



TRANSMITTAL

TO: Scott Lindebak, PE	FROM: Trevor Kurth, PE CFM
COMPANY: City of Wichita	DATE: 8-11-10
ADDRESS: 8 th Floor City Hall	PROJECT: Harry & Webb Commercial
CITY/ STATE: Wichita, Kansas	PROJECT NUMBER:

RE:
Harry & Webb Commercial

VIA: DELIVERY

We are sending you ATTACHED UNDER SEPARATE COVER

PLANS PRINTS SHOP DRAWINGS SAMPLES SPECS
 COPY OF LETTER CHANGE ORDER DISK OTHER

COPIES	DATE	DESCRIPTION
1	8-11-10	Harry & Webb Commercial Drainage Plan

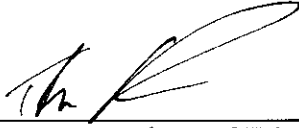
URGENT FOR APPROVAL FOR YOUR INFO FOR REVIEW & COMMENT

APPROVED, AS NOTED REVISE AS NOTED REVISE AND RETURN

AS REQUESTED PLEASE REPLY FOR BIDS DUE

NOTES/ COMMENTS:

Scott,
Please review and comment. Please call me and we can discuss this.
trk

SIGNED: 
Trevor R. Kurth, P.E. CFM

Copy: file

ENGINEERING
SURVEYING
PLANNING
LANDSCAPE
ARCHITECTURE

B a u g h m a n
C o m p a n y , P . A .
315 Ellis Street
Wichita, Kansas 67203
P 316.262.7271
F 316.262.0149



Davidson, Tim

From: Trevor Kurth [tkurth@baughmanco.com]
Sent: Wednesday, August 25, 2010 4:37 PM
To: Davidson, Tim
Subject: RE: Harry & Webb Commercial

Tim,

Post-Developed Conditions under the Discharge Points Summary.

Also, the CN is exactly the same as the existing CN for this area. Common sense will tell someone that it is un-developed based solely on the Proposed Plan sheet. The basin lines are very clear as is the CN – this area is undeveloped – whether in the Reserve or not. I tried to be as conservative as possible with high CNs for the rest of the site (98 for all of it – even with the open space left at the corners as you can see). I really don't see how this would not be enforceable. If someone deviates from the basin areas or the CNs – then they need to prove why and how they will take care of it. Seems really clear from where I am standing. When a site plan is officially submitted, you/Scott need to review it and make sure it matches the Drainage Plan. If it doesn't, then these questions/concerns can be dealt with more in-depth.
trk

From: Davidson, Tim [mailto:TDavidson@wichita.gov]
Sent: Wednesday, August 25, 2010 4:24 PM
To: Trevor Kurth
Subject: RE: Harry & Webb Commercial

Trevor,

Can you more explicitly point out in the report that all of Basin 2, post-, is not developed? That clarity will make it easier to enforce the drainage plan/report in the future. You can infer all of Basin 2, post-, is undeveloped when you look at the curve number, but that is easy to miss. While looking at the drainage plan, we had the impression that the part outside of the reserve was going to be developed/paved, and it was not clear if the curve number for Basin 2, post-, was an oversight, or not.

No need for another paper copy, a pdf, stamped and sealed will work fine.

Please include your best-guess break for Basin 5 with respect to the sump for the inlets and narrative on how that drains.

Thanks!

Tim

From: Trevor Kurth [mailto:tkurth@baughmanco.com]
Sent: Wednesday, August 25, 2010 3:58 PM
To: Davidson, Tim
Subject: RE: Harry & Webb Commercial

Tim,

The assurance would come in the form of you guys enforcing the Drainage Plan when (if) someone comes along and wants to develop/pave back there. That is why we do these and they are kept on file, make sure people follow them when they try to pull a building permit. If the site plan changes from the Drainage Plan, Stormwater and/or OCI need to make

DRAINAGE PLAN

HARRY & WEBB

COMMERCIAL

ADDITION

TO

WICHITA, SEDGWICK COUNTY, KANSAS

PREPARED BY



09 AUGUST 2010



**Public Works, Engineering Division
Final Drainage Plan Submittal Checklist**

Reviewer: _____ Date: _____
 Subdivision Name: HARRY & WEBB COMMERCIAL ADD Location: SE CORNER HARRY & WEBB
 Total Land Area Of Ownership: 1.10 Acres
 Type: _____ Residential X Commercial _____ Industrial _____ Recreation _____ Municipal _____ Other _____
 Applicant: WALMART Contact: _____ Phone #: _____
 Engineer: SWERMAN CO Contact: TREVOR KURTH PE CF Phone # 262-7271

Please check the appropriate box:

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

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

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



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

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



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

Tab 4. Floodplain Submittal	Applicant			Engr	
	I	NA	Explanation / Location in Plan	I	NA
A. Provide source of flood profile		X	NO FEMA on Property		
B. Nearest base flood elevations		X			
C. Delineation of pre-developed regulatory floodplain/floodway limits		X			
D. Delineation of post-developed regulatory floodplain and floodway limits		Y			
E. Floodplain boundary determination per elevation (project limits shown)		Y			
F. Provide source of floodway data table and discharges		Y			
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits		X			
H. Provide regulatory floodway and four natural profile models (10, 50, 100, and 500-yr) for existing and future watershed conditions		X			
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)		X			
J. Flood plains and floodways located within a Reserve, where necessary		X			

Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	Applicant			Engr	
	I/R	NA	Explanation / Location in Plan	I/R	NA
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		X	None expected		
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		Y			
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		X			
D. Kansas Department of Transportation		X			
E. Sedgwick County Right-of-way Permit		X			

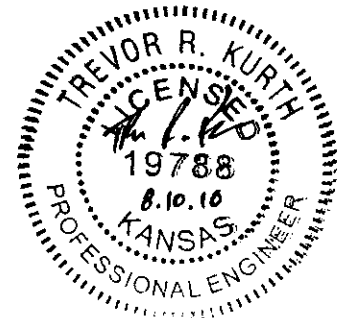


DRAINAGE PLAN HARRY & WEBB COMMERCIAL ADDITON

FINAL REPORT

**Prepared by Baughman Company, P.A.
09 August 2010**

**By Trevor R. Kurth, P.E., CFM
N. Brent Wooten, P.E., L.S.**



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- Downstream Drainage Capacity

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- Kansas Dept of Agriculture – DWR Permitting
- FEMA
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Exhibits

- Exhibit 1: Site Location Map
- Exhibit 2: Aerial Photo Exhibit with Lidar Topography
- Exhibit 3: Plat — Half Scale
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Appendices: Supporting Calculations

- Appendix A: USGS Soils Survey
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Plan Sheets

- Drainage & Grading Plan 1: 50 Scale

PROJECT NARRATIVE

EXISTING CONDITIONS

The site is located near the southeast corner of Harry and Webb in Wichita, Sedgwick County, Kansas. The site has access off of Webb Road just south of the existing Subway restaurant as well as access off of Harry just to the east of Autozone Auto Parts Store. The site is primarily located behind the aforementioned business to the south and east, respectively.

Currently, the site is vacant and is covered in cedar trees. The site is covered by various easements, including a sanitary sewer main located near the center of the property.

The site has a 'high point' in the topography located near the southwest corner which allows the site to drain in multiple directions. The majority of the runoff flows to the north and into the Harry ROW. These drainage patterns can be seen on the Existing Conditions exhibit.

PROPOSED CONDITIONS

The property is expected to be developed into a 2 lot commercial market place with associated utilities, driving and paved parking surfaces, and drainage conveyance systems. The perimeter grades, for the most part, are to remain as existing. The site is expected to be paved with internal storm sewer utilized to direct the runoff to the proposed detention pond located near the north east corner of the proposed addition. The pond will discharge to an existing storm water sewer located in the Harry Street ROW. Portions of the property that are not expected to be paved or developed will remain as existing with existing flow conditions intact. For a half-scale copy of the Plat, see Exhibit 3.

OFFSITE CONDITIONS

There does not appear to be any offsite runoff of concern encroaching this property at this time. The property drains primarily to the north. However, there are smaller basins that drain to the south and west adjacent properties via sheet flow or shallow concentrated flow. The properties to the north and west are currently developed into commercial businesses and none appear to have onsite detention. These areas drain primarily to the respective street ROW's to the west and north. The area to the south is a developed residential subdivision with what appears to be a dry detention basin located to the southeast of this property.

The USGS Quadrangle Sheet can be seen with the site location plotted as Exhibit 1. The Aerial for this area can be viewed as Exhibit 2.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values.

- STORM SERIES
 - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 100-yr Storm Events Modeled
 - 2-yr Rainfall Depth = 3.5 in
 - 10-yr Rainfall Depth = 5.3 in
 - 100-yr Rainfall Depth = 7.9 in

- FLOW DATA
 - Areas per LIDAR data, USGS Quadrangle Sheet, Aerial Photos, and Site Visits
 - Hydrograph Method used for Existing Flows (CN = 84)
 - Time of Concentration: Lag Method (minimum 15 min)

SITE CHARACTERISTICS

The site consists of approximately 10 acres of currently open space land. There is no development currently on the site. The site has a high point in the topography located near the southwest corner and is completely surrounded by residential and commercial development.

The existing site characteristics can be seen from the aerial exhibit (Exhibit 2).

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

The site was analyzed for pre-development conditions using the hydrograph method for the 2, 10, and 100 year storm events. A CN was utilized of an 84 due to the area having a Soil Type D and being of fair condition open space cover. The time of concentration was calculated using Lag Method with a minimum time of concentration of 15 minutes. These calculations are shown in the HydraFlow Hydrographs section of the Appendices.

DOWNSTREAM DRAINAGE CAPACITY

The site currently flows to the surrounding properties and ROW's. The southern portion of the site sheet flows to the south and east toward current platted residential properties. There is a dry detention area located just to the southeast of this site. The majority of the site flows to the north and east onto current developed commercial property and the Harry Street ROW. This runoff is then directed to the east via storm water sewer in the Harry ROW. The storm water sewer discharges just to the north and east and into an open ditch section.

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in developing the drainage and grading plans.

- STORM SERIES
 - 24-hour; 2-yr, 10-yr, 100-yr Storm Events Modeled
 - Hydrograph Method utilized for Developed Flows
 - CN = 98 (Paved Commercial/Industrial Impervious Area)
 - Time of Concentration; Lag Method, minimum Tc = 15min

- GRADING CONSTRAINTS
 - All perimeter lot grades matched

DEVELOPED CONDITIONS HYDROLOGIC ANALYSIS

The site is proposed to be developed into a commercial neighborhood market with an outparcel. The development will consist of an approximately 35,000 sqft building with associated parking. The outparcel is assumed to be fully paved as well. The site will drain via internal storm water sewer which will convey the developed runoff to the north east to the proposed detention facility. A Curve Number of 98, although conservative, was used for the basins representing the market and parking areas. These areas, when developed, will likely have additional green space that was not accounted for in these calculations.

DETENTION FACILITIES

There is one detention facility proposed on this site at this time. The pond can be seen on the half-scale drainage plan in Exhibit 4. The detention pond, located in Reserve A, can be viewed in further detail below.

- DETENTION POND

This pond is located near the northeast corner of the property near the sites entrance off of Harry Street. The pond will feature a wet surface at a static elevation of 1352.0. The pond will discharge to the Harry Street ROW storm water sewer system to the northwest via an 18" RCP at the static elevation. The pond is proposed to have a 100-year water surface elevation of a 1356.0. This pond is anticipated to detain the majority of the sites runoff after development.

DISCHARGE POINTS SUMMARY

The majority of the site discharges to the north and onto commercial paved properties and the Harry Street ROW. Currently, there is a large SWS system in Harry Street which discharges into an open ditch section along Harry. After development, the pond will detain this runoff to at least existing conditions, as well as pipe the runoff to the system; whereas, the current site sheet flows into the street ROW and into the curb inlet.

The site also has a portion drain to the south and east and onto the adjacent residential to the south. This area will be left untouched and located in a Reserve. This area is expected to runoff less after development than currently as the basin is

reduced in size. There are small basins which will continue to discharge to the adjacent properties to the east and to the Webb Road ROW. These areas are not expected to increase runoff onto adjoining properties after development. There is a slight increase in runoff to the Webb Road ROW. This area ultimately drains to the same basin as the northern portion of the site, and slight overdetention will be used to compensate for the increase.

POTENTIAL UPSTREAM/DOWNSTREAM IMPACTS

Due to the site proposing detention at the northeast corner, there are no upstream or downstream impacts expected with this development. The site will match all surrounding property grades as well as.

FLOODPLAIN SUBMITTAL

SOURCE OF FLOODPLAIN INFORMATION

The site lies within a FEMA Zone X. The location of the property, on FEMA FIRM Panel 386 of 700 for Sedgwick County, Kansas, effective February 2, 2007, is attached as Exhibit 5.

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS

There does not appear to be any jurisdictional waters of the US on this site.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING

There does not appear to be any DWR permitting needed on the proposed site at this time.

FEMA

There is no mapped floodplain located upon the proposed site. Therefore, no FEMA permitting is expected at this time.

KANSAS DEPT OF TRANSPORTATION

There does not appear to be any KDOT permitting needed on the proposed project.

SEDGWICK COUNTY PERMITTING

There does not appear to be any Sedgwick County permitting needed at this time.

EXHIBITS

EXHIBIT 1: Site Location Map

EXHIBIT 2: Aerial Photo Exhibit with Lidar Topography

EXHIBIT 3: Plat – Half Scale

EXHIBIT 4: Drainage Plan – Half Scale

EXHIBIT 5: Floodplain Location (FIRM)

EXHIBIT 6: Existing Conditions Exhibit

SITE LOCATION EXHIBIT
HARRY & WEBB COMMERCIAL ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

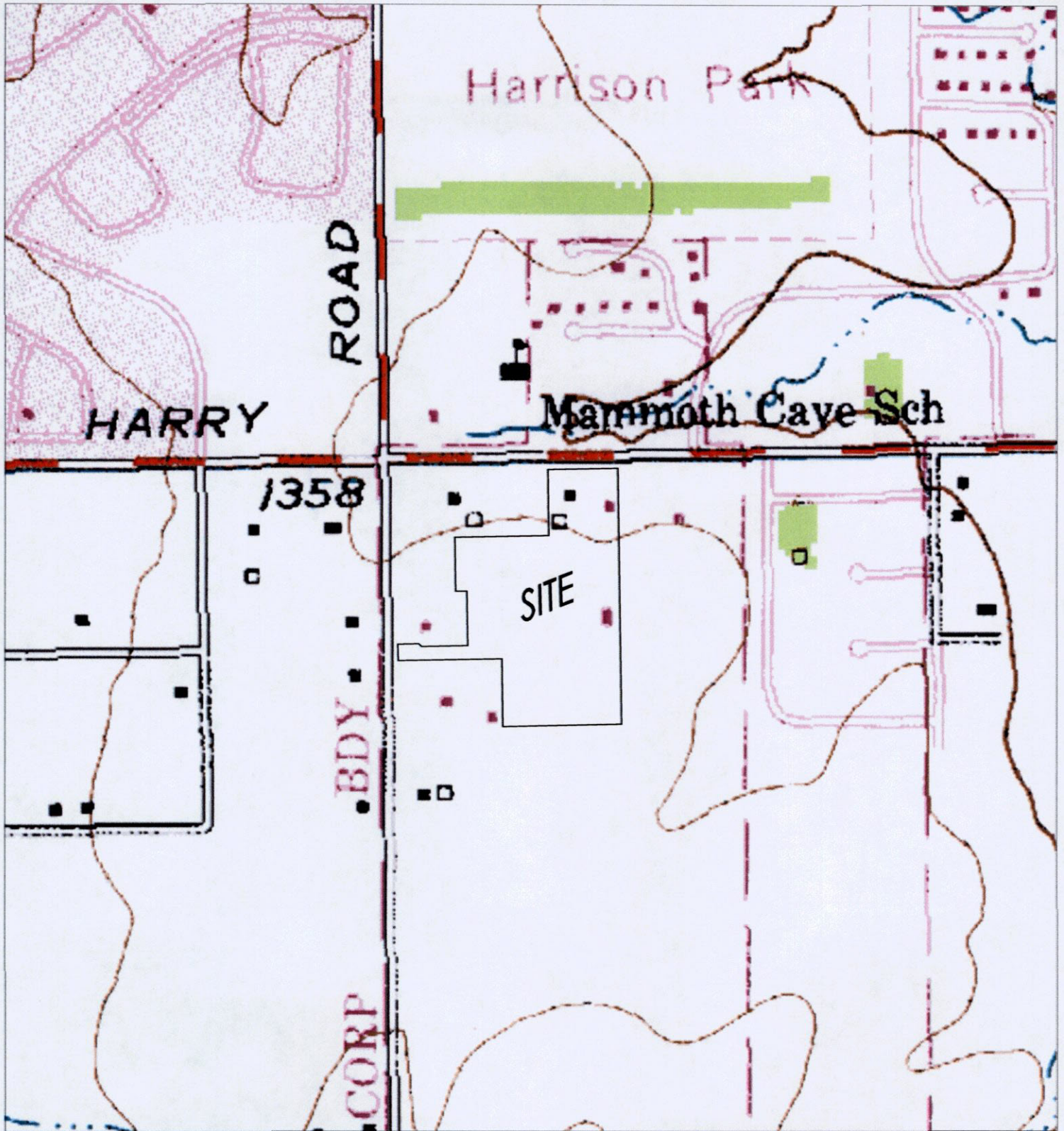
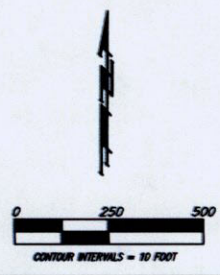


EXHIBIT 1
HARRY & WEBB COMMERCIAL ADDITION
09 Aug 2010



AERIAL EXHIBIT
HARRY & WEBB COMMERCIAL ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

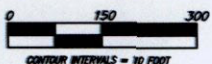


EXHIBIT 3
HARRY & WEBB COMMERCIAL ADDITION
09 Aug 2010

ONE-STEP FINAL PLAT

HARRY AND WEBB COMMERCIAL ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS

State of Kansas) SS We, Baughman Company, P.A., Surveyors in aforesaid Sedgwick County) do hereby certify that we have surveyed and platted "HARRY AND WEBB COMMERCIAL ADDITION", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as All of Lot 1, Block 1, Nguyen Addition, an addition to Sedgwick County, Kansas, TOGETHER with a tract beginning at a point 441.83 feet East and 521 feet South of the Northwest Corner of the Northwest Quarter (NW1/4) of Section 33, Township 27 South, Range 2 East of the 6th P.M., Sedgwick County, Kansas; thence South 464 feet; thence East 441.6 feet; thence North 996.15 feet; thence West 20 feet; thence South 532 feet; thence West 421.6 feet, more or less, to the point of beginning, except that portion dedicated for street on Film 100, Page 459, TOGETHER with that part of Lot 3, Block 1, Webb Road Addition, Sedgwick County, Kansas described as follows: Beginning at the southwest corner of said Lot 3; thence northerly along the west line of said Lot 3, 197.93 feet to a point 15.00 feet south of the southwest corner of a tract of land described in Kansas Statutory Warranty Deed recorded in Film 2016 at Page 1465; thence easterly parallel with the south line of said tract of land and parallel with the easterly portion of the north line of said Lot 3, 348.66 feet to a point on the east line of said Lot 3, said point being 240.00 feet south of the northeast corner of said Lot 3; thence southerly along the east line of said Lot 3, 35.00 feet to a deflection corner in said east line; thence easterly along a portion of the east line of said Lot 3, 39.085 feet to a deflection corner in said east line; thence southerly along the east line of said Lot 3, 197.00 feet to the southeast corner of said Lot 3; thence westerly along the south line of said Lot 3, 220.685 feet to a deflection corner in said south line; thence northerly along a portion of the south line of said Lot 3, 34.07 feet to a deflection corner in said south line; thence westerly along the south line of said Lot 3, 166.72 feet to the point of beginning, and TOGETHER with that part of Lot 1, Block 1, Subway Addition to Wichita, Sedgwick County, Kansas described as follows: Beginning at the southeast corner of said Lot 1; thence S89°41'51"W along the south line of said Lot 1, 381.66 feet to the southwest corner of said Lot 1; thence N00°07'01"W along the west line of said Lot 1, 60.00 feet to a point 60.00 feet normally distant north of the south line of said Lot 1; thence N89°41'51"E parallel with the south line of said Lot 1, 75.50 feet; thence S45°18'09"E, 14.14 feet to a point 50.00 feet normally distant north of the south line of said Lot 1; thence N89°41'51"E parallel with the south line of said Lot 1, 171.14 feet to a point 125.00 feet normally distant west of the east line of said Lot 1; thence N00°06'10"W parallel with the east line of said Lot 1, 200.37 feet to a point on the north line of said Lot 1; thence N89°40'54"E along the north line of said Lot 1, 125.00 feet to the northeast corner of said Lot 1; thence S00°06'10"E along the east line of said Lot 1, 250.40 feet to the point of beginning.

