Drainage Report
The Country Hollow Addition
Wichita, Sedgwick County, Kansas

Location

The subject property is in the city of Wichita, Sedgwick County, Kansas. The proposed development is located north of Harry Street, east of 127th Street East, south of Kellogg Avenue, and west of 143rd Street East in Section 26, Township 27 South, Range 2 East. The site's area is approximately 135 acres, & will be platted in multiple phases. The entry for the site will be on 127th Street East. The site is shown on the Andover, Kansas Quadrangle, located in Appendix A.

Soils

According to the NRCS (SCS) Sedgwick County Soil Survey (Appendix B) soils on the site are Rosehill silty clay 1 to 3 percent slopes, (Rd – HSG "D"), Clime silty clay, 3 to 7 percent slope, (Ce – HSG "C"), and Blanket silty loam 1 to 3 percent slopes, (Bb – HSG "C"). The HSG used to select runoff coefficients is "D".

Pre-Project Conditions

Pre-Project Development
The site is currently agricultural land.

Pre-Project Landform and Slope
Slopes across the site range from 0.5-5.0%.

Pre-Project Drainage Conditions
The site is entirely in Zone C, areas of minimal flooding. The nearest Zone B, area 500-year flood, is located approximately 575 feet east of the site. The nearest Zone A2, area within the 100-year flood plain, is located approximately 780 feet east of the site (FIRM Panel 225, Sedgwick County, Kansas, June 3, 1986) (Appendix C).

Pre-Project Runoff Characteristics
The site is divided into three watersheds. The watersheds are shown on the Existing Watershed Boundaries, Appendix D. The watershed labeled West is approximately 10 acres and drains off site to the south. The Middle Watershed is approximately 110 acres and also drains offsite to the south. The watershed labeled East is approximately 16 acres that drains offsite to the east to the Spring Branch of Four-Mile Creek. A curve number of 80 was used for all areas. The times of concentration were calculated using

the FAA Method, Appendix E. The flow rate from each watershed was calculated using the SCS method in Hydraflow Hydrographs by Intelisolve, Appendix F. A summary of the flow leaving the site is located below in Table 1.

Table 1. Pre-Project runoff.

	2-Year	5-Year	10-Year	100-Year
West Watershed	17.9	28.0	34.8	60.5
South Watershed	109.2	170.3	212.1	370.5
East Watershed	25.9	40.6	50.7	88.3

Post-Project Conditions

Post-Project Development

A portion of the site along the northern edge of the property will be zoned for commercial use. The remainder of the site will be developed as ¼ acre single family residential lots.

Post-Project Landform and Slope

Post-Project slopes are expected to range from 0.5% to 3.0%. The Lot Grading Plan is in Appendix G. Proposed stormwater sewer will pick up runoff from the site and route it into proposed ponds. The Drainage and Utility Plan, Appendix H, shows the proposed utilities and detention ponds.

Post-Project Runoff Characteristics

Detention for the site will be provided by 5 ponds located in the existing south watershed. Stormwater Sewer systems will be used to route runoff from the west watershed into the south watershed. A portion of the east watershed will also be diverted into the south watershed, where the runoff can be more readily detained. The ponds were sized using SCS Method in Hydraflow Hydrographs by Intelisolve, Appendix J. The time of concentration to each pond was determined using the FAA Method, Appendix E. The site was divided into sub-watersheds in order to size the SWS and the ponds. The sub-watersheds are shown in the Drainage and Utility Plan, Appendix G. The SWS was sized using the Rational Method, the time of concentration to each inlet was determined using the FAA Method, Appendix I. A summary of the post-project flows leaving the site is located below in Table 2.

Table 2. Post-Project runoff.

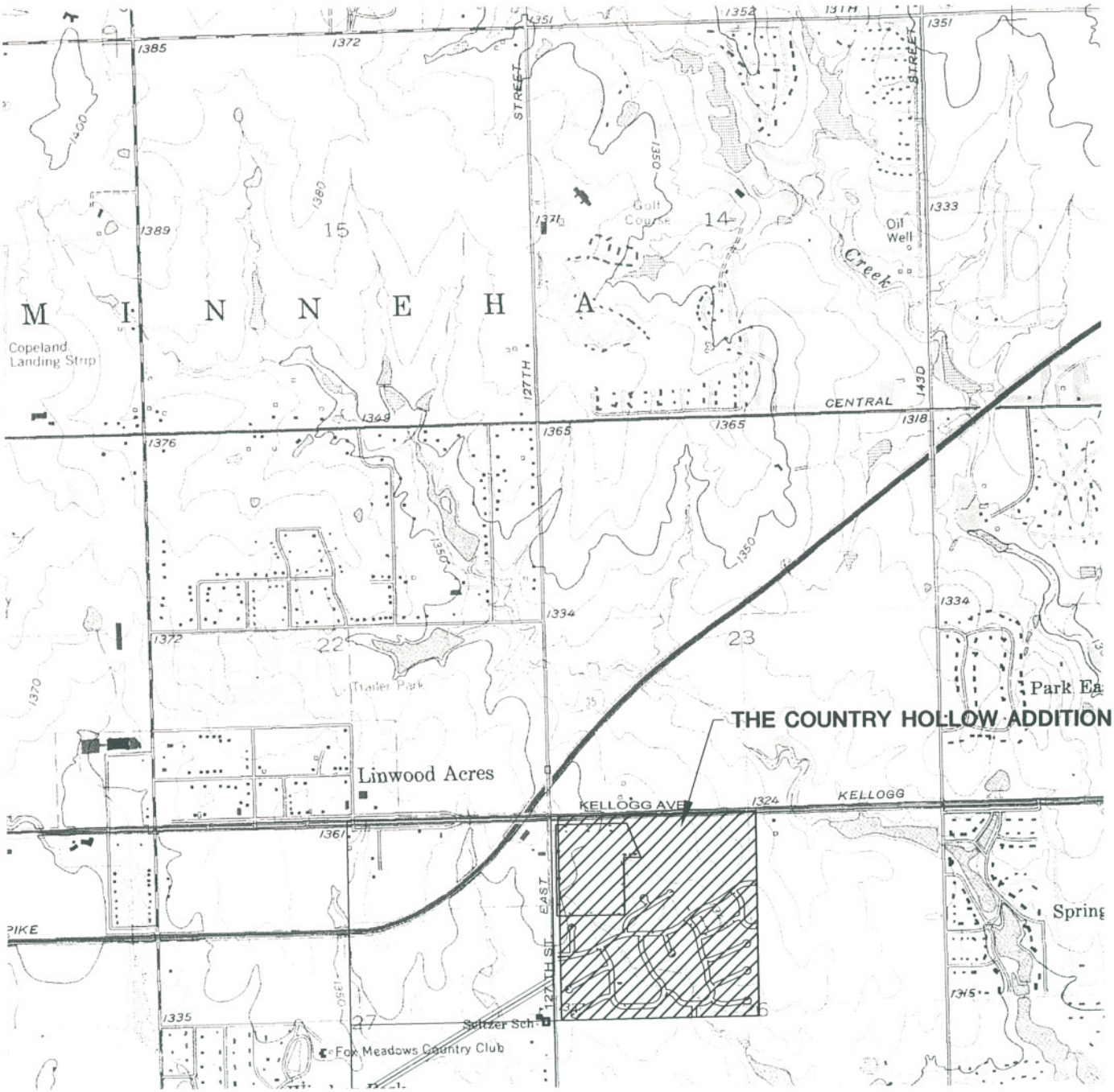
	2-Year	5-Year	10-Year	100-Year
West Watershed	0.0	0.0	0.0	0.0
South Watershed	107.5	168.4	209.6	361.8
East Watershed	29.4	40.9	49.4	75.4

Runoff decreases from the site in all areas during the 100-Year event.

Summary

The Country Hollow Addition is approximately 135 acres that will be developed for both commercial and residential purposes. Currently, the site is agricultural land. The proposed site will have approximately 190 residential lots, 5 commercial lots. The site is located in the southeast corner of Kellogg and 127th Street East. Currently the site drains into three watersheds. The watersheds have been analyzed under Pre-Project and Post-Project conditions. Stormwater sewer will be used to redirect flow from the east and west and route it into the proposed detention ponds. Proposed detention ponds will provide approximately 20 acre-feet of detention. Peak flows from the site are decrease from pre to post project conditions due to the detention ponds.

Appendix A
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

N

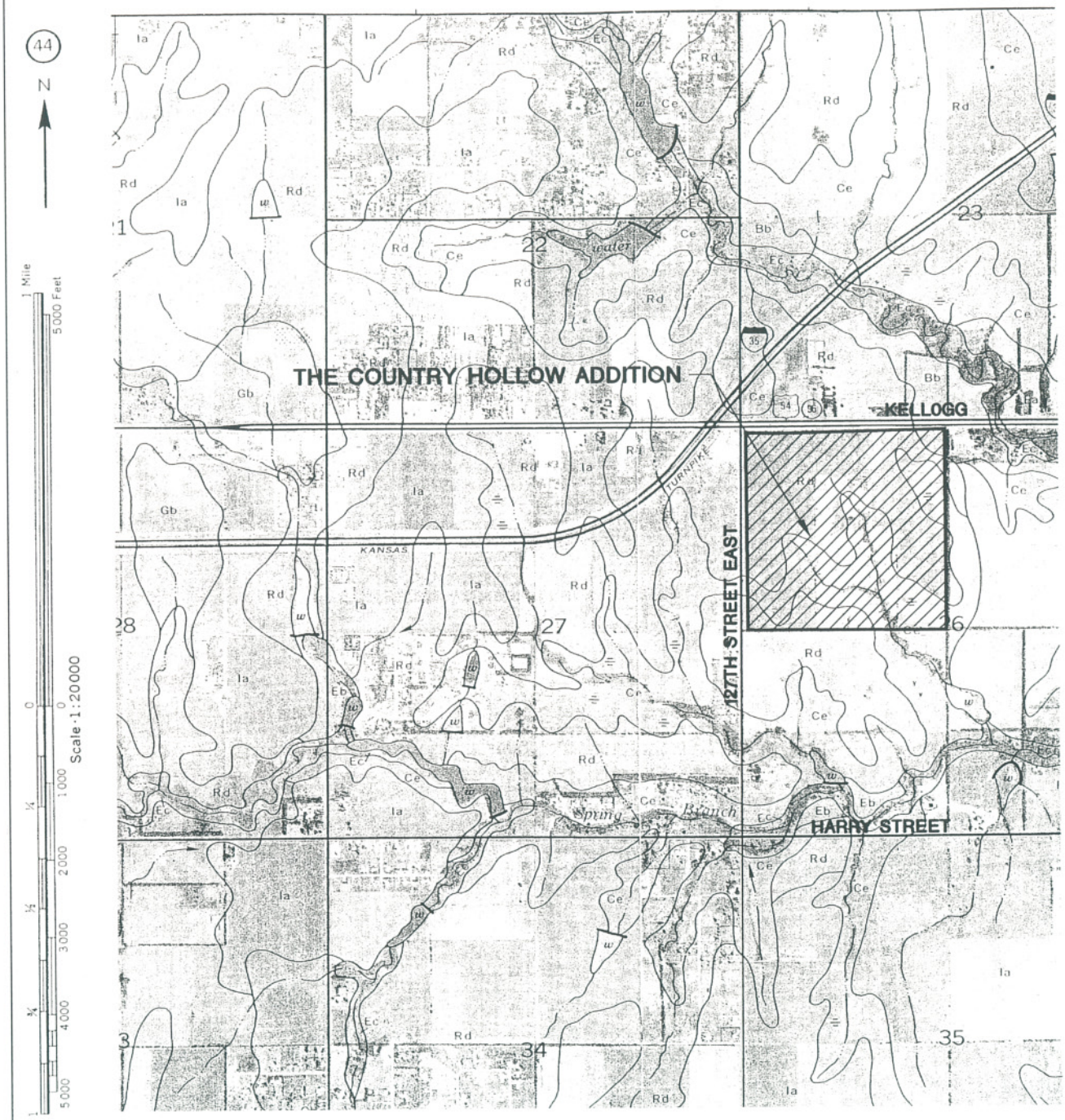
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

THE COUNTRY HOLLOW ADDITION
PROJECT NAME

WICHITA EAST QUADRANGLE MAP
SHEET TITLE

AJK	SMD	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04429	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix B
Soil Survey



