

PROJECT: Woodland Estates Second Addition **TO:** Vicky Huang, P.E.
 City of Wichita
 Engineering Dept. - 7th floor
 455 N. Main
 Wichita, KS 67202

PROJECT NO:

DATE: March 31, 1998

We are sending you the following items: Attached
 Under separate cover
 Via _____

Drawings Specifications Computer: Disk(s)
 Maps Petitions Other

COMMENTS: Enclosed is the Drainage and Utility Plan for the referenced project. Please review and comment, and call if you have questions.

For Your Approval As Requested
 For Your Use For Your Files
 Approved As Noted For Review and Comment

REMARKS:

Signed: *Greg Allison*
 Greg Allison, P.E.

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Preliminary Drainage Report
Woodland Lakes Estates Second Addition
 MKEC Project 97158
 March 31, 1998

Location
 The site is between the Kansas Turnpike (I-35) Lincoln, in the northeast quarter of Section 27, T27S, R2E. Adjacent plats include Woodland Lakes Estates (east), Cedar View (west), Windsor Park Addition (southwest), and an unplatted tract immediately south of Lincoln. Dimensions are roughly 1200 ft north-south, and 750 ft east-west. The total platted area is approximately 23.86 acres.

Site Conditions

Soils
 According to the NRCS (SCS) Sedgwick County Soil Survey, virtually the entire site is in the Rosehill Series: silty clay, 1 to 3 percent slopes; well-drained soil on upland divides and uneven side slopes. Substratum is a calcareous shaly clay. In places the surface layer is calcareous. The Hydrologic Soil Group (HSG) for this soil is "D".

Current Development

The parcel is currently undeveloped, and is essentially isolated from adjacent property by two natural channels flowing from north to south. These channels, in conjunction with the Interstate 35 roadway, protect the site from offsite stormwater flows. Recent farming has produced wheat.

Landform and Slope

The site is on an upland divide, with natural channels to the east and west. Elevations vary from approximately 1361 at the center of the north boundary, to 1340 in the southeast corner. Slopes are 2.5 to 3.5 percent.

Regional Drainage Conditions

Adjacent channels are minor tributaries to Spring Branch Fourmile Creek. Terrain is rolling, with regional slopes on the order of 30 to 40 ft per mile. Soils in the area draining toward the site are in the Rosehill and Irwin series, both with assigned hydrologic soil group (HSG) D. Pertinent portions of the Andover, Kansas USGS Quadrangle are copied and attached, showing the site location and extent of off-site drainage areas.

The major drainage feature in the area is Spring Branch to Fourmile Creek, which flows eastward along the south section line, approximately 1/2 mile from the site. Several small lakes have been constructed in the intervening area.

In conjunction with platting for the Woodland Lakes Estates Addition, a brief analysis of regional runoff was completed. This analysis includes areas north, west, and east of Woodland Lakes Estates 2nd Addition. A copy of the Woodland Lakes Estates Addition Drainage and Utility Plan showing calculations is attached.

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The channel on the parcel's west boundary begins north of I-35 (drainage area north of I-35 - 137 ac) and crosses the highway through a 6x4 ft box culvert into reserve areas for Cedar View Addition and the proposed Woodland Lakes Estates 2nd Addition. At the south side of the plat, the stream crosses Lincoln through a 12x4 RCB.

The east side channel receives no significant flow from off-site, except for a portion of the Woodland Lakes Estates Addition. This incidental flow passes under Lincoln through a 48 inch RCP. Farther south of the site, the channels pass through small lakes and combine near the center of east side of the southeast quarter of Section 27. This channel then enters Spring Branch in the southwest quarter of Section 27.

No portion of the site is included in a regulatory floodplain (FIRM Panel 225, Sedgwick County, June 3, 1986). The nearest regulatory floodplain is on Spring Branch, approximately 1/2 mile south of the site.

Off-Site Drainage Conditions

Existing Characteristics

The adjacent channels have been included in drainage reserve areas for the adjacent plats. Interior drainage facilities will discharge to these regional facilities.

Proposed System

No changes are proposed for the off-site drainage system.

