

## **NOTICE OF PUBLIC MEETING**

**Governmental Body: Van Meter Planning and Zoning Commission**

**Date of Meeting: Monday May 3<sup>rd</sup>, 2021**

**Time/Location of Meeting: 5:30 PM – City Hall, 310 Mill Street**

### **Agenda:**

1. Call to Order/Roll Call
2. Approval of Agenda
3. Approval of Minutes – 4-5-2021
4. Discussion and Action – Hudson Heights Plat 1 Preliminary Plat
5. Adjournment

Posted this 30<sup>th</sup> Day of April 2021

## Meeting Minutes

**Governmental Body: Van Meter Planning and Zoning Commission**

**Date of Meeting: Monday, April 5<sup>th</sup>, 2021**

**Time/Location of Meeting: 5:30 PM – 310 Mill Street**

### Agenda:

1. Call to Order/Roll Call  
Akers called the meeting to order at 5:30  
Roll was called: Harrison, Feldman, DeVore, Akers, Hulse present. Wahlert present via phone. Bruins absent.  
Staff present included City Administrator Kyle Michel
2. Approval of Agenda  
Hulse moved, supported by Feldman, to approve the agenda as published. Motion carried unanimously.
3. Approval of Minutes –3-1-2021 Meeting Minutes  
Harrison moved, supported by DeVore, to approve the minutes. Motion carried unanimously.
4. Discussion and Action: Preliminary Site Plan – 410 Wilson Street  
Paul Scieszinski presented an overview of a proposed site plan for a mixed-use project for his property at 410 Wilson Street. Matt Floden, Grace Architecture & Design, assisted with the presentation. Discussion ensued regarding zoning and building code compliance. Mr. Scieszinski and City Administrator Michel provided an overview of the Community Catalyst Grant being pursued in support of this project as well as the requirements and timeline associated with the grant application.  
City Administrator Michel asked that in support of the grant application timeline that the Commission grant approval of a preliminary site plan so that the City and Mr. Scieszinski could move the grant application forward. A final site plan would be submitted for consideration by the Commission at their next meeting.  
Feldman moved, supported by Harrison, to recommend approval of the preliminary site plan as submitted to the City Council. Motion carried unanimously.
5. Adjournment  
Motion by Feldman, supported by Devore. Motion carried unanimously.  
The meeting was adjourned at 6:18 pm.

# PRELIMINARY PLAT

# HUDSON HEIGHTS PLAT I

# VAN METER, IOWA



VICINITY SKETCH

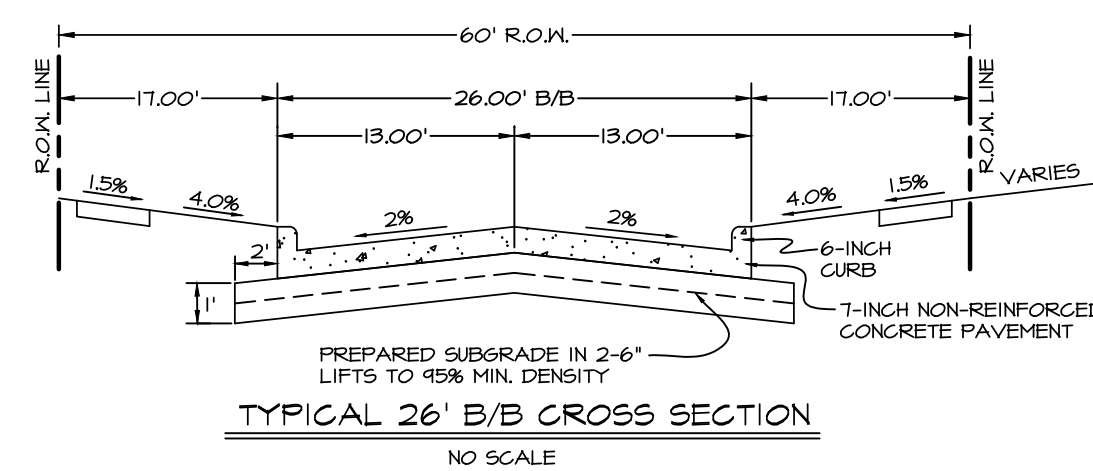


### NPDES/SWPPP

- OWNER AND/OR CONTRACTOR ARE REQUIRED TO OBTAIN NPDES PERMIT AND FOLLOW REQUIREMENTS OF ASSOCIATED STORM WATER POLLUTION PREVENTION PLAN PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.

### GRADING NOTES

- STRIP TOPSOIL FROM ALL AREAS WHICH ARE TO RECEIVE STRUCTURAL FILL.
- ALL AREAS TO RECEIVE FILL TO BE BENCHES.
- PREPARE BOTTOM OF BENCH FOR FILL BY DISCING TO A DEPTH OF 6-INCHES.
- ALL SITE GRADING FILL SHALL BE COMPACTED TO DENSITY THAT IS NOT LESS THAN 95% STANDARD PROCTOR. MOISTURE CONTENT OF FILL MATERIAL SHALL MATCH URBAN STANDARD.
- MAINTAIN ALL CUT AND FILL AREAS FOR SURFACE DRAINAGE AT ALL TIMES.
- FINAL GRADES WITHIN PAVED AREAS SHALL BE WITHIN 0.1' OF PLAN GRADE, ALL OTHER AREAS TO BE WITHIN 0.2' OF PLAN GRADE.
- STRIP BLACK DIRT AND RE-SPREAD. (8" MINIMUM)
- ADDITIONAL SILT FENCING MAY BE REQUIRED BY CITY AFTER FIELD INSPECTION.



BENCHMARKS  
XXXXX

### PROPERTY OWNER / APPLICANT:

WILLIAM C KNAPP LC  
5000 WESTOWN PKWY SUITE 400  
WEST DES MOINES IA 50266-5921

KNAPP SUSAN K TERRY REVOCABLE TRUST  
KNAPP PROPERTIES LC  
5000 WESTOWN PKWY, SUITE 400  
WEST DES MOINES IA 50266

### ZONING

R-1 SINGLE FAMILY RESIDENTIAL DISTRICT

### SETBACKS:

FRONT - 35'  
SIDE - 8' MINIMUM  
REAR - 35'

### FLOOD ZONE

ZONE 'X'  
FEMA FIRM FLOOD INSURANCE RATE MAP NUMBER  
19044C0340F, REVISED 12-7-2018.

### LEGAL DESCRIPTION

LOT 1 AND A PORTION OF LOT 2, WEIGEL ADDITION PLAT 4, AN OFFICIAL PLAT RECORDED IN BOOK 7, PAGE 48, CITY OF VAN METER, DALLAS COUNTY, IOWA THAT IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SE CORNER OF SAID LOT 1; THENCE S89°55'39"W, 526.50 FEET ALONG THE SOUTH LINE OF SAID LOT 1 TO THE SW CORNER OF SAID LOT 1, SAID POINT ALSO BEING THE SE CORNER OF SAID LOT 2; THENCE N84°50'20"W, 883.49 FEET ALONG THE SOUTH LINE OF SAID LOT 2 TO A POINT; THENCE N00°35'47"E, 560.45 FEET TO A POINT ON THE NORTH LINE OF SAID LOT 2; THENCE S89°35'53"E, 197.53 FEET ALONG SAID NORTH LINE OF LOT 2 TO THE SW CORNER OF PARK VIEW ESTATES PLAT 1, AN OFFICIAL PLAT RECORDED IN BOOK 817, PAGE 904; THENCE S89°46'03"E, 389.86 FEET ALONG SAID NORTH LINE OF LOT 2 AND THE SOUTH LINE OF SAID PARK VIEW ESTATES PLAT 1 TO THE SE CORNER OF SAID PARK VIEW ESTATES PLAT 1, SAID POINT ALSO BEING THE SW CORNER OF WEIGEL ADDITION PLAT 2, AN OFFICIAL PLAT RECORDED IN BOOK 5, PAGE 489; THENCE S89°44'22"E, 389.56 FEET ALONG SAID NORTH LINE OF LOT 2 AND THE SOUTH LINE OF SAID WEIGEL ADDITION PLAT 2 TO THE NE CORNER OF SAID LOT 2 AND THE SE CORNER OF SAID WEIGEL ADDITION PLAT 2, SAID POINT ALSO BEING THE NW CORNER OF SAID LOT 1 WEIGEL ADDITION PLAT 4 AND THE SW CORNER OF WEIGEL ADDITION PLAT 1, AN OFFICIAL PLAT RECORDED IN BOOK 5, PAGE 167; THENCE S89°38'54"E, 356.82 FEET ALONG THE NORTH LINE OF SAID LOT 1 AND THE SOUTH LINE OF SAID WEIGEL ADDITION PLAT 1 TO THE NE CORNER OF SAID LOT 1 AND THE SE CORNER OF SAID WEIGEL ADDITION PLAT 1, SAID POINT ALSO BEING ON THE WEST LINE OF PARCEL 'Y' IN THE PLAT OF SURVEY RECORDED IN BOOK 2009, PAGE 691; THENCE S06°37'05"W, 916.6 FEET ALONG THE EAST LINE OF SAID LOT 1 AND THE SAID WEST LINE OF PARCEL 'Y' TO A POINT; THENCE S04°51'13"E, 471.43 FEET ALONG SAID EAST LINE OF LOT 1 AND SAID WEST LINE OF PARCEL 'Y' AS WELL AS THE WEST LINE OF PARCEL 'Z' IN SAID PLAT OF SURVEY TO THE POINT OF BEGINNING AND CONTAINING 17.44 ACRES MORE OR LESS.

### NOTES:

- PARCEL MAY BE SUBJECT TO EASEMENTS, LICENSES, OR AGREEMENTS OF RECORD. NO TITLE WORK WAS PERFORMED BY SURVEYOR.
- ALLOWABLE ERROR OF CLOSURE FOR BOUNDARY IS 1:10,000 AND ALLOWABLE ERROR OF CLOSURE FOR EACH LOT IS 1:5,000.
- MONUMENTS TO BE SET WITHIN ONE YEAR OF FINAL PLAT'S RECORDING DATE.
- LOT 'A' IS TO BE DEDICATED TO CITY OF VAN METER.
- ALL UTILITIES INDICATED ON PLAT ARE PUBLIC UNLESS OTHERWISE NOTED.
- WATER SERVICES TO BE 1-INCH PVC AND SHALL BE BORED WHEN FEASIBLE, STOP BOXES TO BE FORD BALL VALVE TYPE CURB STOPS.

### GENERAL NOTES

- ONE WEEK PRIOR TO CONSTRUCTION, CONTRACTOR SHALL CONTACT:
  - CITY OF VAN METER (515-946-2644)
  - WILLIAM C KNAPP LC (515) 223-4000
  - CIVIL ENGINEERING CONSULTANTS INC. (515-276-4884)
  - IOWA ONE CALL
- LOCATION OF EXISTING FACILITIES AND APPURTENANCES SHOWN ON PLAN ARE BASED ON AVAILABLE INFORMATION WITHOUT UNCOVERING AND MEASURING TO DETERMINE EXACT FACILITIES LOCATIONS. CIVIL ENGINEERING CONSULTANTS, INC. DOES NOT GUARANTEE LOCATIONS OF EXISTING FACILITIES AS SHOWN, OR THAT ALL EXISTING FACILITIES ARE SHOWN. IT IS CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL PUBLIC AND PRIVATE UTILITY PROVIDERS SERVING AREA, AND IOWA ONE CALL, TO DETERMINE EXTENT AND PRECISE LOCATION OF EXISTING FACILITIES BEFORE CONSTRUCTION BEGINS.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH 2019 URBAN STANDARD SPECIFICATIONS. CONTRACTOR SHALL VERIFY LOCATION AND PROTECT ALL UTILITIES AND STRUCTURES. DAMAGE TO UTILITIES AND STRUCTURES SHALL BE REPAIRED BY CONTRACTOR AT CONTRACTOR'S EXPENSE TO SATISFACTION OF OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT LOCATIONS OF UTILITY SERVICES.
- CONTRACTOR SHALL RECONNECT ALL FIELD TILE INTERCEPTED DURING CONSTRUCTION.
- ALL STATIONING IS BASED ON STREET CENTERLINE MEASUREMENT AND SPECIFICATIONS.

### UTILITIES

WATER: VAN METER MUNICIPAL SERVICES  
SANITARY: CITY OF VAN METER

### PARKLAND DEDICATION:

CALCULATION FOR PARKLAND DEDICATION IS PER CHAPTER 173 - DEDICATION OF PARKLAND WITHIN ORDINANCE 2021-02:  
24 LOTS \* 2.8 PEOPLE PER LOT \* 0.005 AC = 0.336 ACRES OR 14,636 SF.  
MINIMUM DEDICATION REQUIRED FOR ANY DEVELOPMENT: 20,000 SF.

### Sheet List Table

SHEET NUMBER	SHEET TITLE
01	COVER SHEET
02	DIMENSION SHEET
03	GRADING & UTILITY SHEET
04	GRADING & UTILITY SHEET

### GENERAL LEGEND

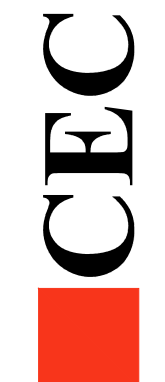
PROPOSED	EXISTING
PLAT BOUNDARY	LOT LINE
SECTION LINE	SANITARY/STORM MANHOLE
LOT LINE	WATER VALVE
CENTERLINE	FIRE HYDRANT
EASEMENT LINE	STORM SEWER SINGLE INTAKE
FLARED END SECTION	STORM SEWER DOUBLE INTAKE
TYPE SK-501 STORM INTAKE	STORM SEWER INTAKE FLARED END SECTION
TYPE SK-502 STORM INTAKE	DECIDUOUS TREE
TYPE SK-503 STORM INTAKE	CONIFEROUS TREE
TYPE SK-504 STORM INTAKE	SHRUB
TYPE SK-505 STORM INTAKE	POWER POLE
TYPE SK-506 STORM INTAKE	STREET LIGHT
TYPE SK-511 STORM INTAKE	GUY ANCHOR
TYPE SK-512 STORM INTAKE	ELECTRIC TRANSFORMER
TYPE SK-513 STORM INTAKE	GAS METER
TYPE SK-401 STORM MANHOLE	TELEPHONE RISER
TYPE SK-402 STORM MANHOLE	SIGN
TYPE SK-403 STORM MANHOLE	UNDERGROUND TELEVISION
TYPE SK-301 SANITARY MANHOLE	UNDERGROUND ELECTRIC
TYPE SK-302 SANITARY MANHOLE	UNDERGROUND GAS
TYPE SK-304 SANITARY MANHOLE	UNDERGROUND FIBER OPTIC
STORM/SANITARY CLEANOUT	UNDERGROUND TELEPHONE
WATER VALVE	SANITARY SEWER WITH SIZE
FIRE HYDRANT ASSEMBLY	STORM SEWER WITH SIZE
BLOW-OFF HYDRANT	WATER MAIN WITH SIZE
DETECTABLE WARNING PANEL	EXISTING CONTOUR
SANITARY SEWER WITH SIZE	TREELINE
SANITARY SERVICE	BUILDING SETBACK LINE
STORM SEWER WITH SIZE	PUBLIC UTILITY EASEMENT
STORM SERVICE	MINIMUM OPENING ELEVATION
WATER MAIN WITH SIZE	TREES TO BE REMOVED
WATER SERVICE	
PROPOSED CONTOUR	
SILT FENCE	
RIP RAP	
ADDRESS	
FOUND CORNER	
SET CORNER 5/8" IR. W/O RANGE CAP #12265	
MEASURED DISTANCE	
PREVIOUSLY RECORDED DISTANCE	

### CERTIFICATIONS

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.  PAUL J.D. CLAUSEN, IOWA LICENSE NO. 28172 DATE MY LICENSE RENEWAL DATE IS DECEMBER 31, 2021 PAGES OR SHEETS COVERED BY THIS SEAL: this sheet only
I HEREBY CERTIFY THAT THIS LAND SURVEYING DOCUMENT WAS PREPARED AND THE RELATED SURVEY WORK WAS PERFORMED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF IOWA.  JEFFREY A. GADDIS, IOWA LICENSE NO. 10391 DATE MY LICENSE RENEWAL DATE IS DECEMBER 31, 2022



Civil Engineering Consultants, Inc.  
2400 86th Street Unit 12 Des Moines, Iowa 50322  
515.276.4884 Fax: 515.276.7084 mail@cecinc.com



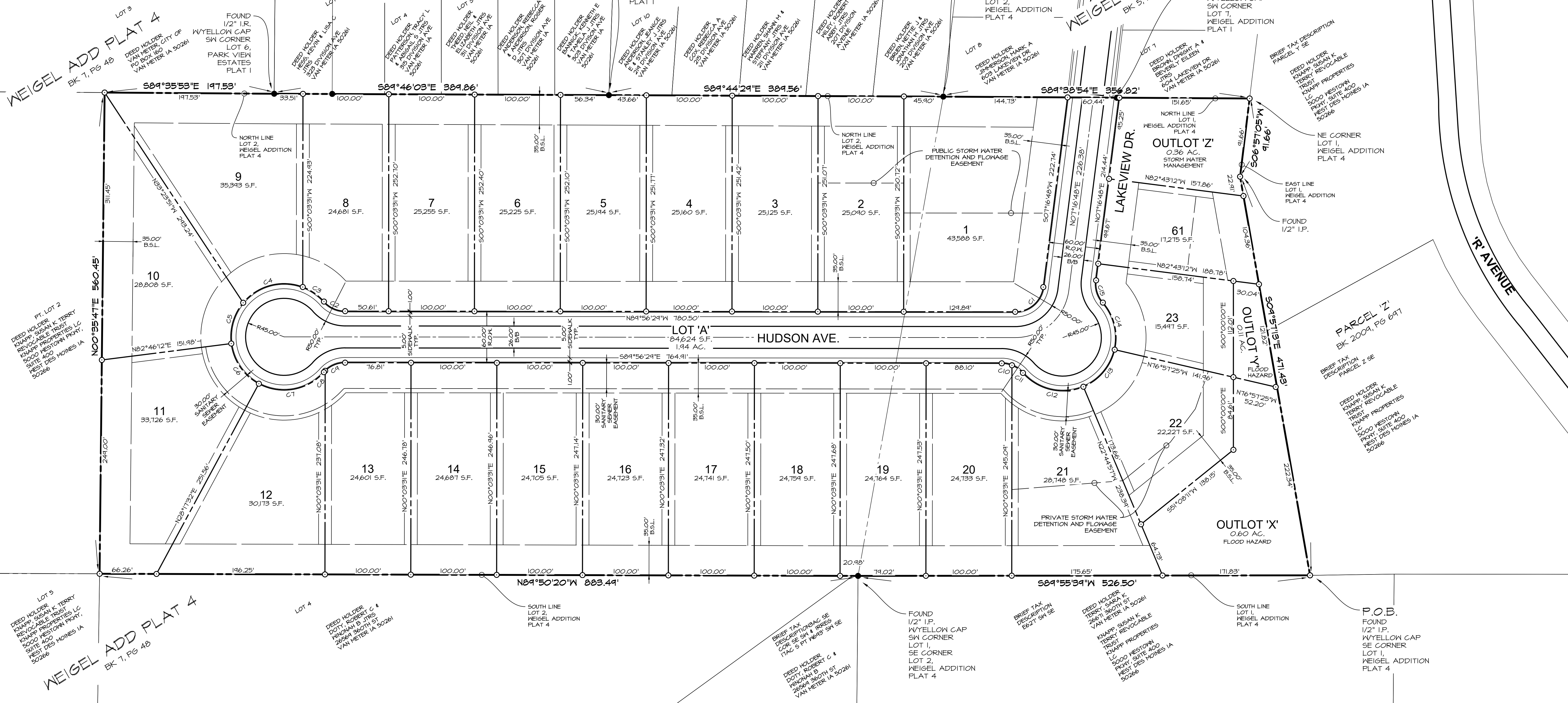
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DATE OF SURVEY: 10-14-2019  
DESIGNED BY: PC  
DRAWN BY: KEH

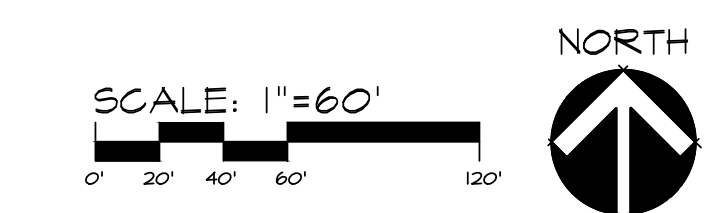
HUDSON HEIGHTS PLAT I  
VAN METER, IOWA  
COVER SHEET

SHEET  
01  
OF 04

CURVE	DELTA	RADIUS	LENGTH	TANGENT	CHORD	CH. BEARING
C1	82°46'43"	33.00'	41.68'	29.08'	43.64'	S48°40'04"W
C2	48°21'32"	33.00'	21.91'	14.85'	27.04'	N65°42'43"W
C3	21°51'28"	62.00'	30.25'	15.43'	24.45'	N55°21'41"W
C4	70°45'18"	62.00'	76.56'	44.02'	71.74'	S75°10'55"W
C5	47°02'04"	62.00'	50.90'	26.48'	44.48'	S16°11'14"W
C6	54°28'40"	62.00'	58.95'	31.42'	56.76'	S34°28'08"E
C7	76°41'33"	62.00'	82.99'	44.05'	76.43'	N74°56'45"E
C8	76°41'33"	62.00'	82.99'	44.05'	76.43'	N74°56'45"E
C9	44°38'43"	33.00'	25.11'	13.55'	25.07'	N67°44'04"E
C10	21°07'41"	33.00'	12.17'	6.15'	12.10'	S74°22'36"E
C11	27°19'45"	33.00'	15.74'	8.02'	15.54'	S55°08'50"E
C12	71°55'54"	62.00'	71.12'	44.44'	72.24'	S77°06'57"E
C13	54°12'24"	62.00'	58.66'	31.73'	56.50'	N40°08'44"E
C14	54°13'19"	62.00'	58.67'	31.74'	56.51'	N4°04'05"W
C15	48°21'32"	33.00'	21.91'	14.85'	27.04'	N16°56'58"W



