oc	---	---	---	5.18 s	---	---	---	---	---	5.180
2.80	10.653	1357.30	6.84 oc	---	---	---	5.39 s	---	---	---	---	---	5.394
2.90	11.057	1357.40	6.91 oc	---	---	---	5.61 s	---	---	---	---	---	5.610
3.00	11.460	1357.50	6.98 oc	---	---	---	6.81 s	---	---	---	---	---	6.810
3.10	11.894	1357.60	7.05 oc	---	---	---	4.11 s	---	---	---	---	---	4.111
3.20	12.327	1357.70	7.12 oc	---	---	---	4.26 s	---	---	---	---	---	4.259
3.30	12.760	1357.80	7.19 oc	---	---	---	4.41 s	---	---	---	---	---	4.407
3.40	13.194	1357.90	7.25 oc	---	---	---	4.56 s	---	---	---	---	---	4.557
3.50	13.627	1358.00	7.32 oc	---	---	---	4.71 s	---	---	---	---	---	4.706
3.60	14.060	1358.10	7.39 oc	---	---	---	4.86 s	---	---	---	---	---	4.856
3.70	14.494	1358.20	7.45 oc	---	---	---	5.01 s	---	---	---	---	---	5.007

Continues on next page...

West Prairie Pointe Pond

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.80	14.927	1358.30	7.52 oc	---	---	---	5.16 s	---	---	---	---	---	5.158
3.90	15.360	1358.40	7.58 oc	---	---	---	5.31 s	---	---	---	---	---	5.310
4.00	15.793	1358.50	7.64 oc	---	---	---	0.00 s	---	---	---	---	---	7.643
4.10	16.297	1358.60	7.71 oc	---	---	---	0.00	---	---	---	---	---	7.706
4.20	16.800	1358.70	7.77 oc	---	---	---	0.00	---	---	---	---	---	7.769
4.30	17.303	1358.80	7.83 oc	---	---	---	0.00	---	---	---	---	---	7.831
4.40	17.806	1358.90	7.89 oc	---	---	---	0.00	---	---	---	---	---	7.893
4.50	18.309	1359.00	7.95 oc	---	---	---	0.00	---	---	---	---	---	7.954
4.60	18.812	1359.10	8.01 oc	---	---	---	0.00	---	---	---	---	---	8.014
4.70	19.315	1359.20	8.07 oc	---	---	---	0.00	---	---	---	---	---	8.074
4.80	19.819	1359.30	8.13 oc	---	---	---	0.00	---	---	---	---	---	8.134
4.90	20.322	1359.40	8.19 oc	---	---	---	0.00	---	---	---	---	---	8.193
5.00	20.825	1359.50	8.25 oc	---	---	---	0.00	---	---	---	---	---	8.252

...End

Pond No. 3 - South Pond/Prairie Pointe Pond

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 1354.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1354.50	331,290	0.000	0.000
1.00	1355.50	357,270	7.904	7.904
2.00	1356.50	384,560	8.515	16.419
3.00	1357.50	411,540	9.138	25.557
4.00	1358.50	442,405	9.802	35.359

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.00	0.60	0.00	0.00
Crest El. (ft)	= 1355.00	1354.50	0.00	0.00
Weir Coeff.	= 3.20	3.33	3.33	3.33
Weir Type	= Rect	Rect	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0.000	1354.50	---	---	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.790	1354.60	---	---	---	---	0.00	0.06	---	---	---	---	0.063
0.20	1.581	1354.70	---	---	---	---	0.00	0.18	---	---	---	---	0.179
0.30	2.371	1354.80	---	---	---	---	0.00	0.33	---	---	---	---	0.328
0.40	3.161	1354.90	---	---	---	---	0.00	0.51	---	---	---	---	0.505
0.50	3.952	1355.00	---	---	---	---	0.00	0.71	---	---	---	---	0.706
0.60	4.742	1355.10	---	---	---	---	0.20	0.93	---	---	---	---	1.130
0.70	5.533	1355.20	---	---	---	---	0.57	1.17	---	---	---	---	1.741
0.80	6.323	1355.30	---	---	---	---	1.05	1.43	---	---	---	---	2.480
0.90	7.113	1355.40	---	---	---	---	1.62	1.71	---	---	---	---	3.323
1.00	7.904	1355.50	---	---	---	---	2.26	2.00	---	---	---	---	4.261
1.10	8.755	1355.60	---	---	---	---	2.97	2.30	---	---	---	---	5.279
1.20	9.607	1355.70	---	---	---	---	3.75	2.63	---	---	---	---	6.374
1.30	10.458	1355.80	---	---	---	---	4.58	2.96	---	---	---	---	7.540
1.40	11.310	1355.90	---	---	---	---	5.46	3.31	---	---	---	---	8.773
1.50	12.161	1356.00	---	---	---	---	6.40	3.67	---	---	---	---	10.07
1.60	13.013	1356.10	---	---	---	---	7.38	4.04	---	---	---	---	11.43
1.70	13.864	1356.20	---	---	---	---	8.41	4.43	---	---	---	---	12.84
1.80	14.716	1356.30	---	---	---	---	9.48	4.82	---	---	---	---	14.31
1.90	15.567	1356.40	---	---	---	---	10.60	5.23	---	---	---	---	15.83
2.00	16.419	1356.50	---	---	---	---	11.76	5.65	---	---	---	---	17.41
2.10	17.332	1356.60	---	---	---	---	12.95	6.08	---	---	---	---	19.03
2.20	18.246	1356.70	---	---	---	---	14.19	6.52	---	---	---	---	20.70
2.30	19.160	1356.80	---	---	---	---	15.45	6.97	---	---	---	---	22.42
2.40	20.074	1356.90	---	---	---	---	16.76	7.43	---	---	---	---	24.19
2.50	20.988	1357.00	---	---	---	---	18.10	7.90	---	---	---	---	26.00
2.60	21.901	1357.10	---	---	---	---	19.47	8.38	---	---	---	---	27.85
2.70	22.815	1357.20	---	---	---	---	20.88	8.86	---	---	---	---	29.74
2.80	23.729	1357.30	---	---	---	---	22.32	9.36	---	---	---	---	31.68
2.90	24.643	1357.40	---	---	---	---	23.79	9.87	---	---	---	---	33.66
3.00	25.557	1357.50	---	---	---	---	25.30	10.38	---	---	---	---	35.68
3.10	26.537	1357.60	---	---	---	---	26.83	10.91	---	---	---	---	37.74
3.20	27.517	1357.70	---	---	---	---	28.39	11.44	---	---	---	---	39.83
3.30	28.497	1357.80	---	---	---	---	29.98	11.98	---	---	---	---	41.96
3.40	29.477	1357.90	---	---	---	---	31.60	12.53	---	---	---	---	44.13
3.50	30.458	1358.00	---	---	---	---	33.25	13.08	---	---	---	---	46.34
3.60	31.438	1358.10	---	---	---	---	34.93	13.65	---	---	---	---	48.58
3.70	32.418	1358.20	---	---	---	---	36.63	14.22	---	---	---	---	50.85
3.80	33.398	1358.30	---	---	---	---	38.36	14.80	---	---	---	---	53.16

