MAPPING AND ANALYSIS OF THE SHANDON-ROSEWOOD WATERSHED AND ASSOCIATED STORM DRAINAGE COLLECTION SYSTEM NETWORK

Prepared for:

The City of Columbia, South Carolina

May 2011

COX AND DINKINS
ENGINEERS · SURVEYORS

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PREFACE

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MAY 23, 2011

PREFACE

As delineated, the Shandon-Rosewood watershed encompasses 750± acres. The upstream limit of the 750± acre Shandon-Rosewood watershed is in the vicinity of Gladden Road and Hagood Road, just south of Trenholm Road. The downstream limit of the 750± acre Shandon-Rosewood watershed is in the vicinity of the Live Oak Street and South Ott Road intersection. The eastern limits of the Shandon-Rosewood watershed are along Monroe Street near the intersection of Prospect Street and along Live Oak Street near the intersection of South Kilbourne Road. The western limit of the Shandon-Rosewood watershed is near the intersection of Duncan Street and Princess Street.

In the vicinity of the upstream watershed limit the ground elevation is approximately 354 (NAVD88). In the vicinity of the downstream watershed limit the ground elevation is approximately 190 (NAVD88). There, the piped drainage discharges into open channels.

SURVEYING AND MAPPING

Cox and Dinkins, Inc. has completed a survey of visible and accessible storm drainage structures (nodes) and pipes (links) within the 750± acre Shandon-Rosewood watershed. That survey began with establishing horizontal and vertical control points throughout the 750± acre Shandon-Rosewood watershed using survey grade GPS technology combined with conventional surveying techniques. Working on the South Carolina State Plane Coordinate System (SCSPCS; Horizontal NAD 83/2007; Vertical NAVD 88), Cox and Dinkins, Inc. proceeded to field locate and to determine the type of structure, approximate size and distinguishing features of all visible and accessible storm drainage structures (nodes). The survey also determined rim or top of structure (node) elevations along with pipe inverts and diameters or applicable geometry of visible and accessible pipes (links). Field survey data was then processed and compiled into a detailed project map. The project map includes approximate lengths of pipes (links), their diameters or applicable geometries, notes regarding apparent condition and apparent flow direction, and their location relative to approximate street centerlines.

DRAINAGE MODELING APPROACH

The storm drainage collection system as surveyed and mapped within the 750± acre Shandon-Rosewood watershed is in excess of 1,000 nodes (drainage structures) and in excess of 1,000 links (conduits). Due to physical characteristics of the drainage collection system, the 750± acre Shandon-Rosewood watershed has been divided into two primary sub-watersheds, namely the **east branch watershed** and the **west branch watershed**. The **east branch watershed** and the **west branch watershed** initially discharge into two independent open channels and those open channels converge into one open channel near the downstream limits of the study area. That configuration allows the described subdivision of the Shandon-Rosewood watershed into the **east branch watershed** and the **west branch watershed**. The described subdivision of the Shandon-Rosewood watershed into the **east branch watershed** and the **west branch watershed** also fits modeling constraints of the drainage software since it allows the creation of two independent watersheds, each with nodes (structures) and links (conduits) numbering less than 1,000. The **east branch watershed** contains 400± acres and the storm drainage collection system within the **east branch watershed** contains 700+ nodes (drainage structures) and 700+ links (conduits). The **west branch watershed** contains 350± acres and the storm drainage collection system within the **west branch watershed** contains 500+ nodes (drainage structures) and 500+ links (conduits).

DRAINAGE SOFTWARE AND MODEL PARAMETERS

XPSWMM 2009 (service Pack 3) was selected to conduct the study of the Shandon-Rosewood storm drainage network. The **XPSWMM** software purchased for use on this project has the capability of analyzing systems containing up to 1,000 nodes, each node representing either a drainage structure such as a catch basin or a point of significance along a conveyance such as a ditch. As described previously, the Shandon-Rosewood watershed has more than 1,000 such nodes and the 750± acre Shandon-Rosewood watershed has been divided into the **east branch watershed** and the **west branch watershed**.

Independent **XPSWMM** models have been developed for the **east branch watershed** and the **west branch watershed.** Runoff has been routed through the two separate models using the SCS Hydrology Routing Method. The rainfall events selected for routing were the 2-year, 24-hour rainfall event (3.6" accumulated rainfall) and the 10-year, 24-hour rainfall event (5.3" accumulated rainfall). City of Columbia regulations typically require the 25-year, 24-hour rainfall event be used for watersheds in excess of forty (40) acres. However, the City of Columbia instructed that the 10-year, 24-hour rainfall event be used for modeling associated with the analysis of the 750± acre Shandon-Rosewood watershed. Tailwater conditions (10-year flood) used in the model have been taken from the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) last revised September 29, 2010.

Subdivision of the entire 750± acre Shandon-Rosewood watershed into individual sub-catchments for each storm drainage structure (node) has not been performed. The topographic basis for watershed delineation to that degree of detail does not exist and is beyond the scope of this project. But the **east branch watershed** and the **west branch watershed** have both been further subdivided into smaller sub-watersheds with areas ranging in size from less than one (1) acre to areas on the order of twenty-five (25) acres. For the purposes of this study these watershed subdivisions have been based on significance within the overall watershed. Particular attention has been given to significant

storm drainage junctions and to areas identified by the City of Columbia as having a history of underperformance and/or public complaint.

SIGNIFICANT STORM DRAINAGE JUNCTIONS

*Some of the significant storm drainage junctions and areas identified by the City of Columbia as having a history of underperformance and/or public complaint are as follows:

- Wheat Street at Amherst Avenue
- Monroe Street at Ravenel Street
- Monroe Street between Ravenel Street and Wheat Street
- Heyward Street between Ravenel Street and Wheat Street
- Shandon Street north of Wilmot Avenue
- Monroe Street at Maple Street

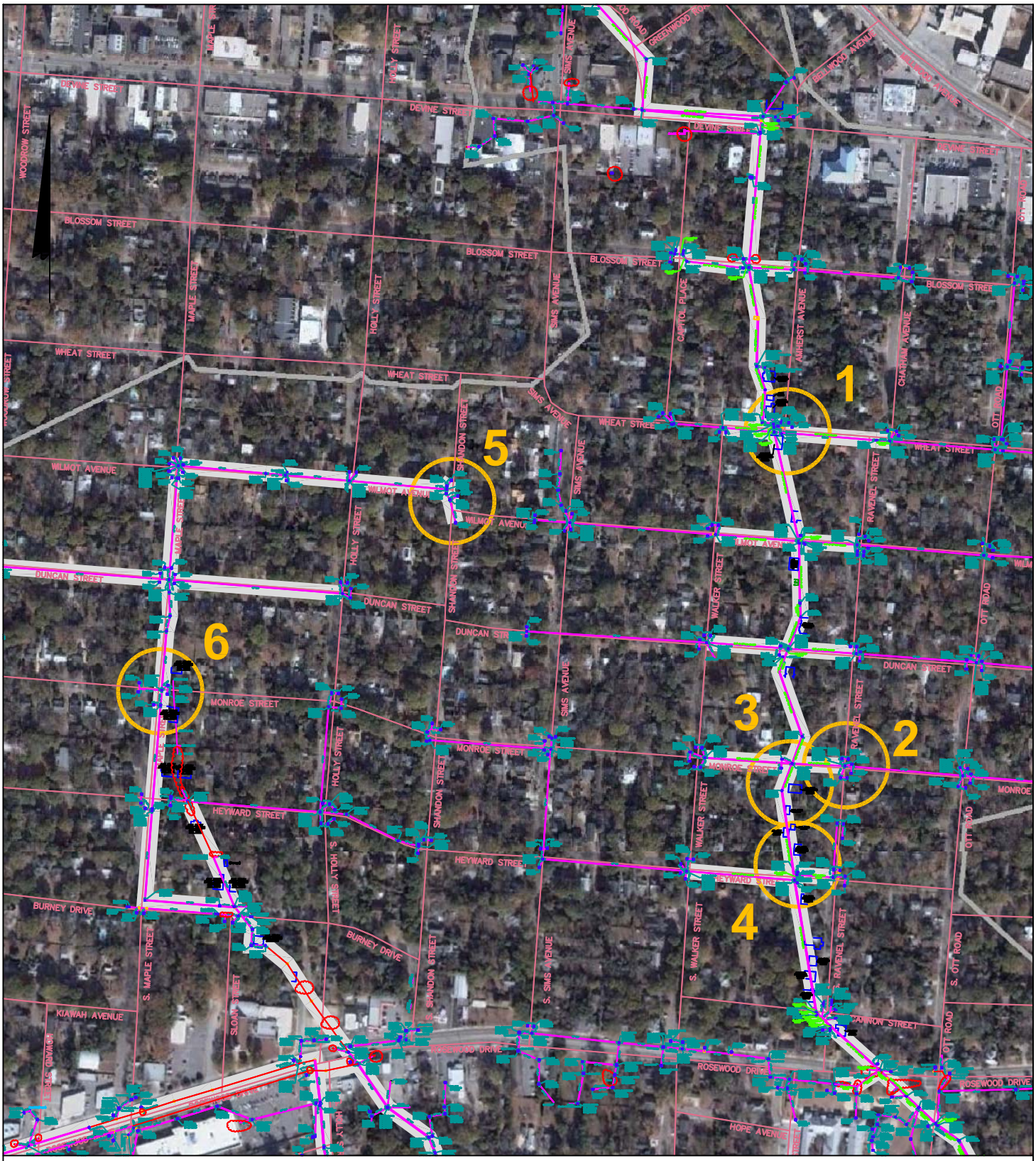
*See graphic following this preface for further identification.

SUMMARY OF MODELS

Initially, the stormwater collection systems in the **east branch watershed** and the **west branch watershed** were modeled to determine their baseline performance during the 2-year, 24-hour rainfall event (3.6" accumulated rainfall) and the 10-year, 24-hour rainfall event (5.3" accumulated rainfall). Those **initial models** indicated underperformance in both stormwater collection systems, with underperformance occurring primarily north of Rosewood Drive. Subsequent modeling was then performed to simulate upgrades to the stormwater collection systems north of Rosewood Drive while monitoring performance impacts on the stormwater collection systems south of Rosewood Drive.

CONCEPTUAL RECOMMENDATIONS FOR IMPROVEMENTS

Conceptual recommendations for improvements to the stormwater collection systems north of Rosewood Drive have been developed based on a number of model variations. Those conceptual recommendations for improvements range from installation of parallel collection systems to in place remedies for certain portions of the existing drainage collection system trunk line(s). In some cases improvements south of Rosewood Drive may also be required. To the degree possible, budget cost projections also accompany these conceptual recommendations for improvements.



PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

0 500 1000

GRAPHIC SCALE IN FEET
SCALE: 1"=500'

PROBLEM AREA AS IDENTIFIED BY THE CITY OF COLUMBIA

1. Wheat Street at Amherst Avenue
2. Monroe Street at Ravenel Street
3. Monroe Street between Ravenel Street and Wheat Street
4. Heyward Street between Ravenel Street and Wheat Street
5. Shandon Street north of Wilmot Avenue
6. Monroe Street at Maple Street

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SECTION 4B…… WEST BRANCH PIPES, STRUCTURES, AND INVERTS (DATA SET)

SECTION 4C…… WEST BRANCH MODEL OF EXISTING SYSTEM WITH PROFILES (ORIGINAL MODEL – WEST)

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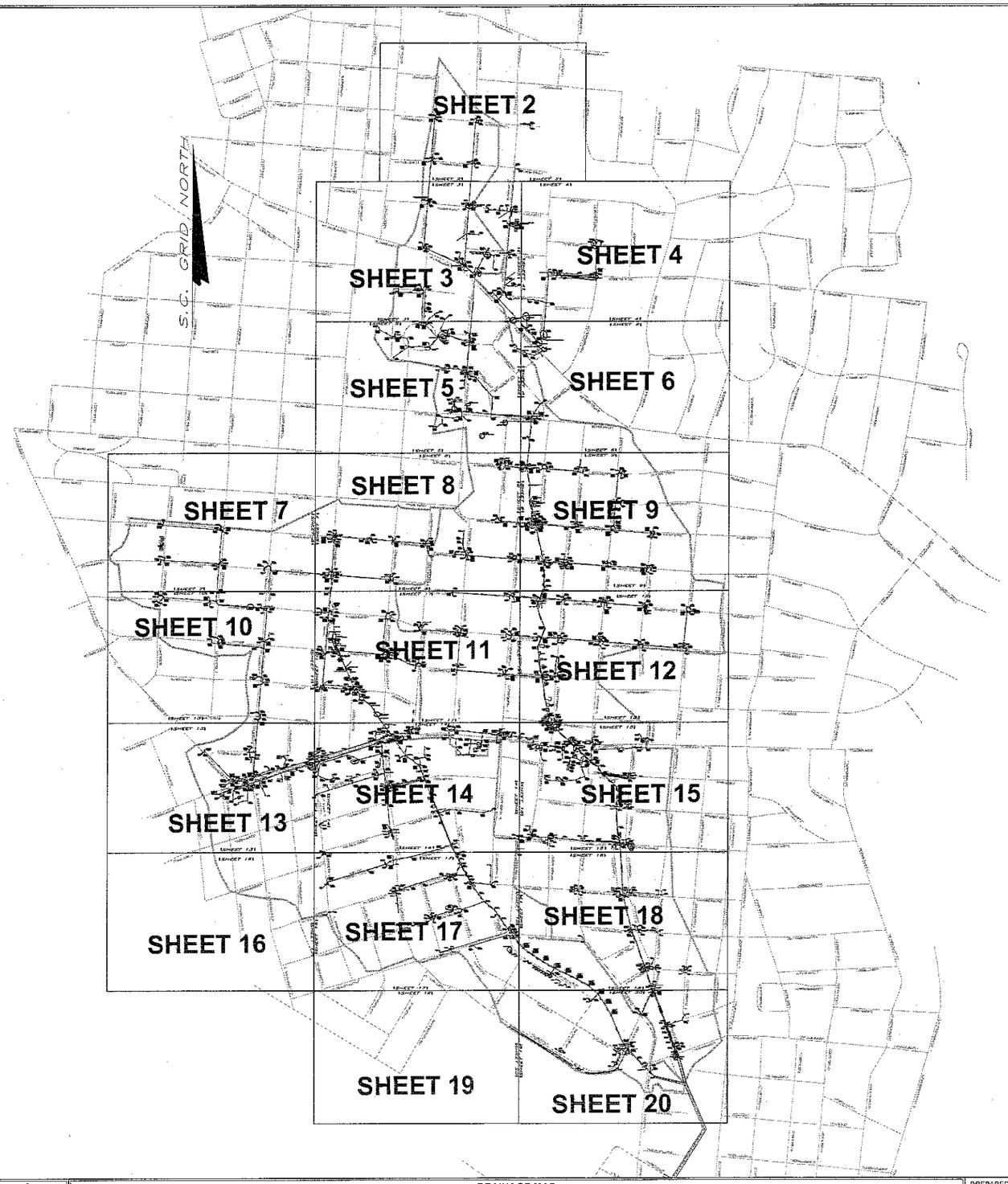
SECTION 1

RECORD DRAWINGS
BASED ON FIELD LOCATED
STORM DRAINAGE
COLLECTION SYSTEM NETWORK



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SCALE: 1" = 400' (0' 200' 400' 800')

TAX MAP NUMBER: CITY OF COLUMBIA

ZONE: W12; W13; W14

CHK: ? | SF: 243 | NO.: 19 | FILE: 94K14-01.dwg | BY: DJ

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
SHEET 1 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

PROF. LAND SURVEYOR NO. 24378
GENE L. DINKINS, JR.

REFERENCES:

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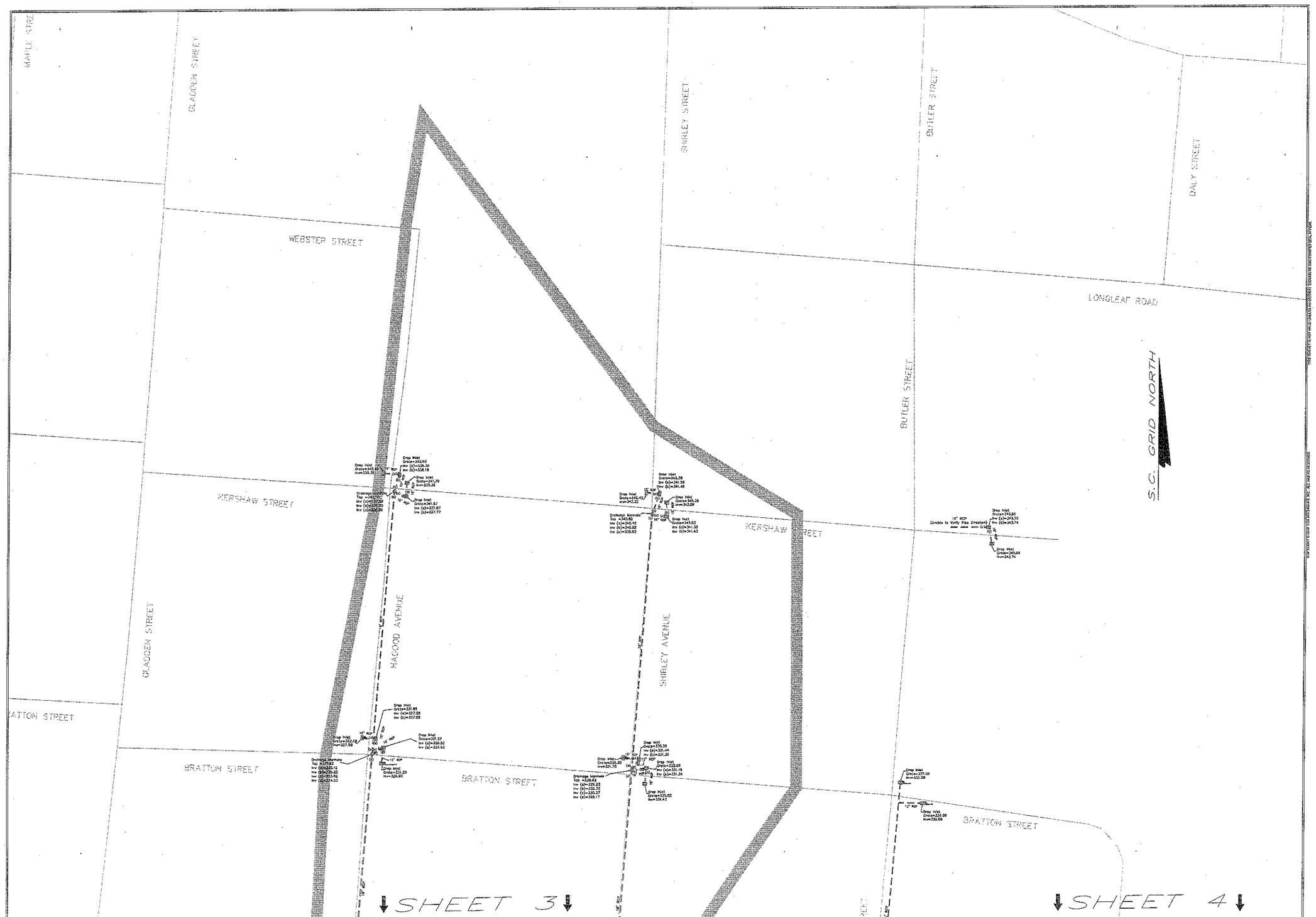

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DATE: 02-08-2009

DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 2 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

SHEET: W12; W13; W14

CHK: 7 | BY: JAS | ACL: 19 | PROJ.: SNW14-01.dwg | REV: 03

PREPARED BY:

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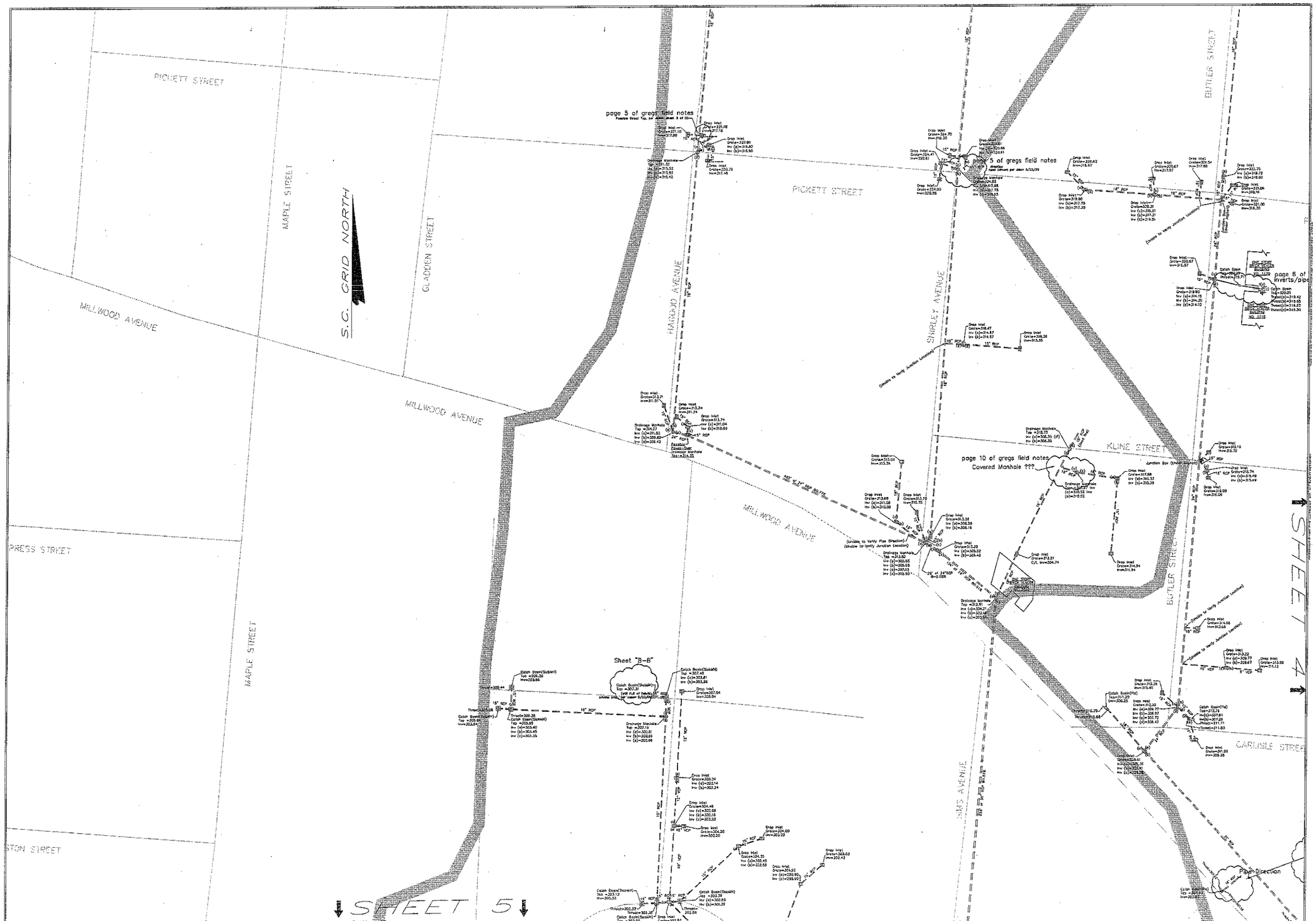
GENE L. GRAYING JR.

REFERENCES:

NOTES:



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No	DATE	DESCRIPTION
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DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 3 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

DATE:	SCALE:	TAX MAP NUMBER:	CODE:	DWG:	SF:	NO.:	PROJ.:	BY:
02-09-2009	1" = 50' (0' 25' 50' 100')	CITY OF COLUMBIA	W12; W13; W14	7	343	19	99014-01.dwg	DS

PREPARED BY:

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REFERENCES:

NOTES:

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1		

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DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 4 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

DATE:	SCALE:	TAX MAP NUMBER:	ESDN:	CHK:	SK:	NO.:	PROJ.:	BY:
02-09-2009	1" = 50' (0' 25' 50' 100')	CITY OF COLUMBIA	W12; W13; W14	?	343	19	RMW14-01.dwg	DJ

PREPARED BY:

REG. LAND SURVEYOR NO. 21275
GENE L. DINKINS, JR.

REFERENCES:

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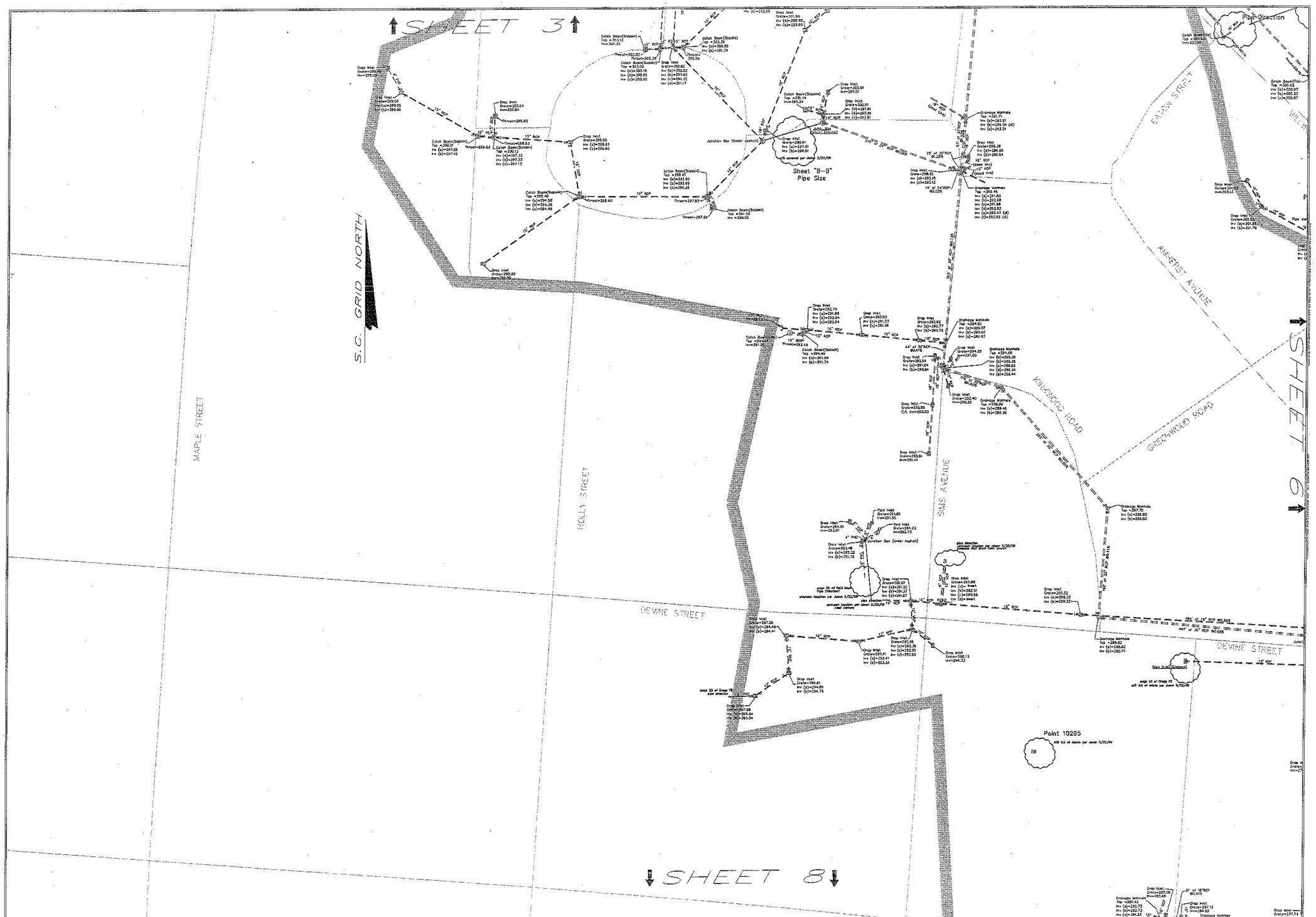

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SOUTH CAROLINA COX AND DINKINS, INC. No. C00294 CERTIFICATE OF AUTHORIZATION

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SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

BOOK: W12; W13; W14

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DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 5 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

REG. LAND SURVEYOR NO. 24221
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DATE: 02-09-2009
SCALE: 1" = 50' (0' 25' 50' 100')
TAX MAP NUMBER: CITY OF COLUMBIA
ZONE: W12; W13; W14
CHKD: 7 | DR: 343 | NO.: 19 | PROJ.: SHEET4-01.dwg | BY: DJ

DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 6 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

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NOTES:

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CITY OF COLUMBIA
Sheet 7 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

DATE:	SCALE:	TAX MAP NUMBER:	SCALE:	DWG.	SH.	NO.	PROJ.:	BY:
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PREPARED BY:

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REFERENCES:

NOTES:

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Sheet 8 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

DATE	SCALE	TAX MAP NUMBER	DWG	CHK	BY	NO.	PROJ.	BY
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PREPARED BY:
REG. LAND SURVEYOR NO. 24278
SONY L. SIMMONS, JR.

REFERENCES:

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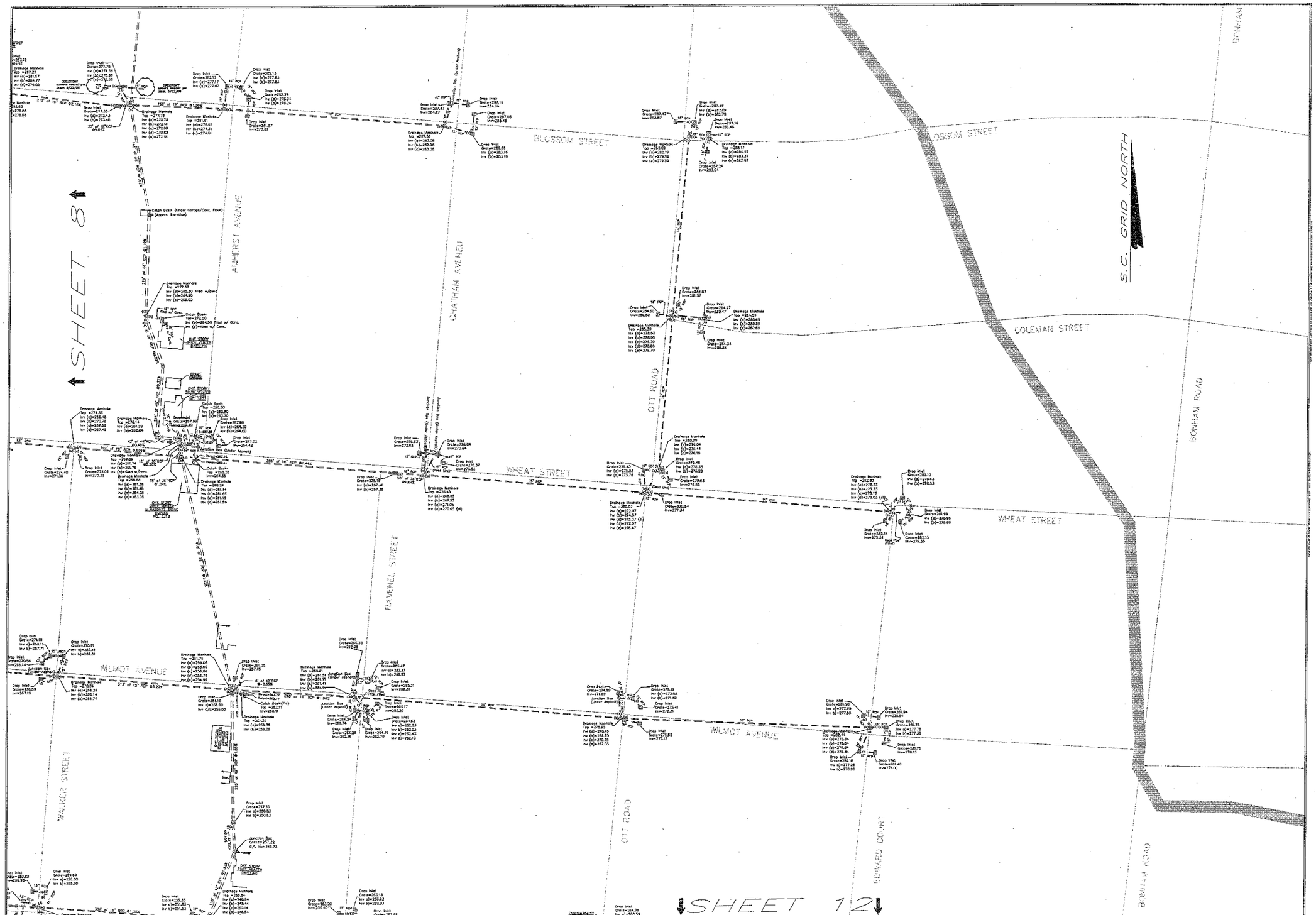

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SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

SHOW: W12; W13; W14

CHK: T | BY: 343 | NO: 10 | FIELD: BM614-01.dwg | BY: DJ

DRAINAGE MAP

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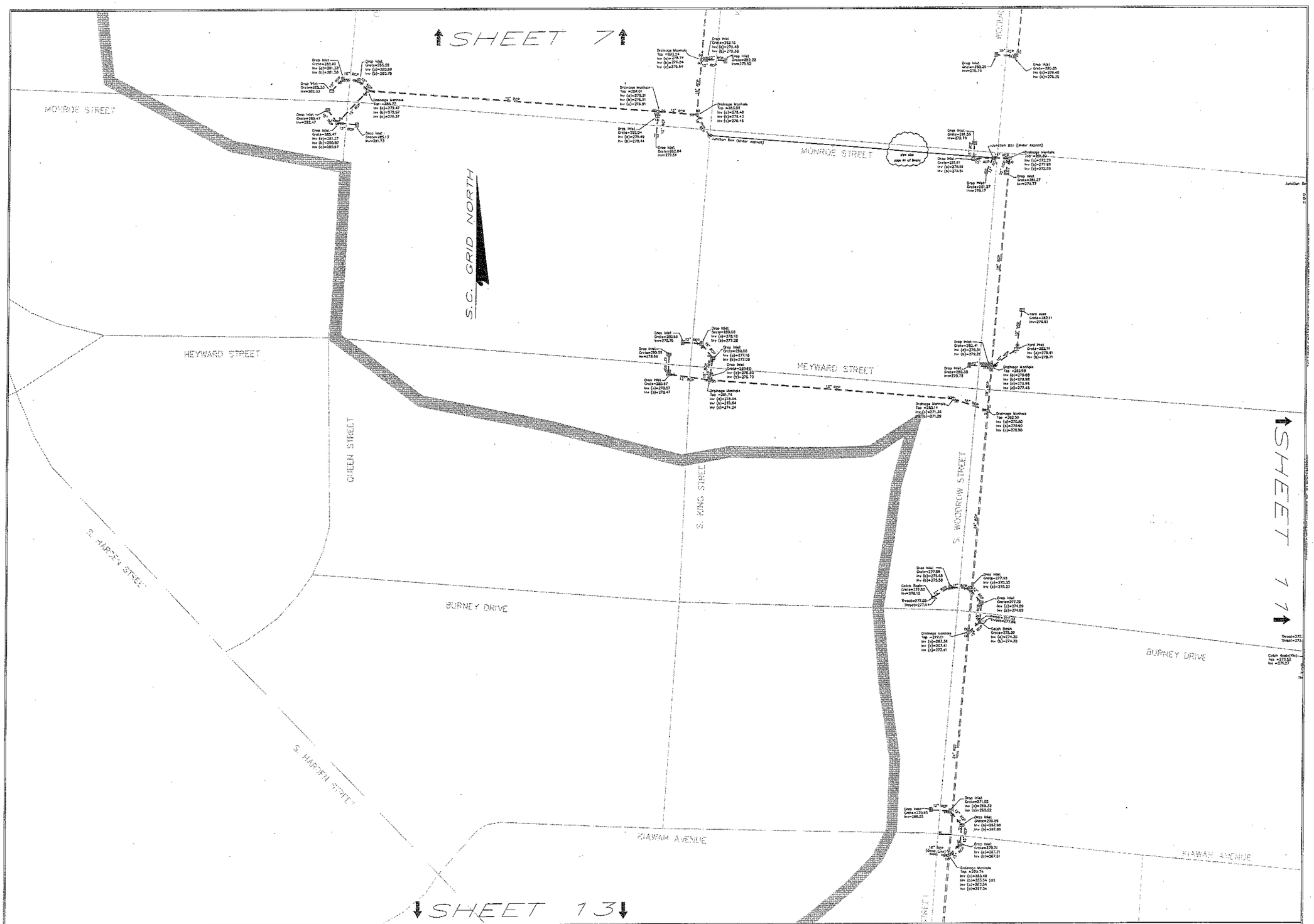
CITY OF COLUMBIA
Sheet 9 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY: REGT. LAND SURVEYOR NO. 3470 KONELL DAVIS, JR.

REFERENCES:

NOTES:



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DATE: 02-03-2009

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

BOOK: W12; W13; W14

CHK: 7 | BY: 243 | NO.: 19 | FILE: 9108E4-01.dwg | BY: DJ

DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 10 of 20

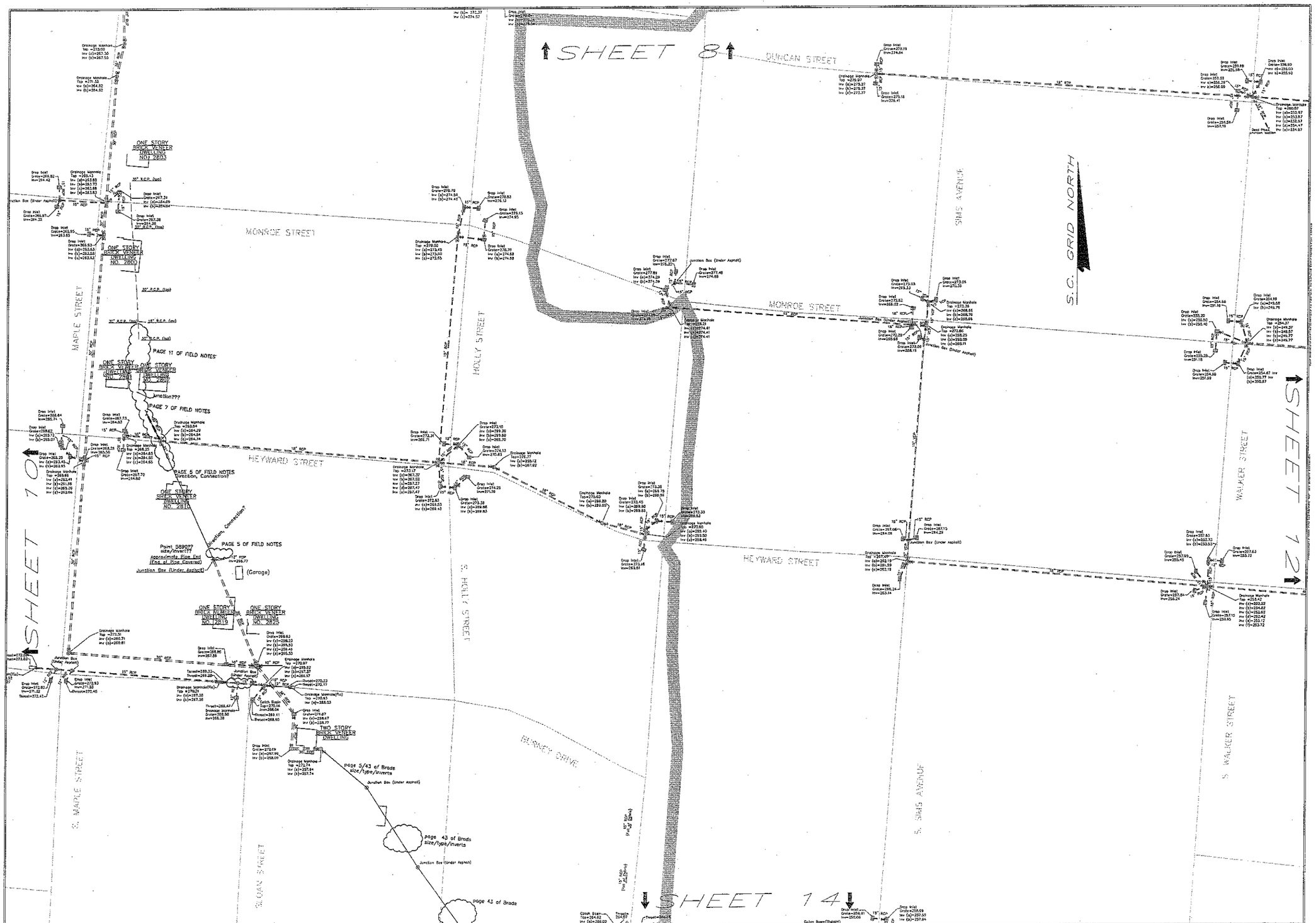
RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

REG. LANE SURVEYOR NO. 24276
DOUG L. DINKINS, JR.

REFERENCES:

NOTES:



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DATE: 02-09-2009

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

GRID: W12; W13; N14

CHK:	EF:	ADJ:	PROJ:	BY:
7	343	19	50914-01.dwg	03

DRAINAGE MAP

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CITY OF COLUMBIA
Sheet 11 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

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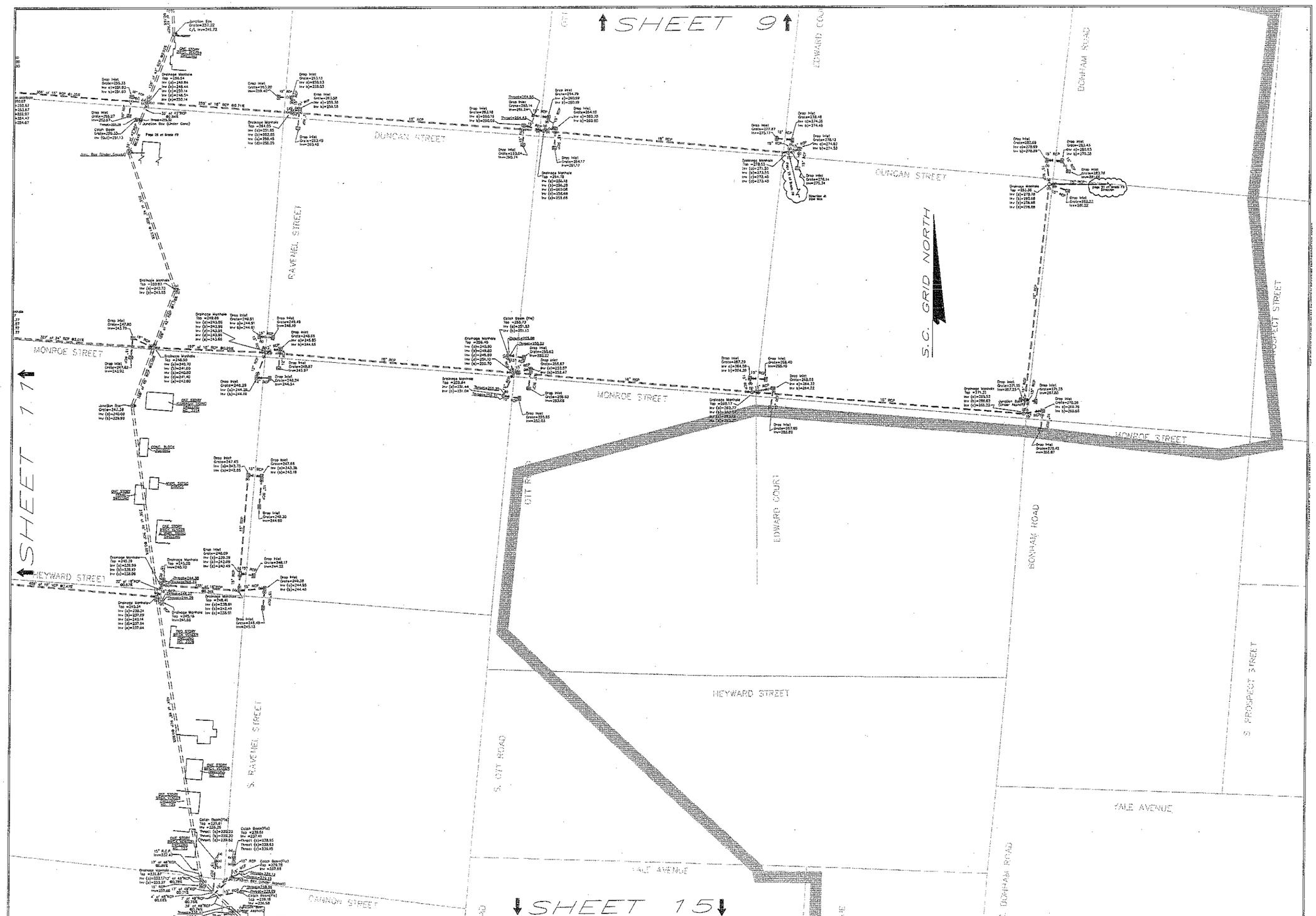
GAIL L. DINKINS, JR.

REFERENCES:

NOTES:



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SCALE: 1" = 50' (0' 25' 50' 100')

DRAINAGE MAP

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CITY OF COLUMBIA

Sheet 12 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

TAX MAP NUMBER: CITY OF COLUMBIA

BOOK: W12; W13; W14

CHK:	SP:	NO:	PROJ.:	BY:
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PREPARED BY: REG. LAND SURVEYOR NO. 24379 EDWIN L. DARNS, JR.

REFERENCES:

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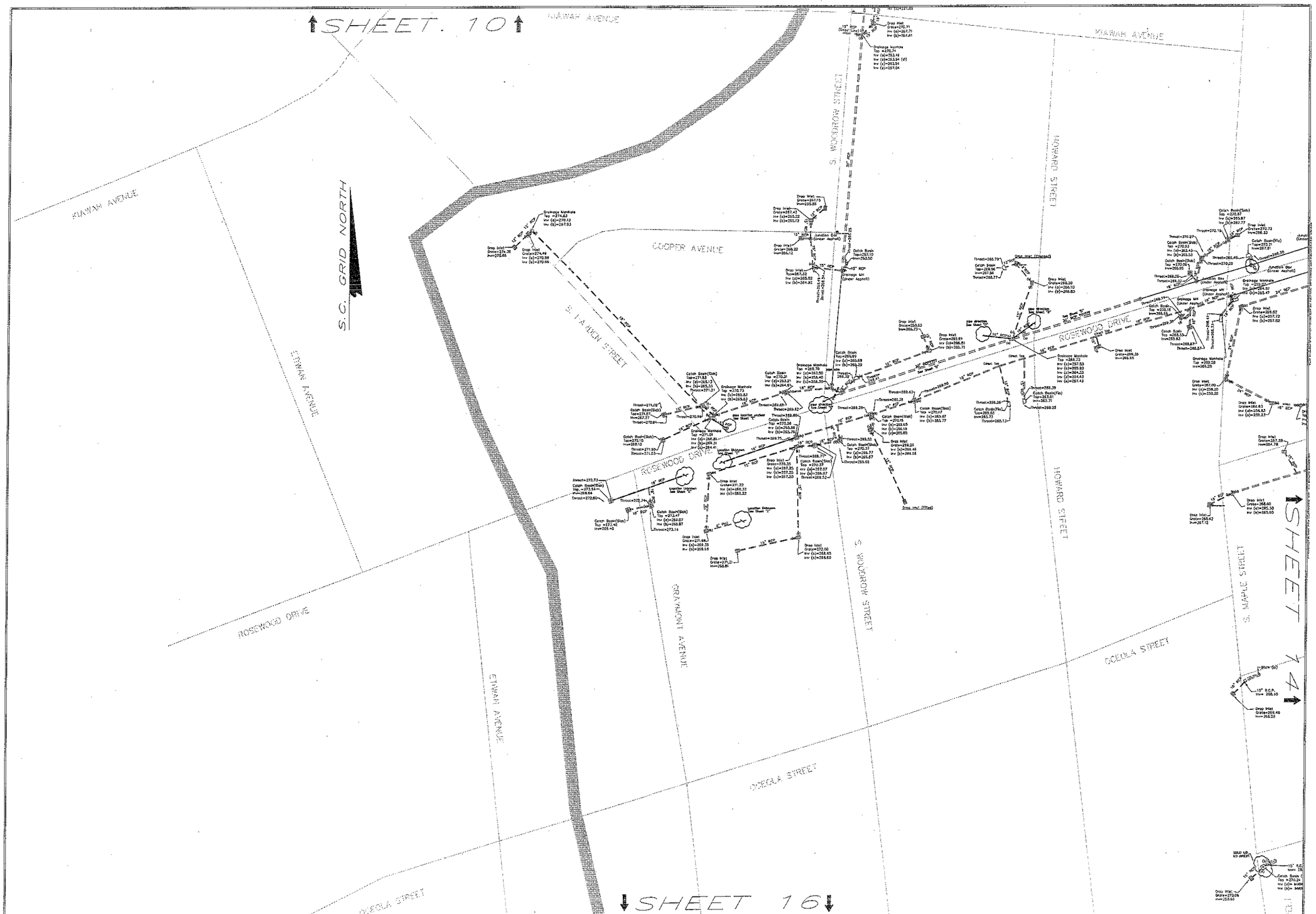

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1		

COX AND DINKINS, INC. No. C2034
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CERTIFICATE OF AUTHORIZATION SEAL

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DWG: 02-09-2009
SCALE: 1" = 50' (0' 25' 50' 100')
TAX MAP NUMBER: CITY OF COLUMBIA
SHEET: W12; W13; W14
CHKD: ? | SF: 343 | NO: 10 | REDLL: 9W314-01.dwg | BY: DJ

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
Sheet 13 of 20

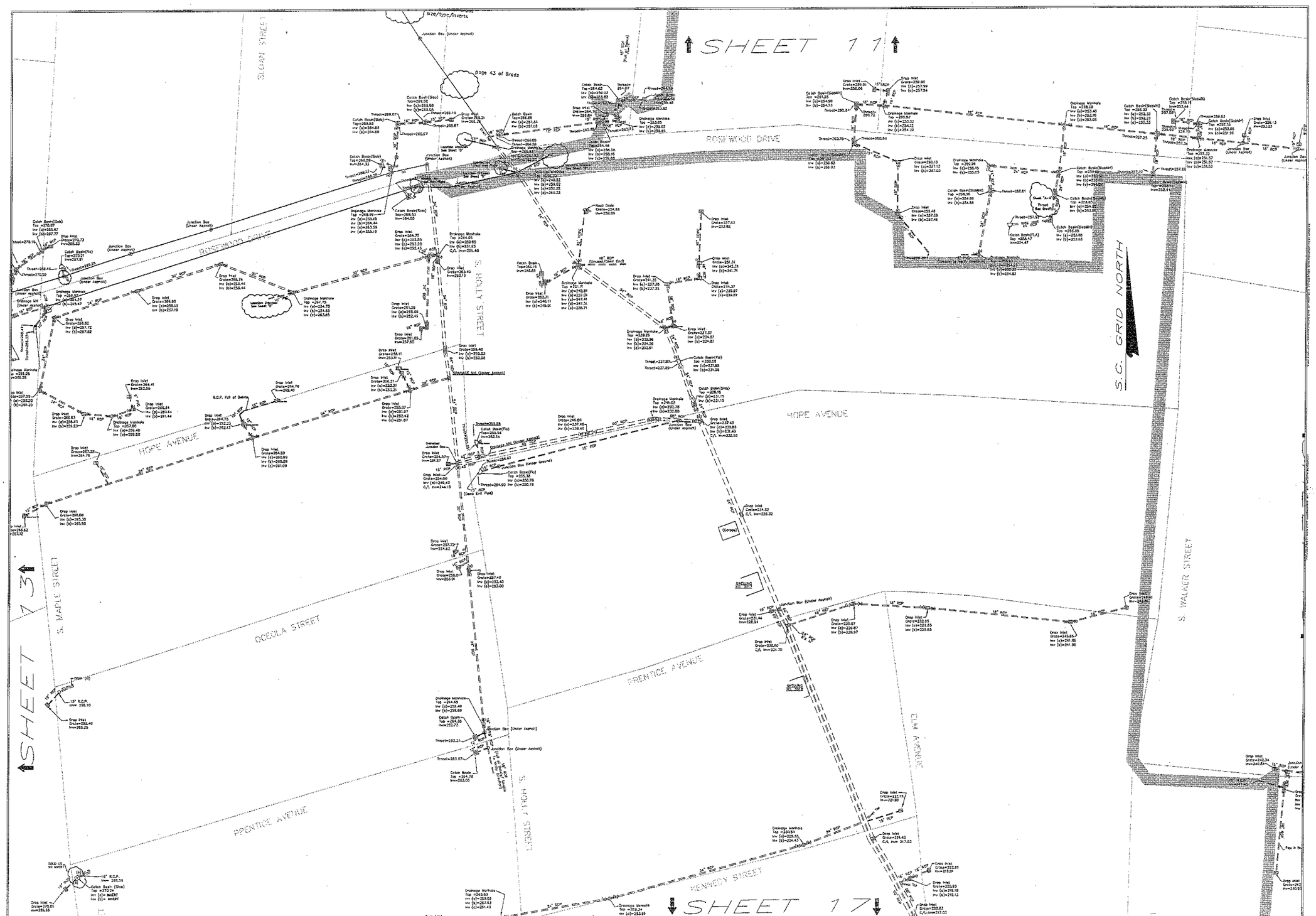
RICHLAND COUNTY; COLUMBIA, S.C.

PREPARED BY:

REGISTERED PROFESSIONAL ENGINEER (LAND SURVEYOR) No. 24276
COXE L. DINKINS, JR.

REFERENCES:

NOTES:



REVISIONS		
No.	DATE	DESCRIPTION

COX AND DINKINS, INC. No. C00284 — CERTIFICATE OF AUTHORIZATION SEAL

COX AND DINKINS
ENGINEERS - SURVEYORS

COX AND DINKINS, INC.
724 BELTLINE BLVD.
COLUMBIA, SOUTH CAROLINA 29204
803-254-5588 Fax: 803-765-0883
Email: Mail@CoxandDinkins.com

DATE: 02-03-2009

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

BOOK: W12; W13; W14

Dwg: 7 | SP: 343 | Acc: 19 | PROJ: 30014-01.dwg | BY: DD

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
Sheet 14 of 20

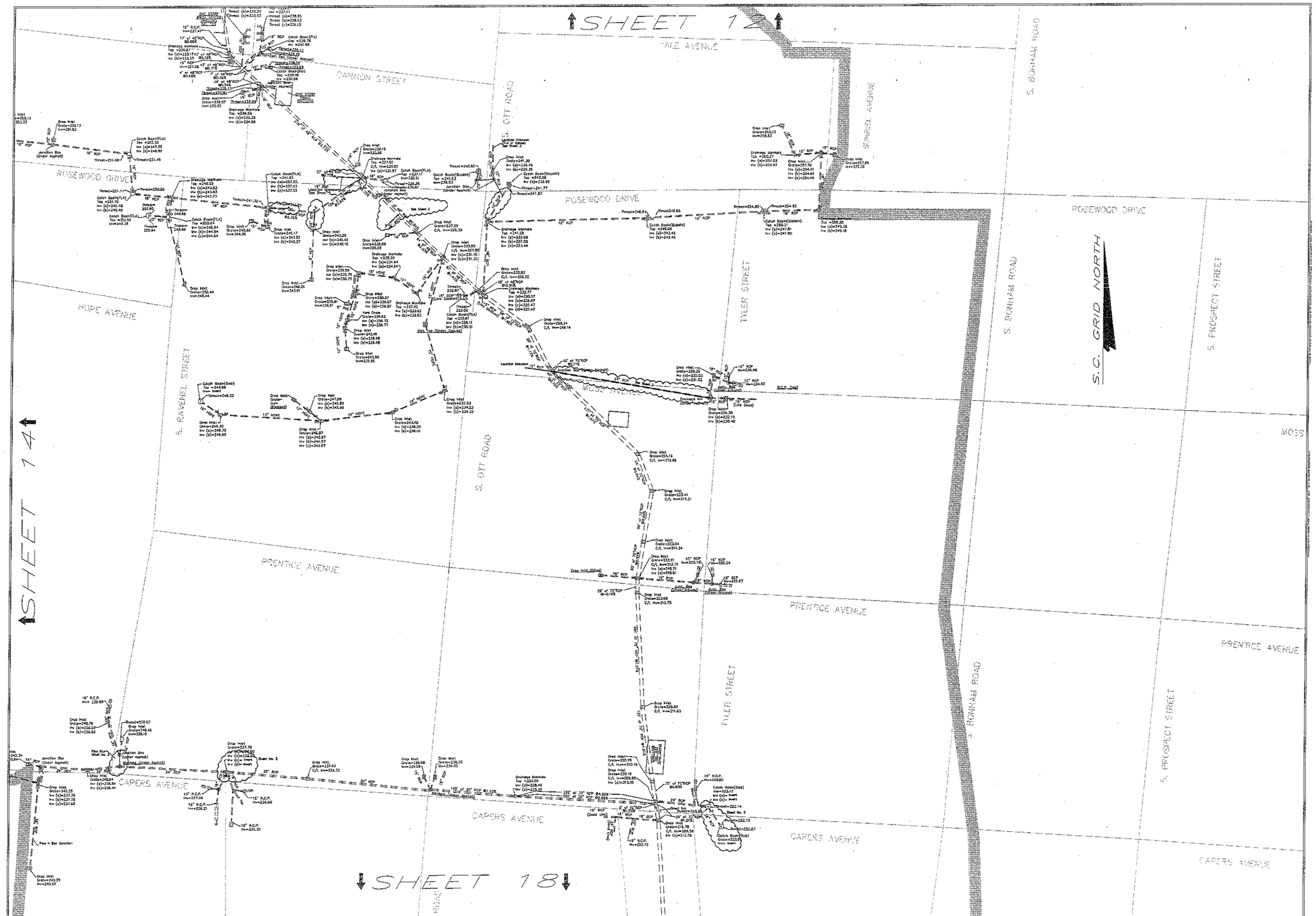
RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

REG. LAND SURVEYOR NO. 14279
EDWIN L. DINKINS, JR.

REFERENCES:

NOTES:



REVISIONS		
No.	DATE	DESCRIPTION
1		

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION No. C00094

DESIGNATE AUTHENTICATION SEAL

COX AND DINKINS, INC.
ENGINEERS - SURVEYORS
COX AND DINKINS, INC.
701 BEST FRIEND BLVD.
COLUMBIA, SOUTH CAROLINA 29206
803-754-0918 FAX: 803-754-1980
Email: cdinc@cox-and-dinkins.com

DATE: 02-09-2009
SCALE: 1" = 50' (0' 25' 50' 100')
FAX MAP NUMBER: CITY OF COLUMBIA
SHEET: M12; M13; M14
DWG: 7
BY: 343
NO.: 19
FILE: SM814-01.dwg
BY: DJ

DRAINAGE MAP

PREPARED FOR:

CITY OF COLUMBIA
Sheet 15 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

REGIST. LAND SURVEYOR NO. 24028
JOHN L. DINKINS, JR.

REFERENCES:

NOTES:

REVISIONS

NO.	DATE	DESCRIPTION

SOUTH CAROLINA COX AND DINKINS, INC. No. C00294 CERTIFICATE OF AUTHORIZATION

CERTIFICATE AUTHORIZATION SEAL

COX AND DINKINS ENGINEERS - SURVEYORS

COX AND DINKINS INC.
724 WELTLINE BLVD.
COLUMBIA, SOUTH CAROLINA 29206
803-254-5518 Fax 803-782-0905
Email: mail@coxanddinkins.com

DATE: 02-08-2009

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
Sheet 16 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

CODE: W12; W13; W14

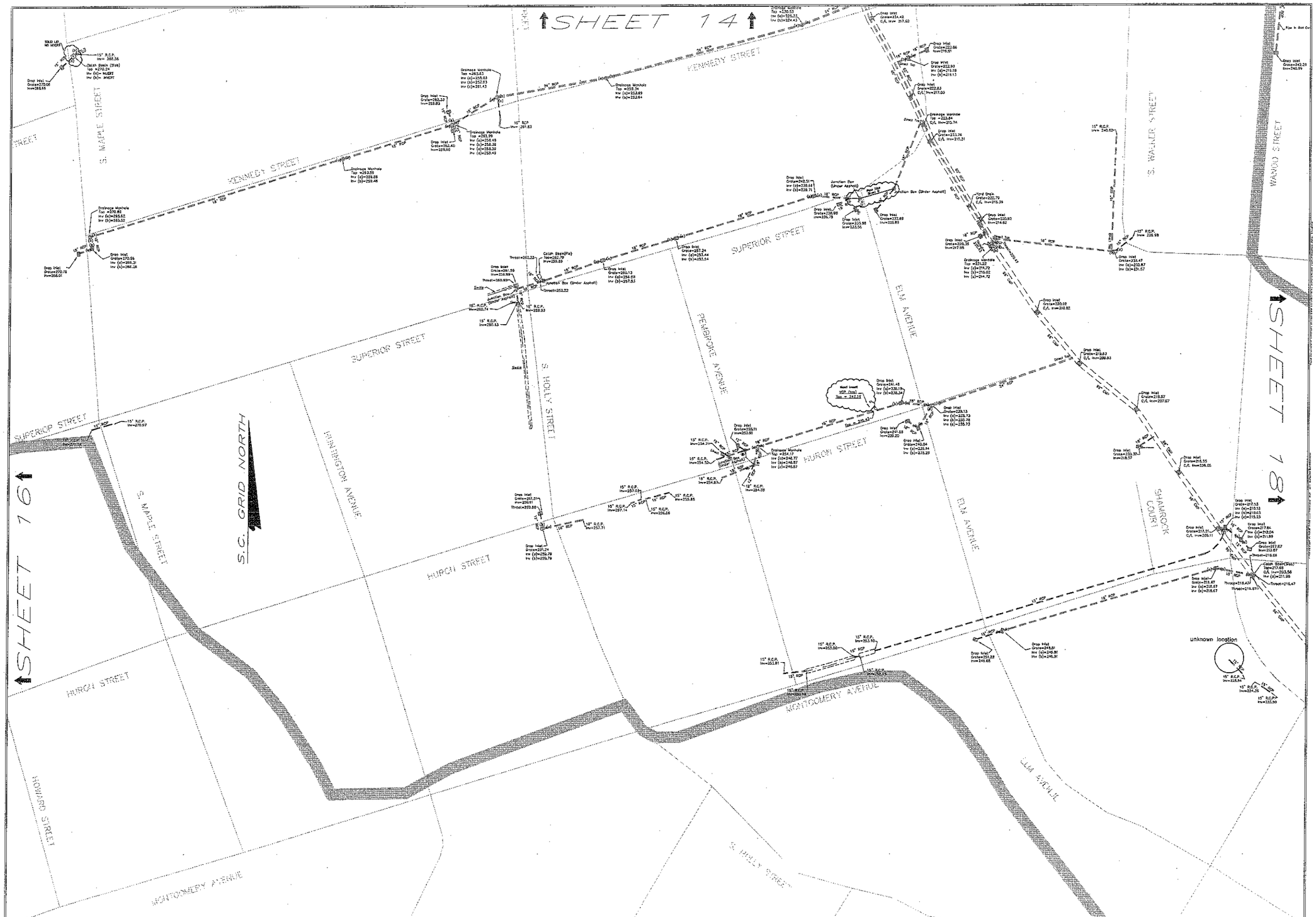
DWN:	BY:	NO.:	PROJ.#:	RV:
T	JAS	19	9908141-01.dwg	03

PREPARED BY:

REG'T. LAND SURVEYOR NO. 24376
RENE L. DANIEL JR.

REFERENCES:

NOTES:



REVISIONS		
No	DATE	DESCRIPTION
1		

COX AND DINKINS, INC. No. C00234 — CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

COX AND DINKINS
ENGINEERS - SURVEYORS

COX AND DINKINS, INC.
704 BELTLINE BLVD.
COLUMBIA, SOUTH CAROLINA 29205
803-254-0418 Fax 803-765-0990
Email: cdi@coxandinkins.com

DATE: 02-09-2009

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

BOOK: W12; W13; W14

DWG.	SF.	NO.	FIELD:	BY:
7	343	19	DWG14-01.dwg	DS

DRAINAGE MAP

PREPARED FOR:

CITY OF COLUMBIA
Sheet 17 of 20

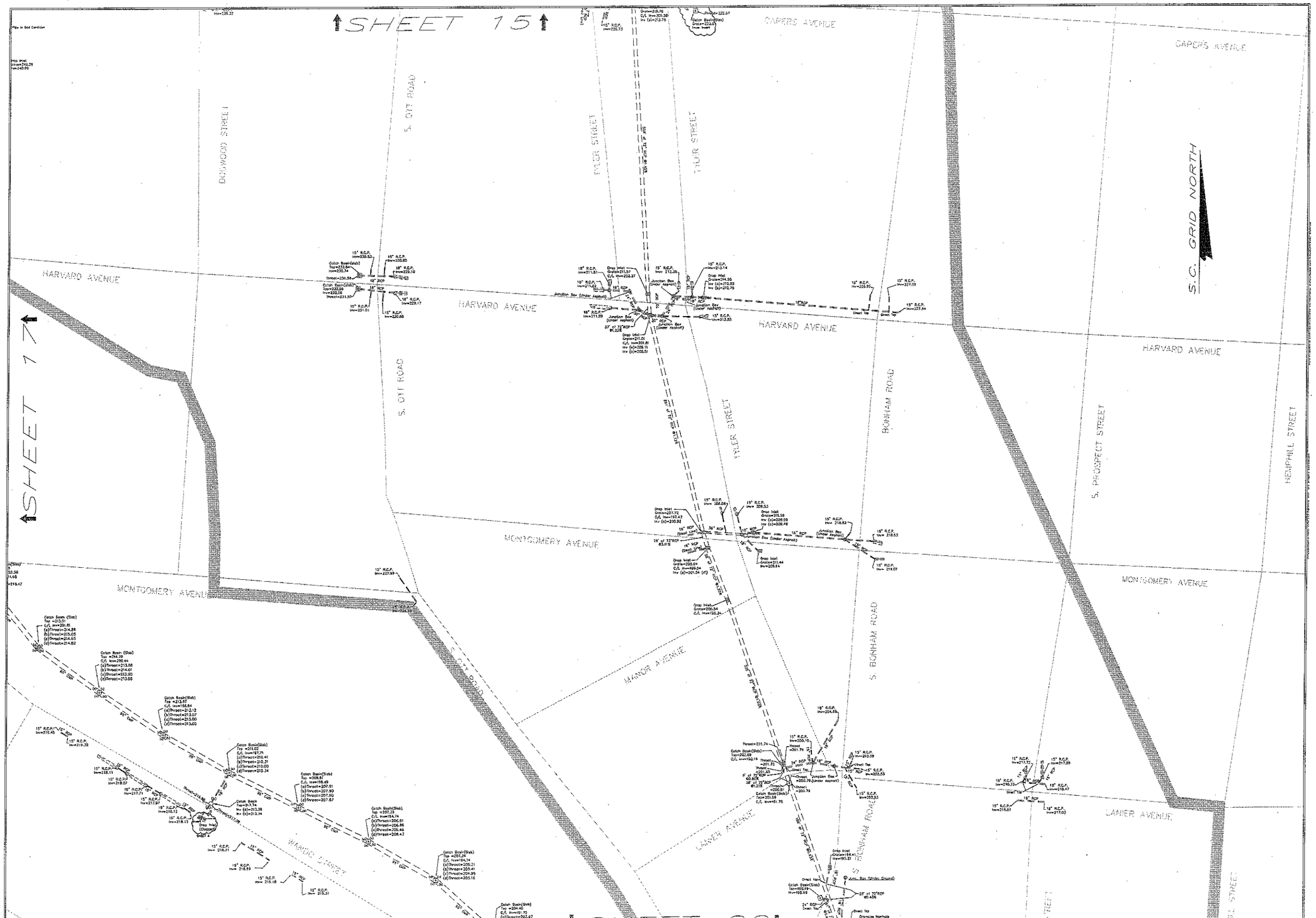
RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

REG. LICENSED SURVEYOR NO. 24273
CONE L. DINKINS, JR.

REFERENCES:

NOTES:



REVISIONS		
No.	DATE	DESCRIPTION

COX AND DINKINS, INC. Est. C00294 — CERTIFICATE OF AUTHORIZATION

CERTIFICATE AUTHORIZATION SEAL

COX AND DINKINS — ENGINEERS - SURVEYORS

COX AND DINKINS, INC.
7164 RICHLAND RD.
COLUMBIA, SOUTH CAROLINA 29203
803-736-0375 Fax 803-736-0865
EMAIL: cdinc@cox-and-dinkins.com

DATE: 02-09-2009

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
Sheet 18 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

SCALE: 1" = 50' (0' 25' 50' 100')

TAX MAP NUMBER: CITY OF COLUMBIA

EGRS: W12, W13, W14

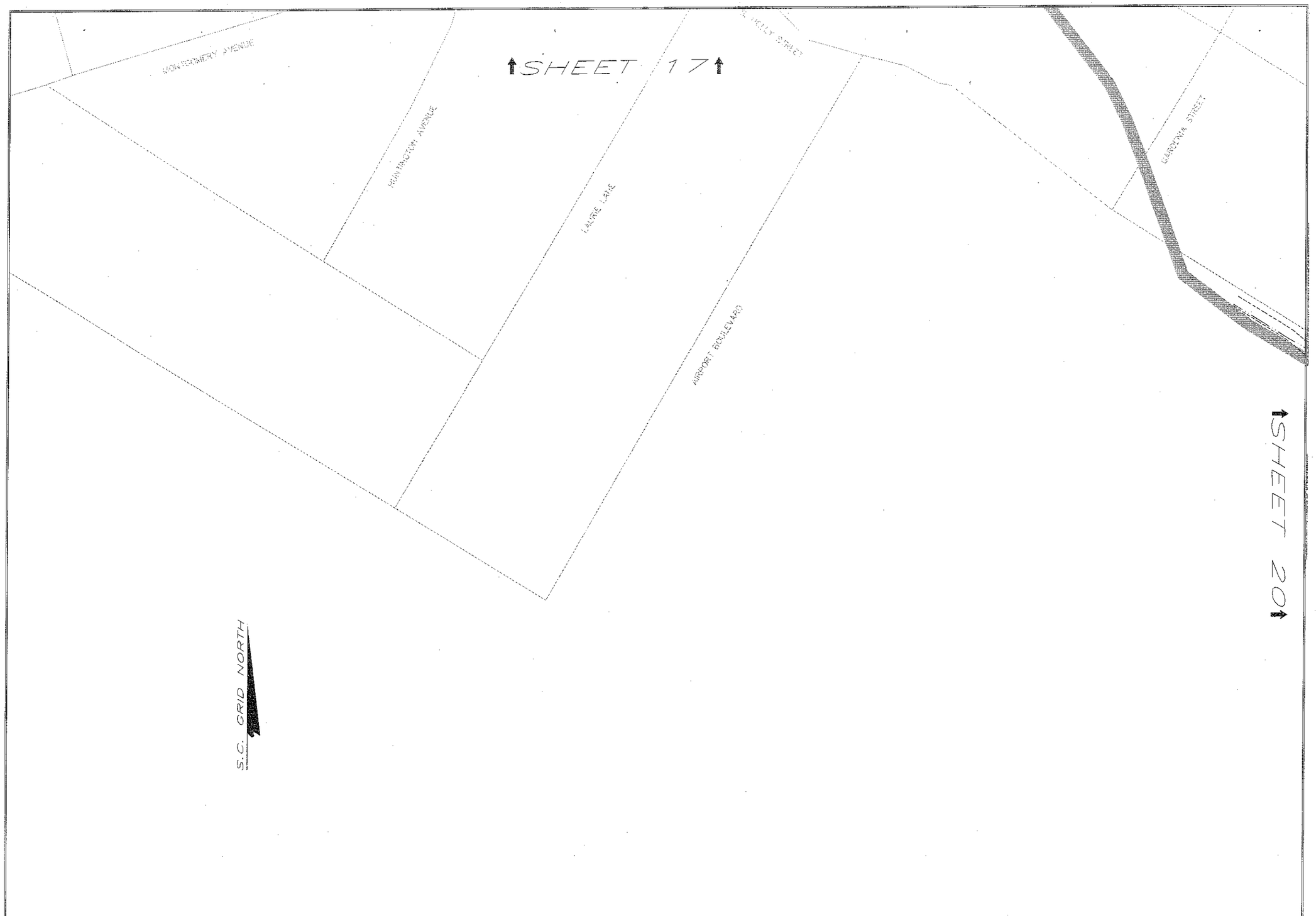
Dwg.	Sh.	Rev.	Field Book	By
7	343	19	Book14-31.dwg	03

PREPARED BY:

PROF. LAND SURVEYOR NO. 14373
GENE E. DINKINS, JR.

REFERENCES:

NOTES:



REVISIONS		
No	DATE	DESCRIPTION
1		

SOUTH CAROLINA COX AND DINKINS, INC. No. C00054 CERTIFICATE OF AUTHORIZATION

CERTIFICATE AUTHORIZATION, SEAL

COX AND DINKINS ENGINEERS - SURVEYORS

COX AND DINKINS INC
724 BELTLINE BLVD.
COLUMBIA, SOUTH CAROLINA 29204
803-254-6518 Fax: 803-254-5785
Email: cox@cox-and-dinkins.com

DATE: 02-09-2009

SCALE: 1" = 50' 0' 25' 50' 100'

TAX MAP NUMBER: CITY OF COLUMBIA

BOOK: W12; W13; W14

CH: 7 | SH: 343 | NO: 19 | FILE: SHW14-01.dwg | BY: DJ

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
Sheet 19 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

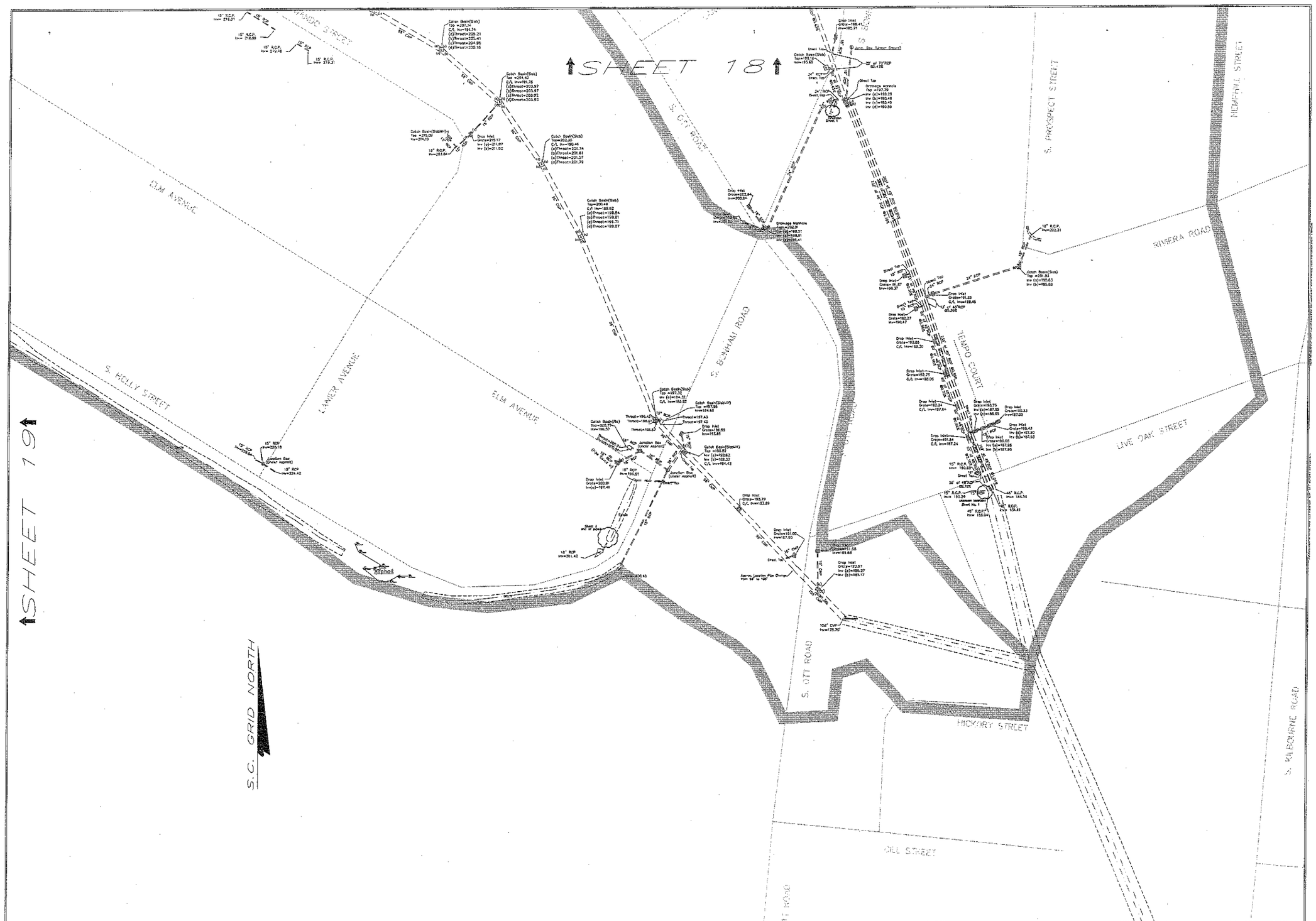
PREPARED BY:

REG. LAND SURVEYOR NO. 24276
DOUG L. DINKINS, JR.

REFERENCES:

NOTES:

1



REVISIONS		
No.	DATE	DESCRIPTION
1		

COX AND DINKINS, INC. No. C00224 — SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

COX AND DINKINS — ENGINEERS • SURVEYORS

COX AND DINKINS INC.
724 SILTRAE BLVD.
COLUMBIA, SOUTH CAROLINA 29204
803-748-0016 Fax: 803-748-0080
Email: cdinc@cyberlink.com

DRAINAGE MAP

PREPARED FOR

CITY OF COLUMBIA
Sheet 20 of 20

RICHLAND COUNTY, COLUMBIA, S.C.

PREPARED BY:

FCP, LAND SURVEYOR NO. 24378
GENE L. DINKINS, JR.

REFERENCES:

NOTES:

DATE	SCALE	TAX MAP NUMBER	BOOK	CHK	BY	NO.	PROJ.	SHT
02-09-2009	1" = 50' (0' 25' 50' 100')	CITY OF COLUMBIA	W12; W13; W14	9	JAS	19	SAN14-01.dwg	03

COX AND DINKINS
ENGINEERS · SURVEYORS

SECTION 2

COORDINATE FILE FOR FIELD LOCATED STORM DRAINAGE COLLECTION SYSTEM NETWORK (ENTIRE SYSTEM AS SURVEYED & LISTED IN NUMERICAL ORDER)

