September 1, 1998

Ms. Vicki Huang, P.E.
City Engineer's Office
City of Wichita
455 N. Main
Wichita, Kansas 67202

Reference: Cedar View Addition Off-site Drainage
MKEC Project 96037

Dear Ms. Huang:

Enclosed is a revised Drainage and Utility Plan for the subdivision referenced above.

The site is in the Spring Branch watershed (a tributary of Fourmile Creek), and lies about ½ mile north of the Spring Branch bridge at Greenwich, at the northeast corner of Greenwich and Lincoln. Problem areas include the following:

- A 42 inch culvert passes under I-35 just east of Greenwich. This flows into the east right of way ditch. Downstream culverts under Lincoln and at two driveways are 24 inch CMPs. The upstream (I-35) culvert capacity is approximately 75 cfs. This is also the approximate 100-year peak flow from the upper watershed north of I-35. Pre-development runoff from the Cedar View site is calculated as 22 cfs and 120 cfs for the 2-year and 100-year events, respectively. The downstream 24 inch culverts have capacities of approximately 25 cfs. Consequently, the Greenwich Road system is inadequate for even the 2-year event under existing conditions.

- A culvert (2-5x4 RCB and 1-57x37 CMP) passes under Greenwich approximately 350 ft south of Lincoln. Flow to this crossing originates north west of Greenwich and Kellogg on Raytheon property. Our preliminary analyses indicate that the culvert capacity is approximately 300 cfs, which is less than a 5-year event. Our preliminary HEC-1 analysis (which does not include detention on Raytheon property) calculates the 100-year flow as approximately 840 cfs.

- Just a few hundred feet downstream of the Greenwich Road culvert, the channel feeds a fishing lake in the Windsor Park area. The culverts under Bayley were analyzed using HY8. This road section appears likely to affect tail water conditions for future improvements to Greenwich Road.

These off-site conditions result in extensive street flooding along Greenwich at and below Lincoln under current conditions.

Improvements we propose in the Cedar View Addition Drainage Report will not significantly alleviate flooding caused by regional conditions. As we will maintain peak flows from the site at or below pre-construction levels, the development will not aggravate flooding conditions. To keep the area's contribution to peak flow rates below pre-development levels, two detention areas are planned. One of these will lie on the proposed school parcel near the center of the plat.

Our preliminary model for the school parcel includes a single detention basin with a minimum of 1.3 acre feet of storage, coupled with an outlet structure that allows a maximum discharge of 65 cfs. If the school site design does not conform to these criteria, alternate detention configurations should be prepared by the designer and evaluated using our hydrologic model of the area. (Please pass this information to the firm designing the school site, and help us stay informed regarding their site drainage plans).

A second detention basin is planned for Reserve "A" at the southeast corner of the plat. Discharge from this detention basin will enter the ditch just east of Greenwich and upstream of the culvert under Lincoln. Because the downstream culverts are inadequate, the tailwater for the Reserve "A" discharge structure is high. We expect that future changes will include modifying Greenwich Road to an urban section, and that drainage improvements associated with this change may provide improved tailwater conditions for the detention pond.

Before Greenwich Road improvements are designed, we recommend that the City re-evaluate the Reserve "A"detention in conjunction with a more comprehensive hydrologic evaluation of the watersheds along Greenwich and north of Spring Branch. Detention outlet facilities might need to be coordinated with roadway drainage facilities to ensure a balanced, well-designed ultimate system.

I hope this information is helpful. Please call if you'd like to discuss this further.

Very truly yours,

MID-KANSAS ENGINEERING CONSULTANTS, INC.

Gregory J. Allison, P.E.

GJA:TKM/dm

c: Kenton Cox, SJCF

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Drainage Report
Cedar View Addition
MKEC Project 96037
Revised September 1, 1998

Location

The site is between the Kansas Turnpike (I-35) and Lincoln, east of Greenwich Road in the south half of the northwest quarter of Section 27, T27S, R2E. Adjacent plats include Woodland Lakes Estates Second Addition (east), Cedar View (west), Windsor Park Addition (south). Three large unplatted parcels comprising a total of 4.3 acres lie along Greenwich Road and form most of the west boundary for the site.

