Crafton Tull

901 N 47th Street, Suite 400
Rogers, AR 72756

479.636.4838 (ph)
479.631.6224 (fax)

July 13, 2020

City of Elkins
C/O Zach Moore, P.E.,
1874 Stokenbury Rd
Elkins, AR 72727

RE: Stokenbury Farms Phase I of Phase II Subdivision
CTA Job No. 1910106901

Mr. Moore,

The current drainage situation in the roadside ditch along HWY 16 does not provide positive drainage in the area. The existing ditch is relatively flat with various low points. From our initial analysis and field survey information, we determined that storm water collects in the ditch and cannot drain north or south efficiently. The pre-development design analyzed study points at both the north and south ends of the ditch.

The preliminary subdivision design showed regrading of the ditch and storm sewer installation to improve the drainage. ARDOT provided road plans for this portion of HWY 16 that show even though HWY 16 falls to the north, the drainage ditch was proposed to flow south. The driveway at the Stinson property (northeast corner of the proposed development) was intended to be the high point directing water both north and south away from the driveway. Existing conditions and inadequate maintenance of the ditch do not support the conditions intended by ARDOT.

We have since reevaluated the study points with a single study point along HWY 16: study point 4A. The post-development flows are less than pre-development flows at the discharge location intended by ARDOT. Please see attached drainage maps and the table below for the hydrologic summary.

Table 7. Study Point 4A

Storm Event	*Existing Outflow*	*Proposed Outflow*	*Difference*
(yrs)	(cfs)	(cfs)	(cfs)
1	14.38	14.04	-0.34
2	17.51	16.8	-0.71
5	23.11	21.71	-1.40
10	28.3	26.21	-2.09
25	35.98	32.82	-3.16
50	42.45	38.35	-4.10
100	49.28	44.16	-5.12

Construction plans will be revised to provide positive drainage from the north end of the project property to the 5'x2' RCB under HWY 16 at the south end of the project. Pipe capacity calculations have been provided as well.

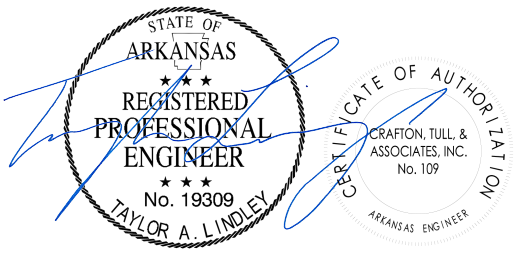
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479.631.6224 (fax)

Please contact us at your earliest convenience if you have any questions.

Sincerely,
Crafton Tull & Associates, Inc.

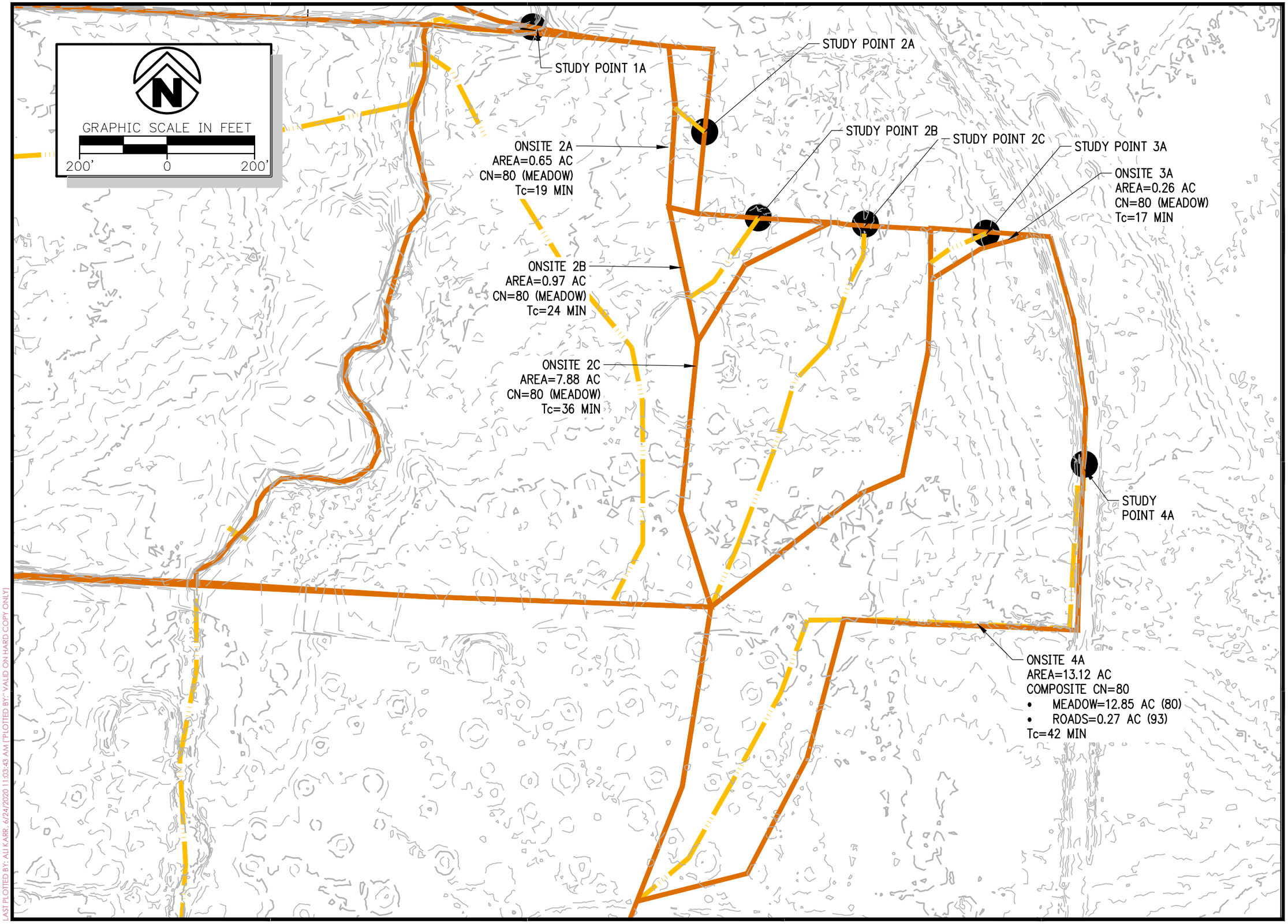


Taylor Lindley, P.E.
Project Manager

Ali Karr, E.I.
Project Engineer

Attachments:

- Revised Pre-Development Drainage Map
- Revised Post-Development Drainage Map
- ARDOT Construction Plan
- Revised Inlet Map
- Storm Sewer Spreadsheet Calculations
- PondPack Report



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No. 109
ARKANSAS

STOKENBURY FARMS
ELKINS, AR

Key Plan

No.	Description	Date

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PROJECT NO: 19106900
ISSUE DATE:
CONTACT: D. ELLIS
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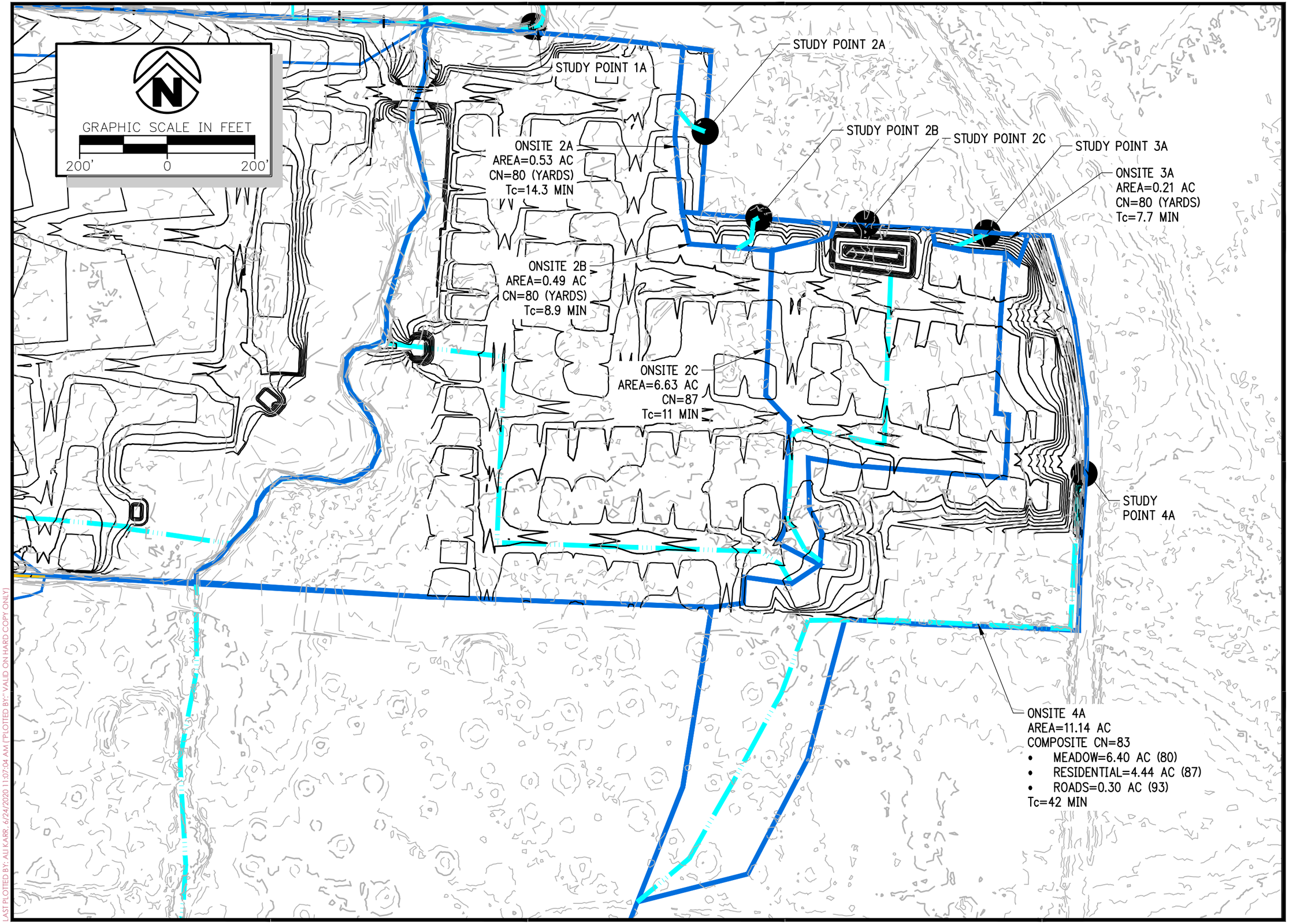
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PRE-DEVELOPMENT DRAINAGE MAP

DRAWING: G:\19106901_ELKINSPH1\INFRASTRUCTURE\CIVIL\REPORTS\DRAINAGE\MAPS\DRAINAGE MAP.DWG
LAYOUT: ENLARGED PRE _LAST SAVED: AE5162. 4/14/2020 12:36:15 PM
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POST-DEVELOPMENT DRAINAGE MAP-ENLARGED VIEW

DRAWING: G:\19106901_ELKINSPH1\INFRASTRUCTURE\CIVIL\REPORTS\DRAINAGE\MAPS\DRAINAGE MAP.DWG
LAYOUT: ENLARGED POST , LAST SAVED: AES162, 4/14/2020 12:36:15 PM
LAST PLOTTED BY: ALI KARR, 6/24/2020 11:07:04 AM ("PLOTTED BY:" VALID ON HARD COPY ONLY)

Sta. 524+73 - In Place
5'x8'x26' R.C. Box Culvt
RETAIN & Extend
6' Rt & 8' Lt

P.I. 530+58.0

CEMETERY

2-RIW M.P.C.P.