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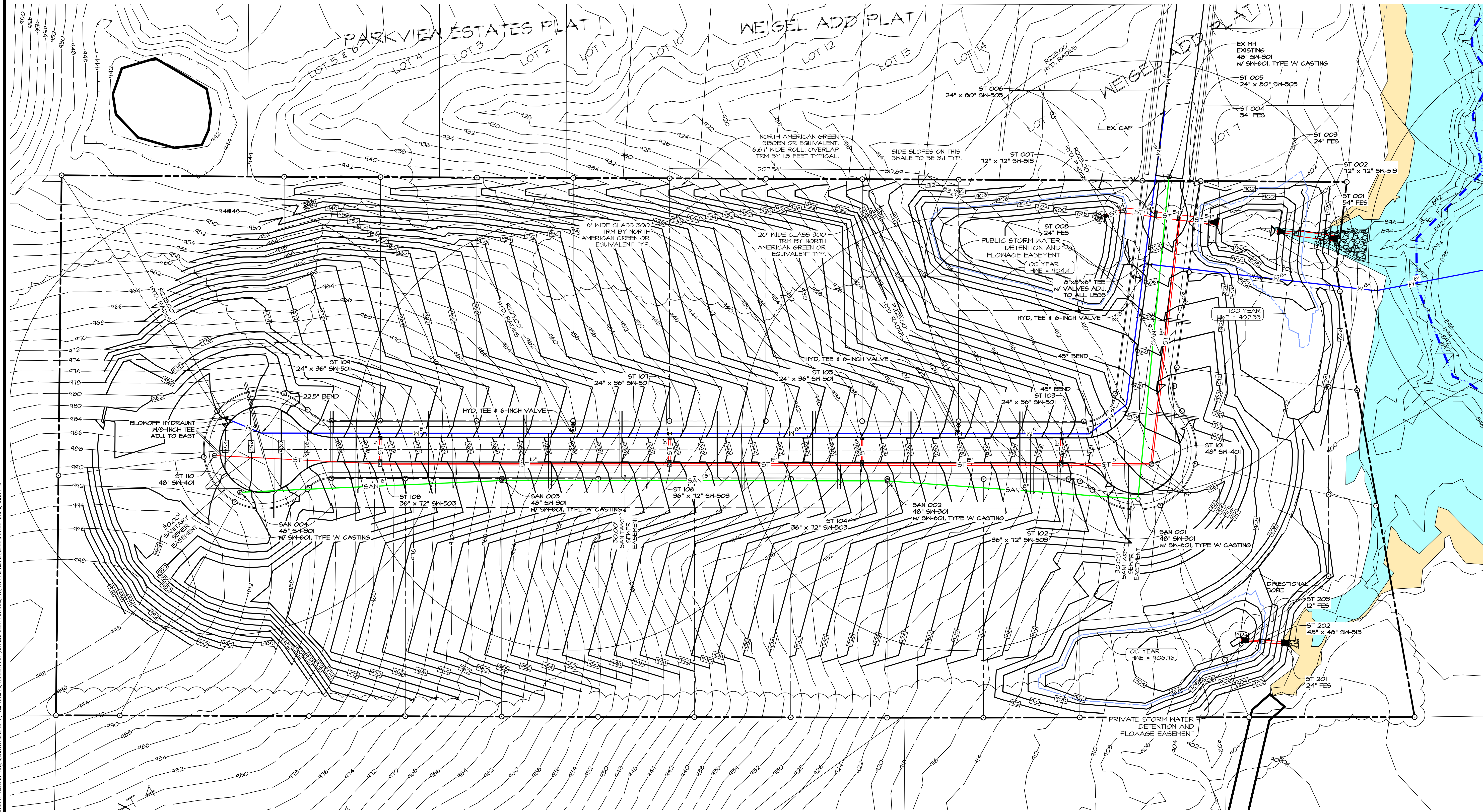
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1" = 120' PRINTED ON 11"x17" SHEET

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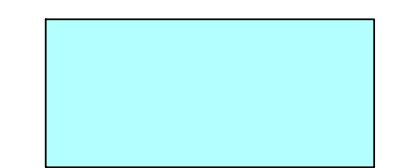
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DESIGNED BY: PC  
DRAWN BY: MEH

HUDSON HEIGHTS PLAT 1  
VAN METER, IOWA  
DIMENSION SHEET  
SHEET 02 OF 04  
E-6228



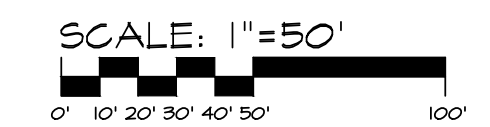
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ZONE 'A'  
 WITHOUT BASE  
 FLOOD ELEVATION (BFE)

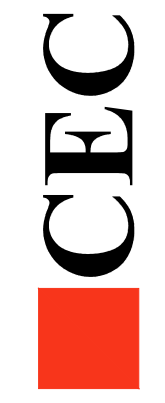


ZONE X  
 0.2% ANNUAL CHANCE FLOOD HAZARD, AREAS  
 OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE  
 DEPTH LESS THAN ONE FOOT OR WITH DRAINAGE  
 AREAS OF LESS THAN ONE SQUARE MILE



1" = 50' PRINTED ON 22"x34" SHEET  
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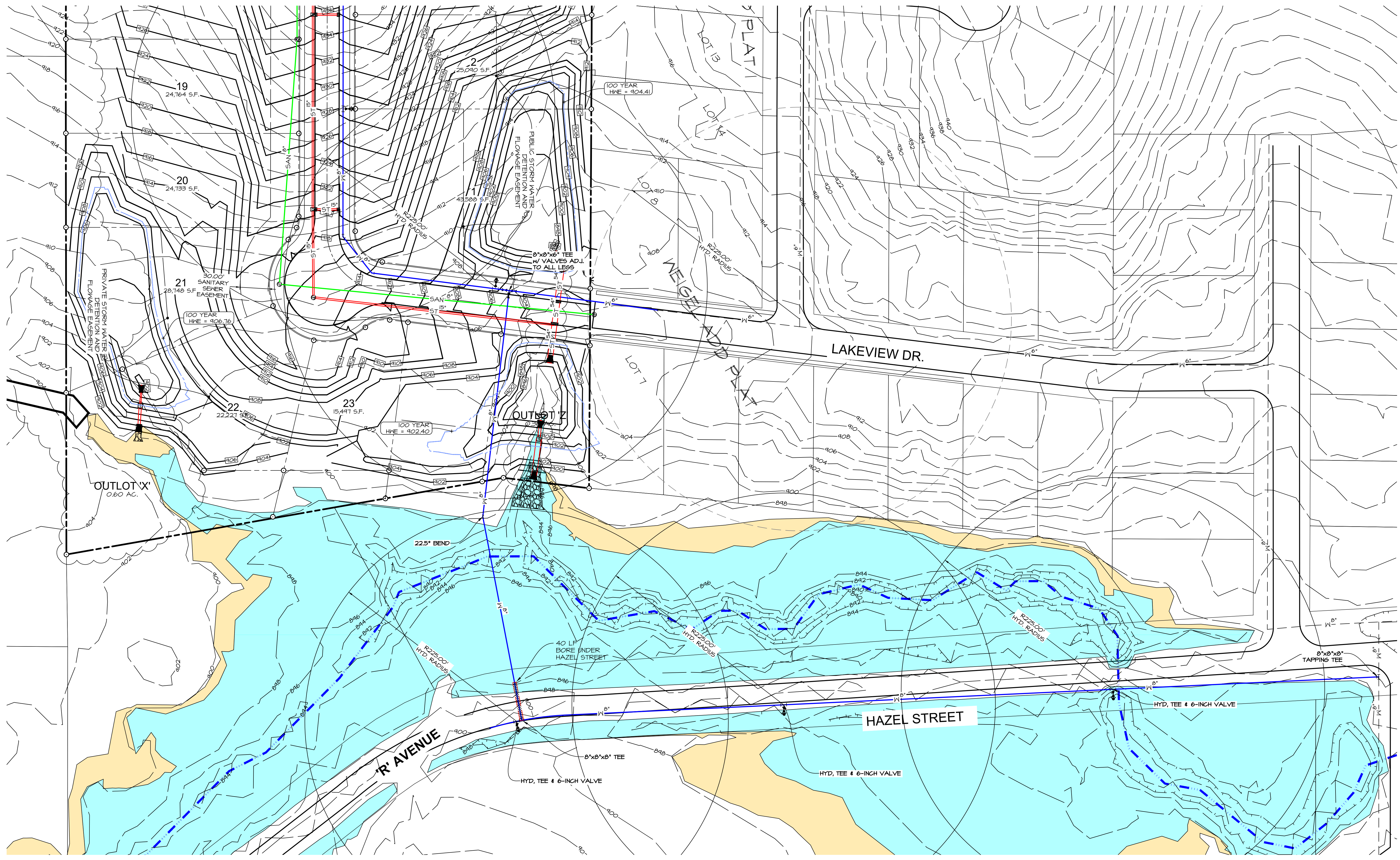


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DATE OF SURVEY:	10-14-2019	
DESIGNED BY:	PC	
DRAWN BY:	MEH	

**HUDSON HEIGHTS PLAT 1**  
 VAN METER, IOWA  
**GRADING & UTILITY SHEET**

SHEET  
**03**  
 OF  
 04

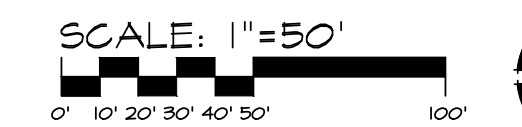
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ZONE 'A'  
WITHOUT BASE  
FLOOD ELEVATION (BFE)



ZONE X  
0.2% ANNUAL CHANCE FLOOD HAZARD, AREAS  
OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE  
DEPTH LESS THAN ONE FOOT OR WITH DRAINAGE  
AREAS OF LESS THAN ONE SQUARE MILE



SCALE: 1"=50'  
0' 10' 20' 30' 40' 50' 100'



NORTH

1" = 50' PRINTED ON 22"x34" SHEET  
1" = 100' PRINTED ON 11"x17" SHEET

DATE:	REVISIONS	COMMENTS
APRIL 28, 2021	1	
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	5	PC
	6	MEH

DATE OF SURVEY: 10-14-2018  
DESIGNED BY: PC  
DRAWN BY: MEH

HUDSON HEIGHTS PLAT I  
VAN METER, IOWA  
GRADING & UTILITY SHEET

**STORMWATER MANAGEMENT REPORT**

Project: Hudson Heights Plat 1  
Prepared By: Paul Clausen, P.E.

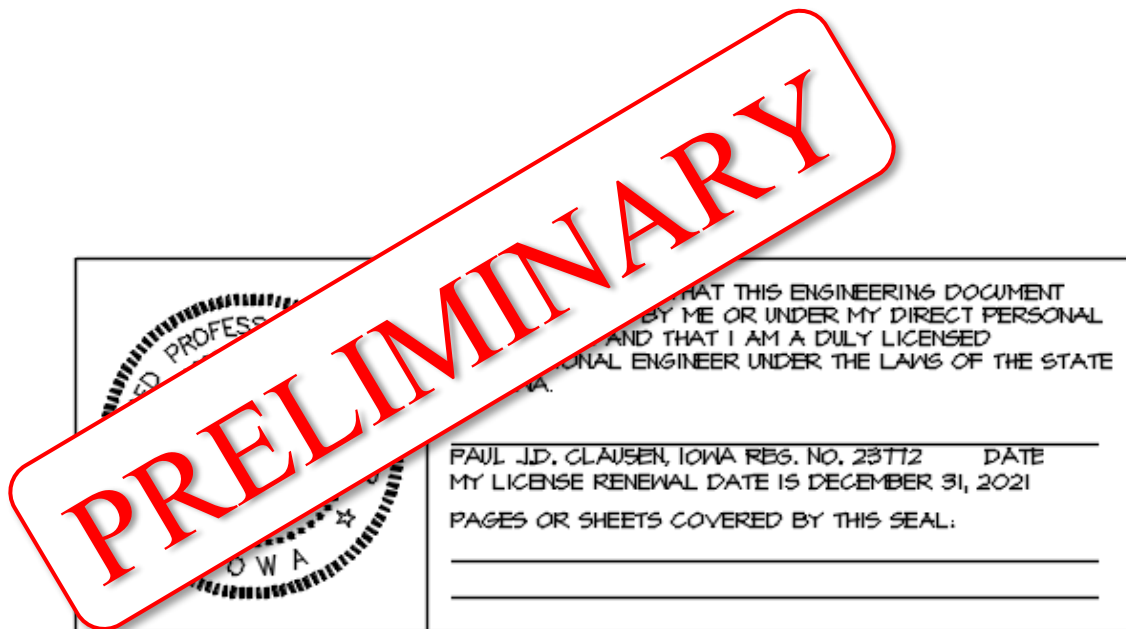


Civil Engineering Consultants, Inc.

Date: April 28, 2021

Revised:

Project No: E6228



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## 1. Site Characteristics

### a. Pre-developed Conditions

Coon Creek Plat 1 is a 17.34 acre site located north of 360<sup>th</sup> Street, west of R Avenue, south of Division Avenue and east of Old Portland Road in Van Meter, Iowa. Approximately 16.56 acres of the site will be disturbed during improvements. Stormwater runoff drains towards the east into Coon Creek, ending in the Raccoon River.

The soils predominantly consist of Ladoga silty clay loam with slopes between 9% to 14%; Van Meter silt loam with slopes between 14% to 30%; and Colo, occasionally flooded-Ely silty clay loams, dissected till plain with slopes between 1% to 3%. Ladoga silty clay loam is classified as Hydrologic Soils Group C. Van Meter silt loam is classified as Hydrologic Soils Group D. Colo, occasionally flooded-Ely silty clay loams, dissected till plain is classified as Hydrologic Soils Group C/D. Hydrologic soils group C/D soils have a low infiltration rate when thoroughly wet with a slow rate of water transmission. The USDA Hydrologic Soils Report may be found in the Appendix.

### b. Post-development Conditions

The Coon Creek Plat 1 project will consist of the development of twenty-five single-family residential lots. Approximately 16.56 acres of the project site will be disturbed while 0.78 acres of the site are to remain undisturbed. Three detention basins located in the northeast and southeast corners of the site will provide stormwater detention for the site. The detention basins will release stormwater runoff into Coon Creek before ultimately draining to the Raccoon River. The proposed conditions are assumed to have soils classified as Hydrologic Soils Group C.

### c. Peak Stormwater Runoff Table

Stormwater Runoff Rate Summary								
Area Description	Area (Acres)	Runoff Rate, cfs						
		1-year	2-year	5-year	10-year	25-year	50-year	100-year
EXISTING DA1	16.56	11.23	15.91	25.06	33.83	47.96	60.28	73.50
OFFSITE 1	42.71	26.63	36.43	55.24	73.03	101.14	125.45	151.36
DA1	5.57	6.92	9.11	13.24	17.07	23.01	28.05	33.37
DA2	1.05	1.51	1.97	2.86	3.68	4.96	6.04	7.18
DA3	9.94	12.34	16.26	23.63	30.47	41.05	50.05	59.55
DA1 POND		2.37	2.53	2.82	3.08	3.45	3.51	3.54
DA2 POND (SITE ONLY)		10.95	12.08	14.53	16.08	18.16	19.40	20.64
DA3 POND (SITE ONLY)		10.52	12.98	16.41	17.88	20.40	22.23	23.80
TOTAL SITE RELEASE		13.29	14.60	17.35	19.16	21.61	22.72	24.18
DA2 POND (SITE + OFFSITE)		18.45	20.76	54.01	83.60	121.88	152.33	183.77
DA3 POND (SITE + OFFSITE)		20.74	24.04	58.39	84.66	120.94	150.01	180.79
TOTAL SITE + OFFSITE RELEASE		20.64	23.06	56.82	86.67	125.27	155.57	187.12

**d. Contributing Off-site Drainage**

Approximately 42.71 acres of offsite area will drain onto the Coon Creek site. The offsite area consists of 11.93 acres of single-family residential lots and 30.78 acres of open space. The offsite area will be treated as pass-thru in the northeast detention basin referred to as DA3 pond within this report. Refer to the drainage maps found in the Appendix.

**e. Floodways, Floodplains and Wetlands**

See Appendix for the Wetlands map and FIRM Panel Number 19049C0340F, effective date December 7, 2018.

**2. Drainage Basin**

**a. Pre-developed Analysis**

**1) Pre-developed Land Use**

**All CN Values are from Section 2B-4**

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Area (ac)	Curve Number
Existing DA1	Pasture, grassland, or Range – good condition	C	16.56	74
<b>Total Area / Weighted Curve Number</b>			<b>16.56</b>	<b>74</b>
			=====	===

**2) Precipitation Model**

Rainfall Intensity Duration Frequency (IDF) Curve.

1-Yr	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
2.67	3.08	3.81	4.46	5.44	6.26	7.12

3) Time of Concentration

		TIME OF CONCENTRATION
		SUBAREA
		Existing DA1
SHEET FLOW	n (Manning's "n")	0.15
	L (length of flow)	100
	P2 (two year, 24 hr rainfall)	3.08
	S (slope in ft/ft)	1.8%
	T <sub>SF</sub> (MINUTES)	10.42
SHALLOW CONCENTRATED FLOW	L (length of flow in feet)	1398
	S (slope in ft/ft)	7.2%
	Ground Cover	SHORT-GRASS
	Velocity Coefficient (TABLE 2-B-3.02)	6.96
	V (ft/sec)	1.86
	T <sub>CF</sub> (MINUTES)	12.52
CHANNEL FLOW	n (mannings "n")	N/A
	A (cross sectional area)	N/A
	P (wetted perimeter)	N/A
	S (slope ft/ft)	N/A
	V (velocity ft/sec)	N/A
	L (Length of flow in feet)	N/A
	T <sub>CF</sub> (MINUTES)	N/A
<b>TIME OF CONCENTRATION (MINUTES)</b>		<b>22.93</b>

\*Min ToC is 15 Minutes

4) Summary of Pre-Developed Runoff

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)
-----						
SUBAREAS						
<b>Existing DA1</b>	15.91 12.13	25.06 12.13	33.83 12.13	47.96 12.10	60.28 12.10	73.50 12.10

# Hydrograph Report

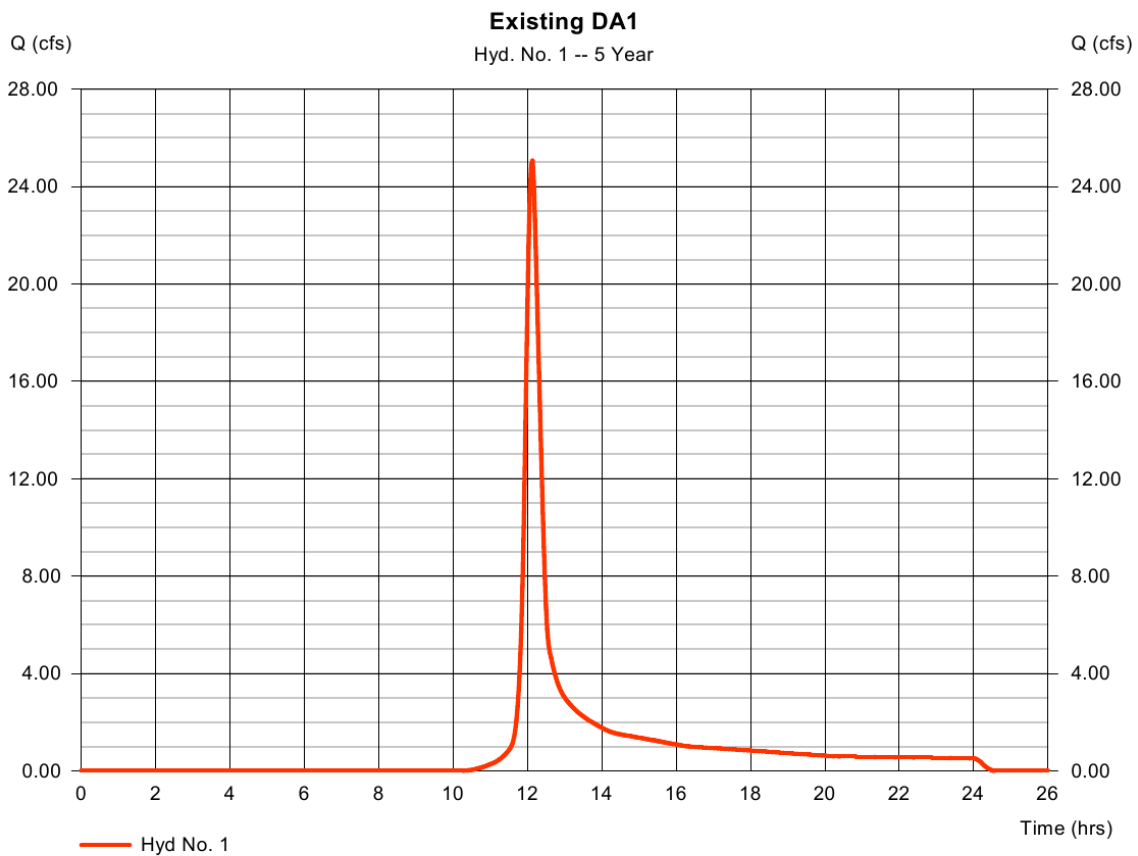
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## Hyd. No. 1

Existing DA1

Hydrograph type	= SCS Runoff	Peak discharge	= 25.06 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.13 hrs
Time interval	= 2 min	Hyd. volume	= 89,229 cuft
Drainage area	= 16.560 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.90 min
Total precip.	= 3.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

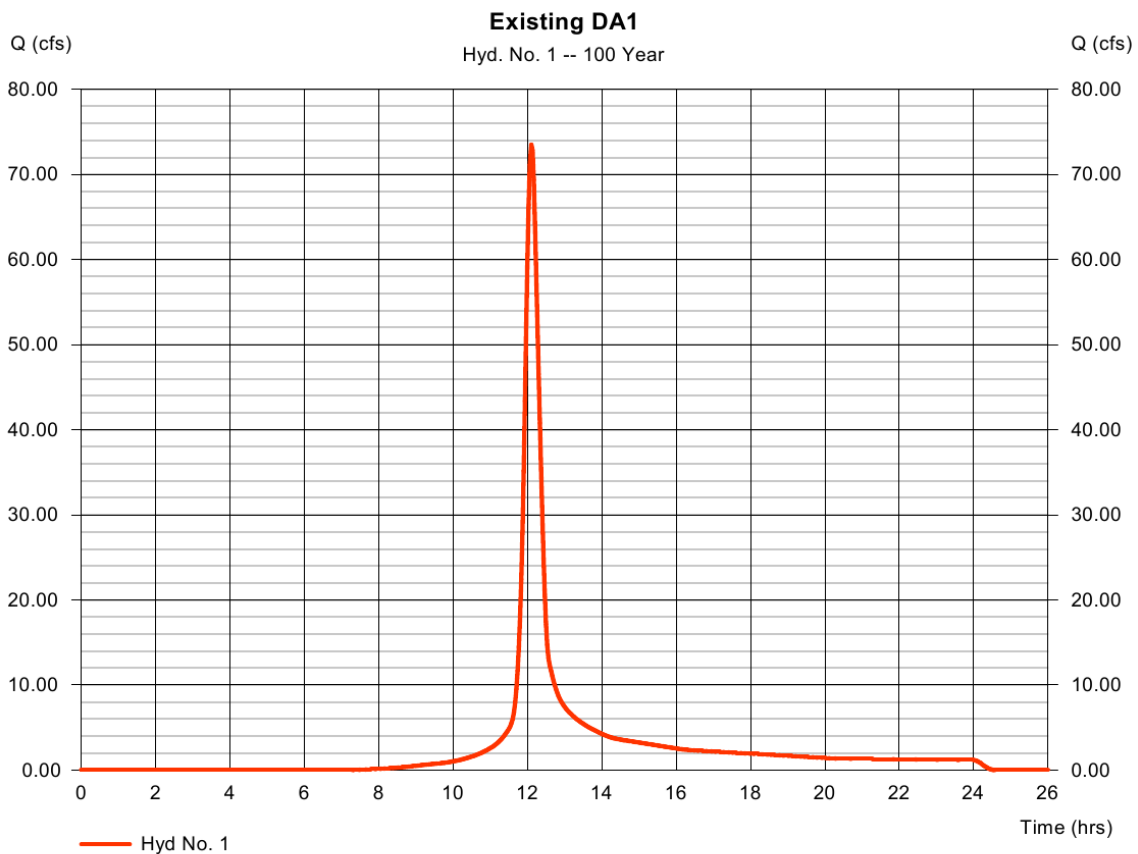
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Monday, 08 / 19 / 2019

## Hyd. No. 1

Existing DA1

Hydrograph type	= SCS Runoff	Peak discharge	= 73.50 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 253,731 cuft
Drainage area	= 16.560 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 22.90 min
Total precip.	= 7.12 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



b. *Offsite Runoff Analysis*

1) **Watershed Area**

All CN Values are from Section 2B-4

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Area (ac)	Curve Number
Offsite 1	Residential districts by average lot size – ¼ acre	C	11.93	83
	Open space – good condition	C	30.78	74
<b>Total Area / Weighted Curve Number</b>			<b>42.71</b>	<b>77</b>
			=====	===

2) **Time of Concentration**

		TIME OF CONCENTRATION
		SUBAREA
		Offsite 1
<b>SHEET FLOW</b>	n (Manning's "n")	0.15
	L (length of flow)	100
	P2 (two year, 24 hr rainfall)	3.08
	S (slope in ft/ft)	0%
	T <sub>SF</sub> (MINUTES)	19.01
<b>SHALLOW CONCENTRATED FLOW</b>	L (length of flow in feet)	1491
	S (slope in ft/ft)	0.0531
	Ground Cover	SHORT-GRASS
	Velocity Coefficient (TABLE 2-B-3.02)	6.96
	V (ft/sec)	1.60
	T <sub>CF</sub> (MINUTES)	15.49
<b>CHANNEL FLOW</b>	n (mannings "n")	N/A
	A (cross sectional area)	N/A
	P (wetted perimter)	N/A
	S (slope ft/ft)	N/A
	V (velocity ft/sec)	N/A
	L (Length of flow in feet)	N/A
	T <sub>CF</sub> (MINUTES)	N/A
<b>TIME OF CONCENTRATION (MINUTES)</b>		<b>34.50</b>

**3) Precipitation Model**

Rainfall Intensity Duration Frequency (IDF) Curve.

