Final Drainage Report
Greenwich Business Center
Wichita, Sedgwick County, Kansas

Location

The subject property will be annexed by the city of Wichita, Sedgwick County, Kansas. The proposed development is located on the southeast corner of 29th Street North and Greenwich Road, and generally comprises the north half of the northwest quarter and the west half of the northeast quarter of Section 3, Township 27 South, Range 2 East. The plat has an area of 187 acres. The site is shown on the Andover, Kansas Quadrangle, located in Appendix A. Greenwich Business Center (GBC) will develop as light industrial lots.

Soils

According to the NRCS (SCS) Sedgwick County Soil Survey (Appendix B) soils on the site are;

A. Rosehill silty clay, 1-3% slopes, (Rd – HSG "D"),
B. Goessel silty clay, 1-2% slopes (Gb – HSG "D"),
C. Irwin silty clay loam 1-3% slopes, (Ia – HSG "D"),
D. Irwin silty clay loam 2-6% slopes, (Ic – HSG "D").

The HSG used to select runoff coefficients is "D".

Pre-Project Conditions

Pre-Project Land Use

The site is currently pastureland.

Pre-Project Landform and Slope

The project site is at a ridge top, straddling the divide between the Fourmile Creek and West Fork Fourmile Creek watersheds. Slopes across the site range from 0.1% to 3.0%.

Pre-Project Drainage Conditions

The entire site is in Zone C – areas outside of the 500-year flood plain. The nearest 100-year flood plain (Zone A) is just southwest of the site. (FIRM Panel 150, Sedgwick County, Kansas, June 3, 1986 (Appendix C)). Two additional Zone A floodplain areas are shown slightly more than ¼ mile east of the site.

Pre-Project Runoff Characteristics

The site contributes flow to three watersheds shown on the Existing Drainage Boundaries drawing in Appendix D. The West and East watersheds drain into unnamed tributaries to West Fork Fourmile Creek. These tributaries flow under K-96 through a 2-6'x3' reinforced concrete box (RCB) culvert and a 2-48" reinforced concrete pipe (RCP) culvert respectively. The Northeast watershed drains east into an unobstructed and unnamed tributary to Fourmile Creek.

The Corps of Engineers' HEC-HMS software (version 2.2.2) was used to calculate hydrographs/peak flow rates from the watersheds. The HEC-HMS summary tables are Appendix E.

Calculation methods include the following:

- Time of concentration (T_c) values were calculated using the FAA method and are shown in Appendix F.
- SCS Type II 24-hour rainfall distribution.
- SCS Curve Number method for calculating loss rates.
- SCS Dimensionless Unit Hydrograph for hydrograph transformation.

The existing conditions models for the three watersheds are further described below.

Northeast Watershed

The calculated 100-year peak discharge (existing conditions) from the site at the northeast corner is approximately 323 cfs. This includes unattenuated flow from a small watershed north of 29th Street. Peak discharges calculated for pre-development conditions in the Northeast Watershed are show in Table 1.

Table 1: Northeast watershed summary of existing calculated peak flow rates.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Onsite	63.8	95.6	118.6	176.0	203.0
Offsite	50.4	75.0	92.8	136.9	157.8
Combined	101.1	151.8	188.5	279.6	322.9

East Watershed

The hydrologic model representing existing conditions includes the detention already constructed for The Fairmont subdivision, as well as the unplanned detention at K-96. Detailed survey of existing ground adjacent to K-96 was used to develop detention characteristics adjacent to K-96. The existing conditions model represents Greenwich Business Center and the adjacent property to the south as separate watersheds.

The existing conditions model indicates that the dry detention provided by the existing contours upstream from the KDOT culvert is significant. The detention is located on a

roughly triangular parcel in the SW ¼ of Section 3 north of K-96. The model indicates that the water temporarily stored behind the K-96 embankment during a 100-year event is approximately 5.5 ft deep, with an attenuated peak discharge of approximately 215 cfs (presuming inlet control conditions at the culvert), rather than the design flow of 156 cfs shown on highway plans. Table 2 shows the existing flows in the East Wastershed.

Table 2: East watershed summary of existing calculated peak flow rates.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Fairmont	9.0	14.1	34.5	80.6	108.3
GBC	101.2	150.8	186.6	275.1	317.2
South Prop.	81.6	121.7	150.7	222.5	256.6
Det. Discharge	95.9	127.2	147.9	196.4	214.8

West Watershed

The West Watershed includes several off-site parcels as shown on the drawing in Appendix D. The existing land form provides no effective detention at the K-96 embankment. The Pre-Developed HEC-HMS model assumed the entire watershed undeveloped agricultural pasture land. Table 3 shows the existing flows at various locations in the West Watershed.

Table 3: West watershed summary of existing calculated peak flow rates.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
A1 (at 29th)	34.4	51.4	63.7	94.1	108.6
A2 (at 29th)	29.7	44.6	55.3	82.1	94.8
Greenwich W	58.4	87.6	108.8	161.3	186.2
Greenwich E	105.6	158.5	197.0	292.5	338.0
Ex. Farm Pond	201.4	318.2	396.7	590.1	681.7
South Prop	83.2	124.7	154.9	229.8	265.4
K96 Res W In	283.7	442.9	551.6	819.1	946.4
K96 Res W Out	263.3	434.0	543.3	808.2	933.5

Peak flow rates leaving each of the three watersheds under pre-project conditions are shown in Table 4.

Table 4. Pre-project runoff.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Northeast	101.1	151.8	188.5	279.6	322.9
East	95.9	127.2	147.9	196.4	214.8
West	263.3	434.0	543.3	808.2	933.5

Post-Project Conditions

Post-Project Development

The site will develop as industrial and commercial lots.

Post-Project Landform and Slope

Final slopes have not yet been determined, but are expected to range from 0.5% to 3.0%. Storm sewers will carry runoff from the site to proposed detention ponds. A Four Corner Lot Grading Plan is Appendix G. A Utility Plan is Appendix H.

Post-Project Runoff Characteristics

The site has been divided into three watersheds for the purpose of sizing detention facilities. Appendix I shows the proposed detention plan. Two of the three discharge locations flow to culverts under K-96. The design flow values shown on KDOT construction documents for these culverts are much lower than calculated peak flow rates shown in Table 4 above for the West and East watershed. The normal requirement to avoid increasing peak flow rates above pre-development conditions applies to the Northeast watershed. The proposed solution for the East watershed is to work with the adjacent landowner to develop a combination of detention and conveyance to protect the existing development at The Fairmont and maintain current conditions at the K-96 culvert. The proposed solution for the West watershed includes asking the City to require all property owners in the watershed to ensure that post-development discharges will accommodate the existing culvert capacity restrictions.

Details of the post-project watershed plans follow.

Northeast Watershed

Detention planned near the plat's northeast corner in Reserve B, will reduce the 100-year peak discharge to approximately 312 cfs. This presumes that at the time of development the property north of 29th Street will construct detention facilities to reduce the 100-year peak discharge across 29th Street to less than 140 cfs. Peak discharges calculated for post- development conditions are show in Table 5.

Table 5: Northeast watershed summary of developed calculated peak flow rates.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Onsite	120.5	163.6	193.7	266.2	300.1
Offsite	57.7	79.1	93.6	125.5	138.7
Combined	177.9	242.2	286.8	390.9	437.9
Det. Discharge	114.6	164.3	198.3	278.6	311.7

East Watershed

The East Watershed drains through the adjacent property to the south to a culvert under K-96 comprising 2-48" RCPs. According to KDOT construction documents, the design flow for the culvert is 156 cfs. The calculated existing peak flow rate to the culvert is 508 cfs as shown in Table 4.

The initial plan was to provide separate detention for the east portion of this parcel at the southeast corner near the center of the section. This would have required diverting flow from a small area north of 27th Street and primarily east of Richfield Street across a divide along the property's south boundary to the quarter section line, then south along the west boundary to the detention facility. The initial plan has been abandoned in favor of negotiating joint detention for the east watershed.

The proposed conditions model calculates the developed peak flow rate from the K-96 culvert to be 230 cfs using the existing unplanned detention. Minor grading will be completed in the detention area to reduce the peak flow rate to less than the current value of 215 cfs. The post-project flows from the East Watershed are located below in Table 6.

Table 6: East watershed summary of developed calculated peak flow rates.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Fairmont	9.0	14.1	34.5	80.6	108.3
GBC	261.7	341.1	396.4	529.7	592.2
South Prop.	88.7	115.7	134.4	179.6	200.8
Det Discharge	114.3	141.3	157.9	197.6	214.6

West Watershed

As stated in the pre-project runoff characteristics, the West Watershed includes several off-site parcels and the existing land form provides no effective detention at the K-96 embankment. The proposed solution requires detention facilities at Watersheds A1, A2, B, D, and E. Target discharges and storages are shown on the proposed detention plan in Appendix I. Detention at Watershed D is sized to accommodate the requirements for Watershed C. Existing and proposed discharges from each watershed are shown in Appendix E.

Table 7 is a summary of peak flow rates at locations where flow enters or leaves the site as well as calculated flow rates at K-96 under existing and developed conditions.

Table 7: West watershed summary of developed calculated peak flow rates.

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
A1 (at 29th)	6.5	8.9	10.4	13.8	15.1
A2 (at 29th)	7.3	9.8	11.6	15.0	16.3
Greenwich W	66.2	90.0	106.6	146.5	165.2
Greenwich E	105.5	143.6	170.1	234.2	263.9
GBC Res W	54.0	82.5	103.6	137.5	150.6
South Prop	160.1	217.4	257.4	353.9	399.1
K96 Res W In	188.6	264.0	318.1	451.8	510.4
K96 Res W Out	76.7	118.5	150.2	206.9	229.1

Development in the watershed will require several years to complete. Two interim conditions were modeled to project peak flow rates under conditions of partial development. A total of four conditions were analyzed

- Existing conditions show current performance, including the current essentially ineffective detention at K-96 using contours based on recent survey.

- Interim 1 conditions show calculated peak flow rates when only Greenwich Business Center is developed and on-site detention is provided just north of 27th Street.

- Interim 2 conditions show calculated peak flow rates when the property south of 27th Street is developed, and significant additional detention is added just north of K-96 and east of Greenwich Road.

- Developed conditions show calculated peak flow rates when all properties in the watershed are developed and the recommended off-site detention is provided.

Table 8 provides a summary of peak flow rates at K-96 under the four conditions analyzed. For practical purposes, calculated flows exceeding 240 cfs at the K-96 Reservoir West Outlet are expected to pass to the south through the K-96 bridge over Greenwich.

Table 8: West watershed summary of calculated interim peak flow rates at K-96

Conditions	2-yr (cfs)	5-yr (cfs)	10-yr (cfs)	50-yr (cfs)	100-yr (cfs)
Existing					
K96 Res W In	283.7	442.9	551.6	819.1	946.4
K96 Res W Out	263.3	434.0	543.3	808.2	933.5
Interim 1					
K96 Res W In	138.3	215.1	266.5	375.8	424.8
K96 Res W Out	137.7	210.1	258.2	372.4	421.3
Interim 2					
K96 Res W In	194.6	276.1	335.3	471.8	529.9
K96 Res W Out	86.3	135.8	166.6	220.2	240.9
Developed					
K96 Res W In	188.6	264.0	318.1	451.8	510.4
K96 Res W Out	76.7	118.5	150.2	206.9	229.1

Inflow to the K-96 reservoir area is lower in Interim 1 conditions than in Interim 2 conditions. This is because land between the Greenwich Business Center detention and the K-96 Reservoir West detention area is undeveloped in Interim 1 conditions, and developed in Interim 2 conditions. Interim 2 conditions do not include detention from the smaller watersheds north of 29th Street or west of Greenwich, but do modify land use characteristics for the parcel between the detention areas.

Discharge from the K-96 facility, however, is reduced in Interim 2 conditions because the detention facility is to be constructed at that time (Interim 1 conditions do not include constructing detention at K-96). Discharge is further reduced in the final conditions because the smaller watersheds north of 29th and west of Greenwich will have added significant storm water detention.

The planned reduction to peak flow rates at K-96 incorporates both onsite and offsite detention into the hydrologic model. Proposed final conditions in the West Watershed are shown in the table below. Accomplishing this goal will require participation by all property owners in the watershed.

Detention storage is allocated among the parcels by establishing a constant ratio of detention volume to watershed area for all those affected. Preliminary detention coordination requirements for the affected parcels within the West Watershed are shown in Table 9.

Table 9: Proposed detention requirements

Watershed ID	Area (acres)	Detention Volume (ac-ft)	Q100 Release (cfs)
A1	19.8	5.7	15.1
A2	22.1	6.5	16.3
B	17.3	5.0	13.6
C + D	92.8	26.7	160
E	62.7	18.1	230

Detention coordination includes limiting values for both minimum detention volume and maximum peak discharge. We recommend that the City use this as the basis for stormwater management plans throughout the basin, and use caution when considering waiving these requirements. The final configuration for off-site detention facilities should be incorporated into the regional watershed model, and no increase should be permitted in the resulting peak discharges from the GBC West and K-96 West reservoirs.

Local Stormwater System

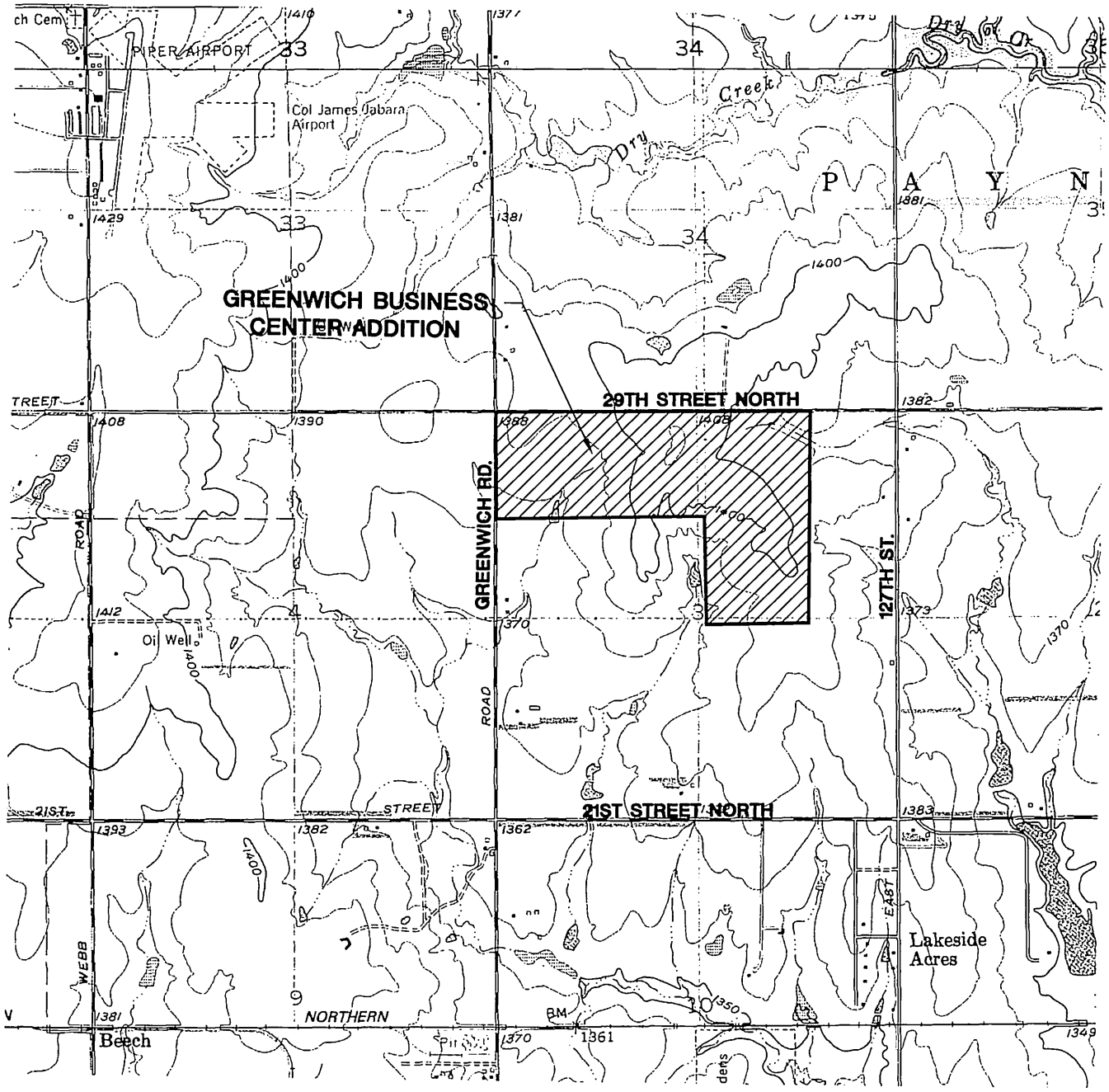
Flow to the local stormwater sewer system (SWS) was calculated using the Rational Method. The SWS pipes were sized using Hydraflow Storm Sewer by Intelisolve. The locations for these facilities are shown on the Drainage Plan in Appendix J. The Hydraflow Storm Sewer output is located in Appendix K.

Summary

Greenwich Business Center comprises approximately 187 acres to be developed as general commercial and light industrial lots. The site is located at Greenwich Road and 29th Street North. The site receives flow from the north and west, and discharges flow south to K-96 right of way, and east near the north east boundary to undeveloped property.

The detention pond near the site's northeast corner will reduce the 100-year peak discharge from the Northeast watershed to a rate slightly lower than the rate experienced under pre-development conditions. The detention scheme proposed for the West and East watersheds will reduce peak discharges to the capacities of the existing structures under K-96. Full participation by the adjacent property owners will be required for the scheme to be effective.

Appendix A
Andover, Kansas Quadrangle



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

J:\CIVIL\05039\DWG\PROP\DRNG\05039QUAD.DWG

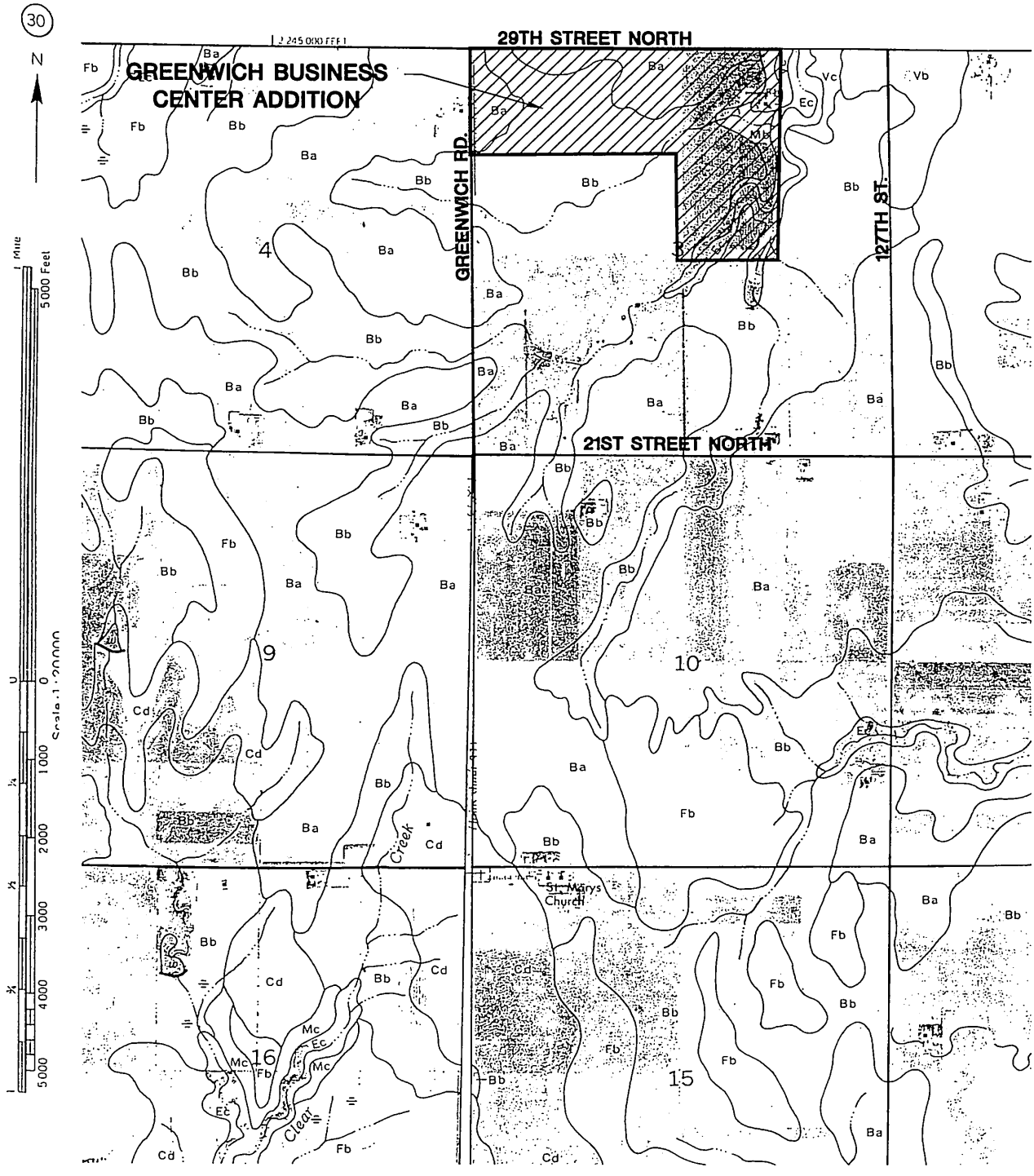
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

GREENWICH BUSINESS CENTER ADDITION
PROJECT NAME

ANDOVER, KANSAS QUADRANGLE
SHEET TITLE

AK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JANUARY 2006	05039	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix B
Sedgwick County Soil Survey