Framing Barn

Framing House

P.C. 525+59.3

Δ = 38°48' Rt.
D = 4°00'
T = 504.7'
L = 970.4'

P.T. 535+28.7

S 38°08' E

S 0°47' W

Sta. 519+00 - Install
C.M. Arch Pipe Culvt 20' Long
1.5 Sq. Ft. Waterway
Rt. Side Drain
Constr. Appr. = 10 Cu. Yd.

Sta. 526+25 - In Place
2'x6'x18' Masonry Box
Rt. Side Drain
REMOVE & Install
C.M. Arch Pipe Culvt 20' Long
2.8 Sq. Ft. Waterway
Constr. Appr. = 10 Cu. Yd.

Sta. 535+30 - In Place
3'x2'x29' R.C. Box Culvt
RETAIN & Extend
5' Rt. & 14' Lt.

Sta. 540+25 Install
C.M. Arch Pipe Culvt 20' Long
1.5 Sq. Ft. Waterway
Lt. Side Drain
Constr. Appr. = 10 Cu. Yd.

Sta. 544+62 - Install
C.M. Arch Pipe Culvt 20' Long
1.5 Sq. Ft. Waterway
Rt. Side Drain
Constr. Appr. = 10 Cu. Yd.

PLAN

PROFILE

STA 510+274 To STA 541+91.6

Unclassified Excavation (Normal)	2802 Cu. Yd.
" " (Outlets Etc.)	20 Cu. Yd.
Embankment + 20%	2802 Cu. Yd.
Special Compaction of Earthwork	2802 Cu. Yd.
Overhaul	7272 Sta. Yd.

1204.50

1210
1200
1190

20%

20.7% RVGT

FL 1197.7

FL 1199.1

-24000
-25000
-26000
-27000

2618 Cu. Yds. Bal. Line

Avg. Haul = 2830 Lin. Ft.

O.H. = (28.3 - 100) x 0.9 = 19,818 Sta. Yd.

27,066 Cu. Yds. Bal. Line

Avg. Haul = 1320 Lin. Ft.

27.1 Cu. Yds. Free Haul

O.H. = 14.2 x 100 x 1.0 = 334 Cu. Yd.

BM UE-40-A 0 East (New)
Sta 535+34 Elev. 1202.52

510 515 520 525 530 535 540 545 546

PLATE 1 - PLAN - PROFILE, U.P.R.R. & B. C. STANDARD
KEUFFEL & ESSER CO., NEW YORK
K. E. CO. NO. 348-1

INLET 4-1
AREA=0.07 AC
Tc=5 MIN

INLET 3-2
AREA=0.36 AC
Tc=8 MIN

INLET 4-2
AREA=0.51 AC
Tc=8 MIN

INLET 3-3
AREA=0.36 AC
Tc=8 MIN

INLET 10-2
AREA=0.56 AC
Tc=8 MIN

S3° 35' 12"W 376.64'

INLET 3-6
AREA=0.69 AC
Tc=12 MIN

INLET 10-1
AREA=1.92 AC
Tc=14 MIN

INLET 3-5
AREA=0.39 AC
Tc=9 MIN

S86° 26' 10"E 802.92'

INLET 11-4
AREA=0.53 AC
Tc=7 MIN

INLET 3-8
AREA=0.58 AC
Tc=10 MIN

INLET 3-9
AREA=0.98 AC
Tc=13 MIN

INLET 11-2
AREA=1.46 AC
Tc=9 MIN

C1

L2

GRAPHIC SCALE IN FEET
100' 0 100'

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ARKANSAS ENGINEER NO. 1,741

STOKENBURY FARMS
ELKINS, AR

Key Plan

No.	Description	Date

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ISSUE DATE:
CONTACT: T. LINDLEY
CHECKED BY:

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INLET MAP- 1 OF 2

DRAWING: G:\19106901_ELKINSPH1\INFRASTRUCTURE\CIVIL\REPORTS\DRAINAGE\MAPS\INLET MAP.DWG
LAYOUT: 1 , LAST SAVED: AE5162, 2/19/2020 4:39:55 PM
LAST PLOTTED BY: ALI KARR, 7/13/2020 8:41:39 AM ("PLOTTED BY:" VALID ON HARD COPY ONLY)

Crafton Tull

Job Description: Stokenbury Farms Phase I
CTA Job Number: 19106901

Date: February 21, 2020
By: Ali Karr, E.I.

				OVERLAND FLOW				CHANELIZED FLOW						TOTAL
	DRAINAGE AREA	INLET LOCATION	AREA (acres)	LENGTH (ft)	SLOPE (%)	RUNOFF (C)	TIME OF CONC. (min)	SURFACE TYPE	LENGTH (ft)	SLOPE (%)	RUNOFF (n)	VELOCITY (ft/sec)	TIME OF CONC. (min)	TIME OF CONC. (min)
1	1-2	JUSTIN ST	0.62	72	1.50%	0.57	7.07	Paved	227	0.50%	0.013	1.44	2.63	10
2	1-3	JUSTIN ST	1.83	184	1.50%	0.57	11.30	Paved	240	0.50%	0.013	1.44	2.78	14
3	1-4	STINSON RD	1.34	120	1.50%	0.57	9.13	Paved	242	0.50%	0.013	1.44	2.81	12
4	1-5	STINSON RD	1.32	37	2.00%	0.57	4.61	Paved	497	0.90%	0.013	1.93	4.30	9
5	2-1	PATRICIA LN	0.42	71	1.30%	0.57	7.37	Paved	151	0.50%	0.013	1.44	1.75	9
6	2-2	PATRICIA LN	0.37	57	2.20%	0.57	5.54	Paved	158	0.50%	0.013	1.44	1.83	7
7	3-2	SAYDI ST	0.36	64	2.20%	0.57	5.87	Paved	177	0.50%	0.013	1.44	2.05	8
8	3-3	SAYDI ST	0.36	54	2.70%	0.57	5.03	Paved	221	0.50%	0.013	1.44	2.56	8
9	3-5	JENNIFER ANN LN	0.39	57	1.50%	0.57	6.29	Paved	310	1.10%	0.013	2.13	2.42	9
10	3-6	JENNIFER ANN LN	0.69	152	1.50%	0.57	10.27	Paved	187	1.10%	0.013	2.13	1.46	12
11	3-8	JUSTIN ST	0.58	59	1.50%	0.57	6.40	Paved	297	0.50%	0.013	1.44	3.44	10
12	3-9	JUSTIN ST	0.98	149	1.50%	0.57	10.17	Paved	219	0.50%	0.013	1.44	2.54	13
13	4-1	JENNIFER ANN LN	0.07	30	2.20%	0.57	4.02	Paved	1	1.00%	0.013	2.03	0.01	5
14	4-2	JENNIFER ANN LN	0.51	93	3.00%	0.57	6.38	Paved	109	0.50%	0.013	1.44	1.26	8
15	5-2	HILDA LN	0.71	76	1.30%	0.57	7.62	Paved	256	0.70%	0.013	1.70	2.51	10
16	5-3	HILDA LN	1.04	232	1.50%	0.57	12.69	Paved	139	0.50%	0.013	1.44	1.61	14
17	5-4	JENNIFER ANN LN	0.49	68	1.50%	0.57	6.87	Paved	157	0.50%	0.013	1.44	1.82	9
18	5-5	JENNIFER ANN LN	1.24	135	1.50%	0.57	9.68	Paved	340	0.50%	0.013	1.44	3.94	14
19	6-1	STINSON RD	1.67	151	1.40%	0.57	10.48	Paved	282	0.50%	0.013	1.44	3.27	14
20	6-2	STINSON RD	1.14	72	1.50%	0.57	7.07	Paved	397	0.70%	0.013	1.70	3.89	11
21	7-1	HILDA LN	0.65	40	3.30%	0.57	4.05	Paved	262	0.70%	0.013	1.70	2.57	7
22	7-3	HILDA LN	0.36	41	2.00%	0.57	4.85	Paved	162	0.60%	0.013	1.57	1.71	7
23	7-5	TROY ST	1.32	65	2.20%	0.57	5.91	Paved	273	0.92%	0.013	1.95	2.33	8
24	7-6	TROY ST	1.17	104	1.25%	0.57	9.03	Paved	79	0.50%	0.013	1.44	0.92	10
25	7-8	OLIVER ALLEN LN	0.13	42	1.50%	0.57	5.40	Paved	81	1.50%	0.013	2.49	0.54	6
26	7-9	OLIVER ALLEN LN	0.40	34	1.50%	0.57	4.86	Paved	162	1.50%	0.013	2.49	1.08	6
26	8-1	HILDA LN	0.53	80	1.30%	0.57	7.82	Paved	222	0.70%	0.013	1.70	2.18	10
27	9-1	TROY ST	0.41	92	1.00%	0.57	9.15	Paved	92	0.50%	0.013	1.44	1.07	10
28	10-1	HILDA LN	1.92	213	1.50%	0.57	12.16	Paved	333	1.90%	0.013	2.80	1.98	14
29	10-2	HILDA LN	0.56	59	2.10%	0.57	5.72	Paved	343	1.90%	0.013	2.80	2.04	8
30	11-2	NORTH DRIVEWAY	1.46	105	3.30%	0.57	6.57	Unpaved	405	2.50%	0.030	2.55	2.65	9
31	11-4	NORTH DRIVEWAY	0.53	120	7.60%	0.57	5.32	Unpaved	150	0.60%	0.030	1.25	2.00	7

Job Description: Stokenbury Farms Phase I **Date:** February 21, 2020
CTA Job Number: 19106901 **By:** Ali Karr, E.I.

