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April 19, 1996

APR 2 2 1996

City of O'Fallon
Attn: Colleen Kramme
138 South Main Street
O'Fallon, MO 63366

Re: Avondale Improvement Plan Review
Bax Project No. 95-7230

Dear Colleen:

Enclosed please find two (2) sets of revised plans for approval. I have revised the plans per your comments dated April 11, 1996 and have the following comments:

1. A copy of the Fire Chief's approval letter will be forwarded to you as soon as it is received.

2. The storm sewer between CI 125 and CI 166 will be constructed on compacted fill.

3. The width of Knaust Road was incorrectly shown on the preliminary plan.

4. The Developer will provide revised covenants and typical elevations of homes to Planning and Zoning.

5. The Developer will contribute to the bike path fund.

Please call if you need any further information.

Sincerely,

David L. Jones

DLJ:drf
Enclosures

cc: Tom Johnson

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BAX ENGINEERING CO., INC.
1052 South Cloverleaf Drive
St. Peters, MO 63376-6445
314-928-5552 FAX 928-1718

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STORMWATER DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
BAX PROJECT NO. 96-7230
AVONDALE PHASE 1 - O'FALLON
APRIL 13 1996

INTRODUCTION:

The tract of land is presently an undeveloped site located in the City of O'Fallon, Missouri. It is proposed that the tract, consisting of Phase-1 with 35.1 acres, along with future phases, be developed into a single family residential subdivision. A stormwater detention basin shall be constructed near the Southwest corner of Phase-1. This basin will provide detention for Phase-1 and future development when considering the increased runoff for the entire tract of 98.0 acres. Additional detention above and beyond City of O'Fallon requirements may be provided in future development. The storage volume and outflow rates shall be proportioned to insure that the peak rate of runoff leaving the site under post-developed conditions is less than or equal to the peak rate of runoff leaving the site under pre-developed conditions for the required design storms. The basin shall be analyzed for the 25 and 100 year frequency - 20 minute duration design storms.

GENERAL SITE DATA AND RUNOFF CALCULATIONS:

Site area: Phase-1 - 35.1 acres
Future - 62.9 acres
Total tract - 98.0 acres

The pre-developed P.I. factors to be used for the analysis are:

25 Year-20 minute storm (assumed 5% impervious):
2.31 c.f.s./ac.

100 Year-20 minute storm (assumed 5% impervious):
2.95 c.f.s./ac.

The post-developed P.I. factors to be used for the analysis are:

25 Year-20 minute storm (onsite residential):
3.26 c.f.s./ac.
25 Year-20 minute storm (offsite - 1 acre single family):
2.58 c.f.s./ac.

100 Year-20 minute storm (onsite residential):
4.17 c.f.s./ac.
100 Year-20 minute storm (offsite - 1 acre single family):
3.30 c.f.s./ac.

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TIME OF CONCENTRATION:

Of the inflows to the basin, the most remote point of origination lies to the northeast near Knaust Rd. It will flow approximately 460 feet overland to a curb inlet then an additional 940 feet via the storm sewer to the detention basin. Time of concentration is estimated as follows:

A) T(overland) : L = 460 feet
Elevation difference = 577 - 562 = 15 feet
T(overland) = 1.2 minutes : See figure 1

B) T(sewer) : L = 940 feet
Estimated velocity of 7 ft./sec.
T(sewer) = 134.3 sec. = 2.2 minutes

Total 3.4 minutes - USE 3 minutes

REQUIRED ATTENUATION:

= TRACT AREA x [PI(post) - PI(pre)]

25 year-20 minute storm
98.0 x [3.26 - 2.31] = 93.10 c.f.s

100 year-20 minute storm
98.0 x [4.17 - 2.95] = 119.56 c.f.s

BASIN PEAK INFLOWS:

Inflows to the basin have been estimated from the drainage area map of Phase-1 of the project. (see sheets 14 & 15 of construction plans)

Onsite areas (assumed 40% impervious - single family)
Total 22.73 acres

Offsite areas (assumed 1 acre single family)
Total 8.85 acres

25 year-20 minute storm

Q(onsite)	22.73 x 3.26 =	74.10 cfs
Q(offsite)	8.85 x 2.58 =	22.83 cfs
	Total	96.93 cfs

100 year-20 minute storm

Q(onsite)	22.73 x 4.17 =	94.78 cfs
Q(offsite)	8.85 x 3.30 =	29.21 cfs
	Total	123.99 cfs

PERMITTED RELEASE RATE:

The permitted release rate of the basin is found by subtracting the required attenuation from the peak inflow to the basin for each design storm. Inflows to the basin have been estimated from the drainage area map of the project.