Site Drainage Conditions

Current Runoff Characteristics

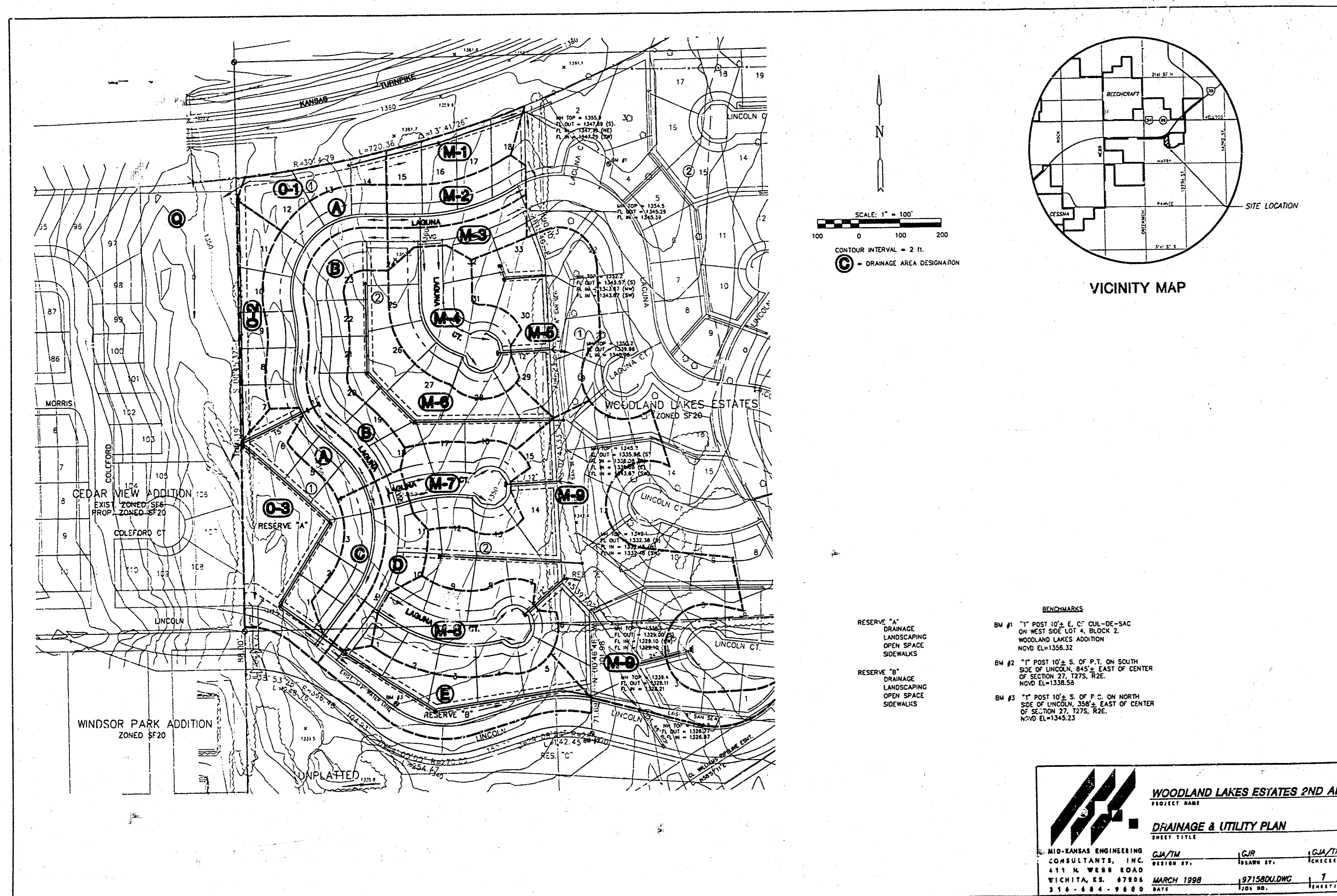
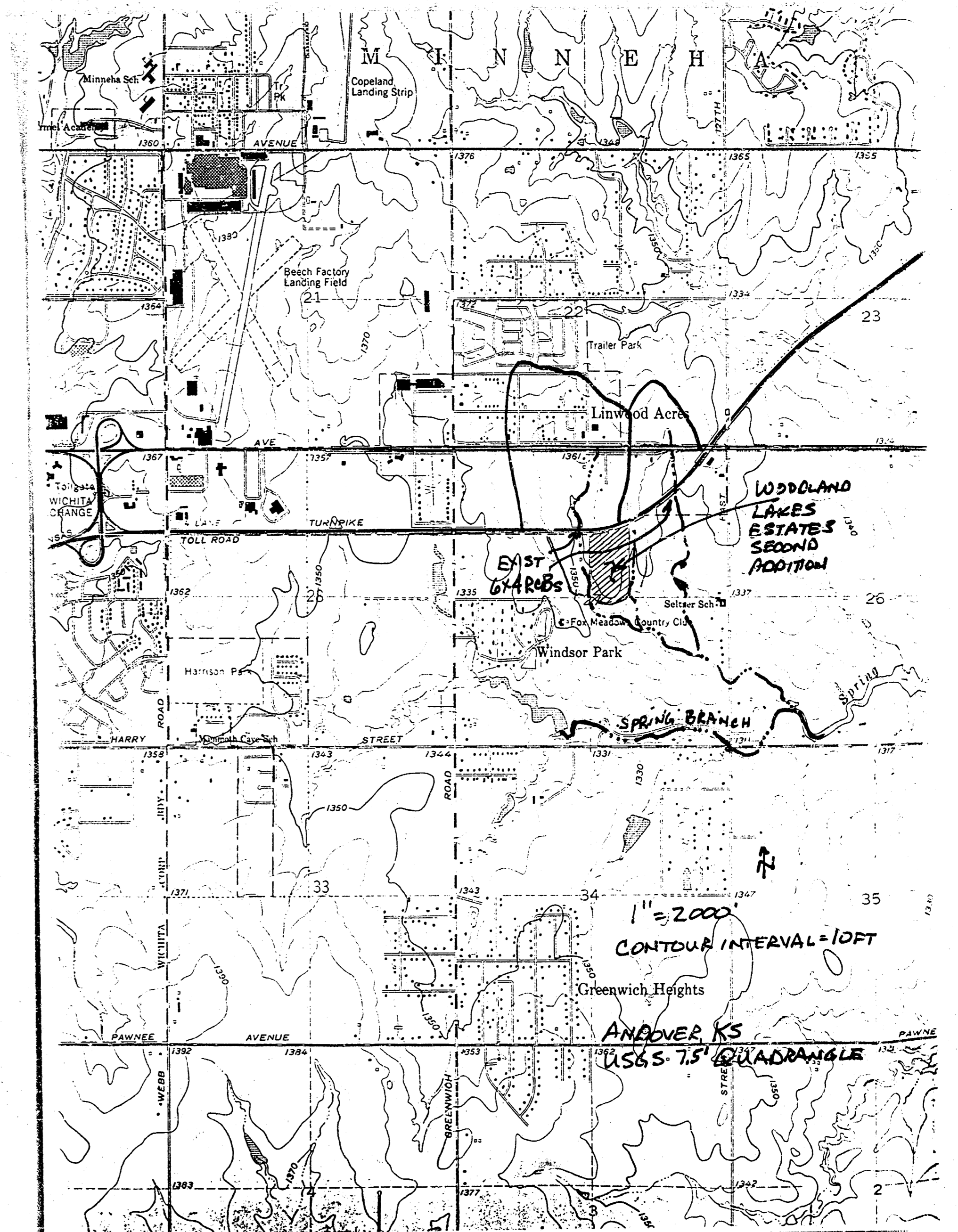
Site runoff is currently uncontrolled. Using City guidelines for Rational C selection, the 2- and 100-year values are 0.30 and 0.65 respectively. Pre-development runoff from the 2-year storm is calculated in the attached spreadsheet as 6 cfs from the west third of the site, and approximately 11 cfs from the west two thirds of the site. Corresponding values for 100-year runoff are 35 cfs and 69 cfs, respectively.

