Drainage Plan
Ellson Court Addition
Pre-Development vs. Post-Development Runoff

Existing Conditions

The existing site contains 2.32 acres of vacant land. The existing soil is listed under the hydrological soil group D. The runoff length for the site is 650 feet at a slope of 1.7 %. Using the TR-20 method, we have determined the pre-developed runoff from the site (listed in Table 3) for the 2, 5, 10, and 100-year events.

Using the TR-20 method the offsite runoff (from Fountains Addition) has been determined. The storage data and drainage area come from POE & Associates' design. MKEC verified the drainage area and then provided the runoff curve number, time of concentration, and the discharge rate. Table 1 lists the values used by POE & Associates and MKEC Engineering Consultants. The discharge rate comes from HY-8 culvert analysis. The discharge from the pond, and the storage elevations were calculated for the 2, 5, 10, and 100-year events and are listed in Table 2. POE & Associates had calculated a discharge of 186 cfs and water surface elevation of 1368.41 for the 100-year event using Hec-1.

Discharge from:	Storage	Da		Tc
Fountains Addn.	Ac-Ft	Acres	CN	Hours
POE & Assoc.	5.82	60.1	81.7	0.32
MKEC	5.82	60.1	90.3	0.65

Table 1

Fountains Pond	2-Yr	5-Yr	10-Yr	100-Yr
Discharge from Pond (cfs)	54	95	121	217
Pond Elevation (ft)	1367.28	1367.86	1368.17	1369.02
Runoff from Church (cfs)	7	11	13	21

Table 2

The discharge from Fountains Addition Pond during the larger storms will be slightly lower than the rates shown in the TR-20 report. The weir opening above the 1368.4 elevation becomes narrower as the weir becomes part of the wing-wall. The weir structure will act more as an inlet as the water forms around the "wing-walls" of the box (as the pond reaches higher elevations) and drops into the opening. At this point velocity losses will occur.

The offsite runoff from the church lot is located in Table 2. The church has approximately 4.1 acres draining into the basin. The curve number is 85,

from which about 25% of the area is impervious ground. The time of concentration equals 0.47 hours.

Proposed Conditions

The length of runoff stayed the same for the existing site under proposed conditions (650 feet), along with the slope (1.7 %). The coefficients increased due to the increase in impervious area. Using the TR-20 method, we have determined the post-development runoff from the site (listed in Table 3) for the 2, 5, 10, and 100-year events.

Ellson Court Addition	2-Yr	5-Yr	10-Yr	100-Yr
Pre-Developed (cfs)	3	5	7	11
Post-Developed (cfs)	5	8	9	15

Table 3

The discharges from the TR-20 report were placed into Hec-Ras to model the depth of flow through the ditch channel. From that report we raised the minimum pad elevation three feet above the flow elevations in the nearest cross-sections. The BFE (Base Flood Elevation) for each cross-section is shown on the drainage and utility plan. The centerline of Ellson Street is about 1.8 feet above the BFE.