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION POINT FILE

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1001	780273.19	2002423.36	178.70	108” C.M.P.	
1002	780323.33	2002378.69	190.97	CB (grated)	
1003	780390.06	2002377.96	191.58	CB (grated)	
1004	780382.81	2002337.27	191.00	CB (grated w/ hood)	
1005	780464.14	2002237.88	193.79	CB (grated)	
1006	780563.59	2002140.19	195.82	CB (slab top w/ mh)	
1007	780595.85	2002134.02	196.99	CB (grated w/ hood)	
1008	780617.17	2002098.25	197.98	CB (Florida type)	
1009	780620.09	2002087.89	197.32	CB (slab top w/ mh)	
1010	780572.50	2002041.09	200.77	CB (Florida type)	
1011	780545.30	2002020.10	200.91	CB (grated w/ hood)	
1012	780514.67	2002049.37	196.42	18" R.C.P. (inv)	
1014	780612.34	2002097.94	197.40	Throat	
1015	780619.80	2002101.45	197.43	Throat	
1016	780619.12	2002089.36	196.57	Throat	
1017	780618.16	2002087.05	196.61	Throat	
1018	780621.46	2002088.64	196.43	Throat	
1019	780568.99	2002040.75	200.64	Throat	
1020	780573.39	2002035.45	200.91	Throat	
1021	780940.02	2001953.67	200.49	CB (slab top)	
1022	780941.74	2001952.50	199.87	Throat	
1023	780941.32	2001955.33	199.71	Throat	
1024	780938.63	2001954.68	199.81	Throat	
1025	780939.23	2001952.04	199.84	Throat	
1026	781067.80	2001883.95	202.35	CB (slab top)	
1027	781069.42	2001883.22	201.79	Throat	
1028	781068.56	2001885.76	201.57	Throat	
1029	781065.98	2001884.66	201.61	Throat	
1030	781067.06	2001882.18	201.74	Throat	
1031	781176.85	2001808.28	204.40	CB (slab top)	
1032	781178.05	2001806.94	203.93	Throat	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1033	781178.12	2001809.77	203.92	Throat	
1034	781175.39	2001809.73	203.97	Throat	
1035	781175.26	2001806.95	203.97	Throat	
1036	781120.81	2001757.50	215.17	CB (grated w/ hood)	
1037	781114.14	2001718.15	216.09	CB (slab top w/ mh)	
1038	781115.80	2001719.60	214.44	Throat	
1039	781096.32	2001728.23	203.84	15" R.C.P. (inv)	
1040	781268.88	2001703.94	207.34	CB (slab top)	
1041	781270.64	2001703.18	205.16	Throat	
1042	781270.95	2001705.98	204.95	Throat	
1043	781268.17	2001705.90	205.41	Throat	
1044	781268.12	2001703.23	205.21	Throat	
1046	781337.08	2001584.54	207.39	CB (slab top)	
1047	781337.83	2001583.02	206.43	Throat	
1048	781338.96	2001585.75	206.46	Throat	
1049	781336.10	2001586.34	206.86	Throat	
1050	781335.28	2001583.64	206.91	Throat	
1051	781396.95	2001461.15	208.61	CB (slab top)	
1052	781458.05	2001337.12	211.02	CB (slab top)	
1053	781456.43	2001336.16	210.41	Throat	
1054	781524.12	2001218.90	213.67	CB (slab top)	
1055	781522.47	2001218.22	213.12	Throat	
1056	781524.99	2001217.09	213.05	Throat	
1057	781526.26	2001219.73	213.00	Throat	
1058	781523.33	2001220.96	213.07	Throat	
1059	781598.64	2001104.33	214.79	CB (slab top)	
1060	781599.74	2001102.53	213.96	Throat	
1061	781600.50	2001105.43	213.90	Throat	
1062	781597.47	2001106.08	214.01	Throat	
1063	781596.68	2001103.32	213.88	Throat	
1064	781676.90	2000993.51	215.51	CB (slab top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1065	781675.15	2000993.01	214.86	Throat	
1066	781675.38	2000994.67	215.05	Throat	
1067	781632.01	2000869.95	225.54	15" R.C.P. (inv)	
1068	781467.16	2001138.43	218.11	15" R.C.P. (inv)	
1069	781458.92	2001152.19	218.07	15" R.C.P. (inv)	
1070	781436.70	2001190.09	217.71	15" R.C.P. (inv)	
1071	781422.82	2001214.57	217.97	15" R.C.P. (inv)	
1072	781397.61	2001255.76	218.12	15" R.C.P. (inv)	
1073	781388.67	2001268.11	218.12	15" R.C.P. (inv)*	
1074	781380.16	2001284.78	217.08	CB (grated w/ hood)	
1075	781404.93	2001304.60	217.74	CB (Florida type)	
1076	781405.33	2001300.06	216.98	Throat	
1077	781401.86	2001305.92	217.09	Throat	
1078	781336.45	2001358.14	218.31	15" R.C.P. (inv)	
1079	781305.06	2001409.86	218.89	15" R.C.P. (inv)	
1080	781280.11	2001449.49	219.18	15" R.C.P. (inv)	
1081	781267.46	2001469.80	219.31	15" R.C.P. (inv)	
1082	781678.60	2000994.78	214.65	Throat	
1083	781678.76	2000992.52	214.82	Throat	
1084	781803.86	2000887.25	217.68	CB (slab top w/ mh)	
1085	781804.22	2000889.78	216.47	Throat	
1086	781806.20	2000887.26	216.66	Throat	
1087	781803.97	2000884.94	216.47	Throat	
1088	781801.61	2000887.44	216.67	Throat	
1089	781849.16	2000881.14	217.87	CB (grated w/ hood)	
1090	781865.85	2000865.74	217.84	CB (grated w/ hood)	
1091	781886.96	2000836.73	217.53	CB (grated w/ hood)	
1092	781885.09	2000824.85	217.21	CB (grated)	
1093	781815.98	2000821.19	219.47	CB (grated w/ hood)	
1095	781609.89	2000904.44	224.36	15" R.C.P. (inv)	
1096	781600.12	2000919.44	223.50	15" R.C.P. (inv)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1097	781529.70	2001036.19	219.45	15" R.C.P. (inv)	
1098	781522.42	2001048.61	219.32	15" R.C.P. (inv)	
1099	781490.85	2001103.07	219.16	Ditch (top)	
1100	781487.21	2001100.88	220.07	Ditch (top)	
1101	781488.30	2001104.00	218.87	Ditch (cl)	
1102	781467.53	2001137.80	218.61	Ditch (cl)	
1103	781464.52	2001137.74	220.55	Ditch (top)	
1104	781469.19	2001140.17	219.32	Ditch (top)	
1105	781457.74	2001150.47	219.97	Ditch (top)	
1106	781461.19	2001152.81	219.45	Ditch (top)	
1107	781458.52	2001152.50	218.74	Ditch (cl)	
1108	781436.78	2001189.29	218.09	Ditch (cl)	
1109	781437.78	2001191.41	219.22	Ditch (top)	
1110	781433.27	2001189.09	220.34	Ditch (top)	
1111	781420.74	2001212.37	219.88	Ditch (top)	
1112	781424.78	2001215.06	219.14	Ditch (top)	
1113	781422.05	2001215.17	218.36	Ditch (cl)	
1114	781401.16	2001250.44	218.25	Ditch (cl)	
1115	781399.81	2001256.88	218.96	Ditch (top)	
1116	781394.86	2001254.77	219.79	Ditch (top)	
1119	781396.36	2001462.73	207.90	Throat	
1120	781398.51	2001462.22	207.90	Throat	
1121	781397.77	2001459.46	207.87	Throat	
1122	781395.41	2001460.23	207.91	Throat	
1123	781456.96	2001338.39	210.31	Throat	
1124	781459.68	2001337.82	210.00	Throat	
1125	781458.65	2001335.20	210.34	Throat	
1128	782028.21	2000681.72	220.37	CB (grated w/ hood)	
1129	782093.36	2000677.52	218.57	CB (grated)	
1130	782173.73	2000575.35	219.63	CB (grated)	
1131	781707.50	2000440.32	248.81	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1132	781692.39	2000393.04	251.28	CB (grated w/ hood)	
1133	782100.98	2000312.61	239.13	CB (grated w/ hood)	
1134	782061.84	2000288.82	240.84	CB (grated w/ hood)	
1135	782073.86	2000269.76	241.55	CB (grated w/ hood)	
1136	782105.93	2000258.37	241.49	CB (grated w/ hood)	
1137	782031.48	1999968.22	255.11	CB (grated w/ hood)	
1140	781976.69	1999986.26	254.58	12" R.C.P. (inv)	
1141	781975.92	1999940.05	254.87	18" R.C.P. (inv)	
1142	782007.70	1999930.32	254.52	15" R.C.P. (inv)	
1143	782022.40	1999936.38	254.71	15" R.C.P. (inv)	
1145	781931.84	1999779.23	257.14	15" R.C.P. (inv)	
1146	781938.65	1999798.07	257.03	15" R.C.P. (inv)	
1147	781939.19	1999805.31	256.56	15" R.C.P. (inv)	
1148	781950.26	1999847.99	255.86	15" R.C.P. (inv)	
1149	781903.35	1999696.24	257.71	18" R.C.P. (inv)	
1150	781888.31	1999623.70	261.24	CB (grated)	
1151	781914.74	1999619.27	261.51	CB (grated)	
1152	781916.29	1999619.21	260.68	Throat	
1153	782262.88	2000499.02	220.02	CB (grated)	
1154	782393.46	2000668.50	235.98	12" R.C.P. (inv)	
1155	782368.44	2000637.08	235.47	CB (grated)	
1159	782379.44	2000417.35	221.22	Storm MH	
1160	782384.55	2000420.35	220.47	Throat	
1161	782379.83	2000413.44	220.43	Throat	
1162	782396.22	2000395.96	220.35	CB (grated w/ hood)	
1163	782426.10	2000396.53	220.92	CB (grated w/ hood)	
1164	782442.40	2000209.90	232.69	CB (grated w/ hood)	
1165	782443.41	2000173.83	235.96	CB (grated w/ hood)	
1166	782452.33	2000144.83	238.98	CB (grated w/ hood)	
1167	782467.24	2000100.25	242.51	CB (grated w/ hood)	
1170	782394.13	1999856.23	257.24	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1171	782355.70	1999727.19	260.13	CB (grated)	
1172	782328.31	1999614.51	262.79	CB (Florida type)	
1173	782330.91	1999609.43	262.23	Throat	
1174	782323.42	1999616.81	262.22	Throat	
1175	782312.59	1999573.05	261.59	CB (grated)	
1176	782312.74	1999572.11	260.98	Throat	
1177	782283.23	1999576.55	259.93	18" R.C.P. (inv)	
1178	782282.11	1999576.02	260.13	15" R.C.P. (inv)	
1179	782282.80	1999567.20	260.74	15" R.C.P. (inv)	
1183	782826.38	2000248.66	223.78	CB (grated w/ hood)	
1184	782777.31	2000199.39	224.42	CB (grated w/ hood)	
1185	782766.29	2000076.84	230.53	Storm MH	
1186	782707.47	2000265.85	222.93	CB (grated w/ hood)	
1187	782721.57	2000299.12	222.86	CB (grated w/ hood)	
1188	782638.14	2000270.29	222.83	CB (grated w/ hood)	
1189	782561.95	2000305.49	223.76	CB (grated w/ hood)	
1192	782062.63	1998821.57	271.12	15" R.C.P. (inv)	
1193	782073.03	1998857.41	270.97	15" R.C.P. (inv)	
1195	782369.98	1998795.58	270.76	CB (grated w/ hood)	
1196	782379.38	1998820.15	270.56	CB (grated w/ hood)	
1197	782399.23	1998816.19	270.82	Storm MH	
1198	782534.45	1999265.06	263.56	Storm MH	
1199	782592.88	1999458.03	262.99	Storm MH	
1200	782582.94	1999460.42	262.40	CB (grated)	
1201	782615.78	1999451.69	262.33	CB (grated w/ hood)	
1202	782641.06	1999537.18	263.63	Storm MH	
1203	782674.06	1999731.27	259.34	Junction Box (under Asphalt)	
1213	783188.09	2000162.03	230.97	CB (grated w/ hood)	
1214	783150.47	2000046.93	230.80	CB (grated w/ hood)	
1215	783178.81	2000031.28	232.40	Junction Box (under Asphalt)	
1216	783175.51	2000017.29	231.44	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1218	783180.64	2000293.54	232.82	CB (grated w/ hood)	
1219	783421.84	1999496.29	255.38	CB (Florida type)	
1220	783423.77	1999495.42	254.67	Throat	
1221	783415.86	1999492.03	254.90	Throat	
1222	783448.18	1999494.11	255.15	Junction Box (under Asphalt)	
1223	783487.76	1999688.04	246.86	CB (grated w/ hood)	
1224	783513.65	1999804.29	241.08	Storm MH	
1225	783538.13	1999875.48	238.15	CB (slab top w/ mh)	
1226	783508.03	1999887.59	237.43	CB (grated w/ hood)	
1231	783613.37	1999848.26	238.58	CB (Florida type)	
1232	783615.90	1999846.03	237.87	Throat	
1233	783611.15	1999846.66	237.89	Throat	
1234	783671.45	1999824.23	239.26	CB (grated)	
1235	783675.94	1999836.11	236.79	Computed Point	
1237	783473.39	1999489.07	255.94	Calc for Sewer (Engine	
1238	783482.89	1999484.46	255.58	Throat	
1239	783471.57	1999487.07	255.35	Throat	
1240	783437.02	1999455.27	254.00	CB (grated w/ hood)	
1241	783435.73	1999439.04	254.57	CB (grated)	
1243	783767.77	1999604.06	250.19	CB (slab top w/ mh)	
1244	783750.49	1999610.33	252.71	CB (grated w/ hood)	
1245	783782.88	1999670.21	251.71	CB (grated)	
1247	783945.35	1999559.09	266.32	Storm MH	
1249	783903.66	1999366.91	268.53	CB (slab top w/ mh)	
1250	783906.57	1999368.15	267.75	Throat	
1251	783905.32	1999364.11	267.77	Throat	
1252	783801.85	1999418.34	264.05	Storm MH	
1253	783790.60	1999417.17	263.49	CB (grated w/ hood)	
1254	783798.43	1999402.37	264.75	CB (grated w/ hood)	
1255	783675.36	1999399.32	261.26	CB (grated w/ hood)	
1256	783672.37	1999389.67	261.05	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1257	783736.95	1999164.05	267.75	Storm MH	
1258	783787.51	1999033.14	266.74	CB (grated w/ hood)	
1259	783740.97	1998884.80	266.69	CB (grated w/ hood)	
1260	783695.21	1998736.73	266.52	CB (grated w/ hood)	
1261	783680.54	1998701.28	269.28	Storm MH	
1262	783682.08	1998699.11	269.25	Corner of Catch Basin	
1263	783681.78	1998703.97	269.36	Corner of Catch Basin	
1264	783668.48	1998703.15	269.17	Corner of Catch Basin	
1265	783668.44	1998698.10	268.95	Corner of Catch Basin	
1266	783670.57	1998698.18	268.33	Throat	
1267	783681.62	1998698.84	268.41	Throat	
1268	783705.44	1998721.56	269.97	Storm MH	
1269	783706.48	1998717.26	269.95	Corner of Catch Basin	
1270	783701.72	1998718.63	270.04	Corner of Catch Basin	
1271	783706.30	1998731.64	270.21	Corner of Catch Basin	
1272	783710.88	1998730.11	269.99	Corner of Catch Basin	
1273	783710.72	1998728.87	269.45	Throat	
1274	783707.51	1998719.16	269.29	Throat	
1275	783713.60	1998719.00	269.57	Storm MH	
1276	783568.19	1998711.08	267.00	CB (grated w/ hood)	
1277	783526.36	1998791.89	266.63	CB (grated)	
1278	783556.76	1998871.34	264.41	CB (grated)	
1279	783522.31	1998841.61	267.60	Storm MH	
1280	783534.08	1998878.54	266.54	CB (grated)	
1281	782930.53	1999491.46	264.78	CB (slab top w/ mh)	
1282	782930.01	1999489.20	263.67	Throat	
1283	782957.58	1999489.90	264.38	CB (slab top w/ mh)	
1284	782956.68	1999487.94	263.31	Throat	
1285	783249.74	1999476.38	257.40	CB (grated w/ hood)	
1286	783255.07	1999458.33	258.01	CB (grated w/ hood)	
1287	783282.66	1999452.53	257.72	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1288	783633.89	1999432.36	258.48	CB (grated w/ hood)	
1290	783565.32	1999371.28	255.87	CB (grated w/ hood)	
1291	783594.27	1999356.67	256.21	CB (grated w/ hood)	
1292	783603.60	1999349.86	258.11	Computed Point	
1293	783548.50	1999134.71	264.70	Computed Point	
1294	783508.13	1999074.15	264.73	CB (grated w/ hood)	
1295	783483.27	1999091.64	264.59	CB (grated w/ hood)	
1298	783441.22	1998813.64	267.28	CB (grated)	
1299	783369.07	1998723.71	268.00	CB (grated w/ hood)	
1300	783348.71	1998682.87	268.62	CB (grated w/ hood)	
1301	783018.09	1998727.93	269.49	CB (grated)	
1302	783018.02	1998728.72	268.25	15" R.C.P. (inv)	
1303	783038.57	1998748.01	268.10	15" R.C.P. (inv)	
1304	783037.37	1998748.71	269.74	Ditch (top)	
1305	783038.60	1998748.16	268.56	Ditch (cl)	
1306	783045.51	1998757.22	268.88	Ditch (cl)	
1307	783043.56	1998758.16	269.74	Ditch (top)	
1308	783049.93	1998774.95	269.80	Ditch (top)	
1309	783052.20	1998774.81	269.10	Ditch (cl)	
1310	783053.66	1998774.32	269.22	Ditch (top)	
1311	783047.52	1998755.83	269.42	Ditch (top)	
1312	783041.95	1998746.36	269.56	Ditch (top)	
1314	782695.44	1998762.35	270.06	CB (grated w/ hood)	
1315	782715.13	1998783.28	270.24	CB (slab top)	
1316	782719.10	1998789.51	268.56	15" R.C.P. (inv)	
1317	782720.70	1998787.34	270.08	Ditch (top)	
1318	782719.20	1998789.23	268.71	Ditch (cl)	
1319	782717.07	1998790.13	270.09	Ditch (top)	
1320	782723.73	1998805.80	270.20	Ditch (top)	
1321	782726.74	1998805.75	269.11	Ditch (cl)	
1322	782729.40	1998804.47	269.65	Ditch (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1337	780566.13	2002060.27	199.46	Junction Box (under Asphalt)	
1338	780532.53	2002110.35	199.59	Junction Box (under Asphalt)	
1339	780512.86	2002098.13	198.86	Underground Pipe Junction	
1340	780514.78	2002049.04	196.51	18" R.C.P. (inv)	
1341	780507.86	2002049.80	197.83	Swale (cl)	
1342	780491.06	2002045.90	198.95	Swale (cl)	
1343	780454.56	2002028.12	199.98	Swale (cl)	
1344	780414.69	2002009.22	201.82	Swale (cl)	
1345	780413.90	2002001.08	204.58	Swale (top)	
1346	780407.88	2002004.73	202.91	Swale (top)	
1347	780412.81	2002012.94	201.67	Swale (top)	
1348	780436.67	2002025.85	200.94	Swale (top)	
1349	780471.40	2002041.92	200.01	Swale (top)	
1350	780503.81	2002053.58	199.19	Swale (top)	
1351	780516.05	2002052.70	199.16	Swale (top)	
1352	780518.08	2002048.31	199.14	Swale (top)	
1353	780509.70	2002043.28	201.98	Swale (top)	
1354	780487.57	2002032.03	203.33	Swale (top)	
1355	780453.25	2002017.04	204.52	Swale (top)	
1358	780391.24	2001994.98	201.42	18" R.C.P. (inv)	
1359	780389.86	2001996.16	202.87	Swale (top)	
1360	780394.18	2001994.90	203.35	Swale (top)	
1361	780395.62	2001986.47	205.86	Swale (top)	
1362	780387.55	2001984.78	204.83	Swale (top)	
1363	780380.12	2001981.19	203.82	Swale (top)*/647	
1364	780365.25	2002026.06	200.45	18" R.C.P. (inv)	
1365	780364.95	2002031.88	203.32	Ditch (top)	
1366	780370.67	2002025.56	203.31	Ditch (top)	
1367	780350.79	2001997.16	203.83	Ditch (top)	
1368	780346.72	2001999.06	202.73	Ditch (cl)	
1369	780341.45	2002001.47	204.50	Ditch (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1370	780329.49	2001973.01	205.62	Ditch (top)	
1371	780337.30	2001971.40	204.21	Ditch (cl)	
1372	780341.93	2001969.60	204.98	Ditch (top)	
1373	780328.11	2001906.67	206.68	Ditch (top)	
1374	780323.41	2001907.04	205.74	Ditch (cl)	
1375	780317.94	2001907.80	208.07	Ditch (top)	
1376	780310.93	2001849.54	209.74	Ditch (top)	
1377	780316.10	2001848.96	207.74	Ditch (cl)	
1378	780321.00	2001848.61	208.33	Ditch (top)	
1379	780314.00	2001792.51	209.66	Ditch (top)	
1380	780309.02	2001791.49	209.18	Ditch (cl)	
1381	780301.87	2001790.84	211.10	Ditch (top)	
1382	780299.70	2001730.56	212.46	Ditch (top)	
1383	780304.93	2001729.22	211.10	Ditch (cl)	
1384	780313.90	2001730.07	212.10	Ditch (top)	
1385	780321.52	2001680.05	213.36	Ditch (top)	
1386	780316.87	2001676.36	212.66	Ditch (cl)	
1387	780310.86	2001674.14	215.07	Ditch (top)	
1400	780396.35	2001538.51	217.40	Swale (top)	
1401	780394.31	2001537.08	216.94	Swale (cl)	
1402	780385.21	2001531.88	220.15	Swale (top)	
1403	780410.00	2001488.07	221.71	Swale (top)	
1404	780417.85	2001493.04	219.41	Swale (cl)	
1405	780423.00	2001497.53	220.10	Swale (top)	
1406	780453.84	2001453.28	221.83	Swale (top)	
1407	780447.81	2001450.25	221.04	Swale (cl)	
1408	780439.41	2001444.55	223.60	Swale (top)	
1409	780467.31	2001395.68	226.74	Swale (top)	
1410	780476.58	2001401.33	223.47	Swale (cl)	
1411	780486.25	2001405.97	224.28	Swale (top)	
1412	780500.86	2001387.83	225.38	Swale (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1413	780493.40	2001375.58	224.57	Swale (top)	
1414	780482.70	2001369.10	224.49	Swale (top)	
1415	780493.29	2001348.81	224.75	Swale (top)	
1416	780507.39	2001352.56	224.98	Swale (cl)	
1417	780522.04	2001349.93	226.51	Swale (top)	
1418	780550.65	2001304.19	228.51	Swale (top)	
1419	780542.28	2001297.11	227.19	Swale (cl)	
1420	780534.63	2001290.19	228.71	Swale (top)	
1421	780568.45	2001237.06	231.19	Swale (top)	
1422	780575.22	2001240.38	229.97	Swale (cl)	
1423	780583.21	2001243.69	231.06	Swale (top)	
1424	780616.37	2001192.10	233.85	Swale (top)	
1425	780609.43	2001187.36	232.56	Swale (cl)	
1426	780603.35	2001182.88	233.26	Swale (top)	
1427	780638.98	2001129.77	235.65	Swale (top)	
1428	780642.73	2001132.43	235.22	Swale (cl)	
1429	780649.41	2001135.93	236.32	Swale (top)	
1430	780682.97	2001084.64	239.17	Swale (top)	
1431	780675.85	2001079.81	237.93	Swale (cl)	
1432	780671.62	2001076.85	238.64	Swale (top)	
1433	780702.05	2001029.83	240.89	Swale (top)	
1434	780705.76	2001031.68	240.13	Swale (cl)	
1435	780712.86	2001034.08	241.18	Swale (top)	
1436	780745.02	2000984.40	243.51	Swale (top)	
1437	780738.77	2000980.21	242.52	Swale (cl)	
1438	780728.84	2000974.62	243.59	Swale (top)	
1439	780759.88	2000935.35	244.76	Swale (top)	
1440	780762.63	2000937.48	244.51	Swale (cl)	
1441	780775.20	2000948.52	245.89	Swale (top)	
1442	780806.30	2000897.26	247.47	Swale (top)	
1443	780792.36	2000888.79	245.79	Swale (cl)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1444	780789.64	2000887.43	246.14	Swale (top)	
1445	780819.09	2000839.93	247.29	Swale (top)	
1446	780821.23	2000841.12	247.07	Swale (cl)	
1447	780835.03	2000849.39	248.40	Swale (top)	
1449	780553.25	2001379.34	226.04	15" R.C.P. (inv)	
1450	780562.99	2001389.32	226.18	15" R.C.P. (inv)	
1451	780546.72	2001392.14	227.28	Junction Box (under Asphalt)+/-	
1452	780532.41	2001414.27	224.42	15" R.C.P. (inv)	
1455	781672.96	2000213.55	253.10	15" R.C.P. (inv)	
1456	781669.09	2000213.69	254.73	Ditch (top)	
1457	781672.93	2000215.61	255.04	Ditch (top)	
1458	781676.11	2000213.11	255.33	Ditch (top)	
1459	781668.60	2000186.16	255.86	Ditch (top)	
1460	781664.14	2000185.12	254.78	Ditch (top)	
1461	781661.48	2000187.83	254.62	Ditch (top)	
1462	781664.25	2000187.62	252.93	15" R.C.P. (inv)	
1463	781662.10	2000178.35	253.00	15" R.C.P. (inv)	
1464	781665.01	2000176.71	255.34	Ditch (top)	
1465	781662.53	2000180.81	254.86	Ditch (top)	
1466	781657.61	2000177.95	254.64	Ditch (top)	
1467	781645.29	2000135.76	254.28	Ditch (top)	
1468	781647.36	2000133.55	252.88	Ditch (cl)	
1469	781651.55	2000132.32	254.82	Ditch (top)	
1470	781641.96	2000094.64	254.66	Ditch (top)	
1472	781638.59	2000088.00	254.99	Ditch (top)	
1473	781634.60	2000096.66	255.02	Ditch (top)	
1474	781638.12	2000093.41	253.48	15" R.C.P. (inv)	
1475	781634.08	2000052.64	253.81	15" R.C.P. (inv)	
1479	781879.67	2000828.64	217.80	R.C.P. (top)	
1480	781885.31	2000836.59	217.60	R.C.P. (top)	
1481	781872.07	2000832.15	218.13	R.C.P. (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1482	781855.27	2000821.44	219.11	R.C.P. (top)	
1483	781841.57	2000801.50	220.66	R.C.P. (top)	
1484	781672.96	2000213.55	253.10	R.C.P. (top)	
1486	781983.39	2000753.08	216.55	CB (grated)	
1488	782045.81	2000709.01	218.71	R.C.P. (top)	
1489	782182.97	2000563.20	220.09	R.C.P. (top)	
1491	782087.82	2000209.02	245.43	VCP (top)	
1492	782104.26	2000196.98	247.19	VCP (top)	
1493	782023.84	1999980.65	255.28	Junction Box (under Asphalt)	
1494	781998.33	1999996.89	254.67	Junction Box (under Asphalt)	
1495	782014.13	1999950.62	256.24	R.C.P. (top)	
1497	782321.18	1999621.01	262.15	R.C.P. (top)	
1498	782320.26	1999622.58	262.13	Junction Box (under Asphalt)	
1499	782320.33	1999624.66	262.07	R.C.P. (top)	
1500	782314.76	1999571.38	261.76	Swale (top)	
1501	782307.67	1999552.25	261.93	Swale (top)	
1502	782297.42	1999522.39	262.09	Swale (top)	
1503	782294.85	1999522.99	261.77	Swale (cl)	
1504	782301.83	1999545.04	261.66	Swale (cl)	
1505	782312.61	1999571.17	261.13	Swale (cl)	
1506	782310.04	1999571.92	262.01	Swale (top)	
1507	782303.35	1999552.71	261.70	Swale (top)	
1508	782285.19	1999567.08	262.19	Ditch (top)	
1509	782284.47	1999563.56	261.87	Ditch (top)	
1510	782280.79	1999564.13	261.71	Ditch (top)	
1511	782281.36	1999567.15	261.85	Ditch (top)	
1512	782282.72	1999565.22	260.63	Ditch (cl)	
1513	782283.10	1999567.22	260.74	Ditch (cl)	
1514	782283.13	1999574.82	261.64	Ditch (top)	
1515	782283.80	1999577.79	261.78	Ditch (top)	
1516	782280.16	1999579.24	262.22	Ditch (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1517	782279.16	1999574.91	261.59	Ditch (top)	
1518	782281.01	1999576.15	260.09	Ditch (cl)	
1519	782283.05	1999575.82	259.99	Ditch (cl)	
1520	782281.13	1999573.84	261.88	Swale (top)	
1521	782229.59	1999580.35	261.64	Swale (top)	
1522	782175.04	1999587.39	262.06	Swale (top)	
1523	782120.93	1999593.22	262.02	Swale (top)	
1524	782062.69	1999599.42	261.83	Swale (top)	
1525	782062.53	1999601.90	261.71	Swale (cl)	
1526	782114.10	1999596.49	261.70	Swale (cl)	
1527	782169.11	1999590.04	261.76	Swale (cl)	
1528	782222.05	1999584.34	261.66	Swale (cl)	
1529	782278.06	1999576.83	261.40	Swale (cl)	
1530	782279.66	1999579.55	262.28	Swale (top)	
1531	782219.40	1999588.89	262.03	Swale (top)	
1532	782174.99	1999593.18	261.98	Swale (top)	
1533	782120.69	1999598.32	261.82	Swale (top)	
1534	782067.43	1999603.95	261.81	Swale (top)	
1542	782306.27	1999573.83	262.37	Junction Box (under Asphalt)	
1543	782462.57	2000161.04	237.11	Junction Box (under Asphalt)	
1544	782462.66	2000181.09	235.34	Junction Box (under Asphalt)	
1545	782479.85	2000242.63	228.84	Junction Box (under Asphalt)	
1546	782591.18	2000293.89	223.90	Junction Box (under Asphalt)	
1547	782598.93	2000290.21	223.80	R.C.P. (top)	
1548	782449.08	2000375.50	222.79	Storm Cleanout	
1551	782809.89	2000192.30	224.76	R.C.P. (top)	
1552	782808.96	2000188.54	224.80	R.C.P. (top)	
1554	783180.58	2000293.81	232.95	CB (grated w/ hood)	
1556	782029.95	2000003.99	254.17	Storm MH	
1559	783345.25	1999961.60	234.52	CB (grated)	
1564	780497.96	2002691.76	186.56	48" R.C.P. (inv)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1565	780495.32	2002687.23	184.81	48" R.C.P. (inv)	
1566	780493.11	2002682.04	185.04	48" R.C.P. (inv)	
1567	780493.69	2002649.03	190.29	15" R.C.P. (inv)	
1568	780615.08	2002697.05	190.33	CB (grated w/ hood)	
1569	780608.90	2002682.87	190.43	CB (grated w/ hood)	
1570	780603.50	2002669.50	190.55	CB (grated w/ hood)	
1571	780598.74	2002655.64	190.75	CB (grated w/ hood)	
1572	780596.37	2002648.98	192.14	R.C.P. (top)	
1573	780586.57	2002643.13	191.84	CB (grated)	
1574	780642.36	2002623.25	192.34	CB (grated)	
1575	780698.07	2002601.44	192.76	CB (grated)	
1576	780755.34	2002582.39	192.85	CB (grated)	
1577	780812.64	2002548.11	192.27	CB (grated)	
1578	780817.64	2002560.57	193.26	R.C.P. (top)	
1579	780818.86	2002564.22	193.27	R.C.P. (top)	
1580	780821.20	2002568.37	192.86	R.C.P. (top)	
1581	780833.11	2002563.97	192.91	R.C.P. (top)	
1582	780838.71	2002578.46	191.85	CB (grated)	
1583	780870.37	2002527.38	191.87	CB (grated)	
1584	780873.46	2002535.73	192.91	R.C.P. (top)	
1586	780527.84	2002655.94	190.68	15" R.C.P. (inv)	
1587	780526.10	2002666.97	192.34	R.C.P. (top)	
1589	781174.58	2002422.72	197.79	Storm MH	
1590	781235.05	2002387.06	198.19	CB (slab top)	
1591	781233.09	2002386.55	196.96	Throat	
1592	781232.20	2002402.72	198.64	R.C.P. (top)	
1593	781259.62	2002397.50	198.52	R.C.P. (top)	
1594	781460.40	2002455.34	203.53	15" R.C.P. (inv)	
1595	781462.76	2002436.24	204.44	R.C.P. (top)	
1596	781426.76	2002450.18	202.93	15" R.C.P. (inv)	
1597	781473.74	2002441.45	203.58	15" R.C.P. (inv)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1598	781462.46	2002429.19	204.44	R.C.P. (top)	
1599	781465.41	2002410.61	203.62	Junction Box (under Asphalt)	
1600	781546.11	2002417.04	204.69	18" R.C.P. (inv)	
1601	781493.48	2002369.98	200.10	15" R.C.P. (inv)	
1602	781471.19	2002373.29	202.19	Junction Box (under Asphalt)	
1603	781462.85	2002324.36	202.20	R.C.P. (top)	
1604	781468.18	2002320.68	202.69	CB (slab top w/ mh)	
1605	781467.52	2002318.60	201.72	Throat	
1606	781470.42	2002320.23	201.74	Throat	
1607	781469.00	2002322.78	201.79	Throat	
1608	781466.07	2002321.34	201.65	Throat	
1609	781435.58	2002329.39	200.81	Throat	
1610	781437.96	2002331.19	200.79	Throat	
1611	781436.35	2002333.77	200.79	Throat	
1612	781435.77	2002331.53	201.69	CB (slab top)	
1613	781288.26	2002403.49	198.41	CB (grated w/ hood)	
1615	782590.77	2000293.02	223.84	Storm MH	
1617	781847.02	2002183.83	208.04	CB (grated w/ hood)	
1618	781755.80	2002220.12	206.54	CB (grated)	
1619	781841.08	2002276.61	211.44	CB (grated w/ hood)	
1620	781873.23	2002264.81	211.59	CB (grated w/ hood)	
1621	781873.02	2002436.74	218.89	15" R.C.P. (inv)	
1622	781860.50	2002426.48	219.74	Junction Box (under Asphalt)	
1623	781856.95	2002478.67	218.63	18" R.C.P. (inv)	
1624	781859.46	2002478.06	220.12	Ditch (top)	
1625	781854.02	2002477.35	220.59	Ditch (top)	
1626	781850.55	2002492.73	220.46	Ditch (top)	
1627	781855.93	2002493.49	220.90	Ditch (top)	
1628	781853.69	2002492.52	220.28	Ditch (cl)	
1629	781857.07	2002478.99	218.97	Ditch (cl)	
1630	781825.72	2002480.86	219.07	15" R.C.P. (inv)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1631	781827.42	2002480.71	220.33	Ditch (top)	
1632	781827.92	2002496.88	220.14	Ditch (top)	
1633	781824.43	2002496.99	220.47	Ditch (top)	
1634	781824.34	2002480.21	220.51	Ditch (top)	
1635	781825.75	2002481.28	219.19	Ditch (cl)	
1636	781826.26	2002497.24	220.18	Ditch (cl)	
1638	781841.25	2002274.70	211.58	R.C.P. (top)	
1639	781841.61	2002272.84	211.70	R.C.P. (top)	
1640	781869.42	2002245.49	211.69	R.C.P. (top)	
1641	781870.04	2002244.58	211.68	Junction Box (under Asphalt)	
1642	781870.64	2002244.41	211.63	R.C.P. (top)	
1643	781903.72	2002236.02	209.53	R.C.P. (top)	
1644	781903.72	2002236.02	209.53	15" R.C.P. (inv)	
1645	781902.64	2002233.89	210.72	Ditch (top)	
1646	781903.99	2002238.46	211.68	Ditch (top)	
1647	781917.70	2002232.50	210.83	Ditch (top)	
1648	781915.45	2002229.55	210.49	Ditch (top)	
1649	781915.31	2002231.44	210.35	Ditch (cl)	
1650	781903.54	2002236.13	209.66	Ditch (cl)	
1651	781905.52	2002210.84	209.64	Ditch (top)	
1652	781918.61	2002207.46	209.60	Ditch (top)	
1653	781918.37	2002206.68	209.47	Ditch (cl)	
1654	781918.06	2002204.68	209.78	Ditch (top)	
1655	781905.23	2002207.69	209.82	Ditch (top)	
1656	781906.34	2002209.55	208.38	Ditch (cl)	
1657	781905.82	2002209.49	208.08	15" R.C.P. (inv)	
1658	781872.73	2002216.40	210.29	R.C.P. (top)*INT	
1663	781404.43	2002738.41	216.51	18" R.C.P. (inv)	
1664	781436.27	2002743.30	216.73	15" R.C.P. (inv)	
1665	781432.57	2002788.37	218.47	15" R.C.P. (inv)	
1666	781434.52	2002776.22	219.75	R.C.P. (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1667	781443.80	2002782.64	217.89	15" R.C.P. (inv)	
1668	781442.91	2002780.58	219.79	Ditch (top)	
1669	781442.39	2002785.35	220.32	Ditch (top)	
1670	781443.56	2002782.98	218.12	Ditch (cl)	
1671	781473.06	2002784.14	219.83	Ditch (top)	
1672	781473.07	2002782.02	219.59	Ditch (cl)	
1673	781472.49	2002780.50	220.80	Ditch (top)	
1674	781456.15	2002755.86	219.39	Ditch (top)	
1675	781455.31	2002751.80	219.29	Ditch (top)	
1676	781454.75	2002754.09	219.10	Ditch (cl)	
1677	781442.64	2002752.50	217.80	Ditch (cl)	
1678	781442.94	2002750.08	219.29	Ditch (top)	
1679	781441.86	2002754.08	219.20	Ditch (top)	
1680	781442.36	2002752.15	217.72	15" R.C.P. (inv)	
1681	781435.96	2002746.32	218.68	R.C.P. (top)	
1682	781401.57	2002787.11	217.03	18" R.C.P. (inv)	
1685	780955.95	2002746.46	204.13	Ditch (top)	
1686	780956.05	2002747.52	203.93	Ditch (cl)	
1687	780956.35	2002749.52	204.34	Ditch (top)	
1688	780940.09	2002756.77	203.22	Ditch (top)	
1689	780939.09	2002755.00	202.38	Ditch (cl)	
1690	780937.87	2002753.89	204.05	Ditch (top)	
1691	780929.88	2002772.38	204.29	Ditch (top)	
1692	780931.40	2002772.52	204.43	Ditch (cl)	
1693	780933.78	2002772.79	204.59	Ditch (top)	
1694	780939.23	2002753.98	202.31	18" R.C.P. (inv)	
1695	780886.01	2002733.02	201.83	CB (slab top w/ mh)	
1700	782253.09	2002078.97	211.01	CB (grated w/ hood)	
1701	782290.17	2002075.39	211.57	CB (grated w/ hood)	
1702	782266.07	2002008.48	211.99	18" R.C.P. (inv)	
1703	782266.09	2002007.87	212.01	Ditch (cl)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1704	782269.02	2001974.97	215.24	Ditch (cl)	
1705	782266.51	2001974.72	215.67	Ditch (top)	
1706	782272.05	2001972.04	215.39	Ditch (top)	
1707	782268.90	2002010.16	214.21	Ditch (top)	
1708	782263.06	2002009.19	214.09	Ditch (top)	
1709	782294.37	2001996.21	213.97	Ditch (top)	
1710	782295.14	2001978.89	214.68	Ditch (top)	
1711	782298.43	2001978.85	214.22	Ditch (cl)	
1712	782300.33	2001978.67	214.98	Ditch (top)	
1713	782300.49	2001997.17	214.30	Ditch (top)	
1714	782297.47	2001995.30	211.85	Ditch (cl)	
1715	782297.42	2001995.31	211.89	18" R.C.P. (inv)	
1716	782306.72	2002006.09	211.81	18" R.C.P. (inv)	
1717	782306.71	2002006.08	211.85	Ditch (cl)	
1718	782305.89	2002009.19	213.81	Ditch (top)	
1719	782305.54	2002003.83	214.18	Ditch (top)	
1720	782315.06	2002003.94	213.53	Ditch (top)	
1721	782314.30	2002006.92	213.02	Ditch (cl)	
1722	782315.21	2002009.85	213.41	Ditch (top)	
1723	782297.13	2002005.91	214.22	Junction Box (under Asphalt)	
1724	782286.16	2002120.86	213.10	R.C.P. (top)	
1725	782294.64	2002129.56	214.17	R.C.P. (top)	
1726	782299.69	2002129.63	212.35	15" R.C.P. (inv)	
1727	782299.65	2002132.49	213.92	Ditch (top)	
1728	782311.47	2002131.65	213.73	Ditch (top)	
1729	782311.03	2002130.70	213.55	Ditch (cl)	
1730	782311.86	2002128.55	213.99	Ditch (top)	
1731	782298.62	2002127.22	214.28	Ditch (top)	
1732	782300.40	2002129.93	212.66	Ditch (cl)	
1733	782297.48	2002151.43	214.34	Ditch (top)	
1734	782297.91	2002155.12	214.72	Ditch (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1735	782311.27	2002154.37	214.52	Ditch (top)	
1736	782310.94	2002152.22	214.16	Ditch (cl)	
1737	782311.50	2002150.44	214.15	Ditch (top)	
1738	782298.33	2002153.44	213.32	Ditch (cl)	
1739	782298.27	2002153.45	213.14	15" R.C.P. (inv)	
1740	782284.50	2002153.67	214.79	Junction Box (under Asphalt)	
1741	782283.40	2002174.52	214.95	CB (grated w/ hood)	
1742	782249.83	2002167.70	212.85	15" R.C.P. (inv)	
1743	782249.82	2002167.69	212.89	Ditch (cl)	
1744	782252.23	2002167.21	214.23	Ditch (top)	
1745	782247.83	2002167.01	214.32	Ditch (top)	
1746	782249.50	2002181.59	215.50	Ditch (top)	
1747	782251.95	2002180.57	214.77	Ditch (cl)	
1748	782253.83	2002181.94	214.91	Ditch (top)	
1749	782259.57	2002465.99	227.47	R.C.P. (top)	
1750	782287.18	2002469.13	226.95	15" R.C.P. (inv)	
1751	782283.87	2002502.55	227.09	15" R.C.P. (inv)	
1752	782257.87	2002502.45	228.53	R.C.P. (top)	
1753	782255.63	2002520.28	227.84	15" R.C.P. (inv)	
1757	782324.43	2001562.45	232.64	CB (slab top w/ mh)	
1758	782323.90	2001560.07	231.56	Throat	
1759	782300.85	2001560.74	232.56	CB (slab top w/ mh)	
1760	782300.50	2001558.59	231.57	Throat	
1761	782297.35	2001583.25	232.72	R.C.P. (top)	
1762	782285.23	2001581.73	231.01	15" R.C.P. (inv)	
1763	782336.63	2001583.04	230.83	15" R.C.P. (inv)	
1764	782323.94	2001581.73	232.48	R.C.P. (top)	
1765	782322.01	2001606.00	232.43	R.C.P. (top)	
1766	782339.81	2001607.37	230.80	15" R.C.P. (inv)	
1767	782322.20	2001623.79	229.19	18" R.C.P. (inv)	
1768	782322.01	2001624.23	229.38	Ditch (cl)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1769	782319.78	2001623.80	230.95	Ditch (top)	
1770	782324.70	2001623.58	230.72	Ditch (top)	
1771	782321.21	2001648.28	229.61	Ditch (top)	
1772	782319.08	2001647.33	229.23	Ditch (cl)	
1773	782316.66	2001648.50	229.43	Ditch (top)	
1774	782293.86	2001625.42	229.17	18" R.C.P. (inv)	
1775	782293.76	2001625.93	229.29	Ditch (cl)	
1776	782296.07	2001625.06	230.66	Ditch (top)	
1777	782290.70	2001623.91	231.23	Ditch (top)	
1778	782290.16	2001646.98	229.75	Ditch (top)	
1779	782292.50	2001646.36	229.41	Ditch (cl)	
1780	782294.88	2001647.47	229.53	Ditch (top)	
1781	782278.87	2001603.90	230.68	15" R.C.P. (inv)	
1782	782295.22	2001605.30	232.35	R.C.P. (top)	
1786	782872.62	2001647.99	238.25	CB (grated w/ hood)	
1787	782873.11	2001628.41	238.08	CB (grated w/ hood)	
1788	782783.78	2002156.44	223.61	CB (slab top)	
1789	782783.79	2002158.80	222.57	Throat	
1790	782785.96	2002156.74	222.73	Throat	
1791	782818.85	2002133.04	223.12	CB (slab top)	
1792	782816.57	2002132.51	222.29	Throat	
1793	782818.57	2002135.15	222.14	Throat	
1794	782820.58	2002116.77	222.32	R.C.P. (top)*INT	
1795	782834.88	2002112.26	222.36	R.C.P. (top)	
1796	782845.29	2002111.33	222.31	R.C.P. (top)	
1797	782848.90	2002110.96	220.90	15" R.C.P. (inv)	
1798	782849.16	2002112.75	221.98	Swale (top)	
1799	782848.84	2002108.82	222.11	Swale (top)	
1800	782849.52	2002111.13	221.11	Swale (cl)	
1801	782865.60	2002110.30	221.93	Swale (cl)	
1802	782866.28	2002109.19	222.07	Swale (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1803	782866.39	2002112.86	222.21	Swale (top)	
1804	782862.96	2002034.33	220.79	CB (grated)	
1805	782828.19	2002040.22	220.18	CB (grated w/ hood)	
1806	782795.11	2002045.40	219.78	CB (grated w/ hood)	
1807	782823.53	2002040.06	220.66	30” R.C.P. (top)	
1808	782838.57	2001788.76	233.58	Storm MH	
1809	782850.49	2001639.97	238.64	Junction Box (under Asphalt)*MH	
1810	782848.85	2001636.83	238.69	R.C.P. (top)*INT	
1819	782251.33	2002101.57	212.26	Junction Box (under Asphalt)	
1820	782262.08	2002059.63	212.45	Junction Box (under Asphalt)	
1821	782295.35	2002041.81	213.01	Junction Box (under Asphalt)	
1822	781874.11	2002175.72	207.72	CB (grated w/ hood)	
1824	782798.06	2001998.82	221.98	R.C.P. (top)	
1825	782769.88	2001992.30	220.73	15" R.C.P. (inv)	
1826	782801.02	2001967.52	223.40	.C.P. (top)	
1827	782774.54	2001965.82	223.29	R.C.P. (top)	
1828	782801.00	2001946.15	224.43	R.C.P. (top)	
1831	782993.76	2002015.34	220.80	CB (grated)	
1833	782870.29	2001418.86	237.60	CB (grated w/ hood)	
1834	782882.53	2001276.81	237.70	CB (grated w/ hood)	
1838	782848.50	2001305.07	236.68	15" R.C.P. (inv)	
1839	782850.84	2001304.39	238.33	Ditch (top)	
1840	782846.29	2001304.13	238.17	Ditch (top)	
1841	782849.02	2001321.68	238.17	Ditch (top)	
1842	782851.92	2001321.19	238.11	Ditch (top)	
1843	782850.68	2001320.96	237.99	Ditch (cl)	
1844	782848.11	2001305.81	236.91	Ditch (cl)	
1845	782851.96	2001287.09	238.79	Junction Box (under Asphalt)	
1846	782852.43	2001262.34	238.94	Junction Box (under Asphalt)	
1847	782853.87	2001248.35	237.09	15" R.C.P. (inv)	
1848	782854.72	2001249.07	238.64	Headwall (edge)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1849	782854.74	2001248.66	238.66	Headwall (edge)	
1850	782852.11	2001248.45	238.74	Headwall (edge)	
1851	782852.14	2001248.80	238.77	Headwall (edge)	
1852	782851.78	2001248.64	238.77	Ditch (top)	
1853	782856.06	2001249.17	238.63	Ditch (top)	
1854	782860.07	2001232.71	238.58	Ditch (top)	
1855	782856.66	2001232.80	238.91	Ditch (top)	
1856	782859.03	2001233.69	238.57	Ditch (cl)	
1857	782854.21	2001247.65	237.69	Ditch (cl)	
1858	782828.04	2001258.92	236.21	15" R.C.P. (inv)	
1859	782828.48	2001256.48	238.24	Ditch (top)	
1860	782828.33	2001261.53	238.03	Ditch (top)	
1861	782790.57	2001259.90	237.42	Ditch (top)	
1862	782790.46	2001256.45	237.90	Ditch (top)	
1863	782791.24	2001259.08	237.41	Ditch (cl)	
1864	782827.95	2001258.92	236.37	Ditch (cl)	
1865	782794.83	2001284.92	236.32	15" R.C.P. (inv)	
1866	782794.92	2001287.20	237.69	Ditch (top)	
1867	782795.24	2001282.24	237.53	Ditch (top)	
1868	782787.48	2001281.53	237.28	Ditch (top)	
1869	782786.58	2001286.88	237.76	Ditch (top)	
1870	782787.70	2001283.81	236.94	Ditch (cl)	
1871	782793.76	2001284.79	236.57	Ditch (cl)	
1875	782940.72	2001088.31	240.46	CB (Florida type)	
1876	782940.87	2001085.67	239.63	Throat	
1877	782887.37	2001025.65	240.94	CB (grated w/ hood)	
1878	782893.52	2000940.05	242.62	Junction Box (under Asphalt)	
1879	782897.51	2000918.57	242.34	CB (grated)	
1880	782877.11	2000888.26	241.45	15" R.C.P. (inv)	
1881	782864.26	2000936.71	242.28	CB (grated w/ hood)	
1885	782913.54	2001083.68	240.41	Junction Box (under Asphalt)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1886	782971.34	2001063.16	240.78	Storm MH	
1887	782995.64	2001065.71	239.00	18" R.C.P. (inv)	
1888	782995.45	2001063.16	240.60	Ditch (top)	
1889	782994.86	2001067.66	240.64	Ditch (top)	
1890	783010.41	2001069.05	240.72	Ditch (top)	
1891	783010.88	2001064.75	240.73	Ditch (top)	
1892	783010.67	2001067.02	240.46	Ditch (cl)	
1893	782996.68	2001065.74	239.14	Ditch (cl)	
1895	782717.16	2000922.88	240.99	18" R.C.P. (inv)	
1896	782715.63	2000922.86	242.29	CB (grated)	
1899	783547.38	1999133.29	264.73	R.C.P. (top)	
1900	783530.66	1999075.17	266.27	R.C.P. (top)	
1901	783524.00	1999067.81	266.28	R.C.P. (top)	
1902	783508.13	1999074.15	264.73	R.C.P. (top)	
1903	783586.72	1999439.76	257.79	Storm MH (Covered)	
1905	783407.37	1998833.41	267.55	R.C.P. (top)	
1906	783263.66	1999474.02	258.12	R.C.P. (top)	
1907	783286.78	1999470.85	257.56	R.C.P. (top)	
1908	782980.67	1999507.25	264.10	Storm MH (Covered)	
1910	783431.56	1999529.27	253.43	Junction Box (under Asphalt)	
1911	783421.73	1999493.38	254.73	R.C.P. (top)	
1912	782638.18	1999539.02	263.69	R.C.P. (top)	
1913	782602.23	1999543.47	262.58	15" R.C.P. (inv)	
1914	782368.50	2000630.74	235.26	R.C.P. (top)	
1915	782569.88	2000638.67	240.62	15" R.C.P. (inv)	
1916	783154.98	2000552.25	245.66	CB (grated w/ hood)	
1917	783179.76	2000650.21	246.41	CB (grated w/ hood)	
1918	782892.99	2001084.62	240.47	Storm MH (Covered)	
1919	780992.30	2002251.86	202.94	CB (grated w/ hood)	
1920	780965.10	2002241.10	202.60	CB (grated)	
1921	780954.36	2002280.23	203.04	Storm MH (Covered)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1923	781797.01	2001637.89	227.99	15" R.C.P. (inv)	
1924	781754.50	2001667.78	227.35	15" R.C.P. (top)*F	
1926	783207.72	2002151.47	225.67	18" R.C.P. (inv)	
1927	783207.75	2002151.47	225.97	Ditch (cl)	
1928	783205.34	2002150.28	227.46	Ditch (top)	
1929	783209.81	2002150.62	227.45	Ditch (top)	
1930	783207.76	2002172.54	227.99	Ditch (top)	
1931	783203.52	2002171.09	227.85	Ditch (top)	
1932	783206.82	2002169.74	227.31	Ditch (cl)	
1933	783208.97	2002137.20	227.14	Junction Box (under Asphalt)	
1934	783222.42	2002137.26	225.34	15" R.C.P. (inv)	
1935	783222.10	2002137.58	225.51	Ditch (cl)	
1936	783221.54	2002135.67	226.89	Ditch (top)	
1937	783221.73	2002140.04	226.93	Ditch (top)	
1938	783236.59	2002139.52	226.99	Ditch (top)	
1939	783235.31	2002137.31	226.56	Ditch (cl)	
1940	783237.10	2002134.82	226.72	Ditch (top)	
1941	783223.39	2002111.83	225.15	15" R.C.P. (inv)	
1942	783223.52	2002111.66	225.43	Ditch (cl)	
1943	783222.94	2002109.88	226.70	Ditch (top)	
1944	783222.04	2002113.95	226.65	Ditch (top)	
1945	783238.35	2002116.34	226.47	Ditch (top)	
1946	783238.05	2002114.86	226.28	Ditch (cl)	
1947	783239.48	2002112.21	226.71	Ditch (top)	
1948	783211.17	2002105.11	226.61	Junction Box (under Asphalt)	
1949	783218.92	2002004.95	222.91	CB (grated w/ hood)	
1950	783194.05	2002004.18	223.05	CB (grated w/ hood)	
1951	783224.62	2001938.65	226.16	CB (grated w/ hood)	
1953	782981.33	1999504.36	264.69	Storm MH	
1955	783676.14	1999837.79	237.37	CB (grated)	
1956	781163.22	2002378.70	198.32	R.C.P. (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1957	781178.24	2002406.75	198.27	R.C.P. (top)	
1958	781178.88	2002423.43	197.96	R.C.P. (top)	
1959	781201.22	2002426.17	198.52	R.C.P. (top)	
1960	781270.60	2002431.24	199.23	Junction Box (under Asphalt)	
1962	783282.89	2002014.90	223.04	CB (grated)	
1963	783372.15	2002029.52	223.41	CB (grated)	
1966	783436.47	2002003.96	224.16	CB (grated)	
1969	783588.21	2001843.69	226.22	CB (grated w/ hood)	
1970	783554.16	2001879.60	226.20	CB (grated w/ hood)	
1971	783534.48	2002129.63	234.03	Storm MH (Covered)	
1972	783533.55	2002159.93	234.30	CB (grated)	
1973	783532.56	2002174.64	235.16	R.C.P. (top)	
1974	783563.53	2002171.18	237.00	Ditch (top)	
1975	783557.36	2002170.31	236.02	Ditch (top)	
1976	783553.39	2002187.64	236.56	Ditch (top)	
1977	783557.27	2002188.78	237.21	Ditch (top)	
1978	783555.58	2002187.31	236.59	Ditch (cl)	
1979	783560.13	2002171.30	234.79	Ditch (cl)	
1980	783560.27	2002171.07	234.62	15" R.C.P. (inv)	
1981	783561.18	2002163.36	236.23	Junction Box (under Asphalt)	
1982	783571.47	2002164.09	234.46	15" R.C.P. (inv)	
1983	783570.47	2002165.56	236.54	Ditch (top)	
1984	783571.22	2002161.52	236.39	Ditch (top)	
1985	783578.67	2002162.07	236.35	Ditch (top)	
1986	783578.35	2002164.66	236.38	Ditch (top)	
1987	783578.00	2002163.43	236.13	Ditch (cl)	
1988	783571.36	2002164.04	234.90	Ditch (cl)	
1989	783573.57	2002137.54	235.22	CB (grated w/ hood)	
1992	783821.73	2001555.19	238.06	CB (grated)	
1993	783825.85	2001608.55	237.29	CB (grated)	
1994	783782.25	2001655.29	235.80	CB (grated)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
1995	783712.48	2001689.01	233.61	CB (Florida type)	
1996	783705.44	2001694.05	233.06	Throat	
1997	783717.41	2001694.98	232.97	Throat	
1998	783722.50	2001718.97	232.52	CB (grated w/ hood)	
1999	783715.97	2001726.04	232.77	Storm MH	
2000	783843.87	2001731.80	241.28	Storm MH	
2002	783549.04	2001660.42	237.93	CB (grated w/ hood)	
2003	783511.32	2001566.77	243.40	CB (grated w/ hood)	
2006	783496.66	2001438.80	246.87	CB (grated)	
2007	783513.10	2001418.20	247.88	CB (grated)	
2008	783512.49	2001418.27	245.99	12" HDPE (inv)	
2009	783533.83	2001389.87	247.99	CB (grated)	
2010	783512.80	2001418.40	245.89	12" HDPE (inv)	
2011	783508.06	2001260.62	249.30	CB (grated)	
2014	783622.48	2001483.96	245.96	CB (grated)	
2015	783659.14	2001480.17	242.18	CB (grated)	
2016	783673.34	2001484.73	239.62	Yard Inlet	
2017	783701.67	2001482.53	238.81	CB (grated)	
2018	783699.87	2001492.44	239.57	PVC (top)	
2019	783719.45	2001500.07	239.07	CB (grated)	
2020	783755.33	2001504.12	239.09	CB (grated)	
2022	783664.97	2001625.17	237.78	CB (slab top)	
2023	783719.21	2001609.74	237.42	Storm MH	
2024	783747.08	2001568.35	238.39	Storm MH	
2025	783834.29	2001422.55	243.25	CB (grated)	
2026	783743.92	2001419.84	246.01	CB (grated)	
2027	783836.39	2001340.77	246.17	CB (grated)	
2028	783846.66	2001312.48	245.96	CB (grated)	
2029	783736.87	2001195.26	250.44	CB (grated)	
2030	783531.57	2001226.17	249.99	CB (slab top)	
2031	783533.79	2001226.51	249.22	Throat	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2032	783854.47	2001164.98	250.64	CB (Florida type)	
2033	783856.36	2001162.55	249.88	Throat	
2034	783850.13	2001161.81	249.88	Throat	
2035	783857.38	2001127.30	251.58	CB (Florida type)	
2036	783858.76	2001130.21	250.80	Throat	
2037	783850.71	2001129.25	250.94	Throat	
2038	783888.14	2001172.21	248.93	Storm MH	
2039	783869.85	2001342.70	241.83	CB (Florida type)	
2040	783873.16	2001333.19	241.32	Throat	
2041	783872.00	2001344.75	240.77	Throat	
2042	783861.24	2001424.71	239.83	R.C.P. (top)	
2044	783658.86	2001805.97	229.24	CB (grated)	
2045	783850.15	2002017.29	249.06	CB (slab top w/ mh)	
2046	783852.12	2002019.92	248.81	Throat	
2047	783853.90	2002032.33	248.85	Throat	
2049	783860.93	2002223.44	255.21	CB (slab top w/ mh)	
2050	783862.21	2002223.33	254.82	Throat	
2051	783863.49	2002228.36	254.63	Throat	
2052	783863.47	2002320.93	256.28	Storm MH	
2054	783960.13	2002347.91	257.86	CB (grated w/ hood)	
2055	783963.07	2002324.69	257.76	CB (grated w/ hood)	
2056	783960.05	2002276.54	260.27	Storm MH	
2059	784011.77	2002254.11	260.12	CB (grated)	
2062	783932.87	2001716.79	241.63	CB (slab top w/ mh)	
2063	783933.39	2001718.44	240.90	Throat	
2064	783932.00	2001741.47	241.30	CB (grated w/ hood)	
2067	783909.48	2001770.70	242.09	CB (slab top w/ mh)	
2068	783907.64	2001770.41	241.27	Throat	
2069	783907.64	2001775.55	241.77	Throat	
2070	783917.41	2001551.01	237.11	CB (Florida type)	
2071	783914.90	2001556.11	236.36	Throat	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2072	783921.84	2001509.04	237.02	Storm MH	
2073	783915.92	2001543.43	236.61	Throat	
2074	783945.64	2001501.37	236.16	CB (grated)	
2075	783964.98	2001093.45	252.39	CB (Florida type)	
2076	783962.56	2001095.23	251.49	Throat	
2077	783963.97	2001082.05	251.68	Throat	
2078	783895.58	2001100.07	251.70	CB (Florida type)	
2079	783897.78	2001101.01	250.95	Throat	
2080	783898.55	2001095.19	251.11	Throat	
2081	783581.68	2001850.59	226.22	Junction Box (under Asphalt)	
2082	784001.50	2000771.26	257.32	Storm MH	
2083	784026.34	2000772.71	257.56	CB (slab top w/ mh)	
2084	784025.47	2000770.04	256.75	Throat	
2085	784028.45	2000770.28	256.83	Throat	
2086	784031.10	2000728.33	258.19	CB (slab top w/ mh)	
2087	784029.95	2000730.48	256.98	Throat	
2088	784037.19	2000731.42	257.05	Throat	
2089	784006.01	2000690.52	257.25	Throat	
2090	784005.30	2000696.81	257.34	Throat	
2091	783938.92	2000692.78	258.14	CB (slab top w/ mh)	
2092	783940.66	2000693.39	257.60	Throat	
2093	783942.33	2000684.50	257.52	Throat	
2095	783941.14	2000525.68	259.02	CB (slab top w/ mh)	
2096	783903.92	2000519.14	258.65	CB (slab top w/ mh)	
2097	783878.43	2000513.35	257.99	Throat	
2098	783857.83	2000511.57	258.55	CB (slab top w/ mh)	
2099	783850.01	2000437.11	258.47	CB (Florida type)	
2100	783851.33	2000437.06	257.92	Throat	
2101	783797.77	2000380.69	258.93	Storm MH	
2102	783910.35	2000402.40	258.56	CB (slab top w/ mh)	
2103	783910.14	2000403.82	257.81	Throat	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2104	783953.80	2000398.32	259.95	Storm MH	
2105	784024.50	2000535.18	258.98	Storm MH	
2106	784008.59	2000700.34	258.33	CB (slab top w/ mh)	
2107	784006.01	2000855.63	256.13	CB (grated)	
2108	783992.54	2000853.72	257.30	Junction Box (under Asphalt)	
2109	783981.94	2000954.56	255.78	Junction Box (under Asphalt)	
2110	783989.83	2000955.40	255.13	CB (grated)	
2112	783802.08	2000291.40	258.39	15" R.C.P. (inv)	
2113	783870.17	2000235.42	259.46	CB (grated)	
2114	783960.61	2000236.41	260.13	CB (grated)	
2115	783994.13	2000158.10	261.53	CB (slab top w/ mh)	
2116	783996.67	2000158.82	260.69	Throat	
2117	783996.95	2000151.77	260.75	Throat	
2118	784062.62	2000161.89	261.58	CB (slab top w/ mh)	
2119	784060.20	2000162.58	260.72	Throat	
2120	784060.55	2000156.79	260.81	Throat	
2121	784088.20	2000192.89	259.91	CB (grated w/ hood)	
2122	784085.99	2000216.91	259.99	CB (grated w/ hood)	
2123	784060.40	2000208.83	260.57	Storm MH	
2126	783875.82	1999886.09	257.52	CB (grated)	
2127	783785.09	1999882.71	251.31	CB (grated)	
2128	783758.94	1999884.54	244.37	CB (grated)	
2131	783748.86	1999826.09	241.35	CB (grated)	
2133	781179.61	2002401.65	198.44	R.C.P. (top)	
2134	781164.35	2002393.82	197.33	R.C.P. (top)	
2135	782938.87	1999512.49	264.47	Junction Box (under Asphalt)	
2136	782965.86	1999506.46	264.27	Junction Box (under Asphalt)	
2137	784267.10	1999764.60	265.46	15" R.C.P. (inv)	
2138	784246.88	1999762.52	265.30	15" R.C.P. (inv)	
2139	784169.58	1999756.61	264.61	15" R.C.P. (inv)	
2140	784151.72	1999754.97	264.52	15" R.C.P. (inv)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2141	784071.79	1999784.26	264.56	CB (slab top w/ mh)	
2142	784070.31	1999781.46	263.82	Throat	
2143	784081.78	1999782.42	264.18	Throat	
2144	784069.94	1999739.49	264.62	CB (slab top w/ mh)	
2145	784067.98	1999741.95	263.90	Throat	
2146	784079.46	1999742.71	264.07	Throat	
2147	784035.43	1999738.87	263.95	Storm MH	
2148	784045.95	1999717.81	264.74	CB (grated)	
2149	784033.55	1999712.39	264.48	CB (slab top w/ mh)	
2150	784031.26	1999714.25	263.73	Throat	
2151	784029.92	1999701.93	263.85	Throat	
2152	784011.39	1999530.55	266.88	CB (slab top w/ mh)	
2153	784008.92	1999531.88	266.05	Throat	
2154	784006.97	1999520.29	266.26	Throat	
2155	783989.82	1999523.70	266.93	Storm MH	
2156	784008.19	1999509.24	267.08	R.C.P. (top)	
2157	784038.27	1999441.10	268.21	CB (grated)	
2158	784033.75	1999394.96	269.58	CB (slab top w/ mh)	
2159	784032.03	1999392.72	268.87	Throat	
2160	784043.01	1999391.79	269.10	Throat	
2161	784031.55	1999347.39	269.68	CB (slab top w/ mh)	
2162	784029.72	1999349.94	268.97	Throat	
2163	784039.28	1999350.72	269.07	Throat	
2164	783958.86	1999319.06	268.88	CB (slab top w/ mh)	
2165	783957.34	1999321.32	268.28	Throat	
2166	783954.11	1999311.79	268.27	Throat	
2167	783919.94	1999438.79	267.24	Storm MH (Covered)	
2170	783659.54	1998645.03	268.33	CB (slab top w/ mh)	
2171	783663.29	1998648.56	268.87	Throat	
2172	783652.80	1998649.80	268.87	Throat	
2173	783676.88	1998629.04	270.16	CB (slab top w/ mh)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2174	783679.03	1998626.53	269.35	Throat	
2175	783680.00	1998630.42	269.19	Throat	
2176	783691.57	1998646.40	269.66	Storm MH	
2177	783625.73	1998480.42	269.35	CB (grated)	
2178	783530.33	1998349.87	269.01	CB (Florida type)	
2179	783537.29	1998346.78	268.39	Throat	
2180	783523.58	1998348.01	268.25	Throat	
2181	783524.86	1998321.45	269.03	CB (Florida type)	
2182	783530.45	1998322.80	268.26	Throat	
2183	783520.20	1998324.51	268.13	Throat	
2184	783531.94	1998152.99	270.17	CB (slab top w/ mh)	
2185	783534.21	1998151.04	269.43	Throat	
2186	783537.14	1998160.76	269.50	Throat	
2187	783507.92	1998073.88	270.15	CB (slab top w/ mh)	
2188	783512.32	1998079.38	269.38	Throat	
2189	783508.82	1998067.85	269.26	Throat	
2190	783481.02	1998073.13	269.26	CB (grated)	
2191	783354.97	1998136.92	269.95	CB (grated)	
2192	783462.43	1998019.31	270.37	CB (slab top w/ mh)	
2193	783463.77	1998016.55	269.60	Throat	
2194	783450.41	1998018.16	269.66	Throat	
2195	783454.10	1997975.58	270.37	CB (slab top w/ mh)	
2196	783455.80	1997977.68	269.52	Throat	
2197	783444.64	1997978.89	269.71	Throat	
2198	783468.45	1997943.05	270.26	CB (slab top w/ mh)	
2199	783471.32	1997944.16	269.65	Throat	
2200	783467.51	1997931.78	269.75	Throat	
2201	783452.18	1997943.60	270.35	CB (grated)	
2202	783404.64	1997789.04	271.22	CB (grated)	
2203	783304.77	1997784.74	271.98	CB (grated)	
2204	783270.09	1997840.96	271.21	CB (grated)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2205	783293.42	1997947.83	272.00	CB (grated)	
2206	783349.62	1997685.32	273.47	CB (slab top w/ mh)	
2207	783350.77	1997682.52	272.74	Throat	
2208	783340.77	1997683.48	273.14	Throat	
2209	783358.17	1997612.49	273.54	CB (slab top w/ mh)	
2210	783357.15	1997601.66	272.80	Throat	
2211	783361.39	1997613.20	272.73	Throat	
2212	783342.27	1997643.89	273.40	CB (slab top w/ mh)	
2214	783464.35	1997705.52	272.10	CB (slab top w/ mh)	
2215	783462.76	1997707.81	271.53	Throat	
2216	783458.90	1997697.46	271.60	Throat	
2217	783508.61	1997708.00	271.87	CB (slab top w/ mh)	
2218	783509.57	1997711.45	270.94	Throat	
2219	783518.25	1997703.01	271.08	Throat	
2220	783524.24	1997776.62	271.83	CB (slab top w/ mh)	
2221	783521.23	1997775.24	270.99	Throat	
2222	783530.15	1997766.29	271.21	Throat	
2223	783506.56	1997796.76	270.73	Storm MH	
2224	783547.01	1997924.28	270.31	CB (slab top w/ mh)	
2225	783545.22	1997926.63	269.62	Throat	
2226	783541.57	1997914.75	269.68	Throat	
2227	783571.96	1998047.33	269.99	CB (Florida type)	
2228	783567.65	1998041.59	269.29	Throat	
2229	783571.73	1998056.13	269.41	Throat	
2230	783643.70	1998168.04	268.63	CB (grated)	
2231	783737.07	1998360.93	268.30	CB (grated)	
2232	783770.51	1998332.87	268.57	Computed Point	
2233	783763.45	1998310.89	269.56	CB (Florida type)	
2234	783767.04	1998309.13	268.79	Throat	
2235	783759.78	1998308.27	268.77	Throat	
2236	783753.78	1998645.16	270.05	CB (slab top w/ mh)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2237	783751.68	1998646.89	269.32	Throat	
2238	783749.36	1998639.47	269.26	Throat	
2239	783739.30	1998656.39	269.95	Storm MH (Covered)	
2240	783779.46	1998665.49	270.93	CB (slab top w/ mh)	
2241	783777.62	1998667.64	270.20	Throat	
2242	783788.93	1998668.62	270.27	Throat	
2243	783812.12	1998712.81	270.87	CB (slab top w/ mh)	
2244	783810.95	1998710.18	270.16	Throat	
2245	783785.21	1998747.97	270.21	CB (Florida type)	
2246	783785.39	1998756.73	269.38	Throat	
2247	783781.15	1998742.79	269.46	Throat	
2248	783502.47	1997790.99	271.01	Storm MH	
2249	783831.00	1997471.71	274.83	Storm MH	
2250	783825.58	1997466.11	274.49	CB (grated w/ hood)	
2252	783379.82	1997680.36	272.42	R.C.P. (top)	
2253	783488.95	1998015.09	269.57	R.C.P. (top)	
2254	783545.61	1998020.92	270.05	Storm MH	
2255	783554.47	1998003.89	269.70	Storm MH	
2256	783639.05	1998327.65	269.73	Storm MH	
2257	783708.36	1998554.85	269.62	Storm MH	
2258	783643.07	1998475.47	269.64	R.C.P. (top)	
2259	783960.05	1999398.45	268.33	Storm MH	
2260	783972.97	1999344.97	268.43	Junction Box (under Asphalt)	
2261	783848.01	1999014.63	270.13	Storm MH (Covered) ASPH	
2262	783806.05	1998872.20	270.14	Storm MH	
2263	783820.10	1998728.98	270.73	CB (grated)	
2264	783618.95	1998178.20	269.61	CB (grated)	
2314	783591.98	1998304.58	269.92	R.C.P. (top)	
2315	783604.29	1998348.81	269.83	R.C.P. (top)	
2323	780950.33	2002283.66	202.91	Storm MH	
2356	783918.36	2001743.42	241.04	Junction Box (under Asphalt)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
2357	783916.63	2001713.20	240.30	Junction Box (under Asphalt)	
2358	783936.56	2001492.21	237.13	R.C.P. (top)	
2359	782590.70	1999541.54	261.83	15" R.C.P. (inv)	
2360	783946.51	1999336.96	268.99	Storm MH (Covered)	
5001	784495.30	1999159.50	270.93	CB (Florida type)	
5002	784497.20	1999165.64	270.17	Throat	
5003	784498.72	1999111.96	270.97	Storm MH	
5004	784473.76	1999090.82	270.14	CB (slab top w/ mh)	
5005	784471.80	1999089.96	269.11	Throat	
5006	784474.50	1999088.79	268.90	Throat	
5007	784477.86	1999061.00	269.88	CB (grated)	
5008	784476.84	1999060.66	269.47	CB (grated) (Throat)	
5009	784505.25	1999036.56	270.21	CB (Florida type)	
5010	784508.22	1999027.49	269.28	Throat	
5011	784507.38	1999037.75	269.33	Throat	
5012	784536.22	1999042.77	268.86	CB (grated)	
5013	784533.45	1999097.50	268.93	CB (grated)	
5018	784508.37	1999024.54	270.11	Corner of Catch Basin	
5019	784504.03	1999024.09	270.07	Corner of Catch Basin	
5020	784502.74	1999038.22	270.23	Corner of Catch Basin	
5021	784507.17	1999038.56	270.22	Corner of Catch Basin	
5026	784448.56	1999165.32	271.87	CB (grated)	
5027	784388.12	1999160.81	272.09	CB (grated)	
5032	784497.06	1999166.64	270.94	Corner of Catch Basin	
5033	784492.69	1999166.31	270.95	Corner of Catch Basin	
5034	784493.56	1999154.54	270.93	Corner of Catch Basin	
5035	784497.98	1999154.91	270.93	Corner of Catch Basin	
5036	784497.81	1999156.89	270.23	Throat	
5040	784387.84	1999213.84	272.74	Storm MH	
5050	784718.13	1999033.65	266.77	12" R.C.P. (inv)	
5054	784557.10	1998763.23	272.51	Storm MH	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5055	784508.58	1998759.04	272.93	CB (grated)	
5056	784507.42	1998758.81	272.45	Throat	
5057	784509.12	1998732.02	272.42	Throat	
5058	784510.18	1998732.11	272.82	CB (grated)	
5059	784531.74	1998704.89	273.52	CB (Florida type)	
5060	784533.98	1998707.34	273.49	Corner of Catch Basin	
5061	784529.55	1998706.86	273.53	Corner of Catch Basin	
5062	784530.75	1998692.66	273.65	Corner of Catch Basin	
5063	784535.10	1998693.06	273.60	Corner of Catch Basin	
5064	784535.15	1998694.26	273.03	Throat	
5065	784534.18	1998706.62	272.59	Throat	
5069	784953.47	1998750.62	268.64	CB (grated w/ hood)	
5070	784919.70	1998748.05	268.62	CB (grated w/ hood)	
5071	784900.24	1998764.36	268.25	CB (grated w/ hood)	
5072	784897.88	1998790.47	268.26	CB (grated w/ hood)	
5073	784891.27	1998789.63	268.66	Storm MH	
5074	784910.70	1998858.28	267.70	CB (grated w/ hood)	
5075	784944.62	1998860.88	267.73	CB (grated w/ hood)	
5076	784936.50	1998860.27	268.25	Storm MH	
5077	784926.44	1998923.39	268.54	Storm MH	
5097	784886.72	1999417.75	273.17	Storm MH	
5098	784845.06	1999421.42	272.63	CB (grated w/ hood)	
5099	784842.43	1999447.16	273.38	CB (grated w/ hood)	
5100	784861.20	1999469.91	274.26	CB (grated w/ hood)	
5101	784895.04	1999472.70	274.13	CB (grated w/ hood)	
5102	784916.86	1999453.35	273.10	CB (grated w/ hood)	
5103	784919.14	1999427.50	273.31	CB (grated w/ hood)	
5104	784878.12	1999516.54	276.77	Storm MH	
5105	784779.42	1999709.24	275.60	Storm MH	
5109	784759.32	1999785.83	273.90	Storm MH	
5110	784766.57	1999786.00	273.45	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5111	784783.13	1999805.55	273.35	CB (grated w/ hood)	
5112	784780.70	1999833.63	273.33	CB (grated w/ hood)	
5113	784732.78	1999783.07	273.16	CB (grated w/ hood)	
5120	785280.24	1999449.71	278.00	Storm MH	
5121	785274.77	1999496.14	278.78	CB (grated w/ hood)	
5122	785308.40	1999498.54	279.15	CB (grated w/ hood)	
5123	785329.67	1999486.55	278.83	CB (grated w/ hood)	
5124	785331.34	1999460.74	278.79	CB (grated w/ hood)	
5128	785285.59	1998821.63	266.93	CB (grated w/ hood)	
5129	785287.64	1998795.66	266.95	CB (grated w/ hood)	
5130	785342.00	1998825.94	268.43	Storm MH	
5131	785326.99	1998846.64	267.38	CB (grated w/ hood)	
5132	785360.85	1998849.32	267.39	CB (grated w/ hood)	
5133	785369.58	1998742.24	266.82	CB (grated w/ hood)	
5134	785335.82	1998738.06	266.97	CB (grated w/ hood)	
5135	785347.01	1998742.99	267.90	Junction Box (under Asphalt)	
5136	785377.34	1998868.42	269.07	30" R.C.P. (top)	
5137	785308.49	1998871.43	266.67	30" R.C.P. (top)	
5144	785562.82	1998843.70	271.32	Storm MH	
5145	785619.54	1998857.00	273.00	Storm MH	
5150	785188.27	1998880.96	268.09	30" R.C.P. (top)	
5151	785134.78	1998883.52	268.46	30" R.C.P. (top)	
5152	785133.75	1998897.29	267.41	15" R.C.P. (inv)	
5153	785104.29	1998884.96	267.82	30" R.C.P. (top)	
5157	785754.63	1998853.34	275.97	Storm MH	
5158	785740.99	1998872.39	275.01	CB (grated w/ hood)	
5159	785774.51	1998875.53	274.92	CB (grated w/ hood)	
5160	785798.15	1998862.84	276.01	CB (grated w/ hood)	
5161	785800.51	1998836.94	276.53	CB (grated w/ hood)	
5162	785778.91	1998820.77	275.57	CB (grated w/ hood)	
5163	785745.18	1998817.52	275.48	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5164	785708.28	1998854.20	275.16	Junction Box (under Asphalt)	
5168	785702.85	1999501.79	279.57	Storm MH	
5169	785687.33	1999530.50	278.84	CB (grated w/ hood)	
5170	785721.41	1999533.31	278.89	CB (grated w/ hood)	
5171	785743.10	1999520.31	279.24	CB (grated w/ hood)	
5172	785745.27	1999494.29	279.23	CB (grated w/ hood)	
5176	786136.23	1998863.79	279.93	CB (grated w/ hood)	
5177	786134.35	1998882.92	280.44	Storm MH	
5178	786133.95	1998889.70	279.89	CB (grated w/ hood)	
5179	786156.11	1998904.65	279.64	CB (grated w/ hood)	
5180	786184.13	1998906.40	279.55	CB (grated w/ hood)	
5181	786209.09	1998895.79	280.15	CB (grated w/ hood)	
5182	786210.16	1998869.72	280.22	CB (grated w/ hood)	
5183	786188.32	1998854.17	279.88	CB (grated w/ hood)	
5184	786160.29	1998853.20	279.74	CB (grated w/ hood)	
5185	786180.59	1998887.96	280.52	Storm MH	
5188	786151.78	1999214.88	280.33	Storm MH	
5189	786145.30	1999288.25	280.15	Storm MH	
5190	786124.95	1999292.37	279.48	CB (grated w/ hood)	
5191	786156.06	1999294.92	280.15	CB (Florida type)	
5192	786154.14	1999292.58	280.07	Corner of Catch Basin	
5193	786159.08	1999293.18	280.33	Corner of Catch Basin	
5194	786158.83	1999297.16	280.17	Corner of Catch Basin	
5195	786153.77	1999296.86	280.03	Corner of Catch Basin	
5196	786153.77	1999296.01	279.34	Throat	
5197	786153.93	1999293.50	279.29	Throat	
5200	786124.50	1999526.72	281.09	Storm MH	
5201	786157.22	1999527.36	280.40	CB (grated w/ hood)	
5202	786155.76	1999553.48	280.55	CB (grated w/ hood)	
5205	786125.93	1999908.78	278.78	CB (grated w/ hood)	
5206	786104.94	1999891.43	278.53	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5207	786092.69	1999891.48	279.20	Storm MH	
5208	786076.95	1999889.15	278.53	CB (grated w/ hood)	
5209	786053.44	1999903.05	278.29	CB (grated w/ hood)	
5210	786067.60	1999932.35	278.24	CB (grated w/ hood)	
5211	785967.75	1999924.37	278.72	CB (grated w/ hood)	
5215	785801.19	1998121.01	281.36	CB (grated w/ hood)	
5216	785835.34	1998123.74	281.52	CB (grated w/ hood)	
5217	785853.23	1998149.79	281.38	CB (grated w/ hood)	
5218	785850.47	1998183.81	281.36	CB (grated w/ hood)	
5219	785806.84	1998185.31	281.87	Storm MH	
5220	785570.37	1998161.25	280.35	CB (grated w/ hood)	
5221	785573.12	1998127.19	280.29	CB (grated w/ hood)	
5224	784175.46	2001330.05	239.61	CB (Florida type)	
5225	784186.92	2001328.24	239.42	Corner of Catch Basin	
5226	784186.60	2001332.78	239.59	Corner of Catch Basin	
5227	784163.75	2001331.49	239.64	Corner of Catch Basin	
5228	784164.04	2001326.70	239.58	Corner of Catch Basin	
5229	784164.18	2001326.54	239.15	Throat	
5230	784175.51	2001327.25	238.93	Throat	
5231	784186.59	2001327.90	238.95	Throat	
5232	784180.57	2001301.98	239.23	Throat	
5233	784169.78	2001301.15	239.30	Throat	
5234	784159.52	2001300.41	239.52	Throat	
5235	784159.47	2001300.14	240.04	Corner of Catch Basin	
5236	784167.73	2001295.98	239.87	Corner of Catch Basin	
5237	784172.19	2001296.15	239.88	Corner of Catch Basin	
5238	784180.59	2001301.73	239.73	Corner of Catch Basin	
5239	784169.88	2001298.27	239.91	CB (Florida type)	
5240	784149.66	2001340.89	239.78	CB (Florida type)	
5241	784147.22	2001338.65	239.76	Corner of Catch Basin	
5242	784152.09	2001338.94	239.82	Corner of Catch Basin	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5243	784151.47	2001343.05	239.78	Corner of Catch Basin	
5244	784146.00	2001349.72	239.59	Corner of Catch Basin	
5245	784145.73	2001349.65	239.12	Throat	
5246	784146.95	2001339.33	239.19	Throat	
5247	784141.56	2001323.91	239.62	Junction Box (under Asphalt)	
5248	784118.40	2001341.18	238.54	Throat	
5249	784117.61	2001350.32	238.69	Throat	
5250	784117.50	2001350.40	239.19	Corner of Catch Basin	
5251	784113.34	2001343.81	239.13	Corner of Catch Basin	
5252	784114.01	2001339.89	239.15	Corner of Catch Basin	
5253	784118.24	2001340.35	239.19	Corner of Catch Basin	
5254	784115.56	2001342.26	239.18	CB (Florida type)	
5255	784078.55	2001323.82	238.55	CB (Florida type)	
5256	784090.12	2001321.97	238.64	Corner of Catch Basin	
5257	784089.90	2001326.99	238.69	Corner of Catch Basin	
5258	784067.16	2001325.58	238.54	Corner of Catch Basin	
5259	784067.29	2001320.65	238.46	Corner of Catch Basin	
5260	784067.59	2001320.49	237.99	Throat	
5261	784078.84	2001321.13	237.81	Throat	
5262	784089.98	2001321.81	238.11	Throat	
5263	784072.20	2001296.00	238.07	CB (grated w/ hood)	
5264	784126.68	2001275.79	237.06	15" R.C.P. (inv)	
5265	784137.53	2001272.33	239.87	Storm MH	
5266	784154.99	2001258.01	237.47	15" R.C.P. (inv)	
5296	784612.05	2001377.80	249.48	CB (grated w/ hood)	
5297	784646.04	2001380.34	249.38	CB (grated w/ hood)	
5298	784668.42	2001360.67	248.17	CB (grated w/ hood)	
5299	784672.69	2001336.97	248.09	CB (grated w/ hood)	
5300	784844.49	2001350.03	247.45	CB (grated w/ hood)	
5301	784842.34	2001373.94	247.68	CB (grated w/ hood)	
5302	784788.82	2001369.82	248.30	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5304	784642.38	2001334.94	248.41	Storm MH	
5305	784652.45	2001200.15	245.39	Storm MH	
5306	784631.91	2001191.23	245.34	Storm MH	
5307	784622.24	2001200.89	245.16	CB (Florida type)	
5308	784624.52	2001198.94	245.15	Corner of Catch Basin	
5309	784620.27	2001198.61	245.14	Corner of Catch Basin	
5310	784619.88	2001202.84	245.21	Corner of Catch Basin	
5311	784624.15	2001203.22	245.17	Corner of Catch Basin	
5312	784624.30	2001202.50	244.29	Throat	
5313	784624.51	2001199.97	244.27	Throat	
5314	784660.17	2001204.52	244.38	Throat	
5315	784660.38	2001201.74	244.36	Throat	
5316	784660.55	2001201.03	245.13	Corner of Catch Basin	
5317	784664.57	2001201.61	245.23	Corner of Catch Basin	
5318	784664.44	2001205.58	245.26	Corner of Catch Basin	
5319	784660.23	2001205.30	245.15	Corner of Catch Basin	
5320	784662.54	2001203.30	245.20	CB (Florida type)	
5337	784709.76	2000813.11	257.63	CB (grated w/ hood)	
5338	784711.69	2000789.03	257.63	CB (grated w/ hood)	
5339	784692.34	2000766.29	257.95	CB (grated w/ hood)	
5340	784658.29	2000764.16	257.84	CB (grated w/ hood)	
5341	784637.05	2000783.30	257.15	CB (grated w/ hood)	
5342	784665.73	2000787.35	258.42	Storm MH	
5346	784710.55	2000250.43	267.49	Storm MH	
5347	784680.09	2000237.18	266.24	CB (grated w/ hood)	
5348	784750.24	2000242.50	267.06	CB (grated w/ hood)	
5349	784751.94	2000266.82	267.15	CB (grated w/ hood)	
5352	785101.16	2000268.72	272.09	CB (grated w/ hood)	
5353	785118.33	2000255.04	272.28	CB (grated w/ hood)	
5354	785152.23	2000257.34	272.62	CB (grated w/ hood)	
5355	785168.81	2000273.78	273.03	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5356	785167.26	2000297.80	273.06	CB (grated w/ hood)	
5357	785162.51	2000284.15	273.36	Storm MH	
5358	785121.39	2000280.85	272.86	Storm MH	
5362	785155.10	1999828.15	278.21	Storm MH	
5363	785151.43	1999816.17	277.59	CB (grated w/ hood)	
5364	785185.29	1999818.67	277.89	CB (grated w/ hood)	
5365	785217.70	1999836.93	277.67	CB (grated w/ hood)	
5366	785194.61	1999868.57	277.48	CB (grated w/ hood)	
5370	785054.17	2000839.50	254.67	CB (grated w/ hood)	
5371	785055.83	2000815.62	254.69	CB (grated w/ hood)	
5372	785076.69	2000798.59	255.28	CB (grated w/ hood)	
5373	785110.74	2000801.13	255.20	CB (grated w/ hood)	
5374	785128.80	2000821.09	254.66	CB (grated w/ hood)	
5375	785126.92	2000845.07	254.19	CB (grated w/ hood)	
5376	785089.48	2000855.91	254.37	Storm MH	
5380	785050.83	2001140.76	247.82	CB (grated w/ hood)	
5381	785084.76	2001144.21	247.80	CB (grated w/ hood)	
5382	785067.52	2001182.06	248.90	Storm MH	
5383	784987.21	2001218.60	250.17	Storm MH	
5384	784990.92	2001170.39	248.63	Storm MH	
5385	784960.69	2001168.05	248.67	Storm MH	
5391	785015.31	2001362.98	248.29	CB (grated w/ hood)	
5392	785013.89	2001386.90	248.24	CB (grated w/ hood)	
5393	785031.25	2001402.57	248.67	CB (grated w/ hood)	
5394	785065.19	2001405.34	248.65	CB (grated w/ hood)	
5395	785084.63	2001392.00	249.49	CB (grated w/ hood)	
5396	785086.74	2001367.97	249.51	CB (grated w/ hood)	
5397	785058.85	2001379.31	249.86	Storm MH	
5402	784983.26	2001804.80	255.22	Throat	
5403	784980.31	2001804.53	255.31	Throat	
5404	784982.09	2001802.43	255.94	CB (Florida type)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5405	784984.02	2001804.75	255.85	Corner of Catch Basin	
5406	784984.46	2001800.51	255.83	Corner of Catch Basin	
5407	784980.17	2001800.11	256.04	Corner of Catch Basin	
5408	784979.79	2001804.34	256.04	Corner of Catch Basin	
5409	785050.39	2001811.82	255.60	Corner of Catch Basin	
5410	785050.80	2001807.53	255.77	Corner of Catch Basin	
5411	785055.08	2001807.91	255.87	Corner of Catch Basin	
5412	785054.60	2001812.16	255.71	Corner of Catch Basin	
5413	785053.99	2001812.18	255.08	Throat	
5414	785051.26	2001811.97	255.02	Throat	
5415	785052.71	2001809.84	255.73	CB (Florida type)	
5416	785048.40	2001837.97	255.62	CB (grated w/ hood)	
5417	785028.75	2001850.09	256.67	CB (grated w/ hood)	
5418	784994.85	2001847.23	256.63	CB (grated w/ hood)	
5419	784977.62	2001830.71	255.83	CB (grated w/ hood)	
5420	785022.24	2001820.19	256.40	Storm MH	
5425	785011.65	2002240.52	267.39	CB (grated w/ hood)	
5426	785009.43	2002268.53	268.40	CB (grated w/ hood)	
5427	784993.97	2002281.50	268.02	CB (grated w/ hood)	
5428	784960.15	2002277.91	267.95	CB (grated w/ hood)	
5430	784987.36	2002244.51	268.17	Storm MH	
5434	784948.51	2002729.23	271.32	Storm MH	
5435	784920.05	2002760.82	270.42	CB (grated w/ hood)	
5436	784953.97	2002764.00	270.26	CB (grated w/ hood)	
5437	784970.00	2002751.03	271.35	CB (grated w/ hood)	
5438	784972.73	2002723.30	271.15	CB (grated w/ hood)	
5441	785349.97	2002772.63	283.38	Storm MH	
5442	785338.32	2002806.22	283.22	CB (grated w/ hood)	
5443	785372.45	2002807.27	283.76	CB (grated w/ hood)	
5444	785390.77	2002795.73	283.43	CB (grated w/ hood)	
5445	785391.60	2002767.93	282.69	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5446	785357.94	2002777.85	283.70	CB (grated w/ hood)	
5450	785378.94	2002322.11	278.14	CB (grated w/ hood)	
5451	785412.92	2002325.32	278.13	CB (grated w/ hood)	
5452	785428.55	2002312.30	278.46	CB (grated w/ hood)	
5453	785431.11	2002284.33	277.87	CB (grated w/ hood)	
5454	785406.00	2002305.33	278.79	CB (grated w/ hood)	
5458	785415.37	2001890.16	264.17	CB (grated w/ hood)	
5459	785449.81	2001891.49	264.18	CB (grated w/ hood)	
5460	785469.23	2001879.08	264.79	CB (grated w/ hood)	
5461	785474.16	2001853.58	265.20	Corner of Catch Basin	
5462	785474.56	2001849.34	265.23	Corner of Catch Basin	
5463	785470.34	2001848.95	265.07	Corner of Catch Basin	
5464	785469.99	2001853.14	265.08	Corner of Catch Basin	
5465	785472.23	2001851.27	265.14	Storm MH	
5466	785473.95	2001853.68	264.58	Throat	
5467	785470.47	2001853.35	264.43	Throat	
5468	785454.97	2001834.96	263.16	CB (grated w/ hood)	
5469	785420.98	2001833.45	263.04	CB (grated w/ hood)	
5470	785445.31	2001870.34	264.78	Storm MH	
5474	785450.92	2001433.96	263.45	CB (grated w/ hood)	
5475	785484.78	2001436.46	263.58	CB (grated w/ hood)	
5476	785504.28	2001423.50	263.13	CB (grated w/ hood)	
5477	785505.50	2001399.49	263.20	CB (grated w/ hood)	
5478	785478.50	2001421.88	264.05	Storm MH	
5483	785466.64	2001147.33	256.33	CB (Florida type)	
5484	785469.30	2001150.07	256.28	Corner of Catch Basin	
5485	785463.87	2001149.64	256.35	Corner of Catch Basin	
5486	785464.24	2001144.68	256.30	Corner of Catch Basin	
5487	785469.70	2001145.12	256.27	Corner of Catch Basin	
5488	785469.71	2001146.17	255.38	Throat	
5489	785469.48	2001149.18	255.32	Throat	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5490	785473.43	2001134.03	255.27	CB (grated)	
5491	785507.05	2001138.76	255.33	CB (grated w/ hood)	
5492	785496.89	2001167.73	256.54	Storm MH	
5502	785667.18	2001211.33	257.33	CB (grated)	
5508	785545.73	2000876.74	259.60	CB (grated w/ hood)	
5509	785547.65	2000852.82	259.88	CB (grated w/ hood)	
5510	785530.19	2000836.79	259.59	CB (grated w/ hood)	
5511	785496.35	2000834.48	259.59	CB (grated w/ hood)	
5512	785519.76	2000862.21	260.07	Storm MH	
5516	785578.60	2000190.76	279.19	CB (grated w/ hood)	
5517	785544.77	2000188.84	279.16	CB (grated w/ hood)	
5520	785561.72	2000190.12	279.97	Junction Box (under Asphalt)	
5522	785967.74	2000218.85	277.10	CB (grated w/ hood)	
5523	785977.58	2000219.48	277.78	Junction Box (under Asphalt)	
5524	785995.68	2000220.99	277.02	CB (grated w/ hood)	
5525	785968.27	2000351.62	278.08	Storm MH	
5527	785936.99	2000331.17	277.32	CB (grated w/ hood)	
5528	785942.35	2000355.65	277.13	CB (grated w/ hood)	
5529	786000.79	2000359.78	277.25	CB (grated w/ hood)	
5530	786011.51	2000336.65	277.37	CB (grated w/ hood)	
5531	786032.97	2000318.88	278.29	CB (grated)	
5532	786089.60	2000307.66	278.58	CB (grated)	
5533	786150.24	2000314.21	278.84	CB (grated)	
5534	786236.94	2000318.43	280.17	CB (grated)	
5537	785918.30	2000866.13	270.59	CB (grated w/ hood)	
5538	785946.29	2000867.21	270.54	CB (grated w/ hood)	
5539	785959.62	2000882.54	271.01	CB (grated w/ hood)	
5540	785958.09	2000906.54	270.91	CB (grated w/ hood)	
5541	785923.84	2000895.30	270.84	Storm MH	
5546	785892.40	2001208.09	261.10	CB (grated w/ hood)	
5547	785898.45	2001207.15	261.76	Storm MH	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5548	785920.03	2001213.77	261.05	CB (grated)	
5549	785890.71	2001225.75	261.36	Storm MH	
5550	785886.89	2001231.17	262.11	CB (Florida type)	
5551	785889.39	2001233.85	262.17	Corner of Catch Basin	
5552	785884.16	2001233.23	262.16	Corner of Catch Basin	
5553	785884.48	2001228.57	262.07	Corner of Catch Basin	
5554	785889.79	2001228.90	262.06	Corner of Catch Basin	
5555	785889.83	2001229.43	261.27	Throat	
5556	785889.56	2001233.12	261.17	Throat	
5567	785924.18	2001431.34	265.38	CB (grated w/ hood)	
5568	785916.14	2001454.82	265.47	CB (grated w/ hood)	
5569	785900.56	2001468.02	265.21	CB (grated w/ hood)	
5570	785872.91	2001465.96	265.17	CB (grated w/ hood)	
5571	785859.39	2001450.49	264.63	CB (grated w/ hood)	
5572	785844.19	2001449.08	264.19	CB (grated w/ hood)	
5573	785847.36	2001425.47	264.28	CB (grated w/ hood)	
5574	785861.36	2001426.53	264.54	CB (grated w/ hood)	
5575	785884.91	2001425.15	265.61	Storm MH	
5580	785890.41	2001893.48	274.99	CB (grated w/ hood)	
5581	785880.57	2001920.79	275.12	CB (grated w/ hood)	
5582	785865.00	2001933.66	275.41	CB (grated w/ hood)	
5583	785836.63	2001932.03	275.52	CB (grated w/ hood)	
5584	785845.67	2001898.63	275.95	Storm MH	
5587	785848.88	2002328.80	281.90	CB (grated w/ hood)	
5588	785846.20	2002356.67	281.94	CB (grated w/ hood)	
5589	785828.14	2002369.47	281.78	CB (grated w/ hood)	
5590	785800.21	2002366.47	281.75	CB (grated w/ hood)	
5591	785784.07	2002350.19	281.40	CB (grated w/ hood)	
5592	785786.33	2002322.23	281.18	CB (grated w/ hood)	
5593	785827.64	2002342.96	282.44	Storm MH	
5599	786363.61	2000682.88	279.65	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5600	786377.18	2000698.57	279.49	CB (grated w/ hood)	
5601	786374.44	2000726.48	279.48	CB (grated w/ hood)	
5602	786335.76	2000732.51	279.12	CB (grated w/ hood)	
5603	786337.62	2000740.17	279.41	Storm MH	
5606	786322.61	2000923.50	274.58	Storm MH	
5607	786306.96	2000910.30	274.40	CB (grated w/ hood)	
5608	786305.27	2000934.23	274.09	CB (grated w/ hood)	
5609	786306.52	2001115.08	268.24	Storm MH	
5610	786324.81	2001114.18	268.68	Storm MH	
5611	786336.49	2001112.37	269.89	Storm MH	
5612	786340.29	2001070.86	270.14	Storm MH	
5613	786300.43	2001142.56	268.26	CB (Florida type)	
5614	786302.36	2001144.94	268.20	Corner of Catch Basin	
5615	786298.31	2001144.53	268.31	Corner of Catch Basin	
5616	786298.21	2001140.44	268.35	Corner of Catch Basin	
5617	786302.75	2001140.65	268.22	Corner of Catch Basin	
5618	786302.82	2001141.21	267.45	Throat	
5619	786302.58	2001143.63	267.41	Throat	
5620	786328.75	2001129.22	267.99	CB (grated w/ hood)	
5621	786342.37	2001140.04	268.50	CB (Florida type)	
5622	786336.73	2001141.03	268.37	Corner of Catch Basin	
5623	786340.78	2001137.34	268.57	Corner of Catch Basin	
5624	786344.01	2001137.52	268.59	Corner of Catch Basin	
5625	786351.60	2001143.11	268.56	Corner of Catch Basin	
5626	786346.37	2001142.67	267.82	Throat	
5627	786340.84	2001142.06	267.69	Throat	
5628	786340.85	2001169.44	267.80	CB (grated w/ hood)	
5629	786324.77	2001181.87	267.52	CB (grated w/ hood)	
5632	786323.43	2001145.10	268.30	Junction Box (under Asphalt)	
5645	786275.84	2001496.87	275.16	CB (grated w/ hood)	
5646	786272.47	2001546.81	276.45	Storm MH	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5647	786311.17	2001538.52	276.63	CB (grated w/ hood)	
5648	786309.20	2001572.23	276.84	CB (grated w/ hood)	
5649	786293.43	2001580.39	276.37	CB (grated w/ hood)	
5655	786240.36	2001940.75	280.07	Storm MH	
5656	786280.06	2001937.09	279.43	CB (grated w/ hood)	
5657	786279.28	2001963.43	280.09	Storm MH	
5658	786278.39	2001971.28	279.45	CB (grated w/ hood)	
5659	786262.79	2001984.37	279.63	CB (grated w/ hood)	
5660	786235.99	2001969.45	279.54	CB (grated w/ hood)	
5661	786189.95	2002364.92	282.14	CB (grated w/ hood)	
5662	786187.70	2002392.92	282.15	CB (grated w/ hood)	
5663	786200.89	2002408.29	281.96	CB (grated w/ hood)	
5664	786230.00	2002396.86	282.13	CB (grated w/ hood)	
5665	786205.14	2002374.35	282.83	Storm MH	
5670	786520.64	2002038.91	284.34	CB (grated w/ hood)	
5671	786545.03	2002042.56	284.59	Storm MH	
5672	786548.16	2002043.09	284.27	CB (grated w/ hood)	
5673	786570.09	2001996.12	284.87	CB (grated w/ hood)	
5674	786552.40	2001960.40	284.60	CB (grated w/ hood)	
5675	786550.18	2001986.50	285.30	Storm MH	
5678	786863.11	2002013.17	288.09	Storm MH	
5679	786836.51	2002044.71	287.24	CB (grated w/ hood)	
5680	786870.38	2002048.07	287.16	CB (grated w/ hood)	
5681	786887.32	2002023.30	287.49	CB (grated w/ hood)	
5682	786889.34	2001989.19	287.47	CB (grated w/ hood)	
5688	786464.17	2001081.30	268.71	Storm MH	
5701	786547.05	2001079.95	272.00	CB (slab top w/ mh)	
5702	786552.55	2001049.68	272.60	Storm MH	
5708	786728.85	2001054.44	274.63	Computed Point	
5711	786983.74	2000775.41	287.12	CB (grated w/ hood)	
5712	786986.63	2000747.54	287.08	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5713	786975.85	2000729.17	286.99	CB (grated w/ hood)	
5714	786942.10	2000726.47	286.82	CB (grated w/ hood)	
5715	786972.30	2000743.55	287.43	Storm MH	
5716	786970.70	2000774.61	287.27	Storm MH	
5717	786944.07	2000789.06	286.93	Storm MH	
5719	786921.12	2001020.41	277.78	Storm MH	
5720	786919.60	2000998.23	277.38	CB (grated w/ hood)	
5721	786953.62	2001000.60	277.79	CB (grated w/ hood)	
5722	786953.27	2001192.70	282.17	CB (grated w/ hood)	
5723	786951.72	2001218.64	282.13	CB (grated w/ hood)	
5724	786935.06	2001232.41	282.24	CB (grated w/ hood)	
5725	786901.13	2001229.82	281.87	CB (grated w/ hood)	
5726	786913.82	2001187.78	281.91	Storm MH	
5729	786882.83	2001579.11	287.58	Storm MH	
5730	786922.02	2001587.45	287.47	CB (grated w/ hood)	
5731	786919.17	2001621.20	287.16	CB (grated w/ hood)	
5732	786903.02	2001632.51	287.08	CB (grated w/ hood)	
5733	786869.07	2001629.10	286.66	CB (grated w/ hood)	
5736	783771.98	1998028.64	267.10	CB (Florida type)	
5737	783767.47	1998025.91	266.25	Throat	
5738	783775.55	1998026.54	266.25	Throat	
5739	783779.08	1998026.99	266.97	Corner of Catch Basin	
5740	783773.51	1998030.16	267.10	Corner of Catch Basin	
5741	783770.00	1998030.11	267.15	Corner of Catch Basin	
5742	783763.89	1998025.84	266.97	Corner of Catch Basin	
5743	783756.23	1997971.01	267.13	Corner of Catch Basin	
5744	783763.14	1997967.83	267.33	Corner of Catch Basin	
5745	783767.08	1997967.89	267.39	Corner of Catch Basin	
5746	783774.51	1997972.52	267.29	Corner of Catch Basin	
5747	783769.59	1997972.25	266.54	Throat	
5748	783762.30	1997971.70	266.49	Throat	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5749	783765.40	1997969.49	267.32	CB (Florida type)	
5750	783816.31	1997948.50	268.22	CB (grated w/ hood)	
5751	783848.09	1997965.38	267.42	CB (grated w/ hood)	
5752	783869.03	1997990.06	267.15	CB (grated w/ hood)	
5755	784252.55	1998020.85	270.95	CB (grated w/ hood)	
5756	784250.34	1998054.99	271.02	CB (grated w/ hood)	
5757	784225.80	1998076.27	270.89	CB (grated w/ hood)	
5758	784191.80	1998073.34	270.71	CB (grated w/ hood)	
5759	784172.62	1998053.56	270.74	Storm MH	
5762	784562.28	1998084.92	277.01	Storm MH	
5763	784580.77	1998104.84	278.30	CB (Florida type)	
5764	784582.98	1998102.65	278.28	Corner of Catch Basin	
5765	784578.46	1998102.47	278.14	Corner of Catch Basin	
5766	784577.82	1998111.80	278.42	Corner of Catch Basin	
5767	784581.89	1998116.16	278.48	Corner of Catch Basin	
5768	784582.16	1998113.77	277.84	Throat	
5769	784582.93	1998104.13	277.43	Throat	
5770	784614.56	1998107.33	277.29	CB (grated w/ hood)	
5771	784639.27	1998086.43	277.93	CB (grated w/ hood)	
5772	784641.84	1998052.31	277.98	CB (grated w/ hood)	
5773	784624.11	1998021.21	277.82	CB (Florida type)	
5774	784622.91	1998018.93	277.71	Corner of Catch Basin	
5775	784626.51	1998019.29	277.88	Corner of Catch Basin	
5776	784626.34	1998022.42	277.85	Corner of Catch Basin	
5777	784622.01	1998029.25	277.68	Corner of Catch Basin	
5778	784621.99	1998027.38	277.01	Throat	
5779	784622.67	1998020.22	277.05	Throat	
5783	784950.36	1998116.35	282.50	Storm MH	
5784	785026.69	1998122.51	282.98	Storm MH	
5785	785027.31	1998117.53	282.41	CB (grated w/ hood)	
5786	785030.31	1998083.54	282.38	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5787	784971.48	1998056.09	283.14	Storm MH	
5789	785057.94	1998166.93	282.11	Yard Inlet	
5790	785125.91	1998176.30	282.11	Yard Inlet	
5793	785391.22	1998152.00	281.89	Storm MH	
5794	785366.66	1998144.80	281.27	CB (grated w/ hood)	
5795	785368.91	1998110.74	281.27	CB (grated w/ hood)	
5796	785391.01	1998087.99	281.61	CB (grated w/ hood)	
5797	785419.02	1998089.81	281.59	CB (grated w/ hood)	
5799	785389.12	1998112.39	282.00	Junction Box (under Asphalt)	
5801	785842.28	1997604.66	283.94	CB (grated w/ hood)	
5802	785876.33	1997607.12	283.81	CB (grated w/ hood)	
5803	785882.39	1997628.31	284.32	Storm MH	
5804	785896.93	1997638.34	283.66	CB (grated w/ hood)	
5805	785894.32	1997672.28	283.79	CB (grated w/ hood)	
5807	786229.73	1997664.94	284.94	CB (grated w/ hood)	
5808	786245.24	1997656.85	285.78	Storm MH	
5809	786251.54	1997629.67	286.33	Storm MH	
5810	786255.12	1997637.18	285.33	CB (grated w/ hood)	
5811	786289.02	1997639.83	285.33	CB (grated w/ hood)	
5813	786339.48	1997007.04	293.12	CB (grated w/ hood)	
5814	786305.66	1997002.39	293.19	CB (grated w/ hood)	
5815	786301.73	1997001.50	293.75	Storm MH	
5821	785916.31	1997014.44	288.79	Storm MH	
5822	785892.28	1996977.41	288.40	CB (grated w/ hood)	
5823	785926.13	1996980.48	288.33	CB (grated w/ hood)	
5824	785946.87	1996998.43	288.44	CB (grated w/ hood)	
5825	785944.41	1997026.28	288.37	CB (grated w/ hood)	
5826	786041.29	1997006.88	289.51	12" R.C.P. (inv)	
5827	786062.11	1997008.74	289.61	12" R.C.P. (inv)	
5828	786082.51	1997010.47	289.94	12" R.C.P. (inv)	
5829	786102.09	1997011.94	290.36	12" R.C.P. (inv)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5830	786142.39	1997014.55	290.75	12" R.C.P. (inv)	
5831	786166.70	1997016.44	291.14	12" R.C.P. (inv)	
5836	785513.48	1997009.37	285.77	Storm MH	
5837	785531.51	1996993.37	285.28	CB (grated w/ hood)	
5838	785533.94	1996965.57	285.10	CB (grated w/ hood)	
5839	785513.66	1996945.87	285.33	CB (grated w/ hood)	
5840	785480.04	1996939.09	285.47	CB (grated w/ hood)	
5841	785458.05	1996956.47	285.47	CB (grated w/ hood)	
5842	785453.68	1996990.15	285.13	CB (grated w/ hood)	
5847	785433.63	1997522.33	282.04	CB (grated w/ hood)	
5848	785467.59	1997524.95	282.04	CB (grated w/ hood)	
5849	785475.39	1997525.60	284.01	Storm MH	
5850	785469.79	1997595.45	283.08	Storm MH	
5851	785566.49	1997603.26	283.24	Storm MH	
5852	785566.64	1997611.89	282.18	CB (grated w/ hood)	
5853	785563.90	1997645.83	282.22	CB (grated w/ hood)	
5854	785433.27	1997617.40	283.48	Computed Point	
5856	785050.43	1997547.97	280.59	CB (grated w/ hood)	
5857	785015.99	1997547.43	280.67	CB (grated w/ hood)	
5858	785071.47	1997572.44	280.66	CB (grated w/ hood)	
5859	785069.12	1997606.29	280.68	CB (grated w/ hood)	
5860	785044.04	1997627.05	280.66	CB (grated w/ hood)	
5861	785010.18	1997622.27	280.60	CB (grated w/ hood)	
5862	785005.46	1997621.62	281.74	Storm MH	
5867	785392.62	1998122.75	281.93	Computed Point	
5869	785752.54	1998873.51	275.85	Junction Box (under Asphalt)	
5870	785798.20	1998857.08	276.68	Junction Box (under Asphalt)	
5871	785757.30	1998819.59	276.23	Junction Box (under Asphalt)	
5872	783759.36	1998020.65	266.83	Computed Point	
5873	783815.18	1997964.73	267.91	Junction Box (under Asphalt)	
5874	784180.48	1999385.15	271.57	Junction Box (under Asphalt)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5875	784320.24	1999295.05	274.38	Junction Box (under Asphalt)	
5878	785738.38	1999495.51	279.01	Junction Box (under Asphalt)	
5882	784497.83	1999126.01	270.86	Junction Box (under Asphalt)	
5883	784530.31	1999099.27	269.43	Computed Point	
5884	784502.91	1999063.62	270.12	Junction Box (under Asphalt)	
5889	784718.33	1999019.18	268.03	Junction Box (under Asphalt)	
5890	784719.06	1999014.19	268.04	R.C.P. (inv) Covered	
5892	784139.49	2001324.89	239.72	Junction Box (under Asphalt)	
5893	784109.91	2001305.32	239.02	Junction Box (under Asphalt)	
5894	784116.34	2001299.83	239.14	Junction Box (under Asphalt)	
5895	784122.82	2001294.45	239.65	Junction Box (under Asphalt)	
5896	784128.39	2001281.44	239.46	Junction Box (under Asphalt)	
5897	784154.04	2001266.91	239.69	Junction Box (under Asphalt)	
5898	784082.24	2001330.18	238.49	Junction Box (under Asphalt)	
5899	784966.08	2001143.96	248.24	Computed Point	
5900	785168.96	2001219.71	250.83	Computed Point	
5901	785097.78	2000277.10	272.63	Junction Box (under Asphalt)	
5902	784747.31	2000252.20	267.43	Junction Box (under Asphalt)	
5903	785123.04	2000255.59	272.97	Junction Box (under Asphalt)	
5904	784972.64	2002731.50	271.87	Computed Point	
5905	785197.95	1999835.06	277.93	Junction Box (under Asphalt)	
5907	785410.58	2001134.33	255.60	Junction Box (under Asphalt)	
5908	785615.87	2001214.07	258.50	Junction Box (under Asphalt)	
5909	785466.26	2001155.27	256.20	Junction Box (under Asphalt)	
5910	785861.06	2001432.69	265.42	Junction Box (under Asphalt)	
5911	785917.27	2001430.67	265.38	Junction Box (under Asphalt)	
5912	785881.16	2001895.54	275.22	Junction Box (under Asphalt)	
5913	786308.18	2001568.58	276.99	Junction Box (under Asphalt)	
5914	786310.05	2001551.49	277.17	Junction Box (under Asphalt)	
5915	786922.65	2001593.51	288.15	Junction Box (under Asphalt)	
5916	786859.41	2002047.18	288.17	Computed Point	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
5917	786002.37	2000336.69	277.70	Junction Box (under Asphalt)	
5918	785923.89	2000888.44	270.97	Junction Box (under Asphalt)	
5919	783891.16	2001537.46	237.24	Computed Point	
5920	783767.51	1998753.71	270.06	R.C.P. (top)	
5922	783484.21	1997820.04	270.97	Storm MH	
5923	783801.92	1997441.68	274.36	CB (grated w/ hood)	
5927	784528.79	1998741.78	273.52	Junction Box (under Asphalt)	
5928	784526.56	1998769.69	273.52	Junction Box (under Asphalt)	
5929	785615.87	2001214.07	257.22	Storm MH	
5930	784966.71	2001144.10	247.38	Storm MH	
6001	780277.75	2002432.17	188.66	Ditch (top)	
6002	780273.14	2002426.09	179.30	Ditch (bot)	
6003	780269.15	2002423.35	179.25	Ditch (bot)	
6004	780261.36	2002422.43	189.55	Ditch (top)	
6005	780272.40	2002423.16	179.20	108” C.M.P.	
6008	780486.65	2002703.13	189.44	Ditch (top)	
6009	780486.52	2002697.12	180.62	Ditch (bot)	
6010	780482.16	2002685.87	182.18	Ditch (bot)	
6011	780479.52	2002674.51	189.27	Ditch (top)	
6015	779145.53	2002650.59	176.58	Ditch (top)	
6022	779126.83	2002600.72	168.44	Ditch (bot)	
6023	779130.21	2002595.20	168.18	Ditch (bot)	
6026	779092.76	2002571.39	168.29	Ditch (bot)	
6031	779153.11	2002636.72	169.79	Ditch (bot)	
6032	779158.57	2002627.20	169.48	Ditch (bot)	
6033	779167.21	2002620.75	176.17	Ditch (top)	
6043	778614.12	2002311.24	170.67	Ditch (top)	
6044	778612.33	2002353.86	170.72	Ditch (top)	
6045	778879.66	2002420.26	172.76	Ditch (top)	
6046	778899.72	2002412.03	164.31	Ditch (bot)	
6047	778915.94	2002407.65	164.64	Ditch (bot)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
6048	778919.74	2002391.14	173.00	Ditch (top)	
6049	778941.27	2002407.84	172.87	Ditch (top)	
6050	778626.43	2002333.27	162.84	Ditch (bot)	
6051	778623.82	2002341.27	163.12	Ditch (bot)	
6052	778437.01	2002305.81	169.23	Ditch (top)	
6053	778430.56	2002317.85	162.04	Ditch (bot)	
6054	778428.98	2002326.63	161.93	Ditch (bot)	
6055	778433.33	2002345.15	170.25	Ditch (top)	
6062	777633.56	2002494.74	166.88	Ditch (top)	
6063	777633.31	2002501.03	162.19	Ditch (bot)	
6064	777626.57	2002525.72	160.69	Ditch (bot)	
6065	777624.69	2002537.40	166.31	Ditch (top)	
6066	777835.78	2002463.93	166.81	Ditch (top)	
6067	777831.79	2002454.18	161.98	Ditch (bot)	
6068	777828.68	2002441.49	161.00	Ditch (bot)	
6069	777826.38	2002429.70	167.58	Ditch (top)	
6074	777502.70	2002495.13	165.50	Ditch (top)	
6075	777504.72	2002500.22	160.94	Ditch (bot)	
6076	777511.86	2002539.22	160.93	Ditch (bot)	
6077	777516.26	2002548.63	167.50	Ditch (top)	
6078	777048.22	2002700.44	166.10	Ditch (top)	
6079	777049.79	2002694.34	160.74	Ditch (bot)	
6080	777038.54	2002665.77	160.65	Ditch (bot)	
6081	777030.91	2002656.11	169.10	Ditch (top)	
6085	775568.42	2004661.40	161.14	Ditch (top)	
6086	775602.58	2004613.97	160.25	Ditch (top)	
6087	775613.73	2004577.11	160.60	Ditch (top)	
6088	775585.06	2004541.40	165.89	Ditch (top)	
6089	775531.31	2004588.90	164.89	Ditch (top)	
6094	775704.61	2004443.59	161.56	Ditch (top)	
6095	775696.35	2004474.45	161.53	Ditch (top)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
6096	775713.66	2004506.08	161.72	Ditch (top)	
6097	775789.25	2004438.07	158.60	Ditch (top)	
6098	775778.05	2004422.66	150.78	Ditch (bot)	
6099	775770.39	2004414.40	150.95	Ditch (bot)	
6100	775719.71	2004456.59	148.90	96” C.M.P.	
6101	775713.81	2004479.60	148.71	96” C.M.P.	
6102	775590.71	2004599.76	147.77	96” C.M.P.	
6103	775590.59	2004576.26	148.14	96” C.M.P.	
6106	775762.09	2004371.17	169.50	Ditch (top)	
6115	779694.14	2003001.79	183.15	Ditch (top)	
6116	779694.93	2002984.42	171.74	Ditch (bot)	
6117	779699.10	2002976.62	170.60	Ditch (bot)	
6118	779697.73	2002963.39	183.37	Ditch (top)	
6121	780204.70	2002747.91	183.74	Ditch (top)	
6122	780196.98	2002756.68	175.95	Ditch (bot)	
6123	780194.73	2002773.80	176.09	Ditch (bot)	
6124	780208.34	2002777.57	183.49	Ditch (top)	
6125	780186.08	2002765.75	175.69	Ditch (bot)	
6126	780178.25	2002760.38	185.26	Ditch (top)	
10001	790775.40	1999955.03	342.46	CB (grated w/ hood)	
10002	790772.83	1999983.01	342.03	CB (grated w/ hood)	
10003	790758.48	1999996.88	341.79	CB (grated w/ hood)	
10004	790734.58	1999994.80	341.67	CB (grated w/ hood)	
10005	790743.18	1999974.46	342.50	Storm MH	
10008	790738.71	2000421.41	345.42	CB (grated w/ hood)	
10009	790736.87	2000445.44	345.38	CB (grated w/ hood)	
10010	790721.20	2000458.89	345.29	CB (grated w/ hood)	
10011	790697.00	2000458.64	345.03	CB (grated w/ hood)	
10012	790701.06	2000432.65	345.82	Storm MH	
10016	790228.95	2000878.12	337.08	Computed Point	
10017	790192.45	2000918.20	336.09	Computed Point	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10021	790274.08	2000382.54	335.30	CB (grated w/ hood)	
10022	790271.87	2000410.54	335.39	CB (grated w/ hood)	
10023	790256.37	2000423.65	335.09	CB (grated w/ hood)	
10024	790228.38	2000421.10	335.02	CB (grated w/ hood)	
10025	790251.97	2000397.48	335.92	Storm MH	
10029	790312.15	1999918.98	332.08	CB (grated w/ hood)	
10030	790310.21	1999942.87	331.88	CB (grated w/ hood)	
10031	790294.64	1999956.67	331.27	CB (grated w/ hood)	
10032	790266.65	1999953.65	331.20	CB (grated w/ hood)	
10033	790283.51	1999936.41	331.92	Storm MH	
10036	789846.94	1999880.68	321.18	CB (grated w/ hood)	
10037	789845.01	1999904.62	321.18	CB (grated w/ hood)	
10038	789828.99	1999918.14	320.80	CB (grated w/ hood)	
10039	789801.07	1999915.68	320.79	CB (grated w/ hood)	
10040	789815.63	1999898.08	321.32	Storm MH	
10044	789767.35	2000327.28	324.00	CB (grated w/ hood)	
10045	789795.29	2000329.49	324.41	CB (grated w/ hood)	
10046	789808.48	2000344.99	324.70	CB (grated w/ hood)	
10047	789806.02	2000372.81	324.61	CB (grated w/ hood)	
10048	789784.57	2000359.85	324.95	Storm MH	
10052	789778.89	2000557.93	320.62	CB (grated w/ hood)	
10053	789748.06	2000588.83	319.80	CB (grated w/ hood)	
10054	789739.04	2000712.18	320.31	CB (grated w/ hood)	
10055	789767.39	2000709.14	320.67	CB (grated w/ hood)	
10058	790646.82	2001039.61	345.99	CB (grated w/ hood)	
10059	790675.82	2001033.14	345.95	CB (grated w/ hood)	
10062	789760.88	2000795.12	321.54	CB (grated w/ hood)	
10063	789770.26	2000834.94	322.57	CB (grated w/ hood)	
10064	789755.37	2000851.45	321.06	CB (grated w/ hood)	
10065	789723.49	2000850.64	321.00	CB (grated w/ hood)	
10066	789601.42	2000792.60	320.67	CB (grated)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10067	789590.93	2000820.33	319.90	CB (grated w/ hood)	
10068	789581.56	2000867.70	320.29	Corner of Catch Basin	
10069	789578.79	2000867.35	320.27	Corner of Catch Basin	
10070	789579.00	2000864.50	320.31	Corner of Catch Basin	
10071	789580.71	2000864.85	319.71	Throat	
10080	789572.41	2000908.07	320.11	Corner of Catch Basin	
10081	789572.62	2000905.37	320.07	Corner of Catch Basin	
10082	789575.51	2000905.57	320.08	Corner of Catch Basin	
10083	789572.43	2000906.37	319.65	Throat	
10084	789573.36	2000908.22	319.62	Throat	
10085	789575.40	2000906.71	319.50	Throat	
10086	789574.32	2000905.26	319.42	Throat	
10089	789245.44	2000811.02	319.09	CB (grated)	
10090	789258.22	2000808.63	318.74	CB (grated w/ hood)	
10091	789289.86	2000811.74	319.10	CB (grated w/ hood)	
10093	789244.46	2000648.73	317.68	CB (grated)	
10094	789255.25	2000578.40	318.27	Storm MH	
10095	789296.05	2000565.44	318.75	Storm MH	
10100	789113.70	2000638.25	314.94	CB (grated)	
10101	788983.53	2000793.85	314.68	CB (grated)	
10105	789113.00	2000471.04	313.21	CB (grated)	
10113	789037.04	2000434.62	312.91	Storm MH	
10114	789119.99	2000329.77	313.32	CB (grated w/ hood)	
10115	789144.32	2000315.69	313.26	CB (grated w/ hood)	
10116	789133.80	2000307.27	313.80	Storm MH	
10117	789186.51	2000291.33	313.75	CB (grated w/ hood)	
10118	789170.54	2000255.10	313.68	CB (grated w/ hood)	
10120	789275.20	2000264.03	315.09	CB (grated)	
10122	789336.68	1999884.45	313.74	CB (grated w/ hood)	
10123	789322.71	1999882.00	314.35	Computed Point	
10124	789328.36	1999858.53	314.27	Storm MH	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10125	789354.98	1999864.85	313.34	CB (grated w/ hood)	
10126	789374.82	1999841.83	313.71	CB (grated w/ hood)	
10128	788909.49	2000907.12	313.58	CB (grated)	
10129	788914.44	2000846.30	313.22	CB (grated)	
10131	788870.93	2000731.22	312.35	CB (grated)	
10132	788846.45	2000760.11	312.22	CB (grated w/ hood)	
10133	788824.37	2000777.10	312.50	Corner of Catch Basin	
10134	788830.47	2000777.30	312.87	Corner of Catch Basin	
10135	788826.85	2000783.27	313.04	Corner of Catch Basin	
10136	788825.82	2000789.18	313.02	Corner of Catch Basin	
10137	788823.41	2000789.01	312.58	Corner of Catch Basin	
10138	788826.04	2000779.16	312.76	CB (Florida type)	
10139	788824.27	2000776.86	311.83	Throat	
10140	788823.64	2000785.02	311.71	Throat	
10141	788788.95	2000791.76	311.50	CB (grated)	
10143	788839.93	2000634.43	311.31	Corner of Catch Basin	
10144	788842.42	2000636.86	311.24	Corner of Catch Basin	
10145	788845.96	2000633.52	311.37	Corner of Catch Basin	
10146	788848.52	2000625.51	311.34	Corner of Catch Basin	
10147	788847.38	2000626.28	310.75	Throat	
10148	788839.91	2000633.48	310.68	Throat	
10149	788842.43	2000634.54	311.20	CB (Florida type)	
10150	788769.34	2000700.46	309.61	CB (grated w/ hood)	
10151	788761.59	2001021.67	312.08	CB (grated)	
10152	788753.28	2001134.49	312.24	CB (grated)	
10173	788723.33	2001224.00	312.08	CB (grated w/ hood)	
10174	789018.88	2001248.38	317.38	Storm MH	
10175	789059.99	2001244.41	318.12	Junction Box (under Asphalt)	
10176	789081.61	2001245.50	316.42	18" R.C.P. (inv)	
10177	789056.99	2001280.89	317.22	CB (grated w/ hood)	
10178	789053.32	2001319.90	317.90	Corner of Catch Basin	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10179	789055.70	2001327.87	318.15	Corner of Catch Basin	
10180	789055.40	2001331.59	318.14	Corner of Catch Basin	
10181	789052.20	2001339.53	317.90	Corner of Catch Basin	
10182	789051.96	2001338.19	317.31	Throat	
10183	789052.42	2001329.35	316.99	Throat	
10184	789052.97	2001320.89	317.33	Throat	
10185	789053.94	2001329.51	317.96	CB (Florida type)	
10186	789025.21	2001328.74	317.73	CB (Florida type)	
10187	789026.34	2001337.94	317.29	Throat	
10188	789026.75	2001328.76	316.67	Throat	
10189	789027.25	2001320.16	317.14	Throat	
10190	789027.16	2001318.97	317.73	Corner of Catch Basin	
10191	789022.28	2001318.81	317.97	Corner of Catch Basin	
10192	789021.21	2001338.19	318.03	Corner of Catch Basin	
10193	789026.02	2001338.41	317.82	Corner of Catch Basin	
10194	789014.06	2001395.86	317.48	CB (grated)	
10195	789039.29	2001562.06	318.45	CB (grated w/ hood)	
10196	789048.43	2001744.62	318.45	CB (grated w/ hood)	
10197	789046.46	2001769.54	318.42	CB (grated)	
10198	789046.58	2001762.37	319.29	Storm MH	
10201	789377.74	2001737.25	322.39	CB (grated w/ hood)	
10202	789395.13	2001751.56	323.15	CB (grated)	
10203	789391.75	2001773.72	322.92	CB (grated)	
10207	789352.81	2001736.53	321.84	CB (grated)	
10209	788417.38	2001198.04	306.40	CB (grated w/ hood)	
10211	788524.53	2000841.33	307.93	CB (Florida type)	
10212	788524.83	2000844.17	307.81	Corner of Catch Basin	
10213	788522.09	2000841.22	307.89	Corner of Catch Basin	
10214	788524.53	2000838.96	307.98	Corner of Catch Basin	
10215	788529.36	2000837.68	307.94	Corner of Catch Basin	
10216	788534.62	2000834.65	308.02	Corner of Catch Basin	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10217	788534.81	2000834.86	307.96	Corner of Catch Basin	
10218	788533.55	2000836.33	307.42	Throat	
10219	788525.93	2000843.47	307.16	Throat	
10220	788457.09	2000991.70	305.48	Throat	
10221	788449.34	2000998.58	305.36	Throat	
10222	788447.99	2001000.00	305.99	Corner of Catch Basin	
10223	788450.68	2001002.94	306.03	Corner of Catch Basin	
10224	788454.49	2000999.66	306.09	Corner of Catch Basin	
10225	788455.45	2000995.92	306.11	Corner of Catch Basin	
10226	788459.67	2000990.24	306.12	Corner of Catch Basin	
10227	788459.34	2000989.89	306.16	Corner of Catch Basin	
10228	788450.89	2001000.37	306.02	CB (Florida type)	
10229	788456.90	2001014.53	306.26	CB (grated)	
10230	788422.37	2001041.39	305.68	CB (grated)	
10231	788401.69	2001039.43	304.82	Storm MH	
10232	788273.53	2000883.55	304.53	CB (grated w/ hood)	
10233	788228.36	2000909.84	305.03	CB (grated)	
10234	788170.00	2001014.44	303.64	CB (grated)	
10235	788151.67	2001093.55	302.95	CB (grated)	
10236	788174.31	2001153.14	302.49	CB (Florida type)	
10237	788174.51	2001155.75	302.43	Corner of Catch Basin	
10238	788171.92	2001153.00	302.44	Corner of Catch Basin	
10239	788174.67	2001150.54	302.57	Corner of Catch Basin	
10240	788179.93	2001149.40	302.56	Corner of Catch Basin	
10241	788183.21	2001147.30	302.59	Corner of Catch Basin	
10242	788184.74	2001146.72	302.55	Corner of Catch Basin	
10243	788178.98	2001152.24	301.92	Throat	
10244	788175.44	2001155.44	301.86	Throat	
10247	788302.98	2001131.23	303.64	CB (Florida type)	
10248	788295.43	2001137.41	303.48	Corner of Catch Basin	
10249	788297.01	2001134.00	303.54	Corner of Catch Basin	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10250	788299.34	2001131.42	303.55	Corner of Catch Basin	
10251	788309.35	2001122.61	303.63	Corner of Catch Basin	
10252	788309.68	2001122.94	303.62	Corner of Catch Basin	
10253	788306.66	2001127.27	303.63	Corner of Catch Basin	
10254	788305.92	2001130.89	303.66	Corner of Catch Basin	
10255	788302.07	2001134.19	303.65	Corner of Catch Basin	
10256	788298.44	2001135.95	303.57	Corner of Catch Basin	
10257	788296.04	2001137.97	303.50	Corner of Catch Basin	
10258	788296.98	2001133.90	302.86	Throat	
10259	788300.08	2001130.77	302.63	Throat	
10260	788302.73	2001128.33	302.75	Throat	
10261	788308.22	2001123.42	303.00	Throat	
10265	787796.73	2000318.16	293.91	CB (grated w/ hood)	
10266	787881.94	2000324.10	293.58	CB (grated)	
10267	787915.50	2000351.88	293.40	CB (grated w/ hood)	
10268	787961.74	2000355.90	294.25	CB (grated w/ hood)	
10269	787967.53	2000328.16	293.54	CB (grated w/ hood)	
10270	787994.76	2000298.77	292.92	CB (grated)	
10271	787990.23	2000345.99	294.52	Storm MH	
10272	787945.99	2000342.42	294.69	Storm MH	
10273	788292.07	2000372.13	299.48	Storm MH	
10274	788295.32	2000358.58	298.83	CB (grated w/ hood)	
10275	788316.02	2000384.65	299.39	CB (grated w/ hood)	
10276	788383.10	2000379.45	301.71	Storm MH	
10278	787912.05	2000446.73	295.06	Storm MH	
10281	787699.82	2000637.60	297.70	Storm MH	
10282	787508.93	2000621.87	295.62	Storm MH	
10285	787538.07	2000287.32	296.07	CB (grated w/ hood)	
10286	787533.53	2000342.30	295.86	CB (grated w/ hood)	
10287	787460.69	2000327.73	296.13	CB (grated w/ hood)	
10288	787489.18	2000290.60	295.96	CB (grated w/ hood)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10289	787478.15	2000065.80	297.26	CB (grated)	
10290	787412.74	2000070.89	296.81	CB (grated)	
10291	787372.87	2000011.80	297.99	CB (grated)	
10293	788008.75	2000068.60	294.44	CB (slab top)	
10294	787513.60	2000590.32	295.52	CB (grated w/ hood)	
10295	787274.02	2000508.97	293.92	CB (grated)	
10296	787422.70	2001063.31	293.92	Storm MH	
10297	787426.96	2001061.22	293.20	CB (grated w/ hood)	
10298	787470.04	2001066.94	293.88	Computed Point	
10299	787485.49	2001073.61	294.54	Storm MH	
10300	787483.42	2001120.03	294.34	Storm MH	
10301	787470.38	2001130.51	293.04	CB (grated w/ hood)	
10302	787483.66	2001187.27	293.51	CB (grated w/ hood)	
10304	787431.81	2000780.36	294.24	CB (grated w/ hood)	
10306	787467.69	2000193.35	297.11	CB (grated)	
10308	787614.13	2001159.94	294.41	CB (grated w/ hood)	
10309	787630.12	2001189.75	294.18	CB (grated w/ hood)	
10317	787259.38	2001025.14	283.94	CB (grated)	
10318	787257.58	2001032.55	283.18	CB (grated)	
10319	787256.41	2001037.15	283.80	R.C.P. (top)	
10321	790193.41	2000875.76	337.02	R.C.P. (top)	
10322	789729.83	2000831.04	322.74	Storm MH (Covered)	
10323	789732.92	2000791.16	322.74	R.C.P. (top)	
10324	789275.51	2000795.48	319.98	Computed Point	
10325	789479.42	2000371.64	318.47	CB (grated)	
10326	789471.21	2000474.93	318.36	CB (grated)	
10327	789481.08	2000333.83	319.58	R.C.P. (top)	
10329	787643.09	2000198.11	293.48	CB (grated)	
10332	787664.87	2000228.74	294.23	Yard Inlet	
10333	787675.39	2000215.36	294.05	Yard Inlet	
10334	787677.59	2000175.96	294.01	CB (grated)	

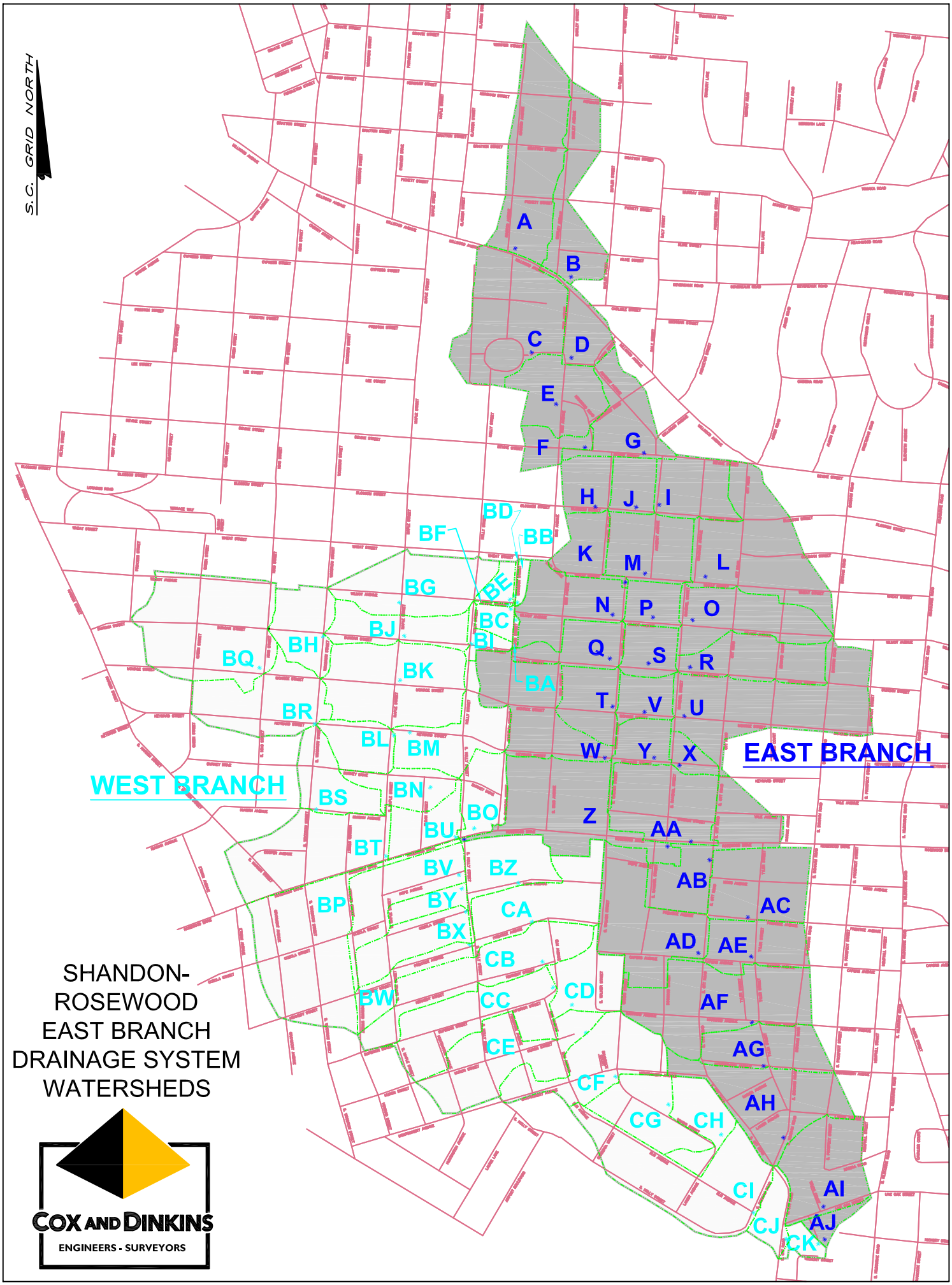
POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10335	787579.68	2000203.19	296.74	HDPE (top)*+-	
10336	787646.58	2000204.51	293.54	Junction Box (under Asphalt)	
10338	788391.02	2000124.06	300.91	CB (grated w/ hood)	
10339	788430.06	2000132.01	300.91	CB (grated w/ hood)	
10340	788399.17	2000093.02	301.14	CB (slab top w/ mh)	
10341	788399.16	2000094.14	300.49	Throat	
10342	788363.59	2000023.37	299.61	CB (grated w/ hood)	
10343	788345.26	2000018.06	299.97	Computed Point	
10344	788539.22	2000091.28	301.90	CB (grated)	
10345	788227.85	1999929.00	301.56	CB (slab top w/ mh)	
10346	788247.55	1999920.27	298.45	CB (slab top w/ mh)	
10347	788246.47	1999920.76	297.92	Throat	
10348	788248.61	1999692.10	299.48	CB (slab top w/ mh)	
10349	788248.84	1999693.69	298.60	Throat	
10350	788344.03	1999676.19	299.55	CB (grated)	
10351	788353.32	1999541.98	300.12	CB (slab top w/ mh)	
10352	788353.93	1999541.03	299.53	Throat	
10353	788476.33	1999349.85	299.45	CB (grated)	
10354	788131.58	1999524.06	298.80	CB (grated)	
10356	788506.28	1999807.81	303.12	CB (slab top w/ mh)	
10357	788505.85	1999809.40	302.22	Throat	
10358	788507.57	1999834.45	303.00	CB (slab top w/ mh)	
10359	788506.52	1999833.80	302.38	Throat	
10360	788509.07	1999856.86	302.82	CB (grated)	
10361	788509.55	1999875.23	303.39	CB (slab top w/ mh)	
10362	788509.96	1999875.73	302.56	Throat	
10363	788605.28	1999978.88	304.35	CB (grated)	
10364	788618.45	2000021.06	304.60	CB (grated)	
10365	788640.47	1999881.59	304.20	CB (grated)	
10366	788641.04	1999865.00	304.48	CB (grated)	
10367	788875.74	1999877.36	307.04	CB (grated)	

POINT NO.	NORTHING	EASTING	ELEVATION	POINT DESCRIPTION	NOTES:
10368	788866.40	1999849.39	307.46	CB (slab top w/ mh)	
10369	788866.44	1999848.56	306.85	Throat	
10370	788868.06	1999827.18	307.31	CB (slab top w/ mh)	
10371	788868.03	1999828.32	306.69	Throat	
10372	788725.29	1999869.47	305.24	CB (grated)	
10373	788832.17	1999849.30	307.16	Storm MH	
10374	788845.67	1999575.31	305.95	CB (slab top w/ mh)	
10375	788846.31	1999574.50	305.36	Throat	
10376	788847.81	1999552.31	305.84	CB (slab top w/ mh)	
10377	788848.12	1999548.03	305.08	Throat	
10378	788884.17	1999576.34	306.36	CB (slab top w/ mh)	
10379	788884.17	1999574.72	305.44	Throat	
10386	788431.93	1999375.64	299.56	CB (grated)	
10391	788376.69	2000123.69	299.93	Computed Point	
10394	788539.35	2000091.07	302.17	CB (grated)	
10395	788004.80	2000194.61	293.03	CB (grated)	
10396	788013.53	2000097.40	293.74	CB (grated)	
10397	788016.60	2000056.06	293.53	15" R.C.P. (inv)	
10398	788016.50	2000056.12	295.07	Headwall (top/center)	
10399	788223.79	1999929.45	297.66	Throat	
10400	788390.36	1999543.94	300.54	CB (slab top w/ mh)	
10401	788389.92	1999542.43	299.80	Throat	
10402	788355.27	1999514.01	300.21	CB (slab top w/ mh)	
10403	788355.21	1999515.62	299.53	Throat	
10404	788007.44	2000090.95	294.49	CB (slab top w/ mh)	
10405	788007.57	2000089.01	293.49	Throat	
10407	788572.36	2000129.01	303.03	CB (grated w/ hood)	
10408	784126.10	2001273.88	239.96	CB (slab top w/ mh)	

COX AND DINKINS
ENGINEERS · SURVEYORS

SECTION 3A

EAST BRANCH
WATERSHED DELINEATIONS
AND CHARACTERISTICS



SHANDON-
ROSEWOOD
EAST BRANCH
DRAINAGE SYSTEM
WATERSHEDS

COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WATERSHED

WATER-SHED ID NO	NODE NO	AREA (ACRES)	IMPERVIOUS PERCENTAGE	OVERLAND SLOPE	TIME OF CONCEN TRATION	PERVIOUS AREA CURVE NO	2-YR PEAK FLOW AREA (CFS)	2-YR TOTAL SURFACE RUNOFF (INCHES)	10-YR PEAK FLOW AREA (CFS)	10-YR TOTAL SURFACE RUNOFF (INCHES)
A	10123	20.88	42	1.99	44.72	76	18.49	1.36	37.72	2.69
B	10113	12.63	49	2.15	37.78	79	14.69	1.54	28.17	2.93
C	10391	21.04	26	1.16	52.83	71	12.11	1.04	27.66	2.23
D	10273	5.66	61	1.49	24.03	83	10.54	1.85	18.81	3.34
E	10272	10.9	40	1.01	22.76	76	14.88	1.35	29.98	2.66
F	10294	3.69	85	0.88	18.26	92	10.94	2.63	17.17	4.28
G	10296	10.13	55	1.25	31.05	81	14.81	1.7	27.44	3.15
H	5715	5.24	56	1.79	14.28	81	11.68	1.75	21.34	3.23
I	5726	8.76	68	1.56	21.5	86	19.47	2.08	33.19	3.63
J	5719	4.66	61	3.14	10.32	84	12.66	1.94	22.03	3.45
K	5606	5.89	38	2.22	22.04	75	7.83	1.3	16.03	2.6
L	5646	22.21	49	1.23	41.83	79	24.17	1.55	46.44	2.95
M	5609	10.7	43	2.83	16.17	77	18.73	1.44	36.56	2.81
N	5541	11.5	52	1.17	34.21	80	15.04	1.63	28.36	3.05
O	5575	13	48	1.55	34.97	79	15.98	1.55	30.63	2.96
P	5547	4.58	48	2.41	12.88	79	9.4	1.56	17.72	2.96
Q	5512	7.05	48	2.23	22.97	79	11.2	1.56	21.37	2.96
R	5478	10.82	38	1.96	37.6	75	10.21	1.28	21.16	2.58
S	5492	5.18	48	2.72	12.32	79	10.84	1.56	20.36	2.96
T	5376	7.44	38	3.14	17.84	75	11.07	1.3	22.48	2.61
U	5397	24.31	35	1.51	68.09	74	14.1	1.22	30.06	2.48
V	5382	4.62	48	5.89	9.22	79	10.35	1.56	19.47	2.97
W	5342	15.4	43	1.28	57.43	77	12.01	1.41	24.03	2.76
X	5304	2.6	38	3.26	13.03	75	4.39	1.3	8.85	2.6
Y	5306	4.94	38	1.63	26	75	5.97	1.3	12.27	2.6
Z	2039	19.82	46	1.6	47.11	78	18.78	1.48	36.86	2.85
AA	2072	14.34	51	2.26	23.82	80	23.44	1.62	43.89	3.05
AB	1999	13.83	54	1.49	33.3	81	19.3	1.7	35.81	3.14
AC	1950	13.47	48	2.52	24.6	79	20.52	1.56	39.15	2.96
AD	1809	17.65	40	1.24	55.48	76	13.39	1.34	27.34	2.67
AE	1806	9.18	39	3.05	18.86	76	13.95	1.35	27.84	2.68
AF	1700	22.36	42	2.38	32.18	77	26.13	1.42	51.91	2.77
AG	1617	9.58	34	2.96	19.38	74	12.85	1.23	26.66	2.51
AH	1589	17.21	46	2.19	36.84	78	19.33	1.48	37.71	2.85

All Hydrographic Shapes are Curvilinear.
All Shape Factors are 484.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WATERSHED

WATER-SHED ID NO	NODE NO	AREA (ACRES)	IMPERVIOUS PERCENTAGE	OVERLAND SLOPE	TIME OF CONCEN TRATION	PERVIOUS AREA CURVE NO	2-YR PEAK FLOW AREA (CFS)	2-YR TOTAL SURFACE RUNOFF (INCHES)	10-YR PEAK FLOW AREA (CFS)	10-YR TOTAL SURFACE RUNOFF (INCHES)
AI	1565	13.6	56	2.96	21.49	82	25.74	1.77	46.47	3.23
AJ	10440	1.91	56	2.69	12.24	82	4.58	1.78	8.22	3.26

All Hydrographic Shapes are Curvilinear.
All Shape Factors are 484.

COX AND DINKINS
ENGINEERS · SURVEYORS

SECTION 3B

EAST BRANCH
PIPES, STRUCTURES,
AND INVERTS

(DATA SET ORDERED ACCORDING TO DRAINAGE PATTERN; UPSTREAM TO DOWNSTREAM)

1. HAGOOD AVENUE NO. 1
2. MILLWOOD AVENUE NO. 1
3. SHIRLEY AVENUE NO. 1
4. KLINE STREET NO. 1
5. SIMS AVENUE NO. 1
6. EPWORTH CHILDREN'S HOME NO. 1
7. EPWORTH CHILDREN'S HOME NO.2
8. EPWORTH CHILDREN'S HOME NO. 3
9. EPWORTH CHILDREN'S HOME NO. 4
10. SIMS AVENUE NO. 2
11. KIRKWOOD ROAD NO. 1
12. DEVINE STREET NO. 1
13. DEVINE STREET NO. 2
14. DEVINE STREET NO. 3
15. DEVINE STREET NO. 4
16. DEVINE STREET NO. 5
17. BLOSSOM STREET NO. 1
18. BLOSSOM STREET NO. 2
19. OTT ROAD NO. 1
20. WHEAT STREET NO. 1
21. WHEAT STREET NO. 2
22. AMHERST AVENUE NO. 1
23. SIMS AVENUE NO. 3
24. WILMOT AVENUE NO. 1
25. WILMOT AVENUE NO. 2
26. DUNCAN STREET NO. 1
27. DUNCAN STREET NO. 2
28. BONHAM STREET NO. 1
29. MONROE STREET NO. 1
30. MONROE STREET NO. 2
31. MONROE STREET NO. 3
32. SIMS AVENUE NO. 4
33. HEYWARD STREET NO. 1
34. RAVENEL & HEYWARD STREET NO. 1
35. S RAVENEL STREET NO. 1
36. S RAVENEL STREET NO. 2
37. S RAVENEL STREET NO. 3
38. S RAVENEL STREET NO. 4
39. ROSEWOOD DRIVE NO. 1
40. ROSEWOOD DRIVE NO. 2
41. ROSEWOOD ELEM. SCHOOL NO. 1
42. ROSEWOOD ELEM. SCHOOL NO. 2
43. MOSS AVENUE NO. 1
44. PRINTICE AVENUE NO. 1
45. CAPERS AVENUE NO. 1
46. CAPERS AVENUE NO. 2
47. CAPERS AVENUE NO. 3
48. HARVARD AVENUE NO. 1
49. HARVARD AVENUE NO. 2
50. HARVARD AVENUE NO. 3
51. MONTGOMERY AVENUE NO. 1
52. LANIER AVENUE NO. 1
53. LANIER AVENUE NO. 2
54. S BONHAM ROAD NO. 1
55. S BONHAM ROAD NO. 2
56. S OTT ROAD NO. 1
57. S BONHAM ROAD NO. 3
58. S PROSPECT STREET NO. 1
59. TEMPO COURT NO. 1

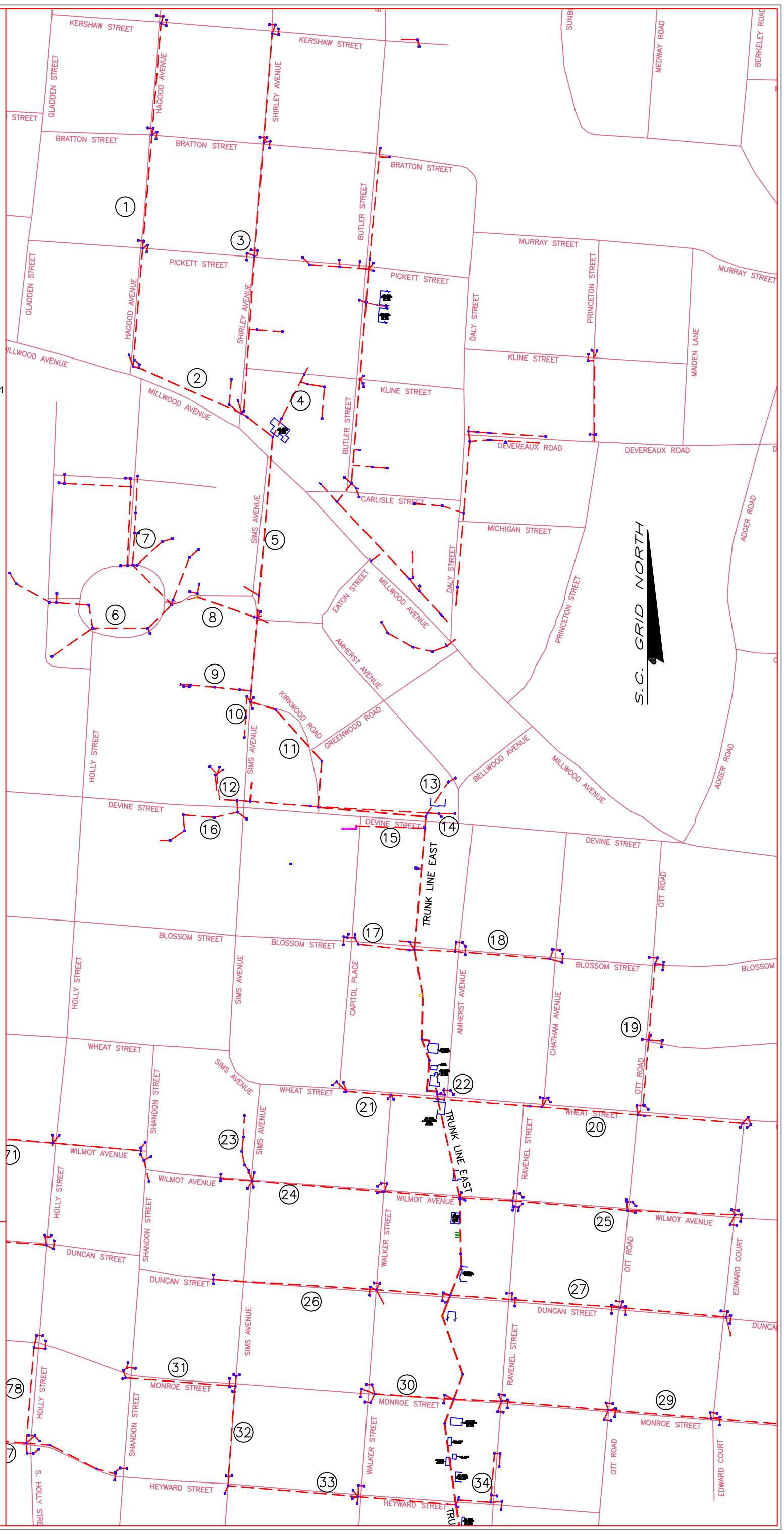
TRUNK LINE EAST (AND DITCH)

60. WILMOT AVENUE NO. 3
61. DUNCAN STREET NO. 3
62. KING STREET NO. 1
63. MONROE STREET NO. 4
64. WOODROW STREET NO. 1
65. HEYWARD STREET NO. 2
66. S HARDEN STREET NO. 1
67. ROSEWOOD DRIVE NO. 3
68. ROSEWOOD DRIVE NO. 4
69. ROSEWOOD DRIVE NO. 5
70. HOWARD STREET NO. 1
71. WILMOT AVENUE NO. 4
72. MAPLE STREET NO. 1
73. WOODROW STREET NO. 2
74. DUNCAN STREET NO. 4
75. DUNCAN STREET NO. 5
76. MONROE STREET NO. 5
77. HEYWARD STREET NO. 3
78. HOLLY STREET NO. 1
79. BURNEY DRIVE NO. 1
80. BURNEY DRIVE NO. 2
81. ROSEWOOD DRIVE NO. 6
82. ROSEWOOD DRIVE NO. 7
83. ROSEWOOD DRIVE NO. 8
84. HOPE AVENUE NO. 1
85. S HOLLY STREET NO. 1
86. OCEOLA STREET NO. 1
87. PRENTICE AVENUE NO. 3
88. S HOLLY STREET NO. 2
89. HOPE AVENUE NO. 2
90. HOPE AVENUE NO. 3
91. PRENTICE AVENUE NO. 2
92. KENNEDY STREET NO. 1
93. SUPERIOR STREET NO. 1
94. S HOLLY STREET NO. 3
95. SUPERIOR STREET NO. 2
96. S WALKER STREET NO. 1
97. HURON STREET NO. 1
98. MONTGOMERY AVENUE NO. 2
99. MONTGOMERY AVENUE NO. 3
100. WANDO STREET NO. 1
101. WANDO STREET NO. 2
102. LANIER AVENUE NO. 3
103. S HOLLY STREET NO. 4
104. S HOLLY STREET NO. 5

TRUNK LINE WEST (AND DITCH)

SHANDON-ROSEWOOD WATERSHED SPREADSHEET KEY EAST BRANCH SHEET NO. 1 OF 2

COX AND DINKINS
ENGINEERS - SURVEYORS



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1. HAGOOD AVENUE NO. 1
2. MILLWOOD AVENUE NO. 1
3. SHIRLEY AVENUE NO. 1
4. KLINE STREET NO. 1
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14. DEVINE STREET NO. 3
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16. DEVINE STREET NO. 5
17. BLOSSOM STREET NO. 1
18. BLOSSOM STREET NO. 2
19. OTT ROAD NO. 1
20. WHEAT STREET NO. 1
21. WHEAT STREET NO. 2
22. AMHERST AVENUE NO. 1
23. SIMS AVENUE NO. 3
24. WILMOT AVENUE NO. 1
25. WILMOT AVENUE NO. 2
26. DUNCAN STREET NO. 1
27. DUNCAN STREET NO. 2
28. BONHAM STREET NO. 1
29. MONROE STREET NO. 1
30. MONROE STREET NO. 2
31. MONROE STREET NO. 3
32. SIMS AVENUE NO. 4
33. HEYWARD STREET NO. 1
34. RAVENEL & HEYWARD STREET NO. 1
35. S RAVENEL STREET NO. 1
36. S RAVENEL STREET NO. 2
37. S RAVENEL STREET NO. 3
38. S RAVENEL STREET NO. 4
39. ROSEWOOD DRIVE NO. 1
40. ROSEWOOD DRIVE NO. 2
41. ROSEWOOD ELEM. SCHOOL NO. 1
42. ROSEWOOD ELEM. SCHOOL NO. 2
43. MOSS AVENUE NO. 1
44. PRINTICE AVENUE NO. 1
45. CAPERS AVENUE NO. 1
46. CAPERS AVENUE NO. 2
47. CAPERS AVENUE NO. 3
48. HARVARD AVENUE NO. 1
49. HARVARD AVENUE NO. 2
50. HARVARD AVENUE NO. 3
51. MONTGOMERY AVENUE NO. 1
52. LANIER AVENUE NO. 1
53. LANIER AVENUE NO. 2
54. S BONHAM ROAD NO. 1
55. S BONHAM ROAD NO. 2
56. S OTT ROAD NO. 1
57. S BONHAM ROAD NO. 3
58. S PROSPECT STREET NO. 1
59. TEMPO COURT NO. 1

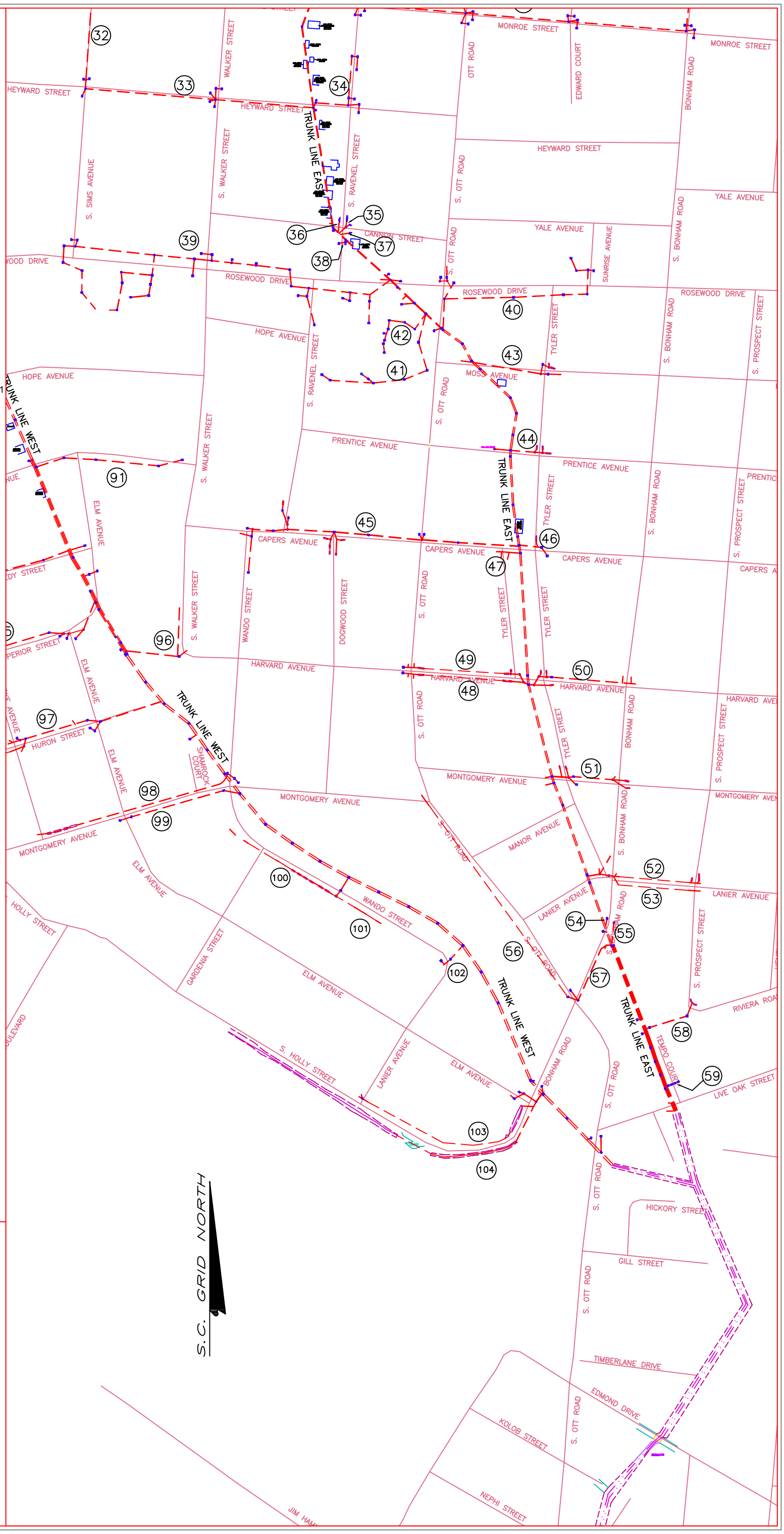
TRUNK LINE EAST (AND DITCH)

60. WILMOT AVENUE NO. 3
61. DUNCAN STREET NO. 3
62. KING STREET NO. 1
63. MONROE STREET NO. 4
64. WOODROW STREET NO. 1
65. HEYWARD STREET NO. 2
66. S HARDEN STREET NO. 1
67. ROSEWOOD DRIVE NO. 3
68. ROSEWOOD DRIVE NO. 4
69. ROSEWOOD DRIVE NO. 5
70. HOWARD STREET NO. 1
71. WILMOT AVENUE NO. 4
72. MAPLE STREET NO. 1
73. WOODROW STREET NO. 2
74. DUNCAN STREET NO. 4
75. DUNCAN STREET NO. 5
76. MONROE STREET NO. 5
77. HEYWARD STREET NO. 3
78. HOLLY STREET NO. 1
79. BURNEY DRIVE NO. 1
80. BURNEY DRIVE NO. 2
81. ROSEWOOD DRIVE NO. 6
82. ROSEWOOD DRIVE NO. 7
83. ROSEWOOD DRIVE NO. 8
84. HOPE AVENUE NO. 1
85. S HOLLY STREET NO. 1
86. OCEOLA STREET NO. 1
87. PRENTICE AVENUE NO. 3
88. S HOLLY STREET NO. 2
89. HOPE AVENUE NO. 2
90. HOPE AVENUE NO. 3
91. PRENTICE AVENUE NO. 2
92. KENNEDY STREET NO. 1
93. SUPERIOR STREET NO. 1
94. S HOLLY STREET NO. 3
95. SUPERIOR STREET NO. 2
96. S WALKER STREET NO. 1
97. HURON STREET NO. 1
98. MONTGOMERY AVENUE NO. 2
99. MONTGOMERY AVENUE NO. 3
100. WANDO STREET NO. 1
101. WANDO STREET NO. 2
102. LANIER AVENUE NO. 3
103. S HOLLY STREET NO. 4
104. S HOLLY STREET NO. 5

TRUNK LINE WEST (AND DITCH)

SHANDON-ROSEWOOD WATERSHED SPREADSHEET KEY EAST BRANCH SHEET NO. 2 OF 2

COX AND DINKINS
ENGINEERS - SURVEYORS



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ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION - EAST BRANCH

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1 HAGOOD AVENUE NO. 1										
10001	342.46	339.36	15	1	28.1	3.77	10002	342.03	338.3	
10002	342.03	338.18	15	1	30.86	2.2	10005	342.5	337.5	
10003	341.79	338.39	15	1	23.99	2.17	10004	341.67	337.87	
10004	341.67	337.77	15	1	22.08	4.17	10005	342.5	336.85	
10005	342.5	336	15	1	461.24	2.36	10033	331.92	325.12	
10029	332.08	327.58	15	1	23.97	1.25	10030	331.88	327.28	
10030	331.88	327.08	15	1	27.47	3.13	10033	331.92	326.22	
10032	331.2	326.9	15	1	28.15	0.99	10031	331.27	326.62	
10031	331.27	326.52	15	1	23.12	3.03	10033	331.92	325.82	
10033	331.92	324.52	18	1	439.59	1.94	10425	316	316	asmd dn
10036	321.18	317.88	15	1	19.9	9.45	10425	316	316	asmd dn
10037	321.18	317.18	15	1	4.11	28.71	10425	316	316	asmd dn
10425	316	316	18	1	29.86	1.61	10040	321.32	315.52	asmd up
10039	320.79	317.49	18	1	28.03	2.1	10038	320.8	316.9	
10039	320.79	317.49	15	1	28.03	2.1	10038	320.8	316.9	
10038	320.8	316.8	15	1	24.1	3.65	10040	321.32	315.92	
10040	321.32	315.42	18	1	488.87	1.19	10124	314.27	309.62	
10126	313.71	311.91	15	1	49.37	0.79	10124	314.27	311.52	
2 MILLWOOD AVENUE NO. 1										
10124	314.27	309.42	24	1	24.14	0.83	10123	314.35	309.22	asmd dn
10125	313.34	311.24	15	1	26.82	0.75	10122	313.74	311.04	
10122	313.74	310.89	15	1	14.18	11.78	10123	314.35	309.22	asmd dn
10123	314.35	309.22	24	1	465.34	0.77	10116	313.8	305.65	asmd up
10116	313.8	305.5	24	1	26.4	-0.08	10114	313.32	305.52	
10114	313.32	305.42	24	1	133.69	0.91	10113	312.91	304.21	
3 SHIRLEY AVENUE NO. 1										
10008	345.42	342.22	15	1	24.1	3.07	10009	345.38	341.48	
10009	345.38	341.48	15	1	38.03	2.79	10012	345.82	340.42	
10010	345.29	342.09	15	1	24.2	2.73	10011	345.03	341.43	
10011	345.03	341.43	15	1	26.31	3.08	10012	345.82	340.62	
10012	345.82	339.62	15	1	450.47	2.31	10025	335.92	329.22	
10021	335.3	331.7	15	1	28.09	0.93	10022	335.39	331.44	
10022	335.39	331.39	15	1	23.8	4.5	10025	335.92	330.32	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
10024	335.02	331.42	15	1	28.11	0.64	10023	335.09	331.24	
10023	335.09	331.19	15	1	26.54	3.47	10025	335.92	330.27	
10025	335.92	329.17	18	1	446.42	2.46	10426	318.3	318.2	asmd dn
10046	324.7	318.3	15	1	16.76	0.6	10426	318.3	318.2	asmd dn
10047	324.61	320.66	15	1	11.16	22.04	10426	318.3	318.2	asmd dn
10426	318.3	318.2	18	1	22.49	1.11	10048	324.95	317.95	asmd up
10044	324	320.85	15	1	28.03	0.86	10045	324.41	320.61	
10045	324.41	320.61	15	1	32.2	5.16	10048	324.95	318.95	
10048	324.95	317.75	18	1	304.6	1.52	10327	319.58	313.12	asmd dn
10326	318.36	315.56	15	1	103.62	0.57	10325	318.47	314.97	
10325	318.47	314.87	15	1	37.85	4.62	10327	319.58	313.12	asmd dn
10327	319.58	313.12	18	1	337.25	1.35	10115	313.26	308.56	asmd up
10115	313.26	308.18	18	1	13.47	7.65	10116	313.8	307.15	
10117	313.75	310.75	15	1	55.07	9.26	10116	313.8	305.65	
10120	315.09	313.24	18	1	105.04	2.06	10118	313.68	311.08	
10118	313.68	310.08	15	1	63.81	6.94	10116	313.8	305.65	
4 KLINE STREET NO. 1										
10095	318.75	308.35	18	1	34.75	1.01	10419	318	308	asmd dn
10100	314.94	311.94	15	1	131.18	1.19	10093	317.68	310.38	
10093	317.68	310.33	18	1	71.15	-0.27	10094	318.27	310.52	
10094	318.27	310.52	18	1	30.5	8.26	10419	318	308	asmd dn
10419	318	308	18	1	171.21	1.9	10105	313.21	304.74	asmd up
10105	313.21	304.74	18	1	84.24	1.52	10113	312.91	303.46	
5 SIMS AVENUE NO. 1										
10113	312.91	303.51	30	1	656.26	1.57	10276	301.71	293.21	
10276	301.71	293.21	30	1	66.54	1.52	10427	300	292.2	asmd dn
10275	299.39	296.99	18	1	10.56	45.36	10427	300	292.2	asmd dn
10427	300	292.2	30	1	24.78	1.29	10273	299.48	291.88	asmd up
10273	299.48	291.83	30	1	302.97	0.73	10271	294.52	289.62	
10271	294.52	289.57	30	1	44.38	0.41	10272	294.69	289.39	
6 EPWORTH CHILDREN'S HOME NO. 1										
10376	305.09	303.84	15	1	23.1	1.69	10374	305.36	303.45	
10378	305.44	303.56	15	1	38.51	0.42	10374	305.36	303.4	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
10374	305.36	303.35	15	1	274.32	0.25	10373	307.16	302.66	
10370	306.51	304.51	15	1	22.27	4.04	10368	306.85	303.61	
10368	306.85	303.61	15	1	34.23	2.78	10373	307.16	302.66	
10373	307.16	302.66	15	1	324.94	0.82	10358	302.38	300	
10356	302.22	300.32	15	1	26.67	0.82	10358	302.38	300.1	
10358	302.38	299.9	15	1	22.46	2.58	10360	302.82	299.32	
10367	307.04	305.04	12	1	150.66	1.19	10372	305.24	303.24	
10372	305.24	303.14	15	1	84.37	1.14	10366	304.48	302.18	
10365	304.2	302.2	15	1	16.6	-0.48	10366	304.48	302.28	
10366	304.48	302.08	15	1	132.22	0.69	10360	302.82	301.17	
10364	304.6	303.2	15	1	44.19	1.47	10363	304.35	302.55	
10363	304.35	302.45	15	1	141.09	0.75	10361	302.56	301.39	
10361	302.56	300.89	15	1	18.38	0.38	10360	302.82	300.82	
10360	302.82	297.92	15	1	229.82	1.88	10343	299.97	293.6	asmd dn
10407	303.03	300.43	15	1	50.22	3.05	10344	301.9	298.9	
10344	301.9	298.9	15	1	188.3	1	10342	299.61	297.01	
10342	299.61	296.81	18	1	19.08	0.58	10343	299.97	296.7	asmd dn
7 EPWORTH CHILDREN'S HOME NO.2										
10353	299.45	298.05	15	1	51.35	-0.02	10386	299.56	298.06	
10386	299.56	298.06	15	1	158.19	0.32	10402	299.53	297.56	
10402	299.53	297.46	15	1	28.04	0.5	10351	299.53	297.32	
10400	299.8	297.84	15	1	37.09	1.4	10351	299.53	297.32	
10351	299.53	297.12	15	1	134.53	0.87	10350	299.55	295.95	
10350	299.55	295.9	15	1	96.74	1.36	10348	298.6	294.58	
10354	298.8	295.8	15	1	204.78	0.69	10348	298.6	294.38	
10348	298.6	294.48	15	1	228.17	0.23	10346	297.92	293.95	
10345	297.66	299.06	15	1	21.55	12.58	10346	297.92	296.35	
10346	297.92	293.95	15	1	138.24	0.25	10343	299.97	293.6	asmd dn
8 EPWORTH CHILDREN'S HOME NO. 3										
10343	299.97	293.6	24	1	110.21	0.18	10391	299.93	293.4	asmd dn&up
10340	300.49	298.24	15	1	32.09	1.34	10338	300.91	297.81	
10339	300.91	299.01	15	1	39.84	3.01	10338	300.91	297.81	
10338	300.91	297.81	15	1	14.33	30.77	10391	299.93	293.4	asmd dn
10391	299.93	293.4	24	1	248.58	0.09	10274	298.83	293.18	asmd up