Continues on next page...

South Pond/Prairie Pointe Pond

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.90	34.378	1358.40	---	---	---	---	40.12	15.39	---	---	---	---	55.51
4.00	35.359	1358.50	---	---	---	---	41.91	15.98	---	---	---	---	57.89

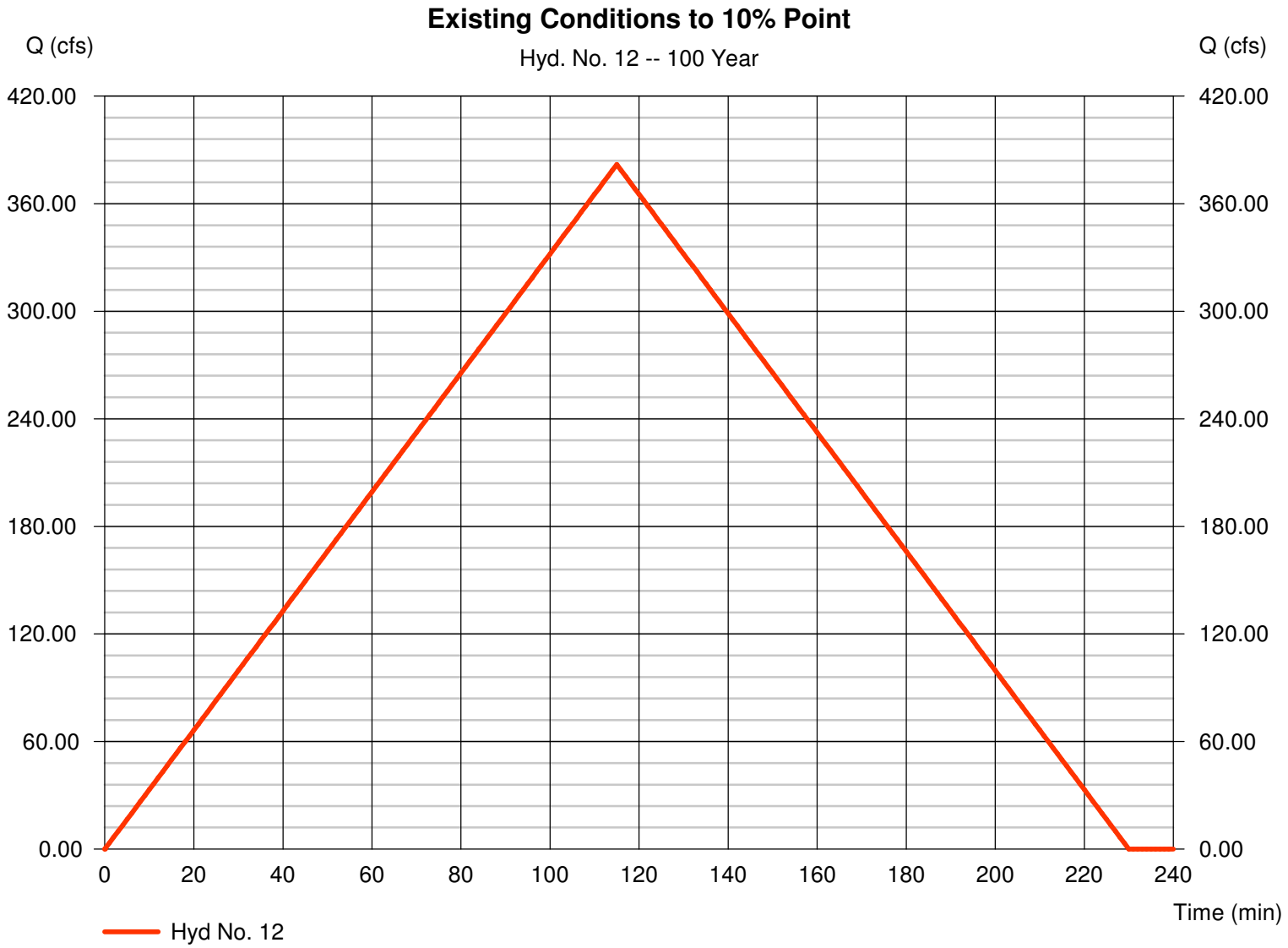
...End

Hydrograph Report

Hyd. No. 12

Existing Conditions to 10% Point

Hydrograph type	=	Rational	Peak discharge	=	381.83 cfs
Storm frequency	=	100 yrs	Time to peak	=	115 min
Time interval	=	1 min	Hyd. volume	=	60.483 acft
Drainage area	=	313.000 ac	Runoff coeff.	=	0.48
Intensity	=	2.541 in/hr	Tc by User	=	115.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1