J:\CIVIL\05039\DWG\PROP\DRNG\05039SOIL.DWG

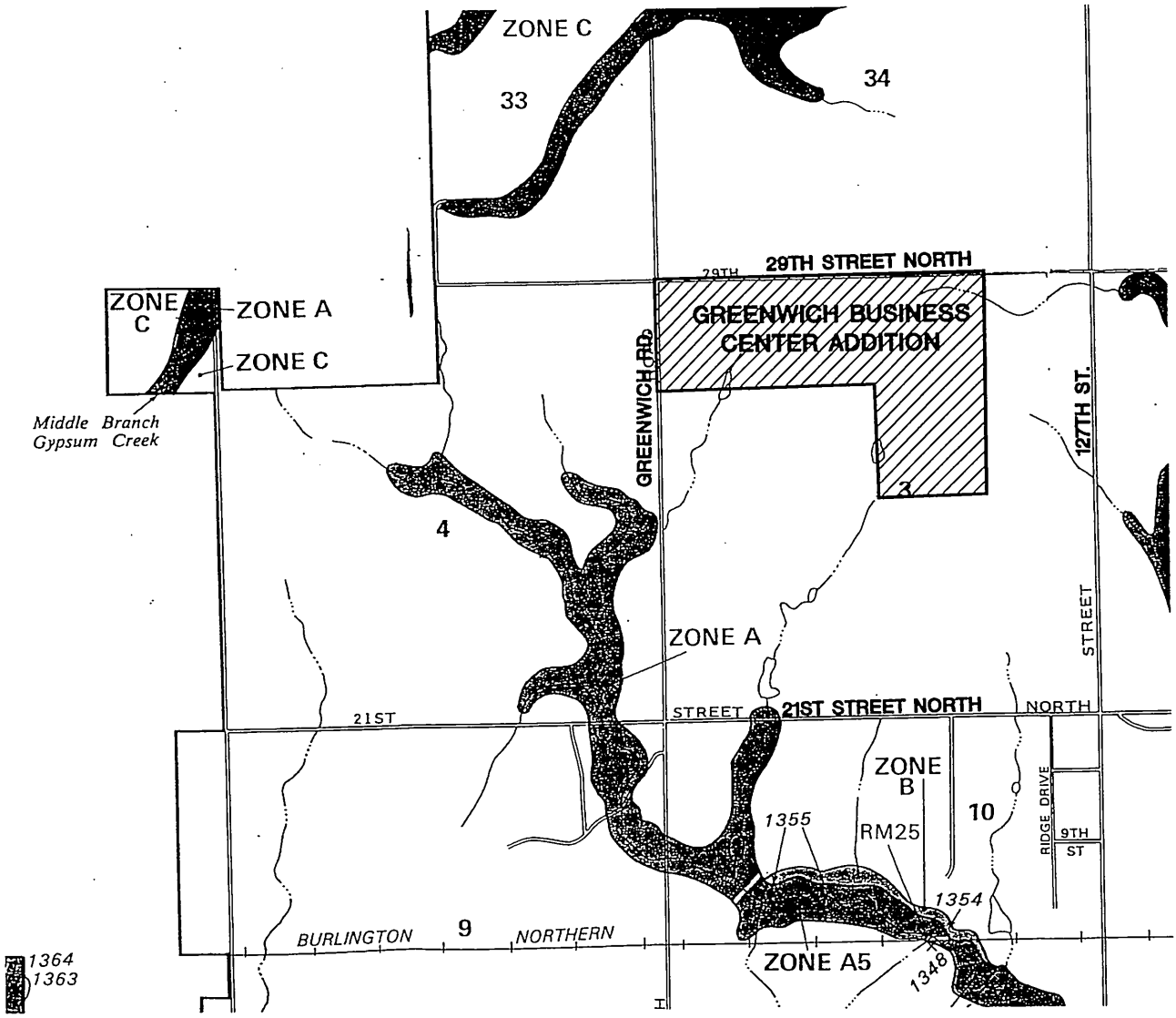
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

GREENWICH BUSINESS CENTER ADDITION
PROJECT NAME

SOIL SURVEY
SEDGWICK COUNTY, KANSAS
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JANUARY 2006	05039	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix C
Flood Insurance Rate Map (FIRM) &
Flood Boundary & Floodway Map (FBFM)



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
(UNINCORPORATED AREAS)

PANEL 150 OF 300

COMMUNITY-PANEL NUMBER
200321 0150 A

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency

APPROXIMATE SCALE

2000 0 2000 FEET

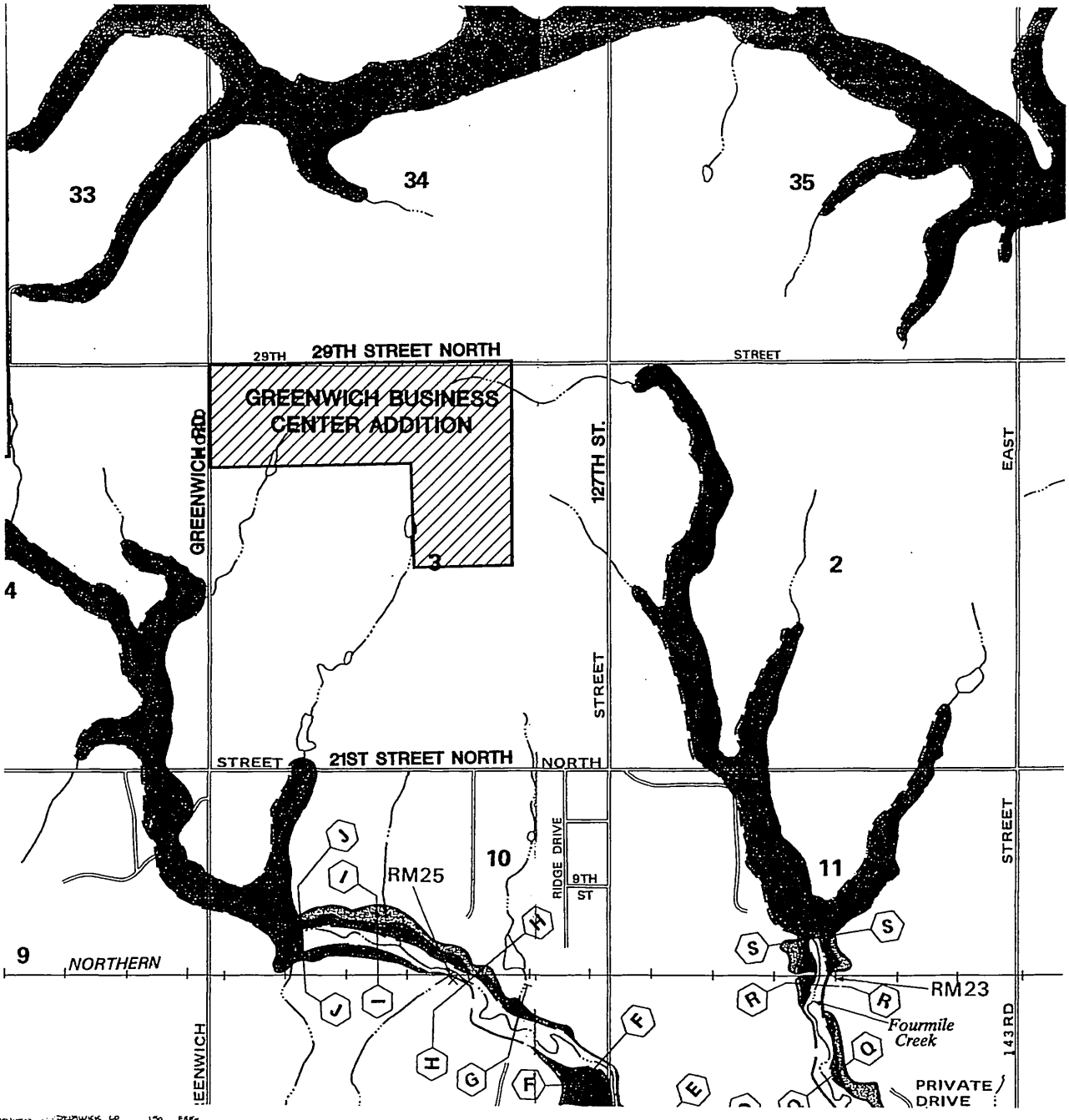
J:\CIVIL\05039\PROP\DRNG\05039FM.DWG

MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

GREENWICH BUSINESS CENTER ADDITION
PROJECT NAME

FLOOD INSURANCE RATE MAP
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JANUARY 2006	05039	1 / 1
DATE	JOB NO.	SHEET/OF



NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY

FLOOD BOUNDARY AND FLOODWAY MAP

SEDGWICK COUNTY, KANSAS (UNINCORPORATED AREAS)

PANEL 150 OF 380

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER 200321 0150

EFFECTIVE DATE: JUNE 3, 1986

Federal Emergency Management Agency

APPROXIMATE SCALE

2000 0 2000 FEET

J:\CIVIL\05039\DWG\PROP\DRNG\05039F3FM

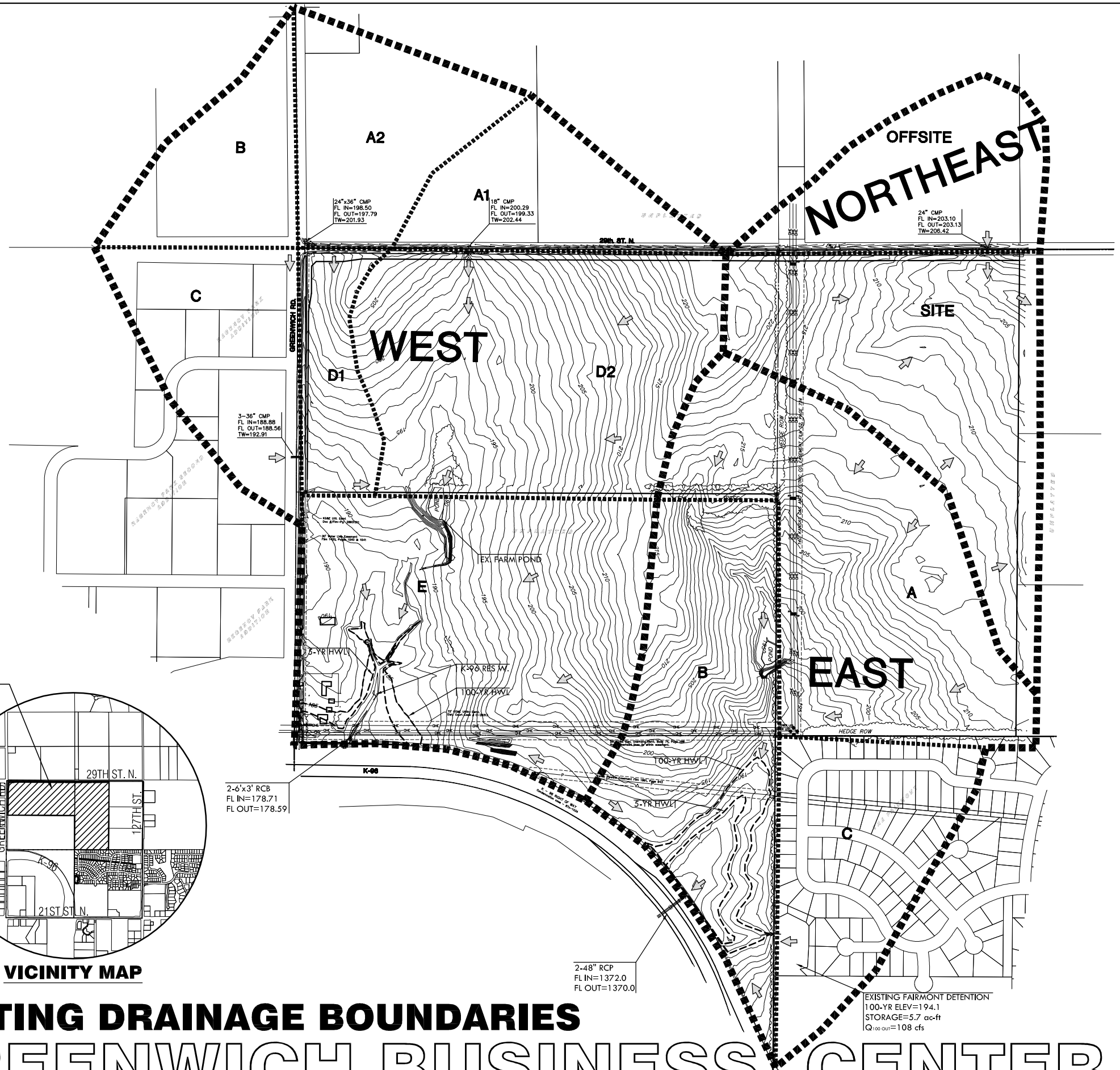
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

GREENWICH BUSINESS CENTER ADDITION
PROJECT NAME

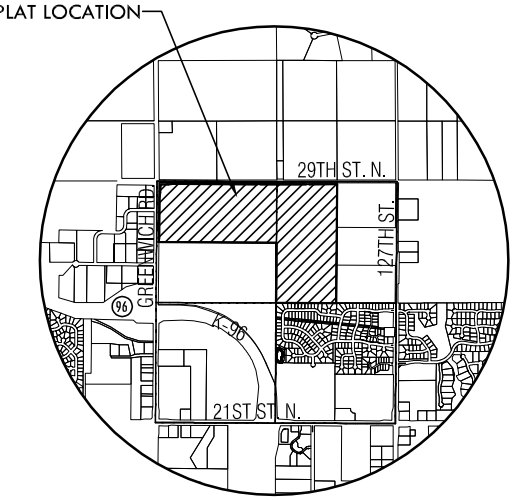
FLOOD BOUNDARY AND FLOODWAY MAP
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JANUARY 2006	05039	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix D
Existing Drainage Boundaries



PLAT LOCATION



VICINITY MAP

NOTES

1. ZONING: Existing - SF-20 and RR
   Proposed - LI upon annexation w/ P.O.
2. ANNEXATION: An application for annexation shall be submitted to the City of Wichita
3. PUBLIC UTILITIES: Shall be extended to site by petitions
4. EXISTING USE: Vacant Land and Cultivated Fields
5. PLAT AREA: Gross= 158.81 Ac.
   Net =155.65 Ac.
6. SURVEY DATE: May 12th, 2005 (by MKEC)
7. MINIMUM PADS: As shown on the Final Drainage Plan
8. LOT TOTAL - 42
9. RESERVES USES: Open space, drainage, utilities, in designated locations, monuments, landscaping, and irrigation.

BENCH MARK

BM #1 Brass Disc on top of curb in front of fire hydrant, Lot 1, Block 1, Recency Park Addition, an Addition to Wichita, Sedgwick County, KS

Elev.=191.56 (City of Wichita)
1378.96 (NGVD 29)

LEGEND

- Sec. Corner
- Fnd. Prop. Corner
- GM - GAS METER
- SSMH - SANITARY SEWER MANHOLE
- POWER POLE/GUY ANCHOR
- KGE - ELECTRIC BOX
- SN - SIGN
- GATE
- TREES
- EDGE OF TREES
- POLE - POLE
- HLP - HIGH TENSION POWER LINE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- TR - TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC
- ZONED PARCELS
- STREET DEDICATION WIDTH VARIES 60' ALONG S.L. 75' AT INTERSECTION
- WATERSHED BOUNDARIES
- DRAINAGE BOUNDARIES
- DA - DRAINAGE AREAS
- EAST - WATERSHED AREAS
- FLOW ARROW
- FLOODPLAIN BOUNDRY
- HWL - HIGH WATER LINE

SCALE: 1"=300'

300 0 300 600

EXISTING DRAINAGE BOUNDARIES

GREENWICH BUSINESS CENTER ADDITION

OWNER / DEVELOPER: Ritchie Development Corporation 8100 E. 22nd North, #1000 Wichita, KS 67226-2310 (316) 684-7300

Date: January, 2006

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600
www.mkec.com

J:\Civil\05039\dwg\Prop\dmg\05039existing Drainage plan.dwg 12/13/2005 11:13:14 AM CST

Appendix E
HEC-HMS Summary Tables

HEC-HMS OUTPUT SUMMARY TABLE

Northeast

Existing	2-Year	5-Year	10-Year	50-Year	100-Year
Onsite	63.8	95.6	118.6	176.0	203.2
Offsite	50.4	75.0	92.8	136.9	157.8
Combined	101.1	151.8	188.5	279.6	322.9

Developed	2-Year	5-Year	10-Year	50-Year	100-Year
Onsite	120.5	163.6	193.7	266.2	300.1
Offsite	57.7	79.1	93.6	125.5	138.7
Combined	177.9	242.2	286.8	390.9	437.9
Det. Discharge	114.6	164.3	198.3	278.6	311.7

East Design = 156 cfs

Existing	2-Year	5-Year	10-Year	50-Year	100-Year
Fairmont	9.0	14.1	34.5	80.6	108.3
GBC	101.2	150.8	186.6	275.1	317.2
South Prop.	81.6	121.7	150.7	222.5	256.6
Det Discharge	95.9	127.2	147.9	196.4	214.8

Developed	2-Year	5-Year	10-Year	50-Year	100-Year
Fairmont	9.0	14.1	34.5	80.6	108.3
GBC	261.7	341.1	396.4	529.7	592.2
South Prop.	88.7	115.7	134.4	179.6	200.8
Det Discharge	114.3	141.3	157.9	197.6	214.6

HEC-HMS OUTPUT SUMMARY TABLE

West Design = 232 cfs

Existing	2-Year	5-Year	10-Year	50-Year	100-Year
A1 (at 29th)	34.4	51.4	63.7	94.1	108.6
A2 (at 29th)	29.7	44.6	55.3	82.1	94.8
Greenwich W	58.4	87.6	108.8	161.3	186.2
Greenwich E	105.6	158.5	197.0	292.5	338.0
Ex. Farm Pond	201.4	318.2	396.7	590.1	681.7
South Prop	83.2	124.7	154.9	229.8	265.4
K96 Res W In	283.7	442.9	551.6	819.1	946.4
K96 Res W Out	263.3	434.0	543.3	808.2	933.5

Interim 1	2-Year	5-Year	10-Year	50-Year	100-Year
A1 (at 29th)	34.4	51.4	63.7	94.1	108.6
A2 (at 29th)	29.7	44.6	55.3	82.1	94.8
Greenwich W	89.4	125.3	150.7	212.6	241.8
Greenwich E	148.4	209.4	252.6	358.6	408.5
GBC Res W	71.1	110.5	129.9	168.1	217.4
South Prop	83.2	124.7	154.9	229.8	265.4
K96 Res W In	138.3	215.1	266.5	375.8	424.8
K96 Res W Out	137.7	210.1	258.2	372.4	421.3

Interim 2	2-Year	5-Year	10-Year	50-Year	100-Year
A1 (at 29th)	34.4	51.4	63.7	94.1	108.6
A2 (at 29th)	29.7	44.6	55.3	82.1	94.8
Greenwich W	89.4	125.3	150.7	212.6	241.8
Greenwich E	148.4	209.4	252.6	358.6	408.5
GBC Res W	71.1	110.5	129.9	168.1	183.3
South Prop	160.1	217.4	257.4	353.9	399.1
K96 Res W In	194.6	276.1	335.3	471.8	529.9
K96 Res W Out	86.3	135.8	166.6	220.2	240.9

Developed	2-Year	5-Year	10-Year	50-Year	100-Year
A1 (at 29th)	6.5	8.9	10.4	13.8	15.1
A2 (at 29th)	7.3	9.8	11.6	15.0	16.3
Greenwich W	66.2	90.0	106.6	146.5	165.2
Greenwich E	105.5	143.6	170.0	234.2	263.9
GBC Res W	54.0	82.5	103.6	137.5	150.6
South Prop	160.1	217.4	257.4	353.9	399.1
K96 Res W In	188.6	264.0	318.1	451.8	510.4
K96 Res W Out	76.7	118.5	150.2	206.9	229.1

Appendix F
Times of Concentration Calculations

Time of Concentration Calculations
Greenwich Business Center

Soil Group **D**

Area Name	C 2-yr	C 5-yr	C 10-yr	C 100-yr	Land Use	Maximum Elevation	Minimum Elevation	Flow Length (L)	T_c 2-yr	T_c 5-yr	T_c 10-yr	T_c 100-yr	Lag 100-yr = (0.6*Tc)
Pre-Developed West Watershed													
A1	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1410.0	1387.7	1365	45.2	42.3	36.7	25.4	15
A2	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1400.0	1388.8	1676	67.4	63.2	54.8	37.9	23
B	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1401.0	1387.0	1298	50.6	47.4	41.1	28.5	17
C	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1391.0	1380.0	1683	68.1	63.8	55.3	38.3	23
D1	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1394.5	1378.4	1443	52.7	49.4	42.9	29.7	18
D2	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1410.1	1376.4	2204	58.7	55.0	47.7	33.0	20
E	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1402.4	1370.4	2531	67.0	62.8	54.4	37.7	23
Pre-Developed East Watershed													
A	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1411.0	1378.0	1365	39.6	37.2	32.2	22.3	13
B	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1408.0	1383.0	1200	39.1	36.6	31.7	22.0	13
C	0.50	0.54	0.62	0.76	Residential - 1/4 Acre	1392.0	1380.0	1600	47.5	44.4	38.0	26.9	16
Pre-Developed Northeast Watershed													
Offsite	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1405.0	1380.0	972	32.8	30.7	26.6	18.4	11
Onsite	0.30	0.35	0.45	0.65	Urban Lawn - Slopes 1-4%	1401.1	1388.3	1700	65.3	61.2	53.0	36.7	22
Post-Developed West Watershed													
A1	0.68	0.69	0.73	0.80	Industrial - Light	1410.0	1387.7	1365	23.7	23.2	20.9	16.9	10
A2	0.68	0.69	0.73	0.80	Industrial - Light	1400.0	1388.8	1676	35.4	34.6	31.2	25.3	15
B	0.68	0.69	0.73	0.80	Industrial - Light	1401.0	1387.0	1298	26.6	25.9	23.4	19.0	11
C	0.68	0.69	0.73	0.80	Industrial - Light	1391.0	1380.0	1683	35.7	34.9	31.5	25.5	15
D1	0.68	0.69	0.73	0.80	Industrial - Light	1394.5	1378.4	1443	27.7	27.0	24.4	19.8	12
D2	0.68	0.69	0.73	0.80	Industrial - Light	1410.1	1376.4	2204	30.8	30.1	27.1	22.0	13
E	0.68	0.69	0.73	0.80	Industrial - Light	1402.4	1370.4	2531	35.2	34.3	31.0	25.1	15
Post-Developed East Watershed													
A	0.68	0.69	0.73	0.80	Industrial - Light	1411.0	1378.0	1365	20.8	20.3	18.3	15.0	9
B	0.68	0.69	0.73	0.80	Industrial - Light	1408.0	1383.0	1200	20.5	20.0	18.1	15.0	9
C	0.50	0.54	0.62	0.76	Residential - 1/4 Acre	1392.0	1380.0	1600	47.5	44.4	38.0	26.9	16
Post-Developed Northeast Watershed													
Offsite	0.68	0.69	0.73	0.80	Industrial - Light	1405.0	1380.0	972	17.2	16.8	15.2	15.0	9
Onsite	0.68	0.69	0.73	0.80	Industrial - Light	1401.1	1388.3	1700	34.3	33.4	30.2	24.5	15

Appendix G
Four Corner Lot Grading Plan

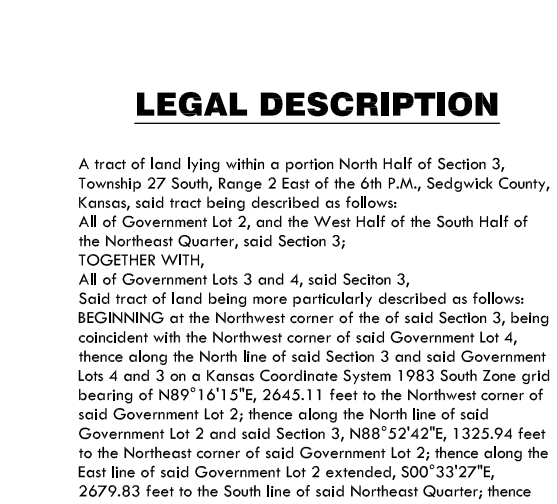
LEGAL DESCRIPTION

A tract of land lying within a portion North Half of Section 3, Township 27 South, Range 2 East of the 6th P.M., Sedgwick County, Kansas, said tract being described as follows:
All of Government Lot 2, and the West Half of the South Half of the Northeast Quarter, said Section 3;
TOGETHER WITH,
All of Government Lots 3 and 4, said Seciton 3,
Said tract of land being more particularly described as follows:
BEGINNING at the Northwest corner of the of said Section 3, being coincident with the Northwest corner of said Government Lot 4, thence along the North line of said Section 3 and said Government Lots 4 and 3 on a Kansas Coordinate System 1983 South Zone grid bearing of N89°16'15"E, 2645.11 feet to the Northwest corner of said Government Lot 2; thence along the North line of said Government Lot 2 and said Section 3, N88°52'42"E, 1325.94 feet to the Northeast corner of said Government Lot 2; thence along the East line of said Government Lot 2 extended, S00°33'27"E, 2679.83 feet to the South line of said Northeast Quarter; thence along the said South line, being coincident with the North line of The Fairmont, an addition to Wichita, Sedgwick County, Kansas, S89°07'06"W, 1324.14 feet to the Center Quarter corner being the Northwest corner of said The Fairmont; thence along the West line of said Northeast Quarter, N00°35'43"W, 1331.13 feet to the Southeast corner of said Government Lot 3; thence along the South lines of said Government Lots 3 and 4, S89°14'33"W, 2646.39 feet to the Southwest corner of said Government Lot 4 being coincident with the West line of said Section 3; thence along said West line N00°32'28"W, 1344.46 feet to the POINT OF BEGINNING.