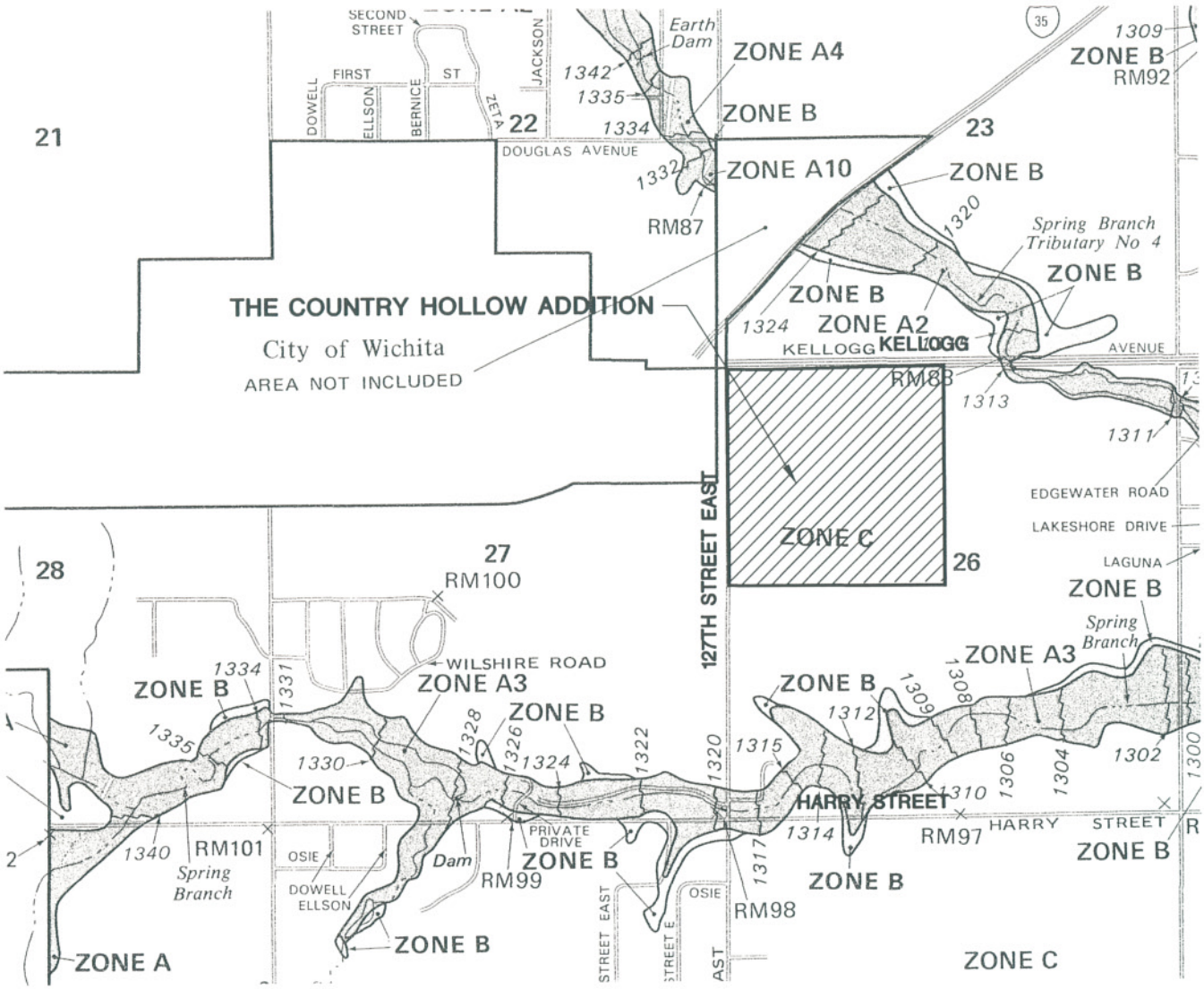
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

THE COUNTRY HOLLOW ADDITION
PROJECT NAME

SOIL SURVEY
SEDGWICK COUNTY, KANSAS
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04429	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix C
FIRM & FBFM



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
(UNINCORPORATED AREAS)

PANEL 225 OF 300

COMMUNITY-PANEL NUMBER
200321 0225 A

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency

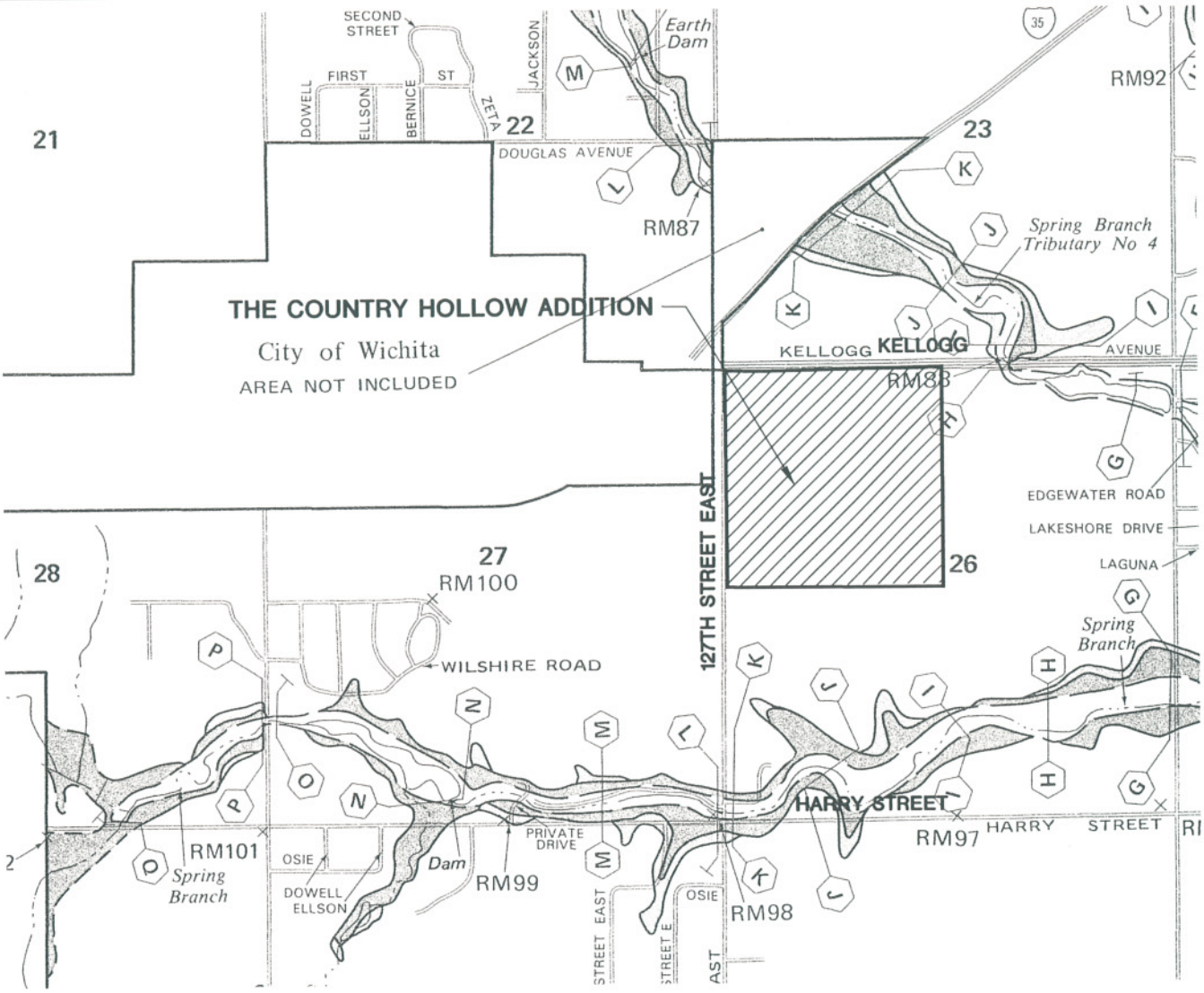
APPROXIMATE SCALE
2000 0 2000 FEET

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

THE COUNTRY HOLLOW ADDITION
PROJECT NAME

FIRM PANEL 225
SEDGWICK COUNTY, KANSAS
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04429	1 / 1
DATE	JOB NO.	SHEET/OF



NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY

FLOOD BOUNDARY AND FLOODWAY MAP

SEDGWICK COUNTY, KANSAS
(UNINCORPORATED AREAS)

PANEL 225 OF 300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
200321 0225

EFFECTIVE DATE:
JUNE 3, 1986

Federal Emergency Management Agency

N

APPROXIMATE SCALE
2000 0 2000 FEET

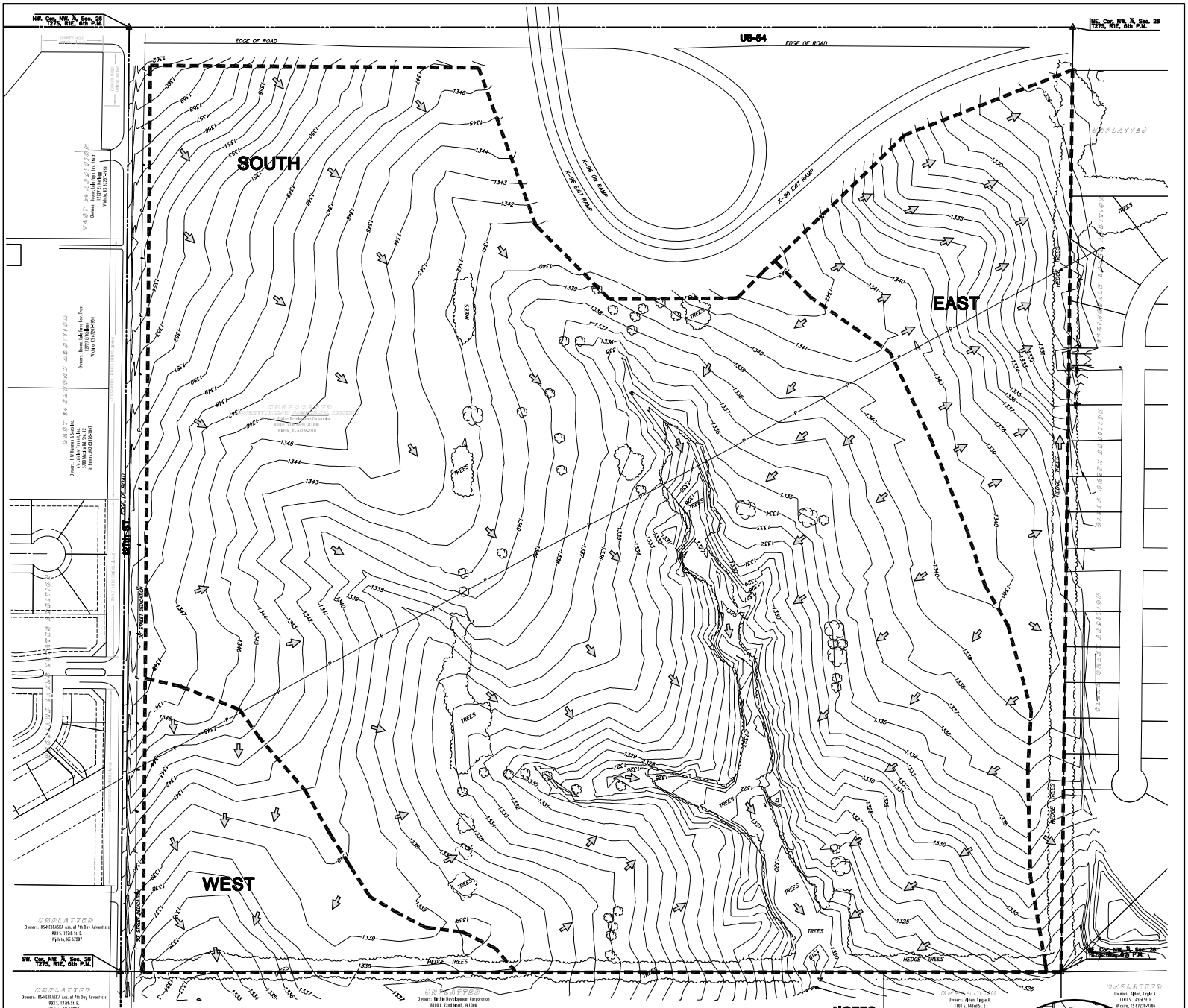
MKEC ENGINEERING CONSULTANTS
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

