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1997
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DRAINAGE ANALYSIS FOR AVONDALE HEIGHTS BAX PROJECT NO. 95-7230

I. PURPOSE: This report will determine the relationship between the pre-developed and the post-developed drainage on a 15 year storm. It will determine the result the development has on the adjoining Lot 44 of Highland Trails.

II. PRE-DEVELOPED FLOW

Per the Existing Conditions Exhibit (Exhibit 1), the Total Area Tributary to Point A is 92.99 Acres.

Using City of O'Fallon Criteria:

92.99 Ac. x 1.87 c.f.s./Ac. = 173.89 c.f.s.

Exhibit 2 provides a Manning's Equation to determine the velocity under existing conditions.

V = 4.35 ft./sec.

III. POST-DEVELOPED FLOW

Per the Post-Developed Exhibit (Exhibit 3) the Total Area Tributary is:

38.88 Ac. x 2.64 c.f.s./Ac. = 102.64 c.f.s. onsite
54.56 Ac. x 1.87 c.f.s./Ac. = 102.03 c.f.s. offsite

The approved Detention Report for a 25 year storm depicts 93.1 c.f.s. detained. Extrapolating to a 15 year storm yields a reduction of flow of 75.5 c.f.s.

Approximately 204.67 c.f.s. - 75.5 c.f.s. = 129.67 c.f.s.

Post-Developed flow to Point A = 129.62 c.f.s.

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IV. SUMMARY

The post-developed flow is less than the pre-developed flow by 25 percent. This project has improved the drainage on Lot 44 of Highland Trails.

An energy dissipator will also be provided to prevent erosion problems.

NATURAL CHANNELS

VARIABLES LIST:
Y - FLOW ELEVATION Q - FLOWRATE S - CHANNEL SLOPE

VARIABLE TO BE SOLVED (Y,Q OR S) ? Y

Q (CFS) ? 173.89
S (FT/FT) ? .01

Enter up to 20 cross-section points.
Enter <Return> only for distance to end.

CROSS-SECTION POINTS

DIST	ELEV	COEFF	DIST	ELEV	COEFF
1	518	.04			
13	516	.04			
22	514	.04			
30	514	.04			
49	516	.04			
60	518	.04			

RESULTS

Y= 515.89 FT
A= 40.00 SF
P= 34.71 FT
V= 4.35 FPS
F= 0.71 SUB-CRITICAL FLOW

<Shift> <Prt Sc> print <Return> repeat <Space Bar> back to menu

EXHIBIT 2

File

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AVONDALE 1 - EXISTING CONDITIONS

1. Existing Tributary Area to East-West Creek

Onsite = 22.70 Acres
Offsite = 8.85 Acres
Total = 31.58 Acres

Using City of O'Fallon PI Factors
31.58 Acres x 1.87 = **59.05 c.f.s.**

2. Post Developed Flow

Per Detention Report for Lake

25 Year Release Rate: 3.26 c.f.s.
100 Year Release Rate: 3.77 c.f.s.
Flow Bypassing Basin: 4.62 c.f.s.

Net Post Developed Flow From Phase I
3.26 c.f.s. + 4.62 c.f.s. = **7.88 c.f.s.**

7.88 c.f.s. < 59.05 c.f.s. Major Deduction in Flow!!!!

It should be noted that the lake in Phase 1 was designed to provide detention for the entire 98 Acre tract, not just Phase I.

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AVONDALE HEIGHTS - TOTAL FLOW

1. Total Area to Creek from Phase I and II

   92.75 Acres

   92.75 Acres x 1.87 = **173.44 c.f.s. (Existing)**

2. Total Actual Flow - Post Developed

Phase I =	7.88 c.f.s.	
Phase II =	26.42 Ac. x 2.64 =	69.75 c.f.s.
	22.82 Ac. x 1.87 =	42.64 c.f.s.

   69.74 c.f.s. + 42.64 c.f.s. + 7.88 c.f.s. = **120.27 c.f.s.**

   173.44 (Existing)
   120.27 (Developed)
   53.17 c.f.s. Reduction in Flow!!

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