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
10274	298.83	293.13	24	1	13.93	3.23	10273	299.48	292.68	
9 EPWORTH CHILDREN'S HOME NO. 4										
10270	292.92	290.72	15	1	47.44	0.21	10271	294.52	290.62	
10293	293.44	291.99	15	1	22.39	0.45	10404	293.49	291.89	
10395	293.03	291.18	15	1	104.64	0.39	10270	292.92	290.77	
10396	293.74	291.99	15	1	97.6	0.78	10395	293.03	291.23	
10397	293.53	293.53	15	1	41.45	3.59	10396	293.74	292.04	
10404	293.49	291.74	15	1	8.87	-3.38	10396	293.74	292.04	
10 SIMS AVENUE NO. 2										
10265	293.91	291.41	18	1	85.42	0.68	10266	293.58	290.83	
10266	293.58	290.83	18	1	85.69	-0.25	10269	293.54	291.04	
10269	293.54	290.84	18	1	25.83	5.61	10272	294.69	289.39	
11 KIRKWOOD ROAD NO. 1										
10267	293.4	290.35	15	1	31.92	2.85	10272	294.69	289.44	
10268	294.25	291	15	1	20.73	6.32	10272	294.69	289.69	
10272	294.69	289.34	30	1	109.69	0.8	10278	295.06	288.46	
10278	295.06	288.36	30	1	285.43	0.55	10281	297.7	286.8	
10281	297.7	286.6	30	1	191.54	0.41	10282	295.62	285.82	
12 DEVINE STREET NO. 1										
10335	296.74	296.24	6	1	63.61	6.15	10329	293.48	292.33	asmd up
10329	293.48	292.33	6	1	7.29	5.9	10336	293.54	291.9	asmd dn
10334	294.01	292.91	6	1	42.15	2.4	10336	293.54	291.9	asmd dn
10333	294.05	291.95	6	1	30.79	0.16	10336	293.54	291.9	asmd dn
10332	294.23	292.73	6	1	30.36	2.73	10336	293.54	291.9	asmd dn
10336	293.54	291.9	15	1	105.51	-0.07	10420	295.9	291.97	asmd dn&up
10420	295.9	291.97	15	1	72.57	0.14	10285	296.07	291.87	asmd up
10285	296.07	291.22	15	1	55.17	0.4	10286	295.86	291	asmd dn
10286	295.86	290.9	15	1	248.82	0.63	10294	295.52	289.32	asmd up
10294	295.52	289.22	15	1	484.11	0.35	10299	294.54	287.54	
10299	294.54	287.49	18	1	16.83	27.87	10298	293.88	282.8	asmd dn
10298	293.88	282.8	30	1	47.48	0.51	10296	293.92	282.56	asmd up
10297	293.2	289.6	15	1	4.75	10.11	10296	293.92	289.12	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
10282	295.62	285.77	30	1	446.77	0.66	10298	293.88	282.8	
13 DEVINE STREET NO. 2										
10309	294.18	290.18	18	1	33.83	0.8	10308	294.41	289.91	
10308	294.41	289.81	15	1	154.92	1.47	10299	294.54	287.54	
14 DEVINE STREET NO. 3										
10302	293.51	290.81	12	1	67.24	2.33	10300	294.34	289.24	
10301	293.04	289.44	15	1	16.73	1.79	10300	294.34	289.14	
10300	294.34	289.14	12	1	46.47	3.44	10299	294.54	287.54	
15 DEVINE STREET NO. 4										
10304	294.24	291.75	15	1	283.1	1.46	10296	293.92	287.62	asmd up
16 DEVINE STREET NO. 5										
10291	297.99	295.54	12	1	71.28	0.95	10290	296.81	294.86	
10290	296.81	294.76	12	1	65.61	0.46	10289	297.26	294.46	
10289	297.26	294.41	15	1	127.98	0.78	10306	297.11	293.41	
10306	297.11	293.36	12	1	99.6	0	10288	295.96	293.36	
10287	296.13	294.33	12	1	46.8	3.57	10288	295.96	292.66	
10288	295.96	292.51	12	1	49	2.33	10285	296.07	291.37	
17 BLOSSOM STREET NO. 1										
5714	286.82	284.22	15	1	33.86	4.81	5713	286.99	282.59	
5713	286.99	282.49	15	1	14.81	-1.62	5715	287.43	282.73	
5712	287.08	283.48	15	1	14.88	5.04	5715	287.43	282.73	
5715	287.43	281.83	18	1	31.1	0.51	5716	287.27	281.67	
5711	287.12	284.92	15	1	13.06	1.15	5716	287.27	284.77	
5716	287.27	279.02	18	1	30.3	2.61	5717	286.93	278.23	
5717	286.93	278.03	15	1	210.6	2.16	5720	277.38	273.48	
5720	277.38	273.48	18	1	22.23	5.85	5719	277.78	272.18	
18 BLOSSOM STREET NO. 2										
5732	287.08	283.48	15	1	34.12	0.94	5733	286.66	283.16	
5733	286.66	283.16	15	1	51.85	0.15	5729	287.58	283.08	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5731	287.16	284.36	15	1	27.91	0.57	5915	288.15	284.2	asmd dn
5730	287.47	284.27	15	1	6.09	1.15	5915	288.15	284.2	asmd dn
5915	288.15	284.2	15	1	42.34	2.65	5729	287.58	283.08	asmd up
5729	287.58	282.98	18	1	392.56	2.21	5726	281.91	274.31	
5725	281.87	278.67	15	1	34.03	0.97	5724	282.24	278.34	
5724	282.24	278.24	15	1	21.61	1.43	5723	282.13	277.93	
5723	282.13	277.83	15	1	25.99	2.54	5722	282.17	277.17	
5722	282.17	277.07	15	1	39.76	1.16	5726	281.91	276.61	
5726	281.91	274.01	18	1	167.53	1.09	5719	277.78	272.18	
19 OTT ROAD NO. 1										
5682	287.47	282.87	15	1	34.17	-0.06	5681	287.49	282.89	
5681	287.49	282.79	15	1	26.24	2.29	5678	288.09	282.19	
5680	287.16	283.46	15	1	11.01	0.82	5916	288.17	283.37	
5679	287.24	283.04	15	1	23.03	0.3	5916	288.17	282.97	
5916	288.17	280.57	15	1	34.21	1.7	5678	288.09	279.99	
5678	288.09	279.89	15	1	314.06	0.41	5675	285.3	278.6	
5673	284.87	281.57	15	1	22.11	8.46	5675	285.3	279.7	
5674	284.6	280.8	15	1	26.19	4.2	5675	285.3	279.7	
5670	284.34	280.84	15	1	24.66	0.61	5671	284.59	280.69	
5672	284.27	280.47	15	1	3.17	-6.94	5671	284.59	280.69	
5671	284.59	280.59	15	1	56.3	3.53	5675	285.3	278.6	
5675	285.3	278.6	15	1	271.88	0.79	5657	280.09	276.44	
5659	279.63	276.53	15	1	20.36	0.88	5658	279.45	276.35	
5658	279.45	276.2	15	1	7.9	0.13	5657	280.09	276.19	
5657	280.09	276.04	15	1	26.35	0.8	5656	279.43	275.83	
5656	279.43	275.78	15	1	39.87	2.28	5655	280.07	274.87	
20 WHEAT STREET NO. 1										
5662	282.15	279.35	15	1	20.25	1.93	5663	281.96	278.96	
5663	281.96	278.86	15	1	31.27	0.74	5664	282.13	278.63	
5664	282.13	278.53	15	1	33.54	1.04	5665	282.83	278.18	
5661	282.14	279.34	15	1	17.88	3.41	5665	282.83	278.73	
5665	282.83	275.33	15	1	435.03	0.75	5655	280.07	272.07	
5660	279.54	277.34	15	1	29.03	3	5655	280.07	276.47	
5655	280.07	272.07	15	1	395.25	1.02	5646	276.45	268.05	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5649	276.37	273.52	15	1	18.9	0.63	5913	276.99	273.4	asmd dn
5648	276.84	273.64	15	1	3.79	6.33	5913	276.99	273.4	asmd dn
5913	276.99	273.4	15	1	17.19	0.58	5914	277.17	273.3	asmd dn&up
5647	276.63	273.93	15	1	13.02	4.84	5914	277.17	273.3	asmd dn
5914	277.17	273.3	15	1	37.87	5.94	5646	276.45	271.05	asmd up
5646	276.45	267.95	18	1	50.05	1.08	5645	275.16	267.41	
5645	275.16	267.36	18	1	383.02	1.44	5609	268.24	261.84	
21 WHEAT STREET NO. 2										
5599	279.65	277.35	15	1	20.74	4.63	5600	279.49	276.39	
5600	279.49	276.29	15	1	57.41	3.62	5603	279.41	274.21	
5601	279.48	276.18	15	1	39.28	5.52	5603	279.41	274.01	
5602	279.12	275.77	15	1	7.88	5.84	5603	279.41	275.31	
5603	279.41	273.21	18	1	183.94	3.06	5606	274.58	267.58	
5607	274.4	271.3	15	1	20.47	2.54	5606	274.58	270.78	
5608	274.09	270.39	15	1	20.39	4.46	5606	274.58	269.48	
5606	274.58	267.48	18	1	192.25	3.01	5609	268.24	261.69	
22 AMHERST AVENUE NO. 1										
5629	267.52	264.42	15	1	20.32	0.59	5628	267.8	264.3	
5628	267.8	264	15	1	29.44	0.68	5621	267.69	263.8	
5621	267.69	263.7	15	1	19.6	1.02	5632	268.3	263.5	
5613	267.45	264.86	15	1	23.14	5.88	5632	268.3	263.5	
5632	268.3	263.5	24	1	30.95	1.36	5610	268.68	263.08	
5620	267.99	264.29	15	1	15.55	19.94	5610	268.68	261.19	
23 SIMS AVENUE NO. 3										
5534	280.17	277.77	12	1	86.8	0.73	5533	278.84	277.14	asmd dn
5533	278.84	277.04	12	1	60.99	-0.07	5532	278.58	277.08	asmd dn
5532	278.58	276.98	12	1	57.73	0.68	5531	278.29	276.59	asmd up
5531	278.29	276.19	15	1	27.86	1.15	5530	277.37	275.87	
5530	277.37	275.87	18	1	9.14	4.05	5917	277.7	275.5	
5917	277.7	275.5	15	1	37.23	4.89	5525	278.08	273.68	asmd up
24 WILMOT AVENUE NO. 1										
5524	277.02	273.42	15	1	18.16	-4.74	5523	277.78	274.28	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5522	277.1	274.4	15	1	9.86	2.23	5523	277.78	274.18	
5523	277.78	274.08	15	1	132.47	0.3	5525	278.08	273.68	
5527	277.32	275.82	10	1	37.37	3.32	5525	278.08	274.58	
5528	277.13	274.73	15	1	26.23	0.76	5525	278.08	274.53	
5529	277.25	275.15	15	1	33.53	4.09	5525	278.08	273.78	
5525	278.08	273.58	18	1	538.65	1.36	5918	270.97	266.25	asmd dn
5537	270.59	267.19	15	1	23	4.13	5918	270.97	266.24	
5918	270.97	266.25	15	1	6.86	0.15	5541	270.84	266.24	asmd up
5538	270.54	268.14	15	1	20.31	0.15	5539	271.01	268.11	
5539	271.01	267.71	15	1	24.05	1.25	5540	270.91	267.41	
5540	270.91	267.31	15	1	36.05	1.58	5541	270.84	266.74	
5541	270.84	266.14	18	1	312.88	3.22	5547	261.76	256.06	
25 WILMOT AVENUE NO. 2										
5591	281.4	278	15	1	28.05	2.57	5592	281.18	277.28	
5592	281.18	276.98	15	1	46.22	2.47	5593	282.44	275.84	
5590	281.75	278.15	15	1	28.09	1.32	5589	281.78	277.78	
5589	281.78	277.38	15	1	26.51	3.55	5593	282.44	276.44	
5588	281.94	278.54	15	1	28	3.36	5587	281.9	277.6	
5587	281.9	277.5	15	1	25.53	2.59	5593	282.44	276.84	
5593	282.44	273.54	15	1	444.7	1.46	5584	275.95	267.05	
5582	275.41	272.31	15	1	20.2	1.44	5581	275.12	272.02	
5581	275.12	271.82	15	1	25.26	0.79	5912	275.22	271.62	
5580	274.99	271.69	15	1	9.48	0.74	5912	275.22	271.62	
5912	275.22	271.42	15	1	35.62	1.88	5584	275.95	270.75	
5583	275.52	272.12	15	1	34.6	4.83	5584	275.95	270.45	
5584	275.95	266.95	15	1	475.1	1.23	5575	265.61	261.11	
5570	265.17	262.27	15	1	20.55	0.68	5571	264.63	262.13	
5572	264.19	262.79	12	1	15.27	1.05	5571	264.63	262.63	
5571	264.63	262.03	15	1	17.88	0.5	5910	265.42	261.94	asmd dn
5573	264.28	262.18	12	1	15.49	1.55	5910	265.42	261.94	asmd dn
5910	265.42	261.94	15	1	6.17	3.24	5574	264.54	261.74	
5574	264.54	261.74	15	1	23.59	0.97	5575	265.61	261.51	
5569	265.21	262.31	15	1	20.42	0.69	5568	265.47	262.17	
5568	265.47	261.97	15	1	24.18	-0.04	5911	265.38	261.98	asmd dn
5567	265.38	262.08	15	1	6.94	1.44	5911	265.38	261.98	asmd dn

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5911	265.38	261.95	15	1	32.83	1.64	5575	265.61	261.41	
5575	265.61	261.11	18	1	218.42	1.99	5547	261.76	256.76	
26 DUNCAN STREET NO. 1										
5517	279.16	276.41	15	1	17	6.71	5520	279.97	275.27	
5516	279.19	274.84	15	1	16.89	-2.55	5520	279.97	275.27	
5520	279.97	273.37	18	1	673.4	3.03	5512	260.07	252.97	
5511	259.59	257.19	15	1	33.92	2.65	5510	259.59	256.29	
5510	259.59	256.09	15	1	27.48	5.17	5512	260.07	254.67	
5509	259.88	256.98	15	1	24	4.08	5508	259.6	256	
5508	259.6	255.9	15	1	29.76	4.81	5512	260.07	254.47	
5512	260.07	252.97	15	1	306.37	1.35	5492	256.54	248.84	
5490	255.27	252.67	15	1	33.95	2.18	5491	255.33	251.93	
5491	255.33	251.63	15	1	30.7	4.85	5492	256.54	250.14	
27 DUNCAN STREET NO. 2										
5450	278.14	275.34	15	1	34.13	2.08	5451	278.13	274.63	
5451	278.13	274.53	15	1	21.15	5.34	5454	278.79	273.4	
5453	277.87	275.17	15	1	28.09	2.53	5452	278.46	274.46	
5452	278.46	274.36	15	1	23.6	4.07	5454	278.79	273.4	
5454	278.79	271.2	18	1	436.76	3.42	5470	264.78	256.28	
5458	264.17	261.17	15	1	34.47	0.84	5459	264.18	260.88	
5459	264.18	260.78	15	1	21.62	20.81	5470	264.78	256.28	
5465	264.43	261.24	15	1	27.97	2.32	5460	264.79	260.59	
5460	264.79	260.19	15	1	25.47	0.43	5470	264.78	260.08	
5469	263.04	260.74	15	1	34.02	1.7	5468	263.16	260.16	
5468	263.16	260.06	15	1	36.68	1.04	5470	264.78	259.68	
5470	264.78	256.18	18	1	449.69	0.92	5478	264.05	252.05	
5474	263.45	260.45	15	1	33.95	2.56	5475	263.58	259.58	
5475	263.58	259.38	15	1	15.87	5.86	5478	264.05	258.45	
5477	263.2	259.4	15	1	24.04	1.54	5476	263.13	259.03	
5476	263.13	258.93	15	1	25.83	2.63	5478	264.05	258.25	
5478	264.05	251.95	18	1	254.81	0.71	5492	256.54	250.14	
28 BONHAM STREET NO. 1										
5443	283.76	281.06	15	1	21.65	0.6	5444	283.43	280.93	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5444	283.43	279.38	15	1	27.81	1.4	5445	282.69	278.99	
5445	282.69	278.89	15	1	41.89	0.02	5441	283.38	278.88	
5442	283.22	281.22	15	1	35.55	1.52	5441	283.38	280.68	
5441	283.38	278.78	18	1	379.57	3.21	5904	271.87	266.6	asmd dn
5438	271.15	267.25	15	1	8.2	7.93	5904	271.87	266.6	asmd dn
5437	271.35	267.8	15	1	19.71	6.09	5904	271.87	266.6	asmd dn
5904	271.87	266.6	18	1	24.24	1.57	5434	271.32	266.22	asmd up
29 MONROE STREET NO. 1										
5435	270.42	266.87	15	1	34.07	0.32	5436	270.26	266.76	
5436	270.26	266.66	15	1	35.2	0.11	5434	271.32	266.62	
5434	271.32	265.52	15	1	486.27	0.5	5430	268.17	263.07	
5428	267.95	265.8	15	1	34.01	4.35	5427	268.02	264.32	
5427	268.02	264.22	15	1	37.58	2.93	5430	268.17	263.12	
5426	268.4	265.1	15	1	28.1	1.81	5425	267.39	264.59	
5425	267.39	264.29	15	1	24.62	4.14	5430	268.17	263.27	
5430	268.17	262.77	18	1	425.75	3.99	5420	256.4	245.8	
5418	256.63	253.08	15	1	34.02	1.5	5417	256.67	252.57	
5417	256.67	252.47	15	1	30.6	4.48	5420	256.4	251.1	
5419	255.83	252.03	15	1	28.63	2.06	5404	255.22	251.44	
5404	255.22	251.04	15	1	43.9	2.82	5420	256.4	249.8	
5416	255.62	252.22	15	1	28.46	2.42	5415	255.02	251.53	
5415	255.02	251.13	15	1	32.18	1.34	5420	256.4	250.7	
5420	256.4	245.8	18	1	442.4	0.42	5397	249.86	243.96	
5393	248.67	245.97	15	1	34.05	3.29	5394	248.65	244.85	
5394	248.65	244.65	15	1	26.79	2.58	5397	249.86	243.96	
5395	249.49	246.19	15	1	24.12	5.31	5396	249.51	244.91	
5396	249.51	244.91	15	1	30.11	3.16	5397	249.86	243.96	
5392	248.24	244.54	15	1	23.96	1.04	5391	248.29	244.29	
5391	248.29	244.19	15	1	46.5	0.71	5397	249.86	243.86	
5397	249.86	243.66	18	1	197.44	0.89	5382	248.9	241.9	
30 MONROE STREET NO. 2										
5372	255.28	251.18	15	1	34.14	1.99	5373	255.2	250.5	
5373	255.2	250.4	15	1	58.76	1.07	5376	254.37	249.77	
5374	254.66	251.16	15	1	24.05	5.28	5375	254.19	249.89	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5375	254.19	249.79	15	1	38.98	0.56	5376	254.37	249.57	
5371	254.69	251.59	15	1	23.94	3.43	5370	254.67	250.77	
5370	254.67	250.67	15	1	38.94	3.34	5376	254.37	249.37	
5376	254.37	249.37	24	1	326.89	2.01	5382	248.9	242.8	
5380	247.82	243.92	18	1	34.1	0.65	5381	247.8	243.7	
5381	247.8	243.7	18	1	41.59	5.53	5382	248.9	241.4	
31 MONROE STREET NO. 3										
5366	277.48	274.88	15	1	33.68	0.83	5905	277.93	274.6	asmd dn
5365	277.67	275.22	15	1	19.84	3.13	5905	277.93	274.6	asmd dn
5905	277.93	274.6	15	1	20.71	1.01	5364	277.89	274.39	asmd up
5364	277.89	274.29	15	1	31.64	-0.38	5362	278.21	274.41	
5363	277.59	274.69	15	1	12.53	2.23	5362	278.21	274.41	
5362	278.21	274.41	15	1	428.64	1.38	5903	272.97	268.5	asmd dn
5353	272.28	268.68	15	1	4.74	3.8	5903	272.97	268.5	asmd dn
5354	272.62	269.02	15	1	29.24	1.78	5903	272.97	268.5	asmd dn
5903	272.97	268.5	15	1	25.31	0.95	5358	272.86	268.26	asmd up
32 SIMS AVENUE NO. 4										
5355	273.03	269.33	15	1	12.13	5.52	5357	273.36	268.66	
5356	273.06	270.36	15	1	14.45	11.07	5357	273.36	268.76	
5357	273.36	268.66	15	1	41.25	1.33	5358	272.86	268.11	
5358	272.86	268.06	15	1	23.91	0.67	5901	272.63	267.9	asmd dn
5352	272.09	268.19	15	1	9.04	3.21	5901	272.63	267.9	asmd dn
5901	272.63	267.9	15	1	351.35	1.39	5902	267.43	263	asmd dn&up
5348	267.06	264.06	15	1	10.13	10.46	5902	267.43	263	asmd dn
5349	267.15	264.29	15	1	15.34	8.41	5902	267.43	263	asmd dn
5902	267.43	263	15	1	36.8	2.2	5346	267.49	262.19	asmd up
5347	266.24	263.14	15	1	33.22	2.86	5346	267.49	262.19	
33 HEYWARD STREET NO. 1										
5346	267.49	261.99	18	1	538.79	1.76	5342	258.42	252.52	
5340	257.84	255.24	15	1	24.35	1.72	5342	258.42	254.82	
5341	257.15	252.65	15	1	28.96	0.1	5342	258.42	252.62	
5339	257.95	255.45	15	1	33.94	5.1	5342	258.42	253.72	
5337	257.63	253.73	15	1	24.16	0	5338	257.63	253.73	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5338	257.63	253.53	15	1	45.99	0.89	5342	258.42	253.12	
5342	258.42	252.42	18	1	405.29	3.47	5306	245.34	238.34	
34 RAVENEL & HEYWARD STREET NO. 1										
5302	248.3	244.9	15	1	53.68	2.83	5301	247.68	243.38	
5301	247.68	243.18	15	1	24.01	1.79	5300	247.45	242.75	
5300	247.45	242.65	15	1	172.3	1.25	5299	248.09	240.49	
5298	248.17	244.22	15	1	24.08	8.85	5299	248.09	242.09	
5299	248.09	239.39	15	1	30.38	1.58	5304	248.41	238.91	
5296	249.48	245.13	15	1	34.08	0.44	5297	249.38	244.98	
5297	249.38	244.48	15	1	45.55	4.54	5304	248.41	242.41	
5304	248.41	238.61	18	1	135.17	0.31	5305	245.39	238.19	
5320	244.36	240.7	18	1	10.57	6.72	5305	245.39	239.99	
5305	245.39	238.09	18	1	22.39	0.67	5306	245.34	237.94	
35 S RAVENEL STREET NO. 1										
5224	239.15	237.41	15	1	36.34	0.58	5892	239.72	237.2	
5240	239.19	237.68	15	1	18.96	2.53	5892	239.72	237.2	
5892	239.72	237.2	15	1	37.81	4.05	10433	239.14	235.67	
36 S RAVENEL STREET NO. 2										
5239	239.52	236.26	15.6	1	53.15	1.05	10432	239.65	235.7	asmd dn
37 S RAVENEL STREET NO. 3										
5254	238.54	236.98	15.6	1	40.85	3.33	10434	239.02	235.62	asmd dn
38 S RAVENEL STREET NO. 4										
5255	238.11	235.35	18	1	7.35	36.05	5898	238.49	232.7	asmd dn
5263	238.07	235.92	15.6	1	28.54	2	5255	238.11	235.35	
39 ROSEWOOD DRIVE NO. 1										
2112	258.39	258.39	15	1	88.15	0.94	2113	259.46	257.56	
2113	259.46	257.46	15	1	90.45	0.36	2114	260.13	257.13	
2114	260.13	257.03	15	1	85.18	0.47	2115	260.69	256.63	
2115	260.69	256.03	18	1	68.59	1.53	2118	260.72	254.98	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
2118	260.72	254.73	18	1	46.99	1.09	2123	260.57	254.22	
2121	259.91	258.06	15	1	24.12	0.29	2122	259.99	257.99	
2122	259.99	257.94	15	1	26.84	9.02	2123	260.57	255.52	
2123	260.57	254.12	18	1	328.32	0.29	2105	258.98	253.18	
2101	258.93	254.83	24	1	114.65	0.15	2102	257.81	254.66	
2102	257.81	354.66	24	1	43.64	228.02	2104	259.95	255.15	
2104	259.95	255.05	24	1	127.99	1.08	2095	258.02	253.67	
2099	257.92	254.47	24	1	74.87	1.1	2098	257.55	253.65	
2098	257.55	253.65	24	1	46.71	-0.86	2096	257.65	254.05	
2096	257.65	253.95	24	1	37.79	1.67	2095	258.02	253.32	
2095	258.02	254.07	18	1	83.9	0.7	2105	258.98	253.48	
2105	258.98	253.08	18	1	165.92	0.51	2106	257.34	252.23	
2091	257.6	252.94	18	1	70.08	0.87	2106	257.34	252.33	
2106	257.34	252.33	18	1	71.27	1.07	2082	257.32	251.57	
2086	256.98	252.44	18	1	44.63	0.85	2083	256.75	252.06	
2083	256.75	251.96	18	1	24.88	1.57	2082	257.32	251.57	
2082	257.32	251.52	18	1	82.95	1.59	2108	257.3	250.2	asmd dn
2107	256.13	253.23	15	1	13.6	22.28	2108	257.3	250.2	asmd dn
2108	257.3	250.2	18	1	101.4	1.48	2109	255.78	248.7	asmd dn&up
2110	255.13	251.63	15	1	7.93	36.95	2109	255.78	248.7	asmd dn
2109	255.78	248.7	18	1	139.92	0.79	2075	251.49	247.59	asmd up
2075	251.49	246.99	18	1	69.72	1.85	2078	250.95	245.7	
2078	250.95	245.4	18	1	72.52	2.16	2038	248.93	243.83	
2029	250.44	248.44	15	1	121.44	2.06	2032	249.88	245.94	
2035	250.8	246.38	15	1	37.79	4.08	2032	249.88	244.84	
2032	249.88	244.64	18	1	34.44	2.35	2038	248.93	243.83	
2038	248.93	243.73	18	1	171.47	3.62	2039	240.77	237.53	
2028	245.96	244.06	15	1	30.1	1.63	2027	246.17	243.57	
2027	246.17	243.27	18	1	33.52	16.53	2039	240.77	237.73	
2039	240.77	237.23	18	1	82.46	2.7	2042	239.83	235	asmd dn
2026	246.01	243.91	8	1	90.41	2.72	2025	243.25	241.45	
2025	243.25	240.15	18	1	27.04	19.05	2042	239.83	235	asmd dn
2042	239.83	235	18	1	103.85	2.92	2072	237.02	231.97	asmd up
40 ROSEWOOD DRIVE NO. 2										
2059	260.12	258.62	18	1	56.37	2.84	2056	260.27	257.02	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
2054	257.86	255.36	15	1	23.41	3.84	2055	257.76	254.46	
2056	260.27	256.97	15	1	48.24	4.79	2055	257.76	254.66	
2055	257.76	254.41	18	1	99.67	5.05	2052	256.28	249.38	
2052	256.28	249.18	18	1	97.52	1.3	2049	254.82	247.91	
2049	254.82	247.86	18	1	206.43	2.13	2045	248.81	243.46	
2045	248.81	243.46	18	1	285.56	2.23	2000	241.28	237.08	
2062	240.9	239.03	15	1	16.63	7.4	2357	240.3	237.8	asmd dn
2357	240.3	237.7	15	1	30.27	-2.78	2356	241.04	238.54	asmd dn&up
2064	241.3	239.35	15	1	13.78	5.88	2356	241.04	238.54	asmd dn
2356	241.04	238.44	15	1	32.7	7.49	10435	241.7	235.99	asmd dn&up
2067	241.27	236.99	18	1	23.16	4.32	10435	241.7	235.99	asmd dn
2067	241.27	236.99	18	1	76.28	4.34	2000	241.28	233.68	
2000	241.28	233.48	18	1	128.03	6.26	1999	232.77	225.47	
41 ROSEWOOD ELEMENTARY SCHOOL NO. 1										
2030	249.22	247	15	1	41.71	0.72	2011	249.3	246.7	asmd dn
2011	249.3	246.6	15	1	178.54	1.47	2006	246.87	243.97	
2009	247.99	246.5	12	1	35.1	1.74	2007	247.88	245.89	asmd up
2007	247.88	245.99	15	1	26.36	5.39	2006	246.87	244.57	
2006	246.87	243.67	15	1	128.81	4.25	2003	243.4	238.2	
2003	243.4	238.1	15	1	100.96	3.54	2002	237.93	234.53	
2002	237.93	234.33	15	1	121.17	1.51	2022	236.78	232.5	asmd dn
2022	236.78	232.5	15	1	121.09	1.16	1994	235.8	231.1	asmd up
42 ROSEWOOD ELEMENTARY SCHOOL NO. 2										
2014	245.96	239.96	12	1	36.86	3.47	2015	242.18	238.68	
2015	242.18	236.88	12	1	14.91	0.74	2016	239.62	236.77	
2016	239.62	236.72	12	1	27.63	67.75	2018	239.57	218	asmd dn
2017	238.81	236.81	8	1	10.07	186.79	2018	239.57	218	asmd dn
2018	239.57	218	12	1	21.01	-88.86	2019	239.07	236.67	asmd up
2019	239.07	236.57	12	1	36.11	2.16	2020	239.09	235.79	
2020	239.09	235.79	15	1	64.76	1.78	2024	238.39	234.64	
2024	238.39	234.64	15	1	49.9	2.04	2023	237.42	233.62	
2023	237.42	233.62	15	1	77.77	2.98	1994	235.8	231.3	
43 MOSS AVENUE NO. 1										

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1978	236.59	236.59	12	1	16.64	10.82	1979	234.79	234.79	Ditch
1980	234.62	234.62	15	1	7.76	4.12	1981	236.23	234.3	asmd dn
1987	236.13	236.13	12	1	6.67	18.44	1988	234.9	234.9	Ditch
1982	234.46	234.46	15	1	10.32	1.55	1981	236.23	234.3	asmd dn
1981	236.23	234.3	18	1	28.64	7.96	1989	235.22	232.02	asmd up
1989	235.22	231.02	18	1	39.88	2.31	1971	234.03	230.1	asmd dn
1972	234.3	230.4	18	1	30.31	0.99	1971	234.03	230.1	asmd dn
1971	234.03	230.1	24	1	283	2.86	2081	226.22	222	asmd dn&up
44 PRINTICE AVENUE NO. 1										
1932	227.31	227.31	12	1	18.29	7.33	1927	225.97	225.97	Ditch
1926	225.67	225.67	18	1	14.32	4.68	1933	227.14	225	asmd dn
1939	226.56	226.56	12	1	13.21	7.95	1935	225.51	225.51	Ditch
1934	225.34	225.34	15	1	13.45	2.53	1933	227.14	225	asmd dn
1933	227.14	225	18	1	32.17	1.55	1948	226.61	224.5	asmd dn&up
1946	226.28	226.58	12	1	14.88	7.73	1942	225.43	225.43	Ditch
1941	225.15	225.15	15	1	13.95	4.66	1948	226.61	224.5	asmd dn
1948	226.61	224.5	18	1	100.46	5.86	1949	222.91	218.61	asmd up
1951	226.16	220	18	1	66.54	1.94	1949	222.91	218.71	asmd up
45 CAPERS AVENUE NO. 1										
1896	242.29	240.99	18	1	149.27	2.15	1881	242.28	237.78	
1880	241.45	241.45	15	1	50.13	7.32	1881	242.28	237.78	
1881	242.28	237.68	24	1	29.45	1.63	1878	242.62	237.2	asmd dn
1879	242.34	240.84	15	1	21.85	16.66	1878	242.62	237.2	asmd dn
1878	242.62	237.2	24	1	85.82	0.77	1877	240.94	236.54	asmd up
1877	240.94	236.44	24	1	59.24	1.25	1918	240.47	235.7	asmd dn
1892	240.46	240.46	12	1	14.05	9.4	1893	239.14	239.14	Ditch
1887	239	239	18	1	24.43	8.68	1886	240.78	236.88	
1886	240.78	236.28	18	1	61.33	0.29	1885	240.41	236.1	asmd dn
1875	239.63	238.16	18	1	27.57	7.47	1885	240.41	236.1	asmd dn
1885	240.41	236.1	18	1	20.57	1.94	1918	240.47	235.7	asmd dn&up
1918	240.47	235.7	24	1	192.47	1.09	1834	237.7	233.6	
1863	237.41	237.41	12	1	36.71	2.83	1864	236.37	236.37	Ditch
1864	236.37	236.37	12	1	0.09	177.78	1858	236.21	236.21	Ditch
1858	236.21	236.21	15	1	24.63	0.85	1846	238.94	236	asmd dn

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1856	238.57	238.57	12	1	14.77	5.96	1857	237.69	237.69	Ditch
1857	237.69	237.69	12	1	0.78	76.92	1847	237.09	237.09	Ditch
1847	237.09	237.09	15	1	14.06	7.75	1846	238.94	236	asmd dn
1846	238.94	236	18	1	33.4	7.19	1834	237.7	233.6	asmd up
1870	236.94	236.94	12	1	6.14	6.03	1871	236.57	236.57	Ditch
1871	236.57	236.57	12	1	1.08	23.15	1865	236.32	236.32	Ditch
1865	236.32	236.32	15	1	57.17	0.38	1845	238.79	236.1	asmd dn
1843	237.99	237.99	12	1	15.37	7.03	1844	236.91	236.91	Ditch
1844	236.91	236.91	12	1	0.84	27.38	1838	236.68	236.68	Ditch
1838	236.68	236.68	15	1	18.31	3.17	1845	238.79	236.1	asmd dn
1845	238.79	236.1	18	1	32.25	7.75	1834	237.7	233.6	asmd up
1834	237.7	233.5	30	1	142.58	0.84	1833	237.6	232.3	
1833	237.6	232.3	30	1	221.99	0.9	1809	238.64	230.3	asmd dn
1787	238.08	234.08	15	1	25.4	14.88	1809	238.64	230.3	asmd dn
1786	238.25	234.05	15	1	23.54	15.93	1809	238.64	230.3	asmd dn
1809	238.64	230.3	30	1	149.27	1.22	1808	233.58	228.48	asmd up
1808	233.58	225.38	30	1	251.67	4.85	1805	220.18	213.18	
1808	233.58	225.38	30	1	251.75	2.99	1807	220.66	217.86	asmd dn
46 CAPERS AVENUE NO. 2										
1828	224.43	222.72	18	1	21.37	4.82	1826	223.4	221.69	
1827	223.29	221.81	15	1	26.53	0.45	1826	223.4	221.69	asmd dn
1826	223.4	221.69	18	1	31.44	4.52	1824	221.98	220.27	
1825	220.73	220.73	15	1	28.92	12.9	1824	221.98	217	
1824	221.98	217	18	1	46.67	6.9	1806	219.78	213.78	
47 CAPERS AVENUE NO. 3										
1788	222.73	227	18	1	42.16	18.98	1791	222.29	219	asmd dn&up
1791	222.29	219.5	18	1	16.36	9.17	1794	222.32	218	asmd dn&up
1801	221.93	221.93	12	1	16.1	5.09	1800	221.11	221.11	Ditch
1800	221.11	221.11	12	1	0.64	32.81	1797	220.9	220.9	Ditch
1797	220.9	220.9	15	1	14.08	13.49	1795	222.36	219	asmd dn
1795	222.36	219	15	1	14.99	6.67	1794	222.32	218	asmd dn&up
1794	222.32	218	24	1	76.93	6.27	1805	220.18	213.18	asmd up
48 HARVARD AVENUE NO. 1										

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1759	231.57	230.56	18	1	22.78	2.9	1761	232.72	229.9	asmd dn
1762	231.01	231.01	15	1	12.21	9.09	1761	232.72	229.9	asmd dn
1761	232.72	229.9	18	1	22.15	1.81	1782	232.35	229.5	asmd dn&up
1781	230.68	230.68	15	1	16.41	7.19	1782	232.35	229.5	asmd dn
1782	232.35	229.5	18	1	20.17	1.64	1775	229.17	229.17	
1775	229.29	229.29	12	1	20.47	-0.59	1779	229.41	229.41	Ditch
1779	229.41	229.41	12	1	329.45	4.3	1704	215.24	215.24	Swale
1704	215.24	215.24	12	1	33.03	9.78	1703	212.01	212.01	Ditch
1703	211.99	211.99	18	1	51.31	1.93	1820	212.45	211	asmd dn
49 HARVARD AVENUE NO. 2										
1757	231.56	230.74	18	1	19.29	2.8	1764	232.48	230.2	asmd dn
1763	230.83	230.83	15	1	12.76	4.94	1764	232.48	230.2	asmd dn
1764	232.48	230.2	18	1	24.35	2.87	1765	232.43	229.5	asmd dn&up
1766	230.8	230.8	15	1	17.85	7.28	1765	232.43	229.5	asmd dn
1765	232.43	220.5	18	1	17.79	-48.85	1767	229.19	229.19	
1767	229.19	229.19	12	1	0.48	-39.58	1768	229.38	229.38	Ditch
1768	229.38	229.38	12	1	23.29	0.64	1772	229.23	229.23	Ditch
1772	229.23	229.23	12	1	332.16	4.52	1711	214.22	214.22	Swale
1711	214.22	214.22	12	1	16.48	14.38	1714	211.85	211.85	Ditch
1715	211.89	211.89	18	1	10.6	1.79	1723	214.22	211.7	asmd dn
1721	213.02	213.02	12	1	7.64	15.31	1717	211.85	211.85	Ditch
1716	211.81	211.81	18	1	9.59	1.15	1723	214.22	211.7	asmd dn
1723	214.22	211.7	18	1	35.94	0.83	1821	213.01	211.4	asmd dn&up
1821	213.01	211.3	24	1	37.74	0.79	1820	212.45	211	asmd dn&up
1820	212.45	211	30	1	21.33	27.61	1700	211.01	205.11	asmd up
50 HARVARD AVENUE NO. 3										
1753	227.84	227.84	15	1	17.97	5.23	1752	228.53	226.9	asmd dn
1751	227.09	227.09	15	1	26	0.73	1752	228.53	226.9	asmd dn
1752	228.53	226.9	15	1	36.5	0.27	1749	227.47	226.8	asmd dn&up
1750	226.95	226.95	15	1	27.79	0.54	1749	227.47	226.8	asmd dn
1749	227.47	226.8	18	1	292.44	4.77	1741	214.95	212.85	
1741	214.95	212.75	18	1	20.88	0.72	1740	214.79	212.6	asmd dn
1736	214.16	214.16	12	1	12.67	6.63	1738	213.32	213.32	Ditch
1739	213.14	213.14	15	1	13.77	3.92	1740	214.79	212.6	asmd dn

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1740	214.79	212.6	18	1	32.85	0.91	1724	213.1	212.3	asmd dn&up
1726	212.35	212.35	15	1	5.05	0.59	1725	214.17	212.32	asmd dn
1732	212.66	212.66	12	1	0.77	40.26	1726	212.35	212.35	Ditch
1729	213.55	213.55	12	1	10.66	8.35	1732	212.66	212.66	Ditch
1725	214.17	212.32	15	1	12.15	0.16	1724	213.1	212.3	asmd dn&up
1724	213.1	212.3	24	1	39.81	3.27	1819	212.26	211	asmd dn&up
1747	214.77	214.77	12	1	13.05	14.41	1743	212.89	212.89	Ditch
1742	212.85	212.85	15	1	66.15	1.28	1819	212.26	212	asmd dn
1819	212.26	208	30	1	22.67	10.98	1700	211.01	205.51	asmd up
51 MONTGOMERY AVENUE NO. 1										
1636	220.18	220.18	12	1	15.97	6.2	1635	219.19	219.19	Ditch
1630	219.07	219.07	15	1	64.55	1.04	1622	219.74	218.4	asmd dn
1628	220.28	220.28	12	1	13.95	9.39	1629	218.97	218.97	Ditch
1623	218.63	218.63	18	1	52.31	0.44	1622	219.74	218.4	asmd dn
1621	218.89	218.89	18	1	16.19	3.03	1622	219.74	218.4	asmd dn
1622	219.74	218.4	18	1	162.17	5.43	1620	211.59	209.59	asmd up
1620	211.59	209.49	18	1	20.48	0.93	1641	211.68	209.3	asmd dn
1619	211.44	209.94	18	1	43.18	1.48	1641	211.68	209.3	asmd dn
1649	210.35	210.35	12	1	12.67	5.45	1650	209.66	209.66	Ditch
1644	209.53	209.53	15	1	34.75	0.66	1641	211.68	209.3	asmd dn
1641	211.68	208.5	24	1	28.31	1.77	1658	210.29	208	asmd dn&up
1653	209.47	209.47	12	1	12.37	8.81	1656	208.38	208.38	Ditch
1657	208.08	208.08	15	1	33.8	0.24	1658	210.29	208	asmd dn
1658	210.29	208	36	1	40.7	17.4	1822	207.72	200.92	asmd up
52 LANIER AVENUE NO. 1										
1665	218.47	218.47	18	1	12.31	3.82	1666	219.75	218	asmd dn
1667	217.89	217.89	15	1	11.28	-0.98	1666	219.75	218	asmd dn
1666	219.75	218	18	1	29.93	4.01	1681	218.68	216.8	asmd dn&up
1672	219.59	219.59	12	1	29.53	4.98	1670	218.12	218.12	Ditch
1670	218.12	218.12	12	1	0.42	54.76	1667	217.89	217.89	Ditch
1680	217.72	217.72	15	1	8.66	10.62	1681	218.68	216.8	asmd dn
1676	219.1	219.1	12	1	12.21	10.65	1677	217.8	217.8	Ditch
1677	217.8	217.8	12	1	0.45	17.78	1680	217.72	217.72	Ditch
1681	218.68	216.8	18	1	3.04	2.3	1664	216.73	216.73	asmd up

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1664	216.73	216.73	12	1	288.97	4.91	1594	203.53	202.53	Swale
1594	203.53	202.53	15	1	19.25	0.68	1595	204.44	202.4	asmd dn
1597	203.58	203.58	15	1	12.15	9.71	1595	204.44	202.4	asmd dn
1595	204.44	202.93	18	1	7.06	0.42	1598	204.44	202.9	asmd dn
53 LANIER AVENUE NO. 2										
1682	217.03	217.03	18	1	48.78	1.07	1663	216.51	216.51	
1663	216.51	216.51	12	1	289.09	4.7	1596	202.93	202.93	Swale
1596	202.93	202.93	15	1	41.41	0.07	1598	204.44	202.9	asmd dn
1598	204.44	202.9	18	1	18.81	10.58	1599	203.62	200.91	asmd dn&up
1599	203.62	200.91	18	1	37.76	3.73	1602	202.19	199.5	asmd dn&up
1600	204.69	204.69	18	1	86.76	5.98	1602	202.19	199.5	asmd dn
1601	200.1	200.1	15	1	22.53	2.66	1602	202.19	199.5	asmd dn
1602	202.19	198.89	24	1	49.64	5.58	1603	202.2	196.12	asmd dn&up
54 S BONHAM ROAD NO. 1										
1613	198.41	195.21	18	1	29.26	2.43	1593	198.52	194.5	asmd dn
55 S BONHAM ROAD NO. 2										
1960	199.23	195	18	1	96.4	4.57	1589	197.79	190.59	asmd up
56 S OTT ROAD NO. 1										
1923	227.99	227.99	15	1	51.97	3.54	1924	227.35	226.15	
1924	227.35	226.15	12	1	975.63	2.58	1920	202.6	201	Swale
1920	202.6	201	18	1	45.05	4.64	2323	202.91	198.91	
1919	202.94	200.84	18	1	52.66	3.67	2323	202.91	198.91	
57 S BONHAM ROAD NO. 3										
2323	202.91	196.41	24	1	233.14	2.32	1956	198.32	191	asmd dn
1956	198.32	191	24	1	28.2	2.13	2133	198.44	190.4	asmd dn&up
2134	197.33	190.8	12	1	17.15	2.33	2133	198.44	190.4	asmd dn&up
2133	198.44	190.4	24	1	5.28	0.95	1957	198.27	190.35	asmd dn&up
1957	198.27	190.35	24	1	16.38	0.31	1589	197.79	190.3	asmd up
58 S PROSPECT STREET NO. 1										

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1694	202.31	202.31	18	1	57.2	11.68	1695	200.83	195.63	
1692	204.43	204.43	12	1	19.13	10.72	1689	202.38	202.38	Ditch
1686	203.93	203.93	12	1	18.54	8.36	1689	202.38	202.38	Ditch
1689	202.38	202.38	12	1	1.03	6.8	1694	202.31	202.31	Ditch
1695	200.83	195.58	24	1	161.64	3.79	1582	191.85	189.45	
1582	191.85	189.45	24	1	15.53	2.9	1581	192.91	189	asmd dn
59 TEMPO COURT NO. 1										
1568	190.33	187.93	18	1	15.47	0	1569	190.43	187.93	
1569	190.43	187.93	18	1	14.42	-0.14	1570	190.55	187.95	
1570	190.55	187.95	18	1	14.65	-0.68	1571	190.75	188.05	
1571	190.75	187.85	18	1	7.07	2.12	1572	192.14	187.7	asmd dn
TRUNK LINE EAST(AND DITCH)										
10296	293.92	282.52	30	1	169.66	2.31	10421	284	278.6	asmd dn
10317	283.94	279.94	12	1	7.63	9.96	10318	283.18	279.18	
10318	283.18	279.18	12	1	16.56	1.69	10421	284	278.9	asmd dn
10421	284	278.6	30	1	333.75	2.31	5719	277.78	270.88	asmd up
5721	277.79	274.59	15	1	38.06	6.59	5719	277.78	272.08	
5719	277.78	270.78	36	1	195.26	1.63	5708	274.63	267.6	asmd dn
5708	274.63	267.5	48	1	176.36	1.42	5702	272.6	265	asmd up
5701	272	264.5	48	1	30.77	-2.6	5702	272.6	265.3	
5702	272.6	264.9	48	1	93.87	2.02	5688	268.71	263	asmd dn
5688	268.71	263	48	1	124.32	0.77	5612	270.14	262.04	asmd up
5612	270.14	261.99	48	1	41.68	0.48	5611	269.89	261.79	
5611	269.89	261.74	36	1	11.82	2.2	5610	268.68	261.48	
5610	268.68	261.38	36	1	18.31	1.04	5609	268.24	261.19	
5609	268.24	261.14	36	1	418.33	1.45	5547	261.76	255.06	
5548	261.05	257.15	24	1	22.57	4.83	5547	261.76	256.06	
5547	261.76	254.96	42	1	6.12	-0.65	5546	261.1	255	
5550	261.17	260.11	15	1	6.63	12.82	5549	261.36	259.26	
5549	261.36	259.26	42	1	17.74	2.03	5546	261.1	258.9	
5546	261.1	255	42	1	225.24	1.85	5502	257.33	250.83	
5502	257.33	250.83	42	1	51.38	2.16	5929	257.22	249.72	
5929	257.22	249.72	42	1	127.69	0.92	5492	256.54	248.54	
5492	256.54	248.44	42	1	33.07	2.84	5909	256.2	247.5	asmd dn

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION - EAST BRANCH

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5483	255.32	251.13	15	1	7.95	45.66	5909	256.2	247.5	asmd dn
5909	256.2	247.5	42	1	59.49	0.84	5907	255.6	247	asmd dn&up
5907	255.6	247	42	1	256.26	1.55	5900	250.83	243.03	asmd up
5900	250.83	242.73	42	1	108.2	1.78	5382	248.9	240.8	
5382	248.9	240.7	48	1	107.72	0.58	5930	247.38	240.08	
5930	247.38	239.98	48	1	338.1	0.6	5306	245.34	237.94	
5307	244.27	241.66	18	1	13.67	11.12	5306	245.34	240.14	
5306	245.34	237.89	48	1	483.83	0.9	5897	239.69	233.52	asmd dn
5266	237.47	237.47	15	1	8.95	3.13	5897	239.69	237.19	asmd dn
5897	239.69	233.52	48	1	17.38	0.86	5265	239.87	233.37	asmd up
5265	239.87	233.17	48	1	12.9	0.78	5896	239.46	233.07	asmd dn
10408	239.96	237.06	15	1	7.9	15.7	5896	239.46	235.82	asmd dn
5896	239.46	233.07	48	1	16.95	0.71	10432	239.65	232.95	asmd dn&up
10432	239.65	232.95	48	1	4.44	0.68	10433	239.14	232.92	asmd dn&up
10433	239.14	232.92	48	1	6.62	0.76	10434	239.02	232.87	asmd dn&up
10434	239.02	232.87	48	1	39.12	0.74	5898	238.49	232.58	asmd dn&up
5898	238.49	232.58	48	1	217.89	0.73	2358	237.13	230.98	asmd dn&up
2074	236.16	233.56	18	1	12.9	12.09	2358	237.13	232	asmd dn
2358	237.13	230.98	48	1	22.36	0.72	2072	237.02	230.82	asmd up
2072	237.02	230.82	48	1	41.82	1.72	5919	237.24	230.1	asmd dn&up
5919	237.24	230.1	48	1	96.54	0.84	1993	237.29	229.29	asmd dn&up
1993	237.29	229.29	48	1	63.92	2.33	1994	235.8	227.8	
1994	235.8	227.8	48	1	87.32	1.47	1998	232.52	226.52	
1998	232.52	226.52	48	1	9.62	10.91	1999	232.77	225.47	
1999	232.77	220.57	72	1	98.24	1.46	2044	229.24	219.14	
2044	229.24	219.14	72	1	80.09	1.17	1969	226.22	218.2	asmd dn
1969	226.22	218.2	72	1	9.5	2.11	2081	226.22	218	asmd dn&up
2081	226.22	218	72	1	39.99	0.75	1970	226.2	217.7	asmd dn&up
1970	226.2	217.7	72	1	171.22	1.07	1966	224.16	215.86	asmd up
1966	224.16	215.86	72	1	69.21	0.94	1963	223.41	215.21	
1963	223.41	215.21	72	1	90.45	0.96	1962	223.04	214.34	
1962	223.04	214.34	72	1	64.74	0.97	1949	222.91	213.71	
1949	222.91	213.71	72	1	24.88	-0.16	1950	223.05	213.75	
1950	223.05	213.75	72	1	200.6	1.07	1831	220.8	211.6	
1831	220.8	211.6	72	1	132.17	1.07	1804	220.79	210.19	
1804	220.79	210.19	72	1	35.27	0.6	1805	220.18	209.98	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1805	220.18	209.98	72	1	4.66	1.07	1807	220.66	209.93	asmd dn
1807	220.66	209.93	72	1	28.92	1.21	1806	219.78	209.58	asmd up
1806	219.78	209.58	72	1	505.83	1.45	1701	211.57	202.27	
1701	211.57	202.27	72	1	37.25	1.23	1700	211.01	201.81	
1700	211.01	201.81	72	1	391.13	1.12	1822	207.72	197.42	
1822	207.72	197.42	72	1	28.28	3.11	1617	208.04	196.54	
1617	208.04	196.54	72	1	98.17	1.22	1618	206.54	195.34	
1618	206.54	195.34	72	1	304.69	1.03	1604	201.65	192.19	
1604	201.65	192.19	72	1	6.48	1.08	1603	202.2	192.12	asmd dn
1603	202.2	192.12	72	1	28.01	1.21	1612	200.79	191.78	asmd up
1612	200.79	191.78	72	1	188.1	0.43	1593	198.52	190.97	asmd dn
1613	198.41	195.21	18	1	29.26	2.43	1593	198.52	194.5	asmd dn
1593	198.52	190.97	72	1	27.91	0.43	1592	198.64	190.85	asmd dn&up
1590	196.96	195.69	24	1	15.92	5.28	1592	198.64	194.85	asmd dn
1592	198.64	190.85	72	1	60.99	0.43	1589	197.79	190.59	asmd up
1589	197.79	190.29	48	1	321.63	0.39	1584	194	189.03	asmd dn
1583	191.87	190.37	15	1	8.9	4.16	1584	194	190	asmd dn
1584	194	189.03	48	1	61.1	0.38	1578	193.26	188.8	asmd up
1577	192.27	190.47	15	1	13.43	7.22	1578	193.26	189.5	asmd dn
1578	193.26	188.8	48	1	66.01	0.76	1576	192.85	188.3	
1576	192.85	188.3	48	1	60.36	0.4	1575	192.76	188.06	
1575	192.76	188.06	48	1	59.83	0.7	1574	192.34	187.64	
1574	192.34	187.64	48	1	59.23	0.68	1573	191.84	187.24	
1573	191.84	187.24	48	1	65	2.18	1587	192.34	185.82	asmd dn
1586	190.68	190.68	15	1	11.17	-1.61	1587	192.34	190.86	
1587	192.34	185.82	48	1	36.27	2.15	1566	190.56	185.04	asmd up
1567	190.29	190.29	15	1	33.02	15.9	1566	190.56	185.04	
1566	190.56	185.04	48	1	13.64	26.69	10439	189.44	181.4	Ditch
1589	197.79	190.49	48	1	382.27	0.44	1579	193.27	188.81	
1579	193.27	188.81	48	1	188	0.62	10424	192.34	187.64	asmd dn
10424	192.34	187.64	48	1	158.18	2.04	1565	190.56	184.41	asmd up
1565	190.56	184.41	48	1	12.68	23.74	10439	189.44	181.4	Ditch
1589	197.79	190.49	48	1	369.42	0.55	1581	192.91	188.45	
1581	192.91	188.45	48	1	12.7	0.39	1580	192.86	188.4	
1580	192.86	188.4	48	1	238.84	0.3	1572	192.14	187.68	
1572	192.14	187.68	48	1	107.31	1.04	1564	190.56	186.56	

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION - EAST BRANCH

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1564	190.56	186.56	48	1	14.52	35.54	10439	189.44	181.4	Ditch
10439	189.44	181.4	96	1	301.81	1.83	10440	185.26	175.89	Ditch
10440	185.26	175.89	112.8	1	537.73	0.88	10441	183.37	171.17	Ditch
10441	183.37	171.17	146.4	1	643.99	0.24	10442	181.85	169.64	Ditch
10442	181.85	169.64	82.8	1	43.72	3.04	10443	175.3	168.31	Ditch
10443	175.3	168.31	37.2	1	43.88	0.71	10444	171.15	168	Ditch
10444	171.15	168	31.2	1	244.26	1.45	10445	173	164.47	Ditch
10445	173	164.47	102	1	293.12	0.51	10446	171.6	162.98	Ditch
10446	171.6	162.98	92.4	1	196.16	0.51	10447	170.3	161.98	Ditch
10447	170.3	161.98	99.6	1	612.76	0.08	10448	170	161.49	Ditch
10448	170	161.49	79.2	1	211.61	0.02	10449	168.1	161.44	Ditch
10449	168.1	161.44	64.8	1	121.26	0.41	10450	167.5	160.94	Ditch
10450	167.5	160.94	79.2	1	490.41	0.05	10451	169.1	160.7	Ditch
10451	169.1	160.7	100.8	1	33	0	10452	169.6	150.87	Ditch
10452	169.6	150.87	224.4	1	86.5	2.5	6101	168	148.71	Ditch
6101	168	148.71	96	1	172.02	0.55	6102	160.6	147.77	
10452	169.6	150.87	224.4	1	67.08	2.94	6100	168	148.9	Ditch
6100	168	148.9	96	1	176.05	0.43	6103	160.6	148.14	

SECTION 3C

EAST BRANCH
MODEL OF EXISTING SYSTEM
ORIGINAL MODEL – EAST

(WITH SPREADSHEET FOR 2- & 10-YEAR EVENTS & PROFILES FOR 10-YEAR EVENT)

East Branch Watershed (Original Model)

The **east branch watershed** contains approximately 413 acres. The **east branch watershed** begins just south of Trenholm Road between Gladden Road and Hagood Road and expands to the south, crossing Millwood Avenue, Devine Street, and Rosewood Drive. For the purpose of analysis the **east branch watershed** has been divided into thirty-six (36) subwatersheds ranging in size from 1.9 acres to 24.3 acres. As surveyed the storm drainage system within the **east branch watershed** consists of 715 nodes and 706 links. In the current model 115 nodes and 117 links have been activated along the main storm drainage route and analysis has been performed on that main route.

The original model for the **east branch watershed** indicates both **surcharge** and **ponding** along the main storm drainage route. **Surcharge** is indicated when the hydraulic grade line (HGL) exceeds the pipe crown for a particular reach. For the analyzed portion of the **east branch watershed**, the original model indicates surcharge in the main route from the intersection of Millwood Avenue and Hagood Avenue and continuing down through the system to just south of Rosewood Drive at Rosewood Elementary School. The model also identifies surcharge near the intersection of Montgomery Avenue and Tyler Street and continuing down to the transition to the triple 48" RCPs at the Bonham Road crossing. For the 10-year, 24-hour rainfall event (5.3" accumulated rainfall) the model also indicates surcharge near the outfall at Live Oak Street.

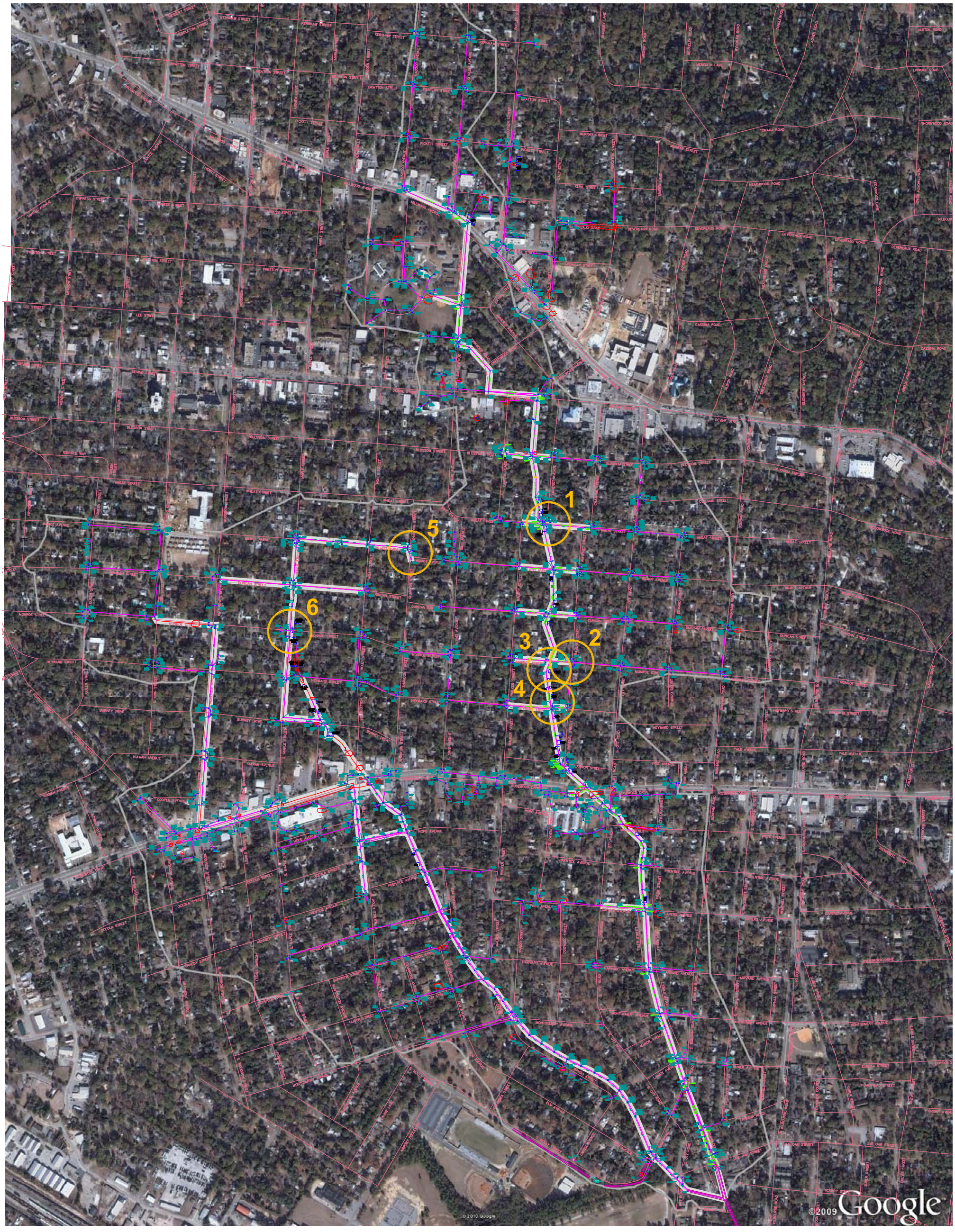
Ponding is indicated when the hydraulic grade line (HGL) exceeds the ground elevation or top elevation at a particular structure. Ponding is identified by overcapacity but with the assumption that overcapacity volume is not being redirected to another node downstream. The current model indicates ponding in the vicinity of certain nodes, and where the model identifies ponding in the vicinity of a cluster of nodes such as a street intersection, worst case data has been identified. For the analyzed portion of the **east branch watershed**, some of the significant locations identified by the model as experiencing ponding during the 10-year, 24-hour rainfall event are as follows: (1) Millwood Avenue at Hagood Avenue; (2) Blossom Street at Amherst Avenue; (3) Wheat Street at Amherst Avenue; (4) Wheat Street at Chatham Avenue; (5) Ravenel Street at Amherst Avenue; (6) along Wilmot, Duncan, and Monroe Streets; and (7) Rosewood Drive at Rosewood Elementary School.

See the tables on the following pages for additional areas of ponding as identified by the original model.

The table below lists locations of ponding in the **east branch watershed** as identified by the original model. Further detailed study of these areas, including detailed topographic surveys, will be required in order to further analyze and assess.

East Branch Location	2-year storm	10-year storm
Intersection of Millwood Avenue and Hagood Avenue	NA	Ponding Indicated
Sims Avenue north of intersection w/ Amherst Avenue	NA	Ponding Indicated
Main storm line from Epworth Children's Home west of Sims Avenue	Ponding Indicated	Ponding Indicated
Intersection of Sims Avenue and Amherst Avenue	Ponding Indicated	Ponding Indicated
Sims Avenue approximately 45' north of Kirkwood Road	Ponding Indicated	Ponding Indicated
Intersection of Sims Avenue and Kirkwood Road	Ponding Indicated	Ponding Indicated
Kirkwood Road approximately 110' east of Sims Avenue	NA	Ponding Indicated
Intersection of Devine Street and Kirkwood Road	Ponding Indicated	Ponding Indicated
Approx. 200' south of Devine Street between Capitol Place and Amherst Avenue	NA	Ponding Indicated
Intersection of Blossom Street and Capitol Place	NA	Ponding Indicated
Intersection of Blossom Street and Amherst Avenue	NA	Ponding Indicated
Blossom Street between Capitol Place and Amherst Avenue	NA	Ponding Indicated
Approximately 150' north of Wheat Street between Capitol Place and Amherst Avenue	Ponding Indicated	Ponding Indicated
Intersection of Wheat Street and Walker Street	NA	Ponding Indicated
Intersection of Wheat Street and Chatham Avenue	Ponding Indicated	Ponding Indicated
Intersection of Wheat Street and Ravenel Street	Ponding Indicated	Ponding Indicated
Wheat Street west of intersection with Amherst Avenue	Ponding Indicated	Ponding Indicated
Intersection of Wilmot Avenue and Walker Street	NA	Ponding Indicated
Intersection of Wilmot Avenue and Ravenel Street	Ponding Indicated	Ponding Indicated
Wilmot Avenue between Walker Street and Ravenel Street	Ponding Indicated	Ponding Indicated
Approximately 180' north of Duncan Avenue between Walker Street and Ravenel Street	Ponding Indicated	Ponding Indicated
Approximately 135' north of Duncan Street between Walker Street and Ravenel Street	Ponding Indicated	Ponding Indicated
Intersection of Duncan Street and Walker Street	Ponding Indicated	Ponding Indicated
Intersection of Duncan Street and Ravenel Street	NA	Ponding Indicated

East Branch Location	2-year storm	10-year storm
Duncan Street between Walker Street and Ravenel Street	NA	Ponding Indicated
Approximately 80' south of Duncan Street between Walker Street and Ravenel Street	NA	Ponding Indicated
Approximately 110' north of Monroe Street between Walker Street and Ravenel Street	NA	Ponding Indicated
Intersection of Monroe Street and Ravenel Street	Ponding Indicated	Ponding Indicated
Monroe Street between Walker Street and Ravenel Street	NA	Ponding Indicated
Approximately 100' south of Monroe Street between Walker Street and Ravenel Street	Ponding Indicated	Ponding Indicated
Intersection of Heyward Street and Walker Street	NA	Ponding Indicated
Heyward Street between Walker Street and Ravenel Street	NA	Ponding Indicated
Near the intersection of Cannon Street and Ravenel Street	NA	Ponding Indicated
South side of Rosewood Drive between S. Ravenel Street and S. Ott Road	Ponding Indicated	Ponding Indicated
Approximately 333' north of Live Oak Street near Tempo Court	NA	Ponding Indicated



LEGEND

0 300 600 900 1200
GRAPHIC SCALE IN FEET
SCALE: 1"=300'

PROBLEM AREA AS IDENTIFIED BY THE CITY OF COLUMBIA

ANALYZED NETWORK

MAGNETIC

1. Wheat Street at Amherst Avenue
2. Monroe Street at Ravenel Street
3. Monroe Street between Ravenel Street and Wheat Street
4. Heyward Street between Ravenel Street and Wheat Street
5. Shandon Street north of Wilmot Avenue
6. Monroe Street at Maple Street

PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

ANALYZED NETWORK LINES

ISSUE DATES / REVISIONS

No.	DATE	DESCRIPTION
1	.	.

SOUTH CAROLINA
COX AND DINKINS, INC.
No. C00294
CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

MAY 2011

COX AND DINKINS
ENGINEERS - SURVEYORS

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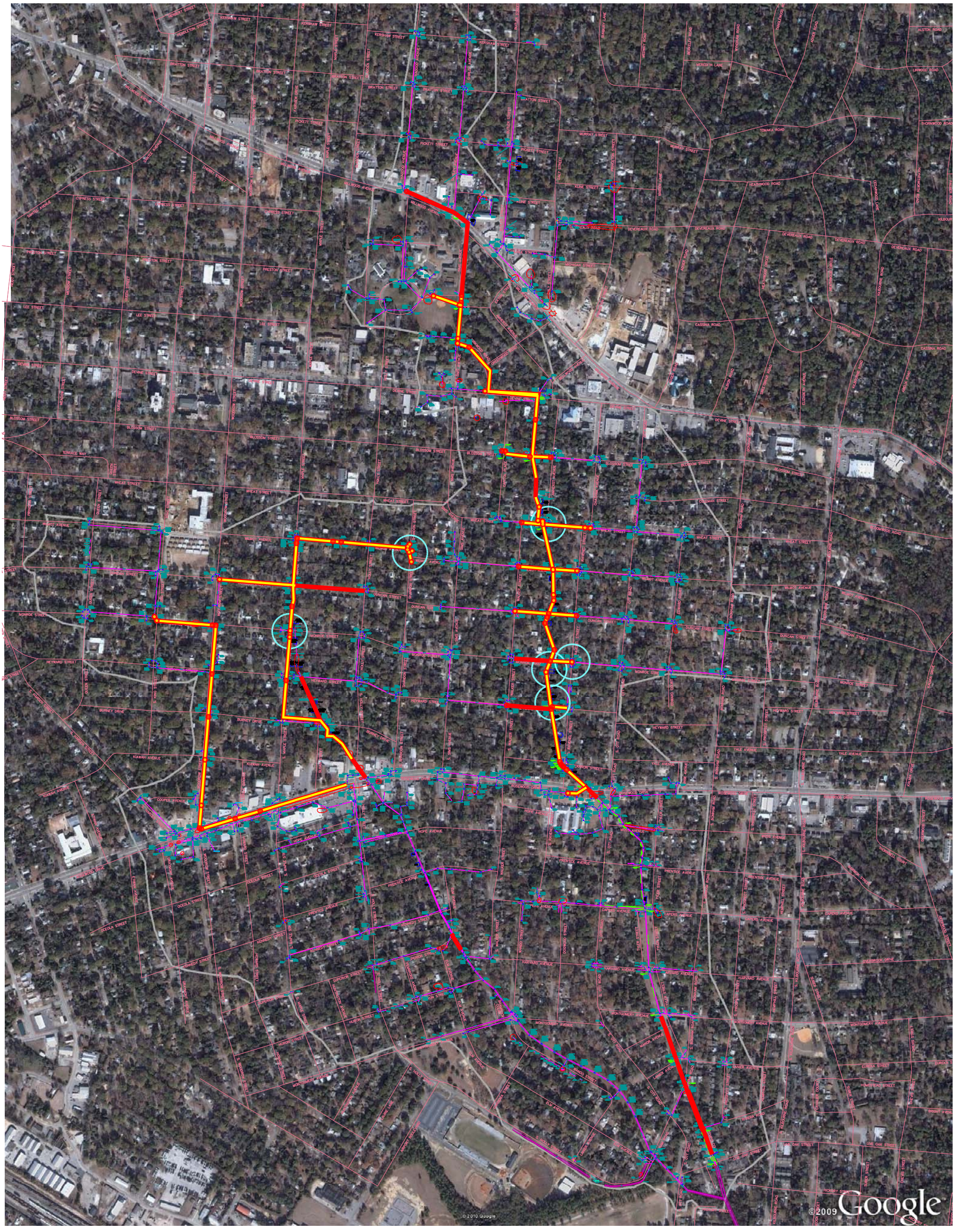

0 300 600 900 1200
GRAPHIC SCALE IN FEET
SCALE: 1"=300'

LEGEND

PROBLEM AREA AS IDENTIFIED BY THE CITY OF COLUMBIA

2-YR STORM PIPE SURCHARGE (YELLOW)

2-YR STORM PONDING (YELLOW)

10-YR STORM PIPE SURCHARGE (RED)

10-YR STORM PONDING (RED)

MAGNETIC

PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

PROBLEM AREAS

ISSUE DATES / REVISIONS

No.	DATE	DESCRIPTION
1	.	.

SOUTH CAROLINA — COX AND DINKINS, INC. No. C00294 — CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

MAY 2011

COX AND DINKINS
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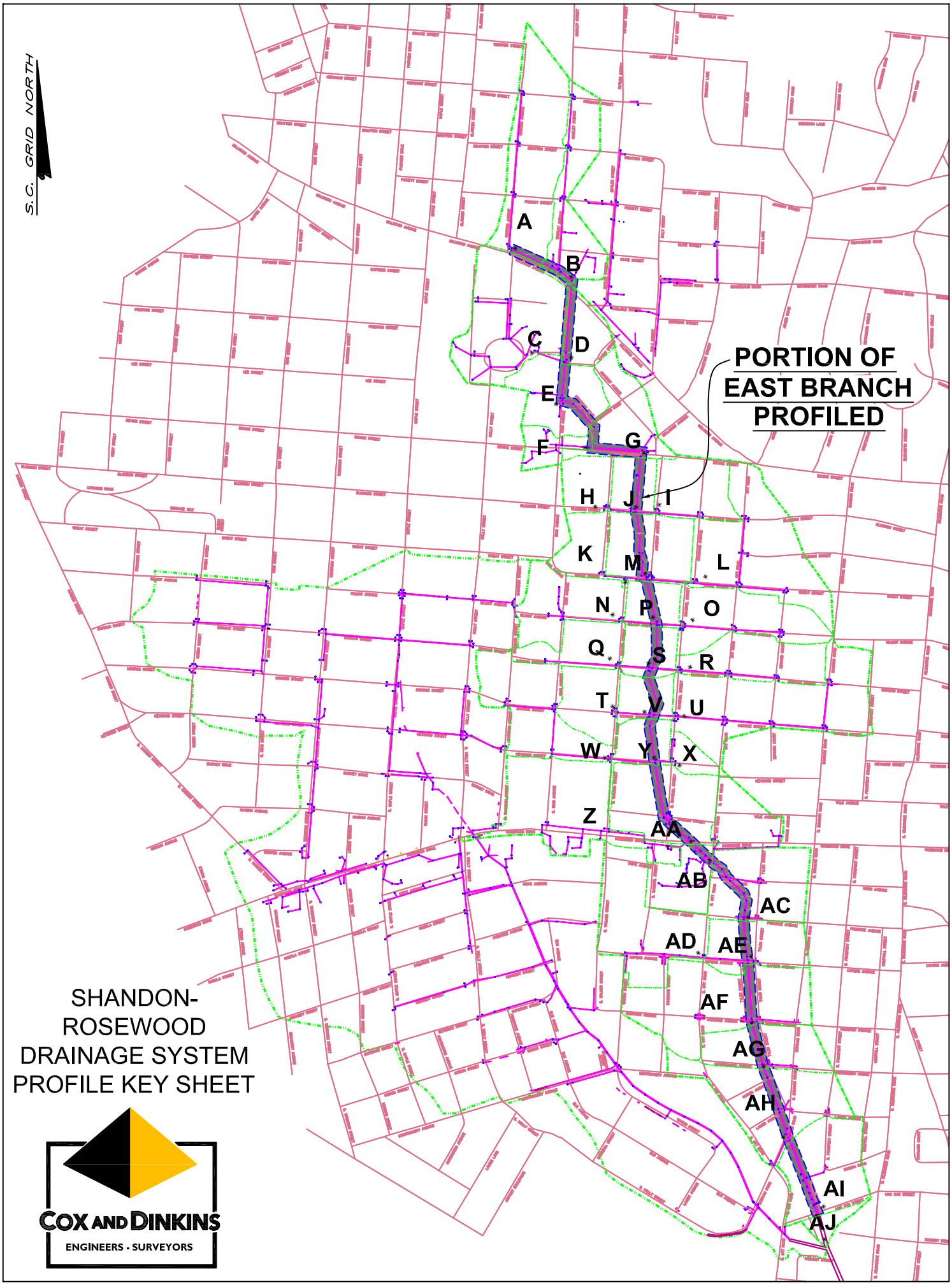


SHANDON-
ROSEWOOD
DRAINAGE SYSTEM
PROFILE KEY SHEET

COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH EXISTING MODEL - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
10123.1	10 yr 24 hr	10123	314.35	309.22	311.22	316.08	2	1	465.34	0.77	10116	313.8	305.65	307.65	312.06	asmd up	13.22	13.22	18.4	25.9	8.14
10116.1	10 yr 24 hr	10116	313.8	305.5	307.5	312.06	2	1	26.4	-0.08	10114	313.32	305.52	307.52	311.87		13.22	13.22	5.78	25.91	8.22
10114.1	10 yr 24 hr	10114	313.32	305.42	307.42	311.87	2	1	133.69	0.91	10113	312.91	304.21	306.21	310.94		13.22	13.28	19.98	25.92	8.22
10113.1	10 yr 24 hr	10113	312.91	303.51	306.01	310.94	2.5	1	656.26	1.57	10276	301.71	293.21	295.71	301.96		12.42	12.42	47.72	45.74	9.2
10276.1	10 yr 24 hr	10276	301.71	293.21	295.71	301.96	2.5	1	66.54	1.52	10427	300	292.2	294.7	301.44	asmd dn	12.42	12.42	46.92	45.72	9.17
10427.1	10 yr 24 hr	10427	300	292.2	294.7	301.44	2.5	1	24.78	1.29	10273	299.48	291.88	294.38	301.26	asmd up	12.42	12.42	43.28	45.71	9.17
10391.1	10 yr 24 hr	10391	299.93	293.4	295.4	305.03	2	1	248.58	0.09	10274	298.83	293.18	295.18	301.3	asmd up	12.63	12.63	6.25	27.66	8.55
10274.1	10 yr 24 hr	10274	298.83	293.13	295.13	301.3	2	1	13.93	3.23	10273	299.48	292.68	294.68	301.26		14.45	14.45	37.76	25.11	7.88
10273.1	10 yr 24 hr	10273	299.48	291.83	294.33	301.26	2.5	1	302.97	0.73	10271	294.52	289.62	292.12	297.17		12.9	12.9	32.53	45.96	9.21
10271.1	10 yr 24 hr	10271	294.52	289.57	292.07	297.17	2.5	1	44.38	0.41	10272	294.69	289.39	291.89	296.7		13.63	13.63	24.26	40.35	8.12
10272.1	10 yr 24 hr	10272	294.69	289.34	291.84	296.7	2.5	1	109.69	0.8	10278	295.06	288.46	290.96	295.55		13.85	13.83	34.11	40.78	8.21
10278.1	10 yr 24 hr	10278	295.06	288.36	290.86	295.55	2.5	1	285.43	0.55	10281	297.7	286.8	289.3	293.9		14.52	14.52	28.16	40.58	8.17
10281.1	10 yr 24 hr	10281	297.7	286.6	289.1	293.9	2.5	1	191.54	0.41	10282	295.62	285.82	288.32	292.94		14.52	14.52	24.31	40.58	8.2
10282.1	10 yr 24 hr	10282	295.62	285.77	288.27	292.94	2.5	1	446.77	0.66	10298	293.88	282.8	285.3	290.76	asmd dn	14.52	14.53	31.05	40.58	8.24
10294.1	10 yr 24 hr	10294	295.52	289.22	290.52	296.41	1.3	1	484.11	0.35	10299	294.54	287.54	288.84	290.85		12.6	12.6	3.92	8.58	6.34
10299.1	10 yr 24 hr	10299	294.54	287.49	288.99	290.85	1.5	1	16.83	27.87	10298	293.88	282.8	284.3	290.76	asmd dn	12.6	12.05	51.49	8.61	15.8
10298.1	10 yr 24 hr	10298	293.88	282.8	285.3	290.76	2.5	1	47.48	0.51	10296	293.92	282.56	285.06	290.39	asmd up	12.85	12.85	27.08	48.45	9.57
10296.1	10 yr 24 hr	10296	293.92	282.52	285.02	290.39	2.5	1	169.66	2.31	10421	284	278.6	281.1	286.09	asmd dn	12.32	12.93	57.89	61.45	13.2
10421.1	10 yr 24 hr	10421	284	278.6	281.1	286.09	2.5	1	333.75	2.31	5719	277.78	270.88	273.38	277.64	asmd up	12.32	14.48	57.93	61.44	12.92
5715.1	10 yr 24 hr	5715	287.43	281.83	283.33	287.95	1.5	1	31.1	0.51	5716	287.27	281.67	283.17	287.29		12	12	7	15.07	8.44
5716.1	10 yr 24 hr	5716	287.27	279.02	280.52	287.29	1.5	1	30.3	2.61	5717	286.93	278.23	279.73	286.7		12	11.92	15.75	14.85	8.75
5717.1	10 yr 24 hr	5717	286.93	278.03	279.33	286.7	1.3	1	210.6	2.16	5720	277.38	273.48	274.78	277.98		12.02	12	9.79	14.76	10.91
5720.1	10 yr 24 hr	5720	277.38	273.48	274.98	277.98	1.5	1	22.23	5.85	5719	277.78	272.18	273.68	277.64		12.02	11.93	23.59	14.49	12.52
5726.1	10 yr 24 hr	5726	281.91	274.01	275.51	283.12	1.5	1	167.53	1.09	5719	277.78	272.18	273.68	277.64		12.65	12.67	10.19	19.95	10.98
5719.1	10 yr 24 hr	5719	277.78	270.78	273.78	277.64	3	1	195.26	1.63	5708	274.63	267.6	270.6	273.05	asmd dn	12.07	12.07	79.04	100.23	14.08
5708.1	10 yr 24 hr	5708	274.63	267.5	271.5	273.05	4	1	176.36	1.42	5702	272.6	265	269	272.28	asmd up	12.13	11.97	158.81	101.74	12.03
5702.1	10 yr 24 hr	5702	272.6	264.9	268.9	272.28	4	1	93.87	2.02	5688	268.71	263	267	271.9	asmd dn	12.13	11.95	189.76	100.36	11.94
5688.1	10 yr 24 hr	5688	268.71	263	267	271.9	4	1	124.32	0.77	5612	270.14	262.04	266.04	271.22	asmd up	12.12	11.95	117.21	100.08	8.58
5612.1	10 yr 24 hr	5612	270.14	261.99	265.99	271.22	4	1	41.68	0.48	5611	269.89	261.79	265.79	271.09		12.07	12.07	92.4	100	7.91
5611.1	10 yr 24 hr	5611	269.89	261.74	264.74	271.09	3	1	11.82	2.2	5610	268.68	261.48	264.48	270.92		12.07	12.07	91.86	99.95	13.99
5610.1	10 yr 24 hr	5610	268.68	261.38	264.38	270.92	3	1	18.31	1.04	5609	268.24	261.19	264.19	270.69		12	12	63.09	81.99	11.49
5606.1	10 yr 24 hr	5606	274.58	267.48	268.98	274.61	1.5	1	192.25	3.01	5609	268.24	261.69	263.19	270.69		12.18	12.18	16.93	15.52	8.57
5646.1	10 yr 24 hr	5646	276.45	267.95	269.45	278.65	1.5	1	50.05	1.08	5645	275.16	267.41	268.91	277.13		12.65	12.63	10.13	20.63	11.25
5645.1	10 yr 24 hr	5645	275.16	267.36	268.86	277.13	1.5	1	383.02	1.44	5609	268.24	261.84	263.34	270.69		14.93	14.95	11.71	18.65	10.23
5609.1	10 yr 24 hr	5609	268.24	261.14	264.14	270.69	3	1	418.33	1.45	5547	261.76	255.06	258.06	262.86		11.98	11.98	74.67	87.49	12.29
5541.1	10 yr 24 hr	5541	270.84	266.14	267.64	271.99	1.5	1	312.88	3.22	5547	261.76	256.06	257.56	262.86		12.55	12.55	17.51	17.28	9.6
5575.1	10 yr 24 hr	5575	265.61	261.11	262.61	267.21	1.5	1	218.42	1.99	5547	261.76	256.76	258.26	262.86		12.62	12.62	13.77	14.45	8.02
5547.1	10 yr 24 hr	5547	261.76	254.96	258.46	262.86	3.5	1	6.12	-0.65	5546	261.1	255	258.5	262.77		12.12	12.12	75.53	131.33	13.57
5546.1	10 yr 24 hr	5546	261.1	255	258.5	262.77	3.5	1	225.24	1.85	5502	257.33	250.83	254.33	259.65		12.17	11.95	127.12	115.05	14.05
5502.1	10 yr 24 hr	5502	257.33	250.83	254.33	259.65	3.5	1	51.38	2.16	5929	257.22	249.72	253.22	258.99		14.92	11.92	137.32	115.13	12.4
5929.1	10 yr 24 hr	5929	257.22	249.72	253.22	258.99	3.5	1	127.69	0.92	5492	256.54	248.54	252.04	257.48		14.68	14.68	89.81	120.43	12.41
5512.1	10 yr 24 hr	5512	260.07	252.97	254.27	261.35	1.3	1	306.37	1.35	5492	256.54	248.84	250.14	257.48		12.42	12	7.73	8	5.85
5478.1	10 yr 24 hr	5478	264.05	251.95	253.45	264.51	1.5	1	254.81	0.71	5492	256.54	250.14	251.64	257.48		12.53	12.53	8.22	17.02	9.22
5492.1	10 yr 24 hr	5492	256.54	248.44	251.94	257.48	3.5	1	33.07	2.84	5909	256.2	247.5	251	256.95	asmd dn	14.68	11.93	157.51	123.92	13.86
5909.1	10 yr 24 hr	5909	256.2	247.5	251	256.95	3.5	1	59.49	0.84	5907	255.6	247	250.5	255.97	asmd dn&	14.68	14.68	85.65	123.9	12.77
5907.1	10 yr 24 hr	5907	255.6	247	250.5	255.97	3.5	1	256.26	1.55	5900	250.83	243.03	246.53	251.81	asmd up	14.68	11.93	116.28	123.87	13.35
5900.1	10 yr 24 hr	5900	250.83	242.73	246.23	251.81	3.5	1	108.2	1.78	5382	248.9	240.8	244.3	250.09		14.68	14.68	124.77	123.83	12.78
5376.1	10 yr 24 hr	5376	254.37	249.37	251.37	253.33	2	1	326.89	2.01	5382	248.9	242.8	244.8	250.09		12.17	12.17	29.78	22.45	7.1
5397.1	10 yr 24 hr	5397	249.86	243.66	245.16	252.4	1.5	1	197.44	0.89	5382	248.9	241.9	243.4	250.09		15.02	15.02	9.21	20.44	11.24

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH EXISTING MODEL - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5382.1	10 yr 24 hr	5382	248.9	240.7	244.7	250.09	4	1	107.72	0.58	5930	247.38	240.08	244.08	249.04		12	12	101.19	150.54	11.9
5930.1	10 yr 24 hr	5930	247.38	239.98	243.98	249.04	4	1	338.1	0.6	5306	245.34	237.94	241.94	245.9		13.93	13.93	103.61	146.96	11.61
5342.1	10 yr 24 hr	5342	258.42	252.42	253.92	259.32	1.5	1	405.29	3.47	5306	245.34	238.34	239.84	245.9		13.02	13.03	18.18	18.26	10.1
5304.1	10 yr 24 hr	5304	248.41	238.61	240.11	246.45	1.5	1	135.17	0.31	5305	245.39	238.19	239.69	245.9		12.12	12.12	5.44	8.82	4.86
5305.1	10 yr 24 hr	5305	245.39	238.09	239.59	245.9	1.5	1	22.39	0.67	5306	245.34	237.94	239.44	245.9		12.1	12.1	7.98	8.78	4.85
5306.1	10 yr 24 hr	5306	245.34	237.89	241.89	245.9	4	1	483.83	0.9	5897	239.69	233.52	237.52	239.87	asmd dn	13.45	13.45	126.76	155.41	12.3
5897.1	10 yr 24 hr	5897	239.69	233.52	237.52	239.87	4	1	17.38	0.86	5265	239.87	233.37	237.37	239.66	asmd up	13.45	13.45	123.91	155.4	12.33
5265.1	10 yr 24 hr	5265	239.87	233.17	237.17	239.66	4	1	12.9	0.78	5896	239.46	233.07	237.07	239.5	asmd dn	13.45	13.45	117.44	155.41	12.33
5896.1	10 yr 24 hr	5896	239.46	233.07	237.07	239.5	4	1	16.95	0.71	10432	239.65	232.95	236.95	239.3	asmd dn&	13.45	13.45	112.23	155.4	12.33
10432.1	10 yr 24 hr	10432	239.65	232.95	236.95	239.3	4	1	4.44	0.68	10433	239.14	232.92	236.92	239.25	asmd dn&	13.45	13.45	109.64	155.41	12.34
10433.1	10 yr 24 hr	10433	239.14	232.92	236.92	239.25	4	1	6.62	0.76	10434	239.02	232.87	236.87	239.17	asmd dn&	13.45	13.45	115.92	155.42	12.34
10434.1	10 yr 24 hr	10434	239.02	232.87	236.87	239.17	4	1	39.12	0.74	5898	238.49	232.58	236.58	238.7	asmd dn&	13.45	13.45	114.84	155.42	12.34
5898.1	10 yr 24 hr	5898	238.49	232.58	236.58	238.7	4	1	217.89	0.73	2358	237.13	230.98	234.98	236.09	asmd dn&	13.45	13.47	114.3	155.43	12.36
2358.1	10 yr 24 hr	2358	237.13	230.98	234.98	236.09	4	1	22.36	0.72	2072	237.02	230.82	234.82	235.82	asmd up	13.47	13.92	112.83	155.45	13.5
2039.1	10 yr 24 hr	2039	240.77	237.23	238.73	242.6	1.5	1	82.46	2.7	2042	239.83	235	236.5	239.2	asmd dn	13.15	13.17	16.04	20.22	11.27
2042.1	10 yr 24 hr	2042	239.83	235	236.5	239.2	1.5	1	103.85	2.92	2072	237.02	231.97	233.47	235.82	asmd up	13.15	13.17	16.66	20.23	11.33
2072.1	10 yr 24 hr	2072	237.02	230.82	234.82	235.82	4	1	41.82	1.72	5919	237.24	230.1	234.1	234.84	asmd dn&	12.25	12.25	175.01	206.06	16.3
5919.1	10 yr 24 hr	5919	237.24	230.1	234.1	234.84	4	1	96.54	0.84	1993	237.29	229.29	233.29	232.72	asmd dn&	12.25	12.25	122.18	206.05	15.92
1993.1	10 yr 24 hr	1993	237.29	229.29	233.29	232.72	4	1	63.92	2.33	1994	235.8	227.8	231.8	231.31		12.25	12.27	203.65	206.04	17.94
1994.1	10 yr 24 hr	1994	235.8	227.8	231.8	231.31	4	1	87.32	1.47	1998	232.52	226.52	230.52	228.44		12.25	12.25	161.49	206.04	18.56
1998.1	10 yr 24 hr	1998	232.52	226.52	230.52	228.44	4	1	9.62	10.91	1999	232.77	225.47	229.47	227.39		12.25	12.25	440.66	206.04	34.47
1999.1	10 yr 24 hr	1999	232.77	220.57	226.57	223.7	6	1	98.24	1.46	2044	229.24	219.14	225.14	222.44		12.3	12.32	474.46	240.38	16.04
2044.1	10 yr 24 hr	2044	229.24	219.14	225.14	222.44	6	1	80.09	1.17	1969	226.22	218.2	224.2	221.57	asmd dn	12.3	12.32	426.04	240.36	15.06
1969.1	10 yr 24 hr	1969	226.22	218.2	224.2	221.57	6	1	9.5	2.11	2081	226.22	218	224	221.47	asmd dn&	12.3	12.32	570.6	240.35	14.66
2081.1	10 yr 24 hr	2081	226.22	218	224	221.47	6	1	39.99	0.75	1970	226.2	217.7	223.7	221.09	asmd dn&	12.3	12.32	340.61	240.35	14.22
1970.1	10 yr 24 hr	1970	226.2	217.7	223.7	221.09	6	1	171.22	1.07	1966	224.16	215.86	221.86	219.41	asmd up	12.3	12.35	407.67	240.37	14.52
1966.1	10 yr 24 hr	1966	224.16	215.86	221.86	219.41	6	1	69.21	0.94	1963	223.41	215.21	221.21	218.81		12.32	12.38	381.11	240.41	13.84
1963.1	10 yr 24 hr	1963	223.41	215.21	221.21	218.81	6	1	90.45	0.96	1962	223.04	214.34	220.34	218.07		12.32	12.42	385.68	240.5	13.62
1962.1	10 yr 24 hr	1962	223.04	214.34	220.34	218.07	6	1	64.74	0.97	1949	222.91	213.71	219.71	217.59		12.32	12.48	387.94	240.59	13.16
1949.1	10 yr 24 hr	1949	222.91	213.71	219.71	217.59	6	1	24.88	-0.16	1950	223.05	213.75	219.75	217.41		12.32	12.48	157.68	240.64	12.79
1950.1	10 yr 24 hr	1950	223.05	213.75	219.75	217.41	6	1	200.6	1.07	1831	220.8	211.6	217.6	215.31		12.28	12.3	407.13	278.19	15.37
1831.1	10 yr 24 hr	1831	220.8	211.6	217.6	215.31	6	1	132.17	1.07	1804	220.79	210.19	216.19	213.97		12.28	12.28	406.18	278.2	15.14
1804.1	10 yr 24 hr	1804	220.79	210.19	216.19	213.97	6	1	35.27	0.6	1805	220.18	209.98	215.98	213.62		12.28	12.27	303.45	278.15	14.89
1809.1	10 yr 24 hr	1809	238.64	230.3	232.8	231.77	2.5	1	149.27	1.22	1808	233.58	228.48	230.98	229.95	asmd up	12.65	12.67	42.06	27.33	9.12
1808.1	10 yr 24 hr	1808	233.58	225.38	227.38	226.14	2	1	251.67	4.85	1805	220.18	213.18	215.18	213.94		12.65	12.67	46.25	14.14	12.93
1808.2	10 yr 24 hr	1808	233.58	225.38	227.88	226.14	2.5	1	251.75	2.99	1807	220.66	217.86	220.36	218.62	asmd dn	12.65	12.67	65.83	13.18	10.46
1805.1	10 yr 24 hr	1805	220.18	209.98	215.98	213.62	6	1	4.66	1.07	1807	220.66	209.93	215.93	213.57	asmd dn	12.3	12.38	407.35	285.58	15.94
1807.1	10 yr 24 hr	1807	220.66	209.93	215.93	213.57	6	1	28.92	1.21	1806	219.78	209.58	215.58	213.22	asmd up	12.32	12.48	432.63	292.67	16.58
1806.1	10 yr 24 hr	1806	219.78	209.58	215.58	213.22	6	1	505.83	1.45	1701	211.57	202.27	208.27	206.84		12.28	12.22	472.75	313.43	17.18
1701.1	10 yr 24 hr	1701	211.57	202.27	208.27	206.84	6	1	37.25	1.23	1700	211.01	201.81	207.81	206.58		12.3	12.18	437.01	311.95	14.81
1700.1	10 yr 24 hr	1700	211.01	201.81	207.81	206.58	6	1	391.13	1.12	1822	207.72	197.42	203.42	203.12		12.32	12.52	416.63	362.65	16.35
1822.1	10 yr 24 hr	1822	207.72	197.42	203.42	203.12	6	1	28.28	3.11	1617	208.04	196.54	202.54	202.96		12.35	12.77	693.71	362.7	17.25
1617.1	10 yr 24 hr	1617	208.04	196.54	202.54	202.96	6	1	98.17	1.22	1618	206.54	195.34	201.34	202.13		12.32	12.53	434.79	380.97	15.19
1618.1	10 yr 24 hr	1618	206.54	195.34	201.34	202.13	6	1	304.69	1.03	1604	201.65	192.19	198.19	199.5		12.32	12.53	399.86	380.67	14.14
1604.1	10 yr 24 hr	1604	201.65	192.19	198.19	199.5	6	1	6.48	1.08	1603	202.2	192.12	198.12	199.44	asmd dn	12.33	12.33	408.73	380.61	13.1
1603.1	10 yr 24 hr	1603	202.2	192.12	198.12	199.44	6	1	28.01	1.21	1612	200.79	191.78	197.78	199.17	asmd up	12.32	12.33	433.27	380.57	13.11
1612.1	10 yr 24 hr	1612	200.79	191.78	197.78	199.17	6	1	188.1	0.43	1593	198.52	190.97	196.97	197.57	asmd dn	12.32	12.33	258.06	380.48	13.19
1593.1	10 yr 24 hr	1593	198.52	190.97	196.97	197.57	6	1	27.91	0.43	1592	198.64	190.85	196.85	197.32	asmd dn&	12.33	12.2	257.86	380.43	13.3
1592.1	10 yr 24 hr	1592	198.64	190.85	196.85	197.32	6	1	60.99	0.43	1589	197.79	190.59	196.59	196.76	asmd up	12.33	12.2	256.76	380.4	13.45

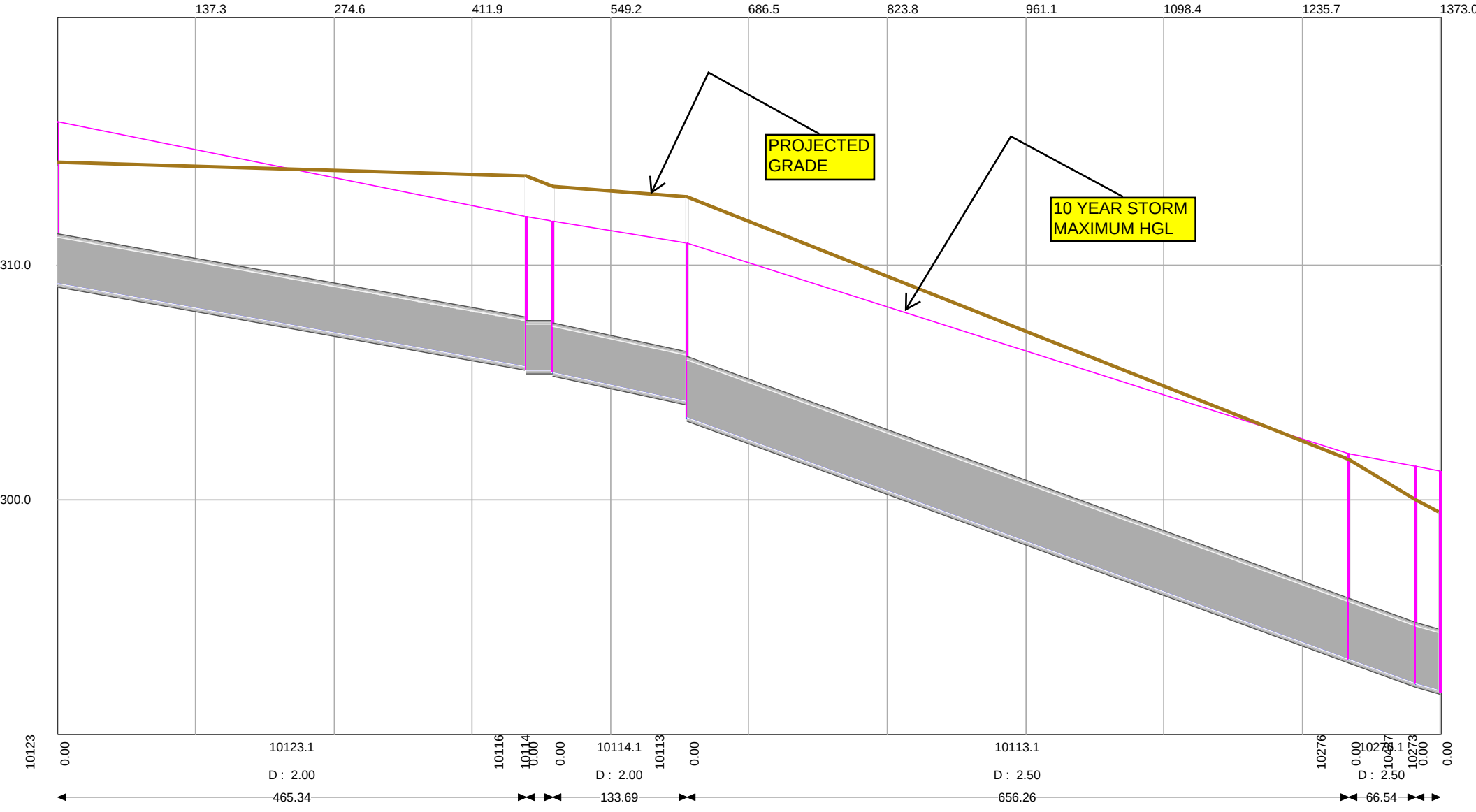
All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH EXISTING MODEL - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
1589.1	10 yr 24 hr	1589	197.79	190.29	194.29	196.76	4	1	321.63	0.39	1584	194	189.03	193.03	193.23	asmd dn	12.35	12.35	83.48	140.32	11.1
1584.1	10 yr 24 hr	1584	194	189.03	193.03	193.23	4	1	61.1	0.38	1578	193.26	188.8	192.8	192.58	asmd up	12.35	12.35	81.84	140.33	10.95
1578.1	10 yr 24 hr	1578	193.26	188.8	192.8	192.58	4	1	66.01	0.76	1576	192.85	188.3	192.3	191.94		12.35	12.35	116.09	140.34	11.45
1576.1	10 yr 24 hr	1576	192.85	188.3	192.3	191.94	4	1	60.36	0.4	1575	192.76	188.06	192.06	191.34		12.35	12.35	84.11	140.34	11.79
1575.1	10 yr 24 hr	1575	192.76	188.06	192.06	191.34	4	1	59.83	0.7	1574	192.34	187.64	191.64	190.63		12.35	12.35	111.75	140.35	12.85
1574.1	10 yr 24 hr	1574	192.34	187.64	191.64	190.63	4	1	59.23	0.68	1573	191.84	187.24	191.24	189.7		12.35	12.35	109.61	140.36	14.19
1573.1	10 yr 24 hr	1573	191.84	187.24	191.24	189.7	4	1	65	2.18	1587	192.34	185.82	189.82	188.1	asmd dn	12.35	12.37	197.15	140.36	17.47
1587.1	10 yr 24 hr	1587	192.34	185.82	189.82	188.1	4	1	36.27	2.15	1566	190.56	185.04	189.04	186.5	asmd up	12.35	12.37	195.6	140.36	19.88
1566.1	10 yr 24 hr	1566	190.56	185.04	189.04	186.5	4	1	13.64	26.69	10439	189.44	181.4	185.4	185.28	Ditch	12.35	12.5	689.04	140.36	28.44
10422.1	10 yr 24 hr	1589	197.79	190.49	194.49	196.76	4	1	382.27	0.44	1579	193.27	188.81	192.81	192.51		12.35	12.35	88.42	142.04	11.3
1579.1	10 yr 24 hr	1579	193.27	188.81	192.81	192.51	4	1	188	0.62	10424	192.34	187.64	191.64	190.32	asmd dn	12.35	12.35	105.22	142.06	12.02
10424.1	10 yr 24 hr	10424	192.34	187.64	191.64	190.32	4	1	158.18	2.04	1565	190.56	184.41	188.41	186.24	asmd up	12.35	12.35	190.6	142.04	16.5
1565.1	10 yr 24 hr	1565	190.56	184.41	188.41	186.24	4	1	12.68	23.74	10439	189.44	181.4	185.4	185.28	Ditch	12.25	12.18	649.87	179.78	28.82
10423.1	10 yr 24 hr	1589	197.79	190.49	194.49	196.76	4	1	369.42	0.55	1581	192.91	188.45	192.45	193.04		12.35	12.35	99.12	134.84	10.64
1581.1	10 yr 24 hr	1581	192.91	188.45	192.45	193.04	4	1	12.7	0.39	1580	192.86	188.4	192.4	192.92		12.35	12.35	83.69	134.85	10.24
1580.1	10 yr 24 hr	1580	192.86	188.4	192.4	192.92	4	1	238.84	0.3	1572	192.14	187.68	191.68	190.53		12.35	12.35	73.23	134.86	10.53
1572.1	10 yr 24 hr	1572	192.14	187.68	191.68	190.53	4	1	107.31	1.04	1564	190.56	186.56	190.56	187.71		12.35	12.35	136.27	134.87	15.13
1564.1	10 yr 24 hr	1564	190.56	186.56	190.56	187.71	4	1	14.52	35.54	10439	189.44	181.4	185.4	185.28	Ditch	12.35	12.4	795.14	134.88	34.47
10439.1	10 yr 24 hr	10439	189.44	181.4	189.4	185.28	8	1	301.81	1.83	10440	185.26	175.89	183.89	179.77	Ditch	12.32	12.32	2107.93	452.22	9.7

All Pipes are Circular and have a Roughness of 0.014.

EAST BRANCH ORIGINAL MODEL - NODES 10123-10273
Day [0] Time 00:01:00 Step 1



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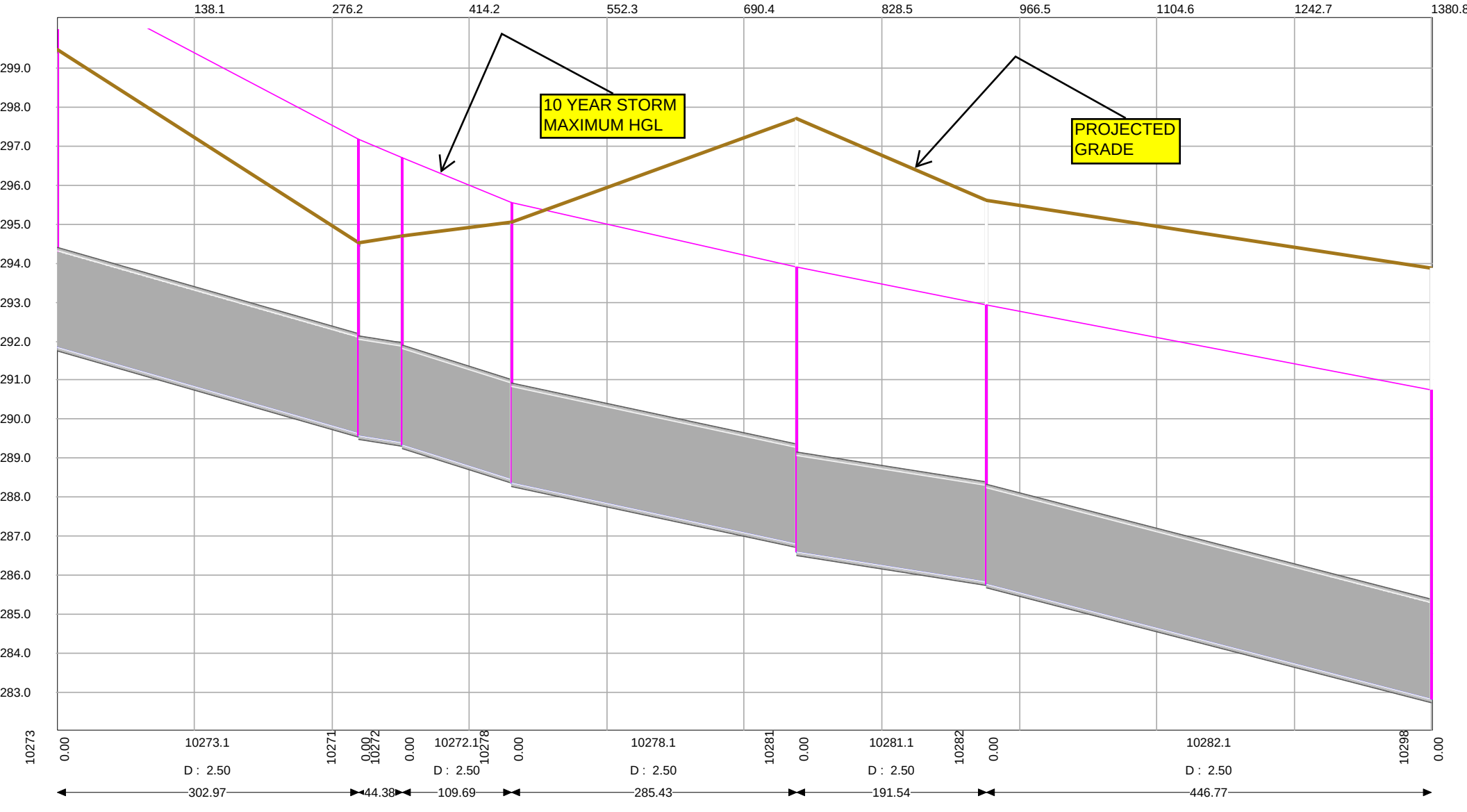

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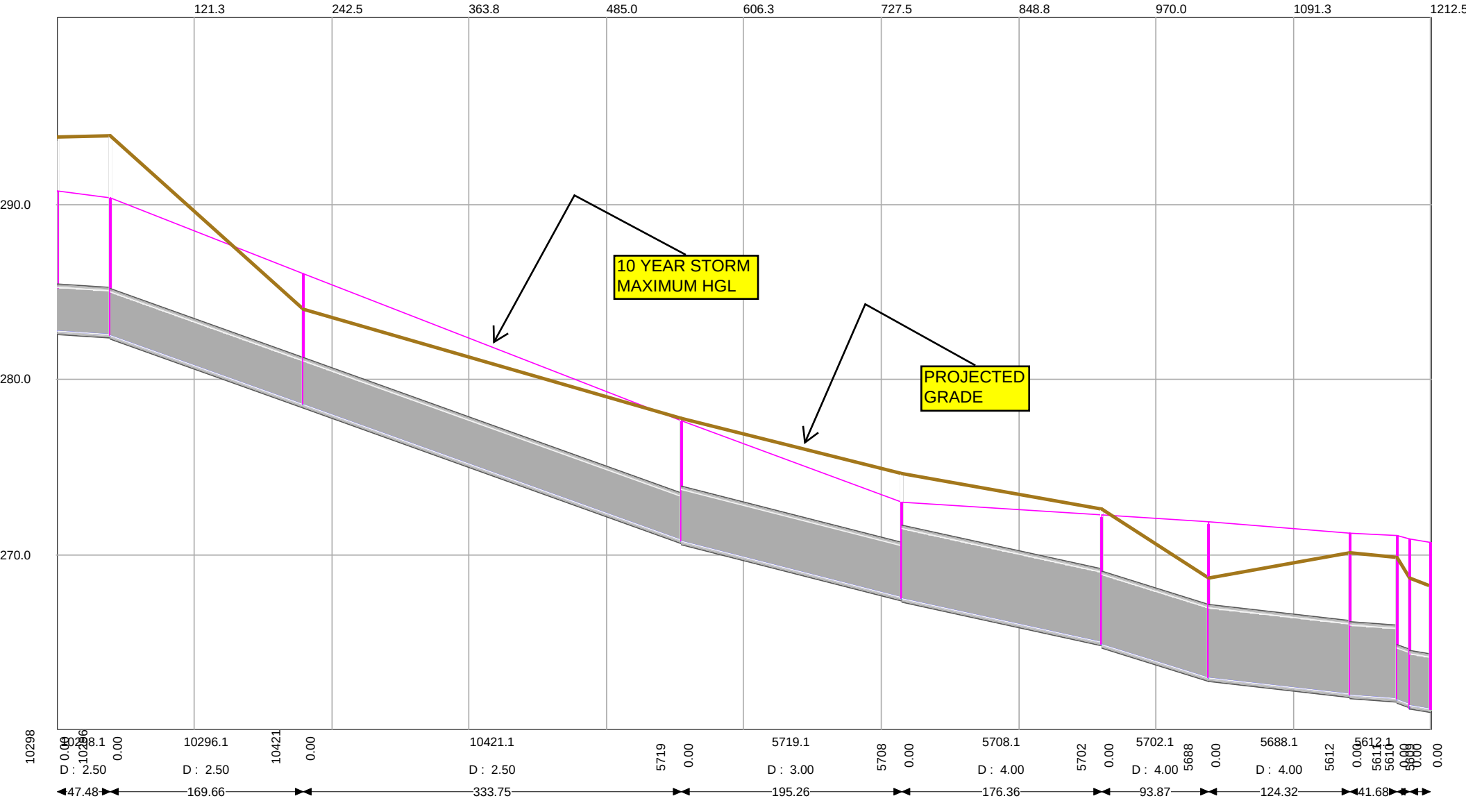

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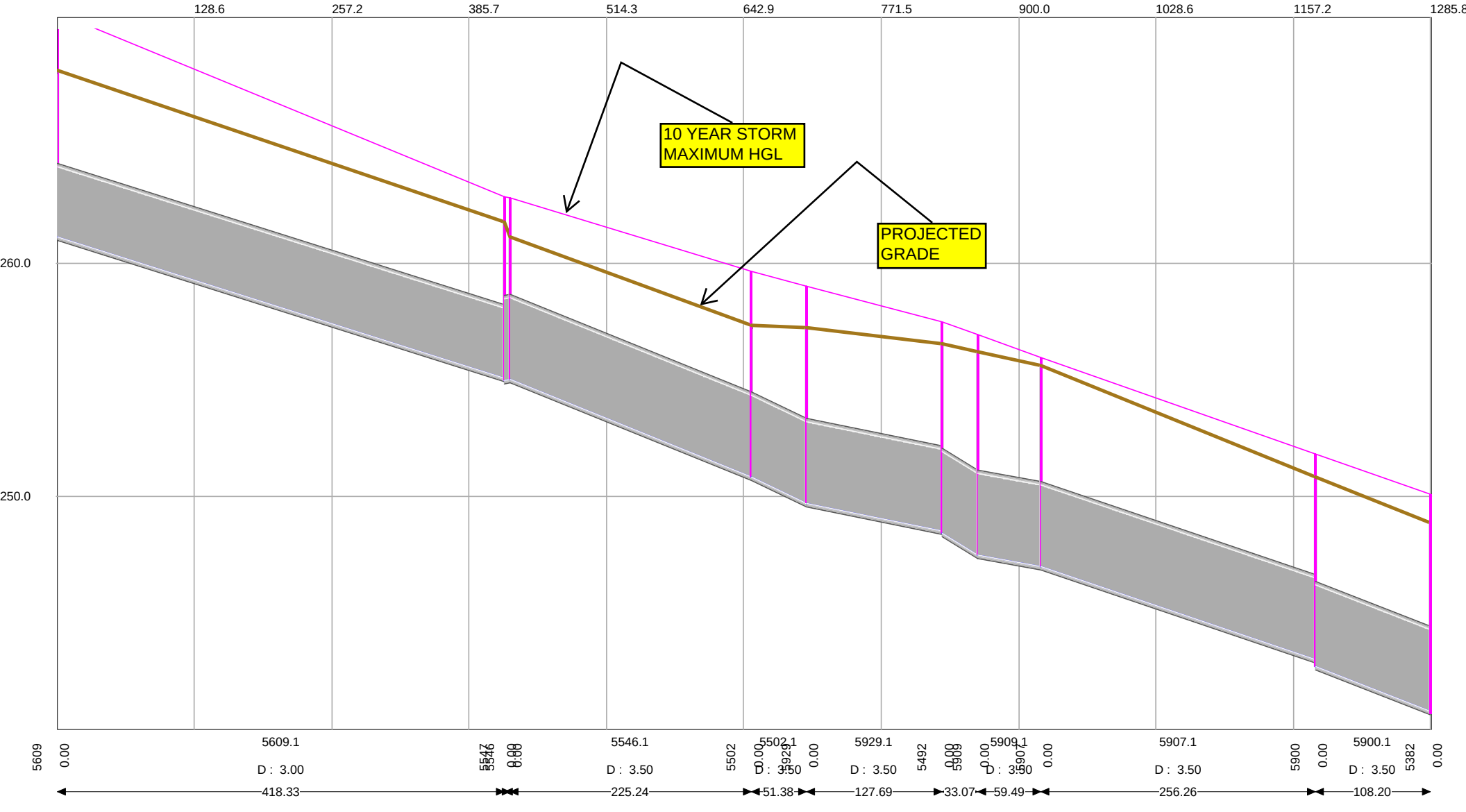

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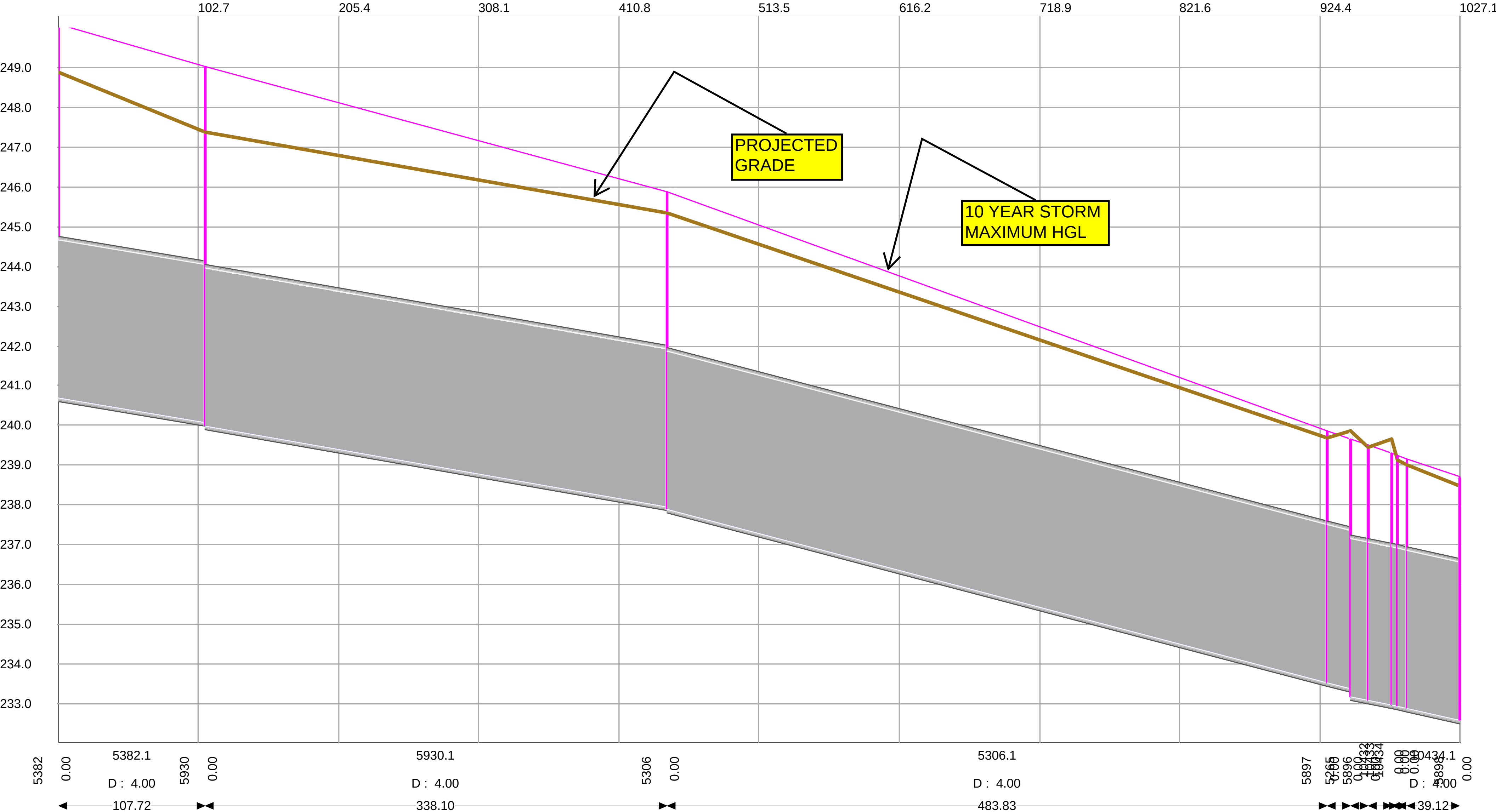

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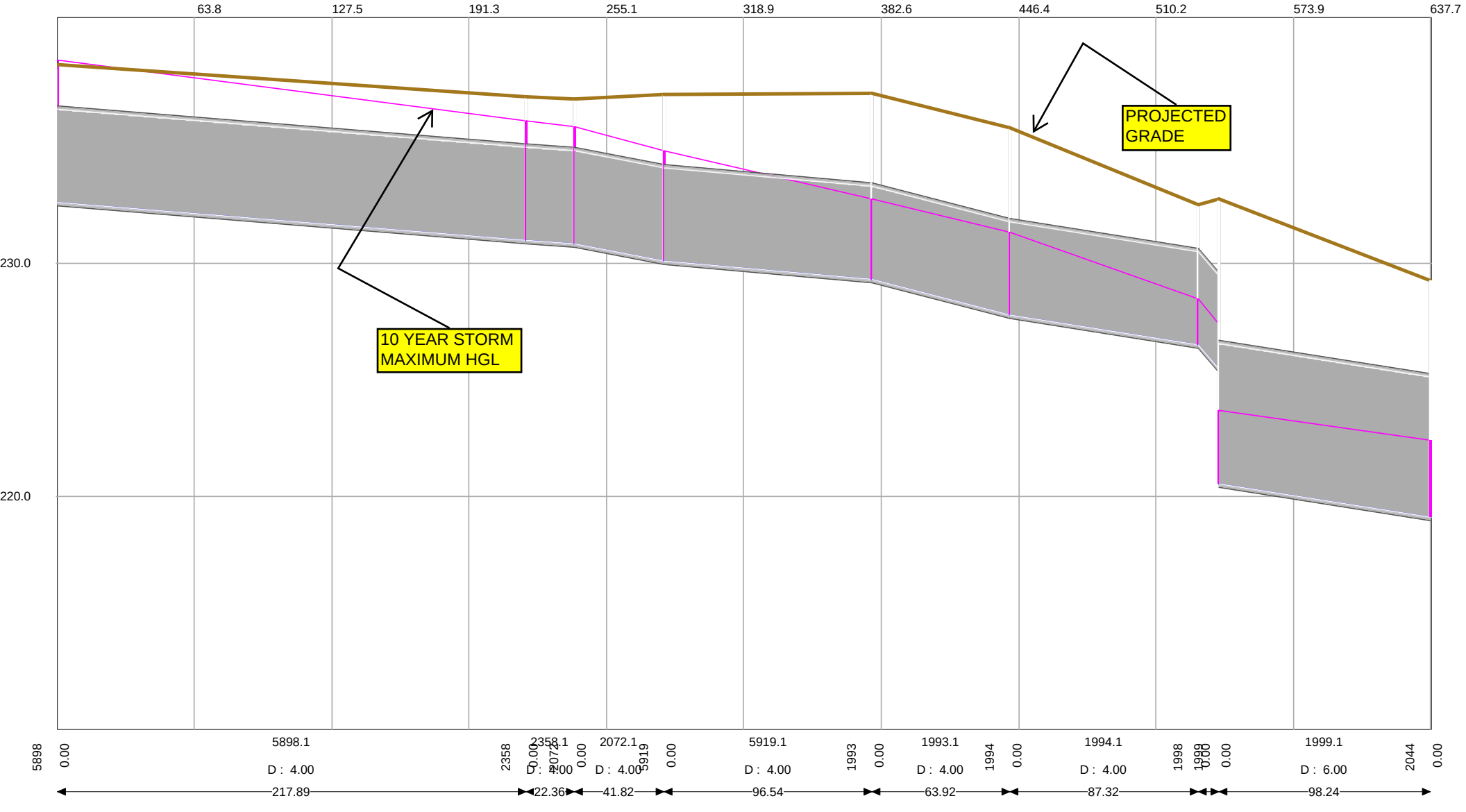

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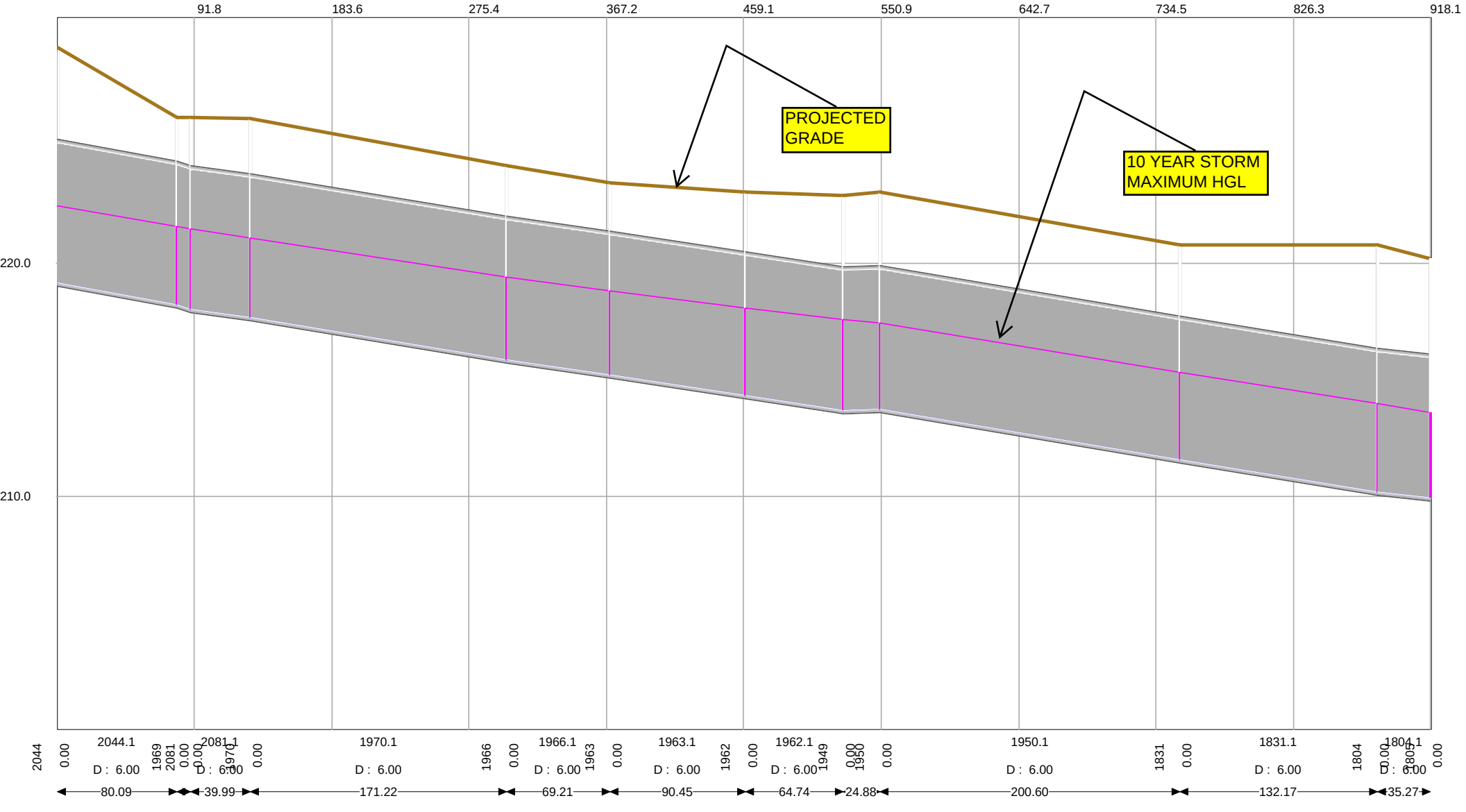

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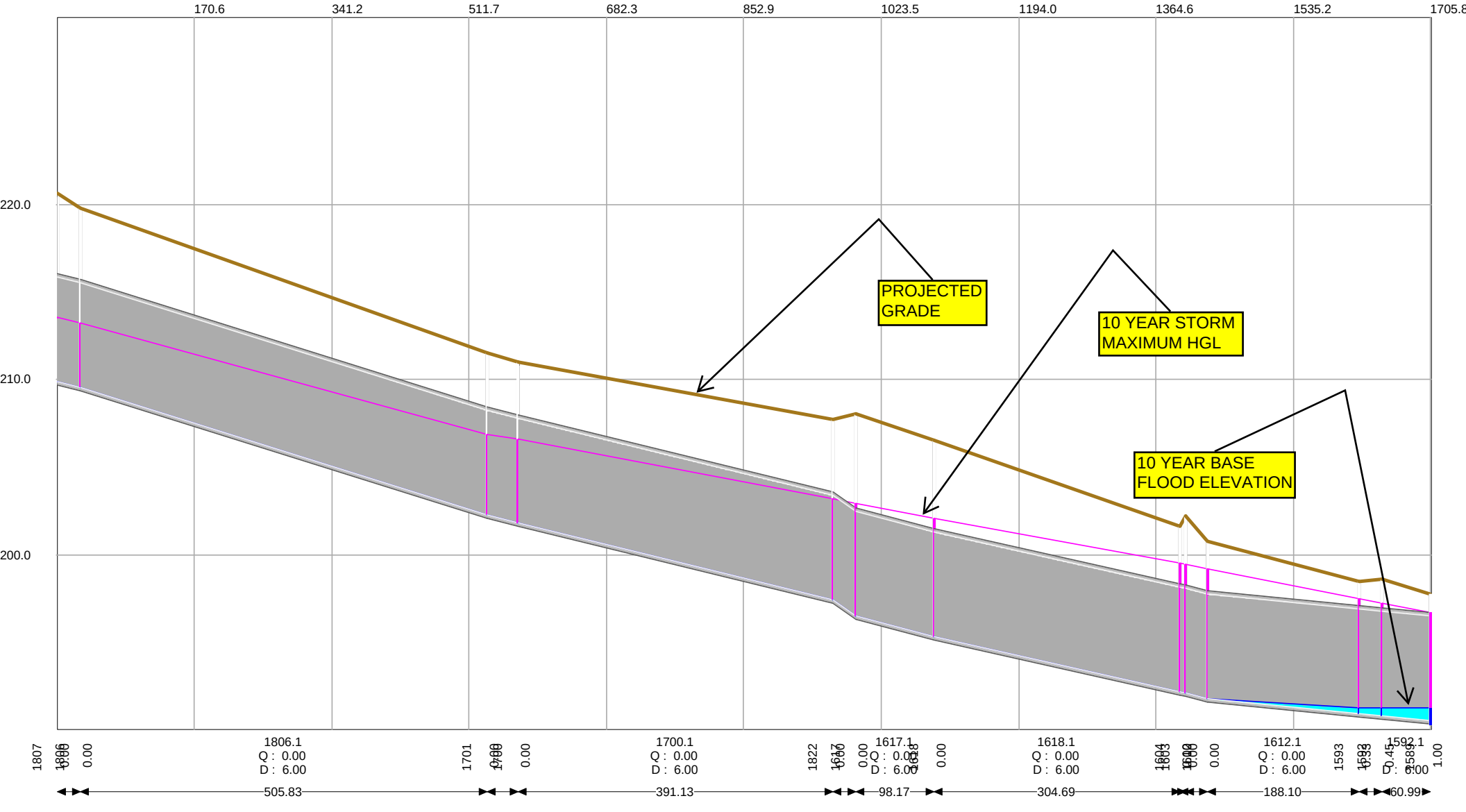