CATCH BASINS IN A SUMP: DESIGN (10 - YEAR STORM EVENT)

	INLET NUMBER	INLET LOCATION	AREA Tc (min)	TYPE OF INLET	AREA (ac)	C	TOTAL Tc (min)	* I (in/hr)	RUNOFF AT INLET (CA)	CARRY-OVER FROM UPSTREAM INLET (CA)	TOTAL FLOW Qt (cfs)	INLET LENTGTH (ft)	AREA OPENING (sf^2)	*** CLOG REDUC. (%)	** CAPAC. Qp (cfs) CURB	** CAPAC Qp (cfs) GRATE	DEPTH AT CURB d (ft)		RDWY CROSS SLOPE (ft/ft)	SPREAD AT INLET (ft)	SPREAD AT GRATE (ft)	TOTAL RUNOFF (CA)
1	1-2	JUSTIN ST	10		0.62	0.57	10	5.87	0.35		2.07	17		20	14.4	0.0	0.14		0.0300	4.57		0.35
2	1-3	JUSTIN ST	14		1.83	0.57	14	5.06	1.04		5.28	20		20	17.0	0.0	0.23		0.0300	7.65		1.04
3	1-4	STINSON RD	12		1.34	0.57	12	5.42	0.76		4.14	20		20	17.0	0.0	0.20		0.0300	6.51		0.76
4	1-5	STINSON RD	9		1.32	0.57	9	6.12	0.75		4.61	20		20	17.0	0.0	0.21		0.0300	6.99		0.75
5																						
6	2-1	PATRICIA LN	9		0.42	0.57	9	6.12	0.24		1.47	8		20	6.8	0.0	0.18		0.0300	6.00		0.24
7	2-2	PATRICIA LN	7		0.37	0.57	7	6.74	0.21		1.40	8		20	6.8	0.0	0.17		0.0300	5.83		0.21
8																						
9	3-2	SAYDI ST	8		0.36	0.57	8	6.41	0.21		1.32	5		20	4.2	0.0	0.23		0.0300	7.64		0.21
10	3-3	SAYDI ST	8		0.36	0.57	8	6.41	0.21		1.32	8		20	6.8	0.0	0.17		0.0300	5.58		0.21
11	3-5	JENNIFER ANN LN	9		0.39	0.57	9	6.12	0.22		1.36	8		20	6.8	0.0	0.17		0.0300	5.71		0.22
12	3-8	JUSTIN ST	10		0.58	0.57	10	5.87	0.33		1.95	12		20	10.2	0.0	0.17		0.0300	5.53		0.33
13	3-9	JUSTIN ST	13		0.98	0.57	13	5.23	0.56		2.92	12		20	10.2	0.0	0.22		0.0300	7.25		0.56
14																						
15	4-1	JENNIFER ANN LN	5		0.07	0.57	5	7.56	0.04		0.30	4		20	3.4	0.0	0.10		0.0300	3.32		0.04
16	4-2	JENNIFER ANN LN	8		0.51	0.57	8	6.41	0.29	0.01	1.95	8		20	6.8	0.0	0.22		0.0300	7.26		0.30
17																						
18	5-2	HILDA LN	10		0.71	0.57	10	5.87	0.40		2.37	13		20	11.0	0.0	0.18		0.0300	5.98		0.40
19	5-3	HILDA LN	14		1.04	0.57	14	5.06	0.59	0.01	3.06	13		20	11.0	0.0	0.21		0.0300	7.08		0.60
20	5-4	JENNIFER ANN LN	9		0.49	0.57	9	6.12	0.28		1.71	12		20	10.2	0.0	0.15		0.0300	5.07		0.28
21	5-5	JENNIFER ANN LN	14		1.24	0.57	14	5.06	0.70		3.57	16		20	13.6	0.0	0.21		0.0300	6.84		0.70
22																						
23	6-1	STINSON RD	14		1.67	0.57	14	5.06	0.95		4.82	16		20	13.6	0.0	0.25		0.0300	8.35		0.95
24	6-2	STINSON RD	11		1.14	0.57	11	5.63	0.65		3.66	12		20	10.2	0.0	0.25		0.0300	8.43		0.65
25																						
26	7-5	TROY ST	8		1.32	0.57	8	6.41	0.75		4.83	20		20	17.0	0.0	0.22		0.0300	7.21		0.75
27	7-6	TROY ST	10		1.17	0.57	10	5.87	0.67		3.91	20		20	17.0	0.0	0.19		0.0300	6.27		0.67
28	7-8	OLIVER ALLEN LN	6		0.13	0.57	6	7.12	0.07		0.53	4		20	3.4	0.0	0.14		0.0300	4.82		0.07
29	7-9	OLIVER ALLEN LN	6		0.40	0.57	6	7.12	0.23		1.63	8		20	6.8	0.0	0.19		0.0300	6.44		0.23
30																						
31	8-1	HILDA LN	10		0.53	0.57	10	5.87	0.30		1.77	8		20	6.8	0.0	0.20		0.0300	6.81		0.30
32																						
33	9-1	TROY ST	10		0.41	0.57	10	5.87	0.23		1.37	8		20	6.8	0.0	0.17		0.0300	5.74		0.23
34																						
35	10-1	HILDA LN	14		1.92	0.57	14	5.06	1.09		5.54	20		20	17.0	0.0	0.24		0.0300	7.90		1.09
36	10-2	HILDA LN	8		0.56	0.57	8	6.41	0.32		2.05	16		20	13.6	0.0	0.14		0.0300	4.72		0.32
37																						
38	11-2	NORTH DRIVEWAY	9		1.46	0.57	9	6.12	0.83		5.10	FES										0.83
39	11-4	NORTH DRIVEWAY	7		0.53	0.57	7	6.74	0.30		2.04	FES										0.30

* 5 MINUTES IS THE MINIMUM TIME OF CONCENTRATION FOR CATCHMENT BASINS (10 - YEAR I = 7.34 IN/HR).

** CAPACITY FOR A MXIMUM OF 6" HEADWATER

*** CLOG REDUCTION FACTOR FOR CURB/AREA INLETS IS 20% FOR GRATED INLETS IS 50%

Job Description Stokenbury Farms Phase I **Date:** February 21, 2020
CTA Job Number 19106901 **By:** Ali Karr, E.I.

CATCH BASINS IN A SUMP: DESIGN (100 - YEAR STORM EVENT)

	INLET NUMBER	INLET LOCATION	AREA Tc (min)	TYPE OF INLET	AREA (ac)	C	TOTAL Tc (min)	* I (in/hr)	RUNOFF AT INLET (CA)	CARRY-OVER FROM UPSTREAM INLET (CA)	TOTAL FLOW Qt (cfs)	INLET LENTGTH (ft)	AREA OPENING (sf^2)	*** CLOG REDUC. (%)	** CAPAC. Qp (cfs) CURB	** CAPAC Qp (cfs) GRATE	DEPTH AT CURB d (ft)		RDWY CROSS SLOPE (ft/ft)	SPREAD AT INLET (ft)		TOTAL RUNOFF (CA)
1	1-2	JUSTIN ST	10	0	0.62	0.57	10	8.43	0.35		2.98	17	0	20	14.4	0.0	0.17		0.0300	5.82		0.35
2	1-3	JUSTIN ST	14	0	1.83	0.57	14	7.29	1.04		7.61	20	0	20	17.0	0.0	0.29		0.0300	9.76		1.04
3	1-4	STINSON RD	12	0	1.34	0.57	12	7.81	0.76		5.96	20	0	20	17.0	0.0	0.25		0.0300	8.30		0.76
4	1-5	STINSON RD	9	0	1.32	0.57	9	8.80	0.75		6.62	20	0	20	17.0	0.0	0.27		0.0300	8.90		0.75
5																						
6	2-1	PATRICIA LN	9	0	0.42	0.57	9	8.80	0.24		2.11	8	0	20	6.8	0.0	0.23		0.0300	7.64		0.24
7	2-2	PATRICIA LN	7	0	0.37	0.57	7	9.68	0.21		2.01	8	0	20	6.8	0.0	0.22		0.0300	7.41		0.21
8																						
9	3-2	SAYDI ST	8	0	0.36	0.57	8	9.21	0.21		1.89	5	0	20	4.2	0.0	0.29		0.0300	9.72		0.21
10	3-3	SAYDI ST	8	0	0.36	0.57	8	9.21	0.21		1.89	8	0	20	6.8	0.0	0.21		0.0300	7.11		0.21
11	3-5	JENNIFER ANN LN	9	0	0.39	0.57	9	8.80	0.22		1.96	8	0	20	6.8	0.0	0.22		0.0300	7.27		0.22
12	3-8	JUSTIN ST	10	0	0.58	0.57	10	8.43	0.33		2.80	12	0	20	10.2	0.0	0.21		0.0300	7.04		0.33
13	3-9	JUSTIN ST	13	0	0.98	0.57	13	7.54	0.56		4.21	12	0	20	10.2	0.0	0.28		0.0300	9.25		0.56
14																						
15	4-1	JENNIFER ANN LN	5	0	0.07	0.57	5	10.83	0.04		0.43	4	0	20	3.4	0.0	0.13		0.0300	4.22		0.04
16	4-2	JENNIFER ANN LN	8	0	0.51	0.57	8	9.21	0.29	0.05	3.12	8	0	20	6.8	0.0	0.30		0.0300	9.92		0.34
17																						
18	5-2	HILDA LN	10	0	0.71	0.57	10	8.43	0.40		3.41	13	0	20	11.0	0.0	0.23		0.0300	7.62		0.40
19	5-3	HILDA LN	14	0	1.04	0.57	14	7.29	0.59	0.04	4.63	13	0	20	11.0	0.0	0.28		0.0300	9.34		0.63
20	5-4	JENNIFER ANN LN	9	0	0.49	0.57	9	8.80	0.28		2.46	12	0	20	10.2	0.0	0.19		0.0300	6.46		0.28
21	5-5	JENNIFER ANN LN	14	0	1.24	0.57	14	7.29	0.70		5.14	16	0	20	13.6	0.0	0.26		0.0300	8.72		0.70
22																						
23	6-1	STINSON RD	14	0	1.67	0.57	14	7.29	0.95		6.94	16	0	20	13.6	0.0	0.32		0.0300	10.66		0.95
24	6-2	STINSON RD	11	0	1.14	0.57	11	8.10	0.65		5.27	12	0	20	10.2	0.0	0.32		0.0300	10.74		0.65
25																						
26	7-5	TROY ST	8	0	1.32	0.57	8	9.21	0.75		6.93	20	0	20	17.0	0.0	0.28		0.0300	9.17		0.75
27	7-6	TROY ST	10	0	1.17	0.57	10	8.43	0.67		5.62	20	0	20	17.0	0.0	0.24		0.0300	7.98		0.67
28	7-8	OLIVER ALLEN LN	6	0	0.13	0.57	6	10.21	0.07		0.76	4	0	20	3.4	0.0	0.18		0.0300	6.13		0.07
29	7-9	OLIVER ALLEN LN	6	0	0.40	0.57	6	10.21	0.23		2.34	8	0	20	6.8	0.0	0.25		0.0300	8.19		0.23
30																						
31	8-1	HILDA LN	10	0	0.53	0.57	10	8.43	0.30		2.55	8	0	20	6.8	0.0	0.26		0.0300	8.67		0.30
32																						
33	9-1	TROY ST	10	0	0.41	0.57	10	8.43	0.23		1.97	8	0	20	6.8	0.0	0.22		0.0300	7.31		0.23
34																						
35	10-1	HILDA LN	14	0	1.92	0.57	14	7.29	1.09		7.98	20	0	20	17.0	0.0	0.30		0.0300	10.08		1.09
36	10-2	HILDA LN	8	0	0.56	0.57	8	9.21	0.32		2.94	16	0	20	13.6	0.0	0.18		0.0300	6.01		0.32
37																						
38	11-2	NORTH DRIVEWAY	9	0	1.46	0.57	9	8.80	0.83		7.32	FES										0.83
39	11-4	NORTH DRIVEWAY	7	0	0.53	0.57	7	9.68	0.30		2.92	FES										0.30

* 5 MINUTES IS THE MINIMUM TIME OF CONCENTRATION FOR CATCHMENT BASINS (100 - YEAR I = 10.22 IN/HR).
** CAPACITY FOR A MXIMUM OF 6" HEADWATER
*** CLOG REDUCTION FACTOR FOR CURB/AREA INLETS IS 20% FOR GRATED INLETS IS 50%

Crafton Tull

Job Description: Stokenbury Farms Phase I
CTA Job Number: 19106901

Date: February 21, 2020
By: Ali Karr, E.I.