BENCH MARK

BM ⊕ Brass Disc on top of curb in front of fire hydrant, Lot 1, Block 1, Recency Park Addition, an Addition to Wichita, Sedgwick County, KS

Elev.=191.56 (City of Wichita)
1378.96 (NGVD 29)



VICINITY MAP

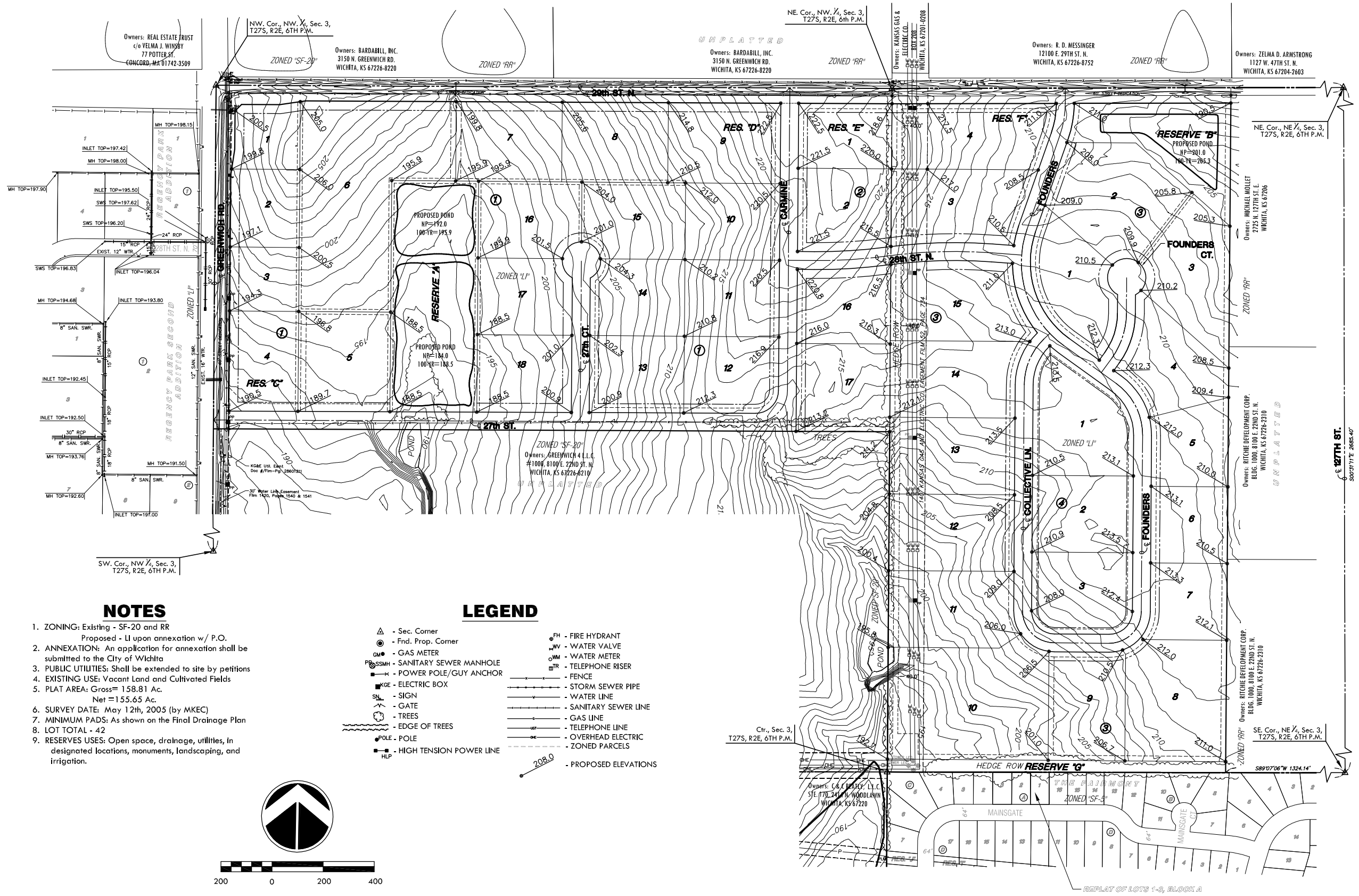
NOTES

1. ZONING: Existing - SF-20 and RR
   Proposed - LI upon annexation w/ P.O.
2. ANNEXATION: An application for annexation shall be submitted to the City of Wichita
3. PUBLIC UTILITIES: Shall be extended to site by petitions
4. EXISTING USE: Vacant Land and Cultivated Fields
5. PLAT AREA: Gross= 158.81 Ac.
   Net =155.65 Ac.
6. SURVEY DATE: May 12th, 2005 (by MKEC)
7. MINIMUM PADS: As shown on the Final Drainage Plan
8. LOT TOTAL - 42
9. RESERVES USES: Open space, drainage, utilities, in designated locations, monuments, landscaping, and irrigation.

LEGEND

- Sec. Corner
- Fnd. Prop. Corner
- GM - GAS METER
- PB SSMH - SANITARY SEWER MANHOLE
- POWER POLE/GUY ANCHOR
- KGE - ELECTRIC BOX
- SN - SIGN
- GATE
- TREES
- EDGE OF TREES
- POLE - POLE
- HLP - HIGH TENSION POWER LINE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- TR - TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OHE - OVERHEAD ELECTRIC
- ZONED PARCELS
- 208.0 - PROPOSED ELEVATIONS

200 0 200 400



FOUR CORNER LOT GRADING PLAN

GREENWICH BUSINESS CENTER ADDITION

OWNER / DEVELOPER: Ritchie Development Corporation 8100 E. 22nd North, #1000 Wichita, KS 67226-2310 (316) 684-7300

Date: January, 2006

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600
www.mkec.com

J:\Grad\05039\dwg\grad05039GP.dwg 12/19/2005 10:39:46 AM CST

Appendix H
Utility Plan

BENCH MARK

Brass Disc on top of curb in front of fire hydrant,
Lot 1, Block 1, Recency Park Addition, an Addition
to Wichita, Sedgwick County, KS

Elev.=191.56 (City of Wichita)
1378.96 (NGVD 29)

LEGEND

- Sec. Corner
- Fnd. Prop. Corner
- GM - GAS METER
- SSMH - SANITARY SEWER MANHOLE
- POLE - POWER POLE/GUY ANCHOR
- KGE - ELECTRIC BOX
- SN - SIGN
- GATE
- TREES
- EDGE OF TREES
- POLE
- HLP - HIGH TENSION POWER LINE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- TR - TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC
- ZONED PARCELS
- STREET DEDICATION WIDTH VARIES
  60' ALONG S.L.
  75' AT INTERSECTION

NW. Cor., NW. ¼, Sec. 3, T27S, R2E, 6TH P.M.

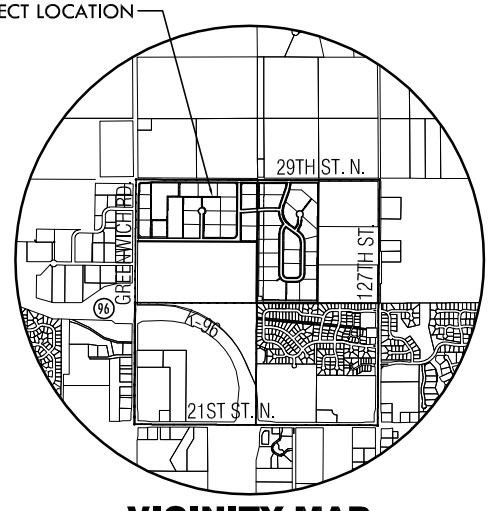
NE. Cor., NW. ¼, Sec. 3, T27S, R2E, 6th P.M.

NE. Cor., NE ¼, Sec. 3, T27S, R2E, 6TH P.M.

SW. Cor., NW ¼, Sec. 3, T27S, R2E, 6TH P.M.

SE. Cor., NW ¼, Sec. 3, T27S, R2E, 6TH P.M.

PROJECT LOCATION



VICINITY MAP

NOTES

1. ZONING: Existing - SF-20 and RR
   Proposed - LI upon annexation w/ P.O.
2. ANNEXATION: An application for annexation shall be submitted to the City of Wichita
3. PUBLIC UTILITIES: Shall be extended to site by petitions
4. EXISTING USE: Vacant Land and Cultivated Fields
5. PLAT AREA: Gross= 158.81 Ac.
   Net =155.65 Ac.
6. SURVEY DATE: May 12th, 2005 (by MKEC)
7. MINIMUM PADS: As shown on the Final Drainage Plan
8. LOT TOTAL - 42
9. RESERVES USES: Open space, drainage, utilities, in designated locations, monuments, landscaping, and irrigation.

200 0 200 400

UTILITY PLAN

GREENWICH BUSINESS CENTER ADDITION

Revised Date: January, 2006

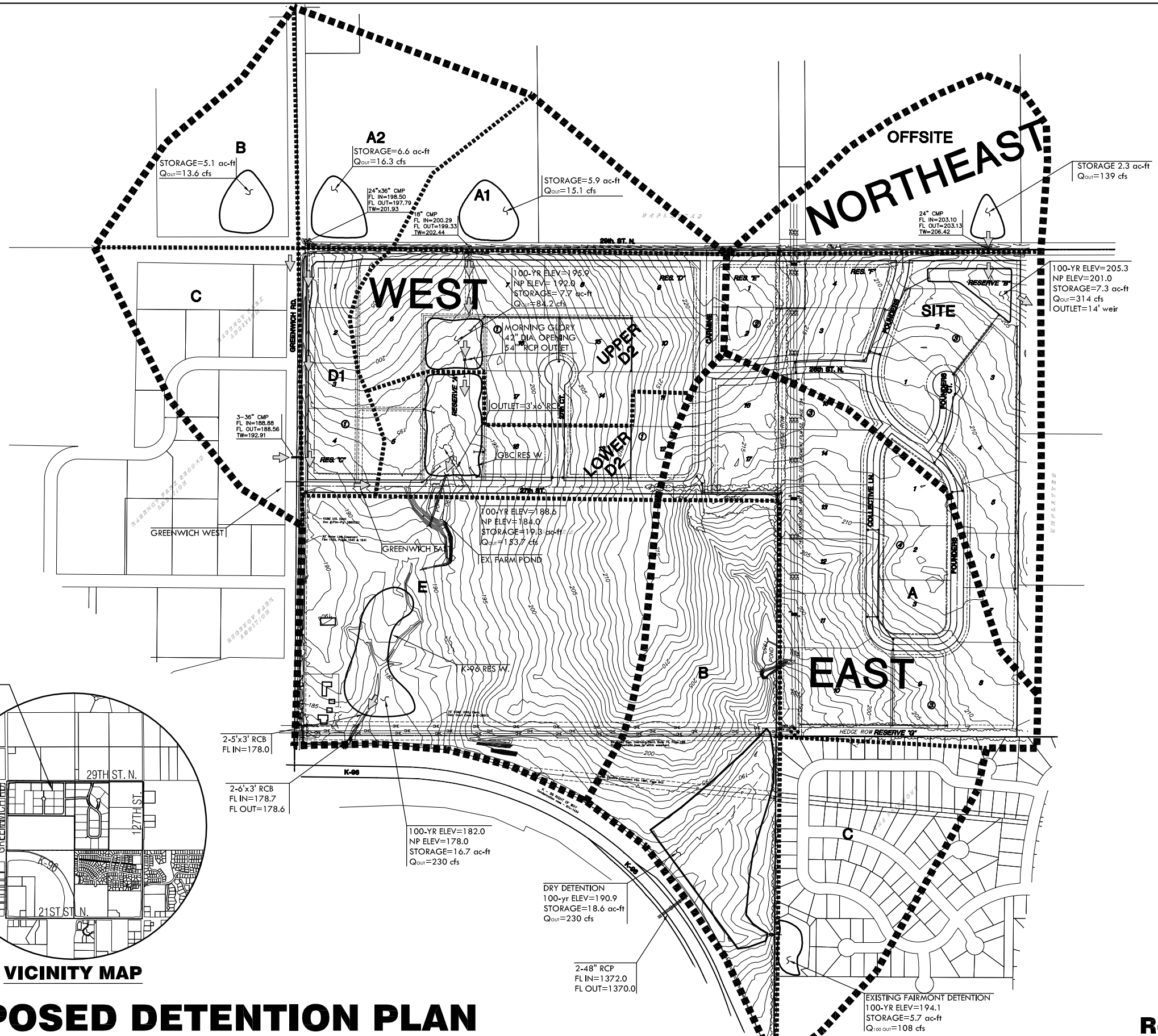
Date: August, 2005

OWNER / DEVELOPER: Ritchie Development Corporation 8100 E. 22nd North, #1000 Wichita, KS 67226-2310 (316) 684-7300

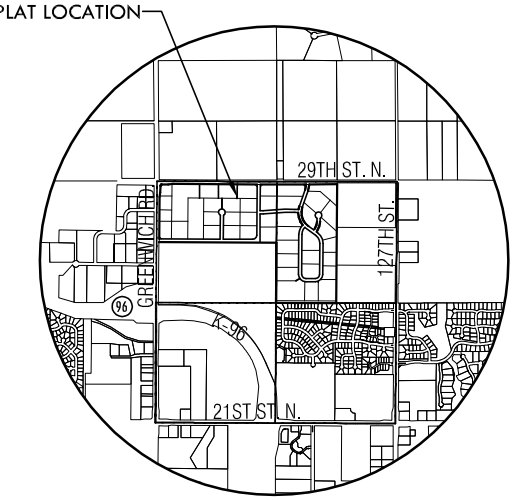
MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600
www.mkec.com

J:\Civil\05039\dwg\Prop Util\05039UP.dwg 6/27/2005 11:14:11 AM CST

Appendix I
Proposed Detention Plan



PLAT LOCATION



VICINITY MAP

NOTES

1. ZONING: Existing - SF-20 and RR
   Proposed - LI upon annexation w/ P.O.
2. ANNEXATION: An application for annexation shall be submitted to the City of Wichita
3. PUBLIC UTILITIES: Shall be extended to site by petitions
4. EXISTING USE: Vacant Land and Cultivated Fields
5. PLAT AREA: Gross= 158.81 Ac.
   Net =155.65 Ac.
6. SURVEY DATE: May 12th, 2005 (by MKEC)
7. MINIMUM PADS: As shown on the Final Drainage Plan
8. LOT TOTAL - 42
9. RESERVES USES: Open space, drainage, utilities, in designated locations, monuments, landscaping, and irrigation.

BENCH MARK

BM #1 Brass Disc on top of curb in front of fire hydrant, Lot 1, Block 1, Recency Park Addition, an Addition to Wichita, Sedgwick County, KS

Elev.=191.56 (City of Wichita)
1378.96 (NGVD 29)

LEGEND

- Sec. Corner
- Fnd. Prop. Corner
- GM - GAS METER
- SSMH - SANITARY SEWER MANHOLE
- POWER POLE/GUY ANCHOR
- KGE - ELECTRIC BOX
- SN - SIGN
- GATE
- TREES
- EDGE OF TREES
- POLE - POLE
- HLP - HIGH TENSION POWER LINE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- TR - TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC
- ZONED PARCELS
- STREET DEDICATION WIDTH VARIES 60' ALONG S.L. 75' AT INTERSECTION
- WATERSHED BOUNDARIES
- DRAINAGE BOUNDARIES
- DA - DRAINAGE AREAS
- EAST - WATERSHED AREAS
- FLOW ARROW

SCALE: 1"=300'

300 0 300 600

PROPOSED DETENTION PLAN

GREENWICH BUSINESS CENTER ADDITION

Revised Date: January, 2006

Date: August, 2005

OWNER / DEVELOPER: Ritchie Development Corporation 8100 E. 22nd North, #1000 Wichita, KS 67226-2310 (316) 684-7300

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600
www.mkec.com

J:\Civil\05039\dwg\Prop\dmg\05039proposed detention plan.dwg 12/13/2005 11:13:14 AM CST

Appendix J
Drainage Plan

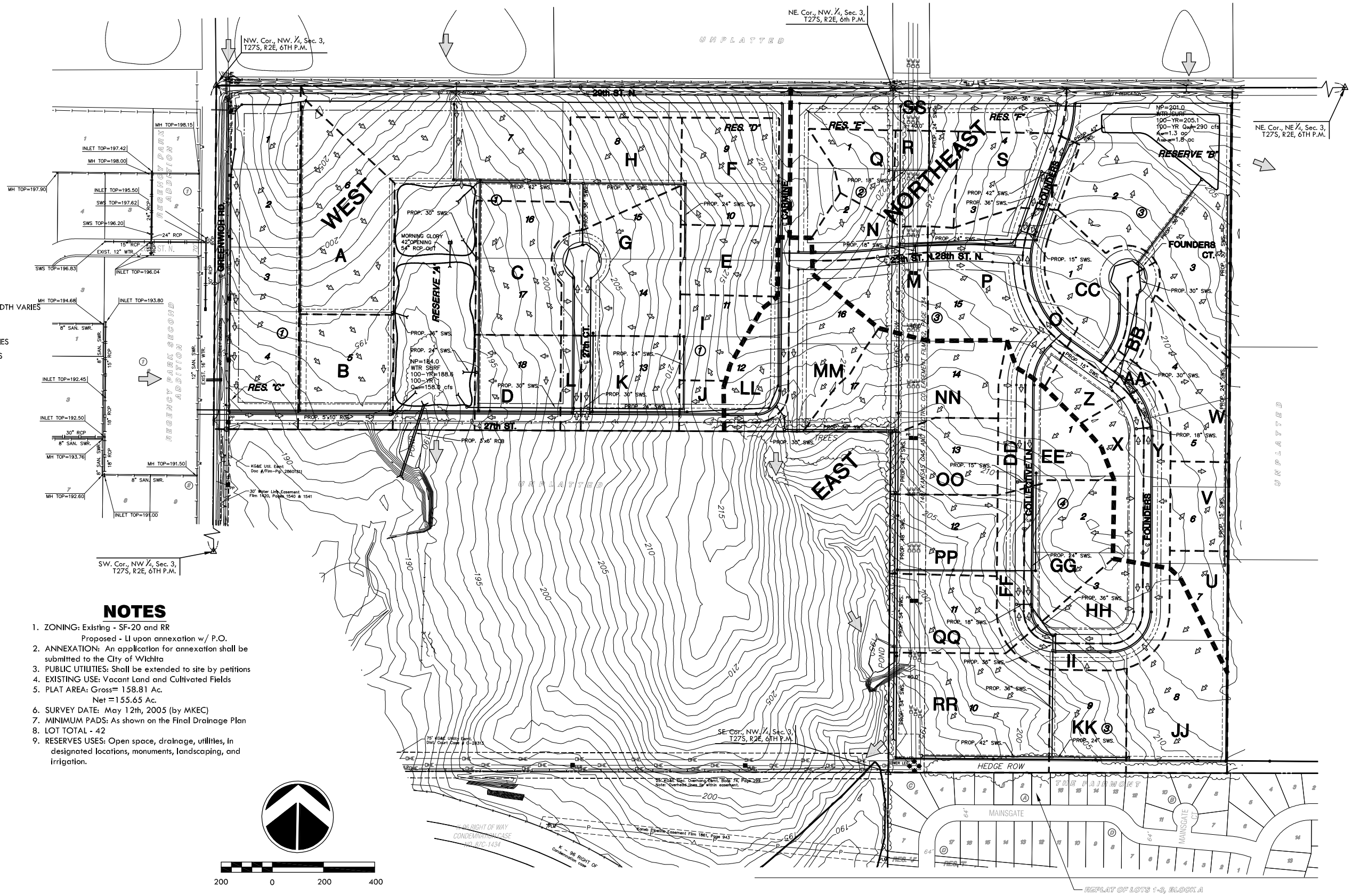
BENCH MARK

Brass Disc on top of curb in front of fire hydrant,
Lot 1, Block 1, Recency Park Addition, an Addition
to Wichita, Sedgwick County, KS

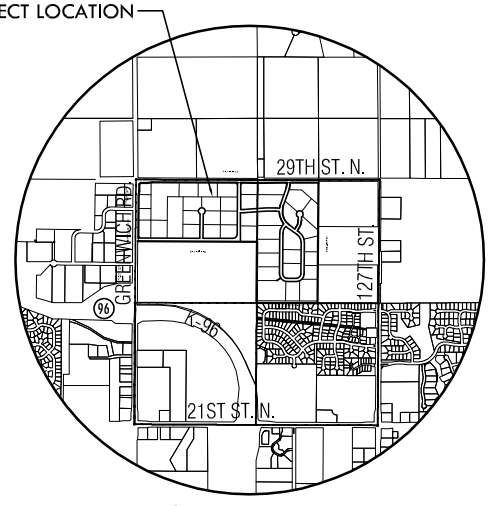
Elev.=191.56 (City of Wichita)
1378.96 (NGVD 29)

LEGEND

- Sec. Corner
- Fnd. Prop. Corner
- GM - GAS METER
- SSMH - SANITARY SEWER MANHOLE
- POLE - POWER POLE/GUY ANCHOR
- KGE - ELECTRIC BOX
- SN - SIGN
- GATE
- TREES
- EDGE OF TREES
- POLE
- HLP - HIGH TENSION POWER LINE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- TR - TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC
- ZONED PARCELS
- STREET DEDICATION WIDTH VARIES 60' ALONG S.L. 75' AT INTERSECTION
- WATERSHED BOUNDARIES
- DRAINAGE BOUNDARIES
- DA - DRAINAGE AREAS
- EAST - WATERSHED AREAS
- FLOW ARROW



PROJECT LOCATION



VICINITY MAP

NOTES

1. ZONING: Existing - SF-20 and RR
   Proposed - LI upon annexation w/ P.O.
2. ANNEXATION: An application for annexation shall be submitted to the City of Wichita
3. PUBLIC UTILITIES: Shall be extended to site by petitions
4. EXISTING USE: Vacant Land and Cultivated Fields
5. PLAT AREA: Gross= 158.81 Ac.
   Net =155.65 Ac.
6. SURVEY DATE: May 12th, 2005 (by MKEC)
7. MINIMUM PADS: As shown on the Final Drainage Plan
8. LOT TOTAL - 42
9. RESERVES USES: Open space, drainage, utilities, In designated locations, monuments, landscaping, and irrigation.