Dimensions are roughly 1050 ft north-south, and 2300 ft east-west. The total platted area, including the detention reserve (Reserve "A") is approximately 56.8 acres.

Existing Site Conditions

Soils

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

Current Development

The parcel is currently undeveloped agricultural land.

Landform and Slope

The site is on an upland divide, and is divided by al low ridge. Natural channels lie to the east and west, and a small channel appears to be forming at the south side approximately 1,900 ft east of Greenwich. 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.

Runoff from approximately 2/3 of the property (~33 ac) flows west toward Greenwich Road. It is isolated from flows from the north by I-35. A 42" RCP passes under I-35 near the property's northwest corner, but flow passes around the northwest corner into a small channel passing through the three parcels just south of I-35 along Greenwich Road.

Runoff from most of the rest of the site (~16 ac) flows east toward a channel shared with the Woodland Lakes Estates subdivision and fed by a 10x5 RCB under I-35.

A small watershed (~6.5 ac) is wedged between the two larger watersheds and flows to a shallow swale (mentioned previously) that crosses Lincoln to a small lake surrounded by Bedford Court.

Drainage Conditions

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 ½ mile south of the site.

Channels adjacent to the site are minor tributaries to Spring Branch. 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. The pertinent portion of the Andover, Kansas USGS Quadrangle is copied and attached, showing the site location and extent of off-site drainage areas.

Upstream of Site. The regional channel east of the site has been included in a drainage reserve area for this and the adjacent plat (Woodland Lakes Estates 2nd Addition). Interior drainage facilities in the east portion will discharge to these regional facilities. The channel begins north of I-35 (drainage area north of I-35 ~ 137 ac) and crosses the highway through a 6x4 ft box culvert into the shared reserve area. At the southeast corner of the plat, the stream crosses Lincoln through a 12x4 RCB.

The west portion of the site flows to a ditch in the right of way east of Greenwich Road. This ditch receives flow from north of I-35 via a 42-inch culvert just east of Greenwich. A cursory HEC-1 analysis of the watershed indicates a 100-year flow rate of approximately 75 cfs. Culverts under Lincoln and driveways to Greenwich Road are single 24 inch CMPs or equivalent CMPAs. Because the culverts are relatively small, flow covers part of the east Greenwich Road driving lane in all but the smallest events.

Downstream of Site. The major drainage feature in the area is Spring Branch, a tributary of Fourmile Creek. Spring Branch flows eastward along the south section line, approximately ½ mile from the site. Several small lakes have been constructed in the immediate area, including one just east of Greenwich Road on Spring Branch, and one north of Spring Branch on an unnamed tributary in the Windsor Park Addition, also just east of Greenwich Road.

Discharge from the site will be to the Greenwich Road right of way, approximately 1,500 ft north of the Spring Branch bridge. The effective Flood Insurance Rate Map shows the 100-year water surface elevation at the downstream side of the Spring Branch bridge to be 1331. The existing flow line elevation in the ditch just north of Lincoln, approximately 1,500 ft from the bridge, is 1331.24 ft.

Approximately 350 ft south of Lincoln, a tributary to Spring Branch crosses Greenwich Road into the Windsor Park area. Based on information taken from the USGS topographic map and using the HEC-1 computer program in a simple, single basin analysis, the 100-year peak flow rate just east of Greenwich is 944 cfs. This channel continues across Bayley into a fishing lake in Windsor Park, then to another lake immediately south on Spring Branch's channel. The 100-year peak flow rate just west of Greenwich was similarly calculated as 836 cfs.

