

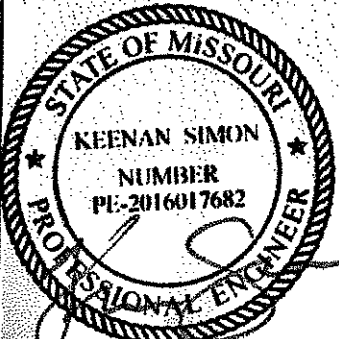

# STORMWATER REPORT

## City of Lee's Summit

### Jackson County, Missouri

### Summit Innovation Campus NorthPoint Development

September 2016

	<p>I hereby certify 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 Missouri.</p>
	<p> Keenan Simon, P.E. License No. MO-PE 2016017682 My renewal date is December 31, 2016</p>

Date: 9/14/16

9/14/16

PREPARED BY



**THHinc M<sup>C</sup>CLURE™**  
ENGINEERING CP

## **Introduction**

This report details stormwater impacts of the development of Lot 3 of Summit Orchard 1<sup>st</sup> Plat located in Lee's Summit, Missouri.

## **Project Description**

Summit Technology Campus is located southeast of the Interstate-470/State Highway 50 interchange. The entire development covers approximately 367 acres, and is bordered to the south by Chipman Road, to the north by I-470, to the west by Blue Parkway, and to the east by the Union Pacific Railroad. Lot 3 of the Summit Innovation Center is located on the North corner of NW Ward Rd. and NW Innovation Pkwy.

Mr. Mark Pomerence proposes to develop Lot 3 of Summit Orchard 1<sup>st</sup> Plat with a multi-family development referred to as NorthPoint Development. This report explores the impact of this development on stormwater runoff in the surrounding areas.

## **Existing System**

The existing site primarily drains to the southern portion of the property. The runoff is then collected in a drainage swale north of Chipman Rd and piped to the east side of the gravel KCPL access road. East of the gravel access road, the stormwater is discharged into a gravel swale that drains to north and east under the railroad line to the regional detention basin constructed in 2008.

A Stormwater Master Plan and model was prepared for the Summit Technology Campus development in 2007 and approved by the City. The Master plan established a regional detention facility on Tract C at the northeast corner of the development. The improvements were constructed in 2008 and the facility has been in operation since that time.

## **Proposed Improvements:**

The proposed development of NorthPoint site is 62% impervious which is within the parameters of the original study. We do not propose a revision to the original hydraulic study for the regional detention basin.

The proposed development of Lot 3 of Summit Orchard 1<sup>st</sup> Plat includes a multi-family development consisting of six housing buildings, a club/pool house, and parking as determined by the City of Lee's Summit Code of Ordinances. The development will add approximately 368,803 square feet (8.47 acres) of impervious surfaces. With Lot 3 totaling 598,606 square feet (13.7 acres), this is approximately 62% impervious.

Additional stormwater provisions have been added at three discharge points on the east side of the KCPL gravel access road. To dissipate flows, each discharge

point contains a rock stilling basin with a 12-inch discharge pipe. This facility will act as a small detention basin for small rain events.

**Drainage Areas and Proposed Pipe Sizes:**

The proposed site stormwater drainage areas can be found on Sheet C003 – Drainage Area.

The drainage area table which tabulates the “C” for the drainage areas is included in this report.

The stormsewer pipe sizing is based off the rational method and has been sized to convey a 100 year storm event. Also included in the calculations are the 1 year and 25 year storm events.