25 year-20 minute storm
Permitted release rate:
96.93 c.f.s. - 93.10 c.f.s. = 3.83 c.f.s

100 year-20 minute storm
Permitted release rate:
123.99 c.f.s. - 119.56 c.f.s. = 4.43 c.f.s

STORM ROUTING CALCULATIONS AND RESULTS:

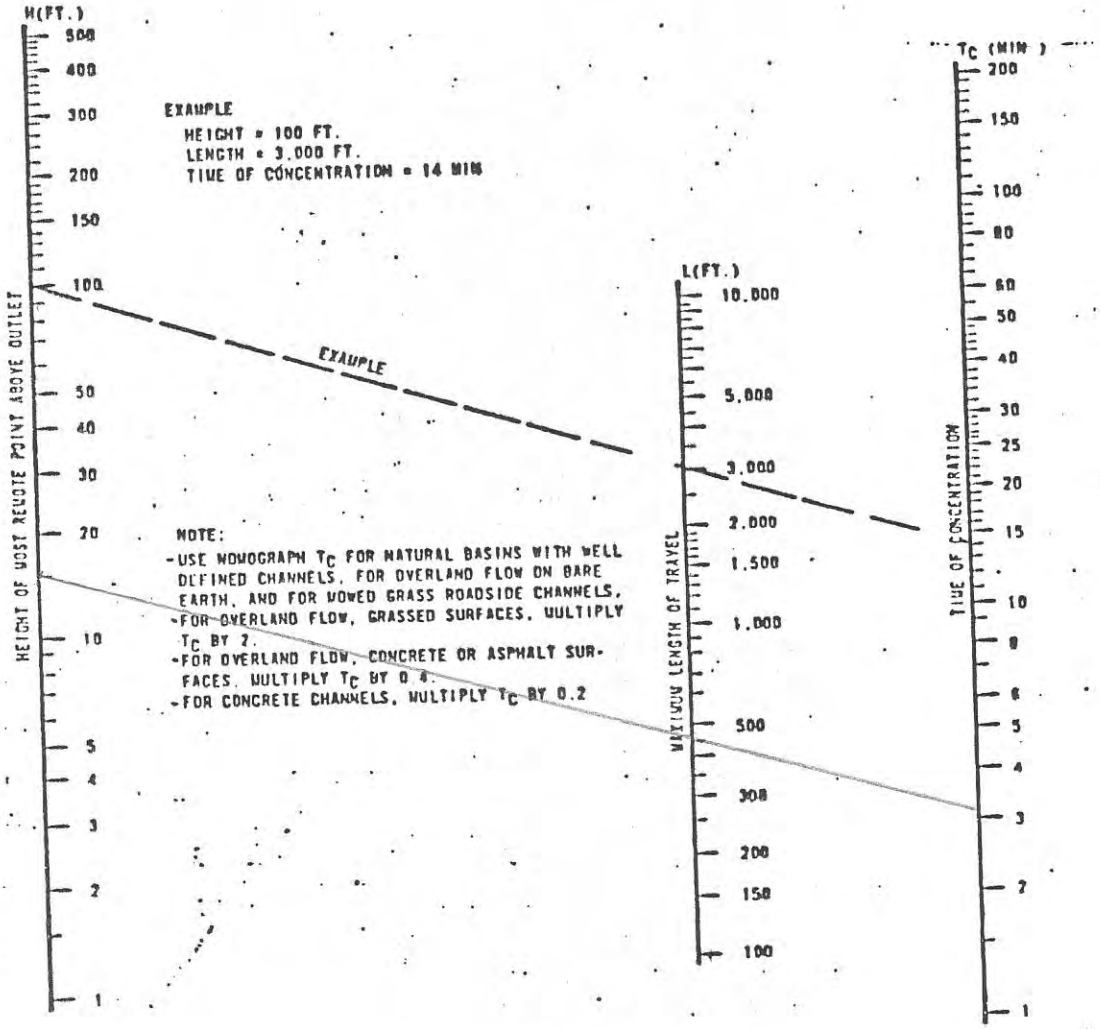
A computer program was used in routing the design 25 and 100 year-20 minute storms through the basin. As found in the routing calculations, the results are as follows:

20 MIN STORM	PERMITTED RELEASE RATE	CALCULATED RELEASE RATE	PEAK ELEVATION
25 YEAR	3.83 cfs	3.26 cfs	524.36 ft.
100 YEAR	4.43 cfs	3.77 cfs	524.94 ft.

As shown above, the calculated release rate of each of the design storms is significantly less than the respective permitted release rate as required for the detention basin.

SUMMARY

Normal Pool (low flow elevation)	522.00 ft.
25 year-20min H.W.	524.36 ft.
100 year-20min H.W.	524.94 ft.
100 year-20min H.W.(low flow blocked)	525.00 ft.
(see routing for blocked low flow pp.	20-27)
OVERFLOW SILL ELEVATION	525.00 ft.
TOP OF BERM	526.80 ft.