<b>1-Yr</b>	<b>2-Yr</b>	<b>5-Yr</b>	<b>10-Yr</b>	<b>25-Yr</b>	<b>50-Yr</b>	<b>100-Yr</b>
<b>2.67</b>	<b>3.08</b>	<b>3.81</b>	<b>4.46</b>	<b>5.44</b>	<b>6.26</b>	<b>7.12</b>

**4) Summary of Offsite Runoff**

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)
-----						
<b>SUBAREAS</b>						
<b>Offsite 1</b>	36.43 12.27	55.24 12.27	73.03 12.27	101.14 12.23	125.45 12.23	151.36 12.23

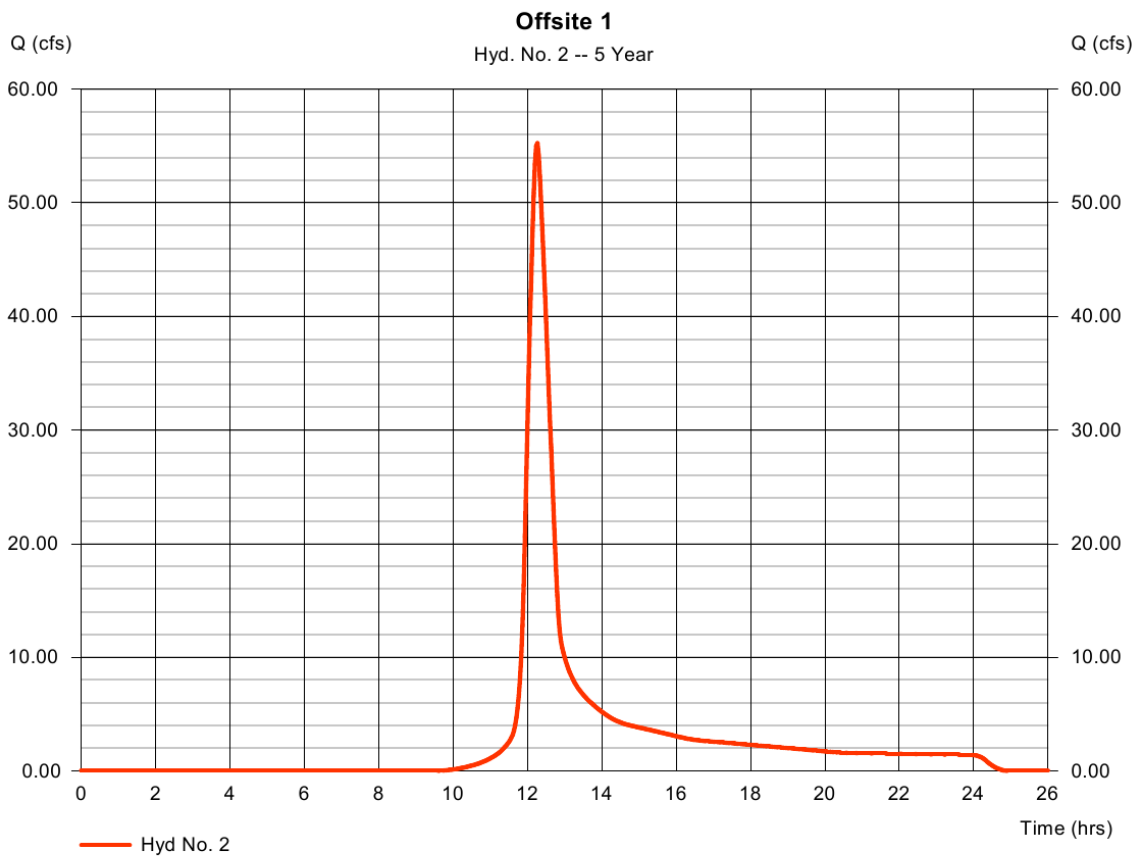
# Hydrograph Report

## Hyd. No. 2

### Offsite 1

Hydrograph type	= SCS Runoff	Peak discharge	= 55.24 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.27 hrs
Time interval	= 2 min	Hyd. volume	= 255,165 cuft
Drainage area	= 42.710 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 34.50 min
Total precip.	= 3.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.930 x 83) + (30.780 x 74)] / 42.710





# Hydrograph Report

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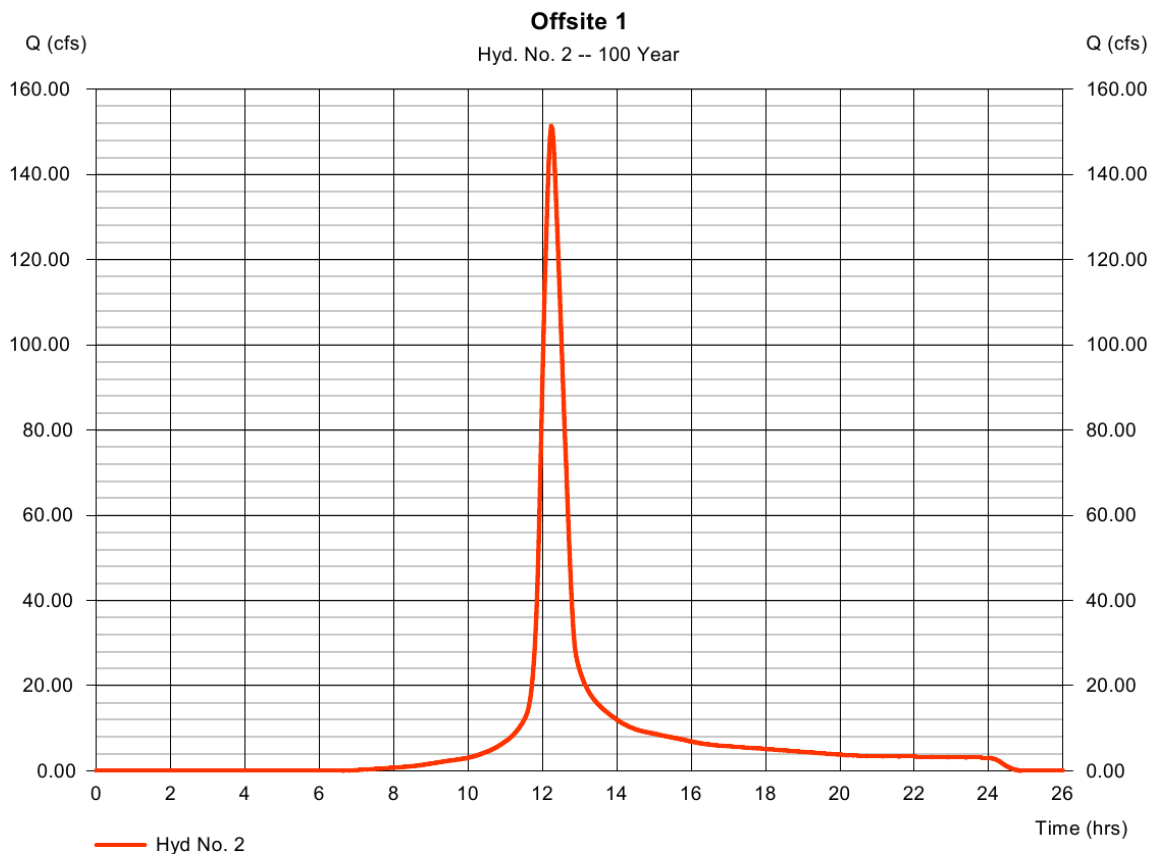
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## Hyd. No. 2

Offsite 1

Hydrograph type	= SCS Runoff	Peak discharge	= 151.36 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 685,727 cuft
Drainage area	= 42.710 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 34.50 min
Total precip.	= 7.12 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

\* Composite (Area/CN) = [(11.930 x 83) + (30.780 x 74)] / 42.710



**c. Post-development Runoff Analysis**

**1) Developed Detained Drainage Area**

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
<b>DA1</b>	Residential districts by average lot size – ½ acre	C	5.57	80
<b>DA2</b>	Residential districts by average lot size – ½ acre	C	1.05	80
<b>DA3</b>	Residential districts by average lot size – ½ acre	C	9.94	80
<b>Total Area / Weighted Curve Number</b>			<b>16.56</b>	<b>80</b>
			=====	==

**2) Time of Concentration**

The time of concentration for DA1 and DA3 is assumed to be 15 minutes.

The time of concentration for DA2 is assumed to be 10 minutes.

### 3) Summary of Developed Runoff

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period					
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)	(cfs) (hr)
-----						
<b>SUBAREAS</b>						
<b>DA1</b>	9.11	13.24	17.07	23.01	28.05	33.37
	12.03	12.03	12.03	12.03	12.03	12.03
<b>DA2</b>	1.97	2.86	3.68	4.96	6.04	7.18
	12.03	12.00	12.00	12.00	12.00	12.00
<b>DA3</b>	16.26	23.63	30.47	41.05	50.05	59.55
	12.03	12.03	12.03	12.03	12.03	12.03

# Hydrograph Report

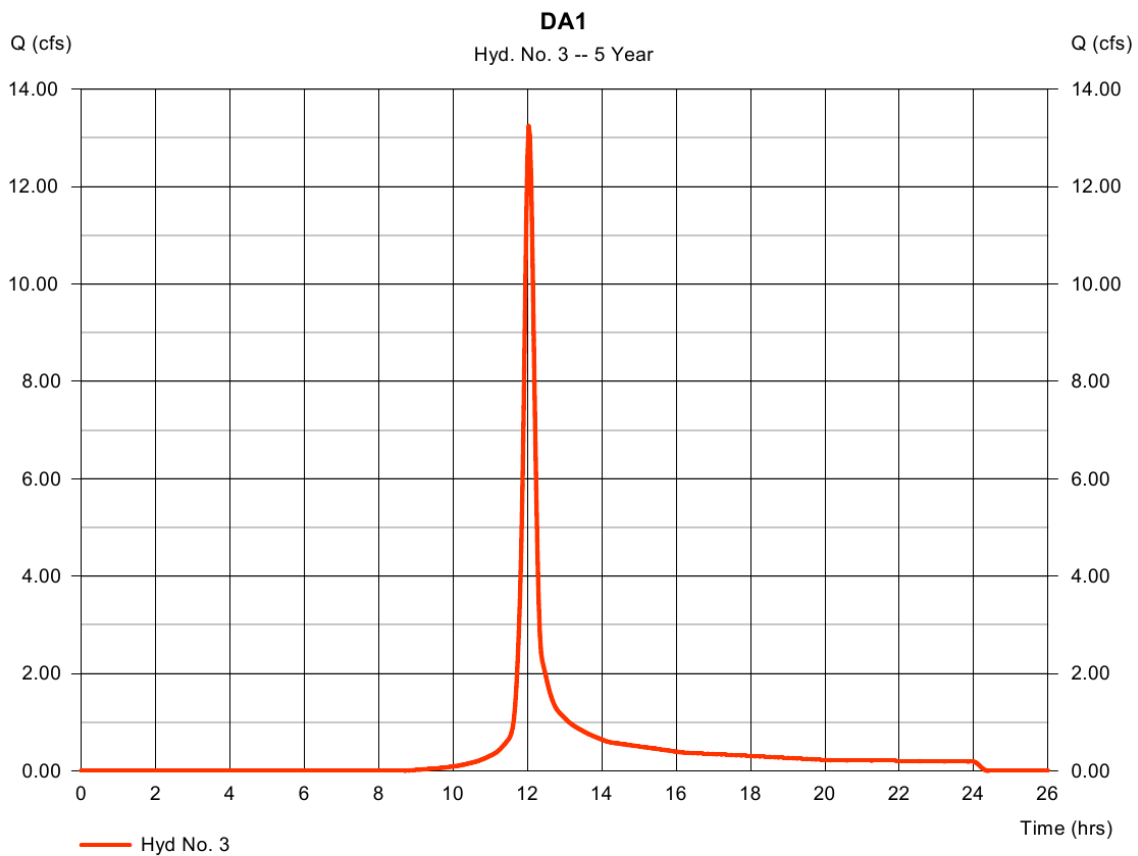
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## Hyd. No. 3

DA1

Hydrograph type	= SCS Runoff	Peak discharge	= 13.24 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 37,175 cuft
Drainage area	= 5.570 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

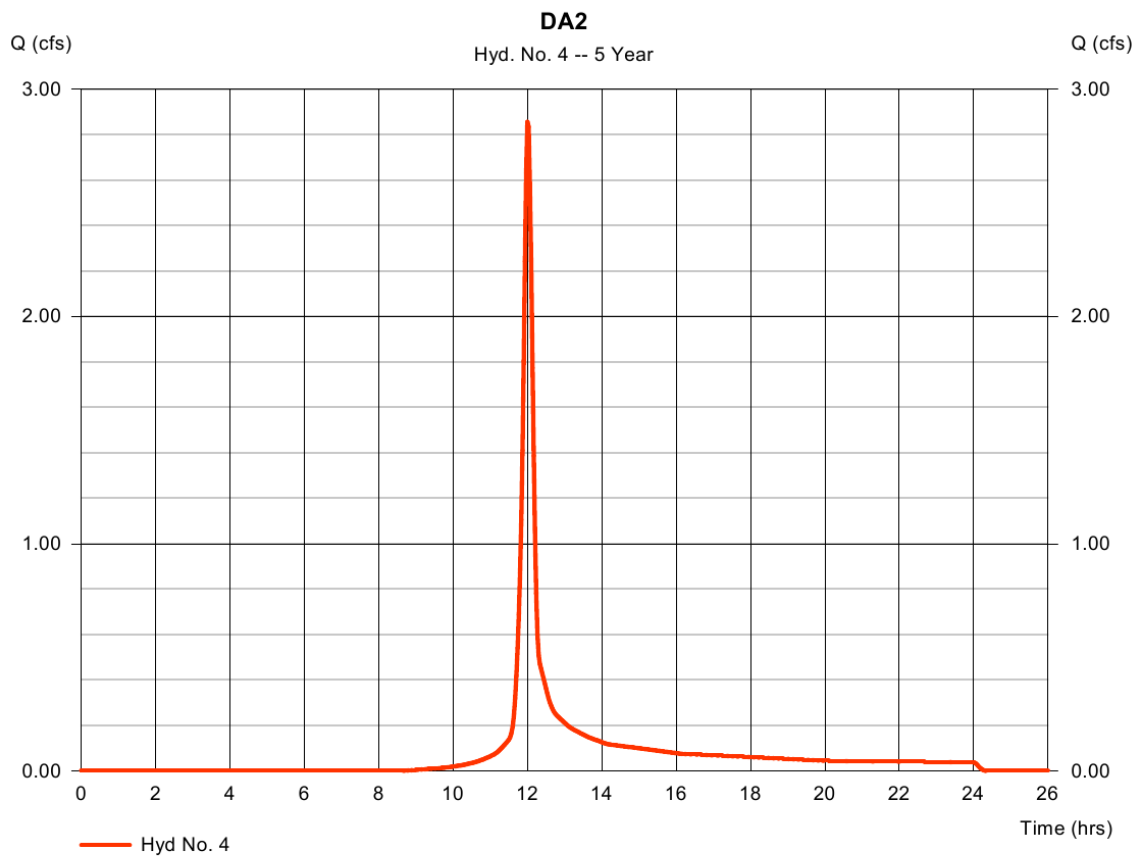
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## Hyd. No. 4

DA2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.856 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 7,412 cuft
Drainage area	= 1.050 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

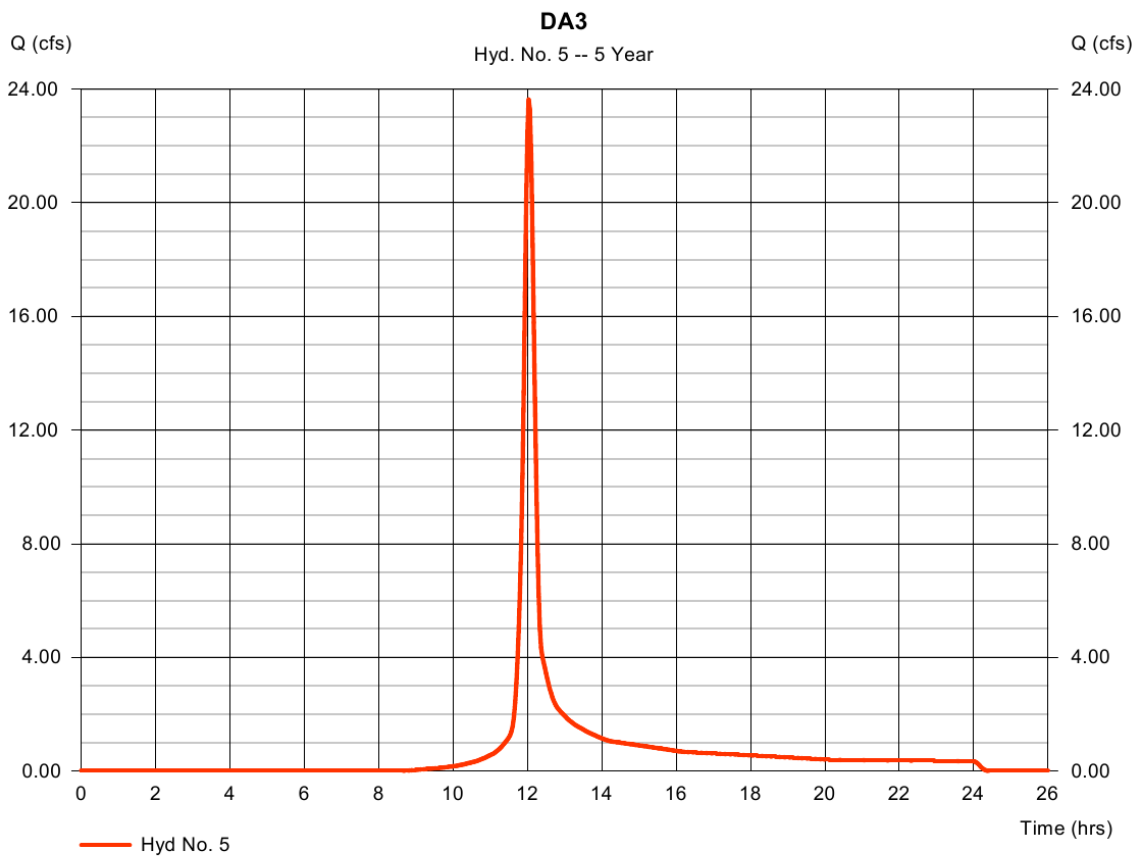
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## Hyd. No. 5

DA3

Hydrograph type	= SCS Runoff	Peak discharge	= 23.63 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 66,340 cuft
Drainage area	= 9.940 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.81 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

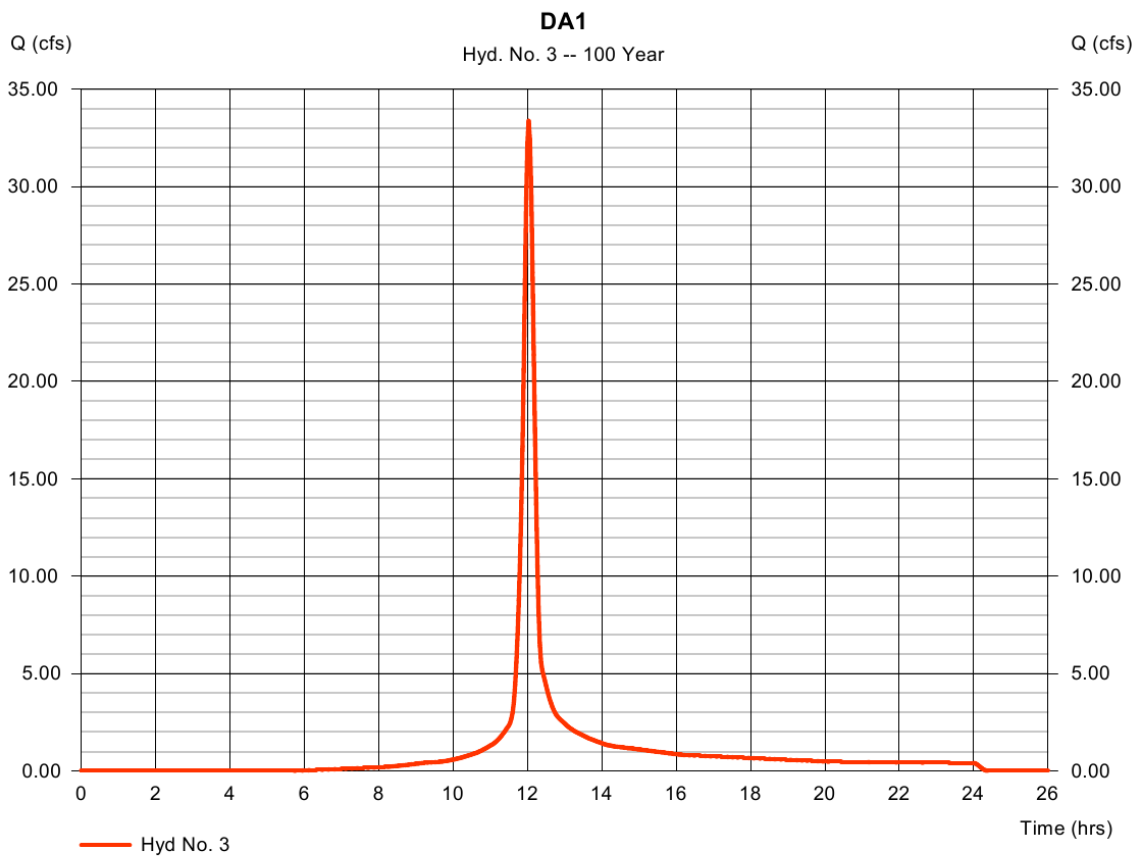


# Hydrograph Report

## Hyd. No. 3

DA1

Hydrograph type	= SCS Runoff	Peak discharge	= 33.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 94,730 cuft
Drainage area	= 5.570 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.12 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