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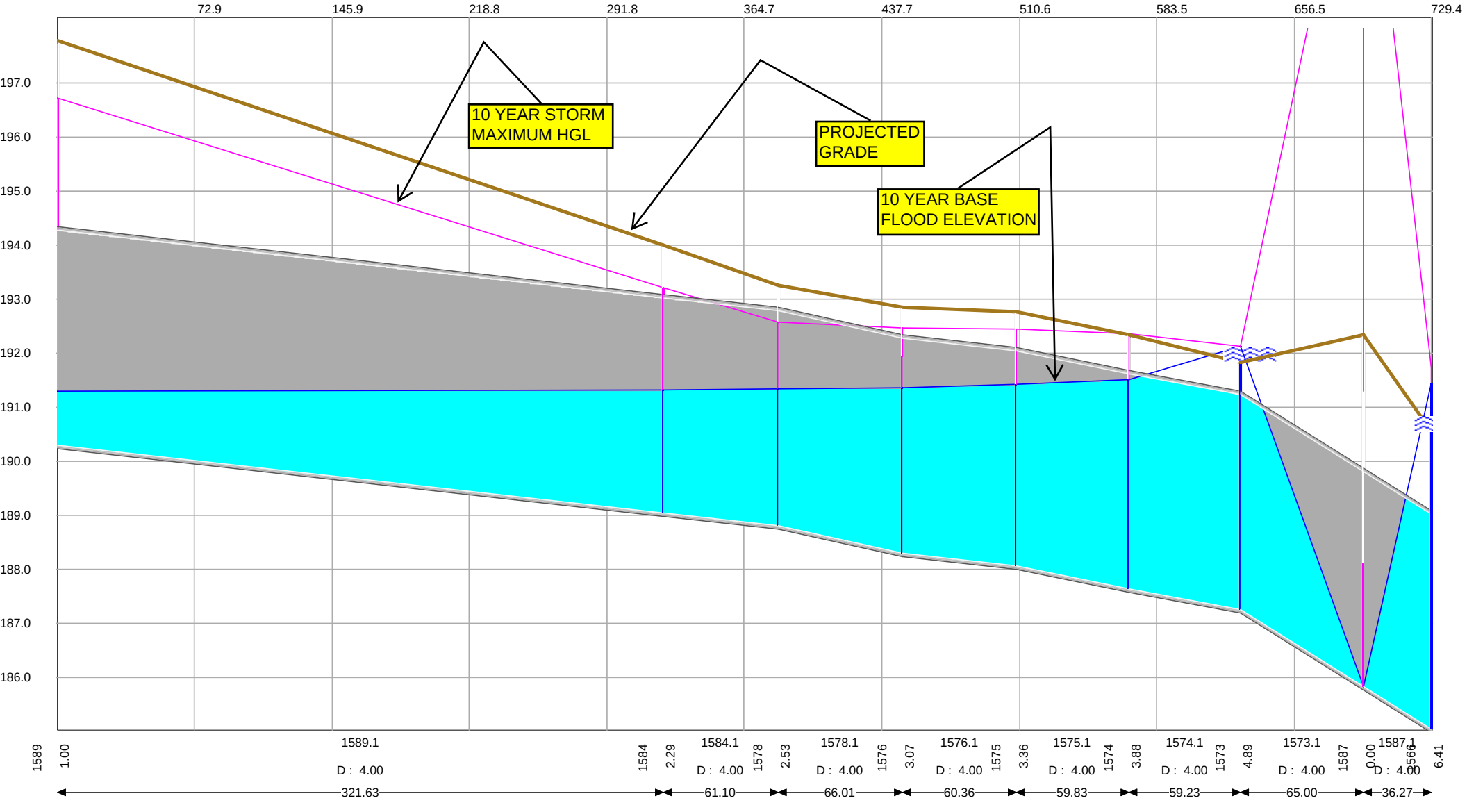

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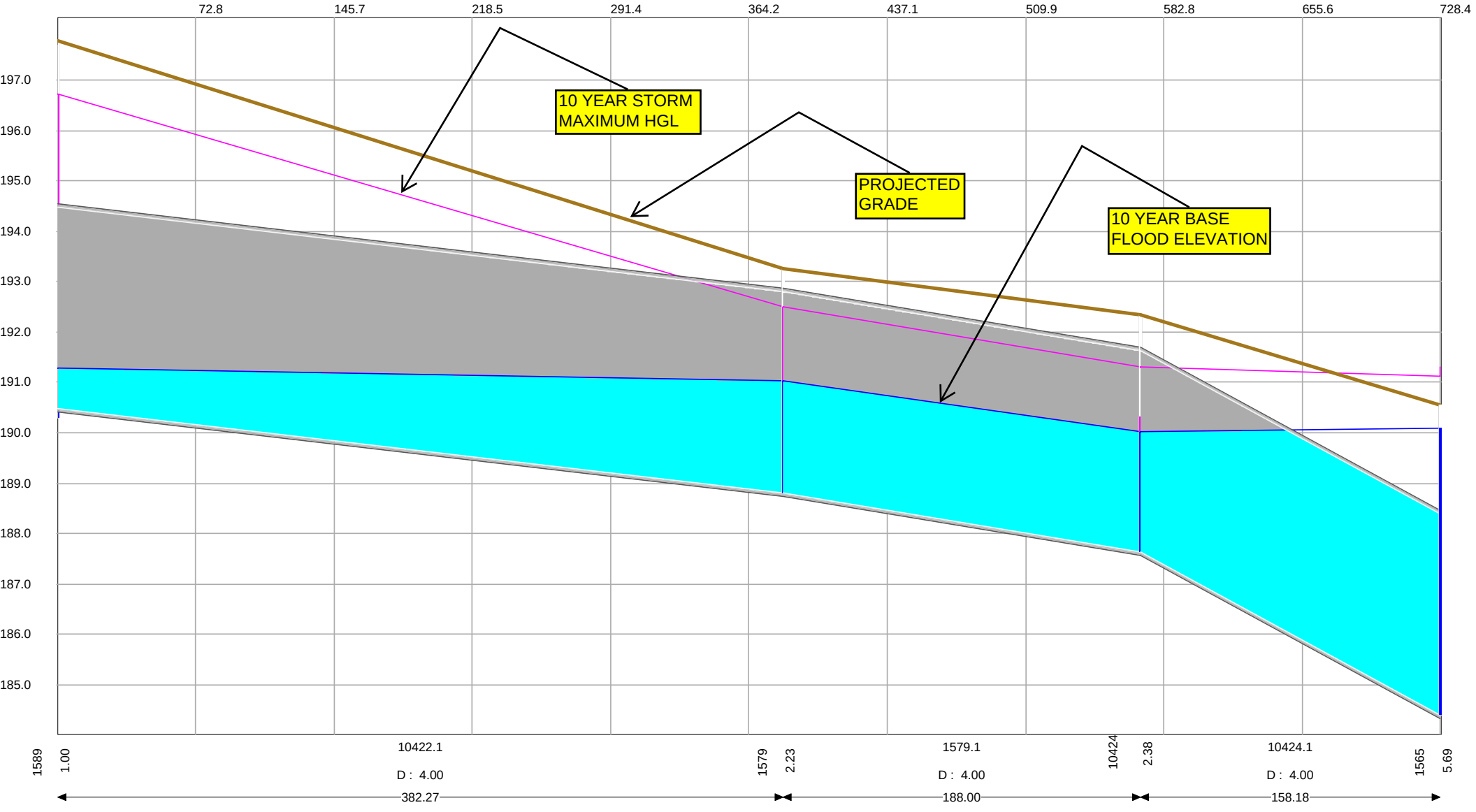

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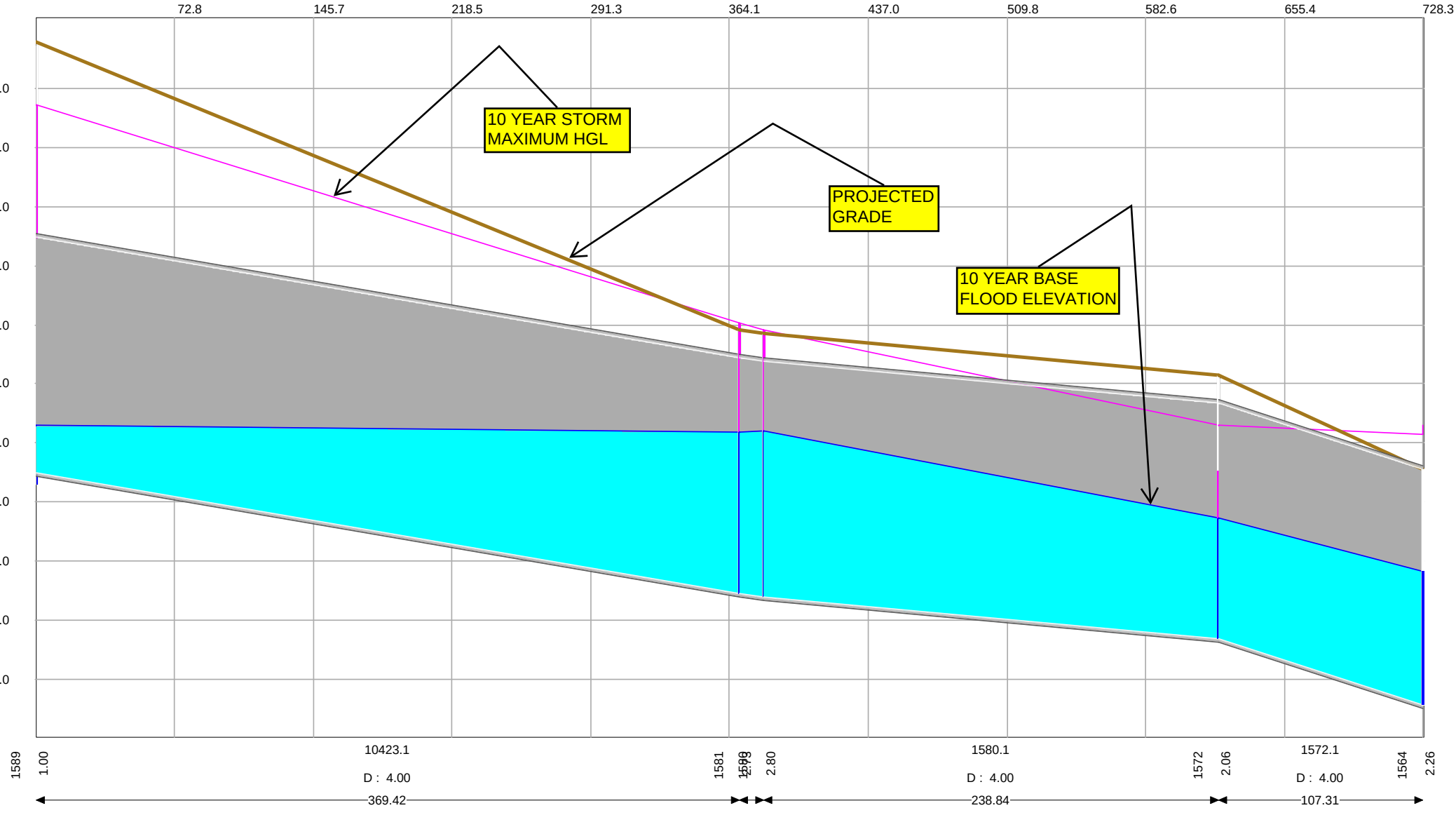


ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
10123.1	2 yr 24 hr	10123	314.35	309.22	311.22	310.87	2	1	465.34	0.77	10116	313.8	305.65	307.65	307.26	asmd up	12.53	12.6	18.4	18.49	6.69
10116.1	2 yr 24 hr	10116	313.8	305.5	307.5	307.26	2	1	26.4	-0.08	10114	313.32	305.52	307.52	307.07		12.53	12.53	5.78	18.48	6.38
10114.1	2 yr 24 hr	10114	313.32	305.42	307.42	306.94	2	1	133.69	0.91	10113	312.91	304.21	306.21	305.73		12.55	12.57	19.98	18.48	7.22
10113.1	2 yr 24 hr	10113	312.91	303.51	306.01	305.41	2.5	1	656.26	1.57	10276	301.71	293.21	295.71	300.02		12.48	12.22	47.72	32.33	8.65
10276.1	2 yr 24 hr	10276	301.71	293.21	295.71	300.02	2.5	1	66.54	1.52	10427	300	292.2	294.7	299.62	asmd dn	12.48	13.45	46.92	32.32	7.15
10427.1	2 yr 24 hr	10427	300	292.2	294.7	299.62	2.5	1	24.78	1.29	10273	299.48	291.88	294.38	299.48	asmd up	12.48	12.48	43.28	32.31	6.5
10391.1	2 yr 24 hr	10391	299.93	293.4	295.4	300.32	2	1	248.58	0.09	10274	298.83	293.18	295.18	299.52	asmd up	12.65	12.65	6.25	12.11	3.8
10274.1	2 yr 24 hr	10274	298.83	293.13	295.13	299.52	2	1	13.93	3.23	10273	299.48	292.68	294.68	299.48		12.92	13.45	37.76	18.88	8.27
10273.1	2 yr 24 hr	10273	299.48	291.83	294.33	299.48	2.5	1	302.97	0.73	10271	294.52	289.62	292.12	295.95		12.58	12.58	32.53	42.68	8.59
10271.1	2 yr 24 hr	10271	294.52	289.57	292.07	295.95	2.5	1	44.38	0.41	10272	294.69	289.39	291.89	295.55		12.83	12.83	24.26	37.28	7.52
10272.1	2 yr 24 hr	10272	294.69	289.34	291.84	295.55	2.5	1	109.69	0.8	10278	295.06	288.46	290.96	294.44		12.97	12.97	34.11	38.59	7.79
10278.1	2 yr 24 hr	10278	295.06	288.36	290.86	294.44	2.5	1	285.43	0.55	10281	297.7	286.8	289.3	291.71		12.97	12.97	28.16	38.59	7.79
10281.1	2 yr 24 hr	10281	297.7	286.6	289.1	291.71	2.5	1	191.54	0.41	10282	295.62	285.82	288.32	290.16		12.97	12.97	24.31	38.59	7.81
10282.1	2 yr 24 hr	10282	295.62	285.77	288.27	290.16	2.5	1	446.77	0.66	10298	293.88	282.8	285.3	286.63	asmd dn	12.97	12.98	31.05	38.59	7.86
10294.1	2 yr 24 hr	10294	295.52	289.22	290.52	295.75	1.3	1	484.11	0.35	10299	294.54	287.54	288.84	288.67		12.27	12.27	3.92	8.29	6.15
10299.1	2 yr 24 hr	10299	294.54	287.49	288.99	287.98	1.5	1	16.83	27.87	10298	293.88	282.8	284.3	286.63	asmd dn	12.27	12.23	51.49	8.29	15.73
10298.1	2 yr 24 hr	10298	293.88	282.8	285.3	286.63	2.5	1	47.48	0.51	10296	293.92	282.56	285.06	286.05	asmd up	12.43	12.4	27.08	44.81	8.94
10296.1	2 yr 24 hr	10296	293.92	282.52	285.02	286.05	2.5	1	169.66	2.31	10421	284	278.6	281.1	282.31	asmd dn	12.42	12.5	57.89	58.56	13.37
10421.1	2 yr 24 hr	10421	284	278.6	281.1	282.31	2.5	1	333.75	2.31	5719	277.78	270.88	273.38	275.11	asmd up	12.42	12.57	57.93	59.22	13.1
5715.1	2 yr 24 hr	5715	287.43	281.83	283.33	283.39	1.5	1	31.1	0.51	5716	287.27	281.67	283.17	282.97		12.12	12.12	7	11.67	6.54
5716.1	2 yr 24 hr	5716	287.27	279.02	280.52	282.42	1.5	1	30.3	2.61	5717	286.93	278.23	279.73	281.99		12.13	12.23	15.75	11.68	8.93
5717.1	2 yr 24 hr	5717	286.93	278.03	279.33	281.99	1.3	1	210.6	2.16	5720	277.38	273.48	274.78	275.28		12.13	12.13	9.79	11.71	9.05
5720.1	2 yr 24 hr	5720	277.38	273.48	274.98	275.28	1.5	1	22.23	5.85	5719	277.78	272.18	273.68	275.11		12.13	12.08	23.59	11.65	12.8
5726.1	2 yr 24 hr	5726	281.91	274.01	275.51	281.43	1.5	1	167.53	1.09	5719	277.78	272.18	273.68	275.11		12.22	12.22	10.19	19.47	10.77
5719.1	2 yr 24 hr	5719	277.78	270.78	273.78	275.11	3	1	195.26	1.63	5708	274.63	267.6	270.6	271.41	asmd dn	12.22	12.12	79.04	87.54	12.64
5708.1	2 yr 24 hr	5708	274.63	267.5	271.5	271.41	4	1	176.36	1.42	5702	272.6	265	269	270.84	asmd up	12.22	12.1	158.81	87.37	12.19
5702.1	2 yr 24 hr	5702	272.6	264.9	268.9	270.84	4	1	93.87	2.02	5688	268.71	263	267	270.53	asmd dn	12.22	12.07	189.76	87.31	11.91
5688.1	2 yr 24 hr	5688	268.71	263	267	270.53	4	1	124.32	0.77	5612	270.14	262.04	266.04	270.15	asmd up	12.22	12.07	117.21	87.29	8.64
5612.1	2 yr 24 hr	5612	270.14	261.99	265.99	270.15	4	1	41.68	0.48	5611	269.89	261.79	265.79	270.04		12.22	12.05	92.4	87.26	7.66
5611.1	2 yr 24 hr	5611	269.89	261.74	264.74	270.04	3	1	11.82	2.2	5610	268.68	261.48	264.48	269.9		12.22	12.22	91.86	87.24	12.22
5610.1	2 yr 24 hr	5610	268.68	261.38	264.38	269.9	3	1	18.31	1.04	5609	268.24	261.19	264.19	269.69		12.13	12.13	63.09	77.39	10.85
5606.1	2 yr 24 hr	5606	274.58	267.48	268.98	270.41	1.5	1	192.25	3.01	5609	268.24	261.69	263.19	269.69		12.23	12.07	16.93	7.8	6.78
5646.1	2 yr 24 hr	5646	276.45	267.95	269.45	277.36	1.5	1	50.05	1.08	5645	275.16	267.41	268.91	276.14		12.6	12.6	10.13	17.12	9.38
5645.1	2 yr 24 hr	5645	275.16	267.36	268.86	276.14	1.5	1	383.02	1.44	5609	268.24	261.84	263.34	269.69		13.2	13.22	11.71	18.18	10
5609.1	2 yr 24 hr	5609	268.24	261.14	264.14	269.69	3	1	418.33	1.45	5547	261.76	255.06	258.06	261.81		12.12	12.12	74.67	90.6	12.68
5541.1	2 yr 24 hr	5541	270.84	266.14	267.64	268.95	1.5	1	312.88	3.22	5547	261.76	256.06	257.56	261.81		12.37	12.12	17.51	15.02	8.51
5575.1	2 yr 24 hr	5575	265.61	261.11	262.61	265.85	1.5	1	218.42	1.99	5547	261.76	256.76	258.26	261.81		12.27	12.27	13.77	13.77	7.7
5547.1	2 yr 24 hr	5547	261.76	254.96	258.46	261.81	3.5	1	6.12	-0.65	5546	261.1	255	258.5	261.73		12.27	12.08	75.53	117.91	13.61
5546.1	2 yr 24 hr	5546	261.1	255	258.5	261.73	3.5	1	225.24	1.85	5502	257.33	250.83	254.33	258.65		12.18	12.07	127.12	113.12	14.03
5502.1	2 yr 24 hr	5502	257.33	250.83	254.33	258.65	3.5	1	51.38	2.16	5929	257.22	249.72	253.22	257.97		12.95	13.23	137.32	110.13	12.42
5929.1	2 yr 24 hr	5929	257.22	249.72	253.22	257.97	3.5	1	127.69	0.92	5492	256.54	248.54	252.04	256.39		13.13	13.13	89.81	115.32	11.9
5512.1	2 yr 24 hr	5512	260.07	252.97	254.27	260.38	1.3	1	306.37	1.35	5492	256.54	248.84	250.14	256.39		12.13	12.13	7.73	8.38	6.14
5478.1	2 yr 24 hr	5478	264.05	251.95	253.45	258.98	1.5	1	254.81	0.71	5492	256.54	250.14	251.64	256.39		12.42	12.42	8.22	10.19	5.64
5492.1	2 yr 24 hr	5492	256.54	248.44	251.94	256.39	3.5	1	33.07	2.84	5909	256.2	247.5	251	255.84	asmd dn	12.62	12.05	157.51	121.66	13.94
5909.1	2 yr 24 hr	5909	256.2	247.5	251	255.84	3.5	1	59.49	0.84	5907	255.6	247	250.5	254.85	asmd dn&	12.62	12.95	85.65	121.66	12.55
5907.1	2 yr 24 hr	5907	255.6	247	250.5	254.85	3.5	1	256.26	1.55	5900	250.83	243.03	246.53	250.59	asmd up	12.62	12.07	116.28	121.66	13.36
5900.1	2 yr 24 hr	5900	250.83	242.73	246.23	250.59	3.5	1	108.2	1.78	5382	248.9	240.8	244.3	248.8		12.92	12.92	124.77	121.93	12.59
5376.1	2 yr 24 hr	5376	254.37	249.37	251.37	250.49	2	1	326.89	2.01	5382	248.9	242.8	244.8	248.8		12.18	12.1	29.78	11.06	7.07
5397.1	2 yr 24 hr	5397	249.86	243.66	245.16	250.69	1.5	1	197.44	0.89	5382	248.9	241.9	243.4	248.8		13.28	13.28	9.21	18.44	10.2

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5382.1	2 yr 24 hr	5382	248.9	240.7	244.7	248.8	4	1	107.72	0.58	5930	247.38	240.08	244.08	247.73		12.13	12.13	101.19	138.23	10.93
5930.1	2 yr 24 hr	5930	247.38	239.98	243.98	247.73	4	1	338.1	0.6	5306	245.34	237.94	241.94	244.4		12.13	12.13	103.61	137.58	10.89
5342.1	2 yr 24 hr	5342	258.42	252.42	253.92	253.43	1.5	1	405.29	3.47	5306	245.34	238.34	239.84	244.4		12.68	12.73	18.18	12.01	9.14
5304.1	2 yr 24 hr	5304	248.41	238.61	240.11	244.51	1.5	1	135.17	0.31	5305	245.39	238.19	239.69	244.4		12.15	12.15	5.44	4.41	2.45
5305.1	2 yr 24 hr	5305	245.39	238.09	239.59	244.4	1.5	1	22.39	0.67	5306	245.34	237.94	239.44	244.4		12.15	12.15	7.98	4.43	2.46
5306.1	2 yr 24 hr	5306	245.34	237.89	241.89	244.4	4	1	483.83	0.9	5897	239.69	233.52	237.52	238.62	asmd dn	12.63	12.63	126.76	149.41	11.8
5897.1	2 yr 24 hr	5897	239.69	233.52	237.52	238.62	4	1	17.38	0.86	5265	239.87	233.37	237.37	238.42	asmd up	12.62	12.42	123.91	149.42	11.68
5265.1	2 yr 24 hr	5265	239.87	233.17	237.17	238.42	4	1	12.9	0.78	5896	239.46	233.07	237.07	238.26	asmd dn	12.63	12.52	117.44	149.44	11.83
5896.1	2 yr 24 hr	5896	239.46	233.07	237.07	238.26	4	1	16.95	0.71	10432	239.65	232.95	236.95	238.06	asmd dn&	12.63	12.47	112.23	149.43	11.76
10432.1	2 yr 24 hr	10432	239.65	232.95	236.95	238.06	4	1	4.44	0.68	10433	239.14	232.92	236.92	238.01	asmd dn&	12.63	12.43	109.64	149.44	11.7
10433.1	2 yr 24 hr	10433	239.14	232.92	236.92	238.01	4	1	6.62	0.76	10434	239.02	232.87	236.87	237.93	asmd dn&	12.63	12.42	115.92	149.43	11.67
10434.1	2 yr 24 hr	10434	239.02	232.87	236.87	237.93	4	1	39.12	0.74	5898	238.49	232.58	236.58	237.48	asmd dn&	12.65	12.38	114.84	149.44	11.61
5898.1	2 yr 24 hr	5898	238.49	232.58	236.58	237.48	4	1	217.89	0.73	2358	237.13	230.98	234.98	234.97	asmd dn&	12.75	13.2	114.3	149.51	11.55
2358.1	2 yr 24 hr	2358	237.13	230.98	234.98	234.97	4	1	22.36	0.72	2072	237.02	230.82	234.82	234.71	asmd up	12.75	13.17	112.83	149.94	12.98
2039.1	2 yr 24 hr	2039	240.77	237.23	238.73	240.83	1.5	1	82.46	2.7	2042	239.83	235	236.5	238.06	asmd dn	12.7	12.7	16.04	18.16	10.19
2042.1	2 yr 24 hr	2042	239.83	235	236.5	238.06	1.5	1	103.85	2.92	2072	237.02	231.97	233.47	234.71	asmd up	12.7	12.7	16.66	18.16	10.22
2072.1	2 yr 24 hr	2072	237.02	230.82	234.82	234.71	4	1	41.82	1.72	5919	237.24	230.1	234.1	234.01	asmd dn&	12.3	12.48	175.01	180.18	14.58
5919.1	2 yr 24 hr	5919	237.24	230.1	234.1	234.01	4	1	96.54	0.84	1993	237.29	229.29	233.29	232.32	asmd dn&	12.3	12.47	122.18	180.17	14.73
1993.1	2 yr 24 hr	1993	237.29	229.29	233.29	232.32	4	1	63.92	2.33	1994	235.8	227.8	231.8	230.96		12.3	12.32	203.65	180.17	17.57
1994.1	2 yr 24 hr	1994	235.8	227.8	231.8	230.96	4	1	87.32	1.47	1998	232.52	226.52	230.52	228.3		12.3	12.32	161.49	180.17	17.8
1998.1	2 yr 24 hr	1998	232.52	226.52	230.52	228.3	4	1	9.62	10.91	1999	232.77	225.47	229.47	227.25		12.3	12.32	440.66	180.16	33.3
1999.1	2 yr 24 hr	1999	232.77	220.57	226.57	223.36	6	1	98.24	1.46	2044	229.24	219.14	225.14	222.07		12.33	12.35	474.46	199.42	15.41
2044.1	2 yr 24 hr	2044	229.24	219.14	225.14	222.07	6	1	80.09	1.17	1969	226.22	218.2	224.2	221.19	asmd dn	12.33	12.38	426.04	199.45	14.48
1969.1	2 yr 24 hr	1969	226.22	218.2	224.2	221.19	6	1	9.5	2.11	2081	226.22	218	224	221.09	asmd dn&	12.33	12.38	570.6	199.44	14.11
2081.1	2 yr 24 hr	2081	226.22	218	224	221.09	6	1	39.99	0.75	1970	226.2	217.7	223.7	220.71	asmd dn&	12.35	12.38	340.61	199.44	13.62
1970.1	2 yr 24 hr	1970	226.2	217.7	223.7	220.71	6	1	171.22	1.07	1966	224.16	215.86	221.86	218.98	asmd up	12.35	12.4	407.67	199.42	14
1966.1	2 yr 24 hr	1966	224.16	215.86	221.86	218.98	6	1	69.21	0.94	1963	223.41	215.21	221.21	218.37		12.35	12.43	381.11	199.47	13.42
1963.1	2 yr 24 hr	1963	223.41	215.21	221.21	218.37	6	1	90.45	0.96	1962	223.04	214.34	220.34	217.59		12.35	12.48	385.68	199.52	13.26
1962.1	2 yr 24 hr	1962	223.04	214.34	220.34	217.59	6	1	64.74	0.97	1949	222.91	213.71	219.71	217.11		12.35	12.48	387.94	199.58	12.86
1949.1	2 yr 24 hr	1949	222.91	213.71	219.71	217.11	6	1	24.88	-0.16	1950	223.05	213.75	219.75	216.94		12.35	12.5	157.68	199.61	12.52
1950.1	2 yr 24 hr	1950	223.05	213.75	219.75	216.94	6	1	200.6	1.07	1831	220.8	211.6	217.6	214.81		12.3	12.3	407.13	218.42	14.59
1831.1	2 yr 24 hr	1831	220.8	211.6	217.6	214.81	6	1	132.17	1.07	1804	220.79	210.19	216.19	213.42		12.3	12.3	406.18	218.48	14.47
1804.1	2 yr 24 hr	1804	220.79	210.19	216.19	213.42	6	1	35.27	0.6	1805	220.18	209.98	215.98	213.04		12.3	12.18	303.45	218.51	14.39
1809.1	2 yr 24 hr	1809	238.64	230.3	232.8	231.27	2.5	1	149.27	1.22	1808	233.58	228.48	230.98	229.45	asmd up	12.67	12.67	42.06	13.39	7.61
1808.1	2 yr 24 hr	1808	233.58	225.38	227.38	225.91	2	1	251.67	4.85	1805	220.18	213.18	215.18	213.71		12.67	12.67	46.25	7	10.6
1808.2	2 yr 24 hr	1808	233.58	225.38	227.88	225.91	2.5	1	251.75	2.99	1807	220.66	217.86	220.36	218.38	asmd dn	12.67	12.67	65.83	6.39	8.48
1805.1	2 yr 24 hr	1805	220.18	209.98	215.98	213.04	6	1	4.66	1.07	1807	220.66	209.93	215.93	212.98	asmd dn	12.32	12.35	407.35	222.05	15.51
1807.1	2 yr 24 hr	1807	220.66	209.93	215.93	212.98	6	1	28.92	1.21	1806	219.78	209.58	215.58	212.65	asmd up	12.33	12.43	432.63	225.55	15.89
1806.1	2 yr 24 hr	1806	219.78	209.58	215.58	212.65	6	1	505.83	1.45	1701	211.57	202.27	208.27	205.65		12.3	12.3	472.75	235.57	16.37
1701.1	2 yr 24 hr	1701	211.57	202.27	208.27	205.65	6	1	37.25	1.23	1700	211.01	201.81	207.81	205.3		12.3	12.2	437.01	235.43	14.47
1700.1	2 yr 24 hr	1700	211.01	201.81	207.81	205.3	6	1	391.13	1.12	1822	207.72	197.42	203.42	200.59		12.32	12.32	416.63	261.13	15.53
1822.1	2 yr 24 hr	1822	207.72	197.42	203.42	200.59	6	1	28.28	3.11	1617	208.04	196.54	202.54	200.19		12.32	12.53	693.71	261.26	17.17
1617.1	2 yr 24 hr	1617	208.04	196.54	202.54	200.19	6	1	98.17	1.22	1618	206.54	195.34	201.34	199.21		12.32	12.33	434.79	270.82	14.96
1618.1	2 yr 24 hr	1618	206.54	195.34	201.34	199.21	6	1	304.69	1.03	1604	201.65	192.19	198.19	196.75		12.32	12.33	399.86	270.9	13.79
1604.1	2 yr 24 hr	1604	201.65	192.19	198.19	196.75	6	1	6.48	1.08	1603	202.2	192.12	198.12	196.72	asmd dn	12.32	12.33	408.73	270.86	11.78
1603.1	2 yr 24 hr	1603	202.2	192.12	198.12	196.72	6	1	28.01	1.21	1612	200.79	191.78	197.78	196.63	asmd up	12.32	12.33	433.27	270.85	11.63
1612.1	2 yr 24 hr	1612	200.79	191.78	197.78	196.63	6	1	188.1	0.43	1593	198.52	190.97	196.97	195.61	asmd dn	12.32	12.33	258.06	270.81	11.18
1593.1	2 yr 24 hr	1593	198.52	190.97	196.97	195.61	6	1	27.91	0.43	1592	198.64	190.85	196.85	195.45	asmd dn&	12.32	12.33	257.86	270.77	11.57
1592.1	2 yr 24 hr	1592	198.64	190.85	196.85	195.45	6	1	60.99	0.43	1589	197.79	190.59	196.59	195.1	asmd up	12.33	12.33	256.76	270.82	11.68

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
1589.1	2 yr 24 hr	1589	197.79	190.29	194.29	193.79	4	1	321.63	0.39	1584	194	189.03	193.03	192.02	asmd dn	12.33	12.35	83.48	96.5	8.4
1584.1	2 yr 24 hr	1584	194	189.03	193.03	192.02	4	1	61.1	0.38	1578	193.26	188.8	192.8	191.61	asmd up	12.35	12.35	81.84	96.5	9.65
1578.1	2 yr 24 hr	1578	193.26	188.8	192.8	191.61	4	1	66.01	0.76	1576	192.85	188.3	192.3	191.12		12.35	12.35	116.09	96.52	10.23
1576.1	2 yr 24 hr	1576	192.85	188.3	192.3	191.12	4	1	60.36	0.4	1575	192.76	188.06	192.06	190.65		12.35	12.35	84.11	96.54	10.28
1575.1	2 yr 24 hr	1575	192.76	188.06	192.06	190.65	4	1	59.83	0.7	1574	192.34	187.64	191.64	190.05		12.35	12.35	111.75	96.56	11.33
1574.1	2 yr 24 hr	1574	192.34	187.64	191.64	190.05	4	1	59.23	0.68	1573	191.84	187.24	191.24	189.22		12.35	12.35	109.61	96.57	12.49
1573.1	2 yr 24 hr	1573	191.84	187.24	191.24	189.22	4	1	65	2.18	1587	192.34	185.82	189.82	187.7	asmd dn	12.35	12.35	197.15	96.57	15.74
1587.1	2 yr 24 hr	1587	192.34	185.82	189.82	187.7	4	1	36.27	2.15	1566	190.56	185.04	189.04	186.13	asmd up	12.35	12.35	195.6	96.57	17.6
1566.1	2 yr 24 hr	1566	190.56	185.04	189.04	186.13	4	1	13.64	26.69	10439	189.44	181.4	185.4	184.68	Ditch	12.35	12.43	689.04	96.57	27.15
10422.1	2 yr 24 hr	1589	197.79	190.49	194.49	193.79	4	1	382.27	0.44	1579	193.27	188.81	192.81	191.55		12.33	12.35	88.42	93.8	8.62
1579.1	2 yr 24 hr	1579	193.27	188.81	192.81	191.55	4	1	188	0.62	10424	192.34	187.64	191.64	189.76	asmd dn	12.35	12.35	105.22	93.83	10.52
10424.1	2 yr 24 hr	10424	192.34	187.64	191.64	189.76	4	1	158.18	2.04	1565	190.56	184.41	188.41	185.75	asmd up	12.35	12.35	190.6	93.83	14.53
1565.1	2 yr 24 hr	1565	190.56	184.41	188.41	185.75	4	1	12.68	23.74	10439	189.44	181.4	185.4	184.68	Ditch	12.23	12.23	649.87	117.48	26.57
10423.1	2 yr 24 hr	1589	197.79	190.49	194.49	193.79	4	1	369.42	0.55	1581	192.91	188.45	192.45	191.79		12.33	12.35	99.12	98.95	8.92
1581.1	2 yr 24 hr	1581	192.91	188.45	192.45	191.79	4	1	12.7	0.39	1580	192.86	188.4	192.4	191.71		12.35	12.35	83.69	98.92	8.84
1580.1	2 yr 24 hr	1580	192.86	188.4	192.4	191.71	4	1	238.84	0.3	1572	192.14	187.68	191.68	190.07		12.35	12.35	73.23	98.97	9.17
1572.1	2 yr 24 hr	1572	192.14	187.68	191.68	190.07	4	1	107.31	1.04	1564	190.56	186.56	190.56	187.51		12.35	12.35	136.27	98.99	13.6
1564.1	2 yr 24 hr	1564	190.56	186.56	190.56	187.51	4	1	14.52	35.54	10439	189.44	181.4	185.4	184.68	Ditch	12.35	12.35	795.14	98.99	31.32
10439.1	2 yr 24 hr	10439	189.44	181.4	189.4	184.68	8	1	301.81	1.83	10440	185.26	175.89	183.89	179.16	Ditch	12.32	12.32	2107.93	308.76	8.65

All Pipes are Circular and have a Roughness of 0.014.

SECTION 3D

EAST BRANCH
SOUTH OF ROSEWOOD
EVALUATIONS

East Branch Watershed (South of Rosewood Drive Evaluations)

As outlined previously the majority of the surcharge and ponding identified in the **east branch watershed** occurs north of Rosewood Drive. When problems associated with surcharge and/or ponding within the system north of Rosewood Drive are addressed it is anticipated that the system south of Rosewood Drive may be negatively impacted. In order to forecast the impact of north of Rosewood Drive remedies on the system south of Rosewood Drive, several alternate scenarios have been modeled.

In the first alternate scenario (**Alternate E1**) the watershed area north of Rosewood Drive was modeled as a single watershed with an approximate area of 300 acres. This 300 acre area encompasses the area represented by twenty-eight (28) subwatersheds from the **original model**, along with a weighted curve number (CN = 78) and a weighted overland slope (1.79%). The hydraulic length (8,900') for the single 300 acre watershed was determined by measuring the flow path from the most remote point in the 300 acre watershed to a point along the conveyance system near Rosewood Drive. Peak runoff rates (2-year & 10-year, 24-hour) to that point on the conveyance system near Rosewood Drive were compared for both models (**original model vs Alternate E1**) and the peak runoff rate for the 2-year, 24-hour rainfall event was found to be significantly less for the single 300 acre watershed (199 CFS **original model** vs. 122 CFS for the single 300 acre watershed **Alternate E1**). The peak runoff rate for the 10-year, 24-hour rainfall event was found to be only slightly less for the single 300 acre watershed (240 CFS **original model** vs. 241 CFS for the single 300 acre watershed **Alternate E1**). While these peak runoff rates do not negatively impact the system south of Rosewood Drive it appears that this representation of the single 300 acre watershed (**Alternate E1**) is not an accurate representation of the remedied system north of Rosewood Drive due to the reduced peak runoff rate for the 2-year, 24-hour rainfall event.

A second alternate approach (**Alternate E2**) to characterizing the single 300 acre watershed north of Rosewood Drive was taken in an effort to better represent the time to peak to a common point along Rosewood Drive following anticipated system remedies north of Rosewood Drive. In the **original model** the time to peak to a common point along Rosewood Drive (Node 1999) was on the order of twelve (12) hours. In the model for the single 300 acre watershed north of Rosewood Drive (**Alternate E1**) the time to peak to this common point along Rosewood Drive (Node 1999) was on the order of fourteen (14) hours, thus resulting in the reduced peak rate described above. Therefore the hydraulic length for the 300 acre watershed north of Rosewood Drive was modified (shortened) such that the time to peak to the common point along Rosewood Drive (Node 1999) nearly matches the twelve (12) hour time to peak from the original model. With that modification applied the resultant model (**Alternate E2**) indicates peak runoff rates (2-year & 10-year, 24-hour) to the common point on the conveyance system near Rosewood Drive (Node 1999) on the order of 380 CFS and 740 CFS, respectively. These peak runoff rates do negatively impact the system south of Rosewood Drive. Specifically the model for **Alternate E2** indicates additional surcharge and ponding along portions of the system south of Rosewood Drive for the 2-year and 10-year, 24-hour rainfall events. These areas of surcharge and ponding are in addition to those identified by the **original model**.

A third alternate approach (**Alternate E3**) to characterizing the single 300 acre watershed north of Rosewood Drive was taken in an effort to better represent the peak runoff rates anticipated following system remedies north of Rosewood Drive. In the **original model** the peak runoff rate for the 2-year, 24-hour rainfall event was approximately 200 CFS and the peak runoff rate for the 10-year, 24-hour rainfall event was approximately 240 CFS (to the

point along the conveyance system near Rosewood Drive @ Node 1999). The hydraulic length for the 300 acre watershed north of Rosewood Drive was again modified (shortened) such that the peak runoff rate for the 2-year, 24-hour rainfall event nearly matches 200 CFS as in the **original model** (to the point along the conveyance system near Rosewood Drive @ Node 1999). This modification also produces a peak runoff rate of approximately 370 CFS for the 10-year, 24-hour rainfall event, which represents an increase of approximately 50% over the 10-year, 24-hour peak from the original model to the common point along Rosewood Drive. The increased peak runoff rate for the 10-year, 24-hour event does negatively impact the system south of Rosewood Drive but to a lesser degree than associated with **Alternate E2** (matching the time to peak). Specifically the model for **Alternate E3** indicates additional surcharge and ponding along portions of the system south of Rosewood Drive but only for the 10-year, 24-hour rainfall event. These areas of surcharge and ponding are in addition to those identified by the **original model**.

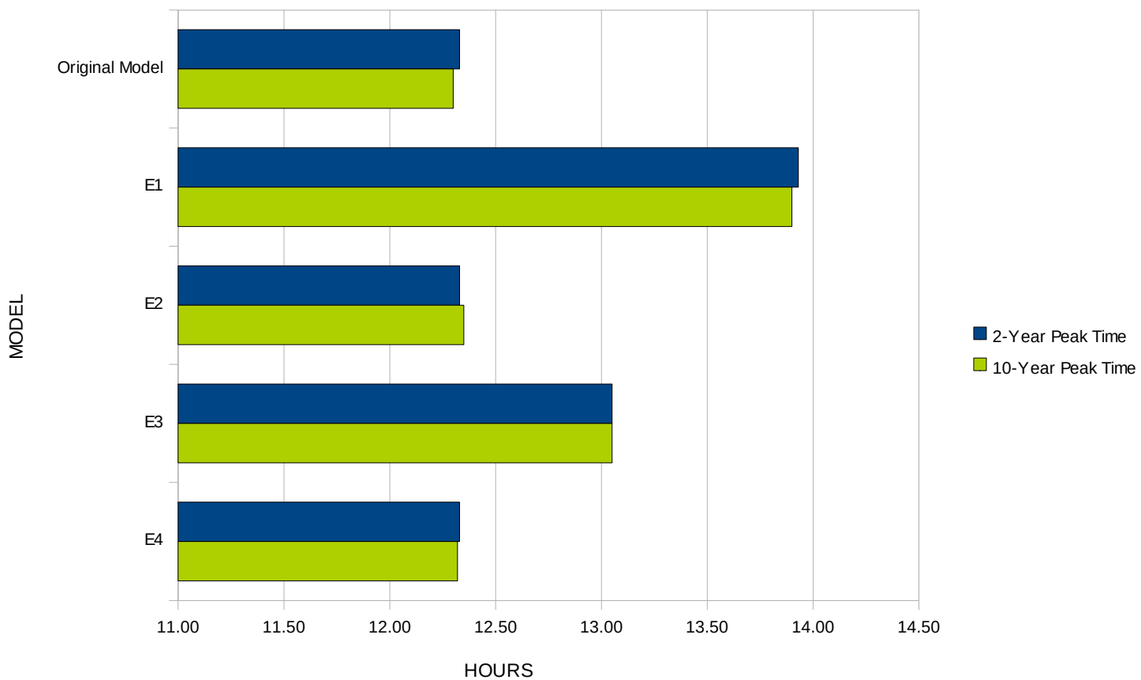
A fourth alternate approach (**Alternate E4**) to characterizing the single 300 acre watershed north of Rosewood Drive was taken in an effort to model the in-place upgrade of the underperforming trunk line north of Rosewood Drive. Diameters of existing pipes along the trunk line north of Rosewood Drive were systematically upsized until such time that ponding was eliminated along the portion of the trunk line north of Rosewood Drive. The upsizing of the portion of the trunk line north of Rosewood Drive results in significant impacts on the system south of Rosewood Drive. Increased ponding in portions of the system south of Rosewood Drive is evident and is shown in more detail in the following spreadsheet and graphically by the profiles following the spreadsheet.

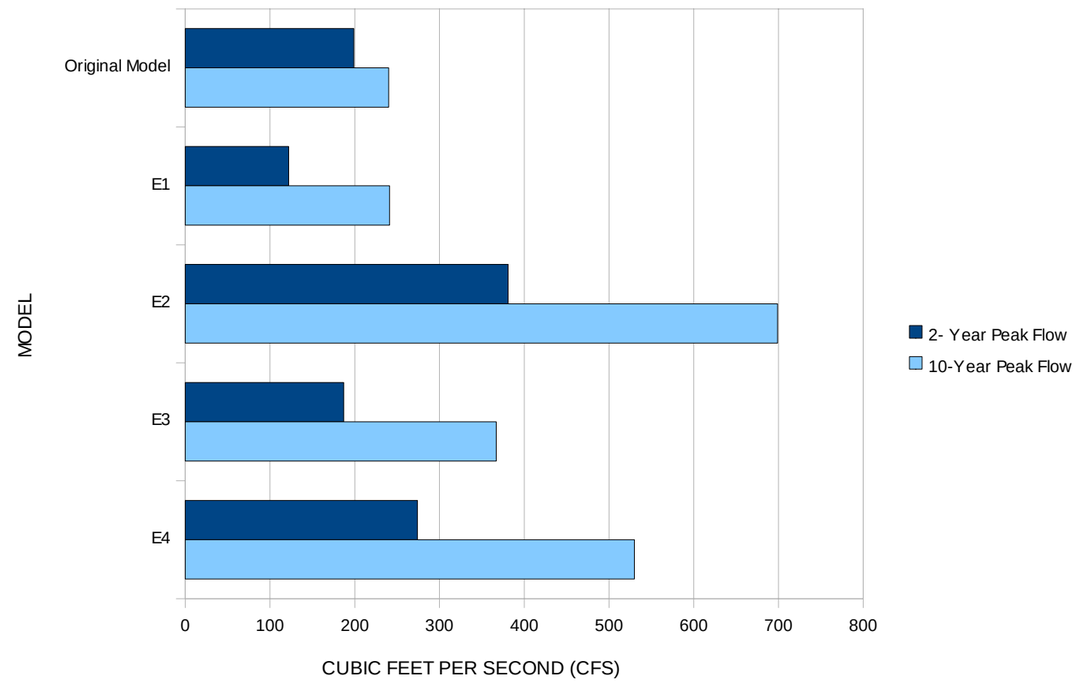
The common denominator to all of the alternate analyses for the **east branch watershed** is that improvements to the system north of Rosewood Drive must consider impacts upon the system downstream of Rosewood Drive. Efforts to lengthen time to peak must be taken such that the collection system south of Rosewood Drive does not receive additional loading to the extent that would negatively impact its performance. Negative impacts could be described as increased ponding to the extent that ponding becomes a nuisance or a public complaint. See the following spreadsheet for a summary comparison of the alternate analyses performed for the **east branch watershed**.

East Branch North of Rosewood Improvements Simulations Alternates and Results

Name	Watershed Area	Percentage Impervious Area	Pervious CN	Hydraulic Length (feet)	Overland Slope	Time of Concentration (hours)	Peaks @ Node 1999 2-year storm Peak Flow (cfs)	Peaks @ Node 1999 2-year storm Peak Time (hours)	Peaks @ Node 1999 10-year storm Peak Flow (cfs)	Peaks @ Node 1999 10-year storm Peak Time (hours)	Peaks @ Node 10439 2-year storm Peak Flow (cfs)	Peaks @ Node 10439 2-year storm Peak Time (hours)	Peaks @ Node 10439 10-year storm Peak Flow (cfs)	Peaks @ Node 10439 10-year storm Peak Time (hours)
Original Model	301.79	Composed of Multiple Watersheds				0.48	199	12.33	240	12.30	309	12.32	452	12.32
E1	301.79	46%	78	8907	1.79%	2.42	122	13.93	241	13.90	136	13.93	266	13.88
E2	301.79	46%	78	1300	1.79%	0.52	381	12.33	699	12.35	461	12.35	499	12.27
E3	301.79	46%	78	4500	1.79%	1.40	187	13.05	367	13.05	217	13.07	423	13.05
E4	301.79	Composed of Multiple Watersheds				0.48	274	12.33	530	12.32	380	12.37	498	12.27

PEAK FLOW AND TIME AT NODE 1999





E1 – SINGLE WATERSHED NORTH OF ROSEWOOD WITH WEIGHTED OVERLAND SLOPE. HL = OVERLAND AND PIPE RUN.

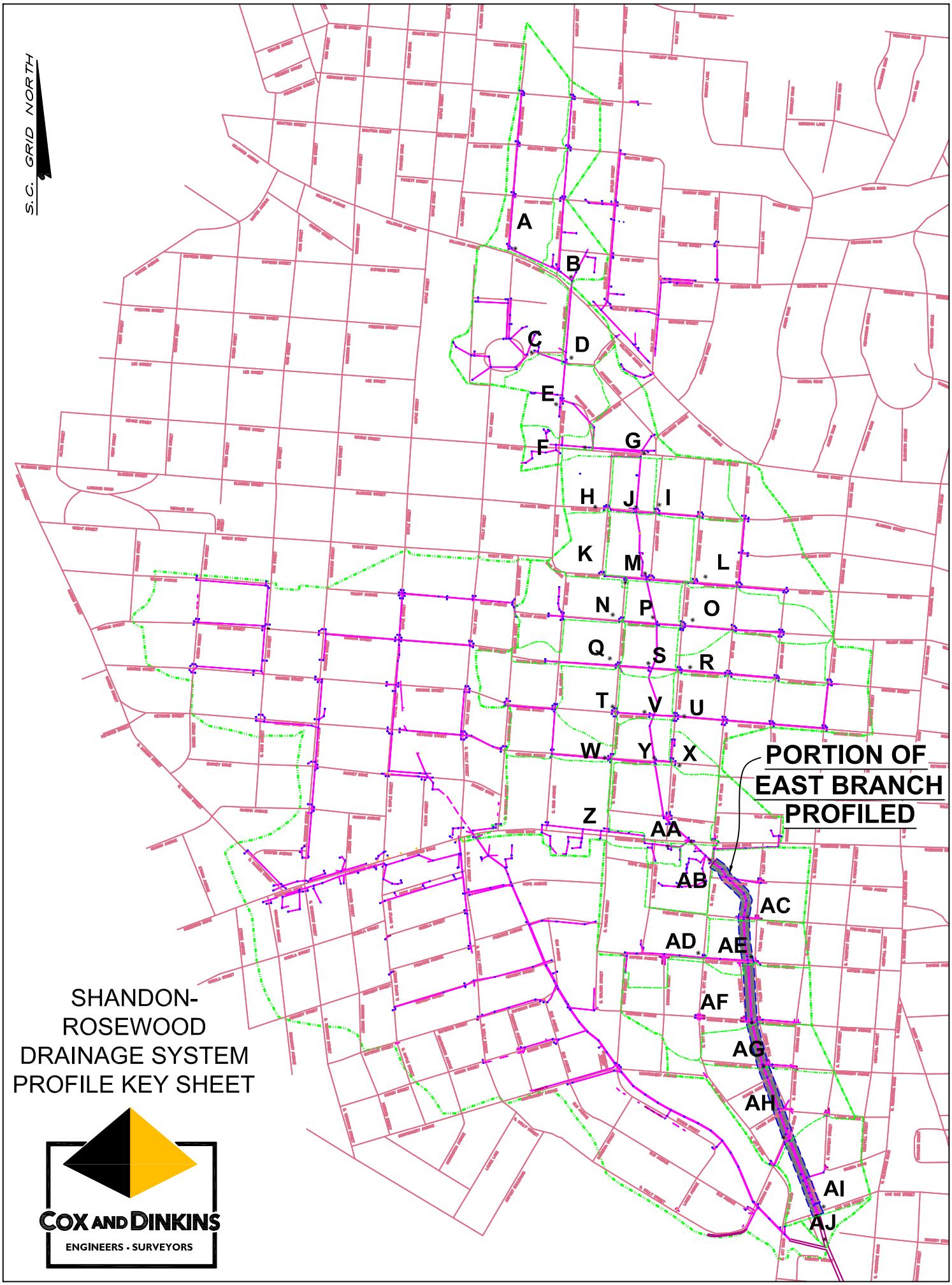
E2 – SAME AS E1 EXCEPT HL ADJUSTED TO MATCH PEAK TIME OF ORIGINAL MODEL AT NODE 1999.

E3 – SAME AS E1 EXCEPT HL ADJUSTED TO MATCH PEAK FLOW OF ORIGINAL MODEL AT NODE 1999 FOR 2-YEAR STORM.

E4 – MULTIPLE WATERSHEDS AS ORIGINAL MODEL WITH PIPES UPSIZED TO REMOVE PONDING AND MINIMIZE SURCHARGE.

COX AND DINKINS
ENGINEERS · SURVEYORS

EAST BRANCH
ALTERNATE E4
WITH SOUTH OF ROSEWOOD
TRUNK LINE EVALUATION



SHANDON-
ROSEWOOD
DRAINAGE SYSTEM
PROFILE KEY SHEET

COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. E-4 TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
10123.1	10 yr 24 hr	10123	314.35	309.22	312.22	311.54	3.0	2.0	1	465.34	0.40	10116	313.80	307.36	310.36	309.36	asmd up	12.52	12.52	39.16	37.63	6.53
10116.1	10 yr 24 hr	10116	313.80	307.26	310.26	309.11	3.0	2.0	1	26.40	0.76	10114	313.32	307.06	310.06	308.91		12.52	12.52	53.91	37.63	8.24
10114.1	10 yr 24 hr	10114	313.32	306.96	309.96	308.82	3.0	2.0	1	133.69	0.75	10113	312.91	305.96	308.96	307.82		12.52	12.52	53.57	37.65	8.20
10113.1	10 yr 24 hr	10113	312.91	303.51	306.51	305.70	3.0	2.5	1	656.26	1.57	10276	301.71	293.21	296.21	295.04		12.47	12.48	77.59	64.47	11.89
10276.1	10 yr 24 hr	10276	301.71	293.21	296.71	295.04	3.5	2.5	1	66.54	1.52	10427	300.00	292.20	295.70	293.63	asmd dn	12.48	12.48	115.10	64.46	13.00
10427.1	10 yr 24 hr	10427	300.00	292.20	295.20	293.63	3.0	2.5	2	24.78	1.29	10273	299.48	291.88	294.88	293.31	asmd up	12.48	12.48	70.38	64.47	9.74
10391.1	10 yr 24 hr	10391	299.93	293.40	296.40	295.06	3.0	2.0	1	248.58	0.57	10274	298.83	291.98	294.98	293.64	asmd up	12.63	12.65	46.81	27.66	6.90
10274.1	10 yr 24 hr	10274	298.83	291.88	294.88	293.54	3.0	2.0	1	13.93	0.57	10273	299.48	291.80	294.80	293.46		12.63	12.63	46.94	27.66	6.91
10273.1	10 yr 24 hr	10273	299.48	290.38	293.88	292.64	3.5	2.5	2	302.97	0.54	10271	294.52	288.74	292.24	291.16		12.48	12.55	68.73	99.12	7.54
10271.1	10 yr 24 hr	10271	294.52	288.74	292.24	291.16	3.5	2.5	2	44.38	0.54	10272	294.69	288.50	292.00	290.99		12.48	12.60	68.70	99.36	7.18
10272.1	10 yr 24 hr	10272	294.69	288.50	292.00	290.99	3.5	2.5	2	109.69	0.54	10278	295.06	287.91	291.41	290.41		12.42	12.42	68.52	115.03	7.87
10278.1	10 yr 24 hr	10278	295.06	287.91	291.41	290.41	3.5	2.5	2	285.43	0.54	10281	297.70	286.37	289.87	288.96		12.43	12.45	68.62	115.04	7.79
10281.1	10 yr 24 hr	10281	297.70	286.37	289.87	288.96	3.5	2.5	2	191.54	0.54	10282	295.62	285.33	288.83	288.07		12.43	12.50	68.84	115.05	7.50
10282.1	10 yr 24 hr	10282	295.62	285.33	288.83	288.07	3.5	2.5	2	446.77	0.54	10298	293.88	282.92	286.42	286.26	asmd dn	12.45	12.50	68.62	115.15	7.03
10294.1	10 yr 24 hr	10294	295.52	289.22	291.72	290.87	2.5	1.3	1	484.11	0.35	10299	294.54	287.54	290.04	288.94		12.18	12.20	22.44	17.08	5.09
10299.1	10 yr 24 hr	10299	294.54	287.49	289.99	287.99	2.5	1.5	1	16.83	27.27	10298	293.88	282.90	285.40	286.26	asmd dn	12.18	12.15	198.90	17.08	15.15
10298.1	10 yr 24 hr	10298	293.88	282.87	286.87	286.26	4.0	2.5	1	47.48	0.65	10296	293.92	282.56	286.56	285.88	asmd up	12.40	12.40	107.78	122.04	10.77
10296.1	10 yr 24 hr	10296	293.92	282.52	286.52	285.06	4.0	2.5	1	169.66	2.31	10421	284.00	278.60	282.60	281.15	asmd dn	12.37	12.38	202.75	148.24	17.60
10421.1	10 yr 24 hr	10421	284.00	278.60	282.60	281.15	4.0	2.5	1	333.75	2.31	5719	277.78	270.88	274.88	273.87	asmd up	12.37	12.42	202.86	148.24	17.34
5715.1	10 yr 24 hr	5715	287.43	281.83	283.83	283.62	2.0	1.5	1	31.10	0.51	5716	287.27	281.67	283.67	283.32		12.12	12.12	15.07	21.33	7.26
5716.1	10 yr 24 hr	5716	287.27	279.02	281.02	280.17	2.0	1.5	1	30.30	2.61	5717	286.93	278.23	280.23	279.38		12.12	12.12	33.92	21.32	11.40
5717.1	10 yr 24 hr	5717	286.93	278.03	280.03	279.36	2.0	1.3	1	210.60	2.16	5720	277.38	273.48	275.48	274.45		12.12	12.13	30.88	21.32	10.04
5720.1	10 yr 24 hr	5720	277.38	273.48	275.48	274.45	2.0	1.5	1	22.23	5.85	5719	277.78	272.18	274.18	273.87		12.12	12.05	50.80	21.24	14.77
5726.1	10 yr 24 hr	5726	281.91	274.01	276.51	275.76	2.5	1.5	1	167.53	1.09	5719	277.78	272.18	274.68	273.93		12.20	12.23	39.81	33.19	9.07
5719.1	10 yr 24 hr	5719	277.78	270.78	275.28	273.87	4.5	3.0	1	195.26	1.63	5708	274.63	267.60	272.10	270.78	asmd dn	12.28	12.30	233.03	188.12	16.13
5708.1	10 yr 24 hr	5708	274.63	267.50	272.00	270.78	4.5	4.0	1	176.36	1.42	5702	272.60	265.00	269.50	268.37	asmd up	12.30	12.37	217.41	188.10	15.16
5702.1	10 yr 24 hr	5702	272.60	264.90	269.40	268.37	4.5	4.0	1	93.87	2.02	5688	268.71	263.00	267.50	267.28	asmd dn	12.30	12.37	259.79	188.16	14.12
5688.1	10 yr 24 hr	5688	268.71	263.00	267.50	267.28	4.5	4.0	1	124.32	0.77	5612	270.14	262.04	266.54	266.13	asmd up	12.30	12.30	160.46	188.18	12.10
5612.1	10 yr 24 hr	5612	270.14	261.99	266.49	266.13	4.5	4.0	1	41.68	0.48	5611	269.89	261.79	266.29	265.74		12.30	12.30	126.49	188.18	12.34
5611.1	10 yr 24 hr	5611	269.89	261.74	266.24	265.28	4.5	3.0	1	11.82	2.20	5610	268.68	261.48	265.98	265.14		12.30	12.45	270.82	188.19	14.12
5610.1	10 yr 24 hr	5610	268.68	261.38	265.88	265.14	4.5	3.0	1	18.31	1.04	5609	268.24	261.19	265.69	264.95		12.30	12.35	186.01	188.19	13.33
5606.1	10 yr 24 hr	5606	274.58	267.48	269.48	268.49	2.0	1.5	1	192.25	3.01	5609	268.24	261.69	263.69	264.95		12.22	12.18	36.46	16.00	9.22
5646.1	10 yr 24 hr	5646	276.45	267.95	270.95	269.84	3.0	1.5	1	50.05	1.08	5645	275.16	267.41	270.41	269.30		12.47	12.47	64.33	46.44	9.90
5645.1	10 yr 24 hr	5645	275.16	267.36	270.36	269.12	3.0	1.5	1	383.02	1.44	5609	268.24	261.84	264.84	264.95		12.47	12.55	74.35	46.47	10.32
5609.1	10 yr 24 hr	5609	268.24	261.14	266.14	264.95	5.0	3.0	1	418.33	1.45	5547	261.76	255.06	260.06	259.39		12.28	12.22	291.55	262.24	16.21
5541.1	10 yr 24 hr	5541	270.84	266.14	268.14	267.51	2.0	1.5	1	312.88	3.22	5547	261.76	256.06	258.06	259.39		12.35	12.42	37.70	28.35	12.00
5575.1	10 yr 24 hr	5575	265.61	261.11	263.61	262.54	2.5	1.5	1	218.42	1.99	5547	261.76	256.76	259.26	259.39		12.37	12.47	53.75	30.66	10.24
5547.1	10 yr 24 hr	5547	261.76	254.96	259.96	259.39	5.0	3.5	1	6.12	-0.65	5546	261.10	255.00	260.00	259.29		12.28	12.20	195.52	324.97	17.89
5546.1	10 yr 24 hr	5546	261.10	255.00	260.00	259.29	5.0	3.5	1	225.24	1.85	5502	257.33	250.83	255.83	255.52		12.30	12.48	329.06	324.99	18.37
5502.1	10 yr 24 hr	5502	257.33	250.83	255.83	255.52	5.0	3.5	1	51.38	2.16	5929	257.22	249.72	254.72	254.67		12.30	12.48	355.46	325.04	17.05
5929.1	10 yr 24 hr	5929	257.22	249.72	255.22	254.67	5.5	3.5	1	127.69	0.92	5492	256.54	248.54	254.04	253.44		12.30	12.30	299.76	325.09	14.46
5512.1	10 yr 24 hr	5512	260.07	252.97	255.47	254.49	2.5	1.3	1	306.37	1.35	5492	256.54	248.84	251.34	252.77		12.22	12.17	44.22	21.28	6.52
5478.1	10 yr 24 hr	5478	264.05	251.95	254.45	253.70	2.5	1.5	1	254.81	0.71	5492	256.54	250.14	252.64	252.77		12.42	12.62	32.10	21.28	6.28
5492.1	10 yr 24 hr	5492	256.54	248.44	253.94	252.77	5.5	3.5	1	33.07	2.84	5909	256.20	247.50	253.00	252.27	asmd dn	12.28	12.45	525.72	370.79	18.52
5909.1	10 yr 24 hr	5909	256.20	247.50	253.00	252.27	5.5	3.5	1	59.49	0.84	5907	255.60	247.00	252.50	251.48	asmd dn&up	12.28	12.33	285.87	370.77	17.07
5907.1	10 yr 24 hr	5907	255.60	247.00	252.50	251.48	5.5	3.5	1	256.26	1.55	5900	250.83	243.03	248.53	247.84	asmd up	12.30	12.45	388.12	370.94	17.99
5900.1	10 yr 24 hr	5900	250.83	242.73	248.23	247.84	5.5	3.5	1	108.20	1.78	5382	248.90	240.80	246.30	246.40		12.30	12.30	416.46	371.14	16.08
5376.1	10 yr 24 hr	5376	254.37	249.37	251.37	250.83	2.0	2.0	1	326.89	2.01	5382	248.90	242.80	244.80	246.40		12.17	12.12	29.78	22.40	8.99
5397.1	10 yr 24 hr	5397	249.86	243.66	246.66	246.47	3.0	1.5	1	197.44	0.89	5382	248.90	241.90	244.90	246.40		12.82	13.17	58.47	30.27	7.53
5382.1	10 yr 24 hr	5382	248.90	240.70	246.70	246.40	6.0	4.0	1	107.72	0.58	5930	247.38	240.08	246.08	245.42		12.28	12.28	298.35	402.69	14.58
5930.1	10 yr 24 hr	5930	247.38	239.98	244.98	244.25	5.0	4.0	2	338.10	0.60	5306	245.34	237.94	242.94	241.99		12.30	12.30	187.85	402.75	11.35

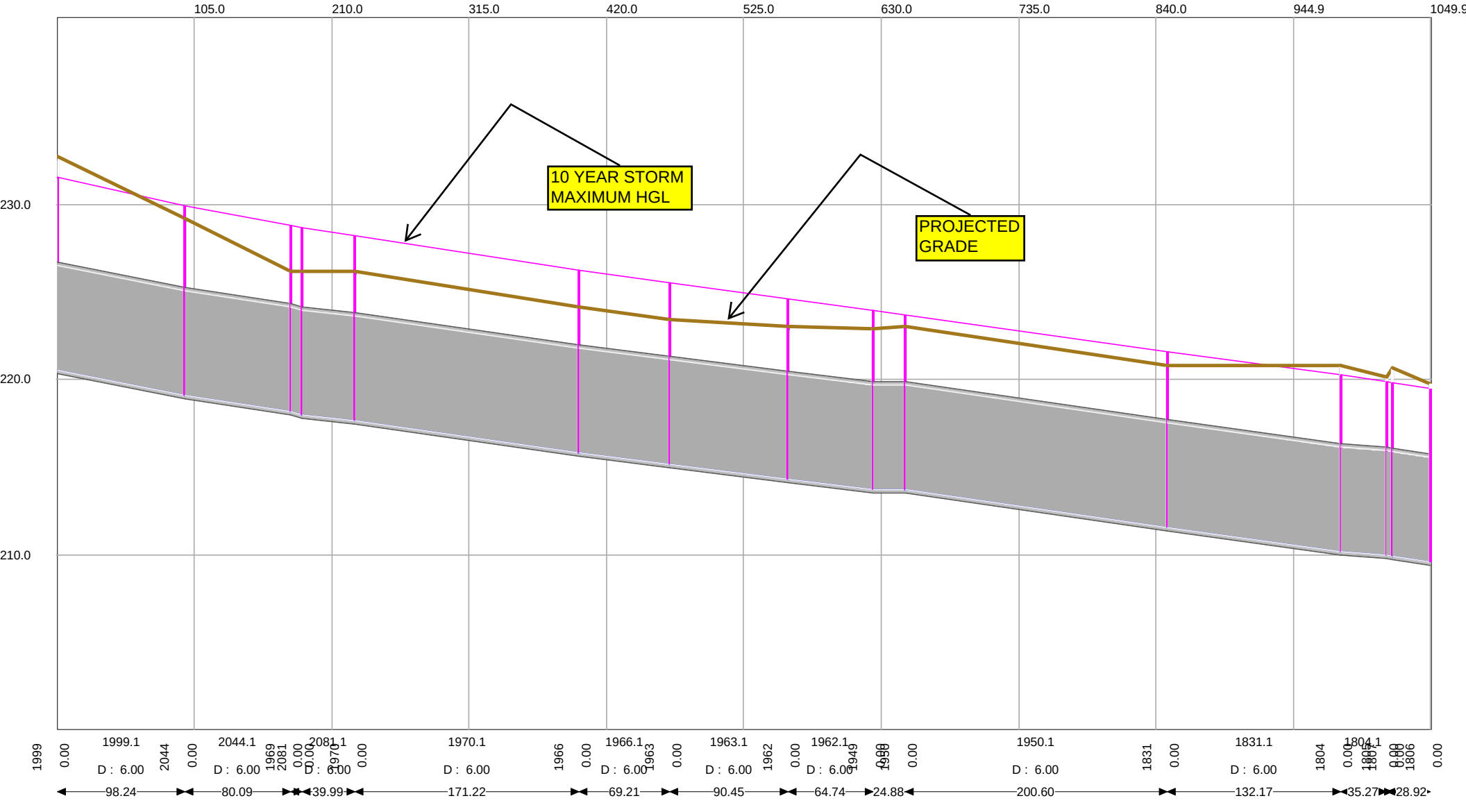
All Pipes are Circular and have a Roughness of 0.014.
Some Pipes were increased from 1 to 2 Barrels.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. E-4 TEN YEAR STORM

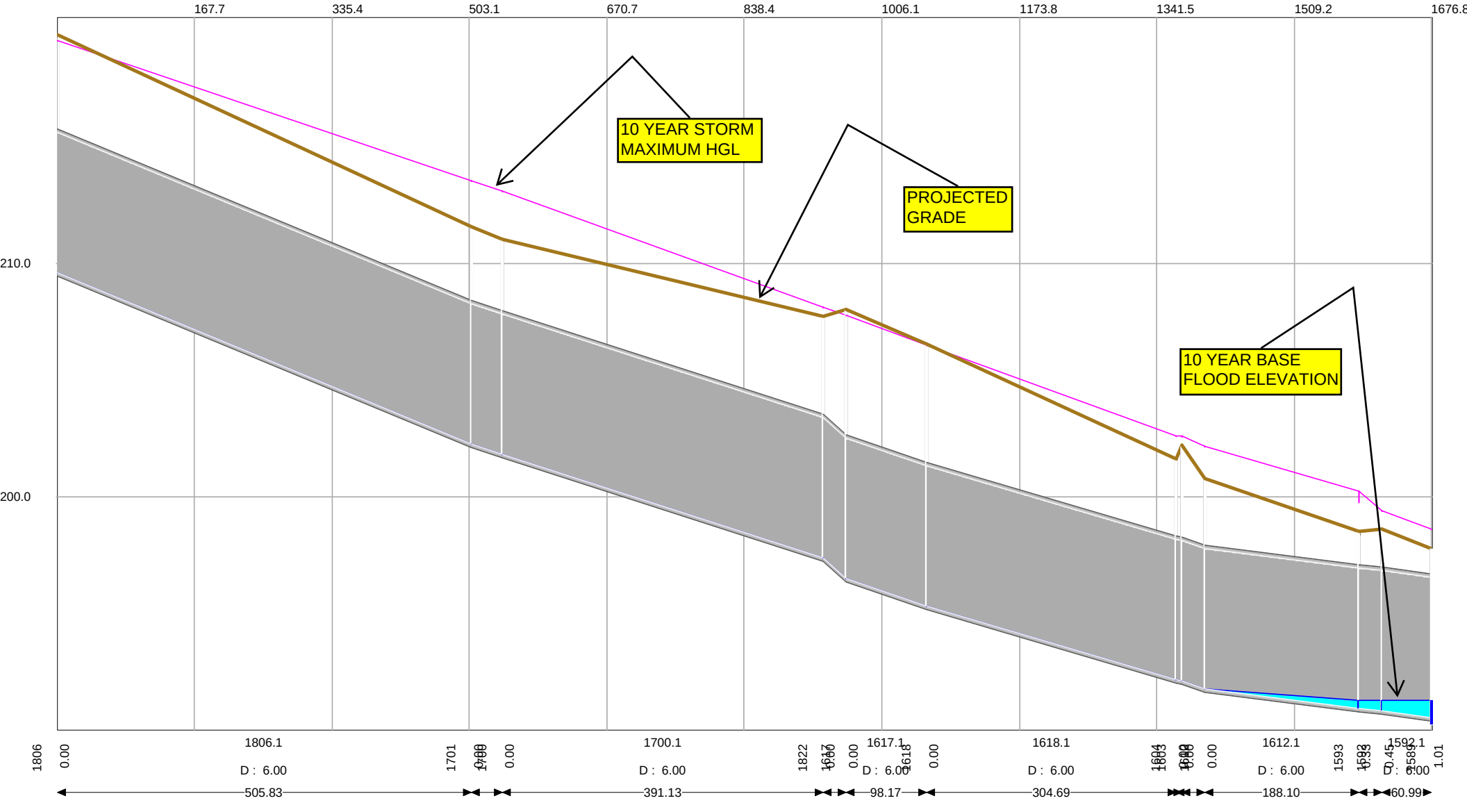
Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5342.1	10 yr 24 hr	5342	258.42	252.42	254.42	253.55	2.0	1.5	1	405.29	3.47	5306	245.34	238.34	240.34	241.82		12.68	12.68	39.15	24.02	12.22
5304.1	10 yr 24 hr	5304	248.41	238.61	241.11	241.83	2.5	1.5	1	135.17	0.31	5305	245.39	238.19	240.69	241.82		12.12	12.05	21.23	8.64	1.80
5305.1	10 yr 24 hr	5305	245.39	238.09	240.59	241.82	2.5	1.5	1	22.39	0.67	5306	245.34	237.94	240.44	241.82		12.12	12.13	31.17	8.53	1.72
5306.1	10 yr 24 hr	5306	245.34	237.89	242.89	241.82	5.0	4.0	2	483.83	0.90	5897	239.69	233.52	238.52	237.71	asmd dn	12.30	12.23	229.84	430.93	13.01
5897.1	10 yr 24 hr	5897	239.69	233.52	239.02	237.71	5.5	4.0	2	17.38	0.86	5265	239.87	233.37	238.87	237.62	asmd up	12.32	12.68	289.69	430.05	11.51
5265.1	10 yr 24 hr	5265	239.87	233.17	238.67	237.62	5.5	4.0	2	12.90	0.78	5896	239.46	233.07	238.57	237.55	asmd dn	12.32	12.20	274.54	430.03	10.71
5896.1	10 yr 24 hr	5896	239.46	233.07	238.57	237.55	5.5	4.0	2	16.95	0.71	10432	239.65	232.95	238.45	237.47	asmd dn&up	12.32	12.20	262.37	430.01	10.62
10432.1	10 yr 24 hr	10432	239.65	232.95	238.45	237.47	5.5	4.0	2	4.44	0.68	10433	239.14	232.92	238.42	237.45	asmd dn&up	12.32	12.18	256.32	429.98	10.54
10433.1	10 yr 24 hr	10433	239.14	232.92	238.42	237.45	5.5	4.0	2	6.62	0.76	10434	239.02	232.87	238.37	237.42	asmd dn&up	12.32	12.20	271.00	429.98	10.52
10434.1	10 yr 24 hr	10434	239.02	232.87	238.37	237.42	5.5	4.0	2	39.12	0.74	5898	238.49	232.58	238.08	237.24	asmd dn&up	12.32	12.20	268.48	429.94	10.45
5898.1	10 yr 24 hr	5898	238.49	232.58	238.08	237.24	5.5	4.0	2	217.89	0.73	2358	237.13	230.98	236.48	236.27	asmd dn&up	12.32	12.20	267.21	429.73	10.07
2358.1	10 yr 24 hr	2358	237.13	230.98	236.98	236.27	6.0	4.0	1	22.36	0.72	2072	237.02	230.82	236.82	236.03	asmd up	12.32	12.22	332.66	429.50	16.46
2039.1	10 yr 24 hr	2039	240.77	237.23	239.73	238.66	2.5	1.5	1	82.46	2.70	2042	239.83	235.00	237.50	236.91	asmd dn	12.52	12.65	62.63	36.86	12.63
2042.1	10 yr 24 hr	2042	239.83	235.00	237.50	236.91	2.5	1.5	1	103.85	2.92	2072	237.02	231.97	234.47	236.03	asmd up	12.52	12.75	65.06	36.96	10.47
2072.1	10 yr 24 hr	2072	237.02	230.82	236.82	236.03	6.0	4.0	1	41.82	1.72	5919	237.24	230.10	236.10	235.43	asmd dn&up	12.32	12.23	516.00	496.17	19.24
5919.1	10 yr 24 hr	5919	237.24	230.10	236.10	235.43	6.0	4.0	1	96.54	0.84	1993	237.29	229.29	235.29	234.01	asmd dn&up	12.32	12.23	360.22	496.03	19.19
1993.1	10 yr 24 hr	1993	237.29	229.29	235.29	234.01	6.0	4.0	1	63.92	2.33	1994	235.80	227.80	233.80	232.95		12.32	12.18	600.42	495.73	22.24
1994.1	10 yr 24 hr	1994	235.80	227.80	233.80	232.95	6.0	4.0	1	87.32	1.47	1998	232.52	226.52	232.52	231.71		12.32	12.15	476.13	495.32	22.67
1998.1	10 yr 24 hr	1998	232.52	226.52	232.52	231.71	6.0	4.0	1	9.62	10.91	1999	232.77	225.47	231.47	231.56		12.32	12.13	1299.23	494.91	40.06

All Pipes are Circular and have a Roughness of 0.014.
Some Pipes were increased from 1 to 2 Barrels.

EAST BRANCH ALTERNATE NO. E-4 (DOWNSTREAM) - NODES 1999-1806
Day [0] Time 00:01:00 Step 1



EAST BRANCH ALTERNATE NO. E-4 (DOWNSTREAM) - NODES 1806-1589
Day [0] Time 00:01:00 Step 1



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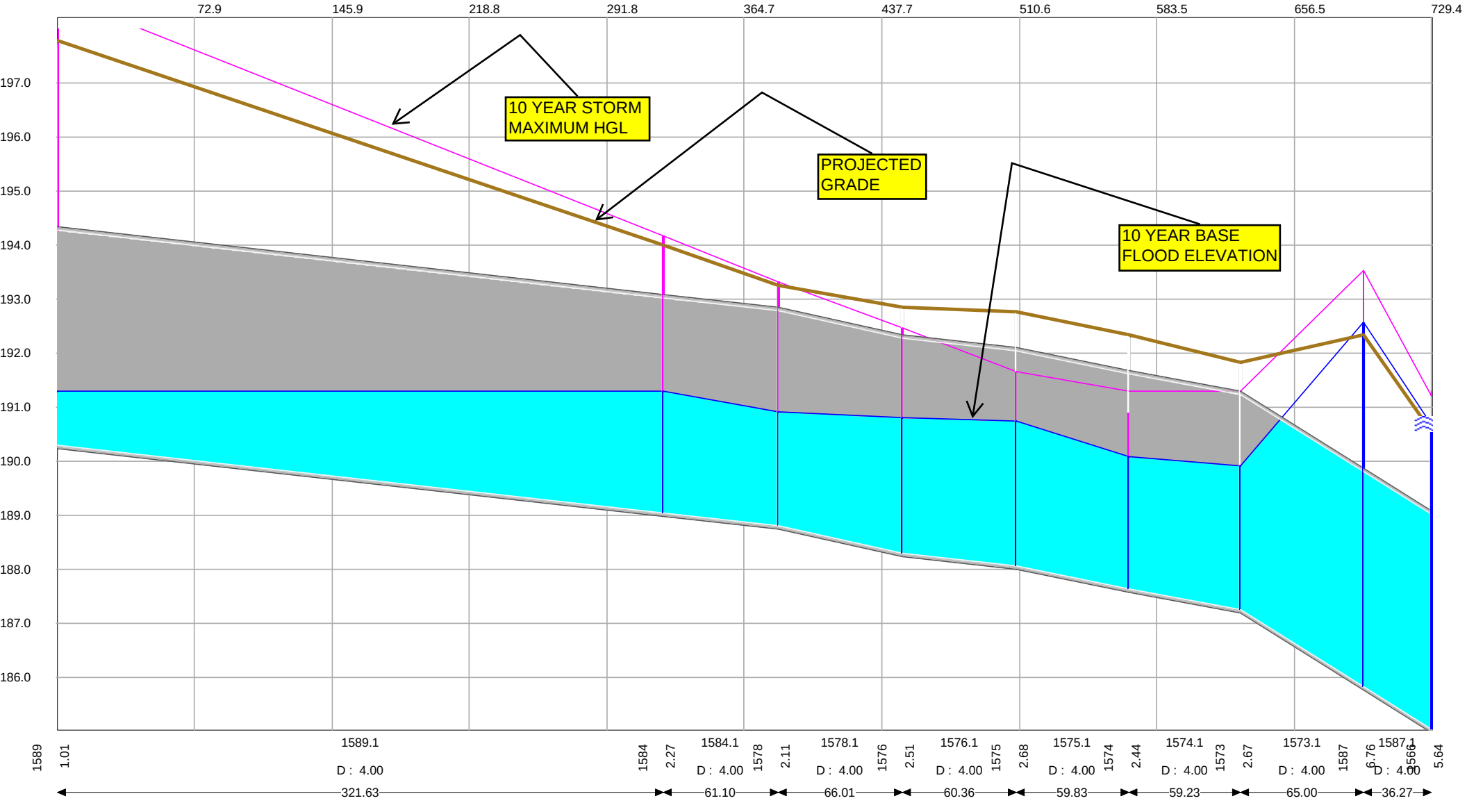

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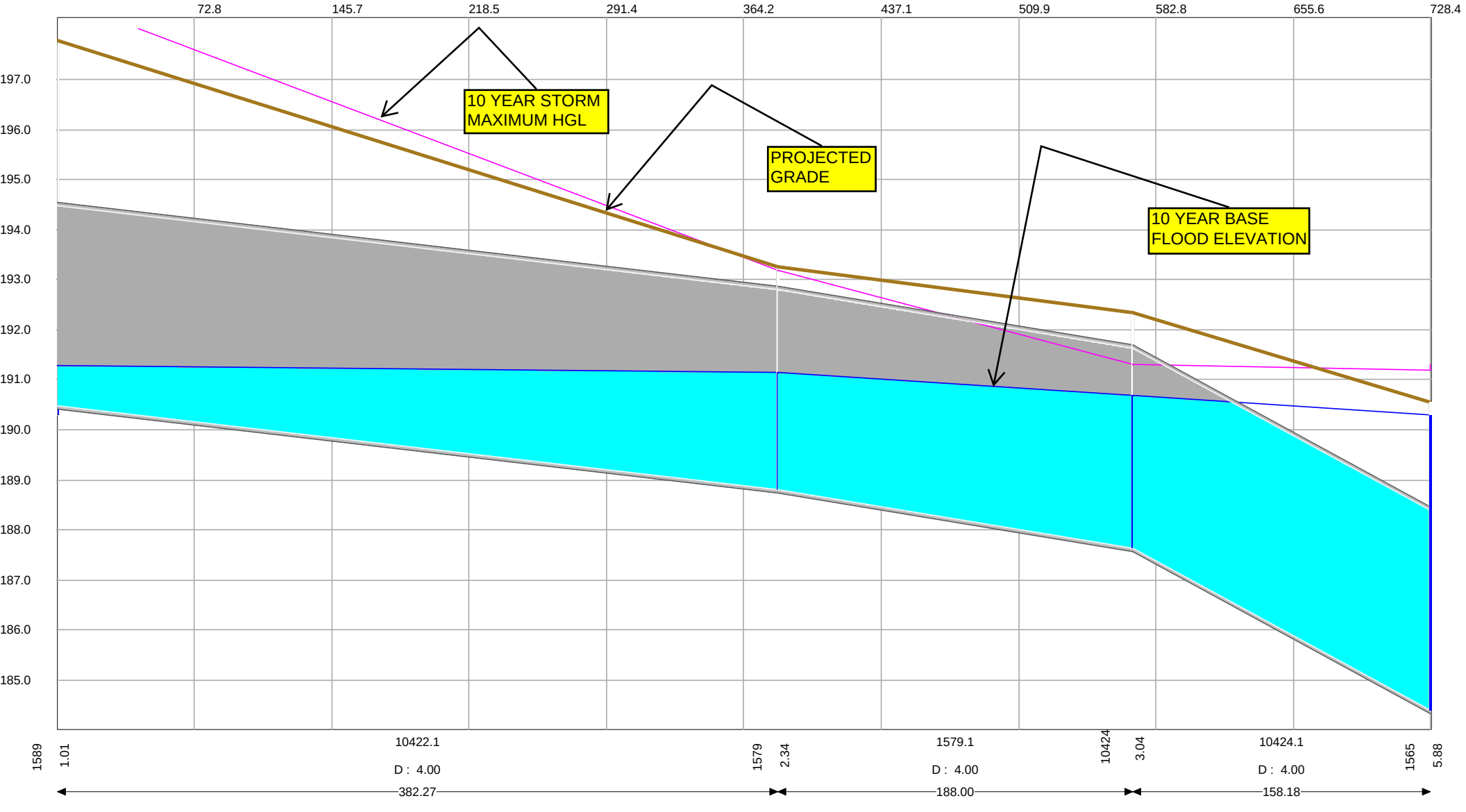
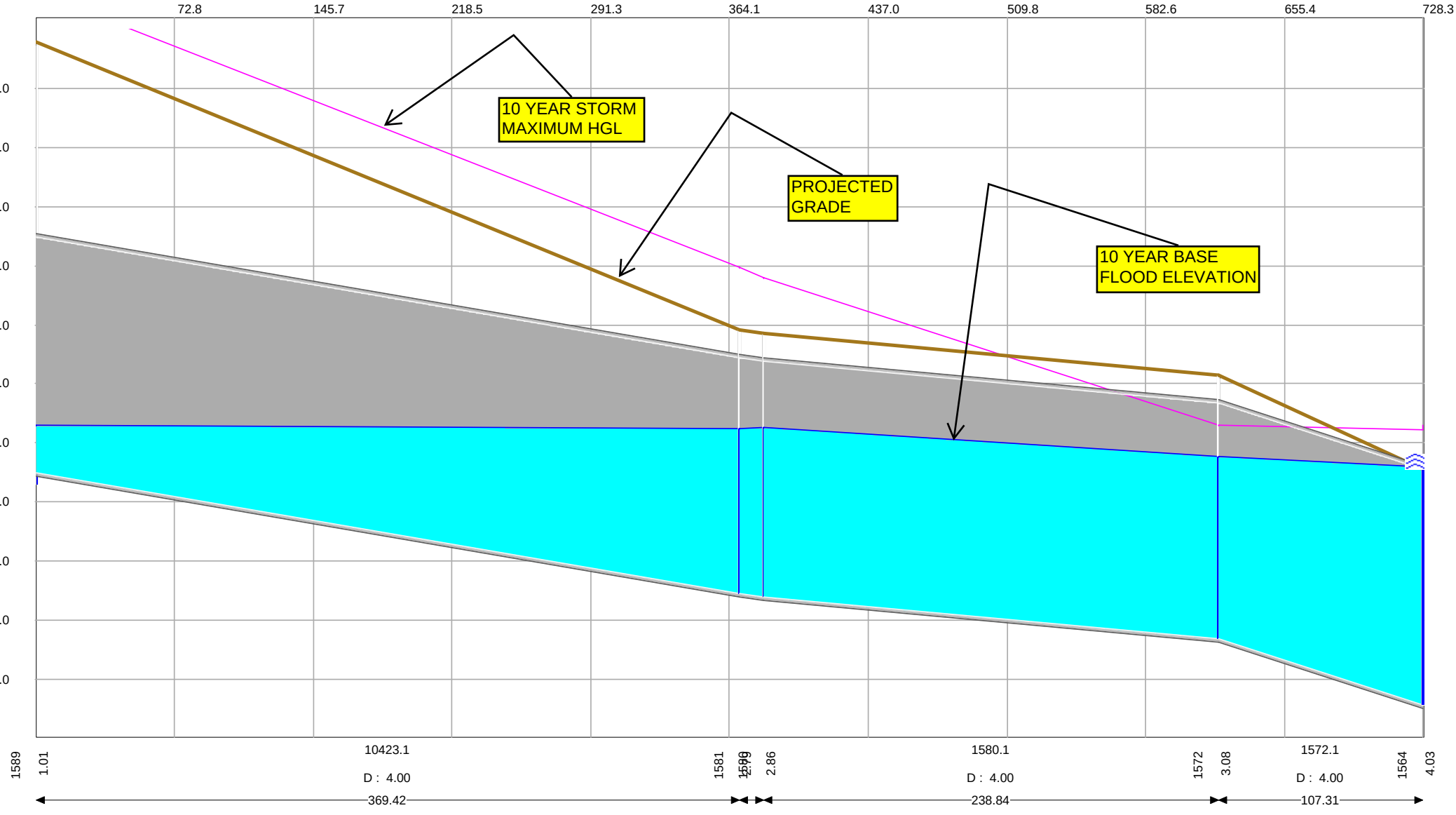


EAST BRANCH ALTERNATE NO. E-4 (DOWNSTREAM) - NODES 1589-1564
Day [0] Time 00:01:00 Step 1



ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. E-4 - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
10123.1	2 yr 24 hr	10123	314.35	309.22	312.22	310.68	3.0	2.0	1	465.34	0.40	10116	313.80	307.36	310.36	308.74	asmd up	12.53	12.55	39.16	18.48	5.45
10116.1	2 yr 24 hr	10116	313.80	307.26	310.26	308.47	3.0	2.0	1	26.40	0.76	10114	313.32	307.06	310.06	308.27		12.53	12.55	53.91	18.48	6.91
10114.1	2 yr 24 hr	10114	313.32	306.96	309.96	308.18	3.0	2.0	1	133.69	0.75	10113	312.91	305.96	308.96	307.18		12.55	12.55	53.57	18.48	6.88
10113.1	2 yr 24 hr	10113	312.91	303.51	306.51	304.89	3.0	2.5	1	656.26	1.57	10276	301.71	293.21	296.21	294.50		12.48	12.52	77.59	32.37	10.27
10276.1	2 yr 24 hr	10276	301.71	293.21	296.71	294.50	3.5	2.5	1	66.54	1.52	10427	300.00	292.20	295.70	293.18	asmd dn	12.48	12.50	115.10	32.35	10.43
10427.1	2 yr 24 hr	10427	300.00	292.20	295.20	293.18	3.0	2.5	2	24.78	1.29	10273	299.48	291.88	294.88	292.86	asmd up	12.50	12.50	70.38	32.36	8.08
10391.1	2 yr 24 hr	10391	299.93	293.40	296.40	294.44	3.0	2.0	1	248.58	0.57	10274	298.83	291.98	294.98	293.02	asmd up	12.67	12.67	46.81	12.11	5.55
10274.1	2 yr 24 hr	10274	298.83	291.88	294.88	292.92	3.0	2.0	1	13.93	0.57	10273	299.48	291.80	294.80	292.84		12.67	12.67	46.94	12.11	5.57
10273.1	2 yr 24 hr	10273	299.48	290.38	293.88	291.82	3.5	2.5	2	302.97	0.54	10271	294.52	288.74	292.24	290.25		12.48	12.53	68.73	48.27	6.43
10271.1	2 yr 24 hr	10271	294.52	288.74	292.24	290.25	3.5	2.5	2	44.38	0.54	10272	294.69	288.50	292.00	290.06		12.50	12.57	68.70	48.38	6.14
10272.1	2 yr 24 hr	10272	294.69	288.50	292.00	290.06	3.5	2.5	2	109.69	0.54	10278	295.06	287.91	291.41	289.47		12.43	12.43	68.52	56.18	6.76
10278.1	2 yr 24 hr	10278	295.06	287.91	291.41	289.47	3.5	2.5	2	285.43	0.54	10281	297.70	286.37	289.87	287.94		12.45	12.45	68.62	56.17	6.76
10281.1	2 yr 24 hr	10281	297.70	286.37	289.87	287.94	3.5	2.5	2	191.54	0.54	10282	295.62	285.33	288.83	286.95		12.45	12.47	68.84	56.18	6.68
10282.1	2 yr 24 hr	10282	295.62	285.33	288.83	286.95	3.5	2.5	2	446.77	0.54	10298	293.88	282.92	286.42	285.01	asmd dn	12.47	12.52	68.62	56.20	6.25
10294.1	2 yr 24 hr	10294	295.52	289.22	291.72	290.47	2.5	1.3	1	484.11	0.35	10299	294.54	287.54	290.04	288.64		12.18	12.20	22.44	10.86	4.51
10299.1	2 yr 24 hr	10299	294.54	287.49	289.99	287.89	2.5	1.5	1	16.83	27.27	10298	293.88	282.90	285.40	285.01	asmd dn	12.18	12.12	198.90	10.86	13.85
10298.1	2 yr 24 hr	10298	293.88	282.87	286.87	285.01	4.0	2.5	1	47.48	0.65	10296	293.92	282.56	286.56	284.70	asmd up	12.42	12.42	107.78	60.48	8.82
10296.1	2 yr 24 hr	10296	293.92	282.52	286.52	284.20	4.0	2.5	1	169.66	2.31	10421	284.00	278.60	282.60	280.28	asmd dn	12.37	12.38	202.75	74.67	14.90
10421.1	2 yr 24 hr	10421	284.00	278.60	282.60	280.28	4.0	2.5	1	333.75	2.31	5719	277.78	270.88	274.88	272.82	asmd up	12.38	12.40	202.86	74.66	14.68
5715.1	2 yr 24 hr	5715	287.43	281.83	283.83	283.09	2.0	1.5	1	31.10	0.51	5716	287.27	281.67	283.67	282.90		12.12	12.13	15.07	11.67	5.63
5716.1	2 yr 24 hr	5716	287.27	279.02	281.02	279.83	2.0	1.5	1	30.30	2.61	5717	286.93	278.23	280.23	279.04		12.12	12.13	33.92	11.66	9.79
5717.1	2 yr 24 hr	5717	286.93	278.03	280.03	278.96	2.0	1.3	1	210.60	2.16	5720	277.38	273.48	275.48	274.13		12.13	12.13	30.88	11.65	8.47
5720.1	2 yr 24 hr	5720	277.38	273.48	275.48	274.13	2.0	1.5	1	22.23	5.85	5719	277.78	272.18	274.18	272.83		12.13	12.13	50.80	11.66	13.12
5726.1	2 yr 24 hr	5726	281.91	274.01	276.51	275.25	2.5	1.5	1	167.53	1.09	5719	277.78	272.18	274.68	273.41		12.22	12.22	39.81	19.47	8.06
5719.1	2 yr 24 hr	5719	277.78	270.78	275.28	272.82	4.5	3.0	1	195.26	1.63	5708	274.63	267.60	272.10	269.63	asmd dn	12.28	12.30	233.03	97.92	14.01
5708.1	2 yr 24 hr	5708	274.63	267.50	272.00	269.62	4.5	4.0	1	176.36	1.42	5702	272.60	265.00	269.50	267.12	asmd up	12.28	12.30	217.41	97.94	13.31
5702.1	2 yr 24 hr	5702	272.60	264.90	269.40	266.98	4.5	4.0	1	93.87	2.02	5688	268.71	263.00	267.50	265.69	asmd dn	12.28	12.30	259.79	97.94	13.13
5688.1	2 yr 24 hr	5688	268.71	263.00	267.50	265.69	4.5	4.0	1	124.32	0.77	5612	270.14	262.04	266.54	264.91	asmd up	12.28	12.30	160.46	97.94	9.79
5612.1	2 yr 24 hr	5612	270.14	261.99	266.49	264.91	4.5	4.0	1	41.68	0.48	5611	269.89	261.79	266.29	264.70		12.28	12.30	126.49	97.92	8.98
5611.1	2 yr 24 hr	5611	269.89	261.74	266.24	263.88	4.5	3.0	1	11.82	2.20	5610	268.68	261.48	265.98	263.72		12.28	12.32	270.82	97.92	13.07
5610.1	2 yr 24 hr	5610	268.68	261.38	265.88	263.72	4.5	3.0	1	18.31	1.04	5609	268.24	261.19	265.69	263.54		12.28	12.32	186.01	97.93	11.72
5606.1	2 yr 24 hr	5606	274.58	267.48	269.48	268.11	2.0	1.5	1	192.25	3.01	5609	268.24	261.69	263.69	263.54		12.23	12.22	36.46	7.83	7.37
5646.1	2 yr 24 hr	5646	276.45	267.95	270.95	269.23	3.0	1.5	1	50.05	1.08	5645	275.16	267.41	270.41	268.68		12.47	12.48	64.33	24.16	8.45
5645.1	2 yr 24 hr	5645	275.16	267.36	270.36	268.54	3.0	1.5	1	383.02	1.44	5609	268.24	261.84	264.84	263.54		12.48	12.50	74.35	24.15	9.03
5609.1	2 yr 24 hr	5609	268.24	261.14	266.14	263.54	5.0	3.0	1	418.33	1.45	5547	261.76	255.06	260.06	257.64		12.28	12.28	291.55	135.51	14.41
5541.1	2 yr 24 hr	5541	270.84	266.14	268.14	267.02	2.0	1.5	1	312.88	3.22	5547	261.76	256.06	258.06	257.64		12.37	12.38	37.70	15.03	10.33
5575.1	2 yr 24 hr	5575	265.61	261.11	263.61	262.04	2.5	1.5	1	218.42	1.99	5547	261.76	256.76	259.26	257.69		12.38	12.40	53.75	15.97	9.54
5547.1	2 yr 24 hr	5547	261.76	254.96	259.96	257.64	5.0	3.5	1	6.12	-0.65	5546	261.10	255.00	260.00	257.54		12.30	12.30	195.52	168.23	15.79
5546.1	2 yr 24 hr	5546	261.10	255.00	260.00	257.54	5.0	3.5	1	225.24	1.85	5502	257.33	250.83	255.83	253.47		12.30	12.32	329.06	168.24	16.69
5502.1	2 yr 24 hr	5502	257.33	250.83	255.83	253.47	5.0	3.5	1	51.38	2.16	5929	257.22	249.72	254.72	252.67		12.30	12.32	355.46	168.24	15.78
5929.1	2 yr 24 hr	5929	257.22	249.72	255.22	252.67	5.5	3.5	1	127.69	0.92	5492	256.54	248.54	254.04	251.49		12.30	12.32	299.76	168.24	12.98
5512.1	2 yr 24 hr	5512	260.07	252.97	255.47	253.83	2.5	1.3	1	306.37	1.35	5492	256.54	248.84	251.34	251.05		12.23	12.22	44.22	11.18	6.24
5478.1	2 yr 24 hr	5478	264.05	251.95	254.45	252.92	2.5	1.5	1	254.81	0.71	5492	256.54	250.14	252.64	251.11		12.43	12.45	32.10	10.20	5.80
5492.1	2 yr 24 hr	5492	256.54	248.44	253.94	251.05	5.5	3.5	1	33.07	2.84	5909	256.20	247.50	253.00	250.49	asmd dn	12.30	12.32	525.72	191.39	16.90
5909.1	2 yr 24 hr	5909	256.20	247.50	253.00	250.49	5.5	3.5	1	59.49	0.84	5907	255.60	247.00	252.50	249.73	asmd dn&up	12.30	12.30	285.87	191.40	14.69
5907.1	2 yr 24 hr	5907	255.60	247.00	252.50	249.73	5.5	3.5	1	256.26	1.55	5900	250.83	243.03	248.53	245.76	asmd up	12.30	12.32	388.12	191.45	16.28
5900.1	2 yr 24 hr	5900	250.83	242.73	248.23	245.64	5.5	3.5	1	108.20	1.78	5382	248.90	240.80	246.30	244.37		12.30	12.35	416.46	191.45	14.64
5376.1	2 yr 24 hr	5376	254.37	249.37	251.37	250.21	2.0	2.0	1	326.89	2.01	5382	248.90	242.80	244.80	244.37		12.18	12.12	29.78	11.06	8.23
5397.1	2 yr 24 hr	5397	249.86	243.66	246.66	244.70	3.0	1.5	1	197.44	0.89	5382	248.90	241.90	244.90	244.37		12.87	13.05	58.47	14.12	6.67
5382.1	2 yr 24 hr	5382	248.90	240.70	246.70	244.37	6.0	4.0	1	107.72	0.58	5930	247.38	240.08	246.08	243.75		12.30	12.32	298.35	206.20	11.38
5930.1	2 yr 24 hr	5930	247.38	239.98	244.98	242.63	5.0	4.0	2	338.10	0.60	5306	245.34	237.94	242.94	240.58		12.30	12.32	187.85	206.26	9.79

All Pipes are Circular and have a Roughness of 0.014.
Some Pipes were increased from 1 to 2 Barrels.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. E-4 - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5342.1	2 yr 24 hr	5342	258.42	252.42	254.42	253.18	2.0	1.5	1	405.29	3.47	5306	245.34	238.34	240.34	240.34		12.68	12.78	39.15	12.00	9.65
5304.1	2 yr 24 hr	5304	248.41	238.61	241.11	240.34	2.5	1.5	1	135.17	0.31	5305	245.39	238.19	240.69	240.34		12.10	11.98	21.23	4.14	1.76
5305.1	2 yr 24 hr	5305	245.39	238.09	240.59	240.34	2.5	1.5	1	22.39	0.67	5306	245.34	237.94	240.44	240.34		12.10	12.07	31.17	3.88	1.02
5306.1	2 yr 24 hr	5306	245.34	237.89	242.89	240.34	5.0	4.0	2	483.83	0.90	5897	239.69	233.52	238.52	235.90	asmd dn	12.32	12.33	229.84	219.87	11.54
5897.1	2 yr 24 hr	5897	239.69	233.52	239.02	235.90	5.5	4.0	2	17.38	0.86	5265	239.87	233.37	238.87	235.76	asmd up	12.32	12.35	289.69	219.84	11.15
5265.1	2 yr 24 hr	5265	239.87	233.17	238.67	235.76	5.5	4.0	2	12.90	0.78	5896	239.46	233.07	238.57	235.68	asmd dn	12.32	12.33	274.54	219.84	9.99
5896.1	2 yr 24 hr	5896	239.46	233.07	238.57	235.68	5.5	4.0	2	16.95	0.71	10432	239.65	232.95	238.45	235.58	asmd dn&up	12.32	12.33	262.37	219.84	9.89
10432.1	2 yr 24 hr	10432	239.65	232.95	238.45	235.58	5.5	4.0	2	4.44	0.68	10433	239.14	232.92	238.42	235.55	asmd dn&up	12.32	12.33	256.32	219.84	9.80
10433.1	2 yr 24 hr	10433	239.14	232.92	238.42	235.55	5.5	4.0	2	6.62	0.76	10434	239.02	232.87	238.37	235.51	asmd dn&up	12.32	12.33	271.00	219.83	9.78
10434.1	2 yr 24 hr	10434	239.02	232.87	238.37	235.51	5.5	4.0	2	39.12	0.74	5898	238.49	232.58	238.08	235.29	asmd dn&up	12.32	12.35	268.48	219.83	9.70
5898.1	2 yr 24 hr	5898	238.49	232.58	238.08	235.29	5.5	4.0	2	217.89	0.73	2358	237.13	230.98	236.48	234.23	asmd dn&up	12.33	12.35	267.21	219.90	9.19
2358.1	2 yr 24 hr	2358	237.13	230.98	236.98	234.23	6.0	4.0	1	22.36	0.72	2072	237.02	230.82	236.82	234.01	asmd up	12.33	12.35	332.66	219.99	14.10
2039.1	2 yr 24 hr	2039	240.77	237.23	239.73	238.17	2.5	1.5	1	82.46	2.70	2042	239.83	235.00	237.50	235.93	asmd dn	12.53	12.53	62.63	18.78	11.12
2042.1	2 yr 24 hr	2042	239.83	235.00	237.50	235.93	2.5	1.5	1	103.85	2.92	2072	237.02	231.97	234.47	234.01	asmd up	12.55	12.63	65.06	18.79	10.20
2072.1	2 yr 24 hr	2072	237.02	230.82	236.82	234.01	6.0	4.0	1	41.82	1.72	5919	237.24	230.10	236.10	233.45	asmd dn&up	12.33	12.33	516.00	254.42	16.55
5919.1	2 yr 24 hr	5919	237.24	230.10	236.10	233.45	6.0	4.0	1	96.54	0.84	1993	237.29	229.29	235.29	232.09	asmd dn&up	12.33	12.33	360.22	254.44	16.00
1993.1	2 yr 24 hr	1993	237.29	229.29	235.29	232.09	6.0	4.0	1	63.92	2.33	1994	235.80	227.80	233.80	230.76		12.33	12.33	600.42	254.47	19.50
1994.1	2 yr 24 hr	1994	235.80	227.80	233.80	230.76	6.0	4.0	1	87.32	1.47	1998	232.52	226.52	232.52	228.32		12.33	12.33	476.13	254.48	19.21
1998.1	2 yr 24 hr	1998	232.52	226.52	232.52	228.32	6.0	4.0	1	9.62	10.91	1999	232.77	225.47	231.47	227.27		12.33	12.33	1299.23	254.48	35.65

All Pipes are Circular and have a Roughness of 0.014.
Some Pipes were increased from 1 to 2 Barrels.

COX AND DINKINS
ENGINEERS · SURVEYORS

SECTION 3E

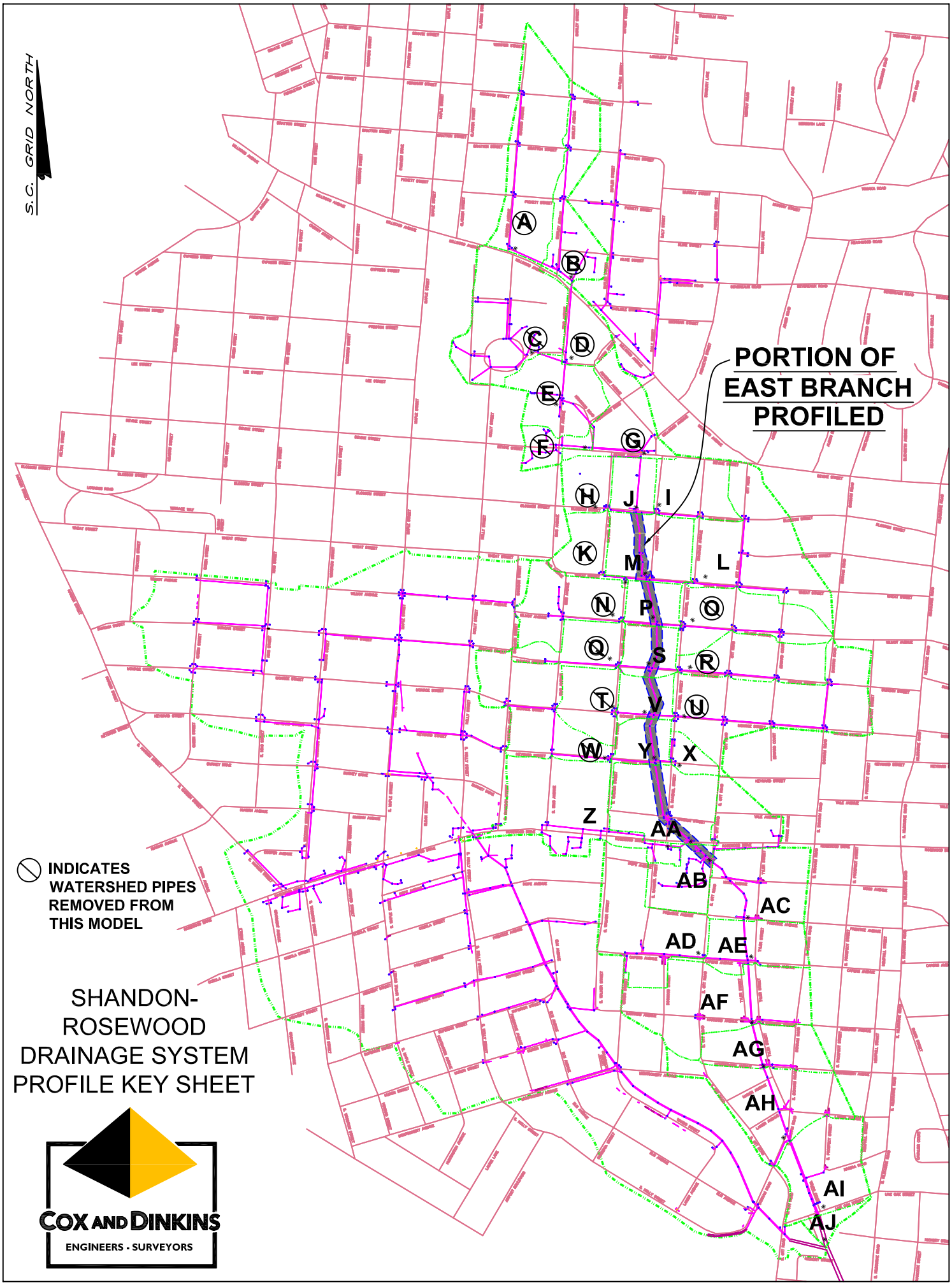
EAST BRANCH
NORTH OF ROSEWOOD
TRUNK LINE EVALUATION
REMOVING WATERSHEDS
A, B, C, D, E, F, G, H, K,
N, O, Q, R, T, U, AND W

East Branch Watershed (North of Rosewood Drive Trunk Line Evaluation)

As outlined previously the majority of the surcharge and ponding identified to date occurs north of Rosewood Drive. The "backbone" of the drainage collection/conveyance system for the **east branch watershed** runs between Walker Street and Ravenel Street. One possible remedy for the surcharge and ponding along this "backbone" is to create one or more parallel drainage collection/conveyance systems that will intercept runoff prior to its entry into the "backbone". Ott Road has been identified as the primary potential corridor for such a parallel installation. Installing a parallel collection/conveyance system along the Ott Road corridor would intercept approximately fifty (50) acres or approximately eighteen (18) percent of the current drainage area (north of Rosewood Drive) prior to its entry into the "backbone". In order to determine the degree of remedy of such an installation the **original model** has been modified to remove certain subwatersheds with land area approximating fifty (50) acres. The resultant model continues to indicate surcharge and ponding along portions of the "backbone" of the system north of Rosewood Drive for both the 2-year and 10-year, 24-hour rainfall events, but to a lesser degree than indicated by the **original model.**

Sims Avenue has also been identified as a secondary potential corridor for a parallel installation. But installing a parallel collection/conveyance system along the Sims Avenue corridor would only intercept an area of approximately twenty-six (26) acres or approximately nine (9) percent of the current drainage area (north of Rosewood Drive) prior to its entry into the "backbone". In order to determine the degree of remedy of such an additional installation the original model has been modified to remove certain subwatersheds with land area approximating twenty-six (26) acres. With an approximate total of seventy-six (76) acres or twenty-seven (27) percent of the current drainage area (north of Rosewood Drive) removed from the "backbone", the resultant model continues to indicate surcharge and ponding along portions of the "backbone" of the system north of Rosewood Drive for both the 2-year and 10-year, 24-hour rainfall events, but to a lesser degree than indicated by the **original model** and to a lesser degree with only the Ott Road interceptor.

This modeled data is interpreted as an indication of certain inherent shortcomings associated with the "backbone" drainage collection/conveyance system between Walker Street and Ravenel Street. In addition to the parallel collection/conveyance system installation, certain direct remedies are also required for the "backbone" drainage collection/conveyance system between Walker Street and Ravenel Street. Those remedies include replacement of certain existing pipes and drainage structures and rerouting existing pipes that conflict with existing building structures.



SHANDON-ROSEWOOD DRAINAGE SYSTEM PROFILE KEY SHEET

COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WITHOUT NORTHEASTWEST WATERSHED PIPES - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5715.1	10 yr 24 hr	5715	287.43	281.83	283.33	287.84	1.5	1	31.1	0.51	5716	287.27	281.67	283.17	287.06		12.22	12.22	7	15.68	8.71
5716.1	10 yr 24 hr	5716	287.27	279.02	280.52	287.06	1.5	1	30.3	2.61	5717	286.93	278.23	279.73	286.32		12.22	11.92	15.75	15.68	8.75
5717.1	10 yr 24 hr	5717	286.93	278.03	279.33	286.32	1.3	1	210.6	2.16	5720	277.38	273.48	274.78	274.37		12.22	12.22	9.79	15.68	11.76
5720.1	10 yr 24 hr	5720	277.38	273.48	274.98	274.37	1.5	1	22.23	5.85	5719	277.78	272.18	273.68	273.07		12.22	12.23	23.59	15.68	14.28
5726.1	10 yr 24 hr	5726	281.91	274.01	275.51	282.71	1.5	1	167.53	1.09	5719	277.78	272.18	273.68	273.68		12.35	12.35	10.19	23.13	12.74
5719.1	10 yr 24 hr	5719	277.78	270.78	273.78	272.75	3	1	195.26	1.63	5708	274.63	267.6	270.6	269.76	asmd dn	12.08	12.07	79.04	59.57	12.24
5708.1	10 yr 24 hr	5708	274.63	267.5	271.5	269.76	4	1	176.36	1.42	5702	272.6	265	269	269.93	asmd up	12.08	12.03	158.81	60.75	11.48
5702.1	10 yr 24 hr	5702	272.6	264.9	268.9	269.93	4	1	93.87	2.02	5688	268.71	263	267	269.83	asmd dn	12.08	12.02	189.76	60	11.39
5688.1	10 yr 24 hr	5688	268.71	263	267	269.83	4	1	124.32	0.77	5612	270.14	262.04	266.04	269.7	asmd up	12.08	11.98	117.21	59.94	8.06
5612.1	10 yr 24 hr	5612	270.14	261.99	265.99	269.7	4	1	41.68	0.48	5611	269.89	261.79	265.79	269.66		12.08	11.98	92.4	59.91	7.1
5611.1	10 yr 24 hr	5611	269.89	261.74	264.74	269.66	3	1	11.82	2.2	5610	268.68	261.48	264.48	269.61		12.08	11.98	91.86	59.9	8.61
5610.1	10 yr 24 hr	5610	268.68	261.38	264.38	269.61	3	1	18.31	1.04	5609	268.24	261.19	264.19	269.52		12.08	12.08	63.09	57	7.99
5606.1	10 yr 24 hr	5606	274.58	267.48	268.98	274.33	1.5	1	192.25	3.01	5609	268.24	261.69	263.19	269.52		12.22	12.22	16.93	16	8.85
5646.1	10 yr 24 hr	5646	276.45	267.95	269.45	278.62	1.5	1	50.05	1.08	5645	275.16	267.41	268.91	276.57		12.78	12.78	10.13	21.34	11.63
5645.1	10 yr 24 hr	5645	275.16	267.36	268.86	276.57	1.5	1	383.02	1.44	5609	268.24	261.84	263.34	269.52		13.55	13.55	11.71	18.54	10.19
5609.1	10 yr 24 hr	5609	268.24	261.14	264.14	269.52	3	1	418.33	1.45	5547	261.76	255.06	258.06	261.46		12.05	12.05	74.67	89.99	12.64
5541.1	10 yr 24 hr	5541	270.84	266.14	267.64	271.91	1.5	1	312.88	3.22	5547	261.76	256.06	257.56	261.46		12.68	12.68	17.51	21.12	11.76
5575.1	10 yr 24 hr	5575	265.61	261.11	262.61	261.48	1.5	1	218.42	1.99	5547	261.76	256.76	258.26	261.46		12.15	12.53	13.77	-0.18	0.62
5547.1	10 yr 24 hr	5547	261.76	254.96	258.46	261.46	3.5	1	6.12	-0.65	5546	261.1	255	258.5	261.37		12.15	12.03	75.53	118.97	13.72
5546.1	10 yr 24 hr	5546	261.1	255	258.5	261.37	3.5	1	225.24	1.85	5502	257.33	250.83	254.33	258.19		12.1	12.02	127.12	115.32	14.1
5502.1	10 yr 24 hr	5502	257.33	250.83	254.33	258.19	3.5	1	51.38	2.16	5929	257.22	249.72	253.22	257.47		12.53	12.53	137.32	121.72	12.57
5929.1	10 yr 24 hr	5929	257.22	249.72	253.22	257.47	3.5	1	127.69	0.92	5492	256.54	248.54	252.04	255.9		12.62	12.62	89.81	127.66	13.17
5512.1	10 yr 24 hr	5512	260.07	252.97	254.27	257.56	1.3	1	306.37	1.35	5492	256.54	248.84	250.14	255.9		12.07	12.68	7.73	-3.96	3.68
5478.1	10 yr 24 hr	5478	264.05	251.95	253.45	257.4	1.5	1	254.81	0.71	5492	256.54	250.14	251.64	255.9		12.07	12.68	8.22	2.9	3.08
5492.1	10 yr 24 hr	5492	256.54	248.44	251.94	255.9	3.5	1	33.07	2.84	5909	256.2	247.5	251	255.39	asmd dn	12.62	12	157.51	129.42	13.91
5909.1	10 yr 24 hr	5909	256.2	247.5	251	255.39	3.5	1	59.49	0.84	5907	255.6	247	250.5	254.46	asmd dn&	12.63	12.65	85.65	127.88	13.22
5907.1	10 yr 24 hr	5907	255.6	247	250.5	254.46	3.5	1	256.26	1.55	5900	250.83	243.03	246.53	250.45	asmd up	12.67	12.67	116.28	129.25	13.37
5900.1	10 yr 24 hr	5900	250.83	242.73	246.23	250.45	3.5	1	108.2	1.78	5382	248.9	240.8	244.3	248.76		12.65	12.65	124.77	128.91	13.35
5376.1	10 yr 24 hr	5376	254.37	249.37	251.37	249.37	2	1	326.89	2.01	5382	248.9	242.8	244.8	248.76		0	0	29.78	0	0
5397.1	10 yr 24 hr	5397	249.86	243.66	245.16	248.87	1.5	1	197.44	0.89	5382	248.9	241.9	243.4	248.76		12.7	12.72	9.21	1.37	2.32
5382.1	10 yr 24 hr	5382	248.9	240.7	244.7	248.76	4	1	107.72	0.58	5930	247.38	240.08	244.08	247.8		12.08	12.08	101.19	136.37	10.79
5930.1	10 yr 24 hr	5930	247.38	239.98	243.98	247.8	4	1	338.1	0.6	5306	245.34	237.94	241.94	244.88		12.07	12.07	103.61	133.72	10.59
5342.1	10 yr 24 hr	5342	258.42	252.42	253.92	252.42	1.5	1	405.29	3.47	5306	245.34	238.34	239.84	244.88		0	0	18.18	0	0
5304.1	10 yr 24 hr	5304	248.41	238.61	240.11	245.87	1.5	1	135.17	0.31	5305	245.39	238.19	239.69	244.98		12.1	12.1	5.44	8.81	4.87
5305.1	10 yr 24 hr	5305	245.39	238.09	239.59	244.98	1.5	1	22.39	0.67	5306	245.34	237.94	239.44	244.88		12.1	12.1	7.98	8.78	4.86
5306.1	10 yr 24 hr	5306	245.34	237.89	241.89	244.88	4	1	483.83	0.9	5897	239.69	233.52	237.52	239.39	asmd dn	12.08	12.08	126.76	145.39	11.53
5897.1	10 yr 24 hr	5897	239.69	233.52	237.52	239.39	4	1	17.38	0.86	5265	239.87	233.37	237.37	239.19	asmd up	12.08	12.08	123.91	145.19	11.53
5265.1	10 yr 24 hr	5265	239.87	233.17	237.17	239.19	4	1	12.9	0.78	5896	239.46	233.07	237.07	239.04	asmd dn	12.08	12.08	117.44	144.97	11.51
5896.1	10 yr 24 hr	5896	239.46	233.07	237.07	239.04	4	1	16.95	0.71	10432	239.65	232.95	236.95	238.85	asmd dn&	12.08	12.08	112.23	144.69	11.49
10432.1	10 yr 24 hr	10432	239.65	232.95	236.95	238.85	4	1	4.44	0.68	10433	239.14	232.92	236.92	238.8	asmd dn&	12.08	12.08	109.64	144.59	11.48
10433.1	10 yr 24 hr	10433	239.14	232.92	236.92	238.8	4	1	6.62	0.76	10434	239.02	232.87	236.87	238.73	asmd dn&	12.08	12.08	115.92	144.27	11.46
10434.1	10 yr 24 hr	10434	239.02	232.87	236.87	238.73	4	1	39.12	0.74	5898	238.49	232.58	236.58	238.28	asmd dn&	12.08	12.08	114.84	143.94	11.43
5898.1	10 yr 24 hr	5898	238.49	232.58	236.58	238.28	4	1	217.89	0.73	2358	237.13	230.98	234.98	235.82	asmd dn&	12.12	12.12	114.3	143.83	11.38
2358.1	10 yr 24 hr	2358	237.13	230.98	234.98	235.82	4	1	22.36	0.72	2072	237.02	230.82	234.82	235.59	asmd up	12.12	12.72	112.83	143.61	11.61
2039.1	10 yr 24 hr	2039	240.77	237.23	238.73	242.54	1.5	1	82.46	2.7	2042	239.83	235	236.5	238.82	asmd dn	12.92	12.92	16.04	21.72	12.11
2042.1	10 yr 24 hr	2042	239.83	235	236.5	238.82	1.5	1	103.85	2.92	2072	237.02	231.97	233.47	235.59	asmd up	12.93	12.93	16.66	21.72	12.2
2072.1	10 yr 24 hr	2072	237.02	230.82	234.82	235.59	4	1	41.82	1.72	5919	237.24	230.1	234.1	234.7	asmd dn&	12.23	12.23	175.01	202.89	15.52
5919.1	10 yr 24 hr	5919	237.24	230.1	234.1	234.7	4	1	96.54	0.84	1993	237.29	229.29	233.29	232.66	asmd dn&	12.23	12.23	122.18	202.88	15.62
1993.1	10 yr 24 hr	1993	237.29	229.29	233.29	232.66	4	1	63.92	2.33	1994	235.8	227.8	231.8	231.26		12.23	12.25	203.65	202.87	17.9

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WITHOUT NORTHEASTWEST WATERSHED PIPES - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
1994.1	10 yr 24 hr	1994	235.8	227.8	231.8	231.26	4	1	87.32	1.47	1998	232.52	226.52	230.52	228.43		12.23	12.23	161.49	202.86	18.47
1998.1	10 yr 24 hr	1998	232.52	226.52	230.52	228.43	4	1	9.62	10.91	1999	232.77	225.47	229.47	227.38		12.23	12.23	440.66	202.86	34.34
1999.1	10 yr 24 hr	1999	232.77	220.57	226.57	223.66	6	1	98.24	1.46	2044	229.24	219.14	225.14	222.4		12.27	12.3	474.46	235.91	15.97
5715.1	2 yr 24 hr	5715	287.43	281.83	283.33	283.39	1.5	1	31.1	0.51	5716	287.27	281.67	283.17	282.97		12.12	12.12	7	11.67	6.54
5716.1	2 yr 24 hr	5716	287.27	279.02	280.52	282.58	1.5	1	30.3	2.61	5717	286.93	278.23	279.73	282.16		12.13	12.02	15.75	11.65	8.74
5717.1	2 yr 24 hr	5717	286.93	278.03	279.33	282.16	1.3	1	210.6	2.16	5720	277.38	273.48	274.78	274.23		12.13	12.13	9.79	11.65	9.04
5720.1	2 yr 24 hr	5720	277.38	273.48	274.98	274.23	1.5	1	22.23	5.85	5719	277.78	272.18	273.68	272.93		12.13	12.13	23.59	11.66	13.3
5726.1	2 yr 24 hr	5726	281.91	274.01	275.51	280.18	1.5	1	167.53	1.09	5719	277.78	272.18	273.68	273.68		12.22	12.22	10.19	19.47	10.83
5719.1	2 yr 24 hr	5719	277.78	270.78	273.78	272.3	3	1	195.26	1.63	5708	274.63	267.6	270.6	269.12	asmd dn	12.13	12.15	79.04	40.41	11.24
5708.1	2 yr 24 hr	5708	274.63	267.5	271.5	268.88	4	1	176.36	1.42	5702	272.6	265	269	266.38	asmd up	12.13	12.15	158.81	40.47	10.56
5702.1	2 yr 24 hr	5702	272.6	264.9	268.9	266.19	4	1	93.87	2.02	5688	268.71	263	267	264.69	asmd dn	12.13	12.13	189.76	40.47	11.04
5688.1	2 yr 24 hr	5688	268.71	263	267	264.69	4	1	124.32	0.77	5612	270.14	262.04	266.04	263.9	asmd up	12.13	12.12	117.21	40.34	7.98
5612.1	2 yr 24 hr	5612	270.14	261.99	265.99	263.9	4	1	41.68	0.48	5611	269.89	261.79	265.79	263.75		12.15	12.12	92.4	40.19	7.05
5611.1	2 yr 24 hr	5611	269.89	261.74	264.74	263.75	3	1	11.82	2.2	5610	268.68	261.48	264.48	263.71		12.15	12.02	91.86	40.15	8.89
5610.1	2 yr 24 hr	5610	268.68	261.38	264.38	263.71	3	1	18.31	1.04	5609	268.24	261.19	264.19	263.67		12.15	12.05	63.09	40.09	7.41
5606.1	2 yr 24 hr	5606	274.58	267.48	268.98	268.2	1.5	1	192.25	3.01	5609	268.24	261.69	263.19	263.67		12.23	12.23	16.93	7.83	8.42
5646.1	2 yr 24 hr	5646	276.45	267.95	269.45	277.14	1.5	1	50.05	1.08	5645	275.16	267.41	268.91	275.42		12.62	12.62	10.13	19.07	10.46
5645.1	2 yr 24 hr	5645	275.16	267.36	268.86	275.42	1.5	1	383.02	1.44	5609	268.24	261.84	263.34	263.67		12.88	12.88	11.71	17.66	9.75
5609.1	2 yr 24 hr	5609	268.24	261.14	264.14	263.67	3	1	418.33	1.45	5547	261.76	255.06	258.06	257.59		12.18	12.25	74.67	76.45	12.04
5541.1	2 yr 24 hr	5541	270.84	266.14	267.64	267.21	1.5	1	312.88	3.22	5547	261.76	256.06	257.56	257.38		12.37	12.38	17.51	15.03	11.13
5575.1	2 yr 24 hr	5575	265.61	261.11	262.61	261.11	1.5	1	218.42	1.99	5547	261.76	256.76	258.26	257.38		0	0	13.77	0	0
5547.1	2 yr 24 hr	5547	261.76	254.96	258.46	257.38	3.5	1	6.12	-0.65	5546	261.1	255	258.5	257.28		12.18	12.18	75.53	94.53	13.42
5546.1	2 yr 24 hr	5546	261.1	255	258.5	257.28	3.5	1	225.24	1.85	5502	257.33	250.83	254.33	253.4		12.18	12.2	127.12	94.52	14.06
5502.1	2 yr 24 hr	5502	257.33	250.83	254.33	253.4	3.5	1	51.38	2.16	5929	257.22	249.72	253.22	252.75		12.18	12.33	137.32	94.47	12.46
5929.1	2 yr 24 hr	5929	257.22	249.72	253.22	252.75	3.5	1	127.69	0.92	5492	256.54	248.54	252.04	251.54		12.2	12.2	89.81	94.5	10.71
5512.1	2 yr 24 hr	5512	260.07	252.97	254.27	252.97	1.3	1	306.37	1.35	5492	256.54	248.84	250.14	250.9		0	0	7.73	0	0
5478.1	2 yr 24 hr	5478	264.05	251.95	253.45	251.95	1.5	1	254.81	0.71	5492	256.54	250.14	251.64	250.9		0	0	8.22	0	0
5492.1	2 yr 24 hr	5492	256.54	248.44	251.94	250.9	3.5	1	33.07	2.84	5909	256.2	247.5	251	250.35	asmd dn	12.18	12.2	157.51	102.91	14.04
5909.1	2 yr 24 hr	5909	256.2	247.5	251	250.35	3.5	1	59.49	0.84	5907	255.6	247	250.5	249.57	asmd dn&	12.18	12.18	85.65	102.89	12.4
5907.1	2 yr 24 hr	5907	255.6	247	250.5	249.57	3.5	1	256.26	1.55	5900	250.83	243.03	246.53	245.59	asmd up	12.2	12.2	116.28	102.79	13.65
5900.1	2 yr 24 hr	5900	250.83	242.73	246.23	245.46	3.5	1	108.2	1.78	5382	248.9	240.8	244.3	244.05		12.2	12.28	124.77	102.88	12.74
5376.1	2 yr 24 hr	5376	254.37	249.37	251.37	249.37	2	1	326.89	2.01	5382	248.9	242.8	244.8	244.05		0	0	29.78	0	0
5397.1	2 yr 24 hr	5397	249.86	243.66	245.16	244.05	1.5	1	197.44	0.89	5382	248.9	241.9	243.4	244.05		12.1	12.23	9.21	-0.27	0.6
5382.1	2 yr 24 hr	5382	248.9	240.7	244.7	244.05	4	1	107.72	0.58	5930	247.38	240.08	244.08	243.34		12.18	12.17	101.19	108.24	9.66
5930.1	2 yr 24 hr	5930	247.38	239.98	243.98	243.34	4	1	338.1	0.6	5306	245.34	237.94	241.94	241.09		12.2	12.22	103.61	108.31	9.69
5342.1	2 yr 24 hr	5342	258.42	252.42	253.92	252.42	1.5	1	405.29	3.47	5306	245.34	238.34	239.84	240.94		0	0	18.18	0	0
5304.1	2 yr 24 hr	5304	248.41	238.61	240.11	241.16	1.5	1	135.17	0.31	5305	245.39	238.19	239.69	240.96		12.12	12.12	5.44	4.37	2.46
5305.1	2 yr 24 hr	5305	245.39	238.09	239.59	240.96	1.5	1	22.39	0.67	5306	245.34	237.94	239.44	240.94		12.12	12.12	7.98	4.35	2.45
5306.1	2 yr 24 hr	5306	245.34	237.89	241.89	240.94	4	1	483.83	0.9	5897	239.69	233.52	237.52	236.62	asmd dn	12.2	12.22	126.76	117.15	11.4
5897.1	2 yr 24 hr	5897	239.69	233.52	237.52	236.62	4	1	17.38	0.86	5265	239.87	233.37	237.37	236.47	asmd up	12.22	12.22	123.91	117.06	11.21
5265.1	2 yr 24 hr	5265	239.87	233.17	237.17	236.47	4	1	12.9	0.78	5896	239.46	233.07	237.07	236.37	asmd dn	12.22	12.18	117.44	117.07	10.59
5896.1	2 yr 24 hr	5896	239.46	233.07	237.07	236.37	4	1	16.95	0.71	10432	239.65	232.95	236.95	236.24	asmd dn&	12.22	12.18	112.23	117.07	10.59
10432.1	2 yr 24 hr	10432	239.65	232.95	236.95	236.24	4	1	4.44	0.68	10433	239.14	232.92	236.92	236.2	asmd dn&	12.22	12.18	109.64	117.08	10.62
10433.1	2 yr 24 hr	10433	239.14	232.92	236.92	236.2	4	1	6.62	0.76	10434	239.02	232.87	236.87	236.15	asmd dn&	12.22	12.18	115.92	117.08	10.63
10434.1	2 yr 24 hr	10434	239.02	232.87	236.87	236.15	4	1	39.12	0.74	5898	238.49	232.58	236.58	235.85	asmd dn&	12.22	12.18	114.84	117.08	10.63
5898.1	2 yr 24 hr	5898	238.49	232.58	236.58	235.85	4	1	217.89	0.73	2358	237.13	230.98	234.98	234.13	asmd dn&	12.22	12.18	114.3	117.09	10.7
2358.1	2 yr 24 hr	2358	237.13	230.98	234.98	234.13	4	1	22.36	0.72	2072	237.02	230.82	234.82	233.94	asmd up	12.22	12.18	112.83	116.96	11.14
2039.1	2 yr 24 hr	2039	240.77	237.23	238.73	240.32	1.5	1	82.46	2.7	2042	239.83	235	236.5	237.3	asmd dn	12.55	12.55	16.04	18.78	10.56
2042.1	2 yr 24 hr	2042	239.83	235	236.5	237.3	1.5	1	103.85	2.92	2072	237.02	231.97	233.47	233.94	asmd up	12.55	12.73	16.66	18.78	10.74

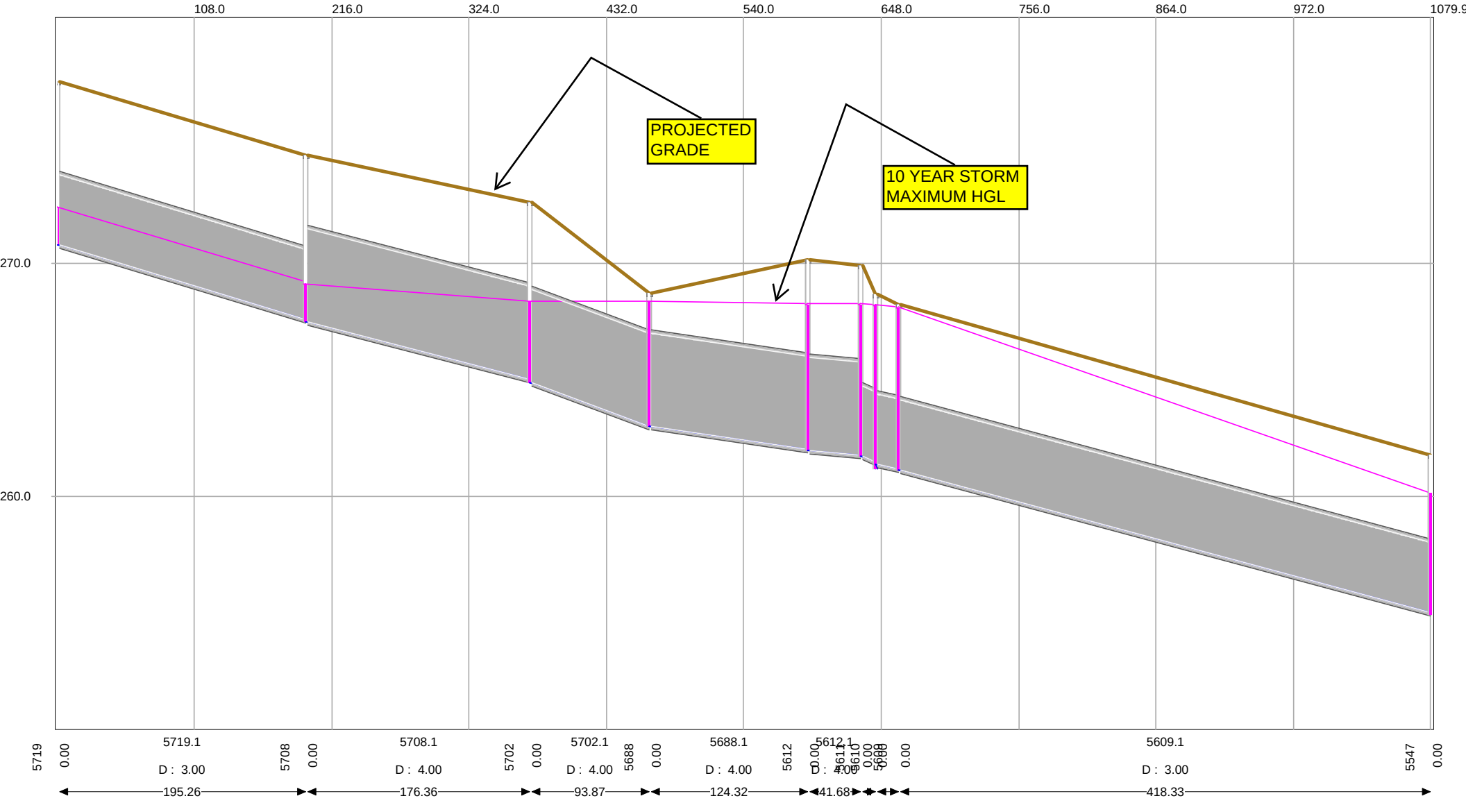
All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WITHOUT NORTHEASTWEST WATERSHED PIPES - TEN YEAR STORM

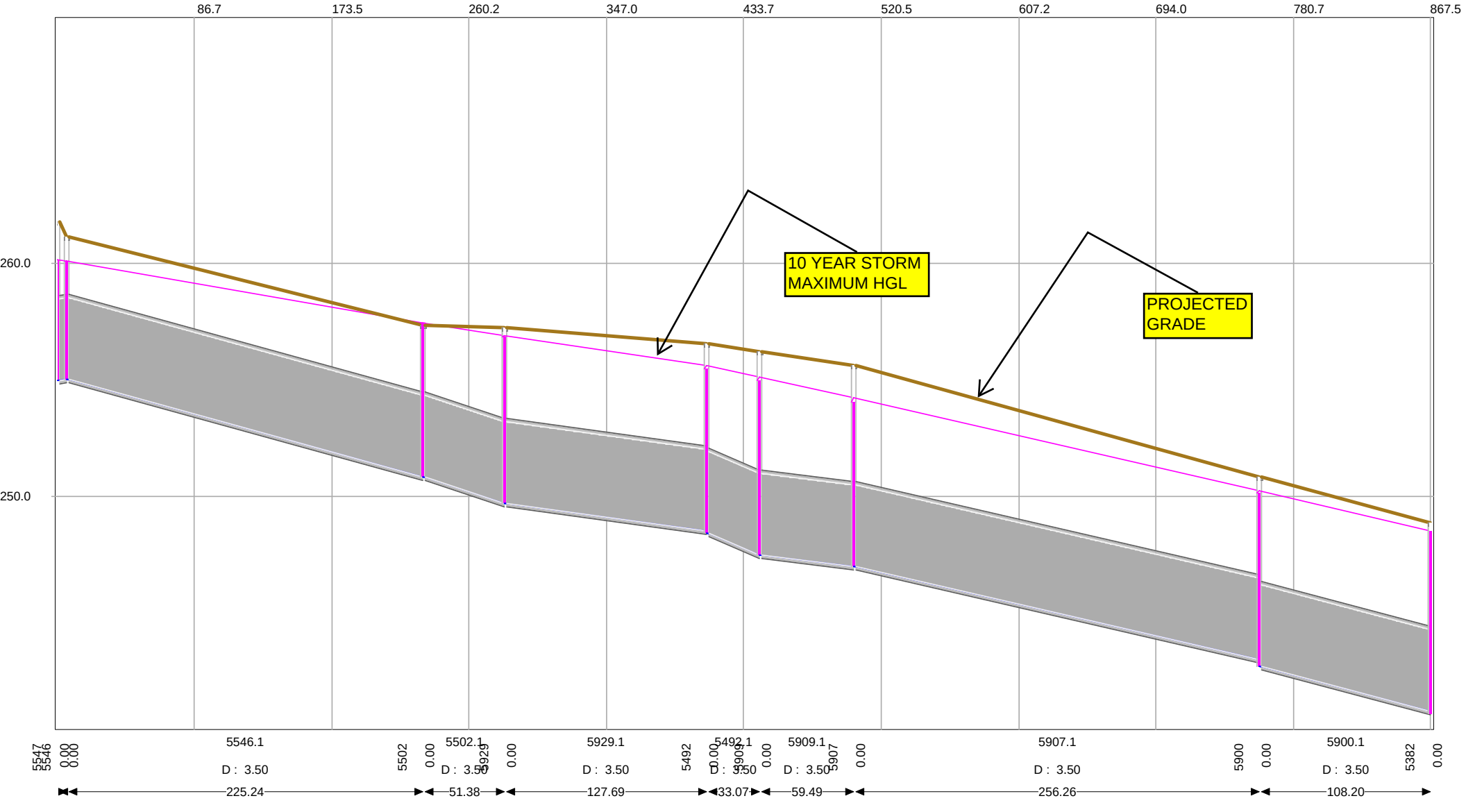
Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
2072.1	2 yr 24 hr	2072	237.02	230.82	234.82	233.94	4	1	41.82	1.72	5919	237.24	230.1	234.1	233.37	asmd dn&	12.23	12.25	175.01	149.77	14.18
5919.1	2 yr 24 hr	5919	237.24	230.1	234.1	233.37	4	1	96.54	0.84	1993	237.29	229.29	233.29	231.93	asmd dn&	12.23	12.23	122.18	149.8	13.92
1993.1	2 yr 24 hr	1993	237.29	229.29	233.29	231.93	4	1	63.92	2.33	1994	235.8	227.8	231.8	230.61		12.23	12.25	203.65	149.81	16.89
1994.1	2 yr 24 hr	1994	235.8	227.8	231.8	230.61	4	1	87.32	1.47	1998	232.52	226.52	230.52	228.13		12.23	12.23	161.49	149.81	16.73
1998.1	2 yr 24 hr	1998	232.52	226.52	230.52	228.13	4	1	9.62	10.91	1999	232.77	225.47	229.47	227.08		12.23	12.23	440.66	149.8	31.7
1999.1	2 yr 24 hr	1999	232.77	220.57	226.57	223.08	6	1	98.24	1.46	2044	229.24	219.14	225.14	221.78		12.25	12.25	474.46	166.31	14.78

All Pipes are Circular and have a Roughness of 0.014.

