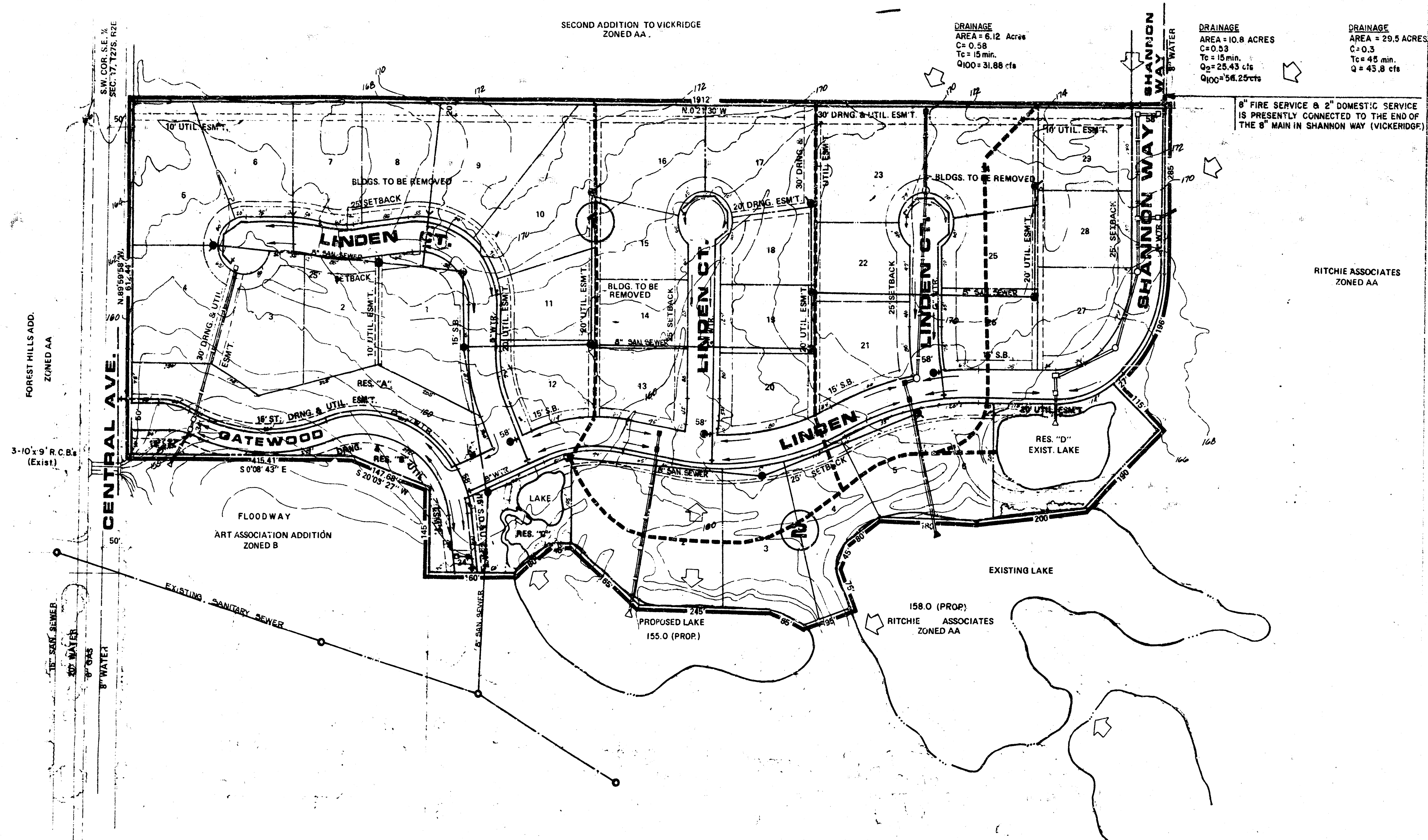
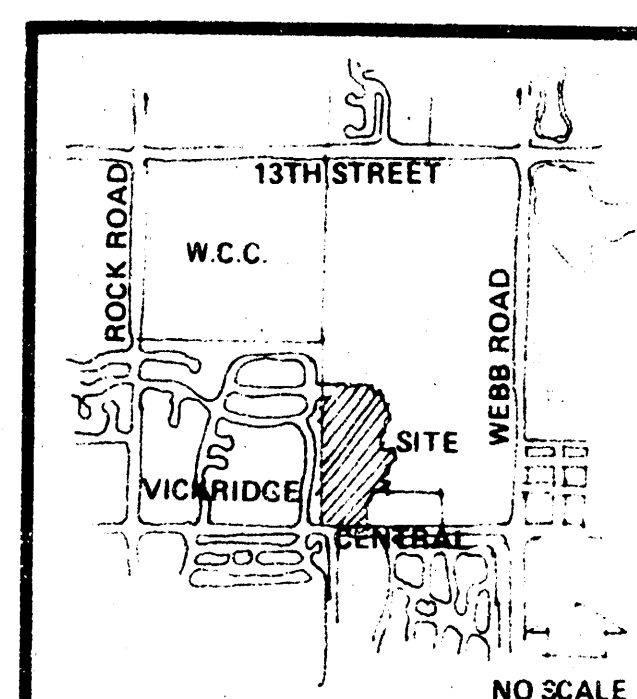




# NOTES:

RESERVES "A", "B" AND "C" FOR DRAINAGE, LANDSCAPING, WALKS, OPEN SPACE AND ENTRY MONUMENTS.  
RESERVES "D" IS FOR DRAINAGE LANDSCAPING, WALKS, AND OPEN SPACE.