Field investigation and cursory survey was completed for the Windsor Park fishing lake dam and the culverts under Bayley. The field information, runoff calculations, and hydraulic analyses indicate that water flows over the Bayley street/culvert section following heavy rain, and that Bayley can control backwater elevations for the culvert at the intersection of Greenwich and Lincoln.

(This was corroborated by discussion with a Windsor Park resident, who indicated that Bayley is usually under water after heavy rains. Culvert analysis using the HY8 computer program with survey data and the calculated flow rates indicate that flows exceeding about 620 cfs flow over Bayley, with a water surface elevation of 1333 using the 100-year flow. HY8 analysis of the Greenwich culvert just north of Bayley indicates that water also flows over Greenwich during the 100-year event.)

While Bayley will likely be the ultimate control for backwater conditions at Lincoln, small culverts (24 inch) currently control the water surface elevations at Lincoln and Greenwich during most events. The calculated pre-development 100-year flow to the Lincoln culvert and the two driveway culverts is 250 cfs. This far exceeds the culverts' capacities (~25 cfs), so most water will flow over the road surface.

Any improvement to the culvert under Lincoln with this project will be ineffective due to the driveway culverts downstream and the control section at Bayley. Additionally, any drainage improvements installed now would probably be removed when Greenwich is improved to an urban section.

Greenwich Road geometry modifications extend south of Lincoln past the first driveway to Greenwich Road Station 47+72. A single 24-inch RCP will be installed from upstream of Lincoln to south of the modifications to replace the existing culverts under Lincoln and the residential driveway. Until Greenwich Road is modified, runoff will continue to flow over Greenwich Road following all but the most frequent storms. When Greenwich Road is modified to urban standards, significant drainage improvements may be required from Lincoln downstream to Spring Branch to control street flooding.

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. The site can be divided into three primary watersheds identified by the sub-areas shown on the Drainage and Utility Plan. The East Watershed comprises sub-areas A through F; the Bedford Watershed comprises sub-areas G and G; the West Watershed comprises sub-areas I through P. Post-development runoff from the 2-year and 100-year storms is calculated in the attached spreadsheet.

Proposed Site Runoff Characteristics

General runoff patterns will be preserved under proposed conditions. The spreadsheet in the appendix shows calculated post-development flows without detention effects.

Under the proposed plan, the East and Bedford watersheds will continue to be uncontrolled. The East Watershed will discharge to the regional channel shared with Woodland Lakes Estates 2nd Addition. As proposed in the Woodland Lakes Estates 2nd Addition drainage report, no on-site storage is provided for the east watershed. The total runoff from the site is much smaller than the flow from upstream areas; the channel capacity appears adequate for the flows, and additional storage is under construction downstream of Lincoln. Similarly, the Bedford Watershed is relatively small, and the lake enclosed by Bedford Ct. provides storage before discharging to detention areas at Woodland Lakes Estates.

The West Watershed is larger and discharges to Greenwich Road. As noted previously, downstream conditions in Greenwich Road from Lincoln south to Spring Branch are very poor. Consequently, detention facilities are planned to hold post-development storm flows at or below pre-development levels. Several HEC-1 models of the West Watershed have been prepared to evaluate detention facility options.

The upper 20 acres of the West Watershed has been set aside for a school. Drainage from the school parcel is being planned separately by others. Discharge from the school parcel will be to a storm sewer along the north side of Lincoln, which will subsequently

discharge to a detention basin in Reserve A. Most of the balance of the West Watershed will discharge to a storm sewer near the south end of Dowell Circle, which will flow directly to the Reserve A detention basin.

A narrow strip along the north side of the residential area will continue to flow uncontrolled to the Greenwich Road ditch north of the Reserve A detention outlet. A portion of the Lincoln St. right of way will flow uncontrolled to a small system just east of Greenwich, then discharge to the culvert along Greenwich south of Lincoln.