# Hydrograph Report

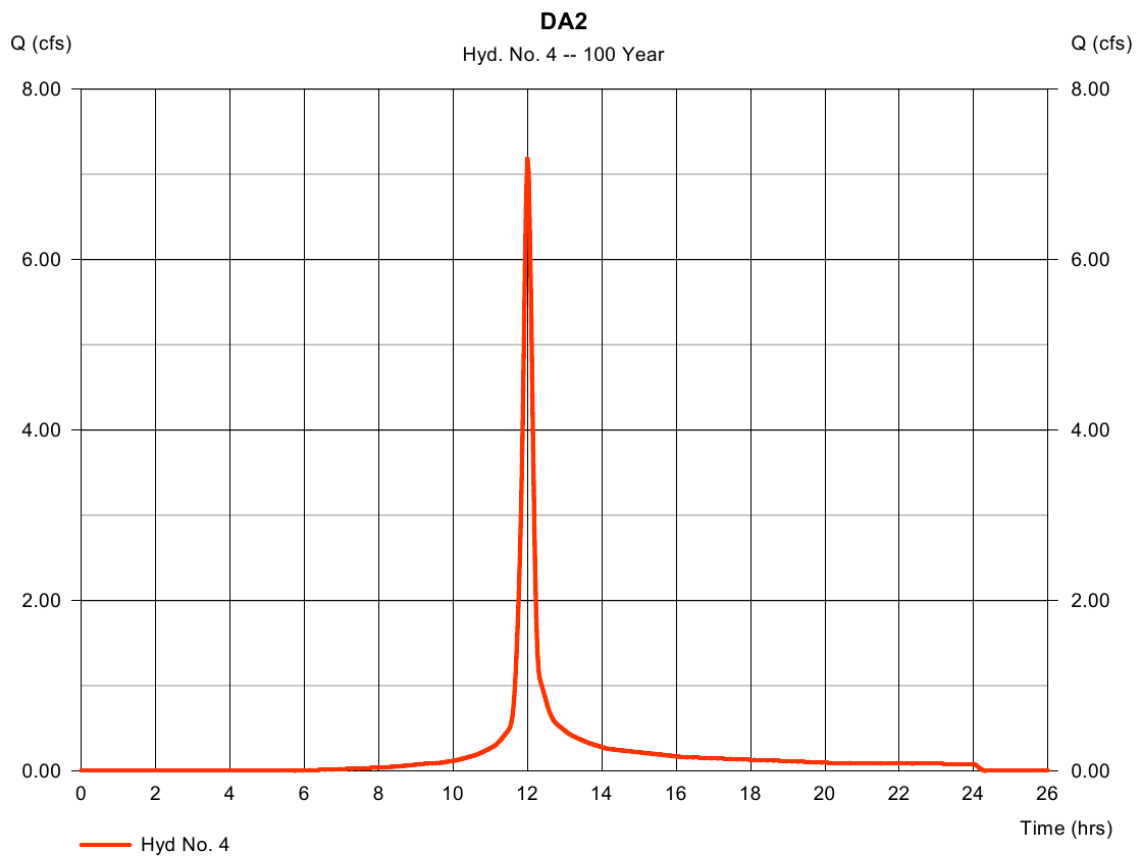
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## Hyd. No. 4

DA2

Hydrograph type	= SCS Runoff	Peak discharge	= 7.184 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.00 hrs
Time interval	= 2 min	Hyd. volume	= 18,888 cuft
Drainage area	= 1.050 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 7.12 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484





# Hydrograph Report

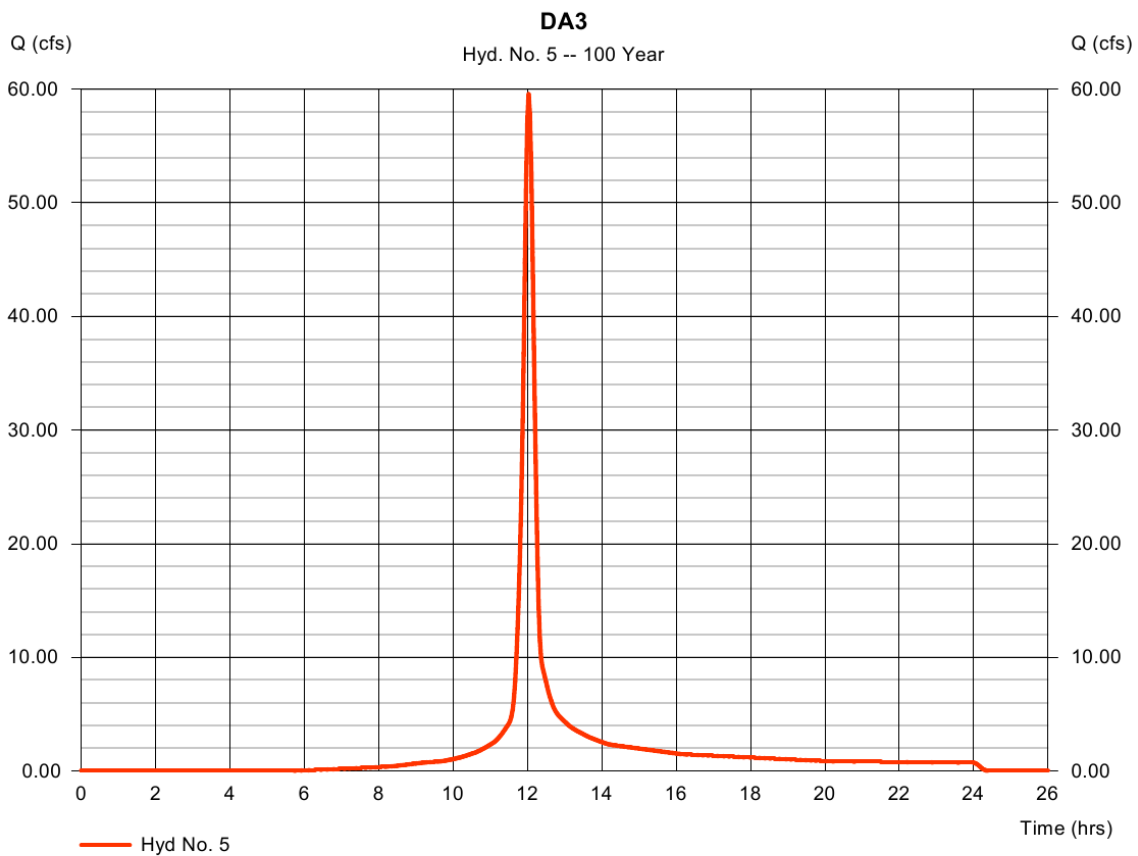
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## Hyd. No. 5

DA3

Hydrograph type	= SCS Runoff	Peak discharge	= 59.55 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 169,051 cuft
Drainage area	= 9.940 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.12 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



**d. Stormwater Conveyance Design**

**1) Design Information References**

- i. The Rational Method was used to determine design flows. Manning's Equation was used to determine pipe capacities.
- ii. Intakes were located to provide bypass flows below the maximum 50% bypass flow for the 5-year event. (See Figure 5.1 Storm Sewer Intake Calculations)
- iii. Low point intakes were designed to intercept the 100-year storm event. Pipes downstream from low point intakes were designed to convey 100-year flows.
- iv. Cleansing velocities within storm sewer pipes were calculated using  $\frac{1}{2}$  full pipes. All cleansing velocities were between 3 fps and 15 fps.

2) Storm Sewer

1. Storm Sewer System

2. Intake Calculations

A	B	D	E	F	G	H	I	J	K	L	M	N	O	O	P	R		S	P	T				P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
DRAINAGE AREA IDENTIFIER	Area (ac)	I5 (in/hr)	I10 (in/hr)	I100 (in/hr)	c5	c10	c100	Q5 (cfs)	Q10 (cfs)	Q100 (cfs)	q5 + bypass	q10 + bypass	q100 + bypass	* CG LP	INT. Type SW-	Slope (ft/ft)	Street X-Slope	Road Width (ft)	T <sub>100</sub>	Encroach. 100	E0 <sub>2</sub>	E0 <sub>5</sub>	E0 <sub>100</sub>	Q <sub>i5</sub> (cfs)	Q <sub>i10</sub> (cfs)	Q <sub>i100</sub> (cfs)	d5 ft	d10 ft	d100 (ft)	Qb5 (cfs)	Qb10 (cfs)	Qb100 (cfs)	%Capture 5Yr	%Capture 10Yr	%Capture 100Yr	Bypasses To Intake
ST 109	0.29	4.12	4.82	7.44	0.45	0.50	0.65	0.54	0.70	1.40	0.54	0.70	1.40	1	501	7.50%	2.00%	13.0	5.64	0.86	0.85	0.81	0.69	0.48	0.60	0.95	0.08	0.09	0.11	0.06	0.10	0.45	89%	86%	68%	ST 107
ST 108	0.28	4.12	4.82	7.44	0.45	0.50	0.65	0.52	0.67	1.35	0.52	0.67	1.35	1	501	7.50%	2.00%	13.0	5.56	0.94	0.86	0.81	0.70	0.47	0.58	0.93	0.08	0.09	0.11	0.05	0.09	0.43	90%	86%	68%	ST 106
ST 107	0.42	4.12	4.82	7.44	0.45	0.50	0.65	0.78	1.01	2.03	0.84	1.11	2.48	1	501	7.50%	2.00%	13.0	6.50	0.00	0.78	0.73	0.63	0.70	0.88	1.55	0.09	0.10	0.13	0.14	0.23	0.93	83%	79%	62%	ST 105
ST 106	0.40	4.12	4.82	7.44	0.45	0.50	0.65	0.74	0.96	1.93	0.79	1.06	2.36	1	501	7.50%	2.00%	13.0	6.50	0.00	0.79	0.74	0.63	0.67	0.84	1.48	0.09	0.10	0.13	0.13	0.21	0.89	84%	80%	62%	ST 104
ST 105	0.30	4.12	4.82	7.44	0.45	0.50	0.65	0.56	0.72	1.45	0.69	0.95	2.38	1	501	7.50%	2.00%	13.0	6.50	0.00	0.81	0.76	0.63	0.60	0.78	1.49	0.09	0.10	0.13	0.10	0.18	0.89	86%	81%	62%	ST 103
ST 104	0.30	4.12	4.82	7.44	0.45	0.50	0.65	0.56	0.72	1.45	0.68	0.93	2.34	1	501	7.50%	2.00%	13.0	6.50	0.00	0.81	0.76	0.63	0.59	0.76	1.46	0.09	0.10	0.13	0.09	0.17	0.88	86%	82%	62%	ST 102
ST 103	0.30	4.12	4.82	7.44	0.45	0.50	0.65	0.56	0.72	1.45	0.65	0.90	2.34	1	501	7.50%	2.00%	13.0	6.50	0.00	0.82	0.77	0.63	0.57	0.74	1.46	0.08	0.10	0.13	0.09	0.16	0.88	87%	82%	62%	ST 006
ST 102	0.31	4.12	4.82	7.44	0.45	0.50	0.65	0.57	0.75	1.50	0.67	0.92	2.38	1	501	7.50%	2.00%	13.0	6.50	0.00	0.82	0.76	0.63	0.58	0.75	1.48	0.09	0.10	0.13	0.09	0.16	0.89	87%	82%	62%	ST 005
ST 006	8.66	4.12	4.82	7.44	0.55	0.60	0.70	19.62	25.04	45.10	19.71	25.20	45.98	0	505	1.00%	2.00%	13.0	6.50	0.00	NA	NA	NA	11.67	14.88	27.65	0.31	0.50	1.12	8.04	10.33	18.33	59%	59%	60%	LP
ST 005	1.21	4.12	4.82	7.44	0.55	0.60	0.70	2.74	3.50	6.30	10.87	13.99	25.52	0	505	1.00%	2.00%	13.0	6.50	0.00	NA	NA	NA	10.87	13.99	25.52	0.31	0.50	1.12	0.00	0.00	0.00	100%	100%	100%	LP

a. Pipe Calculations

All Minimum Pipe Slopes are based on using RCP																	
No Pipe Slopes less than 0.40% shall be used																	
Struc	to	Struc	Cumm Q <sub>5</sub> pipe cfs	Cumm Q <sub>10</sub> pipe cfs	Cumm Q <sub>100</sub> pipe cfs	DESIGN STORM	Min 54"	Min 48"	Min 42"	Min 36"	Min 33"	Min 30"	Min 27"	Min 24"	Min 21"	Min 18"	Min 15"
							54	48	42	36	33	30	27	24	21	18	15
ST 109	to	ST 108	0.48	0.60	0.95	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
ST 108	to	ST 106	0.95	1.18	1.88	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.03%
ST 107	to	ST 106	0.70	0.88	1.55	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%
ST 106	to	ST 104	2.31	2.91	4.91	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.03%	0.08%	0.20%
ST 105	to	ST 104	0.60	0.78	1.49	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
ST 104	to	ST 102	3.50	4.45	7.85	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.02%	0.04%	0.08%	0.18%	0.47%
ST 103	to	ST 102	0.57	0.74	1.46	Q10pipe cfs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
ST 102	to	ST 101	4.64	5.94	10.80	Q10pipe cfs	0.00%	0.00%	0.00%	0.01%	0.01%	0.02%	0.04%	0.07%	0.14%	0.32%	0.84%
ST 101	to	ST 005	4.64	5.94	10.80	Q10pipe cfs	0.00%	0.00%	0.00%	0.01%	0.01%	0.02%	0.04%	0.07%	0.14%	0.32%	0.84%
ST 006	to	ST 005	70.06	99.54	208.44	Q100pipe cfs	1.12%	2.09%	4.27%	9.71%	15.45%	25.69%	45.05%	84.44%	172.12%	391.64%	1035.60%
ST 005	to	ST 004	85.58	119.47	244.77	Q100pipe cfs	1.54%	2.89%	5.89%	13.39%	21.30%	35.42%	62.13%	116.44%	237.35%	540.05%	1428.01%

**1) TR-55 Design Limitations**

TR-55 includes a method for estimating required storage volume based upon peak inflow, peak outflow, and total runoff volume. This method may result in storage errors of 25% and should not be used in final design. The detention basin size in final design should be based upon actual hydrograph routing utilizing methods such as WINTR-55 or TR-20.



**e. Channel Design**

Hydraflow Hydrographs Extension for Autocad was used to route storm events to determine the flowrate that will pass through the North Rear Yard Swale during the 100-year storm event. Hydraflow Express Extension for Autocad was used to model the channel. The following sheets include detailed Hydraflow and Express reports of the channel.

**North Rear Yard Swale Summary:**

**The Hydraflow routing shows 10.94 cfs will release from the site and travel through the North Rear Yard Swale during the 100-year storm event.**

**Channel Report**

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc.

Wednesday, Apr 28 2021

**NORTH REAR YARD SWALE**

**Trapezoidal**

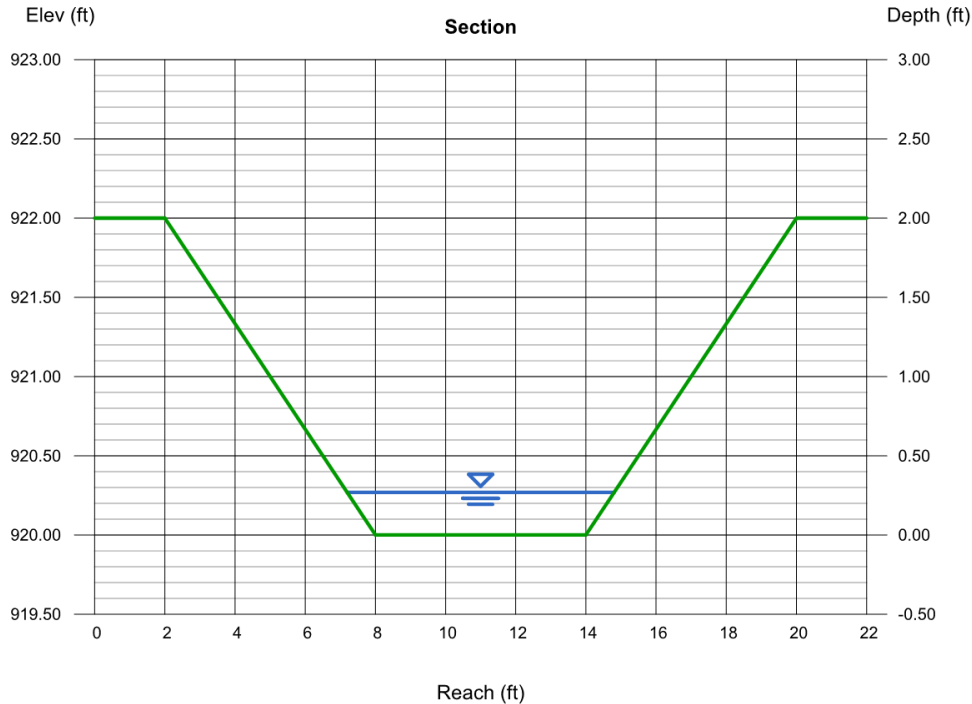
Bottom Width (ft) = 6.00  
 Side Slopes (z:1) = 3.00, 3.00  
 Total Depth (ft) = 2.00  
 Invert Elev (ft) = 920.00  
 Slope (%) = 10.71  
 N-Value = 0.030

**Highlighted**

Depth (ft) = 0.27  
 Q (cfs) = 10.94  
 Area (sqft) = 1.84  
 Velocity (ft/s) = 5.95  
 Wetted Perim (ft) = 7.71  
 Crit Depth, Yc (ft) = 0.44  
 Top Width (ft) = 7.62  
 EGL (ft) = 0.82

**Calculations**

Compute by: Known Q  
 Known Q (cfs) = 10.94



**f. Stormwater Facilities Design – Onsite**

**1) Release Rate**

The allowed release rate of the Coon Creek site during the developed 100-year rain event will be limited to the peak stormwater runoff rate of the 5-year rain event with pre-developed conditions.

**Q<sub>5-YEAR ONSITE PREDEVELOPED</sub> = 25.06 cfs**



## 2) Detention Basin Performance

### Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

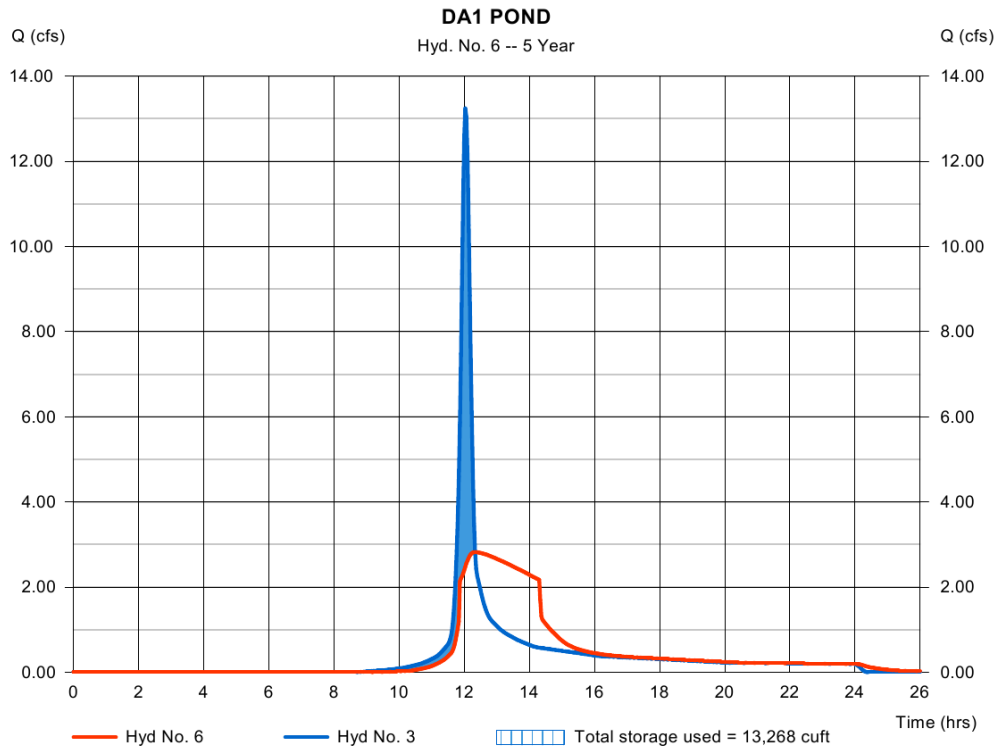
Monday, 08 / 19 / 2019

#### Hyd. No. 6

DA1 POND

Hydrograph type	= Reservoir	Peak discharge	= 2.822 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 37,167 cuft
Inflow hyd. No.	= 3 - DA1	Max. Elevation	= 905.15 ft
Reservoir name	= DA1 POND	Max. Storage	= 13,268 cuft

Storage Indication method used.



# Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Pond No. 1 - DA1 POND

### Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 902.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	902.00	20	0	0
1.00	904.00	5,500	2,760	2,760
4.00	906.00	12,700	27,300	30,060
5.00	908.00	17,000	14,850	44,910
6.00	909.00	19,000	18,000	62,910

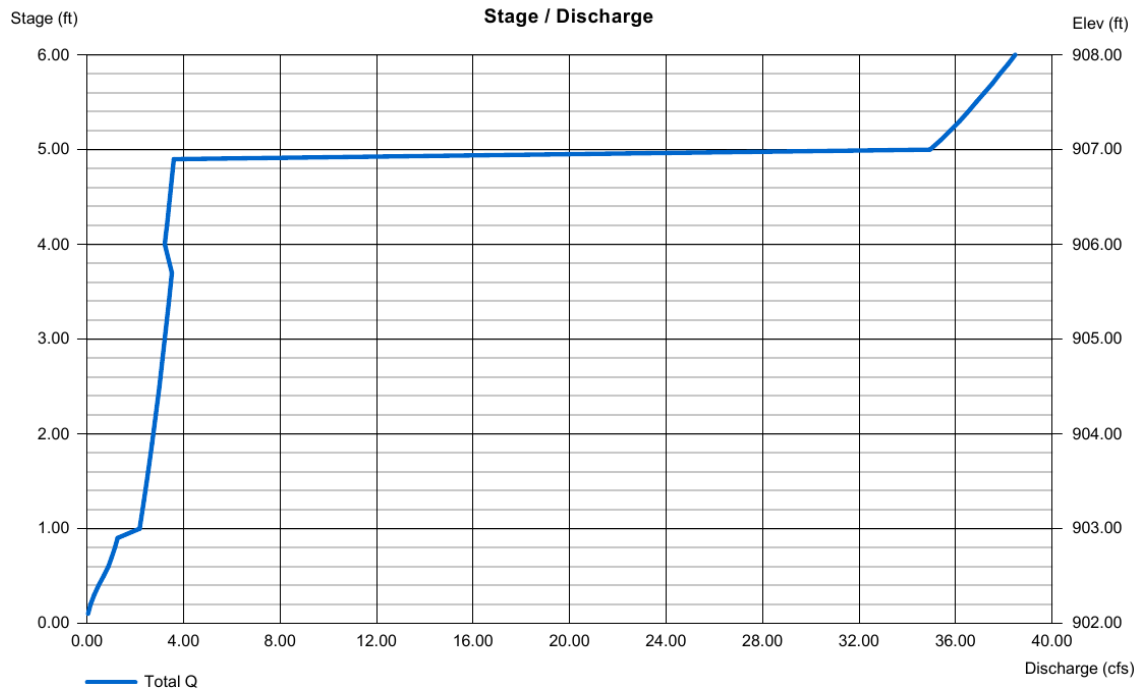
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	8.00	0.00	0.00
Span (in)	= 24.00	8.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 901.50	902.00	0.00	0.00
Length (ft)	= 50.00	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	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 18.00	0.00	0.00	0.00
Crest El. (ft)	= 907.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

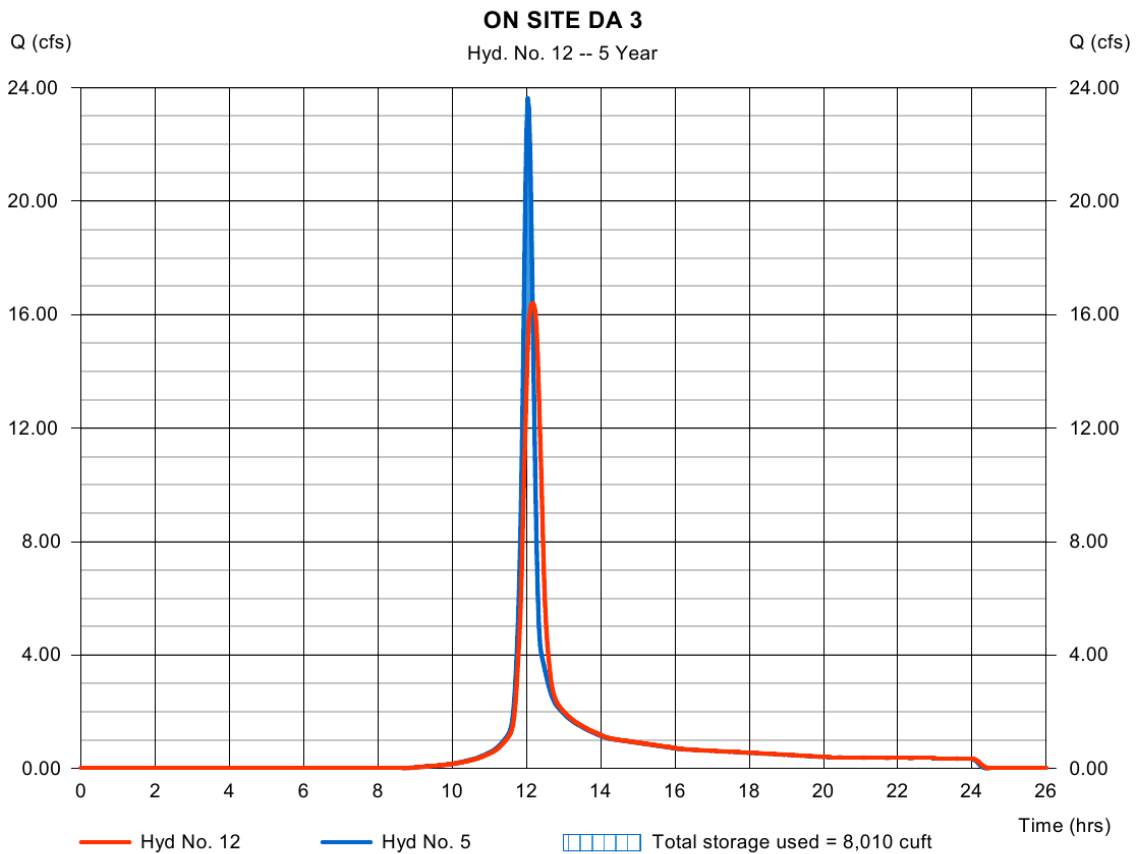
Monday, 08 / 19 / 2019

## Hyd. No. 12

ON SITE DA 3

Hydrograph type	= Reservoir	Peak discharge	= 16.41 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 66,340 cuft
Inflow hyd. No.	= 5 - DA3	Max. Elevation	= 900.11 ft
Reservoir name	= DA3 POND	Max. Storage	= 8,010 cuft

Storage Indication method used.



# Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Pond No. 3 - DA3 POND

### Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 897.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	898.00	50	0	0
2.00	900.00	6,900	6,950	6,950
4.00	902.00	12,750	19,650	26,600
6.00	904.00	16,080	28,830	55,430
6.50	904.50	17,150	8,308	63,738

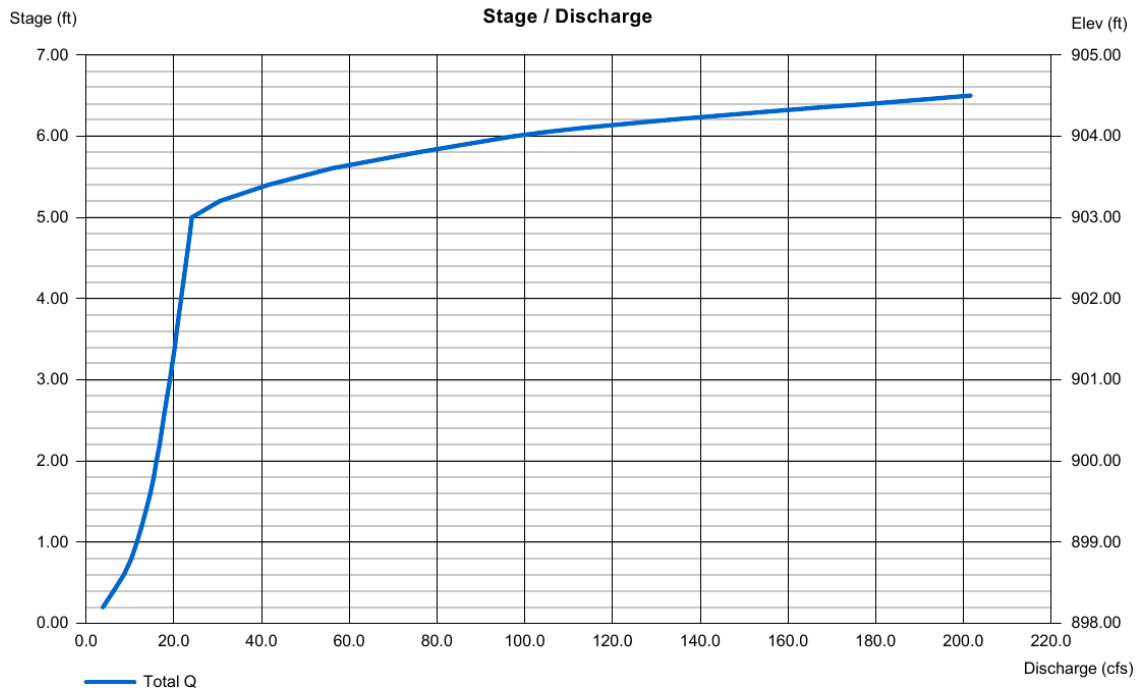
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 54.00	21.00	0.00	0.00
Span (in)	= 54.00	21.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 896.39	897.00	0.00	0.00
Length (ft)	= 60.00	0.00	0.00	0.00
Slope (%)	= 0.40	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	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 24.00	50.00	0.00	0.00
Crest El. (ft)	= 903.00	904.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Rect	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

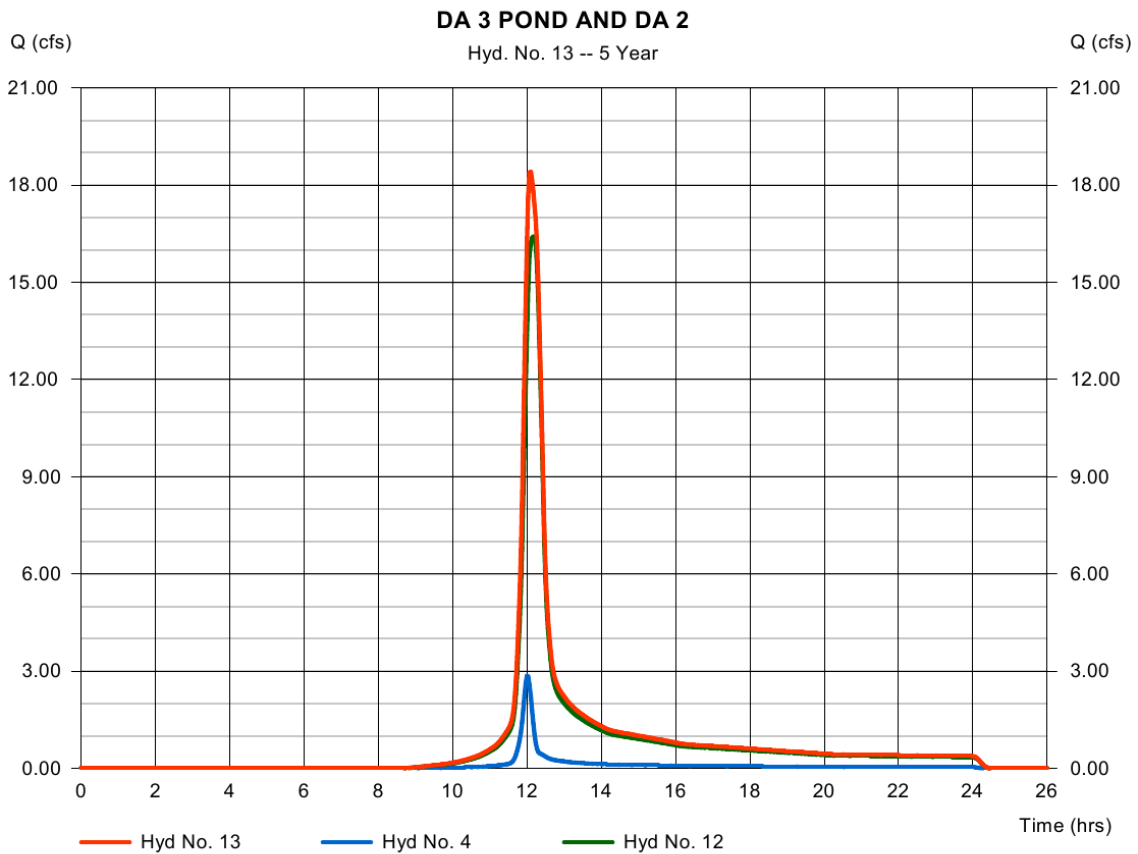
Monday, 08 / 19 / 2019

## Hyd. No. 13

DA 3 POND AND DA 2

Hydrograph type = Combine  
Storm frequency = 5 yrs  
Time interval = 2 min  
Inflow hyds. = 4, 12

Peak discharge = 18.41 cfs  
Time to peak = 12.10 hrs  
Hyd. volume = 73,752 cuft  
Contrib. drain. area = 1.050 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

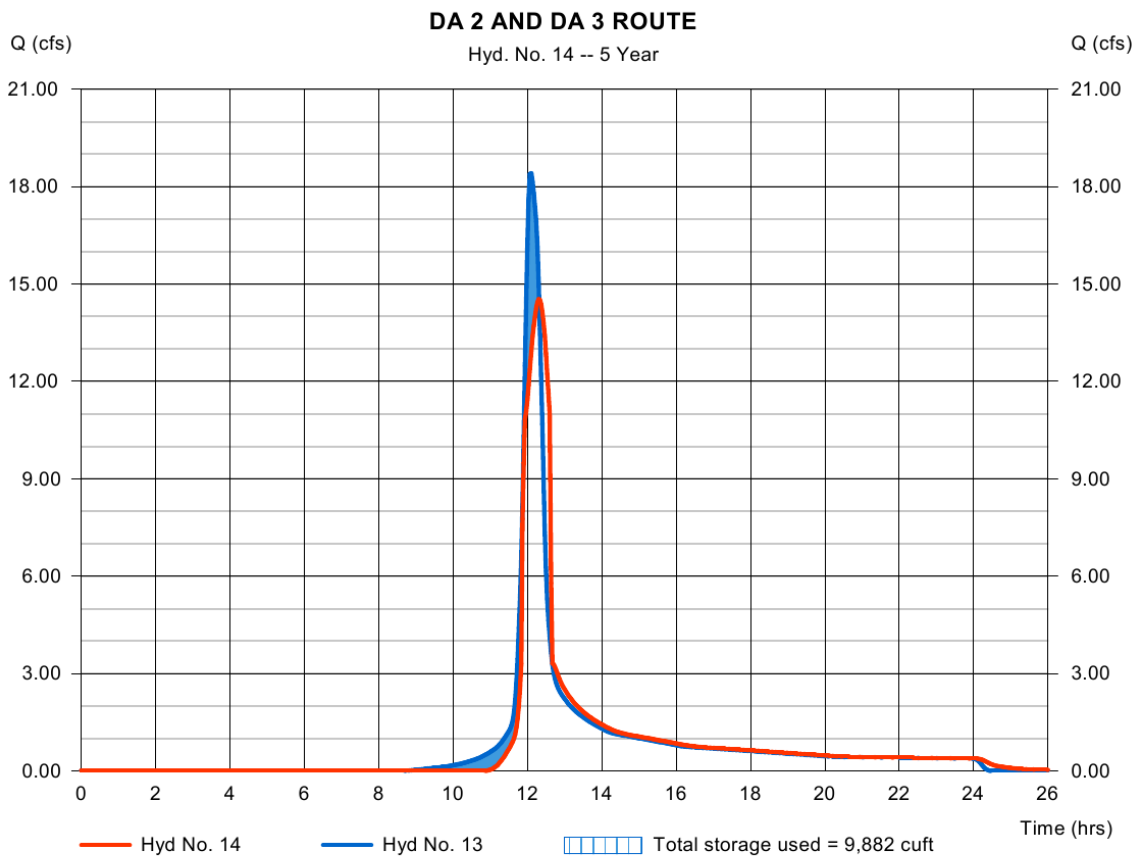
Monday, 08 / 19 / 2019

## Hyd. No. 14

### DA 2 AND DA 3 ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 14.53 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 72,435 cuft
Inflow hyd. No.	= 13 - DA 3 POND AND DA 2	Max. Elevation	= 898.96 ft
Reservoir name	= DA2 POND	Max. Storage	= 9,882 cuft

Storage Indication method used.



# Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Pond No. 2 - DA2 POND

### Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Beginning Elevation = 895.00 ft

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	895.00	29	0	0
1.00	896.00	2,590	1,310	1,310
2.00	898.00	4,024	3,307	4,617
4.00	900.00	6,975	10,999	15,616
6.00	902.00	10,725	17,700	33,316
7.00	903.00	12,000	11,363	44,679

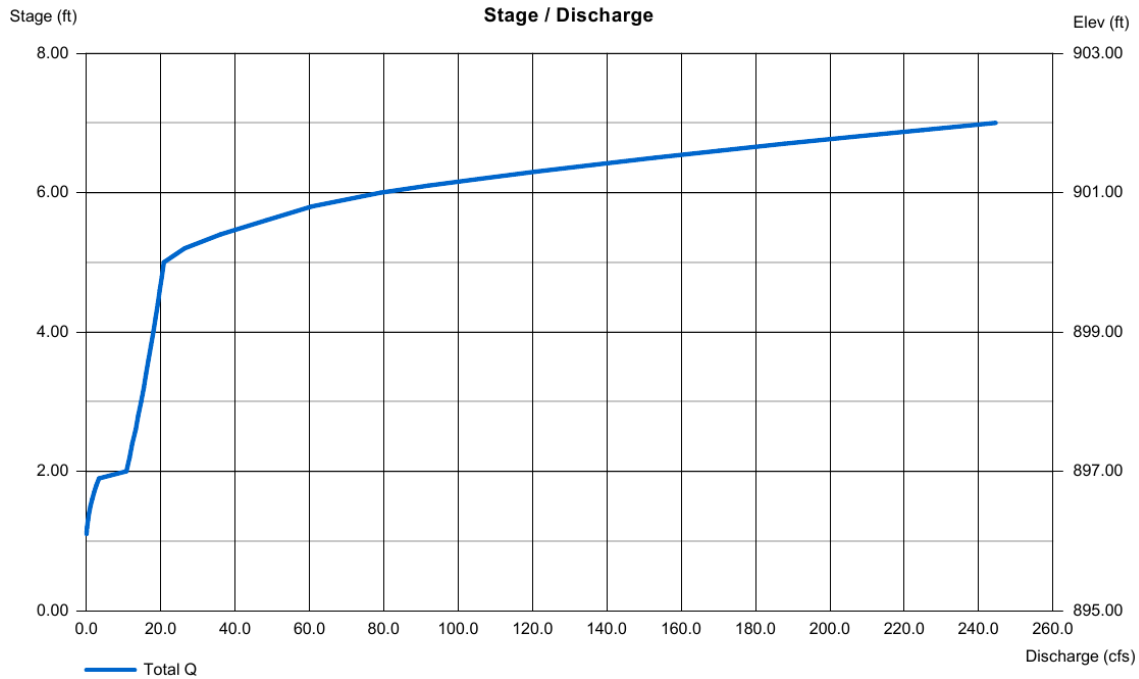
### Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 54.00	21.00	0.00	0.00
Span (in)	= 54.00	21.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 896.00	896.01	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 0.40	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	Yes	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	40.00	0.00	0.00
Crest El. (ft)	= 901.00	902.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Rect	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

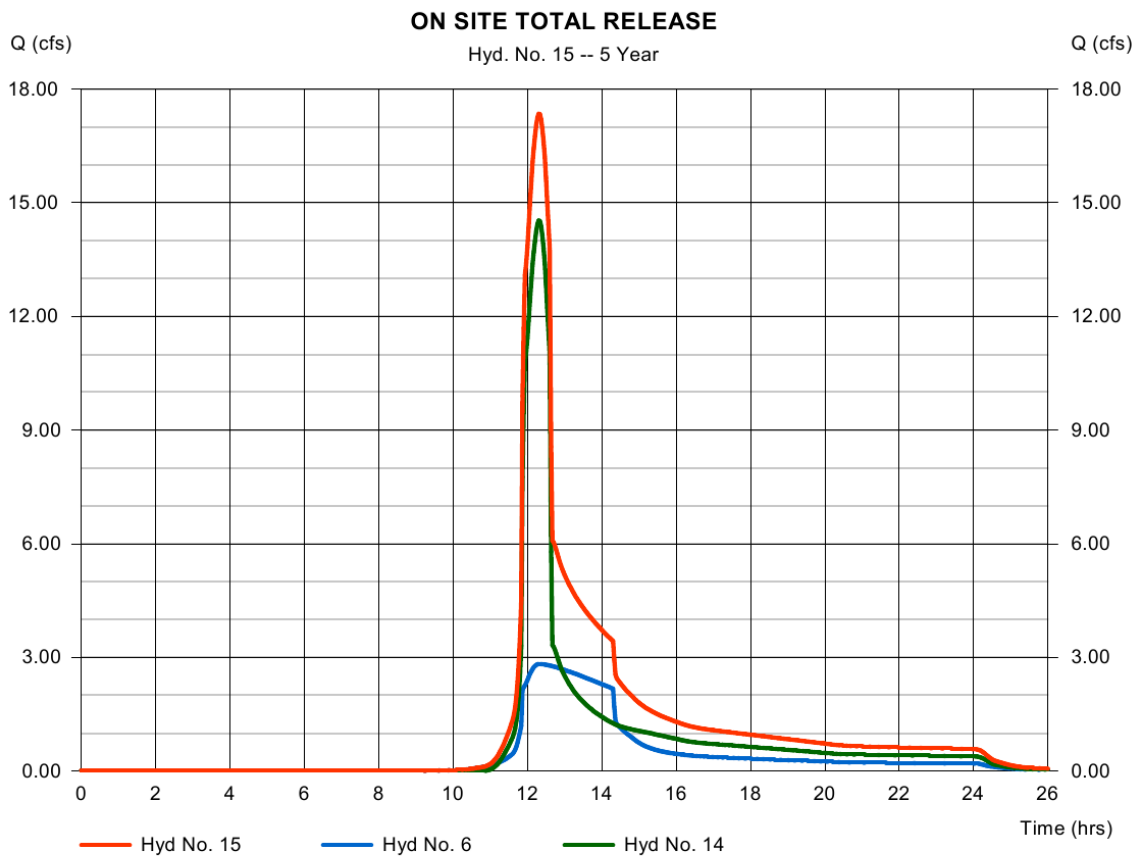


# Hydrograph Report

## Hyd. No. 15

### ON SITE TOTAL RELEASE

Hydrograph type	= Combine	Peak discharge	= 17.35 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 109,602 cuft
Inflow hyds.	= 6, 14	Contrib. drain. area	= 0.000 ac





# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

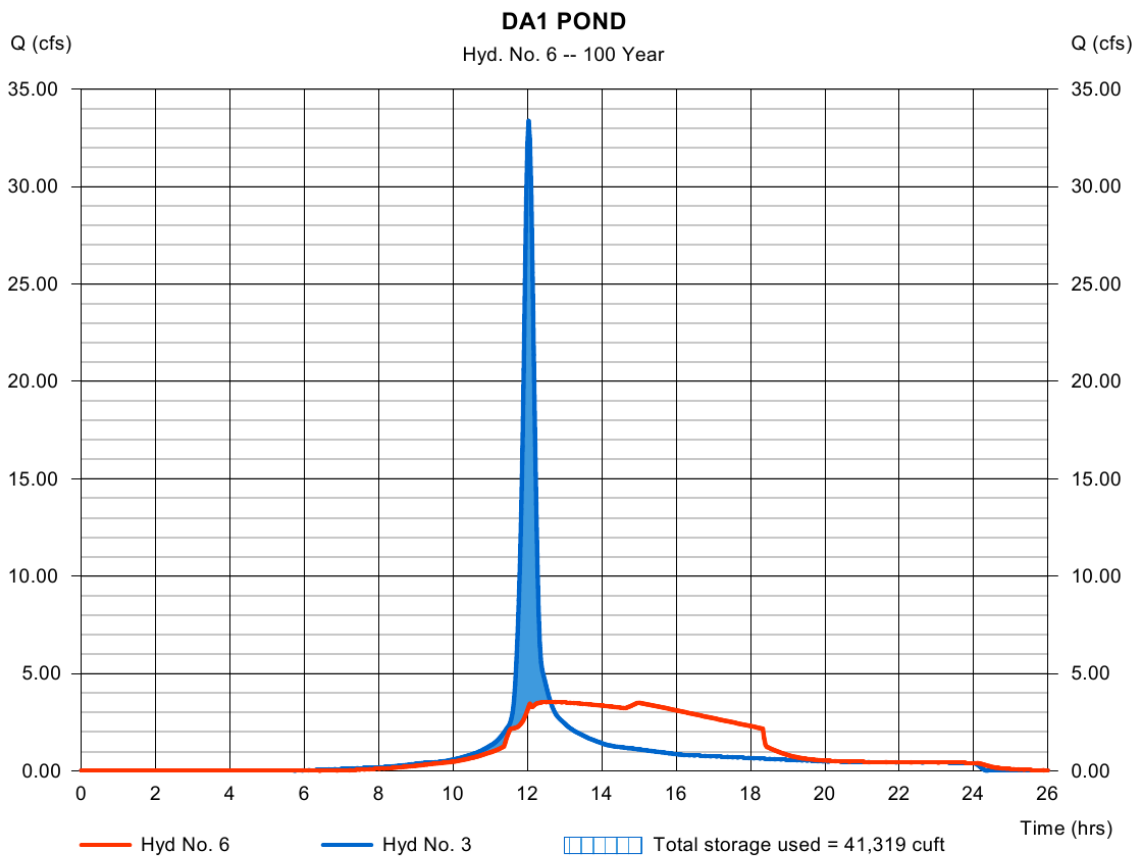
Monday, 08 / 19 / 2019

## Hyd. No. 6

DA1 POND

Hydrograph type	= Reservoir	Peak discharge	= 3.535 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.63 hrs
Time interval	= 2 min	Hyd. volume	= 94,722 cuft
Inflow hyd. No.	= 3 - DA1	Max. Elevation	= 906.76 ft
Reservoir name	= DA1 POND	Max. Storage	= 41,319 cuft

Storage Indication method used.