Proposed Site Runoff Characteristics

Uncontrolled discharge is proposed for all on-site basins. The "M" and "O" series drainage areas will drain directly to the east and west reserve areas, respectively. The remaining drainage areas will flow through local storm sewer pipes to the same areas. Post-development runoff from the 2-year storm is calculated in the attached spreadsheet as 10 cfs from the west third of the site, and approximately 16 cfs from the west two thirds of the site. Corresponding values for 100-year runoff are approximately 37 cfs and 76 cfs, respectively. Compared with channel capacities and because there is significant storage just downstream in several lakes, these increases are considered insignificant, and no on-site storage is planned.

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Area ID	Area AC	Adjacent Area AC	C1	C100	T2	T100	Q2	Q100	INLET		PIPE	Pipe Size	Min Slope	COMMENTS
									Q2	Q100				
A	1.97	0.50	0.76	23	15	3.10	7.37	3.06	11.06	3.06	12	2.00%	2-year Design	
A+B	1.59	0.50	0.76	19	15	3.42	7.37	3.72	8.90	2.72	15	2.00%	2-year pipe, slope exists between Lots 6 and 7, Block 2 for 100yr	
C	0.79	0.50	0.76	13	15	3.61	7.37	1.43	4.44				To north side Lincoln, Reserve A at Cedar View Addition	
D	0.73	0.50	0.76	20	15	3.42	7.37	1.25	4.08				To Side Lapina Runoff	
E	1.78	0.50	0.76	26	15	2.96	7.37	2.43	9.56				Runoff from N. Side Lincoln	
E'	2.5	0.51	0.76	34	19	2.52	6.66	3.16	12.72				Channel Flow in 48" RCP @ WLE Reserve E	
M-1	0.76	0.68	0.60	15	15	3.83	7.37	1.67	4.47				To WLE Watershed F-1	
M-2	0.79	0.68	0.60	15	15	3.83	7.37	2.06	4.96				To WLE Watershed F-1	
M-1 + M-2	1.5	0.50	0.76	30	15	3.33	7.37	2.56	8.67				To WLE Watershed F-1	
M-3	0.87	0.50	0.76	18	15	3.61	7.37	1.03	3.21				To WLE Watershed H-2	
M-4	1.77	0.50	0.76	19	15	3.51	7.37	3.10	9.90	3.10	12	2.00%	2-year pipe, slope exists between Lots 29 and 30, Block 2 for 100yr	
M-5	2.11	0.32	0.67	23	15	3.10	7.37	2.09	10.4				Interconnecting Flow to Reserve E	
M-1 THRU M-5	6.0	0.44	0.73	27	15	2.84	7.37	7.44	32.2				Total to narrow section of Reserve E	
M-6	1.55	0.50	0.76	26	15	3.36	7.37	2.86	10.2				Average slope = 1.5 percent	
M-7	1.25	0.50	0.76	15	15	3.83	7.37	2.40	7.21	2.40	12	2.00%	2-year pipe, slope exists between Lots 14 and 15, Block 2 for 100yr	
M-8	1.87	0.50	0.76	15	15	3.83	7.37	3.59	11.27	3.59	12	2.00%	2-year pipe, slope exists between Lots 6 and 7, Block 2 for 100yr	
M-9	0.56	0.32	0.67	33	18	2.52	6.64	4.80	27.26				South half of Reserve E	
M-1 THRU M-9	17.0	0.41	0.72	40	22	2.24	6.26	15.78	75.34				Discharge to 48" RCP at Woodland Lakes Estates under Lincoln	
O-1	0.66	0.32	0.67	32	17	2.62	7.00	0.56	3.11				Discharge to Cedar View Reserve H	
O-2	0.78	0.32	0.67	15	15	3.83	7.37	0.93	3.76				Discharge to Cedar View Reserve H	
O-3	2.32	0.32	0.67	32	16	1.57	7.00	1.91	10.87				Discharge to Cedar View Reserve H	
O-1 THRU O-3	3.7	0.24	0.51	36	25	2.44	6.01	2.15	11.47				Discharge to Cedar View Reserve H	
O	147.00	0.62	0.69	72	52	1.47	4.05	112.37	404.34				Of site watershed including area north of I-35	
O-1 THRU O-3 + O + A + B	154.3	0.51	0.66	72	52	1.47	4.05	116.31	412.57				Check flow to 12x4 RCB at Lincoln	
Pre-development East	18.00	0.30	0.65	46	26	2.08	5.90	11.21	69.03				Discharge to Woodland Lakes Estates Reserve E	
Pre-development West	6.00	0.30	0.65	44	25	2.11	6.01	5.70	35.16				Discharge to Cedar View Reserve H	

From Sedgwick Co. Soil Survey, with on site use in HSG D.
 To Calculate Using City of Wichita Procedure
 Watersheds are single family 1/4 Acre areas except as noted below
 Watershed M-6 and M-9 are Urban Lot areas