# 1 Year Design Storm

## Drainage Area and Pipe Design

PROJECT NorthPoint  
 STORM RECURRENCE INTERVAL 1 Year Design Storm

COMPUTED BY \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE June 28th, 2016

INLET NUMBER	DRAIN AREA	DRAIN AREA SIZE (acre) A	RUNOFF COEFF. C	EQUIV. AREA C x A	ACC. EQUIV. AREA	TIME OF CONC. Tc	RAINFALL L (in/hr)	TOTAL RUNOFF (cfs) Q	LENGTH OF SEW. (ft)	SEW. SIZE (in)	SLOPE REQ'D (ft/ft)	SLOPE PROV. (ft/ft)	VELOC. FULL (ft/s)	CAPC. FULL (cfs)	FLOW TIME (min)	TOTAL TIME (min)	PIPE TYPE	ROUGH. COEFF. N
Exist A2	DA3	0.32	0.70	0.23	0.23	5	4.48	1.01	119	24	0.0000	0.025	13.46	42.27	0.1	5	HDPE	0.011
Exist A3	DA1	0.67	0.91	0.61	0.61	5	4.48	2.75	158	30	0.0000	0.00131	3.57	17.54	0.7	6	HDPE	0.011

**Total Flow for Line A at Structure A3 3.76**

Exist A4	DA2	0.53	0.93	0.49	0.49	5	4.48	2.22	71	30	0.0000	0.02	13.97	68.55	0.1	5	HDPE	0.011
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**Total Flow for Line A at Structure A4 5.98**

DD1	DA9	0.48	0.90	0.43	0.43	5	4.48	1.94	125	15	0.0006	0.0146	7.52	9.22	0.3	5	HDPE	0.011
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**Total Flow for Line DD at Structure B4 1.94**

EE3	DA22	0.56	0.74	0.42	0.42	5	4.48	1.87	72	18	0.0002	0.01	7.02	12.41	0.2	5	HDPE	0.011
EE2	DA17	0.17	0.80	0.13	0.13	5	4.48	0.59	36	18	0.0000	0.0099	6.99	12.35	0.1	5	HDPE	0.011
Total Q Storm Line EE								2.46										
EE1	DA32	0.14	0.80	0.11	0.11	5	4.48	0.50	30	18	0.0000	0.0102	7.09	12.54	0.1	5	HDPE	0.011
Total Q Storm Line EE								2.96										

**Total Flow for Line EE at Structure B4 2.96**

Exist B4	DA33	0.21	0.68	0.14	0.14	5	4.48	0.63	141	30	0.0000	0.0473	21.48	105.42	0.1	5	HDPE	0.011
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**Total Flow at Structure B4 from DA 32 0.63**

**Total Flow at Structure B4 from Line DD, Line EE, and DA 32 5.54**

AA5	DA4	0.05	0.50	0.02	0.02	5	4.48	0.10	61	12	0.0000	0.02	7.58	5.95	0.1	5	HDPE	0.011
AA4	DA5	0.04	0.36	0.01	0.01	5	4.48	0.06	48	12	0.0000	0.01	5.36	4.21	0.1	5	HDPE	0.011
Total Q Storm Line AA								0.16										
AA3	DA6	0.36	0.58	0.21	0.21	5	4.48	0.93	92	18	0.0001	0.005	4.97	8.78	0.3	5	HDPE	0.011
Total Q Storm Line AA								1.09										
AA2	DA10	0.30	0.61	0.18	0.18	5	4.48	0.82	42	21	0.0000	0.005	5.50	13.24	0.1	5	HDPE	0.011
Total Q Storm Line AA								1.91										
AA1	DA13	0.24	0.60	0.15	0.15	5	4.48	0.65	47	21	0.0000	0.0052	5.61	13.50	0.1	5	HDPE	0.011
Total Q Storm Line AA								2.57										

**Total Flow for Line AA at Structure B5 2.57**

**Total Flow at Structure B5 from B4 and Line AA 8.11**

FF1	DA16	0.22	0.17	0.04	0.04	5	4.48	0.17	28	15	0.0000	0.0227	9.37	11.50	0.0	5	HDPE	0.011
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**Total Flow for Line FF at Structure B7 0.17**

Exist B7	DA15	0.20	0.78	0.16	0.16	5	4.48	0.71			#DIV/0!					5		0.011
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**Total Flow at Structure B7 from DA 15 0.71**