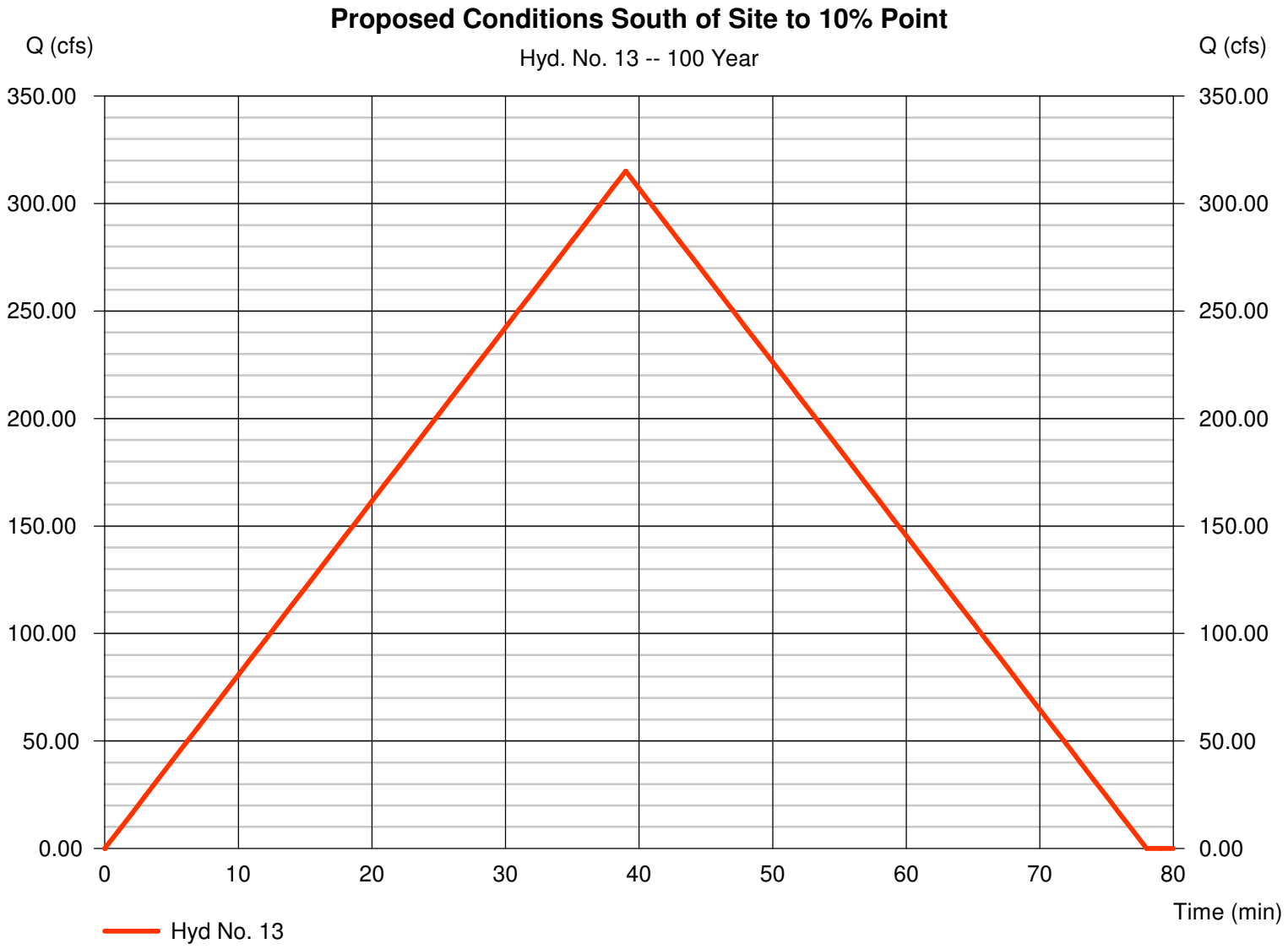


Hydrograph Report

Hyd. No. 13

Proposed Conditions South of Site to 10% Point

Hydrograph type	=	Rational	Peak discharge	=	315.06 cfs
Storm frequency	=	100 yrs	Time to peak	=	39 min
Time interval	=	1 min	Hyd. volume	=	16.925 acft
Drainage area	=	139.000 ac	Runoff coeff.	=	0.48
Intensity	=	4.722 in/hr	Tc by User	=	39.00 min
IDF Curve	=	Sedgwick County.IDF	Asc/Rec limb fact	=	1/1