School Parcel Detention. Proposed site constraints for the school parcel include at least 2.5 ac ft of detention storage and a maximum 100-year discharge from the facility of 65 cfs. The HEC-1 model is provided with this report to aid the school site designer in confirming system performance. The preliminary evaluation assumes storage in a ball field approximately 210x210 ft with the maximum depth at 2.5 ft. The outlet configuration is a modified City of Wichita drop inlet. The inlet's gross opening is 4.5x3 ft, with a grate of 1.5 inch bars 3 ft long at 4 inch centers, for a net orifice opening area of 9.0 sq ft and a weir perimeter of 15 ft. HEC-1 analysis shows the maximum water surface to be 2.2 ft above the detention basin floor.

Reserve A Detention. Discharge from the Reserve A detention basin will be through two 24" RCPs. These will allow the detention basin to function for 2- and 5-year storms. All larger storms will flow over the supplemental spillway along Greenwich Road. The supplemental spillway is in two sections of reinforced turf totalling 60 ft at elevation 1337.5.

The proposed detention will benefit the area by both containing the runoff from frequent storms and maintaining pre-development peak runoff from more severe events. When Greenwich Road is converted to an urban section and new storm management facilities are installed, it may be possible to modify the detention outlet structure to work with the new facilities so that the supplemental spillways are used less frequently.

Peak pre-development flow from west portion of the site was calculated as 110 cfs. The combined peak post-development flow from the developed area is 100 cfs.

Proposed Minimum Pad Elevations

As there are no major drainage channels in this subdivision, minimum pad elevations will be controlled by street grades. All pads will be at least 1 ft above the adjacent top of curb.

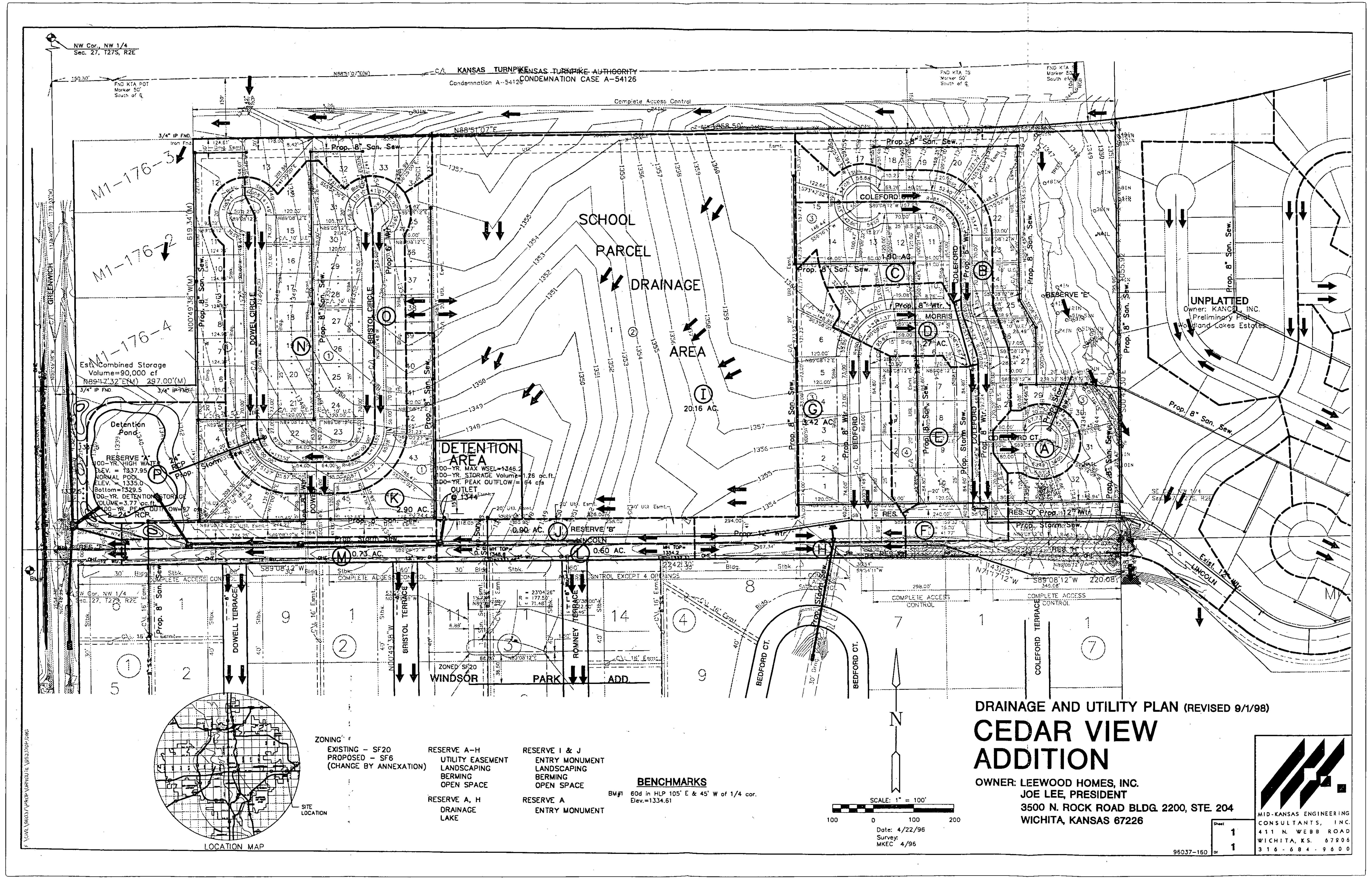
DRAINAGE ANALYSIS SUMMARY (Revised 9/1/98)
CEDAR VIEW ADDITION