THE COUNTRY HOLLOW ADDITION
PROJECT NAME

FBFM PANEL 225
SEDGWICK COUNTY, KANSAS
SHEET TITLE

AJK	KWS	GJA
DESIGN BY:	DRAWN BY:	CHECKED BY:
JUNE 2005	04429	1 / 1
DATE	JOB NO.	SHEET/OF

Appendix D
Existing Watersheds



LEGEND

- Sec. Corner
- Prd. Prop. Corner
- GAS METER
- SANITARY SEWER MANHOLE
- POWER POLE/GUY ANCHOR
- ELECTRIC BOX
- SIGN
- GATE
- TREES
- EDGE OF TREES
- POLE
- EXISTING DRAINAGE AREAS
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC
- FLOW ARROWS

100 0 100 200

NOTES

1. ZONING: Existing - SF-20
   Proposed - LC and SF-5 (SF-5 by annexation)
   (this plat shall conform with) CUP DP-___
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. LEGAL DESCRIPTION: See attached
5. EXISTING USE: Vacant Land and Cultivated Fields
6. PLAT AREA: Gross 138.18 Ac.
   Net 136.43 Ac.
7. SURVEY DATE: 2004 (by Baughman Co.)
8. MINIMUM PADS: As shown on the Final Drainage Plan
9. LOT TOTAL - 187 SF-5 Zoning District
   Lot 37 Blk. 1, is intended for a church (SF-5)
10. RESERVES: All Reserves are platted for for, landscaping, irrigation, open space, monuments, and water features. Reserves "C", "D", "F", and "G" are also platted for drainage. Reserve "E" is also platted for a pool and associated uses, and private play ground.
11. LEGAL DESCRIPTION: See Attached

PLAT LOCATION

VICINITY MAP

EXISTING WATERSHED BOUNDARIES

COUNTRY HOLLOW ADDITION

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

Date: July 2005

MKEC ENGINEERING CONSULTANTS

Appendix E
Hydraflow Tc Calculations

Time of Concentration Calculations
The Country Hollow Addition
Soil Group D

Area Name	C	Maximum Elevation	Minimum Elevation	H	Flow Length (L)	Tc Calc	Tc
Pre-Project							
West	0.67	1348	1333	15	820	18.12	18
South	0.67	1360	1318	42	3222	40.22	40
East	0.67	1340	1325	15	1000	21.38	21
Post-Project							
Lake 1	0.80	1360	1333	27	1660	18.71	19
Lake 2	0.80	1355	1338	17	1240	17.12	17
Lake 3	0.76	1342	1331	11	590	12.08	15
Lake 4	0.76	1347	1330	17	1230	19.27	19
Lake 5	0.77	1340	1320	20	1880	25.23	25
Surface Offsite South	0.76	1342	1318	24	2050	26.29	26
Surface Offsite East	0.78	1338	1325	13	1560	24.18	24

Appendix F
Existing Hydraflow Hydrographs
By Intelisolve
Output

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	17.86	-------	27.97	34.83	-------	-------	60.45	West
2	SCS Runoff	-------	-------	109.16	-------	170.30	212.13	-------	-------	370.48	South
3	SCS Runoff	-------	-------	25.89	-------	40.62	50.67	-------	-------	88.33	East

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	17.86	6	720	1.279	----	------	------	West
2	SCS Runoff	109.16	6	744	14.233	----	------	------	South
3	SCS Runoff	25.89	6	732	2.458	----	------	------	East

Proj. file: Pre Calcs.gpw | Return Period: 2 yr | Run date: 07-29-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	27.97	6	720	1.976	----	------	------	West
2	SCS Runoff	170.30	6	744	21.995	----	------	------	South
3	SCS Runoff	40.62	6	726	3.798	----	------	------	East

Proj. file: Pre Calcs.gpw | Return Period: 5 yr | Run date: 07-29-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	34.83	6	720	2.456	----	------	------	West
2	SCS Runoff	212.13	6	738	27.334	----	------	------	South
3	SCS Runoff	50.67	6	726	4.720	----	------	------	East

Proj. file: Pre Calcs.gpw | Return Period: 10 yr | Run date: 07-29-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	60.45	6	720	4.291	----	------	------	West
2	SCS Runoff	370.48	6	738	47.760	----	------	------	South
3	SCS Runoff	88.33	6	726	8.247	----	------	------	East

Proj. file: Pre Calcs.gpw | Return Period: 100 yr | Run date: 07-29-2005

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

West

Hydrograph type	= SCS Runoff	Peak discharge	= 60.45 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 10.10 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 18 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.291 acft

Hydrograph Discharge Table

Time -- (hrs)	Outflow cfs)
11.80	22.51
11.90	42.14
12.00	60.45 <<
12.10	55.01
12.20	34.66
12.30	17.79

...End

Hydrograph Report

Hyd. No. 2

South

Hydrograph type	= SCS Runoff	Peak discharge	= 370.48 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 108.10 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 40 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 47.760 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.80	80.51
11.90	132.75
12.00	203.42
12.10	272.09
12.20	331.29
12.30	370.48 <<
12.40	366.54
12.50	331.55
12.60	292.50
12.70	250.19
12.80	205.45
12.90	160.42
13.00	118.52
13.10	84.05

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 3

East

Hydrograph type	= SCS Runoff	Peak discharge	= 88.33 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 18.20 ac	Curve number	= 80
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 21 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

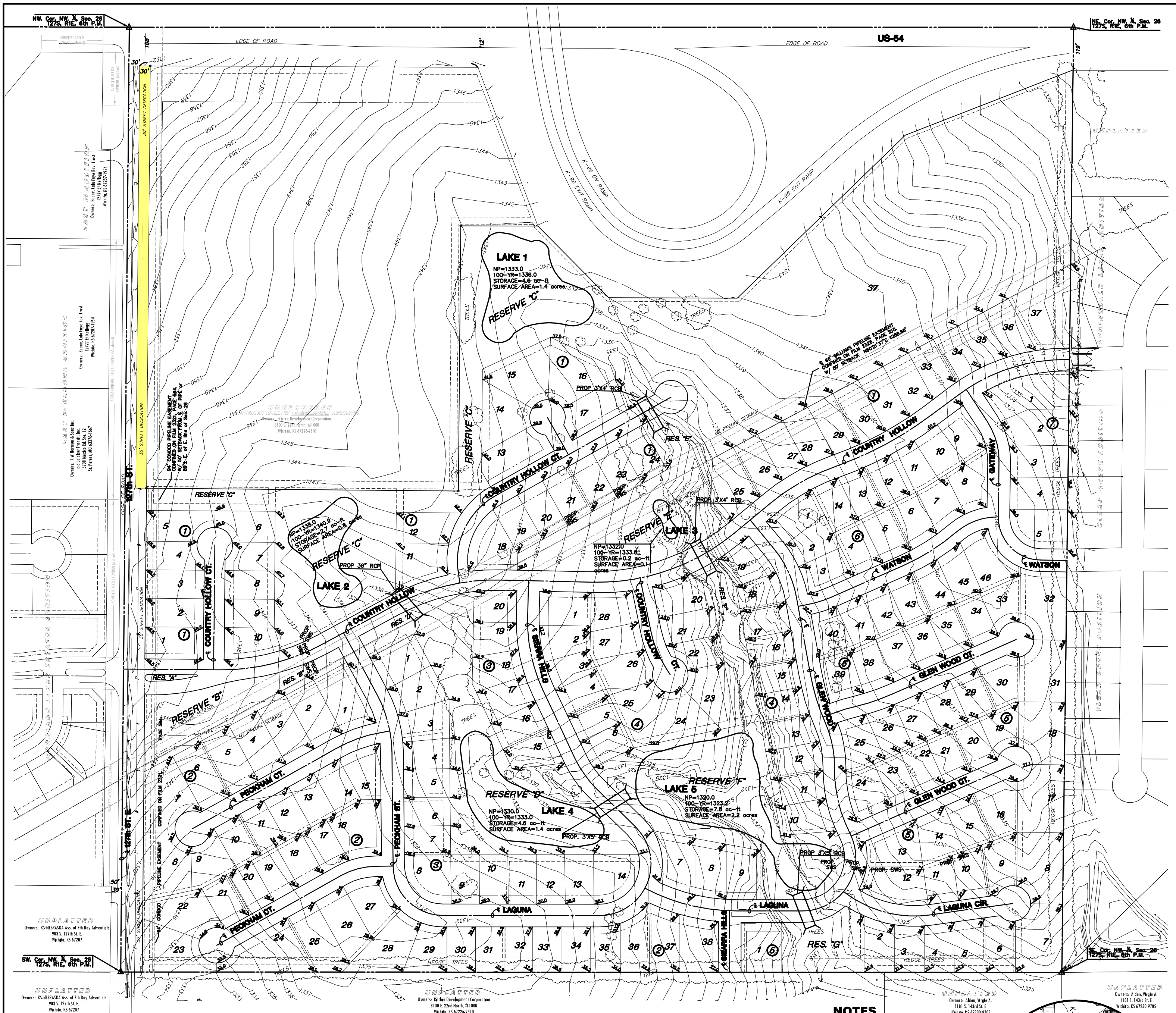
Hydrograph Volume = 8.247 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)	
11.80	25.42	
11.90	46.71	
12.00	71.82	
12.10	88.33	<<
12.20	85.65	
12.30	69.32	
12.40	52.27	
12.50	35.83	
12.60	21.99	

...End

Appendix G
Lot Grading Plan



LEGEND

- Sec. Corner
- Fnd. Prop. Corner
- GAS METER
- SANITARY SEWER MANHOLE
- POWER POLE/GUY ANCHOR
- ELECTRIC BOX
- SIGN
- GATE
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- EDGE OF TREES
- POLE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC

MINIMUM PAD ELEVATIONS (LOWEST OPENINGS)			
LOTS	BLOCK	ELEVATION	
		(CITY DATUM)	(NGVD)
6-12	1	156.6	1344.0
13-17	1	151.6	1339.0
18-25	1	147.4	1334.8
37	1	151.6	1339.0
1-20	3	148.6	1336.0
6-25	4	138.8	1326.2
1-2	5	137.6	1325.0

100 0 100 200

NOTES

1. ZONING: Existing - SF-20
   Proposed - LC and SF-5 (SF-5 by annexation)
   (this plat shall conform with) CUP DP-___
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3. PUBLIC UTILITIES: Shall be extended to site by petitions
4. LEGAL DESCRIPTION: See attached
5. EXISTING USE: Vacant Land and Cultivated Fields
6. PLAT AREA: Grosss 138.18 Ac.
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7. SURVEY DATE: 2004 (by Baughman Co.)
8. MINIMUM PADS: As shown on the Final Drainage Plan
9. LOT TOTAL - 187 SF-5 Zoning District
   Lot 37 Blk. 1, is intended for a church (SF-5)
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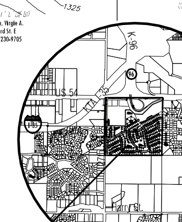