All being situated in the NW1/4 of Sec. 33, Twp. 27-S, R-2-E of the 6th P.M., Sedgwick County, Kansas.

Existing public easements and dedications being vacated by virtue of K.S.A. 12-512(b).

Baughman Company, P.A.

Michael G. Conrey, Surveyor

Know all men by these presents that we, the undersigned, have caused the land in the surveyors certificate to be platted into Lots, a Block, Reserves and Streets, to be known as "HARRY AND WEBB COMMERCIAL ADDITION", Wichita, Sedgwick County, Kansas. Reserves "A", "B", "C" and "D" are hereby reserved for driveways, lakes, signage, entry monuments, sidewalks, open space, landscaping, berms, drainage purposes, and utilities as confined to easements. The utility easements are hereby granted as indicated for the construction and maintenance of all public utilities. The drainage and utility easements are hereby granted as indicated for drainage purposes and for the construction and maintenance of all public utilities. The drainage easements are hereby granted as indicated for drainage purposes. The streets are hereby dedicated to and for the use of the public. Access controls shall be as depicted on the face of the plat and are hereby granted to the City of Wichita, Kansas. The permitted opening locations shall be as determined by the City Engineer of the City of Wichita, Kansas. The Minimum Building Pad Elevations for the lowest opening to the structures shall be as indicated on the face of the plat.

Wal-Mart Stores, Inc.

State of Kansas) SS The foregoing instrument acknowledged before me, this _____ day of _____, 2010, by _____, on behalf of the corporation.

Notary Public

My App't. Exp. _____

This plat of "HARRY AND WEBB COMMERCIAL ADDITION", Wichita, Sedgwick County, Kansas has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this _____ day of _____, 2010.
Wichita-Sedgwick County Metropolitan Area Planning Commission

G. Nelson Van Fleet, Chair

John L. Schlegel, Secretary

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this _____ day of _____, 2010.

Carl Brewer, Mayor

Karen Sublett, City Clerk

Reviewed in accordance with K.S.A. 58-2005 on this _____ day of _____, 2010.

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

Entered on transfer record this _____ day of _____, 2010.

Kelly B. Arnold, County Clerk

State of Kansas) SS This is to certify that this plat has been filed for record in the office of the Register of Deeds, this _____ day of _____, 2010 at _____ o'clock _____ M.; and is duly recorded.

Bill Meek, Register of Deeds

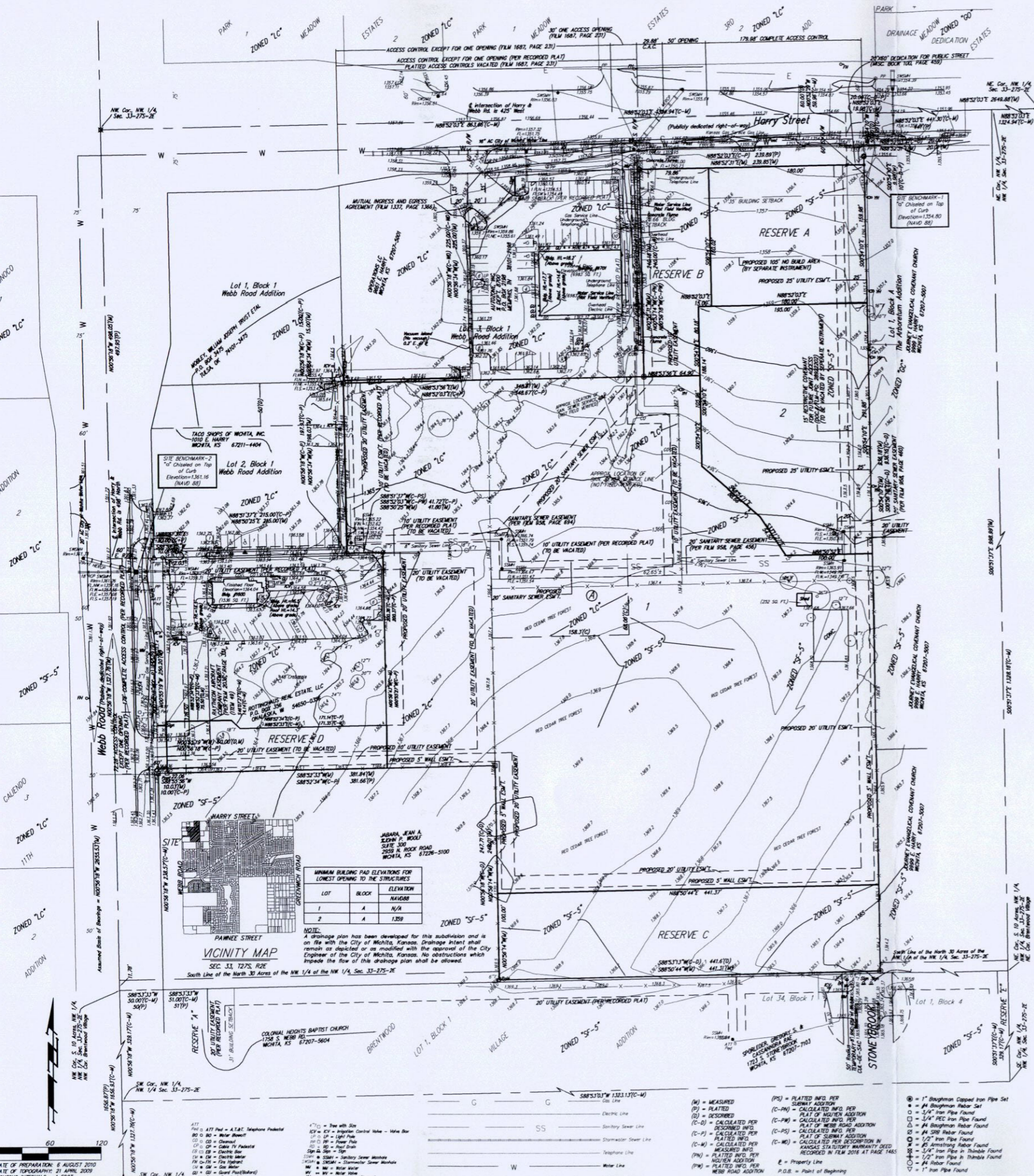
Assistant Vice President
Real Estate

Tonya Buckingham, Deputy

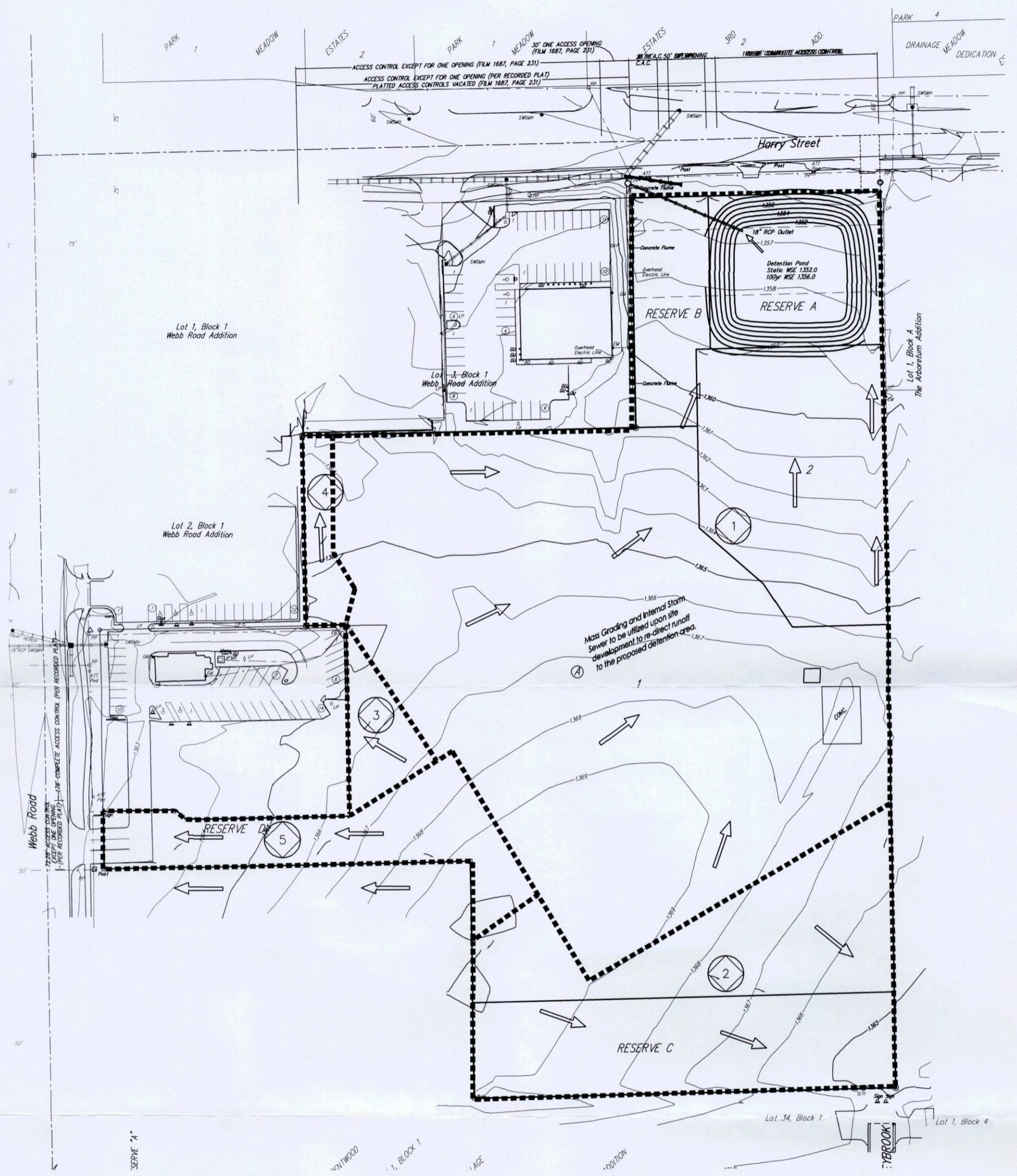
**HARRY AND WEBB
COMMERCIAL ADDITION**

Baughman Company, P.A.
115 18th St., Wichita, KS 67211, P 316-262-2121, F 316-262-0419
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

NOTE:
ADDITIONAL BUILDING SETBACK
REQUIREMENTS AND RESTRICTIONS



HARRY & WEBB COMMERCIAL ADDITION WICHITA, SEDGWICK COUNTY, KANSAS



Mass Grading and Internal Storm Sewer to be utilized upon site development to re-direct runoff to the proposed detention area.

1
Developed Pond
D.A. = 7.0 ac.
CN = 98
Tc = 15 min
Q₂ = 16 cfs
Q₅ = 24 cfs
Q₁₀ = 31 cfs
Q₁₀₀ = 59 cfs

2
Developed to SE
D.A. = 2.0 ac.
CN = 84
Tc = 15 min
Q₂ = 2.2 cfs
Q₅ = 4.5 cfs
Q₁₀ = 6.5 cfs
Q₁₀₀ = 15 cfs

3
Developed to W
D.A. = 0.2 ac.
CN = 84
Tc = 15 min
Q₂ = 0.2 cfs
Q₅ = 0.5 cfs
Q₁₀ = 0.7 cfs
Q₁₀₀ = 1.5 cfs

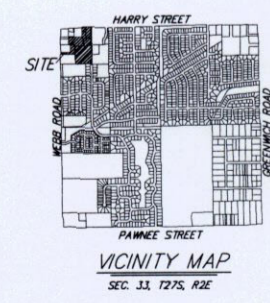
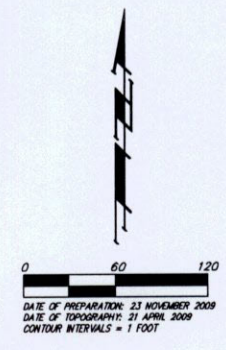
4
Developed to NW
D.A. = 0.16 ac.
CN = 98
Tc = 15 min
Q₂ = 0.4 cfs
Q₅ = 0.6 cfs
Q₁₀ = 0.7 cfs
Q₁₀₀ = 1.3 cfs

5
Developed Webb
D.A. = 0.7 ac.
CN = 98
Tc = 15 min
Q₂ = 1.6 cfs
Q₅ = 2.4 cfs
Q₁₀ = 3.1 cfs
Q₁₀₀ = 5.9 cfs

NOTE: There is no FEMA Special Flood Hazard Area on this property at the time of this plan. This is per FEMA FIRM Panel 386 of 700 for Sedgwick County, Kansas; effective February 2, 2007.

PROPOSED DETENTION POND (Static = 1352.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	14 cfs	4.5 cfs	1353.3
10 yr	31 cfs	11 cfs	1354.4
100 yr	59 cfs	14 cfs	1356.1

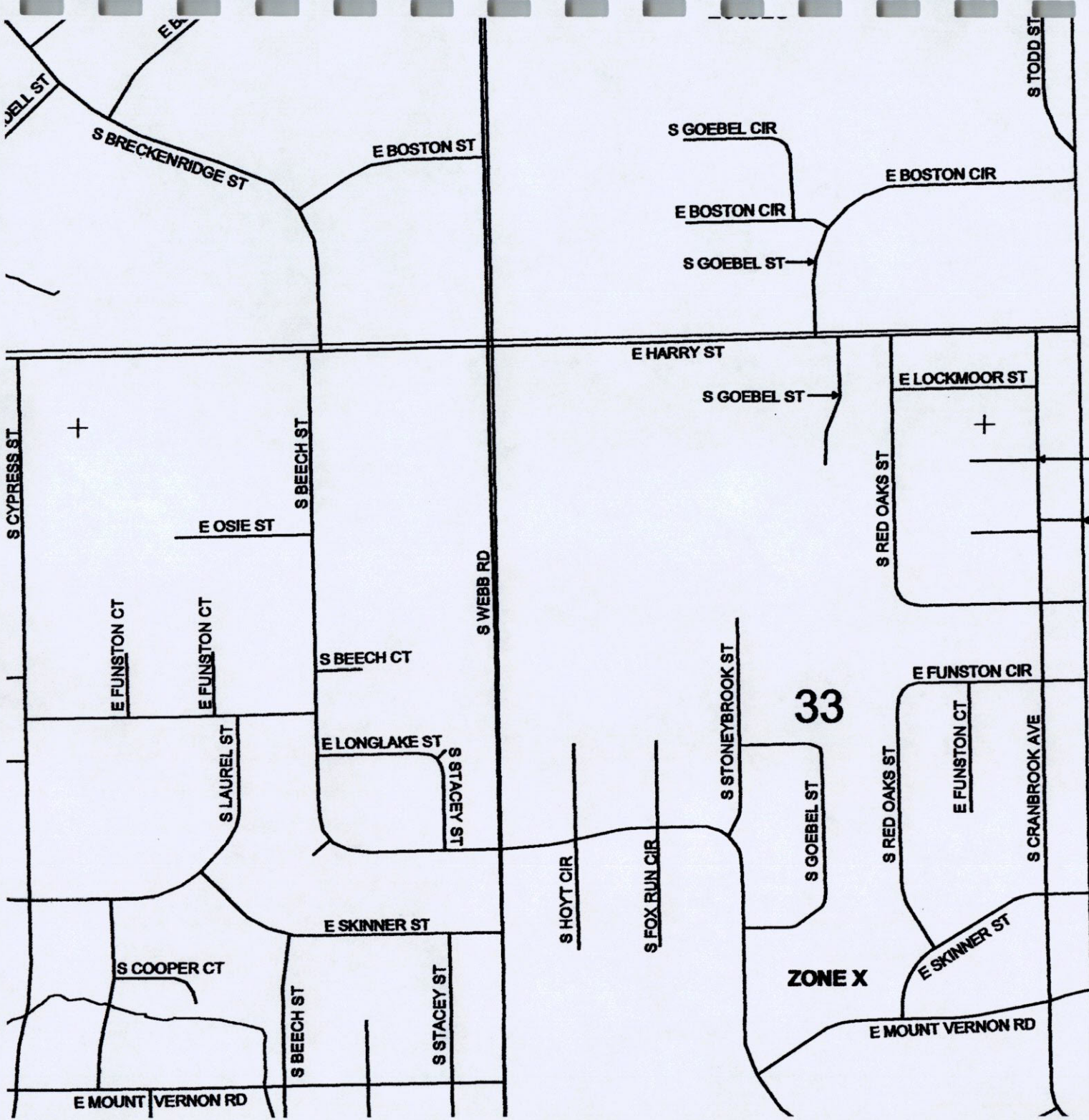
PROPOSED POND	
ELEVATION	AREA (sq ft)
1352	12000
1353	14000
1354	16000
1355	19000
1356	21500
1357	25000



DRAINAGE & GRADING PLAN
HARRY & WEBB COMMERCIAL

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149

Baughman ARCHITECTURE | PLANNING | LANDSCAPE ARCHITECTURE



MAP SCALE 1" = 500'

NATIONAL FLOOD INSURANCE PROGRAM

NFP

PANEL 0386E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS

AND INCORPORATED AREAS

PANEL 386 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:			
COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0386	E
WICHITA, CITY OF	200328	0386	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