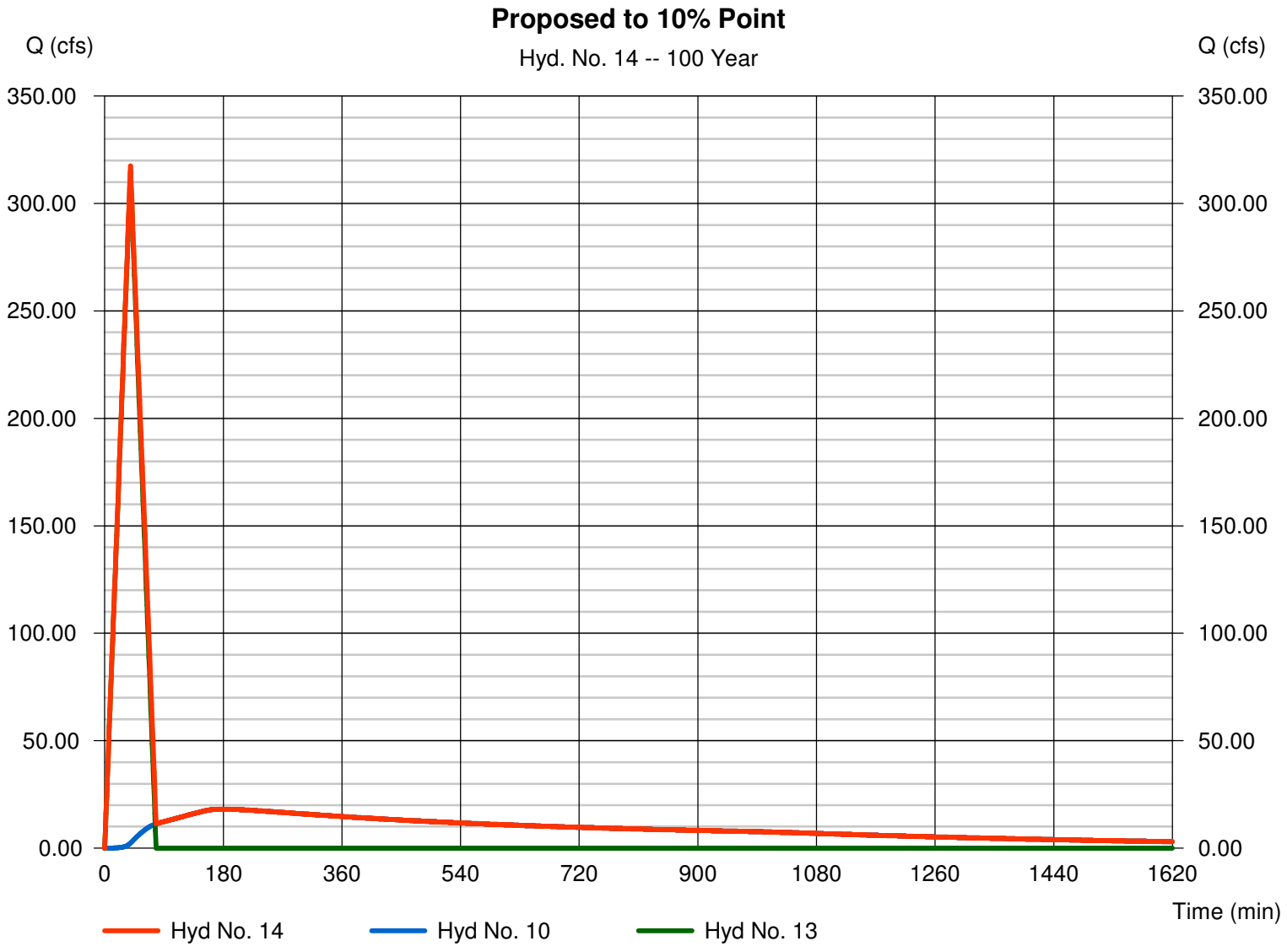


Hydrograph Report

Hyd. No. 14

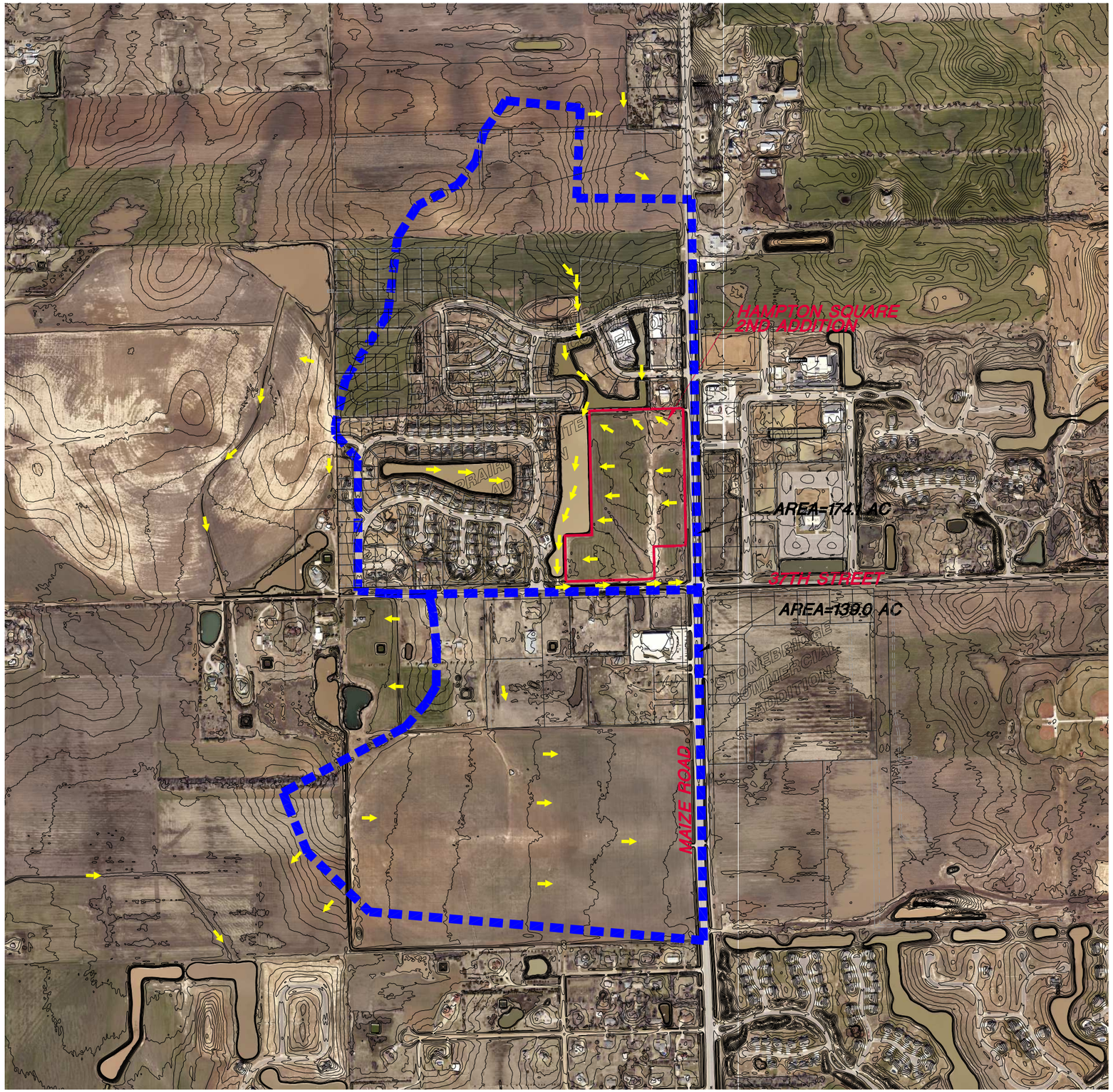
Proposed to 10% Point

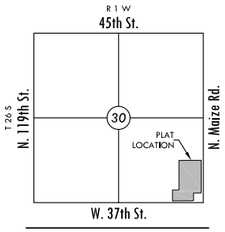
Hydrograph type	= Combine	Peak discharge	= 317.42 cfs
Storm frequency	= 100 yrs	Time to peak	= 39 min
Time interval	= 1 min	Hyd. volume	= 39.780 acft
Inflow hyds.	= 10, 13	Contrib. drain. area	= 139.000 ac



Appendix 3.5

Overall Basin Map





VICINITY MAP

LEGEND

- CONIFEROUS TREE
- DECIDUOUS TREE
- SIGN
- POWER POLE
- ELECTRIC BOX
- LIGHT POLE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- SECTION CORNER
- BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE

-SPOT ELEVATOINS

N

SCALE: 1" = 400'

400 0 400 800

MKEC
ENGINEERING
CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

HAMPTON SQUARE 2ND

MAIZE, KANSAS

OVERALL BASINS

DATE
October 11

REVISED

DESIGN BY
KLA

DRAWN BY
CMJ

CHECKED BY
GJA

SHEET NUMBER
1

J: \Projects\2010\1001010582_Premier Hampton Square 2nd\5-Civil\CAD\Drainage\Drawing\10582_overall_basins.dwg

Appendix 3.6

Water Quality Calculations

Water Quality Calculations

	Hydrologic Soil Group			
Land Use	A	B	C	D
Undisturbed	0.02	0.03	0.04	0.05
Disturbed Pervious	0.15	0.2	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Table from pg 4-44

P = 1.2 Per pg. 4-43

Site Information

Area impervious	72	ac	
Area disturbed pervious	53.3	ac	
Area undisturbed	31.40	ac	
Total Area	156.7	ac	
HSG	C		
R_v =	0.52		Eq 4-24, pg 4-43
WQ_v =	8.14	ac - ft	Eq 4-25, pg 4-44
Q_{wv} =	0.62	in	Eq 4-26, Pg 4-44

HSG = Hydrologic Soil Group
WQ_v = water quality protection volume (acre-feet)
P = rainfall depth (in)
R_v = volumetric runoff coefficient
Q_{wv} = water quality protection volume (inches)

Appendix 3.7

Channel Protection Volume Calculations

Channel Protection Calculations

P =	2.80	in		
R_v =	0.52			From WQv Tab
A =	20.30	ac		Site Area
FP =	1.00			From Table 4-10
Q_{wv} =	1.45	in	$P*R_v$	pg 4-44
CN =	85.46			pg 4-45
S =	1.70			pg 4-46
I_a =	0.34	in		pg 4-46
I_a/P =	0.12			
Tc=	7.50	min.		From other calculations
Tc=	0.13	hours		
q_u =	920	$cfs/mi^2/in$		From Figure 4-6, pg 4-24 need tc
Q_{wq} =	42.43	cfs	q_u*A*Q_{wv}	pg. 4-47
Q =	1.45	in		pg 4-26
Q_p =	42.43	cfs	$q_u*A*Q*F_p$	equation 4-18; pg 4-22
q_o/q_i =	0.02			From Figure 4-17
V_s/V_r =	0.65			From Figure 4-18 or equation on pg 4-51
$V_s = CP_v$ =	1.61	ac-ft		pg 4-52

P =	Rainfall Depth (in)
Rv =	volumetric runoff coefficient
A =	Area (acres)
FP =	Pond and Swamp Adjustment Factors