MAXIMUM ELEVATION 577.0 FT
MINIMUM ELEVATION 562.0 FT.
H = 15.0 ft
LENGTH OF PATH (L) = 460 FT
$T_C = 3.1 \times 0.4 = 1.2$

FIGURE 1

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

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SEDIMENT STORAGE CALCULATIONS
AVONDALE HEIGHTS
BAX PROJECT NO. 95-7230
MAY 1, 1996

Sediment storage will be provide by over excavation of the lake bottom. The following calculations are based on information provided the St. Charles County Soil & Water Conservation District. "Erosion & Sediment Central for Urban Development Sites"

1.	Total disturbed area tributing to lake	20.88 AC
2.	Average slope of land to lake	4.5 %
3.	Average slope length to lake	1000'
4.	Soil loss ratio (Table B-6)	1.3
5.	Sediment delivery ratio (Table B-7)	0.50
6.	Sediment yield (Table B-8)	0.047

Calculate required volume for 1 year construction period:

(1.3) (0.50) (0.047) (20.88) = 0.6379 Ac Ft/Yr = 27,786 Cubic Ft/Yr

Volume Calculation:

ELEVATION	AREA	VOLUME	TOTAL VOLUME
510.0	13,625 S.F.	0	0
508.0	10,400 S.F.	24,025	24,025
507.0	8,800 S.F.	9,600	33,625
506.0	7,200 S.F.	8,000	41,625

Based on the above calculations the lake will be required to be over excavated 2.5' (28,825 of) so as to provide storage for the anticipated sediment run-off.

using table → 160 (35) = $\frac{5,600}{1\text{ yr}} = \frac{28,000}{5\text{ yrs}}$

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1052 South Cloverleaf Drive
St. Peters, MO 63376-6445
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********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-25 .HYD
Outflow Hydrograph: 7230-250.HYD

Starting Pond W.S. Elevation = 522.00 ft

**** Summary of Peak Outflow and Peak Elevation ****

Peak Inflow	=	97.10 cfs
Peak Outflow	=	3.26 cfs
Peak Elevation	=	524.36 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	2.59 ac-ft
Total Storage in Pond	=	2.59 ac-ft

POND-2 Version: 5.17 8/N
EXECUTED: 04-16-1996 01:03:46

Return Freq: 25 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-25 .HYD
Outflow Hydrograph: 7230-250 .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	----	0.0	0.0	0.00	522.00
1.0	32.40	32.4	32.4	32.4	0.01	522.02
2.0	64.70	97.1	129.4	129.5	0.04	522.09
3.0	97.10	161.8	291.0	291.2	0.10	522.20
4.0	96.90	194.0	484.4	485.0	0.29	522.33
5.0	96.90	193.8	677.2	678.2	0.49	522.46
6.0	96.90	193.8	869.7	871.0	0.68	522.58
7.0	96.90	193.8	1061.6	1063.5	0.92	522.71
8.0	96.90	193.8	1253.1	1255.4	1.17	522.83
9.0	96.90	193.8	1444.1	1446.9	1.41	522.96
10.0	96.90	193.8	1634.5	1637.9	1.70	523.08
11.0	96.90	193.8	1824.3	1828.3	2.00	523.20
12.0	96.90	193.8	2013.7	2018.1	2.18	523.32
13.0	96.90	193.8	2202.9	2207.5	2.34	523.44
14.0	96.90	193.8	2391.8	2396.7	2.45	523.55
15.0	96.90	193.8	2580.4	2585.6	2.57	523.67
16.0	96.90	193.8	2768.9	2774.2	2.68	523.78
17.0	96.90	193.8	2957.1	2962.7	2.80	523.90
18.0	96.90	193.8	3145.1	3150.9	2.91	524.01
19.0	96.90	193.8	3332.8	3338.9	3.02	524.12
20.0	89.20	186.1	3512.7	3518.9	3.12	524.22
21.0	56.80	146.0	3652.3	3658.7	3.20	524.30
22.0	24.40	81.2	3727.0	3733.5	3.25	524.35
23.0	0.00	24.4	3744.9	3751.4	3.26	524.36
24.0	0.00	0.0	3738.3	3744.9	3.25	524.35
25.0	0.00	0.0	3731.8	3738.3	3.25	524.35
26.1	0.00	0.0	3725.4	3731.8	3.24	524.34
27.1	0.00	0.0	3718.9	3725.4	3.24	524.34
28.1	0.00	0.0	3712.4	3718.9	3.24	524.34
29.1	0.00	0.0	3705.9	3712.4	3.24	524.34