20173C0386E

EFFECTIVE DATE

FEBRUARY 2, 2007

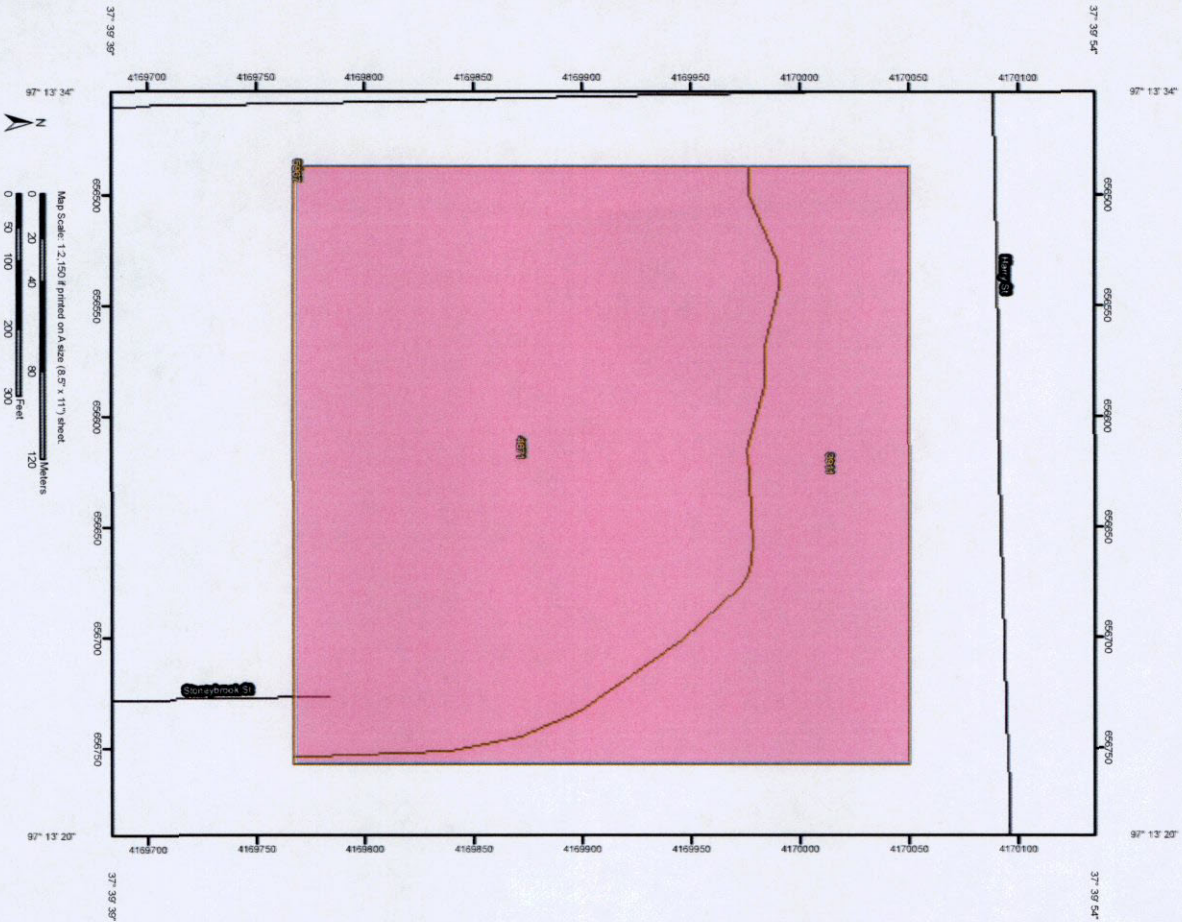
Federal Emergency Management Agency

SUPPORTING CALCULATIONS

APPENDIX A: USGS Soils Survey

**APPENDIX B : HydraFlow Hydrographs
Site Flow and Pond Routing**

USGS Soils Survey



Hydrologic Soil Group—Sedgwick County, Kansas
(Walmart - Harry & Webb)

MAP LEGEND

- Area of Interest (AOI)**
 - Area of Interest (AOI)
- Soils**
 - Soil Map Units
- Soil Ratings**
 - A
 - A/D
 - B
 - B/D
 - C
 - C/D
 - D
 - Not rated or not available
- Political Features**
 - Cities
- Water Features**
 - Oceans
 - Streams and Canals
- Transportation**
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads

MAP INFORMATION

Map Scale: 1:2,150 if printed on A size (8.5" × 11") sheet.
 The soil surveys that comprise your AOI were mapped at 1:24,000.
 Please rely on the bar scale on each map sheet for accurate map measurements.
 Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 14N NAD83
 This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.
 Soil Survey Area: Sedgwick County, Kansas
 Survey Area Data: Version 6, Dec 22, 2009
 Date(s) aerial images were photographed: Data not available.
 The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Sedgwick County, Kansas				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3911	Rosehill silty clay, 1 to 3 percent slopes	D	5.9	31.4%
4671	Irwin silty clay loam, 1 to 3 percent slopes	D	12.9	68.6%
5967	Tabler silty clay loam, 0 to 1 percent slopes	D	0.0	0.0%
Totals for Area of Interest			18.8	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie.

The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

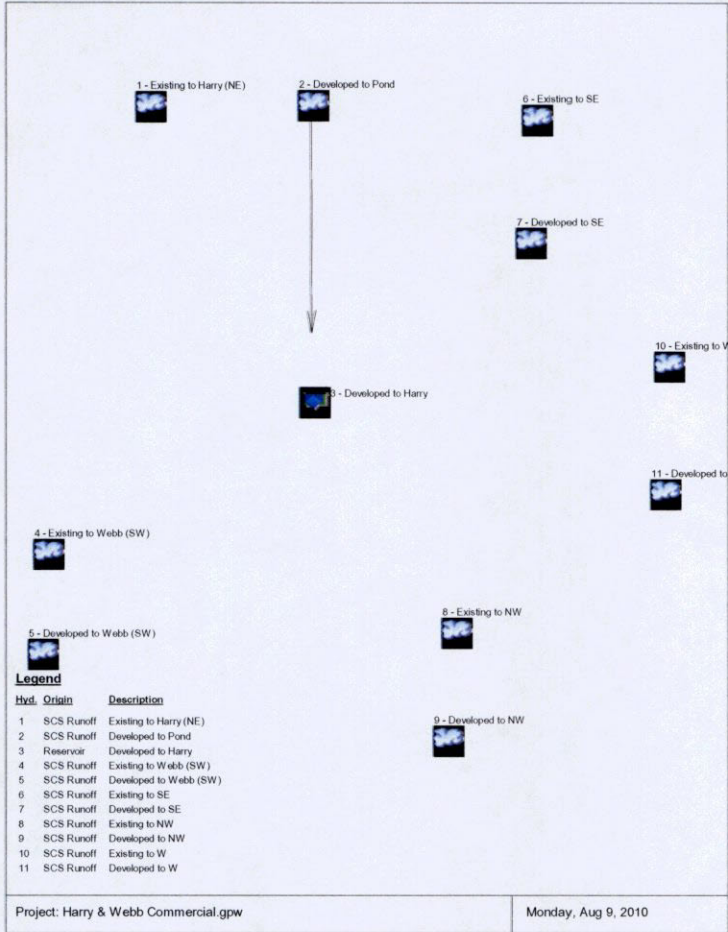
Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

HydraFlow Hydrographs
Site Flow & Pond Routing

Watershed Model Schematic

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



Hydrograph Return Period Recap

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

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	SCS Runoff	----	5.517	----	11.15	16.31	24.74	30.49	36.89	Existing to Harry (NE)	
2	SCS Runoff	----	15.83	----	24.09	31.17	42.47	50.12	58.65	Developed to Pond	
3	Reservoir	2	6.527	----	9.003	10.58	12.31	13.27	14.29	Developed to Harry	
4	SCS Runoff	----	0.883	----	1.784	2.610	3.959	4.878	5.902	Existing to Webb (SW)	
5	SCS Runoff	----	1.583	----	2.409	3.117	4.247	5.012	5.865	Developed to Webb (SW)	
6	SCS Runoff	----	3.200	----	6.467	9.460	14.35	17.68	21.40	Existing to SE	
7	SCS Runoff	----	2.207	----	4.460	6.524	9.897	12.19	14.76	Developed to SE	
8	SCS Runoff	----	0.441	----	0.892	1.305	1.979	2.430	2.951	Existing to NW	
9	SCS Runoff	----	0.362	----	0.551	0.713	0.971	1.146	1.341	Developed to NW	
10	SCS Runoff	----	1.103	----	2.230	3.262	4.949	6.097	7.378	Existing to W	
11	SCS Runoff	----	0.221	----	0.446	0.652	0.990	1.219	1.476	Developed to W	

Proj. file: Harry & Webb Commercial.gpw Monday, Aug 9, 2010

Hydrograph Summary Report

Hydralflow 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 (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	5.517	2	722	15,725	----	----	----	Existing to Harry (NE)
2	SCS Runoff	15.83	2	722	48,874	----	----	----	Developed to Pond
3	Reservoir	6.527	2	734	48,850	2	1353.34	16,158	Developed to Harry
4	SCS Runoff	0.883	2	722	2,516	----	----	----	Existing to Webb (SW)
5	SCS Runoff	1.583	2	722	4,887	----	----	----	Developed to Webb (SW)
6	SCS Runoff	3.200	2	722	9,120	----	----	----	Existing to SE
7	SCS Runoff	2.207	2	722	6,290	----	----	----	Developed to SE
8	SCS Runoff	0.441	2	722	1,258	----	----	----	Existing to NW
9	SCS Runoff	0.362	2	722	1,117	----	----	----	Developed to NW
10	SCS Runoff	1.103	2	722	3,145	----	----	----	Existing to W
11	SCS Runoff	0.221	2	722	629	----	----	----	Developed to W

Harry & Webb Commercial.gpw Return Period: 2 Year Monday, Aug 9, 2010

Hydrograph Report

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

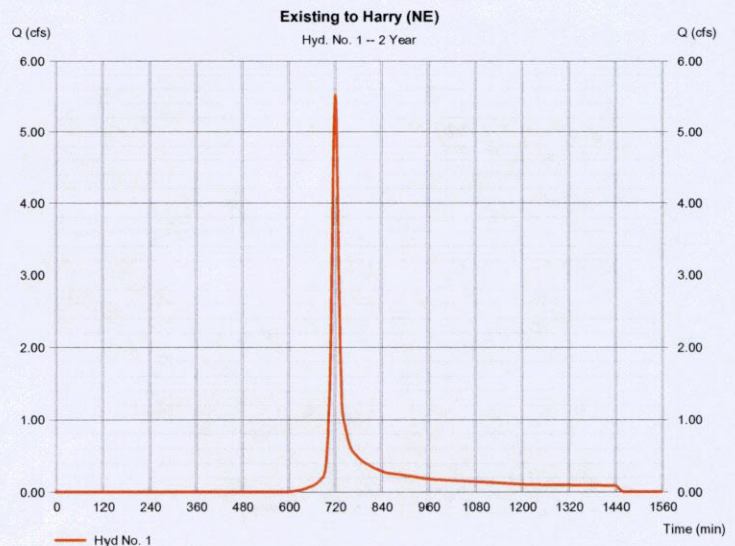
Monday, Aug 9, 2010

Hyd. No. 1

Existing to Harry (NE)

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 5,000 ac
 Basin Slope = 1.8 %
 Tc method = LAG
 Total precip. = 2.20 in
 Storm duration = 24 hrs

Peak discharge = 5.517 cfs
 Time to peak = 722 min
 Hyd. volume = 15,725 cuft
 Curve number = 84
 Hydraulic length = 750 ft
 Time of conc. (Tc) = 16.55 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

Hyd. No. 2

Developed to Pond

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 7.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 2.20 in
 Storm duration = 24 hrs

Peak discharge = 15.83 cfs
 Time to peak = 722 min
 Hyd. volume = 48,874 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484

Hydrograph Report

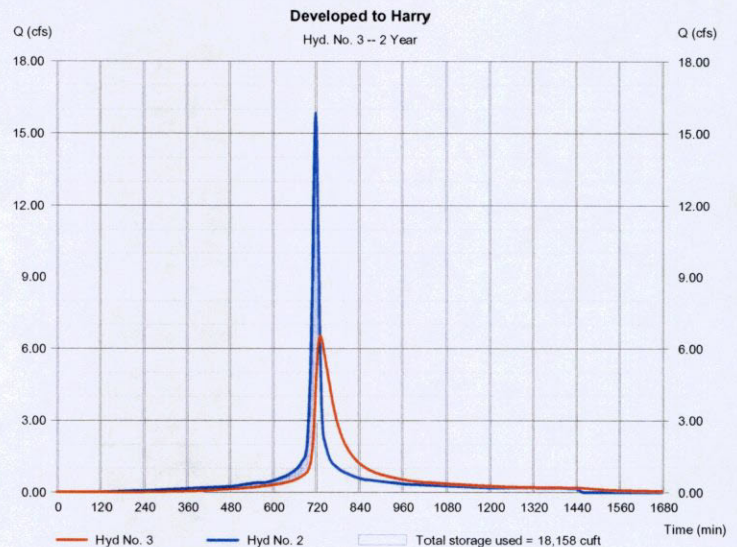
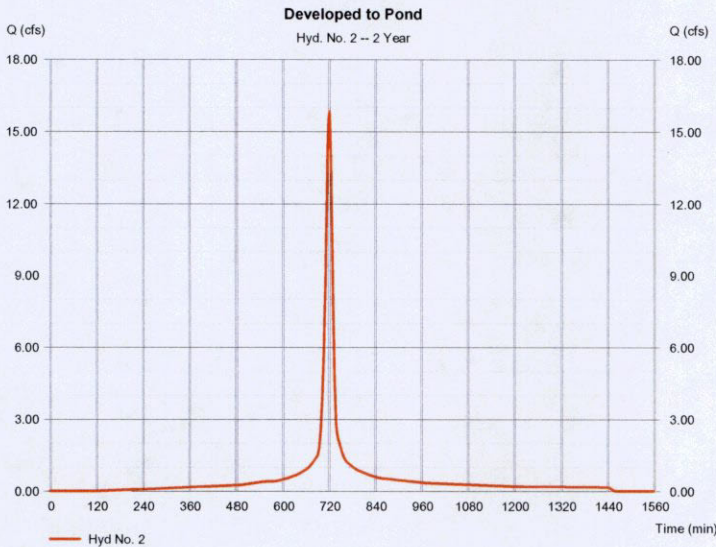
Hyd. No. 3

Developed to Harry

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - Developed to Pond
 Reservoir name = NE Detention

Peak discharge = 6,527 cfs
 Time to peak = 734 min
 Hyd. volume = 48,850 cuft
 Max. Elevation = 1353.34 ft
 Max. Storage = 18,158 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - NE Detention

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 1352.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1352.00	12,000	0	0
1.00	1353.00	14,000	12,986	12,986
2.00	1354.00	16,900	15,426	28,412
3.00	1355.00	19,000	17,938	46,350
4.00	1356.00	21,500	20,235	66,585
5.00	1357.00	25,000	23,226	89,811

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrFRsr]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	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)	= 125.00	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)	= 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 flows checked for orifice conditions (ic) and submergence (o).

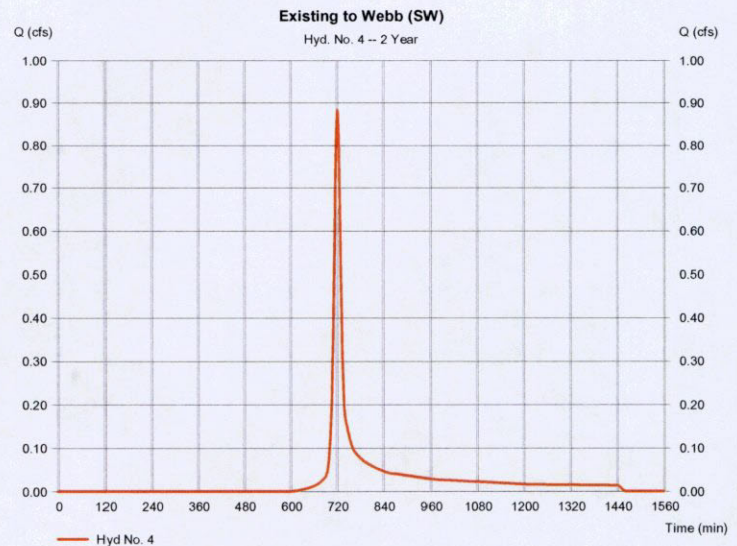
Hydrograph Report

Hyd. No. 4

Existing to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.800 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 2.20 in
 Storm duration = 24 hrs

Peak discharge = 0.883 cfs
 Time to peak = 722 min
 Hyd. volume = 2,516 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

9

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

Monday, Aug 9, 2010

Hyd. No. 5

Developed to Webb (SW)

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 0.700 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 2.20 in
Storm duration = 24 hrs

Peak discharge = 1.583 cfs
Time to peak = 722 min
Hyd. volume = 4,887 cuft
Curve number = 98*
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484

* Composite (Area/CN) = [(0.200 x 84) + (0.500 x 98)] / 0.700

Hydrograph Report

10

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

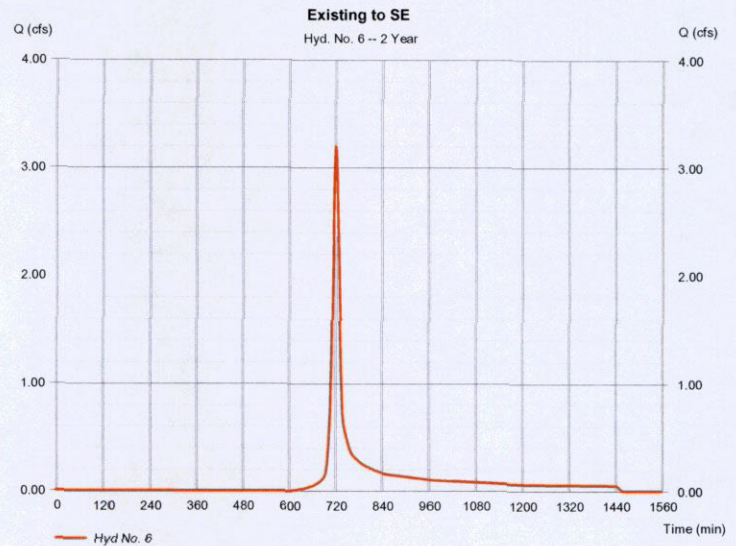
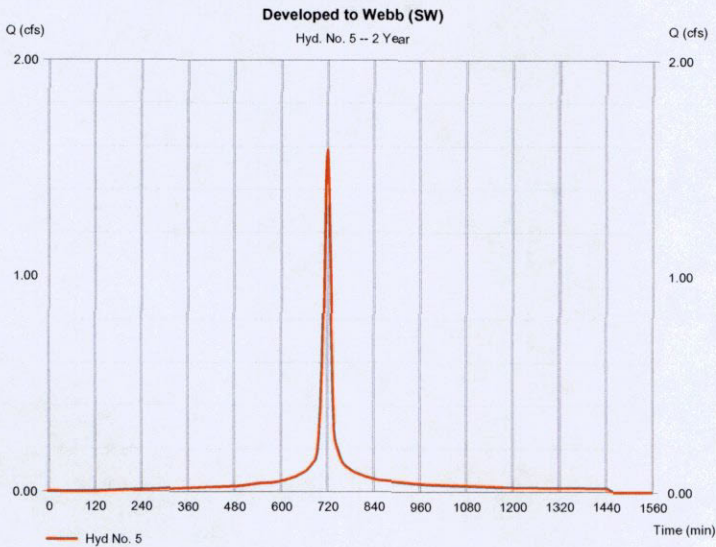
Monday, Aug 9, 2010

Hyd. No. 6

Existing to SE

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 2.900 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 2.20 in
Storm duration = 24 hrs

Peak discharge = 3.200 cfs
Time to peak = 722 min
Hyd. volume = 9,120 cuft
Curve number = 84
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

11

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

Monday, Aug 9, 2010

Hyd. No. 7

Developed to SE

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 2.000 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 2.20 in
Storm duration = 24 hrs

Peak discharge = 2.207 cfs
Time to peak = 722 min
Hyd. volume = 6,290 cuft
Curve number = 84
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484