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

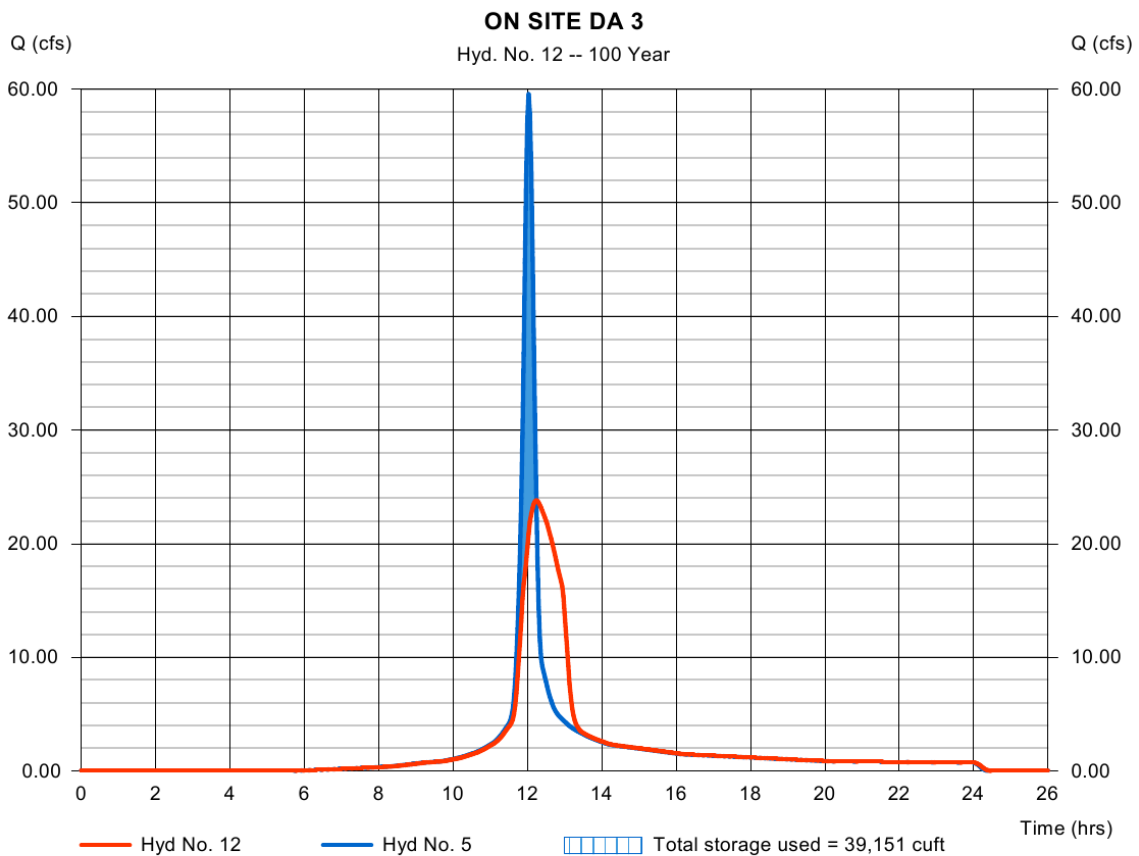
Monday, 08 / 19 / 2019

## Hyd. No. 12

ON SITE DA 3

Hydrograph type	= Reservoir	Peak discharge	= 23.80 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 169,051 cuft
Inflow hyd. No.	= 5 - DA3	Max. Elevation	= 902.87 ft
Reservoir name	= DA3 POND	Max. Storage	= 39,151 cuft

Storage Indication method used.



# Hydrograph Report

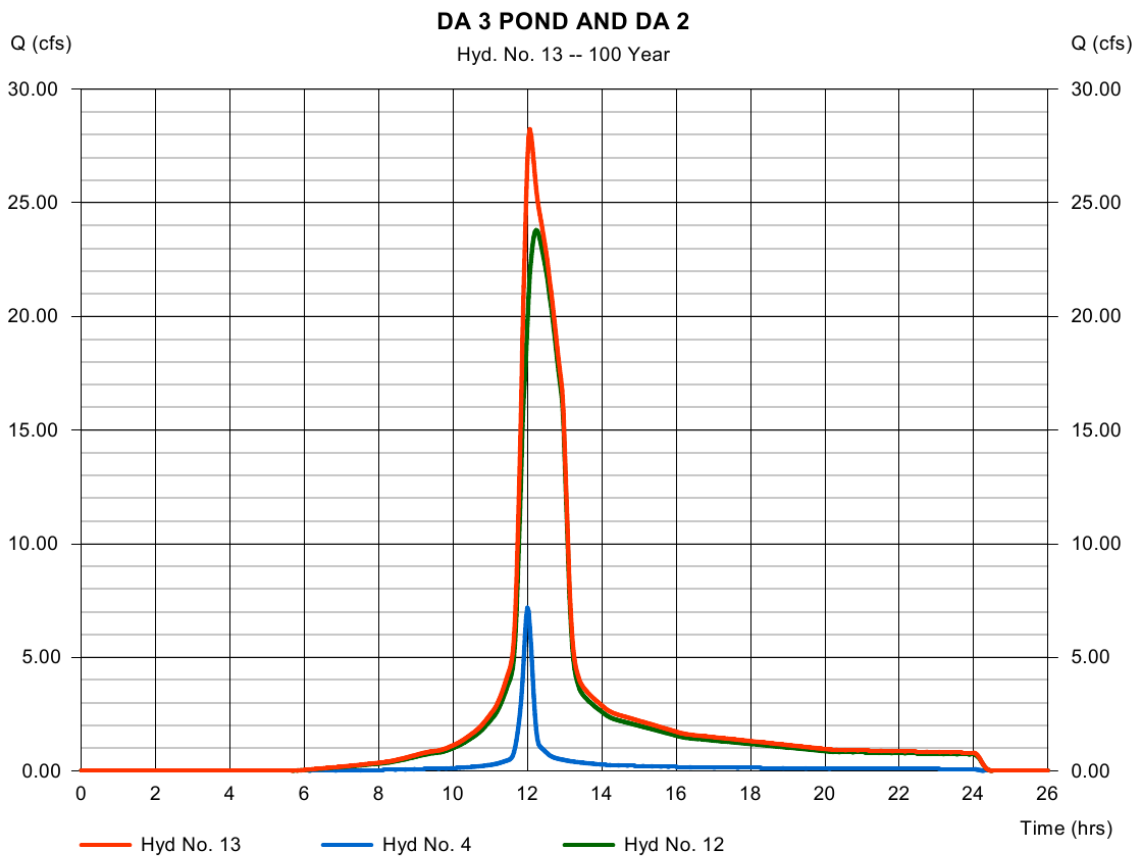
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Hyd. No. 13

DA 3 POND AND DA 2

Hydrograph type	= Combine	Peak discharge	= 28.24 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 187,939 cuft
Inflow hyds.	= 4, 12	Contrib. drain. area	= 1.050 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

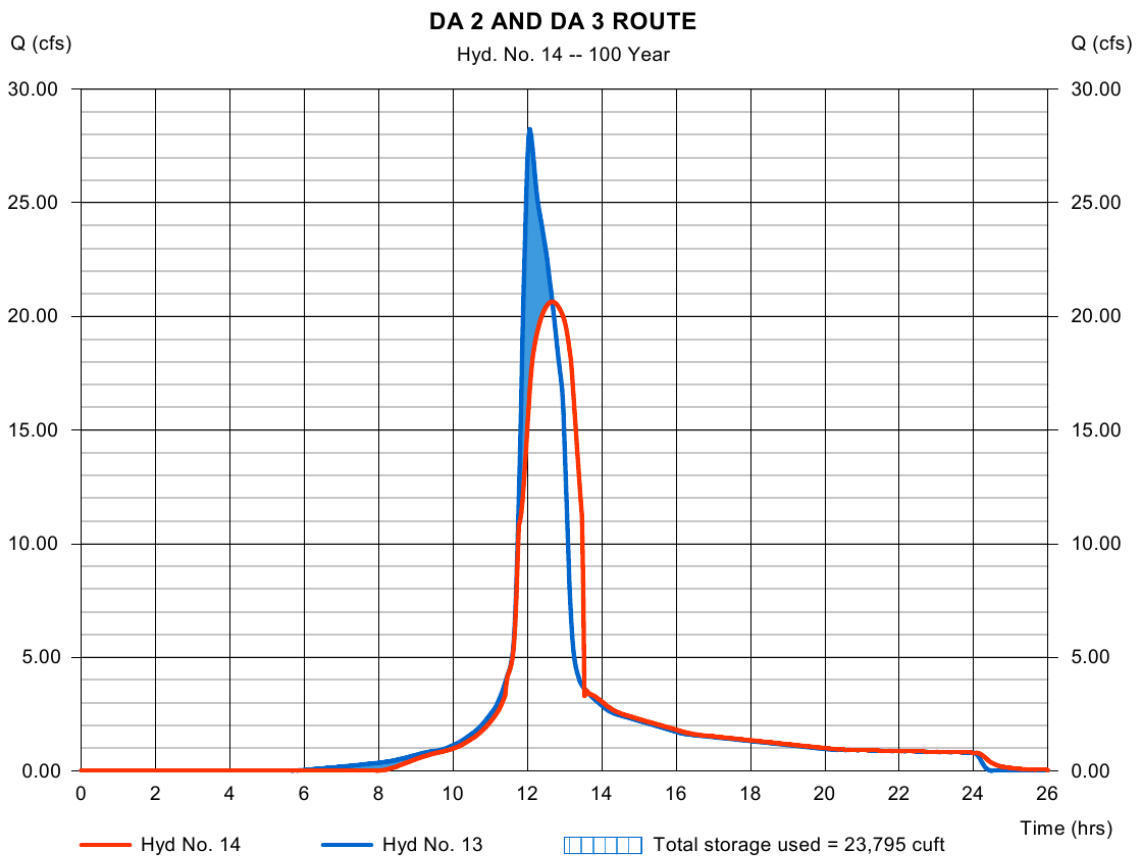
Monday, 08 / 19 / 2019

## Hyd. No. 14

### DA 2 AND DA 3 ROUTE

Hydrograph type	= Reservoir	Peak discharge	= 20.64 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.67 hrs
Time interval	= 2 min	Hyd. volume	= 186,622 cuft
Inflow hyd. No.	= 13 - DA 3 POND AND DA 2	Max. Elevation	= 900.92 ft
Reservoir name	= DA2 POND	Max. Storage	= 23,795 cuft

Storage Indication method used.



# Hydrograph Report

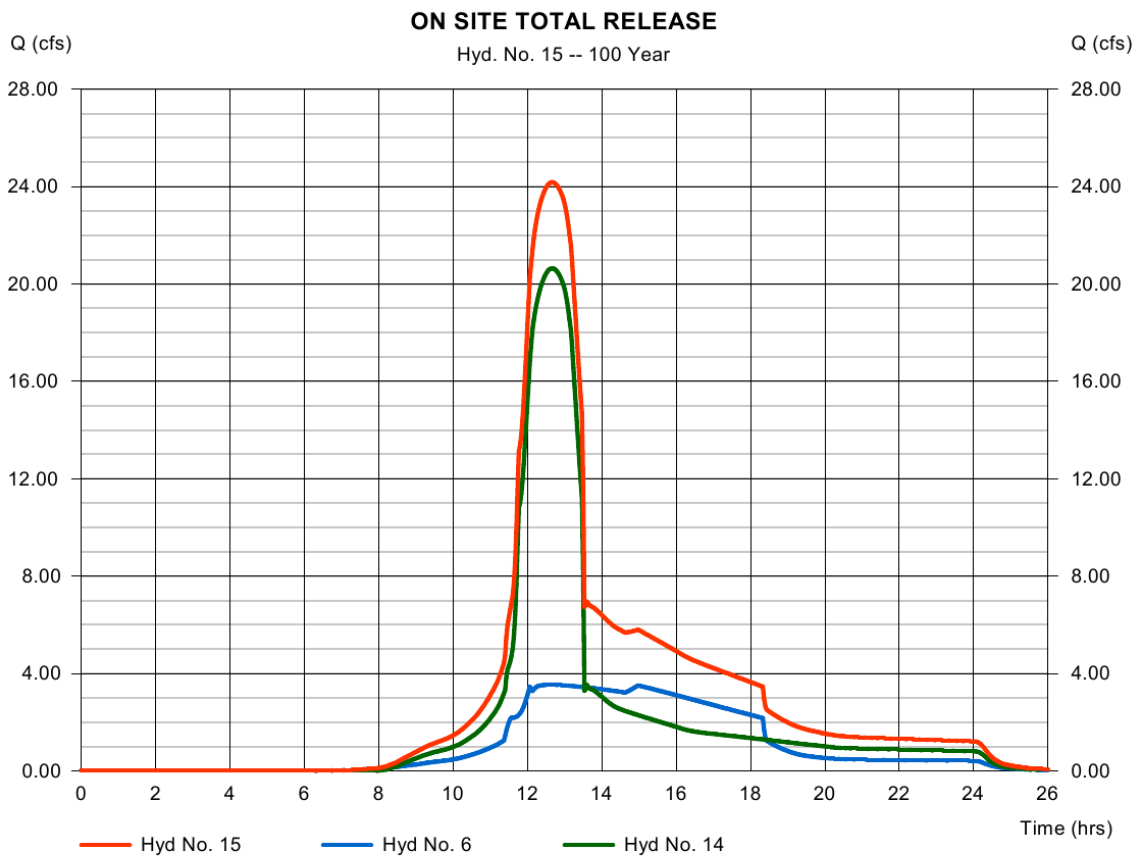
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Hyd. No. 15

### ON SITE TOTAL RELEASE

Hydrograph type	= Combine	Peak discharge	= 24.18 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.67 hrs
Time interval	= 2 min	Hyd. volume	= 281,344 cuft
Inflow hyds.	= 6, 14	Contrib. drain. area	= 0.000 ac



**g. Stormwater Facilities Design – Onsite + Offsite**

**1) Release Rate**

The release rate of the Coon Creek site plus the offsite area during the developed 100-year rain event will not exceed the peak stormwater runoff rate of the 100-year onsite rain event with pre-developed conditions plus the 100-year offsite rain event with existing conditions.

$$Q_{\text{ONSITE} + \text{OFFSITE}} = 73.50 \text{ cfs} + 151.36 \text{ cfs}$$

$$Q_{\text{ONSITE} + \text{OFFSITE}} = 224.86 \text{ cfs}$$

# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

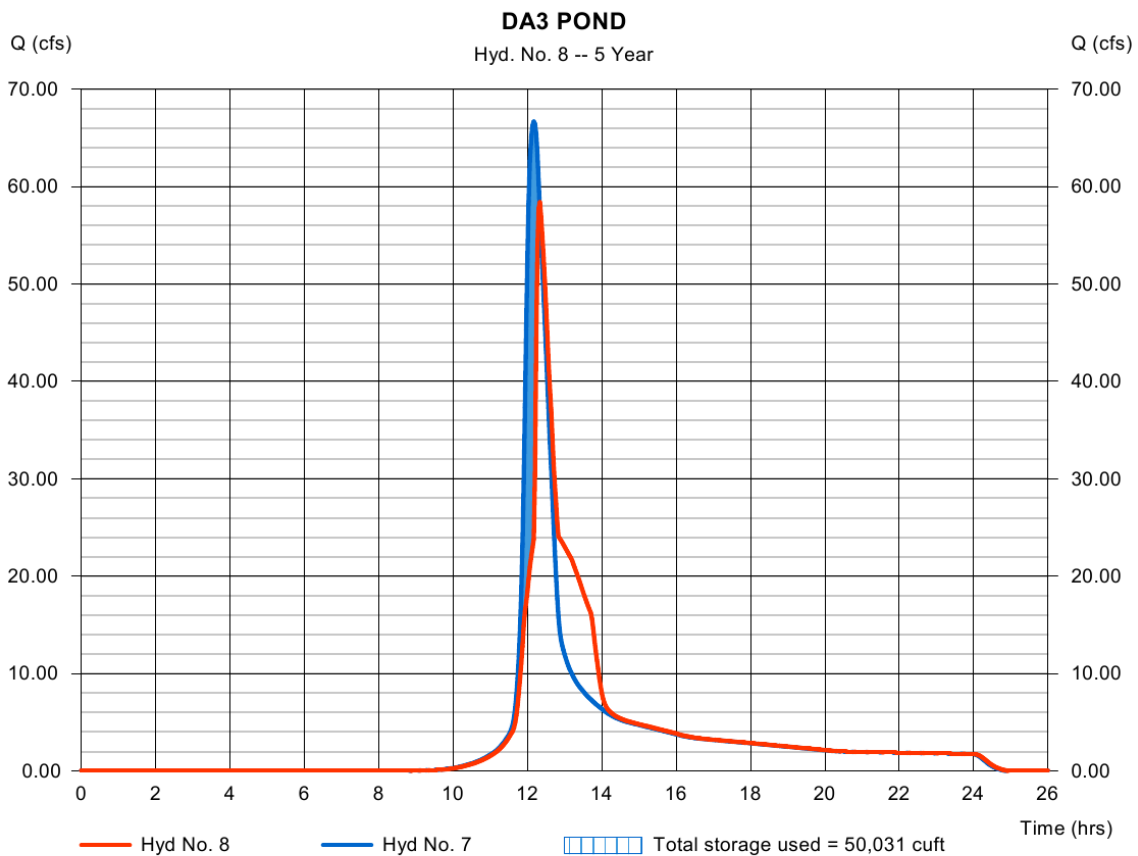
Monday, 08 / 19 / 2019

## Hyd. No. 8

DA3 POND

Hydrograph type	= Reservoir	Peak discharge	= 58.39 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 321,505 cuft
Inflow hyd. No.	= 7 - ONSITE + OFFSITE	Max. Elevation	= 903.63 ft
Reservoir name	= DA3 POND	Max. Storage	= 50,031 cuft

Storage Indication method used.



# Hydrograph Report

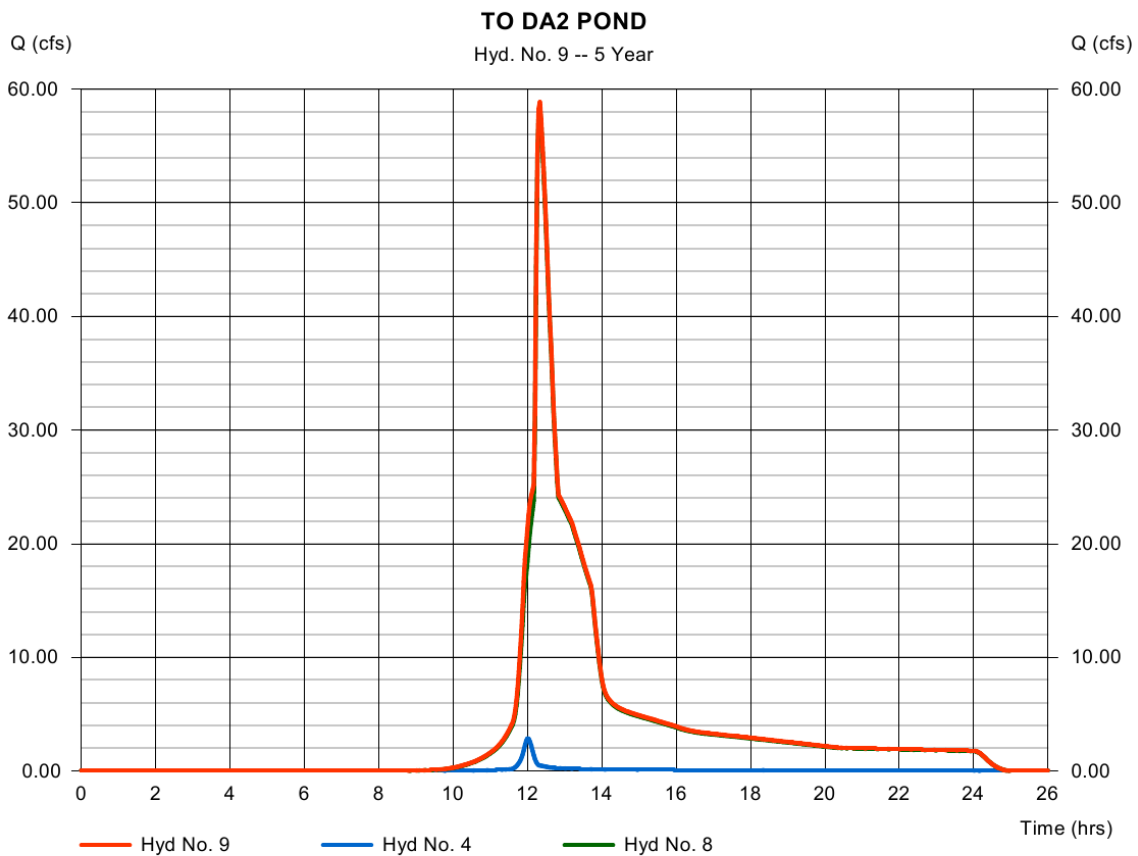
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Hyd. No. 9

TO DA2 POND

Hydrograph type	= Combine	Peak discharge	= 58.86 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.33 hrs
Time interval	= 2 min	Hyd. volume	= 328,917 cuft
Inflow hyds.	= 4, 8	Contrib. drain. area	= 1.050 ac





# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

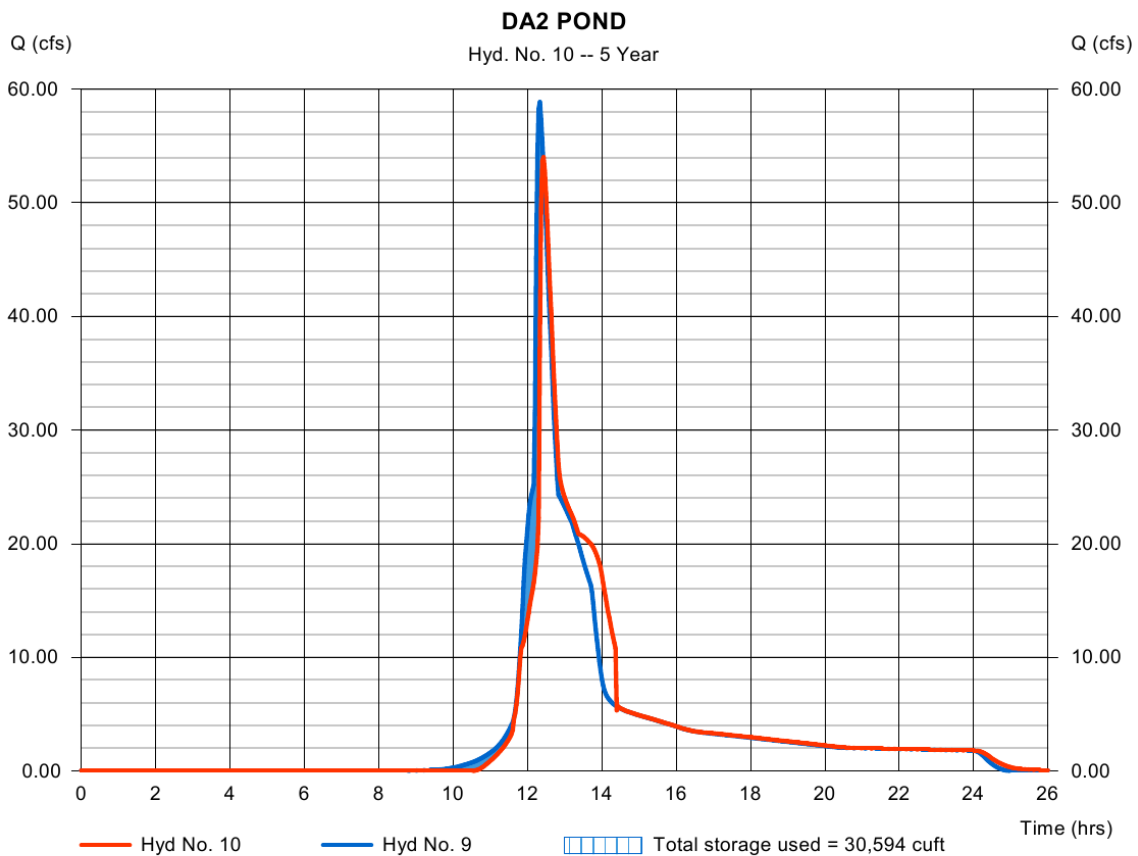
Monday, 08 / 19 / 2019

## Hyd. No. 10

DA2 POND

Hydrograph type	= Reservoir	Peak discharge	= 54.01 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.43 hrs
Time interval	= 2 min	Hyd. volume	= 327,601 cuft
Inflow hyd. No.	= 9 - TO DA2 POND	Max. Elevation	= 901.69 ft
Reservoir name	= DA2 POND	Max. Storage	= 30,594 cuft

Storage Indication method used.