200 0 200 400

DRAINAGE PLAN

GREENWICH BUSINESS CENTER ADDITION

Revised Date: January, 2006

Date: August, 2005

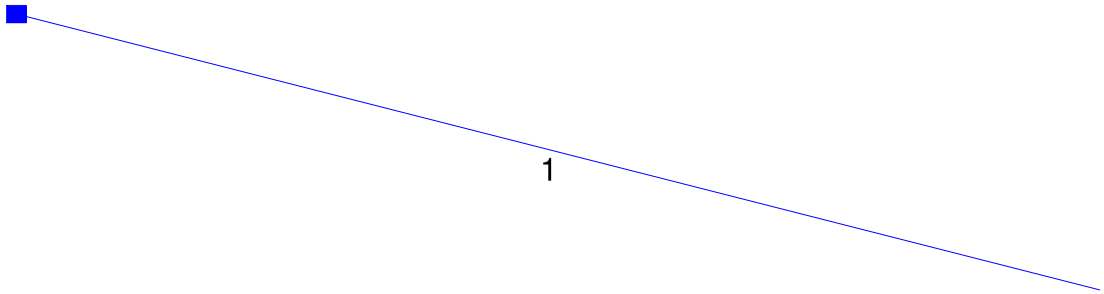
OWNER / DEVELOPER: Ritchie Development Corporation 8100 E. 22nd North, #1000 Wichita, KS 67226-2310 (316) 684-7300

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9000
www.mkec.com

J:\Civil\05039\dwg\Prop\dmg\05039DP.dwg 6/27/2005 11:14:11 AM CST

Appendix K
Hydraflow Storm Sewer Output

Hydraflow Plan View



Project file: 100-yr DA A.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 1	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	56.0	-164.0	Genr	0.00	5.83	0.80	15.0	180.20	7.68	184.50	30	Cir	0.013	1.00	194.00	

Project File: 100-yr DA A.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 1 | Date: 01-05-2006

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		34.35	30 c	56.0	180.20	184.50	7.679	188.52*	188.91*	0.76	End

Project File: 100-yr DA A.stm	IDF File: SedgwickCoKS.IDF	Total No. Lines: 1	Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	56.0	5.83	5.83	0.80	4.66	4.66	15.0	15.0	7.4	34.35	113.6	7.00	30	7.68	184.50	180.20	188.91	188.52	194.00	184.00	

Project File: 100-yr DA A.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 1 | Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 188.52 (ft)

Hydraflow Inlet Report

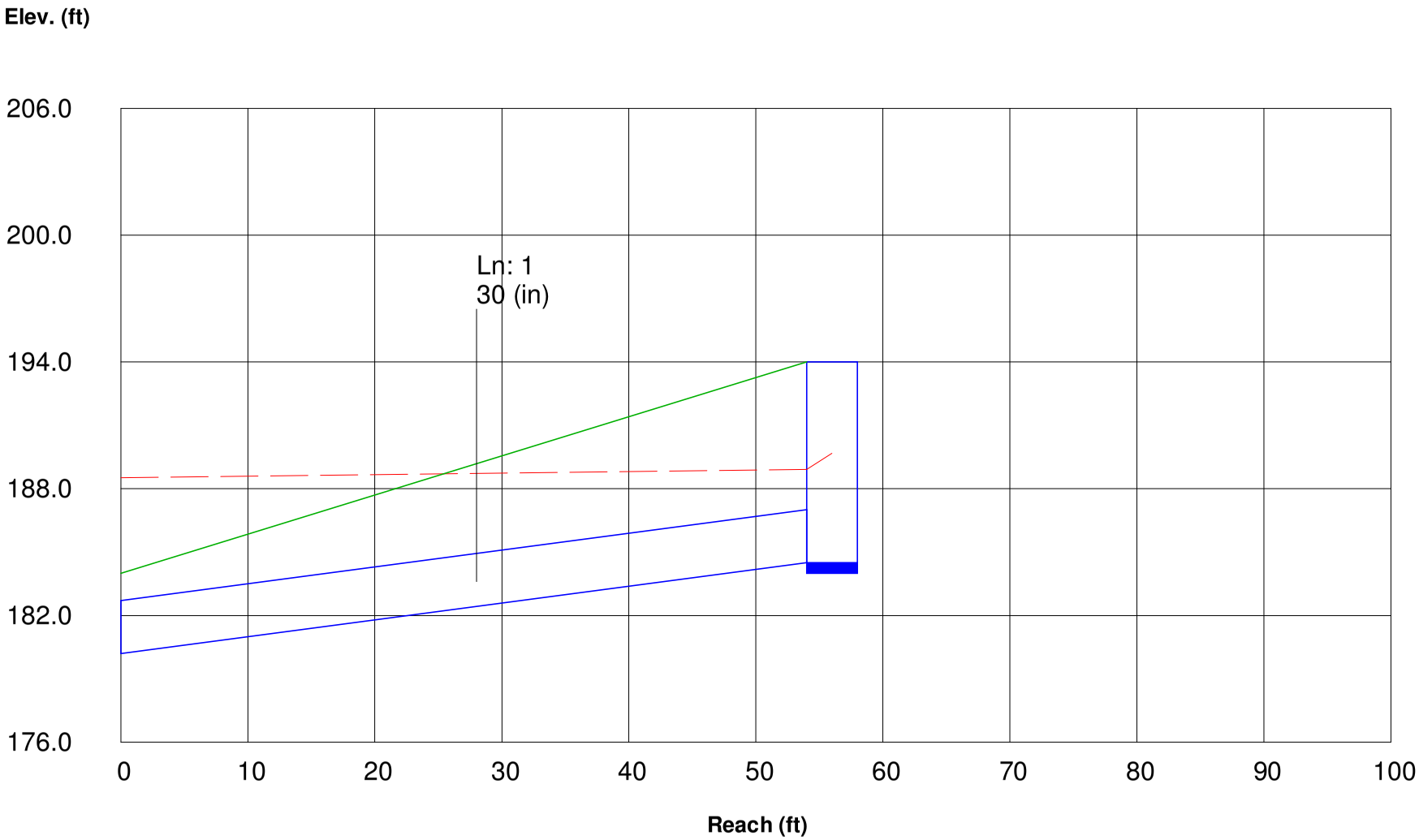
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		34.35	0.00	34.35	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off

Project File: 100-yr DA A.stm	I-D-F File: SedgwickCoKS.IDF	Total number of lines: 1	Run Date: 01-05-2006

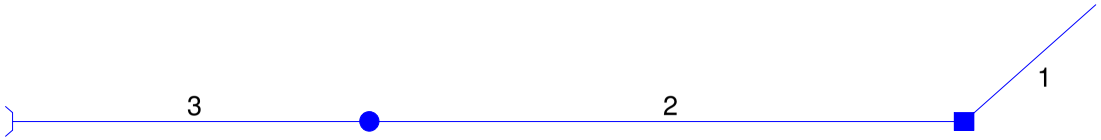
NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 100-yr DA A.stm



Hydraflow Plan View



Project file: South RCB.stm	IDF file: sampleFHA.IDF	No. Lines: 3	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	125.0	135.0	Curb	0.00	3.82	0.69	19.0	183.50	0.40	184.00	60 120	Box	0.013	1.10	190.00	
2	1	400.0	45.0	MH	0.00	0.00	0.00	0.0	184.10	0.10	184.50	60 120	Box	0.013	0.15	192.00	
3	2	240.0	0.0	Hdwl	264.00	0.00	0.00	0.0	184.60	0.10	184.84	60 120	Box	0.013	1.00	190.00	

Project File: South RCB.stm | IDF File: sampleFHA.IDF | Total number of lines: 3 | Date: 01-05-2006

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		281.6	60 x 120 b	125.0	183.50	184.00	0.400	188.77	188.87	0.57	End
2		264.0	60 x 120 b	400.0	184.10	184.50	0.100	189.44*	189.87*	0.07	1
3		264.0	60 x 120 b	240.0	184.60	184.84	0.100	189.94*	190.20*	0.43	2

Project File: South RCB.stm | IDF File: sampleFHA.IDF | Total No. Lines: 3 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	125.0	3.82	3.82	0.69	2.64	2.64	19.0	19.0	6.7	281.6	508.2	5.71	60 b	0.40	184.00	183.50	188.87	188.77	190.00	184.00	
2	1	400.0	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	264.0	254.1	5.28	60 b	0.10	184.50	184.10	189.87	189.44	192.00	190.00	
3	2	240.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	264.0	254.1	5.28	60 b	0.10	184.84	184.60	190.20	189.94	190.00	192.00	

Project File: South RCB.stm | IDF File: sampleFHA.IDF | Total number of lines: 3 | Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 188.77 (ft)

Hydraflow Inlet Report

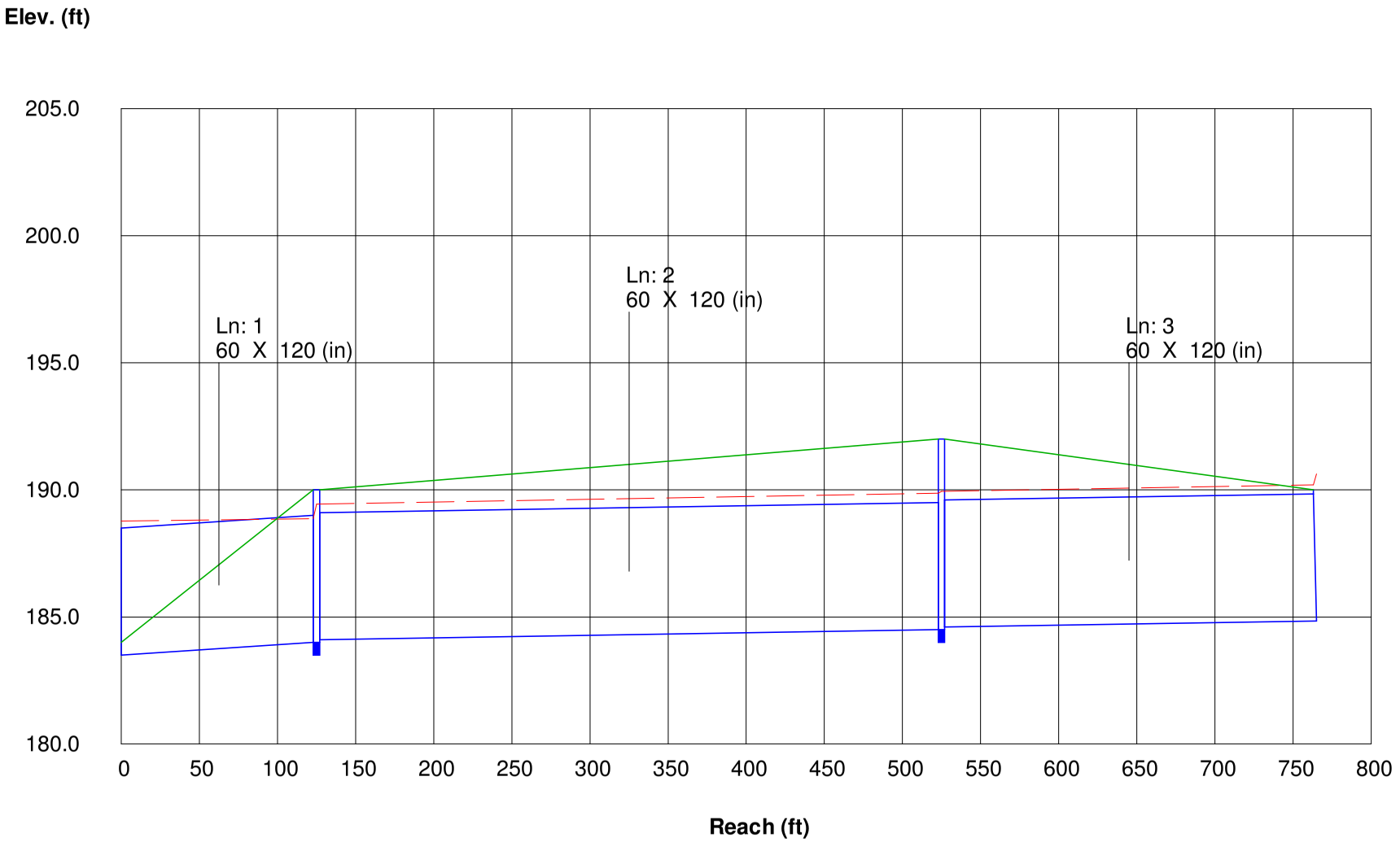
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		17.60	0.00	17.60	0.00	Curb	6.0	632.59	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.18	1.83	0.21	1.85	2.00	Off
2		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	1
3		264.00*	0.00	264.00	0.00	Hdwl	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	2

Project File: South RCB.stm	I-D-F File: sampleFHA.IDF	Total number of lines: 3	Run Date: 01-05-2006

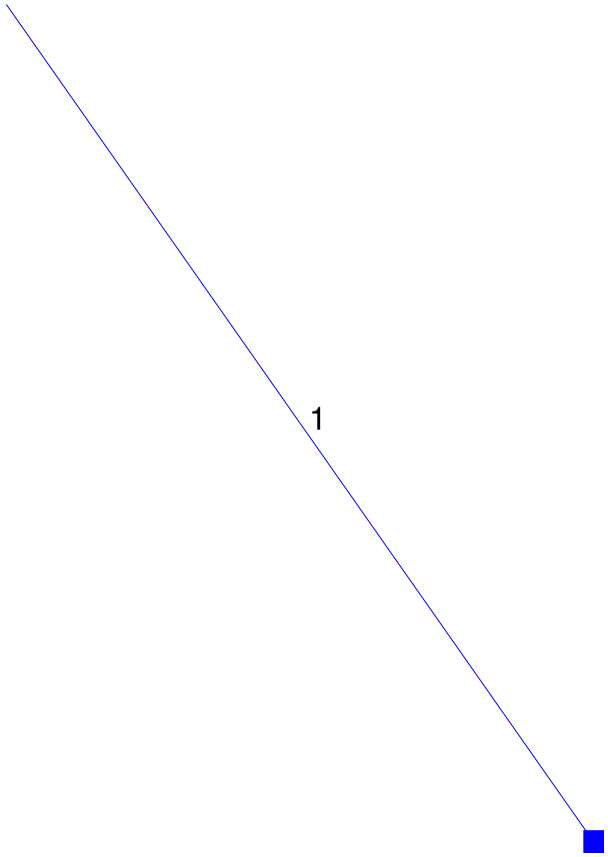
NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: South RCB.stm



Hydraflow Plan View



Project file: 100-yr DA C.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 1	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	87.0	52.0	Genr	0.00	4.07	0.80	15.0	187.67	5.00	192.02	36	Cir	0.013	1.00	196.50	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		23.98	36 c	87.0	187.67	192.02	5.000	195.90*	196.01*	0.18	End

Project File: 100-yr DA C.stm	IDF File: SedgwickCoKS.IDF	Total No. Lines: 1	Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	87.0	4.07	4.07	0.80	3.26	3.26	15.0	15.0	7.4	23.98	149.1	3.39	36	5.00	192.02	187.67	196.01	195.90	196.50	192.00	

Project File: 100-yr DA C.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 1 | Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 195.90 (ft)

Hydraflow Inlet Report

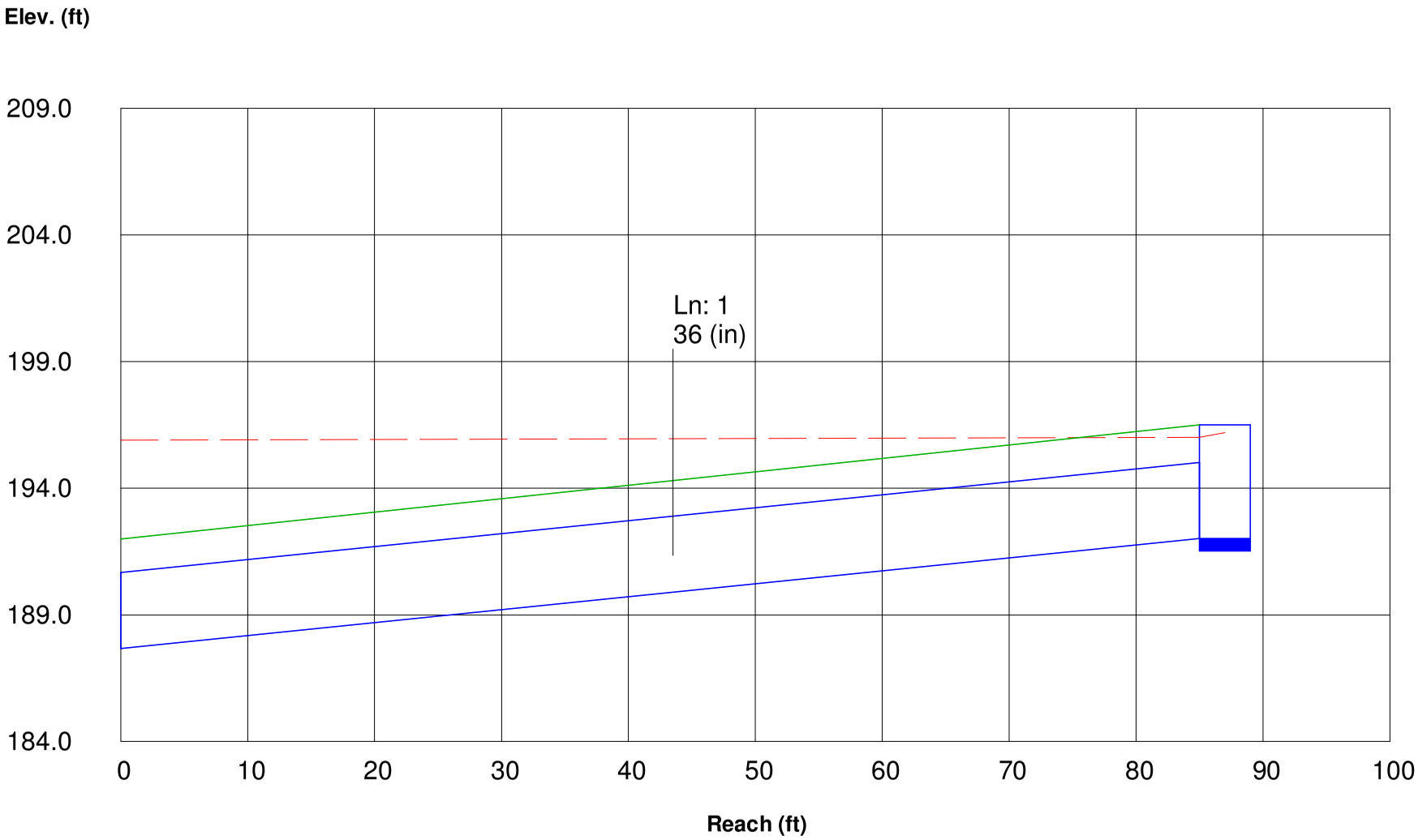
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		23.98	0.00	12.42	11.56	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off

Project File: 100-yr DA C.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 1 | Run Date: 01-05-2006

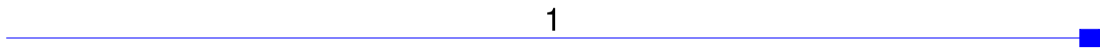
NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 100-yr DA C.stm



Hydraflow Plan View



Project file: 100-yr DA D.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 1	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	47.0	0.0	Genr	0.00	2.87	0.80	15.0	180.75	6.91	184.00	24	Cir	0.013	1.00	190.00	

Project File: 100-yr DA D.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 1 | Date: 01-05-2006

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		16.91	24 c	47.0	180.75	184.00	6.915	188.77*	189.03*	0.45	End

Project File: 100-yr DA D.stm	IDF File: SedgwickCoKS.IDF	Total No. Lines: 1	Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	47.0	2.87	2.87	0.80	2.30	2.30	15.0	15.0	7.4	16.91	59.48	5.38	24	6.91	184.00	180.75	189.03	188.77	190.00	184.00	

Project File: 100-yr DA D.stm

IDF File: SedgwickCoKS.IDF

Total number of lines: 1

Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 188.77 (ft)