Hydrograph Report

12

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

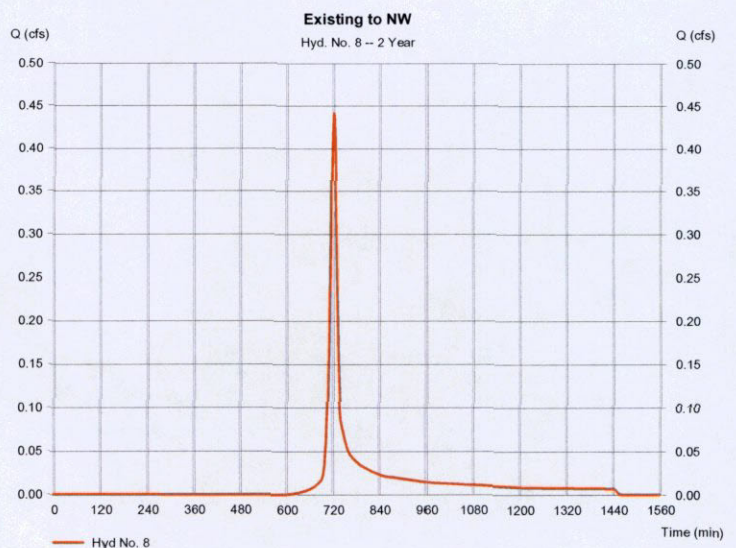
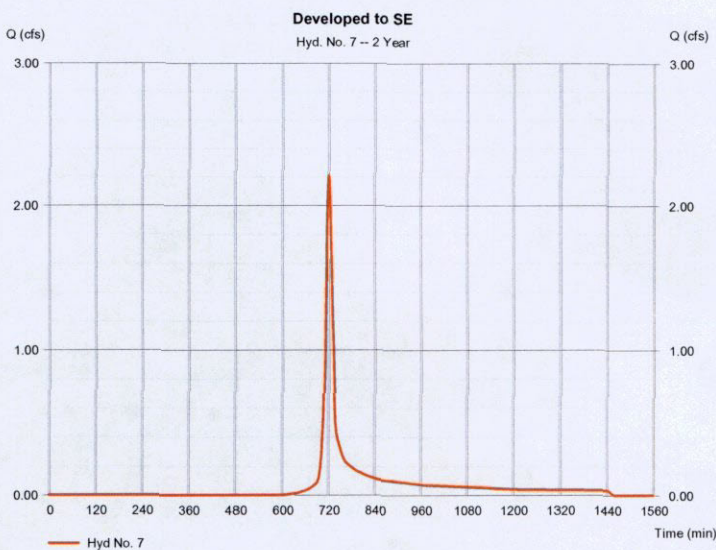
Monday, Aug 9, 2010

Hyd. No. 8

Existing to NW

Hydrograph type = SCS Runoff
Storm frequency = 2 yrs
Time interval = 2 min
Drainage area = 0.400 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 2.20 in
Storm duration = 24 hrs

Peak discharge = 0.441 cfs
Time to peak = 722 min
Hyd. volume = 1,258 cuft
Curve number = 84
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

13

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.096

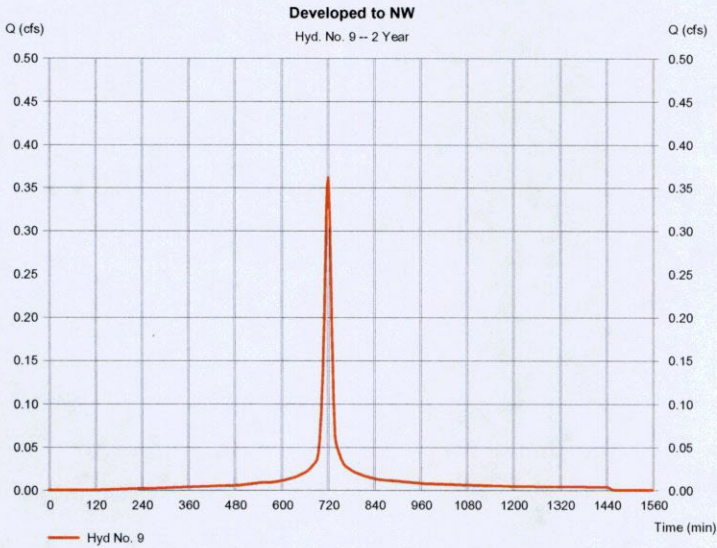
Monday, Aug 9, 2010

Hyd. No. 9

Developed to NW

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.160 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 2.20 in
 Storm duration = 24 hrs

Peak discharge = 0.362 cfs
 Time to peak = 722 min
 Hyd. volume = 1,117 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

14

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.096

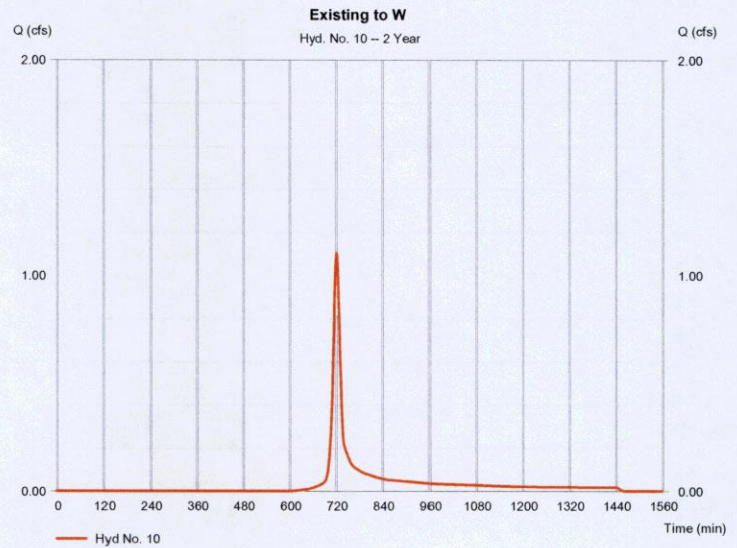
Monday, Aug 9, 2010

Hyd. No. 10

Existing to W

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 1.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 2.20 in
 Storm duration = 24 hrs

Peak discharge = 1.103 cfs
 Time to peak = 722 min
 Hyd. volume = 3,145 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

15

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.096

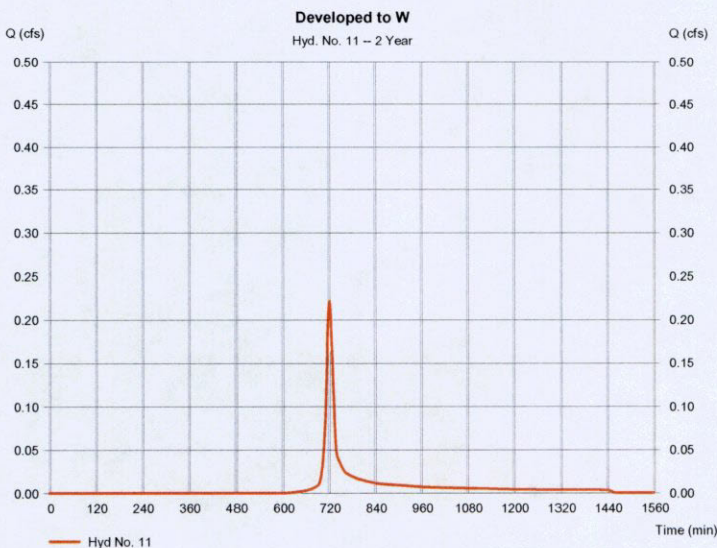
Monday, Aug 9, 2010

Hyd. No. 11

Developed to W

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 0.200 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 2.20 in
 Storm duration = 24 hrs

Peak discharge = 0.221 cfs
 Time to peak = 722 min
 Hyd. volume = 629 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

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Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.096

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	11.15	2	722	31,259	---	---	---	Existing to Harry (NE)
2	SCS Runoff	24.09	2	722	75,987	---	---	---	Developed to Pond
3	Reservoir	9.093	2	734	75,964	2	1353.89	20,758	Existing to Harry
4	SCS Runoff	1.784	2	722	5,001	---	---	---	Existing to Webb (SW)
5	SCS Runoff	2.409	2	722	7,599	---	---	---	Developed to Webb (SW)
6	SCS Runoff	6.467	2	722	18,130	---	---	---	Existing to SE
7	SCS Runoff	4.460	2	722	12,504	---	---	---	Developed to SE
8	SCS Runoff	0.892	2	722	2,501	---	---	---	Existing to NW
9	SCS Runoff	0.551	2	722	1,737	---	---	---	Developed to NW
10	SCS Runoff	2.230	2	722	6,252	---	---	---	Existing to W
11	SCS Runoff	0.446	2	722	1,250	---	---	---	Developed to W

Harry & Webb Commercial.gpw

Return Period: 5 Year

Monday, Aug 9, 2010

Hydrograph Report

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

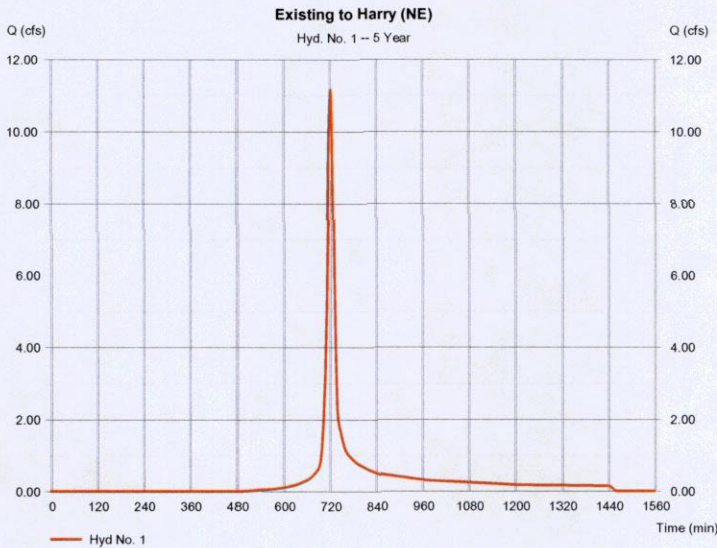
Monday, Aug 9, 2010

Hyd. No. 1

Existing to Harry (NE)

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 5.000 ac
 Basin Slope = 1.8 %
 Tc method = LAG
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 11.15 cfs
 Time to peak = 722 min
 Hyd. volume = 31,259 cuft
 Curve number = 84
 Hydraulic length = 750 ft
 Time of conc. (Tc) = 16.55 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

18

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

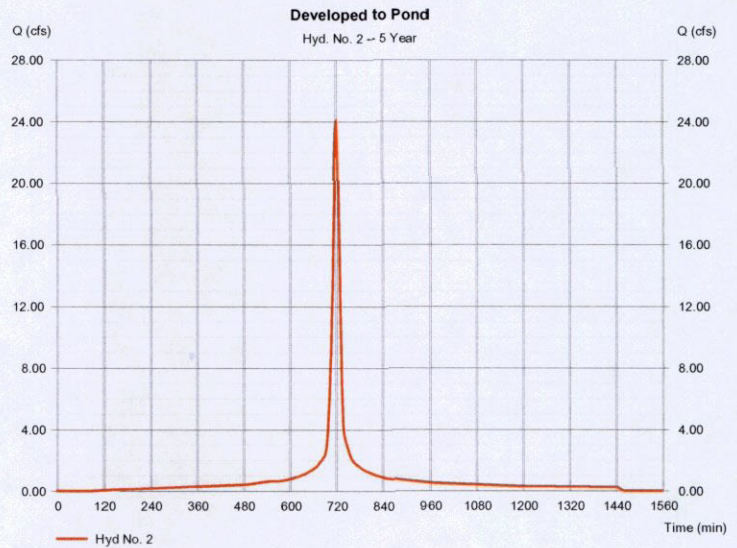
Monday, Aug 9, 2010

Hyd. No. 2

Developed to Pond

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 7.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 24.09 cfs
 Time to peak = 722 min
 Hyd. volume = 75,987 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

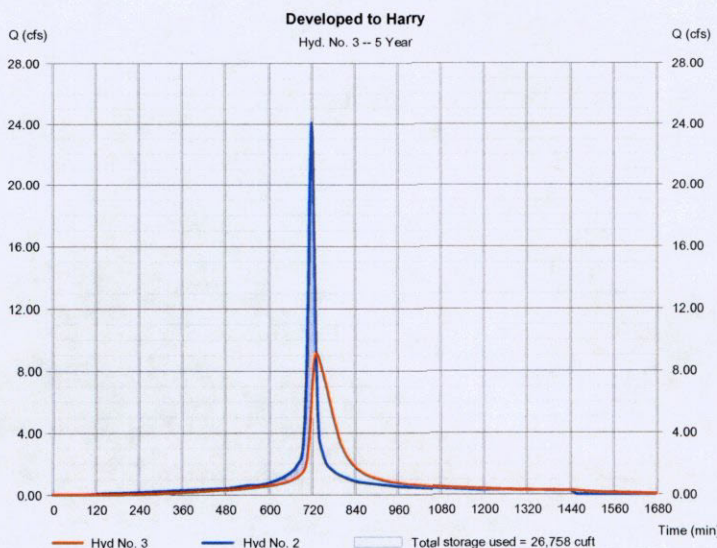
Hyd. No. 3

Developed to Harry

Hydrograph type = Reservoir
 Storm frequency = 5 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - Developed to Pond
 Reservoir name = NE Detention

Peak discharge = 9.093 cfs
 Time to peak = 734 min
 Hyd. volume = 75,964 cuft
 Max. Elevation = 1353.89 ft
 Max. Storage = 26,758 cuft

Storage Indication method used.



Hydrograph Report

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

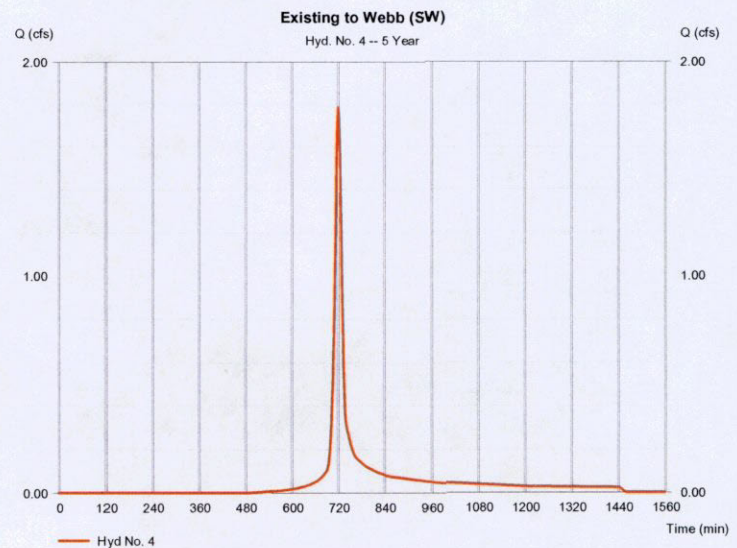
Monday, Aug 9, 2010

Hyd. No. 4

Existing to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 0.800 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 1.784 cfs
 Time to peak = 722 min
 Hyd. volume = 5,001 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

Monday, Aug 9, 2010

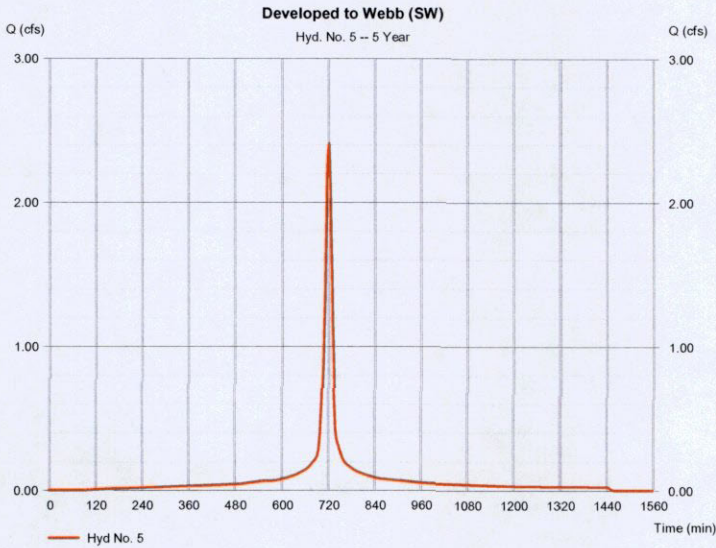
Hyd. No. 5

Developed to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 0.700 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 2.409 cfs
 Time to peak = 722 min
 Hyd. volume = 7,599 cuft
 Curve number = 98*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.200 x 84) + (0.500 x 98)] / 0.700



Hydrograph Report

22

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

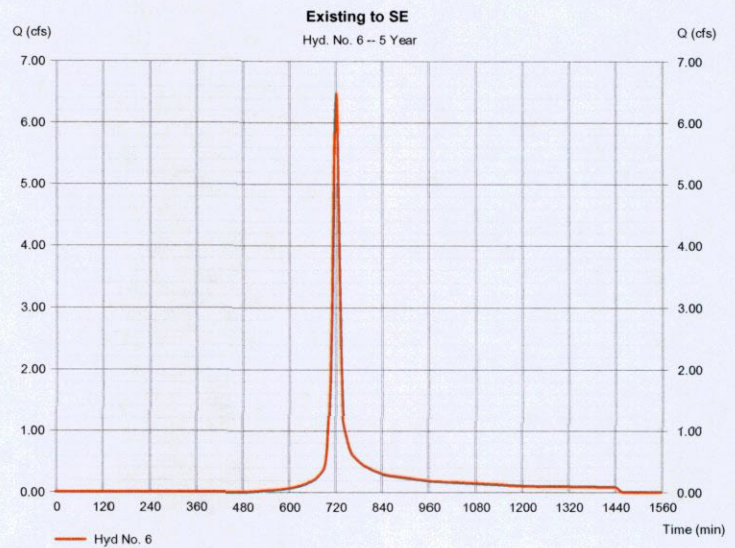
Monday, Aug 9, 2010

Hyd. No. 6

Existing to SE

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 2.900 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 6.467 cfs
 Time to peak = 722 min
 Hyd. volume = 18,130 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

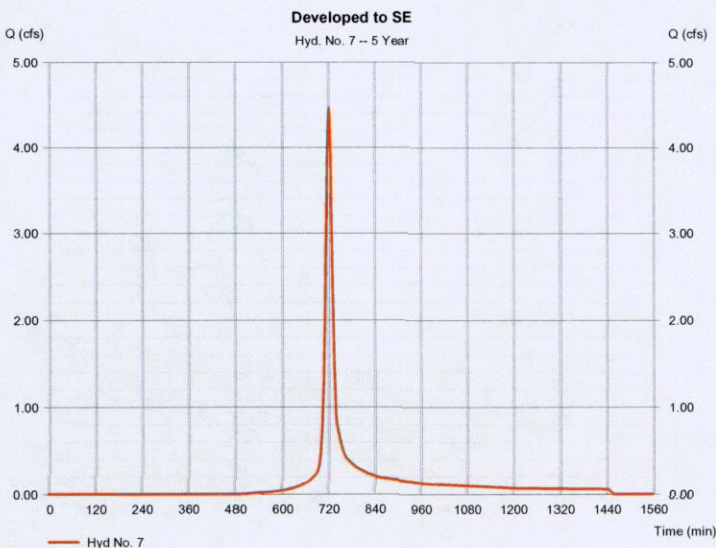
Monday, Aug 9, 2010

Hyd. No. 7

Developed to SE

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 2.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 4.460 cfs
 Time to peak = 722 min
 Hyd. volume = 12,504 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

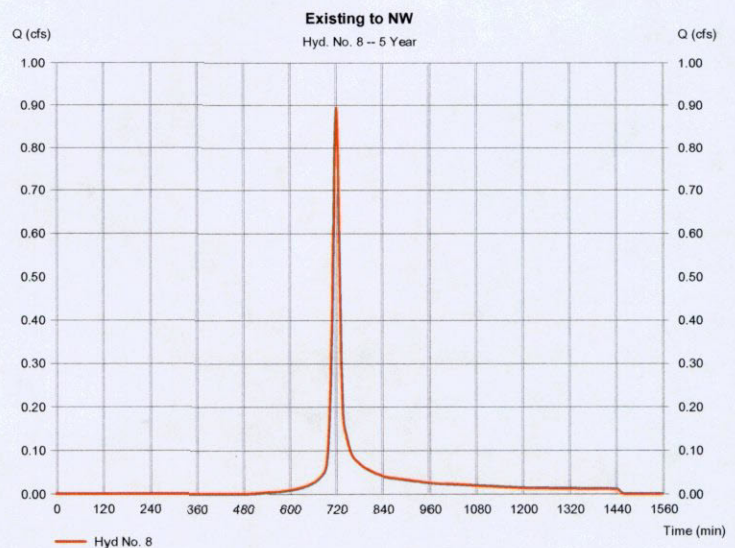
Monday, Aug 9, 2010

Hyd. No. 8

Existing to NW

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 0.400 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 0.892 cfs
 Time to peak = 722 min
 Hyd. volume = 2,501 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