# Hydrograph Report

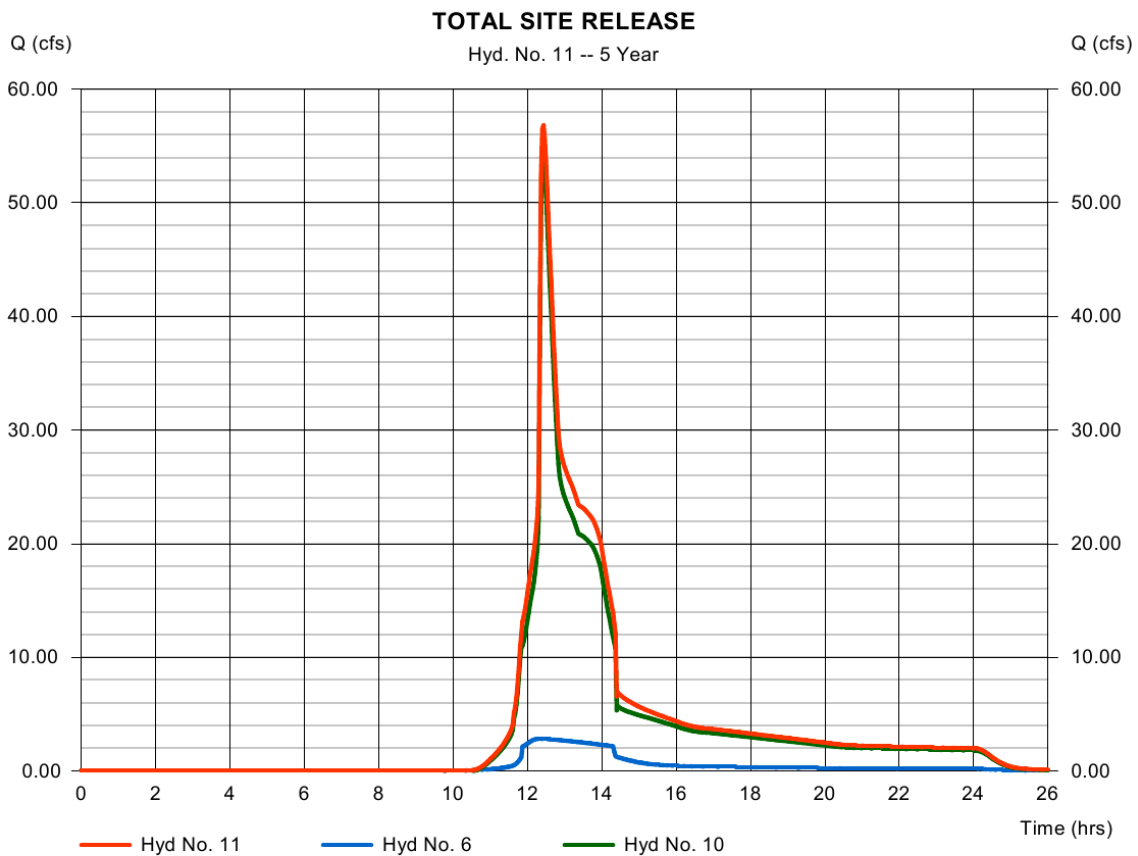
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Hyd. No. 11

### TOTAL SITE RELEASE

Hydrograph type	= Combine	Peak discharge	= 56.82 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.43 hrs
Time interval	= 2 min	Hyd. volume	= 364,768 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 0.000 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

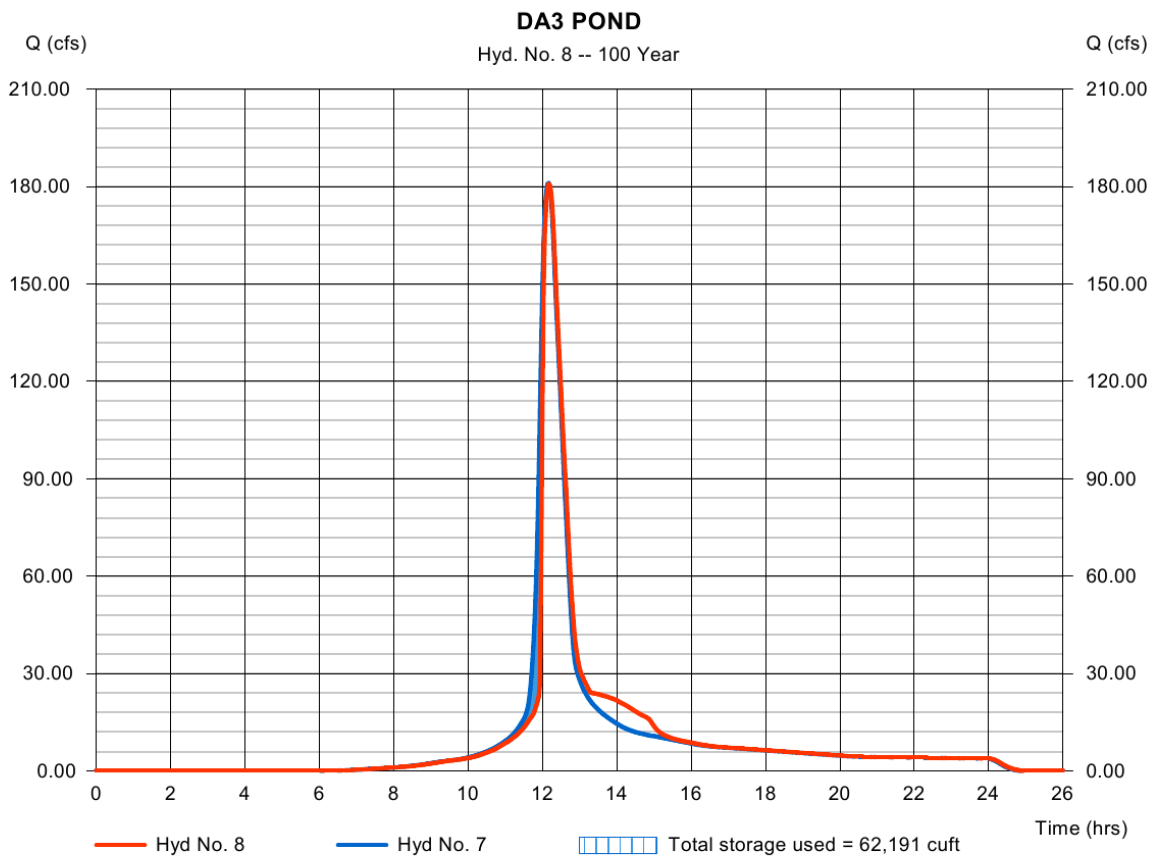
Monday, 08 / 19 / 2019

## Hyd. No. 8

DA3 POND

Hydrograph type	= Reservoir	Peak discharge	= 180.79 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 854,778 cuft
Inflow hyd. No.	= 7 - ONSITE + OFFSITE	Max. Elevation	= 904.41 ft
Reservoir name	= DA3 POND	Max. Storage	= 62,191 cuft

Storage Indication method used.



# Hydrograph Report

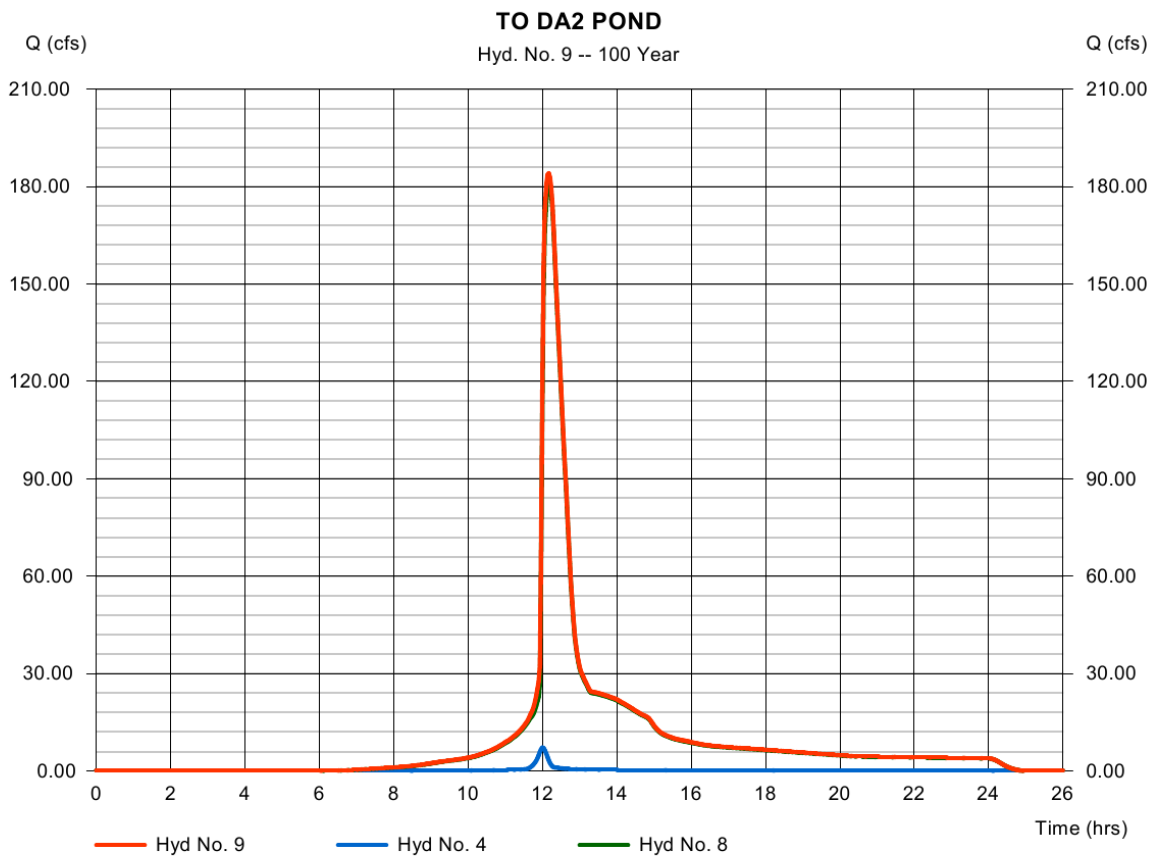
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Hyd. No. 9

TO DA2 POND

Hydrograph type	= Combine	Peak discharge	= 184.08 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 873,666 cuft
Inflow hyds.	= 4, 8	Contrib. drain. area	= 1.050 ac



# Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

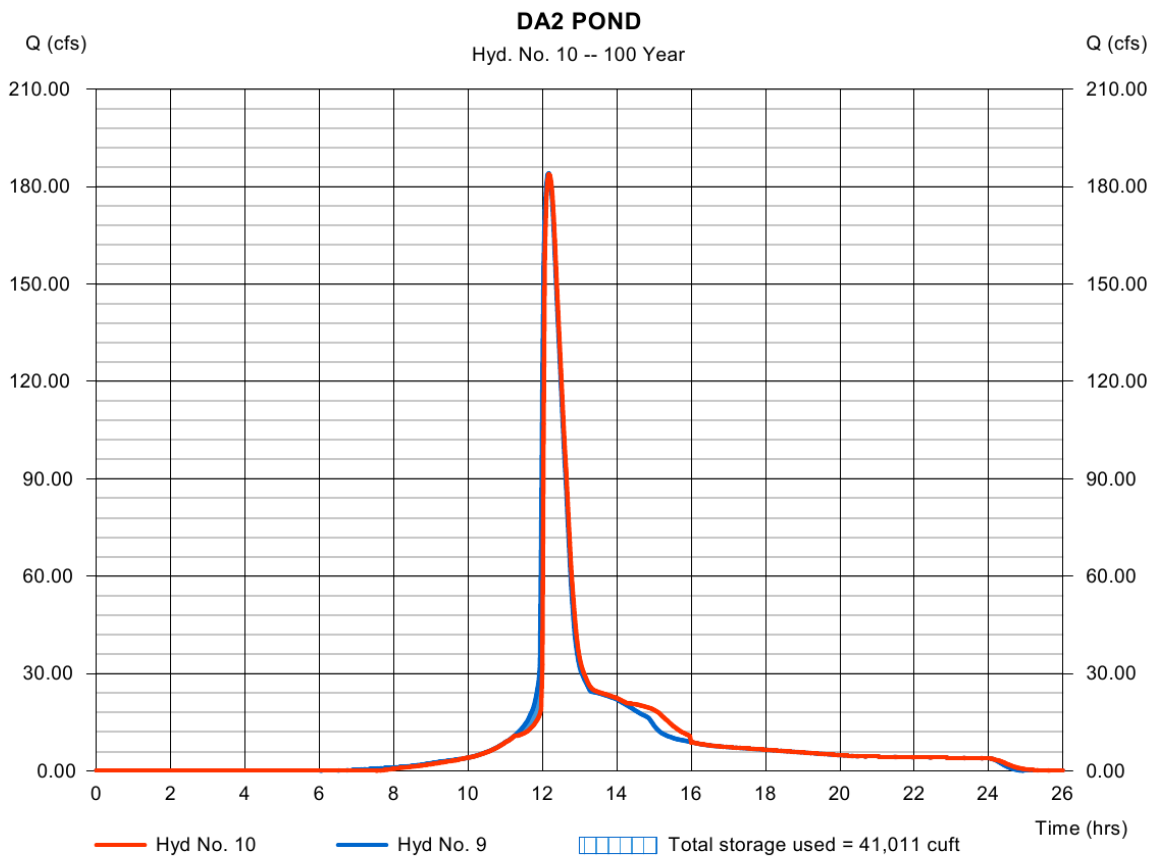
Monday, 08 / 19 / 2019

## Hyd. No. 10

DA2 POND

Hydrograph type	= Reservoir	Peak discharge	= 183.77 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 872,349 cuft
Inflow hyd. No.	= 9 - TO DA2 POND	Max. Elevation	= 902.68 ft
Reservoir name	= DA2 POND	Max. Storage	= 41,011 cuft

Storage Indication method used.



# Hydrograph Report

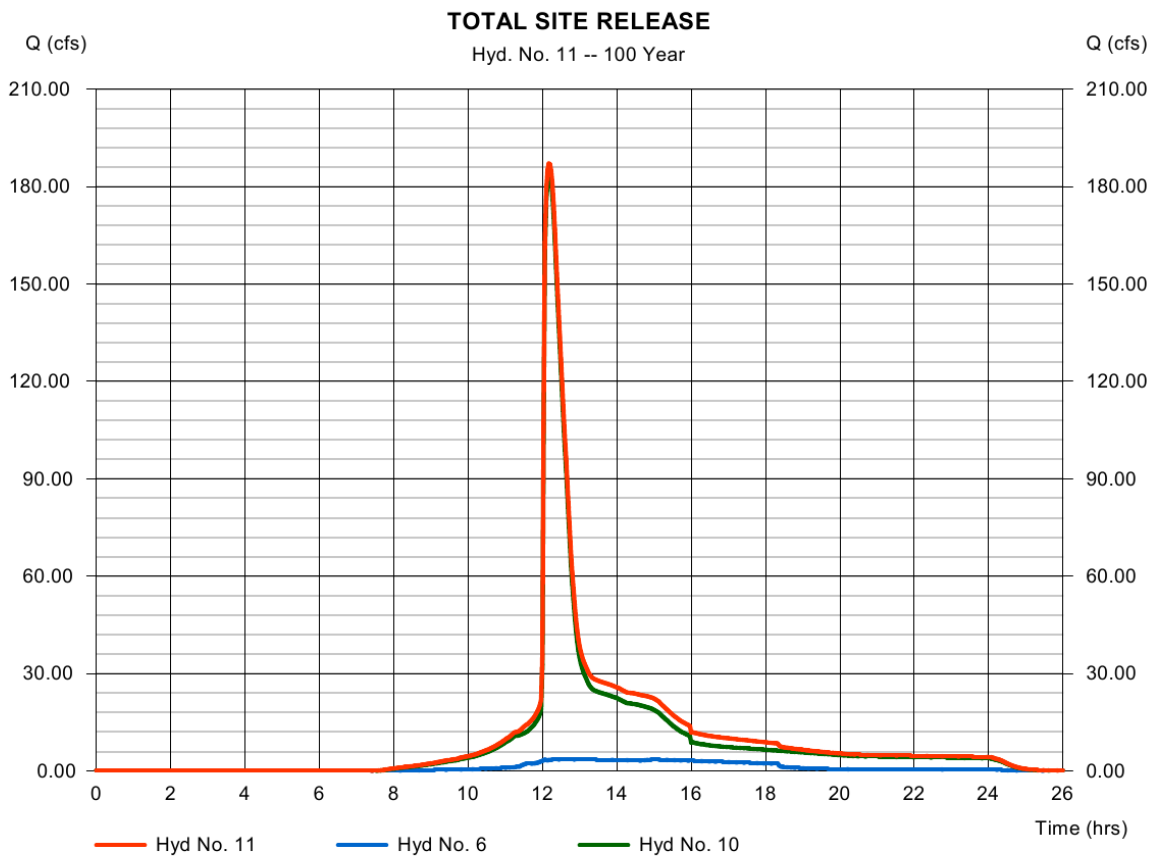
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Monday, 08 / 19 / 2019

## Hyd. No. 11

### TOTAL SITE RELEASE

Hydrograph type	= Combine	Peak discharge	= 187.12 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 2 min	Hyd. volume	= 967,072 cuft
Inflow hyds.	= 6, 10	Contrib. drain. area	= 0.000 ac



### 3. Energy Dissipation Design

The soils predominantly consist of Ladoga silty clay loam with slopes between 9% to 14%; Vanmeter silt loam with slopes between 14% to 30%; and Colo, occasionally flooded-Ely silty clay loams, dissected till plain with slopes between 1% to 3%. Ladoga silty clay loam is classified as Hydrologic Soils Group C. Vanmeter silt loam is classified as Hydrologic Soils Group D. Colo, occasionally flooded-Ely silty clay loams, dissected till plain is classified as Hydrologic Soils Group C/D. Hydrologic soils group C/D soils have a low infiltration rate when thoroughly wet with a slow rate of water transmission. Flared end section discharging stormwater will have rip rap to dissipate the energy of the water flowing into adjacent waterways.

ST 001:

Use 54" RCP @ 0.40%,                      Release  $Q_{100} = 183.77$  cfs                      Pipe  $V_{100} = 11.55$  ft/s

A 40' long x 18" deep apron (98 tonS) of class 'E' riprap will be placed to prevent erosion. Refer to **Figure 7E-10.04:** Design of Outlet Protection, Maximum Tailwater Condition, see appendix.

ST 201:

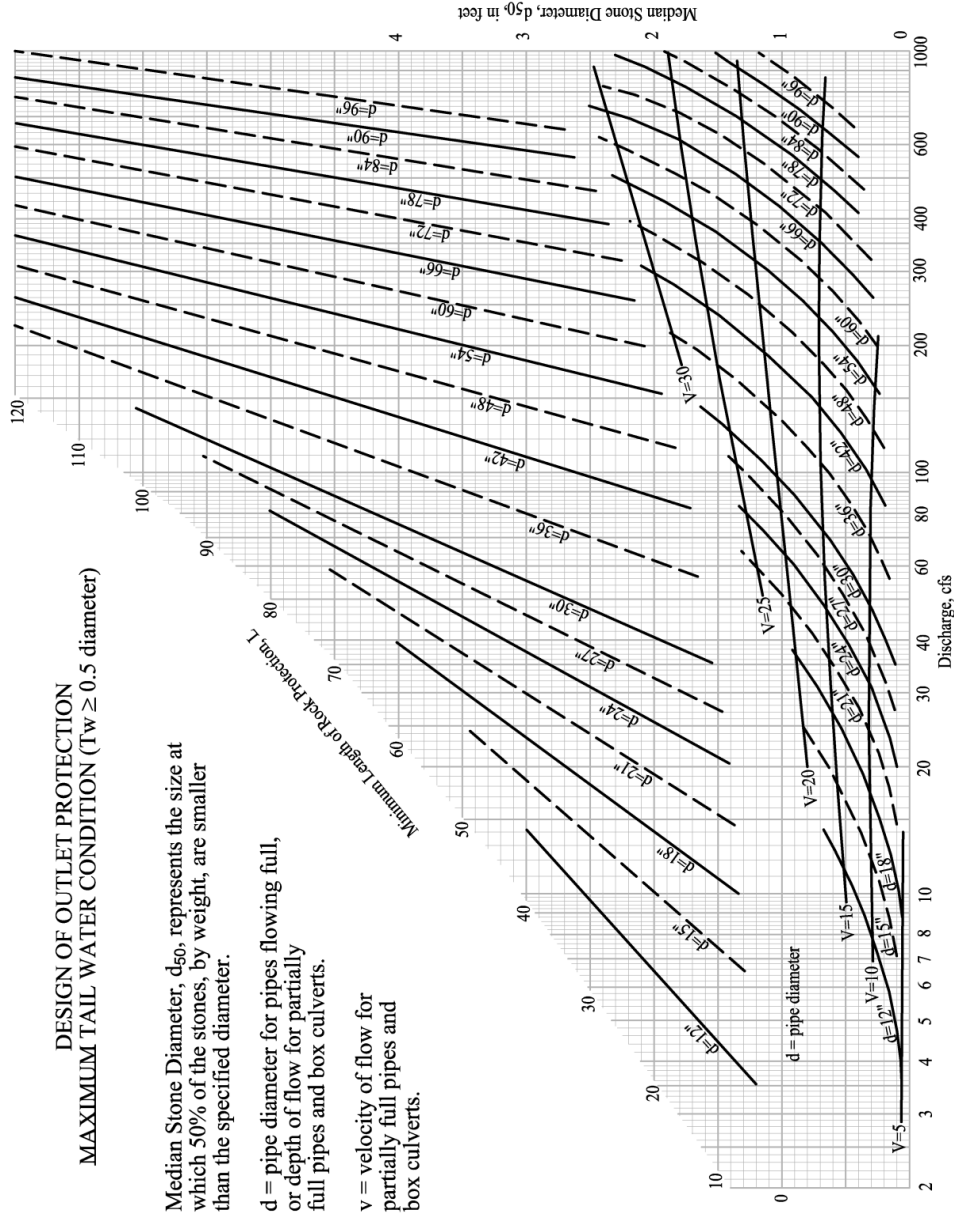
Use 24" RCP @ 1.50%,                      Release  $Q_{100} = 3.54$  cfs                      Pipe  $V_{100} = 1.13$  ft/s

A 10' long x 18" deep apron (22 tons) of class 'E' riprap will be placed to prevent erosion. Refer to **Figure 7E-10.04:** Design of Outlet Protection, Maximum Tailwater Condition, see appendix.