Hydraflow Inlet Report

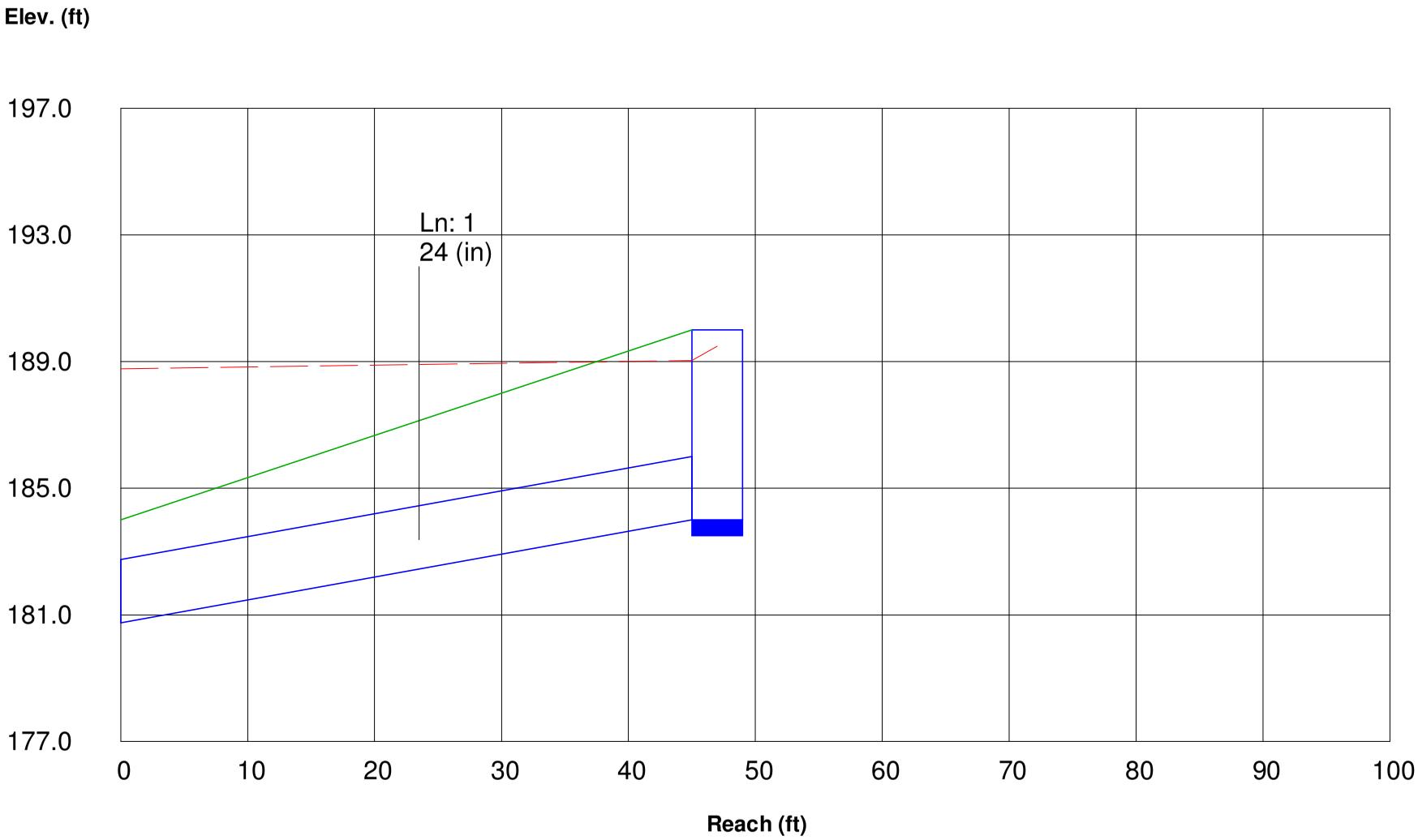
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		16.91	0.00	9.01	7.90	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off

Project File: 100-yr DA D.stm	I-D-F File: SedgwickCoKS.IDF	Total number of lines: 1	Run Date: 01-05-2006

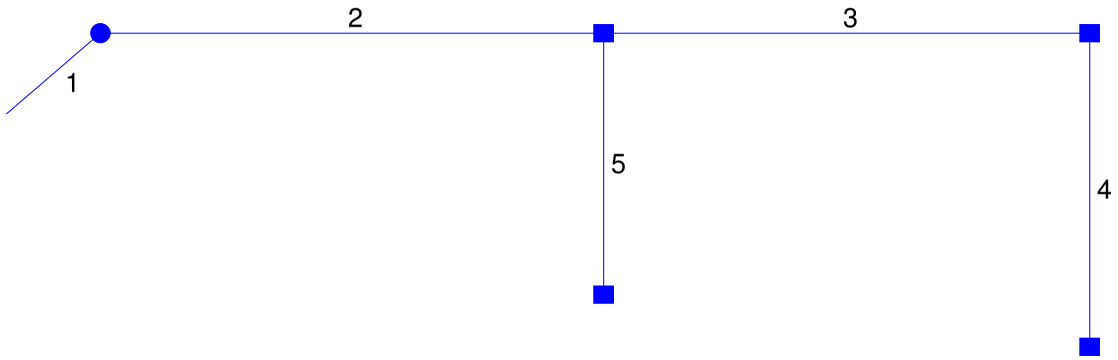
NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 100-yr DA D.stm



Hydraflow Plan View



Project file: 5-yr DA E-H.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 5	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	107.0	-44.0	MH	0.00	0.00	0.00	15.0	187.00	4.67	192.00	42	Cir	0.013	0.75	197.50	
2	1	412.0	44.0	Genr	0.00	3.57	0.69	15.0	192.50	0.12	192.99	36	Cir	0.013	1.50	201.00	
3	2	398.0	0.0	Genr	0.00	3.68	0.69	15.0	193.49	0.15	194.09	30	Cir	0.013	1.50	208.00	
4	3	289.0	90.0	Genr	0.00	2.39	0.69	15.0	194.59	0.21	195.20	24	Cir	0.013	1.00	210.00	
5	2	241.0	90.0	Genr	0.00	5.27	0.69	15.0	193.09	0.12	193.38	36	Cir	0.013	1.00	202.50	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		41.07	42 c	107.0	187.00	192.00	4.673	194.25	194.10	0.54	End
2		42.26	36 c	412.0	192.50	192.99	0.119	195.50*	197.15*	0.83	1
3		18.02	30 c	398.0	193.49	194.09	0.151	197.99*	198.76*	0.31	2
4		7.50	24 c	289.0	194.59	195.20	0.211	199.07*	199.39*	0.09	3
5		16.54	36 c	241.0	193.09	193.38	0.120	197.99*	198.14*	0.09	2

Project File: 5-yr DA E-H.stm | IDF File: SedgwickCoKS.IDF | Total No. Lines: 5 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	107.0	0.00	14.91	0.00	0.00	10.29	15.0	20.0	4.0	41.07	217.5	5.54	42	4.67	192.00	187.00	194.10	194.25	197.50	192.00	
2	1	412.0	3.57	14.91	0.69	2.46	10.29	15.0	18.8	4.1	42.26	23.00	5.98	36	0.12	192.99	192.50	197.15	195.50	201.00	197.50	
3	2	398.0	3.68	6.07	0.69	2.54	4.19	15.0	17.0	4.3	18.02	15.92	3.67	30	0.15	194.09	193.49	198.76	197.99	208.00	201.00	
4	3	289.0	2.39	2.39	0.69	1.65	1.65	15.0	15.0	4.5	7.50	10.39	2.39	24	0.21	195.20	194.59	199.39	199.07	210.00	208.00	
5	2	241.0	5.27	5.27	0.69	3.64	3.64	15.0	15.0	4.5	16.54	23.14	2.34	36	0.12	193.38	193.09	198.14	197.99	202.50	201.00	

Project File: 5-yr DA E-H.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 5 | Run Date: 01-05-2006

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Initial tailwater elevation = 194.25 (ft)

Hydraflow Inlet Report

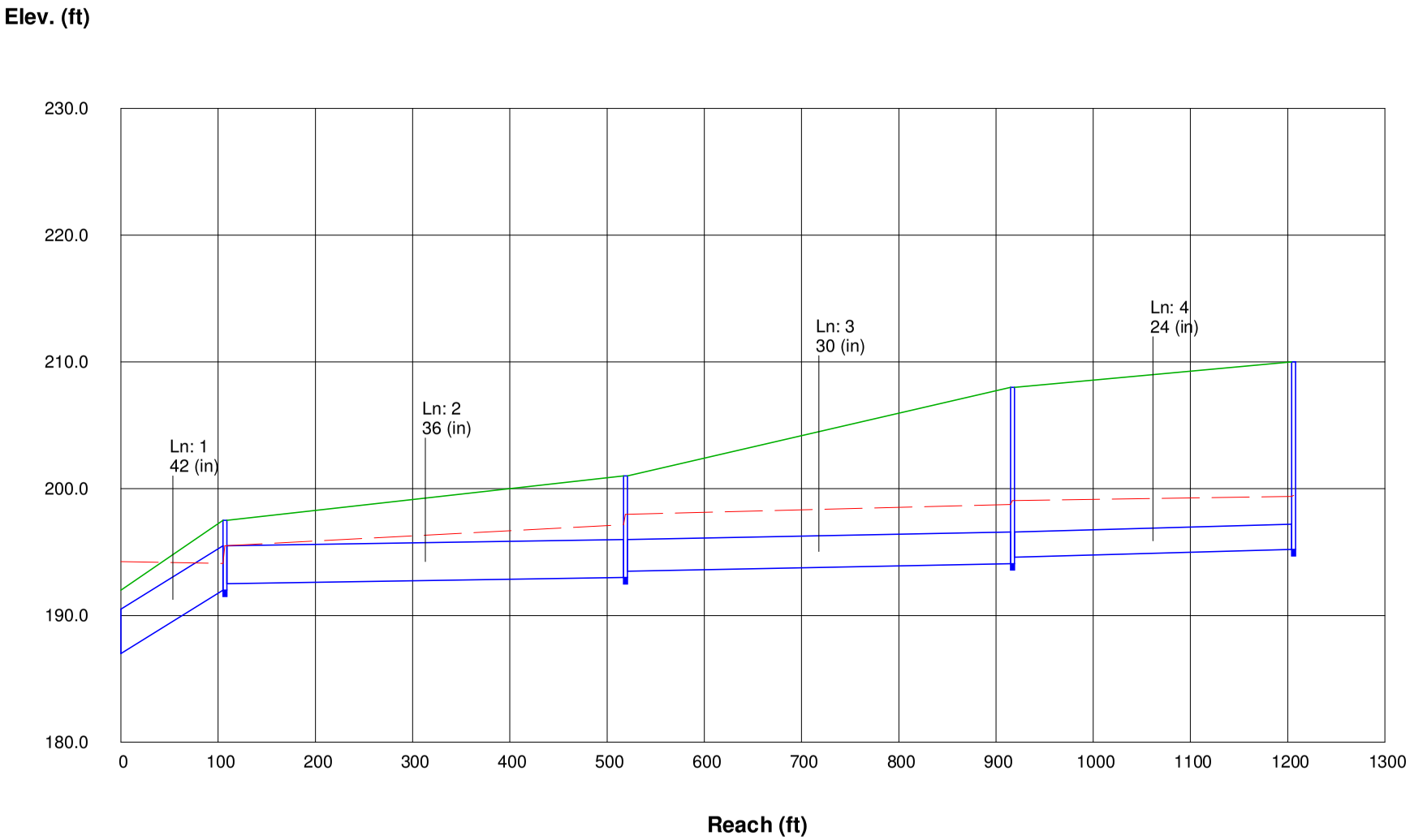
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2		11.21	0.00	11.21	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	1
3		11.55	0.00	11.55	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	2
4		7.50	0.00	7.50	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	3
5		16.54	0.00	16.54	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	2

Project File: 5-yr DA E-H.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 5 | Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added

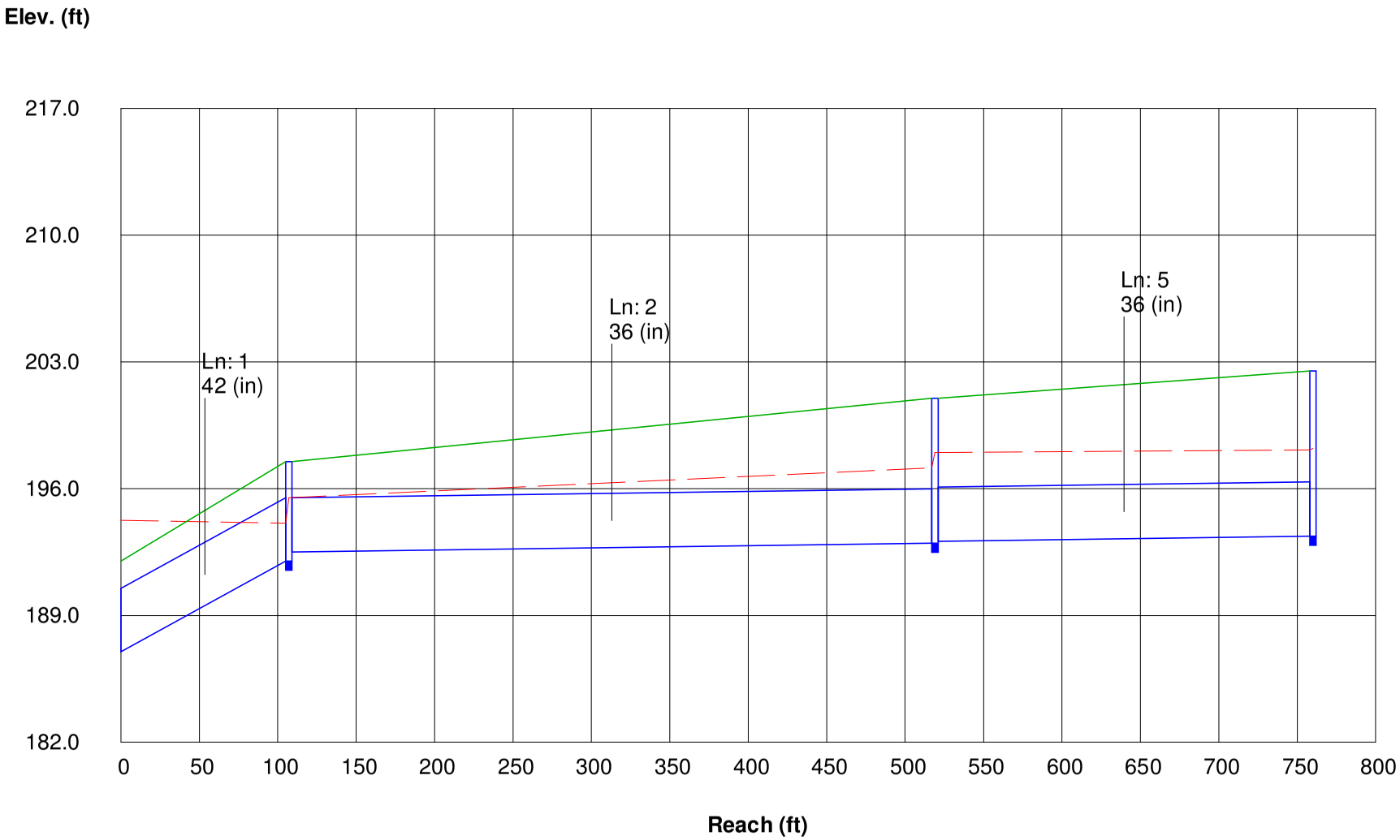
Storm Sewer Profile

Proj. file: 5-yr DA E-H.stm

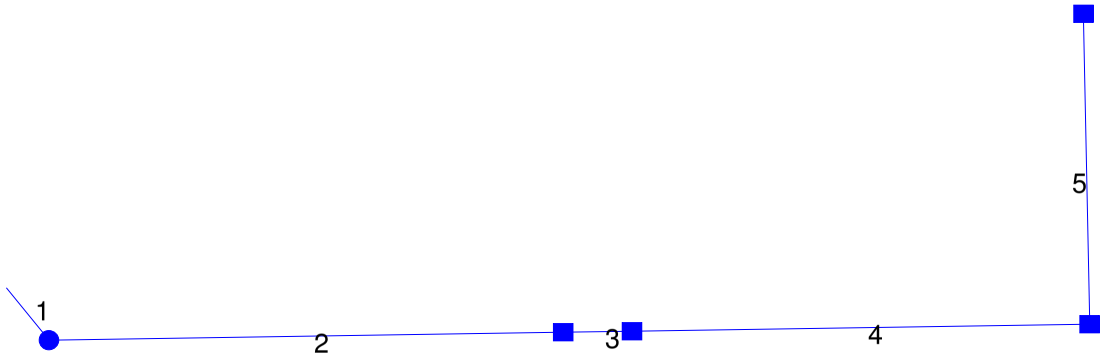


Storm Sewer Profile

Proj. file: 5-yr DA E-H.stm



Hydraflow Plan View



Project file: 100-yr DA I-L.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 5	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	59.0	54.0	MH	0.00	0.00	0.80	15.0	180.20	6.44	184.00	30	Cir	0.013	0.85	193.00	
2	1	418.0	-55.0	Curb	0.00	0.68	0.80	15.0	184.10	0.20	184.94	30	Cir	0.013	0.50	201.00	
3	2	56.0	0.0	Curb	0.00	3.27	0.80	15.0	185.04	0.20	185.15	30	Cir	0.013	0.50	202.00	
4	3	372.0	0.0	Genr	0.00	0.79	0.80	15.0	185.65	0.20	186.39	24	Cir	0.013	1.50	208.00	
5	4	284.0	-90.0	Genr	0.00	1.99	0.80	15.0	186.49	0.20	187.06	24	Cir	0.013	1.00	210.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		36.26	30 c	59.0	180.20	184.00	6.441	188.77*	189.23*	0.72	End
2		37.09	30 c	418.0	184.10	184.94	0.201	189.95*	193.37*	0.44	1
3		33.46	30 c	56.0	185.04	185.15	0.196	193.82*	194.19*	0.36	2
4		15.85	24 c	372.0	185.65	186.39	0.199	194.55*	196.38*	0.59	3
5		11.73	24 c	284.0	186.49	187.06	0.201	196.97*	197.74*	0.22	4

Project File: 100-yr DA I-L.stm	IDF File: SedgwickCoKS.IDF	Total No. Lines: 5	Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	59.0	0.00	6.73	0.80	0.00	5.38	15.0	18.6	6.7	36.26	104.1	7.39	30	6.44	184.00	180.20	189.23	188.77	193.00	184.00	
2	1	418.0	0.68	6.73	0.80	0.54	5.38	15.0	17.7	6.9	37.09	18.38	7.56	30	0.20	184.94	184.10	193.37	189.95	201.00	193.00	
3	2	56.0	3.27	6.05	0.80	2.62	4.84	15.0	17.5	6.9	33.46	18.18	6.82	30	0.20	185.15	185.04	194.19	193.82	202.00	201.00	
4	3	372.0	0.79	2.78	0.80	0.63	2.22	15.0	16.3	7.1	15.85	10.09	5.05	24	0.20	186.39	185.65	196.38	194.55	208.00	202.00	
5	4	284.0	1.99	1.99	0.80	1.59	1.59	15.0	15.0	7.4	11.73	10.13	3.73	24	0.20	187.06	186.49	197.74	196.97	210.00	208.00	

Project File: 100-yr DA I-L.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 5 | Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 188.77 (ft)

Hydraflow Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2		4.01	0.00	4.01	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.39	8.41	0.42	8.41	2.00	1
3		19.27	7.65	26.92	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.87	24.38	0.90	24.38	2.00	2
4		4.65	5.48	2.48	7.65	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	3
5		11.73	0.00	6.25	5.48	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	4

Project File: 100-yr DA I-L.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 5 | Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Hydraflow Inlet Report

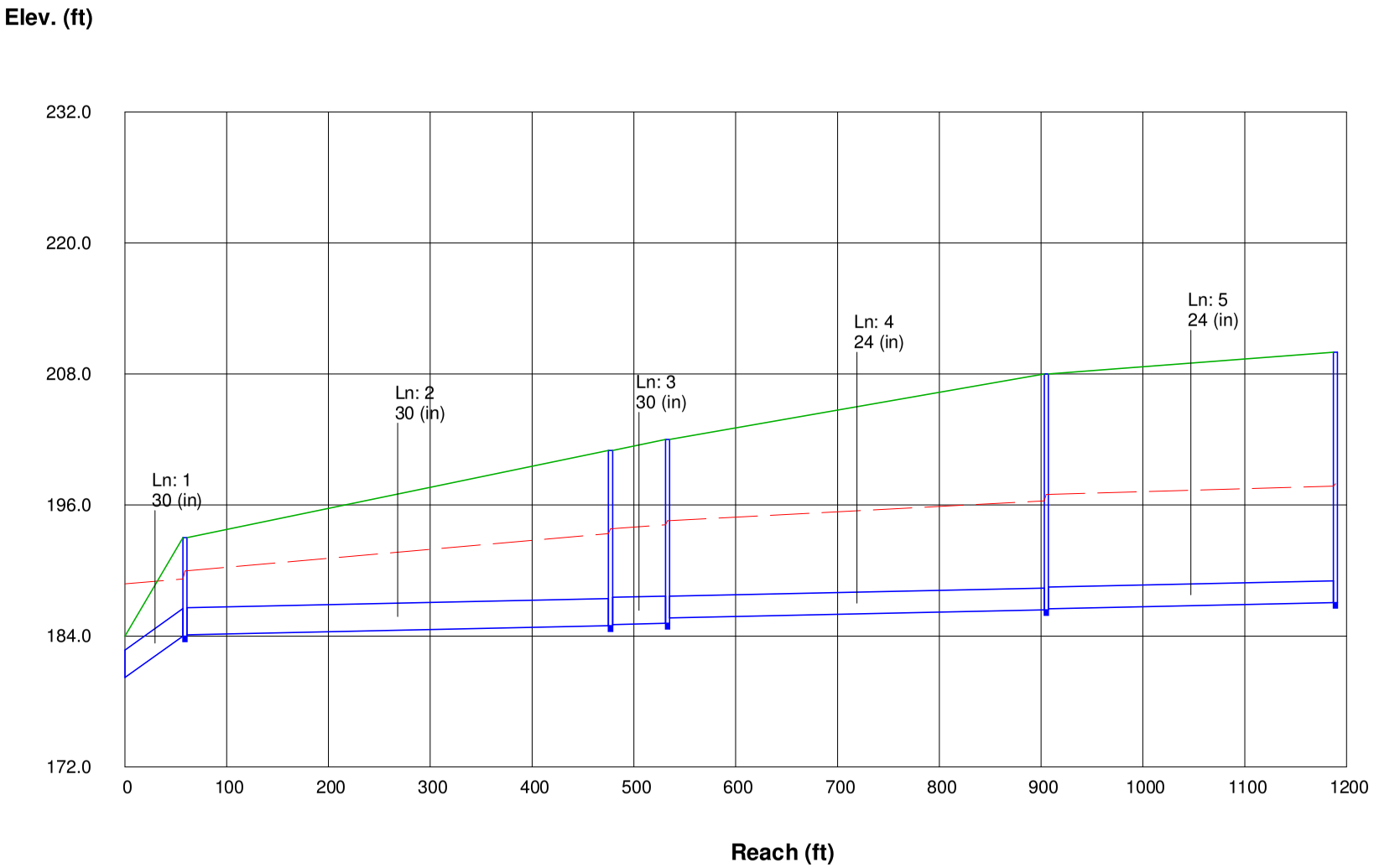
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2		4.01	0.00	4.01	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.39	8.41	0.42	8.41	2.00	1
3		19.27	7.65	26.92	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.87	24.38	0.90	24.38	2.00	2
4		4.65	5.48	2.48	7.65	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	3
5		11.73	0.00	6.25	5.48	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	4

Project File: 100-yr DA I-L.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 5 | Run Date: 01-05-2006