STORM SEWER WORKSHEET: DESIGN (10 - YEAR)

	OUTFALL RUN NO.	NOTES	INLET NUMBER	INLET LOCATION	AREA	INLET "CA"	OTHER "CA"	FROM STRUCTURE NUMBER	TOTAL SUM "CA"	INLET TIME OF CONC. Tc (min)	PIPE RUN Tc (min)	DESIGN Tc (min)	* INTENSITY (in/hr)	PIPE FLOW Qt (cfs)	NUMBER OF RUNS	PIPE SIZE (in)	PIPE FRICTION COEFF. n	PIPE SLOPE (ft/ft)	** PIPE CAPACITY (cfs)	PIPE VELOCITY (ft/sec)	PIPE LENGTH (ft)	PIPE Tc (min)	INLET FLOWLINE ELEVATION (ft)	TOTAL FALL (ft)	OUTLET FLOWLINE ELEVATION (ft)	*** TOP ELEVATION (ft)	STRUCT. HEIGHT (ft)	FLOW vs. CAPACITY (%)
1		SUMP PIPE	1-5	STINSON RD	1.32	0.75			0.75	9.0	0.00	9.00	6.12	4.61	1	18	0.013	0.0040	6.64	3.76	28.46	0.13	1205.92	0.11	1205.80	1209.23	3.31	69%
2		SUMP PIPE	1-4	STINSON RD	1.34	0.76	0.75	1-5	1.52	12.0	0.00	12.00	5.42	8.23	1	24	0.013	0.0040	14.31	4.55	294.38	1.08	1205.70	1.18	1204.52	1209.24	3.54	57%
3		SUMP PIPE	2-2	PATRICIA LN	0.37	0.21			0.21	7.0	0.00	7.00	6.74	1.40	1	18	0.013	0.0049	7.35	4.16	20.34	0.08	1206.66	0.10	1206.56	1210.20	3.54	19%
4		SUMP PIPE	2-1	PATRICIA LN	0.42	0.24	0.21	2-1	0.45	9.0	0.00	9.00	6.12	2.74	1	18	0.013	0.0075	9.09	5.14	205.70	0.67	1206.46	1.54	1204.92	1210.18	3.72	30%
5		SUMP PIPE	1-3	JUSTIN ST	1.83	1.04	1.96	1-4,2-1	3.01	14.0	0.00	14.00	5.06	15.22	1	24	0.013	0.0073	19.33	6.15	27.35	0.07	1204.42	0.20	1204.22	1208.56	4.14	79%
6		SUMP PIPE	1-2	JUSTIN ST	0.62	0.35	3.01	1-3	3.36	10.0	0.00	14.00	5.06	17.01	1	30	0.013	0.0040	25.94	5.28	31.16	0.10	1204.12	0.12	1204.00	1208.56	4.44	66%
7																												
8		SUMP PIPE	3-9	JUSTIN ST	0.98	0.56			0.56	13.0	0.00	13.00	5.23	2.92	1	18	0.013	0.0050	7.43	4.20	27.34	0.11	1204.22	0.14	1204.08	1208.69	4.47	39%
9		SUMP PIPE	3-8	JUSTIN ST	0.58	0.33	0.56	3-9	0.89	10.0	0.00	13.00	5.23	4.66	1	18	0.013	0.0050	7.46	4.22	50.91	0.20	1203.98	0.26	1203.72	1208.69	4.71	62%
10		JUNCTION	3-7	JUNCTION BOX		0.00	0.89	3-8	0.89	0.0	0.00	13.00	5.23	4.66	1	18	0.013	0.0050	7.44	4.21	288.95	1.14	1203.62	1.45	1202.17	1209.32	5.70	63%
11		GRADE PIPE	3-6	JENNIFER ANN LN	0.69	0.38	0.89	3-7	1.27	12.0	0.00	13.00	5.23	6.65	1	18	0.013	0.0062	8.30	4.70	27.35	0.10	1202.07	0.17	1201.90	1206.30	4.23	80%
12		SUMP PIPE	3-5	JENNIFER ANN LN	0.39	0.22	1.27	3-6	1.49	9.0	0.00	13.00	5.23	7.81	1	18	0.013	0.0086	9.71	5.50	46.65	0.14	1201.80	0.40	1201.40	1206.30	4.50	80%
13		SUMP PIPE	4-2	JENNIFER ANN LN	0.51	0.30			0.30	8.0	0.00	8.00	6.41	1.95	1	18	0.013	0.0051	7.46	4.22	27.34	0.11	1202.03	0.14	1201.89	1205.47	3.44	26%
14		SUMP PIPE	4-1	JENNIFER ANN LN	0.07	0.04	0.30	4-2	0.34	5.0	0.00	8.00	6.41	2.21	1	18	0.013	0.0050	7.43	4.20	77.70	0.31	1201.79	0.39	1201.40	1205.47	3.68	30%
15		JUNCTION	3-4	JUNCTION BOX		0.00	1.84	3-5,4-1	1.84	0.0	0.00	13.00	5.23	9.61	1	24	0.013	0.0100	22.62	7.20	156.46	0.36	1200.90	1.56	1199.34	1205.20	4.30	42%
16		SUMP PIPE	10-2	HILDA LN	0.56	0.32			0.32	8.0	0.00	8.00	6.41	2.05	1	18	0.013	0.0050	7.43	4.20	27.34	0.11	1200.46	0.14	1200.32	1204.62	4.16	28%
17		SUMP PIPE	10-1	HILDA LN	1.92	1.09	0.32	10-2	1.41	14.0	0.00	14.00	5.06	7.16	1	24	0.013	0.0075	19.59	6.24	64.49	0.17	1199.82	0.48	1199.34	1204.62	4.80	37%
18		SUMP PIPE	3-3	SAYDI ST	0.36	0.21	3.25	3-4,10-1	3.46	8.0	0.00	14.00	5.06	17.49	1	24	0.013	0.0102	22.79	7.25	27.36	0.06	1199.24	0.28	1198.96	1203.70	4.46	77%
19		SUMP PIPE	3-2	SAYDI ST	0.36	0.21	3.46	3-3	3.66	8.0	0.00	14.00	5.06	18.53	1	30	0.013	0.0040	25.94	5.28	267.33	0.84	1198.86	1.07	1197.79	1203.70	4.84	71%
20																												
21		SUMP PIPE	7-9	OLIVER ALLEN LN	0.40	0.23			0.23	6.0	0.00	6.00	7.12	1.63	1	18	0.013	0.0040	6.64	3.76	31.06	0.14	1207.41	0.12	1207.28	1210.52	3.11	25%
22		SUMP PIPE	7-8	OLIVER ALLEN LN	0.13	0.07	0.23	7-9	0.30	6.0	0.00	6.00	7.12	2.16	1	18	0.013	0.0040	6.64	3.76	31.06	0.14	1207.18	0.12	1207.06	1210.52	3.34	33%
23		GRADE PIPE	7-7	JUNCTION BOX		0.00	0.30	7-8	0.30	0.0	0.00	6.00	7.12	2.16	1	18	0.013	0.0040	6.64	3.76	144.31	0.64	1206.96	0.58	1206.38	1210.58	3.62	33%
24		SUMP PIPE	7-6	TROY ST	1.17	0.67	0.30	7-7	0.97	10.0	0.00	10.00	5.87	5.69	1	18	0.013	0.0040	6.64	3.76	31.06	0.14	1206.28	0.12	1206.16	1209.87	3.59	86%
25		SUMP PIPE	7-5	TROY ST	1.32	0.75	0.97	7-6	1.72	8.0	0.00	10.00	5.87	10.10	1	24	0.013	0.0040	14.31	4.55	280.60	1.03	1205.66	1.12	1204.53	1209.85	4.19	71%
26		SUMP PIPE	9-1	TROY ST	0.41	0.23			0.23	10.0	0.00	10.00	5.87	1.37	1	18	0.013	0.0050	7.43	4.20	27.59	0.11	1205.07	0.14	1204.93	1210.70	5.63	18%
27		JUNCTION	7-4	JUNCTION BOX		0.00	1.96	7-5,9-1	1.96	0.0	0.00	10.00	5.87	11.47	1	24	0.013	0.0040	14.31	4.55	44.87	0.16	1204.43	0.18	1204.25	1210.64	6.21	80%
28		GRADE PIPE	7-3	HILDA LN	0.36	0.21	1.96	7-4	2.16	7.0	0.00	10.00	5.87	12.68	1	24	0.013	0.0050	16.00	5.09	63.67	0.21	1204.15	0.32	1203.84	1209.82	5.67	79%
29		SUMP PIPE	8-1	HILDA LN	0.53	0.30			0.30	10.0	0.00	10.00	5.87	1.77	1	18	0.013	0.0050	7.43	4.20	28.35	0.11	1204.38	0.14	1204.24	1209.39	5.02	24%
30		JUNCTION	7-2	JUNCTION BOX		0.00	2.46	7-3,8-1	2.46	0.0	0.00	10.00	5.87	14.45	1	24	0.013	0.0065	18.24	5.81	226.00	0.65	1203.74	1.47	1202.27	1209.72	5.98	79%
31		SUMP PIPE	6-2	STINSON RD	1.14	0.65			0.65	11.0	0.00	11.00	5.63	3.66	1	18	0.013	0.0040	6.64	3.76	338.81	1.50	1204.38	1.36	1203.02	1209.72	5.34	55%
32		SUMP PIPE	6-1	STINSON RD	1.67	0.95	0.65	6-2	1.60	14.0	0.00	14.00	5.06	8.11	1	24	0.013	0.0040	14.31	4.55	64.08	0.23	1202.52	0.26	1202.27	1207.97	5.44	57%
33		GRADE PIPE	7-1	HILDA LN	0.65	0.36	4.07	7-2,6-1	4.42	7.0	0.00	14.00	5.06	22.40	1	30	0.013	0.0047	28.12	5.73	63.59	0.19	1201.77	0.30	1201.47	1207.73	5.96	80%
34		SUMP PIPE	5-5	JENNIFER ANN LN	1.24	0.70			0.70	14.0	0.00	14.00	5.06	3.57	1	18	0.013	0.0040	6.64	3.76	27.35	0.12	1203.59	0.11	1203.48	1208.17	4.58	54%
35		SUMP PIPE	5-4	JENNIFER ANN LN	0.49	0.28	0.70	5-5	0.98	9.0	0.00	17.00	4.62	4.55	1	18	0.013	0.0040	6.64	3.76	253.01	1.12	1203.38	1.01	1202.37	1208.17	4.79	68%
36		SUMP PIPE	5-3	HILDA LN	1.04	0.60	5.41	5-4,7-1	6.01	14.0	0.00	17.00	4.62	27.78	1	36	0.013	0.0040	42.18	5.97	28.35	0.08	1201.37	0.11	1201.25	1207.28	5.91	66%
37		SUMP PIPE	5-2	HILDA LN	0.71	0.40	6.01	2-3	6.42	10.0	0.00	17.00	4.62	29.65	1	36	0.013	0.0040	42.18	5.97	151.21	0.42	1201.15	0.60	1200.55	1207.32	6.17	70%
38																												
39		SUMP PIPE	11-4	NORTH DRIVEWAY	0.53	0.30			0.30	7.0	0.00	7.00	6.74	2.04	1	18	0.013	0.0020	4.70	2.66	57.40	0.36	1200.97	0.11	1200.86	1207.32	6.35	43%
40		SUMP PIPE	11-2	NORTH DRIVEWAY	1.46	0.83	0.30	11-4	1.13	9.0	0.00	9.00	6.12	6.95	1	24	0.013	0.0020	10.12	3.22	69.23	0.36	1200.00	0.14	1199.86	1207.32	7.32	69%