EAST BRANCH EVALUATION WITHOUT NORTHEASTWEST WATERSHED - NODE 5719-5547
Day [0] Time 00:01:00 Step 1



EAST BRANCH EVALUATION WITHOUT NORTHEASTWEST WATERSHED PIPES - NODES 5547-5382
Day [0] Time 00:01:00 Step 1



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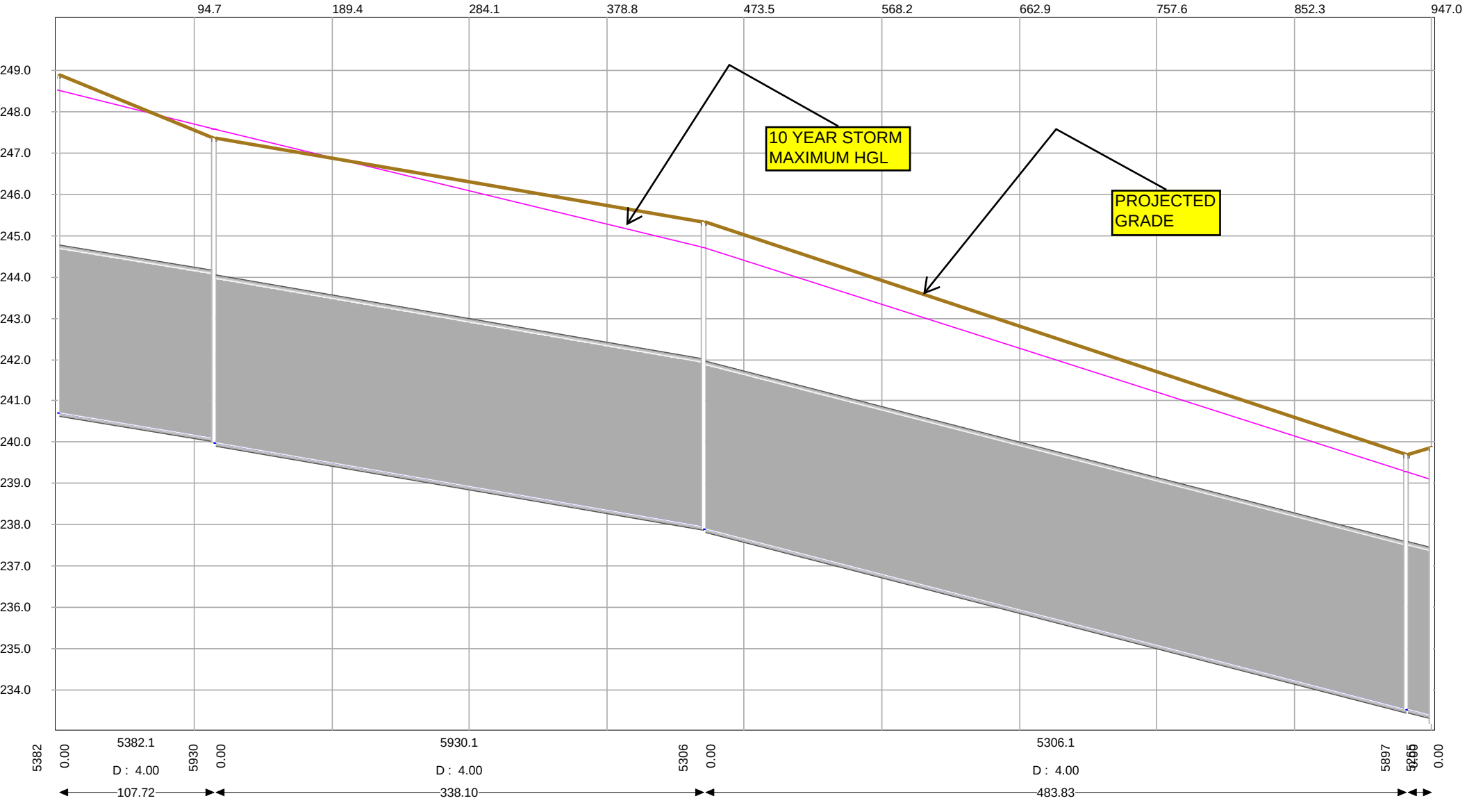
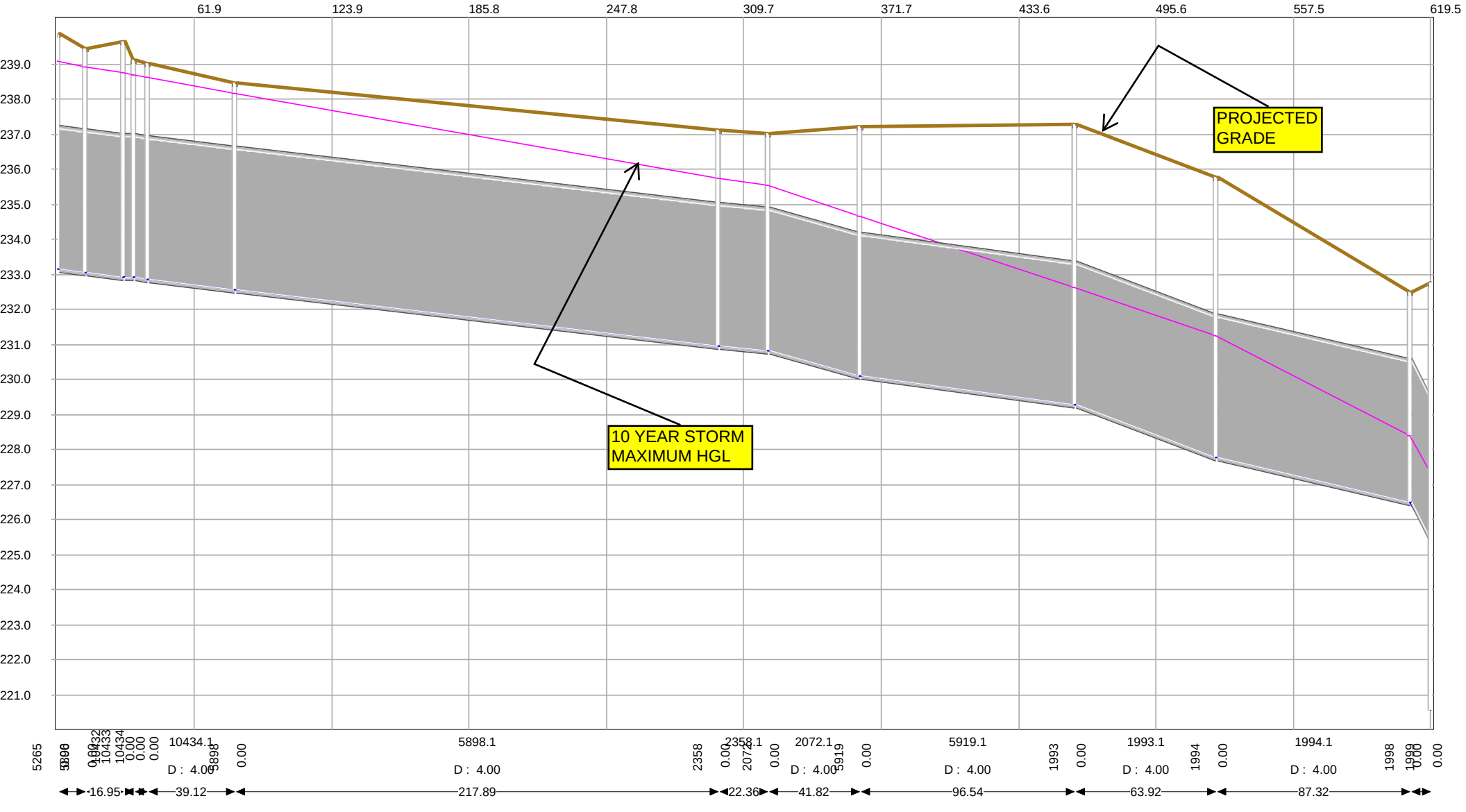
Day [0] Time 00:01:00 Step 1



EAST BRANCH EVALUATION WITHOUT NORTHEASTWEST WATERSHED PIPES - NODE 5265-1999

Day [0] Time 00:01:00 Step 1



ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WITHOUT NORTHEASTWEST WATERSHED PIPES - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5715.1	10 yr 24 hr	5715	287.43	281.83	283.33	287.84	1.5	1	31.1	0.51	5716	287.27	281.67	283.17	287.06		12.22	12.22	7	15.68	8.71
5716.1	10 yr 24 hr	5716	287.27	279.02	280.52	287.06	1.5	1	30.3	2.61	5717	286.93	278.23	279.73	286.32		12.22	11.92	15.75	15.68	8.75
5717.1	10 yr 24 hr	5717	286.93	278.03	279.33	286.32	1.3	1	210.6	2.16	5720	277.38	273.48	274.78	274.37		12.22	12.22	9.79	15.68	11.76
5720.1	10 yr 24 hr	5720	277.38	273.48	274.98	274.37	1.5	1	22.23	5.85	5719	277.78	272.18	273.68	273.07		12.22	12.23	23.59	15.68	14.28
5726.1	10 yr 24 hr	5726	281.91	274.01	275.51	282.71	1.5	1	167.53	1.09	5719	277.78	272.18	273.68	273.68		12.35	12.35	10.19	23.13	12.74
5719.1	10 yr 24 hr	5719	277.78	270.78	273.78	272.75	3	1	195.26	1.63	5708	274.63	267.6	270.6	269.76	asmd dn	12.08	12.07	79.04	59.57	12.24
5708.1	10 yr 24 hr	5708	274.63	267.5	271.5	269.76	4	1	176.36	1.42	5702	272.6	265	269	269.93	asmd up	12.08	12.03	158.81	60.75	11.48
5702.1	10 yr 24 hr	5702	272.6	264.9	268.9	269.93	4	1	93.87	2.02	5688	268.71	263	267	269.83	asmd dn	12.08	12.02	189.76	60	11.39
5688.1	10 yr 24 hr	5688	268.71	263	267	269.83	4	1	124.32	0.77	5612	270.14	262.04	266.04	269.7	asmd up	12.08	11.98	117.21	59.94	8.06
5612.1	10 yr 24 hr	5612	270.14	261.99	265.99	269.7	4	1	41.68	0.48	5611	269.89	261.79	265.79	269.66		12.08	11.98	92.4	59.91	7.1
5611.1	10 yr 24 hr	5611	269.89	261.74	264.74	269.66	3	1	11.82	2.2	5610	268.68	261.48	264.48	269.61		12.08	11.98	91.86	59.9	8.61
5610.1	10 yr 24 hr	5610	268.68	261.38	264.38	269.61	3	1	18.31	1.04	5609	268.24	261.19	264.19	269.52		12.08	12.08	63.09	57	7.99
5606.1	10 yr 24 hr	5606	274.58	267.48	268.98	274.33	1.5	1	192.25	3.01	5609	268.24	261.69	263.19	269.52		12.22	12.22	16.93	16	8.85
5646.1	10 yr 24 hr	5646	276.45	267.95	269.45	278.62	1.5	1	50.05	1.08	5645	275.16	267.41	268.91	276.57		12.78	12.78	10.13	21.34	11.63
5645.1	10 yr 24 hr	5645	275.16	267.36	268.86	276.57	1.5	1	383.02	1.44	5609	268.24	261.84	263.34	269.52		13.55	13.55	11.71	18.54	10.19
5609.1	10 yr 24 hr	5609	268.24	261.14	264.14	269.52	3	1	418.33	1.45	5547	261.76	255.06	258.06	261.46		12.05	12.05	74.67	89.99	12.64
5541.1	10 yr 24 hr	5541	270.84	266.14	267.64	271.91	1.5	1	312.88	3.22	5547	261.76	256.06	257.56	261.46		12.68	12.68	17.51	21.12	11.76
5575.1	10 yr 24 hr	5575	265.61	261.11	262.61	261.48	1.5	1	218.42	1.99	5547	261.76	256.76	258.26	261.46		12.15	12.53	13.77	-0.18	0.62
5547.1	10 yr 24 hr	5547	261.76	254.96	258.46	261.46	3.5	1	6.12	-0.65	5546	261.1	255	258.5	261.37		12.15	12.03	75.53	118.97	13.72
5546.1	10 yr 24 hr	5546	261.1	255	258.5	261.37	3.5	1	225.24	1.85	5502	257.33	250.83	254.33	258.19		12.1	12.02	127.12	115.32	14.1
5502.1	10 yr 24 hr	5502	257.33	250.83	254.33	258.19	3.5	1	51.38	2.16	5929	257.22	249.72	253.22	257.47		12.53	12.53	137.32	121.72	12.57
5929.1	10 yr 24 hr	5929	257.22	249.72	253.22	257.47	3.5	1	127.69	0.92	5492	256.54	248.54	252.04	255.9		12.62	12.62	89.81	127.66	13.17
5512.1	10 yr 24 hr	5512	260.07	252.97	254.27	257.56	1.3	1	306.37	1.35	5492	256.54	248.84	250.14	255.9		12.07	12.68	7.73	-3.96	3.68
5478.1	10 yr 24 hr	5478	264.05	251.95	253.45	257.4	1.5	1	254.81	0.71	5492	256.54	250.14	251.64	255.9		12.07	12.68	8.22	2.9	3.08
5492.1	10 yr 24 hr	5492	256.54	248.44	251.94	255.9	3.5	1	33.07	2.84	5909	256.2	247.5	251	255.39	asmd dn	12.62	12	157.51	129.42	13.91
5909.1	10 yr 24 hr	5909	256.2	247.5	251	255.39	3.5	1	59.49	0.84	5907	255.6	247	250.5	254.46	asmd dn&	12.63	12.65	85.65	127.88	13.22
5907.1	10 yr 24 hr	5907	255.6	247	250.5	254.46	3.5	1	256.26	1.55	5900	250.83	243.03	246.53	250.45	asmd up	12.67	12.67	116.28	129.25	13.37
5900.1	10 yr 24 hr	5900	250.83	242.73	246.23	250.45	3.5	1	108.2	1.78	5382	248.9	240.8	244.3	248.76		12.65	12.65	124.77	128.91	13.35
5376.1	10 yr 24 hr	5376	254.37	249.37	251.37	249.37	2	1	326.89	2.01	5382	248.9	242.8	244.8	248.76		0	0	29.78	0	0
5397.1	10 yr 24 hr	5397	249.86	243.66	245.16	248.87	1.5	1	197.44	0.89	5382	248.9	241.9	243.4	248.76		12.7	12.72	9.21	1.37	2.32
5382.1	10 yr 24 hr	5382	248.9	240.7	244.7	248.76	4	1	107.72	0.58	5930	247.38	240.08	244.08	247.8		12.08	12.08	101.19	136.37	10.79
5930.1	10 yr 24 hr	5930	247.38	239.98	243.98	247.8	4	1	338.1	0.6	5306	245.34	237.94	241.94	244.88		12.07	12.07	103.61	133.72	10.59
5342.1	10 yr 24 hr	5342	258.42	252.42	253.92	252.42	1.5	1	405.29	3.47	5306	245.34	238.34	239.84	244.88		0	0	18.18	0	0
5304.1	10 yr 24 hr	5304	248.41	238.61	240.11	245.87	1.5	1	135.17	0.31	5305	245.39	238.19	239.69	244.98		12.1	12.1	5.44	8.81	4.87
5305.1	10 yr 24 hr	5305	245.39	238.09	239.59	244.98	1.5	1	22.39	0.67	5306	245.34	237.94	239.44	244.88		12.1	12.1	7.98	8.78	4.86
5306.1	10 yr 24 hr	5306	245.34	237.89	241.89	244.88	4	1	483.83	0.9	5897	239.69	233.52	237.52	239.39	asmd dn	12.08	12.08	126.76	145.39	11.53
5897.1	10 yr 24 hr	5897	239.69	233.52	237.52	239.39	4	1	17.38	0.86	5265	239.87	233.37	237.37	239.19	asmd up	12.08	12.08	123.91	145.19	11.53
5265.1	10 yr 24 hr	5265	239.87	233.17	237.17	239.19	4	1	12.9	0.78	5896	239.46	233.07	237.07	239.04	asmd dn	12.08	12.08	117.44	144.97	11.51
5896.1	10 yr 24 hr	5896	239.46	233.07	237.07	239.04	4	1	16.95	0.71	10432	239.65	232.95	236.95	238.85	asmd dn&	12.08	12.08	112.23	144.69	11.49
10432.1	10 yr 24 hr	10432	239.65	232.95	236.95	238.85	4	1	4.44	0.68	10433	239.14	232.92	236.92	238.8	asmd dn&	12.08	12.08	109.64	144.59	11.48
10433.1	10 yr 24 hr	10433	239.14	232.92	236.92	238.8	4	1	6.62	0.76	10434	239.02	232.87	236.87	238.73	asmd dn&	12.08	12.08	115.92	144.27	11.46
10434.1	10 yr 24 hr	10434	239.02	232.87	236.87	238.73	4	1	39.12	0.74	5898	238.49	232.58	236.58	238.28	asmd dn&	12.08	12.08	114.84	143.94	11.43
5898.1	10 yr 24 hr	5898	238.49	232.58	236.58	238.28	4	1	217.89	0.73	2358	237.13	230.98	234.98	235.82	asmd dn&	12.12	12.12	114.3	143.83	11.38
2358.1	10 yr 24 hr	2358	237.13	230.98	234.98	235.82	4	1	22.36	0.72	2072	237.02	230.82	234.82	235.59	asmd up	12.12	12.72	112.83	143.61	11.61
2039.1	10 yr 24 hr	2039	240.77	237.23	238.73	242.54	1.5	1	82.46	2.7	2042	239.83	235	236.5	238.82	asmd dn	12.92	12.92	16.04	21.72	12.11
2042.1	10 yr 24 hr	2042	239.83	235	236.5	238.82	1.5	1	103.85	2.92	2072	237.02	231.97	233.47	235.59	asmd up	12.93	12.93	16.66	21.72	12.2
2072.1	10 yr 24 hr	2072	237.02	230.82	234.82	235.59	4	1	41.82	1.72	5919	237.24	230.1	234.1	234.7	asmd dn&	12.23	12.23	175.01	202.89	15.52
5919.1	10 yr 24 hr	5919	237.24	230.1	234.1	234.7	4	1	96.54	0.84	1993	237.29	229.29	233.29	232.66	asmd dn&	12.23	12.23	122.18	202.88	15.62
1993.1	10 yr 24 hr	1993	237.29	229.29	233.29	232.66	4	1	63.92	2.33	1994	235.8	227.8	231.8	231.26		12.23	12.25	203.65	202.87	17.9

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WITHOUT NORTHEASTWEST WATERSHED PIPES - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
1994.1	10 yr 24 hr	1994	235.8	227.8	231.8	231.26	4	1	87.32	1.47	1998	232.52	226.52	230.52	228.43		12.23	12.23	161.49	202.86	18.47
1998.1	10 yr 24 hr	1998	232.52	226.52	230.52	228.43	4	1	9.62	10.91	1999	232.77	225.47	229.47	227.38		12.23	12.23	440.66	202.86	34.34
1999.1	10 yr 24 hr	1999	232.77	220.57	226.57	223.66	6	1	98.24	1.46	2044	229.24	219.14	225.14	222.4		12.27	12.3	474.46	235.91	15.97
5715.1	2 yr 24 hr	5715	287.43	281.83	283.33	283.39	1.5	1	31.1	0.51	5716	287.27	281.67	283.17	282.97		12.12	12.12	7	11.67	6.54
5716.1	2 yr 24 hr	5716	287.27	279.02	280.52	282.58	1.5	1	30.3	2.61	5717	286.93	278.23	279.73	282.16		12.13	12.02	15.75	11.65	8.74
5717.1	2 yr 24 hr	5717	286.93	278.03	279.33	282.16	1.3	1	210.6	2.16	5720	277.38	273.48	274.78	274.23		12.13	12.13	9.79	11.65	9.04
5720.1	2 yr 24 hr	5720	277.38	273.48	274.98	274.23	1.5	1	22.23	5.85	5719	277.78	272.18	273.68	272.93		12.13	12.13	23.59	11.66	13.3
5726.1	2 yr 24 hr	5726	281.91	274.01	275.51	280.18	1.5	1	167.53	1.09	5719	277.78	272.18	273.68	273.68		12.22	12.22	10.19	19.47	10.83
5719.1	2 yr 24 hr	5719	277.78	270.78	273.78	272.3	3	1	195.26	1.63	5708	274.63	267.6	270.6	269.12	asmd dn	12.13	12.15	79.04	40.41	11.24
5708.1	2 yr 24 hr	5708	274.63	267.5	271.5	268.88	4	1	176.36	1.42	5702	272.6	265	269	266.38	asmd up	12.13	12.15	158.81	40.47	10.56
5702.1	2 yr 24 hr	5702	272.6	264.9	268.9	266.19	4	1	93.87	2.02	5688	268.71	263	267	264.69	asmd dn	12.13	12.13	189.76	40.47	11.04
5688.1	2 yr 24 hr	5688	268.71	263	267	264.69	4	1	124.32	0.77	5612	270.14	262.04	266.04	263.9	asmd up	12.13	12.12	117.21	40.34	7.98
5612.1	2 yr 24 hr	5612	270.14	261.99	265.99	263.9	4	1	41.68	0.48	5611	269.89	261.79	265.79	263.75		12.15	12.12	92.4	40.19	7.05
5611.1	2 yr 24 hr	5611	269.89	261.74	264.74	263.75	3	1	11.82	2.2	5610	268.68	261.48	264.48	263.71		12.15	12.02	91.86	40.15	8.89
5610.1	2 yr 24 hr	5610	268.68	261.38	264.38	263.71	3	1	18.31	1.04	5609	268.24	261.19	264.19	263.67		12.15	12.05	63.09	40.09	7.41
5606.1	2 yr 24 hr	5606	274.58	267.48	268.98	268.2	1.5	1	192.25	3.01	5609	268.24	261.69	263.19	263.67		12.23	12.23	16.93	7.83	8.42
5646.1	2 yr 24 hr	5646	276.45	267.95	269.45	277.14	1.5	1	50.05	1.08	5645	275.16	267.41	268.91	275.42		12.62	12.62	10.13	19.07	10.46
5645.1	2 yr 24 hr	5645	275.16	267.36	268.86	275.42	1.5	1	383.02	1.44	5609	268.24	261.84	263.34	263.67		12.88	12.88	11.71	17.66	9.75
5609.1	2 yr 24 hr	5609	268.24	261.14	264.14	263.67	3	1	418.33	1.45	5547	261.76	255.06	258.06	257.59		12.18	12.25	74.67	76.45	12.04
5541.1	2 yr 24 hr	5541	270.84	266.14	267.64	267.21	1.5	1	312.88	3.22	5547	261.76	256.06	257.56	257.38		12.37	12.38	17.51	15.03	11.13
5575.1	2 yr 24 hr	5575	265.61	261.11	262.61	261.11	1.5	1	218.42	1.99	5547	261.76	256.76	258.26	257.38		0	0	13.77	0	0
5547.1	2 yr 24 hr	5547	261.76	254.96	258.46	257.38	3.5	1	6.12	-0.65	5546	261.1	255	258.5	257.28		12.18	12.18	75.53	94.53	13.42
5546.1	2 yr 24 hr	5546	261.1	255	258.5	257.28	3.5	1	225.24	1.85	5502	257.33	250.83	254.33	253.4		12.18	12.2	127.12	94.52	14.06
5502.1	2 yr 24 hr	5502	257.33	250.83	254.33	253.4	3.5	1	51.38	2.16	5929	257.22	249.72	253.22	252.75		12.18	12.33	137.32	94.47	12.46
5929.1	2 yr 24 hr	5929	257.22	249.72	253.22	252.75	3.5	1	127.69	0.92	5492	256.54	248.54	252.04	251.54		12.2	12.2	89.81	94.5	10.71
5512.1	2 yr 24 hr	5512	260.07	252.97	254.27	252.97	1.3	1	306.37	1.35	5492	256.54	248.84	250.14	250.9		0	0	7.73	0	0
5478.1	2 yr 24 hr	5478	264.05	251.95	253.45	251.95	1.5	1	254.81	0.71	5492	256.54	250.14	251.64	250.9		0	0	8.22	0	0
5492.1	2 yr 24 hr	5492	256.54	248.44	251.94	250.9	3.5	1	33.07	2.84	5909	256.2	247.5	251	250.35	asmd dn	12.18	12.2	157.51	102.91	14.04
5909.1	2 yr 24 hr	5909	256.2	247.5	251	250.35	3.5	1	59.49	0.84	5907	255.6	247	250.5	249.57	asmd dn&	12.18	12.18	85.65	102.89	12.4
5907.1	2 yr 24 hr	5907	255.6	247	250.5	249.57	3.5	1	256.26	1.55	5900	250.83	243.03	246.53	245.59	asmd up	12.2	12.2	116.28	102.79	13.65
5900.1	2 yr 24 hr	5900	250.83	242.73	246.23	245.46	3.5	1	108.2	1.78	5382	248.9	240.8	244.3	244.05		12.2	12.28	124.77	102.88	12.74
5376.1	2 yr 24 hr	5376	254.37	249.37	251.37	249.37	2	1	326.89	2.01	5382	248.9	242.8	244.8	244.05		0	0	29.78	0	0
5397.1	2 yr 24 hr	5397	249.86	243.66	245.16	244.05	1.5	1	197.44	0.89	5382	248.9	241.9	243.4	244.05		12.1	12.23	9.21	-0.27	0.6
5382.1	2 yr 24 hr	5382	248.9	240.7	244.7	244.05	4	1	107.72	0.58	5930	247.38	240.08	244.08	243.34		12.18	12.17	101.19	108.24	9.66
5930.1	2 yr 24 hr	5930	247.38	239.98	243.98	243.34	4	1	338.1	0.6	5306	245.34	237.94	241.94	241.09		12.2	12.22	103.61	108.31	9.69
5342.1	2 yr 24 hr	5342	258.42	252.42	253.92	252.42	1.5	1	405.29	3.47	5306	245.34	238.34	239.84	240.94		0	0	18.18	0	0
5304.1	2 yr 24 hr	5304	248.41	238.61	240.11	241.16	1.5	1	135.17	0.31	5305	245.39	238.19	239.69	240.96		12.12	12.12	5.44	4.37	2.46
5305.1	2 yr 24 hr	5305	245.39	238.09	239.59	240.96	1.5	1	22.39	0.67	5306	245.34	237.94	239.44	240.94		12.12	12.12	7.98	4.35	2.45
5306.1	2 yr 24 hr	5306	245.34	237.89	241.89	240.94	4	1	483.83	0.9	5897	239.69	233.52	237.52	236.62	asmd dn	12.2	12.22	126.76	117.15	11.4
5897.1	2 yr 24 hr	5897	239.69	233.52	237.52	236.62	4	1	17.38	0.86	5265	239.87	233.37	237.37	236.47	asmd up	12.22	12.22	123.91	117.06	11.21
5265.1	2 yr 24 hr	5265	239.87	233.17	237.17	236.47	4	1	12.9	0.78	5896	239.46	233.07	237.07	236.37	asmd dn	12.22	12.18	117.44	117.07	10.59
5896.1	2 yr 24 hr	5896	239.46	233.07	237.07	236.37	4	1	16.95	0.71	10432	239.65	232.95	236.95	236.24	asmd dn&	12.22	12.18	112.23	117.07	10.59
10432.1	2 yr 24 hr	10432	239.65	232.95	236.95	236.24	4	1	4.44	0.68	10433	239.14	232.92	236.92	236.2	asmd dn&	12.22	12.18	109.64	117.08	10.62
10433.1	2 yr 24 hr	10433	239.14	232.92	236.92	236.2	4	1	6.62	0.76	10434	239.02	232.87	236.87	236.15	asmd dn&	12.22	12.18	115.92	117.08	10.63
10434.1	2 yr 24 hr	10434	239.02	232.87	236.87	236.15	4	1	39.12	0.74	5898	238.49	232.58	236.58	235.85	asmd dn&	12.22	12.18	114.84	117.08	10.63
5898.1	2 yr 24 hr	5898	238.49	232.58	236.58	235.85	4	1	217.89	0.73	2358	237.13	230.98	234.98	234.13	asmd dn&	12.22	12.18	114.3	117.09	10.7
2358.1	2 yr 24 hr	2358	237.13	230.98	234.98	234.13	4	1	22.36	0.72	2072	237.02	230.82	234.82	233.94	asmd up	12.22	12.18	112.83	116.96	11.14
2039.1	2 yr 24 hr	2039	240.77	237.23	238.73	240.32	1.5	1	82.46	2.7	2042	239.83	235	236.5	237.3	asmd dn	12.55	12.55	16.04	18.78	10.56
2042.1	2 yr 24 hr	2042	239.83	235	236.5	237.3	1.5	1	103.85	2.92	2072	237.02	231.97	233.47	233.94	asmd up	12.55	12.73	16.66	18.78	10.74

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION EAST BRANCH WITHOUT NORTHEASTWEST WATERSHED PIPES - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
2072.1	2 yr 24 hr	2072	237.02	230.82	234.82	233.94	4	1	41.82	1.72	5919	237.24	230.1	234.1	233.37	asmd dn&	12.23	12.25	175.01	149.77	14.18
5919.1	2 yr 24 hr	5919	237.24	230.1	234.1	233.37	4	1	96.54	0.84	1993	237.29	229.29	233.29	231.93	asmd dn&	12.23	12.23	122.18	149.8	13.92
1993.1	2 yr 24 hr	1993	237.29	229.29	233.29	231.93	4	1	63.92	2.33	1994	235.8	227.8	231.8	230.61		12.23	12.25	203.65	149.81	16.89
1994.1	2 yr 24 hr	1994	235.8	227.8	231.8	230.61	4	1	87.32	1.47	1998	232.52	226.52	230.52	228.13		12.23	12.23	161.49	149.81	16.73
1998.1	2 yr 24 hr	1998	232.52	226.52	230.52	228.13	4	1	9.62	10.91	1999	232.77	225.47	229.47	227.08		12.23	12.23	440.66	149.8	31.7
1999.1	2 yr 24 hr	1999	232.77	220.57	226.57	223.08	6	1	98.24	1.46	2044	229.24	219.14	225.14	221.78		12.25	12.25	474.46	166.31	14.78

All Pipes are Circular and have a Roughness of 0.014.

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SECTION 3F

EAST BRANCH
NORTH OF ROSEWOOD
CONCEPTUAL IMPROVEMENTS

East Branch Watershed (North of Rosewood Drive Conceptual Improvements)

In the absence of a complete design for the direct remedies for the "backbone" drainage collection/conveyance system between Walker Street and Ravenel Street or for the parallel collection/conveyance system installation it is difficult to project anticipated costs. But the following is a general outline of the scopes of work anticipated in conjunction with the direct remedies and the parallel installation.

- Parallel installation of new drainage collection/conveyance system from the south side of the Rosewood Drive corridor to the north side of the Devine Street corridor, generally along the Ott Road corridor (approximately 4,000 feet)
- In place remedies for portions of the "backbone" drainage collection/conveyance system between Walker Street and Ravenel Street, including replacement of certain existing pipes and drainage structures and rerouting existing pipes that conflict with existing building structures
- Installation of replacement water mains and appurtenances along the route of the parallel installation of new drainage collection/conveyance system
- Installation of replacement sanitary sewer mains and appurtenances along the route of the parallel installation of new drainage collection/conveyance system
- Repairs associated with natural gas mains and services, telephone lines and services and CATV lines and services along the route of the parallel installation of new drainage collection/conveyance system
- Landscape repairs in construction areas

For the purposes of budgeting the contemplated remedies described previously have been expanded to include further detailed descriptions of work, including anticipated/projected costs, with the end result being an approximate cost per foot. These detailed descriptions are open for further discussion and comparison to comparable City of Columbia project costs. Those discussions and comparisons may result in significant modifications to the approximated costs.

See the descriptions on the following pages for further information and basis for the budget costs.

Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
New 54” diameter RCP	$100 per foot	$100
Installation of New 54” diameter RCP; includes haul off of excavated material since flowable fill will be required by SCDOT; also includes steel traffic plates 100’ in advance of pavement patch	$75 per foot	$75
New drainage structures; estimate five (5) per 400’ of pipe or per City block	$6000 each	$75
Traffic Control	Allowance	$10
Estimate eight (8) foot wide trench with average depth of ten (10) feet for flowable fill quantity (minus pipe cross section based on OD)	$85 per cubic yard	$185
Saw cut of existing pavement and removal of pavement (saw cut along both sides of installation)	$10 per foot	$10
Assume SCDOT will require 8” full depth asphalt patch over eight (8) foot wide trench	$50 per square yard	$45
Assume SCDOT will require 1-1/2” asphalt overlay over patched streets	$15 per square yard	$45
Assume removal and replacement of curb and gutter along one side of street for every foot of pipe	$15 per foot	$15
Allowance for water service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	$25 per foot	$25
*Allowance for sanitary sewer service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	$25 per foot	$25
Allowance for landscape repairs (equates to $10,000.00 per City block using 400’ block)	$25 per foot	$25
Approximate cost per foot of parallel drainage corridor (along Ott Road from Rosewood Drive to Devine Street)	**$635**	

Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
New 8” diameter water line	$15 per foot	$15
Installation of new 8” diameter water line; includes haul off of excavated material since flowable fill will be required by SCDOT; also includes steel traffic plates 100’ in advance of pavement patch	$15 per foot	$15
New fire hydrants, valves & fittings; per 400’ of pipe or per City block	$8,000	$20
Traffic Control	Allowance	$5
Estimate four (4) foot wide trench with average depth of four (4) feet for flowable fill quantity	$85 per cubic yard	$50
Saw cut of existing pavement and removal of pavement (saw cut along both sides of installation)	$5 per foot	$5
Assume SCDOT will require 8” full depth asphalt patch over four (4) foot wide trench	$50 per square yard	$22
Assume SCDOT will require 1-1/2” asphalt overlay over patched streets	Covered by storm drainage install	$0
Assume removal and replacement of curb and gutter along one side of street for every foot of pipe	$15 per foot	$15
Allowance for water service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
*Allowance for sanitary sewer service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
Allowance for landscape repairs (equates to $4,000.00 per City block using 400’ block)	$10 per foot	$10
Approximate cost of water main installation per foot of parallel drainage corridor (along Ott Road from Rosewood Drive to Devine Street). It is assumed that water main replacement will be required for approximately ½ of the parallel installation route.	**$157**	

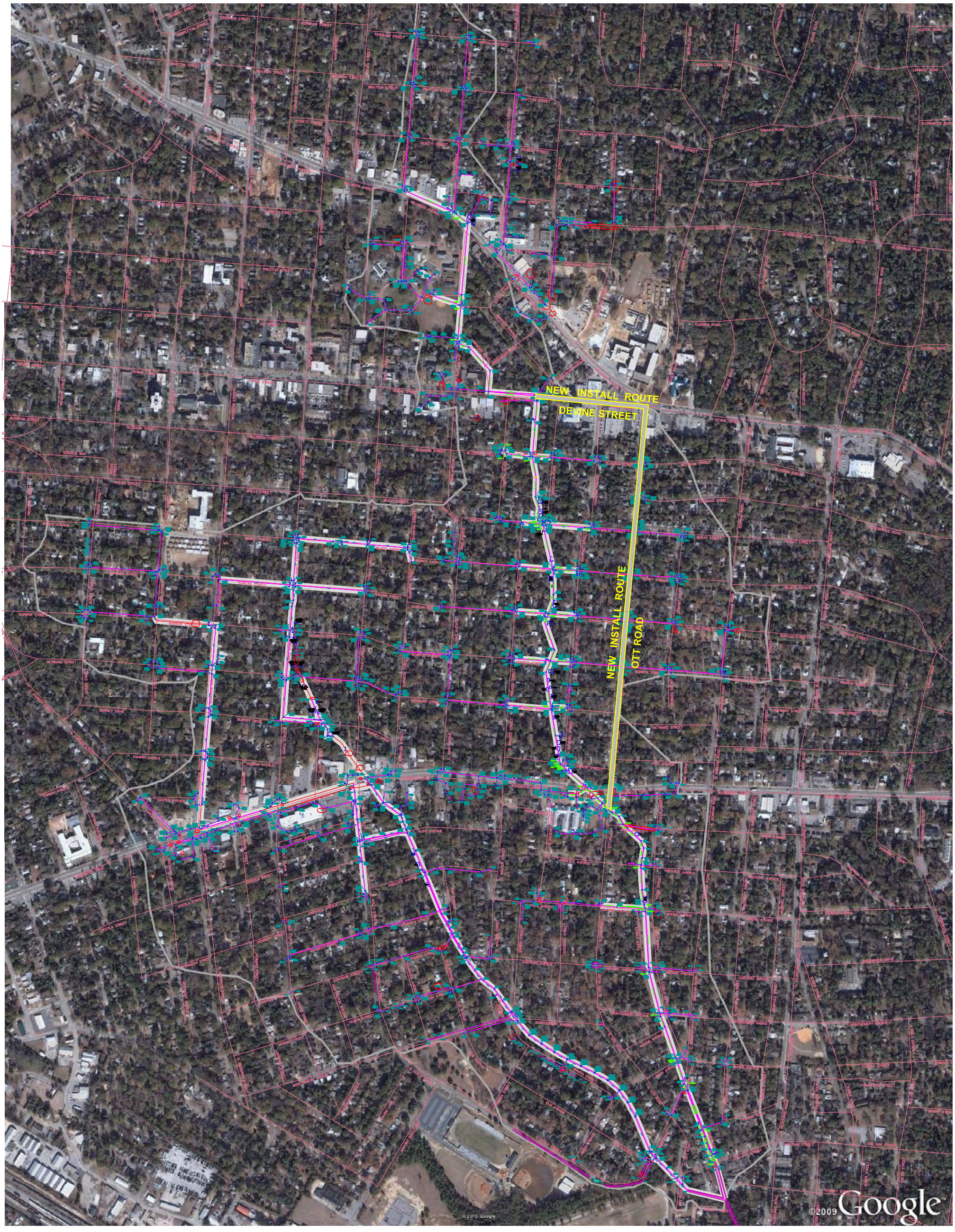
Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
New 8” diameter sanitary sewer line	$15 per foot	$15
Installation of new 8” diameter sanitary sewer line; includes haul off of excavated material since flowable fill will be required by SCDOT; also includes steel traffic plates 100’ in advance of pavement patch	$25 per foot	$25
New manholes; estimate three (3) per 400’ of pipe or per City block	$9,000	$22
Traffic Control	Allowance	$5
Estimate six (6) foot wide trench with average depth of eight (8) feet for flowable fill quantity	$85 per cubic yard	$150
Saw cut of existing pavement and removal of pavement (saw cut along both sides of installation)	$5 per foot	$5
Assume SCDOT will require 8” full depth asphalt patch over six (6) foot wide trench	$50 per square yard	$33
Assume SCDOT will require 1-1/2” asphalt overlay over patched streets	Covered by storm drainage install	$0
Assume removal and replacement of curb and gutter along one side of street for every foot of pipe	Covered by water & storm drainage install	$0
Allowance for water service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
*Allowance for sanitary sewer service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
Allowance for landscape repairs (equates to $4,000.00 per City block using 400’ block)	$10 per foot	$10
Approximate cost of sanitary sewer main installation per foot of parallel drainage corridor (along Ott Road from Rosewood Drive to Devine Street). It is assumed that sanitary sewer main replacement will be required for approximately ½ of the parallel installation route.	**$265**	

Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
Natural gas, electric, telephone and CATV service impacts	$300,000.00 Allowance	$75
Rosewood Drive crossing	$300,000.00 Allowance	$75
Approximate cost of natural gas, electric, telephone and CATV service repairs and Rosewood Drive crossing per foot of parallel drainage corridor (along Ott Road from Rosewood Drive to Devine Street)	**$150**	

Based on the work scopes, projected unit costs and allowances as described in the preceding outline, the anticipated/projected cost per foot for installation of the parallel drainage corridor (along Ott Road from Rosewood Drive to Devine Street) is approximately $635 + ($157 x ½) + ($265 x ½) + $150 = $1000 per foot. Using the 4,000 foot long projected route the anticipated/projected cost to install the parallel drainage is approximately $4 million. An additional 500' of parallel installation may be required along Devine Street, adding another $0.5 million to the anticipated/projected cost. It is also recommended that an additional 10% be added to the anticipated/projected cost to pay for remedial work for portions of the backbone drainage system situated in the corridor between Walker Street and Ravenel Street. Including that additional 10% brings the anticipated/projected cost of remedies for the **east branch watershed** to approximately $5 million.

This is an Opinion of Probable Construction Costs (OPCC) only and this OPCC was developed without control of the costs or the price of labor, equipment or materials, or the ultimate bidder's (contractor's) methods of pricing. In addition, this OPCC was developed without the benefit of final construction documents. As a result of these considerations, proposals based on final design and received through the competitive bidding process may vary significantly from this OPCC.

Certain items are not included in this OPCC. Some of the items not included are: (1) the cost of permanent and/or construction easements; (2) cost of remedies for system issues north or south of Rosewood Drive for portions of the system that were not part of the active analysis; (3) cost of remedies for system issues downstream of Rosewood Drive, whether existing or caused by north of Rosewood Improvements; (4) cost of remedies in the event of negative impact on the open channel downstream of the piped outfall.



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MAGNETIC

PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

PROPOSED SOLUTIONS

ISSUE DATES / REVISIONS

No.	DATE	DESCRIPTION
1	.	.

SOUTH CAROLINA COX AND DINKINS, INC. No. C00294 CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

MAY 2011

COX AND DINKINS
ENGINEERS - SURVEYORS

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PREPARED FOR:

CITY OF COLUMBIA
DEPARTMENT OF UTILITIES & ENGINEERING

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P.O. BOX 147
COLUMBIA, SC 29217-0147
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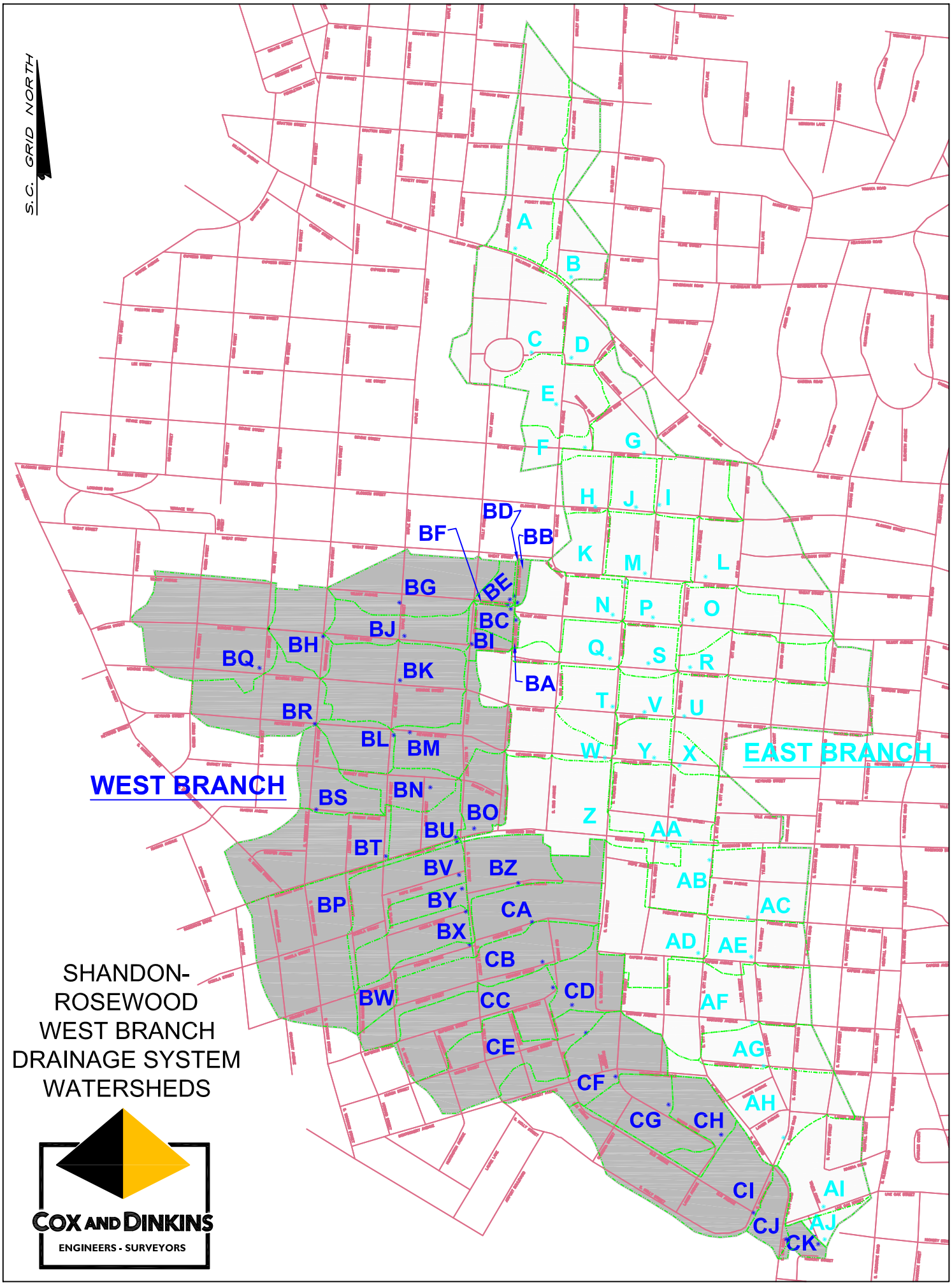
SECTION 4A

WEST BRANCH
WATERSHED DELINEATIONS
AND CHARACTERISTICS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SHANDON-
ROSEWOOD
WEST BRANCH
DRAINAGE SYSTEM
WATERSHEDS
COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WATERSHED

WATERSHED ID	NODE	AREA (ACRES)	IMPERVIOUS %	OVERLAND SLOPE, %	TIME OF CONCENTRATION (MINUTES)	PERVIOUS AREA CURVE NO	2-YR PEAK FLOW AREA (CFS)	2-YR TOTAL SURFACE RUNOFF (INCHES)	10-YR PEAK FLOW AREA (CFS)	10-YR TOTAL SURFACE RUNOFF (INCHES)
BA	5211	0.32	48	0.59	16.20	79	0.62	1.57	1.16	2.99
BB	5210	0.91	45	1.29	15.50	78	1.64	1.45	3.16	2.80
BC	5209	2.15	46	0.48	28.40	78	2.87	1.48	5.57	2.86
BD	5205	0.22	100	1.47	5.70	98	0.99	3.23	1.47	4.91
BE	5206	2.04	50	0.72	23.90	80	3.34	1.63	6.26	3.06
BF	5208	0.20	100	0.46	9.50	98	0.82	3.26	1.22	4.96
BG	5177	14.76	46	0.58	47.80	78	13.86	1.48	27.19	2.85
BH	5219	8.50	34	0.72	33.70	74	8.17	1.23	17.21	2.51
BI	5168	2.04	39	0.85	20.80	75	2.79	1.29	5.71	2.60
BJ	5157	8.54	45	0.98	27.90	78	11.59	1.48	22.54	2.86
BK	5128	20.55	38	0.83	36.70	75	19.72	1.29	40.73	2.59
BL	5073	6.13	46	1.42	30.00	78	7.92	1.49	15.43	2.86
BM	5077	11.53	47	1.01	38.00	79	13.40	1.55	25.71	2.95
BN	5027	6.20	47	1.97	23.00	78	9.40	1.49	18.24	2.88
BO	2155	6.64	53	1.49	24.90	81	11.09	1.71	20.50	3.16
BP	10409	25.57	57	0.77	79.90	82	20.02	1.75	36.78	3.20
BQ	5850	25.22	39	1.17	56.40	75	17.79	1.28	37.08	2.57
BR	5783	14.43	48	0.78	51.70	79	13.47	1.54	25.96	2.94
BS	5759	8.11	43	1.40	28.30	77	10.36	1.42	20.48	2.77
BT	5920	18.60	60	1.17	40.00	83	25.13	1.84	45.10	3.33
BU	2259	6.16	72	2.20	15.00	87	16.76	2.18	28.04	3.75
BV	1903	11.68	70	1.31	35.50	87	20.13	2.17	34.10	3.73
BW	2136	5.42	53	1.04	44.20	81	6.27	1.70	11.67	3.15
BX	1907	8.33	54	1.28	35.70	81	11.08	1.69	20.54	3.13
BY	1240	3.25	56	2.18	15.90	82	7.05	1.77	12.69	3.23
BZ	1226	9.16	62	3.49	14.00	84	22.82	1.94	39.85	3.46
CA	1214	13.78	45	2.13	29.80	78	17.92	1.50	34.92	2.88
CB	10410	16.64	46	2.32	39.40	78	17.92	1.48	35.06	2.85
CC	1547	16.28	47	2.85	32.20	79	21.05	1.55	40.34	2.95
CD	10413	7.96	46	2.86	20.20	78	12.91	1.48	24.88	2.85
CE	1130	16.38	48	3.50	27.70	79	23.44	1.56	44.76	2.96
CF	1084	14.21	49	4.89	17.80	79	25.68	1.56	48.54	2.96
CG	1052	10.07	42	5.47	14.00	77	18.38	1.43	35.86	2.79

All Hydrographic Shapes are Curvilinear.
All Shape Factors are 484.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WATERSHED

WATERSHED ID	NODE	AREA (ACRES)	IMPERVIOUS %	OVERLAND SLOPE, %	TIME OF CONCENTRATION (MINUTES)	PERVIOUS AREA CURVE NO	2-YR PEAK FLOW AREA (CFS)	2-YR TOTAL SURFACE RUNOFF (INCHES)	10-YR PEAK FLOW AREA (CFS)	10-YR TOTAL SURFACE RUNOFF (INCHES)
CH	1031	7.19	28	3.07	20.70	71	7.74	1.05	17.30	2.25
CI	1006	22.47	41	3.22	35.50	76	23.34	1.35	47.24	2.68
CJ	1001	4.11	26	2.79	20.10	71	4.52	1.05	10.08	2.25
CK	10440	1.90	45	2.75	11.90	78	3.87	1.50	7.38	2.90

All Hydrographic Shapes are Curvilinear.
All Shape Factors are 484.

SECTION 4B

WEST BRANCH
PIPES, STRUCTURES,
AND INVERTS

(DATA SET ORDERED ACCORDING TO DRAINAGE PATTERN; UPSTREAM TO DOWNSTREAM)

1. HAGOOD AVENUE NO. 1
2. MILLWOOD AVENUE NO. 1
3. SHIRLEY AVENUE NO. 1
4. KLINE STREET NO. 1
5. SIMS AVENUE NO. 1
6. EPWORTH CHILDREN'S HOME NO. 1
7. EPWORTH CHILDREN'S HOME NO.2
8. EPWORTH CHILDREN'S HOME NO. 3
9. EPWORTH CHILDREN'S HOME NO. 4
10. SIMS AVENUE NO. 2
11. KIRKWOOD ROAD NO. 1
12. DEVINE STREET NO. 1
13. DEVINE STREET NO. 2
14. DEVINE STREET NO. 3
15. DEVINE STREET NO. 4
16. DEVINE STREET NO. 5
17. BLOSSOM STREET NO. 1
18. BLOSSOM STREET NO. 2
19. OTT ROAD NO. 1
20. WHEAT STREET NO. 1
21. WHEAT STREET NO. 2
22. AMHERST AVENUE NO. 1
23. SIMS AVENUE NO. 3
24. WILMOT AVENUE NO. 1
25. WILMOT AVENUE NO. 2
26. DUNCAN STREET NO. 1
27. DUNCAN STREET NO. 2
28. BONHAM STREET NO. 1
29. MONROE STREET NO. 1
30. MONROE STREET NO. 2
31. MONROE STREET NO. 3
32. SIMS AVENUE NO. 4
33. HEYWARD STREET NO. 1
34. RAVENEL & HEYWARD STREET NO. 1
35. S RAVENEL STREET NO. 1
36. S RAVENEL STREET NO. 2
37. S RAVENEL STREET NO. 3
38. S RAVENEL STREET NO. 4
39. ROSEWOOD DRIVE NO. 1
40. ROSEWOOD DRIVE NO. 2
41. ROSEWOOD ELEM. SCHOOL NO. 1
42. ROSEWOOD ELEM. SCHOOL NO. 2
43. MOSS AVENUE NO. 1
44. PRINTICE AVENUE NO. 1
45. CAPERS AVENUE NO. 1
46. CAPERS AVENUE NO. 2
47. CAPERS AVENUE NO. 3
48. HARVARD AVENUE NO. 1
49. HARVARD AVENUE NO. 2
50. HARVARD AVENUE NO. 3
51. MONTGOMERY AVENUE NO. 1
52. LANIER AVENUE NO. 1
53. LANIER AVENUE NO. 2
54. S BONHAM ROAD NO. 1
55. S BONHAM ROAD NO. 2
56. S OTT ROAD NO. 1
57. S BONHAM ROAD NO. 3
58. S PROSPECT STREET NO. 1
59. TEMPO COURT NO. 1

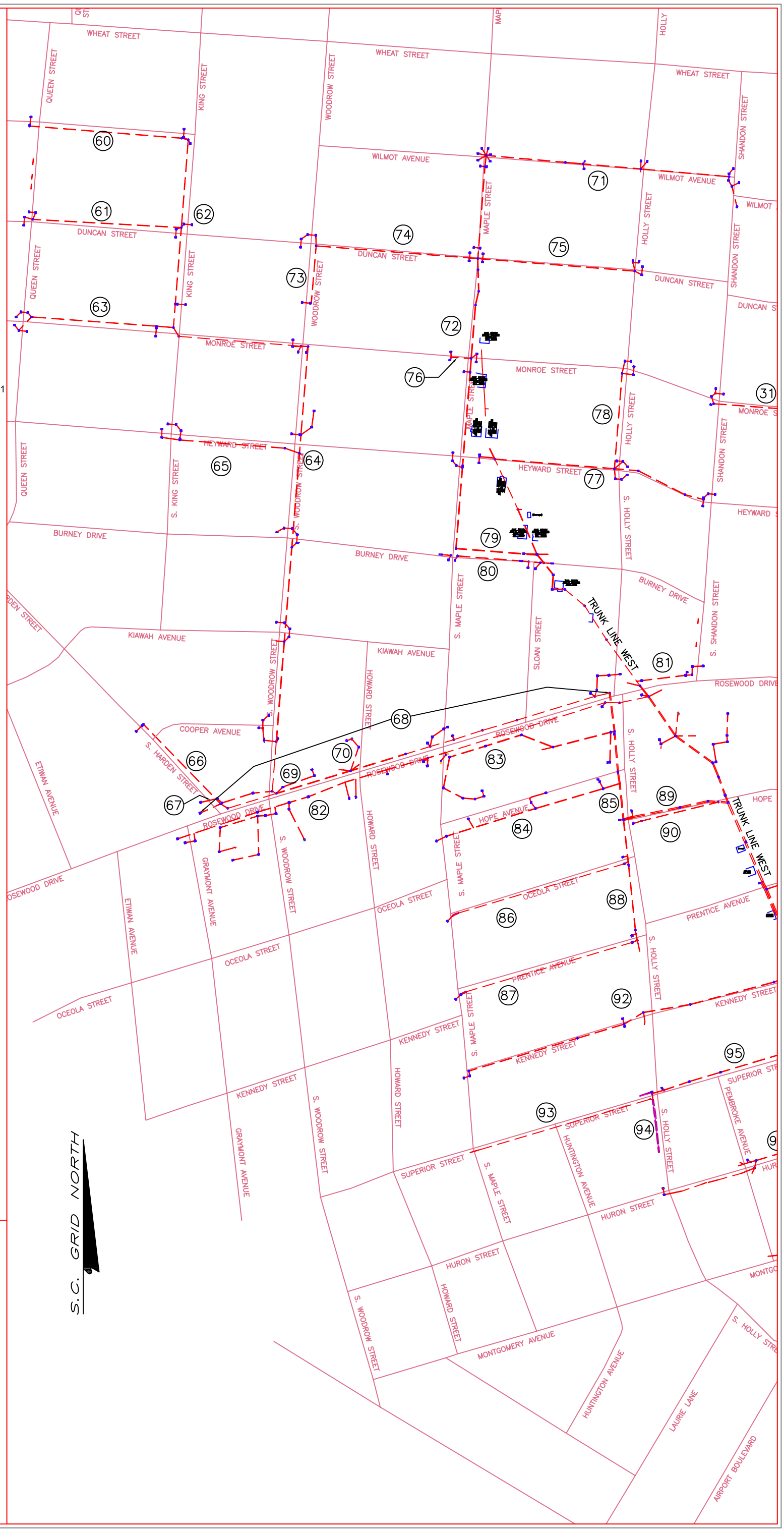
TRUNK LINE EAST (AND DITCH)

60. WILMOT AVENUE NO. 3
61. DUNCAN STREET NO. 3
62. KING STREET NO. 1
63. MONROE STREET NO. 4
64. WOODROW STREET NO. 1
65. HEYWARD STREET NO. 2
66. S HARDEN STREET NO. 1
67. ROSEWOOD DRIVE NO. 3
68. ROSEWOOD DRIVE NO. 4
69. ROSEWOOD DRIVE NO. 5
70. HOWARD STREET NO. 1
71. WILMOT AVENUE NO. 4
72. MAPLE STREET NO. 1
73. WOODROW STREET NO. 2
74. DUNCAN STREET NO. 4
75. DUNCAN STREET NO. 5
76. MONROE STREET NO. 5
77. HEYWARD STREET NO. 3
78. HOLLY STREET NO. 1
79. BURNEY DRIVE NO. 1
80. BURNEY DRIVE NO. 2
81. ROSEWOOD DRIVE NO. 6
82. ROSEWOOD DRIVE NO. 7
83. ROSEWOOD DRIVE NO. 8
84. HOPE AVENUE NO. 1
85. S HOLLY STREET NO. 1
86. OCEOLA STREET NO. 1
87. PRENTICE AVENUE NO. 3
88. S HOLLY STREET NO. 2
89. HOPE AVENUE NO. 2
90. HOPE AVENUE NO. 3
91. PRENTICE AVENUE NO. 2
92. KENNEDY STREET NO. 1
93. SUPERIOR STREET NO. 1
94. S HOLLY STREET NO. 3
95. SUPERIOR STREET NO. 2
96. S WALKER STREET NO. 1
97. HURON STREET NO. 1
98. MONTGOMERY AVENUE NO. 2
99. MONTGOMERY AVENUE NO. 3
100. WANDO STREET NO. 1
101. WANDO STREET NO. 2
102. LANIER AVENUE NO. 3
103. S HOLLY STREET NO. 4
104. S HOLLY STREET NO. 5

TRUNK LINE WEST (AND DITCH)

SHANDON-ROSEWOOD WATERSHED SPREADSHEET KEY WEST BRANCH SHEET NO. 1 OF 2

COX AND DINKINS
ENGINEERS - SURVEYORS



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1. HAGOOD AVENUE NO. 1
2. MILLWOOD AVENUE NO. 1
3. SHIRLEY AVENUE NO. 1
4. KLINE STREET NO. 1
5. SIMS AVENUE NO. 1
6. EPWORTH CHILDREN'S HOME NO. 1
7. EPWORTH CHILDREN'S HOME NO.2
8. EPWORTH CHILDREN'S HOME NO. 3
9. EPWORTH CHILDREN'S HOME NO. 4
10. SIMS AVENUE NO. 2
11. KIRKWOOD ROAD NO. 1
12. DEVINE STREET NO. 1
13. DEVINE STREET NO. 2
14. DEVINE STREET NO. 3
15. DEVINE STREET NO. 4
16. DEVINE STREET NO. 5
17. BLOSSOM STREET NO. 1
18. BLOSSOM STREET NO. 2
19. OTT ROAD NO. 1
20. WHEAT STREET NO. 1
21. WHEAT STREET NO. 2
22. AMHERST AVENUE NO. 1
23. SIMS AVENUE NO. 3
24. WILMOT AVENUE NO. 1
25. WILMOT AVENUE NO. 2
26. DUNCAN STREET NO. 1
27. DUNCAN STREET NO. 2
28. BONHAM STREET NO. 1
29. MONROE STREET NO. 1
30. MONROE STREET NO. 2
31. MONROE STREET NO. 3
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34. RAVENEL & HEYWARD STREET NO. 1
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50. HARVARD AVENUE NO. 3
51. MONTGOMERY AVENUE NO. 1
52. LANIER AVENUE NO. 1
53. LANIER AVENUE NO. 2
54. S BONHAM ROAD NO. 1
55. S BONHAM ROAD NO. 2
56. S OTT ROAD NO. 1
57. S BONHAM ROAD NO. 3
58. S PROSPECT STREET NO. 1
59. TEMPO COURT NO. 1

TRUNK LINE EAST (AND DITCH)

60. WILMOT AVENUE NO. 3
61. DUNCAN STREET NO. 3
62. KING STREET NO. 1
63. MONROE STREET NO. 4
64. WOODROW STREET NO. 1
65. HEYWARD STREET NO. 2
66. S HARDEN STREET NO. 1
67. ROSEWOOD DRIVE NO. 3
68. ROSEWOOD DRIVE NO. 4
69. ROSEWOOD DRIVE NO. 5
70. HOWARD STREET NO. 1
71. WILMOT AVENUE NO. 4
72. MAPLE STREET NO. 1
73. WOODROW STREET NO. 2
74. DUNCAN STREET NO. 4
75. DUNCAN STREET NO. 5
76. MONROE STREET NO. 5
77. HEYWARD STREET NO. 3
78. HOLLY STREET NO. 1
79. BURNEY DRIVE NO. 1
80. BURNEY DRIVE NO. 2
81. ROSEWOOD DRIVE NO. 6
82. ROSEWOOD DRIVE NO. 7
83. ROSEWOOD DRIVE NO. 8
84. HOPE AVENUE NO. 1
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86. OCEOLA STREET NO. 1
87. PRENTICE AVENUE NO. 3
88. S HOLLY STREET NO. 2
89. HOPE AVENUE NO. 2
90. HOPE AVENUE NO. 3
91. PRENTICE AVENUE NO. 2
92. KENNEDY STREET NO. 1
93. SUPERIOR STREET NO. 1
94. S HOLLY STREET NO. 3
95. SUPERIOR STREET NO. 2
96. S WALKER STREET NO. 1
97. HURON STREET NO. 1
98. MONTGOMERY AVENUE NO. 2
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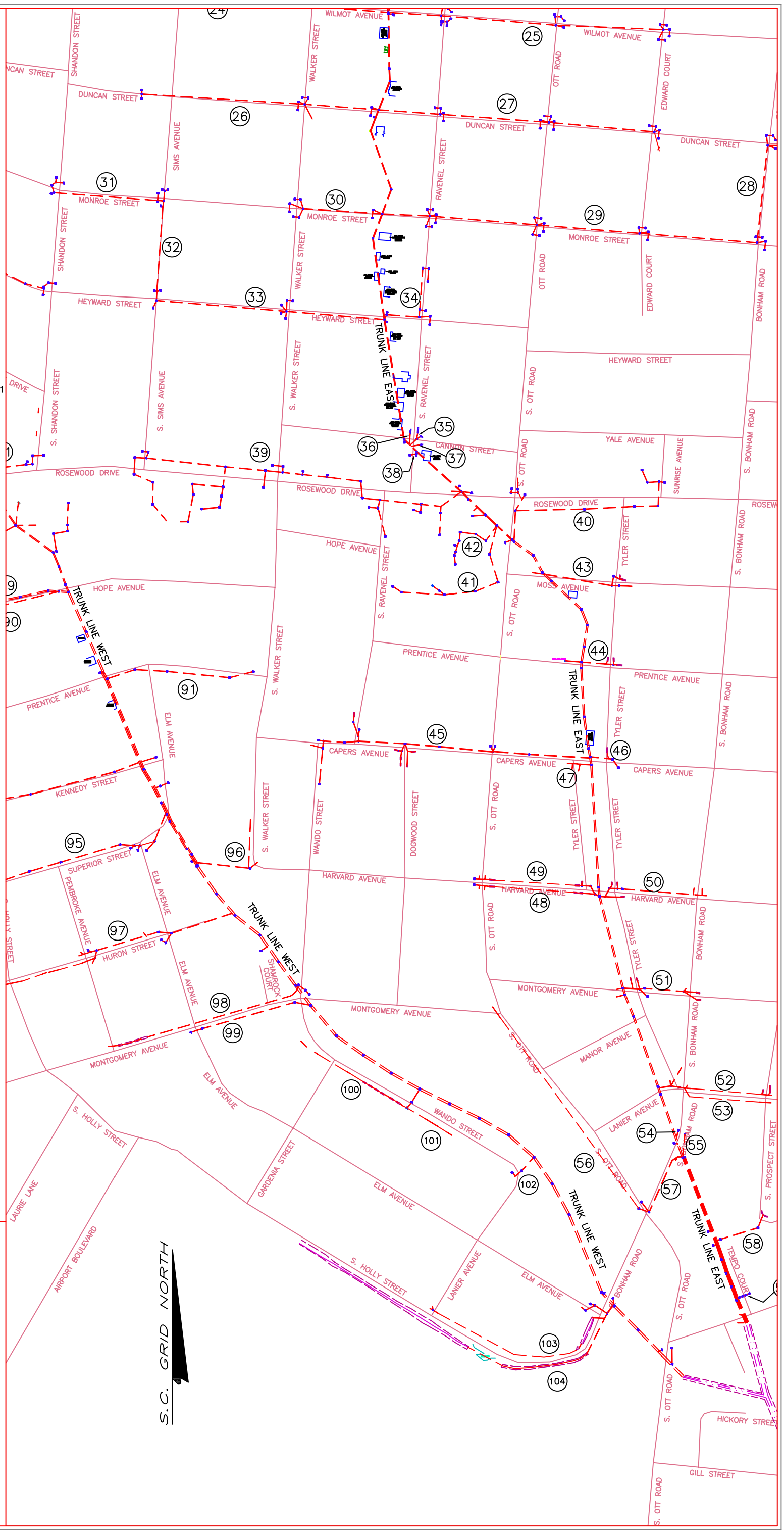
100. WANDO STREET NO. 1
101. WANDO STREET NO. 2
102. LANIER AVENUE NO. 3
103. S HOLLY STREET NO. 4
104. S HOLLY STREET NO. 5

TRUNK LINE WEST (AND DITCH)



SHANDON-ROSEWOOD WATERSHED SPREADSHEET KEY WEST BRANCH SHEET NO. 2 OF 2

COX AND DINKINS
ENGINEERS - SURVEYORS

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ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
60 WILMOT AVENUE NO. 3										
5813	293.12	290.82	15	1	34.1	6.24	5814	293.19	288.69	
5814	293.19	288.59	15	1	4	0.99	5815	293.75	288.55	
5815	293.75	287.35	15	1	630.2	1.29	5809	286.33	279.23	
5809	286.33	279.13	15	1	27.9	0.18	5808	285.78	279.08	
5811	285.33	281.33	12	1	34	0	5810	285.33	281.33	
5810	285.33	281.23	12	1	22	1.59	5808	285.78	280.88	
5807	284.94	282.84	12	1	17.5	1.49	5808	285.78	282.58	
61 DUNCAN STREET NO. 3										
5822	288.4	285.6	15	1	34	1.68	5823	288.33	285.03	
5823	288.33	284.93	15	1	35.4	3.79	5821	288.79	283.59	
5824	288.44	285.64	15	1	28	0.97	5825	288.37	285.37	
5825	288.37	285.37	15	1	30.5	4.2	5821	288.79	284.09	
5801	283.94	280.34	12	1	34.1	0.67	5802	283.81	280.11	
5802	283.81	280.11	12	1	22	1.77	5803	284.32	279.72	
5821	288.79	283.39	15	1	614.8	0.91	5803	284.32	277.82	
62 KING STREET NO. 1										
5808	285.78	278.98	15	1	364	0.32	5803	284.32	277.82	
5805	283.79	281.59	12	1	34	0.38	5804	283.66	281.46	
5804	283.66	281.36	12	1	17.7	2.49	5803	284.32	280.92	
5803	284.32	277.72	18	1	316.9	0.34	5851	283.24	276.64	
5853	282.22	279.62	12	1	34	0.41	5852	282.18	279.48	
5852	282.18	279.38	12	1	8.6	7.42	5851	283.24	278.74	
5851	283.24	276.54	15	1	97	0.06	5850	283.08	276.48	
63 MONROE STREET NO. 4										
5839	285.33	282.33	15	1	28.3	3.64	5838	285.1	281.3	
5838	285.1	281.2	15	1	27.9	1.15	5837	285.28	280.88	
5837	285.28	280.78	15	1	24.1	5.02	5836	285.77	279.57	
5840	285.47	282.47	15	1	28	3.92	5841	285.47	281.37	
5842	285.13	281.73	12	1	34	2.24	5841	285.47	280.97	
5841	285.47	280.87	15	1	76.6	1.83	5836	285.77	279.47	
5836	285.77	279.47	15	1	517.6	0.49	5849	284.01	276.91	
5847	282.04	279.54	12	1	34.1	0.15	5848	282.04	279.49	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5848	282.04	279.44	12	1	7.8	1.66	5849	284.01	279.31	
5849	284.01	276.81	15	1	70.1	0.47	5850	283.08	276.48	
5850	283.08	276.43	18	1	42.6	0.54	5854	283.48	276.2	asmd dn
5854	283.48	276.2	18	1	507	0.52	5867	281.93	273.55	asmd dn&up
5796	281.61	278.51	15	1	34.8	14.25	5867	281.93	273.55	asmd dn
5795	281.27	278.17	15	1	26.6	17.38	5867	281.93	273.55	asmd dn
5867	281.93	273.55	18	1	29.3	3.28	5793	281.89	272.59	asmd up
64 WOODROW STREET NO. 1										
5794	281.27	278.77	15	1	25.6	4.61	5793	281.89	277.59	
5793	281.89	272.29	18	1	365.7	0.36	5784	282.98	270.98	
5790	282.11	279.61	10	1	68.6	1.31	5789	282.11	278.71	
5789	282.11	278.91	10	1	54.3	2.63	5784	282.98	277.48	
5786	282.38	279.78	12	1	34.1	1.38	5785	282.41	279.31	
5785	282.41	279.21	12	1	5	4.58	5784	282.98	278.98	
5784	282.98	270.88	18	1	76.6	-0.03	5783	282.5	270.9	
5783	282.5	270.8	24	1	389.4	0.87	5762	277.01	267.41	
5773	277.82	276.12	12	1	35.8	1.23	5772	277.98	275.68	
5772	277.98	275.58	12	1	34.2	0.73	5771	277.93	275.33	
5771	277.93	275.23	12	1	32.4	1.05	5770	277.29	274.89	
5770	277.29	274.69	15	1	33.9	1.15	5763	278.3	274.3	
5763	278.3	274.3	15	1	27.2	3.27	5762	277.01	273.41	
5762	277.01	267.36	24	1	390.9	0.98	5759	270.74	263.54	
5755	270.95	268.55	12	1	34.2	0.67	5756	271.02	268.32	
5756	271.02	268.22	12	1	32.5	0.71	5757	270.89	267.99	
5757	270.89	267.89	15	1	34.1	0.53	5758	270.71	267.71	
5758	270.71	267.61	15	1	27.6	2.03	5759	270.74	267.05	
5759	270.74	263.49	30	1	414.6	0.5	5872	266.83	261.4	asmd dn
5752	267.15	265.55	12	1	32.4	1.02	5751	267.42	265.22	
5751	267.42	265.12	15	1	32.9	0.15	5873	267.91	265.07	
5750	268.22	266.12	15	1	16.3	6.45	5873	267.91	265.07	
5873	267.91	265.07	15	1	50	0.1	5749	267.32	265.02	asmd up
5749	267.32	264.92	15	1	51.5	6.83	5872	266.83	261.4	asmd dn
5736	267.1	263.5	15	1	14.9	14.06	5872	266.83	261.4	asmd dn
5872	266.83	261.4	30	1	205.6	1.46	2255	269.7	258.4	asmd up

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
65 HEYWARD STREET NO. 2										
5856	280.59	278.69	12	1	34.4	0.35	5857	280.67	278.57	
5857	280.67	278.47	12	1	74.9	0.31	5862	281.74	278.24	
5858	280.66	278.76	15	1	33.9	1.71	5859	280.68	278.18	
5859	280.68	277.28	15	1	32.6	0.37	5860	280.66	277.16	
5860	280.66	277.06	15	1	34.2	0.76	5861	280.6	276.8	
5861	280.6	276.7	15	1	4.8	1.26	5862	281.74	276.64	
5862	281.74	274.24	15	1	435.8	0.67	5787	283.14	271.34	
5787	283.14	271.29	15	1	63.9	0.61	5783	282.5	270.9	
66 S HARDEN STREET NO. 1										
5923	274.36	270.36	12	1	34	-0.97	2250	274.49	270.69	
2250	274.49	270.59	12	1	7.8	5.91	2249	274.83	270.13	
2249	274.83	267.93	15	1	458.1	0.77	2248	271.01	264.41	
67 ROSEWOOD DRIVE NO. 3										
2217	271.87	267.27	18	1	70.4	2.76	2220	271.83	265.33	
2220	271.83	265.13	18	1	26.8	-2.61	2223	270.73	265.83	
2223	270.73	265.83	18	1	133.8	0.91	2224	270.31	264.61	
2224	270.31	263.21	18	1	80	0.89	2255	269.7	262.5	
2255	269.7	258.3	30	1	19.2	0.16	2254	270.05	258.27	asmd dn
68 ROSEWOOD DRIVE NO. 4										
2214	272.1	268.1	15	1	93.6	1.38	2248	271.01	266.81	
2248	271.01	264.31	15	1	34.3	2.65	5922	270.97	263.4	
5922	270.97	263.4	15	1	210.1	2.44	2254	270.05	258.27	asmd dn&up
2254	270.05	258.27	30	1	320.6	0.23	2256	269.73	257.53	asmd up
2256	269.73	257.43	30	1	237.5	0.22	2257	269.62	256.9	asmd dn
2257	269.62	256.9	30	1	106.2	0.28	2239	269.95	256.6	asmd dn&up
2236	270.05	265.85	18	1	18.3	50.49	2239	269.95	256.6	asmd dn
2263	270.73	268.33	18	1	18	3.11	2243	270.87	267.77	
2243	270.87	265.87	18	1	57.5	0.59	2240	270.93	265.53	
2240	270.93	265.43	18	1	41.2	21.44	2239	269.95	256.6	asmd dn
2239	269.95	256.6	30	1	101.3	0.3	5920	270.06	256.3	asmd dn&up
2245	270.21	267.91	18	1	18.6	62.39	5920	270.06	256.3	asmd dn
5920	270.06	256.3	30	1	124.6	0.24	2262	270.14	256	asmd dn&up

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
2262	270.14	256	30	1	148.5	0.13	2261	270.13	255.8	asmd dn&up
2261	270.13	255.8	30	1	337	0.18	2360	268.99	255.19	asmd up
2164	268.88	264.33	15	1	21.8	1.52	2360	268.99	264	asmd dn
2157	268.21	266.36	15	1	46.4	1.47	2158	269.58	265.68	
2158	269.58	265.08	18	1	47.6	0.84	2161	269.68	264.68	
2161	269.68	264.58	18	1	58.6	0.48	2260	268.43	264.3	asmd dn
2260	268.43	264.3	18	1	27.6	1.08	2360	268.99	264	asmd dn&up
2360	268.99	255.09	36	1	63	4.73	2259	268.33	252.11	asmd dn&up
69 ROSEWOOD DRIVE NO. 5										
2230	268.63	266.73	18	1	26.8	-0.3	2264	269.61	266.81	
2264	269.61	266.71	18	1	139.1	0.73	2227	269.99	265.69	
2227	269.99	265.39	18	1	37.3	19.08	2254	270.05	258.27	asmd dn
70 HOWARD STREET NO. 1										
2233	269.56	267.56	12	1	23.1	0.69	2232	268.57	267.4	asmd dn
2232	268.57	267.4	12	1	43.6	1.37	2231	268.3	266.8	asmd up
2231	268.3	266.8	15	1	103.5	2.39	2256	269.73	264.33	
71 WILMOT AVENUE NO. 4										
5211	278.72	276.12	15	1	88.3	0.6	5209	278.29	275.59	
5210	278.24	275.54	15	1	32.5	-0.46	5209	278.29	275.69	
5209	278.29	275.59	15	1	27.3	1.5	5208	278.53	275.18	
5208	278.53	275.13	15	1	15.9	2.7	5207	279.2	274.7	
5205	278.78	275.58	15	1	27.2	2.39	5206	278.53	274.93	
5206	278.53	274.88	15	1	12.3	0.65	5207	279.2	274.8	
5207	279.2	274.7	15	1	366.1	0.17	5200	281.09	274.09	
5202	280.55	277.35	12	1	41.1	6.46	5200	281.09	274.69	
5201	280.4	277.9	12	1	32.7	8.89	5200	281.09	274.99	
5200	281.09	274.29	18	1	239.4	0.18	5189	280.15	273.85	
5190	279.48	275.48	15	1	20.8	2.55	5189	280.15	274.95	
5191	280.15	276.65	15	1	12.7	8.69	5189	280.15	275.55	
5189	280.15	273.65	18	1	73.7	0.03	5188	280.33	273.63	
5188	280.33	273.63	18	1	328.2	0.19	5185	280.52	273.02	
72 MAPLE STREET NO. 1										

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5182	280.22	277.52	15	1	34.7	8.35	5185	280.52	274.62	
5181	280.15	276.25	15	1	29.6	12.96	5185	280.52	272.42	
5180	279.55	275.35	15	1	18.8	4.95	5185	280.52	274.42	
5179	279.64	276.39	15	1	29.6	5.64	5185	280.52	274.72	
5184	279.74	276.94	15	1	40.3	6.26	5185	280.52	274.42	
5183	279.88	275.68	15	1	34.7	4.21	5185	280.52	274.22	
5185	280.52	272.97	18	1	46.5	0.28	5177	280.44	272.84	
5176	279.93	275.03	15	1	19.2	5.15	5177	280.44	274.04	
5178	279.89	277.29	15	1	6.8	4.71	5177	280.44	276.97	
5177	280.44	272.79	18	1	337.1	0.26	5870	276.68	271.9	asmd dn
5160	276.01	272.31	15	1	5.8	7.12	5870	276.68	271.9	asmd dn
5161	276.53	272.63	15	1	20.3	3.6	5870	276.68	271.9	asmd dn
5870	276.68	271.9	18	1	43.7	0.18	5157	275.97	271.82	asmd up
5157	275.97	269.57	24	1	46.4	2.18	5164	275.16	268.56	
5164	275.16	267.96	30	1	88.8	0.52	5145	273	267.5	
5145	273	267.3	30	1	58.3	4.09	5144	271.32	264.92	
5144	271.32	264.82	30	1	221.5	0.45	5130	268.43	263.83	
5131	267.38	264.38	15	1	34	0.85	5132	267.39	264.09	
5132	267.39	264.04	15	1	30	0.53	5130	268.43	263.88	
5130	268.43	263.73	30	1	56.6	0.18	5128	266.93	263.63	
5129	266.95	263.85	15	1	26.1	0.84	5128	266.93	263.63	
5128	266.93	263.58	30	1	395.6	0.38	5073	268.66	262.06	
5069	268.64	265.74	15	1	33.9	1.83	5070	268.62	265.12	
5070	268.62	265.07	15	1	25.4	6.38	5071	268.25	263.45	
5071	268.25	262.95	15	1	26.8	2.01	5073	268.66	262.41	
5073	268.66	261.96	30	1	335.2	0.34	5054	272.51	260.81	
73 WOODROW STREET NO. 2										
5221	280.29	276.79	15	1	34.2	1.14	5220	280.35	276.4	
5220	280.35	276.35	15	1	237.7	0.24	5219	281.87	275.77	
74 DUNCAN STREET NO. 4										
5215	281.36	277.31	15	1	34.3	0.41	5216	281.52	277.17	
5216	281.52	276.97	15	1	31.6	1.23	5217	281.38	276.58	
5217	281.38	276.48	15	1	34.1	-0.09	5218	281.36	276.51	
5218	281.36	276.46	15	1	43.7	1.81	5219	281.87	275.67	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5219	281.87	275.47	15	1	636.2	0.89	5871	276.23	269.78	asmd dn
5163	275.48	270.58	15	1	12.3	6.5	5871	276.23	269.78	asmd dn
5162	275.57	271.07	15	1	21.6	5.96	5871	276.23	269.78	asmd dn
5871	276.23	269.78	15	1	33.9	0.92	5157	275.97	269.47	asmd up
75 DUNCAN STREET NO. 5										
5171	279.24	276.84	15	1	25.3	2.46	5878	279.01	276.22	asmd dn
5172	279.23	276.33	15	1	7	1.57	5878	279.01	276.22	asmd dn
5878	279.01	276.22	15	1	36.1	1.8	5168	279.57	275.57	asmd up
5170	278.89	275.34	15	1	34.2	5.76	5169	278.84	273.37	
5169	278.84	275.79	15	1	32.6	1.38	5168	279.57	275.34	
5168	279.57	273.07	18	1	630.2	0.56	5869	275.85	269.57	asmd dn
5158	275.01	270.76	15	1	11.6	10.26	5869	275.85	269.57	asmd dn
5159	274.92	270.52	15	1	22.1	4.31	5869	275.85	269.57	asmd dn
5869	275.85	269.57	18	1	20.3	0.49	5157	275.97	269.47	asmd up
76 MONROE STREET NO. 5										
5134	266.97	264.32	15	1	12.2	0.98	5135	267.9	264.2	asmd dn
5133	266.82	264.42	15	1	22.6	0.97	5135	267.9	264.2	asmd dn
5135	267.9	264.2	15	1	83.1	0.39	5130	268.43	263.88	asmd up
77 HEYWARD STREET NO. 3										
5112	273.33	269.83	15	1	28.2	0.28	5111	273.35	269.75	
5111	273.35	269.56	15	1	25.6	-1.33	5110	273.45	269.9	
5110	273.45	269.85	15	1	7.3	4.83	5109	273.9	269.5	
5113	273.16	269.61	15	1	26.7	0.6	5109	273.9	269.45	
5109	273.9	269.4	18	1	79.2	0.25	5105	275.6	269.2	
5105	275.6	269.05	18	1	216.5	0.43	5104	276.77	268.12	
5104	276.77	267.92	18	1	99.2	0.55	5097	273.17	267.37	
5097	273.17	267.27	18	1	495.9	0.55	5077	268.54	264.54	
5075	267.73	264.53	15	1	8.1	-1.47	5076	268.25	264.65	
5074	267.7	264.6	15	1	25.9	-0.19	5076	268.25	264.65	
5076	268.25	264.55	18	1	63.9	0.33	5077	268.54	264.34	
78 HOLLY STREET NO. 1										
5122	279.15	274.95	15	1	33.7	0.8	5121	278.78	274.68	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5121	278.78	274.58	15	1	46.8	2.2	5120	278	273.55	
5123	278.83	276.13	15	1	25.9	5.96	5124	278.79	274.59	
5124	278.79	274.49	15	1	52.3	1.89	5120	278	273.5	
5120	278	273.45	15	1	394.8	1.51	5097	273.17	267.47	
5103	273.31	269.71	15	1	25.9	0.42	5102	273.1	269.6	
5101	274.13	270.83	15	1	29.2	3.88	5102	273.1	269.7	
5102	273.1	269.3	15	1	46.6	3.92	5097	273.17	267.47	
5100	274.26	271.16	15	1	29.5	4.34	5099	273.38	269.88	
5099	273.38	269.83	15	1	25.9	1.16	5098	272.63	269.53	
5098	272.63	269.43	15	1	41.8	4.57	5097	273.17	267.52	
79 BURNEY DRIVE NO. 1										
5054	272.51	260.71	30	1	337.1	0.44	5883	269.43	259.23	asmd dn
80 BURNEY DRIVE NO. 2										
5059	273.52	271.27	15	1	37	1.19	5927	273.52	270.83	asmd dn
5057	272.42	271.32	12	1	22	2.23	5927	273.52	270.83	asmd dn
5927	273.52	270.83	15	1	28	1.11	5928	273.52	270.52	asmd dn&up
5056	272.45	271.23	12	1	22	3.22	5928	273.52	270.52	asmd dn
5928	273.52	270.52	15	1	267.7	1.18	5009	270.21	267.36	asmd up
5009	270.21	267.36	15	1	27.2	0.33	5884	270.12	267.27	asmd dn
5008	269.47	268.38	12	1	26.2	4.23	5884	270.12	267.27	asmd dn
5884	270.12	267.27	15	1	48.5	2.27	5003	270.97	266.17	asmd up
5004	270.14	268.04	15	1	32.7	2.05	5003	270.97	267.37	
5003	270.97	265.92	15	1	14.1	49.15	5882	270.86	259	asmd dn
5001	270.93	268.03	12	1	33.6	26.88	5882	270.86	259	asmd dn
81 ROSEWOOD DRIVE NO. 6										
2141	264.56	259.46	18	1	44.8	0.98	2144	264.62	259.02	
2144	264.62	258.82	18	1	34.5	0.49	2147	263.95	258.65	
2147	263.95	258.45	18	1	26.6	0.26	2149	264.48	258.38	
2148	264.74	259.84	18	1	13.5	5.62	2149	264.48	259.08	
2149	264.48	258.18	18	1	183.2	0.46	2152	266.88	257.33	
2152	266.88	257.08	18	1	21.6	0.37	2156	267.08	257	asmd dn
82 ROSEWOOD DRIVE NO. 7										

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
2212	273.4	269.4	18	1	42.1	1.02	2206	273.47	268.97	
2209	273.54	269.84	18	1	71.2	1.32	2252	272.42	268.9	asmd dn
2206	273.47	268.97	18	1	30.6	0.23	2252	272.42	268.9	asmd dn
2252	272.42	268.9	18	1	277.2	1.1	2198	270.26	265.86	asmd up
2198	270.26	265.86	18	1	74.9	0.2	2253	269.57	265.71	asmd dn
2203	271.98	269.38	15	1	100	1.06	2202	271.22	268.32	
2202	271.22	268.22	15	1	161.7	0.6	2201	270.35	267.25	
2204	271.21	268.81	15	1	109.4	0.15	2205	272	268.65	
2205	272	268.6	15	1	158.8	0.85	2201	270.35	267.25	
2201	270.35	267.2	18	1	32	0.41	2195	270.37	267.07	
2195	270.37	266.97	18	1	44.5	0.45	2192	270.37	266.77	
2192	270.37	266.57	18	1	26.9	3.2	2253	269.57	265.71	asmd dn
2253	269.57	265.71	18	1	61.8	0.1	2187	270.15	265.65	asmd up
2191	269.95	267	15	1	141.3	0.31	2190	269.26	266.56	asmd up
2190	269.26	266.46	15	1	26.9	1.15	2187	270.15	266.15	
2187	270.15	265.65	18	1	82.7	-0.27	2184	270.17	265.87	
2184	270.17	265.77	30	1	163.1	0.92	2314	269.92	264.27	asmd dn
2181	269.03	265.73	15	1	69.2	2.11	2314	269.92	264.27	asmd dn
2314	269.92	264.27	30	1	45.9	0.94	2315	269.83	263.84	asmd dn&up
2178	269.01	265.71	15	1	74	2.53	2315	269.83	263.84	asmd dn
2315	269.83	263.84	18	1	132.5	0.92	2258	269.64	262.62	asmd dn&up
2177	269.35	266.65	15	1	18	22.35	2258	269.64	262.62	asmd dn
2258	269.64	262.62	30	1	177.7	0.92	2176	269.66	260.98	asmd dn&up
2173	270.16	266.66	18	1	22.7	24.98	2176	269.66	260.98	asmd dn
2170	268.33	265.63	18	1	32.1	14.5	2176	269.66	260.98	asmd dn
2176	269.66	260.98	30	1	75.9	0.95	1275	269.57	260.26	asmd dn&up
1261	269.28	266.28	18	1	32.1	2.52	1268	269.97	265.47	
1268	269.97	264.57	18	1	8.6	50.41	1275	269.57	260.26	
1275	269.57	260.26	30	1	692.3	0.92	10409	267	253.88	asmd dn&up
1249	268.53	264.03	18	1	21.4	47.5	10409	267	253.88	asmd up
10409	267	253.88	36	1	59.2	0.3	2167	267.24	253.7	asmd dn&up
2167	267.24	253.7	36	1	123	1.2	1247	266.32	252.22	asmd up
83 ROSEWOOD DRIVE NO. 8										
1278	264.41	262.56	6	1	23.8	4.71	1280	266.54	261.44	
1280	266.54	260.64	18	1	38.8	2.94	1279	267.6	259.5	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1279	267.6	259.4	18	1	49.9	0.34	1277	266.63	259.23	
1277	266.63	258.83	24	1	91	0.69	1276	267	258.2	
1276	267	258.2	24	1	129.6	0.29	1260	266.52	257.82	
1260	266.52	257.72	24	1	155	0.34	1259	266.69	257.19	
1259	266.69	256.19	30	1	155.5	0.48	1258	266.74	255.44	
1258	266.74	255.44	30	1	140.3	0.42	1257	267.75	254.85	
1257	267.75	254.75	30	1	246.1	0.63	1254	264.75	253.2	
1256	261.05	257.65	18	1	10.1	25.64	1255	261.26	255.06	
1255	261.26	252.46	24	1	123.1	-0.07	1254	264.75	252.55	
1254	264.75	252.45	30	1	16.3	4.9	1252	264.05	251.65	
84 HOPE AVENUE NO. 1										
1300	268.62	267.12	15	1	45.6	2.67	1299	268	265.9	
1299	268	265.3	24	1	116.2	0.86	1905	267.55	264.3	asmd dn
1298	267.28	264.78	15	1	39.2	1.22	1905	267.55	264.3	asmd dn
1905	267.55	264.3	24	1	269.1	1.19	1295	264.59	261.09	
1293	264.7	262.4	15	1	62.2	0.19	1900	266.27	262.28	asmd dn
1900	266.27	262.28	15	1	9.9	0.3	1901	266.28	262.25	asmd dn&up
1901	266.28	262.25	15	1	17.1	0.12	1902	264.73	262.23	asmd up
1902	264.73	262.13	15	1	30.4	3.75	1295	264.59	260.99	
1295	264.59	260.89	24	1	291.4	2.91	1290	255.87	252.42	
1292	258.11	253.91	15	1	11.6	6.06	1291	256.21	253.21	
1291	256.21	253.21	15	1	32.4	4.13	1290	255.87	251.87	
1290	255.87	251.87	24	1	71.8	4.7	1903	257.79	248.5	asmd dn
85 S HOLLY STREET NO. 1										
2259	268.33	252.11	54	1	159.4	0.45	1252	264.05	251.4	
1252	264.05	251.4	54	1	168.5	0.78	1288	258.48	250.08	
1253	263.49	260.19	18	1	11.3	2.12	1252	264.05	259.95	
1288	258.48	250.03	54	1	47.8	3.2	1903	257.79	248.5	asmd dn
1903	257.79	248.5	54	1	150.5	2.92	1240	254	244.1	
86 OCEOLA STREET NO. 1										
1301	269.49	268.25	15	1	28.7	0.52	1303	268.1	268.1	
1305	268.56	268.56		1	11.4	-2.81	1306	268.88	268.88	Swale
1306	268.88	268.88		1	18.8	-1.17	1309	269.1	269.1	Swale

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1309	269.1	269.1		1	713	1.54	1286	258.01	258.1	Swale
1286	258.01	255.01	15	1	17.9	15.15	1906	258.12	252.3	asmd dn
87 PRENTICE AVENUE NO. 3										
1314	270.06	268.66	15	1	28.7	0.21	1315	270.24	268.6	asmd dn
1315	270.24	268.6	15	1	7.4	0.54	1316	268.56	268.56	
1318	268.71	268.71		1	18.2	-2.2	1321	269.11	269.11	Swale
1321	269.11	269.11		1	715.4	0.76	1281	264.78	263.67	Swale
88 S HOLLY STREET NO. 2										
1281	264.78	263.03	12	1	22.6	14.68	2135	264.47	259.71	asmd dn
2135	264.47	259.71	18	1	27.7	0.4	2136	264.27	259.6	asmd dn&up
1283	264.38	262.73	12	1	18.5	16.91	2136	264.27	259.6	asmd dn
2136	264.27	259.6	18	1	15.6	0.7	1953	264.69	259.49	asmd up
1953	264.69	258.99	24	1	269.9	2.22	1285	257.4	253	
1285	257.4	252.4	30	1	14.1	1.56	1906	258.12	252.18	asmd dn
1286	258.01	255.01	15	1	17.9	15.15	1906	258.12	252.3	asmd dn
1906	258.12	252.18	30	1	23.3	1.63	1907	257.56	251.8	asmd dn&up
1287	257.72	254.62	15	1	18.8	13.95	1907	257.56	252	asmd dn
1907	257.56	251.8	30	1	151.1	1.59	1240	254	249.4	asmd up
89 HOPE AVENUE NO. 2										
1241	254.57	251.87	15	1	16.3	47.73	1240	254	244.1	
1240	254	244.1	42	2	40.4	2.72	1222	255.15	243	asmd dn
1237	255.94	252.64	15	1	25.7	4.43	1222	255.15	251.5	asmd dn
1222	255.15	243	60	1	197.9	1.79	1223	246.86	239.46	
1223	246.86	237.46	60	1	119.1	3.85	1224	241.08	232.88	
1224	241.08	232.78	60	1	43.1	1.55	1909	241.08	232.11	asmd dn
1909	241.08	232.11	60	1	40.4	1.68	1226	237.43	231.43	
90 HOPE AVENUE NO. 3										
1219	255.38	250.78	15	1	34.4	5.18	1910	253.43	249	asmd dn
1910	253.43	249	15	1	327.5	5.16	1909	241.08	232.11	asmd dn&up
91 PRENTICE AVENUE NO. 2										
1917	246.41	243.81	18	1	101.1	1.83	1916	245.66	241.96	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1916	245.66	241.86	18	1	259.7	4.7	1554	232.95	229.65	
1554	232.95	229.6	18	1	132	1.99	1213	230.97	226.97	
1213	230.97	226.87	18	1	121.1	2.2	1214	230.8	224.2	
92 KENNEDY STREET NO. 1										
1195	270.76	268.01	15	1	26.3	6.46	1196	270.56	266.31	
1196	270.56	266.26	15	1	20.2	3.16	1197	270.82	265.62	
1197	270.82	265.52	18	1	468.8	1.27	1198	263.56	259.56	
1198	263.56	259.46	18	1	201.6	0.48	1199	262.99	258.49	
1200	262.4	258.6	15	1	10.2	1.08	1199	262.99	258.49	
1201	262.33	258.83	15	1	23.8	1.85	1199	262.99	258.39	
1199	262.99	258.39	18	1	92.7	0.39	1202	263.63	258.03	
2359	261.83	261.83	15	1	11.7	1.71	1913	262.58	261.63	asmd dn
1913	262.58	262.58	15	1	39.3	2.92	1202	263.63	261.43	asmd up
1202	263.63	257.93	24	1	196.9	2	1203	259.34	253.99	
1203	259.34	253.94	24	1	357.7	8	1185	230.53	225.33	
1185	230.53	224.43	24	1	109	1.31	10410	228	223	asmd dn
93 SUPERIOR STREET NO. 1										
1192	271.12	271.12	15	1	37.3	0.4	1193	270.97	270.97	
1193	270.97	270.97		1	738.2	1.4	1512	260.63	260.63	Swale
1512	260.63	260.63	15	1	2	-5.56	1179	260.74	260.74	
94 S HOLLY STREET NO. 3										
1525	261.71	261.71	24	1	51.9	0.02	1526	261.7	261.7	Ditch
1526	261.7	261.7	24	1	55.4	-0.11	1527	261.76	261.76	Ditch
1527	261.76	261.76	24	1	53.3	0.19	1528	261.66	261.66	Ditch
1528	261.66	261.66	24	1	56.5	0.46	1529	261.4	261.4	Ditch
1529	261.4	261.4	24	1	5.2	28.38	1177	259.93	259.93	Ditch
1179	260.74	260.74	15	1	8.8	6.89	1178	260.13	260.13	
1177	259.93	259.93	18	1	23.2	0.56	1542	262.37	259.8	asmd dn
95 SUPERIOR STREET NO. 2										
1503	261.77	261.77	24	1	23.1	0.48	1504	261.66	261.66	Ditch
1504	261.66	261.66	24	1	28.3	1.87	1505	261.13	261.13	Ditch
1505	261.13	261.13	24	1	1.9	-24.47	1175	261.59	261.59	Ditch

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1175	261.59	259.99	18	1	6.4	2.98	1542	262.37	259.8	asmd dn
1542	262.37	259.8	18	1	50.7	1.58	1498	262.13	259	asmd dn&up
1172	262.79	259.59	15	1	11.4	5.18	1498	262.13	259	asmd dn
1498	262.13	259	18	1	110.5	1.06	1171	260.13	257.83	asmd up
1171	260.13	256.58	18	1	134.6	2.26	1170	257.24	253.54	
1170	257.24	253.44	18	1	254.7	5.43	1167	242.51	239.61	
1167	242.51	239.61	18	1	61	4.69	1543	237.11	236.75	asmd dn
1166	238.98	236.78	18	1	19.2	0.16	1543	237.11	236.75	asmd dn
1543	237.11	236.75	18	1	20.1	16.06	1544	235.34	233.53	asmd dn&up
1165	235.96	233.56	18	1	20.6	0.15	1544	235.34	233.53	asmd dn
1544	235.34	233.53	18	1	63.9	7.37	1545	228.84	228.82	asmd dn&up
1164	232.69	228.89	15	1	49.7	0.14	1545	228.84	228.82	asmd dn
1545	228.84	228.82	18	1	128.2	9.22	1547	223.8	217	asmd dn&up
96 S WALKER STREET NO. 1										
1915	240.62	240.62	15	1	201.5	5.27	1914	235.26	230	asmd dn&up
1154	235.98	235.98	15	1	40.2	7.74	1155	235.47	232.87	
1155	235.47	231.57	18	1	6.3	24.76	1914	235.26	230	asmd dn
1914	235.26	230	18	1	213.6	5.52	10413	221	218.2	asmd dn&up
97 HURON STREET NO. 1										
1151	261.51	259.91	12	1	26.8	0.45	1150	261.24	259.79	
1150	261.24	259.79	18	1	74.1	2.81	1149	257.71	257.71	
1145	257.14	257.14	15	1	20	0.55	1146	257.03	257.03	
1147	256.56	256.56	15	1	44.1	1.59	1148	255.86	255.86	
1141	254.87	254.87	18	1	61.1	1.42	1494	254.67	254	asmd dn
1140	254.58	254.58	12	1	24.1	2.41	1494	254.67	254	asmd dn
1494	254.67	254	18	1	32.4	15.83	1556	254.17	248.87	asmd up
1142	254.52	254.52	15	1	77	7.34	1556	254.17	248.87	
1143	254.71	254.71	15	1	16.5	2.37	1495	256.24	254.32	
1137	255.11	253.91	12	1	14.6	2.81	1493	255.28	253.5	asmd dn
1556	254.17	248.77	18	1	265.5	3.93	1136	241.49	238.34	
1136	241.49	236.19	18	1	54.5	0.75	1133	239.13	235.78	
1135	241.55	239.2	18	1	22.5	4.04	1134	240.84	238.29	
1134	240.84	236.14	18	1	45.8	0.9	1133	239.13	235.73	
1133	239.13	235.73	24	1	263.7	7.18	1489	220.09	216.79	asmd dn

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
98 MONTGOMERY AVENUE NO. 2										
1475	253.81	253.81	15	1	41	0.81	1474	253.48	253.48	
1474	253.48	253.48	24	1	41.2	1.46	1468	252.88	252.88	Ditch
1468	252.88	252.88	24	1	47.2	-0.25	1463	253	253	Ditch
1463	253	253	15	1	9.5	0.74	1462	252.93	252.93	
1462	252.93	252.93	24	1	27.4	-0.62	1484	253.1	253.1	Ditch
1455	253.1	253.1	15	1	611.6	5.55	1483	220.66	219.18	asmd dn
1483	220.66	219.18	15	1	24.2	6.41	1482	219.11	217.63	asmd dn&up
1482	219.11	217.63	15	1	19.9	4.92	1481	218.13	216.65	asmd dn&up
1481	218.13	216.65	15	1	14	3.79	1480	217.6	216.12	asmd dn&up
1480	217.6	216.12	15	1	1.6	53.94	1091	217.53	215.23	asmd up
1089	217.87	213.07	15	1	22.7	4.54	1090	217.84	212.04	
1090	217.84	211.99	15	1	35.9	5.18	1091	217.53	210.13	
1091	217.53	210.03	15	1	10.9	0.28	1479	217.8	210	asmd dn
99 MONTGOMERY AVENUE NO. 3										
1132	251.28	249.68	15	1	49.6	5.58	1131	248.81	246.91	
1131	248.81	245.81	18	1	396	7.36	1093	219.47	216.67	
1093	219.47	216.67	18	1	67.2	6.98	1084	217.68	211.98	
100 WANDO STREET NO. 1										
1097	219.45	219.45	15	1	14.4	0.9	1098	219.32	219.32	
1098	219.32	219.32		1	65.1	0.69	1101	218.87	218.87	Swale
1101	218.87	218.87	14	1	39.7	0.66	1102	218.61	218.61	Ditch
1102	218.61	218.61	14	1	0.7	68.49	1068	218.11	218.11	Ditch
1068	218.11	218.11	15	1	16	0.25	1069	218.07	218.07	
1069	218.07	218.07	14	1	0.5	-131.37	1107	218.74	218.74	Ditch
1107	218.74	218.74	14	1	42.7	1.52	1108	218.09	218.09	Ditch
1108	218.09	218.09	14	1	0.8	47.5	1070	217.71	217.71	Ditch
1070	217.71	217.71	15	1	28	0.93	1071	217.97	217.97	
1071	217.97	217.97	14	1	1	-39.8	1113	218.36	218.36	Ditch
1113	218.36	218.36	14	1	41	0.27	1114	218.25	218.25	Ditch
1114	218.25	218.25	14	1	6.4	2.03	1072	218.12	218.12	Ditch
1072	218.12	218.12	15	1	15.3	0	1073	218.12	218.12	
1073	218.12	218.12		1	18.7	5.56	1074	217.08	217.08	Swale

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
101 WANDO STREET NO. 2										
1081	219.31	219.31	15	1	23.9	0.54	1080	219.18	219.18	
1080	219.18	219.18		1	46.8	0.62	1079	218.89	218.89	Swale
1079	218.89	218.89	15	1	60.5	0.96	1078	218.31	218.31	
1078	218.31	218.31		1	85.4	1.44	1074	217.08	217.08	Swale
1074	217.08	214.5	18	1	31.7	3.5	1075	217.74	213.39	asmd up
1075	217.74	213.34	18	1	62.3	25.1	1052	211.02	197.71	
102 LANIER AVENUE NO. 3										
1037	216.09	214.19	15	1	20.1	5.91	10429	213	213	
1039	213.84	203.84	15	1	4.4	-209.13	10429	213	213	
10429	213	213	15	1	33.8	3.05	1036	215.17	211.97	
1036	215.17	211.92	15	1	75.6	26.67	1031	204.4	191.75	
103 S HOLLY STREET NO. 4										
1449	226.04	226.04	15	1	14.4	3.76	1451	227.28	225.5	asmd dn
1450	226.18	226.18	15	1	16.5	4.12	1451	227.28	225.5	asmd dn
1451	227.28	225.5	15	1	26.4	4.1	1452	224.42	224.42	asmd up
1452	224.42	224.42		1	615	3.35	1363	203.82	203.82	Swale
1363	203.82	203.82	12	1	17.7	13.55	1358	201.42	201.42	Ditch
1358	201.42	201.42	18	1	27.2	0.4	10438	201.31	201.31	asmd dn
1344	201.82	201.82	12	1	44.1	4.17	1343	199.98	199.98	Ditch
1343	199.98	199.98	12	1	40.6	2.54	1342	198.95	198.95	Ditch
1342	198.95	198.95	12	1	17.3	6.49	1341	197.83	197.83	Ditch
1341	197.83	197.83	12	1	7	18.97	1340	196.51	196.51	Ditch
1340	196.51	196.51	18	1	51.3	0.99	10437	198.86	196	asmd dn
104 S HOLLY STREET NO. 5										
1446	247.07	247.07	15	1	55.7	2.3	1443	245.79	245.79	Ditch
1443	245.79	245.79	15	1	57	2.24	1440	244.51	244.51	Ditch
1440	244.51	244.51	15	1	48.9	4.07	1437	242.52	242.52	Ditch
1437	242.52	242.52	15	1	61.1	3.91	1434	240.13	240.13	Ditch
1434	240.13	240.13	15	1	56.7	3.88	1431	237.93	237.93	Ditch
1431	237.93	237.93	15	1	62.2	4.36	1428	235.22	235.22	Ditch
1428	235.22	235.22	15	1	64.2	4.14	1425	232.56	232.56	Ditch

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1425	232.56	232.56	15	1	63.1	4.1	1422	229.97	229.97	Ditch
1422	229.97	229.97	15	1	65.6	4.24	1419	227.19	227.19	Ditch
1419	227.19	227.19	15	1	65.5	3.37	1416	224.98	224.98	Ditch
1416	224.98	224.98	15	1	26.9	1.52	1413	224.57	224.57	Ditch
1413	224.57	224.57	15	1	30.8	3.58	1410	223.47	223.47	Ditch
1410	223.47	223.47	15	1	56.8	4.28	1407	221.04	221.04	Ditch
1407	221.04	221.04	15	1	52.2	3.12	1404	219.41	219.41	Ditch
1404	219.41	219.41	15	1	49.9	4.95	1401	216.94	216.94	Ditch
1401	216.94	216.94	12	1	59.3	3.17	1395	215.06	215.06	
1395	215.06	215.06		1	36.4	2.09	1392	214.3	214.3	Swale
1392	214.3	214.3		1	64.8	2.53	1386	212.66	212.66	Swale
1386	212.66	212.66	8	1	54.2	2.88	1383	211.1	211.1	Ditch
1383	211.1	211.1	8	1	62.4	3.08	1380	209.18	209.18	Ditch
1380	209.18	209.18	8	1	57.9	2.49	1377	207.74	207.74	Ditch
1377	207.74	207.74	8	1	58.5	3.42	1374	205.74	205.74	Ditch
1374	205.74	205.74	8	1	65.8	2.32	1371	204.21	204.21	Ditch
1371	204.21	204.21	8	1	29.2	5.07	1368	202.73	202.73	Ditch
1368	202.73	202.73	8	1	32.8	6.96	1364	200.45	200.45	Ditch
1364	200.45	200.45	18	1	165.3	2.69	10437	198.86	196	asmd dn
10437	198.86	196	18	1	22	18.07	1338	199.59	192.02	asmd dn&up
1011	200.91	197.41	18	1	45.3	5.33	1337	199.46	195	asmd dn
1010	200.77	196.57	18	1	20.2	7.77	1337	199.46	195	asmd dn
1337	199.46	195	18	1	60.3	4.94	1338	199.59	192.02	asmd dn&up
1338	199.59	192.02	36	1	44.5	6.07	10436	195	189.32	asmd up
TRUNK LINE WEST (AND DITCH)										
5077	268.54	264.29	30	1	229.1	1.1	5889	268.03	261.76	asmd dn
5890	268.04	270	12	1	5	163.49	5889	268.03	261.76	asmd dn
5050	266.77	266.77	12	1	14.5	34.62	5889	268.03	261.76	asmd dn
5889	268.03	261.76	30	1	200.8	1.16	5013	268.93	259.43	asmd up
5013	268.93	259.23	30	1	3.6	0	5883	269.43	259.23	asmd dn
5012	268.86	267.86	10	1	54.8	2.43	5013	268.93	266.53	
5883	269.43	259.23	36	1	42.1	0.55	5882	270.86	259	asmd dn&up
5882	270.86	259	36	1	63	0.36	5026	271.87	258.77	asmd up
5026	271.87	258.67	36	1	60.6	0.96	5027	272.09	258.09	
5027	272.09	257.99	36	1	53	0.09	5040	272.74	257.94	

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
5040	272.74	257.94	36	1	105.7	0.09	5875	274.38	257.84	asmd dn
5875	274.38	257.84	36	1	166.3	0.04	5874	271.57	257.78	asmd dn&up
5874	271.57	257.78	36	1	212.3	0.37	2156	267.08	257	asmd dn
2156	267.08	257	36	1	23.4	1.15	2155	266.93	256.73	asmd up
2155	266.93	256.73	48	1	56.8	7.94	1247	266.32	252.22	
1247	266.32	240.22	54	1	196.8	1.63	1245	251.71	237.01	
1246	254.66	252.06	12	1	96.7	4.81	1245	251.71	247.41	
1243	250.19	246.69	18	1	18.4	3.16	1244	252.71	246.11	
1244	252.71	245.91	18	1	68.1	4.41	1245	251.71	242.91	
1245	251.71	236.71	54	1	190.1	1.97	1234	239.26	232.96	
2126	257.52	253.82	15	1	90.8	9.32	2127	251.31	245.36	
2127	251.31	241.71	18	1	26.2	6.64	2128	244.37	239.97	
2128	244.37	239.87	18	1	59.3	4.33	2131	241.35	237.3	
2131	241.35	237.25	18	1	73.7	3.23	1955	237.37	234.87	
1955	237.37	234.87	18	1	14.4	4.25	1234	239.26	234.26	
1234	239.26	232.91	54	1	62.9	1.48	1231	238.58	231.98	
1231	238.58	231.98	54	1	80	1.04	1225	238.15	231.15	
1225	238.15	231.15	54	1	32.4	0.99	1226	237.43	230.83	
1226	237.43	226.53	84	1	178.8	0.68	1559	234.52	225.32	
1559	234.52	225.32	84	1	180.4	0.51	1215	232.4	224.4	asmd dn
1216	231.44	228.94	15	1	14.4	31.59	1215	232.4	224.4	
1215	232.4	224.4	60	1	32.4	0.62	1214	230.8	224.2	asmd up
1214	230.8	224.2	60	1	369.7	1.63	1552	226	218.16	
1183	223.78	221.93	15	1	62.6	-7	1552	226	226.31	
1552	226	218.16	60	1	33.5	1.61	1184	224.42	217.62	
1184	224.42	217.62	60	1	90.5	0.74	10411	223	216.95	asmd dn
1187	222.86	219.91	18	1	36.1	2.02	1186	222.93	219.18	
1186	222.93	219.13	18	1	19.1	3.3	10411	223	218.5	asmd dn
10411	223	216.95	60	1	312.5	0.75	1163	220.92	214.62	asmd up
1163	220.92	214.62	60	1	40.4	-0.2	10413	221	214.7	asmd dn
10413	221	214.7	60	1	12.8	-0.16	1159	221.22	214.72	asmd up
1215	232.4	224.4	60	1	400.2	1.69	10410	228	217.62	asmd dn
10410	228	217.62	60	1	190.4	0.31	1188	222.83	217.03	asmd up
1188	222.83	217.03	60	1	44	2.46	1547	223.8	215.95	asmd dn
1547	223.8	215.95	60	1	8.6	2.43	1615	223.84	215.74	asmd up
1615	223.84	215.74	60	1	31.4	0.73	1189	223.76	215.51	

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1189	223.76	215.51	60	1	132.8	0.09	1548	222.79	215.39	
1548	222.79	215.39	60	1	57.6	0.45	10428	221	215.13	asmd dn
1162	220.35	217.95	18	1	9.6	9.94	10428	221	217	asmd dn
10428	221	215.13	60	1	23.7	0.46	1159	221.22	215.02	asmd up
1159	221.22	211.72	96	1	142.3	0.63	1153	220.02	210.82	
1153	220.02	210.82	96	1	102.5	0.85	1489	220.09	209.95	asmd dn
1489	220.09	209.95	96	1	15.3	0.79	1130	219.63	209.83	asmd up
1130	219.63	209.83	96	1	130	1.66	1129	218.57	207.67	
1129	218.57	207.67	96	1	57	1.23	1488	218.71	206.97	
1128	220.37	218.57	15	1	32.5	15.71	1488	218.71	213.47	asmd dn
1488	218.71	206.97	96	1	76.4	1.2	1486	216.55	206.05	
1486	216.55	206.05	96	1	121.7	0.77	1092	217.21	205.11	
1092	217.21	205.11	96	1	102.4	1.49	1084	217.68	203.58	
1084	217.68	203.58	96	1	165.6	1.07	1064	215.51	201.81	
1064	215.51	201.81	96	1	135.7	1.01	1059	214.79	200.44	
1059	214.79	200.44	96	1	136.7	1.1	1054	213.67	198.94	
1054	213.67	198.94	96	1	135.4	0.91	1052	211.02	197.71	
1052	211.02	197.71	96	1	138.3	0.88	1051	208.61	196.49	
1051	208.61	196.49	96	1	137.2	1.28	1046	207.39	194.74	
1046	207.39	194.74	96	1	137.5	0	1040	207.34	194.74	
1040	207.34	194.74	96	1	139.1	2.15	1031	204.4	191.75	
1031	204.4	191.75	96	1	132.7	0.97	1026	202.35	190.46	
1026	202.35	190.46	96	1	145.6	0.58	1021	200.49	189.62	
1021	200.49	189.62	96	1	346.9	1.15	1009	197.32	185.62	
1008	197.98	194.68	15	1	10.8	3.35	1009	197.32	194.32	
1009	197.32	185.62	96	1	70.3	1.55	10436	195	184.53	
10436	195	184.53	96	1	6.7	1.63	1006	195.82	184.42	
1007	196.99	193.89	15	1	32.8	3.87	1006	195.82	192.62	
1006	195.82	184.42	96	1	139.4	0.38	1005	193.79	183.89	
1005	193.79	183.89	96	1	121	1.97	10430	191.5	181.5	asmd dn
1004	191	187.9	15	1	15.8	24.64	10430	191.5	184	asmd dn
10430	191.5	181.5	96	1	24.2	1.86	10453	191.05	181.05	asmd dn&up
10453	191.05	181.05	108	1	54.8	1.92	10431	190	180	asmd dn&up
1003	191.58	189.68	15	1	66.7	5.11	1002	190.97	186.27	
1002	190.97	185.17	15	1	2.8	77.22	10431	190	183	asmd dn
10431	190	180	108	1	66.2	1.96	1001	188.7	178.7	asmd up

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH

UPSTRM NODE	GROUND ELEVATION	UPSTRM INVERT	DIAMETER (INCHES)	NO. OF BARRELS	LENGTH (FEET)	CONDUIT SLOPE	DOWNSTRM NODE	GROUND ELEVATION	DOWNSTRM INVERT	NOTES
1001	188.7	178.7	96	1	354	0.79	10440	183.89	175.89	Ditch

SECTION 4C

WEST BRANCH
MODEL OF EXISTING SYSTEM
ORIGINAL MODEL – WEST

(WITH SPREADSHEET FOR 2- & 10-YEAR EVENTS & PROFILES FOR 10-YEAR EVENT)

West Branch Watershed (Original Model)

The **west branch watershed** contains approximately 351 acres. The **west branch watershed** begins just south of Wheat Street with the furthest upstream reach located at the intersection of Wheat Street and Shandon Street. The **west branch watershed** expands to the south, crossing Rosewood Drive and continuing to the open ditch south of Live Oak Street and east of South Ott Road. For the purpose of analysis the **west branch watershed** is divided into thirty-seven (37) subwatersheds ranging in size from 0.2 acres to 25.6 acres, with the smaller subwatersheds being situated in the vicinity of the intersection of Wilmot Avenue and Shandon Street. As surveyed the storm drainage system within the **west branch watershed** consists of 564 nodes and 516 links. In the current model 120 nodes and 120 links have been activated along the main storm drainage route and analysis has been performed on that main route.