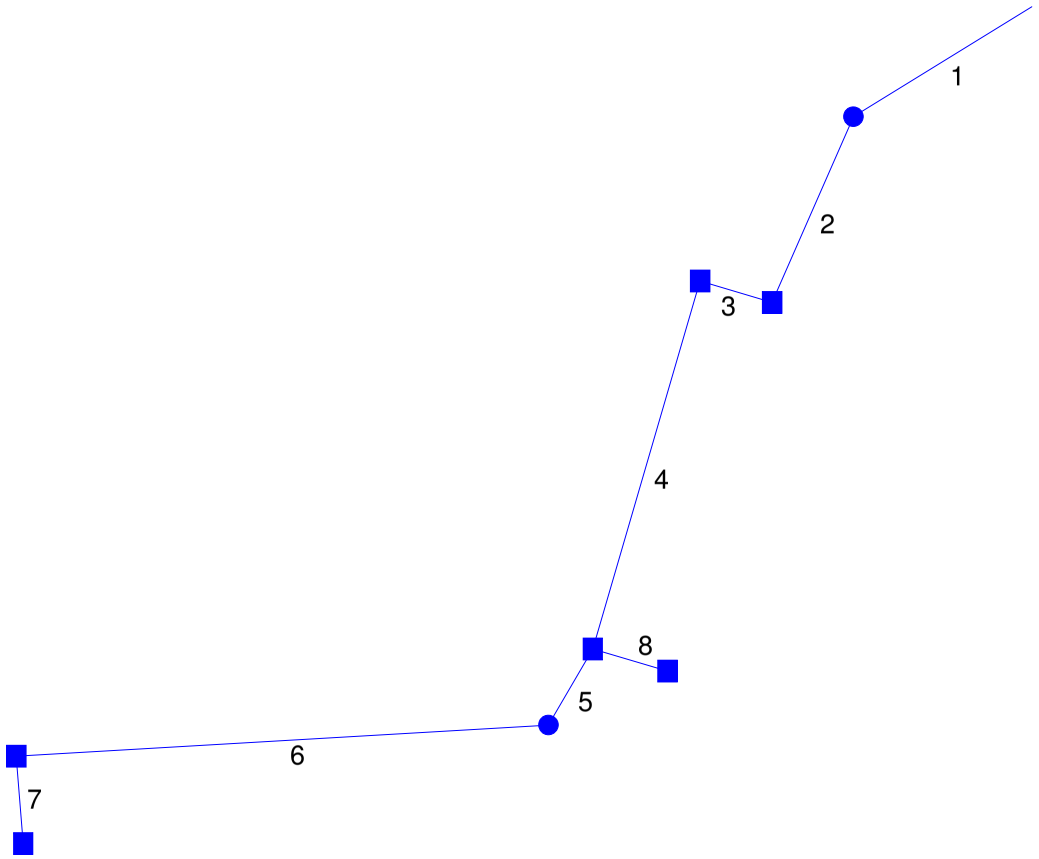
NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 100-yr DA I-L.stm



Hydraflow Plan View



Project file: 5-yr DA mnopst.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 8	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	145.0	151.0	MH	0.00	0.00	0.69	15.0	196.00	3.45	201.00	42	Cir	0.013	0.75	208.00	
2	1	132.0	-35.0	Curb	0.00	0.55	0.69	15.0	201.10	0.10	201.23	42	Cir	0.013	1.50	208.00	
3	2	53.0	79.0	Curb	0.00	2.65	0.69	15.0	201.33	0.09	201.38	42	Cir	0.013	1.50	209.00	
4	3	247.0	-87.0	Curb	0.00	5.02	0.69	15.0	201.88	0.15	202.25	36	Cir	0.013	1.50	209.50	
5	4	58.0	15.0	MH	0.00	0.00	0.69	15.0	202.75	0.21	202.87	24	Cir	0.013	0.85	210.50	
6	5	379.0	54.0	Curb	0.00	1.73	0.69	15.0	202.97	0.20	203.73	24	Cir	0.013	1.50	215.00	
7	6	56.0	-92.0	Curb	0.00	2.33	0.69	15.0	204.23	0.32	204.41	18	Cir	0.013	1.00	215.00	
8	4	55.0	-93.0	Curb	0.00	1.09	0.69	15.0	204.00	0.40	204.22	15	Cir	0.013	1.00	210.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		37.85	42 c	145.0	196.00	201.00	3.448	203.73	203.86	0.24	End
2		38.40	42 c	132.0	201.10	201.23	0.098	204.60*	204.79*	0.37	1
3		37.05	42 c	53.0	201.33	201.38	0.094	205.16*	205.24*	0.35	2
4		30.16	36 c	247.0	201.88	202.25	0.150	205.58*	206.09*	0.42	3
5		12.12	24 c	58.0	202.75	202.87	0.207	206.51*	206.68*	0.20	4
6		12.66	24 c	379.0	202.97	203.73	0.201	206.88*	208.06*	0.38	5
7		7.31	18 c	56.0	204.23	204.41	0.321	208.44*	208.71*	0.27	6
8		3.42	15 c	55.0	204.00	204.22	0.400	206.51*	206.67*	0.12	4

Project File: 5-yr DA mnopst.stm | IDF File: SedgwickCoKS.IDF | Total No. Lines: 8 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	145.0	0.00	13.37	0.69	0.00	9.23	15.0	18.9	4.1	37.85	186.8	4.22	42	3.45	201.00	196.00	203.86	203.73	208.00	201.00	
2	1	132.0	0.55	13.37	0.69	0.38	9.23	15.0	18.3	4.2	38.40	31.57	3.99	42	0.10	201.23	201.10	204.79	204.60	208.00	208.00	
3	2	53.0	2.65	12.82	0.69	1.83	8.85	15.0	18.1	4.2	37.05	30.90	3.85	42	0.09	201.38	201.33	205.24	205.16	209.00	208.00	
4	3	247.0	5.02	10.17	0.69	3.46	7.02	15.0	17.1	4.3	30.16	25.81	4.27	36	0.15	202.25	201.88	206.09	205.58	209.50	209.00	
5	4	58.0	0.00	4.06	0.69	0.00	2.80	15.0	16.8	4.3	12.12	10.29	3.86	24	0.21	202.87	202.75	206.68	206.51	210.50	209.50	
6	5	379.0	1.73	4.06	0.69	1.19	2.80	15.0	15.2	4.5	12.66	10.13	4.03	24	0.20	203.73	202.97	208.06	206.88	215.00	210.50	
7	6	56.0	2.33	2.33	0.69	1.61	1.61	15.0	15.0	4.5	7.31	5.95	4.14	18	0.32	204.41	204.23	208.71	208.44	215.00	215.00	
8	4	55.0	1.09	1.09	0.69	0.75	0.75	15.0	15.0	4.5	3.42	4.08	2.79	15	0.40	204.22	204.00	206.67	206.51	210.00	209.50	

Project File: 5-yr DA mnopst.stm

IDF File: SedgwickCoKS.IDF

Total number of lines: 8

Run Date: 01-05-2006

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Initial tailwater elevation = 203.73 (ft)

Hydraflow Inlet Report

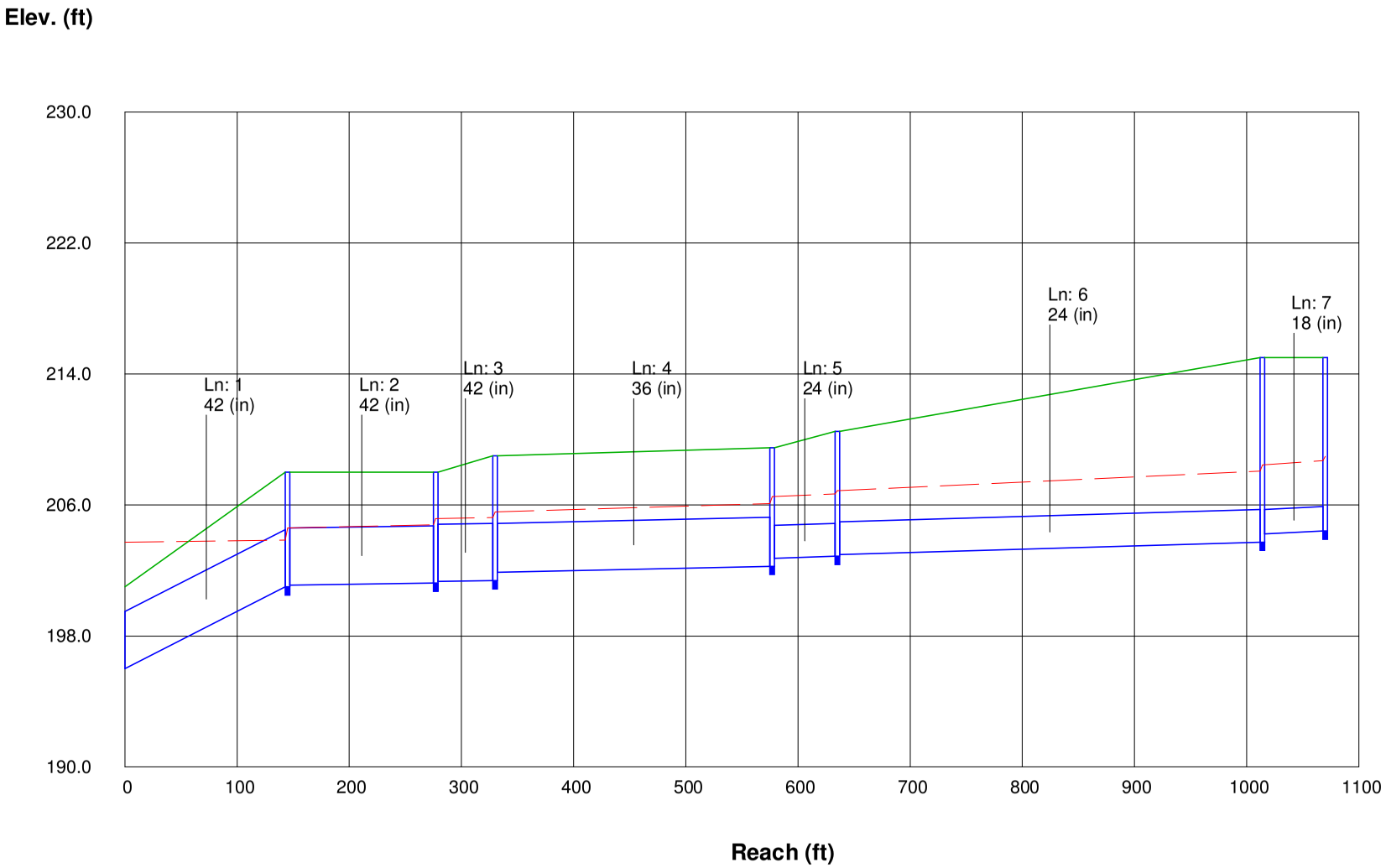
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
2		1.73	0.00	1.73	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.28	4.79	0.31	4.79	2.00	1
3		8.32	4.41	12.73	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.69	18.25	0.71	18.25	2.00	2
4		15.76	0.00	11.34	4.41	Curb	6.0	15.00	0.00	0.00	0.00	0.010	2.00	0.100	0.030	0.013	0.57	14.33	0.58	13.91	2.00	3
5		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	4
6		5.43	0.00	5.43	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.45	10.31	0.48	10.31	2.00	5
7		7.31	0.00	7.31	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.52	12.59	0.54	12.59	2.00	6
8		3.42	0.00	3.42	0.00	Curb	6.0	15.00	0.00	0.00	0.00	0.010	2.00	0.100	0.030	0.013	0.36	7.33	0.38	6.98	2.00	4

Project File: 5-yr DA mnopst.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 8 | Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added

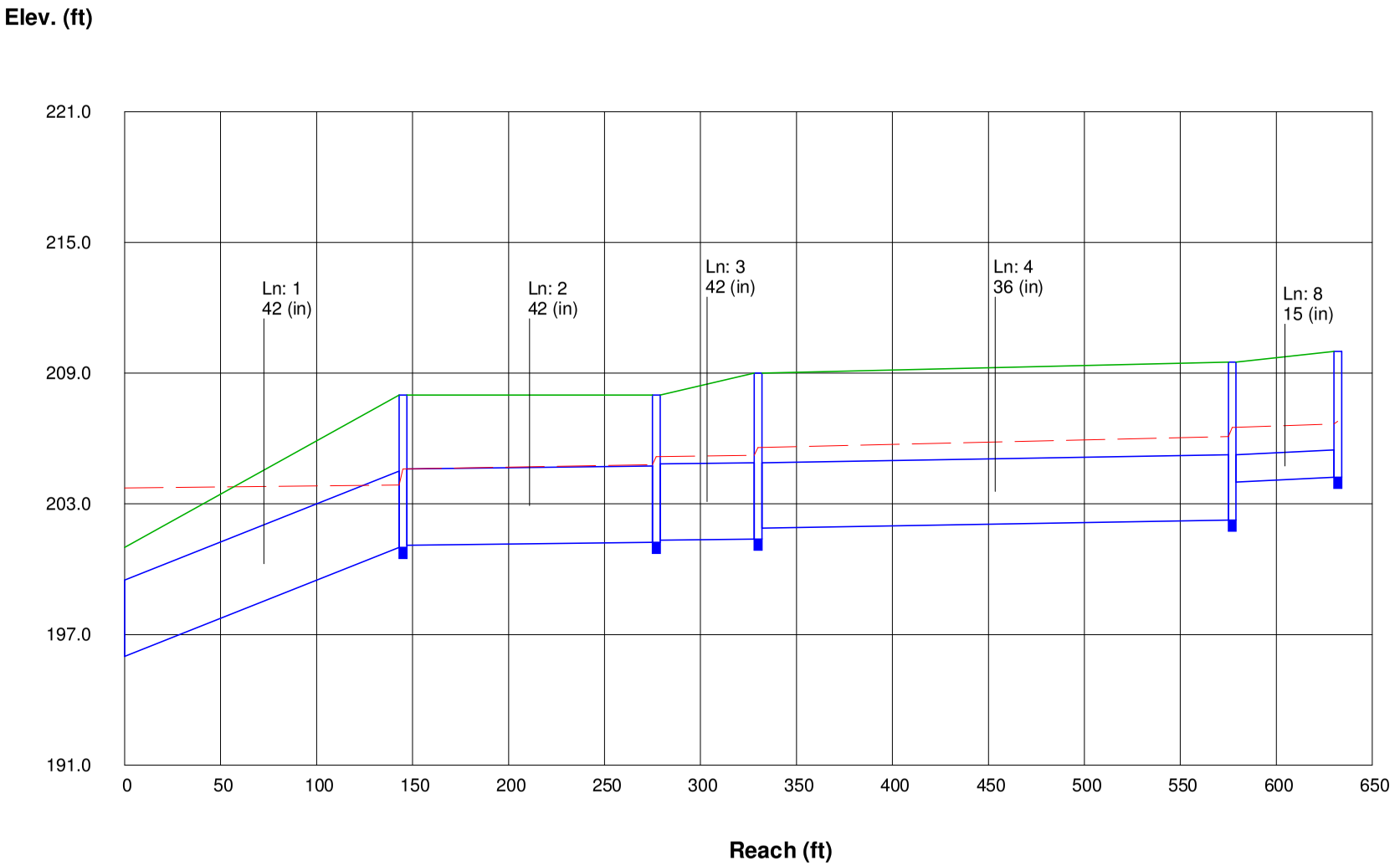
Storm Sewer Profile

Proj. file: 5-yr DA mnopst.stm

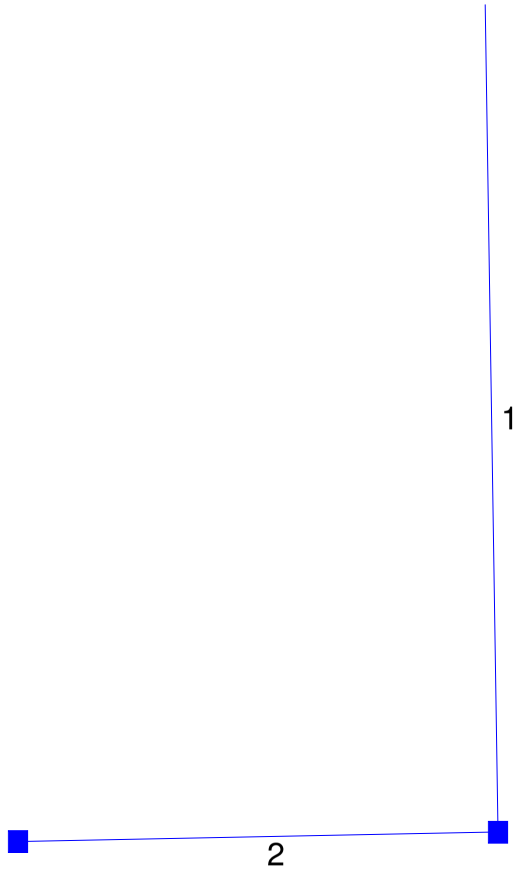


Storm Sewer Profile

Proj. file: 5-yr DA mnopst.stm



Hydraflow Plan View



Project file: 5-yr DA Q-R.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 2	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	243.0	89.0	Genr	0.00	2.07	0.69	15.0	214.50	0.20	214.99	24	Cir	0.013	1.50	218.00	
2	1	157.0	90.0	Genr	0.00	1.76	0.69	15.0	215.49	0.32	215.99	18	Cir	0.013	1.00	220.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		11.74	24 c	243.0	214.50	214.99	0.202	215.71*	217.06*	0.33	End
2		5.52	18 c	157.0	215.49	215.99	0.318	217.39*	217.82*	0.15	1

Project File: 5-yr DA Q-R.stm | IDF File: SedgwickCoKS.IDF | Total No. Lines: 2 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	243.0	2.07	3.83	0.69	1.43	2.64	15.0	15.8	4.4	11.74	10.16	4.81	24	0.20	214.99	214.50	217.06	215.71	218.00	216.00	
2	1	157.0	1.76	1.76	0.69	1.21	1.21	15.0	15.0	4.5	5.52	5.93	3.13	18	0.32	215.99	215.49	217.82	217.39	220.00	218.00	

Project File: 5-yr DA Q-R.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 2 | Run Date: 01-05-2006

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Initial tailwater elevation = 215.71 (ft)

Hydraflow Inlet Report

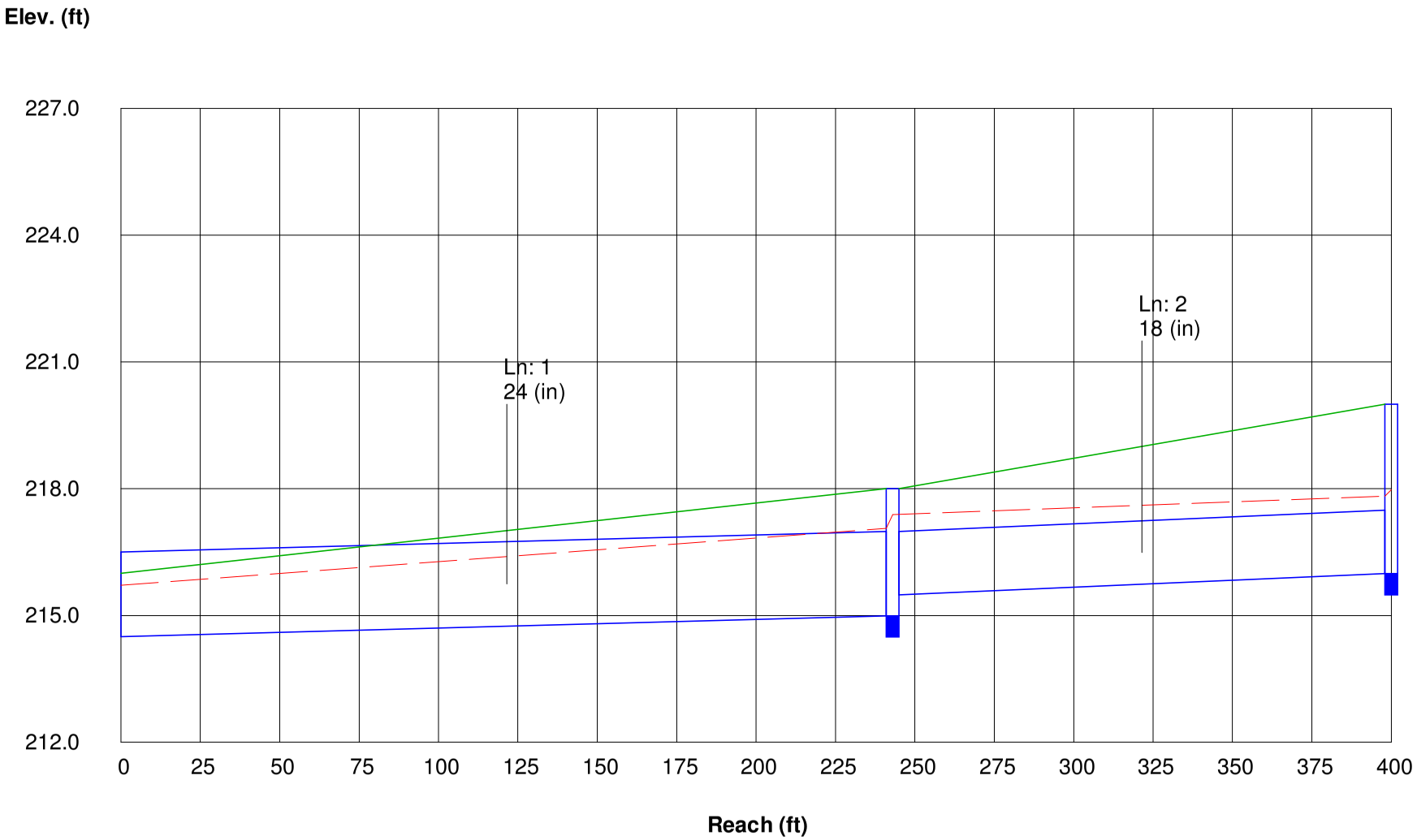
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		6.50	0.00	6.50	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off
2		5.52	0.00	5.52	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	1

Project File: 5-yr DA Q-R.stm	I-D-F File: SedgwickCoKS.IDF	Total number of lines: 2	Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 5-yr DA Q-R.stm



Hydraflow Plan View

Project file: 5-yr DA uvw.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 3	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	669.0	89.0	Genr	0.00	3.44	0.69	18.0	197.20	1.00	203.89	30	Cir	0.013	0.50	208.00	
2	1	403.0	0.0	Genr	0.00	1.84	0.69	18.0	204.39	0.20	205.20	24	Cir	0.013	0.50	210.00	
3	2	372.0	0.0	Genr	0.00	1.35	0.69	16.0	205.95	0.40	207.44	15	Cir	0.013	1.00	211.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		18.12	30 c	669.0	197.20	203.89	1.000	203.72	205.42	0.26	End
2		9.23	24 c	403.0	204.39	205.20	0.201	205.89	206.70	0.10	1
3		4.12	15 c	372.0	205.95	207.44	0.401	206.98	208.47	0.22	2