**Total Flow at Structure B7 from B5, Line FF, and DA 15 0.88**

CC3	DA11	0.47	0.95	0.45	0.45	5	4.48	2.01	92	18	0.0003	0.0109	7.33	12.96	0.2	5	HDPE	0.011
CC2	DA14	0.05	0.95	0.05	0.05	5	4.48	0.23	19	18	0.0000	0.0056	5.26	9.29	0.1	5	HDPE	0.011
Total Q Storm Line CC								2.24										

**Total Flow for Line CC at Structure B6 2.24**

II7	DA18	0.17	0.80	0.13	0.13	5	4.48	0.59	84	12	0.0002	0.01	5.36	4.21	0.3	5	HDPE	0.011
GG1	DA19	0.20	0.68	0.13	0.13	5	4.48	0.60	38	15	0.0001	0.005	4.40	5.40	0.1	5	HDPE	0.011
Total Q Storm Line II								1.19										
II6	DA23	0.28	0.85	0.24	0.24	5	4.48	1.07	100	18	0.0001	0.0062	5.53	9.77	0.3	5	HDPE	0.011
Total Q Storm Line II								2.27										
HH2	DA26	0.33	0.95	0.31	0.31	5	4.48	1.40	77	15	0.0003	0.0195	8.69	10.66	0.1	5	HDPE	0.011
HH1	DA34	0.20	0.95	0.19	0.19	5	4.48	0.87	51	15	0.0001	0.1659	25.34	31.09	0.0	5	HDPE	0.011
Total Q Storm Line HH								2.27										
Total Q Storm Line II & HH								3.13										

INLET NUMBER	DRAIN AREA	DRAIN AREA SIZE (acre) A	RUNOFF COEFF. C	EQUIV. AREA Cx A	ACC. EQUIV. AREA	TIME OF CONC. Tc	RAINFALL L (in/hr)	TOTAL RUNOFF (cfs) Q	LENGTH OF SEW. (ft)	SEW. SIZE (in)	SLOPE REQ'D (ft/ft)	SLOPE PROV. (ft/ft)	VELOC. FULL (ft/s)	CAPC. FULL (cfs)	FLOW TIME (min)	TOTAL TIME (min)	PIPE TYPE	ROUGH. COEFF. N	
II5	DA27	0.18	0.73	0.13	0.13	5	4.48	0.60	75	24	0.0000	0.005	6.02	18.90	0.2	5	HDPE	0.011	
								Total Q Storm Line II & HH											3.74
II4	DA28	0.55	0.72	0.40	0.40	5	4.48	1.78	73	30	0.0000	0.0052	7.12	34.96	0.2	5	HDPE	0.011	
								Total Q Storm Line II & HH											5.51
II3	DA29	0.10	0.36	0.04	0.04	5	4.48	0.17	79	30	0.0000	0.0051	7.05	34.62	0.2	5	HDPE	0.011	
								Total Q Storm Line II & HH											5.68
II2	DA24	0.14	0.95	0.13	0.13	5	4.48	0.58	153	30	0.0000	0.0056	7.39	36.27	0.3	5	HDPE	0.011	
								Total Q Storm Line II & HH											6.26
II1	DA20	0.22	0.95	0.21	0.21	5	4.48	0.93	58	30	0.0000	0.0038	6.09	29.88	0.2	5	HDPE	0.011	
								Total Q Storm Line II & HH											7.18

Total Flow for Line GG, Line HH, and Line II at Structure B6 7.18

Total Flow at Structure B6 from B7, Line CC, and Line II 9.42

JJ2	DA31	0.60	0.92	0.55	0.55	5	4.48	2.48	105	18	0.0004	0.01	7.02	12.41	0.2	5	HDPE	0.011	
								Total Q Storm Line II											2.48
JJ1	DA30	0.78	0.78	0.61	0.61	5	4.48	2.74	113	21	0.0002	0.01	7.79	18.73	0.2	5	HDPE	0.011	
								Total Q Storm Line II											5.22

Total Flow for Line JJ at Structure C3 5.22

KK1	DA35	0.10	0.30	0.03	0.03	5	4.48	0.13	32	12	0.0000	0.019	7.39	5.80	0.1	5	HDPE	0.011
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Total Flow for Line KK at Structure D2 0.13