POND-2 Version: 5.17 S/N:
EXECUTED: 04-16-1996 01:03:46

Return Freq: 25 years

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*****************************************
*                                       *
*      AVONDALE - O'FALLON              *
*        DETENTION ANALYSIS             *
*   PREPARED BY: BAX ENGINEERING        *
*         APRIL 13, 1996                *
*                                       *
*****************************************
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Inflow Hydrograph: 7230-25 .HYD
Rating Table file: 7230 .PND

---INITIAL CONDITIONS---
Elevation = 522.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
522.00	0.0	0.000
522.20	0.1	0.203
522.40	0.4	0.408
522.60	0.7	0.617
522.80	1.1	0.829
523.00	1.5	1.044
523.20	2.0	1.262
523.40	2.3	1.482
523.60	2.5	1.706
523.80	2.7	1.933
524.00	2.9	2.163
524.20	3.1	2.397
524.40	3.3	2.636
524.60	3.5	2.881
524.80	3.7	3.131
525.00	3.8	3.387
525.20	7.1	3.647
525.40	13.0	3.914
525.60	20.5	4.185
525.80	29.4	4.462

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
293.8	293.9
591.9	592.3
894.3	895.0
1201.1	1202.2
1512.5	1514.0
1828.2	1830.2
2148.2	2150.5
2472.5	2475.0
2801.2	2803.9
3134.3	3137.2
3473.5	3476.6
3820.3	3823.6
4174.7	4178.2
4537.1	4540.8
4907.4	4911.2
5285.5	5292.6
5671.2	5684.2
6064.5	6085.0
6465.7	6495.1

Time increment (t) = 1.0 min.

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING
APRIL 13, 1996

Inflow Hydrograph: 7230-100.HYD
Rating Table file: 7230 .PND

----INITIAL CONDITIONS----
Elevation = 522.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
522.00	0.0	0.000
522.20	0.1	0.203
522.40	0.4	0.408
522.60	0.7	0.617
522.80	1.1	0.829
523.00	1.5	1.044
523.20	2.0	1.262
523.40	2.3	1.482
523.60	2.5	1.706
523.80	2.7	1.933
524.00	2.9	2.163
524.20	3.1	2.397
524.40	3.3	2.636
524.60	3.5	2.881
524.80	3.7	3.131
525.00	3.8	3.387
525.20	7.1	3.647
525.40	13.0	3.914
525.60	20.5	4.185
525.80	29.4	4.462

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
293.8	293.9
591.9	592.3
894.3	895.0
1201.1	1202.2
1512.5	1514.0
1828.2	1830.2
2148.2	2150.5
2472.5	2475.0
2801.2	2803.9
3134.3	3137.2
3473.5	3476.6
3820.3	3823.6
4174.7	4178.2
4537.1	4540.8
4907.4	4911.2
5285.5	5292.6
5671.2	5684.2
6064.5	6085.0
6465.7	6495.1

Time increment (t) = 1.0 min.

POND-2 Version: 5.17 S/N:
EXECUTED: 04-16-1996 01:05:47

Return Freq: 100 years

Pond File: 7230 .PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 7230-CO .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00		0.0	0.0	0.00	522.00
1.0	41.40	41.4	41.4	41.4	0.01	522.03
2.0	82.80	124.2	165.5	165.6	0.06	522.11
3.0	124.20	207.0	372.1	372.5	0.18	522.25
4.0	124.00	248.2	617.4	620.0	0.43	522.42
5.0	124.00	248.0	866.1	867.4	0.67	522.58
6.0	124.00	248.0	1112.1	1114.1	0.99	522.74
7.0	124.00	248.0	1357.9	1360.1	1.30	522.90
8.0	124.00	248.0	1602.2	1605.5	1.64	523.06
9.0	124.00	248.0	1846.2	1850.2	2.02	523.21
10.0	124.00	248.0	2089.7	2094.2	2.25	523.36
11.0	124.00	248.0	2332.9	2337.7	2.42	523.52
12.0	124.00	248.0	2575.7	2580.9	2.56	523.66
13.0	124.00	248.0	2818.3	2823.7	2.71	523.81
14.0	124.00	248.0	3060.6	3066.3	2.86	523.96
15.0	124.00	248.0	3302.6	3308.6	3.00	524.10
16.0	124.00	248.0	3544.3	3550.6	3.14	524.24
17.0	124.00	248.0	3785.8	3792.3	3.28	524.38
18.0	124.00	248.0	4026.9	4033.8	3.42	524.52
19.0	124.00	248.0	4267.8	4274.9	3.55	524.65
20.0	114.10	238.1	4496.5	4505.9	3.68	524.78
21.0	72.70	186.8	4677.9	4685.3	3.74	524.88
22.0	31.20	103.9	4774.2	4781.8	3.77	524.90
23.0	0.00	31.2	4797.9	4805.4	3.77	524.94
24.0	0.00	0.0	4790.4	4797.9	3.77	524.94
25.0	0.00	0.0	4782.8	4790.4	3.77	524.93
26.1	0.00	0.0	4775.3	4782.8	3.77	524.93
27.1	0.00	0.0	4767.8	4775.3	3.76	524.93
28.1	0.00	0.0	4760.2	4767.8	3.76	524.92
29.1	0.00	0.0	4752.7	4760.2	3.76	524.92