VICINITY MAP

PRELIMINARY LOT GRADING PLAN

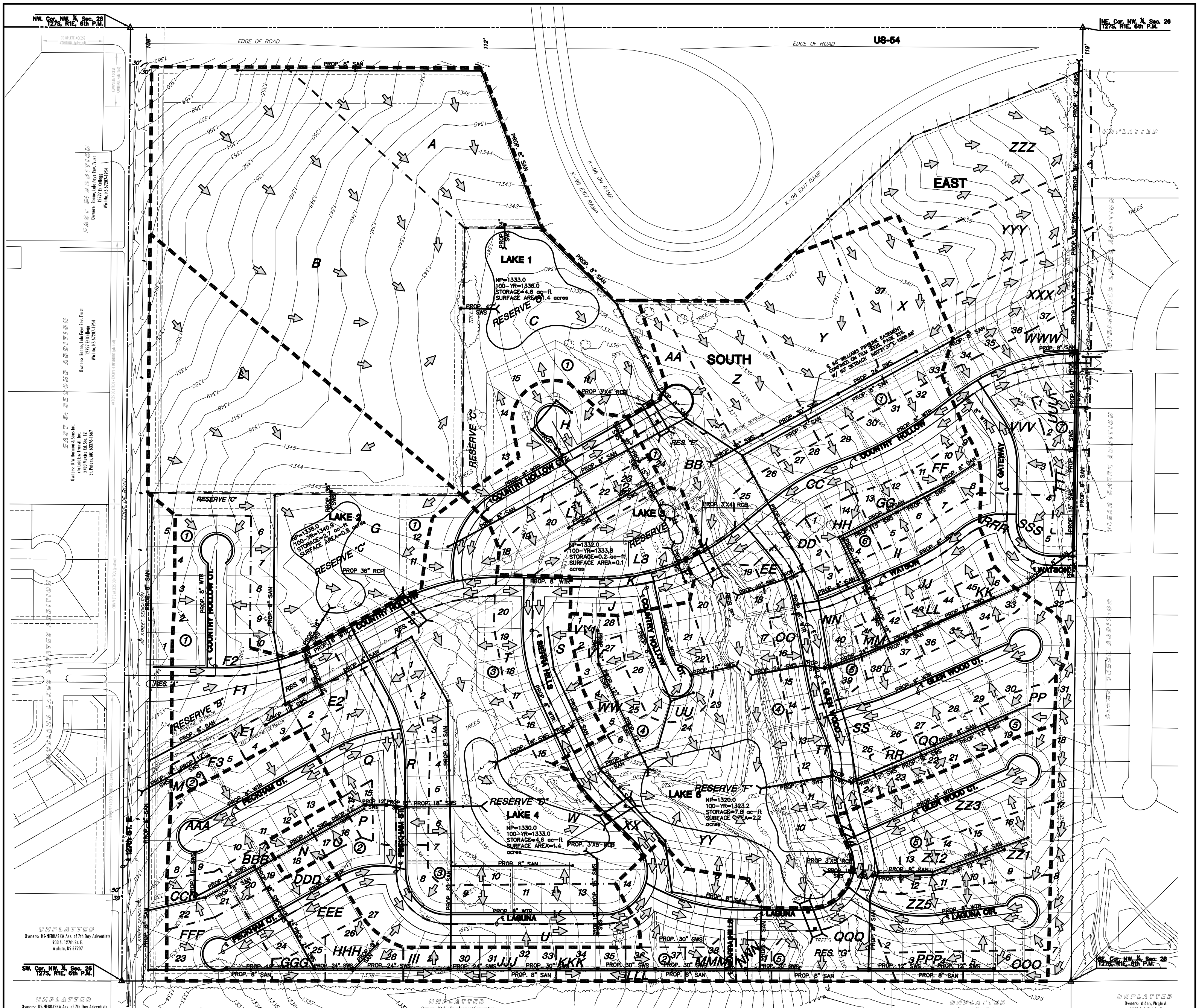
COUNTRY HOLLOW ADDITION

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

Date: July 2005

MKEC ENGINEERING CONSULTANTS

Appendix H
Drainage & Utility Plan



LEGEND

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- EDGE OF TREES
- POLE
- PROP. DRAINAGE AREAS
- PROP. WATERSHED BOUNDARY
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- TELEPHONE RISER
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- OVERHEAD ELECTRIC
- DA - DRAINAGE AREA
- FLOW ARROWS

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1-20	3	148.6	1336.0
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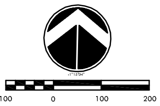

WATERSHED BOUNDARIES

NOTES

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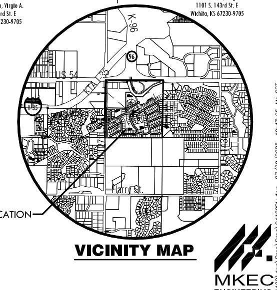

VICINITY MAP

DRAINAGE AND UTILITY PLAN

COUNTRY HOLLOW ADDITION

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

Date: July 2005

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

J:\Civil\04429\dwg\Prop\Drng\04429DU.dwg 07/29/2005 10:43:06 AM CST

Appendix I
Proposed Hydraflow Hydrographs
By Intelisolve
Output

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)							Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	72.34	-------	96.93	112.90	-------	-------	170.62	Surface to Lake 1
2	Reservoir	1	-------	24.53	-------	35.54	42.79	-------	-------	70.06	Lake 1
3	SCS Runoff	-------	-------	42.05	-------	56.33	65.61	-------	-------	99.16	Surface to Lake 2
4	Reservoir	3	-------	15.28	-------	22.46	27.28	-------	-------	41.06	Lake 2
5	SCS Runoff	-------	-------	14.63	-------	21.14	25.42	-------	-------	40.97	Surface to Lake 3
6	Reservoir	5	-------	14.01	-------	19.97	24.05	-------	-------	38.93	Lake 3
7	SCS Runoff	-------	-------	50.60	-------	73.11	87.92	-------	-------	141.72	Surface to Lake 4
8	Combine	4, 7	-------	59.37	-------	86.44	104.20	-------	-------	169.76	Flow to Lake 4
9	Reservoir	8	-------	24.35	-------	38.94	49.28	-------	-------	86.48	Lake 4
10	SCS Runoff	-------	-------	71.14	-------	103.09	124.14	-------	-------	200.72	Surface to Lake 5
11	Combine	2, 6, 9, 10	-------	126.18	-------	186.84	227.31	-------	-------	375.29	Flow to Lake 5
12	Reservoir	11	-------	84.73	-------	133.09	165.77	-------	-------	285.75	Lake 5
13	SCS Runoff	-------	-------	37.99	-------	55.06	66.30	-------	-------	107.19	Surface offsite South
14	Combine	12, 13	-------	107.45	-------	168.37	209.56	-------	-------	361.82	Flow offsite South
16	SCS Runoff	-------	-------	29.39	-------	40.87	48.35	-------	-------	75.36	Surface offsite East

Proj. file: Post Calcs.gpw

Run date: 07-29-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	72.34	6	720	5.337	----	------	------	Surface to Lake 1
2	Reservoir	24.53	6	738	5.337	1	1334.48	2.197	Lake 1
3	SCS Runoff	42.05	6	720	3.102	----	------	------	Surface to Lake 2
4	Reservoir	15.28	6	738	3.102	3	1339.53	1.309	Lake 2
5	SCS Runoff	14.63	6	720	1.032	----	------	------	Surface to Lake 3
6	Reservoir	14.01	6	726	1.032	5	1331.89	0.089	Lake 3
7	SCS Runoff	50.60	6	720	3.568	----	------	------	Surface to Lake 4
8	Combine	59.37	6	720	6.670	4, 7	------	------	Flow to Lake 4
9	Reservoir	24.35	6	744	6.670	8	1331.27	1.847	Lake 4
10	SCS Runoff	71.14	6	726	6.620	----	------	------	Surface to Lake 5
11	Combine	126.18	6	732	19.658	2, 6, 9, 10	------	------	Flow to Lake 5
12	Reservoir	84.73	6	750	19.658	11	1321.42	3.292	Lake 5
13	SCS Runoff	37.99	6	726	3.535	----	------	------	Surface offsite South
14	Combine	107.45	6	738	23.193	12, 13	------	------	Flow offsite South
16	SCS Runoff	29.39	6	726	2.753	----	------	------	Surface offsite East

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	96.93	6	720	7.265	----	------	------	Surface to Lake 1
2	Reservoir	35.54	6	738	7.265	1	1334.90	2.841	Lake 1
3	SCS Runoff	56.33	6	720	4.223	----	------	------	Surface to Lake 2
4	Reservoir	22.46	6	738	4.223	3	1339.91	1.658	Lake 2
5	SCS Runoff	21.14	6	720	1.499	----	------	------	Surface to Lake 3
6	Reservoir	19.97	6	726	1.499	5	1332.13	0.116	Lake 3
7	SCS Runoff	73.11	6	720	5.185	----	------	------	Surface to Lake 4
8	Combine	86.44	6	720	9.408	4, 7	------	------	Flow to Lake 4
9	Reservoir	38.94	6	738	9.408	8	1331.74	2.567	Lake 4
10	SCS Runoff	103.09	6	726	9.620	----	------	------	Surface to Lake 5
11	Combine	186.84	6	732	27.792	2, 6, 9, 10	------	------	Flow to Lake 5
12	Reservoir	133.09	6	744	27.792	11	1321.91	4.503	Lake 5
13	SCS Runoff	55.06	6	726	5.138	----	------	------	Surface offsite South
14	Combine	168.37	6	738	32.930	12, 13	------	------	Flow offsite South
16	SCS Runoff	40.87	6	726	3.871	----	------	------	Surface offsite East

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	112.90	6	720	8.532	----	------	------	Surface to Lake 1
2	Reservoir	42.79	6	738	8.532	1	1335.15	3.243	Lake 1
3	SCS Runoff	65.61	6	720	4.959	----	------	------	Surface to Lake 2
4	Reservoir	27.28	6	732	4.959	3	1340.14	1.880	Lake 2
5	SCS Runoff	25.42	6	720	1.813	----	------	------	Surface to Lake 3
6	Reservoir	24.05	6	726	1.813	5	1332.28	0.135	Lake 3
7	SCS Runoff	87.92	6	720	6.270	----	------	------	Surface to Lake 4
8	Combine	104.20	6	720	11.228	4, 7	------	------	Flow to Lake 4
9	Reservoir	49.28	6	738	11.228	8	1332.03	3.026	Lake 4
10	SCS Runoff	124.14	6	726	11.632	----	------	------	Surface to Lake 5
11	Combine	227.31	6	732	33.205	2, 6, 9, 10	------	------	Flow to Lake 5
12	Reservoir	165.77	6	744	33.205	11	1322.21	5.269	Lake 5
13	SCS Runoff	66.30	6	726	6.212	----	------	------	Surface offsite South
14	Combine	209.56	6	738	39.417	12, 13	------	------	Flow offsite South
16	SCS Runoff	48.35	6	726	4.612	----	------	------	Surface offsite East

Proj. file: Post Calcs.gpw | Return Period: 10 yr | Run date: 07-29-2005

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	170.62	6	720	13.166	----	------	------	Surface to Lake 1
2	Reservoir	70.06	6	732	13.166	1	1335.98	4.623	Lake 1
3	SCS Runoff	99.16	6	720	7.652	----	------	------	Surface to Lake 2
4	Reservoir	41.06	6	732	7.652	3	1340.94	2.682	Lake 2
5	SCS Runoff	40.97	6	720	2.981	----	------	------	Surface to Lake 3
6	Reservoir	38.93	6	726	2.981	5	1332.76	0.197	Lake 3
7	SCS Runoff	141.72	6	720	10.311	----	------	------	Surface to Lake 4
8	Combine	169.76	6	720	17.963	4, 7	------	------	Flow to Lake 4
9	Reservoir	86.48	6	738	17.963	8	1332.96	4.555	Lake 4
10	SCS Runoff	200.72	6	726	19.130	----	------	------	Surface to Lake 5
11	Combine	375.29	6	732	53.241	2, 6, 9, 10	------	------	Flow to Lake 5
12	Reservoir	285.75	6	744	53.241	11	1323.21	7.875	Lake 5
13	SCS Runoff	107.19	6	726	10.217	----	------	------	Surface offsite South
14	Combine	361.82	6	738	63.457	12, 13	------	------	Flow offsite South
16	SCS Runoff	75.36	6	726	7.344	----	------	------	Surface offsite East

Proj. file: Post Calcs.gpw | Return Period: 100 yr | Run date: 07-29-2005

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 1

Surface to Lake 1

Hydrograph type	= SCS Runoff	Peak discharge	= 170.62 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 23.40 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 19 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 13.166 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.90	124.77
12.00	170.62 <<
12.10	150.79
12.20	93.09

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 2

Lake 1

Hydrograph type	= Reservoir	Peak discharge	= 70.06 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 1	Reservoir name	= Lake 1
Max. Elevation	= 1335.98 ft	Max. Storage	= 4.623 acft

Storage Indication method used.