* A MINIMUM TIME OF CONCENTRATION OF 5 MINUTES FOR A GIVEN PART OF A STORM SEWER SYSTEM IS RECOMMENDED. THE 5 MINUTE INTENSITY FOR THE 10 YEAR STORM IS 7.34 in/hr.

** FULL FLOW CAPACITY DOES NOT CONSIDER ADDITIONAL CAPAPCITY DUE TO AVAILABLE HEAD AT INLET FIELD.

*** MANHOLE COVER, GRATE, OR TOP OF HEADWALL ELEVATION.

ELLIPTICAL EQUIVALENT

Crafton Tull

Job Description: Stokenbury Farms Phase I
CTA Job Number: 19106901

Date: February 21, 2020
By: Ali Karr, E.I.

STORM SEWER WORKSHEET: DESIGN (100 - YEAR)

	OUTFALL RUN NO.	NOTES	INLET NUMBER	INLET LOCATION	AREA	INLET "CA"	OTHER "CA"	FROM STRUCTURE NUMBER	TOTAL SUM "CA"	INLET TIME OF CONC. Tc (min)	PIPE RUN Tc (min)	DESIGN Tc (min)	* INTENSITY (in/hr)	PIPE FLOW Qt (cfs)	NUMBER OF RUNS	PIPE SIZE (in)	PIPE FRICTION COEFF. n	PIPE SLOPE (ft/ft)	** PIPE CAPACITY (cfs)	PIPE VELOCITY (ft/sec)	PIPE LENGTH (ft)	PIPE Tc (min)	INLET FLOWLINE ELEVATION (ft)	TOTAL FALL (ft)	OUTLET FLOWLINE ELEVATION (ft)	*** TOP ELEVATION (ft)	STRUCT. HEIGHT (ft)	FLOW vs. CAPACITY (%)
1		SUMP PIPE	1-5	STINSON RD	1.32	0.75			0.75	9.0	0.00	9.00	8.80	6.62	1	18	0.013	0.0040	6.64	3.76	28.46	0.13	1205.92	0.11	1205.80	1209.23	3.31	100%
2		SUMP PIPE	1-4	STINSON RD	1.34	0.76	0.75	1-5	1.52	12.0	0.00	12.00	7.81	11.84	1	24	0.013	0.0040	14.31	4.55	294.38	1.08	1205.70	1.18	1204.52	1209.24	3.54	83%
3		SUMP PIPE	2-2	PATRICIA LN	0.37	0.21			0.21	7.0	0.00	7.00	9.68	2.01	1	18	0.013	0.0049	7.35	4.16	20.34	0.08	1206.66	0.10	1206.56	1210.20	3.54	27%
4		SUMP PIPE	2-1	PATRICIA LN	0.42	0.24	0.21	2-1	0.45	9.0	0.00	9.00	8.80	3.94	1	18	0.013	0.0075	9.09	5.14	205.70	0.67	1206.46	1.54	1204.92	1210.18	3.72	43%
5		SUMP PIPE	1-3	JUSTIN ST	1.83	1.04	1.96	1-4,2-1	3.01	14.0	0.00	14.00	7.29	21.93	1	24	0.013	0.0073	19.33	6.15	27.35	0.07	1204.42	0.20	1204.22	1208.56	4.14	113%
6		SUMP PIPE	1-2	JUSTIN ST	0.62	0.35	3.01	1-3	3.36	10.0	0.00	14.00	7.29	24.51	1	30	0.013	0.0040	25.94	5.28	31.16	0.10	1204.12	0.12	1204.00	1208.56	4.44	94%
7																												
8		SUMP PIPE	3-9	JUSTIN ST	0.98	0.56			0.56	13.0	0.00	13.00	7.54	4.21	1	18	0.013	0.0050	7.43	4.20	27.34	0.11	1204.22	0.14	1204.08	1208.69	4.47	57%
9		SUMP PIPE	3-8	JUSTIN ST	0.58	0.33	0.56	3-9	0.89	10.0	0.00	13.00	7.54	6.71	1	18	0.013	0.0050	7.46	4.22	50.91	0.20	1203.98	0.26	1203.72	1208.69	4.71	90%
10		JUNCTION	3-7	JUNCTION BOX		0.00	0.89	3-8	0.89	0.0	0.00	13.00	7.54	6.71	1	18	0.013	0.0050	7.44	4.21	288.95	1.14	1203.62	1.45	1202.17	1209.32	5.70	90%
11		GRADE PIPE	3-6	JENNIFER ANN LN	0.69	0.35	0.89	3-7	1.24	12.0	0.00	13.00	7.54	9.32	1	18	0.013	0.0062	8.30	4.70	27.35	0.10	1202.07	0.17	1201.90	1206.30	4.23	112%
12		SUMP PIPE	3-5	JENNIFER ANN LN	0.39	0.22	1.24	3-6	1.46	9.0	0.00	13.00	7.54	10.99	1	18	0.013	0.0086	9.71	5.50	46.65	0.14	1201.80	0.40	1201.40	1206.30	4.50	113%
13		SUMP PIPE	4-2	JENNIFER ANN LN	0.51	0.34			0.34	8.0	0.00	8.00	9.21	3.12	1	18	0.013	0.0051	7.46	4.22	27.34	0.11	1202.03	0.14	1201.89	1205.47	3.44	42%
14		SUMP PIPE	4-1	JENNIFER ANN LN	0.07	0.04	0.34	4-2	0.38	5.0	0.00	8.00	9.21	3.48	1	18	0.013	0.0050	7.43	4.20	77.70	0.31	1201.79	0.39	1201.40	1205.47	3.68	47%
15		JUNCTION	3-4	JUNCTION BOX		0.00	1.84	3-5,4-1	1.84	0.0	0.00	13.00	7.54	13.85	1	24	0.013	0.0100	22.62	7.20	156.46	0.36	1200.90	1.56	1199.34	1205.20	4.30	61%
16		SUMP PIPE	10-2	HILDA LN	0.56	0.32			0.32	8.0	0.00	8.00	9.21	2.94	1	18	0.013	0.0050	7.43	4.20	27.34	0.11	1200.46	0.14	1200.32	1204.62	4.16	40%
17		SUMP PIPE	10-1	HILDA LN	1.92	1.09	0.32	10-2	1.41	14.0	0.00	14.00	7.29	10.31	1	24	0.013	0.0075	19.59	6.24	64.49	0.17	1199.82	0.48	1199.34	1204.62	4.80	53%
18		SUMP PIPE	3-3	SAYDI ST	0.36	0.21	3.25	3-4,10-1	3.46	8.0	0.00	14.00	7.29	25.20	1	24	0.013	0.0102	22.79	7.25	27.36	0.06	1199.24	0.28	1198.96	1203.70	4.46	111%
19		SUMP PIPE	3-2	SAYDI ST	0.36	0.21	3.46	3-3	3.66	8.0	0.00	14.00	7.29	26.70	1	30	0.013	0.0040	25.94	5.28	267.33	0.84	1198.86	1.07	1197.79	1203.70	4.84	103%
20																												
21		SUMP PIPE	7-9	OLIVER ALLEN LN	0.40	0.23			0.23	6.0	0.00	6.00	10.21	2.34	1	18	0.013	0.0040	6.64	3.76	31.06	0.14	1207.41	0.12	1207.28	1210.52	3.11	35%
22		SUMP PIPE	7-8	OLIVER ALLEN LN	0.13	0.07	0.23	7-9	0.30	6.0	0.00	6.00	10.21	3.10	1	18	0.013	0.0040	6.64	3.76	31.06	0.14	1207.18	0.12	1207.06	1210.52	3.34	47%
23		GRADE PIPE	7-7	JUNCTION BOX		0.00	0.30	7-8	0.30	0.0	0.00	6.00	10.21	3.10	1	18	0.013	0.0040	6.64	3.76	144.31	0.64	1206.96	0.58	1206.38	1210.58	3.62	47%
24		SUMP PIPE	7-6	TROY ST	1.17	0.67	0.30	7-7	0.97	10.0	0.00	10.00	8.43	8.18	1	18	0.013	0.0040	6.64	3.76	31.06	0.14	1206.28	0.12	1206.16	1209.87	3.59	123%
25		SUMP PIPE	7-5	TROY ST	1.32	0.75	0.97	7-6	1.72	8.0	0.00	10.00	8.43	14.52	1	24	0.013	0.0040	14.31	4.55	280.60	1.03	1205.66	1.12	1204.53	1209.85	4.19	102%
26		SUMP PIPE	9-1	TROY ST	0.41	0.23			0.23	10.0	0.00	10.00	8.43	1.97	1	18	0.013	0.0050	7.43	4.20	27.59	0.11	1205.07	0.14	1204.93	1210.70	5.63	27%
27		JUNCTION	7-4	JUNCTION BOX		0.00	1.96	7-5,9-1	1.96	0.0	0.00	10.00	8.43	16.50	1	24	0.013	0.0040	14.31	4.55	44.87	0.16	1204.43	0.18	1204.25	1210.64	6.21	115%
28		GRADE PIPE	7-3	HILDA LN	0.36	0.21	1.96	7-4	2.16	7.0	0.00	10.00	8.43	18.23	1	24	0.013	0.0050	16.00	5.09	63.67	0.21	1204.15	0.32	1203.84	1209.82	5.67	114%
29		SUMP PIPE	8-1	HILDA LN	0.53	0.30			0.30	10.0	0.00	10.00	8.43	2.55	1	18	0.013	0.0050	7.43	4.20	28.35	0.11	1204.38	0.14	1204.24	1209.39	5.02	34%
30		JUNCTION	7-2	JUNCTION BOX		0.00	2.46	7-3,8-1	2.46	0.0	0.00	10.00	8.43	20.77	1	24	0.013	0.0065	18.24	5.81	226.00	0.65	1203.74	1.47	1202.27	1209.72	5.98	114%
31		SUMP PIPE	6-2	STINSON RD	1.14	0.65			0.65	11.0	0.00	11.00	8.10	5.27	1	18	0.013	0.0040	6.64	3.76	338.81	1.50	1204.38	1.36	1203.02	1209.72	5.34	79%
32		SUMP PIPE	6-1	STINSON RD	1.67	0.95	0.65	6-2	1.60	14.0	0.00	14.00	7.29	11.68	1	24	0.013	0.0040	14.31	4.55	64.08	0.23	1202.52	0.26	1202.27	1207.97	5.44	82%
33		GRADE PIPE	7-1	HILDA LN	0.65	0.33	4.07	7-2,6-1	4.39	7.0	0.00	14.00	7.29	32.04	1	30	0.013	0.0047	28.12	5.73	63.59	0.19	1201.77	0.30	1201.47	1207.73	5.96	114%
34		SUMP PIPE	5-5	JENNIFER ANN LN	1.24	0.70			0.70	14.0	0.00	14.00	7.29	5.14	1	18	0.013	0.0040	6.64	3.76	27.35	0.12	1203.59	0.11	1203.48	1208.17	4.58	77%
35		SUMP PIPE	5-4	JENNIFER ANN LN	0.49	0.28	0.70	5-5	0.98	9.0	0.00	17.00	6.67	6.56	1	18	0.013	0.0040	6.64	3.76	253.01	1.12	1203.38	1.01	1202.37	1208.17	4.79	99%
36		SUMP PIPE	5-3	HILDA LN	1.04	0.63	5.38	5-4,7-1	6.01	14.0	0.00	17.00	6.67	40.09	1	36	0.013	0.0040	42.18	5.97	28.35	0.08	1201.37	0.11	1201.25	1207.28	5.91	95%
37		SUMP PIPE	5-2	HILDA LN	0.71	0.40	6.01	2-3	6.42	10.0	0.00	17.00	6.67	42.78	1	36	0.013	0.0040	42.18	5.97	151.21	0.42	1201.15	0.60	1200.55	1207.32	6.17	101%
38																												
39		SUMP PIPE	11-4	NORTH DRIVEWAY	0.53	0.30			0.30	7.0	0.00	7.00	9.68	2.92	1	18	0.013	0.0020	4.70	2.66	57.40	0.36	1200.97	0.11	1200.86	1207.32	6.35	62%
40		SUMP PIPE	11-2	NORTH DRIVEWAY	1.46	0.83	0.30	4-Nov	1.13	9.0	0.00	9.00	8.80	9.98	1	24	0.013	0.0020	10.12	3.22	69.23	0.36	1200.00	0.14	1199.86	1207.32	7.32	99%