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230 .PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 7230-CO .HYD

Starting Pond W.S. Elevation = 522.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	124.20 cfs
Peak Outflow	=	3.77 cfs
Peak Elevation	=	524.94 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage From Storm	=	3.31 ac-ft
Total Storage in Pond	=	3.31 ac-ft

Outlet Struc File: 7230 .STR

POND 2 Version: 5.17 S/N:
Date Executed: Time Executed:

****

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
APRIL 13, 1996

****

**** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
522.00	0.0	1
522.20	0.1	1
522.40	0.4	1
522.60	0.7	1
522.80	1.1	1
523.00	1.5	1
523.20	2.0	1
523.40	2.3	2
523.60	2.5	2
523.80	2.7	2
524.00	2.9	2
524.20	3.1	2
524.40	3.3	2
524.60	3.5	2
524.80	3.7	2
525.00	3.8	3 +2
525.20	8.3	3 +2
525.40	17.0	3 +2
525.60	27.9	3 +2
525.80	40.9	3 +2
526.00	0.0	

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: SAX ENGINEERING CO., INC.
APRIL 16, 1990

Outlet Structure File: 7230 .STR
Planimeter Input File: 7230 .VOL
Rating Table Output File: 7230 .POND

Min. Elev.(ft) = 522 Max. Elev.(ft) = 526 Incr.(ft) = .2

Additional elevations (ft) to be included in table:

SYSTEM CONNECTIVITY

Structure	No.	Q Table	Q Table
WEIR-VR	3		3
WEIR-VE	1		1
ORIFICE	2		A

Outflow rating table summary was stored in file:
7230 .POND

Outlet Structure File: 7930 .STR

POND-2 Version: 5.17 07N
Date Executed) Time Executed)

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: RBK ENGINEERING CO., INC.
APRIL 13, 1996

Structure No. 3

(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	525.00
E2 elev.(ft)?	526
Weir coefficient?	3
Weir elev.(ft)?	525.00
Length (ft)?	17.00
Contracted/Suppressed (C/S)?	S

STANDARD DOUBLE AREA INLET
OVERFLOW STRUCTURE

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

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************************************
       AVONDALE - O'FALLON
       DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
         APRIL 13, 1996
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***** Structure No. 1 *****
(Input Data)

WEIR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	522
E2 elev.(ft)?	526
Weir coefficient?	3
Weir elev.(ft)?	522
Length (ft)?	.5
Contracted/Suppressed (C/S)?	S

LOW FLOW SLOT 0.5 FEET WIDE × 1.0 FEET HIGH

Outlet Structure File: 7230 SHP

POND 2 Version: 5.17 S/N:
Date Executed: Time Executed:

****

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: MAX ENGINEERING CO., INC.
APRIL 13, 1990

****

>>>>> Structure No. 2 <<<<<
(Input Data)

ORIFICE
Orifice - Based on Area and Datum Elevation

E1 elev.(ft)?	522.5000
E2 elev.(ft)]	526.00
Orifice coeff.?	0.6
Invert elev.(ft)	522.00
Datum elev.(ft) ?	522.5000
Orifice area (sq ft)?	.5

LOW FLOW SLOT 0.5 FEET WIDE X 1.0 FEET HIGH AS ORFICE

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

****
AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
APRIL 15, 1996
****

Outflow Rating Table for Structure #5
WEIR-VR Weir - Vertical Rectangular

**** INLET CONTROL ASSUMED ****

Elevation (ft)	Q (cfs)	Computation Messages
522.00	0.0	E < Inv.El.= 525
522.20	0.0	E < Inv.El.= 525
522.40	0.0	E < Inv.El.= 525
522.60	0.0	E < Inv.El.= 525
522.80	0.0	E < Inv.El.= 525
523.00	0.0	E < Inv.El.= 525
523.20	0.0	E < Inv.El.= 525
523.40	0.0	E < Inv.El.= 525
523.60	0.0	E < Inv.El.= 525
523.80	0.0	E < Inv.El.= 525
524.00	0.0	E < Inv.El.= 525
524.20	0.0	E < Inv.El.= 525
524.40	0.0	E < Inv.El.= 525
524.60	0.0	E < Inv.El.= 525
524.80	0.0	E < Inv.El.= 525
525.00	0.0	H =0.0
525.20	4.6	H =.2
525.40	12.9	H =.4
525.60	23.7	H =.6
525.80	36.5	H =.8
526.00	0.0	E = or > E2=526