Qwv =	water quality protection volume (inches)
CN	Curve Number
S	pg 4-4
Ia	pg 4-4
qu =	Unit peak discharge
Qwq =	water quality peak flow (cfs)
Q	Excess Rainfall Depth (in)
Qp =	Peak Discharge (cfs)
qo/qi =	Ratio of Outflow to Inflow
Vs/Vr =	Ration of Storage Volume to Runoff Volume

Appendix 3.8

Time of Concentration Calculations

Project	Hampton Square Second Addition
Feature	
Analyst	Kara Anderson
Version	4/14/2011
Notes	Tc's for the overall model were previously determined. This Tc is for the developing site.

Sheet	Subbasin	Number of Segments	Sheet Flow (mins)	Shallow Concentrated Flow (mins)	Open Channel Ditch Flow (mins)	Open Channel Pipe Flow (mins)	Open Channel General Flow (mins)	Other (mins)	Total Tc (mins)	Length (feet)	Drop (feet)	Avg. Slope (%)	Avg. Vel. (fps)	Lag (mins)	Lag (hours)	Area (acres)
1	mpton Square Sec	2	4.6	0.0	0.0	2.9	0.0	0.0	7.5	930	3	0.32	2.07	4.5	0.075	20.3
2	SWS Sizing	1	4.6	0.0	0.0	0.0	0.0	0.0	4.6	250	1	0.40	0.91	2.8	0.046	0.1
3	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
4	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
5	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
6	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
7	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
8	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
9	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
10	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
11	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
12	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
13	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
14	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	0.00	0.82	16.4	0.273	500
15	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
16	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
17	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
18	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
19	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
20	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
21	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
22	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
23	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
24	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
25	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500
26	0	6	20.3	2.4	0.1	0.2	0.1	4.2	27.3	1350	47	3.48	0.82	16.4	0.273	500

Subbasin Name	Hampton Square Secor
Drainage Area (ac)	20.3
Drainage Area (sq mi)	0.03171875