	DA25	0.24	0.78	0.19	0.19	5	4.48	0.86								5		
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Total Flow to Curb Cut from DA25 0.86

	DA21	0.22	0.88	0.19	0.19	5	4.48	0.86								5		
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Total Flow to Curb Cut from DA21 0.86

BB1	DA7	0.09	0.37	0.03	0.03	5	4.48	0.15	183	12	0.0000	0.0074	4.61	3.62	0.7	5	HDPE	0.011
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Total Flow to Curb Cut from DA7 0.15

	DA 8	0.33	0.92	0.31	0.31	5	4.48	1.38								5		
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Total Flow to Curb Cut from DA8 1.38

	DA 12	0.22	0.88	0.19	0.19	5	4.48	0.87								5		
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Total Flow to Curb Cut from DA12 0.87

# 25 Year Design Storm

## Drainage Area and Pipe Design

PROJECT NorthPoint  
 STORM RECURRENCE INTERVAL 25 Year Design Storm

COMPUTED BY CHECKED BY DATE June 28th, 2016

INLET NUMBER	DRAIN AREA	DRAIN AREA SIZE (acre) A	RUNOFF COEFF. C	EQUIV. AREA C x A	ACC. EQUIV. AREA	TIME OF CONC. Tc	RAINFAL L (in/hr)	TOTAL RUNOFF F (cfs)	LENGTH OF SEW. (ft)	SEW. SIZE (in)	SLOPE REQ'D (ft/ft)	SLOPE PROV. (ft/ft)	VELOC. FULL (ft/s)	CAPC. FULL (cfs)	FLOW TIME (min)	TOTAL TIME (min)	PIPE TYPE	ROUGH COEFF.
Exist A2	DA3	0.32	0.70	0.23	0.23	5	8.46	1.92	119	24	0.0001	0.025	13.46	42.27	0.1	5	HDPE	0.011
Exist A3	DA1	0.67	0.91	0.61	0.61	5	8.46	5.19	158	30	0.0001	0.00131	3.57	17.54	0.7	6	HDPE	0.011
<b>Total Flow for Line A at Structure A3</b>								<b>7.10</b>										
Exist A4	DA2	0.53	0.93	0.49	0.49	5	8.46	4.18	71	30	0.0001	0.02	13.97	68.55	0.1	5	HDPE	0.011
<b>Total Flow for Line A at Structure A4</b>								<b>11.29</b>										
DD1	DA9	0.48	0.90	0.43	0.43	5	8.46	3.66	125	15	0.0023	0.0146	7.52	9.22	0.3	5	HDPE	0.011
<b>Total Flow for Line DD at Structure B4</b>								<b>3.66</b>										
EE3	DA22	0.56	0.74	0.42	0.42	5	8.46	3.53	72	18	0.0008	0.01	7.02	12.41	0.2	5	HDPE	0.011
EE2	DA17	0.17	0.80	0.13	0.13	5	8.46	1.12	36	18	0.0001	0.0099	6.99	12.35	0.1	5	HDPE	0.011
<b>Total Q Storm Line EE</b>								<b>4.65</b>										
EE1	DA32	0.14	0.80	0.11	0.11	5	8.46	0.95	30	18	0.0001	0.0102	7.09	12.54	0.1	5	HDPE	0.011
<b>Total Q Storm Line EE</b>								<b>5.60</b>										
<b>Total Flow for Line EE at Structure B4</b>								<b>5.60</b>										
Exist B4	DA33	0.21	0.68	0.14	0.14	5	8.46	1.20	141	30	0.0000	0.0473	21.48	105.42	0.1	5	HDPE	0.011
<b>Total Flow at Structure B4 from DA 32</b>								<b>1.20</b>										
<b>Total Flow at Structure B4 from Line DD, Line EE, and DA 32</b>								<b>10.46</b>										
AA5	DA4	0.05	0.50	0.02	0.02	5	8.46	0.19	61	12	0.0000	0.02	7.58	5.95	0.1	5	HDPE	0.011