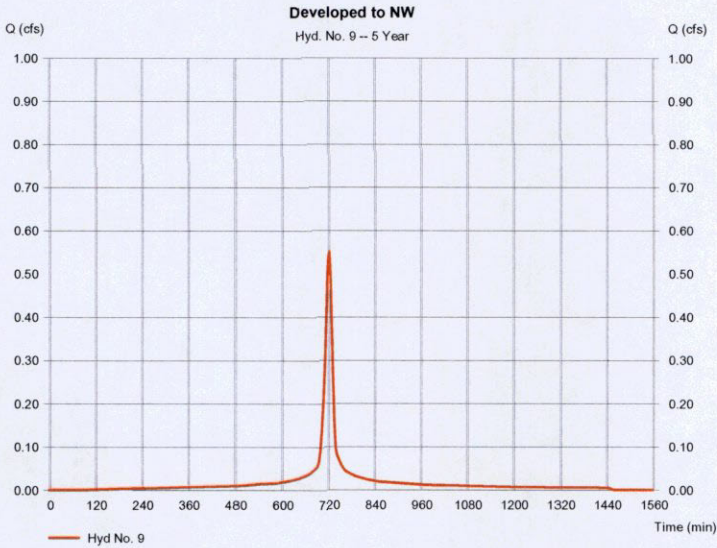
Monday, Aug 9, 2010

Hyd. No. 9

Developed to NW

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 0.160 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 0.551 cfs
 Time to peak = 722 min
 Hyd. volume = 1,737 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

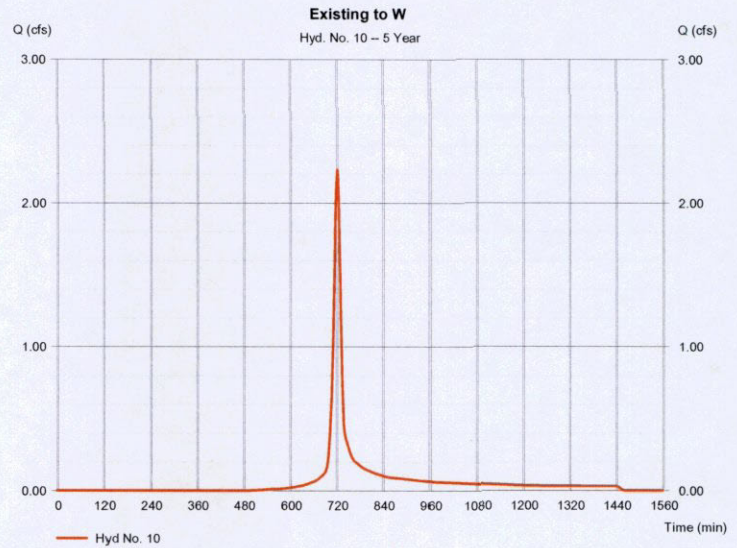
Monday, Aug 9, 2010

Hyd. No. 10

Existing to W

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 1.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 2.230 cfs
 Time to peak = 722 min
 Hyd. volume = 6,252 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

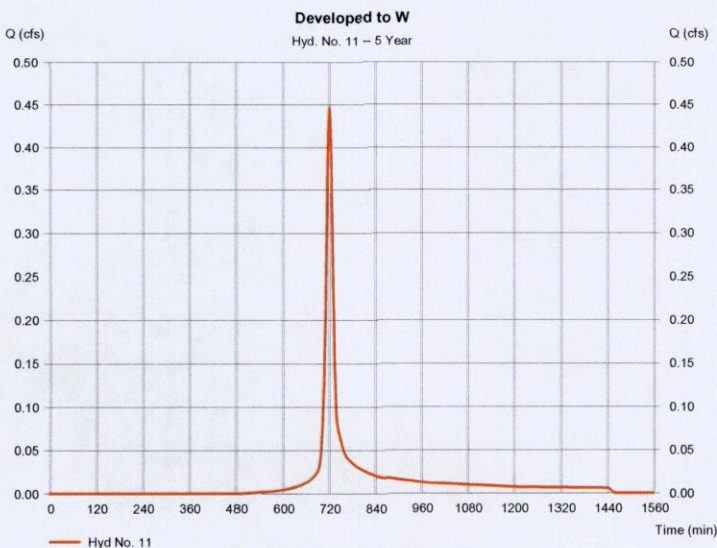
Monday, Aug 9, 2010

Hyd. No. 11

Developed to W

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 2 min
 Drainage area = 0.200 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 3.30 in
 Storm duration = 24 hrs

Peak discharge = 0.446 cfs
 Time to peak = 722 min
 Hyd. volume = 1,250 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

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Hydroflow 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 (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	16.31	2	722	45,880	---	---	---	Existing to Harry (NE)
2	SCS Runoff	31.17	2	722	99,459	---	---	---	Developed to Pond
3	Reservoir	10.58	2	736	99,435	2	1354.35	34,564	Developed to Harry
4	SCS Runoff	2.610	2	722	7,341	---	---	---	Existing to Webb (SW)
5	SCS Runoff	3.117	2	722	9,946	---	---	---	Developed to Webb (SW)
6	SCS Runoff	9.460	2	722	26,611	---	---	---	Existing to SE
7	SCS Runoff	6.524	2	722	18,352	---	---	---	Developed to SE
8	SCS Runoff	1.305	2	722	3,670	---	---	---	Existing to NW
9	SCS Runoff	0.713	2	722	2,273	---	---	---	Developed to NW
10	SCS Runoff	3.262	2	722	9,176	---	---	---	Existing to W
11	SCS Runoff	0.652	2	722	1,835	---	---	---	Developed to W

Harry & Webb Commercial.gpw

Return Period: 10 Year

Monday, Aug 9, 2010

Hydrograph Report

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

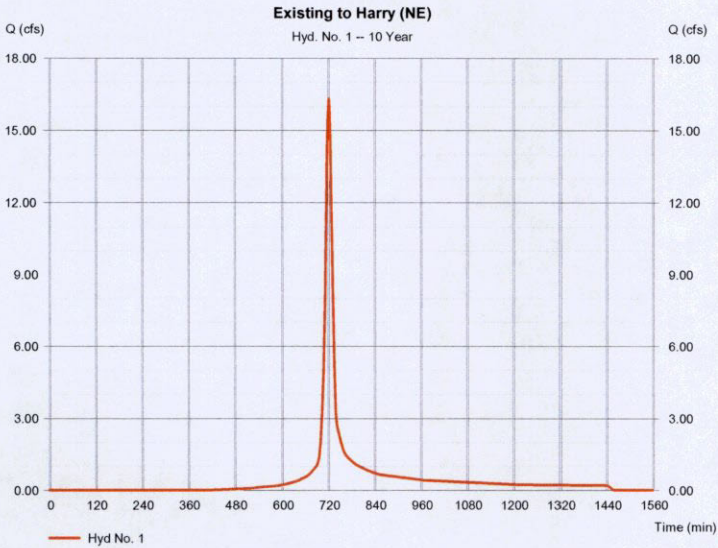
Monday, Aug 9, 2010

Hyd. No. 1

Existing to Harry (NE)

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 5.000 ac
 Basin Slope = 1.8 %
 Tc method = LAG
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 16.31 cfs
 Time to peak = 722 min
 Hyd. volume = 45,880 cuft
 Curve number = 84
 Hydraulic length = 750 ft
 Time of conc. (Tc) = 16.55 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

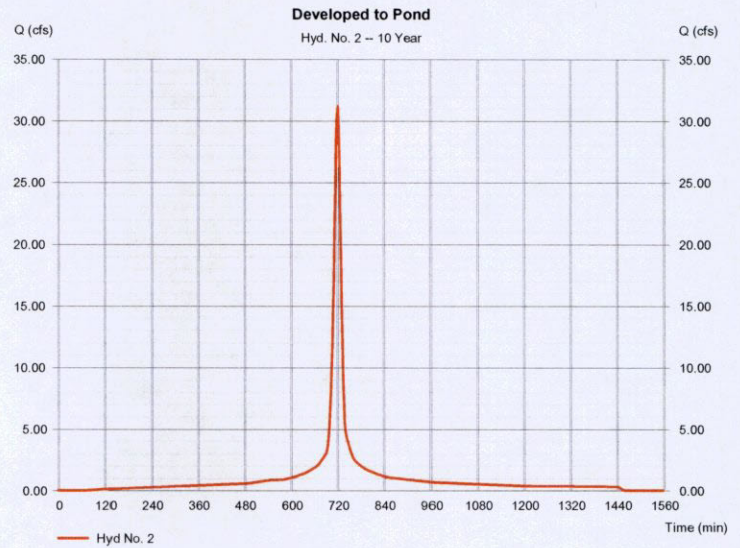
Monday, Aug 9, 2010

Hyd. No. 2

Developed to Pond

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 7.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 31.17 cfs
 Time to peak = 722 min
 Hyd. volume = 99,459 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

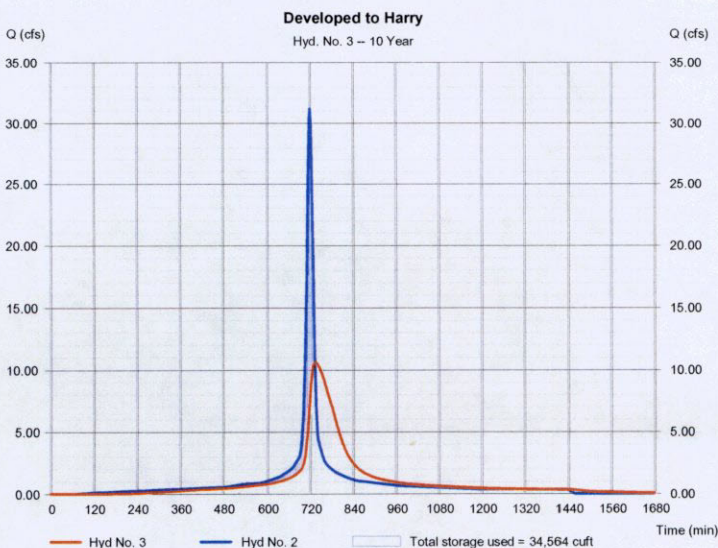
Hyd. No. 3

Developed to Harry

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - Developed to Pond
 Reservoir name = NE Detention

Peak discharge = 10.58 cfs
 Time to peak = 736 min
 Hyd. volume = 99,435 cuft
 Max. Elevation = 1354.35 ft
 Max. Storage = 34,564 cuft

Storage Indication method used.



Hydrograph Report

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

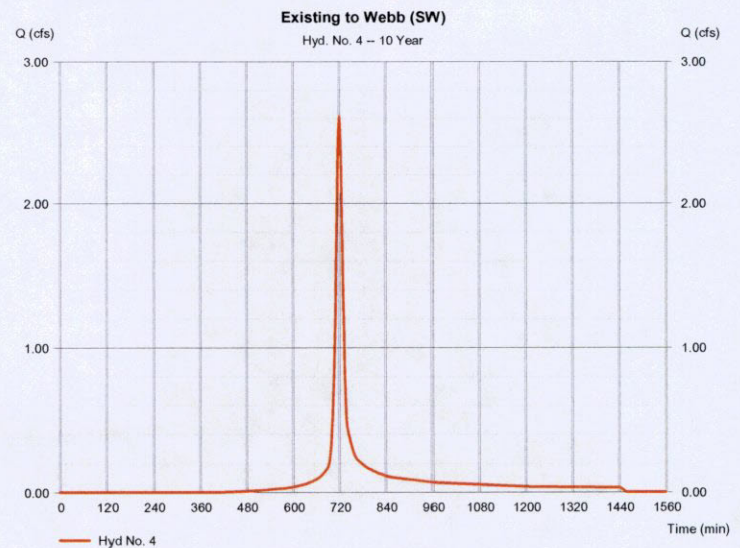
Monday, Aug 9, 2010

Hyd. No. 4

Existing to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 0.800 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 2.610 cfs
 Time to peak = 722 min
 Hyd. volume = 7,341 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

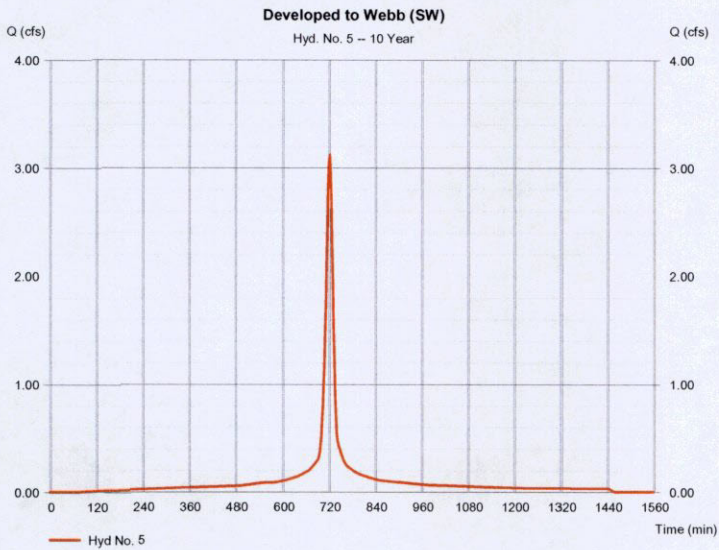
Hyd. No. 5

Developed to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 0.700 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 3.117 cfs
 Time to peak = 722 min
 Hyd. volume = 9,946 cuft
 Curve number = 98*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.200 x 94) + (0.500 x 98)] / 0.700



Hydrograph Report

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

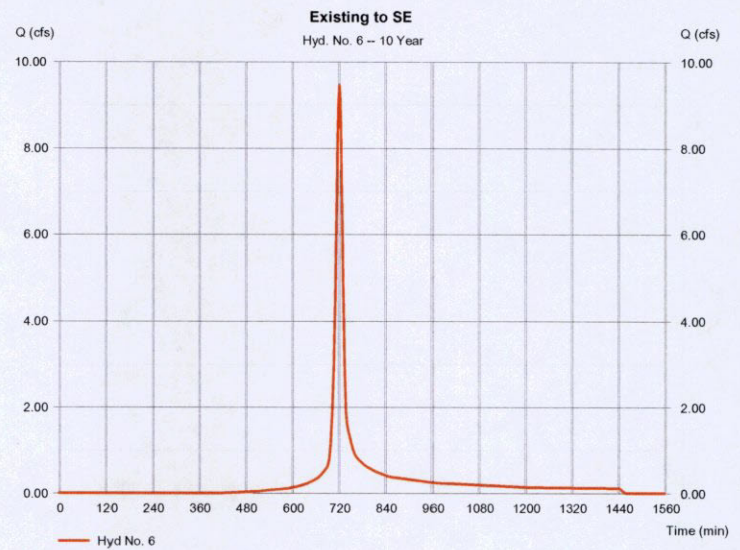
Monday, Aug 9, 2010

Hyd. No. 6

Existing to SE

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 2.900 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 9.460 cfs
 Time to peak = 722 min
 Hyd. volume = 26,611 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

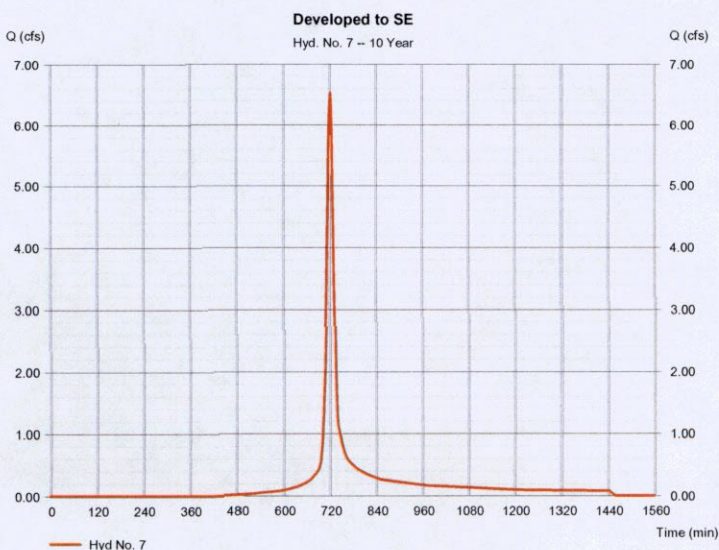
Monday, Aug 9, 2010

Hyd. No. 7

Developed to SE

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 2.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 6.524 cfs
 Time to peak = 722 min
 Hyd. volume = 18,352 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

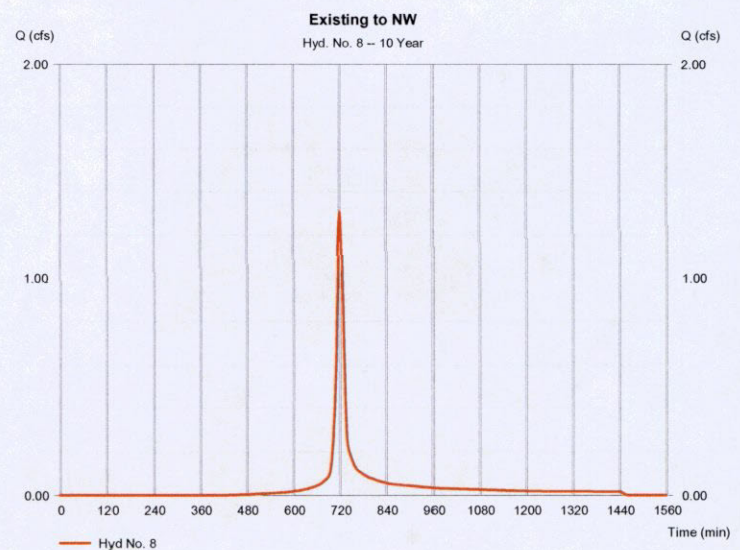
Monday, Aug 9, 2010

Hyd. No. 8

Existing to NW

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 0.400 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 1.305 cfs
 Time to peak = 722 min
 Hyd. volume = 3,670 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydroflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.000

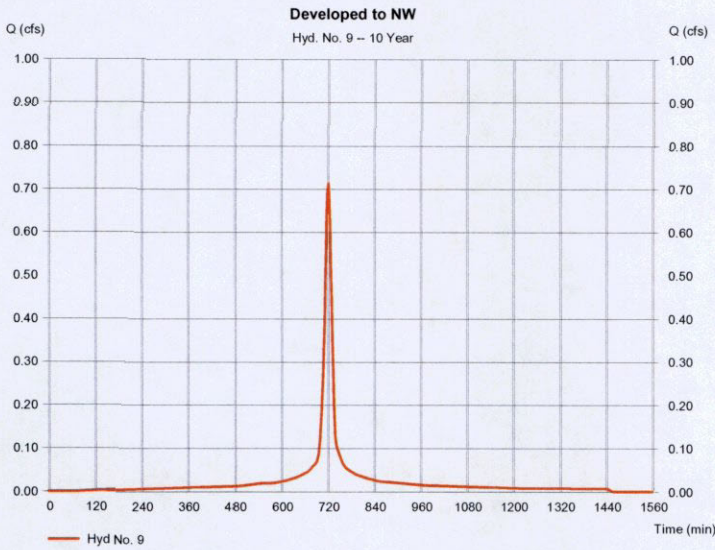
Monday, Aug 9, 2010

Hyd. No. 9

Developed to NW

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 0.160 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 0.713 cfs
 Time to peak = 722 min
 Hyd. volume = 2,273 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydroflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.000