* A MINIMUM TIME OF CONCENTRATION OF 5 MINUTES FOR A GIVEN PART OF A STORM SEWER SYSTEM IS RECOMMENDED. THE 5 MINUTE INTENSITY FOR THE 100 YEAR STORM IS 10.22 in/hr.

** FULL FLOW CAPACITY DOES NOT CONSIDER ADDITIONAL CAPAPCITY DUE TO AVAILABLE HEAD AT INLET FIELD.

*** MANHOLE COVER, GRATE, OR TOP OF HEADWALL ELEVATION.

ELLIPTICAL EQUIVALENT

Study Point 4 Redesign - ARDOT

Project Summary	
Title	
Engineer	Ali Karr, E.I.
Company	Crafton Tull
Date	4/14/2020

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Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Time-Depth Curve: 1 YR	
Label	1 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	1 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.0	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.1	0.1
3.500	0.1	0.1	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.2	0.2	0.2	0.2
5.500	0.2	0.3	0.3	0.3	0.3
6.000	0.3	0.3	0.3	0.3	0.3
6.500	0.3	0.3	0.3	0.3	0.3
7.000	0.3	0.4	0.4	0.4	0.4
7.500	0.4	0.4	0.4	0.4	0.4
8.000	0.4	0.4	0.4	0.4	0.5
8.500	0.5	0.5	0.5	0.5	0.5
9.000	0.5	0.5	0.5	0.5	0.6
9.500	0.6	0.6	0.6	0.6	0.6
10.000	0.6	0.6	0.7	0.7	0.7
10.500	0.7	0.7	0.8	0.8	0.8
11.000	0.8	0.8	0.9	0.9	1.0
11.500	1.0	1.1	1.2	1.5	2.0
12.000	2.3	2.4	2.4	2.5	2.5
12.500	2.6	2.6	2.6	2.7	2.7
13.000	2.7	2.7	2.7	2.8	2.8
13.500	2.8	2.8	2.8	2.8	2.9
14.000	2.9	2.9	2.9	2.9	2.9
14.500	2.9	2.9	3.0	3.0	3.0
15.000	3.0	3.0	3.0	3.0	3.0
15.500	3.0	3.0	3.1	3.1	3.1
16.000	3.1	3.1	3.1	3.1	3.1
16.500	3.1	3.1	3.1	3.1	3.1

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

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

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

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

Time-Depth Curve: 10 YR	
Label	10 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	10 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.4	0.4	0.4
5.500	0.4	0.4	0.4	0.4	0.4
6.000	0.4	0.4	0.4	0.5	0.5
6.500	0.5	0.5	0.5	0.5	0.5
7.000	0.5	0.5	0.5	0.6	0.6
7.500	0.6	0.6	0.6	0.6	0.6
8.000	0.6	0.6	0.7	0.7	0.7
8.500	0.7	0.7	0.7	0.7	0.8
9.000	0.8	0.8	0.8	0.8	0.8
9.500	0.9	0.9	0.9	0.9	0.9
10.000	1.0	1.0	1.0	1.0	1.1
10.500	1.1	1.1	1.1	1.2	1.2
11.000	1.2	1.3	1.3	1.4	1.4
11.500	1.5	1.6	1.9	2.3	3.0
12.000	3.5	3.6	3.7	3.8	3.9
12.500	3.9	3.9	4.0	4.0	4.1
13.000	4.1	4.1	4.2	4.2	4.2
13.500	4.2	4.3	4.3	4.3	4.3
14.000	4.4	4.4	4.4	4.4	4.4
14.500	4.4	4.5	4.5	4.5	4.5
15.000	4.5	4.5	4.6	4.6	4.6
15.500	4.6	4.6	4.6	4.6	4.7
16.000	4.7	4.7	4.7	4.7	4.7
16.500	4.7	4.7	4.8	4.8	4.8

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	4.8	4.8	4.8	4.8	4.8
17.500	4.8	4.9	4.9	4.9	4.9
18.000	4.9	4.9	4.9	4.9	4.9
18.500	4.9	4.9	5.0	5.0	5.0
19.000	5.0	5.0	5.0	5.0	5.0
19.500	5.0	5.0	5.0	5.0	5.0
20.000	5.1	5.1	5.1	5.1	5.1
20.500	5.1	5.1	5.1	5.1	5.1
21.000	5.1	5.1	5.1	5.1	5.1
21.500	5.2	5.2	5.2	5.2	5.2
22.000	5.2	5.2	5.2	5.2	5.2
22.500	5.2	5.2	5.2	5.2	5.2
23.000	5.3	5.3	5.3	5.3	5.3
23.500	5.3	5.3	5.3	5.3	5.3
24.000	5.3	(N/A)	(N/A)	(N/A)	(N/A)

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

Time-Depth Curve: 100 YR	
Label	100 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	100 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.2	0.2
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.3	0.3
3.000	0.3	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.4	0.4
4.000	0.4	0.4	0.4	0.4	0.4
4.500	0.4	0.4	0.5	0.5	0.5
5.000	0.5	0.5	0.5	0.5	0.6
5.500	0.6	0.6	0.6	0.6	0.6
6.000	0.6	0.6	0.7	0.7	0.7
6.500	0.7	0.7	0.7	0.8	0.8
7.000	0.8	0.8	0.8	0.8	0.8
7.500	0.9	0.9	0.9	0.9	0.9
8.000	0.9	1.0	1.0	1.0	1.0
8.500	1.0	1.1	1.1	1.1	1.1
9.000	1.2	1.2	1.2	1.2	1.3
9.500	1.3	1.3	1.3	1.4	1.4
10.000	1.4	1.5	1.5	1.5	1.6
10.500	1.6	1.7	1.7	1.8	1.8
11.000	1.9	1.9	2.0	2.1	2.1
11.500	2.2	2.4	2.8	3.4	4.5
12.000	5.2	5.4	5.5	5.6	5.7
12.500	5.8	5.9	5.9	6.0	6.1
13.000	6.1	6.2	6.2	6.2	6.3
13.500	6.3	6.4	6.4	6.4	6.5
14.000	6.5	6.5	6.5	6.6	6.6
14.500	6.6	6.7	6.7	6.7	6.7
15.000	6.8	6.8	6.8	6.8	6.8
15.500	6.9	6.9	6.9	6.9	6.9
16.000	7.0	7.0	7.0	7.0	7.0
16.500	7.0	7.1	7.1	7.1	7.1

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	7.1	7.1	7.2	7.2	7.2
17.500	7.2	7.2	7.2	7.3	7.3
18.000	7.3	7.3	7.3	7.3	7.3
18.500	7.4	7.4	7.4	7.4	7.4
19.000	7.4	7.4	7.4	7.5	7.5
19.500	7.5	7.5	7.5	7.5	7.5
20.000	7.5	7.5	7.6	7.6	7.6
20.500	7.6	7.6	7.6	7.6	7.6
21.000	7.6	7.6	7.7	7.7	7.7
21.500	7.7	7.7	7.7	7.7	7.7
22.000	7.7	7.7	7.7	7.8	7.8
22.500	7.8	7.8	7.8	7.8	7.8
23.000	7.8	7.8	7.8	7.8	7.9
23.500	7.9	7.9	7.9	7.9	7.9
24.000	7.9	(N/A)	(N/A)	(N/A)	(N/A)