Project File: 5-yr DA uvw.stm | IDF File: SedgwickCoKS.IDF | Total No. Lines: 3 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	669.0	3.44	6.63	0.69	2.37	4.57	18.0	20.3	4.0	18.12	41.01	4.72	30	1.00	203.89	197.20	205.42	203.72	208.00	201.00	
2	1	403.0	1.84	3.19	0.69	1.27	2.20	18.0	18.0	4.2	9.23	10.14	3.65	24	0.20	205.20	204.39	206.70	205.89	210.00	208.00	
3	2	372.0	1.35	1.35	0.69	0.93	0.93	16.0	16.0	4.4	4.12	4.09	3.79	15	0.40	207.44	205.95	208.47	206.98	211.00	210.00	

Project File: 5-yr DA uvw.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 3 | Run Date: 01-05-2006

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Initial tailwater elevation = 203.72 (ft)

Hydraflow Inlet Report

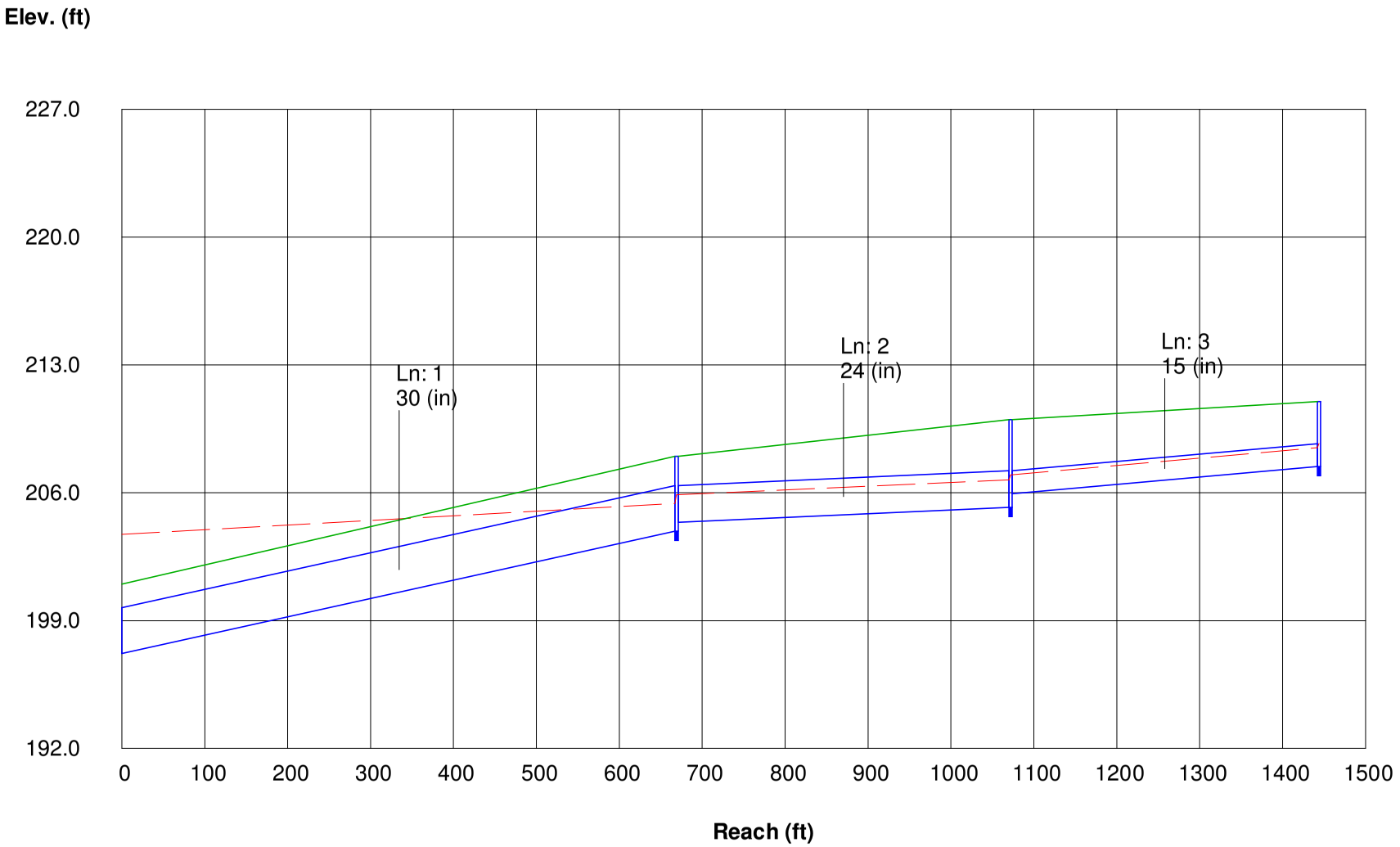
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		9.95	0.00	9.95	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off
2		5.32	0.00	5.32	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	1
3		4.12	0.00	4.12	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	2

Project File: 5-yr DA uvw.stm	I-D-F File: SedgwickCoKS.IDF	Total number of lines: 3	Run Date: 01-05-2006

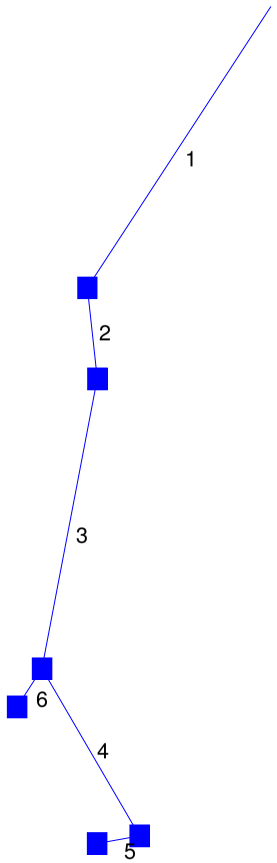
NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 5-yr DA uvw.stm



Hydraflow Plan View



Project file: 5-yr DA X-CC.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 6	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	406.0	126.0	Curb	0.00	3.25	0.69	15.0	196.50	1.35	202.00	36	Cir	0.013	1.10	210.00	
2	1	107.0	-43.0	Curb	0.00	0.81	0.69	15.0	202.50	0.20	202.71	30	Cir	0.013	0.70	210.50	
3	2	346.0	19.0	Curb	0.00	0.38	0.69	15.0	202.81	0.20	203.50	30	Cir	0.013	1.10	212.50	
4	3	233.0	-45.0	Curb	0.00	1.72	0.69	15.0	204.00	0.20	204.47	24	Cir	0.013	1.50	212.50	
5	4	56.0	114.0	Curb	0.00	2.03	0.69	15.0	204.97	0.32	205.15	18	Cir	0.013	1.00	212.50	
6	3	55.0	24.0	Curb	0.00	1.14	0.69	15.0	204.75	0.40	204.97	15	Cir	0.013	1.00	213.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		26.58	36 c	406.0	196.50	202.00	1.355	203.72	204.30	0.36	End
2		17.54	30 c	107.0	202.50	202.71	0.196	204.66	204.83	0.17	1
3		15.95	30 c	346.0	202.81	203.50	0.199	205.00	205.48	0.25	2
4		11.68	24 c	233.0	204.00	204.47	0.202	206.00*	206.62*	0.32	3
5		6.37	18 c	56.0	204.97	205.15	0.321	206.94*	207.15*	0.20	4
6		3.58	15 c	55.0	204.75	204.97	0.400	205.73	205.91	0.20	3

Project File: 5-yr DA X-CC.stm | IDF File: SedgwickCoKS.IDF | Total No. Lines: 6 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	406.0	3.25	9.33	0.69	2.24	6.44	15.0	18.6	4.1	26.58	77.63	4.16	36	1.35	202.00	196.50	204.30	203.72	210.00	201.00	
2	1	107.0	0.81	6.08	0.69	0.56	4.20	15.0	18.1	4.2	17.54	18.17	3.92	30	0.20	202.71	202.50	204.83	204.66	210.50	210.00	
3	2	346.0	0.38	5.27	0.69	0.26	3.64	15.0	16.3	4.4	15.95	18.31	3.66	30	0.20	203.50	202.81	205.48	205.00	212.50	210.50	
4	3	233.0	1.72	3.75	0.69	1.19	2.59	15.0	15.3	4.5	11.68	10.16	3.72	24	0.20	204.47	204.00	206.62	206.00	212.50	212.50	
5	4	56.0	2.03	2.03	0.69	1.40	1.40	15.0	15.0	4.5	6.37	5.95	3.61	18	0.32	205.15	204.97	207.15	206.94	212.50	212.50	
6	3	55.0	1.14	1.14	0.69	0.79	0.79	15.0	15.0	4.5	3.58	4.08	3.54	15	0.40	204.97	204.75	205.91	205.73	213.00	212.50	

Project File: 5-yr DA X-CC.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 6 | Run Date: 01-05-2006

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Initial tailwater elevation = 203.72 (ft)

Hydraflow Inlet Report

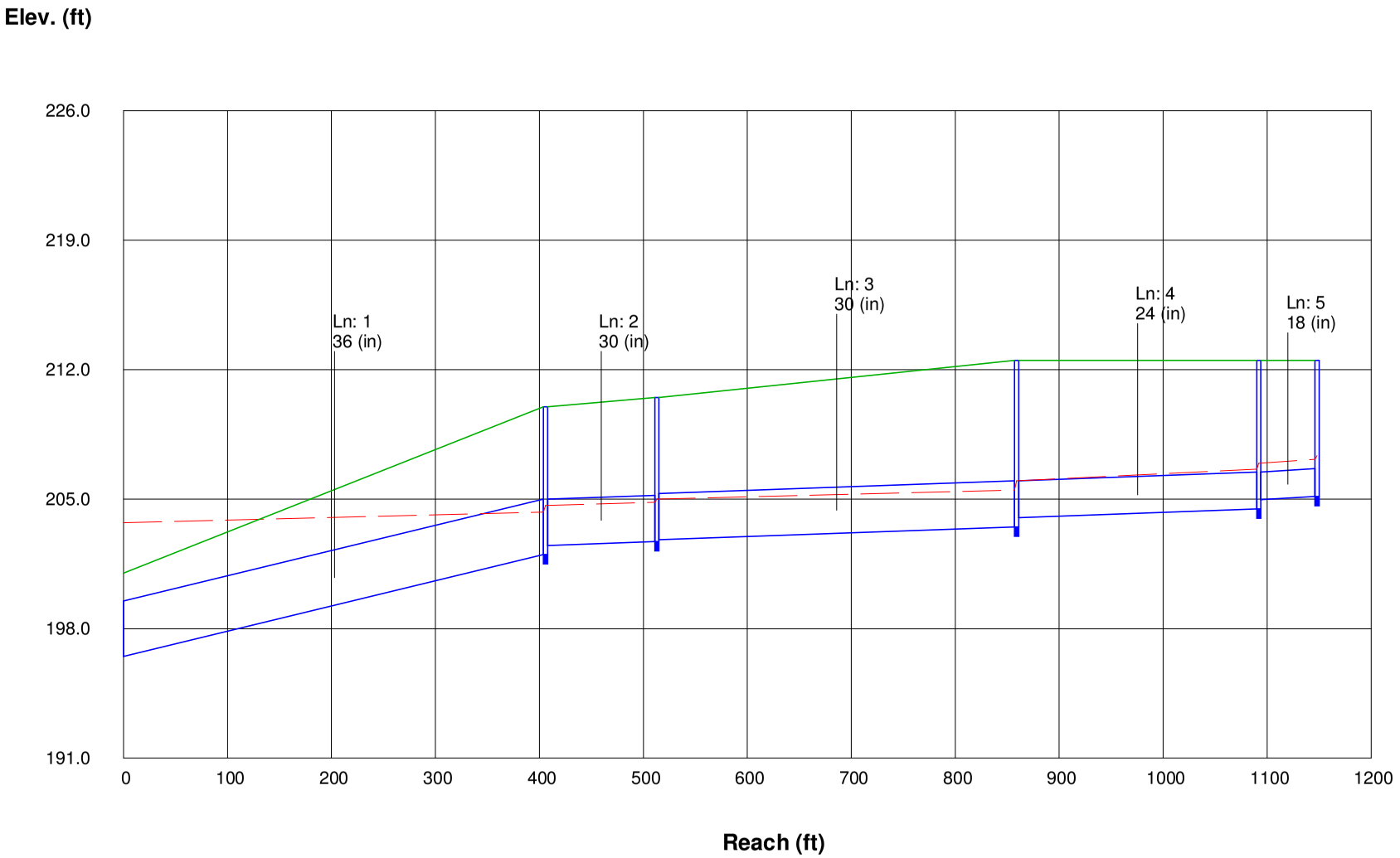
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		10.20	0.00	10.20	0.00	Curb	6.0	19.45	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.45	10.36	0.48	10.36	2.00	Off
2		2.54	0.00	2.54	0.00	Curb	6.0	2.14	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.47	11.05	0.50	11.05	2.00	1
3		1.19	0.00	1.19	0.00	Curb	6.0	1.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.37	7.72	0.40	7.72	2.00	2
4		5.40	0.00	5.40	0.00	Curb	6.0	8.60	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.47	11.05	0.50	11.05	2.00	3
5		6.37	0.00	6.37	0.00	Curb	6.0	10.80	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.47	11.05	0.50	11.05	2.00	4
6		3.58	0.00	3.58	0.00	Curb	6.0	4.48	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.47	11.05	0.50	11.05	2.00	3

Project File: 5-yr DA X-CC.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 6 | Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added

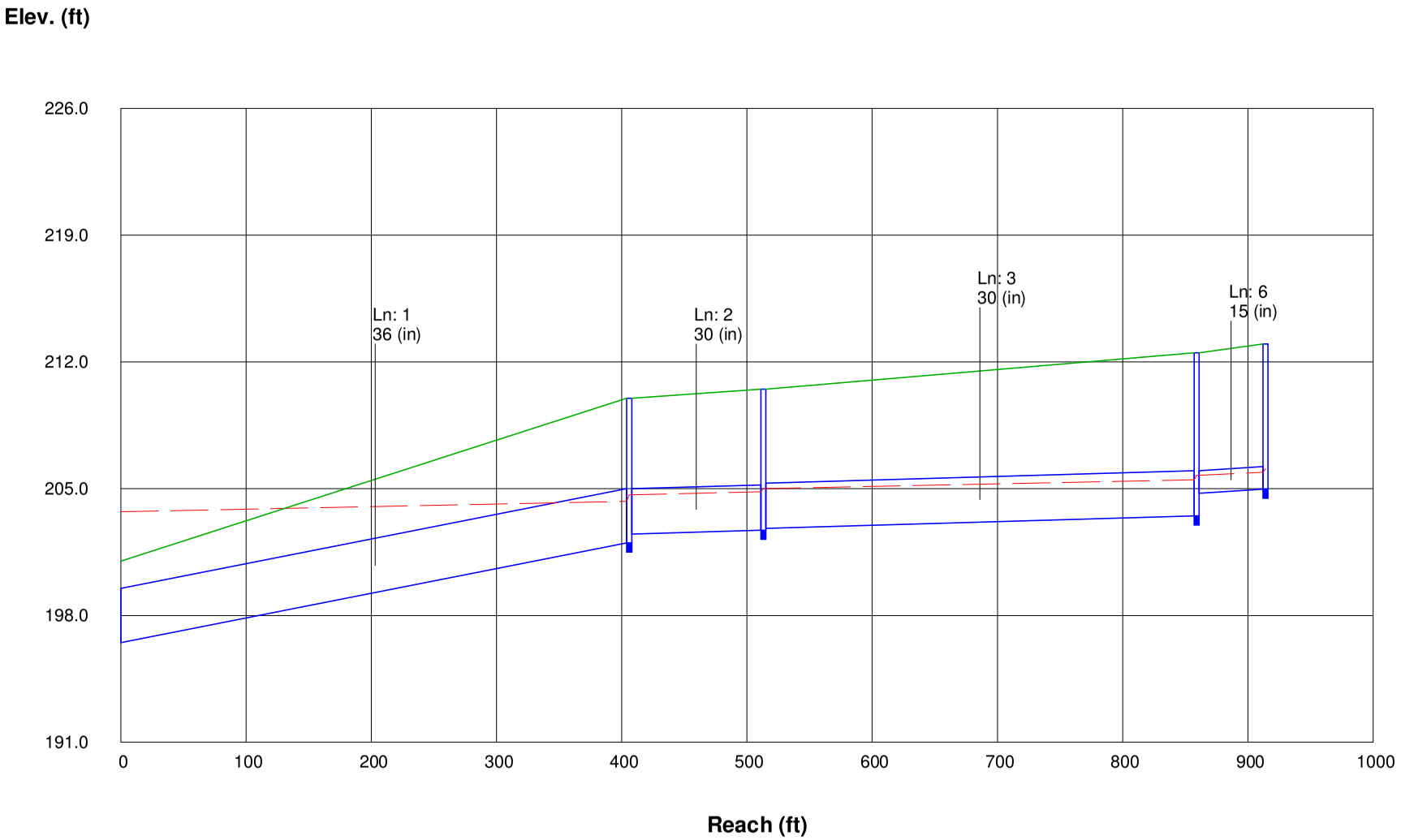
Storm Sewer Profile

Proj. file: 5-yr DA X-CC.stm

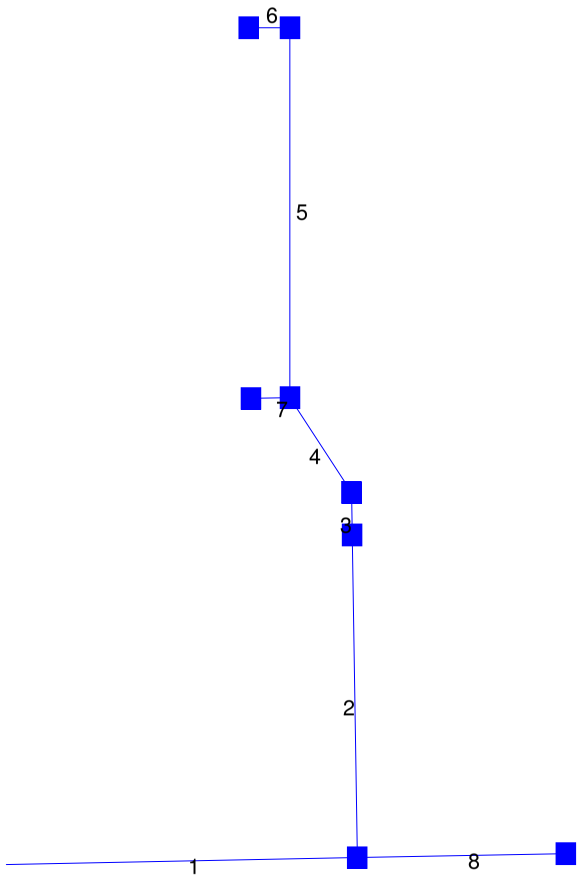


Storm Sewer Profile

Proj. file: 5-yr DA X-CC.stm



Hydraflow Plan View



Project file: 5-yr DA DD-KK.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 8	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	505.0	-1.0	Genr	0.00	2.78	0.69	15.0	189.00	0.10	189.51	42	Cir	0.013	1.50	201.00	
2	1	417.0	-90.0	Curb	0.00	1.99	0.69	15.0	190.01	0.12	190.51	36	Cir	0.013	0.50	206.50	
3	2	55.0	0.0	Curb	0.00	2.14	0.69	15.0	190.61	0.13	190.68	36	Cir	0.013	1.10	206.50	
4	3	151.0	-35.0	Curb	0.00	3.63	0.69	15.0	190.78	0.12	190.96	36	Cir	0.013	1.25	207.50	
5	4	478.0	36.0	Curb	0.00	2.06	0.69	15.0	191.96	0.21	192.96	24	Cir	0.013	1.50	209.50	
6	5	59.0	-90.0	Curb	0.00	1.23	0.69	15.0	193.71	0.41	193.95	15	Cir	0.013	1.00	209.50	
7	4	56.0	-55.0	Curb	0.00	1.43	0.69	15.0	192.46	0.32	192.64	18	Cir	0.013	1.00	207.50	
8	1	300.0	0.0	Genr	0.00	5.01	0.69	15.0	191.01	0.21	191.64	24	Cir	0.013	1.00	207.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		55.60	42 c	505.0	189.00	189.51	0.101	191.28*	193.96*	0.78	End
2		35.45	36 c	417.0	190.01	190.51	0.120	194.74*	195.91*	0.20	1
3		29.96	36 c	55.0	190.61	190.68	0.127	196.11*	196.22*	0.31	2
4		24.31	36 c	151.0	190.78	190.96	0.119	196.53*	196.73*	0.23	3
5		10.24	24 c	478.0	191.96	192.96	0.209	196.96*	197.94*	0.25	4
6		3.86	15 c	59.0	193.71	193.95	0.407	198.19*	198.40*	0.15	5
7		4.49	18 c	56.0	192.46	192.64	0.321	196.96*	197.06*	0.10	4
8		15.73	24 c	300.0	191.01	191.64	0.210	194.74*	196.19*	0.39	1

Project File: 5-yr DA DD-KK.stm | IDF File: SedgwickCoKS.IDF | Total No. Lines: 8 | Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	505.0	2.78	20.27	0.69	1.92	13.99	15.0	20.2	4.0	55.60	31.97	7.07	42	0.10	189.51	189.00	193.96	191.28	201.00	194.00	
2	1	417.0	1.99	12.48	0.69	1.37	8.61	15.0	18.7	4.1	35.45	23.09	5.02	36	0.12	190.51	190.01	195.91	194.74	206.50	201.00	
3	2	55.0	2.14	10.49	0.69	1.48	7.24	15.0	18.5	4.1	29.96	23.79	4.24	36	0.13	190.68	190.61	196.22	196.11	206.50	206.50	
4	3	151.0	3.63	8.35	0.69	2.50	5.76	15.0	17.8	4.2	24.31	23.03	3.44	36	0.12	190.96	190.78	196.73	196.53	207.50	206.50	
5	4	478.0	2.06	3.29	0.69	1.42	2.27	15.0	15.3	4.5	10.24	10.35	3.26	24	0.21	192.96	191.96	197.94	196.96	209.50	207.50	
6	5	59.0	1.23	1.23	0.69	0.85	0.85	15.0	15.0	4.5	3.86	4.12	3.15	15	0.41	193.95	193.71	198.40	198.19	209.50	209.50	
7	4	56.0	1.43	1.43	0.69	0.99	0.99	15.0	15.0	4.5	4.49	5.95	2.54	18	0.32	192.64	192.46	197.06	196.96	207.50	207.50	
8	1	300.0	5.01	5.01	0.69	3.46	3.46	15.0	15.0	4.5	15.73	10.36	5.01	24	0.21	191.64	191.01	196.19	194.74	207.00	201.00	

Project File: 5-yr DA DD-KK.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 8 | Run Date: 01-05-2006

NOTES: Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; Initial tailwater elevation = 191.28 (ft)