TOPOGRAPHY IS FROM AERIAL PHOTOGRAPHY TAKEN JUNE 1985.  
A DRAINAGE CONCEPT PLAN IS TO BE PREPARED BY M.K.E.C. AND SUBMITTED TO CITY ENGINEER.



LOCATION MAP

## DRAINAGE & UTILITY CONCEPT

# WOODLAND ESTATES

OWNER: RITCHIE ASSOCIATES 8100 22ND ST. NO. SUITE 1400 WICHITA, KANSAS 67226

WOODLAND ESTATES DRAINAGE PLAN

| NODE | AREA ACRES | AREA ACCUM. | Tc | C    | I <sub>2</sub> | I <sub>100</sub> | Q <sub>2</sub> | Q <sub>100</sub> | COMMENT                            |
|------|------------|-------------|----|------|----------------|------------------|----------------|------------------|------------------------------------|
| A    | 5.12 Ac    |             | 15 | 0.5  | 4.06           | 8.98             | 23 cfs         | 24" RCP @ 1.2%   | Divide flow & catch with 3 inlets. |
| B1   | 4.00       | 9.1         | 18 | 0.4  | 3.78           | 8.37             | 6.00           | 13               | 24" RCP @ 0.3%                     |
| B2   | 3.00       |             | 18 | 0.46 | 3.73           | 8.37             | 35 cfs         | 30" RCP @ 0.32%  |                                    |
| C    | 7.0        |             | 15 | 0.5  | 4.06           | 8.98             | 6.00           | 18" RCP @ 0.32%  |                                    |
| D    | 6.1        |             | 18 | 0.5  | 3.78           | 8.37             | 29             | 30" @ 0.54%      |                                    |
| E    | 4.6        |             | 15 | 0.5  | 4.06           | 8.98             | 27             | 30" @ 0.5%       |                                    |
| F    | 10.8       | 10.7        | 18 | 0.5  | 4.06           | 8.37             | 45             | 36" @ 0.46%      |                                    |
| G    | 29.5       |             | 15 | 0.58 | 4.06           |                  | 25             | 30" @ 0.30%      |                                    |
| H    | 3.7        |             | 45 | 0.30 |                | 4.95             | 67             | 42" @ 0.48%      |                                    |
|      |            | 44.00       | 15 | 0.58 | 4.06           |                  | 9              |                  |                                    |
|      |            |             |    | 0.39 |                | 4.95             | 85             | 48" @ 0.38%      |                                    |

Woodlands Estates and Gatewood Hydrology Comparison

| Description                                                                                                                                                | Mouth | 100 Year Flow (cfs) Central | Section 3 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------|-----------|
| FEMA - With no upstream constraints, Total Drainage Area = 2.76 sq. mi.                                                                                    | 2590  | 2590                        | -         |
| MKEC - With upstream constraints, Total Drainage Area = 3.03 sq. mi. Drainage Area above Central 2.71 sq. mi. Drainage Area above Section 3 = 2.18 sq. mi. |       |                             |           |
| a. 24 hr. SCS rainfall distribution                                                                                                                        | 2400  | 1920                        | 1368      |
| b. 6 hr. SCS rainfall distribution                                                                                                                         | -     | 1946                        | 1201      |
| c. 6 hr. Weather Bureau Rainfall                                                                                                                           | -     | 1550                        | 1107      |
| d. TR 60 Rainfall                                                                                                                                          | -     | 1326                        | 1088      |
| MKEC - With no upstream constraints, Total Drainage Area = 3.03 sq. mi. Using 24 hr. SCS rainfall distribution                                             | 3410  | -                           | -         |

\*Section 3 located 800 ft. upstream of Central



MID-KANSAS ENGINEERING CONSULTANTS, P.A.  
1609 S.W. 37th STREET  
TOPEKA, KANSAS 66611

## CONFIRMATION

PROJECT: Woodlands Estate  
PROJECT NO.: MKEC DATE: 9/5/86  
TO: File  
FROM: John White  
REF: Hydrology

Attached is a table outlining the various flow calculations that have been completed on the East Branch of Gypsum Creek. The FEMA calculations were completed using TR 55 while the MKEC calculations used TR 20. The same CN numbers were used in all calculations. Following is a brief summary of each set of numbers.

1. FEMA: These calculations assumed no upstream constraints and did not reduce the drainage area as it moved upstream. These assumptions should produce an inflated flow.
2. MKEC using SCS 24 hr. and 6 hr. rainfall. Both of these rainfall distributions have one peak hour with rainfall of about 3 inches. In smaller drainage area this tends to produce higher runoffs.
3. MKEC using 6 hr. Weather Bureau: The Weather Bureau rainfall tends to give reasonable flows except for time of concentration of 15 minutes or less at which point it underestimates flow. The  $t_c$  for this basin is about 1.8 hours.
4. MKEC using TR - 60. The TR - 60 was developed for dam design which is more sensitive to volume than peak inflow. The TR - 60 uses a more constant rainfall and thus produces a longer flatter hydrograph.
5. MKEC with no upstream constraints. This flow was developed to show the comparison of the FEMA calculations to the SCS 24 hour rainfall using the same assumptions. The SCS rainfall produces a peak about 30 percent higher.

Summary: A review of the hydrology seems to point to the 6 hr. Weather Bureau Rainfall using the existing upstream constraints as being the most reasonable. It is recommended that these flows be used in design.

sheet title

project  
WOODLAND ESTATES REVISED

date  
JULY 7, 1986

rev.

BILL G. YUNG DESIGN