		Sheet Flow					Total
selected>>	Select (0 or 1)	1	0	0	0	0	1 segments
	Length (ft)	250	1	1	1	1	250 feet length
	Top Elevation (ft)	1358	1	1	1	1	
	Bottom Elevation (ft)	1357	1	1	1	1	
	Cover	0.011, Concrete, asphalt, etc.	Choose Cover Type	Choose Cover Type	Choose Cover Type	Choose Cover Type	
	Specify alternate "n"						
	Sheet Flow "n" (dim)	0.011	0.000	0.000	0.000	0.000	
	2-yr, 24-hr Rainfall (ins)	3.50	3.50	3.50	3.50	3.50	
	Drop (ft)	1	0	0	0	0	1 feet drop
	Slope (ft/ft)	0.0040	0.0000	0.0000	0.0000	0.0000	
	Slope (%)	0.40	0.00	0.00	0.00	0.00	
	Velocity (fps)	0.91					
	Travel Time (hrs)	0.077					
	Travel Time (mins)	4.59					4.6 mins travel

	Shallow Concentrated Flow						Total
	Select (0 or 1)	0	0	0	0	0	0 segments
	Length (ft)	200	1	1	1	1	0 feet length
	Top Elevation (ft)	30	1	1	1	1	
	Bottom Elevation (ft)	22	1	1	1	1	
	Cover	7, Short grass pasture	Choose Cover Type	Choose Cover Type	Choose Cover Type	Choose Cover Type	
	Specify alternate "K"						
	Surface Coeff (dim)	7.00	0.00	0.00	0.00	0.00	
	Drop (ft)	8	0	0	0	0	0 feet drop
	Slope (ft/ft)	0.0400	0.0000	0.0000	0.0000	0.0000	
	Slope (%)	4.00	0.00	0.00	0.00	0.00	
	Velocity (fps)						
	Travel Time (mins)						0.0 mins travel

	Open Channel Ditch Flow						Total
	Select (0 or 1)	0	0	0	0	0	0 segments
	Length (ft)	100	1	1	1	1	0 feet length
	Top Elevation (ft)	50	1	1	1	1	
	Bottom Elevation (ft)	47	1	1	1	1	
	Channel Lining	0.03, Grassed	Choose Lining Type	Choose Lining Type	Choose Lining Type	Choose Lining Type	
	Bottom Width (ft)	25.00	0.00	1.00	1.00	1.00	
	Left Side Slope (H:V)	3.00	1.00	1.00	1.00	1.00	
	Right Side Slope (H:V)	3.00	1.00	1.00	1.00	1.00	
	Depth (ft)	3.00	1.00	1.00	1.00	1.00	
	Specify alternate "n"						
	Manning "n" (dim)	0.030	0.000	0.000	0.000	0.000	
	Drop (ft)	3	0	0	0	0	0 feet drop
	Slope (ft/ft)	0.0300	0.0000	0.0000	0.0000	0.0000	
	Slope (%)	3.00	0.00	0.00	0.00	0.00	
	Flow Area (sq ft)	102.00	1.00	2.00	2.00	2.00	
	Wet Perimeter (ft)	43.97	2.83	3.83	3.83	3.83	
	Hydraulic Radius (ft)	2.32	0.35	0.52	0.52	0.52	
	Velocity (fps)						
	Normal Flow (cfs)						
selected>>	Travel Time (mins)						0.0 mins travel

	Open Channel Pipe Flow						Total
	Select (0 or 1)	1	0	0	0	0	1 segments
	Length (ft)	680	1	1	1	1	680 feet length
	Top Elevation (ft)	1357	1	1	1	1	
	Bottom Elevation (ft)	1355	1	1	1	1	
	Pipe Material	0.017, Rough concrete	Choose Material Type	Choose Material Type	Choose Material Type	Choose Material Type	
	Diameter (ins)	36.00	1.00	1.00	1.00	1.00	
	Flow Depth (ins)	36.00	1.00	1.00	1.00	1.00	
	Specify alternate "n"						
	Manning "n" (dim)	0.017	0.000	0.000	0.000	0.000	
	Drop (ft)	2	0	0	0	0	2 feet drop
	Slope (ft/ft)	0.0029	0.0000	0.0000	0.0000	0.0000	
	Slope (%)	0.29	0.00	0.00	0.00	0.00	
	Theta (radians)	6.283	6.283	6.283	6.283	6.283	
	Flow Area (sq ft)	7.07	0.01	0.01	0.01	0.01	
	Wet Perimeter (ft)	9.42	0.26	0.26	0.26	0.26	
	Hydraulic Radius (ft)	0.75	0.02	0.02	0.02	0.02	
	Velocity (fps)	3.92					
	Normal Flow (cfs)	27.7					
	Travel Time (mins)	2.89					2.9 mins travel

	Open Channel General Flow						Total
	Select (0 or 1)	0	0	0	0	0	0 segments
	Length (ft)	150	1	1	1	1	0 feet length
	Top Elevation (ft)	30	1	1	1	1	
	Bottom Elevation (ft)	26	1	1	1	1	
	Hydraulic Radius (ft)	2.30	1.00	1.00	1.00	1.00	
	Channel Lining	0.025, Clean Earth	Choose Cover Type	Choose Cover Type	Choose Cover Type	Choose Cover Type	
	Specify alternate "n"						
	Manning "n" (dim)	0.025	0.000	0.000	0.000	0.000	
	Drop (ft)	4	0	0	0	0	0 feet drop
	Slope (ft/ft)	0.0267	0.0000	0.0000	0.0000	0.0000	
	Slope (%)	2.67	0.00	0.00	0.00	0.00	
	Velocity (fps)						
	Travel Time (mins)						0.0 mins travel

	Other (Computed Separately)						Total
	Select (0 or 1)	0	0	0	0	0	0 segments
	Length (ft)	500	1	1	1	1	0 feet length
	Drop (ft)	10	1	1	1	1	0 feet drop
	Velocity (fps)	2.00	1.00	1.00	1.00	1.00	
	Slope (ft/ft)	0.0200	1.0000	1.0000	1.0000	1.0000	
	Slope (%)	2.00	100.00	100.00	100.00	100.00	
	Travel Time (mins)						0.0 mins travel