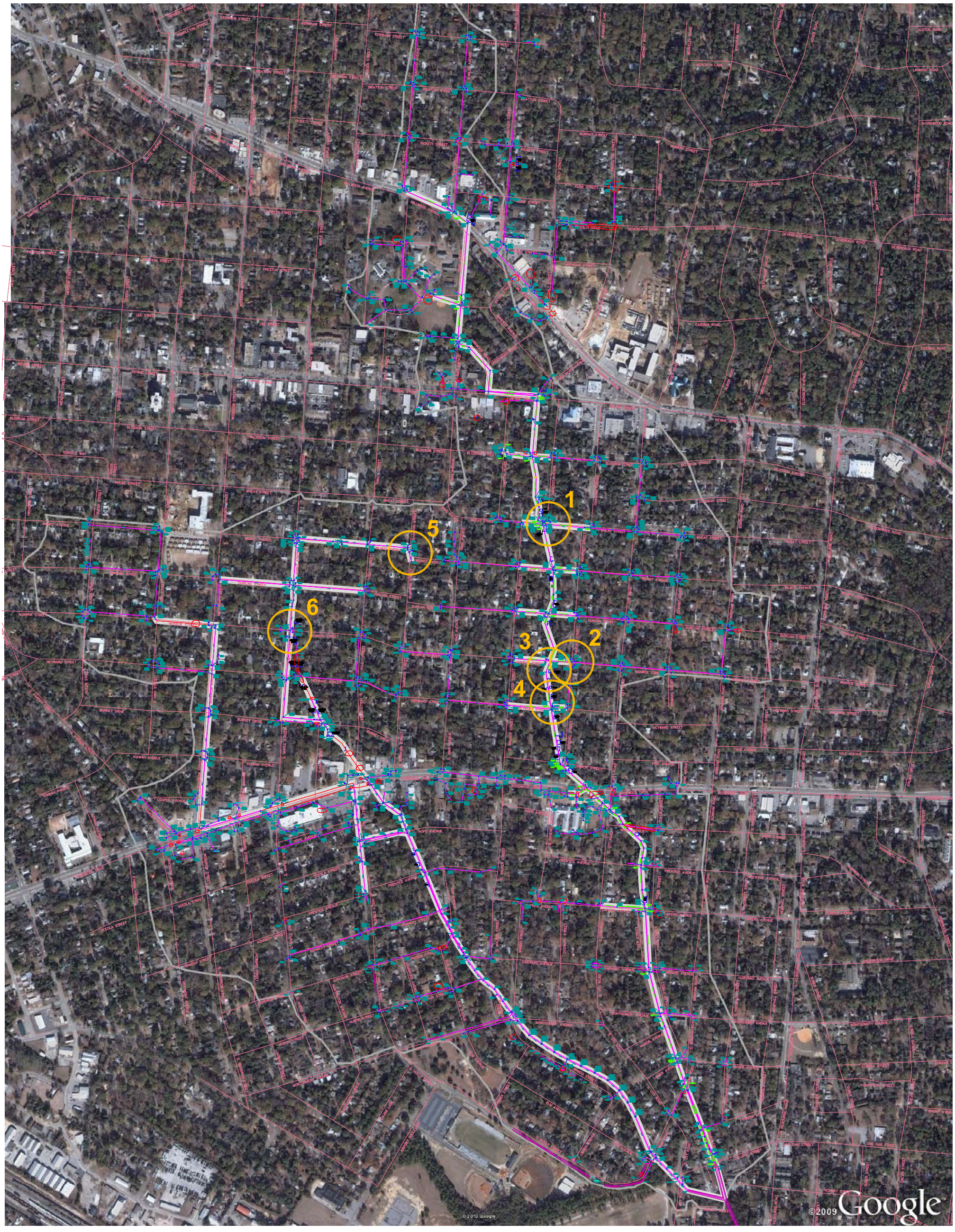
The original model for the **west branch watershed** indicates both **surcharge** and **ponding** along the main storm drainage route. **Surcharge** is indicated when the hydraulic grade line (HGL) exceeds the pipe crown for a particular reach. For the analyzed portion of the **west branch watershed**, the model indicates surcharge in the storm drainage system throughout the analyzed network north of Rosewood Drive. South of Rosewood Drive the model indicates only one area of surcharge, that being a 170' section of storm drainage pipe located south of Elm Avenue.

Ponding is indicated when the hydraulic grade line (HGL) exceeds the ground elevation or top elevation at a particular structure. Ponding is identified by overcapacity but with the assumption that overcapacity volume is not being redirected to another node downstream. The current model indicates ponding in the vicinity of certain nodes, and where the model identifies ponding in the vicinity of a cluster of nodes such as a street intersection, worst case data has been identified. Ponding resulting from the 2-year, 24-hour rainfall event (3.6" accumulated rainfall) is shown at subject nodes by a yellow circle. Ponding resulting from the 10-year, 24-hour rainfall event (5.3" accumulated rainfall) is shown at subject nodes by a red circle. For the analyzed portion of the **east branch watershed**, some of the significant locations identified by the model as experiencing ponding during the 10-year, 24-hour rainfall event are as follows: (1) at the intersection of Wilmot Avenue and Maple Street; (2) at the intersection of Duncan Street and Woodrow Street; (3) Maple Street approximately 190' south of Duncan Street; (4) at the intersection of Monroe Street and Woodrow Street; and (4) at the intersection of Rosewood Drive and Woodrow Street.

See the table on the following page for additional areas of ponding as identified by the original model.

The table below lists locations of ponding in the **west branch watershed** as identified by the original model. Further detailed study of these areas, including detailed topographic surveys, will be required in order to further analyze and assess.

West Branch Location	2-year storm	10-year storm
Intersection of Wilmot Avenue and Shandon Street	Ponding Indicated	Ponding Indicated
Wilmot Avenue between Maple Street and Holly Street	NA	Ponding Indicated
Intersection of Wilmot Avenue and Maple Street	NA	Ponding Indicated
Intersection of Duncan Street and Woodrow Street	Ponding Indicated	Ponding Indicated
Maple Street approximately 190' south of Duncan Street	NA	Ponding Indicated
Intersection of Monroe Street and Maple Street	Ponding Indicated	Ponding Indicated
Intersection of Heyward Street and Maple Street	NA	Ponding Indicated
Intersection of Monroe Street and King Street	Ponding Indicated	Ponding Indicated
Intersection of Monroe Street and Woodrow Street	NA	Ponding Indicated
Intersection of Heyward Street and Woodrow Street	NA	Ponding Indicated
Intersection of Burney Drive and Woodrow Street	NA	Ponding Indicated
Intersection of Kiawah Avenue and Woodrow Street	Ponding Indicated	Ponding Indicated
Approximately 65' south of the intersection of Cooper Avenue and Woodrow Street	Ponding Indicated	Ponding Indicated
Intersection of Rosewood Drive and Woodrow Street	NA	Ponding Indicated
Approximately 35' west of the intersection of Rosewood Drive and Howard Street	NA	Ponding Indicated
Approximately 200' east of the intersection of Rosewood Drive and Howard Street	NA	Ponding Indicated



LEGEND

0 300 600 900 1200
GRAPHIC SCALE IN FEET
SCALE: 1"=300'

PROBLEM AREA AS IDENTIFIED BY THE CITY OF COLUMBIA

ANALYZED NETWORK

MAGNETIC

1. Wheat Street at Amherst Avenue
2. Monroe Street at Ravenel Street
3. Monroe Street between Ravenel Street and Wheat Street
4. Heyward Street between Ravenel Street and Wheat Street
5. Shandon Street north of Wilmot Avenue
6. Monroe Street at Maple Street

PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

ANALYZED NETWORK LINES

ISSUE DATES / REVISIONS

No.	DATE	DESCRIPTION
1	.	.

SOUTH CAROLINA
COX AND DINKINS, INC.
No. C00294
CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

MAY 2011

COX AND DINKINS
ENGINEERS - SURVEYORS

COX AND DINKINS, INC.
724 BELTLINE BLVD.
COLUMBIA, SC 29205
803-254-0518
Fax: 803-765-0993
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PREPARED FOR:

CITY OF COLUMBIA
DEPARTMENT OF UTILITIES & ENGINEERING

1136 WASHINGTON STREET
P.O. BOX 147
COLUMBIA, SC 29217-0147
803-545-3400
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G:\Proj\1458 Rosewood Shandon Drainage\DRAWINGS\SHANDON DRAINAGE BASIN-Presentation UPDATED 05-13-11.dwg, Plotted By: CGM, Plotted: May 20, 2011 - 8:45am

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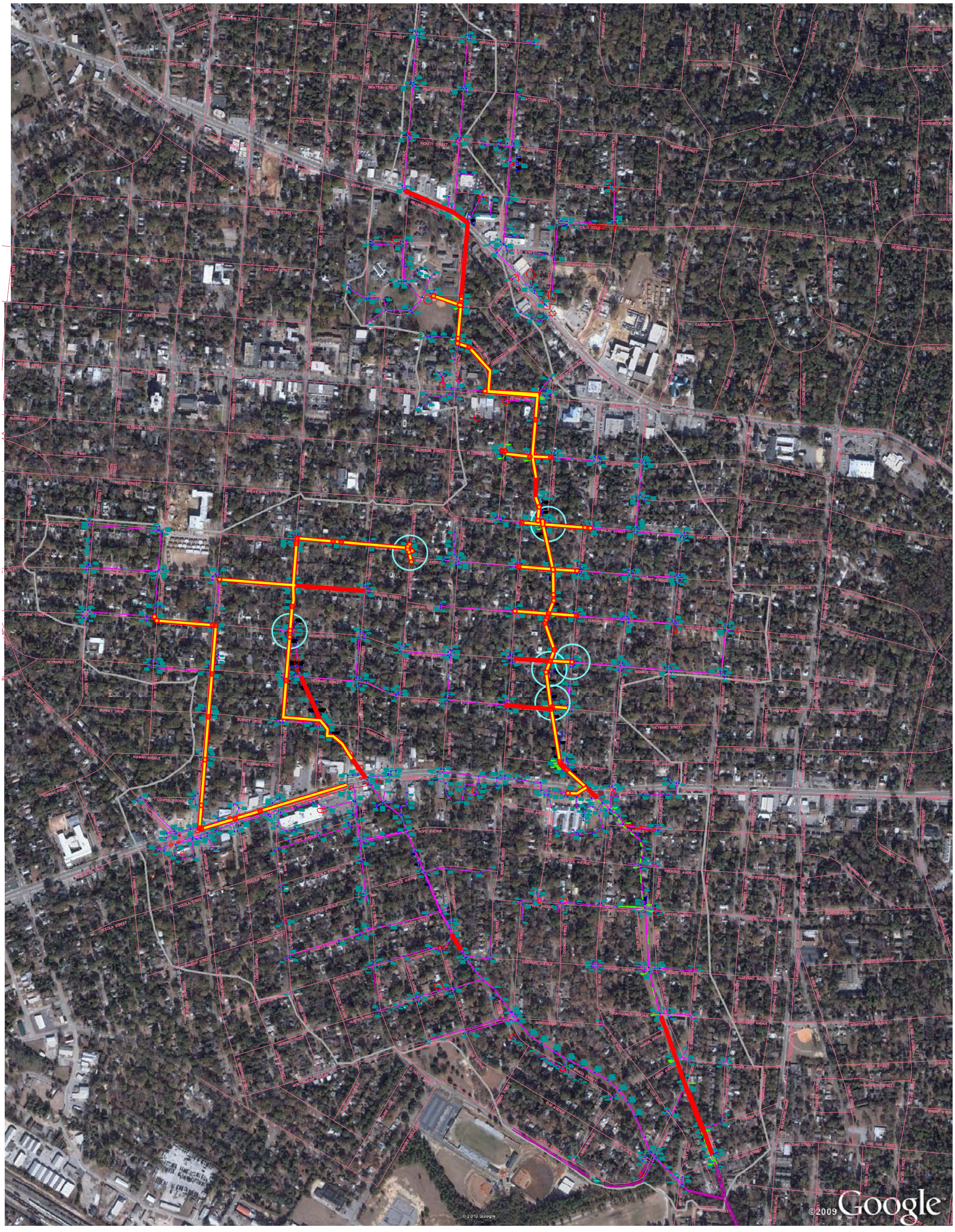

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GRAPHIC SCALE IN FEET
SCALE: 1"=300'

LEGEND

PROBLEM AREA AS IDENTIFIED BY THE CITY OF COLUMBIA

2-YR STORM PIPE SURCHARGE (YELLOW)

2-YR STORM PONDING (YELLOW)

10-YR STORM PIPE SURCHARGE (RED)

10-YR STORM PONDING (RED)

MAGNETIC

PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

PROBLEM AREAS

ISSUE DATES / REVISIONS

No.	DATE	DESCRIPTION
1	.	.

SOUTH CAROLINA — COX AND DINKINS, INC. No. C00294 — CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

MAY 2011

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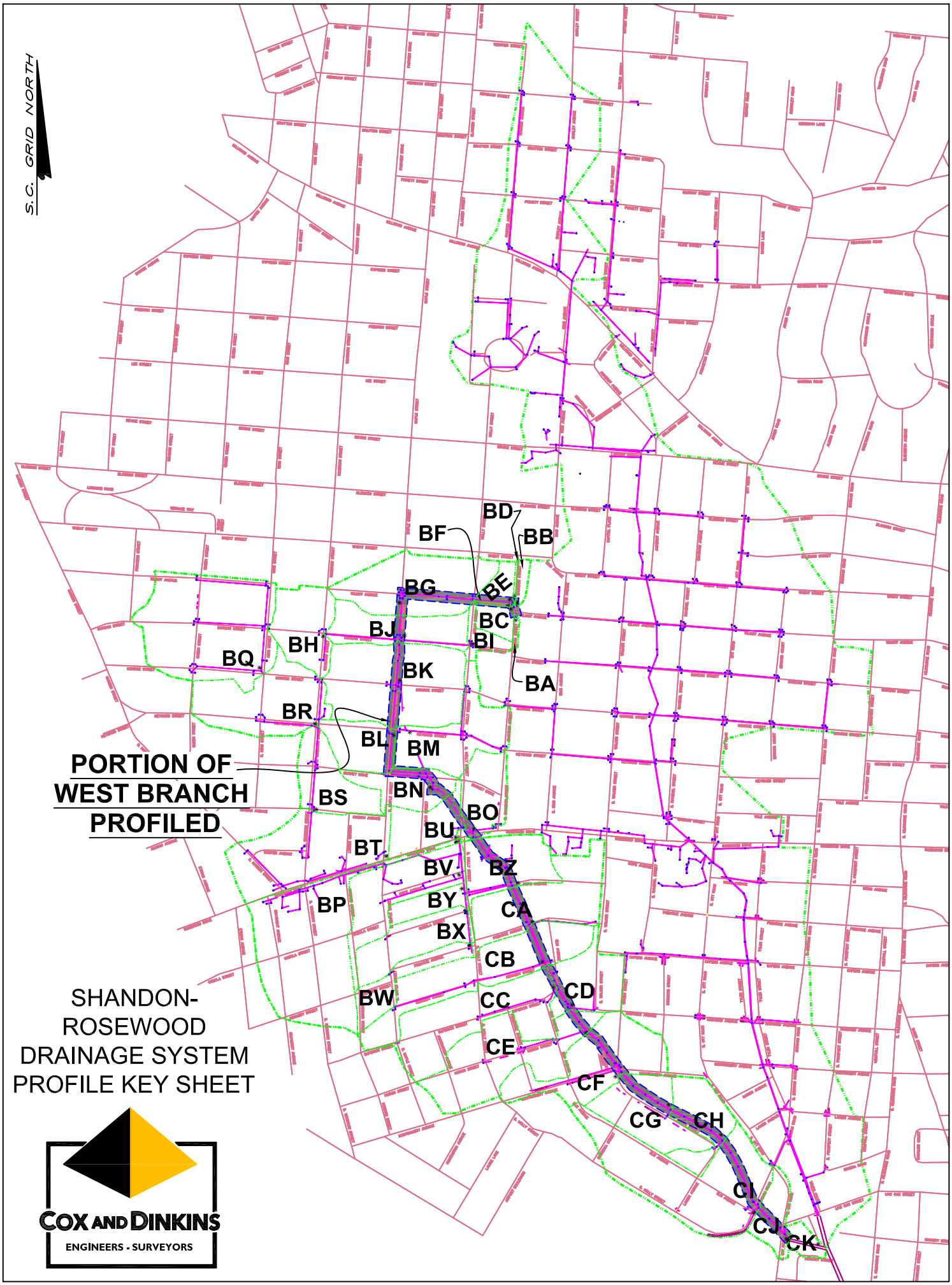


SHANDON-
ROSEWOOD
DRAINAGE SYSTEM
PROFILE KEY SHEET

COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5211.1	10 yr 24 hr	5211	278.72	276.12	277.42	279.39	1.3	1	88.3	0.6	5209	278.29	275.59	276.89	279.39		17.28	17.28	5.16	4.22	3.16
5210.1	10 yr 24 hr	5210	278.24	275.54	276.84	279.39	1.3	1	32.5	-0.46	5209	278.29	275.69	276.99	279.39		17.4	17.4	4.52	4.52	3.38
5209.1	10 yr 24 hr	5209	278.29	275.59	276.89	279.39	1.3	1	27.3	1.5	5208	278.53	275.18	276.48	279.4		17.02	11.78	8.16	4.99	4.03
5208.1	10 yr 24 hr	5208	278.53	275.13	276.43	279.4	1.3	1	15.9	2.7	5207	279.2	274.7	276	279.41		16.98	0.92	10.95	4.99	12.4
5205.1	10 yr 24 hr	5205	278.78	275.58	276.88	279.42	1.3	1	27.2	2.39	5206	278.53	274.93	276.23	279.41		16.82	16.82	10.3	5.17	3.86
5206.1	10 yr 24 hr	5206	278.53	274.88	276.18	279.41	1.3	1	12.3	0.65	5207	279.2	274.8	276.1	279.41		12.03	12.03	5.37	4.55	3.39
5207.1	10 yr 24 hr	5207	279.2	274.7	276	279.41	1.3	1	366.1	0.17	5200	281.09	274.09	275.39	280.21		11.95	11.95	2.72	5.5	4.1
5200.1	10 yr 24 hr	5200	281.09	274.29	275.79	280.21	1.5	1	239.4	0.18	5189	280.15	273.85	275.35	280.46		11.95	11.93	4.18	5.14	2.93
5189.1	10 yr 24 hr	5189	280.15	273.65	275.15	280.46	1.5	1	73.7	0.03	5188	280.33	273.63	275.13	280.55		13.53	13.53	1.61	5.34	2.96
5188.1	10 yr 24 hr	5188	280.33	273.63	275.13	280.55	1.5	1	328.2	0.19	5185	280.52	273.02	274.52	281.23		13.5	13.5	4.21	6.01	3.33
5185.1	10 yr 24 hr	5185	280.52	272.97	274.47	281.23	1.5	1	46.5	0.28	5177	280.44	272.84	274.34	281.4		12.62	13.5	5.16	-7.84	3.23
5177.1	10 yr 24 hr	5177	280.44	272.79	274.29	281.4	1.5	1	337.1	0.26	5870	276.68	271.9	273.4	276.3	asmd dn	12.95	12.95	5.01	14.52	8
5870.1	10 yr 24 hr	5870	276.68	271.9	273.4	276.3	1.5	1	43.7	0.18	5157	275.97	271.82	273.32	275.74	asmd up	12.93	12.93	4.17	14.52	8.22
5219.1	10 yr 24 hr	5219	281.87	275.47	276.77	283.08	1.3	1	636.2	0.89	5871	276.23	269.78	271.08	276.07	asmd dn	13.57	13.57	6.3	8.39	6.18
5871.1	10 yr 24 hr	5871	276.23	269.78	271.08	276.07	1.3	1	33.9	0.92	5157	275.97	269.47	270.77	275.74	asmd up	13.57	13.57	6.37	8.45	6.32
5168.1	10 yr 24 hr	5168	279.57	273.07	274.57	277.63	1.5	1	630.2	0.56	5869	275.85	269.57	271.07	275.79	asmd dn	12.2	12.08	7.27	5.65	3.75
5869.1	10 yr 24 hr	5869	275.85	269.57	271.07	275.79	1.5	1	20.3	0.49	5157	275.97	269.47	270.97	275.74	asmd up	12.2	12.2	6.85	5.59	3.11
5157.1	10 yr 24 hr	5157	275.97	269.57	271.57	275.74	2	1	46.4	2.18	5164	275.16	268.56	270.56	273.64		12.27	12.27	30.99	45.56	14.32
5164.1	10 yr 24 hr	5164	275.16	267.96	270.46	273.64	2.5	1	88.8	0.52	5145	273	267.5	270	272.48		12.27	12.27	27.41	45.54	9.21
5145.1	10 yr 24 hr	5145	273	267.3	269.8	272.48	2.5	1	58.3	4.09	5144	271.32	264.92	267.42	271.86		12.27	12	76.95	45.53	11.22
5144.1	10 yr 24 hr	5144	271.32	264.82	267.32	271.86	2.5	1	221.5	0.45	5130	268.43	263.83	266.33	270.34		12.18	12.18	25.46	41.82	8.44
5130.1	10 yr 24 hr	5130	268.43	263.73	266.23	270.34	2.5	1	56.6	0.18	5128	266.93	263.63	266.13	270.09		12.12	12.12	16.01	36.66	7.43
5128.1	10 yr 24 hr	5128	266.93	263.58	266.08	270.09	2.5	1	395.6	0.38	5073	268.66	262.06	264.56	268.91		14.32	14.35	23.61	32.99	6.66
5073.1	10 yr 24 hr	5073	268.66	261.96	264.46	268.91	2.5	1	335.2	0.34	5054	272.51	260.81	263.31	267.39		13.7	13.7	22.31	34.23	6.93
5054.1	10 yr 24 hr	5054	272.51	260.71	263.21	267.39	2.5	1	337.1	0.44	5883	269.43	259.23	261.73	266.02	asmd dn	13.7	13.77	25.24	34.23	6.94
5077.1	10 yr 24 hr	5077	268.54	264.29	266.79	267.9	2.5	1	229.1	1.1	5889	268.03	261.76	264.26	266.89	asmd dn	12.42	12.87	40.02	25.73	6.61
5889.1	10 yr 24 hr	5889	268.03	261.76	264.26	266.89	2.5	1	200.8	1.16	5013	268.93	259.43	261.93	266.04	asmd up	12.42	12.42	41.03	25.75	5.21
5013.1	10 yr 24 hr	5013	268.93	259.23	261.73	266.04	2.5	1	3.6	0	5883	269.43	259.23	261.73	266.02	asmd dn	12.42	12.42	1.2	25.77	5.2
5883.1	10 yr 24 hr	5883	269.43	259.23	262.23	266.02	3	1	42.1	0.55	5882	270.86	259	262	265.76	asmd dn&up	12.48	12.48	45.78	52.45	7.37
5882.1	10 yr 24 hr	5882	270.86	259	262	265.76	3	1	63	0.36	5026	271.87	258.77	261.77	265.38	asmd up	12.48	12.48	37.42	52.47	7.37
5026.1	10 yr 24 hr	5026	271.87	258.67	261.67	265.38	3	1	60.6	0.96	5027	272.09	258.09	261.09	265.02		12.48	12.48	60.59	52.5	7.38
5027.1	10 yr 24 hr	5027	272.09	257.99	260.99	265.02	3	1	53	0.09	5040	272.74	257.94	260.94	264.46		12.28	12.28	19.02	64.28	9.02
5040.1	10 yr 24 hr	5040	272.74	257.94	260.94	264.46	3	1	105.7	0.09	5875	274.38	257.84	260.84	263.33	asmd dn	12.28	12.28	19.05	64.26	9.03
5875.1	10 yr 24 hr	5875	274.38	257.84	260.84	263.33	3	1	166.3	0.04	5874	271.57	257.78	260.78	261.56	asmd dn&up	12.28	12.32	11.76	64.24	9.04
5874.1	10 yr 24 hr	5874	271.57	257.78	260.78	261.56	3	1	212.3	0.37	2156	267.08	257	260	258.79	asmd dn	12.32	12.32	37.54	64.22	9.43
2156.1	10 yr 24 hr	2156	267.08	257	260	258.79	3	1	23.4	1.15	2155	266.93	256.73	259.73	258.01	asmd up	12.32	12.38	66.53	64.24	15.16
2155.1	10 yr 24 hr	2155	266.93	256.73	260.73	258.01	4	1	56.8	7.94	1247	266.32	252.22	256.22	253.51		12.28	12.28	375.85	83.96	24.09
10409.1	10 yr 24 hr	10409	267	253.88	256.88	255.76	3	1	59.2	0.3	2167	267.24	253.7	256.7	255.27	asmd dn&up	12.97	12.97	34.15	36.78	8.05
2167.1	10 yr 24 hr	2167	267.24	253.7	256.7	255.27	3	1	123	1.2	1247	266.32	252.22	255.22	253.79	asmd up	12.97	12.98	67.94	36.77	9.8
1247.1	10 yr 24 hr	1247	266.32	240.22	244.72	242.23	4.5	1	196.8	1.63	1245	251.71	237.01	241.51	239.02		12.32	12.33	233.21	95.8	13.94
1245.1	10 yr 24 hr	1245	251.71	236.71	241.21	238.63	4.5	1	190.1	1.97	1234	239.26	232.96	237.46	235.07		12.32	12.33	256.47	95.79	14.66
1234.1	10 yr 24 hr	1234	239.26	232.91	237.41	235.07	4.5	1	62.9	1.48	1231	238.58	231.98	236.48	234.29		12.33	12.33	222.04	95.7	12.61
1231.1	10 yr 24 hr	1231	238.58	231.98	236.48	234.29	4.5	1	80	1.04	1225	238.15	231.15	235.65	233.48		12.33	12.33	186	95.75	11.68
1225.1	10 yr 24 hr	1225	238.15	231.15	235.65	233.48	4.5	1	32.4	0.99	1226	237.43	230.83	235.33	233.16		12.33	12.33	181.47	95.82	11.57
5850.1	10 yr 24 hr	5850	283.08	276.43	277.93	285.92	1.5	1	42.6	0.54	5854	283.48	276.2	277.7	285.67	asmd dn	14.68	14.68	7.17	11.49	6.29
5854.1	10 yr 24 hr	5854	283.48	276.2	277.7	285.67	1.5	1	507	0.52	5867	281.93	273.55	275.05	283.11	asmd dn&up	14.68	14.68	7.05	11.49	6.31
5867.1	10 yr 24 hr	5867	281.93	273.55	275.05	283.11	1.5	1	29.3	3.28	5793	281.89	272.59	274.09	282.97	asmd up	14.68	12.07	17.66	11.49	8
5793.1	10 yr 24 hr	5793	281.89	272.29	273.79	282.97	1.5	1	365.7	0.36	5784	282.98	270.98	272.48	282.64		14.65	14.67	5.84	11.53	6.41
5784.1	10 yr 24 hr	5784	282.98	270.88	272.38	282.64	1.5	1	76.6	-0.03	5783	282.5	270.9	272.4	282.6		14.65	14.65	1.58	11.8	6.61

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5783.1	10 yr 24 hr	5783	282.5	270.8	272.8	282.6	2	1	389.4	0.87	5762	277.01	267.41	269.41	277.39		12.58	12.58	19.6	25.34	7.83
5762.1	10 yr 24 hr	5762	277.01	267.36	269.36	277.39	2	1	390.9	0.98	5759	270.74	263.54	265.54	272.81		12.4	12.4	20.77	23.96	7.45
5759.1	10 yr 24 hr	5759	270.74	263.49	265.99	272.81	2.5	1	414.6	0.5	5872	266.83	261.4	263.9	271.32	asmd dn	14.37	14.37	27.04	32.06	6.43
5872.1	10 yr 24 hr	5872	266.83	261.4	263.9	271.32	2.5	1	205.6	1.46	2255	269.7	258.4	260.9	270.66	asmd up	14.37	12.07	46.01	32.08	7.76
2255.1	10 yr 24 hr	2255	269.7	258.3	260.8	270.66	2.5	1	19.2	0.16	2254	270.05	258.27	260.77	270.6	asmd dn	13.78	13.78	15.06	39.67	7.89
2254.1	10 yr 24 hr	2254	270.05	258.27	260.77	270.6	2.5	1	320.6	0.23	2256	269.73	257.53	260.03	270.01	asmd up	14.25	14.25	18.3	35.56	7.08
2256.1	10 yr 24 hr	2256	269.73	257.43	259.93	270.01	2.5	1	237.5	0.22	2257	269.62	256.9	259.4	269.72	asmd dn	14.18	14.18	17.99	35.66	7.13
2257.1	10 yr 24 hr	2257	269.62	256.9	259.4	269.72	2.5	1	106.2	0.28	2239	269.95	256.6	259.1	269.63	asmd dn&up	14.2	14.2	20.24	35.46	7.11
2239.1	10 yr 24 hr	2239	269.95	256.6	259.1	269.63	2.5	1	101.3	0.3	5920	270.06	256.3	258.8	269.55	asmd dn&up	14.28	14.28	20.73	35.58	7.15
5920.1	10 yr 24 hr	5920	270.06	256.3	258.8	269.55	2.5	1	124.6	0.24	2262	270.14	256	258.5	267.11	asmd dn&up	12.48	12.48	18.69	54.57	10.83
2262.1	10 yr 24 hr	2262	270.14	256	258.5	267.11	2.5	1	148.5	0.13	2261	270.13	255.8	258.3	264.16	asmd dn&up	12.48	12.48	13.98	54.57	10.89
2261.1	10 yr 24 hr	2261	270.13	255.8	258.3	264.16	2.5	1	337	0.18	2360	268.99	255.19	257.69	257.53	asmd up	12.48	12.48	16.2	54.57	11
2360.1	10 yr 24 hr	2360	268.99	255.09	258.09	256.47	3	1	63	4.73	2259	268.33	252.11	255.11	254.52	asmd dn&up	12.48	12.6	134.7	54.57	16.14
2259.1	10 yr 24 hr	2259	268.33	252.11	256.61	254.52	4.5	1	159.4	0.45	1252	264.05	251.4	255.9	253.54		12.18	12.18	121.87	74.32	8.76
1252.1	10 yr 24 hr	1252	264.05	251.4	255.9	253.54	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	252.22		12.2	12.2	161.62	73.45	9.95
1288.1	10 yr 24 hr	1288	258.48	250.03	254.53	251.53	4.5	1	47.8	3.2	1903	257.79	248.5	253	250.27	asmd dn	12.2	12.2	326.69	73.47	15.54
1903.1	10 yr 24 hr	1903	257.79	248.5	253	250.27	4.5	1	150.5	2.92	1240	254	244.1	248.6	245.94		12.25	12.25	312.22	101.41	17.43
2136.1	10 yr 24 hr	2136	264.27	259.6	261.1	260.99	1.5	1	15.6	0.7	1953	264.69	259.49	260.99	260.79	asmd up	12.48	12.48	8.19	11.67	6.88
1953.1	10 yr 24 hr	1953	264.69	258.99	260.99	259.84	2	1	269.9	2.22	1285	257.4	253	255	253.85		12.5	12.5	31.29	11.65	9.23
1285.1	10 yr 24 hr	1285	257.4	252.4	254.9	253.39	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	253.27	asmd dn	12.5	12.6	47.58	11.65	6.52
1906.1	10 yr 24 hr	1906	258.12	252.18	254.68	253.27	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	253.28	asmd dn&up	12.5	12.6	48.64	11.66	5.62
1907.1	10 yr 24 hr	1907	257.56	251.8	254.3	253.28	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.88	asmd up	12.42	12.42	48	31.51	10.43
1240.1	10 yr 24 hr	1240	254	244.1	247.6	245.94	3.5	2	40.4	2.72	1222	255.15	243	246.5	245.27	asmd dn 2	12.3	12.3	154.16	136.16	12.91
1222.1	10 yr 24 hr	1222	255.15	243	248	245.27	5	1	197.9	1.79	1223	246.86	239.46	244.46	241.72		12.3	12.33	323.45	136.17	15.76
1223.1	10 yr 24 hr	1223	246.86	237.46	242.46	239.3	5	1	119.1	3.85	1224	241.08	232.88	237.88	235.12		12.3	12.3	474.25	136.18	20.17
1224.1	10 yr 24 hr	1224	241.08	232.78	237.78	235.12	5	1	43.1	1.55	1909	241.08	232.11	237.11	234.41	asmd dn	12.3	12.3	301.53	136.21	15.16
1909.1	10 yr 24 hr	1909	241.08	232.11	237.11	234.41	5	1	40.4	1.68	1226	237.43	231.43	236.43	233.73		12.3	12.3	313.76	136.23	15.42
5850.1	10 yr 24 hr	5850	283.08	276.43	277.93	285.92	1.5	1	42.6	0.54	5854	283.48	276.2	277.7	285.67	asmd dn	14.87	14.87	7.17	11.47	6.28
5854.1	10 yr 24 hr	5854	283.48	276.2	277.7	285.67	1.5	1	507	0.52	5867	281.93	273.55	275.05	283.11	asmd dn&up	14.87	14.87	7.05	11.47	6.3
5867.1	10 yr 24 hr	5867	281.93	273.55	275.05	283.11	1.5	1	29.3	3.28	5793	281.89	272.59	274.09	282.97	asmd up	14.85	12.07	17.66	11.48	8
5793.1	10 yr 24 hr	5793	281.89	272.29	273.79	282.97	1.5	1	365.7	0.36	5784	282.98	270.98	272.48	282.64		14.85	14.85	5.84	11.5	6.4
5784.1	10 yr 24 hr	5784	282.98	270.88	272.38	282.64	1.5	1	76.6	-0.03	5783	282.5	270.9	272.4	282.6		14.83	14.83	1.58	11.75	6.58
5783.1	10 yr 24 hr	5783	282.5	270.8	272.8	282.6	2	1	389.4	0.87	5762	277.01	267.41	269.41	277.39		12.58	12.58	19.6	25.34	7.83
5762.1	10 yr 24 hr	5762	277.01	267.36	269.36	277.39	2	1	390.9	0.98	5759	270.74	263.54	265.54	272.81		12.4	12.4	20.77	23.96	7.45
5759.1	10 yr 24 hr	5759	270.74	263.49	265.99	272.81	2.5	1	414.6	0.5	5872	266.83	261.4	263.9	271.32	asmd dn	14.67	14.67	27.04	31.93	6.41
5872.1	10 yr 24 hr	5872	266.83	261.4	263.9	271.32	2.5	1	205.6	1.46	2255	269.7	258.4	260.9	270.66	asmd up	14.68	12.07	46.01	31.59	7.76
2255.1	10 yr 24 hr	2255	269.7	258.3	260.8	270.66	2.5	1	19.2	0.16	2254	270.05	258.27	260.77	270.6	asmd dn	14.53	14.53	15.06	44.77	8.91
2254.1	10 yr 24 hr	2254	270.05	258.27	260.77	270.6	2.5	1	320.6	0.23	2256	269.73	257.53	260.03	270.01	asmd up	14.55	14.55	18.3	35.9	7.15
2256.1	10 yr 24 hr	2256	269.73	257.43	259.93	270.01	2.5	1	237.5	0.22	2257	269.62	256.9	259.4	269.72	asmd dn	14.57	14.57	17.99	35.9	7.18
2257.1	10 yr 24 hr	2257	269.62	256.9	259.4	269.72	2.5	1	106.2	0.28	2239	269.95	256.6	259.1	269.63	asmd dn&up	14.57	14.57	20.24	35.97	7.22
2239.1	10 yr 24 hr	2239	269.95	256.6	259.1	269.63	2.5	1	101.3	0.3	5920	270.06	256.3	258.8	269.55	asmd dn&up	14.57	14.57	20.73	35.91	7.22
5920.1	10 yr 24 hr	5920	270.06	256.3	258.8	269.55	2.5	1	124.6	0.24	2262	270.14	256	258.5	267.11	asmd dn&up	12.48	12.48	18.69	54.57	10.83
2262.1	10 yr 24 hr	2262	270.14	256	258.5	267.11	2.5	1	148.5	0.13	2261	270.13	255.8	258.3	264.16	asmd dn&up	12.48	12.48	13.98	54.57	10.89
2261.1	10 yr 24 hr	2261	270.13	255.8	258.3	264.16	2.5	1	337	0.18	2360	268.99	255.19	257.69	257.53	asmd up	12.48	12.48	16.2	54.57	11
2360.1	10 yr 24 hr	2360	268.99	255.09	258.09	256.47	3	1	63	4.73	2259	268.33	252.11	255.11	254.52	asmd dn&up	12.48	12.6	134.7	54.57	16.14
2259.1	10 yr 24 hr	2259	268.33	252.11	256.61	254.52	4.5	1	159.4	0.45	1252	264.05	251.4	255.9	253.54		12.18	12.18	121.87	74.33	8.76
1252.1	10 yr 24 hr	1252	264.05	251.4	255.9	253.54	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	252.22		12.2	12.2	161.62	73.46	9.95
1288.1	10 yr 24 hr	1288	258.48	250.03	254.53	251.53	4.5	1	47.8	3.2	1903	257.79	248.5	253	250.27	asmd dn	12.2	12.2	326.69	73.48	15.54
1903.1	10 yr 24 hr	1903	257.79	248.5	253	250.27	4.5	1	150.5	2.92	1240	254	244.1	248.6	245.94		12.25	12.25	312.22	101.41	17.43

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
2136.1	10 yr 24 hr	2136	264.27	259.6	261.1	260.99	1.5	1	15.6	0.7	1953	264.69	259.49	260.99	260.79	asmd up	12.48	12.48	8.19	11.67	6.88
1953.1	10 yr 24 hr	1953	264.69	258.99	260.99	259.84	2	1	269.9	2.22	1285	257.4	253	255	253.85		12.5	12.5	31.29	11.65	9.23
1285.1	10 yr 24 hr	1285	257.4	252.4	254.9	253.39	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	253.27	asmd dn	12.5	12.6	47.58	11.65	6.52
1906.1	10 yr 24 hr	1906	258.12	252.18	254.68	253.27	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	253.28	asmd dn&up	12.5	12.6	48.64	11.66	5.62
1907.1	10 yr 24 hr	1907	257.56	251.8	254.3	253.28	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.88	asmd up	12.42	12.42	48	31.51	10.43
1240.1	10 yr 24 hr	1240	254	244.1	247.6	245.94	3.5	2	40.4	2.72	1222	255.15	243	246.5	245.27	asmd dn	12.3	12.3	154.16	136.16	12.91
1222.1	10 yr 24 hr	1222	255.15	243	248	245.27	5	1	197.9	1.79	1223	246.86	239.46	244.46	241.72		12.3	12.33	323.45	136.17	15.76
1223.1	10 yr 24 hr	1223	246.86	237.46	242.46	239.3	5	1	119.1	3.85	1224	241.08	232.88	237.88	235.12		12.3	12.3	474.25	136.18	20.17
1224.1	10 yr 24 hr	1224	241.08	232.78	237.78	235.12	5	1	43.1	1.55	1909	241.08	232.11	237.11	234.41	asmd dn	12.3	12.3	301.53	136.21	15.16
1909.1	10 yr 24 hr	1909	241.08	232.11	237.11	234.41	5	1	40.4	1.68	1226	237.43	231.43	236.43	233.73		12.3	12.3	313.76	136.24	15.42
1226.1	10 yr 24 hr	1226	237.43	226.53	233.53	230.07	7	1	178.8	0.68	1559	234.52	225.32	232.32	228.79		12.25	12.25	487.99	251.59	12.96
1559.1	10 yr 24 hr	1559	234.52	225.32	232.32	228.79	7	1	180.4	0.51	1215	232.4	224.4	231.4	226.87	asmd dn	12.25	12.22	423.62	251.62	13.78
10412.1	10 yr 24 hr	1215	232.4	224.4	229.4	226.87	5	1	400.2	1.69	10410	228	217.62	222.62	222.1	asmd dn	12.22	12.2	314.78	144.33	13.9
10410.1	10 yr 24 hr	10410	228	217.62	222.62	222.1	5	1	190.4	0.31	1188	222.83	217.03	222.03	221.11	asmd up	12.35	12.55	134.62	173.73	9.58
1188.1	10 yr 24 hr	1188	222.83	217.03	222.03	221.11	5	1	44	2.46	1547	223.8	215.95	220.95	221.1	asmd dn	12.35	13.32	378.89	173.71	11.03
1547.1	10 yr 24 hr	1547	223.8	215.95	220.95	221.1	5	1	8.6	2.43	1615	223.84	215.74	220.74	221.06	asmd up	12.35	12.35	377.91	213.96	10.72
1615.1	10 yr 24 hr	1615	223.84	215.74	220.74	221.06	5	1	31.4	0.73	1189	223.76	215.51	220.51	220.83		12.35	12.35	206.98	213.95	10.58
1189.1	10 yr 24 hr	1189	223.76	215.51	220.51	220.83	5	1	132.8	0.09	1548	222.79	215.39	220.39	219.77		12.35	12.35	72.7	213.94	10.69
1548.1	10 yr 24 hr	1548	222.79	215.39	220.39	219.77	5	1	57.6	0.45	10428	221	215.13	220.13	219.35	asmd dn	12.35	12.35	162.48	213.93	11.77
10428.1	10 yr 24 hr	10428	221	215.13	220.13	219.35	5	1	23.7	0.46	1159	221.22	215.02	220.02	219.18	asmd up	12.35	12.35	164.76	213.91	12.11
1215.1	10 yr 24 hr	1215	232.4	224.4	229.4	226.87	5	1	32.4	0.62	1214	230.8	224.2	229.2	226.59	asmd up	12.25	12.22	190.01	107.45	11.22
1214.1	10 yr 24 hr	1214	230.8	224.2	229.2	226.59	5	1	369.7	1.63	1552	226	218.16	223.16	221.08		12.27	12.3	309.12	141.59	14.87
1552.1	10 yr 24 hr	1552	226	218.16	223.16	221.08	5	1	33.5	1.61	1184	224.42	217.62	222.62	220.81		12.27	12.35	307.04	141.51	11.79
1184.1	10 yr 24 hr	1184	224.42	217.62	222.62	220.81	5	1	90.5	0.74	10411	223	216.95	221.95	220.24	asmd dn	12.27	12.32	208.08	141.49	10.7
10411.1	10 yr 24 hr	10411	223	216.95	221.95	220.24	5	1	312.5	0.75	1163	220.92	214.62	219.62	218.61	asmd up	12.28	12.33	208.82	141.65	10.15
1163.1	10 yr 24 hr	1163	220.92	214.62	219.62	218.61	5	1	40.4	-0.2	10413	221	214.7	219.7	218.46	asmd dn	12.28	12.35	107.62	141.85	8.57
10413.1	10 yr 24 hr	10413	221	214.7	219.7	218.46	5	1	12.8	-0.16	1159	221.22	214.72	219.72	218.39	asmd up	12.23	12.23	95.6	163.62	10.37
1159.1	10 yr 24 hr	1159	221.22	211.72	219.72	215.76	8	1	142.3	0.63	1153	220.02	210.82	218.82	214.59		12.32	12.33	673.54	373.31	14.83
1153.1	10 yr 24 hr	1153	220.02	210.82	218.82	214.59	8	1	102.5	0.85	1489	220.09	209.95	217.95	213.56	asmd dn	12.32	12.33	780.27	373.48	16.15
1489.1	10 yr 24 hr	1489	220.09	209.95	217.95	213.56	8	1	15.3	0.79	1130	219.63	209.83	217.83	213.39	asmd up	12.32	12.37	750.05	373.54	17.1
1130.1	10 yr 24 hr	1130	219.63	209.83	217.83	213.39	8	1	130	1.66	1129	218.57	207.67	215.67	211.53		12.28	12.3	1091.7	418.08	19.19
1129.1	10 yr 24 hr	1129	218.57	207.67	215.67	211.53	8	1	57	1.23	1488	218.71	206.97	214.97	210.9		12.28	12.33	938.55	418.31	17.43
1488.1	10 yr 24 hr	1488	218.71	206.97	214.97	210.9	8	1	76.4	1.2	1486	216.55	206.05	214.05	210.12		12.28	12.33	929.38	418.51	16.99
1486.1	10 yr 24 hr	1486	216.55	206.05	214.05	210.12	8	1	121.7	0.77	1092	217.21	205.11	213.11	208.9		12.28	12.33	744.33	418.81	16.52
1092.1	10 yr 24 hr	1092	217.21	205.11	213.11	208.9	8	1	102.4	1.49	1084	217.68	203.58	211.58	207.74		12.28	12.38	1035.24	419.02	17.93
1084.1	10 yr 24 hr	1084	217.68	203.58	211.58	207.74	8	1	165.6	1.07	1064	215.51	201.81	209.81	206.03		12.25	12.3	875.6	457.41	17.39
1064.1	10 yr 24 hr	1064	215.51	201.81	209.81	206.03	8	1	135.7	1.01	1059	214.79	200.44	208.44	204.68		12.25	12.3	850.98	457.28	17.16
1059.1	10 yr 24 hr	1059	214.79	200.44	208.44	204.68	8	1	136.7	1.1	1054	213.67	198.94	206.94	203.36		12.28	12.27	887.17	454.81	17.05
1054.1	10 yr 24 hr	1054	213.67	198.94	206.94	203.36	8	1	135.4	0.91	1052	211.02	197.71	205.71	202.21		12.27	12.27	807.22	454.51	16.3
1052.1	10 yr 24 hr	1052	211.02	197.71	205.71	202.21	8	1	138.3	0.88	1051	208.61	196.49	204.49	200.96		12.23	12.3	795.46	476.81	16.67
1051.1	10 yr 24 hr	1051	208.61	196.49	204.49	200.96	8	1	137.2	1.28	1046	207.39	194.74	202.74	199.75		12.27	12.27	956.51	482.48	16.69
1046.1	10 yr 24 hr	1046	207.39	194.74	202.74	199.75	8	1	137.5	0	1040	207.34	194.74	202.74	198.55		12.27	12.25	26.78	485.62	15.24
1040.1	10 yr 24 hr	1040	207.34	194.74	202.74	198.55	8	1	139.1	2.15	1031	204.4	191.75	199.75	196.49		12.27	12.28	1241.71	483.62	20.55
1031.1	10 yr 24 hr	1031	204.4	191.75	199.75	196.49	8	1	132.7	0.97	1026	202.35	190.46	198.46	195.34		12.27	12.25	835.04	492.31	16.78
1026.1	10 yr 24 hr	1026	202.35	190.46	198.46	195.34	8	1	145.6	0.58	1021	200.49	189.62	197.62	194.09		12.25	12.28	643.29	497.32	16.42
1021.1	10 yr 24 hr	1021	200.49	189.62	197.62	194.09	8	1	346.9	1.15	1009	197.32	185.62	193.62	190.24		12.25	12.28	909.44	519.33	18.44
1009.1	10 yr 24 hr	1009	197.32	185.62	193.62	190.24	8	1	70.3	1.55	10436	195	184.53	192.53	189.56		12.28	12.27	1054.59	508.77	17.72
10436.1	10 yr 24 hr	10436	195	184.53	192.53	189.56	8	1	6.7	1.63	1006	195.82	184.42	192.42	189.5		12.28	12.27	1085.19	507.6	15.97
1006.1	10 yr 24 hr	1006	195.82	184.42	192.42	189.5	8	1	139.4	0.38	1005	193.79	183.89	191.89	187.94		12.28	12.27	522.22	548.9	17.59

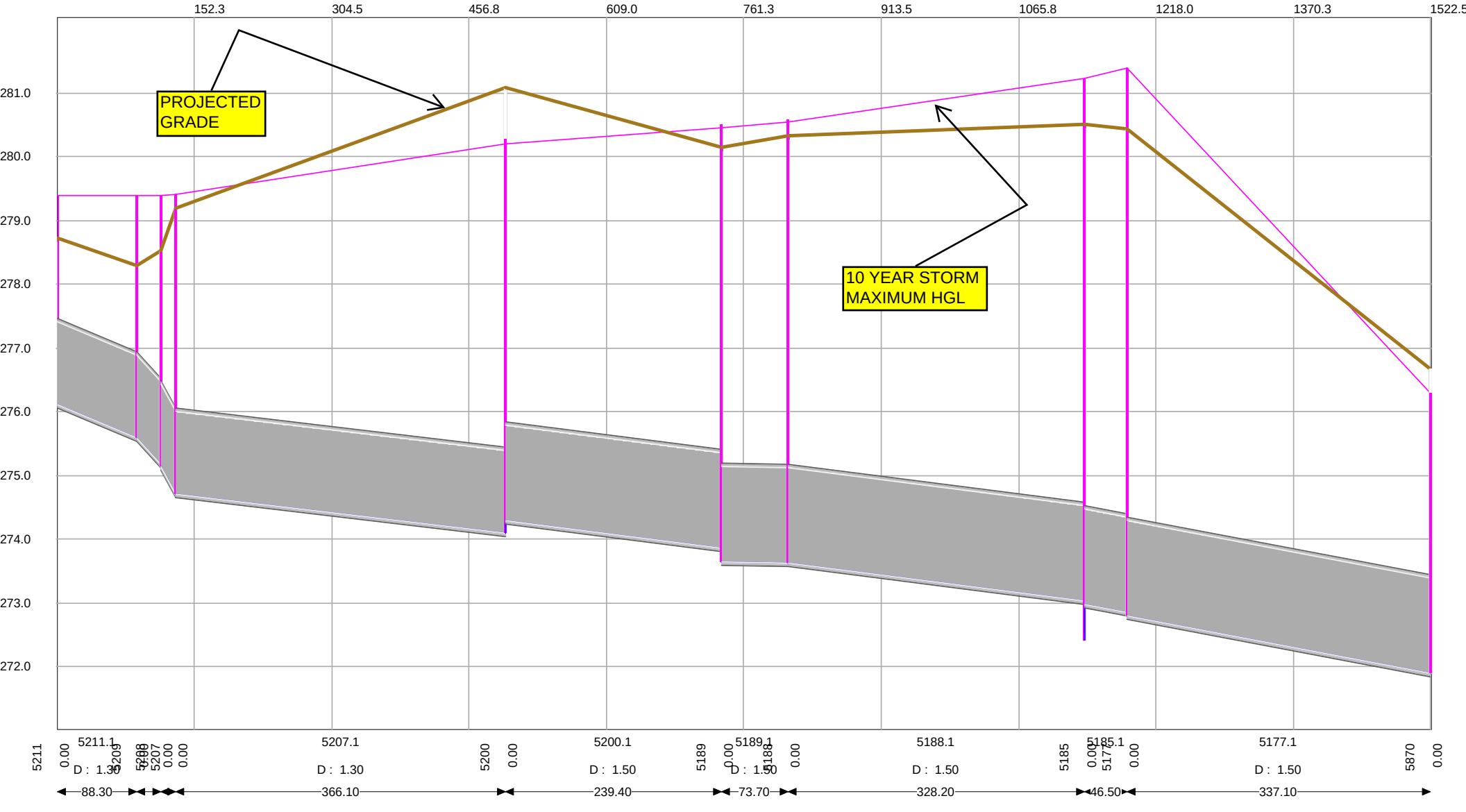
All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TEN YEAR STORM

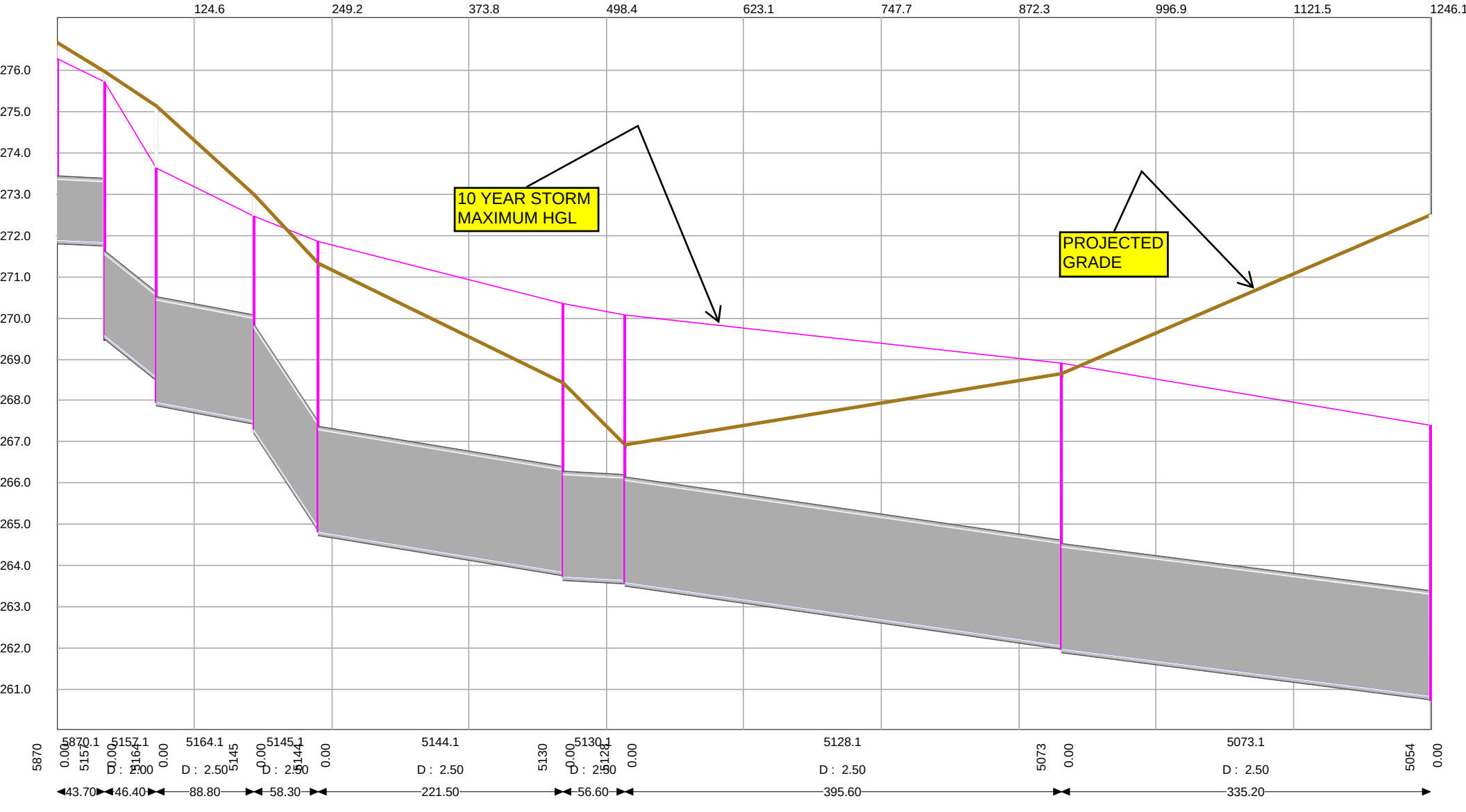
Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
1005.2	10 yr 24 hr	1005	193.79	183.89	191.89	187.94	8	1	121	1.97	10430	191.5	181.5	189.5	185.7	asmd dn	12.28	12.27	1190.29	539.89	22.79
10430.1	10 yr 24 hr	10430	191.5	181.5	189.5	185.7	8	1	24.2	1.86	10453	191.05	181.05	189.05	185.31	asmd dn&up	12.28	12.38	1154.9	534.61	21.74
10453.1	10 yr 24 hr	10453	191.05	181.05	190.05	185.31	9	1	54.8	1.92	10431	190	180	189	184.69	asmd dn&up	12.23	12.38	1604.94	531.55	19.59
10431.1	10 yr 24 hr	10431	190	180	189	184.69	9	1	66.2	1.96	1001	188.7	178.7	187.7	184.23	asmd up	12.27	12.35	1624.79	537.15	17.35
1001.1	10 yr 24 hr	1001	188.7	178.7	186.7	184.23	8	1	354	0.79	10440	183.89	175.89	183.89	181.2	Ditch	12.27	12.3	754.57	587.16	16.78

All Pipes are Circular and have a Roughness of 0.014.

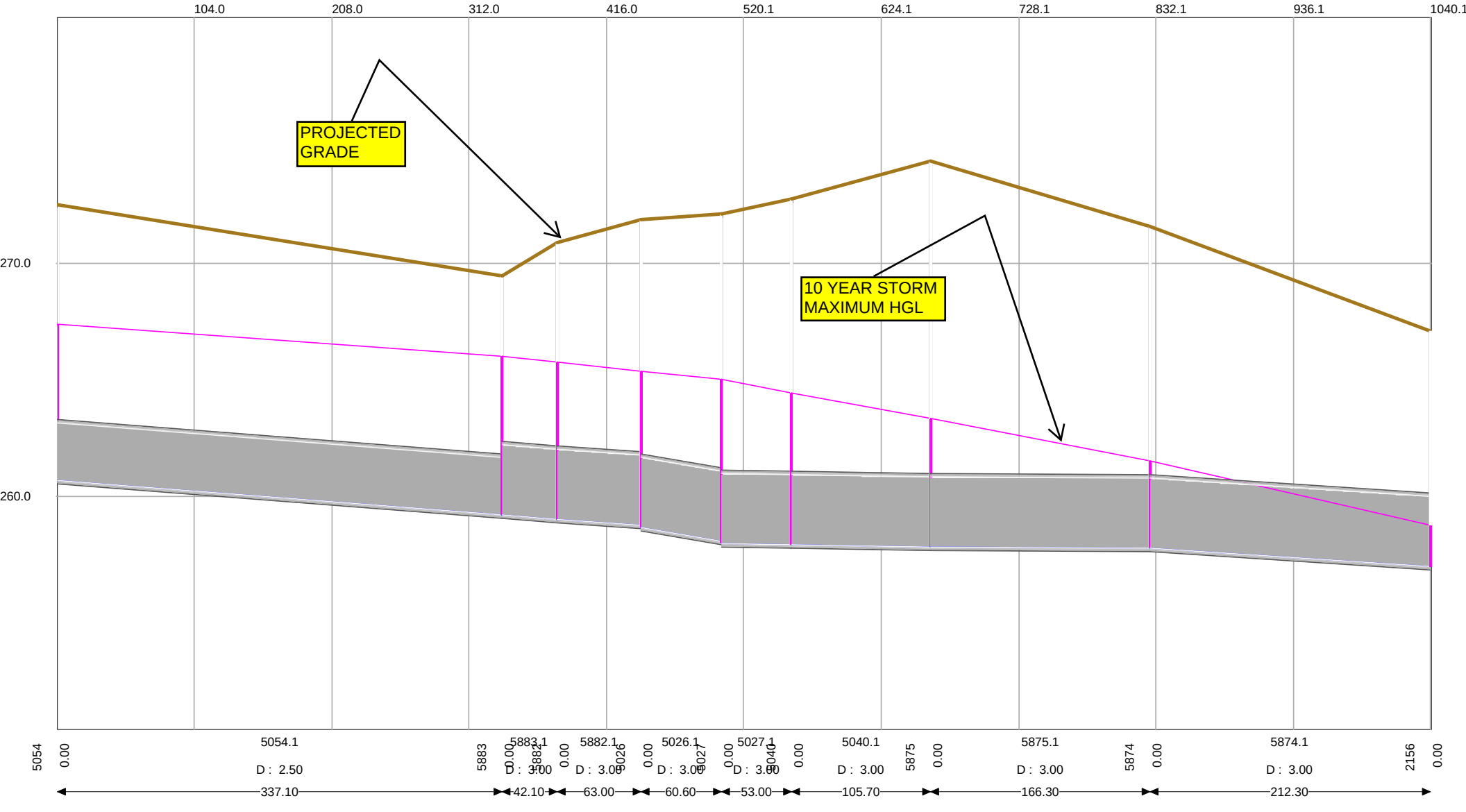
WEST BRANCH ORIGINAL MODEL - NODES 5211-5870
Day [0] Time 00:01:00 Step 1



WEST BRANCH ORIGINAL MODEL - NODES 5870-5054
Day [0] Time 00:01:00 Step 1



WEST BRANCH ORIGINAL MODEL - NODES 5054-2156
Day [0] Time 00:01:00 Step 1



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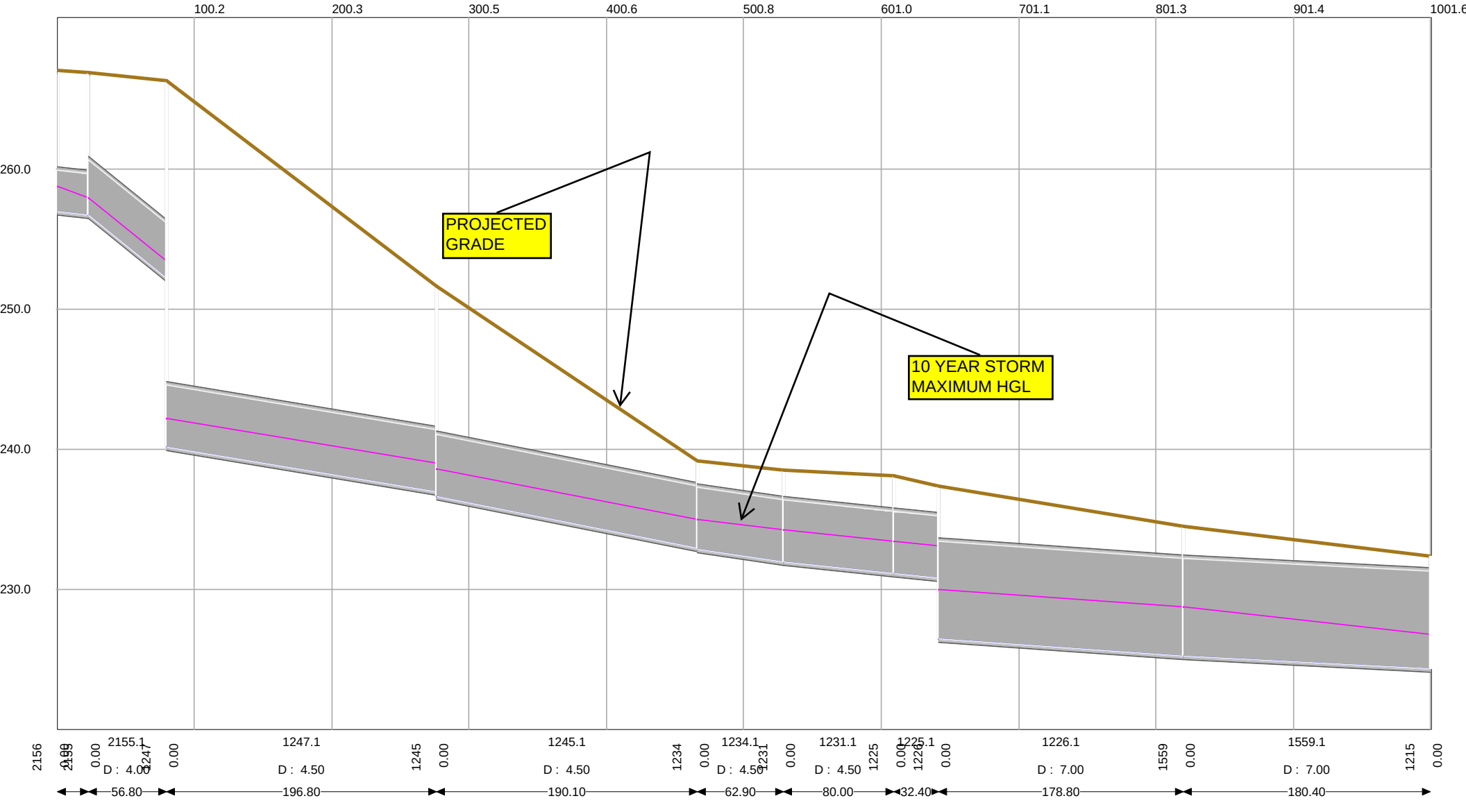
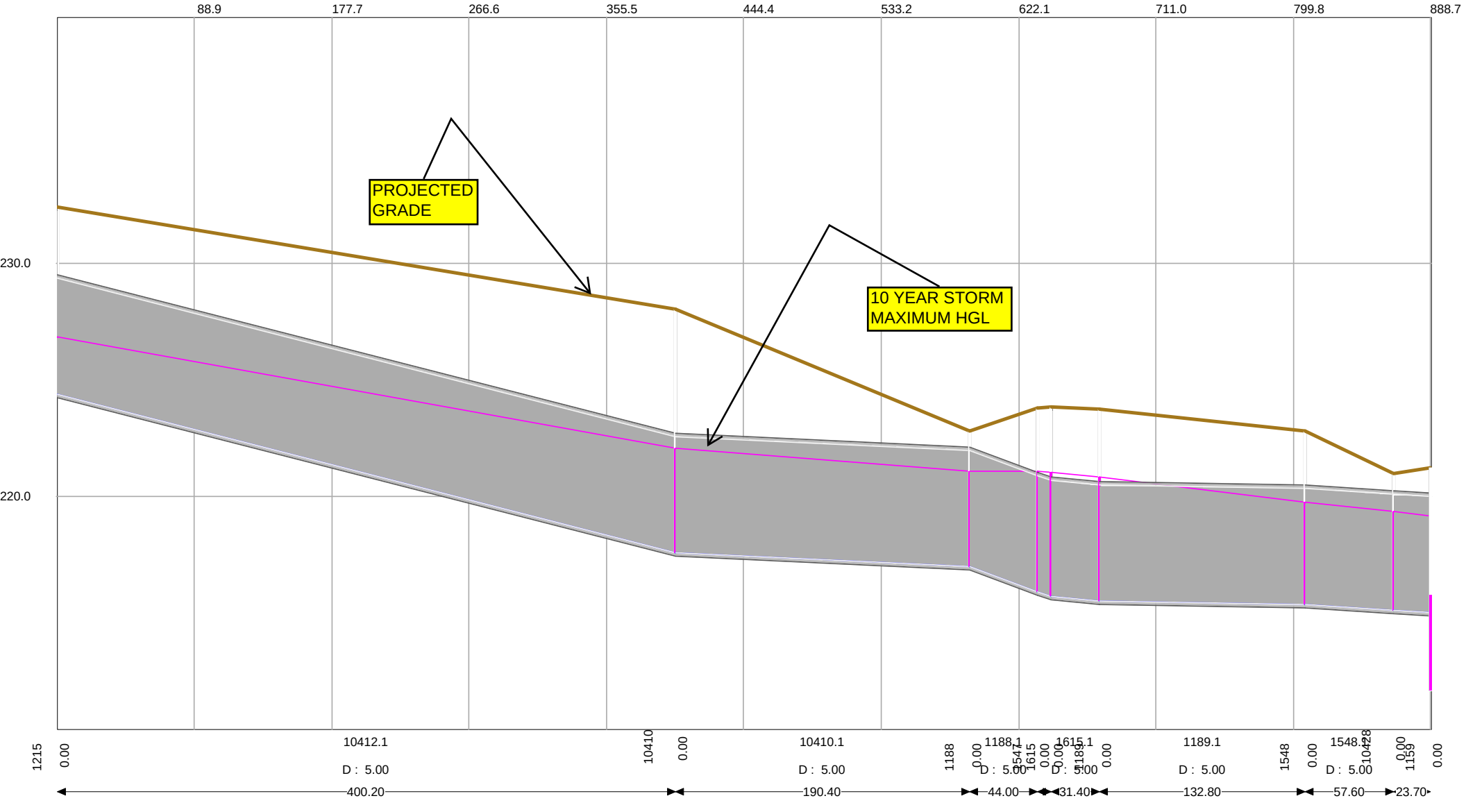
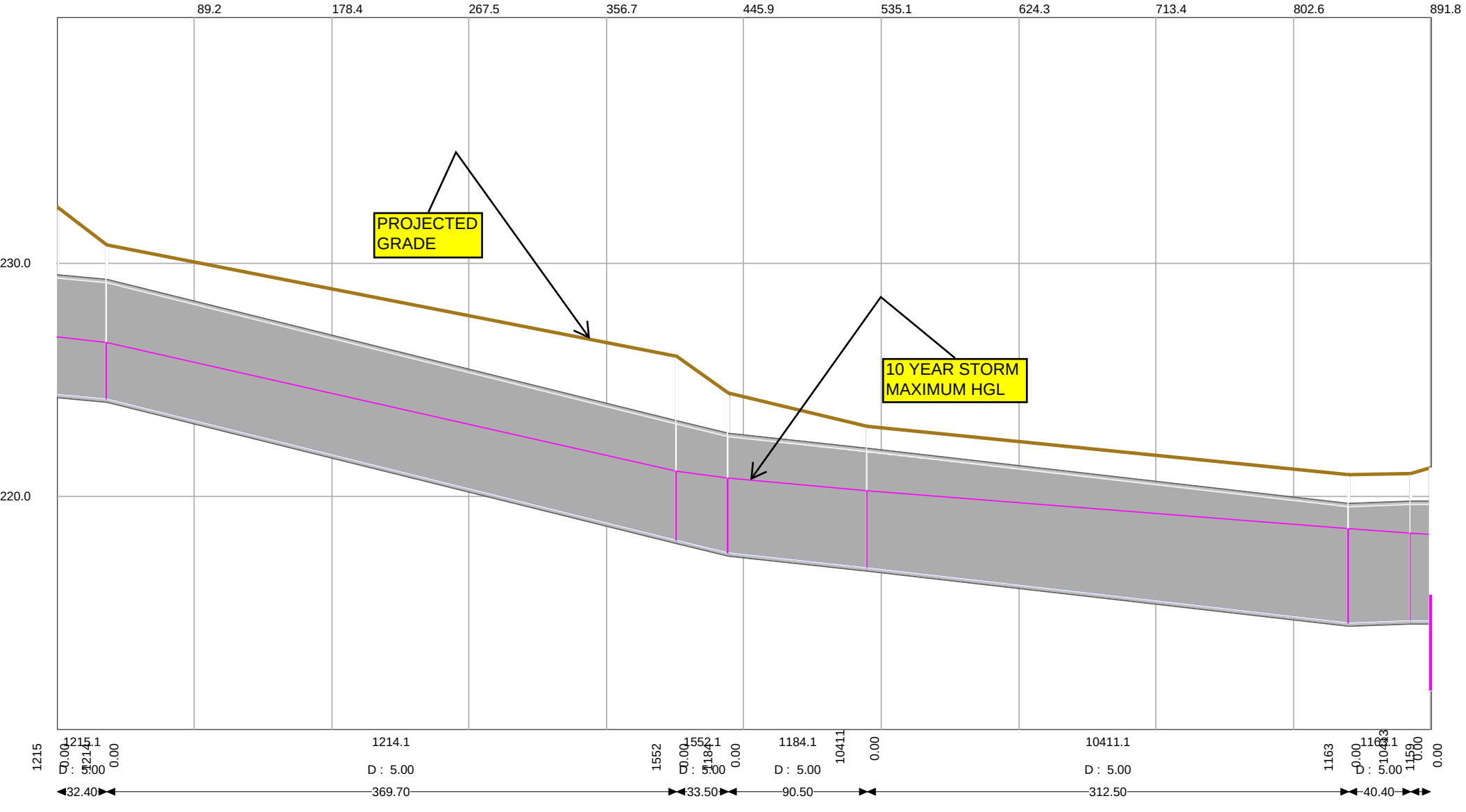


WEST BRANCH ORIGINAL MODEL - NODES 1215-1159
Day [0] Time 00:01:00 Step 1



WEST BRANCH ORIGINAL MODEL - NODES 1215-1159 (EAST SPLIT)
Day [0] Time 00:01:00 Step 1



WEST BRANCH ORIGINAL MODEL - NODES 1159-1054
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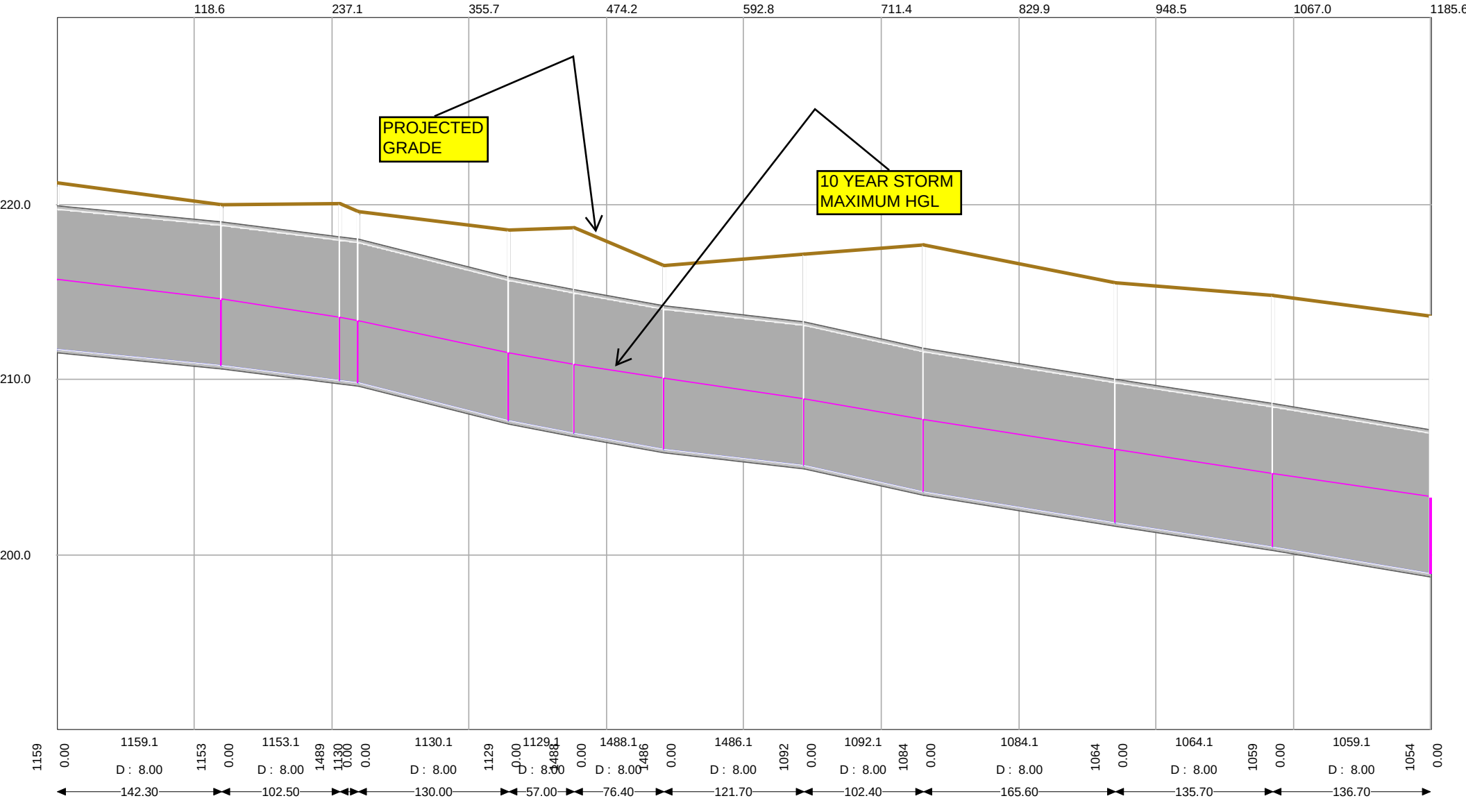
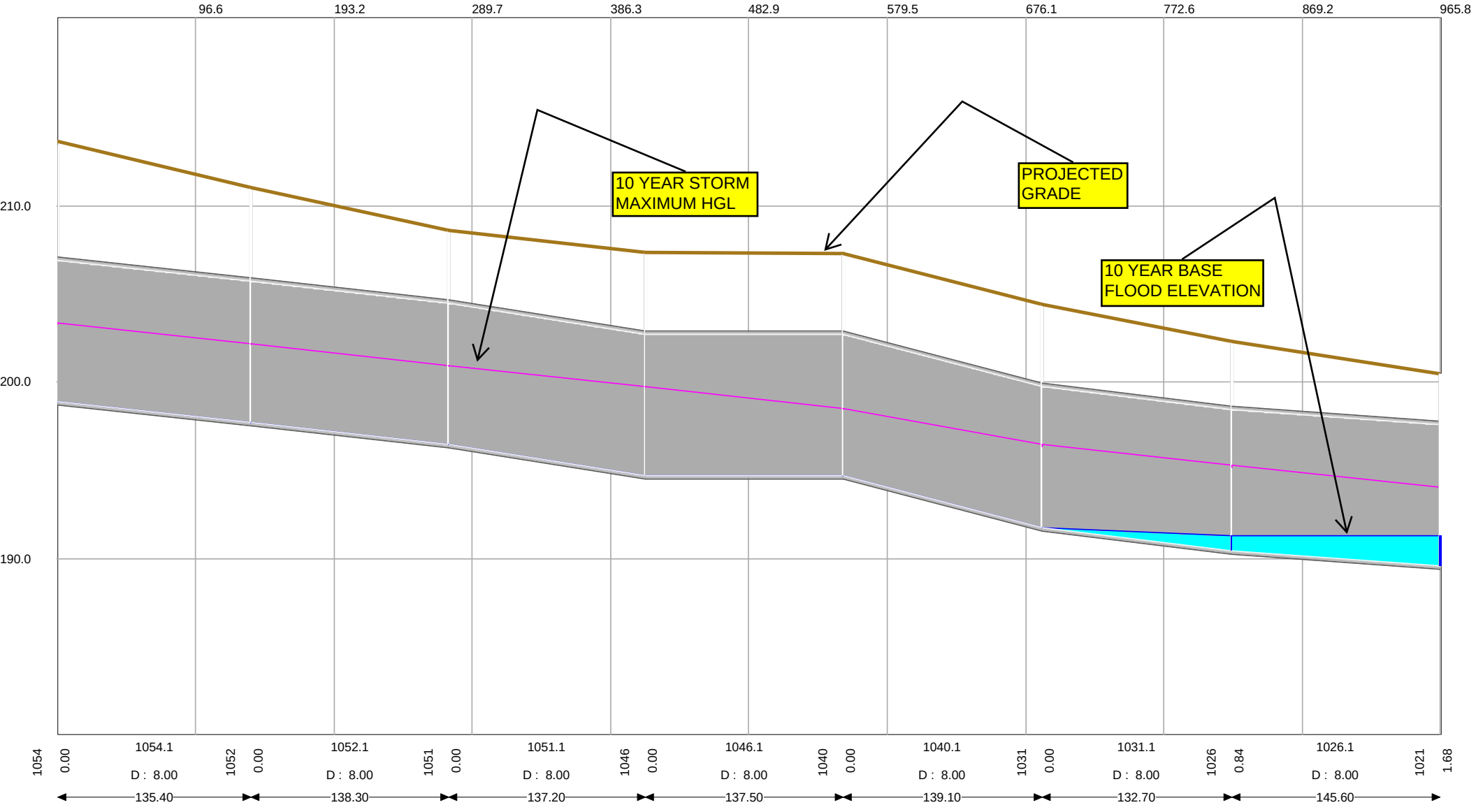
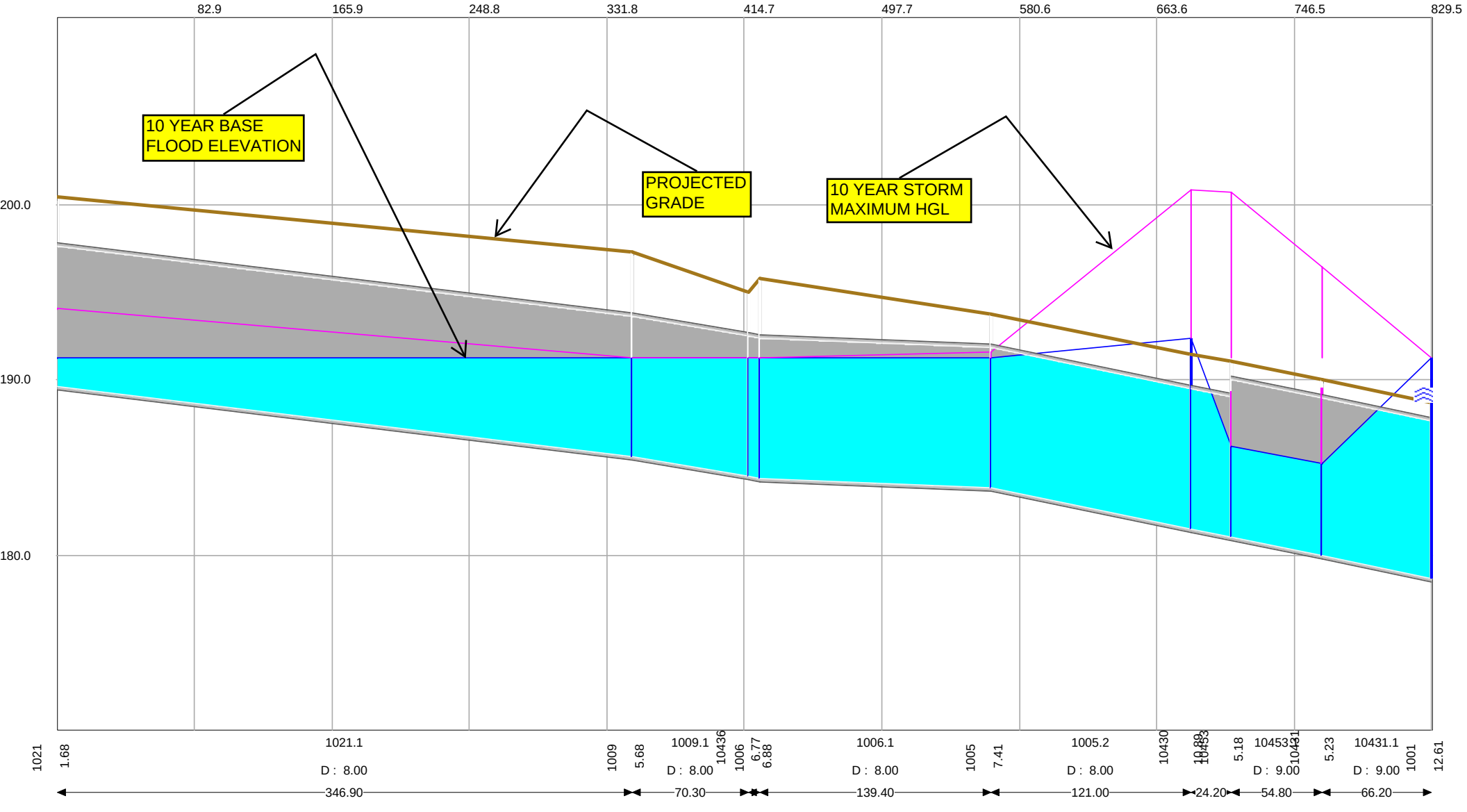


WEST BRANCH ORIGINAL MODEL - MODES 1054-1021
Day [0] Time 00:01:00 Step 1



WEST BRANCH ORIGINAL MODEL - MODES 1021-1001
Day [0] Time 00:01:00 Step 1



ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5211.1	2 yr 24 hr	5211	278.72	276.12	277.42	278.82	1.3	1	88.3	0.6	5209	278.29	275.59	276.89	278.82		14.45	14.45	5.16	4.55	3.41
5210.1	2 yr 24 hr	5210	278.24	275.54	276.84	278.82	1.3	1	32.5	-0.46	5209	278.29	275.69	276.99	278.82		14.48	14.48	4.52	4.54	3.4
5209.1	2 yr 24 hr	5209	278.29	275.59	276.89	278.82	1.3	1	27.3	1.5	5208	278.53	275.18	276.48	278.81		14.45	11.9	8.16	4.63	3.83
5208.1	2 yr 24 hr	5208	278.53	275.13	276.43	278.81	1.3	1	15.9	2.7	5207	279.2	274.7	276	278.81		14.45	14.45	10.95	4.66	3.48
5205.1	2 yr 24 hr	5205	278.78	275.58	276.88	278.86	1.3	1	27.2	2.39	5206	278.53	274.93	276.23	278.81		13.85	1.3	10.3	5.1	6.41
5206.1	2 yr 24 hr	5206	278.53	274.88	276.18	278.81	1.3	1	12.3	0.65	5207	279.2	274.8	276.1	278.81		13.67	13.67	5.37	3.51	2.61
5207.1	2 yr 24 hr	5207	279.2	274.7	276	278.81	1.3	1	366.1	0.17	5200	281.09	274.09	275.39	278.94		12.05	12.05	2.72	5.46	4.07
5200.1	2 yr 24 hr	5200	281.09	274.29	275.79	278.94	1.5	1	239.4	0.18	5189	280.15	273.85	275.35	278.99		12.05	12.03	4.18	5.26	3.01
5189.1	2 yr 24 hr	5189	280.15	273.65	275.15	278.99	1.5	1	73.7	0.03	5188	280.33	273.63	275.13	279.01		12.05	12.05	1.61	4.91	2.82
5188.1	2 yr 24 hr	5188	280.33	273.63	275.13	279.01	1.5	1	328.2	0.19	5185	280.52	273.02	274.52	279.08		14.47	13.98	4.21	4.9	2.75
5185.1	2 yr 24 hr	5185	280.52	272.97	274.47	279.08	1.5	1	46.5	0.28	5177	280.44	272.84	274.34	279.09		14.47	13.98	5.16	4.92	2.75
5177.1	2 yr 24 hr	5177	280.44	272.79	274.29	279.09	1.5	1	337.1	0.26	5870	276.68	271.9	273.4	273.83	asmd dn	12.55	12.55	5.01	12.35	6.86
5870.1	2 yr 24 hr	5870	276.68	271.9	273.4	273.83	1.5	1	43.7	0.18	5157	275.97	271.82	273.32	273.15	asmd up	12.55	12.55	4.17	12.35	7.02
5219.1	2 yr 24 hr	5219	281.87	275.47	276.77	281.87	1.3	1	636.2	0.89	5871	276.23	269.78	271.08	272.86	asmd dn	12.42	12.42	6.3	8.14	5.99
5871.1	2 yr 24 hr	5871	276.23	269.78	271.08	272.86	1.3	1	33.9	0.92	5157	275.97	269.47	270.77	272.37	asmd up	12.42	12.42	6.37	8.16	6.1
5168.1	2 yr 24 hr	5168	279.57	273.07	274.57	273.71	1.5	1	630.2	0.56	5869	275.85	269.57	271.07	272.38	asmd dn	12.22	12.2	7.27	2.77	3.34
5869.1	2 yr 24 hr	5869	275.85	269.57	271.07	272.38	1.5	1	20.3	0.49	5157	275.97	269.47	270.97	272.37	asmd up	12.23	12.23	6.85	2.51	1.37
5157.1	2 yr 24 hr	5157	275.97	269.57	271.57	272.37	2	1	46.4	2.18	5164	275.16	268.56	270.56	271.26		12.33	12.23	30.99	32.8	11.22
5164.1	2 yr 24 hr	5164	275.16	267.96	270.46	271.26	2.5	1	88.8	0.52	5145	273	267.5	270	270.62		12.33	12.22	27.41	32.78	6.97
5145.1	2 yr 24 hr	5145	273	267.3	269.8	270.62	2.5	1	58.3	4.09	5144	271.32	264.92	267.42	270.23		12.33	12.12	76.95	32.76	11.24
5144.1	2 yr 24 hr	5144	271.32	264.82	267.32	270.23	2.5	1	221.5	0.45	5130	268.43	263.83	266.33	269.12		12.33	12.33	25.46	32.75	6.63
5130.1	2 yr 24 hr	5130	268.43	263.73	266.23	269.12	2.5	1	56.6	0.18	5128	266.93	263.63	266.13	268.96		12.28	12.28	16.01	31.23	6.33
5128.1	2 yr 24 hr	5128	266.93	263.58	266.08	268.96	2.5	1	395.6	0.38	5073	268.66	262.06	264.56	267.15		13.33	13.35	23.61	30.81	6.24
5073.1	2 yr 24 hr	5073	268.66	261.96	264.46	267.15	2.5	1	335.2	0.34	5054	272.51	260.81	263.31	265.14		13.08	13.08	22.31	32.11	6.51
5054.1	2 yr 24 hr	5054	272.51	260.71	263.21	265.14	2.5	1	337.1	0.44	5883	269.43	259.23	261.73	263.13	asmd dn	13.08	13.15	25.24	32.13	6.54
5077.1	2 yr 24 hr	5077	268.54	264.29	266.79	265.3	2.5	1	229.1	1.1	5889	268.03	261.76	264.26	263.24	asmd dn	12.4	12.52	40.02	13.39	6.89
5889.1	2 yr 24 hr	5889	268.03	261.76	264.26	263.24	2.5	1	200.8	1.16	5013	268.93	259.43	261.93	263.14	asmd up	12.43	12.58	41.03	13.53	4.84
5013.1	2 yr 24 hr	5013	268.93	259.23	261.73	263.14	2.5	1	3.6	0	5883	269.43	259.23	261.73	263.13	asmd dn	12.43	12.43	1.2	13.56	2.75
5883.1	2 yr 24 hr	5883	269.43	259.23	262.23	263.13	3	1	42.1	0.55	5882	270.86	259	262	262.93	asmd dn&up	12.48	13.83	45.78	43.42	6.25
5882.1	2 yr 24 hr	5882	270.86	259	262	262.93	3	1	63	0.36	5026	271.87	258.77	261.77	262.64	asmd up	12.48	12.47	37.42	43.44	6.13
5026.1	2 yr 24 hr	5026	271.87	258.67	261.67	262.64	3	1	60.6	0.96	5027	272.09	258.09	261.09	262.35		12.48	12.48	60.59	43.45	6.14
5027.1	2 yr 24 hr	5027	272.09	257.99	260.99	262.35	3	1	53	0.09	5040	272.74	257.94	260.94	262.02		12.35	12.35	19.02	49.21	6.94
5040.1	2 yr 24 hr	5040	272.74	257.94	260.94	262.02	3	1	105.7	0.09	5875	274.38	257.84	260.84	261.36	asmd dn	12.35	12.35	19.05	49.21	6.92
5875.1	2 yr 24 hr	5875	274.38	257.84	260.84	261.36	3	1	166.3	0.04	5874	271.57	257.78	260.78	260.35	asmd dn&up	12.37	12.37	11.76	49.21	6.75
5874.1	2 yr 24 hr	5874	271.57	257.78	260.78	260.35	3	1	212.3	0.37	2156	267.08	257	260	258.56	asmd dn	12.37	12.37	37.54	49.22	7.98
2156.1	2 yr 24 hr	2156	267.08	257	260	258.56	3	1	23.4	1.15	2155	266.93	256.73	259.73	257.8	asmd up	12.37	12.4	66.53	49.22	13.85
2155.1	2 yr 24 hr	2155	266.93	256.73	260.73	257.8	4	1	56.8	7.94	1247	266.32	252.22	256.22	253.29		12.3	12.32	375.85	58.91	21.75
10409.1	2 yr 24 hr	10409	267	253.88	256.88	255.25	3	1	59.2	0.3	2167	267.24	253.7	256.7	254.82	asmd dn&up	12.97	12.97	34.15	20.02	6.54
2167.1	2 yr 24 hr	2167	267.24	253.7	256.7	254.82	3	1	123	1.2	1247	266.32	252.22	255.22	253.34	asmd up	12.97	12.98	67.94	20.02	8.36
1247.1	2 yr 24 hr	1247	266.32	240.22	244.72	241.85	4.5	1	196.8	1.63	1245	251.71	237.01	241.51	238.64		12.38	12.4	233.21	65.74	12.6
1245.1	2 yr 24 hr	1245	251.71	236.71	241.21	238.26	4.5	1	190.1	1.97	1234	239.26	232.96	237.46	234.64		12.38	12.4	256.47	65.74	13.32
1234.1	2 yr 24 hr	1234	239.26	232.91	237.41	234.64	4.5	1	62.9	1.48	1231	238.58	231.98	236.48	233.84		12.38	12.4	222.04	65.74	11.53
1231.1	2 yr 24 hr	1231	238.58	231.98	236.48	233.84	4.5	1	80	1.04	1225	238.15	231.15	235.65	233.02		12.4	12.4	186	65.73	10.61
1225.1	2 yr 24 hr	1225	238.15	231.15	235.65	233.02	4.5	1	32.4	0.99	1226	237.43	230.83	235.33	232.7		12.4	12.4	181.47	65.74	10.5
5850.1	2 yr 24 hr	5850	283.08	276.43	277.93	284.53	1.5	1	42.6	0.54	5854	283.48	276.2	277.7	284.14	asmd dn	13.32	13.35	7.17	10.89	5.99
5854.1	2 yr 24 hr	5854	283.48	276.2	277.7	284.14	1.5	1	507	0.52	5867	281.93	273.55	275.05	281.04	asmd dn&up	13.32	13.35	7.05	10.89	6.01
5867.1	2 yr 24 hr	5867	281.93	273.55	275.05	281.04	1.5	1	29.3	3.28	5793	281.89	272.59	274.09	280.88	asmd up	13.33	12.23	17.66	10.89	8.01
5793.1	2 yr 24 hr	5793	281.89	272.29	273.79	280.88	1.5	1	365.7	0.36	5784	282.98	270.98	272.48	278.96		13.35	13.35	5.84	10.89	6.07
5784.1	2 yr 24 hr	5784	282.98	270.88	272.38	278.96	1.5	1	76.6	-0.03	5783	282.5	270.9	272.4	278.56		13.35	13.35	1.58	10.9	6.21

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
5783.1	2 yr 24 hr	5783	282.5	270.8	272.8	278.56	2	1	389.4	0.87	5762	277.01	267.41	269.41	274.93		12.6	13.12	19.6	20.65	7.08
5762.1	2 yr 24 hr	5762	277.01	267.36	269.36	274.93	2	1	390.9	0.98	5759	270.74	263.54	265.54	271.29		12.95	13.22	20.77	20.91	7.29
5759.1	2 yr 24 hr	5759	270.74	263.49	265.99	271.29	2.5	1	414.6	0.5	5872	266.83	261.4	263.9	269.74	asmd dn	12.93	12.25	27.04	27.92	5.96
5872.1	2 yr 24 hr	5872	266.83	261.4	263.9	269.74	2.5	1	205.6	1.46	2255	269.7	258.4	260.9	269.05	asmd up	12.93	12.2	46.01	27.95	7.67
2255.1	2 yr 24 hr	2255	269.7	258.3	260.8	269.05	2.5	1	19.2	0.16	2254	270.05	258.27	260.77	268.98	asmd dn	12.93	12.93	15.06	27.97	5.6
2254.1	2 yr 24 hr	2254	270.05	258.27	260.77	268.98	2.5	1	320.6	0.23	2256	269.73	257.53	260.03	267.93	asmd up	12.93	12.93	18.3	27.99	5.61
2256.1	2 yr 24 hr	2256	269.73	257.43	259.93	267.93	2.5	1	237.5	0.22	2257	269.62	256.9	259.4	267.16	asmd dn	12.95	12.95	17.99	28.03	5.63
2257.1	2 yr 24 hr	2257	269.62	256.9	259.4	267.16	2.5	1	106.2	0.28	2239	269.95	256.6	259.1	266.82	asmd dn&up	12.95	12.95	20.24	28.09	5.65
2239.1	2 yr 24 hr	2239	269.95	256.6	259.1	266.82	2.5	1	101.3	0.3	5920	270.06	256.3	258.8	266.49	asmd dn&up	12.95	12.95	20.73	28.12	5.66
5920.1	2 yr 24 hr	5920	270.06	256.3	258.8	266.49	2.5	1	124.6	0.24	2262	270.14	256	258.5	264.65	asmd dn&up	12.43	12.43	18.69	47.1	9.41
2262.1	2 yr 24 hr	2262	270.14	256	258.5	264.65	2.5	1	148.5	0.13	2261	270.13	255.8	258.3	262.43	asmd dn&up	12.45	12.45	13.98	47.09	9.45
2261.1	2 yr 24 hr	2261	270.13	255.8	258.3	262.43	2.5	1	337	0.18	2360	268.99	255.19	257.69	257.44	asmd up	12.45	12.45	16.2	47.09	9.55
2360.1	2 yr 24 hr	2360	268.99	255.09	258.09	256.35	3	1	63	4.73	2259	268.33	252.11	255.11	254.1	asmd dn&up	12.45	12.48	134.7	47.1	15.66
2259.1	2 yr 24 hr	2259	268.33	252.11	256.61	254.1	4.5	1	159.4	0.45	1252	264.05	251.4	255.9	253.17		12.37	12.37	121.87	52.17	7.85
1252.1	2 yr 24 hr	1252	264.05	251.4	255.9	253.17	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	251.84		12.37	12.38	161.62	52.45	9.07
1288.1	2 yr 24 hr	1288	258.48	250.03	254.53	251.28	4.5	1	47.8	3.2	1903	257.79	248.5	253	249.99	asmd dn	12.37	12.38	326.69	52.44	14.14
1903.1	2 yr 24 hr	1903	257.79	248.5	253	249.99	4.5	1	150.5	2.92	1240	254	244.1	248.6	245.54		12.37	12.38	312.22	72.51	15.84
2136.1	2 yr 24 hr	2136	264.27	259.6	261.1	260.57	1.5	1	15.6	0.7	1953	264.69	259.49	260.99	260.46	asmd up	12.47	12.48	8.19	6.27	5.17
1953.1	2 yr 24 hr	1953	264.69	258.99	260.99	259.6	2	1	269.9	2.22	1285	257.4	253	255	253.61		12.48	12.48	31.29	6.26	7.77
1285.1	2 yr 24 hr	1285	257.4	252.4	254.9	253.07	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	252.92	asmd dn	12.48	12.62	47.58	6.26	5.86
1906.1	2 yr 24 hr	1906	258.12	252.18	254.68	252.92	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	252.83	asmd dn&up	12.48	12.68	48.64	6.27	5.04
1907.1	2 yr 24 hr	1907	257.56	251.8	254.3	252.83	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.43	asmd up	12.42	12.43	48	16.95	8.93
1240.1	2 yr 24 hr	1240	254	244.1	247.6	245.54	3.5	2	40.4	2.72	1222	255.15	243	246.5	244.83	asmd dn	12.37	12.38	154.16	91.64	11.91
1222.1	2 yr 24 hr	1222	255.15	243	248	244.83	5	1	197.9	1.79	1223	246.86	239.46	244.46	241.29		12.38	12.38	323.45	91.9	14.23
1223.1	2 yr 24 hr	1223	246.86	237.46	242.46	238.96	5	1	119.1	3.85	1224	241.08	232.88	237.88	234.67		12.38	12.38	474.25	91.98	18.18
1224.1	2 yr 24 hr	1224	241.08	232.78	237.78	234.67	5	1	43.1	1.55	1909	241.08	232.11	237.11	233.97	asmd dn	12.38	12.38	301.53	92.23	13.66
1909.1	2 yr 24 hr	1909	241.08	232.11	237.11	233.97	5	1	40.4	1.68	1226	237.43	231.43	236.43	233.29		12.38	12.38	313.76	92.38	13.92
5850.1	2 yr 24 hr	5850	283.08	276.43	277.93	284.53	1.5	1	42.6	0.54	5854	283.48	276.2	277.7	284.14	asmd dn	13.32	13.35	7.17	10.89	5.99
5854.1	2 yr 24 hr	5854	283.48	276.2	277.7	284.14	1.5	1	507	0.52	5867	281.93	273.55	275.05	281.04	asmd dn&up	13.32	13.35	7.05	10.89	6.01
5867.1	2 yr 24 hr	5867	281.93	273.55	275.05	281.04	1.5	1	29.3	3.28	5793	281.89	272.59	274.09	280.88	asmd up	13.33	12.23	17.66	10.89	8.02
5793.1	2 yr 24 hr	5793	281.89	272.29	273.79	280.88	1.5	1	365.7	0.36	5784	282.98	270.98	272.48	278.96		13.35	13.35	5.84	10.89	6.07
5784.1	2 yr 24 hr	5784	282.98	270.88	272.38	278.96	1.5	1	76.6	-0.03	5783	282.5	270.9	272.4	278.56		13.35	13.35	1.58	10.9	6.21
5783.1	2 yr 24 hr	5783	282.5	270.8	272.8	278.56	2	1	389.4	0.87	5762	277.01	267.41	269.41	274.93		12.6	13.12	19.6	20.65	7.08
5762.1	2 yr 24 hr	5762	277.01	267.36	269.36	274.93	2	1	390.9	0.98	5759	270.74	263.54	265.54	271.3		12.95	13.22	20.77	20.65	7.29
5759.1	2 yr 24 hr	5759	270.74	263.49	265.99	271.3	2.5	1	414.6	0.5	5872	266.83	261.4	263.9	269.75	asmd dn	12.93	12.25	27.04	27.93	5.96
5872.1	2 yr 24 hr	5872	266.83	261.4	263.9	269.75	2.5	1	205.6	1.46	2255	269.7	258.4	260.9	269.05	asmd up	12.93	12.2	46.01	27.95	7.67
2255.1	2 yr 24 hr	2255	269.7	258.3	260.8	269.05	2.5	1	19.2	0.16	2254	270.05	258.27	260.77	268.98	asmd dn	12.93	12.93	15.06	27.97	5.6
2254.1	2 yr 24 hr	2254	270.05	258.27	260.77	268.98	2.5	1	320.6	0.23	2256	269.73	257.53	260.03	267.93	asmd up	12.93	12.93	18.3	27.99	5.61
2256.1	2 yr 24 hr	2256	269.73	257.43	259.93	267.93	2.5	1	237.5	0.22	2257	269.62	256.9	259.4	267.16	asmd dn	12.95	12.95	17.99	28.05	5.63
2257.1	2 yr 24 hr	2257	269.62	256.9	259.4	267.16	2.5	1	106.2	0.28	2239	269.95	256.6	259.1	266.82	asmd dn&up	12.95	12.95	20.24	28.09	5.65
2239.1	2 yr 24 hr	2239	269.95	256.6	259.1	266.82	2.5	1	101.3	0.3	5920	270.06	256.3	258.8	266.49	asmd dn&up	12.95	12.95	20.73	28.12	5.66
5920.1	2 yr 24 hr	5920	270.06	256.3	258.8	266.49	2.5	1	124.6	0.24	2262	270.14	256	258.5	264.65	asmd dn&up	12.43	12.43	18.69	47.1	9.41
2262.1	2 yr 24 hr	2262	270.14	256	258.5	264.65	2.5	1	148.5	0.13	2261	270.13	255.8	258.3	262.43	asmd dn&up	12.45	12.45	13.98	47.09	9.45
2261.1	2 yr 24 hr	2261	270.13	255.8	258.3	262.43	2.5	1	337	0.18	2360	268.99	255.19	257.69	257.44	asmd up	12.45	12.45	16.2	47.1	9.55
2360.1	2 yr 24 hr	2360	268.99	255.09	258.09	256.35	3	1	63	4.73	2259	268.33	252.11	255.11	254.1	asmd dn&up	12.45	12.48	134.7	47.1	15.66
2259.1	2 yr 24 hr	2259	268.33	252.11	256.61	254.1	4.5	1	159.4	0.45	1252	264.05	251.4	255.9	253.17		12.37	12.37	121.87	52.18	7.85
1252.1	2 yr 24 hr	1252	264.05	251.4	255.9	253.17	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	251.84		12.37	12.38	161.62	52.45	9.07
1288.1	2 yr 24 hr	1288	258.48	250.03	254.53	251.28	4.5	1	47.8	3.2	1903	257.79	248.5	253	249.99	asmd dn	12.37	12.38	326.69	52.44	14.14
1903.1	2 yr 24 hr	1903	257.79	248.5	253	249.99	4.5	1	150.5	2.92	1240	254	244.1	248.6	245.54		12.37	12.38	312.22	72.51	15.84

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
2136.1	2 yr 24 hr	2136	264.27	259.6	261.1	260.57	1.5	1	15.6	0.7	1953	264.69	259.49	260.99	260.46	asmd up	12.47	12.48	8.19	6.27	5.17
1953.1	2 yr 24 hr	1953	264.69	258.99	260.99	259.6	2	1	269.9	2.22	1285	257.4	253	255	253.61		12.48	12.48	31.29	6.26	7.77
1285.1	2 yr 24 hr	1285	257.4	252.4	254.9	253.07	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	252.92	asmd dn	12.48	12.62	47.58	6.26	5.86
1906.1	2 yr 24 hr	1906	258.12	252.18	254.68	252.92	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	252.83	asmd dn&up	12.48	12.68	48.64	6.27	5.04
1907.1	2 yr 24 hr	1907	257.56	251.8	254.3	252.83	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.43	asmd up	12.42	12.43	48	16.95	8.93
1240.1	2 yr 24 hr	1240	254	244.1	247.6	245.54	3.5	2	40.4	2.72	1222	255.15	243	246.5	244.83	asmd dn	12.37	12.38	154.16	91.64	11.91
1222.1	2 yr 24 hr	1222	255.15	243	248	244.83	5	1	197.9	1.79	1223	246.86	239.46	244.46	241.29		12.38	12.38	323.45	91.9	14.23
1223.1	2 yr 24 hr	1223	246.86	237.46	242.46	238.96	5	1	119.1	3.85	1224	241.08	232.88	237.88	234.67		12.38	12.38	474.25	91.98	18.18
1224.1	2 yr 24 hr	1224	241.08	232.78	237.78	234.67	5	1	43.1	1.55	1909	241.08	232.11	237.11	233.97	asmd dn	12.38	12.38	301.53	92.24	13.66
1909.1	2 yr 24 hr	1909	241.08	232.11	237.11	233.97	5	1	40.4	1.68	1226	237.43	231.43	236.43	233.29		12.38	12.38	313.76	92.39	13.91
1226.1	2 yr 24 hr	1226	237.43	226.53	233.53	229.35	7	1	178.8	0.68	1559	234.52	225.32	232.32	228.14		12.38	12.38	487.99	164.9	11.43
1559.1	2 yr 24 hr	1559	234.52	225.32	232.32	228.14	7	1	180.4	0.51	1215	232.4	224.4	231.4	226.3	asmd dn	12.38	12.4	423.62	164.93	11.88
10412.1	2 yr 24 hr	1215	232.4	224.4	229.4	226.3	5	1	400.2	1.69	10410	228	217.62	222.62	220.76	asmd dn	12.38	12.38	314.78	95.83	12.91
10410.1	2 yr 24 hr	10410	228	217.62	222.62	220.76	5	1	190.4	0.31	1188	222.83	217.03	222.03	219.71	asmd up	12.4	12.52	134.62	113.76	9.09
1188.1	2 yr 24 hr	1188	222.83	217.03	222.03	219.71	5	1	44	2.46	1547	223.8	215.95	220.95	219.43	asmd dn	12.4	13	378.89	113.72	10.94
1547.1	2 yr 24 hr	1547	223.8	215.95	220.95	219.43	5	1	8.6	2.43	1615	223.84	215.74	220.74	219.46	asmd up	12.4	12.42	377.91	133.81	9.12
1615.1	2 yr 24 hr	1615	223.84	215.74	220.74	219.46	5	1	31.4	0.73	1189	223.76	215.51	220.51	219.39		12.4	12.42	206.98	133.78	8.5
1189.1	2 yr 24 hr	1189	223.76	215.51	220.51	219.39	5	1	132.8	0.09	1548	222.79	215.39	220.39	218.75		12.4	12.42	72.7	133.66	8.3
1548.1	2 yr 24 hr	1548	222.79	215.39	220.39	218.75	5	1	57.6	0.45	10428	221	215.13	220.13	218.46	asmd dn	12.4	12.42	162.48	133.42	9.56
10428.1	2 yr 24 hr	10428	221	215.13	220.13	218.46	5	1	23.7	0.46	1159	221.22	215.02	220.02	218.33	asmd up	12.42	12.42	164.76	133.42	9.66
1215.1	2 yr 24 hr	1215	232.4	224.4	229.4	226.3	5	1	32.4	0.62	1214	230.8	224.2	229.2	225.99	asmd up	12.38	12.5	190.01	68.34	10.17
1214.1	2 yr 24 hr	1214	230.8	224.2	229.2	225.99	5	1	369.7	1.63	1552	226	218.16	223.16	220.23		12.4	12.38	309.12	84.45	13.13
1552.1	2 yr 24 hr	1552	226	218.16	223.16	220.23	5	1	33.5	1.61	1184	224.42	217.62	222.62	219.92		12.37	12.4	307.04	84.95	10.94
1184.1	2 yr 24 hr	1184	224.42	217.62	222.62	219.92	5	1	90.5	0.74	10411	223	216.95	221.95	219.33	asmd dn	12.37	12.4	208.08	85.08	9.63
10411.1	2 yr 24 hr	10411	223	216.95	221.95	219.33	5	1	312.5	0.75	1163	220.92	214.62	219.62	217.62	asmd up	12.4	12.42	208.82	84.78	9
1163.1	2 yr 24 hr	1163	220.92	214.62	219.62	217.62	5	1	40.4	-0.2	10413	221	214.7	219.7	217.51	asmd dn	12.38	12.42	107.62	84.81	7.01
10413.1	2 yr 24 hr	10413	221	214.7	219.7	217.51	5	1	12.8	-0.16	1159	221.22	214.72	219.72	217.45	asmd up	12.32	12.27	95.6	92.64	8.3
1159.1	2 yr 24 hr	1159	221.22	211.72	219.72	214.81	8	1	142.3	0.63	1153	220.02	210.82	218.82	213.7		12.38	12.42	673.54	225.64	12.77
1153.1	2 yr 24 hr	1153	220.02	210.82	218.82	213.7	8	1	102.5	0.85	1489	220.09	209.95	217.95	212.66	asmd dn	12.38	12.42	780.27	226.37	14.07
1489.1	2 yr 24 hr	1489	220.09	209.95	217.95	212.66	8	1	15.3	0.79	1130	219.63	209.83	217.83	212.47	asmd up	12.38	12.42	750.05	226.59	15.22
1130.1	2 yr 24 hr	1130	219.63	209.83	217.83	212.47	8	1	130	1.66	1129	218.57	207.67	215.67	210.54		12.38	12.33	1091.7	247.04	16.88
1129.1	2 yr 24 hr	1129	218.57	207.67	215.67	210.54	8	1	57	1.23	1488	218.71	206.97	214.97	209.9		12.38	12.33	938.55	246.85	15.28
1488.1	2 yr 24 hr	1488	218.71	206.97	214.97	209.9	8	1	76.4	1.2	1486	216.55	206.05	214.05	209.12		12.38	12.4	929.38	246.4	14.85
1486.1	2 yr 24 hr	1486	216.55	206.05	214.05	209.12	8	1	121.7	0.77	1092	217.21	205.11	213.11	207.88		12.37	12.4	744.33	246.06	14.29
1092.1	2 yr 24 hr	1092	217.21	205.11	213.11	207.88	8	1	102.4	1.49	1084	217.68	203.58	211.58	206.6		12.33	12.43	1035.24	247.25	16.02
1084.1	2 yr 24 hr	1084	217.68	203.58	211.58	206.6	8	1	165.6	1.07	1064	215.51	201.81	209.81	204.87		12.33	12.4	875.6	262.33	15.1
1064.1	2 yr 24 hr	1064	215.51	201.81	209.81	204.87	8	1	135.7	1.01	1059	214.79	200.44	208.44	203.5		12.33	12.35	850.98	262.75	14.92
1059.1	2 yr 24 hr	1059	214.79	200.44	208.44	203.5	8	1	136.7	1.1	1054	213.67	198.94	206.94	202.13		12.33	12.35	887.17	261.77	14.91
1054.1	2 yr 24 hr	1054	213.67	198.94	206.94	202.13	8	1	135.4	0.91	1052	211.02	197.71	205.71	200.94		12.33	12.38	807.22	259.36	14.22
1052.1	2 yr 24 hr	1052	211.02	197.71	205.71	200.94	8	1	138.3	0.88	1051	208.61	196.49	204.49	199.69		12.38	12.45	795.46	266.55	14.47
1051.1	2 yr 24 hr	1051	208.61	196.49	204.49	199.69	8	1	137.2	1.28	1046	207.39	194.74	202.74	198.48		12.35	12.35	956.51	270.69	14.41
1046.1	2 yr 24 hr	1046	207.39	194.74	202.74	198.48	8	1	137.5	0	1040	207.34	194.74	202.74	197.42		12.35	12.45	26.78	272.75	12.4
1040.1	2 yr 24 hr	1040	207.34	194.74	202.74	197.42	8	1	139.1	2.15	1031	204.4	191.75	199.75	195.1		12.35	12.4	1241.71	270.95	18.26
1031.1	2 yr 24 hr	1031	204.4	191.75	199.75	195.1	8	1	132.7	0.97	1026	202.35	190.46	198.46	193.98		12.35	12.4	835.04	271.47	14.47
1026.1	2 yr 24 hr	1026	202.35	190.46	198.46	193.98	8	1	145.6	0.58	1021	200.49	189.62	197.62	192.76		12.4	12.37	643.29	279.36	13.95
1021.1	2 yr 24 hr	1021	200.49	189.62	197.62	192.76	8	1	346.9	1.15	1009	197.32	185.62	193.62	188.87		12.4	12.37	909.44	285.02	15.79
1009.1	2 yr 24 hr	1009	197.32	185.62	193.62	188.87	8	1	70.3	1.55	10436	195	184.53	192.53	188.19		12.47	12.42	1054.59	278.88	15.32
10436.1	2 yr 24 hr	10436	195	184.53	192.53	188.19	8	1	6.7	1.63	1006	195.82	184.42	192.42	188.15		12.47	12.42	1085.19	279.79	13.18
1006.1	2 yr 24 hr	1006	195.82	184.42	192.42	188.15	8	1	139.4	0.38	1005	193.79	183.89	191.89	186.75		12.47	12.42	522.22	302.86	14.47

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH EXISTING MODEL - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time peak Flow (hr)	Time peak Velocity (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velocity f/s
1005.2	2 yr 24 hr	1005	193.79	183.89	191.89	186.75	8	1	121	1.97	10430	191.5	181.5	189.5	184.41	asmd dn	12.47	12.33	1190.29	296.09	19.6
10430.1	2 yr 24 hr	10430	191.5	181.5	189.5	184.41	8	1	24.2	1.86	10453	191.05	181.05	189.05	183.96	asmd dn&up	12.33	12.38	1154.9	302.38	19.89
10453.1	2 yr 24 hr	10453	191.05	181.05	190.05	183.96	9	1	54.8	1.92	10431	190	180	189	183.15	asmd dn&up	12.33	12.42	1604.94	303.21	18.39
10431.1	2 yr 24 hr	10431	190	180	189	183.15	9	1	66.2	1.96	1001	188.7	178.7	187.7	182.52	asmd up	12.33	12.38	1624.79	308.9	16.2
1001.1	2 yr 24 hr	1001	188.7	178.7	186.7	182.52	8	1	354	0.79	10440	183.89	175.89	183.89	179.56	Ditch	12.42	12.48	754.57	319.66	15.07

All Pipes are Circular and have a Roughness of 0.014.

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SECTION 4D

WEST BRANCH
SOUTH OF ROSEWOOD
EVALUATIONS

West Branch Watershed (South of Rosewood Drive Evaluations)

As outlined previously the majority of the surcharge and ponding identified to date in the **west branch watershed** occurs north of Rosewood Drive. When problems associated with surcharge and/or ponding within the system north of Rosewood Drive are addressed it is anticipated that the system south of Rosewood Drive may be negatively impacted. In order to forecast the impact of north of Rosewood Drive remedies on the system south of Rosewood Drive, several alternate scenarios have been modeled.

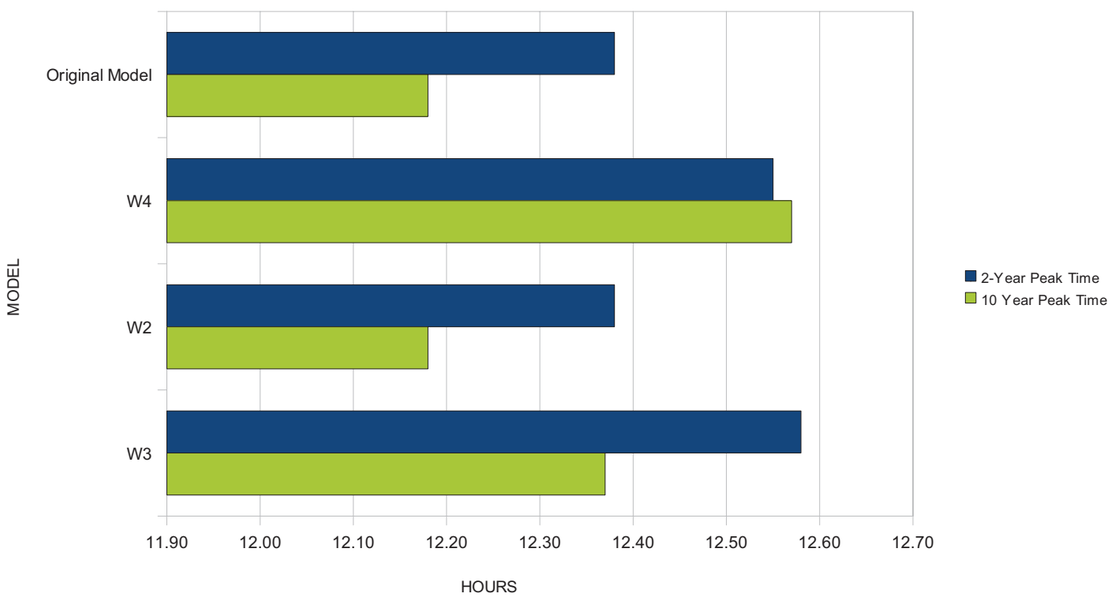
But unlike the **east branch watershed**, the **west branch watershed** does not have a single, central "backbone" drainage collection/conveyance system. In the **west branch watershed** north of Rosewood Drive there are two primary drainage collection/conveyance systems. The first primary system is the drainage collection/conveyance system associated with Maple Street, from the Wilmot Avenue intersection south to Burney Drive, then east along Burney Drive to Sloan Street where it turns southeasterly through the block and extends to Rosewood Drive, east of the S. Holly Street intersection. The second primary system is the drainage collection/conveyance system associated with Woodrow Street, from the Monroe Street intersection south to Rosewood Drive, then east along the north side of Rosewood Drive to the west side of the S. Holly Street intersection. These two primary systems converge along Hope Avenue, south of Rosewood Drive and east of S. Holly Street.

Due to the configuration of the **west branch watershed**, no single, central corridor for parallel installation and intercept has been identified**.** Therefore the initial alternate analysis for south of Rosewood Drive evaluations in the **west branch watershed** consisted of iterative modeling processes whereby existing pipes within the analyzed collection/conveyance system were systematically upsized. This systematic upsizing of existing pipes was performed until the model output no longer indicated ponding north of Rosewood Drive as demonstrated by the **Original Model**. In this alternate scenario (**Alternate W4;** so named to correspond to Alternate E4 since **Alternate W4** based on same approach) the peak runoff rates and the time to the corresponding peaks were compared at the following locations: (1) north of Rosewood Drive between S. Holly Street and S. Shandon Street (Node 2155); (2) north of Rosewood Drive just west of S. Holly Street (Node 2259); and (3) where the **west branch watershed** discharges into the open channel (Node 1001). The comparisons of time to peak for **Alternate W4** show only a minor increase (3%) for the three locations described when compared to the **Original Model**. However, comparisons of peak rates for **Alternate W4** show marked increases in peak runoff rates show marked increase for the three locations described when compared to the **Original Model**. The greatest increase in peak was measured at Node 2155 and the 10-year, 24-hour (**Alternate W4)** peak at Node 2155 was more than double the **Original Model** peak that location. An increase in peak was also measured at Node 2259 but there the 10-year, 24-hour (**Alternate W4)** peak was increased by 55% over the **Original Model** peak that location. Finally, an increase in peak was also measured at Node 1001 but there the 10-year, 24-hour (**Alternate W4)** peak was increased by 16% over the **Original Model** peak that location.

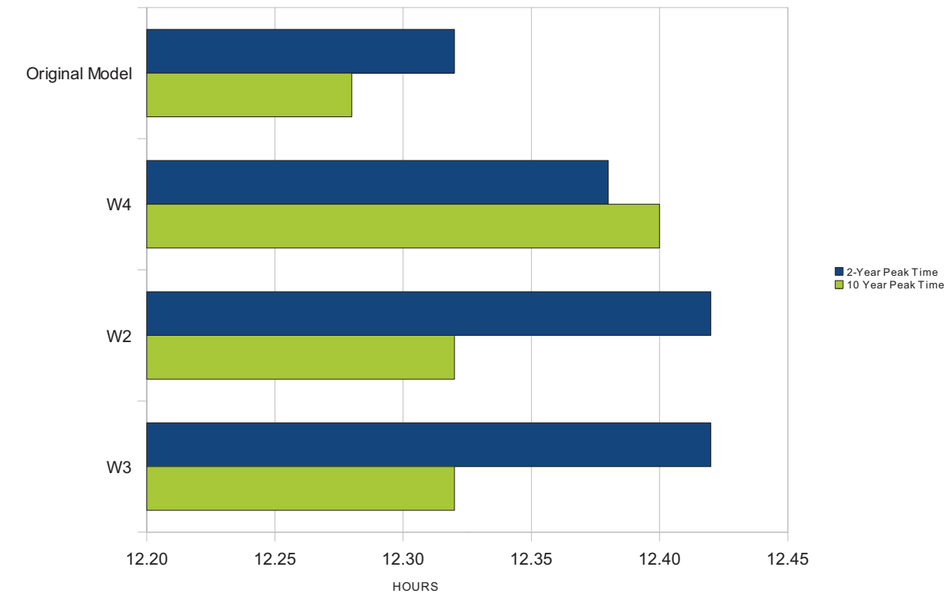
The comparison of **Alternate W4 vs. Original Model** indicates the primary drainage collection/conveyance system associated with Maple Street is the most underperforming portion of the collection systems in the **west branch watershed.** The comparison of **Alternate W4 vs. Original Model** also indicates when north of Rosewood improvements are made, the collection/conveyance system in the **west branch watershed** south of Rosewood is less likely to experience additional negative impacts than were projected by alternates for the **east branch watershed.** Negative impacts could be described as increased ponding to the extent that ponding becomes a nuisance or a public complaint. See the following

spreadsheet for a summary comparison of the alternate analyses performed for the **west branch watershed**.