AA4	DA5	0.04	0.36	0.01	0.01	5	8.46	0.12	48	12	0.0000	0.01	5.36	4.21	0.1	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>0.31</b>										
AA3	DA6	0.36	0.58	0.21	0.21	5	8.46	1.75	92	18	0.0002	0.005	4.97	8.78	0.3	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>2.06</b>										
AA2	DA10	0.30	0.61	0.18	0.18	5	8.46	1.55	42	21	0.0001	0.005	5.50	13.24	0.1	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>3.62</b>										
AA1	DA13	0.24	0.60	0.15	0.15	5	8.46	1.23	47	21	0.0000	0.0052	5.61	13.50	0.1	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>4.85</b>										
<b>Total Flow for Line AA at Structure B5</b>								<b>4.85</b>										
<b>Total Flow at Structure B5 from B4 and Line AA</b>								<b>15.31</b>										
FF1	DA16	0.22	0.17	0.04	0.04	5	8.46	0.32	28	15	0.0000	0.0227	9.37	11.50	0.0	5	HDPE	0.011
<b>Total Flow for Line FF at Structure B7</b>								<b>0.32</b>										
Exist B7	DA15	0.20	0.78	0.16	0.16	5	8.46	1.34			#DIV/0!					5		0.011
<b>Total Flow at Structure B7 from DA 15</b>								<b>1.34</b>										
<b>Total Flow at Structure B7 from B5, Line FF, and DA 15</b>								<b>1.65</b>										
CC3	DA11	0.47	0.95	0.45	0.45	5	8.46	3.80	92	18	0.0009	0.0109	7.33	12.96	0.2	5	HDPE	0.011
CC2	DA14	0.05	0.95	0.05	0.05	5	8.46	0.43	19	18	0.0000	0.0056	5.26	9.29	0.1	5	HDPE	0.011
<b>Total Q Storm Line CC</b>								<b>4.22</b>										
<b>Total Flow for Line CC at Structure B6</b>								<b>4.22</b>										
II7	DA18	0.17	0.80	0.13	0.13	5	8.46	1.12	84	12	0.0007	0.01	5.36	4.21	0.3	5	HDPE	0.011
GG1	DA19	0.20	0.68	0.13	0.13	5	8.46	1.13	38	15	0.0002	0.005	4.40	5.40	0.1	5	HDPE	0.011
<b>Total Q Storm Line II</b>								<b>2.25</b>										
II6	DA23	0.28	0.85	0.24	0.24	5	8.46	2.03	100	18	0.0003	0.0062	5.53	9.77	0.3	5	HDPE	0.011
<b>Total Q Storm Line II</b>								<b>4.28</b>										
HH2	DA26	0.33	0.95	0.31	0.31	5	8.46	2.65	77	15	0.0012	0.0195	8.69	10.66	0.1	5	HDPE	0.011
HH22	DA34	0.20	0.95	0.19	0.19	5	8.46	1.63	51	15	0.0005	0.1659	25.34	31.09	0.0	5	HDPE	0.011
<b>Total Q Storm Line HH</b>								<b>4.28</b>										
<b>Total Q Storm Line II &amp; HH</b>								<b>5.92</b>										
II5	DA27	0.18	0.73	0.13	0.13	5	8.46	1.14	75	24	0.0000	0.005	6.02	18.90	0.2	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>7.06</b>										
II4	DA28	0.55	0.72	0.40	0.40	5	8.46	3.35	73	30	0.0000	0.0052	7.12	34.96	0.2	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>10.41</b>										
II3	DA29	0.10	0.36	0.04	0.04	5	8.46	0.31	79	30	0.0000	0.0051	7.05	34.62	0.2	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>10.72</b>										
II2	DA24	0.14	0.95	0.13	0.13	5	8.46	1.09	153	30	0.0000	0.0056	7.39	36.27	0.3	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>11.81</b>										