Outflow hydrograph volume = 13.166 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.00	170.62 <<	1335.15	42.97	-----	-----	-----	-----	-----	-----	-----	-----	42.97
12.10	150.79	1335.70	60.29	-----	-----	-----	-----	-----	-----	-----	-----	60.29
12.20	93.09	1335.98 <<	70.06	-----	-----	-----	-----	-----	-----	-----	-----	70.06 <<
12.30	46.67	1335.98	70.03	-----	-----	-----	-----	-----	-----	-----	-----	70.03
12.40	25.95	1335.82	64.63	-----	-----	-----	-----	-----	-----	-----	-----	64.63
12.50	22.05	1335.64	58.31	-----	-----	-----	-----	-----	-----	-----	-----	58.31
12.60	18.45	1335.46	52.58	-----	-----	-----	-----	-----	-----	-----	-----	52.58
12.70	15.76	1335.30	47.39	-----	-----	-----	-----	-----	-----	-----	-----	47.39
12.80	14.07	1335.15	42.81	-----	-----	-----	-----	-----	-----	-----	-----	42.81
12.90	12.98	1335.01	38.79	-----	-----	-----	-----	-----	-----	-----	-----	38.79
13.00	12.09	1334.88	35.10	-----	-----	-----	-----	-----	-----	-----	-----	35.10

...End

Reservoir Report

Reservoir No. 1 - Lake 1

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1333.00	61,084	0.000	0.000
1.00	1334.00	65,378	1.452	1.452
2.00	1335.00	69,771	1.551	3.003
3.00	1336.00	74,264	1.653	4.656
4.00	1337.00	78,858	1.758	6.414

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 36.0	0.0	0.0	0.0
Span in	= 48.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1333.00	0.00	0.00	0.00
Length ft	= 0.0	0.0	0.0	0.0
Slope %	= 0.00	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1333.00	0.00	---	---	---	---	---	---	---	---	0.00
0.10	0.145	1333.10	0.43	---	---	---	---	---	---	---	---	0.43
0.20	0.290	1333.20	1.22	---	---	---	---	---	---	---	---	1.22
0.30	0.435	1333.30	2.24	---	---	---	---	---	---	---	---	2.24
0.40	0.581	1333.40	3.44	---	---	---	---	---	---	---	---	3.44
0.50	0.726	1333.50	4.81	---	---	---	---	---	---	---	---	4.81
0.60	0.871	1333.60	6.33	---	---	---	---	---	---	---	---	6.33
0.70	1.016	1333.70	7.97	---	---	---	---	---	---	---	---	7.97
0.80	1.161	1333.80	9.74	---	---	---	---	---	---	---	---	9.74
0.90	1.306	1333.90	11.62	---	---	---	---	---	---	---	---	11.62
1.00	1.452	1334.00	13.62	---	---	---	---	---	---	---	---	13.62
1.10	1.607	1334.10	15.71	---	---	---	---	---	---	---	---	15.71
1.20	1.762	1334.20	17.90	---	---	---	---	---	---	---	---	17.90
1.30	1.917	1334.30	20.18	---	---	---	---	---	---	---	---	20.18
1.40	2.072	1334.40	22.56	---	---	---	---	---	---	---	---	22.56
1.50	2.227	1334.50	25.02	---	---	---	---	---	---	---	---	25.02
1.60	2.382	1334.60	27.56	---	---	---	---	---	---	---	---	27.56
1.70	2.537	1334.70	30.18	---	---	---	---	---	---	---	---	30.18
1.80	2.693	1334.80	32.88	---	---	---	---	---	---	---	---	32.88
1.90	2.848	1334.90	35.66	---	---	---	---	---	---	---	---	35.66
2.00	3.003	1335.00	38.52	---	---	---	---	---	---	---	---	38.52
2.10	3.168	1335.10	41.44	---	---	---	---	---	---	---	---	41.44
2.20	3.334	1335.20	44.44	---	---	---	---	---	---	---	---	44.44
2.30	3.499	1335.30	47.50	---	---	---	---	---	---	---	---	47.50
2.40	3.664	1335.40	50.63	---	---	---	---	---	---	---	---	50.63
2.50	3.830	1335.50	53.83	---	---	---	---	---	---	---	---	53.83
2.60	3.995	1335.60	57.09	---	---	---	---	---	---	---	---	57.09
2.70	4.160	1335.70	60.41	---	---	---	---	---	---	---	---	60.41
2.80	4.326	1335.80	63.80	---	---	---	---	---	---	---	---	63.80
2.90	4.491	1335.90	67.25	---	---	---	---	---	---	---	---	67.25
3.00	4.656	1336.00	70.77	---	---	---	---	---	---	---	---	70.77
3.10	4.832	1336.10	73.09	---	---	---	---	---	---	---	---	73.09
3.20	5.008	1336.20	75.33	---	---	---	---	---	---	---	---	75.33

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
3.30	5.183	1336.30	77.52	---	---	---	---	---	---	---	---	77.52
3.40	5.359	1336.40	79.64	---	---	---	---	---	---	---	---	79.64
3.50	5.535	1336.50	81.71	---	---	---	---	---	---	---	---	81.71
3.60	5.711	1336.60	83.73	---	---	---	---	---	---	---	---	83.73
3.70	5.886	1336.70	85.70	---	---	---	---	---	---	---	---	85.70
3.80	6.062	1336.80	87.62	---	---	---	---	---	---	---	---	87.62
3.90	6.238	1336.90	89.51	---	---	---	---	---	---	---	---	89.51
4.00	6.414	1337.00	91.36	---	---	---	---	---	---	---	---	91.36

...End

Hydrograph Report

Hyd. No. 3

Surface to Lake 2

Hydrograph type	= SCS Runoff	Peak discharge	= 99.16 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 13.60 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 17 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 7.652 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.90	72.52
12.00	99.16 <<
12.10	87.64
12.20	54.10

...End

Hydrograph Report

Hyd. No. 4

Lake 2

Hydrograph type	= Reservoir	Peak discharge	= 41.06 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 3	Reservoir name	= Lake 2
Max. Elevation	= 1340.94 ft	Max. Storage	= 2.682 acft

Storage Indication method used.

Outflow hydrograph volume = 7.652 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.00	99.16 <<	1340.18	28.04	-----	-----	-----	-----	-----	-----	-----	-----	28.04
12.10	87.64	1340.68	37.25	-----	-----	-----	-----	-----	-----	-----	-----	37.25
12.20	54.10	1340.94 <<	41.06	-----	-----	-----	-----	-----	-----	-----	-----	41.06 <<
12.30	27.12	1340.94	41.02	-----	-----	-----	-----	-----	-----	-----	-----	41.02
12.40	15.08	1340.78	38.92	-----	-----	-----	-----	-----	-----	-----	-----	38.92
12.50	12.82	1340.59	35.58	-----	-----	-----	-----	-----	-----	-----	-----	35.58
12.60	10.72	1340.41	32.44	-----	-----	-----	-----	-----	-----	-----	-----	32.44
12.70	9.16	1340.23	29.15	-----	-----	-----	-----	-----	-----	-----	-----	29.16
12.80	8.17	1340.08	25.98	-----	-----	-----	-----	-----	-----	-----	-----	25.98
12.90	7.54	1339.93	22.97	-----	-----	-----	-----	-----	-----	-----	-----	22.97
13.00	7.02	1339.80	20.92	-----	-----	-----	-----	-----	-----	-----	-----	20.92

...End

Reservoir Report

Reservoir No. 2 - Lake 2

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1338.00	34,229	0.000	0.000
1.00	1339.00	37,870	0.828	0.828
2.00	1340.00	41,613	0.912	1.740
3.00	1341.00	45,456	0.999	2.739
4.00	1342.00	49,400	1.089	3.828

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 36.0	0.0	0.0	0.0
Span in	= 36.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1338.00	0.00	0.00	0.00
Length ft	= 0.0	0.0	0.0	0.0
Slope %	= 0.00	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1338.00	0.00	---	---	---	---	---	---	---	---	0.00
0.10	0.083	1338.10	0.09	---	---	---	---	---	---	---	---	0.09
0.20	0.166	1338.20	0.36	---	---	---	---	---	---	---	---	0.36
0.30	0.248	1338.30	0.76	---	---	---	---	---	---	---	---	0.76
0.40	0.331	1338.40	1.38	---	---	---	---	---	---	---	---	1.38
0.50	0.414	1338.50	2.00	---	---	---	---	---	---	---	---	2.00
0.60	0.497	1338.60	2.77	---	---	---	---	---	---	---	---	2.77
0.70	0.579	1338.70	3.69	---	---	---	---	---	---	---	---	3.69
0.80	0.662	1338.80	4.76	---	---	---	---	---	---	---	---	4.76
0.90	0.745	1338.90	5.99	---	---	---	---	---	---	---	---	5.99
1.00	0.828	1339.00	7.38	---	---	---	---	---	---	---	---	7.38
1.10	0.919	1339.10	8.90	---	---	---	---	---	---	---	---	8.90
1.20	1.010	1339.20	9.93	---	---	---	---	---	---	---	---	9.93
1.30	1.101	1339.30	11.67	---	---	---	---	---	---	---	---	11.67
1.40	1.193	1339.40	13.53	---	---	---	---	---	---	---	---	13.53
1.50	1.284	1339.50	14.74	---	---	---	---	---	---	---	---	14.74
1.60	1.375	1339.60	16.74	---	---	---	---	---	---	---	---	16.74
1.70	1.466	1339.70	18.80	---	---	---	---	---	---	---	---	18.80
1.80	1.557	1339.80	20.90	---	---	---	---	---	---	---	---	20.90
1.90	1.649	1339.90	22.25	---	---	---	---	---	---	---	---	22.25
2.00	1.740	1340.00	24.36	---	---	---	---	---	---	---	---	24.36
2.10	1.840	1340.10	26.45	---	---	---	---	---	---	---	---	26.45
2.20	1.940	1340.20	28.49	---	---	---	---	---	---	---	---	28.49
2.30	2.040	1340.30	30.46	---	---	---	---	---	---	---	---	30.46
2.40	2.140	1340.40	32.33	---	---	---	---	---	---	---	---	32.33
2.50	2.240	1340.50	34.10	---	---	---	---	---	---	---	---	34.10
2.60	2.340	1340.60	35.75	---	---	---	---	---	---	---	---	35.75
2.70	2.440	1340.70	37.62	---	---	---	---	---	---	---	---	37.62
2.80	2.539	1340.80	39.19	---	---	---	---	---	---	---	---	39.19
2.90	2.639	1340.90	40.61	---	---	---	---	---	---	---	---	40.61
3.00	2.739	1341.00	41.68	---	---	---	---	---	---	---	---	41.68
3.10	2.848	1341.10	43.05	---	---	---	---	---	---	---	---	43.05
3.20	2.957	1341.20	44.37	---	---	---	---	---	---	---	---	44.37

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
3.30	3.066	1341.30	45.66	---	---	---	---	---	---	---	---	45.66
3.40	3.175	1341.40	46.91	---	---	---	---	---	---	---	---	46.91
3.50	3.284	1341.50	48.13	---	---	---	---	---	---	---	---	48.13
3.60	3.393	1341.60	49.31	---	---	---	---	---	---	---	---	49.31
3.70	3.501	1341.70	50.47	---	---	---	---	---	---	---	---	50.47
3.80	3.610	1341.80	51.61	---	---	---	---	---	---	---	---	51.61
3.90	3.719	1341.90	52.72	---	---	---	---	---	---	---	---	52.72
4.00	3.828	1342.00	53.81	---	---	---	---	---	---	---	---	53.81

...End

Hydrograph Report

Hyd. No. 5

Surface to Lake 3

Hydrograph type	= SCS Runoff	Peak discharge	= 40.97 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 6.10 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.981 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.90	29.32
12.00	40.97 <<
12.10	36.69
12.20	22.86

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 6

Lake 3

Hydrograph type	= Reservoir	Peak discharge	= 38.93 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 5	Reservoir name	= Lake 3
Max. Elevation	= 1332.76 ft	Max. Storage	= 0.197 acft

Storage Indication method used.

Outflow hydrograph volume = 2.981 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
11.90	29.32	1332.21	-----	-----	-----	-----	22.22	-----	-----	-----	-----	22.22
12.00	40.97 <<	1332.64	-----	-----	-----	-----	34.88	-----	-----	-----	-----	34.88
12.10	36.69	1332.76 <<	-----	-----	-----	-----	38.93	-----	-----	-----	-----	38.93 <<
12.20	22.86	1332.47	-----	-----	-----	-----	29.68	-----	-----	-----	-----	29.68

...End

Reservoir Report

Reservoir No. 3 - Lake 3

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1331.00	3,753	0.000	0.000
1.00	1332.00	4,942	0.100	0.100
2.00	1333.00	6,231	0.128	0.228
3.00	1334.00	7,621	0.159	0.387
4.00	1335.00	9,112	0.192	0.579