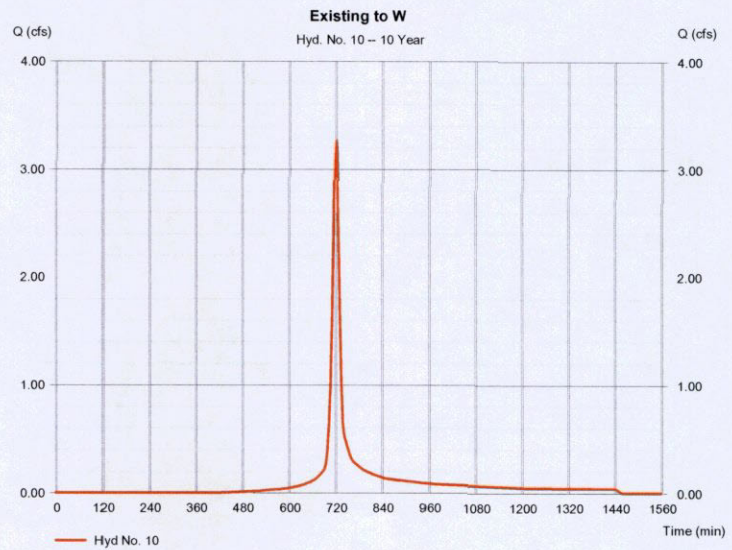
Monday, Aug 9, 2010

Hyd. No. 10

Existing to W

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 1.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 3.262 cfs
 Time to peak = 722 min
 Hyd. volume = 9,176 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydroflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.000

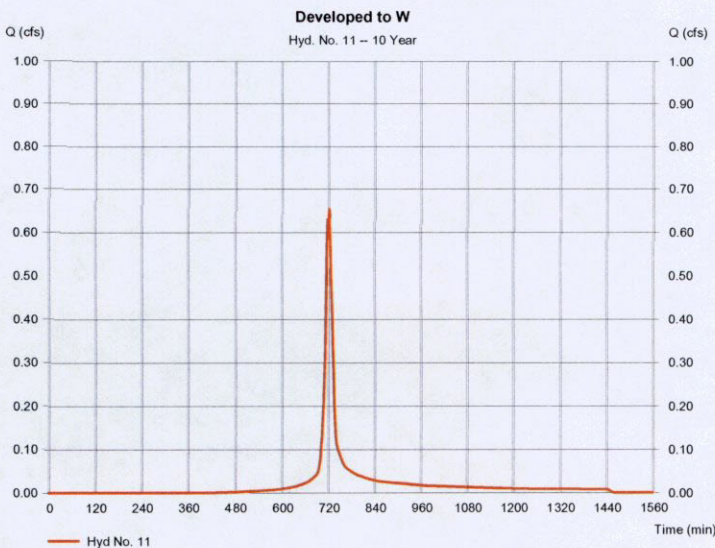
Monday, Aug 9, 2010

Hyd. No. 11

Developed to W

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 0.200 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 4.25 in
 Storm duration = 24 hrs

Peak discharge = 0.652 cfs
 Time to peak = 722 min
 Hyd. volume = 1,835 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

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Hydroflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.000

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	24.74	2	722	70,461	---	---	---	Existing to Harry (NE)
2	SCS Runoff	42.47	2	722	137,057	---	---	---	Developed to Pond
3	Reservoir	12.31	2	736	137,033	2	1355.08	47,980	Developed to Harry
4	SCS Runoff	3.959	2	722	11,274	---	---	---	Existing to Webb (SW)
5	SCS Runoff	4.247	2	722	13,706	---	---	---	Developed to Webb (SW)
6	SCS Runoff	14.35	2	722	40,868	---	---	---	Existing to SE
7	SCS Runoff	9.897	2	722	28,185	---	---	---	Developed to SE
8	SCS Runoff	1.979	2	722	5,637	---	---	---	Existing to NW
9	SCS Runoff	0.971	2	722	3,133	---	---	---	Developed to NW
10	SCS Runoff	4.949	2	722	14,052	---	---	---	Existing to W
11	SCS Runoff	0.990	2	722	2,818	---	---	---	Developed to W

Harry & Webb Commercial.gpw

Return Period: 25 Year

Monday, Aug 9, 2010

Hydrograph Report

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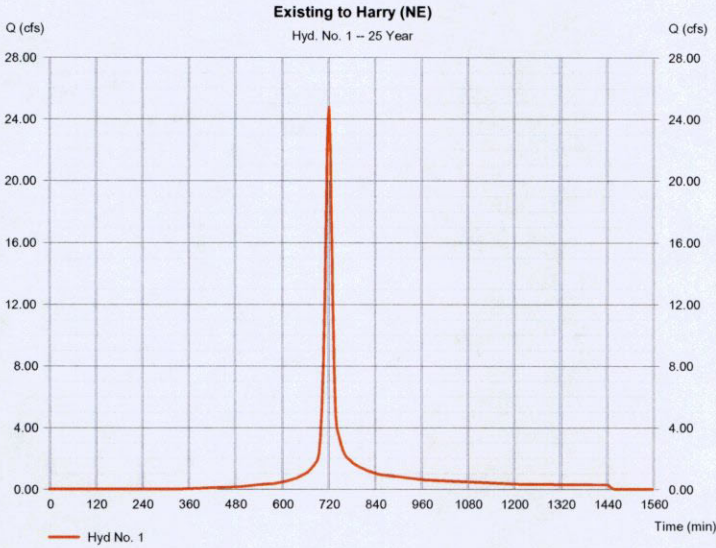
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Monday, Aug 9, 2010

Hyd. No. 1

Existing to Harry (NE)

Hydrograph type = SCS Runoff	Peak discharge = 24.74 cfs
Storm frequency = 25 yrs	Time to peak = 722 min
Time interval = 2 min	Hyd. volume = 70,461 cuft
Drainage area = 5.000 ac	Curve number = 84
Basin Slope = 1.8 %	Hydraulic length = 750 ft
Tc method = LAG	Time of conc. (Tc) = 16.55 min
Total precip. = 5.77 in	Distribution = Type II
Storm duration = 24 hrs	Shape factor = 484



Hydrograph Report

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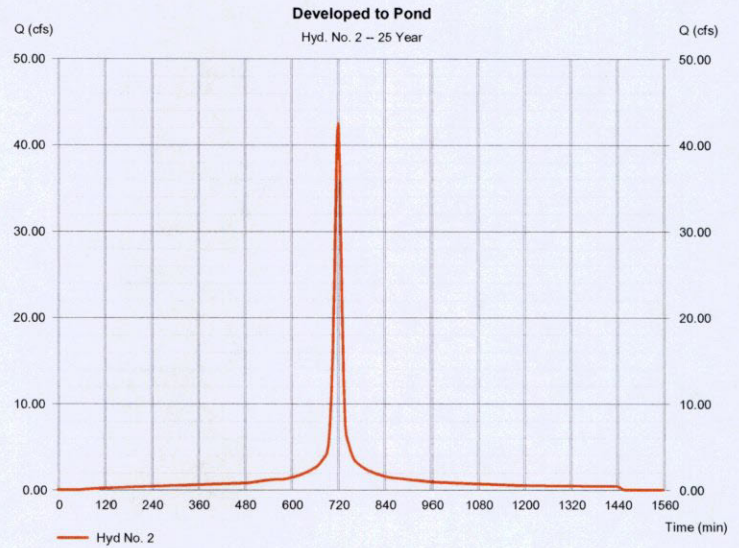
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Monday, Aug 9, 2010

Hyd. No. 2

Developed to Pond

Hydrograph type = SCS Runoff	Peak discharge = 42.47 cfs
Storm frequency = 25 yrs	Time to peak = 722 min
Time interval = 2 min	Hyd. volume = 137,057 cuft
Drainage area = 7.000 ac	Curve number = 98
Basin Slope = 0.0 %	Hydraulic length = 0 ft
Tc method = USER	Time of conc. (Tc) = 15.00 min
Total precip. = 5.77 in	Distribution = Type II
Storm duration = 24 hrs	Shape factor = 484



Hydrograph Report

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

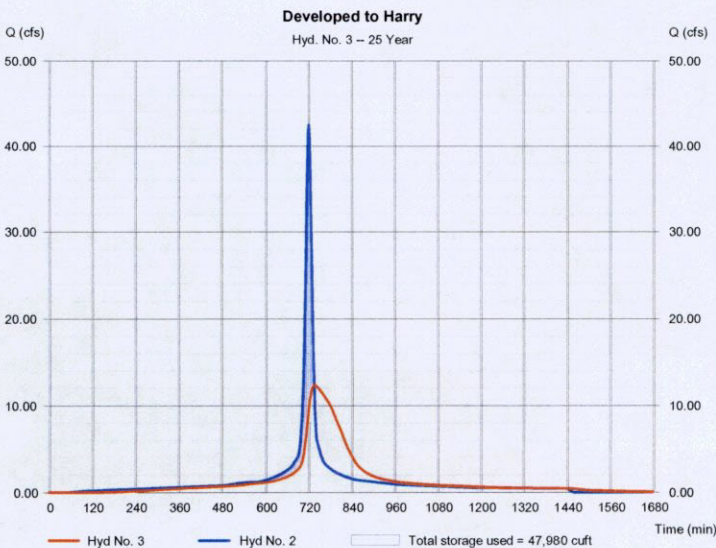
Monday, Aug 9, 2010

Hyd. No. 3

Developed to Harry

Hydrograph type = Reservoir	Peak discharge = 12.31 cfs
Storm frequency = 25 yrs	Time to peak = 736 min
Time interval = 2 min	Hyd. volume = 137,033 cuft
Inflow hyd. No. = 2 - Developed to Pond	Max. Elevation = 1355.08 ft
Reservoir name = NE Detention	Max. Storage = 47,980 cuft

Storage Indication method used.



Hydrograph Report

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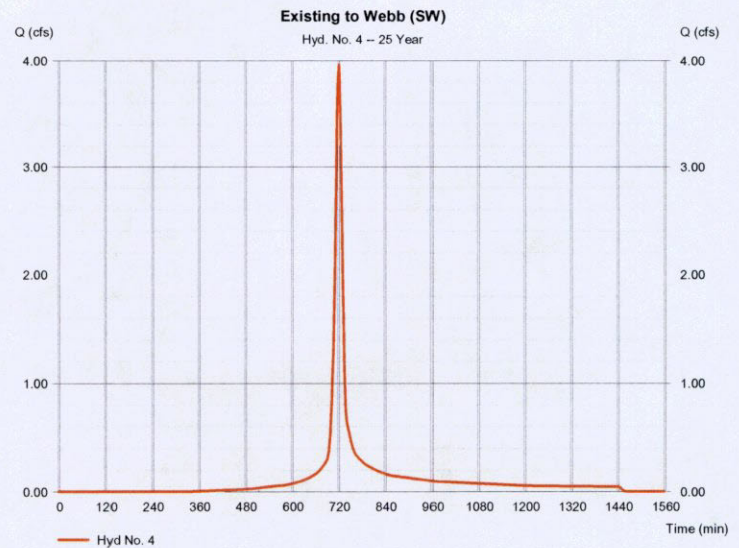
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Monday, Aug 9, 2010

Hyd. No. 4

Existing to Webb (SW)

Hydrograph type = SCS Runoff	Peak discharge = 3,959 cfs
Storm frequency = 25 yrs	Time to peak = 722 min
Time interval = 2 min	Hyd. volume = 11,274 cuft
Drainage area = 0.800 ac	Curve number = 84
Basin Slope = 0.0 %	Hydraulic length = 0 ft
Tc method = USER	Time of conc. (Tc) = 15.00 min
Total precip. = 5.77 in	Distribution = Type II
Storm duration = 24 hrs	Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

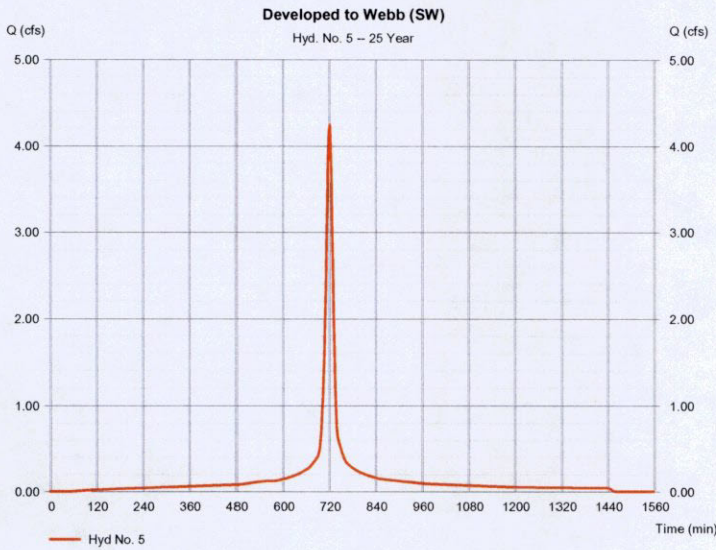
Hyd. No. 5

Developed to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 0.700 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 4.247 cfs
 Time to peak = 722 min
 Hyd. volume = 13,706 cuft
 Curve number = 98*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.200 x 84) + (0.500 x 98)] / 0.700



Hydrograph Report

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

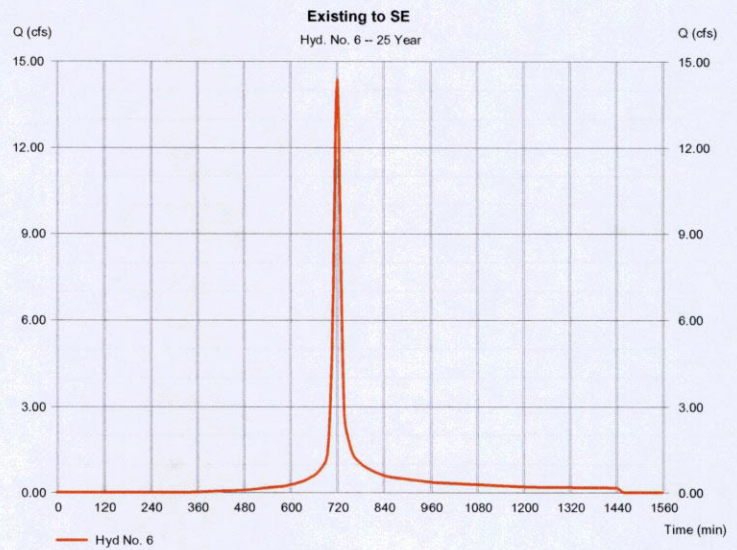
Monday, Aug 9, 2010

Hyd. No. 6

Existing to SE

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 2.900 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 14.35 cfs
 Time to peak = 722 min
 Hyd. volume = 40,868 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

47

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

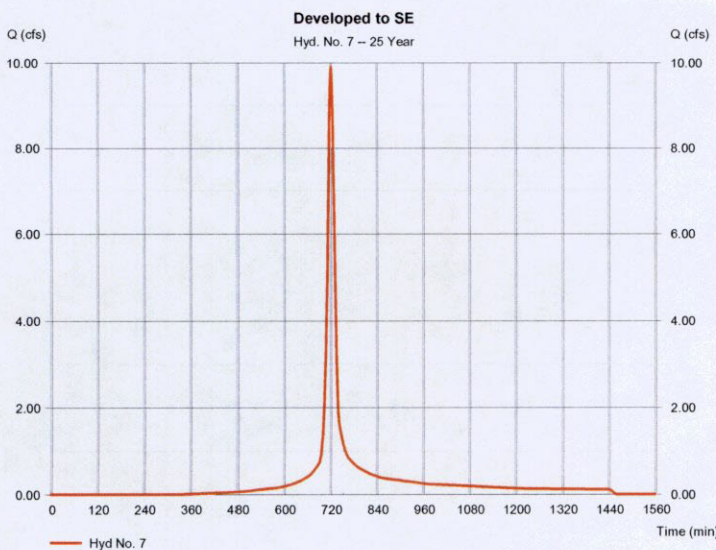
Monday, Aug 9, 2010

Hyd. No. 7

Developed to SE

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 2.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 9.897 cfs
 Time to peak = 722 min
 Hyd. volume = 28,185 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

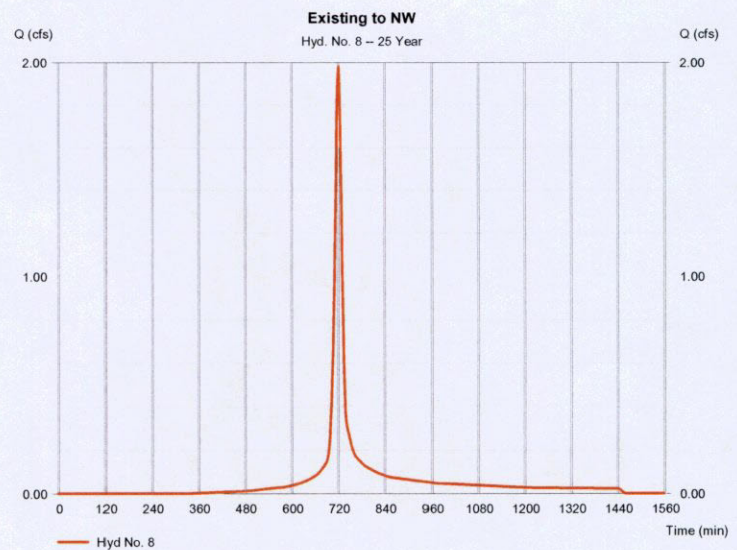
Monday, Aug 9, 2010

Hyd. No. 8

Existing to NW

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 0.400 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 1.979 cfs
 Time to peak = 722 min
 Hyd. volume = 5,637 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

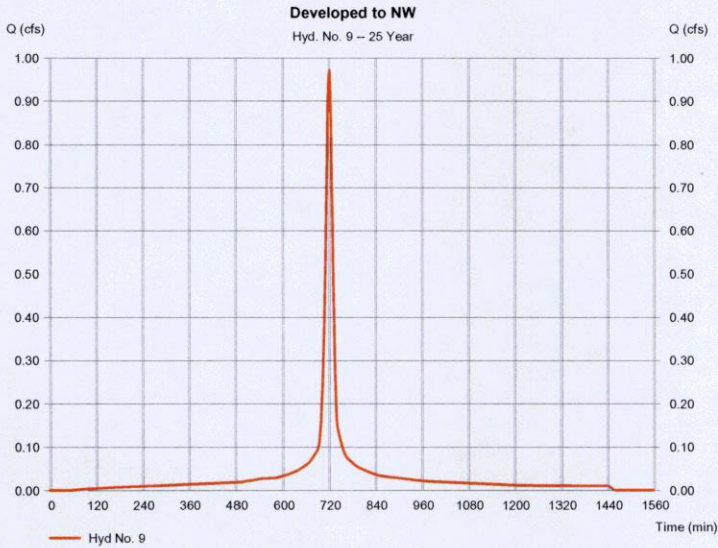
Monday, Aug 9, 2010

Hyd. No. 9

Developed to NW

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 0.160 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 0.971 cfs
 Time to peak = 722 min
 Hyd. volume = 3,133 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

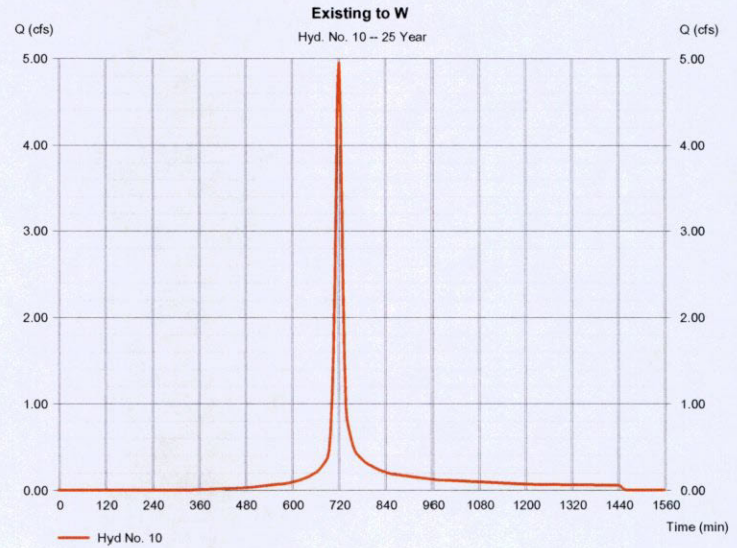
Monday, Aug 9, 2010

Hyd. No. 10

Existing to W

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 1.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 4.949 cfs
 Time to peak = 722 min
 Hyd. volume = 14,092 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