West Branch North of Rosewood Improvements Simulation and Results												
	Peaks @											
Name	Node 2155 (East Trunk)				Node 2259 (West Trunk)				Node 1001 (Outfall to Ditch)			
	2-year storm		10-year storm		2-year storm		10-year storm		2-year storm		10-year storm	
	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)
Original Model	59.10	12.32	83.97	12.28	52.28	12.38	74.37	12.18	297.68	12.43	542.27	12.27
W4	93.58	12.38	182.70	12.40	59.74	12.55	115.20	12.57	324.50	12.40	626.90	12.40
W2	84.50	12.42	117.65	12.32	52.26	12.38	74.30	12.18	322.28	12.38	578.64	12.27
W3	84.50	12.42	117.65	12.32	57.20	12.58	100.81	12.37	311.95	12.42	575.81	12.37



PEAK TIME AT NODE 2259 (WEST TRUNK)



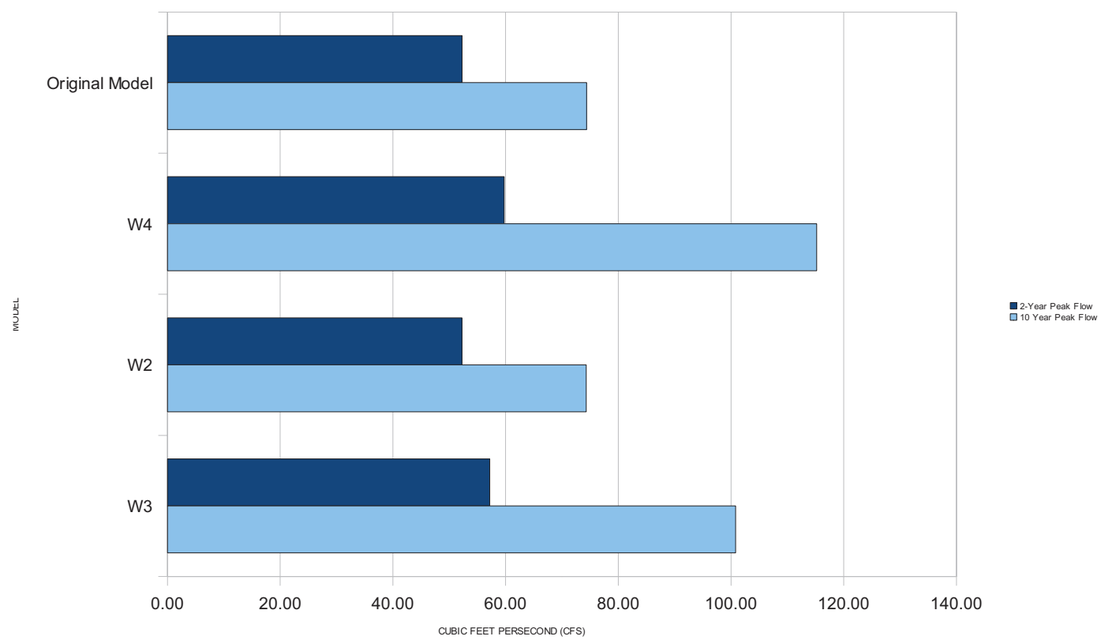
PEAK TIME AT NODE 2155 (EAST TRUNK)

W4 - PIPES NORTH OF ROSEWOOD DRIVE UPSIZED TO ELIMINATE PONDING

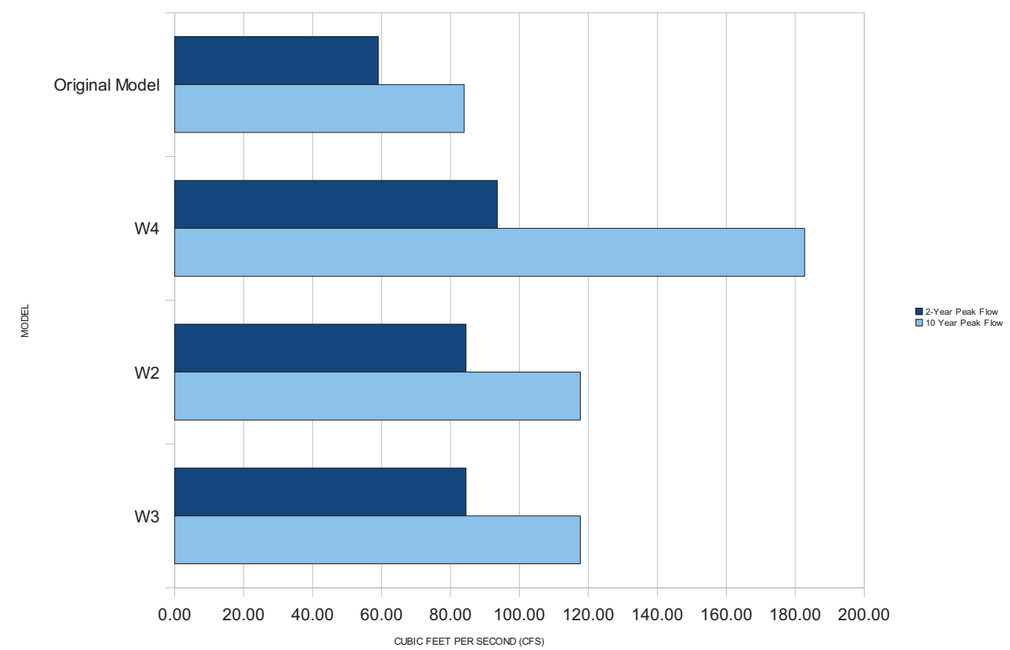
W2 - PARALLEL PIPES ON EAST TRUNK LINE NORTH OF ROSEWOOD DRIVE

W3 - PARALLEL PIPES ON TRUNK LINES NORTH OF ROSEWOOD DRIVE

West Branch North of Rosewood Improvements Simulation and Results												
	Peaks @											
Name	Node 2155 (East Trunk)				Node 2259 (West Trunk)				Node 1001 (Outfall to Ditch)			
	2-year storm		10-year storm		2-year storm		10-year storm		2-year storm		10-year storm	
	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)	Peak Flow (cfs)	Peak Time (hours)
Original Model	59.10	12.32	83.97	12.28	52.28	12.38	74.37	12.18	297.68	12.43	542.27	12.27
W4	93.58	12.38	182.70	12.40	59.74	12.55	115.20	12.57	324.50	12.40	626.90	12.40
W2	84.50	12.42	117.65	12.32	52.26	12.38	74.30	12.18	322.28	12.38	578.64	12.27
W3	84.50	12.42	117.65	12.32	57.20	12.58	100.81	12.37	311.95	12.42	575.81	12.37



PEAK FLOW AT NODE 2259 (WEST TRUNK)



PEAK FLOW AT NODE 2155 (EAST TRUNK)

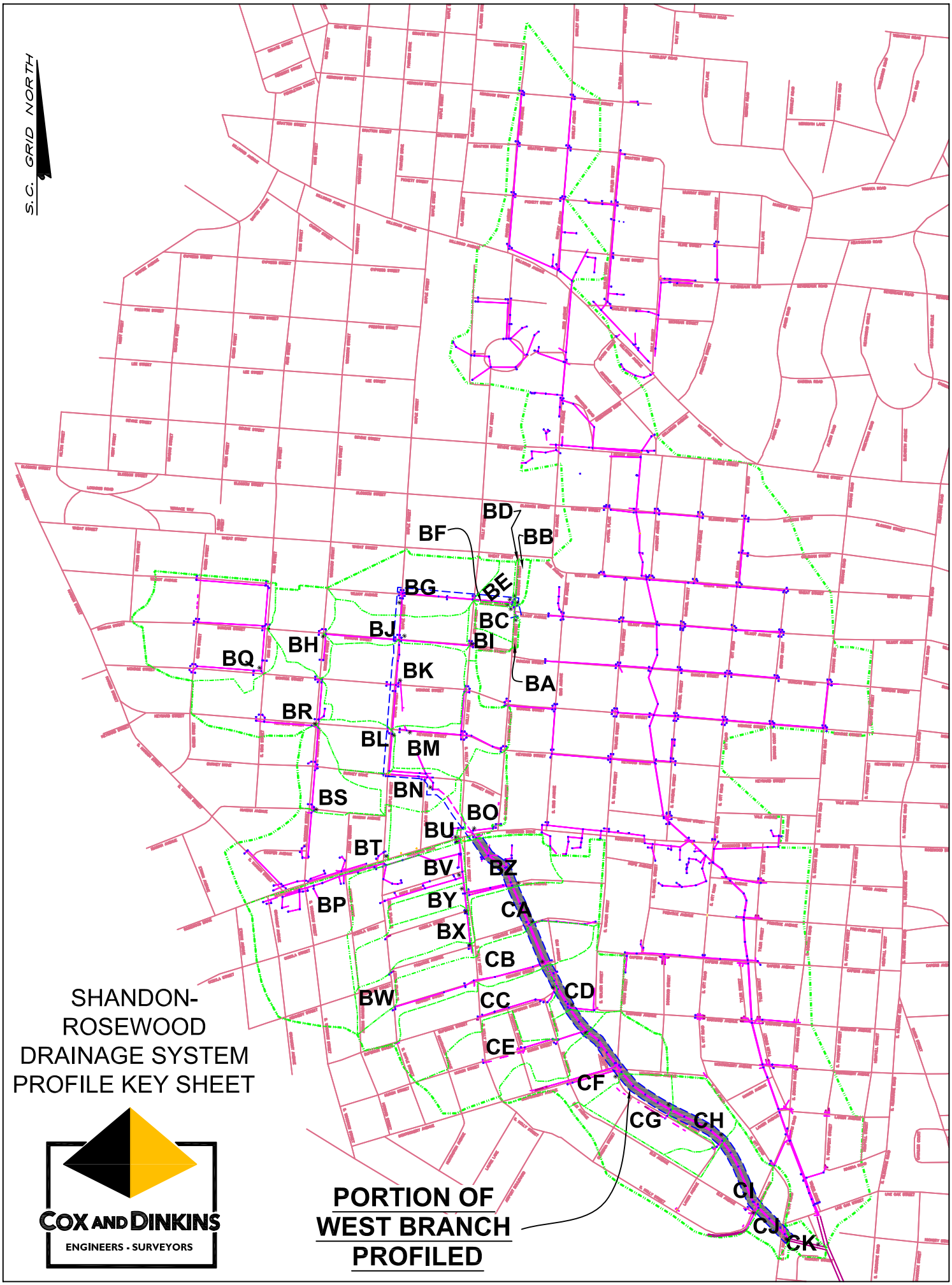
W4 - PIPES NORTH OF ROSEWOOD DRIVE UPSIZED TO ELIMINATE PONDING

W2 - PARALLEL PIPES ON EAST TRUNK LINE NORTH OF ROSEWOOD DRIVE

W3 - PARALLEL PIPES ON TRUNK LINES NORTH OF ROSEWOOD DRIVE

COX AND DINKINS
ENGINEERS · SURVEYORS

WEST BRANCH
ALTERNATE W4
WITH SOUTH OF ROSEWOOD
TRUNK LINE EVALUATION


S.C. GRID NORTH
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SHANDON-
ROSEWOOD
DRAINAGE SYSTEM
PROFILE KEY SHEET
PORTION OF
WEST BRANCH
PROFILED
COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. W-4 - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5211.1	10 yr 24 hr storm	5211	278.72	276.12	278.12	276.81	2	1.3	1	88.3	0.41	5209	278.29	275.76	277.76	276.8		12.15	11.92	13.41	1.13	1.73
5210.1	10 yr 24 hr storm	5210	278.24	275.54	277.54	276.81	2	1.3	1	32.5	0.4	5209	278.29	275.41	277.41	276.8		12.13	12.07	13.29	3.14	1.62
5209.1	10 yr 24 hr storm	5209	278.29	275.41	277.41	276.8	2	1.3	1	27.3	0.4	5208	278.53	275.3	277.3	276.74		12.2	12.2	13.33	8.84	3.78
5208.1	10 yr 24 hr storm	5208	278.53	275.3	277.3	276.74	2	1.3	1	15.9	0.44	5207	279.2	275.23	277.23	276.71		12.18	12.17	13.94	9.41	3.9
5205.1	10 yr 24 hr storm	5205	278.78	275.58	277.08	276.73	1.5	1.3	1	27.2	0.4	5206	278.53	275.47	276.97	276.73		11.98	0.9	6.2	1.45	2.59
5206.1	10 yr 24 hr storm	5206	278.53	275.47	277.47	276.73	2	1.3	1	12.3	0.41	5207	279.2	275.42	277.42	276.71		12.23	11.97	13.39	6.5	3.18
5207.1	10 yr 24 hr storm	5207	279.2	275.23	277.73	276.71	2.5	1.3	1	366.1	0.4	5200	281.09	273.77	276.27	275.25		12.22	12.22	24.05	15.81	5.23
5200.1	10 yr 24 hr storm	5200	281.09	273.77	276.27	275.25	2.5	1.5	1	239.4	0.4	5189	280.15	272.81	275.31	274.16		12.23	0.97	24.12	15.79	5.7
5189.1	10 yr 24 hr storm	5189	280.15	272.81	275.81	274.16	3	1.5	1	73.7	0.39	5188	280.33	272.52	275.52	273.9		12.23	12.2	38.85	15.77	5.12
5188.1	10 yr 24 hr storm	5188	280.33	272.52	275.52	273.9	3	1.5	1	328.2	0.4	5185	280.52	271.21	274.21	273.32		12.23	12.17	39.13	15.67	4.84
5185.1	10 yr 24 hr storm	5185	280.52	271.21	274.21	273.32	3	1.5	1	46.5	0.41	5177	280.44	271.02	274.02	273.31		12.23	12.12	39.59	15.15	3.72
5177.1	10 yr 24 hr storm	5177	280.44	271.02	274.02	273.31	3	1.5	1	337.1	0.4	5870	276.68	269.67	272.67	271.8	asmd dn	12.45	12.47	39.19	36.98	6.46
5870.1	10 yr 24 hr storm	5870	276.68	269.67	272.67	271.8	3	1.5	1	43.7	0.39	5157	275.97	269.5	272.5	271.58	asmd up	12.45	12.45	38.63	37.18	7.13
5219.1	10 yr 24 hr storm	5219	281.87	275.47	277.47	276.95	2	1.3	1	636.2	0.89	5871	276.23	269.78	271.78	271.79	asmd dn	12.37	12.42	19.87	17.2	6.78
5871.1	10 yr 24 hr storm	5871	276.23	269.78	271.78	271.79	2	1.3	1	33.9	0.91	5157	275.97	269.47	271.47	271.58	asmd up	12.4	12.4	20.09	17.3	5.51
5168.1	10 yr 24 hr storm	5168	279.57	273.07	274.57	274.11	1.5	1.5	1	630.2	0.56	5869	275.85	269.57	271.07	271.59	asmd dn	12.22	12.18	7.27	5.63	4.17
5869.1	10 yr 24 hr storm	5869	275.85	269.57	271.57	271.59	2	1.5	1	20.3	0.49	5157	275.97	269.47	271.47	271.58	asmd up	12.23	12.18	14.74	5.48	1.85
5157.1	10 yr 24 hr storm	5157	275.97	269.47	272.97	271.58	3.5	2	1	46.4	1.96	5164	275.16	268.56	272.06	270.9		12.35	12.38	130.83	77.88	12.68
5164.1	10 yr 24 hr storm	5164	275.16	267.96	271.46	270.9	3.5	2.5	1	88.8	0.52	5145	273	267.5	271	270.26		12.35	12.35	67.24	77.9	9.08
5145.1	10 yr 24 hr storm	5145	273	267.3	270.8	269.2	3.5	2.5	1	58.3	4.08	5144	271.32	264.92	268.42	268.15		12.35	12.55	188.76	77.88	14.01
5144.1	10 yr 24 hr storm	5144	271.32	264.82	268.32	268.15	3.5	2.5	1	221.5	0.45	5130	268.43	263.83	267.33	266.76		12.35	12.33	62.46	77.7	8.42
5130.1	10 yr 24 hr storm	5130	268.43	263.73	267.23	266.76	3.5	2.5	1	56.6	0.58	5128	266.93	263.4	266.9	266.4		12.35	12.32	71.34	77.28	9.27
5128.1	10 yr 24 hr storm	5128	266.93	261.9	266.9	266.4	5	2.5	1	395.6	0.15	5073	268.66	261.32	266.32	265.53		12.38	12.3	92.6	117.44	6.51
5073.1	10 yr 24 hr storm	5073	268.66	261.32	266.32	265.53	5	2.5	1	335.2	0.4	5054	272.51	259.98	264.98	264.69		12.4	12.25	152.91	131.28	7.92
5054.1	10 yr 24 hr storm	5054	272.51	259.98	264.98	264.69	5	2.5	1	337.1	0.4	5883	269.43	258.63	263.63	263.81	asmd dn	12.43	12.6	153.04	131.28	7.17
5077.1	10 yr 24 hr storm	5077	268.54	264.29	266.79	265.85	2.5	2.5	1	229.1	1.1	5889	268.03	261.76	264.26	263.98	asmd dn	12.42	12.57	40.02	25.71	8.17
5889.1	10 yr 24 hr storm	5889	268.03	261.76	264.76	263.98	3	2.5	1	200.8	1.16	5013	268.93	259.43	262.43	263.82	asmd up	12.43	12.63	66.72	25.83	5.9
5013.1	10 yr 24 hr storm	5013	268.93	259.23	262.23	263.82	3	2.5	1	3.6	0	5883	269.43	259.23	262.23	263.81	asmd dn	12.45	12.45	1.96	25.86	3.65
5883.1	10 yr 24 hr storm	5883	269.43	258.63	263.63	263.81	5	3	1	42.1	0.4	5882	270.86	258.46	263.46	263.64	asmd dn&up	12.43	12.45	153.68	157.28	7.89
5882.1	10 yr 24 hr storm	5882	270.86	258.46	263.46	263.64	5	3	1	63	0.4	5026	271.87	258.21	263.21	263.38	asmd up	12.43	12.45	152.34	157.32	7.89
5026.1	10 yr 24 hr storm	5026	271.87	258.21	263.21	263.38	5	3	1	60.6	0.41	5027	272.09	257.96	262.96	263.13		12.43	12.47	155.33	157.38	7.91
5027.1	10 yr 24 hr storm	5027	272.09	257.96	262.96	263.13	5	3	1	53	0.04	5040	272.74	257.94	262.94	262.85		12.42	12.42	46.98	168.28	8.45
5040.1	10 yr 24 hr storm	5040	272.74	257.94	262.94	262.85	5	3	1	105.7	0.09	5875	274.38	257.84	262.84	262.33	asmd dn	12.42	12.42	74.39	168.29	8.66
5875.1	10 yr 24 hr storm	5875	274.38	257.84	262.84	262.33	5	3	1	166.3	0.04	5874	271.57	257.78	262.78	261.34	asmd dn&up	12.42	12.42	45.94	168.31	9.25
5874.1	10 yr 24 hr storm	5874	271.57	257.78	262.78	261.34	5	3	1	212.3	0.37	2156	267.08	257	262	259.3	asmd dn	12.42	12.43	146.59	168.32	11.73
2156.1	10 yr 24 hr storm	2156	267.08	257	262	259.3	5	3	1	23.4	1.15	2155	266.93	256.73	261.73	258.5	asmd up	12.42	12.43	259.78	168.33	19.66
2155.1	10 yr 24 hr storm	2155	266.93	256.73	261.73	258.5	5	4	1	56.8	7.94	1247	266.32	252.22	257.22	253.99		12.4	12.4	681.46	182.76	29.4
10409.1	10 yr 24 hr storm	10409	267	253.88	256.88	255.76	3	3	1	59.2	0.3	2167	267.24	253.7	256.7	255.27	asmd dn&up	12.97	12.97	34.15	36.78	8.05
2167.1	10 yr 24 hr storm	2167	267.24	253.7	256.7	255.27	3	3	1	123	1.2	1247	266.32	252.22	255.22	253.79	asmd up	12.97	12.98	67.94	36.77	9.8
1247.1	10 yr 24 hr storm	1247	266.32	240.22	244.72	243.43	4.5	4.5	1	196.8	1.63	1245	251.71	237.01	241.51	240.22		12.42	12.45	233.21	199.83	16.47
1245.1	10 yr 24 hr storm	1245	251.71	236.71	241.21	239.86	4.5	4.5	1	190.1	1.97	1234	239.26	232.96	237.46	236.75		12.42	12.58	256.47	199.82	16.54
1234.1	10 yr 24 hr storm	1234	239.26	232.91	237.41	236.75	4.5	4.5	1	62.9	1.48	1231	238.58	231.98	236.48	236.04		12.43	12.63	222.04	199.81	13.87
1231.1	10 yr 24 hr storm	1231	238.58	231.98	236.48	236.04	4.5	4.5	1	80	1.04	1225	238.15	231.15	235.65	235.2		12.43	12.43	186	199.83	13.24
1225.1	10 yr 24 hr storm	1225	238.15	231.15	235.65	235.2	4.5	4.5	1	32.4	0.99	1226	237.43	230.83	235.33	234.86		12.43	12.43	181.47	199.84	13.27
5850.1	10 yr 24 hr storm	5850	283.08	276.43	279.93	278.34	3.5	1.5	1	42.6	0.54	5854	283.48	276.2	279.7	278.15	asmd dn	12.67	12.67	68.65	37.09	6.9
5854.1	10 yr 24 hr storm	5854	283.48	276.2	279.7	278.15	3.5	1.5	1	507	0.52	5867	281.93	273.55	277.05	274.86	asmd dn&up	12.67	12.68	67.54	37.09	7.02
5867.1	10 yr 24 hr storm	5867	281.93	273.55	277.05	274.86	3.5	1.5	1	29.3	3.28	5793	281.89	272.59	276.09	274.4	asmd up	12.68	12.88	169.11	37.08	10.77
5793.1	10 yr 24 hr storm	5793	281.89	272.29	275.79	274.4	3.5	1.5	1	365.7	0.36	5784	282.98	270.98	274.48	273.21		12.68	12.73	55.92	37.09	6.07
5784.1	10 yr 24 hr storm	5784	282.98	270.88	274.38	273.21	3.5	1.5	1	76.6	-0.03	5783	282.5	270.9	274.4	272.99		12.7	12.78	15.1	37.15	5.57
5783.1	10 yr 24 hr storm	5783	282.5	270.8	274.3	272.99	3.5	2	1	389.4	0.87	5762	277.01	267.41	270.91	269.6		12.67	12.68	87.17	62.46	9.85
5762.1	10 yr 24 hr storm	5762	277.01	267.36	270.86	269.51	3.5	2	1	390.9	0.98	5759	270.74	263.54	267.04	266.08		12.67	12.72	92.35	62.48	9.9
5759.1	10 yr 24 hr storm	5759	270.74	263.49	267.49	266.08	4	2.5	1	414.6	0.5	5872	266.83	261.4	265.4	263.5	asmd dn	12.62	12.63	94.7	71.27	8.49

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. W-4 - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5872.1	10 yr 24 hr storm	5872	266.83	261.4	265.4	263.5	4	2.5	1	205.6	1.46	2255	269.7	258.4	262.4	261.79	asmd up	12.63	12.83	161.12	71.38	10.33
2255.1	10 yr 24 hr storm	2255	269.7	258.3	262.8	261.79	4.5	2.5	1	19.2	0.16	2254	270.05	258.27	262.77	261.76	asmd dn	12.63	12.85	72.18	71.52	5.7
2254.1	10 yr 24 hr storm	2254	270.05	258.27	262.77	261.76	4.5	2.5	1	320.6	0.23	2256	269.73	257.53	262.03	261.26	asmd up	12.65	12.88	87.73	71.83	5.76
2256.1	10 yr 24 hr storm	2256	269.73	257.43	261.93	261.26	4.5	2.5	1	237.5	0.22	2257	269.62	256.9	261.4	260.95	asmd dn	12.67	12.9	86.26	72.43	5.43
2257.1	10 yr 24 hr storm	2257	269.62	256.9	261.4	260.95	4.5	2.5	1	106.2	0.28	2239	269.95	256.6	261.1	260.82	asmd dn&up	12.68	12.88	97.05	72.87	5.23
2239.1	10 yr 24 hr storm	2239	269.95	256.6	261.1	260.82	4.5	2.5	1	101.3	0.3	5920	270.06	256.3	260.8	260.7	asmd dn&up	12.68	12.82	99.37	73.15	5.01
5920.1	10 yr 24 hr storm	5920	270.06	256.3	260.8	260.7	4.5	2.5	1	124.6	0.24	2262	270.14	256	260.5	260.27	asmd dn&up	12.57	12.57	89.6	110.57	7.01
2262.1	10 yr 24 hr storm	2262	270.14	256	260.5	260.27	4.5	2.5	1	148.5	0.13	2261	270.13	255.8	260.3	259.75	asmd dn&up	12.57	12.57	67.01	110.58	7.13
2261.1	10 yr 24 hr storm	2261	270.13	255.8	260.3	259.75	4.5	2.5	1	337	0.18	2360	268.99	255.19	259.69	258.28	asmd up	12.58	12.58	77.69	110.57	7.64
2360.1	10 yr 24 hr storm	2360	268.99	255.09	259.59	256.88	4.5	3	1	63	4.73	2259	268.33	252.11	256.61	255.23	asmd dn&up	12.58	12.63	397.14	110.58	17.12
2259.1	10 yr 24 hr storm	2259	268.33	252.11	256.61	255.23	4.5	4.5	1	159.4	0.45	1252	264.05	251.4	255.9	254.21		12.57	12.57	121.87	115.25	9.9
1252.1	10 yr 24 hr storm	1252	264.05	251.4	255.9	254.21	4.5	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	252.89		12.57	12.58	161.62	115.27	11.03
1288.1	10 yr 24 hr storm	1288	258.48	250.03	254.53	251.94	4.5	4.5	1	47.8	3.2	1903	257.79	248.5	253	250.65	asmd dn	12.57	12.63	326.69	115.27	17.81
1903.1	10 yr 24 hr storm	1903	257.79	248.5	253	250.65	4.5	4.5	1	150.5	2.92	1240	254	244.1	248.6	246.31		12.48	12.52	312.22	143.92	19.14
2136.1	10 yr 24 hr storm	2136	264.27	259.6	261.1	260.99	1.5	1.5	1	15.6	0.71	1953	264.69	259.49	260.99	260.79	asmd up	12.48	12.48	8.19	11.67	6.88
1953.1	10 yr 24 hr storm	1953	264.69	258.99	260.99	259.84	2	2	1	269.9	2.22	1285	257.4	253	255	253.85		12.5	12.5	31.29	11.65	9.23
1285.1	10 yr 24 hr storm	1285	257.4	252.4	254.9	253.39	2.5	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	253.27	asmd dn	12.5	12.6	47.58	11.65	6.52
1906.1	10 yr 24 hr storm	1906	258.12	252.18	254.68	253.27	2.5	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	253.28	asmd dn&up	12.5	12.6	48.64	11.66	5.63
1907.1	10 yr 24 hr storm	1907	257.56	251.8	254.3	253.28	2.5	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.88	asmd up	12.42	12.42	48	31.52	10.43
1240.1	10 yr 24 hr storm	1240	254	244.1	247.6	246.31	3.5	3.5	2	40.4	2.72	1222	255.15	243	246.5	245.65	asmd dn 2 x 4	12.47	12.47	154.16	177.84	13.6
1222.1	10 yr 24 hr storm	1222	255.15	243	248	245.65	5	5	1	197.9	1.79	1223	246.86	239.46	244.46	242.11		12.47	12.47	323.45	177.88	16.85
1223.1	10 yr 24 hr storm	1223	246.86	237.46	242.46	239.6	5	5	1	119.1	3.85	1224	241.08	232.88	237.88	235.51		12.47	12.47	474.25	177.88	21.48
1224.1	10 yr 24 hr storm	1224	241.08	232.78	237.78	235.51	5	5	1	43.1	1.55	1909	241.08	232.11	237.11	234.81	asmd dn	12.47	12.47	301.53	177.89	16.23
1909.1	10 yr 24 hr storm	1909	241.08	232.11	237.11	234.81	5	5	1	40.4	1.68	1226	237.43	231.43	236.43	234.13		12.47	12.47	313.76	177.9	16.47
1226.1	10 yr 24 hr storm	1226	237.43	226.53	233.53	231.1	7	7	1	178.8	0.68	1559	234.52	225.32	232.32	229.74		12.43	12.47	487.99	386	14.59
1559.1	10 yr 24 hr storm	1559	234.52	225.32	232.32	229.74	7	7	1	180.4	0.51	1215	232.4	224.4	231.4	227.92	asmd dn	12.45	12.55	423.62	385.95	15.61
10412.1	10 yr 24 hr storm	1215	232.4	224.4	229.4	227.92	5	5	1	400.2	1.69	10410	228	217.62	222.62	224.53	asmd dn	12.45	12.73	314.78	191.42	14.21
10410.1	10 yr 24 hr storm	10410	228	217.62	222.62	224.53	5	5	1	190.4	0.31	1188	222.83	217.03	222.03	222.88	asmd up	12.5	12.5	134.62	226.63	11.47
1188.1	10 yr 24 hr storm	1188	222.83	217.03	222.03	222.88	5	5	1	44	2.45	1547	223.8	215.95	220.95	222.43	asmd dn	12.48	13.03	378.89	227.51	11.12
1547.1	10 yr 24 hr storm	1547	223.8	215.95	220.95	222.43	5	5	1	8.6	2.44	1615	223.84	215.74	220.74	222.33	asmd up	12.45	12.45	377.91	261.8	13.31
1615.1	10 yr 24 hr storm	1615	223.84	215.74	220.74	222.33	5	5	1	31.4	0.73	1189	223.76	215.51	220.51	221.96		12.45	12.45	206.98	261.79	13.31
1189.1	10 yr 24 hr storm	1189	223.76	215.51	220.51	221.96	5	5	1	132.8	0.09	1548	222.79	215.39	220.39	220.41		12.45	12.45	72.7	261.8	13.31
1548.1	10 yr 24 hr storm	1548	222.79	215.39	220.39	220.41	5	5	1	57.6	0.45	10428	221	215.13	220.13	219.75	asmd dn	12.45	12.45	162.48	261.8	13.36
10428.1	10 yr 24 hr storm	10428	221	215.13	220.13	219.75	5	5	1	23.7	0.46	1159	221.22	215.02	220.02	219.5	asmd up	12.45	12.45	164.76	261.8	13.85
1215.1	10 yr 24 hr storm	1215	232.4	224.4	229.4	227.92	5	5	1	32.4	0.62	1214	230.8	224.2	229.2	227.61	asmd up	12.47	12.57	190.01	195.17	13.87
1214.1	10 yr 24 hr storm	1214	230.8	224.2	229.2	227.61	5	5	1	369.7	1.63	1552	226	218.16	223.16	223.07		12.4	12.55	309.12	224.54	15.81
1552.1	10 yr 24 hr storm	1552	226	218.16	223.16	223.07	5	5	1	33.5	1.61	1184	224.42	217.62	222.62	222.83		12.45	12.6	307.04	223.51	12.27
1184.1	10 yr 24 hr storm	1184	224.42	217.62	222.62	222.83	5	5	1	90.5	0.74	10411	223	216.95	221.95	222.07	asmd dn	12.45	12.55	208.08	223.56	11.61
10411.1	10 yr 24 hr storm	10411	223	216.95	221.95	222.07	5	5	1	312.5	0.75	1163	220.92	214.62	219.62	219.45	asmd up	12.45	12.53	208.82	223.66	11.59
1163.1	10 yr 24 hr storm	1163	220.92	214.62	219.62	219.45	5	5	1	40.4	-0.2	10413	221	214.7	219.7	219.15	asmd dn	12.45	12.45	107.62	223.73	11.59
10413.1	10 yr 24 hr storm	10413	221	214.7	219.7	219.15	5	5	1	12.8	-0.16	1159	221.22	214.72	219.72	219.04	asmd up	12.38	12.38	95.6	235.07	12.78
1159.1	10 yr 24 hr storm	1159	221.22	211.72	219.72	216.45	8	8	1	142.3	0.63	1153	220.02	210.82	218.82	215.23		12.45	12.47	673.54	496.12	16.22
1153.1	10 yr 24 hr storm	1153	220.02	210.82	218.82	215.23	8	8	1	102.5	0.85	1489	220.09	209.95	217.95	214.14	asmd dn	12.45	12.5	780.27	496.24	17.7
1489.1	10 yr 24 hr storm	1489	220.09	209.95	217.95	214.14	8	8	1	15.3	0.78	1130	219.63	209.83	217.83	213.96	asmd up	12.45	12.53	750.05	496.36	18.9
1130.1	10 yr 24 hr storm	1130	219.63	209.83	217.83	213.96	8	8	1	130	1.66	1129	218.57	207.67	215.67	212.15		12.38	12.4	1091.7	534.94	20.25
1129.1	10 yr 24 hr storm	1129	218.57	207.67	215.67	212.15	8	8	1	57	1.23	1488	218.71	206.97	214.97	211.52		12.38	12.4	938.55	534.89	18.48
1488.1	10 yr 24 hr storm	1488	218.71	206.97	214.97	211.52	8	8	1	76.4	1.2	1486	216.55	206.05	214.05	210.73		12.38	12.4	929.38	534.89	18.09
1486.1	10 yr 24 hr storm	1486	216.55	206.05	214.05	210.73	8	8	1	121.7	0.77	1092	217.21	205.11	213.11	209.47		12.38	12.4	744.33	534.93	17.71
1092.1	10 yr 24 hr storm	1092	217.21	205.11	213.11	209.47	8	8	1	102.4	1.49	1084	217.68	203.58	211.58	208.27		12.4	12.55	1035.24	535.23	19.07
1084.1	10 yr 24 hr storm	1084	217.68	203.58	211.58	208.27	8	8	1	165.6	1.07	1064	215.51	201.81	209.81	206.57		12.37	12.42	875.6	557.77	18.2
1064.1	10 yr 24 hr storm	1064	215.51	201.81	209.81	206.57	8	8	1	135.7	1.01	1059	214.79	200.44	208.44	205.22		12.37	12.42	850.98	557.88	17.95
1059.1	10 yr 24 hr storm	1059	214.79	200.44	208.44	205.22	8	8	1	136.7	1.1	1054	213.67	198.94	206.94	203.89		12.37	12.42	887.17	557.4	17.79

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. W-4 - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
1054.1	10 yr 24 hr storm	1054	213.67	198.94	206.94	203.89	8	8	1	135.4	0.91	1052	211.02	197.71	205.71	202.71		12.38	12.42	807.22	557.58	17.12
1052.1	10 yr 24 hr storm	1052	211.02	197.71	205.71	202.71	8	8	1	138.3	0.88	1051	208.61	196.49	204.49	201.47		12.38	12.38	795.46	568.72	17.29
1051.1	10 yr 24 hr storm	1051	208.61	196.49	204.49	201.47	8	8	1	137.2	1.28	1046	207.39	194.74	202.74	200.26		12.38	12.43	956.51	569.48	17.14
1046.1	10 yr 24 hr storm	1046	207.39	194.74	202.74	200.26	8	8	1	137.5	0	1040	207.34	194.74	202.74	199.13		12.38	12.4	26.78	569.53	15.77
1040.1	10 yr 24 hr storm	1040	207.34	194.74	202.74	199.13	8	8	1	139.1	2.15	1031	204.4	191.75	199.75	197.41		12.38	12.57	1241.71	568.86	19.89
1031.1	10 yr 24 hr storm	1031	204.4	191.75	199.75	197.41	8	8	1	132.7	0.97	1026	202.35	190.46	198.46	196.57		12.38	12.57	835.04	579.25	15.18
1026.1	10 yr 24 hr storm	1026	202.35	190.46	198.46	196.57	8	8	1	145.6	0.58	1021	200.49	189.62	197.62	195.78		12.38	12.32	643.29	579.74	14.09
1021.1	10 yr 24 hr storm	1021	200.49	189.62	197.62	195.78	8	8	1	346.9	1.15	1009	197.32	185.62	193.62	194.4		12.4	12.42	909.44	579.92	13.65
1009.1	10 yr 24 hr storm	1009	197.32	185.62	193.62	194.4	8	8	1	70.3	1.55	10436	195	184.53	192.53	194.12		12.4	12.4	1054.59	579.87	11.12
10436.1	10 yr 24 hr storm	10436	195	184.53	192.53	194.12	8	8	1	6.7	1.64	1006	195.82	184.42	192.42	194.08		12.4	12.4	1085.19	579.85	11.08
1006.1	10 yr 24 hr storm	1006	195.82	184.42	192.42	194.08	8	8	1	139.4	0.38	1005	193.79	183.89	191.89	193.36		12.4	12.4	522.22	627	12.01
1005.2	10 yr 24 hr storm	1005	193.79	183.89	191.89	193.36	8	8	1	121	1.98	10430	191.5	181.5	189.5	192.52	asmd dn	12.4	12.4	1190.29	626.94	11.99
10430.1	10 yr 24 hr storm	10430	191.5	181.5	189.5	192.52	8	8	1	24.2	1.86	10453	191.05	181.05	189.05	192.38	asmd dn&up	12.4	12.4	1154.9	626.97	12.44
10453.1	10 yr 24 hr storm	10453	191.05	181.05	190.05	192.38	9	9	1	54.8	1.92	10431	190	180	189	192.24	asmd dn&up	12.4	12.4	1604.94	626.92	9.84
10431.1	10 yr 24 hr storm	10431	190	180	189	192.24	9	9	1	66.2	1.96	1001	192	178.7	187.7	192	asmd up	12.4	12.4	1624.79	626.97	9.83

All Pipes are Circular and have a Roughness of 0.014.

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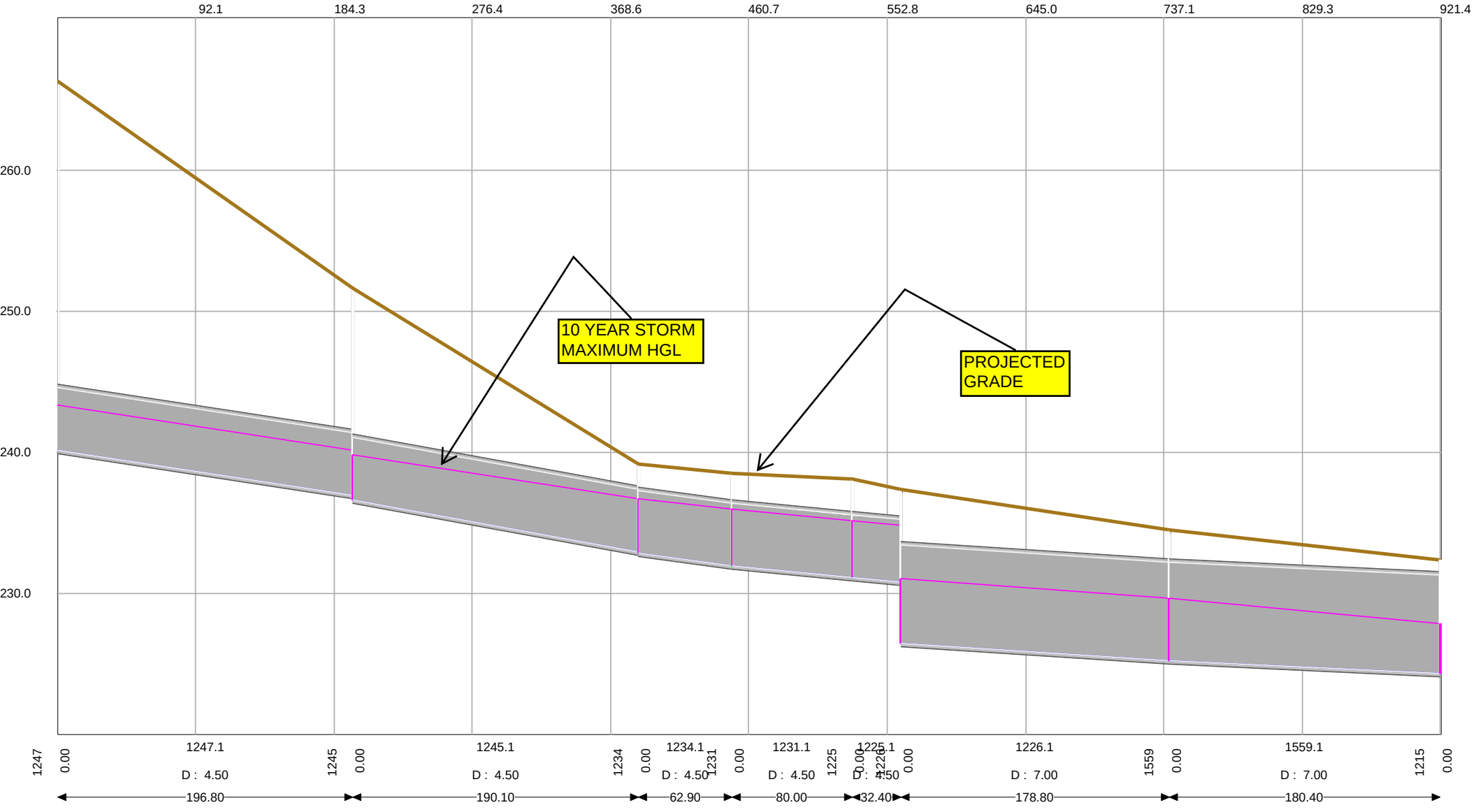
Day [0] Time 00:01:00 Step 1



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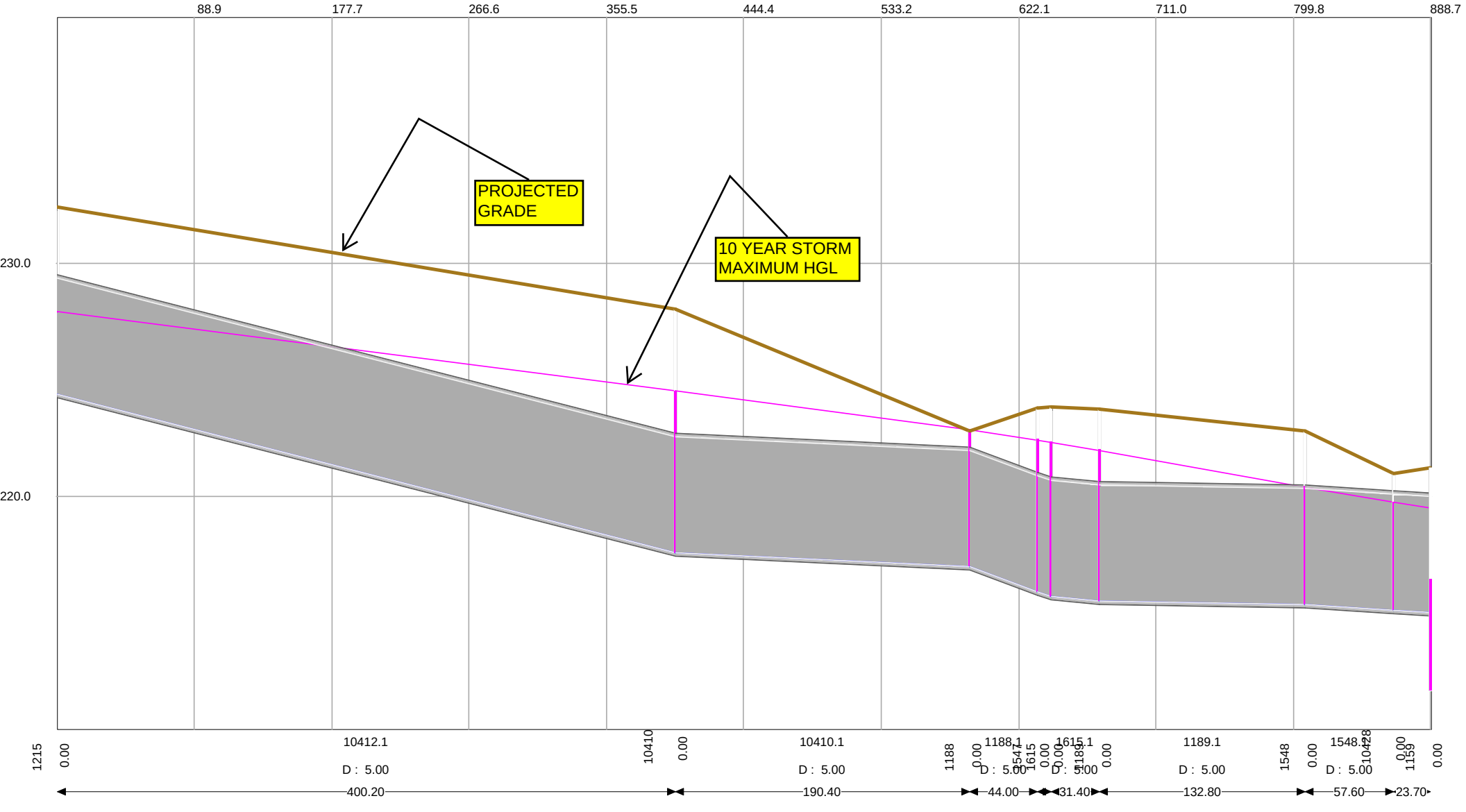

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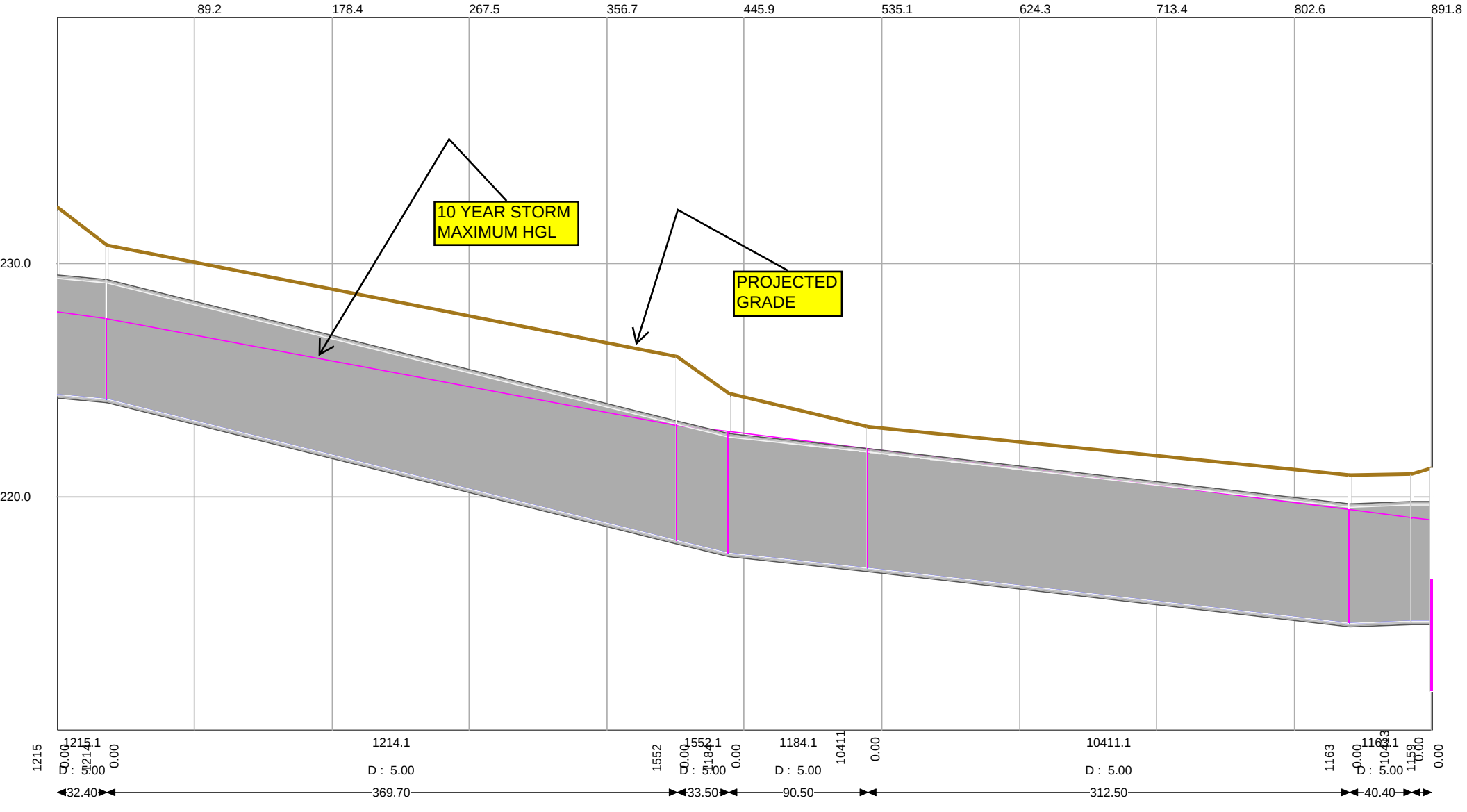

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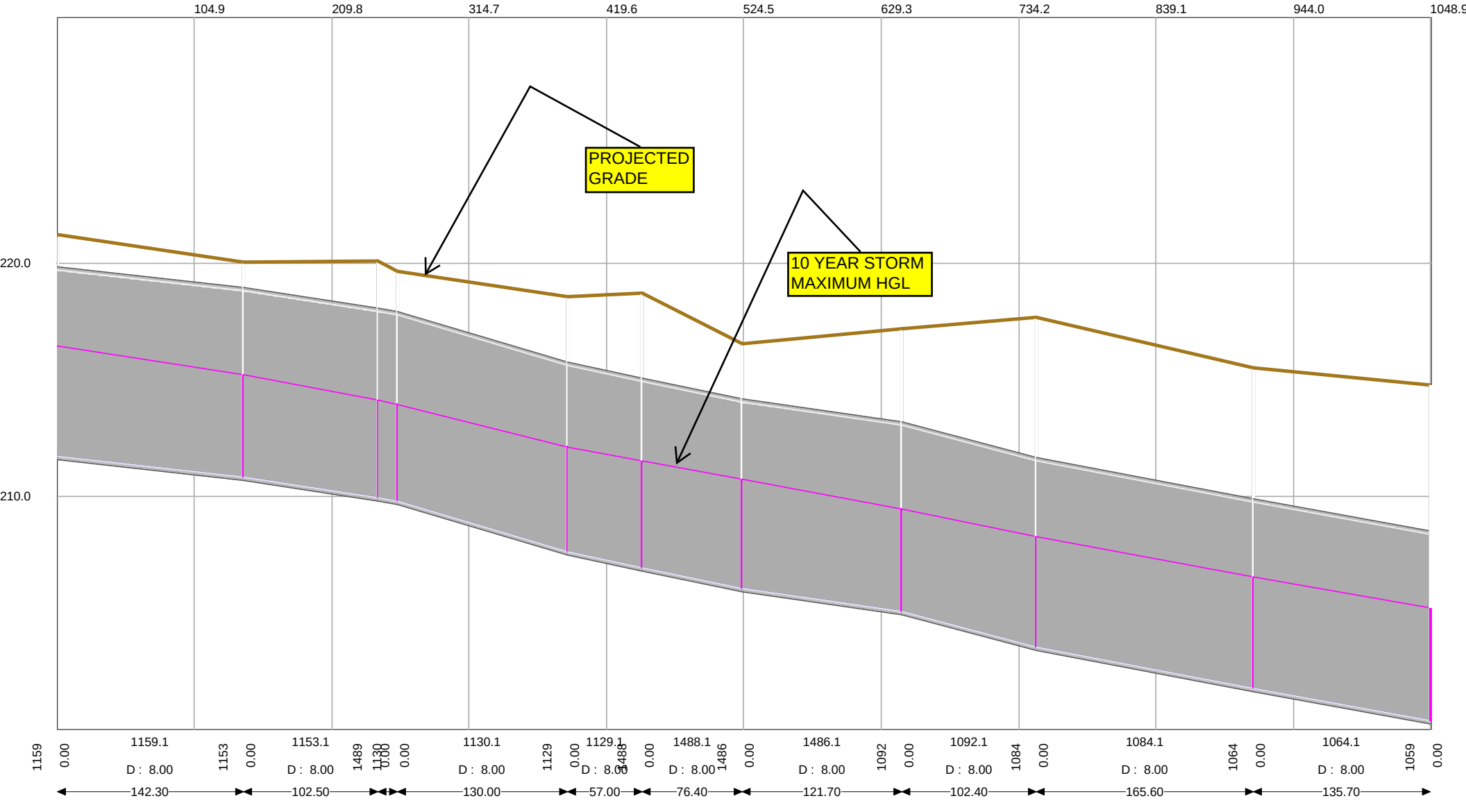

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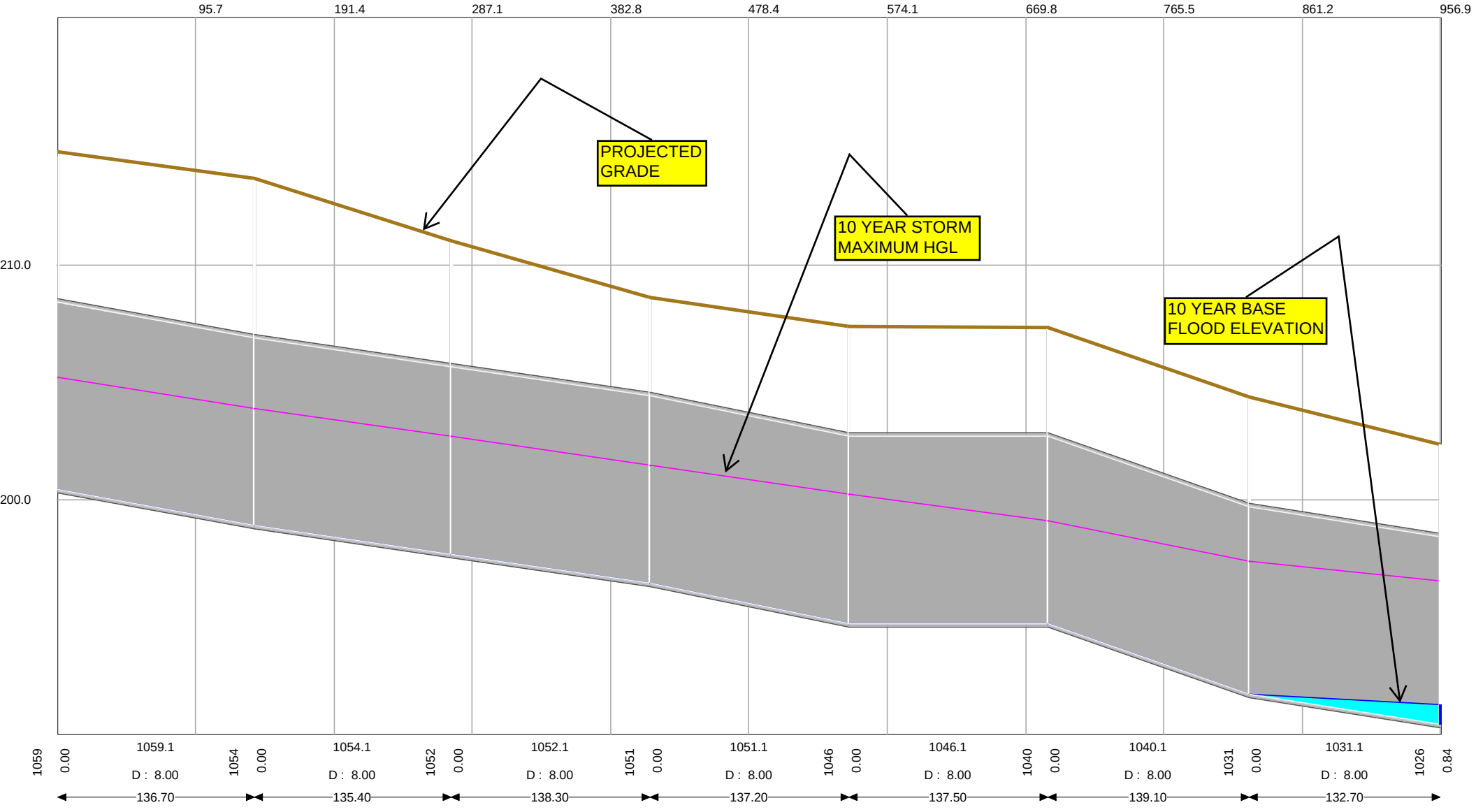

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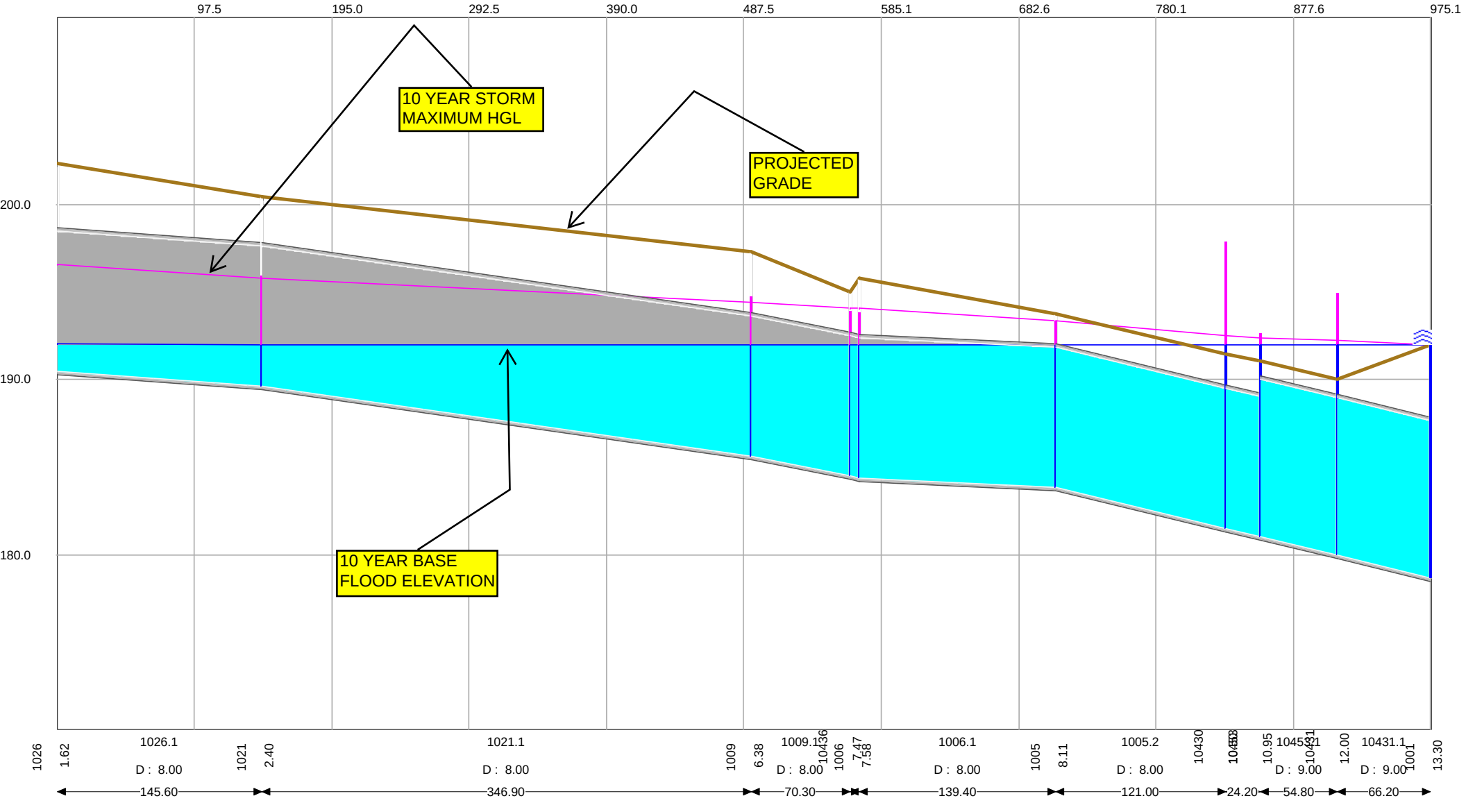


ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. W-4 - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5211.1	2 yr 24 hr storm	5211	278.72	276.12	278.12	276.43	2	1.3	1	88.3	0.41	5209	278.29	275.76	277.76	276.32		12.13	12.05	13.41	0.61	1.79
5210.1	2 yr 24 hr storm	5210	278.24	275.54	277.54	276.33	2	1.3	1	32.5	0.4	5209	278.29	275.41	277.41	276.32		12.13	12.07	13.29	1.63	1.5
5209.1	2 yr 24 hr storm	5209	278.29	275.41	277.41	276.32	2	1.3	1	27.3	0.4	5208	278.53	275.3	277.3	276.27		12.2	12.2	13.33	4.55	3.23
5208.1	2 yr 24 hr storm	5208	278.53	275.3	277.3	276.27	2	1.3	1	15.9	0.44	5207	279.2	275.23	277.23	276.25		12.17	12.15	13.94	4.92	3.27
5205.1	2 yr 24 hr storm	5205	278.78	275.58	277.08	276.27	1.5	1.3	1	27.2	0.4	5206	278.53	275.47	276.97	276.27		11.97	1.3	6.2	0.98	2.47
5206.1	2 yr 24 hr storm	5206	278.53	275.47	277.47	276.27	2	1.3	1	12.3	0.41	5207	279.2	275.42	277.42	276.25		12.22	11.93	13.39	3.5	3.1
5207.1	2 yr 24 hr storm	5207	279.2	275.23	277.73	276.25	2.5	1.3	1	366.1	0.4	5200	281.09	273.77	276.27	274.8		12.2	12.2	24.05	8.34	4.45
5200.1	2 yr 24 hr storm	5200	281.09	273.77	276.27	274.8	2.5	1.5	1	239.4	0.4	5189	280.15	272.81	275.31	273.75		12.22	12.23	24.12	8.33	4.43
5189.1	2 yr 24 hr storm	5189	280.15	272.81	275.81	273.75	3	1.5	1	73.7	0.39	5188	280.33	272.52	275.52	273.46		12.23	12.22	38.85	8.32	4.37
5188.1	2 yr 24 hr storm	5188	280.33	272.52	275.52	273.46	3	1.5	1	328.2	0.4	5185	280.52	271.21	274.21	272.51		12.23	12.2	39.13	8.32	4.23
5185.1	2 yr 24 hr storm	5185	280.52	271.21	274.21	272.51	3	1.5	1	46.5	0.41	5177	280.44	271.02	274.02	272.5		12.25	12.12	39.59	8.07	3.42
5177.1	2 yr 24 hr storm	5177	280.44	271.02	274.02	272.5	3	1.5	1	337.1	0.4	5870	276.68	269.67	272.67	271.11	asmd dn	12.45	12.47	39.19	19.08	5.5
5870.1	2 yr 24 hr storm	5870	276.68	269.67	272.67	271.11	3	1.5	1	43.7	0.39	5157	275.97	269.5	272.5	270.9	asmd up	12.45	12.45	38.63	19.08	5.7
5219.1	2 yr 24 hr storm	5219	281.87	275.47	277.47	276.36	2	1.3	1	636.2	0.89	5871	276.23	269.78	271.78	270.85	asmd dn	12.37	12.37	19.87	8.15	5.86
5871.1	2 yr 24 hr storm	5871	276.23	269.78	271.78	270.85	2	1.3	1	33.9	0.91	5157	275.97	269.47	271.47	270.78	asmd up	12.38	12.42	20.09	8.19	4.69
5168.1	2 yr 24 hr storm	5168	279.57	273.07	274.57	273.71	1.5	1.5	1	630.2	0.56	5869	275.85	269.57	271.07	270.78	asmd dn	12.22	12.18	7.27	2.77	3.51
5869.1	2 yr 24 hr storm	5869	275.85	269.57	271.57	270.78	2	1.5	1	20.3	0.49	5157	275.97	269.47	271.47	270.78	asmd up	12.23	12.18	14.74	2.55	1.43
5157.1	2 yr 24 hr storm	5157	275.97	269.47	272.97	270.78	3.5	2	1	46.4	1.96	5164	275.16	268.56	272.06	269.88		12.35	12.35	130.83	39.09	11.85
5164.1	2 yr 24 hr storm	5164	275.16	267.96	271.46	269.88	3.5	2.5	1	88.8	0.52	5145	273	267.5	271	269.42		12.35	12.37	67.24	39.09	7.25
5145.1	2 yr 24 hr storm	5145	273	267.3	270.8	268.42	3.5	2.5	1	58.3	4.08	5144	271.32	264.92	268.42	266.82		12.35	12.35	188.76	39.09	13.33
5144.1	2 yr 24 hr storm	5144	271.32	264.82	268.32	266.82	3.5	2.5	1	221.5	0.45	5130	268.43	263.83	267.33	265.77		12.37	12.37	62.46	39.09	6.9
5130.1	2 yr 24 hr storm	5130	268.43	263.73	267.23	265.58	3.5	2.5	1	56.6	0.58	5128	266.93	263.4	266.9	265.25		12.37	12.37	71.34	39.09	7.58
5128.1	2 yr 24 hr storm	5128	266.93	261.9	266.9	264.6	5	2.5	1	395.6	0.15	5073	268.66	261.32	266.32	263.65		12.38	12.4	92.6	58.65	5.53
5073.1	2 yr 24 hr storm	5073	268.66	261.32	266.32	263.65	5	2.5	1	335.2	0.4	5054	272.51	259.98	264.98	262.43		12.38	12.38	152.91	66.18	7.34
5054.1	2 yr 24 hr storm	5054	272.51	259.98	264.98	262.43	5	2.5	1	337.1	0.4	5883	269.43	258.63	263.63	261.61	asmd dn	12.4	12.43	153.04	66.18	6.73
5077.1	2 yr 24 hr storm	5077	268.54	264.29	266.79	265.29	2.5	2.5	1	229.1	1.1	5889	268.03	261.76	264.26	262.75	asmd dn	12.4	12.42	40.02	13.39	7.33
5889.1	2 yr 24 hr storm	5889	268.03	261.76	264.76	262.75	3	2.5	1	200.8	1.16	5013	268.93	259.43	262.43	261.62	asmd up	12.42	12.57	66.72	13.37	5.74
5013.1	2 yr 24 hr storm	5013	268.93	259.23	262.23	261.62	3	2.5	1	3.6	0	5883	269.43	259.23	262.23	261.61	asmd dn	12.42	12.02	1.96	13.43	3.21
5883.1	2 yr 24 hr storm	5883	269.43	258.63	263.63	261.61	5	3	1	42.1	0.4	5882	270.86	258.46	263.46	261.54	asmd dn&up	12.42	12.45	153.68	79.62	6.52
5882.1	2 yr 24 hr storm	5882	270.86	258.46	263.46	261.54	5	3	1	63	0.4	5026	271.87	258.21	263.21	261.45	asmd up	12.42	12.45	152.34	79.67	6.27
5026.1	2 yr 24 hr storm	5026	271.87	258.21	263.21	261.45	5	3	1	60.6	0.41	5027	272.09	257.96	262.96	261.38		12.42	12.43	155.33	79.73	5.92
5027.1	2 yr 24 hr storm	5027	272.09	257.96	262.96	261.38	5	3	1	53	0.04	5040	272.74	257.94	262.94	261.24		12.4	12.4	46.98	85.68	6.02
5040.1	2 yr 24 hr storm	5040	272.74	257.94	262.94	261.24	5	3	1	105.7	0.09	5875	274.38	257.84	262.84	260.96	asmd dn	12.4	12.4	74.39	85.69	6.27
5875.1	2 yr 24 hr storm	5875	274.38	257.84	262.84	260.96	5	3	1	166.3	0.04	5874	271.57	257.78	262.78	260.28	asmd dn&up	12.4	12.42	45.94	85.71	6.81
5874.1	2 yr 24 hr storm	5874	271.57	257.78	262.78	260.28	5	3	1	212.3	0.37	2156	267.08	257	262	258.68	asmd dn	12.4	12.42	146.59	85.69	9.13
2156.1	2 yr 24 hr storm	2156	267.08	257	262	258.68	5	3	1	23.4	1.15	2155	266.93	256.73	261.73	257.98	asmd up	12.42	12.42	259.78	85.71	15.34
2155.1	2 yr 24 hr storm	2155	266.93	256.73	261.73	257.98	5	4	1	56.8	7.94	1247	266.32	252.22	257.22	253.47		12.38	12.4	681.46	93.58	24.31
10409.1	2 yr 24 hr storm	10409	267	253.88	256.88	255.25	3	3	1	59.2	0.3	2167	267.24	253.7	256.7	254.82	asmd dn&up	12.97	12.97	34.15	20.02	6.54
2167.1	2 yr 24 hr storm	2167	267.24	253.7	256.7	254.82	3	3	1	123	1.2	1247	266.32	252.22	255.22	253.34	asmd up	12.97	12.98	67.94	20.02	8.36
1247.1	2 yr 24 hr storm	1247	266.32	240.22	244.72	242.31	4.5	4.5	1	196.8	1.63	1245	251.71	237.01	241.51	239.1		12.42	12.42	233.21	102.29	14.18
1245.1	2 yr 24 hr storm	1245	251.71	236.71	241.21	238.7	4.5	4.5	1	190.1	1.97	1234	239.26	232.96	237.46	235.16		12.42	12.42	256.47	102.32	14.9
1234.1	2 yr 24 hr storm	1234	239.26	232.91	237.41	235.16	4.5	4.5	1	62.9	1.48	1231	238.58	231.98	236.48	234.38		12.42	12.42	222.04	102.35	12.78
1231.1	2 yr 24 hr storm	1231	238.58	231.98	236.48	234.38	4.5	4.5	1	80	1.04	1225	238.15	231.15	235.65	233.57		12.42	12.42	186	102.35	11.86
1225.1	2 yr 24 hr storm	1225	238.15	231.15	235.65	233.57	4.5	4.5	1	32.4	0.99	1226	237.43	230.83	235.33	233.25		12.42	12.42	181.47	102.35	11.75
5850.1	2 yr 24 hr storm	5850	283.08	276.43	279.93	277.7	3.5	1.5	1	42.6	0.54	5854	283.48	276.2	279.7	277.53	asmd dn	12.67	12.65	68.65	17.79	5.6
5854.1	2 yr 24 hr storm	5854	283.48	276.2	279.7	277.53	3.5	1.5	1	507	0.52	5867	281.93	273.55	277.05	274.35	asmd dn&up	12.67	12.68	67.54	17.79	5.57
5867.1	2 yr 24 hr storm	5867	281.93	273.55	277.05	274.35	3.5	1.5	1	29.3	3.28	5793	281.89	272.59	276.09	273.65	asmd up	12.68	12.68	169.11	17.79	10.17
5793.1	2 yr 24 hr storm	5793	281.89	272.29	275.79	273.65	3.5	1.5	1	365.7	0.36	5784	282.98	270.98	274.48	272.44		12.68	12.72	55.92	17.79	5.08
5784.1	2 yr 24 hr storm	5784	282.98	270.88	274.38	272.44	3.5	1.5	1	76.6	-0.03	5783	282.5	270.9	274.4	272.24		12.7	12.78	15.1	17.82	4.41
5783.1	2 yr 24 hr storm	5783	282.5	270.8	274.3	272.24	3.5	2	1	389.4	0.87	5762	277.01	267.41	270.91	268.85		12.67	12.68	87.17	30.9	8.28
5762.1	2 yr 24 hr storm	5762	277.01	267.36	270.86	268.76	3.5	2	1	390.9	0.98	5759	270.74	263.54	267.04	265.25		12.67	12.7	92.35	30.9	8.38
5759.1	2 yr 24 hr storm	5759	270.74	263.49	267.49	265.25	4	2.5	1	414.6	0.5	5872	266.83	261.4	265.4	262.69	asmd dn	12.63	12.65	94.7	35.31	6.89

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. W-4 - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5872.1	2 yr 24 hr storm	5872	266.83	261.4	265.4	262.69	4	2.5	1	205.6	1.46	2255	269.7	258.4	262.4	260.32	asmd up	12.63	12.67	161.12	35.31	9.41
2255.1	2 yr 24 hr storm	2255	269.7	258.3	262.8	260.32	4.5	2.5	1	19.2	0.16	2254	270.05	258.27	262.77	260.27	asmd dn	12.65	12.68	72.18	35.33	5.12
2254.1	2 yr 24 hr storm	2254	270.05	258.27	262.77	260.27	4.5	2.5	1	320.6	0.23	2256	269.73	257.53	262.03	259.56	asmd up	12.65	12.72	87.73	35.35	5.19
2256.1	2 yr 24 hr storm	2256	269.73	257.43	261.93	259.56	4.5	2.5	1	237.5	0.22	2257	269.62	256.9	261.4	259.19	asmd dn	12.67	12.8	86.26	35.51	4.88
2257.1	2 yr 24 hr storm	2257	269.62	256.9	261.4	259.19	4.5	2.5	1	106.2	0.28	2239	269.95	256.6	261.1	259.1	asmd dn&up	12.68	12.87	97.05	35.71	4.65
2239.1	2 yr 24 hr storm	2239	269.95	256.6	261.1	259.1	4.5	2.5	1	101.3	0.3	5920	270.06	256.3	260.8	259.03	asmd dn&up	12.68	12.85	99.37	35.87	4.24
5920.1	2 yr 24 hr storm	5920	270.06	256.3	260.8	259.03	4.5	2.5	1	124.6	0.24	2262	270.14	256	260.5	258.79	asmd dn&up	12.55	12.53	89.6	56.91	5.62
2262.1	2 yr 24 hr storm	2262	270.14	256	260.5	258.79	4.5	2.5	1	148.5	0.13	2261	270.13	255.8	260.3	258.45	asmd dn&up	12.55	12.55	67.01	56.91	5.53
2261.1	2 yr 24 hr storm	2261	270.13	255.8	260.3	258.45	4.5	2.5	1	337	0.18	2360	268.99	255.19	259.69	257.38	asmd up	12.57	12.58	77.69	56.91	5.98
2360.1	2 yr 24 hr storm	2360	268.99	255.09	259.59	256.26	4.5	3	1	63	4.73	2259	268.33	252.11	256.61	254.24	asmd dn&up	12.57	12.6	397.14	56.91	15.34
2259.1	2 yr 24 hr storm	2259	268.33	252.11	256.61	254.24	4.5	4.5	1	159.4	0.45	1252	264.05	251.4	255.9	253.29		12.55	12.57	121.87	59.74	8.18
1252.1	2 yr 24 hr storm	1252	264.05	251.4	255.9	253.29	4.5	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	251.97		12.57	12.57	161.62	59.75	9.4
1288.1	2 yr 24 hr storm	1288	258.48	250.03	254.53	251.36	4.5	4.5	1	47.8	3.2	1903	257.79	248.5	253	250.04	asmd dn	12.57	12.6	326.69	59.75	14.9
1903.1	2 yr 24 hr storm	1903	257.79	248.5	253	250.04	4.5	4.5	1	150.5	2.92	1240	254	244.1	248.6	245.56		12.48	12.47	312.22	76.36	16.04
2136.1	2 yr 24 hr storm	2136	264.27	259.6	261.1	260.57	1.5	1.5	1	15.6	0.71	1953	264.69	259.49	260.99	260.46	asmd up	12.47	12.48	8.19	6.27	5.17
1953.1	2 yr 24 hr storm	1953	264.69	258.99	260.99	259.6	2	2	1	269.9	2.22	1285	257.4	253	255	253.61		12.48	12.48	31.29	6.26	7.77
1285.1	2 yr 24 hr storm	1285	257.4	252.4	254.9	253.07	2.5	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	252.92	asmd dn	12.48	12.63	47.58	6.26	5.86
1906.1	2 yr 24 hr storm	1906	258.12	252.18	254.68	252.92	2.5	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	252.83	asmd dn&up	12.48	12.68	48.64	6.27	5.04
1907.1	2 yr 24 hr storm	1907	257.56	251.8	254.3	252.83	2.5	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.43	asmd up	12.42	12.43	48	16.95	8.93
1240.1	2 yr 24 hr storm	1240	254	244.1	247.6	245.56	3.5	3.5	2	40.4	2.72	1222	255.15	243	246.5	244.85	asmd dn 2 x 4	12.47	12.47	154.16	94.72	11.99
1222.1	2 yr 24 hr storm	1222	255.15	243	248	244.85	5	5	1	197.9	1.79	1223	246.86	239.46	244.46	241.31		12.47	12.48	323.45	94.73	14.3
1223.1	2 yr 24 hr storm	1223	246.86	237.46	242.46	238.97	5	5	1	119.1	3.85	1224	241.08	232.88	237.88	234.69		12.47	12.47	474.25	94.73	18.33
1224.1	2 yr 24 hr storm	1224	241.08	232.78	237.78	234.69	5	5	1	43.1	1.55	1909	241.08	232.11	237.11	233.99	asmd dn	12.47	12.48	301.53	94.74	13.73
1909.1	2 yr 24 hr storm	1909	241.08	232.11	237.11	233.99	5	5	1	40.4	1.68	1226	237.43	231.43	236.43	233.31		12.47	12.48	313.76	94.74	13.99
1226.1	2 yr 24 hr storm	1226	237.43	226.53	233.53	229.66	7	7	1	178.8	0.68	1559	234.52	225.32	232.32	228.41		12.43	12.45	487.99	201.69	12.15
1559.1	2 yr 24 hr storm	1559	234.52	225.32	232.32	228.41	7	7	1	180.4	0.51	1215	232.4	224.4	231.4	226.5	asmd dn	12.43	12.45	423.62	201.77	12.82
10412.1	2 yr 24 hr storm	1215	232.4	224.4	229.4	226.5	5	5	1	400.2	1.69	10410	228	217.62	222.62	221.1	asmd dn	12.43	12.45	314.78	115.1	13.52
10410.1	2 yr 24 hr storm	10410	228	217.62	222.62	221.1	5	5	1	190.4	0.31	1188	222.83	217.03	222.03	220.04	asmd up	12.43	12.6	134.62	133.09	9.45
1188.1	2 yr 24 hr storm	1188	222.83	217.03	222.03	220.04	5	5	1	44	2.45	1547	223.8	215.95	220.95	219.77	asmd dn	12.45	12.88	378.89	133.16	10.99
1547.1	2 yr 24 hr storm	1547	223.8	215.95	220.95	219.77	5	5	1	8.6	2.44	1615	223.84	215.74	220.74	219.79	asmd up	12.42	12.43	377.91	152.42	9.42
1615.1	2 yr 24 hr storm	1615	223.84	215.74	220.74	219.79	5	5	1	31.4	0.73	1189	223.76	215.51	220.51	219.7		12.42	12.43	206.98	152.42	8.92
1189.1	2 yr 24 hr storm	1189	223.76	215.51	220.51	219.7	5	5	1	132.8	0.09	1548	222.79	215.39	220.39	219.01		12.42	12.43	72.7	152.42	8.79
1548.1	2 yr 24 hr storm	1548	222.79	215.39	220.39	219.01	5	5	1	57.6	0.45	10428	221	215.13	220.13	218.69	asmd dn	12.42	12.43	162.48	152.41	10.03
10428.1	2 yr 24 hr storm	10428	221	215.13	220.13	218.69	5	5	1	23.7	0.46	1159	221.22	215.02	220.02	218.56	asmd up	12.43	12.43	164.76	152.4	10.2
1215.1	2 yr 24 hr storm	1215	232.4	224.4	229.4	226.5	5	5	1	32.4	0.62	1214	230.8	224.2	229.2	226.17	asmd up	12.45	12.5	190.01	86.78	11.24
1214.1	2 yr 24 hr storm	1214	230.8	224.2	229.2	226.17	5	5	1	369.7	1.63	1552	226	218.16	223.16	220.48		12.42	12.43	309.12	101.77	13.81
1552.1	2 yr 24 hr storm	1552	226	218.16	223.16	220.48	5	5	1	33.5	1.61	1184	224.42	217.62	222.62	220.18		12.42	12.45	307.04	101.78	11.29
1184.1	2 yr 24 hr storm	1184	224.42	217.62	222.62	220.18	5	5	1	90.5	0.74	10411	223	216.95	221.95	219.59	asmd dn	12.42	12.45	208.08	101.78	10.03
10411.1	2 yr 24 hr storm	10411	223	216.95	221.95	219.59	5	5	1	312.5	0.75	1163	220.92	214.62	219.62	217.87	asmd up	12.43	12.45	208.82	101.82	9.43
1163.1	2 yr 24 hr storm	1163	220.92	214.62	219.62	217.87	5	5	1	40.4	-0.2	10413	221	214.7	219.7	217.74	asmd dn	12.43	12.45	107.62	101.92	7.62
10413.1	2 yr 24 hr storm	10413	221	214.7	219.7	217.74	5	5	1	12.8	-0.16	1159	221.22	214.72	219.72	217.68	asmd up	12.42	12.42	95.6	107.84	8.67
1159.1	2 yr 24 hr storm	1159	221.22	211.72	219.72	215.04	8	8	1	142.3	0.63	1153	220.02	210.82	218.82	213.9		12.42	12.43	673.54	260.26	13.33
1153.1	2 yr 24 hr storm	1153	220.02	210.82	218.82	213.9	8	8	1	102.5	0.85	1489	220.09	209.95	217.95	212.84	asmd dn	12.42	12.45	780.27	260.31	14.71
1489.1	2 yr 24 hr storm	1489	220.09	209.95	217.95	212.84	8	8	1	15.3	0.78	1130	219.63	209.83	217.83	212.65	asmd up	12.42	12.47	750.05	260.36	16.01
1130.1	2 yr 24 hr storm	1130	219.63	209.83	217.83	212.65	8	8	1	130	1.66	1129	218.57	207.67	215.67	210.73		12.42	12.42	1091.7	279.03	17.42
1129.1	2 yr 24 hr storm	1129	218.57	207.67	215.67	210.73	8	8	1	57	1.23	1488	218.71	206.97	214.97	210.09		12.42	12.42	938.55	279.14	15.75
1488.1	2 yr 24 hr storm	1488	218.71	206.97	214.97	210.09	8	8	1	76.4	1.2	1486	216.55	206.05	214.05	209.3		12.42	12.43	929.38	279.21	15.3
1486.1	2 yr 24 hr storm	1486	216.55	206.05	214.05	209.3	8	8	1	121.7	0.77	1092	217.21	205.11	213.11	208.06		12.42	12.43	744.33	279.29	14.76
1092.1	2 yr 24 hr storm	1092	217.21	205.11	213.11	208.06	8	8	1	102.4	1.49	1084	217.68	203.58	211.58	206.76		12.42	12.43	1035.24	279.26	16.48
1084.1	2 yr 24 hr storm	1084	217.68	203.58	211.58	206.76	8	8	1	165.6	1.07	1064	215.51	201.81	209.81	205.03		12.4	12.4	875.6	289.75	15.53
1064.1	2 yr 24 hr storm	1064	215.51	201.81	209.81	205.03	8	8	1	135.7	1.01	1059	214.79	200.44	208.44	203.65		12.4	12.43	850.98	290.04	15.34
1059.1	2 yr 24 hr storm	1059	214.79	200.44	208.44	203.65	8	8	1	136.7	1.1	1054	213.67	198.94	206.94	202.28		12.4	12.42	887.17	290.01	15.31

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION ALTERNATE NO. W-4 - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Upsized Dia (ft)	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
1054.1	2 yr 24 hr storm	1054	213.67	198.94	206.94	202.28	8	8	1	135.4	0.91	1052	211.02	197.71	205.71	201.08		12.4	12.42	807.22	289.58	14.64
1052.1	2 yr 24 hr storm	1052	211.02	197.71	205.71	201.08	8	8	1	138.3	0.88	1051	208.61	196.49	204.49	199.82		12.38	12.42	795.46	295.08	14.78
1051.1	2 yr 24 hr storm	1051	208.61	196.49	204.49	199.82	8	8	1	137.2	1.28	1046	207.39	194.74	202.74	198.61		12.38	12.38	956.51	295.39	14.66
1046.1	2 yr 24 hr storm	1046	207.39	194.74	202.74	198.61	8	8	1	137.5	0	1040	207.34	194.74	202.74	197.55		12.38	12.38	26.78	295.95	12.76
1040.1	2 yr 24 hr storm	1040	207.34	194.74	202.74	197.55	8	8	1	139.1	2.15	1031	204.4	191.75	199.75	195.34		12.38	12.43	1241.71	296.33	18.19
1031.1	2 yr 24 hr storm	1031	204.4	191.75	199.75	195.34	8	8	1	132.7	0.97	1026	202.35	190.46	198.46	194.38		12.38	12.43	835.04	301.08	13.7
1026.1	2 yr 24 hr storm	1026	202.35	190.46	198.46	194.38	8	8	1	145.6	0.58	1021	200.49	189.62	197.62	193.59		12.38	12.43	643.29	300.67	12.32
1021.1	2 yr 24 hr storm	1021	200.49	189.62	197.62	193.59	8	8	1	346.9	1.15	1009	197.32	185.62	193.62	192.98		12.4	12.4	909.44	300.39	11.16
1009.1	2 yr 24 hr storm	1009	197.32	185.62	193.62	192.98	8	8	1	70.3	1.55	10436	195	184.53	192.53	192.88		12.4	12.42	1054.59	301.09	6.52
10436.1	2 yr 24 hr storm	10436	195	184.53	192.53	192.88	8	8	1	6.7	1.64	1006	195.82	184.42	192.42	192.87		12.4	12.4	1085.19	301.13	5.99
1006.1	2 yr 24 hr storm	1006	195.82	184.42	192.42	192.87	8	8	1	139.4	0.38	1005	193.79	183.89	191.89	192.6		12.4	12.4	522.22	324.43	6.41
1005.2	2 yr 24 hr storm	1005	193.79	183.89	191.89	192.6	8	8	1	121	1.98	10430	191.5	181.5	189.5	192.38	asmd dn	12.4	12.4	1190.29	324.49	6.31
10430.1	2 yr 24 hr storm	10430	191.5	181.5	189.5	192.38	8	8	1	24.2	1.86	10453	191.05	181.05	189.05	192.28	asmd dn&up	12.4	12.4	1154.9	324.52	6.44
10453.1	2 yr 24 hr storm	10453	191.05	181.05	190.05	192.28	9	9	1	54.8	1.92	10431	190	180	189	192.21	asmd dn&up	12.4	12.4	1604.94	324.53	5.02
10431.1	2 yr 24 hr storm	10431	190	180	189	192.21	9	9	1	66.2	1.96	1001	192	178.7	187.7	192	asmd up	12.4	12.4	1624.79	324.52	5.09

All Pipes are Circular and have a Roughness of 0.014.

SECTION 4E

WEST BRANCH
NORTH OF ROSEWOOD
TRUNK LINE EVALUATION

West Branch Watershed (North of Rosewood Drive Trunk Line Evaluations)

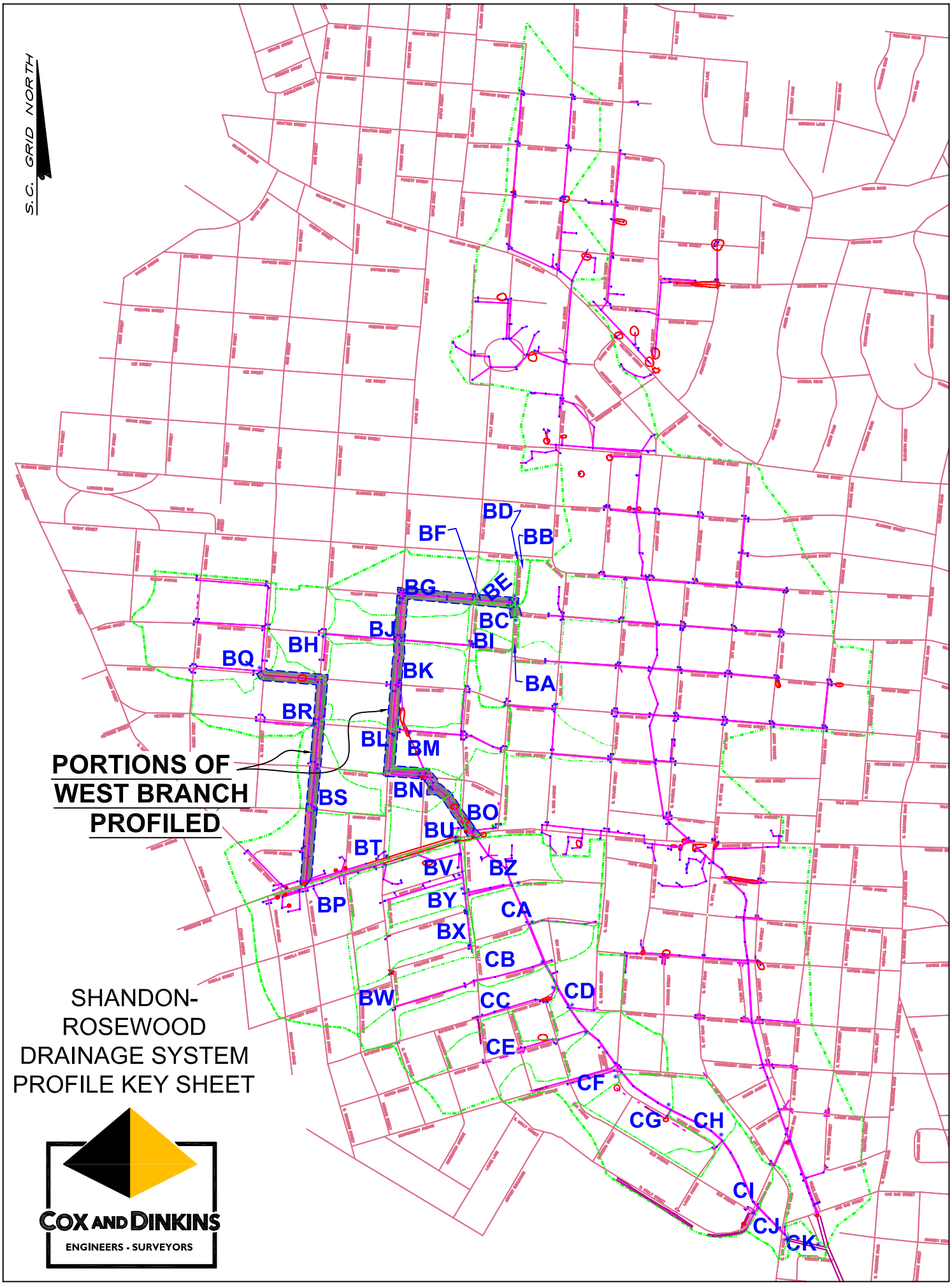
As outlined previously the majority of the surcharge and ponding identified to date in the **west branch watershed** occurs north of Rosewood Drive. North of Rosewood Drive there are two primary drainage collection/conveyance systems. The first primary system is the drainage collection/conveyance system associated with Maple Street, from the Wilmot Avenue intersection south to Burney Drive, then east along Burney Drive to Sloan Street where it turns southeasterly through the block and extends to Rosewood Drive, east of the S. Holly Street intersection. The second primary system is the drainage collection/conveyance system associated with Woodrow Street, from the Monroe Street intersection south to Rosewood Drive, then east along the north side of Rosewood Drive to the west side of the S. Holly Street intersection. These two primary systems converge along Hope Avenue, south of Rosewood Drive and east of S. Holly Street.

Alternate W2 was performed in an effort to represent the parallel installation of certain pipes within the **west branch watershed**, primarily north of Rosewood Drive. In **Alternate W2** the existing pipes in the primary drainage collection/conveyance system associated with Maple Street were doubled to simulate parallel installation. In this alternate scenario (**Alternate W2**) the peak runoff rates and the time to the corresponding peaks were again compared at the following locations: (1) north of Rosewood Drive between S. Holly Street and S. Shandon Street (Node 2155); (2) north of Rosewood Drive just west of S. Holly Street (Node 2259); and (3) where the **west branch watershed** discharges into the open channel (Node 1001). The comparisons of time to peak for **Alternate W2** show change of not more than (1%) for the three locations described when compared to the **Original Model**. However, comparisons of peak rates for **Alternate W2** again show marked increases in peak runoff rates at Node 2155 and Node 1001 when compared to the **Original Model**. The greatest increase in peak was measured at Node 2155 and the 10-year, 24-hour (**Alternate W2)** peak at Node 2155 was more than 40% above the **Original Model** peak for that location. An increase in peak was also measured at Node 1001 but there the 10-year, 24-hour (**Alternate W2)** peak was increased by 7% over the **Original Model** peak for that location.

In **Alternate W3** the existing pipes in the primary drainage collection/conveyance system associated with Woodrow Street were also doubled to simulate parallel installation. In this alternate scenario (**Alternate W3**) the peak runoff rates and the time to the corresponding peaks were again compared at the following locations: (1) north of Rosewood Drive between S. Holly Street and S. Shandon Street (Node 2155); (2) north of Rosewood Drive just west of S. Holly Street (Node 2259); and (3) where the **west branch watershed** discharges into the open channel (Node 1001). The comparisons of time to peak for **Alternate W3** show change of not more than (2%) for the three locations described when compared to the **Original Model**. However, comparisons of peak rates for **Alternate W3** again show marked increases in peak runoff rates at Node 2155, Node 2259 and Node 1001 when compared to the **Original Model**. The greatest increase in peak was measured at Node 2155 and the 10-year, 24-hour (**Alternate W3)** peak at Node 2155 was more than 40% above the **Original Model** peak for that location. An increase in peak was also measured at Node 2259 but there the 10-year, 24-hour (**Alternate W3)** peak was increased by 35% over the **Original Model** peak that location. Finally, an increase in peak was also measured at Node 1001 but there the 10-year, 24-hour (**Alternate W3)** peak was increased by 16% over the **Original Model** peak that location. An increase in peak was also measured at Node 1001 but there the 10-year, 24-hour (**Alternate W3)** peak was increased by 6% over the **Original Model** peak for that location.

The comparison of **Alternates W2 and W3 vs. Original Model** indicates the primary drainage collection/conveyance system associated with Maple Street is the most

underperforming portion of the collection systems in the **west branch watershed.** The comparison of **Alternates W2 and W3 vs. Original Model** also indicates when north of Rosewood improvements are made, the collection/conveyance system in the **west branch watershed** south of Rosewood is less likely to experience additional negative impacts than were projected by alternates for the **east branch watershed.** Negative impacts could be described as increased ponding to the extent that ponding becomes a nuisance or a public complaint. See the following spreadsheet for a summary comparison of the alternate analyses performed for the **west branch watershed**.



SHANDON-
ROSEWOOD
DRAINAGE SYSTEM
PROFILE KEY SHEET

COX AND DINKINS
ENGINEERS - SURVEYORS

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5211.1	10 yr 24 hr	5211	278.72	276.12	277.42	279.00	1.3	2	88.3	0.60	5209	278.29	275.59	276.89	279.00		13.95	13.95	5.16	8.7	3.26
5210.1	10 yr 24 hr	5210	278.24	275.54	276.84	279.00	1.3	2	32.5	-0.46	5209	278.29	275.69	276.99	279.00		13.98	13.98	4.52	8.47	3.17
5209.1	10 yr 24 hr	5209	278.29	275.59	276.89	279.00	1.3	2	27.3	1.50	5208	278.53	275.18	276.48	279.00		13.78	11.87	8.16	9.09	3.63
5208.1	10 yr 24 hr	5208	278.53	275.13	276.43	279.00	1.3	2	15.9	2.70	5207	279.20	274.70	276.00	279.00		13.78	13.78	10.95	9.12	3.4
5205.1	10 yr 24 hr	5205	278.78	275.58	276.88	279.00	1.3	2	27.2	2.39	5206	278.53	274.93	276.23	279.00		13.52	11.83	10.3	6.77	2.6
5206.1	10 yr 24 hr	5206	278.53	274.88	276.18	279.00	1.3	2	12.3	0.65	5207	279.20	274.80	276.10	279.00		12.18	12.18	5.37	6.32	2.35
5207.1	10 yr 24 hr	5207	279.20	274.70	276.00	279.00	1.3	2	366.1	0.17	5200	281.09	274.09	275.39	279.03		12.05	12.05	2.72	11.16	4.16
5200.1	10 yr 24 hr	5200	281.09	274.29	275.79	279.03	1.5	2	239.4	0.18	5189	280.15	273.85	275.35	279.06		12.07	12.05	4.18	10.27	3.02
5189.1	10 yr 24 hr	5189	280.15	273.65	275.15	279.06	1.5	2	73.7	0.03	5188	280.33	273.63	275.13	279.07		13.75	13.75	1.61	9.62	2.71
5188.1	10 yr 24 hr	5188	280.33	273.63	275.13	279.07	1.5	2	328.2	0.19	5185	280.52	273.02	274.52	279.11		13.75	13.75	4.21	9.63	2.71
5185.1	10 yr 24 hr	5185	280.52	272.97	274.47	279.11	1.5	2	46.5	0.28	5177	280.44	272.84	274.34	279.12		13.75	13.75	5.16	9.63	2.72
5177.1	10 yr 24 hr	5177	280.44	272.79	274.29	279.12	1.5	2	337.1	0.26	5870	276.68	271.90	273.40	273.84	asmd dn	12.53	12.53	5.01	24.77	6.88
5870.1	10 yr 24 hr	5870	276.68	271.90	273.40	273.84	1.5	2	43.7	0.18	5157	275.97	271.82	273.32	273.15	asmd up	12.53	12.53	4.17	24.77	7.04
5219.1	10 yr 24 hr	5219	281.87	275.47	276.77	281.97	1.3	2	636.2	0.89	5871	276.23	269.78	271.08	273.25	asmd dn	12.55	12.55	6.3	16.25	5.98
5871.1	10 yr 24 hr	5871	276.23	269.78	271.08	273.25	1.3	2	33.9	0.92	5157	275.97	269.47	270.77	272.77	asmd up	12.55	12.55	6.37	16.27	6.08
5168.1	10 yr 24 hr	5168	279.57	273.07	274.57	273.82	1.5	2	630.2	0.56	5869	275.85	269.57	271.07	272.78	asmd dn	12.22	12.18	7.27	5.63	3.36
5869.1	10 yr 24 hr	5869	275.85	269.57	271.07	272.78	1.5	2	20.3	0.49	5157	275.97	269.47	270.97	272.77	asmd up	12.2	12.2	6.85	5.05	1.41
5157.1	10 yr 24 hr	5157	275.97	269.57	271.57	272.77	2	2	46.4	2.18	5164	275.16	268.56	270.56	271.69		12.32	12.2	30.99	65.75	11.14
5164.1	10 yr 24 hr	5164	275.16	267.96	270.46	271.69	2.5	2	88.8	0.52	5145	273.00	267.50	270.00	271.09		12.32	12.18	27.41	65.73	6.84
5145.1	10 yr 24 hr	5145	273.00	267.30	269.80	271.09	2.5	2	58.3	4.09	5144	271.32	264.92	267.42	270.72		12.32	12.1	76.95	65.71	11
5144.1	10 yr 24 hr	5144	271.32	264.82	267.32	270.72	2.5	2	221.5	0.45	5130	268.43	263.83	266.33	269.67		12.32	12.32	25.46	65.69	6.64
5130.1	10 yr 24 hr	5130	268.43	263.73	266.23	269.67	2.5	2	56.6	0.18	5128	266.93	263.63	266.13	269.51		12.23	12.23	16.01	57.46	5.82
5128.1	10 yr 24 hr	5128	266.93	263.58	266.08	269.51	2.5	2	395.6	0.38	5073	268.66	262.06	264.56	267.50		13.18	13.2	23.61	63.32	6.4
5073.1	10 yr 24 hr	5073	268.66	261.96	264.46	267.50	2.5	2	335.2	0.34	5054	272.51	260.81	263.31	265.33		12.93	12.93	22.31	66.14	6.7
5054.1	10 yr 24 hr	5054	272.51	260.71	263.21	265.33	2.5	2	337.1	0.44	5883	269.43	259.23	261.73	263.16	asmd dn	12.93	13	25.24	66.14	6.71
5077.1	10 yr 24 hr	5077	268.54	264.29	266.79	265.29	2.5	2	229.1	1.10	5889	268.03	261.76	264.26	263.49	asmd dn	12.42	12.52	40.02	25.72	6.44
5889.1	10 yr 24 hr	5889	268.03	261.76	264.26	263.49	2.5	2	200.8	1.16	5013	268.93	259.43	261.93	263.17	asmd up	12.43	12.1	41.03	25.98	4.27
5013.1	10 yr 24 hr	5013	268.93	259.23	261.73	263.17	2.5	2	3.6	0.00	5883	269.43	259.23	261.73	263.16	asmd dn	12.43	12.43	1.2	26.03	2.64
5883.1	10 yr 24 hr	5883	269.43	259.23	262.23	263.16	3	2	42.1	0.55	5882	270.86	259.00	262.00	262.96	asmd dn&up	12.47	12.47	45.78	87.95	6.21
5882.1	10 yr 24 hr	5882	270.86	259.00	262.00	262.96	3	2	63	0.36	5026	271.87	258.77	261.77	262.65	asmd up	12.47	12.47	37.42	87.96	6.21
5026.1	10 yr 24 hr	5026	271.87	258.67	261.67	262.65	3	2	60.6	0.96	5027	272.09	258.09	261.09	262.36		12.47	12.47	60.59	87.97	6.21
5027.1	10 yr 24 hr	5027	272.09	257.99	260.99	262.36	3	2	53	0.09	5040	272.74	257.94	260.94	262.02		12.35	12.35	19.02	99.51	7.02
5040.1	10 yr 24 hr	5040	272.74	257.94	260.94	262.02	3	2	105.7	0.09	5875	274.38	257.84	260.84	261.35	asmd dn	12.35	12.35	19.05	99.51	6.99
5875.1	10 yr 24 hr	5875	274.38	257.84	260.84	261.35	3	2	166.3	0.04	5874	271.57	257.78	260.78	260.37	asmd dn&up	12.35	12.35	11.76	99.5	6.81
5874.1	10 yr 24 hr	5874	271.57	257.78	260.78	260.37	3	2	212.3	0.37	2156	267.08	257.00	260.00	258.57	asmd dn	12.37	12.37	37.54	99.51	8.01
2156.1	10 yr 24 hr	2156	267.08	257.00	260.00	258.57	3	2	23.4	1.15	2155	266.93	256.73	259.73	257.80	asmd up	12.37	12.4	66.53	99.53	13.92
2155.1	10 yr 24 hr	2155	266.93	256.73	260.73	257.80	4	2	56.8	7.94	1247	266.32	252.22	256.22	253.29		12.32	12.32	375.85	117.65	21.75
10409.1	10 yr 24 hr	10409	267.00	253.88	256.88	255.76	3	1	59.2	0.30	2167	267.24	253.70	256.70	255.27	asmd dn&up	12.97	12.97	34.15	36.78	8.05
2167.1	10 yr 24 hr	2167	267.24	253.70	256.70	255.27	3	1	123	1.20	1247	266.32	252.22	255.22	253.79	asmd up	12.97	12.98	67.94	36.77	9.8
1247.1	10 yr 24 hr	1247	266.32	240.22	244.72	242.63	4.5	1	196.8	1.63	1245	251.71	237.01	241.51	239.42		12.37	12.4	233.21	130.9	15.08
1245.1	10 yr 24 hr	1245	251.71	236.71	241.21	239.01	4.5	1	190.1	1.97	1234	239.26	232.96	237.46	235.55		12.37	12.4	256.47	130.9	15.73
1234.1	10 yr 24 hr	1234	239.26	232.91	237.41	235.55	4.5	1	62.9	1.48	1231	238.58	231.98	236.48	234.79		12.37	12.38	222.04	130.9	13.41
1231.1	10 yr 24 hr	1231	238.58	231.98	236.48	234.79	4.5	1	80	1.04	1225	238.15	231.15	235.65	233.98		12.37	12.38	186	130.89	12.52
1225.1	10 yr 24 hr	1225	238.15	231.15	235.65	233.98	4.5	1	32.4	0.99	1226	237.43	230.83	235.33	233.66		12.37	12.38	181.47	130.89	12.42
5850.1	10 yr 24 hr	5850	283.08	276.43	277.93	285.12	1.5	2	42.6	0.54	5854	283.48	276.20	277.70	284.66	asmd dn	13.28	13.3	7.17	22.33	6.13
5854.1	10 yr 24 hr	5854	283.48	276.20	277.70	284.66	1.5	2	507	0.52	5867	281.93	273.55	275.05	281.31	asmd dn&up	13.28	13.3	7.05	22.34	6.15
5867.1	10 yr 24 hr	5867	281.93	273.55	275.05	281.31	1.5	2	29.3	3.28	5793	281.89	272.59	274.09	281.14	asmd up	13.28	12.2	17.66	22.34	7.97
5793.1	10 yr 24 hr	5793	281.89	272.29	273.79	281.14	1.5	2	365.7	0.36	5784	282.98	270.98	272.48	279.04		13.28	13.3	5.84	22.34	6.22
5784.1	10 yr 24 hr	5784	282.98	270.88	272.38	279.04	1.5	2	76.6	-0.03	5783	282.50	270.90	272.40	278.61		13.3	13.32	1.58	22.34	6.36
5783.1	10 yr 24 hr	5783	282.50	270.80	272.80	278.61	2	2	389.4	0.87	5762	277.01	267.41	269.41	275.04		12.87	13.07	19.6	41.43	7.09
5762.1	10 yr 24 hr	5762	277.01	267.36	269.36	275.04	2	2	390.9	0.98	5759	270.74	263.54	265.54	271.45		12.87	13.2	20.77	42.78	7.3

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5759.1	10 yr 24 hr	5759	270.74	263.49	265.99	271.45	2.5	2	414.6	0.50	5872	266.83	261.40	263.90	269.76	asmd dn	12.85	12.25	27.04	55.52	6.05
5872.1	10 yr 24 hr	5872	266.83	261.40	263.90	269.76	2.5	2	205.6	1.46	2255	269.70	258.40	260.90	268.97	asmd up	12.85	12.2	46.01	55.57	7.68
2255.1	10 yr 24 hr	2255	269.70	258.30	260.80	268.97	2.5	2	19.2	0.16	2254	270.05	258.27	260.77	268.90	asmd dn	12.85	12.85	15.06	55.6	5.57
2254.1	10 yr 24 hr	2254	270.05	258.27	260.77	268.90	2.5	2	320.6	0.23	2256	269.73	257.53	260.03	267.70	asmd up	12.85	12.85	18.3	55.64	5.57
2256.1	10 yr 24 hr	2256	269.73	257.43	259.93	267.70	2.5	2	237.5	0.22	2257	269.62	256.90	259.40	266.83	asmd dn	12.85	12.85	17.99	55.69	5.59
2257.1	10 yr 24 hr	2257	269.62	256.90	259.40	266.83	2.5	2	106.2	0.28	2239	269.95	256.60	259.10	266.44	asmd dn&up	12.85	12.85	20.24	55.73	5.6
2239.1	10 yr 24 hr	2239	269.95	256.60	259.10	266.44	2.5	2	101.3	0.30	5920	270.06	256.30	258.80	266.06	asmd dn&up	12.85	12.85	20.73	55.77	5.61
5920.1	10 yr 24 hr	5920	270.06	256.30	258.80	266.06	2.5	2	124.6	0.24	2262	270.14	256.00	258.50	264.31	asmd dn&up	12.45	12.45	18.69	92.03	9.21
2262.1	10 yr 24 hr	2262	270.14	256.00	258.50	264.31	2.5	2	148.5	0.13	2261	270.13	255.80	258.30	262.19	asmd dn&up	12.45	12.45	13.98	92.03	9.24
2261.1	10 yr 24 hr	2261	270.13	255.80	258.30	262.19	2.5	2	337	0.18	2360	268.99	255.19	257.69	257.43	asmd up	12.45	12.45	16.2	92.03	9.34
2360.1	10 yr 24 hr	2360	268.99	255.09	258.09	256.36	3	2	63	4.73	2259	268.33	252.11	255.11	254.41	asmd dn&up	12.45	12.53	134.7	92.02	14.75
2259.1	10 yr 24 hr	2259	268.33	252.11	256.61	254.41	4.5	2	159.4	0.45	1252	264.05	251.40	255.90	253.99		12.37	12.35	121.87	100.86	6.09
1252.1	10 yr 24 hr	1252	264.05	251.40	255.90	253.99	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	252.66		12.37	12.38	161.62	100.62	10.71
1288.1	10 yr 24 hr	1288	258.48	250.03	254.53	251.82	4.5	1	47.8	3.20	1903	257.79	248.50	253.00	250.57	asmd dn	12.37	12.57	326.69	100.61	16.79
1903.1	10 yr 24 hr	1903	257.79	248.50	253.00	250.57	4.5	1	150.5	2.92	1240	254.00	244.10	248.60	246.26		12.37	12.37	312.22	134.62	18.78
2136.1	10 yr 24 hr	2136	264.27	259.60	261.10	260.99	1.5	1	15.6	0.70	1953	264.69	259.49	260.99	260.79	asmd up	12.48	12.48	8.19	11.67	6.88
1953.1	10 yr 24 hr	1953	264.69	258.99	260.99	259.84	2	1	269.9	2.22	1285	257.40	253.00	255.00	253.85		12.5	12.5	31.29	11.65	9.23
1285.1	10 yr 24 hr	1285	257.40	252.40	254.90	253.46	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	253.37	asmd dn	12.5	12.72	47.58	11.66	6.42
1906.1	10 yr 24 hr	1906	258.12	252.18	254.68	253.37	2.5	1	23.3	1.63	1907	257.56	251.80	254.30	253.28	asmd dn&up	12.5	12.72	48.64	11.67	5.57
1907.1	10 yr 24 hr	1907	257.56	251.80	254.30	253.28	2.5	1	151.1	1.59	1240	254.00	249.40	251.90	250.88	asmd up	12.42	12.42	48	31.52	10.43
1240.1	10 yr 24 hr	1240	254.00	244.10	247.60	246.26	3.5	2	40.4	2.72	1222	255.15	243.00	246.50	245.60	asmd dn 2 x 4	12.37	12.38	154.16	170.69	13.49
1222.1	10 yr 24 hr	1222	255.15	243.00	248.00	245.60	5	1	197.9	1.79	1223	246.86	239.46	244.46	242.05		12.37	12.37	323.45	171.7	16.74
1223.1	10 yr 24 hr	1223	246.86	237.46	242.46	239.56	5	1	119.1	3.85	1224	241.08	232.88	237.88	235.47		12.37	12.37	474.25	171.87	21.32
1224.1	10 yr 24 hr	1224	241.08	232.78	237.78	235.47	5	1	43.1	1.55	1909	241.08	232.11	237.11	234.76	asmd dn	12.37	12.37	301.53	172.22	16.09
1909.1	10 yr 24 hr	1909	241.08	232.11	237.11	234.76	5	1	40.4	1.68	1226	237.43	231.43	236.43	234.07		12.37	12.37	313.76	172.4	16.34
1226.1	10 yr 24 hr	1226	237.43	226.53	233.53	230.57	7	1	178.8	0.68	1559	234.52	225.32	232.32	229.25		12.37	12.38	487.99	315.76	13.82
1559.1	10 yr 24 hr	1559	234.52	225.32	232.32	229.25	7	1	180.4	0.51	1215	232.40	224.40	231.40	227.32	asmd dn	12.37	12.38	423.62	312.97	14.77
10412.1	10 yr 24 hr	1215	232.40	224.40	229.40	227.32	5	1	400.2	1.69	10410	228.00	217.62	222.62	223.18	asmd dn	12.38	12.73	314.78	167.84	14.11
10410.1	10 yr 24 hr	10410	228.00	217.62	222.62	223.18	5	1	190.4	0.31	1188	222.83	217.03	222.03	221.96	asmd up	12.38	12.68	134.62	201.99	10.06
1188.1	10 yr 24 hr	1188	222.83	217.03	222.03	221.96	5	1	44	2.46	1547	223.80	215.95	220.95	221.67	asmd dn	12.38	12.92	378.89	201.66	11.13
1547.1	10 yr 24 hr	1547	223.80	215.95	220.95	221.67	5	1	8.6	2.43	1615	223.84	215.74	220.74	221.59	asmd up	12.38	12.38	377.91	241.04	11.71
1615.1	10 yr 24 hr	1615	223.84	215.74	220.74	221.59	5	1	31.4	0.73	1189	223.76	215.51	220.51	221.30		12.38	12.38	206.98	241.01	11.73
1189.1	10 yr 24 hr	1189	223.76	215.51	220.51	221.30	5	1	132.8	0.09	1548	222.79	215.39	220.39	220.10		12.38	12.38	72.7	240.86	11.79
1548.1	10 yr 24 hr	1548	222.79	215.39	220.39	220.10	5	1	57.6	0.45	10428	221.00	215.13	220.13	219.60	asmd dn	12.38	12.4	162.48	240.68	12.62
10428.1	10 yr 24 hr	10428	221.00	215.13	220.13	219.60	5	1	23.7	0.46	1159	221.22	215.02	220.02	219.38	asmd up	12.38	12.38	164.76	240.58	13.04
1215.1	10 yr 24 hr	1215	232.40	224.40	229.40	227.32	5	1	32.4	0.62	1214	230.80	224.20	229.20	227.02	asmd up	12.38	12.53	190.01	146.63	12.7
1214.1	10 yr 24 hr	1214	230.80	224.20	229.20	227.02	5	1	369.7	1.63	1552	226.00	218.16	223.16	221.71		12.38	12.38	309.12	181.39	15.63
1552.1	10 yr 24 hr	1552	226.00	218.16	223.16	221.71	5	1	33.5	1.61	1184	224.42	217.62	222.62	221.46		12.38	12.43	307.04	181.25	12.07
1184.1	10 yr 24 hr	1184	224.42	217.62	222.62	221.46	5	1	90.5	0.74	10411	223.00	216.95	221.95	220.89	asmd dn	12.38	12.38	208.08	181.01	11.18
10411.1	10 yr 24 hr	10411	223.00	216.95	221.95	220.89	5	1	312.5	0.75	1163	220.92	214.62	219.62	219.00	asmd up	12.4	12.4	208.82	179.15	10.88
1163.1	10 yr 24 hr	1163	220.92	214.62	219.62	219.00	5	1	40.4	-0.20	10413	221.00	214.70	219.70	218.79	asmd dn	12.4	12.4	107.62	180.1	9.98
10413.1	10 yr 24 hr	10413	221.00	214.70	219.70	218.79	5	1	12.8	-0.16	1159	221.22	214.72	219.72	218.71	asmd up	12.4	12.4	95.6	193.13	11.31
1159.1	10 yr 24 hr	1159	221.22	211.72	219.72	216.13	8	1	142.3	0.63	1153	220.02	210.82	218.82	214.93		12.4	12.4	673.54	434.57	15.61
1153.1	10 yr 24 hr	1153	220.02	210.82	218.82	214.93	8	1	102.5	0.85	1489	220.09	209.95	217.95	213.86	asmd dn	12.4	12.4	780.27	436.78	17
1489.1	10 yr 24 hr	1489	220.09	209.95	217.95	213.86	8	1	15.3	0.79	1130	219.63	209.83	217.83	213.68	asmd up	12.4	12.45	750.05	437.42	18.02
1130.1	10 yr 24 hr	1130	219.63	209.83	217.83	213.68	8	1	130	1.66	1129	218.57	207.67	215.67	211.84		12.4	12.38	1091.7	475.88	19.78
1129.1	10 yr 24 hr	1129	218.57	207.67	215.67	211.84	8	1	57	1.23	1488	218.71	206.97	214.97	211.22		12.4	12.42	938.55	475.51	18.02
1488.1	10 yr 24 hr	1488	218.71	206.97	214.97	211.22	8	1	76.4	1.20	1486	216.55	206.05	214.05	210.43		12.4	12.42	929.38	474.64	17.63
1486.1	10 yr 24 hr	1486	216.55	206.05	214.05	210.43	8	1	121.7	0.77	1092	217.21	205.11	213.11	209.18		12.38	12.42	744.33	475.41	17.24
1092.1	10 yr 24 hr	1092	217.21	205.11	213.11	209.18	8	1	102.4	1.49	1084	217.68	203.58	211.58	207.96		12.38	12.42	1035.24	476.02	18.68
1084.1	10 yr 24 hr	1084	217.68	203.58	211.58	207.96	8	1	165.6	1.07	1064	215.51	201.81	209.81	206.25		12.33	12.42	875.6	498.36	17.85

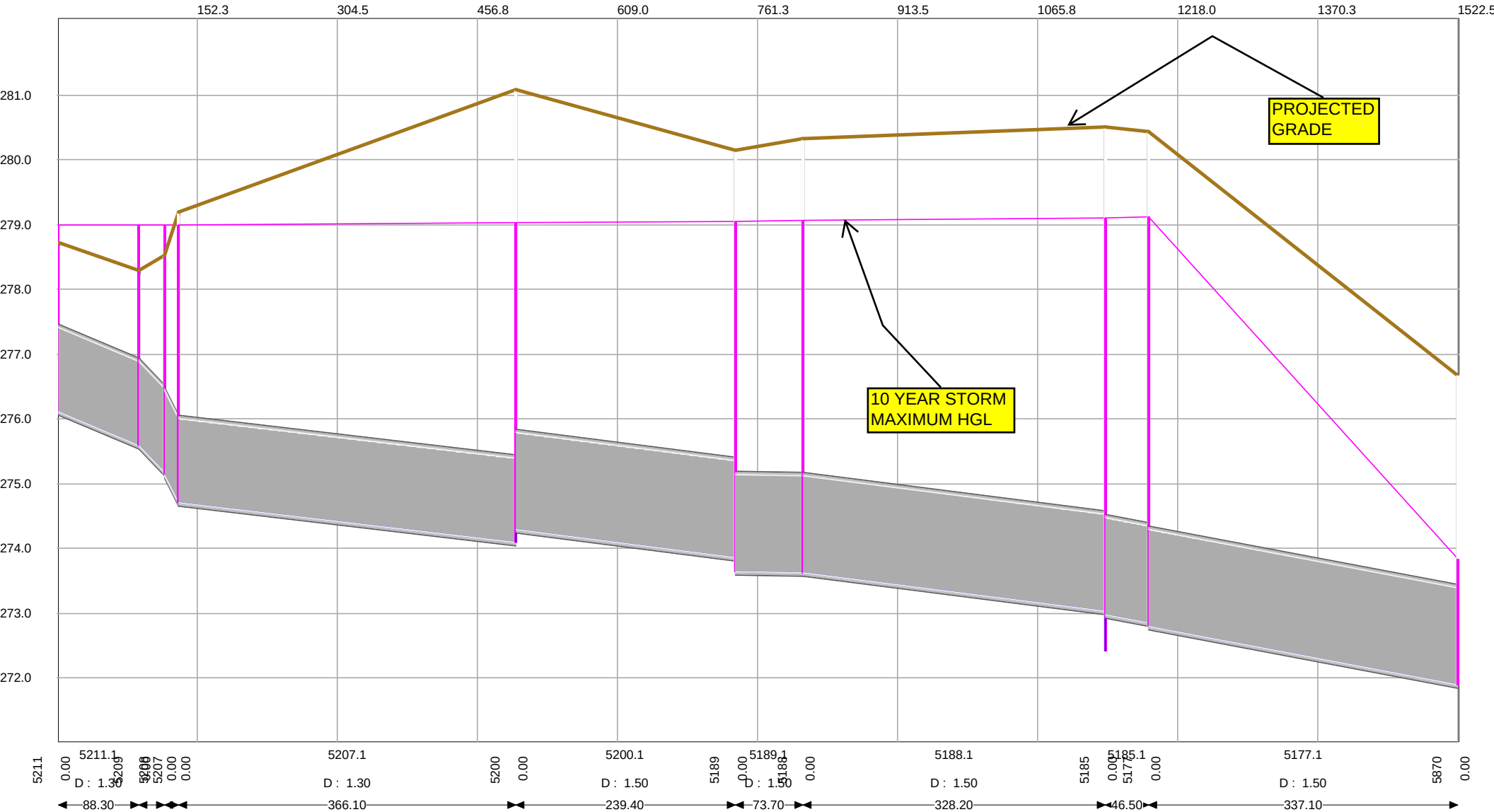
All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - TEN YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
1064.1	10 yr 24 hr	1064	215.51	201.81	209.81	206.25	8	1	135.7	1.01	1059	214.79	200.44	208.44	204.89		12.33	12.42	850.98	499.7	17.56
1059.1	10 yr 24 hr	1059	214.79	200.44	208.44	204.89	8	1	136.7	1.10	1054	213.67	198.94	206.94	203.56		12.33	12.4	887.17	499.89	17.48
1054.1	10 yr 24 hr	1054	213.67	198.94	206.94	203.56	8	1	135.4	0.91	1052	211.02	197.71	205.71	202.37		12.33	12.4	807.22	500.39	16.82
1052.1	10 yr 24 hr	1052	211.02	197.71	205.71	202.37	8	1	138.3	0.88	1051	208.61	196.49	204.49	201.11		12.33	12.35	795.46	514.65	17.12
1051.1	10 yr 24 hr	1051	208.61	196.49	204.49	201.11	8	1	137.2	1.28	1046	207.39	194.74	202.74	199.87		12.33	12.35	956.51	515.08	17.08
1046.1	10 yr 24 hr	1046	207.39	194.74	202.74	199.87	8	1	137.5	0.00	1040	207.34	194.74	202.74	198.65		12.33	12.43	26.78	514.61	15.7
1040.1	10 yr 24 hr	1040	207.34	194.74	202.74	198.65	8	1	139.1	2.15	1031	204.40	191.75	199.75	196.55		12.35	12.42	1241.71	513.79	20.85
1031.1	10 yr 24 hr	1031	204.40	191.75	199.75	196.55	8	1	132.7	0.97	1026	202.35	190.46	198.46	195.39		12.35	12.42	835.04	527.88	16.97
1026.1	10 yr 24 hr	1026	202.35	190.46	198.46	195.39	8	1	145.6	0.58	1021	200.49	189.62	197.62	194.09		12.35	12.42	643.29	530.69	16.64
1021.1	10 yr 24 hr	1021	200.49	189.62	197.62	194.09	8	1	346.9	1.15	1009	197.32	185.62	193.62	191.44		12.35	12.37	909.44	533.4	18.56
1009.1	10 yr 24 hr	1009	197.32	185.62	193.62	191.44	8	1	70.3	1.55	10436	195.00	184.53	192.53	193.13		12.35	12.37	1054.59	533.14	17.81
10436.1	10 yr 24 hr	10436	195.00	184.53	192.53	193.13	8	1	6.7	1.63	1006	195.82	184.42	192.42	194.95		12.35	12.37	1085.19	532.86	16.18
1006.1	10 yr 24 hr	1006	195.82	184.42	192.42	194.96	8	1	139.4	0.38	1005	193.79	183.89	191.89	191.30		12.35	12.37	522.22	579.43	17.91
1005.2	10 yr 24 hr	1005	193.79	183.89	191.89	191.30	8	1	121	1.97	10430	191.50	181.50	189.50	192.10	asmd dn	12.35	12.43	1190.29	577.33	23.06
10430.1	10 yr 24 hr	10430	191.50	181.50	189.50	192.11	8	1	24.2	1.86	10453	191.05	181.05	189.05	193.86	asmd dn&up	0.03	0.03	1154.9	2130.31	42.34
10453.1	10 yr 24 hr	10453	191.05	181.05	190.05	193.86	9	1	54.8	1.92	10431	190.00	180.00	189.00	221.29	asmd dn&up	0.03	0.03	1604.94	1587.12	28.65
10431.1	10 yr 24 hr	10431	190.00	180.00	189.00	221.29	9	1	66.2	1.96	1001	188.70	178.70	187.70	191.20	asmd up	12.37	0.03	1624.79	580.54	20.27
1001.1	10 yr 24 hr	1001	188.70	178.70	186.70	191.20	8	1	354	0.79	10440	183.89	175.89	183.89	183.89	Ditch	0.03	0.03	754.57	700.76	24.09

All Pipes are Circular and have a Roughness of 0.014.

WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - NODES 5211-5870
Day [0] Time 00:01:00 Step 1



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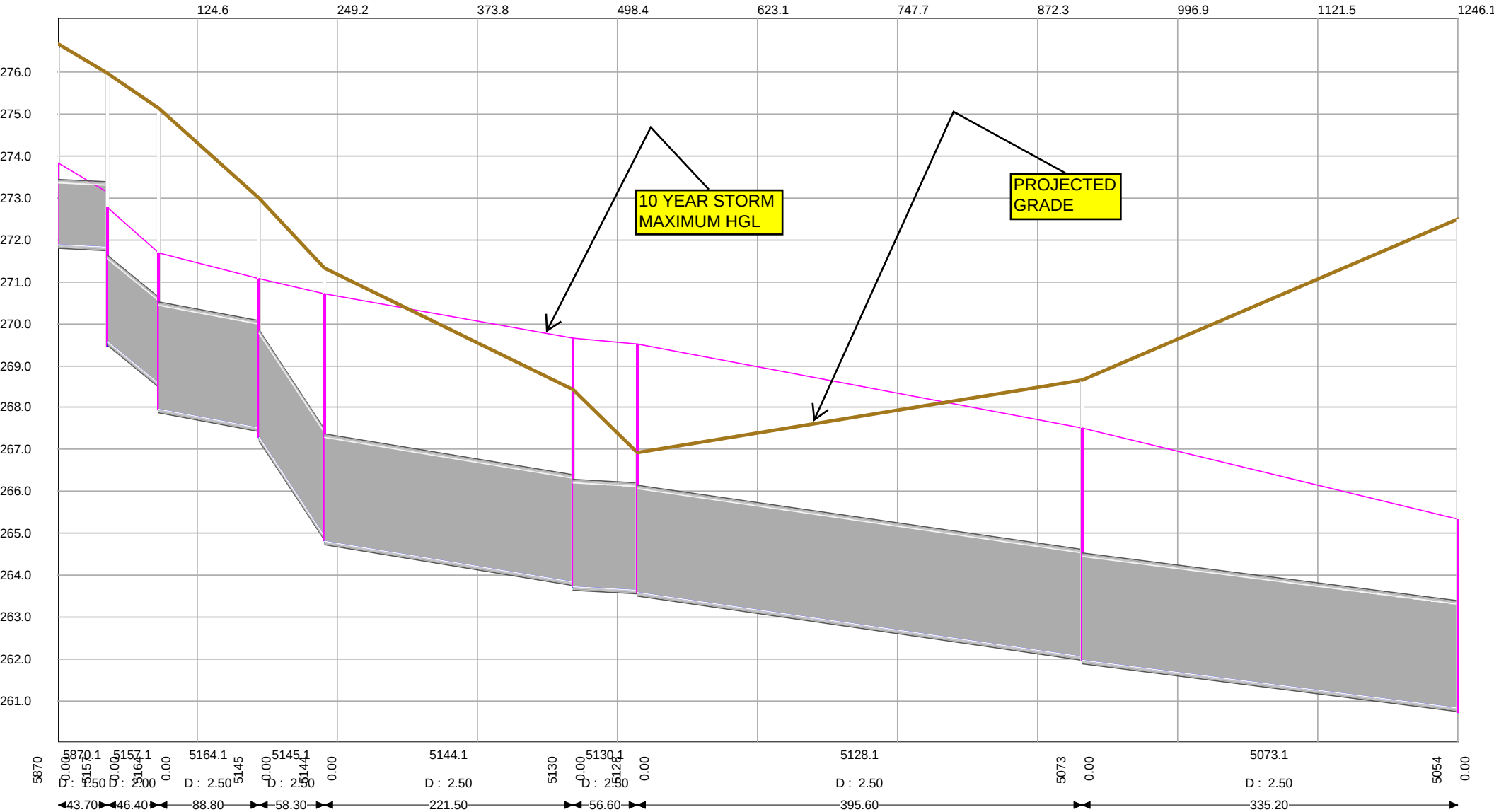
Day [0] Time 00:01:00 Step 1



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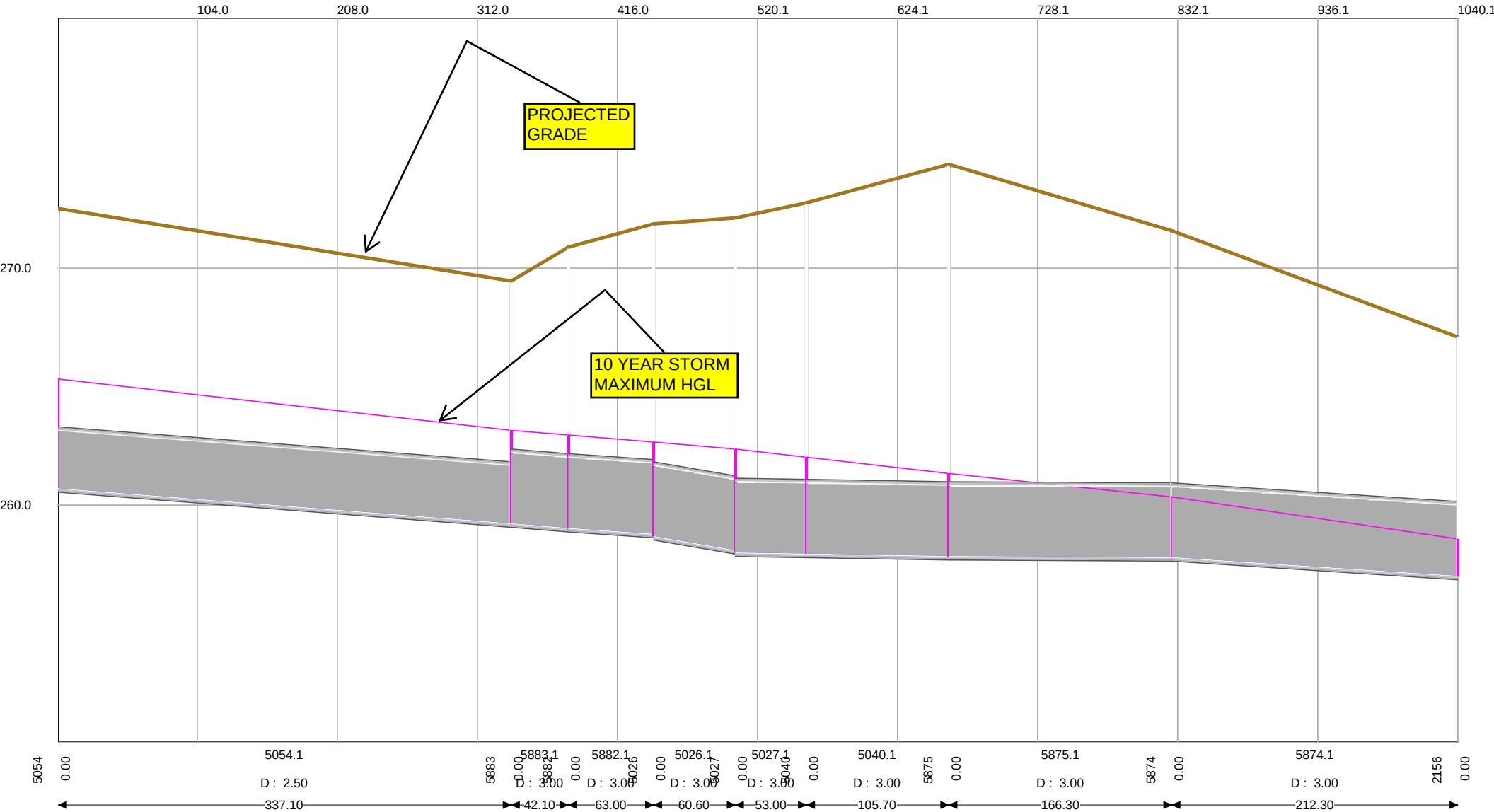

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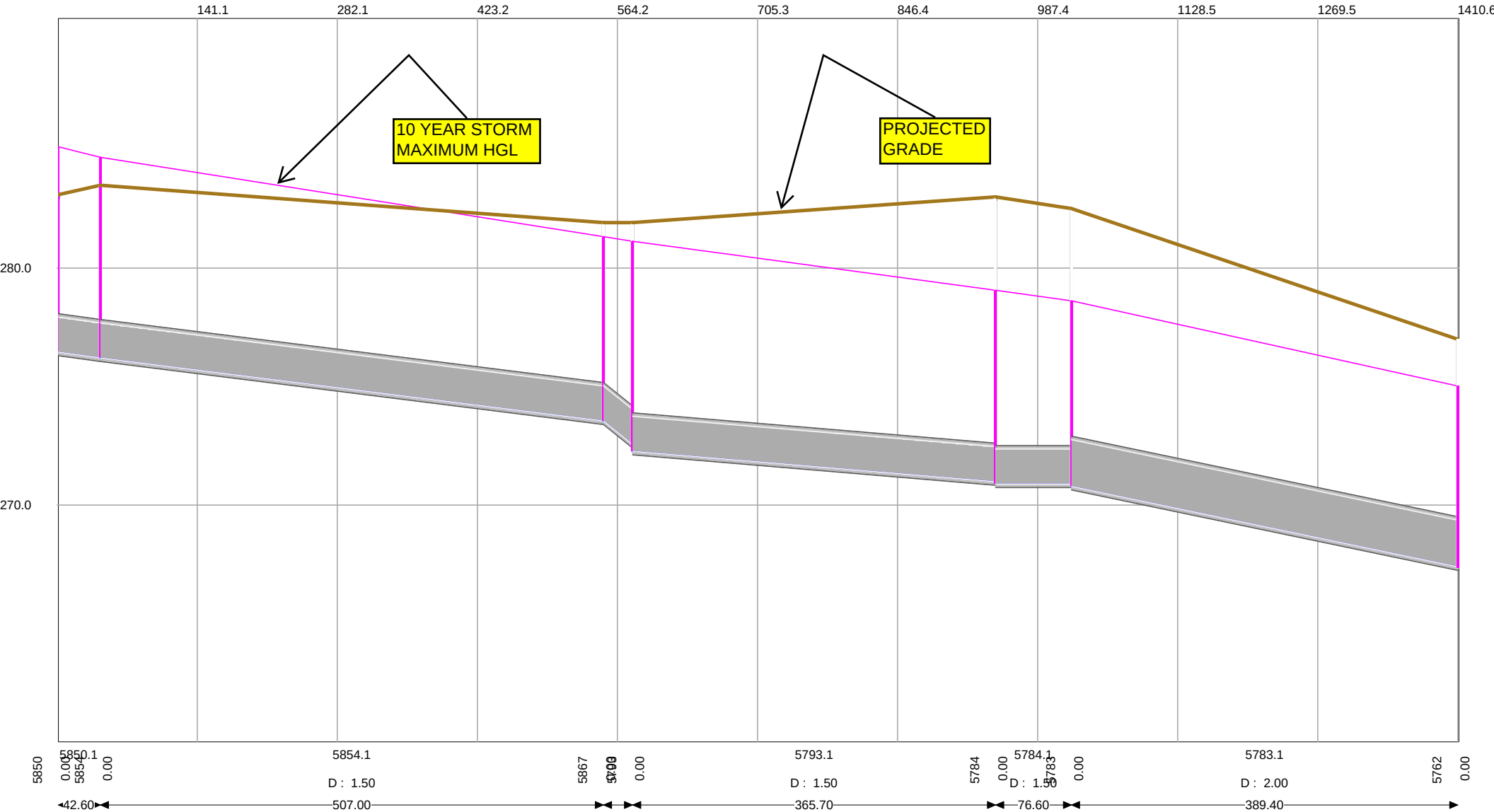
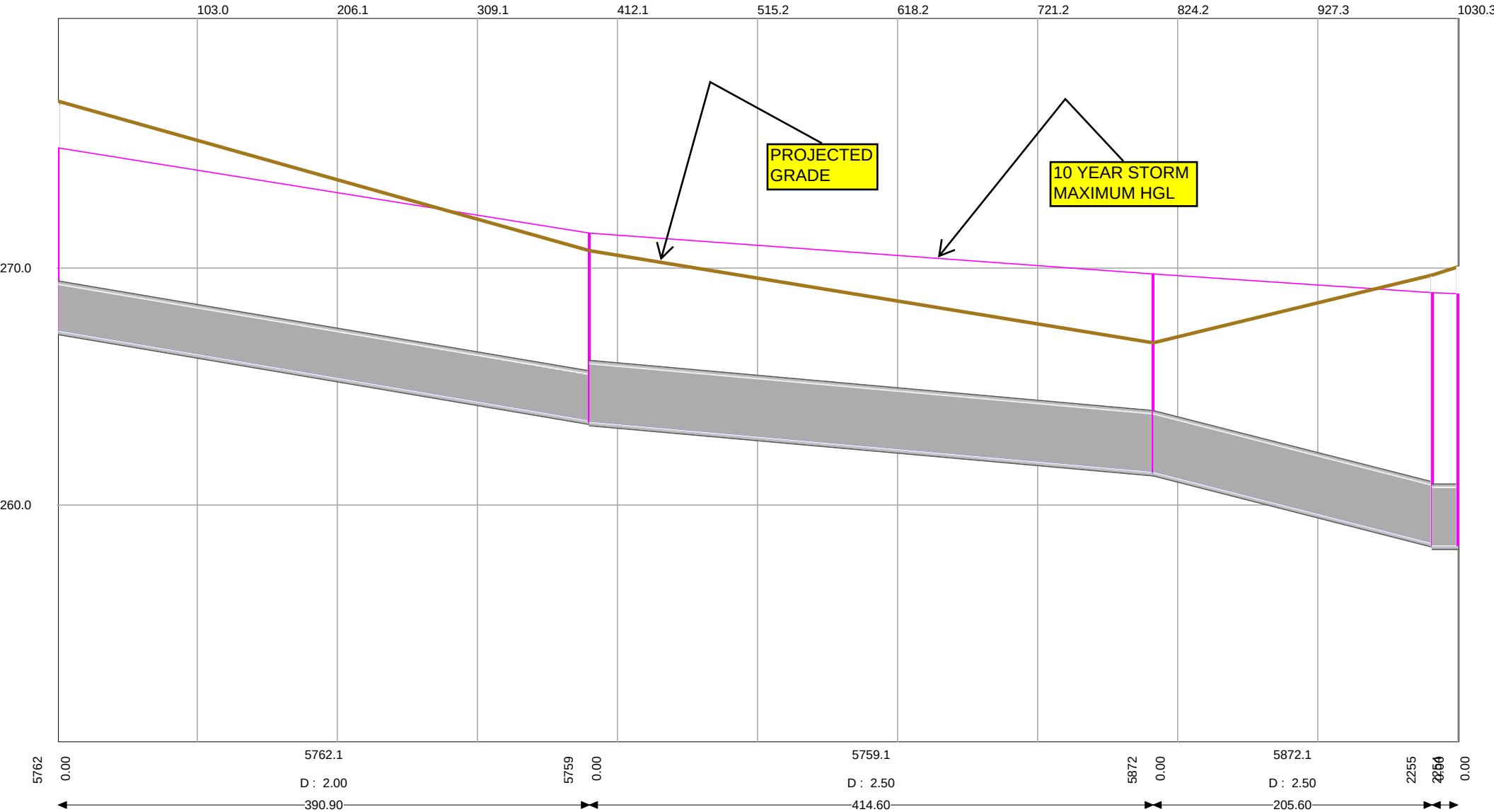


WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - NODES 5762-2254
Day [0] Time 00:01:00 Step 1



ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5211.1	2 yr 24 hr	5211	278.72	276.12	277.42	277.44	1.3	2	88.3	0.6	5209	278.29	275.59	276.89	277.44		12.1	12.05	5.16	0.54	1.56
5210.1	2 yr 24 hr	5210	278.24	275.54	276.84	277.44	1.3	2	32.5	-0.46	5209	278.29	275.69	276.99	277.44		12.13	12.05	4.52	1.57	1.34
5209.1	2 yr 24 hr	5209	278.29	275.59	276.89	277.44	1.3	2	27.3	1.5	5208	278.53	275.18	276.48	277.42		12.25	12.02	8.16	4.34	3.5
5208.1	2 yr 24 hr	5208	278.53	275.13	276.43	277.42	1.3	2	15.9	2.7	5207	279.2	274.7	276	277.41		12.25	11.88	10.95	4.57	2.71
5205.1	2 yr 24 hr	5205	278.78	275.58	276.88	277.41	1.3	2	27.2	2.39	5206	278.53	274.93	276.23	277.41		11.98	1.32	10.3	0.98	3.35
5206.1	2 yr 24 hr	5206	278.53	274.88	276.18	277.41	1.3	2	12.3	0.65	5207	279.2	274.8	276.1	277.41		12.23	11.73	5.37	3.46	1.63
5207.1	2 yr 24 hr	5207	279.2	274.7	276	277.41	1.3	2	366.1	0.17	5200	281.09	274.09	275.39	276.76		12.25	12.25	2.72	8.03	3.01
5200.1	2 yr 24 hr	5200	281.09	274.29	275.79	276.76	1.5	2	239.4	0.18	5189	280.15	273.85	275.35	276.57		12.23	12.15	4.18	7.82	2.8
5189.1	2 yr 24 hr	5189	280.15	273.65	275.15	276.57	1.5	2	73.7	0.03	5188	280.33	273.63	275.13	276.52		12.22	12.15	1.61	7.42	2.45
5188.1	2 yr 24 hr	5188	280.33	273.63	275.13	276.52	1.5	2	328.2	0.19	5185	280.52	273.02	274.52	276.32		12.22	12.12	4.21	6.98	2.56
5185.1	2 yr 24 hr	5185	280.52	272.97	274.47	276.32	1.5	2	46.5	0.28	5177	280.44	272.84	274.34	276.29		12.2	12.1	5.16	6.26	2.25
5177.1	2 yr 24 hr	5177	280.44	272.79	274.29	276.29	1.5	2	337.1	0.26	5870	276.68	271.9	273.4	273.36	asmd dn	12.47	12.47	5.01	18.43	5.18
5870.1	2 yr 24 hr	5870	276.68	271.9	273.4	273.36	1.5	2	43.7	0.18	5157	275.97	271.82	273.32	272.99	asmd up	12.48	12.48	4.17	18.43	5.35
5219.1	2 yr 24 hr	5219	281.87	275.47	276.77	276.23	1.3	2	636.2	0.89	5871	276.23	269.78	271.08	270.83	asmd dn	12.38	12.38	6.3	8.14	4.84
5871.1	2 yr 24 hr	5871	276.23	269.78	271.08	270.83	1.3	2	33.9	0.92	5157	275.97	269.47	270.77	270.7	asmd up	12.42	12.43	6.37	8.17	3.52
5168.1	2 yr 24 hr	5168	279.57	273.07	274.57	273.51	1.5	2	630.2	0.56	5869	275.85	269.57	271.07	270.7	asmd dn	12.23	12.2	7.27	2.76	2.67
5869.1	2 yr 24 hr	5869	275.85	269.57	271.07	270.7	1.5	2	20.3	0.49	5157	275.97	269.47	270.97	270.7	asmd up	12.27	12.23	6.85	2.41	0.92
5157.1	2 yr 24 hr	5157	275.97	269.57	271.57	270.7	2	2	46.4	2.18	5164	275.16	268.56	270.56	269.69		12.38	12.4	30.99	38.02	10.36
5164.1	2 yr 24 hr	5164	275.16	267.96	270.46	269.47	2.5	2	88.8	0.52	5145	273	267.5	270	268.98		12.38	12.4	27.41	38.01	6.15
5145.1	2 yr 24 hr	5145	273	267.3	269.8	268.45	2.5	2	58.3	4.09	5144	271.32	264.92	267.42	267.91		12.37	12.27	76.95	38.08	10.85
5144.1	2 yr 24 hr	5144	271.32	264.82	267.32	267.91	2.5	2	221.5	0.45	5130	268.43	263.83	266.33	267.45		12.37	12.22	25.46	38.73	4.8
5130.1	2 yr 24 hr	5130	268.43	263.73	266.23	267.45	2.5	2	56.6	0.18	5128	266.93	263.63	266.13	267.34		12.37	12.37	16.01	38.72	3.93
5128.1	2 yr 24 hr	5128	266.93	263.58	266.08	267.34	2.5	2	395.6	0.38	5073	268.66	262.06	264.56	265.46		12.58	12.58	23.61	53.26	5.41
5073.1	2 yr 24 hr	5073	268.66	261.96	264.46	265.46	2.5	2	335.2	0.34	5054	272.51	260.81	263.31	263.51		12.5	12.52	22.31	58.47	5.92
5054.1	2 yr 24 hr	5054	272.51	260.71	263.21	263.51	2.5	2	337.1	0.44	5883	269.43	259.23	261.73	261.7	asmd dn	12.52	12.7	25.24	58.58	6.05
5077.1	2 yr 24 hr	5077	268.54	264.29	266.79	264.98	2.5	2	229.1	1.1	5889	268.03	261.76	264.26	262.53	asmd dn	12.42	12.42	40.02	13.38	5.95
5889.1	2 yr 24 hr	5889	268.03	261.76	264.26	262.53	2.5	2	200.8	1.16	5013	268.93	259.43	261.93	261.7	asmd up	12.43	12.25	41.03	13.35	4.3
5013.1	2 yr 24 hr	5013	268.93	259.23	261.73	261.7	2.5	2	3.6	0	5883	269.43	259.23	261.73	261.7	asmd dn	12.45	12.45	1.2	13.35	1.36
5883.1	2 yr 24 hr	5883	269.43	259.23	262.23	261.7	3	2	42.1	0.55	5882	270.86	259	262	261.56	asmd dn&up	12.48	12.7	45.78	71.76	6.08
5882.1	2 yr 24 hr	5882	270.86	259	262	261.56	3	2	63	0.36	5026	271.87	258.77	261.77	261.37	asmd up	12.48	12.7	37.42	71.8	5.9
5026.1	2 yr 24 hr	5026	271.87	258.67	261.67	261.37	3	2	60.6	0.96	5027	272.09	258.09	261.09	261.17		12.48	12.7	60.59	71.84	5.55
5027.1	2 yr 24 hr	5027	272.09	257.99	260.99	261.17	3	2	53	0.09	5040	272.74	257.94	260.94	260.98		12.43	12.43	19.02	76.96	5.3
5040.1	2 yr 24 hr	5040	272.74	257.94	260.94	260.98	3	2	105.7	0.09	5875	274.38	257.84	260.84	260.58	asmd dn	12.43	12.43	19.05	76.96	5.44
5875.1	2 yr 24 hr	5875	274.38	257.84	260.84	260.58	3	2	166.3	0.04	5874	271.57	257.78	260.78	259.95	asmd dn&up	12.43	12.45	11.76	76.95	5.8
5874.1	2 yr 24 hr	5874	271.57	257.78	260.78	259.95	3	2	212.3	0.37	2156	267.08	257	260	258.38	asmd dn	12.45	12.45	37.54	76.97	7.33
2156.1	2 yr 24 hr	2156	267.08	257	260	258.38	3	2	23.4	1.15	2155	266.93	256.73	259.73	257.64	asmd up	12.45	12.47	66.53	76.97	12.72
2155.1	2 yr 24 hr	2155	266.93	256.73	260.73	257.64	4	2	56.8	7.94	1247	266.32	252.22	256.22	253.12		12.42	12.42	375.85	84.48	19.75
10409.1	2 yr 24 hr	10409	267	253.88	256.88	255.25	3	1	59.2	0.3	2167	267.24	253.7	256.7	254.82	asmd dn&up	12.98	12.98	34.15	20.02	6.54
2167.1	2 yr 24 hr	2167	267.24	253.7	256.7	254.82	3	1	123	1.2	1247	266.32	252.22	255.22	253.34	asmd up	12.98	13	67.94	20.02	8.36
1247.1	2 yr 24 hr	1247	266.32	240.22	244.72	242.2	4.5	1	196.8	1.63	1245	251.71	237.01	241.51	238.99		12.48	12.48	233.21	93.63	13.86
1245.1	2 yr 24 hr	1245	251.71	236.71	241.21	238.6	4.5	1	190.1	1.97	1234	239.26	232.96	237.46	235.04		12.48	12.5	256.47	93.63	14.58
1234.1	2 yr 24 hr	1234	239.26	232.91	237.41	235.04	4.5	1	62.9	1.48	1231	238.58	231.98	236.48	234.25		12.48	12.5	222.04	93.63	12.54
1231.1	2 yr 24 hr	1231	238.58	231.98	236.48	234.25	4.5	1	80	1.04	1225	238.15	231.15	235.65	233.44		12.48	12.5	186	93.63	11.61
1225.1	2 yr 24 hr	1225	238.15	231.15	235.65	233.44	4.5	1	32.4	0.99	1226	237.43	230.83	235.33	233.12		12.48	12.5	181.47	93.63	11.5
5850.1	2 yr 24 hr	5850	283.08	276.43	277.93	280.48	1.5	2	42.6	0.54	5854	283.48	276.2	277.7	280.13	asmd dn	12.68	12.68	7.17	17.79	4.98
5854.1	2 yr 24 hr	5854	283.48	276.2	277.7	280.13	1.5	2	507	0.52	5867	281.93	273.55	275.05	275.99	asmd dn&up	12.68	12.68	7.05	17.79	4.98
5867.1	2 yr 24 hr	5867	281.93	273.55	275.05	275.99	1.5	2	29.3	3.28	5793	281.89	272.59	274.09	275.75	asmd up	12.68	12.38	17.66	17.79	7.94
5793.1	2 yr 24 hr	5793	281.89	272.29	273.79	275.75	1.5	2	365.7	0.36	5784	282.98	270.98	272.48	272.77		12.7	12.68	5.84	17.79	4.98
5784.1	2 yr 24 hr	5784	282.98	270.88	272.38	272.77	1.5	2	76.6	-0.03	5783	282.5	270.9	272.4	272.14		12.7	12.7	1.58	17.79	5.09
5783.1	2 yr 24 hr	5783	282.5	270.8	272.8	272.14	2	2	389.4	0.87	5762	277.01	267.41	269.41	268.75		12.68	12.68	19.6	30.98	6.92
5762.1	2 yr 24 hr	5762	277.01	267.36	269.36	268.65	2	2	390.9	0.98	5759	270.74	263.54	265.54	264.98		12.68	12.7	20.77	30.99	7.14

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
5759.1	2 yr 24 hr	5759	270.74	263.49	265.99	264.98	2.5	2	414.6	0.5	5872	266.83	261.4	263.9	262.8	asmd dn	12.65	12.67	27.04	35.5	5.87
5872.1	2 yr 24 hr	5872	266.83	261.4	263.9	262.8	2.5	2	205.6	1.46	2255	269.7	258.4	260.9	261.73	asmd up	12.7	12.4	46.01	35.59	7.4
2255.1	2 yr 24 hr	2255	269.7	258.3	260.8	261.73	2.5	2	19.2	0.16	2254	270.05	258.27	260.77	261.69	asmd dn	12.72	13.08	15.06	35.77	3.9
2254.1	2 yr 24 hr	2254	270.05	258.27	260.77	261.69	2.5	2	320.6	0.23	2256	269.73	257.53	260.03	261	asmd up	12.72	13.08	18.3	35.79	3.99
2256.1	2 yr 24 hr	2256	269.73	257.43	259.93	261	2.5	2	237.5	0.22	2257	269.62	256.9	259.4	260.49	asmd dn	12.72	13.12	17.99	35.82	3.74
2257.1	2 yr 24 hr	2257	269.62	256.9	259.4	260.49	2.5	2	106.2	0.28	2239	269.95	256.6	259.1	260.26	asmd dn&up	12.72	12.72	20.24	35.84	3.64
2239.1	2 yr 24 hr	2239	269.95	256.6	259.1	260.26	2.5	2	101.3	0.3	5920	270.06	256.3	258.8	260.05	asmd dn&up	12.72	12.72	20.73	35.86	3.64
5920.1	2 yr 24 hr	5920	270.06	256.3	258.8	260.05	2.5	2	124.6	0.24	2262	270.14	256	258.5	259.42	asmd dn&up	12.65	12.65	18.69	54.64	5.55
2262.1	2 yr 24 hr	2262	270.14	256	258.5	259.42	2.5	2	148.5	0.13	2261	270.13	255.8	258.3	258.66	asmd dn&up	12.65	12.65	13.98	54.64	5.53
2261.1	2 yr 24 hr	2261	270.13	255.8	258.3	258.66	2.5	2	337	0.18	2360	268.99	255.19	257.69	256.97	asmd up	12.65	12.65	16.2	54.6	5.45
2360.1	2 yr 24 hr	2360	268.99	255.09	258.09	256.01	3	2	63	4.73	2259	268.33	252.11	255.11	253.73	asmd dn&up	12.65	12.67	134.7	54.6	13.42
2259.1	2 yr 24 hr	2259	268.33	252.11	256.61	253.73	4.5	2	159.4	0.45	1252	264.05	251.4	255.9	253.25		12.58	12.6	121.87	57.19	5.44
1252.1	2 yr 24 hr	1252	264.05	251.4	255.9	253.25	4.5	1	168.5	0.78	1288	258.48	250.08	254.58	251.93		12.6	12.6	161.62	57.22	9.29
1288.1	2 yr 24 hr	1288	258.48	250.03	254.53	251.33	4.5	1	47.8	3.2	1903	257.79	248.5	253	250	asmd dn	12.6	12.68	326.69	57.22	14.77
1903.1	2 yr 24 hr	1903	257.79	248.5	253	250	4.5	1	150.5	2.92	1240	254	244.1	248.6	245.51		12.57	12.55	312.22	72.39	15.76
2136.1	2 yr 24 hr	2136	264.27	259.6	261.1	260.57	1.5	1	15.6	0.7	1953	264.69	259.49	260.99	260.46	asmd up	12.48	12.5	8.19	6.27	5.18
1953.1	2 yr 24 hr	1953	264.69	258.99	260.99	259.6	2	1	269.9	2.22	1285	257.4	253	255	253.61		12.5	12.5	31.29	6.26	7.77
1285.1	2 yr 24 hr	1285	257.4	252.4	254.9	253.08	2.5	1	14.1	1.56	1906	258.12	252.18	254.68	252.95	asmd dn	12.5	12.65	47.58	6.27	5.86
1906.1	2 yr 24 hr	1906	258.12	252.18	254.68	252.95	2.5	1	23.3	1.63	1907	257.56	251.8	254.3	252.83	asmd dn&up	12.5	12.7	48.64	6.27	5.04
1907.1	2 yr 24 hr	1907	257.56	251.8	254.3	252.83	2.5	1	151.1	1.59	1240	254	249.4	251.9	250.43	asmd up	12.43	12.45	48	16.95	8.93
1240.1	2 yr 24 hr	1240	254	244.1	247.6	245.51	3.5	2	40.4	2.72	1222	255.15	243	246.5	244.8	asmd dn	12.45	12.53	154.16	89.58	11.85
1222.1	2 yr 24 hr	1222	255.15	243	248	244.8	5	1	197.9	1.79	1223	246.86	239.46	244.46	241.26		12.52	12.47	323.45	89.6	14.1
1223.1	2 yr 24 hr	1223	246.86	237.46	242.46	238.93	5	1	119.1	3.85	1224	241.08	232.88	237.88	234.64		12.52	12.52	474.25	89.6	18.05
1224.1	2 yr 24 hr	1224	241.08	232.78	237.78	234.64	5	1	43.1	1.55	1909	241.08	232.11	237.11	233.94	asmd dn	12.52	12.47	301.53	89.61	13.52
1909.1	2 yr 24 hr	1909	241.08	232.11	237.11	233.94	5	1	40.4	1.68	1226	237.43	231.43	236.43	233.26		12.47	12.47	313.76	89.62	13.79
1226.1	2 yr 24 hr	1226	237.43	226.53	233.53	229.54	7	1	178.8	0.68	1559	234.52	225.32	232.32	228.31		12.47	12.47	487.99	188.17	11.9
1559.1	2 yr 24 hr	1559	234.52	225.32	232.32	228.31	7	1	180.4	0.51	1215	232.4	224.4	231.4	226.42	asmd dn	12.47	12.48	423.62	188.22	12.51
10412.1	2 yr 24 hr	1215	232.4	224.4	229.4	226.42	5	1	400.2	1.69	10410	228	217.62	222.62	220.91	asmd dn	12.47	12.48	314.78	108.22	13.42
10410.1	2 yr 24 hr	10410	228	217.62	222.62	220.91	5	1	190.4	0.31	1188	222.83	217.03	222.03	219.91	asmd up	12.47	12.57	134.62	126.19	9.4
1188.1	2 yr 24 hr	1188	222.83	217.03	222.03	219.91	5	1	44	2.46	1547	223.8	215.95	220.95	219.63	asmd dn	12.47	12.77	378.89	126.28	10.89
1547.1	2 yr 24 hr	1547	223.8	215.95	220.95	219.63	5	1	8.6	2.43	1615	223.84	215.74	220.74	219.59	asmd up	12.43	12.45	377.91	145.6	9.35
1615.1	2 yr 24 hr	1615	223.84	215.74	220.74	219.59	5	1	31.4	0.73	1189	223.76	215.51	220.51	219.47		12.43	12.43	206.98	145.6	8.95
1189.1	2 yr 24 hr	1189	223.76	215.51	220.51	219.47	5	1	132.8	0.09	1548	222.79	215.39	220.39	218.9		12.43	12.45	72.7	145.58	8.84
1548.1	2 yr 24 hr	1548	222.79	215.39	220.39	218.9	5	1	57.6	0.45	10428	221	215.13	220.13	218.6	asmd dn	12.43	12.45	162.48	145.5	9.89
10428.1	2 yr 24 hr	10428	221	215.13	220.13	218.6	5	1	23.7	0.46	1159	221.22	215.02	220.02	218.48	asmd up	12.43	12.45	164.76	145.45	10.01
1215.1	2 yr 24 hr	1215	232.4	224.4	229.4	226.42	5	1	32.4	0.62	1214	230.8	224.2	229.2	226.1	asmd up	12.52	12.6	190.01	80.33	11.04
1214.1	2 yr 24 hr	1214	230.8	224.2	229.2	226.1	5	1	369.7	1.63	1552	226	218.16	223.16	220.38		12.42	12.4	309.12	94.87	13.55
1552.1	2 yr 24 hr	1552	226	218.16	223.16	220.38	5	1	33.5	1.61	1184	224.42	217.62	222.62	220.07		12.43	12.43	307.04	94.94	11.16
1184.1	2 yr 24 hr	1184	224.42	217.62	222.62	220.07	5	1	90.5	0.74	10411	223	216.95	221.95	219.49	asmd dn	12.43	12.43	208.08	95.02	9.88
10411.1	2 yr 24 hr	10411	223	216.95	221.95	219.49	5	1	312.5	0.75	1163	220.92	214.62	219.62	217.77	asmd up	12.43	12.48	208.82	95.06	9.26
1163.1	2 yr 24 hr	1163	220.92	214.62	219.62	217.77	5	1	40.4	-0.2	10413	221	214.7	219.7	217.64	asmd dn	12.45	12.48	107.62	94.92	7.39
10413.1	2 yr 24 hr	10413	221	214.7	219.7	217.64	5	1	12.8	-0.16	1159	221.22	214.72	219.72	217.59	asmd up	12.4	12.4	95.6	101.37	8.47
1159.1	2 yr 24 hr	1159	221.22	211.72	219.72	214.95	8	1	142.3	0.63	1153	220.02	210.82	218.82	213.82		12.45	12.45	673.54	246.24	13.13
1153.1	2 yr 24 hr	1153	220.02	210.82	218.82	213.82	8	1	102.5	0.85	1489	220.09	209.95	217.95	212.77	asmd dn	12.45	12.45	780.27	246.79	14.47
1489.1	2 yr 24 hr	1489	220.09	209.95	217.95	212.77	8	1	15.3	0.79	1130	219.63	209.83	217.83	212.58	asmd up	12.45	12.5	750.05	246.99	15.74
1130.1	2 yr 24 hr	1130	219.63	209.83	217.83	212.58	8	1	130	1.66	1129	218.57	207.67	215.67	210.65		12.4	12.42	1091.7	266.07	17.21
1129.1	2 yr 24 hr	1129	218.57	207.67	215.67	210.65	8	1	57	1.23	1488	218.71	206.97	214.97	210.01		12.42	12.42	938.55	265.91	15.56
1488.1	2 yr 24 hr	1488	218.71	206.97	214.97	210.01	8	1	76.4	1.2	1486	216.55	206.05	214.05	209.22		12.42	12.42	929.38	266.1	15.11
1486.1	2 yr 24 hr	1486	216.55	206.05	214.05	209.22	8	1	121.7	0.77	1092	217.21	205.11	213.11	207.98		12.42	12.42	744.33	266.47	14.56
1092.1	2 yr 24 hr	1092	217.21	205.11	213.11	207.98	8	1	102.4	1.49	1084	217.68	203.58	211.58	206.69		12.42	12.47	1035.24	266.84	16.3
1084.1	2 yr 24 hr	1084	217.68	203.58	211.58	206.69	8	1	165.6	1.07	1064	215.51	201.81	209.81	204.96		12.38	12.38	875.6	277.63	15.35

All Pipes are Circular and have a Roughness of 0.014.

ROSEWOOD-SHANDON STORM DRAINAGE EVALUATION WEST BRANCH WITH PARALLEL PIPES NORTH OF ROSEWOOD - TWO YEAR STORM

Pipe Name	Storm	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Existing Dia (ft)	No of Barrels	Length (ft)	Conduit Slope%	Node	Ground Elev	Invert Elev	Crown Elev	Max Water Elev	Notes	Time/peak Flow (hr)	Time/peak Vel (hr)	Design Full Flow (cfs)	Max Flow (cfs)	Max Velo f/s
1064.1	2 yr 24 hr	1064	215.51	201.81	209.81	204.96	8	1	135.7	1.01	1059	214.79	200.44	208.44	203.58		12.38	12.38	850.98	277.88	15.17
1059.1	2 yr 24 hr	1059	214.79	200.44	208.44	203.58	8	1	136.7	1.1	1054	213.67	198.94	206.94	202.2		12.38	12.4	887.17	278.17	15.15
1054.1	2 yr 24 hr	1054	213.67	198.94	206.94	202.2	8	1	135.4	0.91	1052	211.02	197.71	205.71	201		12.38	12.43	807.22	278.26	14.49
1052.1	2 yr 24 hr	1052	211.02	197.71	205.71	201	8	1	138.3	0.88	1051	208.61	196.49	204.49	199.74		12.38	12.4	795.46	283.76	14.63
1051.1	2 yr 24 hr	1051	208.61	196.49	204.49	199.74	8	1	137.2	1.28	1046	207.39	194.74	202.74	198.52		12.38	12.4	956.51	283.64	14.54
1046.1	2 yr 24 hr	1046	207.39	194.74	202.74	198.52	8	1	137.5	0	1040	207.34	194.74	202.74	197.45		12.4	12.4	26.78	284.01	12.63
1040.1	2 yr 24 hr	1040	207.34	194.74	202.74	197.45	8	1	139.1	2.15	1031	204.4	191.75	199.75	195.11		12.4	12.45	1241.71	284.26	18.42
1031.1	2 yr 24 hr	1031	204.4	191.75	199.75	195.11	8	1	132.7	0.97	1026	202.35	190.46	198.46	193.98		12.4	12.45	835.04	288.96	14.43
1026.1	2 yr 24 hr	1026	202.35	190.46	198.46	193.98	8	1	145.6	0.58	1021	200.49	189.62	197.62	192.75		12.37	12.42	643.29	289.42	13.86
1021.1	2 yr 24 hr	1021	200.49	189.62	197.62	192.75	8	1	346.9	1.15	1009	197.32	185.62	193.62	191.44		12.4	12.42	909.44	289.26	15.96
1009.1	2 yr 24 hr	1009	197.32	185.62	193.62	191.44	8	1	70.3	1.55	10436	195	184.53	192.53	193.13		12.38	12.47	1054.59	290	15.26
10436.1	2 yr 24 hr	10436	195	184.53	192.53	193.13	8	1	6.7	1.63	1006	195.82	184.42	192.42	194.95		12.38	12.47	1085.19	290.56	13.25
1006.1	2 yr 24 hr	1006	195.82	184.42	192.42	194.96	8	1	139.4	0.38	1005	193.79	183.89	191.89	191.3		12.38	12.47	522.22	314.79	14.49
1005.2	2 yr 24 hr	1005	193.79	183.89	191.89	191.3	8	1	121	1.97	10430	191.5	181.5	189.5	192.1	asmd dn	12.38	12.42	1190.29	315.71	19.89
10430.1	2 yr 24 hr	10430	191.5	181.5	189.5	192.11	8	1	24.2	1.86	10453	191.05	181.05	189.05	193.86	asmd dn&up	0.03	0.03	1154.9	2130.31	42.34
10453.1	2 yr 24 hr	10453	191.05	181.05	190.05	193.86	9	1	54.8	1.92	10431	190	180	189	221.29	asmd dn&up	0.03	0.03	1604.94	1587.12	28.65
10431.1	2 yr 24 hr	10431	190	180	189	221.29	9	1	66.2	1.96	1001	188.7	178.7	187.7	191.2	asmd up	12.38	0.03	1624.79	315.55	20.27
1001.1	2 yr 24 hr	1001	188.7	178.7	186.7	191.2	8	1	354	0.79	10440	183.89	175.89	183.89	183.89	Ditch	0.03	0.03	754.57	700.76	24.09

All Pipes are Circular and have a Roughness of 0.014.

COX AND DINKINS
ENGINEERS · SURVEYORS

SECTION 4F

WEST BRANCH
NORTH OF ROSEWOOD
CONCEPTUAL IMPROVEMENTS

West Branch Watershed (North of Rosewood Drive Conceptual Improvements)

Unlike the **east branch watershed**, the **west branch watershed** does not have a single, central "backbone" drainage collection/conveyance system. In the **west branch watershed** north of Rosewood Drive there are two primary drainage collection/conveyance systems. The first primary system is the drainage collection/conveyance system associated with Maple Street, from the Wilmot Avenue intersection south to Burney Drive, then east along Burney Drive to Sloan Street where it turns southeasterly through the block and extends to Rosewood Drive, east of the S. Holly Street intersection. The second primary system is the drainage collection/conveyance system associated with Woodrow Street, from the Monroe Street intersection south to Rosewood Drive, then east along the north side of Rosewood Drive to the west side of the S. Holly Street intersection. These two primary systems converge along Hope Avenue, south of Rosewood Drive and east of S. Holly Street.

In the absence of a complete design for the direct remedies for the primary drainage collection/conveyance systems in the **west branch watershed** it is difficult to project anticipated costs. But the following is a general outline of the scopes of work anticipated in conjunction with the direct remedies and the parallel installation.

- Parallel installation of new drainage collection/conveyance system associated with Maple Street, from the Wilmot Avenue intersection south to Burney Drive, then east along Burney Drive to Sloan Street and then to Rosewood Drive east of the S. Holly Street intersection via an alternate route to be determined by final design (approximately 4,450 feet)
- Parallel installation of new drainage collection/conveyance system associated with Woodrow Street, from the Monroe Street intersection south to Rosewood Drive, then east along the north side of Rosewood Drive to the west side of the S. Maple Street intersection (approximately 3,000 feet)
- Installation of replacement water mains and appurtenances along the route of the parallel installation of new drainage collection/conveyance system
- Installation of replacement sanitary sewer mains and appurtenances along the route of the parallel installation of new drainage collection/conveyance system
- Repairs associated with natural gas mains and services, telephone lines and services and CATV lines and services along the route of the parallel installation of new drainage collection/conveyance system
- Landscape repairs in construction areas

For the purposes of budgeting the contemplated remedies described previously have been expanded to include further detailed descriptions of work, including anticipated/projected costs, with the end result being an approximate cost per foot. These detailed descriptions are open for further discussion and comparison to comparable City of Columbia project costs. Those discussions and comparisons may result in significant modifications to the approximated costs.

See the descriptions on the following pages for further information and basis for the budget costs.

Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
New 36” diameter RCP	$70 per foot	$70
Installation of New 36” diameter RCP; includes haul off of excavated material since flowable fill will be required by SCDOT; also includes steel traffic plates 100’ in advance of pavement patch	$50 per foot	$50
New drainage structures; estimate five (5) per 400’ of pipe or per City block	$6000 each	$75
Traffic Control	Allowance	$10
Estimate eight (6) foot wide trench with average depth of ten (10) feet for flowable fill quantity (minus pipe cross section based on OD)	$85 per cubic yard	$160
Saw cut of existing pavement and removal of pavement (saw cut along both sides of installation)	$10 per foot	$10
Assume SCDOT will require 8” full depth asphalt patch over eight (6) foot wide trench	$50 per square yard	$35
Assume SCDOT will require 1-1/2” asphalt overlay over patched streets	$15 per square yard	$45
Assume removal and replacement of curb and gutter along one side of street for every foot of pipe	$15 per foot	$15
Allowance for water service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	$25 per foot	$25
*Allowance for sanitary sewer service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	$25 per foot	$25
Allowance for landscape repairs (equates to $10,000.00 per City block using 400’ block)	$25 per foot	$25
Approximate cost per foot of parallel drainage corridor (primary drainage collection/conveyance systems associated with Maple Street and Woodrow Street)	**$545**	

Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
New 8” diameter water line	$15 per foot	$15
Installation of new 8” diameter water line; includes haul off of excavated material since flowable fill will be required by SCDOT; also includes steel traffic plates 100’ in advance of pavement patch	$15 per foot	$15
New fire hydrants, valves & fittings; per 400’ of pipe or per City block	$8000	$20
Traffic Control	Allowance	$5
Estimate four (4) foot wide trench with average depth of four (4) feet for flowable fill quantity	$85 per cubic yard	$50
Saw cut of existing pavement and removal of pavement (saw cut along both sides of installation)	$5 per foot	$5
Assume SCDOT will require 8” full depth asphalt patch over four (4) foot wide trench	$50 per square yard	$22
Assume SCDOT will require 1-1/2” asphalt overlay over patched streets	Covered by storm drainage install	$0
Assume removal and replacement of curb and gutter along one side of street for every foot of pipe	$15 per foot	$15
Allowance for water service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
*Allowance for sanitary sewer service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
Allowance for landscape repairs (equates to $4,000.00 per City block using 400’ block)	$10 per foot	$10
Approximate cost of water main installation per foot of parallel drainage corridor (primary drainage collection/conveyance systems associated with Maple Street and Woodrow Street). It is assumed that water main replacement will be required for approximately ½ of the parallel installation route.	**$157**	

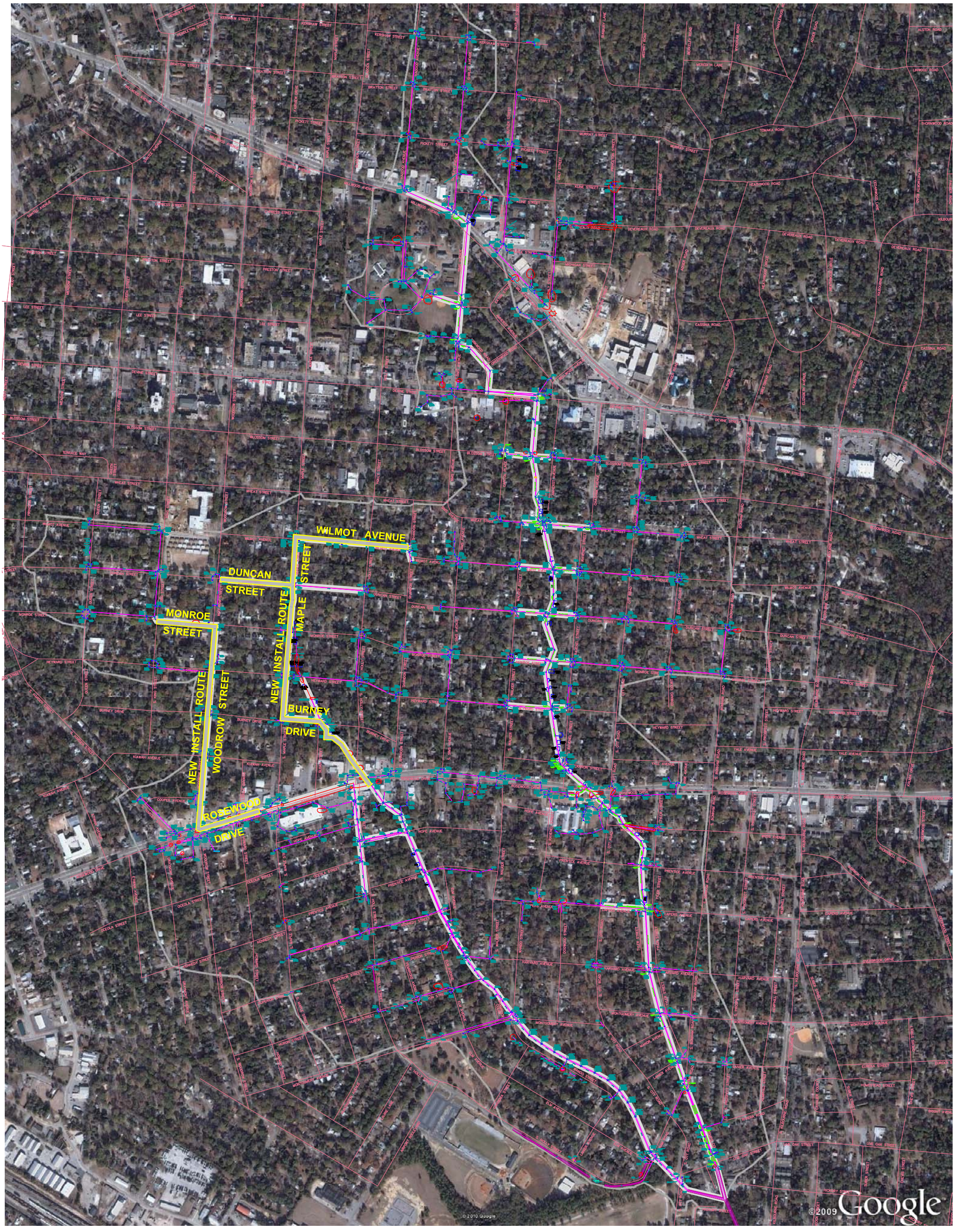
Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
New 8” diameter sanitary sewer line	$15 per foot	$15
Installation of new 8” diameter sanitary sewer line; includes haul off of excavated material since flowable fill will be required by SCDOT; also includes steel traffic plates 100’ in advance of pavement patch	$25 per foot	$25
New manholes; estimate three (3) per 400’ of pipe or per City block	$9000	$22
Traffic Control	Allowance	$5
Estimate six (6) foot wide trench with average depth of eight (8) feet for flowable fill quantity	$85 per cubic yard	$150
Saw cut of existing pavement and removal of pavement (saw cut along both sides of installation)	$5 per foot	$5
Assume SCDOT will require 8” full depth asphalt patch over six (6) foot wide trench	$50 per square yard	$33
Assume SCDOT will require 1-1/2” asphalt overlay over patched streets	Covered by storm drainage install	$0
Assume removal and replacement of curb and gutter along one side of street for every foot of pipe	Covered by water & storm drainage install	$0
Allowance for water service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
*Allowance for sanitary sewer service disconnects/reconnects (equates to $10,000.00 per City block using 400’ block)	Covered by storm drainage install	$0
Allowance for landscape repairs (equates to $4,000.00 per City block using 400’ block)	$10 per foot	$10
Approximate cost of water main installation per foot of parallel drainage corridor (primary drainage collection/conveyance systems associated with Maple Street and Woodrow Street). It is assumed that water main replacement will be required for approximately ½ of the parallel installation route.	**$265**	

Work Scope, Material Description	Unit Cost	Cost Per Foot of Parallel Corridor
Natural gas, electric, telephone and CATV service impacts	$500,000.00 Allowance	$75
Approximate cost of natural gas, electric, telephone and CATV service repairs and Rosewood Drive crossing per foot of parallel drainage corridor (primary drainage collection/conveyance systems associated with Maple Street and Woodrow Street)	**$75**	

Based on the work scopes, projected unit costs and allowances as described in the preceding outline, the anticipated/projected cost per foot for installation of the parallel drainage corridor is approximately $545 + ($157 x ½) + ($265 x ½) + $75 = $830 per foot. Using the 3,700 foot long projected route the anticipated/projected cost to install the parallel drainage for the primary collection/conveyance system associated with Maple Street (ending on Burney Drive at the Sloan Street intersection) is approximately $3.1 million. Additionally, applying that cost to the 3,000 foot long projected route the anticipated/projected cost to install the parallel drainage for the primary collection/conveyance system associated with Woodrow Street (ending at Node 2257 along Rosewood Drive) is approximately $2.5 million additional. Extending the Maple Street parallel route 750 feet as required to replace the through the block portion from Sloan Street Rosewood Drive is approximately $0.6 million additional. It is also recommended that an additional 10% be added to the anticipated/projected cost to pay for remedial work for auxiliary portions of the system not included in the primary systems associated with Maple Street and Woodrow Street. Including that additional 10% brings the anticipated/projected cost of remedies for the **west branch watershed** to approximately $6.8 million.

This is an Opinion of Probable Construction Costs (OPCC) only and this OPCC was developed without control of the costs or the price of labor, equipment or materials, or the ultimate bidder's (contractor's) methods of pricing. In addition, this OPCC was developed without the benefit of final construction documents. As a result of these considerations, proposals based on final design and received through the competitive bidding process may vary significantly from this OPCC.

Certain items are not included in this OPCC. Some of the items not included are: (1) the cost of permanent and/or construction easements; (2) cost of remedies for system issues north or south of Rosewood Drive for portions of the system that were not part of the active analysis; (3) cost of remedies for system issues downstream of Rosewood Drive, whether existing or caused by north of Rosewood Improvements; (4) cost of remedies in the event of negative impact on the open channel downstream of the piped outfall.



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GRAPHIC SCALE IN FEET
SCALE: 1"=300'

MAGNETIC

PROJECT:

SHANDON-ROSEWOOD WATERSHED

LOCATED IN THE CITY OF COLUMBIA
RICHLAND COUNTY, SOUTH CAROLINA

PROPOSED SOLUTIONS

ISSUE DATES / REVISIONS

No.	DATE	DESCRIPTION
1	.	.

SOUTH CAROLINA COX AND DINKINS, INC. No. C00294 CERTIFICATE OF AUTHORIZATION

CERTIFICATE OF AUTHORIZATION SEAL

MAY 2011

COX AND DINKINS
ENGINEERS - SURVEYORS

COX AND DINKINS, INC.
724 BELTLINE BLVD.
COLUMBIA, SC 29205
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PREPARED FOR:

CITY OF COLUMBIA
DEPARTMENT OF UTILITIES & ENGINEERING

1136 WASHINGTON STREET
P.O. BOX 147
COLUMBIA, SC 29217-0147
803-545-3400
Fax: 803-733-8674

G:\Proj\1458 Rosewood Shandon Drainage\DRAWINGS\SHANDON DRAINAGE BASIN-Presentation UPDATED 05-13-11.dwg, Plotted By: cgm, Plotted: May 26, 2011 - 11:28am

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SECTION 5

SUMMARY

Summary

The visible and accessible portions of the storm drainage collection system within the 750± acre Shandon-Rosewood watershed have been surveyed and mapped. The inventory of drainage structures (nodes) exceeds 1,200 and the inventory of pipes (links) also exceeds 1,200. The overall 750± acre watershed has been delineated and divided into two primary sub-watersheds, namely the **east branch watershed** (400± acres) and the **west branch watershed** (350± acres). Two independent **XPSWMM** models of the storm drainage collection systems have been established, one for the **east branch watershed** and one for the **west branch watershed**. All of the survey data has been entered into the **XPSWMM** model and seventy-three sub-watersheds have been delineated and incorporated into the model. The main collection systems have been activated in the model (approximately 120 nodes and links active in both the **east branch watershed** and the **west branch watershed**) and the performance of both storm drainage collection systems has been modeled independently using both the 2-year, 24-hour rainfall event (3.6" accumulated rainfall) and the 10-year, 24-hour rainfall event (5.3" accumulated rainfall). Certain underperforming portions of each system have been identified by these models, with underperformance occurring primarily north of Rosewood Drive. Where these independent collection systems discharge into open channels, tailwater conditions for the 10-year flood (from the FEMA Flood Insurance Study last revised September 29, 2010) have been incorporated into the models.

Certain recommendations have been made for conceptual improvements for each system, primarily north of Rosewood Drive and these concepts are the product of a number of modeling efforts. The concepts for improvements range from installation of parallel collection systems to in place remedies for certain portions of the existing drainage collection system, primarily north of Rosewood Drive and in both the **east branch watershed** and the **west branch watershed**. Modeling has also been performed in an effort to predict the impact of north of Rosewood Drive system improvement concepts on the in-place systems south of Rosewood Drive. Based on interpretation of these models, certain precautions have been made in an effort to minimize the potential for transfer of underperformance from north of Rosewood Drive to south of Rosewood Drive, especially in the **east branch watershed.** But it is also possible that improvements may be required south of Rosewood Drive.

For the purposes of budgeting the conceptual remedies have been expanded to include detailed descriptions of work, including anticipated/projected costs, with the end result being an approximated/projected cost nearing $12 million. This approximated/projected cost is better defined as an Opinion of Probable Construction Cost or OPCC. The OPCC was developed without the benefit of final construction documents and without control of the costs or the price of labor, equipment or materials, or the ultimate bidder's methods of pricing. As a result of these considerations, proposals based on final design and received through the competitive bidding process may vary significantly from this OPCC. The OPCC and it basis is open for further discussion and comparison to comparable City of Columbia project costs. Those discussions and comparisons may also result in significant modifications to the OPCC.

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APPENDIX

Accumulated Rainfall Depths from TR-55 & SCDHEC

Figure B-3 Two-year, 24-hr rainfall

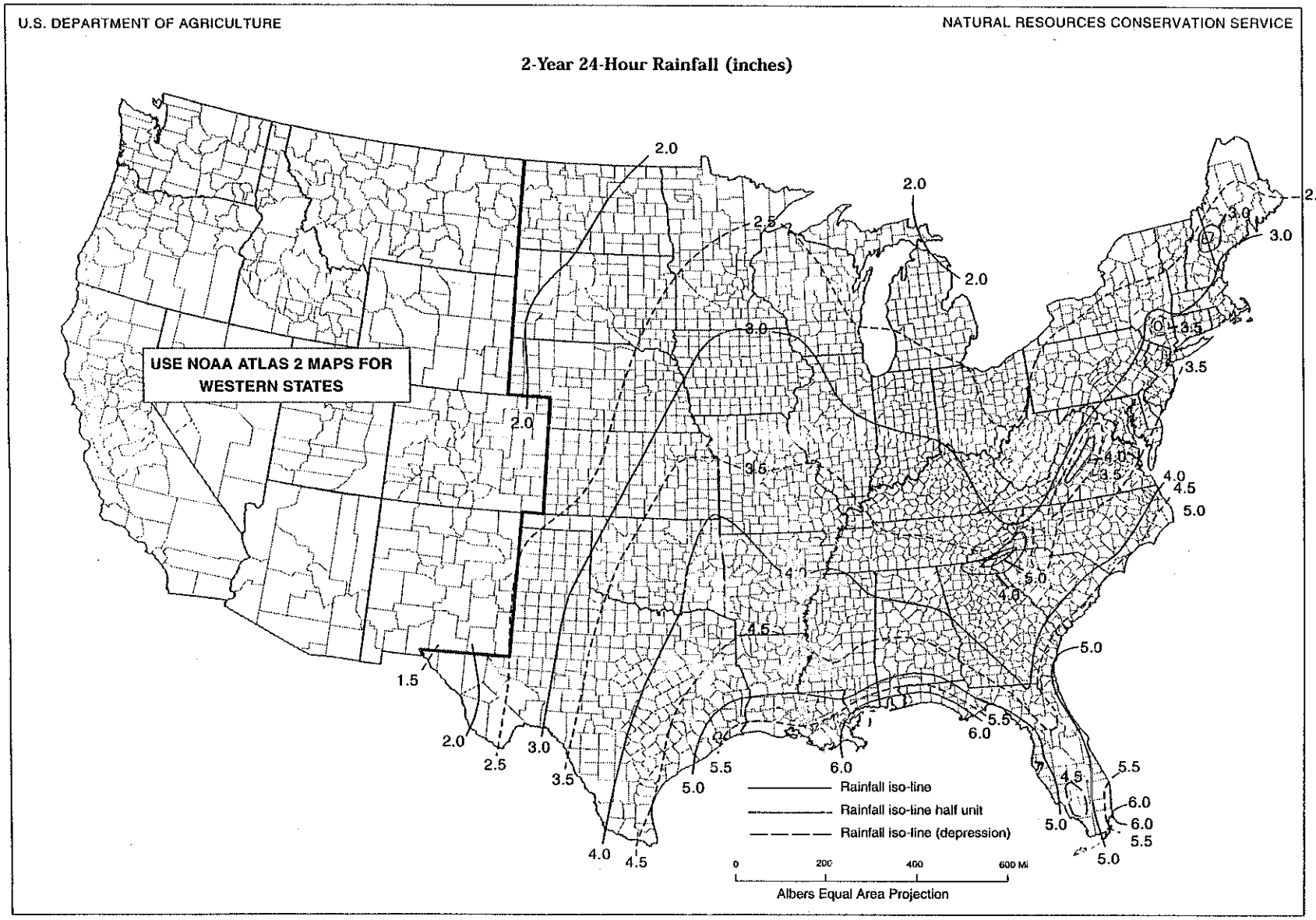


Figure B-5 Ten-year, 24-hr rainfall

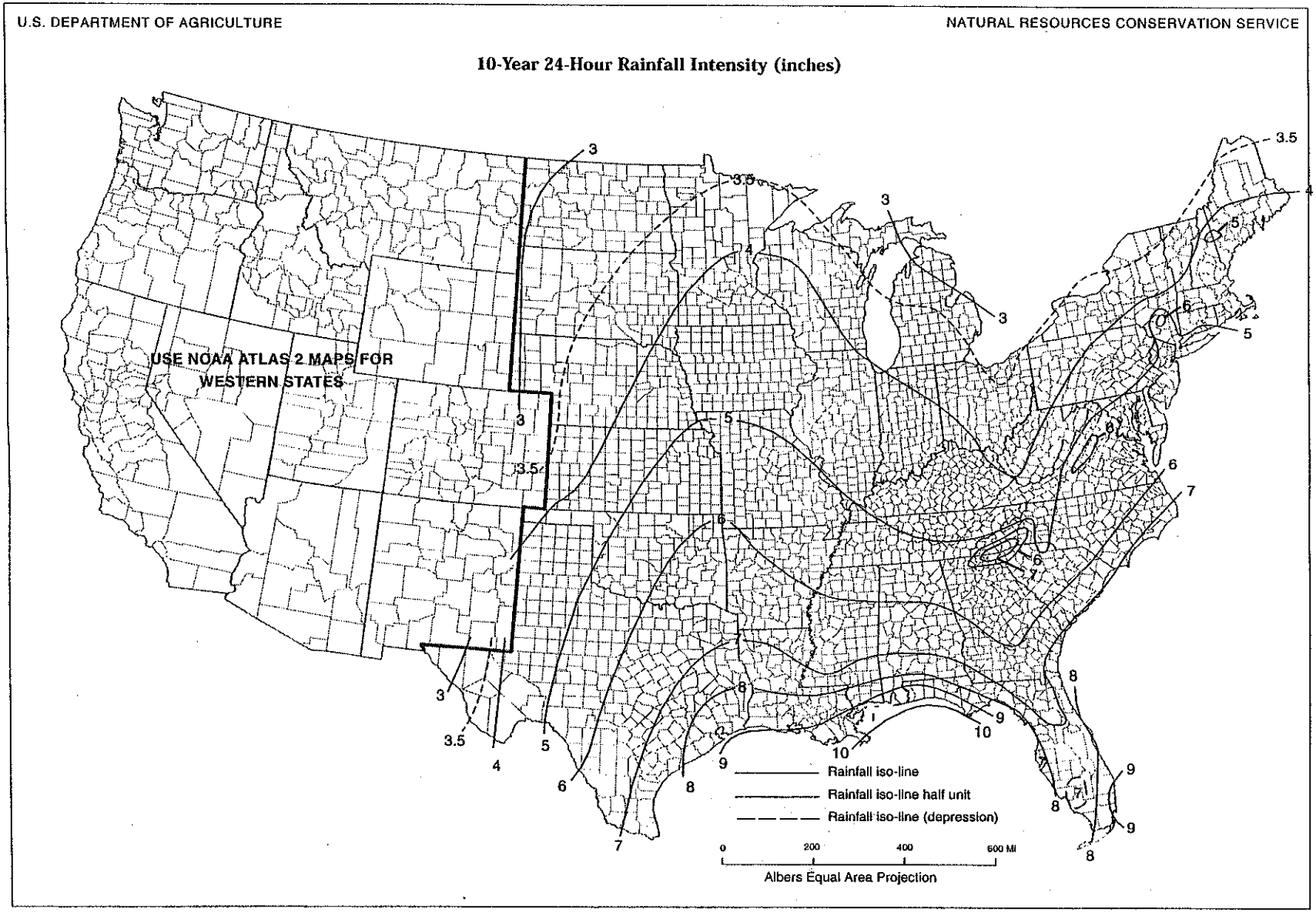
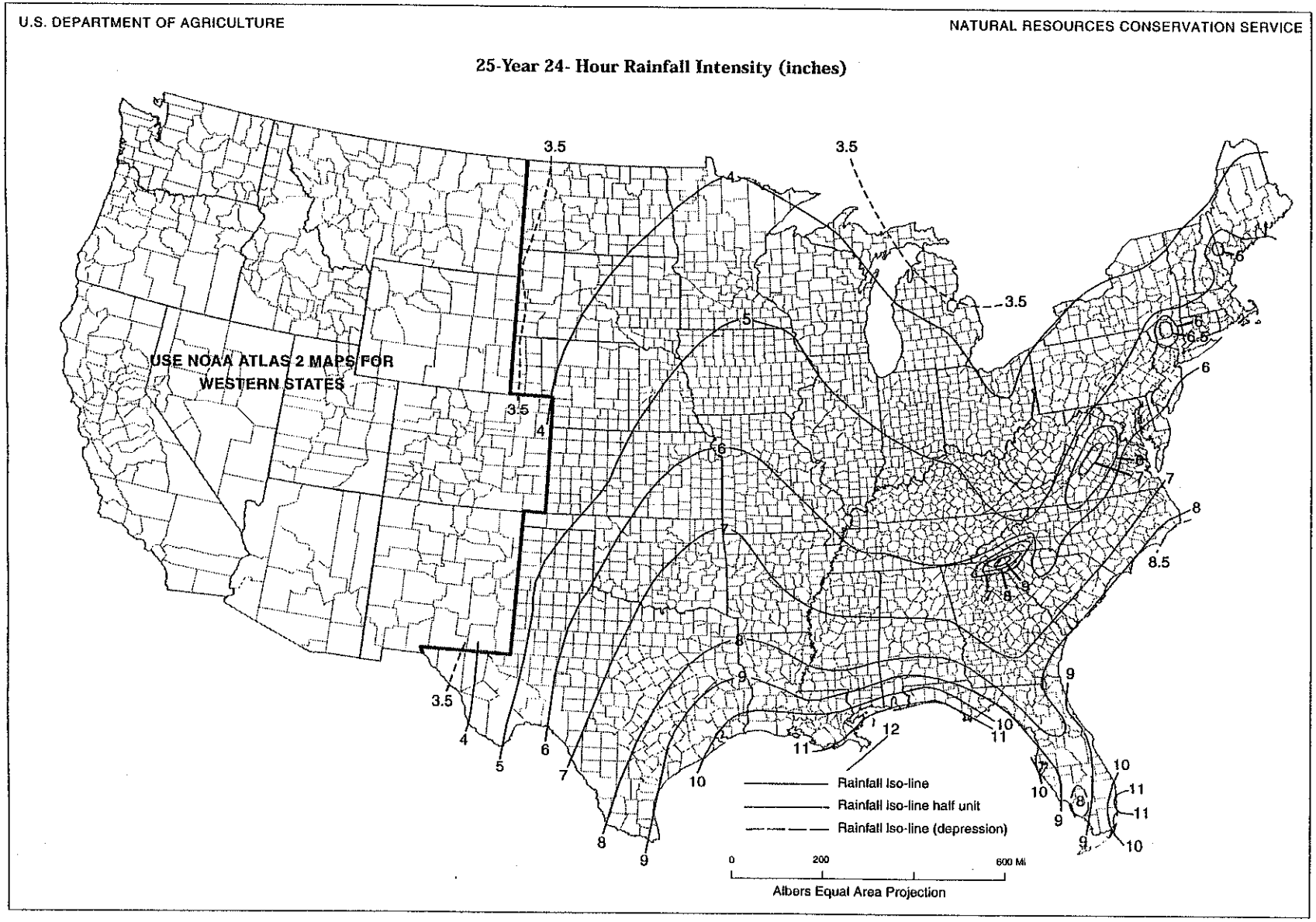


Figure B-6 Twenty-five-year, 24-hr rainfall



APPENDIX F

SOUTH CAROLINA RAINFALL DATA

ADAPTED FROM

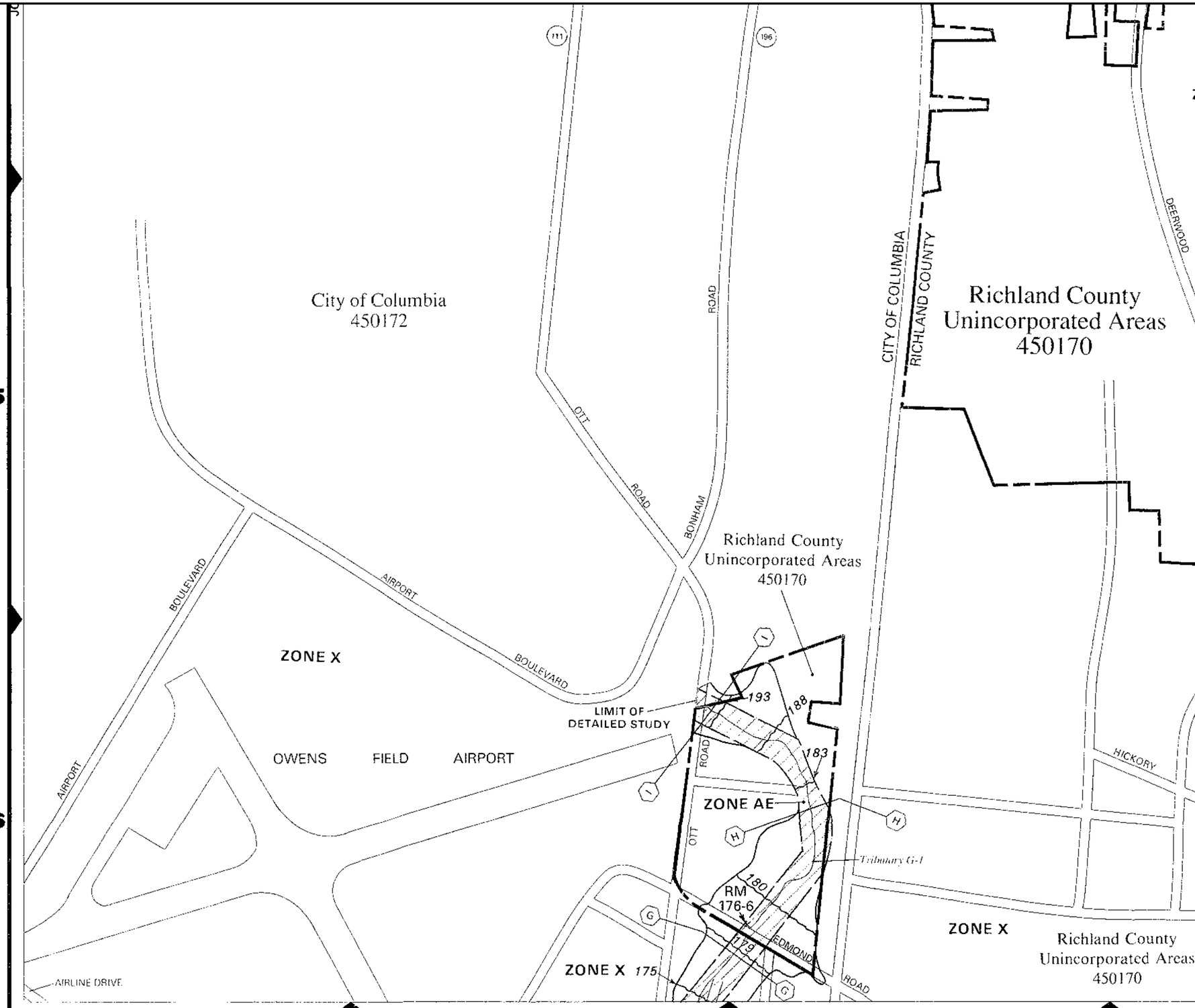
"Precipitation-Frequency Atlas of the United States"
NOAA Atlas 14, Volume 2, Version 2 (draft)
G.M. Bonnin, D. Todd, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2004

NOTE: Rainfall data for counties listed were averaged when multiple or no rainfall station data was available.

RETURN PERIOD 24 HOUR STORM EVENT (INCHES)

County Name	1	2	5	10	25	50	100	R Factors
Abbeville	3.2	3.5	4.4	5.2	6.5	7.7	9.2	250
Aiken	3.2	3.7	4.6	5.3	6.5	7.4	8.4	250
Allendale	3.4	3.8	5.1	6.0	7.0	7.8	8.9	300
Anderson	3.3	3.6	4.5	5.5	6.6	7.9	9.4	275
Bamberg	3.4	3.6	4.6	5.5	6.8	8.1	9.4	300
Barnwell	3.3	3.6	4.5	5.3	6.4	7.3	8.4	275
Beaufort	3.7	4.5	5.8	6.9	8.4	9.7	11.0	400
Berkeley (North)	3.5	3.8	5.0	5.9	7.2	8.2	9.4	350
Berkeley (South)	3.6	4.0	5.2	6.2	7.5	8.6	9.8	350
Calhoun	3.3	3.5	4.5	5.4	6.7	7.9	9.3	275
Charleston	3.8	4.3	5.5	6.6	8.0	9.2	10.4	400
Cherokee	3.0	3.7	4.7	5.4	6.4	7.3	8.1	275
Chester	2.9	3.6	4.6	5.3	6.3	7.1	8.0	250
Chesterfield	3.1	3.5	4.5	5.3	6.6	7.7	9.0	275
Clarendon	3.4	3.7	4.7	5.6	7.0	8.2	9.5	300
Colleton (North)	3.5	3.5	4.5	5.4	6.7	7.9	9.2	350
Colleton (South)	3.6	4.0	5.2	6.1	7.5	8.6	9.7	350
Darlington	3.2	3.5	4.5	5.4	6.7	8.0	9.3	300
Dillon	3.3	3.6	4.7	5.5	6.8	8.8	10.0	325
Dorchester(North)	3.4	3.8	4.9	5.8	7.1	8.1	9.3	325
Dorchester(South)	3.6	4.2	5.4	6.4	7.8	8.9	10.1	325
Edgefield	3.2	3.1	4.5	5.2	6.3	7.2	8.2	250
Fairfield	3.0	3.5	4.4	5.1	6.2	7.1	8.0	250
Florence (North)	3.3	3.5	4.5	5.4	6.7	7.9	9.2	325
Florence (South)	3.3	3.7	4.7	5.6	7.0	8.2	9.6	325
Georgetown (East)	3.6	4.6	5.9	7.0	8.5	9.8	11.1	350
Georgetown (West)	3.6	3.9	5.1	6.0	7.4	8.4	9.6	350
Greenville(North)	4.0	4.2	5.3	6.1	7.3	8.3	9.3	300
Greenville(South)	3.4	3.7	4.6	5.4	6.7	7.8	9.1	300
Greenwood	3.1	3.5	4.4	5.1	6.4	7.6	9.0	250
Hampton (North)	3.4	3.8	4.9	5.8	7.1	8.2	9.3	325
Hampton (South)	3.4	4.2	5.4	6.4	7.8	9.0	10.2	325
Horry (North)	3.4	4.1	5.3	6.3	7.9	9.3	10.8	350
Horry (South)	3.6	4.2	5.4	6.4	7.8	9.0	10.2	350
Jasper	3.5	4.2	5.4	6.4	7.8	9.0	10.2	350
Kershaw	3.1	3.5	4.4	5.1	6.2	7.1	8.1	275
Lancaster	3.0	3.5	4.4	5.2	6.2	7.0	7.9	250
Laurens	3.1	3.6	4.4	5.2	6.5	7.7	9.2	250
Lee	3.2	3.5	4.5	5.4	6.7	7.9	9.3	275
Lexington	3.1	3.6	4.5	5.3	6.4	7.3	8.3	250
Marion (North)	3.3	3.7	4.8	5.7	6.9	8.0	9.1	325
Marion (South)	3.4	4.2	5.5	6.5	7.9	9.1	10.3	325
Marlboro	3.2	3.5	4.5	5.4	6.5	7.5	8.5	300
McCormick	3.2	3.5	4.4	5.2	6.4	7.5	8.9	250
Newberry	3.0	3.6	4.5	5.3	6.4	7.3	8.4	250
Oconee (North)	4.5	4.7	5.8	6.7	7.8	8.8	9.8	300
Oconee (South)	3.5	3.8	4.7	5.5	6.6	7.6	8.6	300
Orangeburg (East)	3.3	3.8	4.9	5.8	7.1	8.1	9.3	275
Orangeburg (West)	3.3	3.6	4.5	5.4	6.8	8.0	9.3	275
Pickens (North)	4.2	5.1	6.2	7.2	8.5	9.5	10.6	300
Pickens (South)	3.7	4.1	5.0	5.8	6.9	7.8	8.8	300
Richland	3.1	3.6	4.5	5.3	6.4	7.3	8.3	275
Saluda	3.4	3.6	4.5	5.2	6.3	7.2	8.2	250
Spartanburg (NW)	3.4	4.5	5.5	6.3	7.5	8.5	9.5	300
Spartanburg (NE)	3.1	3.8	4.8	5.5	6.6	7.4	8.3	275
Spartanburg (SE)	3.1	3.6	4.5	5.5	6.4	7.8	9.3	275
Spartanburg (SW)	3.1	3.7	4.6	5.4	6.7	7.9	9.4	275
Sumter	3.2	3.6	4.6	5.5	6.9	8.1	9.5	275
Union	3.0	3.6	4.5	5.2	6.5	7.7	9.1	250
Williamsburg	3.4	4.1	5.3	6.2	7.6	8.7	9.9	325
York	2.8	3.6	4.5	5.3	6.3	7.1	7.9	250

Firmettes from FEMA
Map Number 45079C0178 H
Revised February 20, 2002
(FIRM Panel 178 of 275)



APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

RICHLAND COUNTY,
SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 176 OF 275
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBIA, CITY OF	450172	0176	G
UNINCORPORATED AREAS	450170	0176	G

Notice To User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0176 G

EFFECTIVE DATE:
JANUARY 19, 1994

Federal Emergency Management Agency

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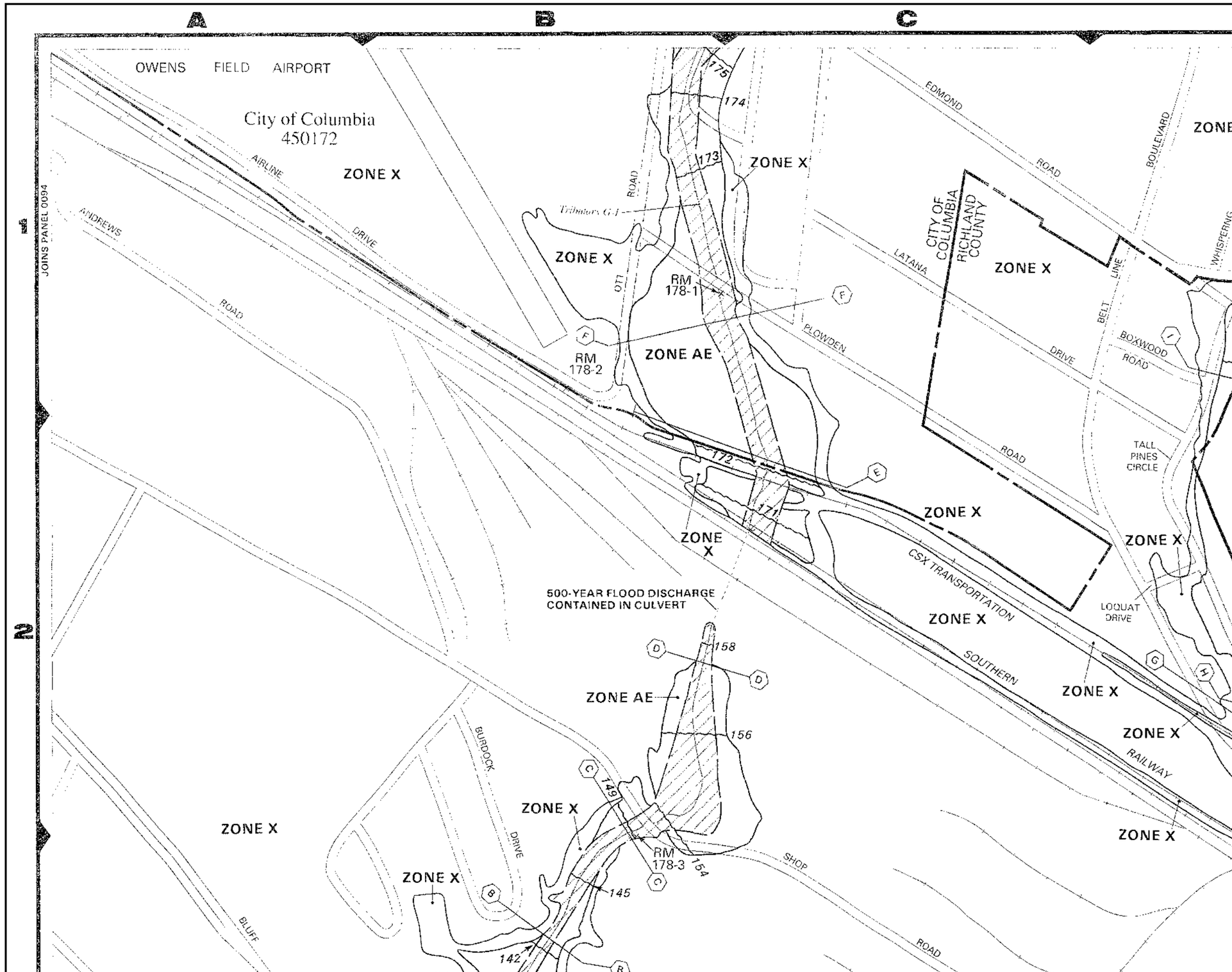

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

RICHLAND COUNTY,
SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 178 OF 275
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBIA, CITY OF	450172	0178	H
UNINCORPORATED AREAS	450170	0178	H

Notice To User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0178 H

MAP REVISED:
FEBRUARY 20, 2002

Federal Emergency Management Agency

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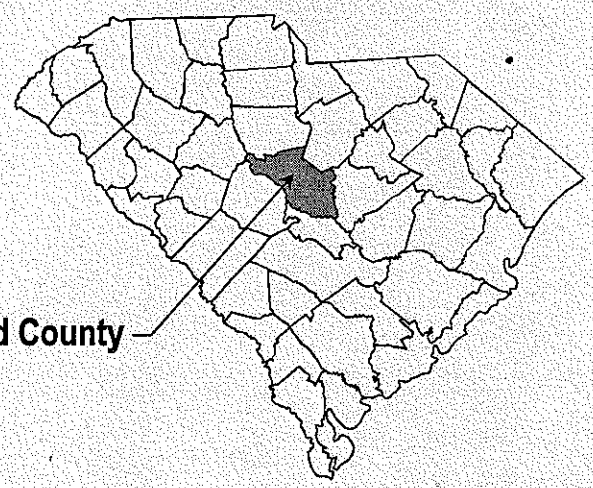
Portions of FEMA Flood Insurance Study
Richland County, SC and Incorporated Areas
Volumes 1 & 2 of 2
Revised February 20, 2002
(for Tributary G-1)

FLOOD INSURANCE STUDY

VOLUME 1 OF 2

RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
ARCADIA LAKES, TOWN OF	450171
COLUMBIA, CITY OF	450172
EASTOVER, TOWN OF	450173
FOREST ACRES, CITY OF	450174
IRMO, TOWN OF	450133
UNINCORPORATED AREAS	450170



REVISED:
FEBRUARY 20, 2002

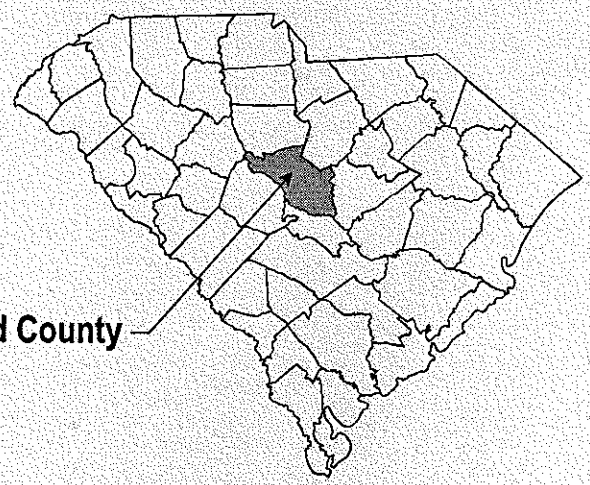
Federal Emergency Management Agency

FLOOD INSURANCE STUDY

VOLUME 2 OF 2

RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
ARCADIA LAKES, TOWN OF	450171
COLUMBIA, CITY OF	450172
EASTOVER, TOWN OF	450173
FOREST ACRES, CITY OF	450174
IRMO, TOWN OF	450133
UNINCORPORATED AREAS	450170



REVISED:
FEBRUARY 20, 2002

Federal Emergency Management Agency

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Gills Creek (continued)								
AG	55,900[1]	310	2,998	3.4	167.4	167.4	167.7	0.3
AH	56,350[1]	410	4,317	2.4	168.0	168.0	168.3	0.3
AI	56,460[1]	458	8,305	1.2	179.2	179.2	179.5	0.3
AJ	57,100[1]	456	9,574	1.0	179.2	179.2	179.5	0.3
AK	57,600[1]	914	17,743	0.5	179.2	179.2	179.5	0.3
AL	58,700[1]	610	11,163	0.9	179.2	179.2	179.5	0.3
AM	60,500[1]	1,290	18,841	0.5	179.3	179.3	179.6	0.3
AN	61,900[1]	370	5,020	1.9	179.3	179.3	179.6	0.3
AO	62,750[1]	124	1,431	6.8	179.3	179.3	179.6	0.3
AP	63,500[1]	554	6,990	0.7	186.4	186.4	187.2	0.8
AQ	64,280[1]	657	7,681	0.6	186.4	186.4	187.2	0.8
AR	64,430[1]	647	10,045	0.4	195.4	195.4	195.7	0.3
AS	65,400[1]	286	4,190	1.1	195.5	195.5	195.8	0.3
AT	67,000[1]	93	1,109	4.2	195.8	195.8	196.1	0.3
AU	68,750[1]	34	486	9.3	198.3	198.3	199.0	0.7
Tributary G-1								
A	8,400[2]	125	693	1.7	139.3	139.3	139.5	0.3
B	9,650[2]	70	389	3.0	142.2	142.2	142.4	0.2
C	10,350[2]	85	454	1.9	148.8	148.8	149.1	0.3
D	11,500[2]	75	304	2.8	157.6	157.6	157.6	0.0
E	12,600[2]	150	1,320	0.6	172.0	172.0	172.0	0.0
F	13,350[2]	150	913	1.5	172.0	172.0	172.3	0.3

[1]Feet above confluence with Congaree River
[2]Feet above mouth

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC AND INCORPORATED AREAS

FLOODWAY DATA

GILLS CREEK - TRIBUTARY G-1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Tributary G-1 (continued)								
G	15,050	140	457	2.6	178.7	178.7	178.9	0.2
H	16,000	140	237	5.1	182.5	182.5	182.5	0.0
I	16,750	150	546	2.2	193.1	193.1	193.3	0.2
Eightmile Branch								
A	800	130	733	4.5	166.8	165.2[2]	166.2	1.0
B	1,050	100	530	6.2	166.8	166.1[2]	167.1	1.0
C	1,700	130	1,175	2.8	169.5	169.5	170.3	0.8
D	2,550	135	1,086	3.0	171.6	171.6	172.5	0.9
E	2,700	115	657	5.0	172.3	172.3	173.2	0.9
F	3,150	140	763	4.3	174.4	174.4	175.4	1.0
G	3,350	130	1,102	2.8	176.7	176.7	177.1	0.4
H	3,950	100	651	4.8	178.7	178.7	179.0	0.3
I	4,450	90	644	4.9	180.8	180.8	181.6	0.8
J	4,600	95	1,215	2.6	181.4	181.4	182.3	0.9
K	5,100	100	605	5.2	182.8	182.8	183.7	0.9
L	5,250	180	762	4.1	184.6	184.6	185.5	0.9
M	6,400	85	509	6.1	189.4	189.4	190.4	1.0
N	7,450	75	515	6.1	196.3	196.3	197.3	1.0
O	7,650	75	784	4.0	202.4	202.4	203.2	0.8
P	8,500	100	419	5.8	204.5	204.5	205.5	1.0
Q	9,300	90	524	4.6	212.9	212.9	213.9	1.0
R	9,450	80	540	4.5	214.8	214.8	215.8	1.0
S	9,700	65	378	6.4	216.7	216.7	217.4	0.7

[1]Feet above mouth
[2]Elevation computed without consideration of backwater effects from Gills Creek

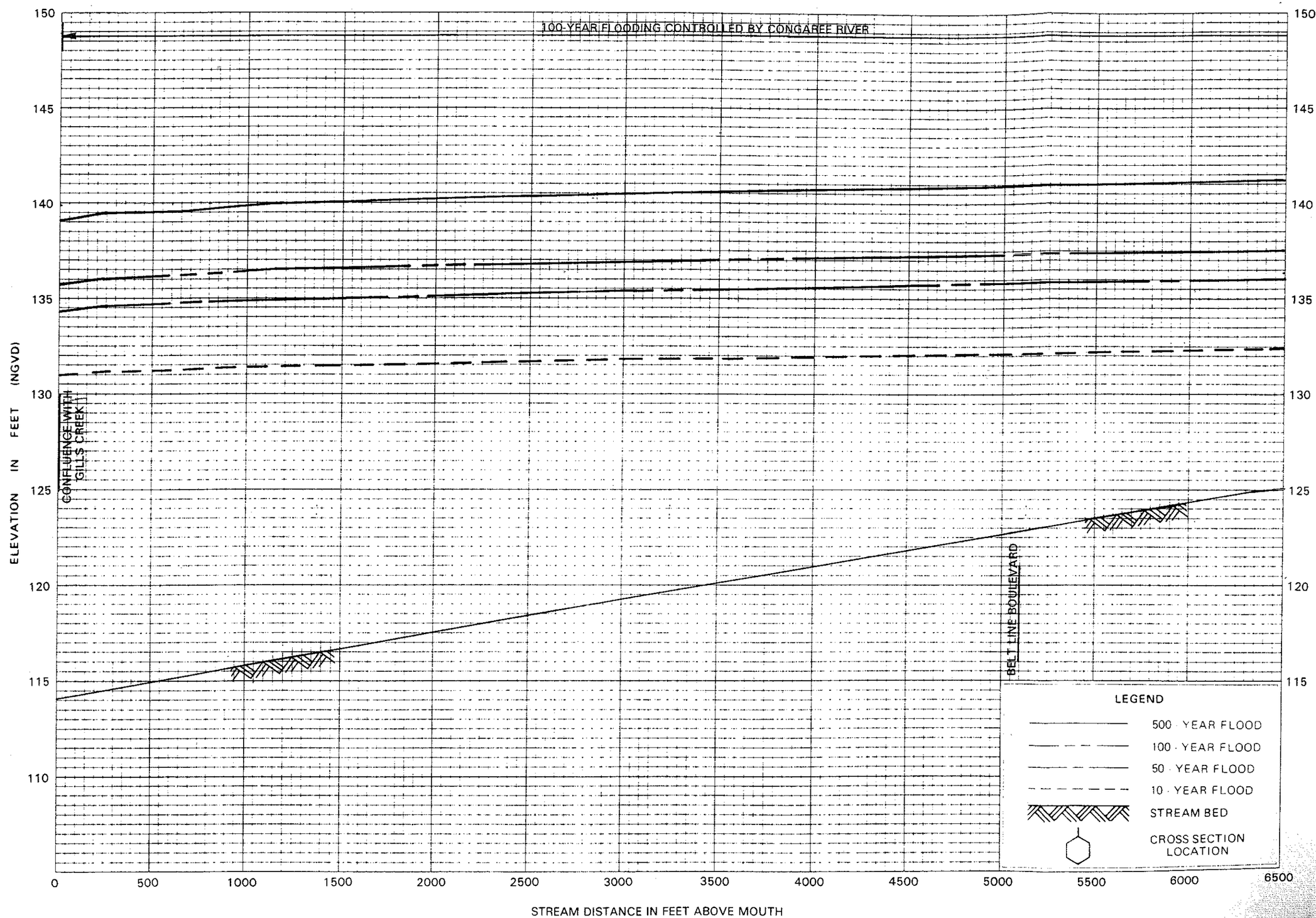
TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC AND INCORPORATED AREAS

FLOODWAY DATA

TRIBUTARY G-1 – EIGHTMILE BRANCH

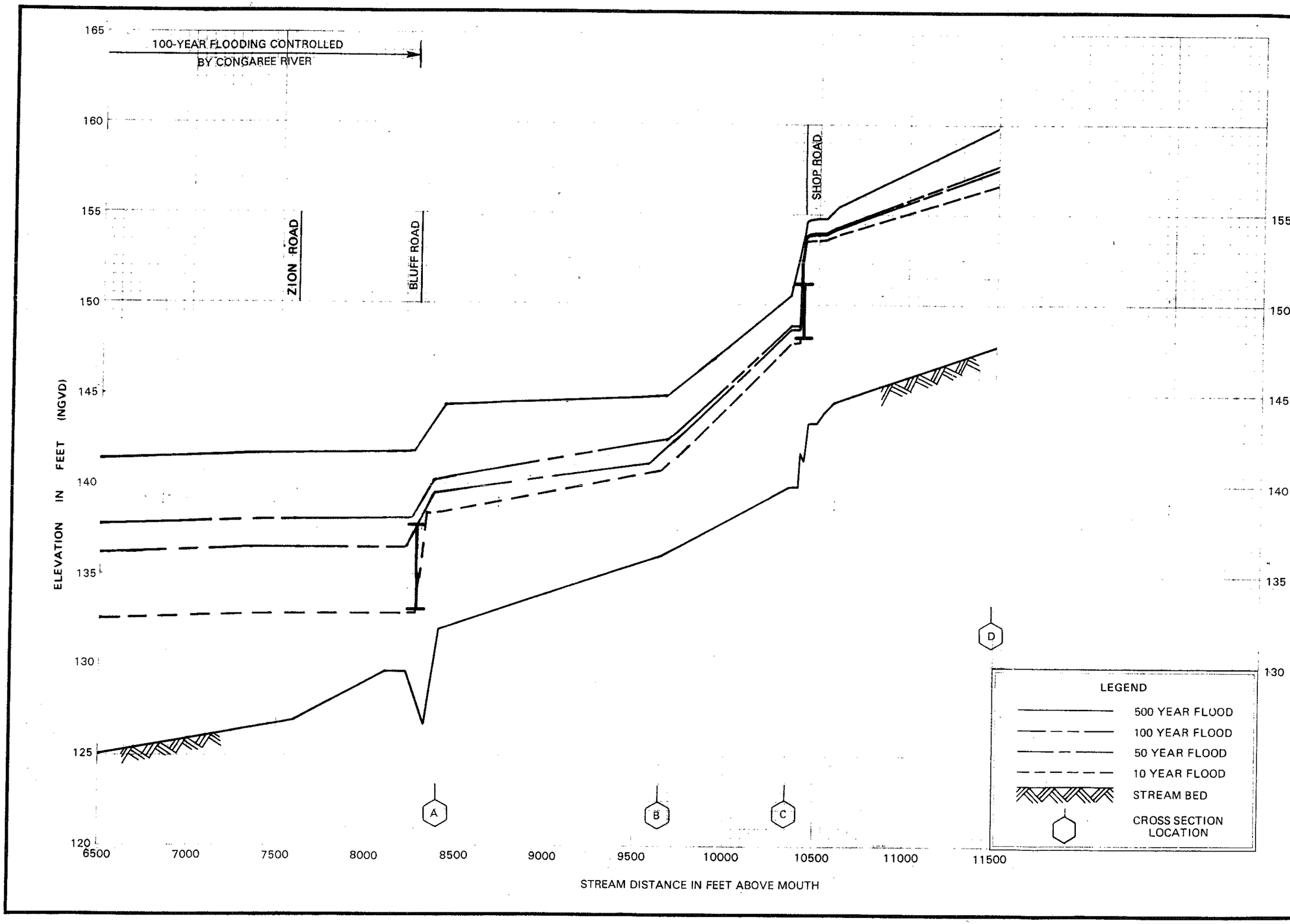


FLOOD PROFILES

TRIBUTARY G-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC
AND INCORPORATED AREAS

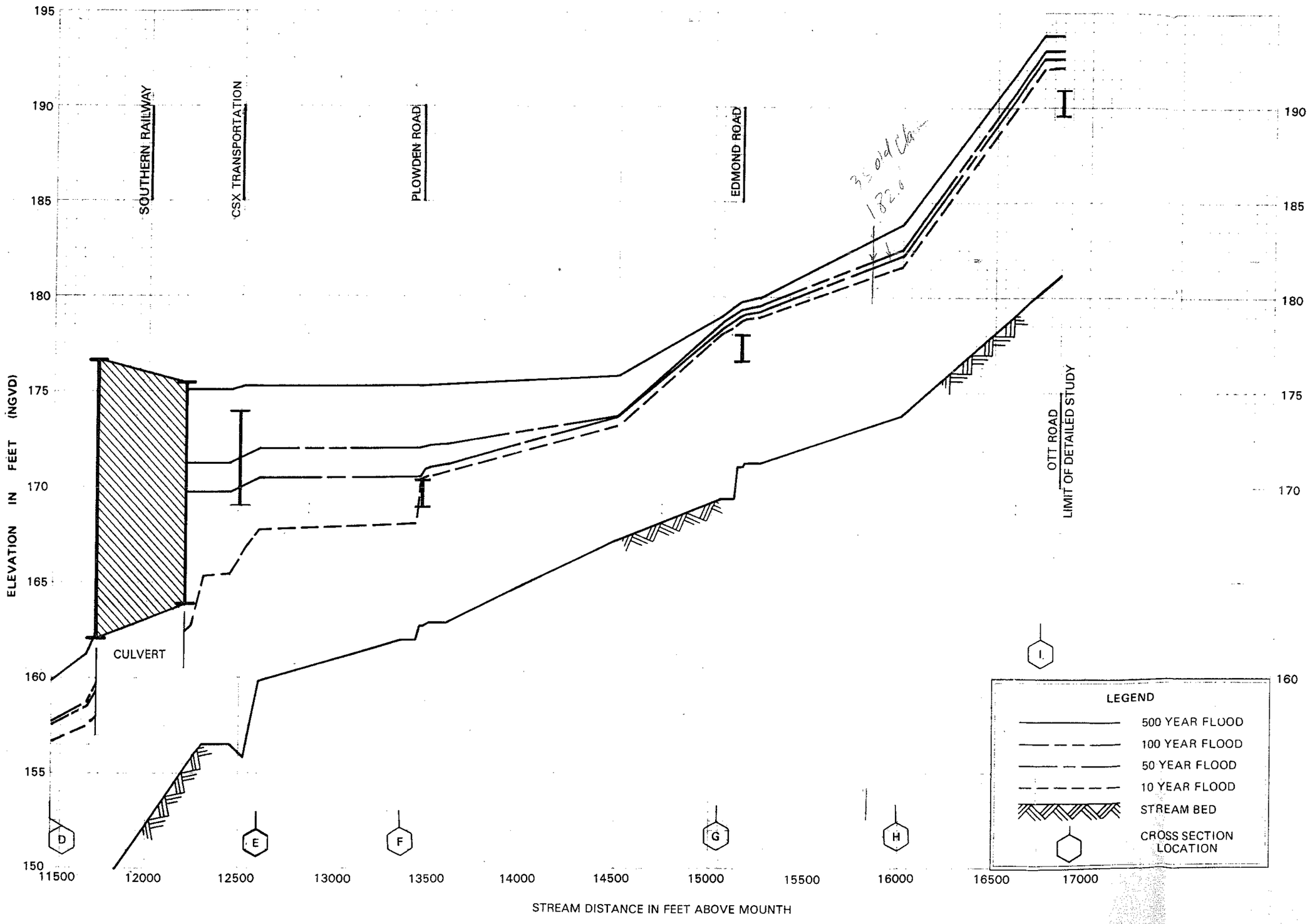


FLOOD PROFILES

TRIBUTARY G-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC
AND INCORPORATED AREAS



FLOOD PROFILES

TRIBUTARY G-1

FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC
AND INCORPORATED AREAS

Firmettes from FEMA
Map Number 45079CIND0A &
Map Number 45079C0376K
Revised September 29, 2010
(FIRM Panels MAP INDEX and 376 of 650)

LISTING OF COMMUNITIES

COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANEL(S)	INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE
ARCADIA LAKES, TOWN OF	450171	0261, 0262	August 2, 1974	November 19, 1980	September 29, 2010
BLYTHEWOOD, TOWN OF	450258	0120, 0125, 0130, 0140	September 29, 2010	September 29, 2010	September 29, 2010
COLUMBIA, CITY OF	450172	0091H, 0092H, 0093H[1], 0094H, 0095, 0160H, 0165, 0178H, 190H, 0210, 0230, 0235, 0236, 0237, 0241, 0242, 0244[1], 0255, 0260, 0261, 0262, 0263, 0264, 0270, 0280, 0285, 0295, 0325, 0357[1], 0376, 0377, 0379, 0381, 0382, 0383, 0405, 0410	June 28, 1974	September 2, 1981	September 29, 2010
EASTOVER, TOWN OF	450173	0439, 0445, 0575	May 31, 1974	September 30, 1988	September 29, 2010
FOREST ACRES, CITY OF	450174	0255, 0261, 0262, 0263, 0264	June 7, 1974	November 5, 1980	September 29, 2010
IRMO, TOWN OF	450133	0090, 0205, 0210	May 17, 1974	May 1, 1980	September 29, 2010
RICHLAND COUNTY, UNINCORPORATED AREAS	450170	0025, 0050, 0070, 0075, 0090, 0091H, 0092H, 0094H, 0095, 0100, 0120, 0125, 0130, 0135, 0140, 0145, 0155, 0160H, 0165, 0170, 178H, 0185, 190H, 0205, 0210, 0220[1], 0230, 0235, 236, 0237, 0241, 0242, 244[1], 0255, 0260, 0261, 0262, 0263, 0264, 0270, 0280, 0285, 0290, 0295, 0325, 0350, 0357[1], 0370, 0376, 0377, 0379, 0381, 0382, 0383, 0384, 0395, 0405, 0410, 0415, 0420, 0439, 0440, 0445, 0450, 0475, 0500, 0525, 0550, 0575, 0600, 0625, 0650	July 29, 1977	November 4, 1981	September 29, 2010

[1] PANEL NOT PRINTED

H SUFFIX FOLLOWING THE PANEL NUMBER DENOTES THAT THE AREA INDICATED ON THE INDEX WAS LAST STUDIED AS PART OF THE FEBRUARY 20, 2002 REVISION BUT NOT INCLUDED IN THE SEPTEMBER 29, 2010 REVISION. MAPS GENERATED AS PART OF THE SEPTEMBER 29, 2010 REVISION WILL NOT DISPLAY ANY FLOOD HAZARD INFORMATION FROM THE UNREVISED AREAS. THE UNREVISED PANELS CAN BE REFERENCED FOR THE EFFECTIVE FLOOD HAZARD INFORMATION USED FOR DETERMINING FLOOD RISK AND INSURANCE RATES FOR THESE AREAS AND WILL CONTINUE TO BE AVAILABLE FROM FEMA AND THE APPLICABLE COMMUNITY MAP REPOSITORIES.

MAP REPOSITORIES

(Map available for reference only, not for distribution.)

TOWN OF ARCADIA LAKES
~~Town Hall~~

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

MAP INDEX

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA

AND INCORPORATED AREAS

MAP INDEX

PANELS PRINTED: 0025, 0050, 0070, 0075, 0090, 0091H, 0092H, 0094H, 0095, 0100, 0120, 0125, 0130, 0135, 0140, 0145, 0155, 0160H, 0165, 0170, 178H, 0185, 0190H 0205, 0210, 0230, 0235, 0236, 0237, 0241, 0242, 0255, 0260, 0261, 0262, 0263, 0264, 0270, 0280, 0285, 0290, 0295, 0325, 0350, 0370, 0376, 0377, 0379, 0381, 0382, 0383, 0384, 0395, 0405, 0410, 0415, 0420, 0439, 0440, 0445, 0450, 0475, 0500, 0525, 0550, 0575, 0600, 0625, 0650

MAP NUMBER
45079CIND0A

MAP REVISED
SEPTEMBER 29, 2010

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

ance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0376K

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA

AND INCORPORATED AREAS

PANEL 376 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBIA, CITY OF	450172	0376	K
RICHLAND COUNTY	450170	0376	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0376K

MAP REVISED
SEPTEMBER 29, 2010

Federal Emergency Management Agency

RICHLAND COUNTY AND CITY OF COLUMBIA AREAS NOT INCLUDED
INFORMATION IS NOT SHOWN ON THIS MAP, SEE EFFECTIVE D
45079C0178H DATED FEBRUARY 20, 2002 FOR FLOOD HA
INFORMATION COVERING THE AREAS NOT INCLUDED

2005000 FT

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Portions of FEMA Flood Insurance Study
Richland County, SC and Incorporated Areas
Volumes 1 & 2 of 2
Revised September 29, 2010
(for Gills Creek Tributary 1)

FLOOD INSURANCE STUDY

RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

VOLUME 1 OF 2

Community Name	Community Number
ARCADIA LAKES, TOWN OF	450171
BLYTHEWOOD, TOWN OF	450258
COLUMBIA, CITY OF	450172
EASTOVER, TOWN OF	450173
FOREST ACRES, CITY OF	450174
IRMO, TOWN OF	450133
RICHLAND COUNTY (UNINCORPORATED AREAS)	450170

REVISED:
SEPTEMBER 29, 2010

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
45079CV001A

FLOOD INSURANCE STUDY

RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

VOLUME 2 OF 2

Community Name	Community Number
ARCADIA LAKES, TOWN OF	450171
BLYTHEWOOD, TOWN OF	450258
COLUMBIA, CITY OF	450172
EASTOVER, TOWN OF	450173
FOREST ACRES, CITY OF	450174
IRMO, TOWN OF	450133
RICHLAND COUNTY (UNINCORPORATED AREAS)	450170

REVISED:
SEPTEMBER 29, 2010

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
45079CV002A

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION[2]	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
GILLS CREEK TRIBUTARY 1								
G	15,050	140	457	2.6	177.9	177.9	178.1	0.2
H	16,000	140	237	5.1	181.7	181.7	181.7	0.0
I	16,750	150	546	2.2	192.3	192.3	192.5	0.2

[1] Feet above confluence with Gills Creek

[2] Flood hazard information downstream of XS G is not shown in this floodway data table. See effective FIS floodway data table for Gills Creek Tributary 1, dated February 20, 2002, for flood hazard information not included.

TABLE 8

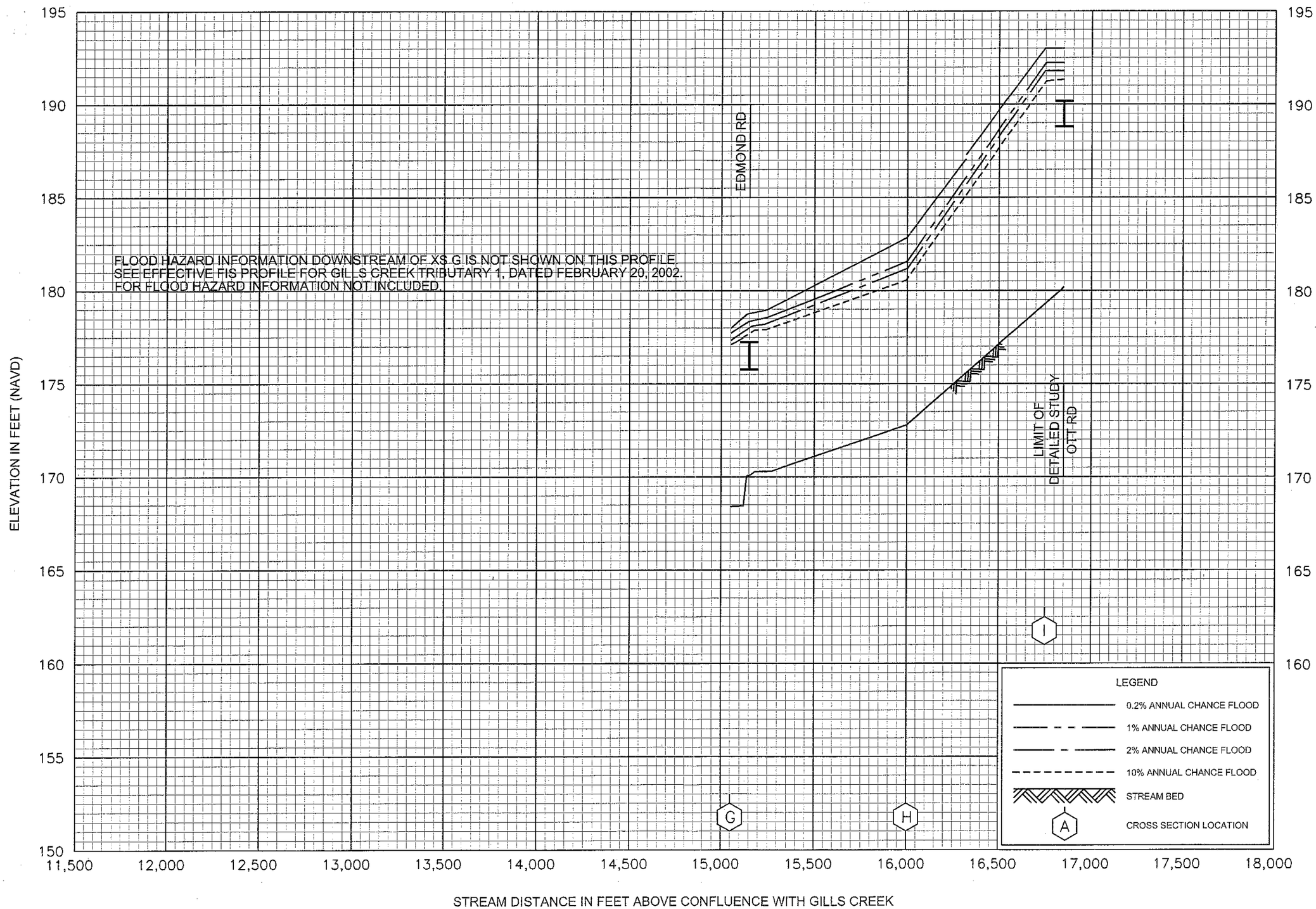
FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC

AND INCORPORATED AREAS

FLOODWAY DATA

GILLS CREEK TRIBUTARY 1



FLOOD PROFILES

GILLS CREEK TRIBUTARY 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

RICHLAND COUNTY, SC

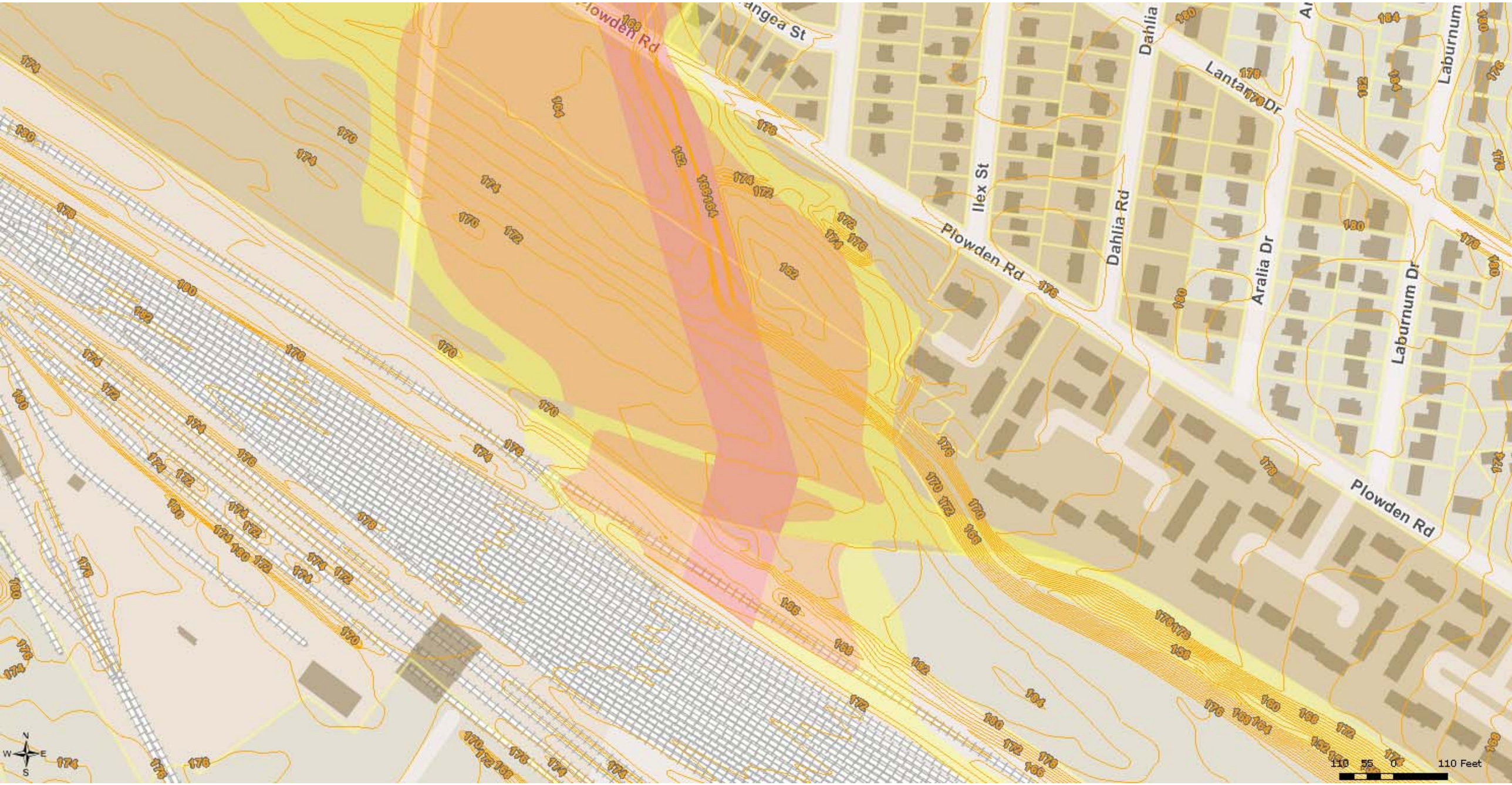
AND INCORPORATED AREAS

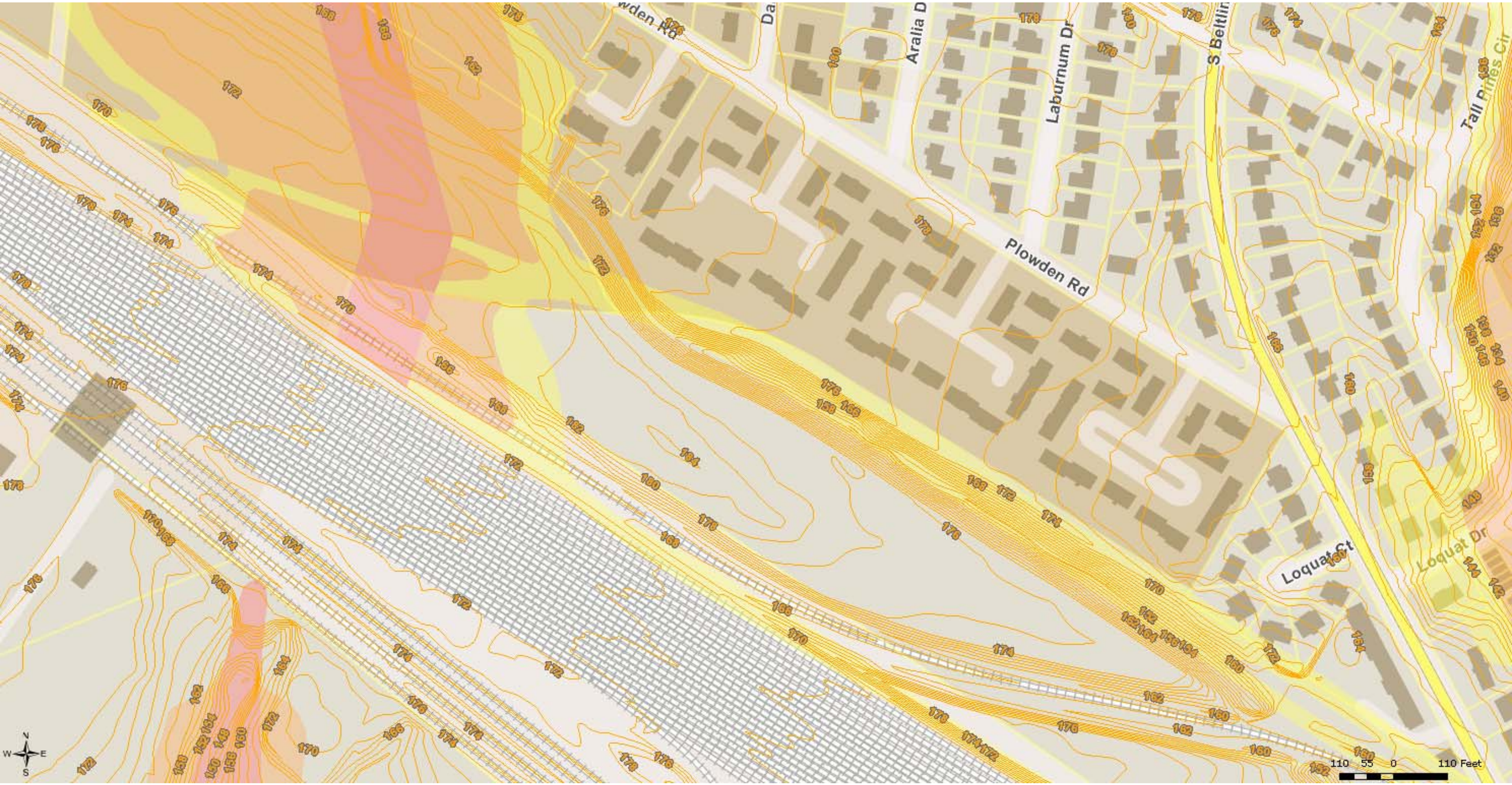
Richland County GIS Images Showing Flood Zone Graphic (From Piped Outfall to Railroad South of Owens Field)

Live Oak St
Kilbourne Ct
Hickory St
Hickory St
Hickory St
Gill St
Gill St
Elizabeth Darby Ln
Old Clayton Ct
Timberlane Dr
Timberlane Dr
S Ott Rd
S Kilbourne Rd
Hancock St
Suber St
BEN ARNOLD CENTER
OWENS FIELD PARK
110 55 0 110 Feet

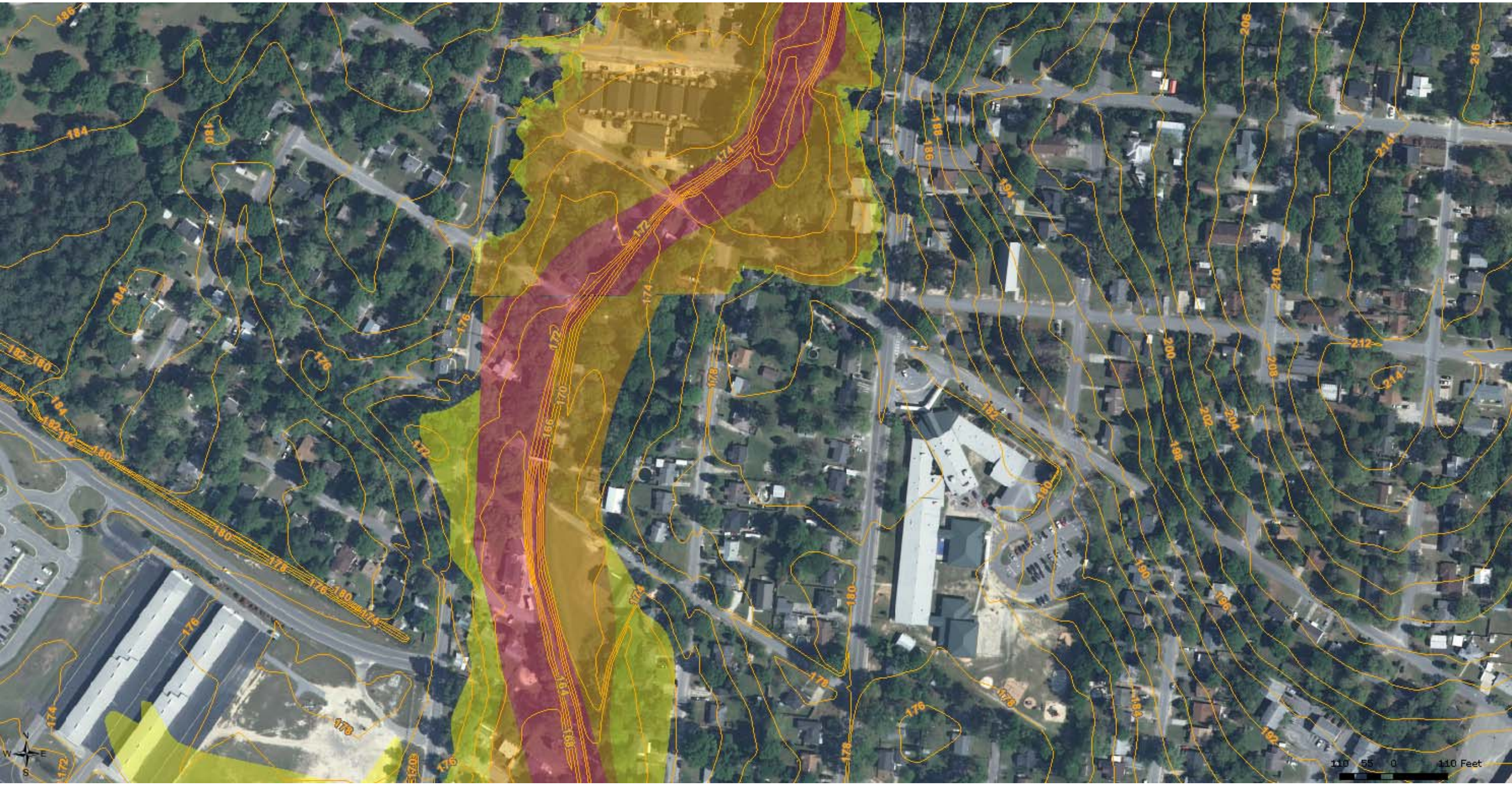
Old Clayton Cr
Timberlane Dr
S Kilbourne Rd
Hancock St
Suber St
Timberlane Dr
Rose Dr
Kolob St
Edmond Dr
Persimmon St
Nephi St
Lotus St
Edmond Dr
Rose Dr
Hibiscus St
Dahlia Rd
110 55 0 110 Feet

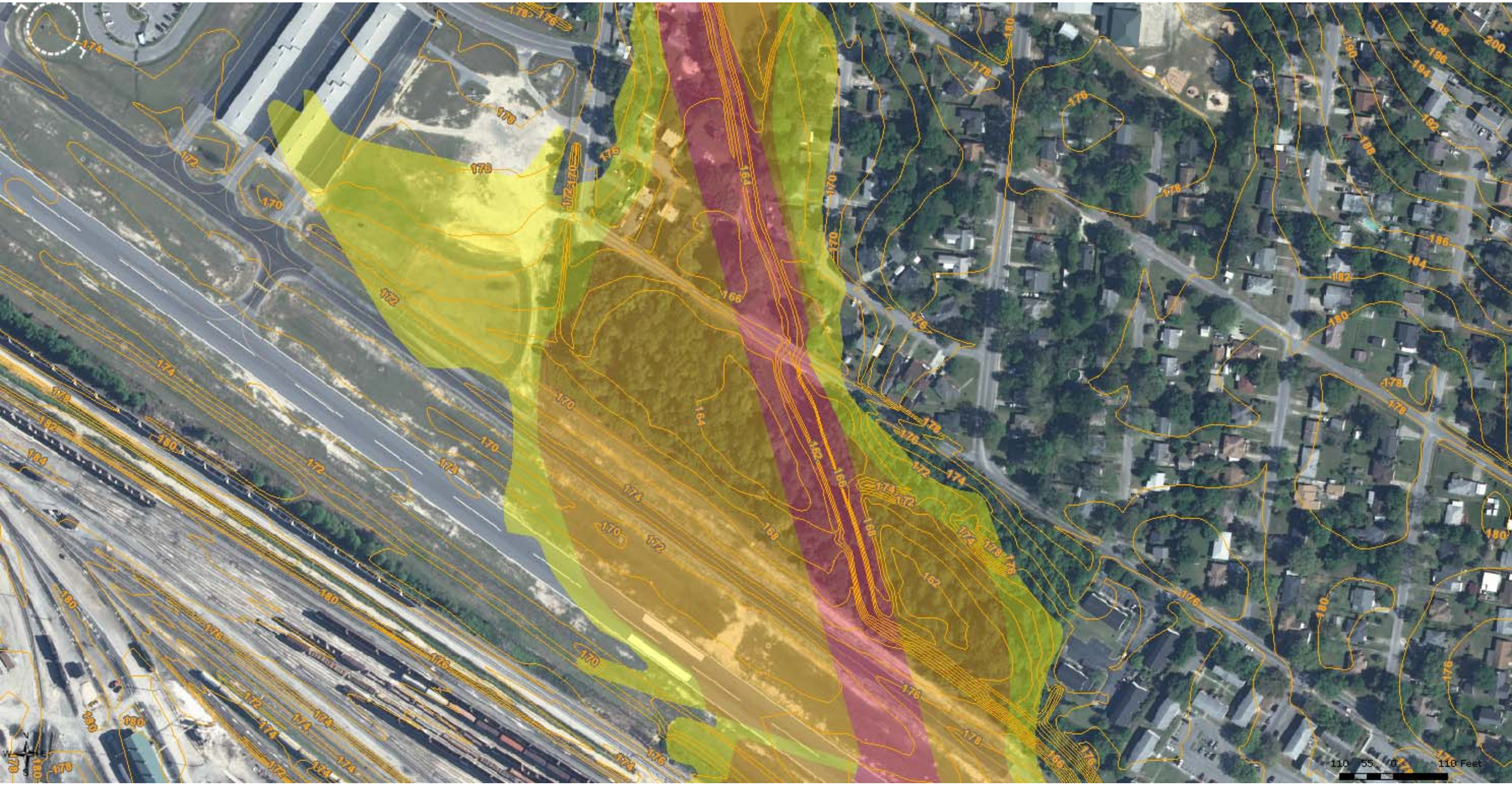
Rose Dr
Hibiscus St
Dahlia Rd
Plowden Rd
Hydrangea St
Ilex St
Dahlia Rd
Lantana Dr
Aralia Dr
Plowden Rd
Dahlia Rd
Aralia Dr
110 55 0 110 Feet


Plowden Rd
angea St
Ilex St
Dahlia
Dahlia Rd
Lantana Dr
Aralia Dr
Laburnum
Laburnum Dr
Plowden Rd
N
W
E
S
110 55 0 110 Feet

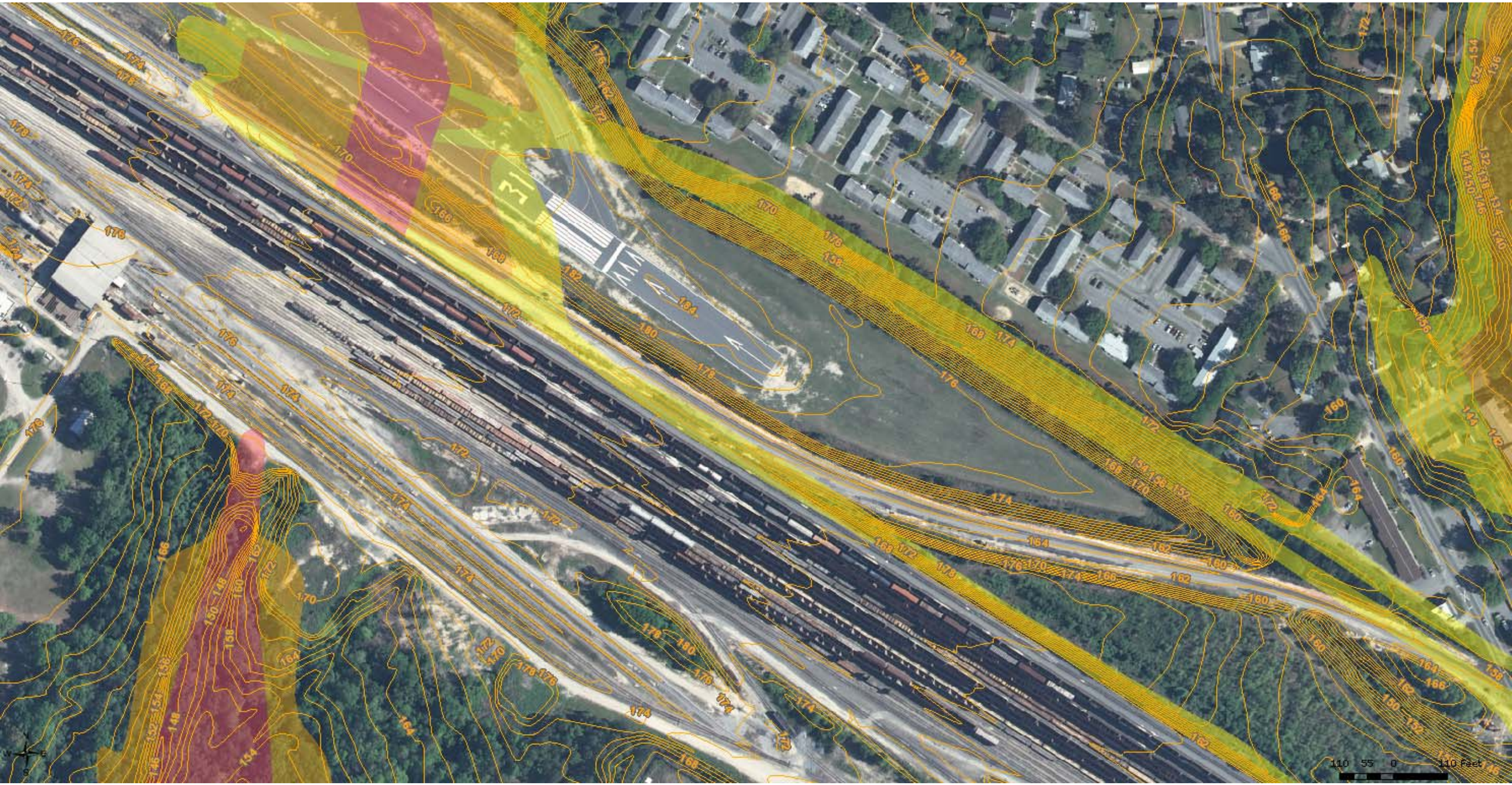

Plowden Rd
Laburnum Dr
Aralia D
S Beltlin
Tall Pines Cir
Loquat Ct
Loquat Dr
110 55 0 110 Feet
N
W
E
S

110 55 0 110 Feet


110 55 0 110 Feet


110 55 0 110 Feet

110 55 0 110 Feet


110 55 0 110 Feet

Tempo Ct
Live Oak St
Hickory St
Hic
202
200
198
196
194
192
190
188
186
184
182
180
178
176
N
W
E
S
60 30 0 60 Feet