# 100 Year Design Storm Calcs

## Drainage Area and Pipe Design

PROJECT NorthPoint  
 STORM RECURRENCE INTERVAL 100 Year Design Sto

COMPUTED BY \_\_\_\_\_ CHECKED BY \_\_\_\_\_ DATE June 28th, 2016

INLET NUMBER	DRAIN AREA	DRAIN AREA SIZE (acre) A	RUNOFF COEFF. C	EQUIV. AREA C x A	ACC. EQUIV. AREA	TIME OF CONC. Tc	RAINFALL L (In/hr)	TOTAL RUNOFF F (cfs)	LENGTH OF SEW. (ft)	SEW. SIZE (in)	SLOPE REQ'D (ft/ft)	SLOPE PROG. (ft/ft)	VELOC. FULL (ft/s)	CAPC. FULL (cfs)	FLOW TIME (min)	TOTAL TIME (min)	PIPE TYPE	ROUGH COEFF.
Exist A2	DA3	0.32	0.70	0.23	0.23	5	10.18	2.30	119	24	0.0001	0.025	13.46	42.27	0.1	5	HDPE	0.011
Exist A3	DA1	0.67	0.91	0.61	0.61	5	10.18	6.24	158	30	0.0002	0.00131	3.57	17.54	0.7	6	HDPE	0.011
<b>Total Flow for Line A at Structure A3</b>								<b>8.55</b>										
Exist A4	DA2	0.53	0.93	0.49	0.49	5	10.18	5.04	71	30	0.0001	0.02	13.97	68.55	0.1	5	HDPE	0.011
<b>Total Flow for Line A at Structure A4</b>								<b>13.58</b>										
DD1	DA9	0.48	0.90	0.43	0.43	5	10.18	4.41	125	15	0.0033	0.0146	7.52	9.22	0.3	5	HDPE	0.011
<b>Total Flow for Line DD at Structure B4</b>								<b>4.41</b>										
EE3	DA22	0.56	0.74	0.42	0.42	5	10.18	4.24	72	18	0.0012	0.01	7.02	12.41	0.2	5	HDPE	0.011
EE2	DA17	0.17	0.80	0.13	0.13	5	10.18	1.35	36	18	0.0001	0.0099	6.99	12.35	0.1	5	HDPE	0.011
<b>Total Q Storm Line EE</b>								<b>5.59</b>										
EE1	DA32	0.14	0.80	0.11	0.11	5	10.18	1.14	30	18	0.0001	0.0102	7.09	12.54	0.1	5	HDPE	0.011
<b>Total Q Storm Line EE</b>								<b>6.74</b>										
<b>Total Flow for Line EE at Structure B4</b>								<b>6.74</b>										
Exist B4	DA33	0.21	0.68	0.14	0.14	5	10.18	1.44	141	30	0.0000	0.0473	21.48	105.42	0.1	5	HDPE	0.011
<b>Total Flow at Structure B4 from DA 32</b>								<b>1.44</b>										
<b>Total Flow at Structure B4 from Line DD, Line EE, and DA 32</b>								<b>12.59</b>										
AA5	DA4	0.05	0.50	0.02	0.02	5	10.18	0.23	61	12	0.0000	0.02	7.58	5.95	0.1	5	HDPE	0.011
AA4	DA5	0.04	0.36	0.01	0.01	5	10.18	0.15	48	12	0.0000	0.01	5.36	4.21	0.1	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>0.37</b>										
AA3	DA6	0.36	0.58	0.21	0.21	5	10.18	2.11	92	18	0.0003	0.005	4.97	8.78	0.3	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>2.48</b>										
AA2	DA10	0.30	0.61	0.18	0.18	5	10.18	1.87	42	21	0.0001	0.005	5.50	13.24	0.1	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>4.35</b>										