Total for Subbasin

Segments	2
Length (ft)	930
Drop (ft)	3
Slope (ft/ft)	0.0032

Subbasin Name	SWS Sizing
Drainage Area (ac)	0.1
Drainage Area (sq mi)	0.00015625

Sheet Flow

selected>>							Total
	Select (0 or 1)	1	0	0	0	0	1 segments
	Length (ft)	250	1	1	1	1	250 feet length
	Top Elevation (ft)	1358	1	1	1	1	
	Bottom Elevation (ft)	1357	1	1	1	1	
	Cover	0.011, Concrete, asphalt, etc.	Choose Cover Type	Choose Cover Type	Choose Cover Type	Choose Cover Type	
	Specify alternate "n"						
	Sheet Flow "n" (dim)	0.011	0.000	0.000	0.000	0.000	
	2-yr, 24-hr Rainfall (ins)	3.50	3.50	3.50	3.50	3.50	
	Drop (ft)	1	0	0	0	0	1 feet drop
	Slope (ft/ft)	0.0040	0.0000	0.0000	0.0000	0.0000	
	Slope (%)	0.40	0.00	0.00	0.00	0.00	
	Velocity (fps)	0.91					
	Travel Time (hrs)	0.077					
	Travel Time (mins)	4.59					4.6 mins travel

Shallow Concentrated Flow

						Total
Select (0 or 1)	0	0	0	0	0	0 segments
Length (ft)	200	1	1	1	1	0 feet length
Top Elevation (ft)	30	1	1	1	1	
Bottom Elevation (ft)	22	1	1	1	1	
Cover	7, Short grass pasture	Choose Cover Type	Choose Cover Type	Choose Cover Type	Choose Cover Type	
Specify alternate "K"						
Surface Coeff (dim)	7.00	0.00	0.00	0.00	0.00	
Drop (ft)	8	0	0	0	0	0 feet drop
Slope (ft/ft)	0.0400	0.0000	0.0000	0.0000	0.0000	
Slope (%)	4.00	0.00	0.00	0.00	0.00	
Velocity (fps)						
Travel Time (mins)						0.0 mins travel

Open Channel Ditch Flow

						Total
Select (0 or 1)	0	0	0	0	0	0 segments
Length (ft)	100	1	1	1	1	0 feet length
Top Elevation (ft)	50	1	1	1	1	
Bottom Elevation (ft)	47	1	1	1	1	
Channel Lining	0.03, Grassed	Choose Lining Type	Choose Lining Type	Choose Lining Type	Choose Lining Type	
Bottom Width (ft)	25.00	0.00	1.00	1.00	1.00	
Left Side Slope (H:V)	3.00	1.00	1.00	1.00	1.00	
Right Side Slope (H:V)	3.00	1.00	1.00	1.00	1.00	
Depth (ft)	3.00	1.00	1.00	1.00	1.00	
Specify alternate "n"						
Manning "n" (dim)	0.030	0.000	0.000	0.000	0.000	
Drop (ft)	3	0	0	0	0	0 feet drop
Slope (ft/ft)	0.0300	0.0000	0.0000	0.0000	0.0000	
Slope (%)	3.00	0.00	0.00	0.00	0.00	
Flow Area (sq ft)	102.00	1.00	2.00	2.00	2.00	
Wet Perimeter (ft)	43.97	2.83	3.83	3.83	3.83	
Hydraulic Radius (ft)	2.32	0.35	0.52	0.52	0.52	
Velocity (fps)						
Normal Flow (cfs)						
Travel Time (mins)						0.0 mins travel

Open Channel Pipe Flow

						Total
Select (0 or 1)	0	0	0	0	0	0 segments
Length (ft)	100	1	1	1	1	0 feet length
Top Elevation (ft)	20	1	1	1	1	
Bottom Elevation (ft)	18	1	1	1	1	
Pipe Material	0.017, Rough concrete	Choose Material Type	Choose Material Type	Choose Material Type	Choose Material Type	
Diameter (ins)	24.00	1.00	1.00	1.00	1.00	
Flow Depth (ins)	24.00	1.00	1.00	1.00	1.00	
Specify alternate "n"						
Manning "n" (dim)	0.017	0.000	0.000	0.000	0.000	
Drop (ft)	2	0	0	0	0	0 feet drop
Slope (ft/ft)	0.0200	0.0000	0.0000	0.0000	0.0000	
Slope (%)	2.00	0.00	0.00	0.00	0.00	
Theta (radians)	6.283	6.283	6.283	6.283	6.283	
Flow Area (sq ft)	3.14	0.01	0.01	0.01	0.01	
Wet Perimeter (ft)	6.28	0.26	0.26	0.26	0.26	
Hydraulic Radius (ft)	0.50	0.02	0.02	0.02	0.02	
Velocity (fps)						
Normal Flow (cfs)						
Travel Time (mins)						0.0 mins travel

Open Channel General Flow

						Total
Select (0 or 1)	0	0	0	0	0	0 segments
Length (ft)	150	1	1	1	1	0 feet length
Top Elevation (ft)	30	1	1	1	1	
Bottom Elevation (ft)	26	1	1	1	1	
Hydraulic Radius (ft)	2.30	1.00	1.00	1.00	1.00	
Channel Lining	0.025, Clean Earth	Choose Cover Type	Choose Cover Type	Choose Cover Type	Choose Cover Type	
Specify alternate "n"						
Manning "n" (dim)	0.025	0.000	0.000	0.000	0.000	
Drop (ft)	4	0	0	0	0	0 feet drop
Slope (ft/ft)	0.0267	0.0000	0.0000	0.0000	0.0000	
Slope (%)	2.67	0.00	0.00	0.00	0.00	
Velocity (fps)						
Travel Time (mins)						0.0 mins travel