C = 3 L (ft) = 17
H (ft) = Table elev. - Invert elev. (525 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir

Outlet Structure File: 7230 .STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

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AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: MAX ENGINEERING CO., INC.
APRIL 13, 1996

****

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
522.00	0.0	H =0.0
522.20	0.1	H = .2
522.40	0.4	H = .4
522.60	0.7	H = .6
522.80	1.1	H = .8
523.00	1.5	H =1.0
523.20	2.0	H =1.2
523.40	2.5	H =1.4
523.60	3.0	H =1.6
523.80	3.6	H =1.8
524.00	4.2	H =2.0
524.20	4.9	H =2.2
524.40	5.6	H =2.4
524.60	6.3	H =2.6
524.80	7.0	H =2.8
525.00	7.8	H =3.0
525.20	8.6	H =3.2
525.40	9.4	H =3.4
525.60	10.2	H =3.6
525.80	11.1	H =3.8
526.00	0.0	E = or > E2=526

C = 3.3 L (ft) = 5
H (ft) = Table elev. - Invert elev. (522 ft)
Q (cfs) = C * L * (H**1.5) - Submerged Weir

Outlet Structure File: 7630 .STP

POND 2 Version: 5.17 S/N:
Date Executed: Time Executed:

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: RAY ENGINEERING CO., INC.
APRIL 12, 1996

Outflow Rating Table for Structure #2
ORIFICE Orifice - Based on Area and Datum Elevation

Elevation (ft)	Q (cfs)	Computation Messages
522.00	0.0	E < S1=522.5000
522.20	0.0	E < S1=522.5000
522.40	0.0	E < S1=522.5000
522.60	0.8	H = 1
522.80	1.3	H =1.2
523.00	1.7	H =1.5
523.20	2.0	H =1.7
523.40	2.3	H = 9
523.60	2.5	H =1.1
523.80	2.7	H =1.3
524.00	2.9	H =1.5
524.20	3.1	H =1.7
524.40	3.3	H =1.9
524.60	3.5	H =2.1
524.80	3.7	H =2.3
525.00	3.8	H =2.5
525.20	4.0	H =2.7
525.40	4.1	H =2.9
525.60	4.2	H =3.1
525.80	4.4	H =3.3
526.00	0.0	E = OF E2=526.00

C = .6 A = .5 sq.ft.
H (ft) = Table elev. - Datum elev. (522.5 ft)
Q (cfs) = C * A * sqr(2g * H)

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*************************************
*                                   *
*     AVONDALE - O'FALLON           *
*      DETENTION ANALYSIS           *
*  PREPARED BY: BAX ENGINEERING     *
*        APRIL 13, 1996             *
*                                   *
*************************************
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Inflow Hydrograph: 7230-100.HYD
Rating Table file: 7230OVER.PND

----INITIAL CONDITIONS----
Elevation = 522.00 ft
Outflow = 0.00 cfs
Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
522.00	0.0	0.000
522.20	0.0	0.203
522.40	0.0	0.408
522.60	0.0	0.617
522.80	0.0	0.829
523.00	0.0	1.044
523.20	0.0	1.262
523.40	0.0	1.482
523.60	0.0	1.706
523.80	0.0	1.933
524.00	0.0	2.163
524.20	0.0	2.397
524.40	0.0	2.630
524.60	0.0	2.881
524.80	0.0	3.131
525.00	0.0	3.387
525.20	4.6	3.647
525.40	12.9	3.914
525.60	25.7	4.185
525.80	36.5	4.462

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + O (cfs)
0.0	0.0
293.8	293.8
591.9	591.9
894.3	894.3
1201.1	1201.1
1512.5	1512.5
1828.2	1828.2
2148.2	2148.2
2472.5	2472.5
2801.2	2801.2
3134.8	3134.8
3473.5	3473.5
3820.3	3820.3
4174.7	4174.7
4537.1	4537.1
4907.4	4907.4
5285.3	5290.1
5671.2	5684.1
6064.5	6090.2
6465.7	6502.2

Time increment (t) = 1.0 min.