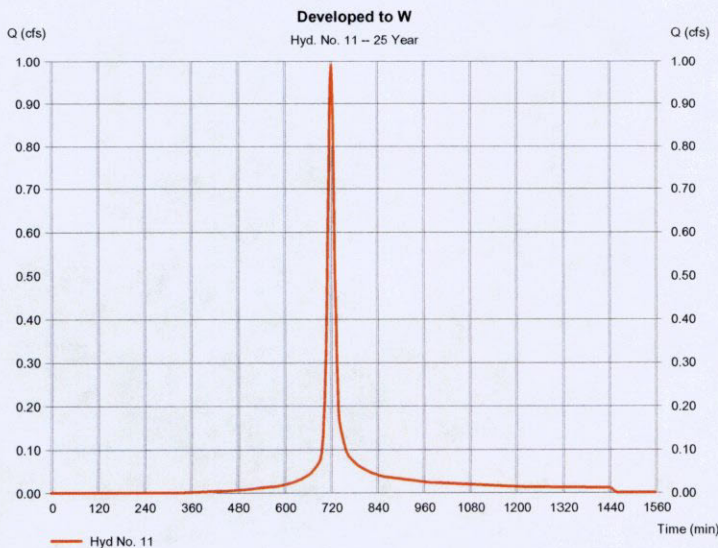
Monday, Aug 9, 2010

Hyd. No. 11

Developed to W

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 0.200 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 5.77 in
 Storm duration = 24 hrs

Peak discharge = 0.990 cfs
 Time to peak = 722 min
 Hyd. volume = 2,818 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

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Hydroflow 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 (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	30.49	2	722	87,599	---	---	---	Existing to Harry (NE)
2	SCS Runoff	50.12	2	722	162,549	---	---	---	Developed to Pond
3	Reservoir	13.27	2	736	162,525	2	1355.55	57,357	Developed to Harry
4	SCS Runoff	4.878	2	722	14,016	---	---	---	Existing to Webb (SW)
5	SCS Runoff	5.012	2	722	16,255	---	---	---	Developed to Webb (SW)
6	SCS Runoff	17.68	2	722	50,808	---	---	---	Existing to SE
7	SCS Runoff	12.19	2	722	35,040	---	---	---	Developed to SE
8	SCS Runoff	2.439	2	722	7,008	---	---	---	Existing to NW
9	SCS Runoff	1.146	2	722	3,715	---	---	---	Developed to NW
10	SCS Runoff	6.097	2	722	17,520	---	---	---	Existing to W
11	SCS Runoff	1.219	2	722	3,504	---	---	---	Developed to W

Hydrograph Report

53

Hydraulics Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

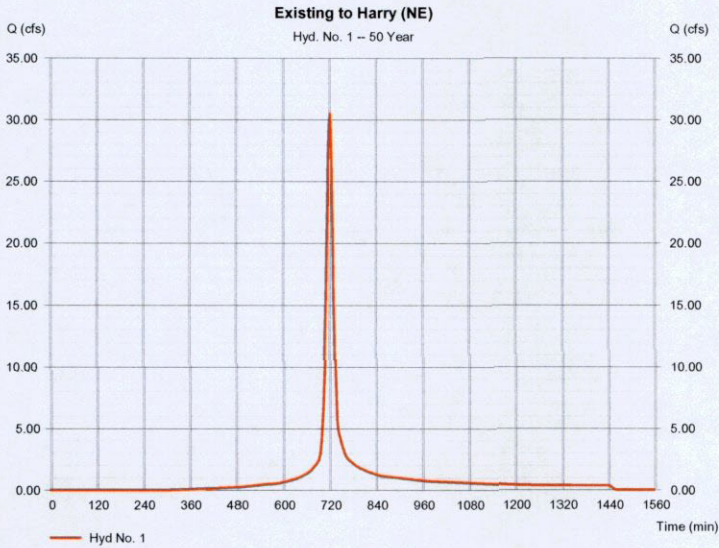
Monday, Aug 9, 2010

Hyd. No. 1

Existing to Harry (NE)

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 5.000 ac
 Basin Slope = 1.8 %
 Tc method = LAG
 Total precip. = 6.80 in
 Storm duration = 24 hrs

Peak discharge = 30.49 cfs
 Time to peak = 722 min
 Hyd. volume = 87,599 cuft
 Curve number = 84
 Hydraulic length = 750 ft
 Time of conc. (Tc) = 16.55 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

54

Hydraulics Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

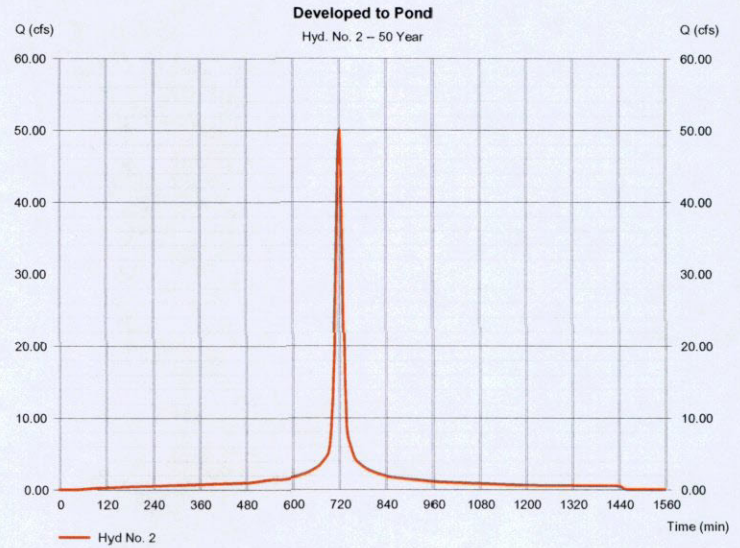
Monday, Aug 9, 2010

Hyd. No. 2

Developed to Pond

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 7.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 6.80 in
 Storm duration = 24 hrs

Peak discharge = 50.12 cfs
 Time to peak = 722 min
 Hyd. volume = 162,549 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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Hydraulics Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

Monday, Aug 9, 2010

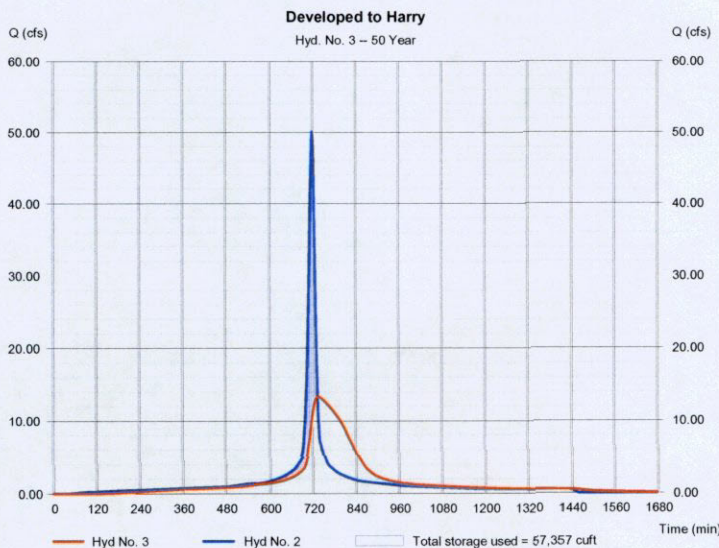
Hyd. No. 3

Developed to Harry

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - Developed to Pond
 Reservoir name = NE Detention

Peak discharge = 13.27 cfs
 Time to peak = 736 min
 Hyd. volume = 162,525 cuft
 Max. Elevation = 1355.55 ft
 Max. Storage = 57,357 cuft

Storage Indication method used.



Hydrograph Report

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Hydraulics Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.006

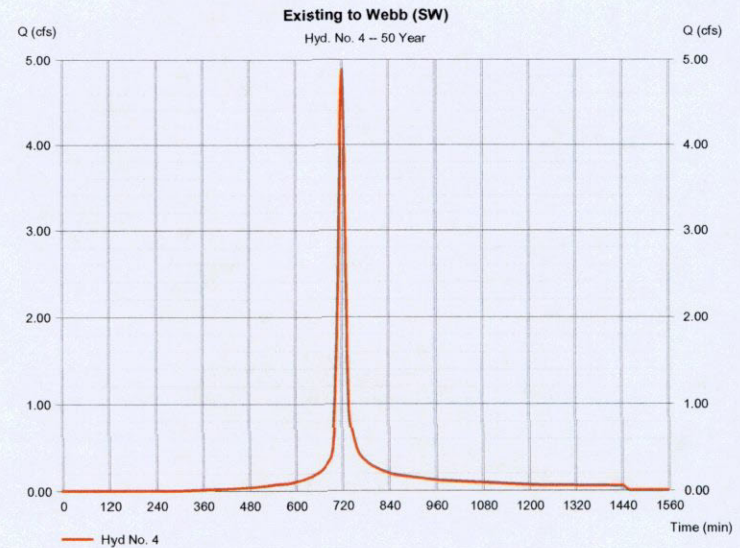
Monday, Aug 9, 2010

Hyd. No. 4

Existing to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 0.800 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 6.80 in
 Storm duration = 24 hrs

Peak discharge = 4.878 cfs
 Time to peak = 722 min
 Hyd. volume = 14,016 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

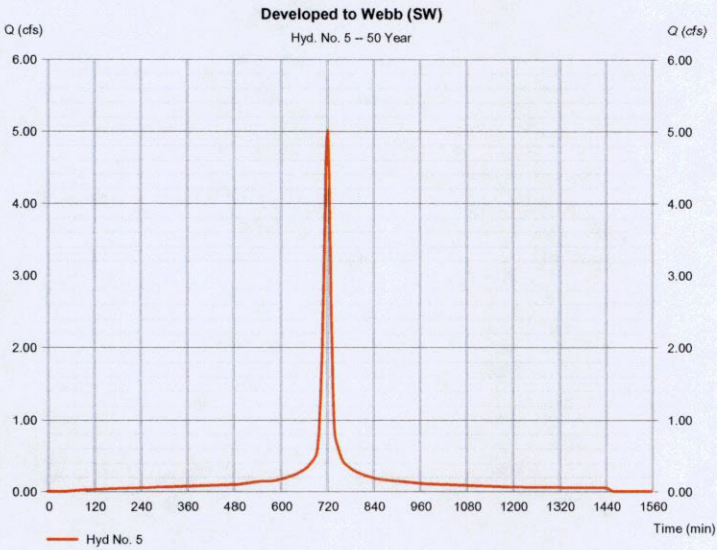
Hyd. No. 5

Developed to Webb (SW)

Hydrograph type = SCS Runoff
Storm frequency = 50 yrs
Time interval = 2 min
Drainage area = 0.700 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 6.80 in
Storm duration = 24 hrs

Peak discharge = 5.012 cfs
Time to peak = 722 min
Hyd. volume = 16,255 cuft
Curve number = 98*
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484

* Composite (Area/CN) = [(0.200 x 84) + (0.500 x 98)] / 0.700



Hydrograph Report

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

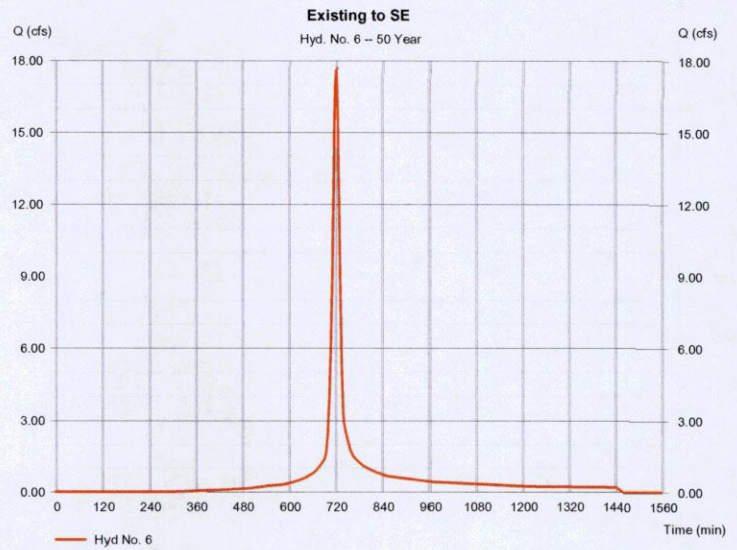
Monday, Aug 9, 2010

Hyd. No. 6

Existing to SE

Hydrograph type = SCS Runoff
Storm frequency = 50 yrs
Time interval = 2 min
Drainage area = 2.900 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 6.80 in
Storm duration = 24 hrs

Peak discharge = 17.68 cfs
Time to peak = 722 min
Hyd. volume = 50,808 cuft
Curve number = 84
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

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

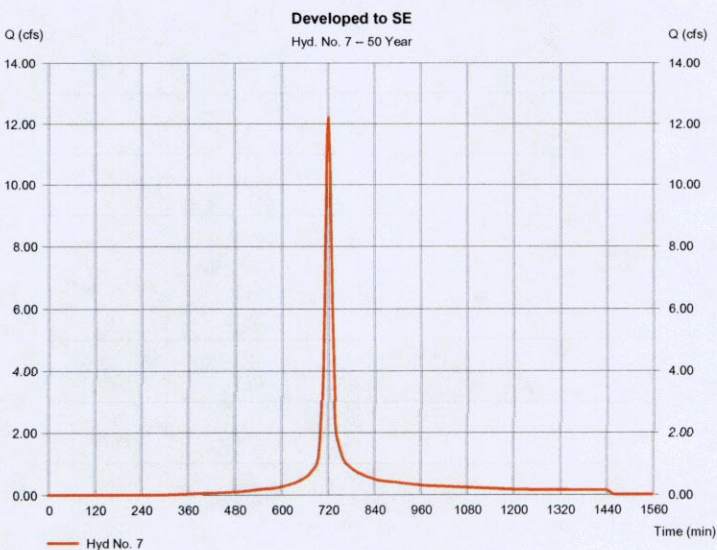
Monday, Aug 9, 2010

Hyd. No. 7

Developed to SE

Hydrograph type = SCS Runoff
Storm frequency = 50 yrs
Time interval = 2 min
Drainage area = 2.000 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 6.80 in
Storm duration = 24 hrs

Peak discharge = 12.19 cfs
Time to peak = 722 min
Hyd. volume = 35,040 cuft
Curve number = 84
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

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

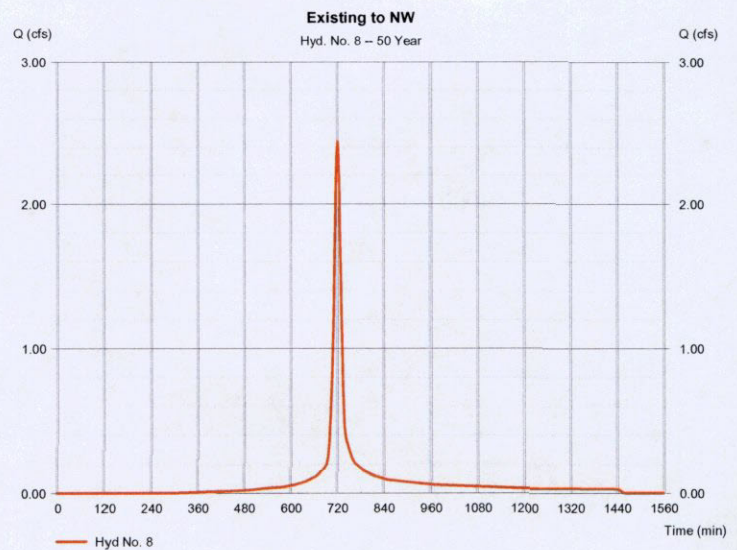
Monday, Aug 9, 2010

Hyd. No. 8

Existing to NW

Hydrograph type = SCS Runoff
Storm frequency = 50 yrs
Time interval = 2 min
Drainage area = 0.400 ac
Basin Slope = 0.0 %
Tc method = USER
Total precip. = 6.80 in
Storm duration = 24 hrs

Peak discharge = 2.439 cfs
Time to peak = 722 min
Hyd. volume = 7,008 cuft
Curve number = 84
Hydraulic length = 0 ft
Time of conc. (Tc) = 15.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

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

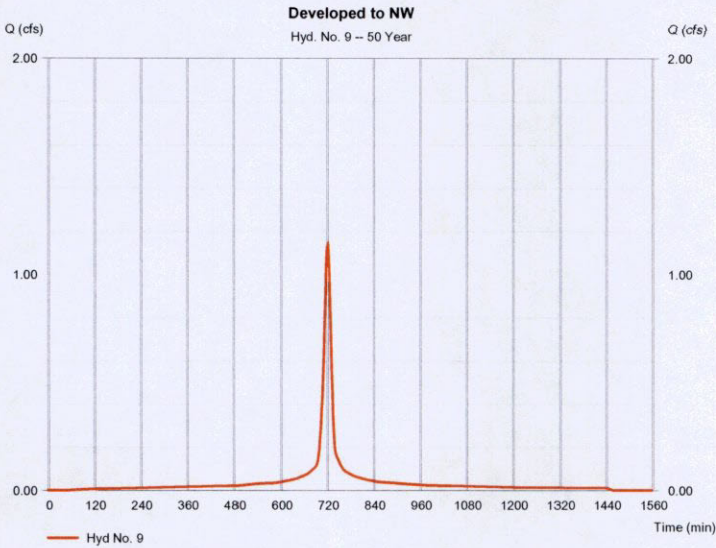
Monday, Aug 9, 2010

Hyd. No. 9

Developed to NW

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 0.160 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 6.80 in
 Storm duration = 24 hrs

Peak discharge = 1.146 cfs
 Time to peak = 722 min
 Hyd. volume = 3,715 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

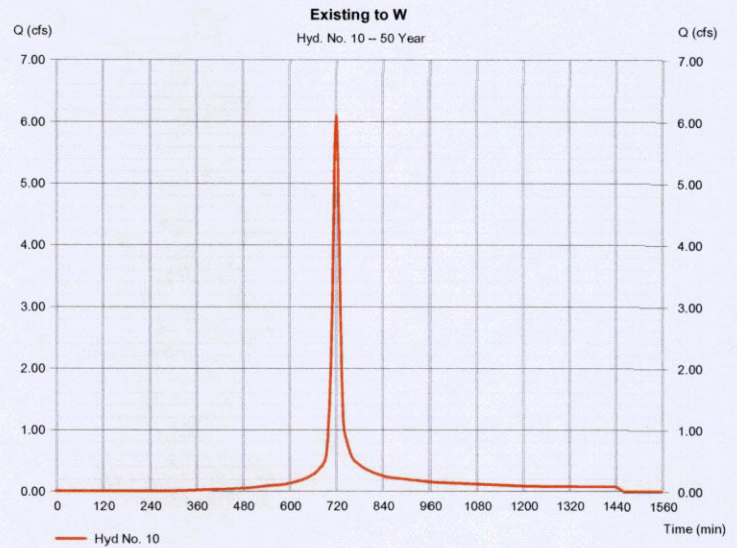
Monday, Aug 9, 2010

Hyd. No. 10

Existing to W

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 1.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 6.80 in
 Storm duration = 24 hrs

Peak discharge = 6.097 cfs
 Time to peak = 722 min
 Hyd. volume = 17,520 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