AA1	DA13	0.24	0.60	0.15	0.15	5	10.18	1.48	47	21	0.0001	0.0052	5.61	13.50	0.1	5	HDPE	0.011
<b>Total Q Storm Line AA</b>								<b>5.83</b>										
<b>Total Flow for Line AA at Structure B5</b>								<b>5.83</b>										
<b>Total Flow at Structure B5 from B4 and Line AA</b>								<b>18.42</b>										
FF1	DA16	0.22	0.17	0.04	0.04	5	10.18	0.38	28	15	0.0000	0.0227	9.37	11.50	0.0	5	HDPE	0.011
<b>Total Flow for Line FF at Structure B7</b>								<b>0.38</b>										
Exist B7	DA15	0.20	0.78	0.16	0.16	5	10.18	1.61			#DIV/0!					5		0.011
<b>Total Flow at Structure B7 from DA 15</b>								<b>1.61</b>										
<b>Total Flow at Structure B7 from B5, Line FF, and DA 15</b>								<b>1.99</b>										
CC3	DA11	0.47	0.95	0.45	0.45	5	10.18	4.57	92	18	0.0014	0.0109	7.33	12.96	0.2	5	HDPE	0.011
CC2	DA14	0.05	0.95	0.05	0.05	5	10.18	0.52	19	18	0.0000	0.0056	5.26	9.29	0.1	5	HDPE	0.011
<b>Total Q Storm Line CC</b>								<b>5.08</b>										
<b>Total Flow for Line CC at Structure B6</b>								<b>5.08</b>										
II7	DA18	0.17	0.80	0.13	0.13	5	10.18	1.35	84	12	0.0010	0.01	5.36	4.21	0.3	5	HDPE	0.011
GG1	DA19	0.20	0.68	0.13	0.13	5	10.18	1.36	38	15	0.0003	0.005	4.40	5.40	0.1	5	HDPE	0.011
<b>Total Q Storm Line II</b>								<b>2.71</b>										
II6	DA23	0.28	0.85	0.24	0.24	5	10.18	2.44	100	18	0.0004	0.0052	5.53	9.77	0.3	5	HDPE	0.011
<b>Total Q Storm Line II</b>								<b>5.15</b>										
HH2	DA26	0.33	0.95	0.31	0.31	5	10.18	3.19	77	15	0.0017	0.0195	8.69	10.66	0.1	5	HDPE	0.011
HH22	DA34	0.20	0.95	0.19	0.19	5	10.18	1.97	51	15	0.0007	0.1659	25.34	31.09	0.0	5	HDPE	0.011
<b>Total Q Storm Line HH</b>								<b>5.16</b>										
<b>Total Q Storm Line II &amp; HH</b>								<b>7.12</b>										
II5	DA27	0.18	0.73	0.13	0.13	5	10.18	1.37	75	24	0.0000	0.005	6.02	18.90	0.2	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>8.49</b>										
II4	DA28	0.55	0.72	0.40	0.40	5	10.18	4.04	73	30	0.0001	0.0052	7.12	34.96	0.2	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>12.53</b>										
II3	DA29	0.10	0.36	0.04	0.04	5	10.18	0.38	79	30	0.0000	0.0051	7.05	34.62	0.2	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>12.90</b>										
II2	DA24	0.14	0.95	0.13	0.13	5	10.18	1.31	153	30	0.0000	0.0056	7.39	36.27	0.3	5	HDPE	0.011
<b>Total Q Storm Line II &amp; HH</b>								<b>14.21</b>										