Chapter 7 - Erosion and Sediment Control Section 7E-10 - Rip Rap

8 Revised: 2013 Edition

Figure 7E-10.04: Design of Outlet Protection, Maximum Tailwater Condition



DESIGN OF OUTLET PROTECTION  
MAXIMUM TAIL WATER CONDITION ( $T_w \geq 0.5$  diameter)

Median Stone Diameter,  $d_{50}$ , represents the size at which 50% of the stones, by weight, are smaller than the specified diameter.

$d$  = pipe diameter for pipes flowing full, or depth of flow for partially full pipes and box culverts.

$v$  = velocity of flow for partially full pipes and box culverts.



#### 4. Permits

## 5. Appendix

Q:\E-FILES\6000\6228 - 2018\_C3D Drawings\Bass Design Files\Drainage Maps\E6228 Existing Drainage Map.dwg, 8/19/2019 3:40:17 PM, Iwiford, 1:2

PLT01, Q:\E-FILES\6000\6228 - 2018\_C3D Drawings\Bass Design Files\Drainage Maps\E6228 Existing Drainage Map.dwg, 8/19/2019 3:40:17 PM, Iwiford, 1:2

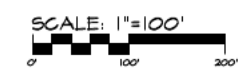
a. Drainage Maps



ZONE 'A'  
WITHOUT BASE  
FLOOD ELEVATION (BFE)



ZONE X  
0.2% ANNUAL CHANCE FLOOD HAZARD, AREAS  
OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE  
DEPTH LESS THAN ONE FOOT OR WITH DRAINAGE  
AREAS OF LESS THAN ONE SQUARE MILE



**CEC**  
Civil Engineering Consultants, Inc.  
2400 86th Street, Unit 12, Des Moines, Iowa 50322  
515.276.4884 · Fax: 515.276.7084 · mail@cecinc.com

DATE	REVISIONS	COMMENTS
AUG. 19, 2014	1	
	2	
	3	
DATE OF SURVEY: JULY XX, 2014	4	
DESIGNED BY: PC	5	
DRAWN BY: HEH	6	

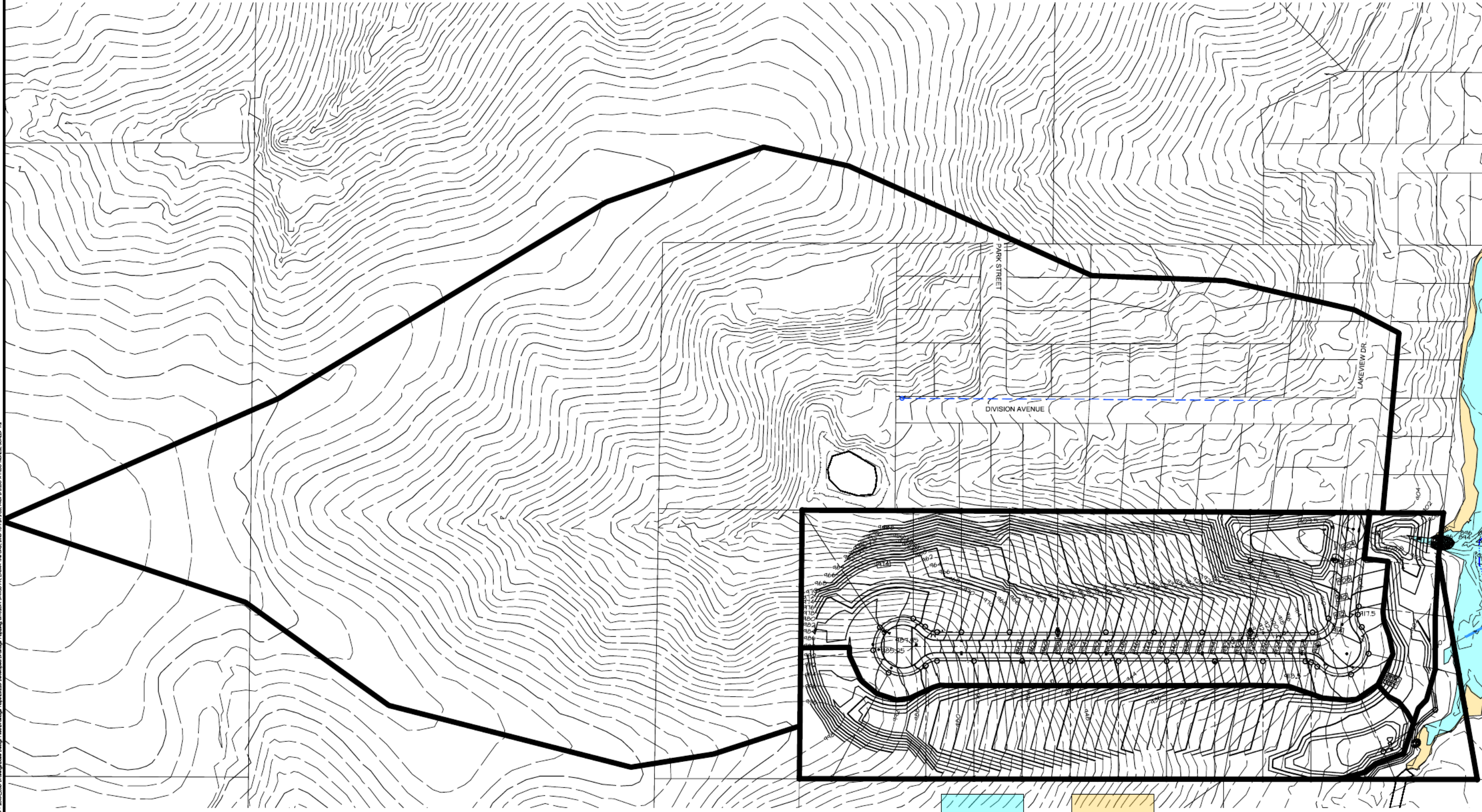
**COON CREEK PLAT 1**  
VAN METER, IOWA  
**EXISTING DRAINAGE MAP**

SHEET  
01  
OF  
03

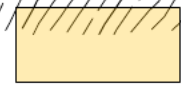
E-6228

Q:\E-FILES\6000\6228 - 2018\_C3D Drawings\Bases Design Files\Drainage Maps\6228 Developed Drainage Map.dwg, 8/19/2019 3:41:52 PM, ltwiford, 1,2

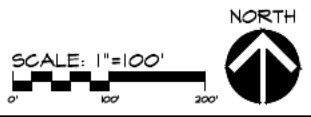
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ZONE 'A'  
WITHOUT BASE  
FLOOD ELEVATION (BFE)



ZONE X  
0.2% ANNUAL CHANCE FLOOD HAZARD, AREAS  
OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE  
DEPTH LESS THAN ONE FOOT OR WITH DRAINAGE  
AREAS OF LESS THAN ONE SQUARE MILE



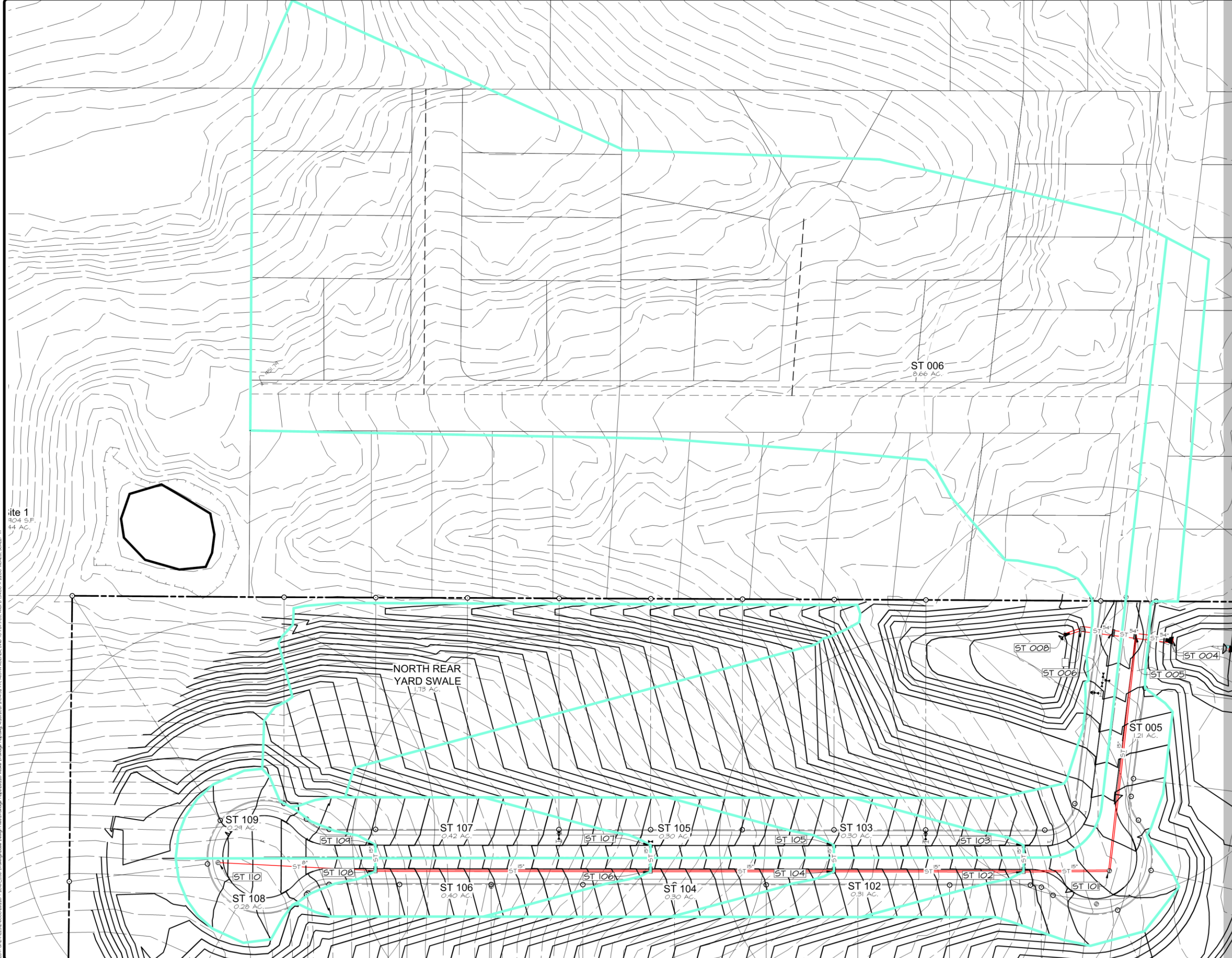
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DATE	REVISIONS	COMMENTS
AUG. 19, 2014	1	
	2	
	3	
	4	
	5	
	6	

DATE OF SURVEY: JULY XX, 2014  
DESIGNED BY: PC  
DRAWN BY: HEH

**COON CREEK PLAT 1**  
VAN METER, IOWA  
**DEVELOPED DRAINAGE MAP**

SHEET  
**02**  
OF  
**03**  
E-6228



Site 1  
104 S.F.  
1.4 AC.

NORTH REAR  
YARD SWALE  
1.75 AC.

ST 006  
8.66 AC.

ST 109  
0.24 AC.

ST 107  
0.42 AC.

ST 105  
0.30 AC.

ST 103  
0.30 AC.

ST 108  
0.28 AC.

ST 106  
0.40 AC.

ST 104  
0.30 AC.

ST 102  
0.31 AC.

ST 005  
1.21 AC.

ST 008

ST 004

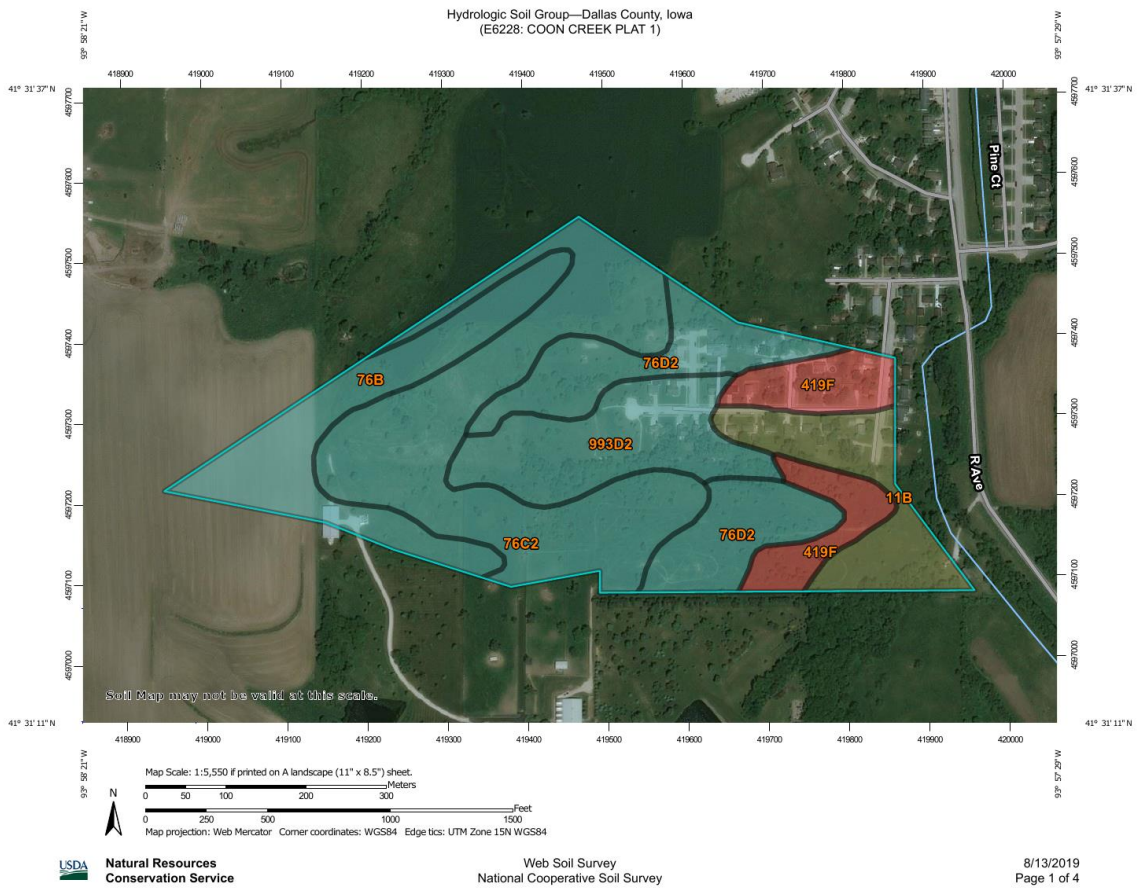
ST 006

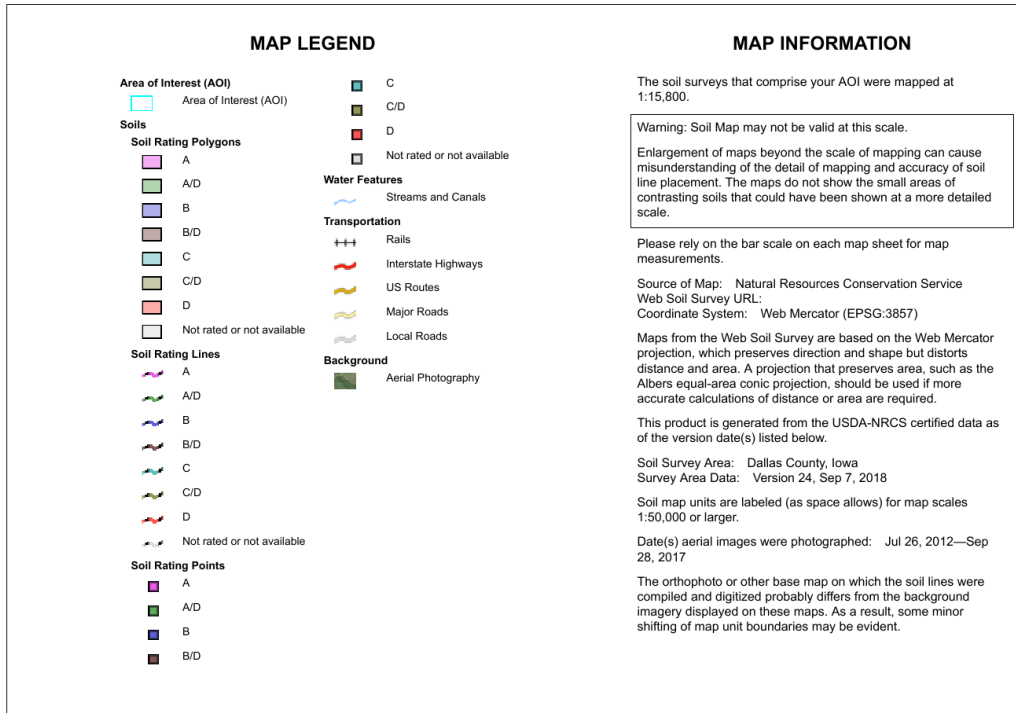
ST 005



DATE:	REVISIONS	COMMENTS
AUG. 19, 2014	1	
	2	
	3	
DATE OF SURVEY: JULY XX, 2014	4	
DESIGNED BY: PC	5	
DRAWN BY: JEH	6	

**b. Web Soils Soil Report**





## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
11B	Colo, occasionally flooded-Ely silty clay loams, dissected till plain, 2 to 5 percent slopes	C/D	6.9	10.4%
76B	Ladoga silt loam, 2 to 5 percent slopes	C	10.6	16.0%
76C2	Ladoga silty clay loam, dissected till plain, 5 to 9 percent slopes, eroded	C	21.2	32.0%
76D2	Ladoga silty clay loam, 9 to 14 percent slopes, eroded	C	11.7	17.7%
419F	Vanmeter silt loam, 14 to 30 percent slopes	D	6.4	9.7%
993D2	Gara-Armstrong complex, 9 to 14 percent slopes, moderately eroded	C	9.4	14.2%
<b>Totals for Area of Interest</b>			<b>66.2</b>	<b>100.0%</b>



## 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

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

c. Wetlands



Coon Creek



August 13, 2019

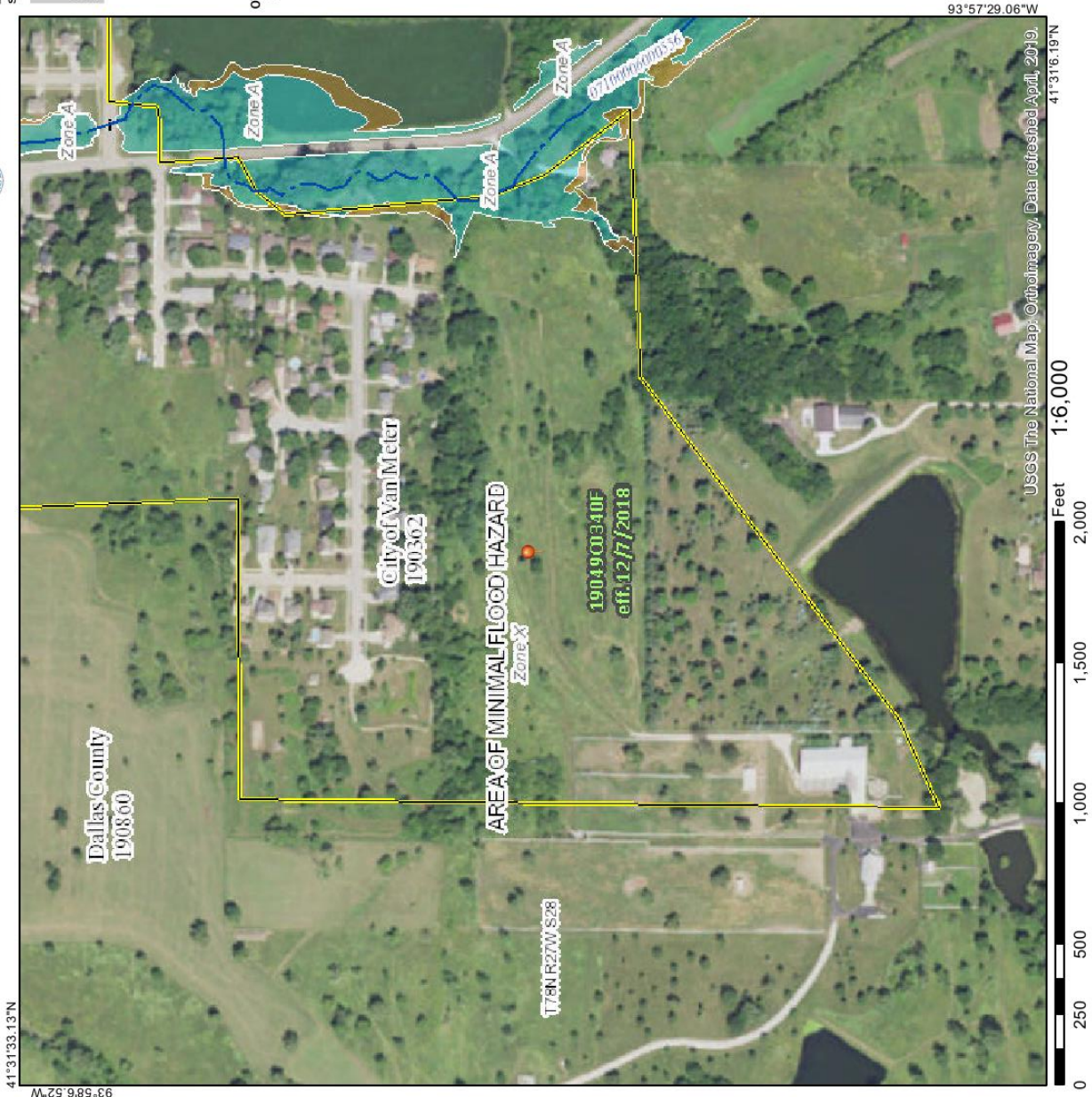
**Wetlands**

- |  |                                   |  |                 |
|--|-----------------------------------|--|-----------------|
|  | Freshwater Emergent Wetland       |  | Lake            |
|  | Freshwater Forested/Shrub Wetland |  | Other           |
|  | Estuarine and Marine Deepwater    |  | Freshwater Pond |
|  | Estuarine and Marine Wetland      |  | Riverine        |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)  
This page was produced by the NWI mapper

# National Flood Hazard Layer FIRMette



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

	Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
	With BFE or Depth <i>Zone AE, AO, AH, VE, AP</i>
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
	Future Flood Hazard <i>Zone X</i>
	Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
	Area with Flood Risk due to Levee <i>Zone D</i>
	NO SCREEN
	Area of Minimal Flood Hazard <i>Zone X</i>
	Effective LOMRs
	Area of Undetermined Flood Hazard <i>Zone D</i>
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	Cross Sections with 1% Annual Chance
	Water Surface Elevation
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Digital Data Available
	No Digital Data Available
	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps. If it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/19/2019 at 2:48:20 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and undetermined areas cannot be used for regulatory purposes.