Area ID**	Area	Accum. Area	C2	C100	Tc2	Tc100	I2	I100	Q2	Q100	INLET					COMMENTS
											Inlet Size	Qi	Qb	Pipe Size	Min Slope	
	ac	ac			min	min	in/hr	in/hr	cfs	cfs	ft	cfs	cfs	in	%	
L (S side Lincoln @ school)	0.60		0.87	0.93	15	15	3.83	7.37	2.00	4.11						
M (S side Lincoln @ residential area)	0.73		0.87	0.93	15	15	3.83	7.37	2.43	5.00				24	0.40%	2-Year Design
L + M		1.3	0.87	0.93	15	15	3.83	7.37	4.43	9.12	5		0	24	0.20%	
K (N side Lincoln @ residential area)	1.51		0.68	0.84	18	15	3.61	7.37	3.71	9.35	5		0			Assumes no gutter flow from School Site
K + L + M		2.8	0.77	0.88	21	15	3.25	7.37	7.10	18.46					2.00%	Discharge to system south side Lincoln.
Total Area, Acres	48.5															
Pre-Development to West	36.4		0.35	0.55	57	34	1.76	5.07	22.4	120.0						
Pre-Development Bedford Ct.	6.5		0.35	0.65	36	22	2.39	6.39	5.4	27.0						
Pre-Development to East	16.0		0.35	0.65	52	31	1.92	5.32	10.8	55.3						

From Sedgwick Co. Soil Survey, soils on site or just north draining to the site are HSG D.
Tc Calculated Using City of Wichita Procedure
Extent of offsite watersheds north of site visually checked. See assumptions in report text.
Watersheds A through G are single family 1/4 Acre areas
Watersheds I and J are Light Commercial areas
Watershed H is Urban Lawn Area