63

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

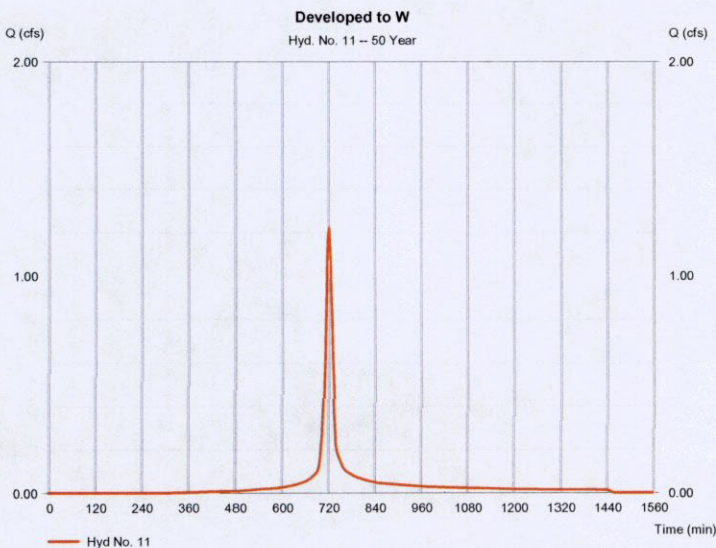
Monday, Aug 9, 2010

Hyd. No. 11

Developed to W

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 2 min
 Drainage area = 0.200 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 6.80 in
 Storm duration = 24 hrs

Peak discharge = 1.219 cfs
 Time to peak = 722 min
 Hyd. volume = 3,504 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Summary Report

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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 (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	36.89	2	722	107,014	----	----	----	Existing to Harry (NE)
2	SCS Runoff	58.65	2	722	191,019	----	----	----	Developed to Pond
3	Reservoir	14.29	2	738	190,995	2	1356.07	68,121	Existing to Harry
4	SCS Runoff	5.902	2	722	17,122	----	----	----	Existing to Webb (SW)
5	SCS Runoff	5.865	2	722	19,102	----	----	----	Developed to Webb (SW)
6	SCS Runoff	21.40	2	722	62,068	----	----	----	Existing to SE
7	SCS Runoff	14.76	2	722	42,805	----	----	----	Developed to SE
8	SCS Runoff	2.951	2	722	8,561	----	----	----	Existing to NW
9	SCS Runoff	1.341	2	722	4,366	----	----	----	Developed to NW
10	SCS Runoff	7.378	2	722	21,403	----	----	----	Existing to W
11	SCS Runoff	1.476	2	722	4,281	----	----	----	Developed to W

Hydrograph Report

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

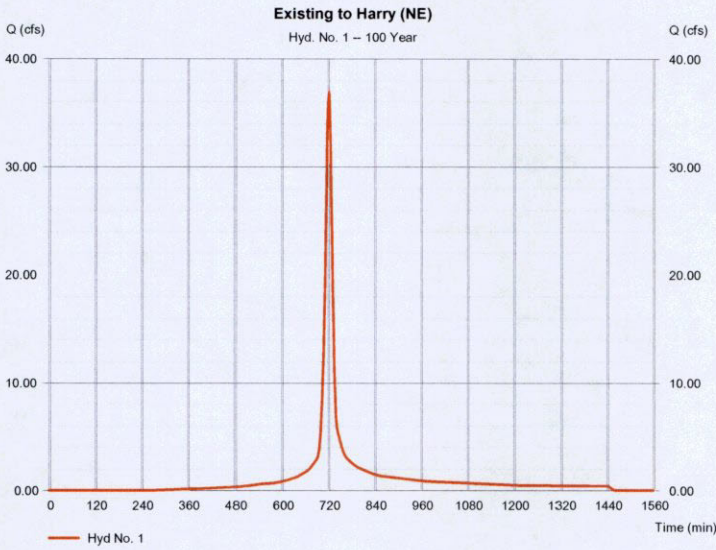
Monday, Aug 9, 2010

Hyd. No. 1

Existing to Harry (NE)

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 5.000 ac
 Basin Slope = 1.8 %
 Tc method = LAG
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 36.89 cfs
 Time to peak = 722 min
 Hyd. volume = 107,014 cuft
 Curve number = 84
 Hydraulic length = 750 ft
 Time of conc. (Tc) = 16.55 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

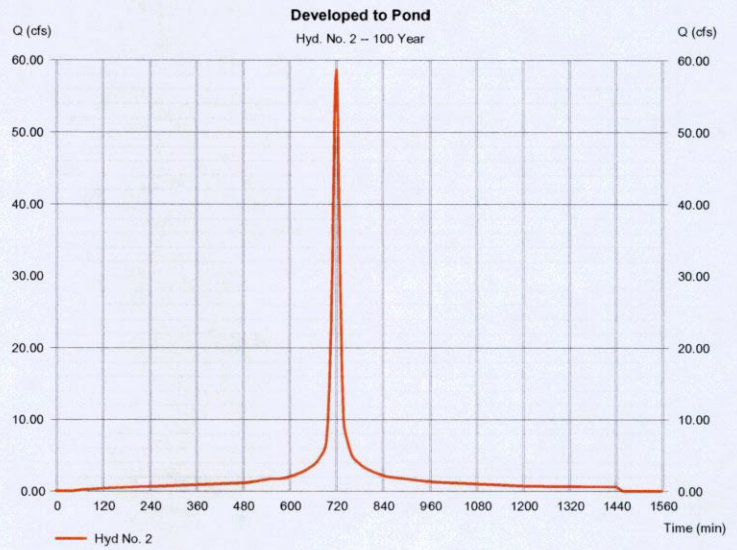
Monday, Aug 9, 2010

Hyd. No. 2

Developed to Pond

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 7.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 58.65 cfs
 Time to peak = 722 min
 Hyd. volume = 191,019 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

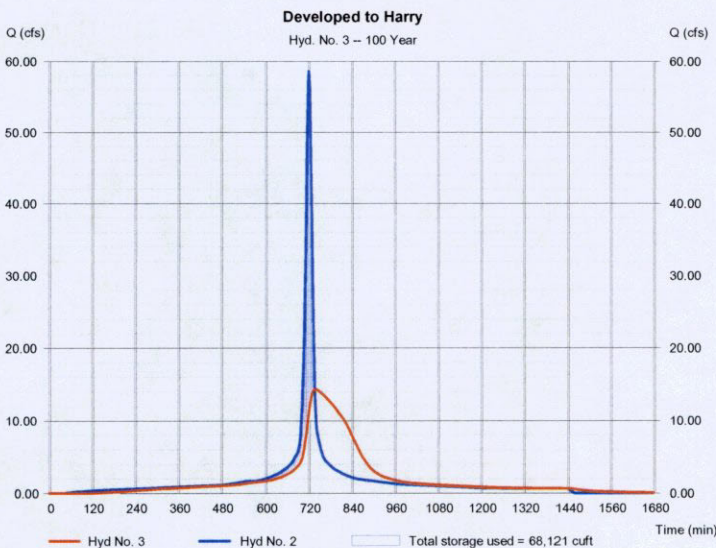
Hyd. No. 3

Developed to Harry

Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyd. No. = 2 - Developed to Pond
 Reservoir name = NE Detention

Peak discharge = 14.29 cfs
 Time to peak = 738 min
 Hyd. volume = 190,995 cuft
 Max. Elevation = 1356.07 ft
 Max. Storage = 68,121 cuft

Storage Indication method used.



Hydrograph Report

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

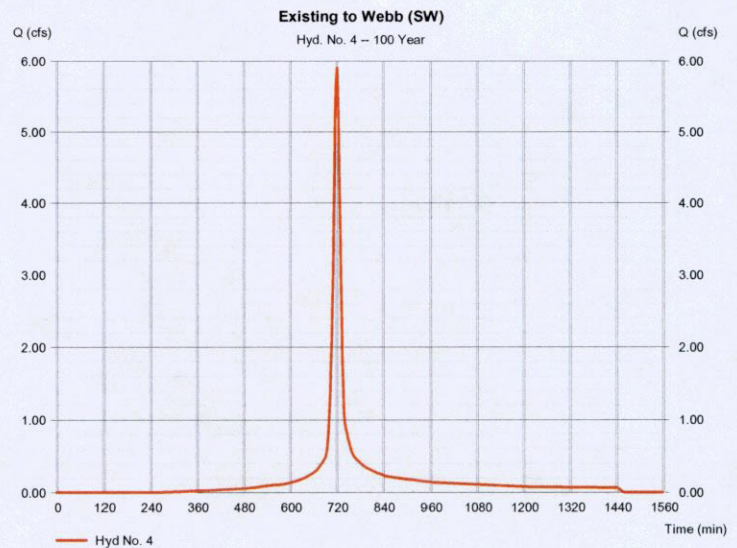
Monday, Aug 9, 2010

Hyd. No. 4

Existing to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 0.800 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 5,902 cfs
 Time to peak = 722 min
 Hyd. volume = 17,122 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

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

Monday, Aug 9, 2010

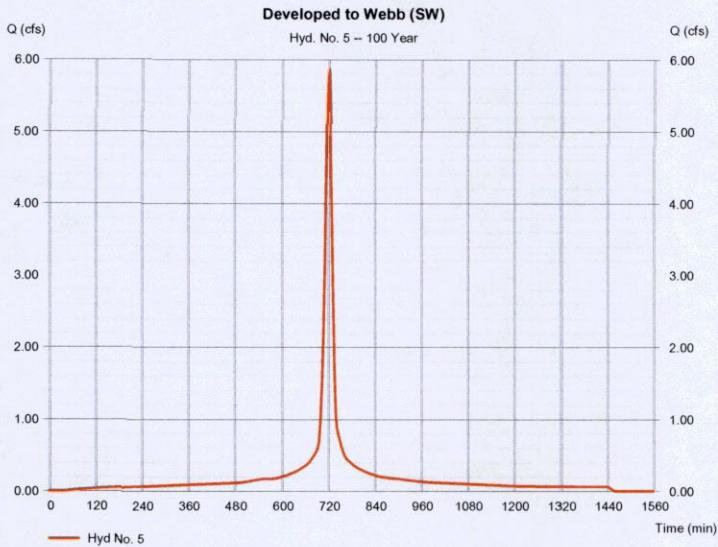
Hyd. No. 5

Developed to Webb (SW)

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 0.700 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 5.865 cfs
 Time to peak = 722 min
 Hyd. volume = 19,102 cuft
 Curve number = 98*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.200 x 84) + (0.500 x 98)] / 0.700



Hydrograph Report

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

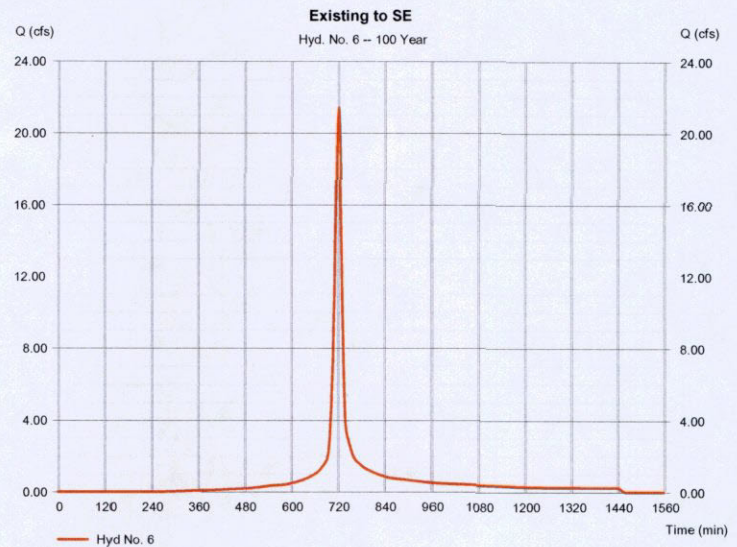
Monday, Aug 9, 2010

Hyd. No. 6

Existing to SE

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 2.900 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 21.40 cfs
 Time to peak = 722 min
 Hyd. volume = 62,068 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

71

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

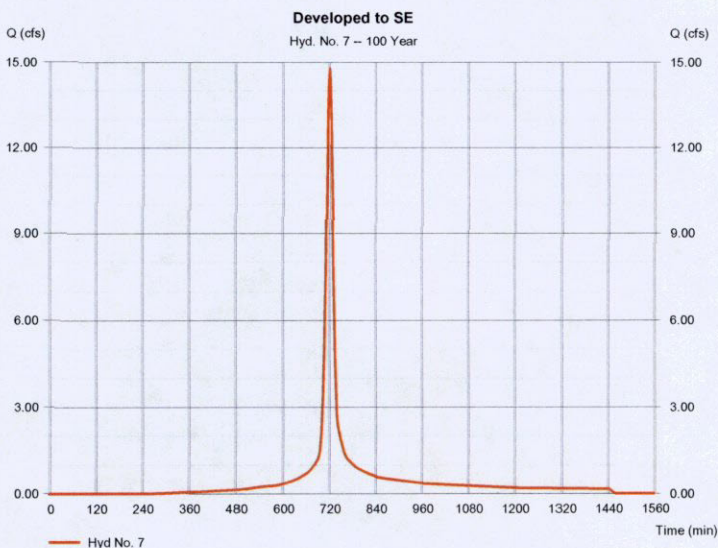
Monday, Aug 9, 2010

Hyd. No. 7

Developed to SE

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 2.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 14.76 cfs
 Time to peak = 722 min
 Hyd. volume = 42,805 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

72

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

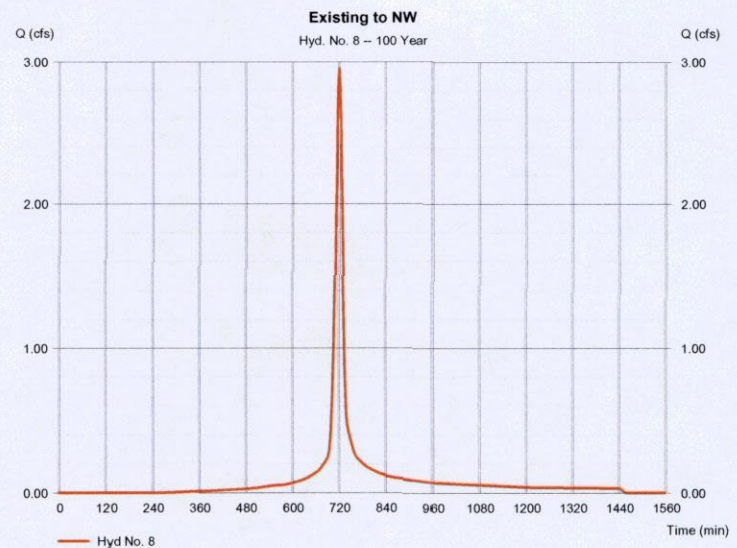
Monday, Aug 9, 2010

Hyd. No. 8

Existing to NW

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 0.400 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 2.951 cfs
 Time to peak = 722 min
 Hyd. volume = 8,561 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

73

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

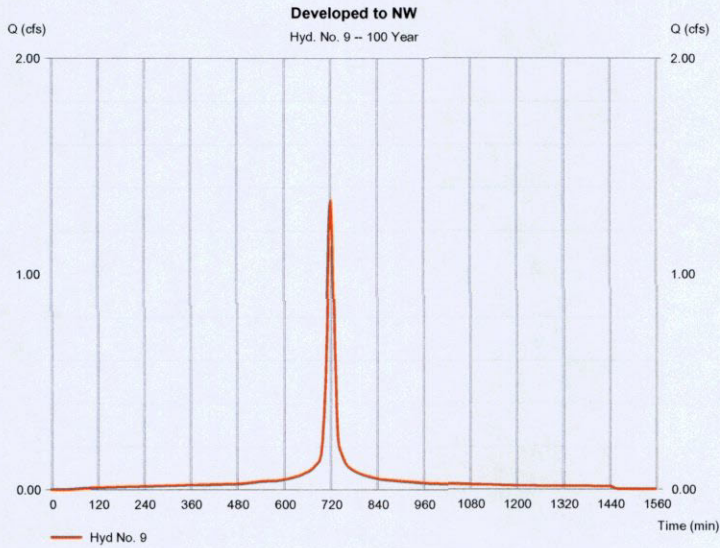
Monday, Aug 9, 2010

Hyd. No. 9

Developed to NW

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 0.160 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 1.341 cfs
 Time to peak = 722 min
 Hyd. volume = 4,366 cuft
 Curve number = 98
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

74

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

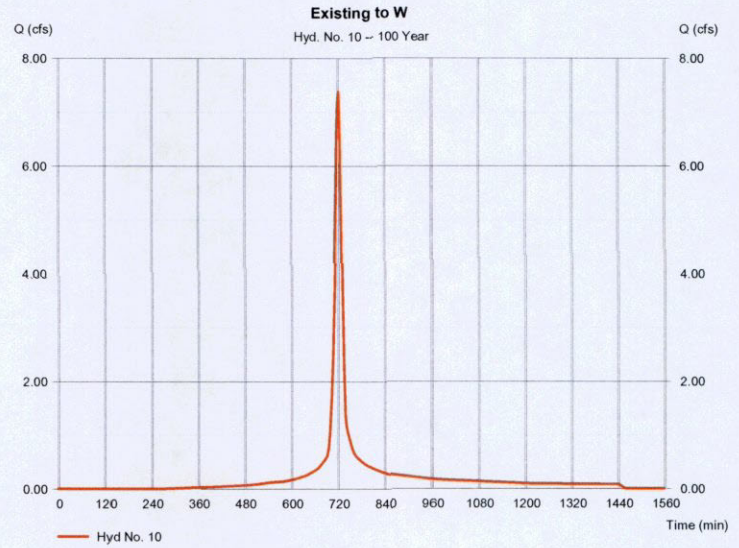
Monday, Aug 9, 2010

Hyd. No. 10

Existing to W

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 1.000 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 7.378 cfs
 Time to peak = 722 min
 Hyd. volume = 21,403 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

75

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

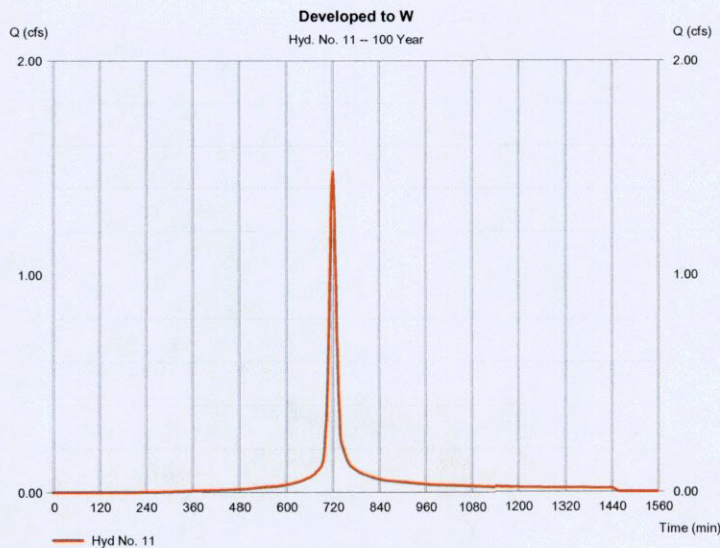
Monday, Aug 9, 2010

Hyd. No. 11

Developed to W

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 0.200 ac
 Basin Slope = 0.0 %
 Tc method = USER
 Total precip. = 7.95 in
 Storm duration = 24 hrs

Peak discharge = 1.476 cfs
 Time to peak = 722 min
 Hyd. volume = 4,281 cuft
 Curve number = 84
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 15.00 min
 Distribution = Type II
 Shape factor = 484



Hydraflow Rainfall Report

76

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

Monday, Aug 9, 2010

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	69.8703	13.1000	0.8658	-----
3	0.0000	0.0000	0.0000	-----
5	79.2597	14.6000	0.8369	-----
10	88.2351	15.5000	0.8279	-----
25	102.6072	16.5000	0.8217	-----
50	114.8193	17.2000	0.8199	-----
100	127.1596	17.8000	0.8186	-----

File name: wch_IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)						
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	100-yr
SCS 24-hour	0.00	2.20	0.00	3.30	4.25	5.77	7.95
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4ndy	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	7.10

Hydrograph No. 11, SCS Runoff, Developed to W 39

Watershed Model Schematic 1

Hydrograph Return Period Recap 2

2 - Year

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 Hydrograph No. 8, SCS Runoff, Existing to NW 12
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Drainage Plan
1:60 Scale