# Drainage Area Calculations

		CN	Total Sq.		Average CN	Total Acres of Section
			Ft. of section			
DA 1			29344		0.910	0.6736
	Grass	0.3	1785	535.5		
	Pvt/sw	0.95	27559	26181.05		
DA 2			23132		0.932	0.5310
	Grass	0.3	658	197.4		
	Pvt/sw	0.95	22474	21350.3		
DA 3			14033		0.703	0.3222
	Grass	0.3	5339	1601.7		
	Pvt/sw	0.95	8694	8259.3		
DA 4			1971		0.498	0.0452
	Grass	0.3	1371	411.3		
	Pvt/sw	0.95	600	570		
DA 5			1714		0.363	0.039
	Grass	0.3	1547	464.1		
	Pvt/sw	0.95	167	158.65		
DA 6			15515		0.582	0.356
	Grass	0.3	8788	2636.4		
	Pvt/sw	0.95	6727	6390.65		
DA 7			3988		0.373	0.092
	Grass	0.3	3541	1062.3		
	Pvt/sw	0.95	447	424.65		
DA 8			14568		0.922	0.334
	Grass	0.3	629	188.7		
	Pvt/sw	0.95	13939	13242.05		
DA 9			20913		0.902	0.480
	Grass	0.3	1537	461.1		
	Pvt/sw	0.95	19376	18407.2		
DA 10			13183		0.606	0.303
	Grass	0.3	6986	2095.8		
	Pvt/sw	0.95	6197	5887.15		
DA 11			20604		0.948	0.473
	Grass	0.3	50	15		
	Pvt/sw	0.95	20554	19526.3		
DA 12			9615		0.882	0.221
	Grass	0.3	1002	300.6		
	Pvt/sw	0.95	8613	8182.35		
DA 13			10576		0.599	0.243
	Grass	0.3	5703	1710.9		
	Pvt/sw	0.95	4873	4629.35		
DA 14			2321		0.950	0.053
	Grass	0.3	0	0		



## Drainage Area Calculations

DA 15	Pvt/sw	0.95	2321	2204.95		
			8792		0.784	0.202
DA 16	Grass	0.3	2251	675.3		
	Pvt/sw	0.95	6541	6213.95		
DA 17			9645		0.169	0.221
	Grass	0.3	1159	347.7		
DA 18	Pvt/sw	0.95	1348	1280.6		
			3673		0.904	0.084
DA 19	Grass	0.3	260	78		
	Pvt/sw	0.95	3413	3242.35		
DA 20			7241		0.797	0.166
	Grass	0.3	1703	510.9		
DA 21	Pvt/sw	0.95	5538	5261.1		
			8576		0.678	0.197
DA 22	Grass	0.3	3591	1077.3		
	Pvt/sw	0.95	4985	4735.75		
DA 23			9508		0.950	0.218
	Grass	0.3	0	0		
DA 24	Pvt/sw	0.95	9508	9032.6		
			9439		0.881	0.217
DA 25	Grass	0.3	999	299.7		
	Pvt/sw	0.95	8440	8018		
DA 26			24403		0.744	0.560
	Grass	0.3	7722	2316.6		
DA 27	Pvt/sw	0.95	16681	15846.95		
			12236		0.853	0.281
DA 28	Grass	0.3	1820	546		
	Pvt/sw	0.95	10416	9895.2		
DA 29			5906		0.950	0.136
	Grass	0.3	0	0		
DA 30	Pvt/sw	0.95	5906	5610.7		
			10655		0.785	0.245
DA 31	Grass	0.3	2709	812.7		
	Pvt/sw	0.95	7946	7548.7		
DA 32			14361		0.950	0.330
	Grass	0.3	0	0		
DA 33	Pvt/sw	0.95	14361	13642.95		
			8056		0.727	0.185
DA 34	Grass	0.3	2768	830.4		
	Pvt/sw	0.95	5288	5023.6		
DA 35			23841		0.724	0.547
	Grass	0.3	8275	2482.5		
DA 36	Pvt/sw	0.95	15566	14787.7		
			4523		0.357	0.104

## Drainage Area Calculations

DA 30	Grass	0.3	4128	1238.4		
	Pvt/sw	0.95	395	375.25		
			34110		0.780	0.783
DA 31	Grass	0.3	8898	2669.4		
	Pvt/sw	0.95	25212	23951.4		
			26194		0.922	0.601
DA 32	Grass	0.3	1134	340.2		
	Pvt/sw	0.95	25060	23807		
			6108		0.801	0.140
DA 33	Grass	0.3	1400	420		
	Pvt/sw	0.95	4708	4472.6		
			9062		0.681	0.208
DA 34	Grass	0.3	3750	1125		
	Pvt/sw	0.95	5312	5046.4		
			8860		0.950	0.203
DA 35	Grass	0.3	0	0		
	Pvt/sw	0.95	8860	8417		
			4321		0.300	0.099
	Grass	0.3	4321	1296.3		
	Pvt/sw	0.95	0	0		