DRAINAGE ANALYSIS SUMMARY (Revised 9/1/98)
CEDAR VIEW ADDITION

Area ID**	Area ac	Accum. Area ac	C2	C100	Tc2 min	Tc100 min	I2 in/hr	I100 in/hr	Q2 cfs	Q100 cfs	INLET Inlet Size ft	INLET Qi cfs	INLET Qb cfs	Pipe Size in	Min Slope %	COMMENTS
A*	0.738		0.50	0.76	15	15	3.83	7.37	1.41	4.13	5	4.13	0	15	0.30%	Discharge to Reserve E
B*	1.918		0.50	0.76	40	23	2.28	6.26	2.19	9.13	5	1.78	0.4			Discharge to E. inlet at Lincoln & Coleford Terr.
C*	1.9		0.50	0.76	23	15	3.10	7.37	2.95	10.64						Inlet not required. Provide Valley Gutter
D (Morris to Coleford)	1.27		0.50	0.76	21	15	3.25	7.37	2.06	7.11						
C + D		3.2	0.50	0.76	29	17	2.72	7.18	4.31	17.30	5	2.66	1.66	18	0.10%	100-year in right of way
E	1.813		0.50	0.76	27	15	2.90	7.37	2.63	10.15						
C + D + E		5.0	0.50	0.76	40	23	2.28	6.26	5.68	23.71	5	2.16	0.84	18	0.20%	100-year in right of way. Q2 = 5.68-2.66 = 3.02 cfs
F	0.562		0.50	0.76	16	15	3.72	7.37	1.05	3.15						
B THROUGH F		7.5	0.50	0.76	41	23	2.21	6.13	8.2	34.8	5	1.42	0.16	18	0.40%	Discharge to culvert on west side of Woodland Lakes Estates Q2 = 8.2- (2.66+2.16+1.78) = 1.60
G	3.42		0.50	0.76	30	17	2.72	7.18	4.65	18.66	5	4.65	0	18	0.20%	
H	0.495		0.50	0.76	27	15	2.90	7.37	0.72	2.77	5	0.72	0			
G + H		3.9	0.50	0.76	29	17	2.72	7.18	5.32	21.36				24	0.10%	Discharge to Bedford Ct. System; Channel in DE to carry ~15 cfs
I (School)	21.51		0.49	0.66	41	29	2.24	5.49	23.61	77.94			*****	42	0.50%	Uncontrolled. School Site Drainage Plan to be completed by others HEC-1 analysis shows Q100=86 cfs (SCS CN method)
J (N. side Lincoln adjacent to school)	0.90		0.87	0.93	15	15	3.83	7.37	3.00	6.17	5		0			Assumes no gutter flow from School Site. Discharge to 42"
I + J		22.4	0.51	0.67	40	29	2.28	5.59	25.82	84.04				42	0.50%	
N (center residential horseshoe)	4.836		0.50	0.76	34	19	2.52	6.68	6.09	24.55	10		0			
O (outside residental Horseshoe	3.39		0.50	0.76	35	20	2.44	6.68	4.14	17.21	10		0			
N + O		8.2	0.50	0.76	35	20	2.44	6.68	10.04	41.76				36	0.20%	Total From E. Residential Area to Detention at Reserve "A" Require DE to carry ~30 cfs Overflow
P (direct flow to detention)	2.94		0.50	0.76	15	15	3.83	7.37	5.63	16.47						
I + J + N + O + P		33.6	0.50	0.70	52	35	1.92	5.07	32.46	119.25						Does not account for storage at school parcel. Discharge to Reserve "A" Detention



DRAINAGE AND UTILITY PLAN (REVISED 9/1/98)
CEDAR VIEW ADDITION
OWNER: LEEWOOD HOMES, INC.
JOE LEE, PRESIDENT
3500 N. ROCK ROAD BLDG. 2200, STE. 204
WICHITA, KANSAS 67226
MID-KANSAS ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316-684-9600
SCALE: 1" = 100'
Date: 4/22/96
Survey: MKEC 4/96
ZONING
EXISTING - SF20
PROPOSED - SF6
(CHANGE BY ANNEXATION)
RESERVE A-H
UTILITY EASEMENT
LANDSCAPING
BERMING
OPEN SPACE
RESERVE A, H
DRAINAGE
LAKE
RESERVE I & J
ENTRY MONUMENT
LANDSCAPING
BERMING
OPEN SPACE
RESERVE A
ENTRY MONUMENT
BENCHMARKS
BM#1 60d in HLP 105' E & 45' W of 1/4 cor.
Elev.=1334.61
LOCATION MAP
SITE LOCATION
SCHOOL PARCEL DRAINAGE AREA
20.16 AC.
DETENTION AREA
Detention Pond
UNPLATTED
KANSAS TURNPIKE
KANSAS TURNPIKE AUTHORITY CONDEMNATION CASE A-54126
Complete Access Control
WINDSOR PARK ADD.
DOWELL TERRACE
BRISTOL TERRACE
ROMNEY TERRACE
BEDFORD CT.
COLEFORD TERRACE
DOWELL CIRCLE
BRISTOL CIRCLE
COLEFORD
MORRIS
GREENWICH
M1-176-3
M1-176-2
M1-176-4
NW Cor. NW 1/4 Sec. 27, T27S, R2E