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 0.0	0.0	0.0	0.0
Span in	= 0.0	0.0	0.0	0.0
No. Barrels	= 0	0	0	0
Invert El. ft	= 0.00	0.00	0.00	0.00
Length ft	= 0.0	0.0	0.0	0.0
Slope %	= 0.00	0.00	0.00	0.00
N-Value	= .000	.000	.000	.000
Orif. Coeff.	= 0.00	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 5.00	0.00	0.00	0.00
Crest El. ft	= 1331.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1331.00	---	---	---	---	0.00	---	---	---	---	0.00
0.10	0.010	1331.10	---	---	---	---	0.53	---	---	---	---	0.53
0.20	0.020	1331.20	---	---	---	---	1.49	---	---	---	---	1.49
0.30	0.030	1331.30	---	---	---	---	2.73	---	---	---	---	2.73
0.40	0.040	1331.40	---	---	---	---	4.21	---	---	---	---	4.21
0.50	0.050	1331.50	---	---	---	---	5.88	---	---	---	---	5.88
0.60	0.060	1331.60	---	---	---	---	7.74	---	---	---	---	7.74
0.70	0.070	1331.70	---	---	---	---	9.75	---	---	---	---	9.75
0.80	0.080	1331.80	---	---	---	---	11.91	---	---	---	---	11.91
0.90	0.090	1331.90	---	---	---	---	14.21	---	---	---	---	14.21
1.00	0.100	1332.00	---	---	---	---	16.65	---	---	---	---	16.65
1.10	0.113	1332.10	---	---	---	---	19.21	---	---	---	---	19.21
1.20	0.125	1332.20	---	---	---	---	21.89	---	---	---	---	21.89
1.30	0.138	1332.30	---	---	---	---	24.68	---	---	---	---	24.68
1.40	0.151	1332.40	---	---	---	---	27.58	---	---	---	---	27.58
1.50	0.164	1332.50	---	---	---	---	30.58	---	---	---	---	30.58
1.60	0.177	1332.60	---	---	---	---	33.69	---	---	---	---	33.69
1.70	0.190	1332.70	---	---	---	---	36.90	---	---	---	---	36.90
1.80	0.202	1332.80	---	---	---	---	40.20	---	---	---	---	40.20
1.90	0.215	1332.90	---	---	---	---	43.60	---	---	---	---	43.60
2.00	0.228	1333.00	---	---	---	---	47.09	---	---	---	---	47.09
2.10	0.244	1333.10	---	---	---	---	50.67	---	---	---	---	50.67
2.20	0.260	1333.20	---	---	---	---	54.33	---	---	---	---	54.33
2.30	0.276	1333.30	---	---	---	---	58.07	---	---	---	---	58.07
2.40	0.292	1333.40	---	---	---	---	61.90	---	---	---	---	61.90
2.50	0.308	1333.50	---	---	---	---	65.81	---	---	---	---	65.81
2.60	0.323	1333.60	---	---	---	---	69.80	---	---	---	---	69.80
2.70	0.339	1333.70	---	---	---	---	73.86	---	---	---	---	73.86
2.80	0.355	1333.80	---	---	---	---	78.00	---	---	---	---	78.00
2.90	0.371	1333.90	---	---	---	---	82.22	---	---	---	---	82.22
3.00	0.387	1334.00	---	---	---	---	86.52	---	---	---	---	86.52
3.10	0.406	1334.10	---	---	---	---	90.88	---	---	---	---	90.88
3.20	0.425	1334.20	---	---	---	---	95.31	---	---	---	---	95.31

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Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
3.30	0.445	1334.30	---	---	---	---	99.81	---	---	---	---	99.81
3.40	0.464	1334.40	---	---	---	---	104.38	---	---	---	---	104.38
3.50	0.483	1334.50	---	---	---	---	109.02	---	---	---	---	109.02
3.60	0.502	1334.60	---	---	---	---	113.72	---	---	---	---	113.72
3.70	0.522	1334.70	---	---	---	---	118.49	---	---	---	---	118.49
3.80	0.541	1334.80	---	---	---	---	123.33	---	---	---	---	123.33
3.90	0.560	1334.90	---	---	---	---	128.23	---	---	---	---	128.23
4.00	0.579	1335.00	---	---	---	---	133.20	---	---	---	---	133.20

...End

Hydrograph Report

Hyd. No. 7

Surface to Lake 4

Hydrograph type	= SCS Runoff	Peak discharge	= 141.72 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 21.10 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 19 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 10.311 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.90	101.40
12.00	141.72 <<
12.10	126.92
12.20	79.07

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 8

Flow to Lake 4

Hydrograph type	= Combine	Peak discharge	= 169.76 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyds.	= 4, 7		

Hydrograph Volume = 17.963 acft

Hydrograph Discharge Table

Time (hrs)	Hyd. 4 + (cfs)	Hyd. 7 = (cfs)	Outflow (cfs)
11.90	17.19	101.40	118.60
12.00	28.04	141.72 <<	169.76 <<
12.10	37.25	126.92	164.17
12.20	41.06 <<	79.07	120.14

...End

Hydrograph Report

Hyd. No. 9

Lake 4

Hydrograph type	= Reservoir	Peak discharge	= 86.48 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Reservoir name	= Lake 4
Max. Elevation	= 1332.96 ft	Max. Storage	= 4.555 acft

Storage Indication method used.

Outflow hydrograph volume = 17.963 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.00	169.76 <<	1332.01	48.34	-----	-----	-----	-----	-----	-----	-----	-----	48.34
12.10	164.17	1332.55	69.15	-----	-----	-----	-----	-----	-----	-----	-----	69.15
12.20	120.14	1332.88	83.01	-----	-----	-----	-----	-----	-----	-----	-----	83.01
12.30	81.08	1332.96 <<	86.48	-----	-----	-----	-----	-----	-----	-----	-----	86.48 <<
12.40	61.31	1332.89	83.46	-----	-----	-----	-----	-----	-----	-----	-----	83.46
12.50	54.64	1332.77	78.53	-----	-----	-----	-----	-----	-----	-----	-----	78.53
12.60	48.41	1332.65	73.40	-----	-----	-----	-----	-----	-----	-----	-----	73.40
12.70	42.80	1332.52	68.23	-----	-----	-----	-----	-----	-----	-----	-----	68.23
12.80	38.17	1332.40	63.18	-----	-----	-----	-----	-----	-----	-----	-----	63.18
12.90	34.23	1332.27	58.40	-----	-----	-----	-----	-----	-----	-----	-----	58.40
13.00	31.41	1332.16	53.97	-----	-----	-----	-----	-----	-----	-----	-----	53.97
13.10	28.24	1332.05	49.88	-----	-----	-----	-----	-----	-----	-----	-----	49.88
13.20	25.54	1331.94	45.94	-----	-----	-----	-----	-----	-----	-----	-----	45.94

...End

Reservoir Report

Reservoir No. 4 - Lake 4

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1330.00	60,018	0.000	0.000
1.00	1331.00	64,763	1.432	1.432
2.00	1332.00	69,610	1.542	2.975
3.00	1333.00	74,557	1.655	4.629
4.00	1334.00	79,604	1.770	6.399

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 36.0	0.0	0.0	0.0
Span in	= 60.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1330.00	0.00	0.00	0.00
Length ft	= 0.0	0.0	0.0	0.0
Slope %	= 0.00	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 0.00	0.00	0.00	0.00
Crest El. ft	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1330.00	0.00	---	---	---	---	---	---	---	---	0.00
0.10	0.143	1330.10	0.54	---	---	---	---	---	---	---	---	0.54
0.20	0.286	1330.20	1.52	---	---	---	---	---	---	---	---	1.52
0.30	0.430	1330.30	2.80	---	---	---	---	---	---	---	---	2.80
0.40	0.573	1330.40	4.31	---	---	---	---	---	---	---	---	4.31
0.50	0.716	1330.50	6.02	---	---	---	---	---	---	---	---	6.02
0.60	0.859	1330.60	7.91	---	---	---	---	---	---	---	---	7.91
0.70	1.003	1330.70	9.97	---	---	---	---	---	---	---	---	9.97
0.80	1.146	1330.80	12.18	---	---	---	---	---	---	---	---	12.18
0.90	1.289	1330.90	14.53	---	---	---	---	---	---	---	---	14.53
1.00	1.432	1331.00	17.02	---	---	---	---	---	---	---	---	17.02
1.10	1.587	1331.10	19.64	---	---	---	---	---	---	---	---	19.64
1.20	1.741	1331.20	22.38	---	---	---	---	---	---	---	---	22.38
1.30	1.895	1331.30	25.23	---	---	---	---	---	---	---	---	25.23
1.40	2.049	1331.40	28.20	---	---	---	---	---	---	---	---	28.20
1.50	2.203	1331.50	31.27	---	---	---	---	---	---	---	---	31.27
1.60	2.358	1331.60	34.45	---	---	---	---	---	---	---	---	34.45
1.70	2.512	1331.70	37.73	---	---	---	---	---	---	---	---	37.73
1.80	2.666	1331.80	41.10	---	---	---	---	---	---	---	---	41.10
1.90	2.820	1331.90	44.58	---	---	---	---	---	---	---	---	44.58
2.00	2.975	1332.00	48.15	---	---	---	---	---	---	---	---	48.15
2.10	3.140	1332.10	51.80	---	---	---	---	---	---	---	---	51.80
2.20	3.306	1332.20	55.55	---	---	---	---	---	---	---	---	55.55
2.30	3.471	1332.30	59.38	---	---	---	---	---	---	---	---	59.38
2.40	3.637	1332.40	63.29	---	---	---	---	---	---	---	---	63.29
2.50	3.802	1332.50	67.29	---	---	---	---	---	---	---	---	67.29
2.60	3.968	1332.60	71.36	---	---	---	---	---	---	---	---	71.36
2.70	4.133	1332.70	75.52	---	---	---	---	---	---	---	---	75.52
2.80	4.299	1332.80	79.75	---	---	---	---	---	---	---	---	79.75
2.90	4.464	1332.90	84.06	---	---	---	---	---	---	---	---	84.06
3.00	4.629	1333.00	88.46	---	---	---	---	---	---	---	---	88.46
3.10	4.806	1333.10	91.36	---	---	---	---	---	---	---	---	91.36
3.20	4.983	1333.20	94.17	---	---	---	---	---	---	---	---	94.17

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Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
3.30	5.160	1333.30	96.90	---	---	---	---	---	---	---	---	96.90
3.40	5.337	1333.40	99.55	---	---	---	---	---	---	---	---	99.55
3.50	5.514	1333.50	102.14	---	---	---	---	---	---	---	---	102.14
3.60	5.691	1333.60	104.66	---	---	---	---	---	---	---	---	104.66
3.70	5.868	1333.70	107.12	---	---	---	---	---	---	---	---	107.12
3.80	6.045	1333.80	109.53	---	---	---	---	---	---	---	---	109.53
3.90	6.222	1333.90	111.88	---	---	---	---	---	---	---	---	111.88
4.00	6.399	1334.00	114.20	---	---	---	---	---	---	---	---	114.20

...End

Hydrograph Report

Hyd. No. 10

Surface to Lake 5

Hydrograph type	= SCS Runoff	Peak discharge	= 200.72 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 36.70 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 25 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 19.130 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.90	110.39
12.00	165.73
12.10	200.72 <<
12.20	192.54
12.30	154.65
12.40	115.55

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 11

Flow to Lake 5

Hydrograph type	= Combine	Peak discharge	= 375.29 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyds.	= 2, 6, 9, 10		

Hydrograph Volume = 53.241 acft

Hydrograph Discharge Table

Time (hrs)	Hyd. 2 + (cfs)	Hyd. 6 + (cfs)	Hyd. 9 + (cfs)	Hyd. 10 = (cfs)	Outflow (cfs)
11.90	26.52	22.22	29.47	110.39	188.60
12.00	42.97	34.88	48.34	165.73	291.92
12.10	60.29	38.93 <<	69.15	200.72 <<	369.08
12.20	70.06 <<	29.68	83.01	192.54	375.29 <<
12.30	70.03	17.87	86.48 <<	154.65	329.02
12.40	64.63	9.37	83.46	115.55	273.01
12.50	58.31	6.36	78.53	78.40	221.61

...End

Hydrograph Report

Hyd. No. 12

Lake 5

Hydrograph type	= Reservoir	Peak discharge	= 285.75 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 11	Reservoir name	= Lake 5
Max. Elevation	= 1323.21 ft	Max. Storage	= 7.875 acft

Storage Indication method used.