Pond File: 7230OVER.PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 7230OVR1.HYD

INFLOW HYDROGRAPH | ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	0.00	-------	0.0	0.0	0.00	522.00
1.0	41.40	41.4	41.4	41.4	0.00	522.03
2.0	82.80	124.2	165.6	165.6	0.00	522.11
3.0	124.20	207.0	372.6	372.6	0.00	522.25
4.0	124.00	248.2	620.8	620.8	0.00	522.42
5.0	124.00	248.0	868.8	868.8	0.00	522.58
6.0	124.00	248.0	1116.8	1116.8	0.00	522.75
7.0	124.00	248.0	1364.8	1364.8	0.00	522.91
8.0	124.00	248.0	1612.8	1612.8	0.00	523.06
9.0	124.00	248.0	1860.8	1860.8	0.00	523.22
10.0	124.00	248.0	2108.8	2108.8	0.00	523.38
11.0	124.00	248.0	2356.8	2356.8	0.00	523.53
12.0	124.00	248.0	2604.8	2604.8	0.00	523.68
13.0	124.00	248.0	2852.8	2852.8	0.00	523.83
14.0	124.00	248.0	3100.8	3100.8	0.00	523.98
15.0	124.00	248.0	3348.8	3348.8	0.00	524.13
16.0	124.00	248.0	3596.8	3596.8	0.00	524.27
17.0	124.00	248.0	3844.8	3844.8	0.00	524.41
18.0	124.00	248.0	4092.8	4092.8	0.00	524.55
19.0	124.00	248.0	4340.8	4340.8	0.00	524.69
20.0	114.10	238.1	4578.9	4578.9	0.00	524.82
21.0	72.70	186.8	4765.7	4765.7	0.00	524.92
22.0	31.20	103.9	4869.6	4869.6	0.00	524.98
23.0	0.00	31.2	4900.8	4900.8	0.00	525.00
24.0	0.00	0.0	4900.8	4900.8	0.00	525.00
25.0	0.00	0.0	4900.8	4900.8	0.00	525.00
26.1	0.00	0.0	4900.8	4900.8	0.00	525.00
27.1	0.00	0.0	4900.8	4900.8	0.00	525.00
28.1	0.00	0.0	4900.8	4900.8	0.00	525.00
29.1	0.00	0.0	4900.8	4900.8	0.00	525.00
30.1	0.00	0.0	4900.8	4900.8	0.00	525.00
31.1	0.00	0.0	4900.8	4900.8	0.00	525.00
32.1	0.00	0.0	4900.8	4900.8	0.00	525.00
33.1	0.00	0.0	4900.8	4900.8	0.00	525.00
34.1	0.00	0.0	4900.8	4900.8	0.00	525.00
35.1	0.00	0.0	4900.8	4900.8	0.00	525.00
36.1	0.00	0.0	4900.8	4900.8	0.00	525.00
37.1	0.00	0.0	4900.8	4900.8	0.00	525.00
38.1	0.00	0.0	4900.8	4900.8	0.00	525.00
39.1	0.00	0.0	4900.8	4900.8	0.00	525.00
40.1	0.00	0.0	4900.8	4900.8	0.00	525.00
41.1	0.00	0.0	4900.8	4900.8	0.00	525.00
42.1	0.00	0.0	4900.8	4900.8	0.00	525.00
43.1	0.00	0.0	4900.8	4900.8	0.00	525.00
44.1	0.00	0.0	4900.8	4900.8	0.00	525.00

POND-2 Version: 5.17 6/N:
EXECUTED: 04-17-1998 22:25:02

Return Freq: 100 years

Pond File: 7230OVER.PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 7250OVR1.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.1	0.00
46.1	0.00
47.1	0.00
48.1	0.00
49.1	0.00

ROUTING COMPUTATIONS

(I+J)2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	4900.8	4900.8	0.00	525.00
0.0	4900.8	4900.8	0.00	525.00
0.0	4900.8	4900.8	0.00	525.00
0.0	4900.8	4900.8	0.00	525.00
0.0	4900.8	4900.8	0.00	525.00

********** SUMMARY OF ROUTING COMPUTATIONS **********

Pond File: 7230OVER.PND
Inflow Hydrograph: 7230-100.HYD
Outflow Hydrograph: 7230OVRI.HYD

Starting Pond W.S. Elevation = 522.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	124.20 cfs
Peak Outflow	=	0.00 cfs
Peak Elevation	=	525.00 ft

***** Summary of Approximate Peak Storage *****

Initial Storage	=	0.00 ac-ft
Peak Storage from Storm	=	3.38 ac-ft
Total Storage in Pond	=	3.38 ac-ft

>>>>>> Warning, peak outflow = last ordinate point. <<<<<<

>>>>>> Warning: peak outflow = last ordinate point <<<<<<
Outlet Structure File: 72.00VER.STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

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AVONDALE O'FALLON
DETENTION ANALYSIS
PREPARED BY: DAX ENGINEERING CO., INC.
APRIL 13, 1996