DRAINAGE ANALYSIS SUMMARY
CEDAR VIEW ADDITION

Area ID	Area ac	C2	C100	Flow Dist ft	del H ft	Slope %	pipe dist ft	pipe time min	Tc2 min	Tc100 min	I2* in/hr	I100* in/hr	Q2 cfs	INLET Q100 cfs	INLET Size ft	INLET Qi cfs	INLET Qb cfs	PIPE Tc2	PIPE Q2	PIPE Size in	PIPE Min Slope %	COMMENTS
A	0.738	0.5	0.76	150	4.5	3.00	150.00	0.63	9	5	3.83	7.37	1.4	4.1		1.13	0.28		1.4	12	1	To nat. channel E. side of development
B	1.918	0.5	0.76	1030	9	0.87	50.00	0.21	36	21	2.39	6.39	2.3	9.3	5	1.83	0.46					
C	2.877	0.5	0.76	600	8	1.33	360.00	1.50	24	14	3.83	7.37	3.3	16.1	20	2.64	0.66			18	0.2	
D	1.813	0.5	0.76	500	4	0.80	50.00	0.21	26	15	2.9	7.37	2.2 2.6	10.2	15 15	2.29 2.56	0.57 0.64		4.9 7.5	18 18	0.3 0.8	
B+C+D	6.608			1030				0.21											9.3	18	1	
E	0.562	0.5	0.76	250	2	0.80	330.00	1.38	18	10	3.51	7.37	1.0	3.1	5	1.30	0.33					
B THRU E	7.17																		10.6	18	1	Discharge to culvert @ nat. channel E side of development
F	5.971	0.5	0.76	710	8	1.13	70.00	0.29	28	16	2.78	7.18	8.3	32.6	10	8.30	0.00		8.3	18	0.8	Sump - to lakes south of Bedford Ct.
G	0.495	0.5	0.76	340	1.5	0.44			26	15	2.9	7.37	0.7	2.8	5	0.72	0.00					To lakes south of Bedford Ct
F+G	6.466																		9.0	21	0.5	Coordinate w/ Landowner - 21 in RCP or open channel
H	2.752	0.5	0.76	510	4.5	0.88	300.00	1.25	25	14	2.96	7.37	4.1	15.4	20	3.26	0.81			15	0.5	
I	1.039	0.5	0.76	550	9.5	1.73	50.00	0.21	21	12	3.25	7.37	1.7	5.8	15	1.35	0.34		1.7	12	0.3	If J inlet in sump, omit inlet for I
J	2.434	0.5	0.76	600	12	2.00	50.00	0.21	21	12	3.25	7.37	4.0	13.6	20	3.43	0.86		5.7	18	0.4	L = 10 if inlet J in sump
K	3.066	0.5	0.76	690	7.5	1.09	340.00	1.42	28	16	2.78	7.18	4.3	16.7	20	3.41	0.85		4.3	15	0.6	
L	2.091	0.5	0.76	780	9	1.15	240.00	1.00	29	16	2.72	7.18	2.8	11.4	20	2.28	0.57		7.1	18	0.7	
Mn	4.976	0.5	0.76	800	9	1.13	150.00	0.63	29	17	2.72	7	3.4	26.5	20	3.84	0.96		10.5	24	0.25	
Ms													3.4			3.48	0.87		13.9	24	0.5	
N	0.562	0.5	0.76	280	5	1.79	740.00	3.08	15	8	3.83	7.37	1.1	3.1	15	1.56	0.39		14.9	24	0.6	Modify if inlet N in sump
O	0.943	0.5	0.76	310	8	2.58	70.00	0.29	14	8	3.83	7.37	1.8	5.3	20	3.09	0.77		16.8	30	0.3	
P	3.75	0.5	0.76	1150	14	1.22	50.00	0.21	34	19	2.48	6.68	4.7	19.0	10	5.42	0.00		23.2	36	0.15	Inlet in Sump - Discharge to retention basin
Q	0.23	0.5	0.76	250	2.5	1.00	50.00	0.21	17	10	3.61	7.37	0.4	1.3			0.00					Combine Q, R, S to single inlet in sump
R	0.275	0.5	0.76	300	7	2.33	50.00	0.21	14	8	3.83	7.37	0.5	1.5			0.00					Combine Q, R, S to single inlet in sump
S	0.68	0.5	0.76	740	6	0.81	50.00	0.21	32	18	2.57	6.84	0.9	3.5	5	1.82			1.8	12	0.4	Combine Q, R, S to single inlet in sump
T	4.836	0.5	0.76	920	8	0.87	50.00	0.21	34	19	2.48	6.68	6.0	24.6	10	6.00	0.00		6.0	18	0.5	
U	4.125	0.5	0.76	1150	12.5	1.09	230.00	0.96	36	20	2.39	6.53	4.9	20.5	10	4.93	0.00		10.9	24	0.3	Sump N side - excess over curb to retention