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

Time-Depth Curve: 2 YR	
Label	2 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	2 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.0	0.0	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.1
3.000	0.1	0.1	0.1	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.2	0.2	0.2	0.2	0.2
5.000	0.2	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.3	0.3
6.000	0.3	0.3	0.3	0.3	0.3
6.500	0.3	0.4	0.4	0.4	0.4
7.000	0.4	0.4	0.4	0.4	0.4
7.500	0.4	0.4	0.4	0.5	0.5
8.000	0.5	0.5	0.5	0.5	0.5
8.500	0.5	0.5	0.5	0.6	0.6
9.000	0.6	0.6	0.6	0.6	0.6
9.500	0.6	0.7	0.7	0.7	0.7
10.000	0.7	0.7	0.7	0.8	0.8
10.500	0.8	0.8	0.8	0.9	0.9
11.000	0.9	1.0	1.0	1.0	1.1
11.500	1.1	1.2	1.4	1.7	2.2
12.000	2.6	2.7	2.7	2.8	2.8
12.500	2.9	2.9	2.9	3.0	3.0
13.000	3.0	3.0	3.1	3.1	3.1
13.500	3.1	3.2	3.2	3.2	3.2
14.000	3.2	3.2	3.2	3.3	3.3
14.500	3.3	3.3	3.3	3.3	3.3
15.000	3.3	3.4	3.4	3.4	3.4
15.500	3.4	3.4	3.4	3.4	3.4
16.000	3.4	3.5	3.5	3.5	3.5
16.500	3.5	3.5	3.5	3.5	3.5

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	3.5	3.5	3.6	3.6	3.6
17.500	3.6	3.6	3.6	3.6	3.6
18.000	3.6	3.6	3.6	3.6	3.6
18.500	3.6	3.7	3.7	3.7	3.7
19.000	3.7	3.7	3.7	3.7	3.7
19.500	3.7	3.7	3.7	3.7	3.7
20.000	3.7	3.7	3.7	3.7	3.8
20.500	3.8	3.8	3.8	3.8	3.8
21.000	3.8	3.8	3.8	3.8	3.8
21.500	3.8	3.8	3.8	3.8	3.8
22.000	3.8	3.8	3.8	3.8	3.8
22.500	3.9	3.9	3.9	3.9	3.9
23.000	3.9	3.9	3.9	3.9	3.9
23.500	3.9	3.9	3.9	3.9	3.9
24.000	3.9	(N/A)	(N/A)	(N/A)	(N/A)

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

Time-Depth Curve: 25 YR	
Label	25 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	25 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.3	0.3	0.3
4.500	0.3	0.4	0.4	0.4	0.4
5.000	0.4	0.4	0.4	0.4	0.4
5.500	0.4	0.5	0.5	0.5	0.5
6.000	0.5	0.5	0.5	0.5	0.5
6.500	0.6	0.6	0.6	0.6	0.6
7.000	0.6	0.6	0.6	0.7	0.7
7.500	0.7	0.7	0.7	0.7	0.7
8.000	0.8	0.8	0.8	0.8	0.8
8.500	0.8	0.8	0.9	0.9	0.9
9.000	0.9	0.9	1.0	1.0	1.0
9.500	1.0	1.0	1.1	1.1	1.1
10.000	1.1	1.2	1.2	1.2	1.2
10.500	1.3	1.3	1.3	1.4	1.4
11.000	1.5	1.5	1.6	1.6	1.7
11.500	1.8	1.9	2.2	2.7	3.6
12.000	4.2	4.3	4.4	4.5	4.5
12.500	4.6	4.7	4.7	4.8	4.8
13.000	4.8	4.9	4.9	4.9	5.0
13.500	5.0	5.0	5.1	5.1	5.1
14.000	5.1	5.2	5.2	5.2	5.2
14.500	5.3	5.3	5.3	5.3	5.3
15.000	5.4	5.4	5.4	5.4	5.4
15.500	5.4	5.5	5.5	5.5	5.5
16.000	5.5	5.5	5.5	5.6	5.6
16.500	5.6	5.6	5.6	5.6	5.6

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	5.7	5.7	5.7	5.7	5.7
17.500	5.7	5.7	5.7	5.8	5.8
18.000	5.8	5.8	5.8	5.8	5.8
18.500	5.8	5.8	5.8	5.9	5.9
19.000	5.9	5.9	5.9	5.9	5.9
19.500	5.9	5.9	5.9	6.0	6.0
20.000	6.0	6.0	6.0	6.0	6.0
20.500	6.0	6.0	6.0	6.0	6.0
21.000	6.0	6.1	6.1	6.1	6.1
21.500	6.1	6.1	6.1	6.1	6.1
22.000	6.1	6.1	6.1	6.1	6.2
22.500	6.2	6.2	6.2	6.2	6.2
23.000	6.2	6.2	6.2	6.2	6.2
23.500	6.2	6.2	6.2	6.3	6.3
24.000	6.3	(N/A)	(N/A)	(N/A)	(N/A)

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

Time-Depth Curve: 5 YR	
Label	5 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	5 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.0	0.0	0.0
1.000	0.0	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.1	0.1	0.1	0.1	0.1
2.500	0.1	0.1	0.1	0.1	0.2
3.000	0.2	0.2	0.2	0.2	0.2
3.500	0.2	0.2	0.2	0.2	0.2
4.000	0.2	0.2	0.2	0.2	0.2
4.500	0.3	0.3	0.3	0.3	0.3
5.000	0.3	0.3	0.3	0.3	0.3
5.500	0.3	0.3	0.3	0.4	0.4
6.000	0.4	0.4	0.4	0.4	0.4
6.500	0.4	0.4	0.4	0.4	0.5
7.000	0.5	0.5	0.5	0.5	0.5
7.500	0.5	0.5	0.5	0.5	0.5
8.000	0.6	0.6	0.6	0.6	0.6
8.500	0.6	0.6	0.6	0.7	0.7
9.000	0.7	0.7	0.7	0.7	0.7
9.500	0.8	0.8	0.8	0.8	0.8
10.000	0.8	0.9	0.9	0.9	0.9
10.500	0.9	1.0	1.0	1.0	1.1
11.000	1.1	1.1	1.2	1.2	1.3
11.500	1.3	1.4	1.6	2.0	2.6
12.000	3.1	3.2	3.2	3.3	3.4
12.500	3.4	3.5	3.5	3.5	3.6
13.000	3.6	3.6	3.6	3.7	3.7
13.500	3.7	3.7	3.8	3.8	3.8
14.000	3.8	3.8	3.8	3.9	3.9
14.500	3.9	3.9	3.9	3.9	4.0
15.000	4.0	4.0	4.0	4.0	4.0
15.500	4.0	4.0	4.1	4.1	4.1
16.000	4.1	4.1	4.1	4.1	4.1
16.500	4.1	4.2	4.2	4.2	4.2

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	4.2	4.2	4.2	4.2	4.2
17.500	4.2	4.2	4.3	4.3	4.3
18.000	4.3	4.3	4.3	4.3	4.3
18.500	4.3	4.3	4.3	4.3	4.4
19.000	4.4	4.4	4.4	4.4	4.4
19.500	4.4	4.4	4.4	4.4	4.4
20.000	4.4	4.4	4.4	4.4	4.5
20.500	4.5	4.5	4.5	4.5	4.5
21.000	4.5	4.5	4.5	4.5	4.5
21.500	4.5	4.5	4.5	4.5	4.5
22.000	4.5	4.5	4.6	4.6	4.6
22.500	4.6	4.6	4.6	4.6	4.6
23.000	4.6	4.6	4.6	4.6	4.6
23.500	4.6	4.6	4.6	4.6	4.6
24.000	4.7	(N/A)	(N/A)	(N/A)	(N/A)

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

Time-Depth Curve: 50 YR	
Label	50 YR
Start Time	0.000 hours
Increment	0.100 hours
End Time	24.000 hours
Return Event	50 years

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
0.000	0.0	0.0	0.0	0.0	0.0
0.500	0.0	0.0	0.1	0.1	0.1
1.000	0.1	0.1	0.1	0.1	0.1
1.500	0.1	0.1	0.1	0.1	0.1
2.000	0.2	0.2	0.2	0.2	0.2
2.500	0.2	0.2	0.2	0.2	0.2
3.000	0.2	0.3	0.3	0.3	0.3
3.500	0.3	0.3	0.3	0.3	0.3
4.000	0.3	0.3	0.4	0.4	0.4
4.500	0.4	0.4	0.4	0.4	0.4
5.000	0.4	0.5	0.5	0.5	0.5
5.500	0.5	0.5	0.5	0.5	0.6
6.000	0.6	0.6	0.6	0.6	0.6
6.500	0.6	0.6	0.7	0.7	0.7
7.000	0.7	0.7	0.7	0.7	0.8
7.500	0.8	0.8	0.8	0.8	0.8
8.000	0.8	0.9	0.9	0.9	0.9
8.500	0.9	1.0	1.0	1.0	1.0
9.000	1.0	1.1	1.1	1.1	1.1
9.500	1.2	1.2	1.2	1.2	1.3
10.000	1.3	1.3	1.3	1.4	1.4
10.500	1.4	1.5	1.5	1.6	1.6
11.000	1.7	1.7	1.8	1.8	1.9
11.500	2.0	2.2	2.5	3.0	4.0
12.000	4.7	4.8	4.9	5.0	5.1
12.500	5.2	5.3	5.3	5.4	5.4
13.000	5.5	5.5	5.5	5.6	5.6
13.500	5.6	5.7	5.7	5.7	5.8
14.000	5.8	5.8	5.8	5.9	5.9
14.500	5.9	5.9	6.0	6.0	6.0
15.000	6.0	6.1	6.1	6.1	6.1
15.500	6.1	6.2	6.2	6.2	6.2
16.000	6.2	6.2	6.3	6.3	6.3
16.500	6.3	6.3	6.3	6.3	6.4

Study Point 4 Redesign - ARDOT

Subsection: Time-Depth Curve
Label: Time-Depth - 1
Scenario: Post-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

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

Time (hours)	Depth (in)	Depth (in)	Depth (in)	Depth (in)	Depth (in)
17.000	6.4	6.4	6.4	6.4	6.4
17.500	6.4	6.5	6.5	6.5	6.5
18.000	6.5	6.5	6.5	6.5	6.6
18.500	6.6	6.6	6.6	6.6	6.6
19.000	6.6	6.6	6.7	6.7	6.7
19.500	6.7	6.7	6.7	6.7	6.7
20.000	6.7	6.7	6.7	6.8	6.8
20.500	6.8	6.8	6.8	6.8	6.8
21.000	6.8	6.8	6.8	6.8	6.9
21.500	6.9	6.9	6.9	6.9	6.9
22.000	6.9	6.9	6.9	6.9	6.9
22.500	6.9	7.0	7.0	7.0	7.0
23.000	7.0	7.0	7.0	7.0	7.0
23.500	7.0	7.0	7.0	7.1	7.1
24.000	7.1	(N/A)	(N/A)	(N/A)	(N/A)