****

***** COMPOSITE OUTFLOW SUMMARY *****

Elevation (ft)	Q (cfs)	Contributing Structures
522.00	0.0	
522.20	0.0	
522.40	0.0	
522.60	0.0	
522.80	0.0	
523.00	0.0	
523.20	0.0	
523.40	0.0	
523.60	0.0	
523.80	0.0	
524.00	0.0	
524.20	0.0	
524.40	0.0	
524.60	0.0	
524.80	0.0	
525.00	0.0	1
525.20	8.6	1
525.40	18.9	1
525.60	23.7	1
525.80	36.5	1
526.00	0.0	

Outlet Structure File: 7230OVCR.STR

PONd-2 Version: 5.17 S/N:
Date Executed: Time executed:

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AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
APRIL 15, 1996
****

Outlet Structure File: 7230OVCR.STR
Planimeter Input File: 7230 .VOL
Rating Table Output File: 7230OVCR.PND

Min. Elev.(ft) = 522 Max. Elev.(ft) = 526 Incr.(ft) = .2

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table	Q Table
WEIR-VR	1	-->	1

Outflow rating table summary was stored in file:
7230OVCR.PND

Outlet Structure File: C:\POND2\DVR.STR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: SAX ENGINEERING CO., INC.
APRIL 13, 1995

Structure No. 1 selected
(Input Data)

METR-VR
Weir - Vertical Rectangular

E1 elev.(ft)?	525.00
E2 elev.(ft)?	526
Weir coefficient?	3
Weir elev.(ft)?	525.00
Length (ft)?	12.00
Contraction/Suppressed (C/S)?	S

STANDARD DBL.-AREA INLET.

Outlet Structure File: 72300VER.5IR

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
APRIL 13, 1996

Outflow Rating Table for Structure #1
WEIR-VR Weir - Vertical Rectangular

**** INLET CONTROL ASSUMED ****

Elevation (ft)	Q (cfs)	Computation Messages
522.00	0.0	E = Inv.El.= 525
522.20	0.0	E = Inv.El.= 525
522.40	0.0	E = Inv.El.= 525
522.60	0.0	E = Inv.El.= 525
522.80	0.0	E = Inv.El.= 525
523.00	0.0	E = Inv.El.= 525
523.20	0.0	E = Inv.El.= 525
523.40	0.0	E = Inv.El.= 525
523.60	0.0	E = Inv.El.= 525
523.80	0.0	E = Inv.El.= 525
524.00	0.0	E = Inv.El.= 525
524.20	0.0	E = Inv.El.= 525
524.40	0.0	E = Inv.El.= 525
524.60	0.0	E = Inv.El.= 525
524.80	0.0	E = Inv.El.= 525
525.00	0.0	H = 0
525.20	4.6	H = .2
525.40	12.9	H = .4
525.60	23.7	H = .6
525.80	36.5	H = .8
526.00	0.0	E = or > E2=526

C = 3.0 L (ft) = 17.0
H (ft) = Table elev. - Invert elev. (525 ft)
Q (cfs) = C * L * (H**1.5) -- Suppressed Weir


Water Tank
North Middle School
INTERCHANGE 217
INTERCHANGE 220
Trailer Park
Trailer Parks
Sage Chapel Cem
Creek
Wesleyan Ch
ST PETERS
SALT LICK ROAD
BOUNDARY
Belleau
Cornerstone Ch
Fort Zumwalt South High Sch
MEXICO
Mount Zion Cem
O'FALLON
CORP BDY
ROAD
Ft Zumwalt South Sch
Progress South Sch
Boonslick State Sch
Oakridge Ch
Church on the Rock
KNAUST
Dardenne Sch
Radio Tower
O'FALLON
CORPORATE
BOUNDARY
WEISS
All Saints Village
COTTLEVILLE
CORP BDY
BM 550
2.7 MI. TO U.S. 61 & 40
701
702
40° 00″
703
704
SCALE 1:24000

Outlet Structure file: 7230 S/N:

POND-2 Version: 5.17 S/N:
Date Executed: Time Executed:

AVONDALE - O'FALLON
DETENTION ANALYSIS
PREPARED BY: BAX ENGINEERING CO., INC.
APRIL 13, 1996

Outflow Rating Table A
Table A

Elevation (ft)	Q (cfs)	Contributing Structures
522.00	0.0	1
522.20	0.1	1
522.40	0.4	1
522.60	0.7	1
522.80	1.1	1
523.00	1.5	1
523.20	2.0	1
523.40	2.3	2
523.60	2.5	2
523.80	2.7	2
524.00	2.9	2
524.20	3.1	2
524.40	3.3	2
524.60	3.5	2
524.80	3.7	2
525.00	3.8	2
525.20	4.0	2
525.40	4.1	2
525.60	4.3	2
525.80	4.4	2
526.00	0.0	--