Other (Computed Separately)

						Total
Select (0 or 1)	0	0	0	0	0	0 segments
Length (ft)	500	1	1	1	1	0 feet length
Drop (ft)	10	1	1	1	1	0 feet drop
Velocity (fps)	2.00	1.00	1.00	1.00	1.00	
Slope (ft/ft)	0.0200	1.0000	1.0000	1.0000	1.0000	
Slope (%)	2.00	100.00	100.00	100.00	100.00	
Travel Time (mins)						0.0 mins travel

Total for Subbasin

Segments	1
Length (ft)	250
Drop (ft)	1
Slope (ft/ft)	0.0040

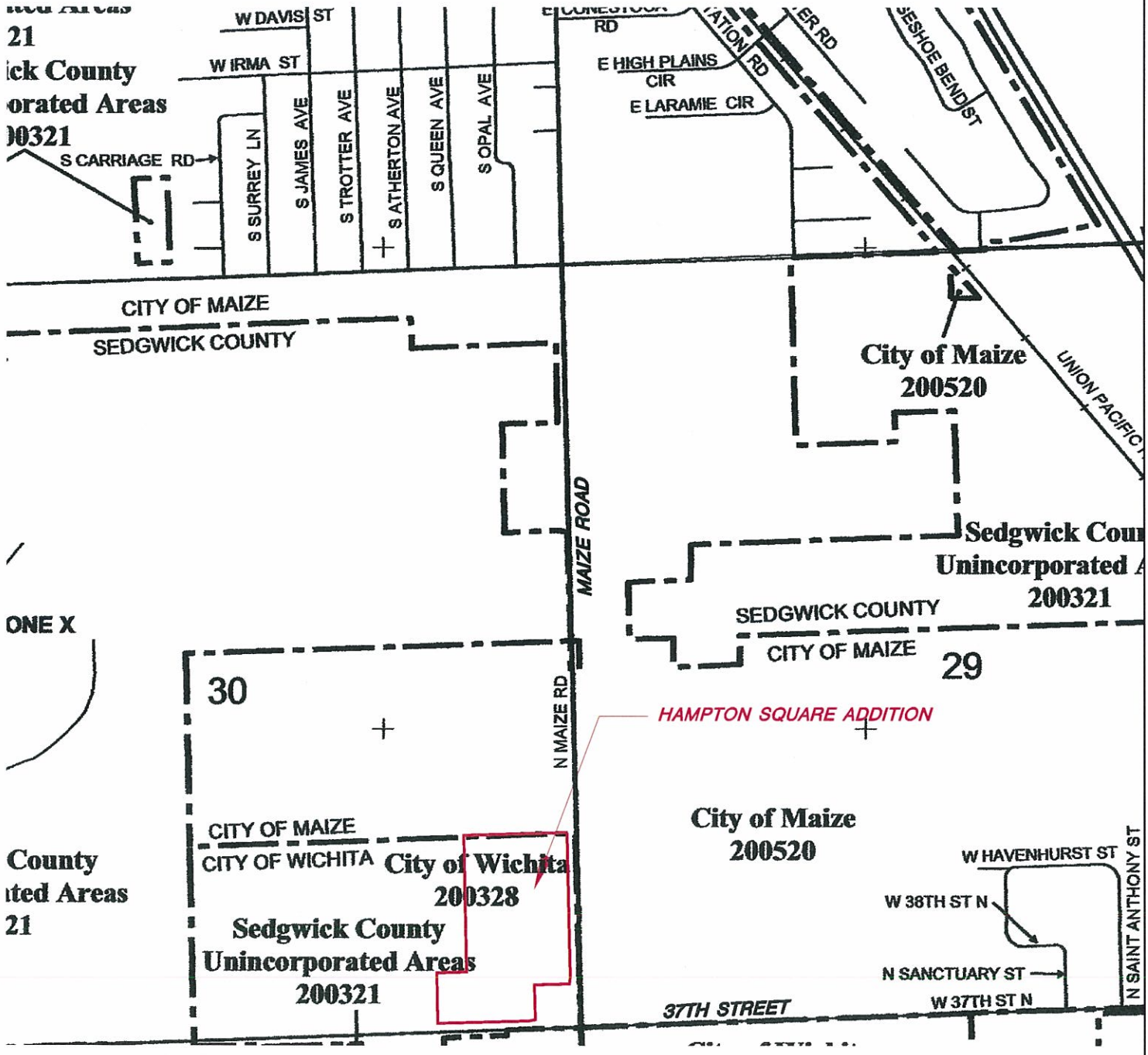
Tab 4. Floodplains

FEMA FIRM

The site is in Zone X according to FIRM panel 20173C0190E, Appendix 4.1. The nearest floodplain is approximately ¾ of a mile south of the site.

Appendix 4.1

Flood Insurance Rate Map (FIRM)



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0190E

FIRM
FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 190 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MAIZE, CITY OF	200520	0190	E
SEDGWICK COUNTY	200321	0190	E
WICHITA, CITY OF	200328	0190	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
20173C0190E

EFFECTIVE DATE
FEBRUARY 2, 2007
Federal Emergency Management Agency

N

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

SECTION 30
TOWNSHIP 26S
RANGE 1W

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

HAMPTON SQUARE 2ND
PROJECT NAME

FIRM MAP
SHEET TITLE

KLA	CMJ	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:

APRIL 2011	10582	1 / 1
DATE	JOB NO.	SHEET/OF

J:\Projects\2010\1001010582_Premier Hampton Square 2nd\5-Civil\CAD\Drainage\Drawing\10582_FIRM.dwg

Tab 5. Federal, State, and Local Permits

US Army Corps of Engineers

The site will not modify any jurisdictional streams or wetlands.

Kansas Department of Agriculture – Division of Water Resources

There are no proposed changes to a stream, floodplain, or pond with a drainage area of more than 160 acres.

FEMA

The site will not modify any FEMA floodplains.