Study Point 4 Redesign - ARDOT

Subsection: Time of Concentration Calculations
Label: ONSITE 4
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	150.00 ft
Manning's n	0.240
Slope	0.005 ft/ft
2 Year 24 Hour Depth	3.9 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.517 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	610.00 ft
Is Paved?	False
Slope	0.008 ft/ft
Average Velocity	1.44 ft/s
Segment Time of Concentration	0.117 hours

Segment #3: TR-55 Channel Flow	
Flow Area	24.0 ft²
Hydraulic Length	925.00 ft
Manning's n	0.040
Slope	0.010 ft/ft
Wetted Perimeter	24.00 ft
Average Velocity	3.73 ft/s
Segment Time of Concentration	0.069 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.704 hours

Study Point 4 Redesign - ARDOT

Subsection: Time of Concentration Calculations
Label: ONSITE 4
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

==== SCS Channel Flow

Tc =	R = Qa / Wp
	V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n
	(Lf / V) / 3600
Where:	R= Hydraulic radius
	Aq= Flow area, square feet
	Wp= Wetted perimeter, feet
	V= Velocity, ft/sec
	Sf= Slope, ft/ft
	n= Manning's n
	Tc= Time of concentration, hours
	Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface:
	V = 16.1345 * (Sf**0.5)
	Paved Surface:
	V = 20.3282 * (Sf**0.5)
	(Lf / V) / 3600
Where:	V= Velocity, ft/sec
	Sf= Slope, ft/ft
	Tc= Time of concentration, hours
	Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =	(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
Where:	Tc= Time of concentration, hours
	n= Manning's n
	Lf= Flow length, feet
	P= 2yr, 24hr Rain depth, inches
	Sf= Slope, %

Study Point 4 Redesign - ARDOT

Subsection: Time of Concentration Calculations
Label: ONSITE 4
Scenario: Pre-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	150.00 ft
Manning's n	0.240
Slope	0.005 ft/ft
2 Year 24 Hour Depth	3.9 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.517 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	610.00 ft
Is Paved?	False
Slope	0.008 ft/ft
Average Velocity	1.44 ft/s
Segment Time of Concentration	0.117 hours

Segment #3: TR-55 Channel Flow	
Flow Area	24.0 ft²
Hydraulic Length	925.00 ft
Manning's n	0.040
Slope	0.010 ft/ft
Wetted Perimeter	24.00 ft
Average Velocity	3.73 ft/s
Segment Time of Concentration	0.069 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.704 hours

Study Point 4 Redesign - ARDOT

Subsection: Time of Concentration Calculations
Label: ONSITE 4
Scenario: Pre-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

==== SCS Channel Flow

Tc =	R = Qa / Wp V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n (Lf / V) / 3600
Where:	R= Hydraulic radius Aq= Flow area, square feet Wp= Wetted perimeter, feet V= Velocity, ft/sec Sf= Slope, ft/ft n= Manning's n Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =	Unpaved surface: V = 16.1345 * (Sf**0.5) Paved Surface: V = 20.3282 * (Sf**0.5) (Lf / V) / 3600
Where:	V= Velocity, ft/sec Sf= Slope, ft/ft Tc= Time of concentration, hours Lf= Flow length, feet

==== SCS TR-55 Sheet Flow

Tc =	(0.007 * ((n * Lf)**0.8)) / ((P**0.5) * (Sf**0.4))
Where:	Tc= Time of concentration, hours n= Manning's n Lf= Flow length, feet P= 2yr, 24hr Rain depth, inches Sf= Slope, %

Study Point 4 Redesign - ARDOT

Subsection: Runoff CN-Area
Label: ONSITE 4
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
OPEN SPACE	87.000	2.659	0.0	0.0	87.000
meadow	80.000	6.397	0.0	0.0	80.000
residential	87.000	1.780	0.0	0.0	87.000
roads	93.000	0.300	0.0	0.0	93.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	11.136	(N/A)	(N/A)	83.140

Study Point 4 Redesign - ARDOT

Subsection: Runoff CN-Area
Label: ONSITE 4
Scenario: Pre-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
roads	93.000	0.270	0.0	0.0	93.000
meadow	80.000	12.848	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	13.118	(N/A)	(N/A)	80.268

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Storm Event	1 YR
Return Event	1 years
Duration	24.000 hours
Depth	3.5 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	14.07 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	14.04 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.9 in
Runoff Volume (Pervious)	1.725 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.708 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Storm Event	1 YR
Return Event	1 years
Duration	24.000 hours
Depth	3.5 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	14.41 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	14.38 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	1.6 in
Runoff Volume (Pervious)	1.789 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	1.770 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

Storm Event	2 YR
Return Event	2 years
Duration	24.000 hours
Depth	3.9 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	16.84 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	16.80 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.2 in
Runoff Volume (Pervious)	2.057 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.038 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

Storm Event	2 YR
Return Event	2 years
Duration	24.000 hours
Depth	3.9 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	17.54 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	17.51 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.0 in
Runoff Volume (Pervious)	2.160 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.139 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Storm Event	5 YR
Return Event	5 years
Duration	24.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	21.76 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	21.71 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.9 in
Runoff Volume (Pervious)	2.653 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.630 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

Storm Event	5 YR
Return Event	5 years
Duration	24.000 hours
Depth	4.7 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	23.16 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	23.11 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	2.6 in
Runoff Volume (Pervious)	2.831 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	2.805 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

Storm Event	10 YR
Return Event	10 years
Duration	24.000 hours
Depth	5.3 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	26.28 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	26.21 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.5 in
Runoff Volume (Pervious)	3.207 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.180 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

Storm Event	10 YR
Return Event	10 years
Duration	24.000 hours
Depth	5.3 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	28.36 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	28.30 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	3.2 in
Runoff Volume (Pervious)	3.460 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.429 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

Storm Event	25 YR
Return Event	25 years
Duration	24.000 hours
Depth	6.3 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	32.91 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	32.82 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.3 in
Runoff Volume (Pervious)	4.030 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	3.997 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

Storm Event	25 YR
Return Event	25 years
Duration	24.000 hours
Depth	6.3 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	36.07 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	35.98 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.0 in
Runoff Volume (Pervious)	4.401 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.363 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

Storm Event	50 YR
Return Event	50 years
Duration	24.000 hours
Depth	7.1 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	38.46 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	38.35 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.1 in
Runoff Volume (Pervious)	4.727 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	4.690 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

Storm Event	50 YR
Return Event	50 years
Duration	24.000 hours
Depth	7.1 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	42.56 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	42.45 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	4.8 in
Runoff Volume (Pervious)	5.203 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	5.160 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

Storm Event	100 YR
Return Event	100 years
Duration	24.000 hours
Depth	7.9 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	11.136 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	44.29 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	44.16 ft³/s

Drainage Area	
SCS CN (Composite)	83.000
Area (User Defined)	11.136 acres
Maximum Retention (Pervious)	2.0 in
Maximum Retention (Pervious, 20 percent)	0.4 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.9 in
Runoff Volume (Pervious)	5.467 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	5.425 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Post-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	17.93 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

Storm Event	100 YR
Return Event	100 years
Duration	24.000 hours
Depth	7.9 in
Time of Concentration (Composite)	0.704 hours
Area (User Defined)	13.118 acres

Computational Time Increment	0.094 hours
Time to Peak (Computed)	12.295 hours
Flow (Peak, Computed)	49.41 ft³/s
Output Increment	0.050 hours
Time to Flow (Peak Interpolated Output)	12.300 hours
Flow (Peak Interpolated Output)	49.28 ft³/s

Drainage Area	
SCS CN (Composite)	80.000
Area (User Defined)	13.118 acres
Maximum Retention (Pervious)	2.5 in
Maximum Retention (Pervious, 20 percent)	0.5 in

Cumulative Runoff	
Cumulative Runoff Depth (Pervious)	5.5 in
Runoff Volume (Pervious)	6.057 ac-ft

Hydrograph Volume (Area under Hydrograph curve)	
Volume	6.008 ac-ft

SCS Unit Hydrograph Parameters	
Time of Concentration (Composite)	0.704 hours
Computational Time Increment	0.094 hours
Unit Hydrograph Shape Factor	483.432
K Factor	0.749
Receding/Rising, Tr/Tp	1.670

Study Point 4 Redesign - ARDOT

Subsection: Unit Hydrograph Summary
Label: ONSITE 4
Scenario: Pre-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

SCS Unit Hydrograph Parameters	
Unit peak, qp	21.12 ft³/s
Unit peak time, Tp	0.469 hours
Unit receding limb, Tr	1.877 hours
Total unit time, Tb	2.346 hours

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	1.708	12.300	14.04
Flow (In)	STUDY POINT 4	1.708	12.300	14.04

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 1 YR

Return Event: 1 years
Storm Event: 1 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	1.770	12.300	14.38
Flow (In)	STUDY POINT 4	1.770	12.300	14.38

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	2.038	12.300	16.80
Flow (In)	STUDY POINT 4	2.038	12.300	16.80

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 2 YR

Return Event: 2 years
Storm Event: 2 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	2.139	12.300	17.51
Flow (In)	STUDY POINT 4	2.139	12.300	17.51

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	2.630	12.300	21.71
Flow (In)	STUDY POINT 4	2.630	12.300	21.71

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 5 YR

Return Event: 5 years
Storm Event: 5 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	2.805	12.300	23.11
Flow (In)	STUDY POINT 4	2.805	12.300	23.11

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	3.180	12.300	26.21
Flow (In)	STUDY POINT 4	3.180	12.300	26.21

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 10 YR

Return Event: 10 years
Storm Event: 10 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	3.429	12.300	28.30
Flow (In)	STUDY POINT 4	3.429	12.300	28.30

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	3.997	12.300	32.82
Flow (In)	STUDY POINT 4	3.997	12.300	32.82

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 25 YR

Return Event: 25 years
Storm Event: 25 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	4.363	12.300	35.98
Flow (In)	STUDY POINT 4	4.363	12.300	35.98

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	4.690	12.300	38.35
Flow (In)	STUDY POINT 4	4.690	12.300	38.35

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 50 YR

Return Event: 50 years
Storm Event: 50 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	5.160	12.300	42.45
Flow (In)	STUDY POINT 4	5.160	12.300	42.45

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Post-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	5.425	12.300	44.16
Flow (In)	STUDY POINT 4	5.425	12.300	44.16

Study Point 4 Redesign - ARDOT

Subsection: Addition Summary
Label: STUDY POINT 4
Scenario: Pre-Development 100 YR

Return Event: 100 years
Storm Event: 100 YR

Summary for Hydrograph Addition at 'STUDY POINT 4'

Upstream Link	Upstream Node
<Catchment to Outflow Node>	ONSITE 4

Node Inflows

Inflow Type	Element	Volume (ac-ft)	Time to Peak (hours)	Flow (Peak) (ft^3/s)
Flow (From)	ONSITE 4	6.008	12.300	49.28
Flow (In)	STUDY POINT 4	6.008	12.300	49.28

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