*BASED ON MINIMUM Tc = 15 MINUTES

DRAINAGE AND UTILITY PLAN (REVISED 9/1/98)

CEDAR VIEW ADDITION

OWNER: LEEWOOD HOMES, INC.
JOE LEE, PRESIDENT
3500 N. ROCK ROAD BLDG. 2200, STE. 204
WICHITA, KANSAS 67226

MID-KANSAS ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316-684-9600

Sheet 1 of 1

96037-160

BENCHMARKS

BM#1 60d in HLP 105' E & 45' W of 1/4 cor.
Elev.=1334.61

ZONING
EXISTING – SF20
PROPOSED – SF6
(CHANGE BY ANNEXATION)

RESERVE A–H
UTILITY EASEMENT
LANDSCAPING
BERMING
OPEN SPACE

RESERVE A, H
DRAINAGE
LAKE

RESERVE I & J
ENTRY MONUMENT
LANDSCAPING
BERMING
OPEN SPACE

RESERVE A
ENTRY MONUMENT

LOCATION MAP

SITE LOCATION

SCALE: 1" = 100'
100 0 100 200

Date: 4/22/96
Survey:
MKEC 4/96

KANSAS TURNPIKE AUTHORITY
CONDEMNATION CASE A-54126

SCHOOL PARCEL DRAINAGE AREA
20.16 AC.

DETENTION AREA
100-YR. MAX WSEL=1346.2
100-YR. STORAGE Volume=1.26 ac.ft.
100=YR. PEAK OUTFLOW = 64 cfs
OUTLET
@ 1344

RESERVE "A"
100-YR. HIGH WATER ELEV. = 1337.95
NORMAL POOL ELEV. = 1335.0
Bottom=1329.5
100-YR. DETENTION STORAGE VOLUME=3.77 ac.ft.
100-YR. PEAK OUTFLOW=97 cfs

Est. Combined Storage Volume=90,000 cf

UNPLATTED
Owner: KANCO, INC.
Preliminary Plat
Woodland Lakes Estates

ZONED SF20
WINDSOR PARK ADD.