Outflow hydrograph volume = 53.241 acft

Hydrograph Discharge Table

Time (hrs)	Inflow cfs	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Outflow cfs
12.10	369.08	1322.37	62.15	-----	-----	-----	121.58	-----	-----	-----	-----	183.74
12.20	375.29 <<	1322.88	82.96	-----	-----	-----	162.28	-----	-----	-----	-----	245.25
12.30	329.02	1323.15	92.83	-----	-----	-----	186.40	-----	-----	-----	-----	279.23
12.40	273.01	1323.21 <<	94.39	-----	-----	-----	191.35	-----	-----	-----	-----	285.75 <<
12.50	221.61	1323.11	91.63	-----	-----	-----	182.62	-----	-----	-----	-----	274.25
12.60	178.83	1322.92	84.83	-----	-----	-----	165.94	-----	-----	-----	-----	250.77
12.70	152.28	1322.69	75.15	-----	-----	-----	147.00	-----	-----	-----	-----	222.15
12.80	137.67	1322.49	66.68	-----	-----	-----	130.43	-----	-----	-----	-----	197.10
12.90	125.15	1322.31	59.69	-----	-----	-----	116.76	-----	-----	-----	-----	176.44
13.00	114.25	1322.15	53.84	-----	-----	-----	105.31	-----	-----	-----	-----	159.15
13.10	104.86	1322.02	48.86	-----	-----	-----	95.57	-----	-----	-----	-----	144.44

...End

Reservoir Report

Reservoir No. 5 - Lake 5

Pond Data

Pond storage is based on known contour areas. Average end area method used.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1320.00	96,110	0.000	0.000
1.00	1321.00	102,682	2.282	2.282
2.00	1322.00	109,356	2.434	4.716
3.00	1323.00	116,130	2.588	7.304
4.00	1324.00	123,006	2.745	10.049

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise in	= 36.0	0.0	0.0	0.0
Span in	= 60.0	0.0	0.0	0.0
No. Barrels	= 1	0	0	0
Invert El. ft	= 1320.00	0.00	0.00	0.00
Length ft	= 0.0	0.0	0.0	0.0
Slope %	= 0.00	0.00	0.00	0.00
N-Value	= .013	.000	.000	.000
Orif. Coeff.	= 0.60	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len ft	= 10.00	0.00	0.00	0.00
Crest El. ft	= 1320.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	0.00	0.00	0.00
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration Rate = 0.00 in/hr/sqft Tailwater Elev. = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
0.00	0.000	1320.00	0.00	---	---	---	0.00	---	---	---	---	0.00
0.10	0.228	1320.10	0.54	---	---	---	1.05	---	---	---	---	1.59
0.20	0.456	1320.20	1.52	---	---	---	2.98	---	---	---	---	4.50
0.30	0.685	1320.30	2.80	---	---	---	5.47	---	---	---	---	8.27
0.40	0.913	1320.40	4.31	---	---	---	8.42	---	---	---	---	12.73
0.50	1.141	1320.50	6.02	---	---	---	11.77	---	---	---	---	17.79
0.60	1.369	1320.60	7.91	---	---	---	15.47	---	---	---	---	23.38
0.70	1.597	1320.70	9.97	---	---	---	19.50	---	---	---	---	29.46
0.80	1.825	1320.80	12.18	---	---	---	23.82	---	---	---	---	36.00
0.90	2.054	1320.90	14.53	---	---	---	28.42	---	---	---	---	42.95
1.00	2.282	1321.00	17.02	---	---	---	33.30	---	---	---	---	50.32
1.10	2.525	1321.10	19.64	---	---	---	38.42	---	---	---	---	58.06
1.20	2.769	1321.20	22.38	---	---	---	43.77	---	---	---	---	66.15
1.30	3.012	1321.30	25.23	---	---	---	49.35	---	---	---	---	74.58
1.40	3.255	1321.40	28.20	---	---	---	55.16	---	---	---	---	83.35
1.50	3.499	1321.50	31.27	---	---	---	61.17	---	---	---	---	92.44
1.60	3.742	1321.60	34.45	---	---	---	67.39	---	---	---	---	101.83
1.70	3.986	1321.70	37.73	---	---	---	73.80	---	---	---	---	111.53
1.80	4.229	1321.80	41.10	---	---	---	80.40	---	---	---	---	121.51
1.90	4.472	1321.90	44.58	---	---	---	87.20	---	---	---	---	131.77
2.00	4.716	1322.00	48.15	---	---	---	94.19	---	---	---	---	142.34
2.10	4.975	1322.10	51.80	---	---	---	101.34	---	---	---	---	153.14
2.20	5.233	1322.20	55.55	---	---	---	108.66	---	---	---	---	164.21
2.30	5.492	1322.30	59.38	---	---	---	116.15	---	---	---	---	175.53
2.40	5.751	1322.40	63.29	---	---	---	123.80	---	---	---	---	187.09
2.50	6.010	1322.50	67.29	---	---	---	131.62	---	---	---	---	198.91
2.60	6.269	1322.60	71.36	---	---	---	139.59	---	---	---	---	210.96
2.70	6.527	1322.70	75.52	---	---	---	147.72	---	---	---	---	223.24
2.80	6.786	1322.80	79.75	---	---	---	156.00	---	---	---	---	235.76
2.90	7.045	1322.90	84.06	---	---	---	164.43	---	---	---	---	248.50
3.00	7.304	1323.00	88.46	---	---	---	173.03	---	---	---	---	261.49
3.10	7.578	1323.10	91.36	---	---	---	181.75	---	---	---	---	273.11
3.20	7.853	1323.20	94.17	---	---	---	190.62	---	---	---	---	284.78

Continues on next page...

Stage / Storage / Discharge Table

Stage ft	Storage acft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	Clv D cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	Total cfs
3.30	8.127	1323.30	96.90	---	---	---	199.62	---	---	---	---	296.52
3.40	8.402	1323.40	99.55	---	---	---	208.76	---	---	---	---	308.31
3.50	8.676	1323.50	102.14	---	---	---	218.03	---	---	---	---	320.17
3.60	8.951	1323.60	104.66	---	---	---	227.44	---	---	---	---	332.10
3.70	9.225	1323.70	107.12	---	---	---	236.98	---	---	---	---	344.11
3.80	9.500	1323.80	109.53	---	---	---	246.65	---	---	---	---	356.18
3.90	9.774	1323.90	111.88	---	---	---	256.45	---	---	---	---	368.34
4.00	10.049	1324.00	114.20	---	---	---	266.40	---	---	---	---	380.60

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 13

Surface offsite South

Hydrograph type	= SCS Runoff	Peak discharge	= 107.19 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 19.60 ac	Curve number	= 87
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 26 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 10.217 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)
11.90	58.96
12.00	88.51
12.10	107.19 <<
12.20	102.83
12.30	82.59
12.40	61.71

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 14

Flow offsite South

Hydrograph type	= Combine	Peak discharge	= 361.82 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyds.	= 12, 13		

Hydrograph Volume = 63.457 acft

Hydrograph Discharge Table

Time (hrs)	Hyd. 12 + (cfs)	Hyd. 13 = (cfs)	Outflow (cfs)
12.00	120.37	88.51	208.88
12.10	183.74	107.19 <<	290.93
12.20	245.25	102.83	348.08
12.30	279.23	82.59	361.82 <<
12.40	285.75 <<	61.71	347.46
12.50	274.25	41.87	316.12
12.60	250.77	25.41	276.18
12.70	222.15	17.20	239.34
12.80	197.10	14.84	211.94
12.90	176.44	13.06	189.50

...End

Hydrograph Report

Hydraflow Hydrographs by Intelisolve

Hyd. No. 16

Surface offsite East

Hydrograph type	= SCS Runoff	Peak discharge	= 75.36 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 13.10 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 24 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 7.344 acft

Hydrograph Discharge Table

Time (hrs)	Outflow (cfs)	
11.90	42.23	
12.00	62.68	
12.10	75.36	<<
12.20	71.93	
12.30	57.56	
12.40	42.82	

...End

Appendix J
Pipe Sizing Calculations

COUNTRY HOLLOW ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS
PRELIMINARY STORM SEWER DESIGN
BY THE RATIONAL METHOD

Project Number: 0401010294
Soil Group: D
Mannings "n": 0.013

Area ID	Area	Accum. Area	Land Use	% Impervious	Runoff Coefficients				Time of Concentration				Rainfall Intensity				Storm Flows				Pipe Sizing								
	ac	ac			C2	C5	C10	C100	Tc2 (min)	Tc5 min	Tc10 min	Tc100 min	I2 (in/hr)	I5 (in/hr)	I10 (in/hr)	I100 (in/hr)	Q2 cfs	Q5 cfs	Q10 cfs	Q100 cfs	Design Storm	Design Q (cfs)	Length of Pipe (ft)	Suggested Pipe at Minimum Slope (in)	Design Pipe Size (in)	Design Slope (%)	Minimum Slope (%)	Design Velocity (fps)	Capacity of Design Pipe (cfs)
A	3.90		Business - Neighborhood	70	0.68	0.69	0.73	0.80	16	16	15	15	3.72	4.56	5.22	7.37	9.87	12.27	14.86	22.99	5	12.27		30	24	0.30	0.29	3.9	12.4
B	14.00		Business - Neighborhood	70	0.68	0.69	0.73	0.80	21	21	19	15	3.25	4.00	4.83	7.37	30.94	38.64	49.36	82.54	5	38.64		48	42	0.15	0.15	4.1	39.0
C	5.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	24	22	19	15	3.03	3.81	4.71	7.37	8.33	11.32	16.06	30.81	None								
D	7.20		Business - Neighborhood	70	0.68	0.69	0.73	0.80	19	18	16	15	3.51	4.20	5.08	7.37	17.18	20.87	26.70	42.45	5	20.87		36	36	0.12	0.10	3.3	23.1
E	1.00		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.92	2.46	3.24	5.60	2	1.92		12	12	0.40	0.29	2.9	2.3
F	0.80		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.53	1.97	2.59	4.48	None								
E+F		1.80			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	3.45	4.43	5.83	10.08	2	3.45		15	15	0.40	0.28	3.3	4.1
G	4.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	7.66	10.18	14.49	25.77	None								
H	1.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	23	22	19	15	3.10	3.90	4.83	7.37	2.33	3.16	4.49	8.40	2	2.33		15	15	0.40	0.13	3.3	4.1
I	1.00		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	23	22	19	15	3.10	3.90	4.83	7.37	1.55	2.11	2.99	5.60	None								
H+I		2.50			0.50	0.54	0.62	0.76	23	22	19	15	3.10	3.90	4.83	7.37	3.88	5.27	7.49	14.00	2	3.88		15	15	0.40	0.36	3.3	4.1
J	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	2	1.15		12	12	0.40	0.10	2.9	2.3
K	0.20		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.38	0.49	0.65	1.12	None								
J+K		0.80			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.53	1.97	2.59	4.48	2	1.53		12	12	0.40	0.18	2.9	2.3
L	2.70		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	4.62	6.28	8.74	15.12	None								
M	5.00		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	26	25	21	15	2.90	3.65	4.50	7.37	7.25	9.86	13.95	28.01	None								
N	0.30		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.57	0.74	0.97	1.68	2	0.57		12	12	0.40	0.03	2.9	2.3
O	0.30		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.57	0.74	0.97	1.68	None								
N+O		0.60			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	2	1.15		12	12	0.40	0.10	2.9	2.3
P	0.20		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.38	0.49	0.65	1.12	None								
N+O+P		0.80			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.53	1.97	2.59	4.48	2	1.53		12	12	0.40	0.18	2.9	2.3
Q	1.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	16	15	15	15	3.72	4.56	5.22	7.37	2.79	3.69	4.85	8.40	None								
N+O+P+Q		2.30			0.50	0.54	0.62	0.76	16	15	15	15	3.72	4.56	5.22	7.37	4.28	5.66	7.44	12.88	2	4.28		18	15	0.44	0.44	3.5	4.3
R	1.10		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	28	27	23	16	2.78	3.50	4.40	7.18	1.53	2.08	3.00	6.00	None								
N+O+P+Q+R		3.40			0.50	0.54	0.62	0.76	28	27	23	16	2.78	3.50	4.40	7.18	4.73	6.43	9.28	18.55	2	4.73		18	18	0.32	0.20	3.4	5.9
S	1.20		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	19	18	15	15	3.51	4.31	5.22	7.37	2.11	2.79	3.88	6.72	2	2.11		12	12	0.40	0.35	2.9	2.3
T	1.30		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	18	17	15	15	3.61	4.43	5.22	7.37	2.35	3.11	4.21	7.28	None								
S+T		2.50			0.50	0.54	0.62	0.76	19	18	15	15	3.51	4.31	5.22	7.37	4.39	5.82	8.09	14.00	2	4.39		18	18	0.32	0.17	3.4	5.9
U	1.90		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	26	24	21	15	2.90	3.65	4.60	7.37	2.76	3.74	5.42	10.64	2	2.76		15	15	0.40	0.18	3.3	4.1
V	1.70		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	27	25	22	15	2.90	3.57	4.50	7.37	2.47	3.28	4.74	9.52	None								
U+V		3.60		0	0.28	0.33	0.43	0.63	27	25	22	15	2.90	3.57	4.50	7.37	2.92	4.24	6.97	16.72	2	2.92		15	15	0.40	0.20	3.3	4.1
W	6.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	30	28	24	17	2.72	3.43	4.31	7.18	8.98	12.22	17.64	36.01	None								
X	2.20		Business - Neighborhood	70	0.68	0.69	0.73	0.80	15	15	15	15	3.83	4.56	5.22	7.37	5.73	6.92	8.38	12.97	5	6.92		24	24	0.21	0.09	3.3	10.4