Hydraflow Inlet Report

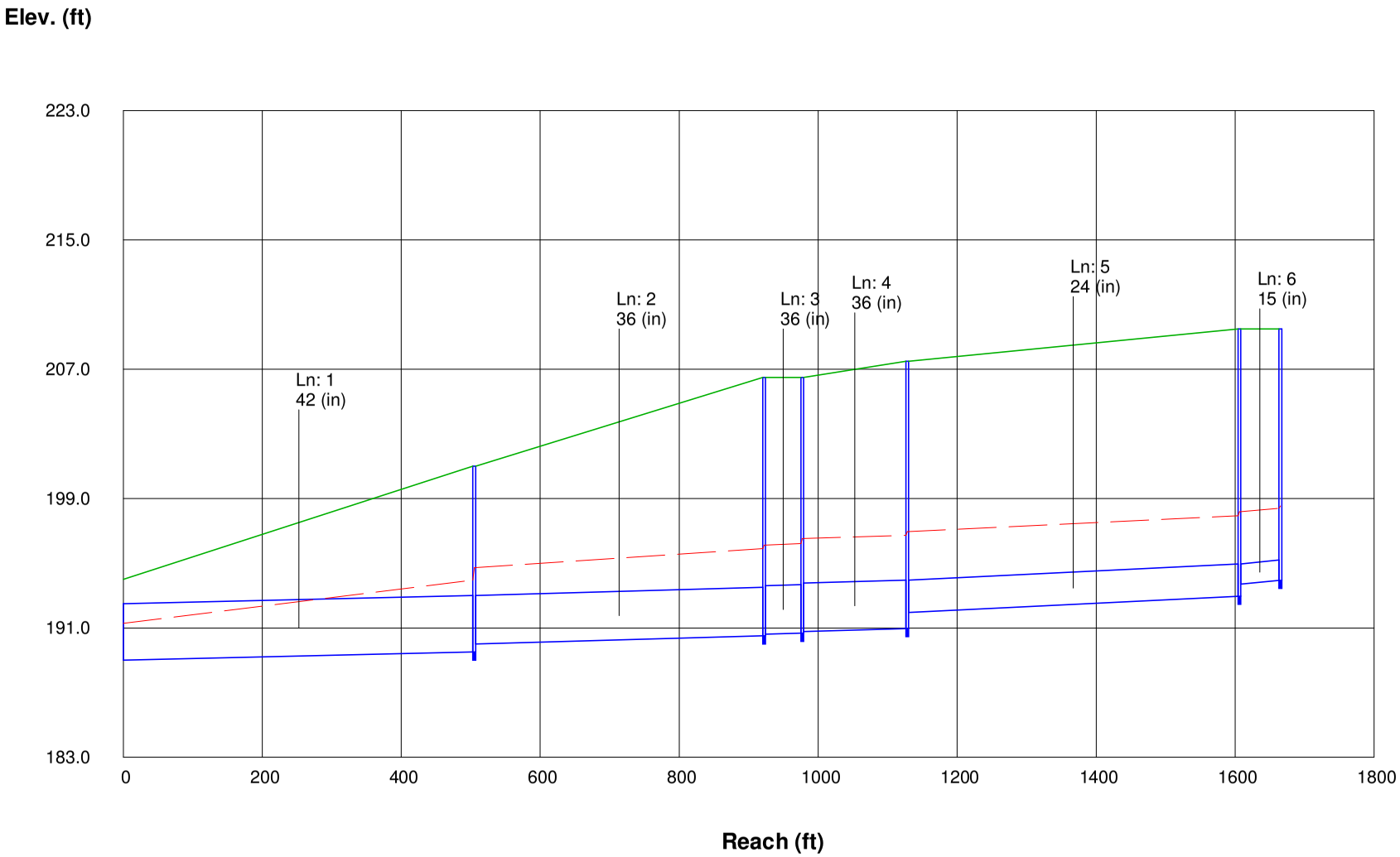
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		8.73	0.00	8.73	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off
2		6.25	0.00	6.25	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.48	11.33	0.51	11.33	2.00	1
3		6.72	0.00	6.72	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.50	11.89	0.52	11.89	2.00	2
4		11.39	0.00	11.39	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.65	16.94	0.67	16.94	2.00	3
5		6.47	0.00	6.47	0.00	Curb	6.0	10.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.49	11.59	0.51	11.59	2.00	4
6		3.86	0.00	3.86	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.47	11.16	0.50	11.16	2.00	5
7		4.49	0.00	4.49	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.51	12.34	0.54	12.34	2.00	4
8		15.73	0.00	15.73	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	1

Project File: 5-yr DA DD-KK.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 8 | Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 52.62 / (Inlet time + 11.20) ^ 0.75; Return period = 5 Yrs. ; * Indicates Known Q added

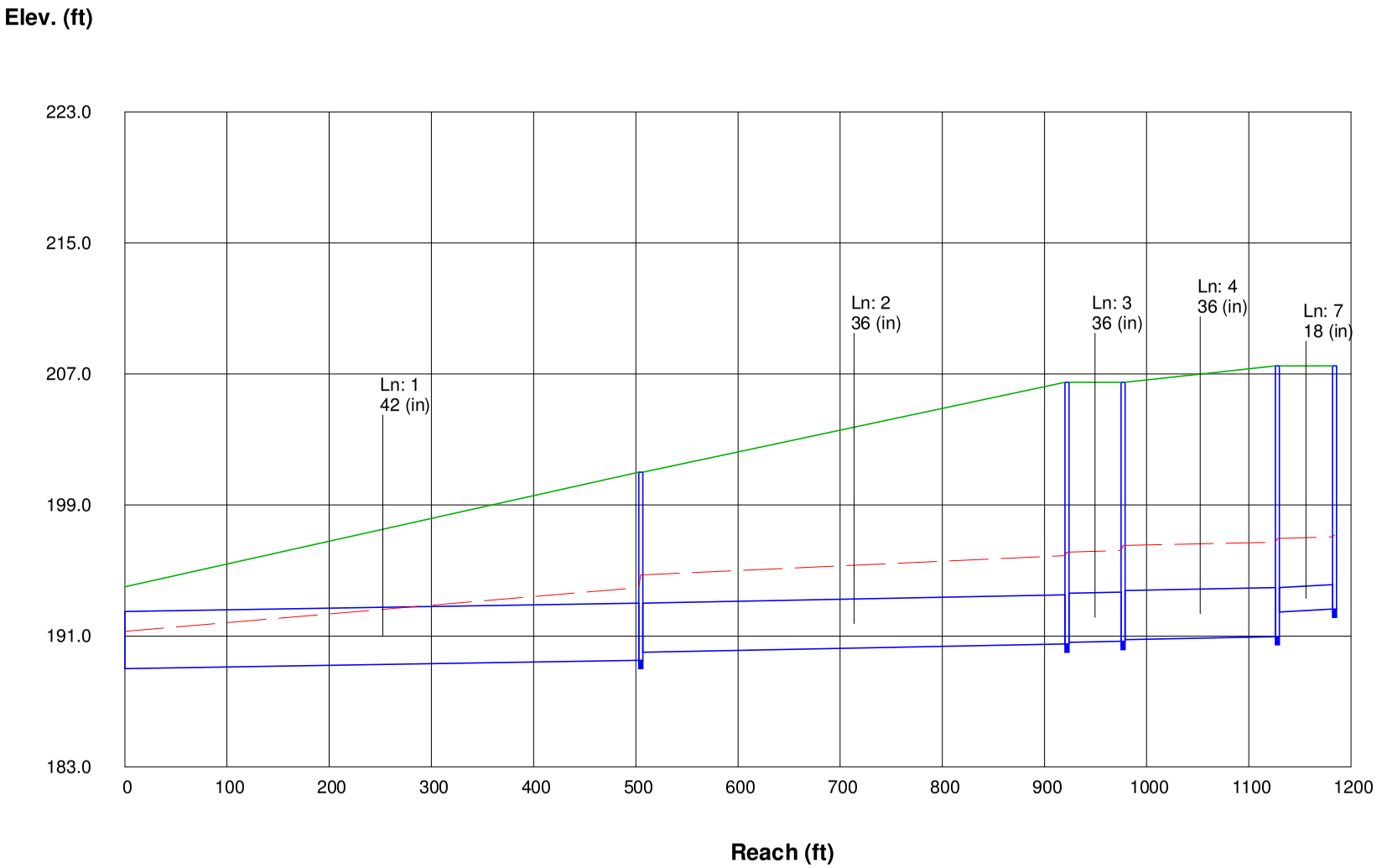
Storm Sewer Profile

Proj. file: 5-yr DA DD-KK.stm



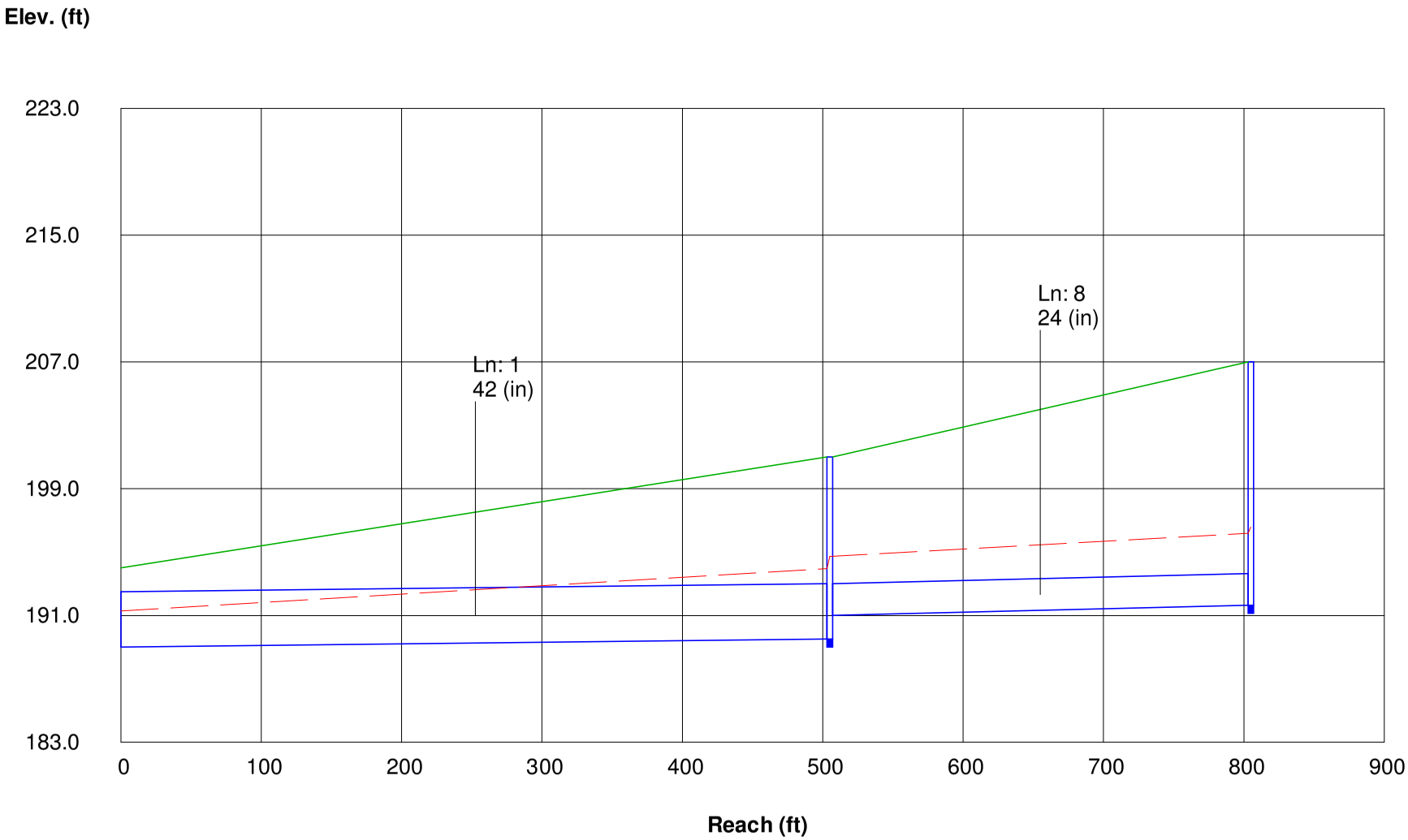
Storm Sewer Profile

Proj. file: 5-yr DA DD-KK.stm

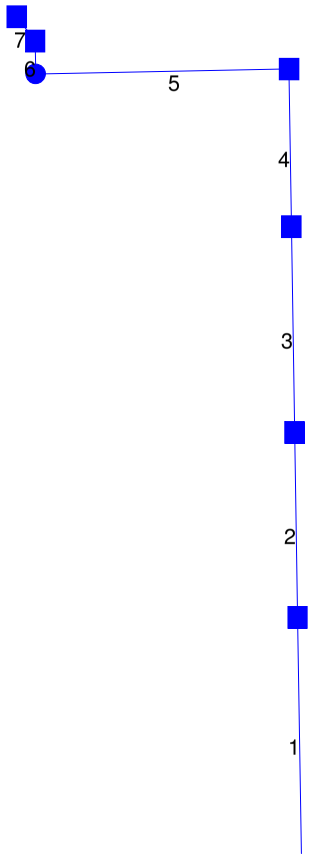


Storm Sewer Profile

Proj. file: 5-yr DA DD-KK.stm



Hydraflow Plan View



Project file: 100-yr DA LL-QQ.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 7	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	364.0	-91.0	Genr	0.00	3.02	0.80	15.0	189.00	0.10	189.36	54	Cir	0.013	0.50	195.00	
2	1	285.0	0.0	Genr	0.00	3.02	0.80	15.0	189.46	0.10	189.75	54	Cir	0.013	0.50	200.00	
3	2	317.0	0.0	Genr	0.00	2.76	0.80	15.0	190.25	0.10	190.57	48	Cir	0.013	0.50	205.00	
4	3	243.0	0.0	Genr	0.00	4.94	0.80	15.0	191.07	0.15	191.43	42	Cir	0.013	1.50	210.50	
5	4	435.0	-90.0	MH	0.00	0.00	0.80	15.0	191.93	0.15	192.58	36	Cir	0.013	1.00	212.00	
6	5	51.0	90.0	Curb	0.00	3.59	0.80	15.0	192.68	0.16	192.76	36	Cir	0.013	1.10	212.00	
7	6	49.0	-39.0	Curb	0.00	2.36	0.80	15.0	193.26	0.20	193.36	30	Cir	0.013	1.00	212.00	

Project File: 100-yr DA LL-QQ.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 7 | Date: 01-05-2006

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		104.1	54 c	364.0	189.00	189.36	0.099	191.93*	194.06*	0.33	End
2		89.99	54 c	285.0	189.46	189.75	0.102	194.40*	194.99*	0.25	1
3		75.32	48 c	317.0	190.25	190.57	0.101	195.24*	196.11*	0.28	2
4		61.06	42 c	243.0	191.07	191.43	0.148	196.39*	197.29*	0.94	3
5		34.64	36 c	435.0	191.93	192.58	0.149	198.23*	199.40*	0.37	4
6		34.79	36 c	51.0	192.68	192.76	0.157	199.77*	199.91*	0.41	5
7		13.91	30 c	49.0	193.26	193.36	0.204	200.33*	200.38*	0.12	6

Project File: 100-yr DA LL-QQ.stm	IDF File: SedgwickCoKS.IDF	Total No. Lines: 7	Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	364.0	3.02	19.69	0.80	2.42	15.75	15.0	19.5	6.6	104.1	61.85	8.02	54	0.10	189.36	189.00	194.06	191.93	195.00	193.00	
2	1	285.0	3.02	16.67	0.80	2.42	13.34	15.0	18.5	6.7	89.99	62.73	5.66	54	0.10	189.75	189.46	194.99	194.40	200.00	195.00	
3	2	317.0	2.76	13.65	0.80	2.21	10.92	15.0	17.6	6.9	75.32	45.64	5.99	48	0.10	190.57	190.25	196.11	195.24	205.00	200.00	
4	3	243.0	4.94	10.89	0.80	3.95	8.71	15.0	16.9	7.0	61.06	38.72	6.35	42	0.15	191.43	191.07	197.29	196.39	210.50	205.00	
5	4	435.0	0.00	5.95	0.80	0.00	4.76	15.0	15.5	7.3	34.64	25.78	4.90	36	0.15	192.58	191.93	199.40	198.23	212.00	210.50	
6	5	51.0	3.59	5.95	0.80	2.87	4.76	15.0	15.3	7.3	34.79	26.41	4.92	36	0.16	192.76	192.68	199.91	199.77	212.00	212.00	
7	6	49.0	2.36	2.36	0.80	1.89	1.89	15.0	15.0	7.4	13.91	18.53	2.83	30	0.20	193.36	193.26	200.38	200.33	212.00	212.00	

Project File: 100-yr DA LL-QQ.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 7 | Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 191.93 (ft)

Hydraflow Inlet Report

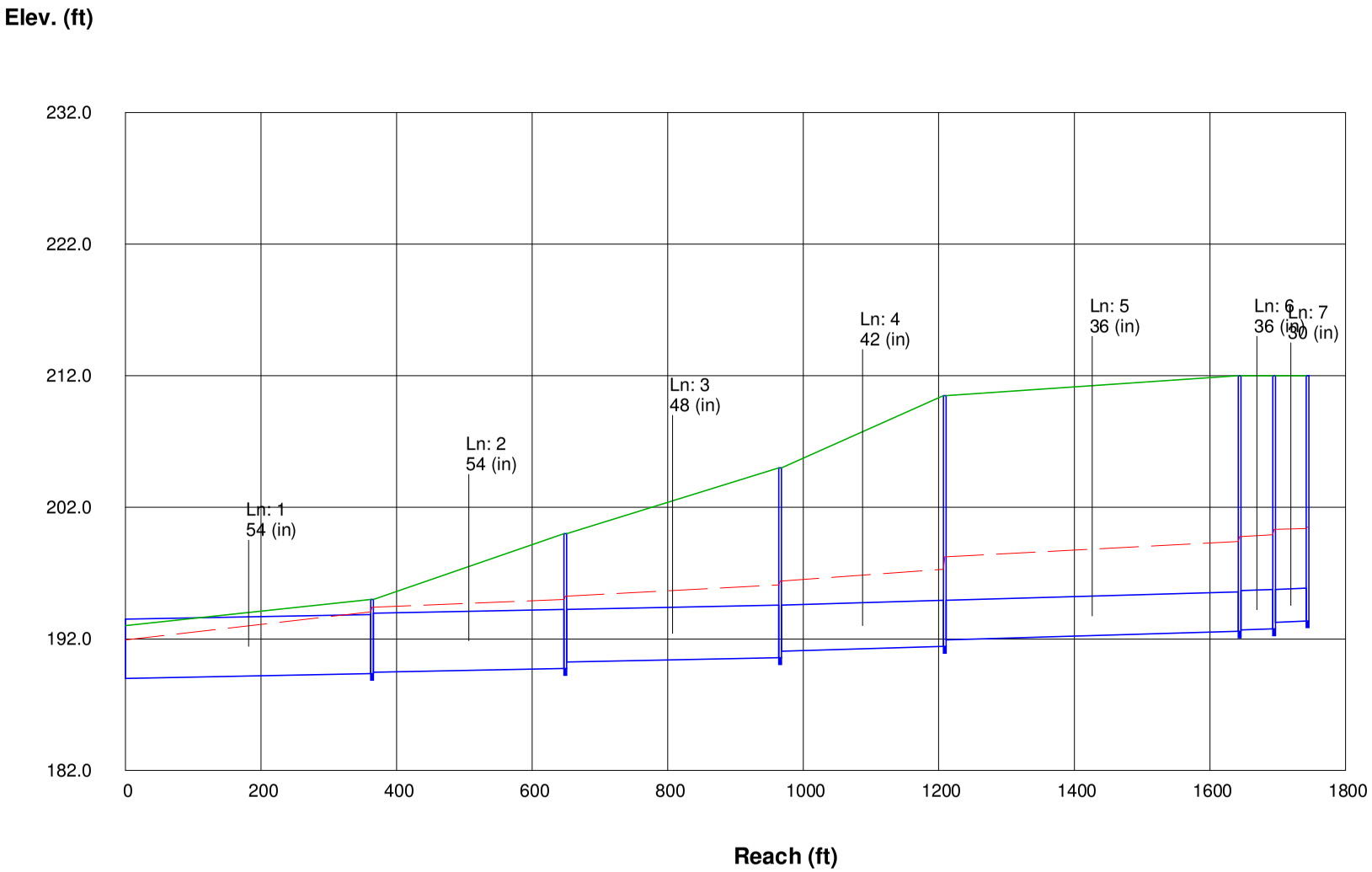
Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		17.79	29.51	9.48	37.83	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	Off
2		17.79	21.20	9.48	29.51	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	1
3		16.26	13.60	8.66	21.20	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	2
4		29.11	0.00	15.51	13.60	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.30	5.33	0.30	5.33	0.0	3
5		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	4
6		21.15	0.00	21.15	0.00	Curb	6.0	15.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.74	20.10	0.77	20.10	2.00	5
7		13.91	0.00	13.91	0.00	Curb	6.0	15.00	0.00	0.00	0.00	Sag	2.00	0.100	0.030	0.000	0.60	15.18	0.62	15.18	2.00	6

Project File: 100-yr DA LL-QQ.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 7 | Run Date: 01-05-2006

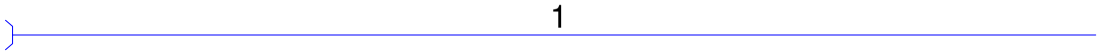
NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 100-yr DA LL-QQ.stm



Hydraflow Plan View



Project file: 100-yr DA SS.stm	IDF file: SedgwickCoKS.IDF	No. Lines: 1	01-05-2006

Hydraflow Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line type	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	118.0	180.0	Hdwl	22.60	5.50	0.80	15.0	207.50	0.12	207.64	29 45	Ellip	0.013	1.00	211.00	

Hydraflow Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1		55.01	29 x 45 e	118.0	207.50	207.64	0.119	209.80*	210.61*	0.93	End

Project File: 100-yr DA SS.stm	IDF File: SedgwickCoKS.IDF	Total No. Lines: 1	Run Date: 01-05-2006

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; * Indicates surcharge condition.

Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	118.0	5.50	5.50	0.80	4.40	4.40	15.0	15.0	7.4	55.01	25.74	7.73	45 e	0.12	207.64	207.50	210.61	209.80	211.00	211.00	

Project File: 100-yr DA SS.stm | IDF File: SedgwickCoKS.IDF | Total number of lines: 1 | Run Date: 01-05-2006

NOTES: Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; Initial tailwater elevation = 209.80 (ft)

Hydraflow Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	depth (ft)	spread (ft)	depth (ft)	spread (ft)	Dep (in)	
1		55.01*	0.00	55.01	0.00	Hdwl	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off

Project File: 100-yr DA SS.stm | I-D-F File: SedgwickCoKS.IDF | Total number of lines: 1 | Run Date: 01-05-2006

NOTES: Inlet N-Values = 0.016 ; Intensity = 62.28 / (Inlet time + 10.10) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added

Storm Sewer Profile

Proj. file: 100-yr DA SS.stm