Area ID	Area	Accum. Area	Land Use	% Impervious	Runoff Coefficients				Time of Concentration				Rainfall Intensity				Storm Flows				Pipe Sizing								
					C2	C5	C10	C100	Tc2	Tc5	Tc10	Tc100	I2	I5	I10	I100	Q2	Q5	Q10	Q100	Design Storm	Design Q (cfs)	Length of Pipe (ft)	Suggested Pipe at Minimum Slope (in)	Design Pipe Size (in)	Design Slope (%)	Minimum Slope (%)	Design Velocity (fps)	Capacity of Design Pipe (cfs)
	ac	ac							(min)	min	min	min	(in/hr)	(in/hr)	(in/hr)	(in/hr)	cfs	cfs	cfs	cfs									
Y	2.80		Business - Neighborhood	70	0.68	0.69	0.73	0.80	22	21	19	16	3.25	3.90	4.71	7.37	6.19	7.53	9.63	16.51	None								
X+Y		5.00			0.68	0.69	0.73	0.80	22	21	19	16	3.25	3.90	4.71	7.37	11.05	13.46	17.19	29.48	5	13.46		30	30	0.16	0.11	3.3	16.4
Z	2.40		Business - Neighborhood	70	0.68	0.69	0.73	0.80	15	15	15	15	3.83	4.56	5.22	7.37	6.25	7.55	9.15	14.15	None								
X+Y+Z		7.40			0.68	0.69	0.73	0.80	22	21	19	16	3.25	3.90	4.71	7.37	16.35	19.91	25.44	43.63	5	19.91		36	36	0.12	0.09	3.3	23.1
AA	0.90		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.72	2.22	2.91	5.04	None								
BB	1.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	2.68	3.45	4.53	7.84	None								
CC	3.20		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	25	24	20	15	2.96	3.73	4.60	7.37	4.74	6.45	9.13	17.92	None								
DD	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	2	1.15		12	12	0.40	0.10	2.9	2.3
EE	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
DD+EE		1.00			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.92	2.46	3.24	5.60	2	1.92		12	12	0.40	0.29	2.9	2.3
FF	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	2	1.15		12	12	0.40	0.10	2.9	2.3
GG	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
FF+GG		1.20			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	2.30	2.95	3.88	6.72	2	2.30		15	15	0.40	0.13	3.3	4.1
HH	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
FF-HH		1.80			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	3.45	4.43	5.83	10.08	2	3.45		15	15	0.40	0.28	3.3	4.1
II	0.80		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	1.37	1.86	2.59	4.48	None								
FF-II		2.60			0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	4.45	6.05	8.41	14.56	2	4.45		18	18	0.32	0.18	3.4	5.9
JJ	0.90		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	1.54	2.09	2.91	5.04	None								
FF-JJ		3.50			0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	5.99	8.15	11.33	19.60	2	5.99		24	18	0.33	0.32	3.4	6.0
KK	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	2	0.96		12	12	0.40	0.07	2.9	2.3
LL	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
KK-LL		1.0			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.92	2.46	3.24	5.60	2	1.92		12	12	0.44	0.29	3.0	2.4
MM	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
FF-MM		5.0			0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	8.55	11.64	16.18	28.01	2	8.55		24	24	0.21	0.14	3.3	10.4
NN	0.80		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.53	1.97	2.59	4.48	None								
FF-NN		5.8			0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	9.92	13.50	18.77	32.49	2	9.92		24	24	0.21	0.19	3.3	10.4
OO	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
FF-OO		6.4			0.50	0.54	0.62	0.76	19	18	15	15	3.42	4.31	5.22	7.37	10.94	14.90	20.71	35.85	2	10.94		30	24	0.24	0.23	3.5	11.1
PP	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	2	0.96		12	12	0.40	0.07	2.9	2.3
QQ	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
PP+QQ		1.1			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	2.11	2.71	3.56	6.16	2	2.11		12	12	0.40	0.35	2.9	2.3
RR	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
PP-RR		1.5			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	2.87	3.69	4.85	8.40	2	2.87		15	15	0.40	0.20	3.3	4.1
SS	3.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	24	22	19	15	3.10	3.90	4.83	7.37	5.27	7.16	10.18	19.04	None								
PP-SS		4.9			0.50	0.54	0.62	0.76	24	22	19	15	3.10	3.90	4.83	7.37	7.60	10.32	14.67	27.45	2	7.60		24	24	0.21	0.11	3.3	10.4

Area ID	Area	Accum. Area	Land Use	% Impervious	Runoff Coefficients				Time of Concentration				Rainfall Intensity				Storm Flows				Pipe Sizing								
					C2	C5	C10	C100	Tc2	Tc5	Tc10	Tc100	I2	I5	I10	I100	Q2	Q5	Q10	Q100	Design Storm	Design Q (cfs)	Length of Pipe (ft)	Suggested Pipe at Minimum Slope (in)	Design Pipe Size (in)	Design Slope (%)	Minimum Slope (%)	Design Velocity (fps)	Capacity of Design Pipe (cfs)
	ac	ac							(min)	min	min	min	(in/hr)	(in/hr)	(in/hr)	(in/hr)	cfs	cfs	cfs	cfs									
TT	0.80		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.53	1.97	2.59	4.48	None								
PP-TT		5.7			0.50	0.54	0.62	0.76	24	22	19	15	3.10	3.90	4.83	7.37	8.84	12.00	17.07	31.93	2	8.84		24	24	0.21	0.15	3.3	10.4
UU	1.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	16	15	15	15	3.72	4.56	5.22	7.37	2.79	3.69	4.85	8.40	2	2.79		15	15	0.40	0.19	3.3	4.1
VV	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	2	0.96		12	12	0.40	0.07	2.9	2.3
WW	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
VV+WW		0.9			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.72	2.22	2.91	5.04	2	1.72		12	12	0.40	0.23	2.9	2.3
XX	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
YY	7.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	33	31	26	19	2.57	3.24	4.05	6.84	9.64	13.12	18.83	38.99	None								
ZZ	8.70		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	24	22	19	15	3.10	3.81	4.71	7.37	13.49	17.90	25.41	48.73	None								
AAA	2.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	4.16	5.54	7.87	14.00	2	4.16		18	15	0.42	0.42	3.4	4.2
BBB	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
AAA+BBB		2.9			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	4.83	6.42	9.13	16.24	2	4.83		18	18	0.32	0.21	3.4	5.9
CCC	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
AAA-CCC		3.4			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	5.66	7.53	10.71	19.04	2	5.66		18	18	0.32	0.29	3.4	5.9
DDD	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
AAA-DDD		4.0			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	6.66	8.86	12.60	22.40	2	6.66		24	24	0.21	0.09	3.3	10.4
EEE	0.60		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.15	1.48	1.94	3.36	None								
AAA-EEE		4.6			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	7.66	10.18	14.49	25.77	2	7.66		24	24	0.21	0.11	3.3	10.4
FFF	1.10		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	2.11	2.71	3.56	6.16	2	2.11		12	12	0.40	0.35	2.9	2.3
GGG	0.30		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.57	0.74	0.97	1.68	None								
AAA-GGG		6.0			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	9.99	13.28	18.90	33.61	2	9.99		24	24	0.21	0.20	3.3	10.4
HHH	0.70		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.34	1.72	2.27	3.92	None								
AAA-HHH		6.7			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	11.16	14.83	21.10	37.53	2	11.16		30	24	0.25	0.24	3.6	11.3
III	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
AAA-III		7.2			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	11.99	15.94	22.68	40.33	2	11.99		30	24	0.30	0.28	3.9	12.4
JJJ	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
AAA-JJJ		7.7			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	12.82	17.05	24.25	43.13	2	12.82		30	30	0.16	0.10	3.3	16.4
KKK	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
AAA-KKK		8.1			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	13.49	17.93	25.51	45.37	2	13.49		30	30	0.16	0.11	3.3	16.4
LLL	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
AAA-LLL		8.5			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	14.15	18.82	26.77	47.61	2	14.15		30	30	0.16	0.12	3.3	16.4
MMM	0.30		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.57	0.74	0.97	1.68	None								
AAA-MMM		8.8			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	14.65	19.48	27.72	49.29	2	14.65		30	30	0.16	0.13	3.3	16.4
NNN	0.20		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.38	0.49	0.65	1.12	None								
AAA-NNN		9.0			0.50	0.54	0.62	0.76	21	19	17	15	3.33	4.10	5.08	7.37	14.99	19.93	28.35	50.41	2	14.99		30	30	0.16	0.13	3.3	16.4

Area ID	Area	Accum. Area	Land Use	% Impervious	Runoff Coefficients				Time of Concentration				Rainfall Intensity				Storm Flows				Pipe Sizing								
					C2	C5	C10	C100	Tc2	Tc5	Tc10	Tc100	I2	I5	I10	I100	Q2	Q5	Q10	Q100	Design Storm	Design Q (cfs)	Length of Pipe (ft)	Suggested Pipe at Minimum Slope (in)	Design Pipe Size (in)	Design Slope (%)	Minimum Slope (%)	Design Velocity (fps)	Capacity of Design Pipe (cfs)
	ac	ac							(min)	min	min	min	(in/hr)	(in/hr)	(in/hr)	(in/hr)	cfs	cfs	cfs	cfs									
OOO	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	2	0.96		12	12	0.40	0.07	2.9	2.3
PPP	0.40		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.77	0.98	1.29	2.24	None								
OOO+PPP		0.90			0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.72	2.22	2.91	5.04	2	1.72		12	12	0.40	0.23	2.9	2.3
QQQ	1.10		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	2.11	2.71	3.56	6.16	None								
RRR	0.80		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	18	17	15	15	3.51	4.31	5.22	7.37	1.40	1.86	2.59	4.48	2	1.40		12	12	0.40	0.16	2.9	2.3
SSS	0.70		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	17	16	15	15	3.61	4.43	5.22	7.37	1.26	1.67	2.27	3.92	None								
RRR+SSS		1.50			0.50	0.54	0.62	0.76	18	17	15	15	3.51	4.31	5.22	7.37	2.63	3.49	4.85	8.40	2	2.63		15	15	0.40	0.17	3.3	4.1
TTT	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
RRR-TTT		2.0			0.50	0.54	0.62	0.76	18	17	15	15	3.51	4.31	5.22	7.37	3.51	4.65	6.47	11.20	2	3.51		15	15	0.40	0.30	3.3	4.1
UUU	0.50		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	0.96	1.23	1.62	2.80	None								
RRR-UUU		2.5			0.50	0.54	0.62	0.76	18	17	15	15	3.51	4.31	5.22	7.37	4.39	5.82	8.09	14.00	2	4.39		18	18	0.32	0.17	3.4	5.9
VVV	1.80		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	18	16	15	15	3.61	4.43	5.22	7.37	3.25	4.31	5.83	10.08	None								
RRR-VVV		4.3			0.50	0.54	0.62	0.76	18	17	15	15	3.51	4.31	5.22	7.37	7.55	10.01	13.92	24.09	2	7.55		24	24	0.21	0.11	3.3	10.4
WWW	1.00		Residential - 1/4 Acre	38	0.50	0.54	0.62	0.76	15	15	15	15	3.83	4.56	5.22	7.37	1.92	2.46	3.24	5.60	None								
RRR-WWW		5.3			0.50	0.54	0.62	0.76	18	17	15	15	3.51	4.31	5.22	7.37	9.30	12.34	17.15	29.69	2	9.30		24	24	0.21	0.17	3.3	10.4
XXX	1.80		Business - Neighborhood	70	0.68	0.69	0.73	0.80	15	15	15	15	3.83	4.56	5.22	7.37	4.69	5.66	6.86	10.61	None								
RRR-XXX		7.1			0.55	0.58	0.65	0.77	18	17	15	15	3.51	4.31	5.22	7.37	13.60	17.69	24.01	40.30	5	17.69		36	30	0.19	0.19	3.6	17.9
YYY	2.00		Business - Neighborhood	70	0.68	0.69	0.73	0.80	15	15	15	15	3.83	4.56	5.22	7.37	5.21	6.29	7.62	11.79	None								
RRR-YYY		9.1			0.58	0.60	0.67	0.78	18	17	15	15	3.51	4.31	5.22	7.37	18.37	23.64	31.63	52.09	5	23.64		42	36	0.13	0.13	3.4	24.0
ZZZ	4.00		Business - Neighborhood	70	0.68	0.69	0.73	0.80	15	15	15	15	3.83	4.56	5.22	7.37	10.42	12.59	15.24	23.58	None								
RRR-ZZZ		13.1			0.61	0.63	0.69	0.78	18	17	15	15	3.51	4.31	5.22	7.37	27.92	35.53	46.88	75.68	5	35.53		48	42	0.13	0.12	3.8	36.3