

Carrier, Christopher

From: Carrier, Christopher
Sent: Tuesday, March 06, 2001 9:56 AM
To: Lackey, Stephen
Subject: Joe Pisciotte Inquiry

Sensitivity: Private

You saw the em I sent to Joe in response to his question about Sawmill Creek Addition and also the em I sent to Vicki H. after I looked at the drainage plan.

I am concerned about my response to a Councilperson when they ask a question like Joe did - "Will this development cause any adverse downstream impacts?" In this case, everything looked okay for the 100 year storm - if they end up doing what was in the report. So - trying to be a good team player, and realizing that this subdivision has already gone through the approval processes, I told him that all was okay.

But - between you and I, I do have several concerns as I hinted in my em to Vicki, as follows:

1. What we review at final plat approval stage is a drainage concept plan only. It can certainly be changed any time before it is built. How can we control what happens after the plat is approved?
2. The plan said everything was designed for the 100 year flood, but the design could be reduced to the 2 year later if adequate overflow was provided. I think this is wrong. First, how many times have we seen where the planned overflow gets obstructed? Also - don't give us a 100 year plan if that's not what you intend to build.
3. SRB's report did great for the 100 year storm, but they did not study the effects on the 5 year storm. Don't they have to look at both? I really think the biggest downstream impacts in situations like this is on the smaller storms (remember Trisha Meyers?).
4. Lastly, do we have the mechanisms in place to ensure that they followup and build consistent with the drainage plan? I wonder.

Okay, with all that, how would you answer Joe? I'm just not real comfortable with what I told him.

Thanks for listening (reading?).

File -
Sawmill Creek
Addition.

Carrier, Christopher

From: Pisciotte, Joe
Sent: Tuesday, February 27, 2001 5:22 PM
To: Carrier, Christopher
Subject: RE: Blessed Sacrament Church

Sensitivity: Private

Chris - thanks for your messages. Sorry about not getting back with you. I do want to have another meeting. Friday afternoon would be okay, or Monday. Tuesday afternoon is possible depending on Council schedule. Let me know. Also, what do you know about possible drainage problems with the development going it at 45th and Rock Road. Any problems for those south of their? Thanks for all your good help, Ciao. Joe Pisciotte

-----Original Message-----

From: Carrier, Christopher
Sent: Tuesday, February 27, 2001 3:02 PM
To: Pisciotte, Joe
Subject: Blessed Sacrament Church
Sensitivity: Private

Did you get my EM on this last week? I've gotten calls from a couple of the neighbors wanting to know whats going on. If you don't want to have another meeting out there, let me know and I'll handle.

Thanks.

Shawn - Please get w/ Vicki H and see what this is all about. Also - if she has a drainage plan - bring it up here so we can look at.
CMC
2-28-01

Carrier, Christopher

From: Carrier, Christopher
Sent: Monday, March 05, 2001 5:07 PM
To: Huang, Vicky
Cc: Lackey, Stephen
Subject: Sawmill Creek Addition Drainage Plan

Sensitivity: Private

At Joe Pisciotte, I reviewed the drainage report for this subdivision and have a few questions:

1. Don't we require detention for both the 5 yr and 100 yr storms?
Their calcs address the 100 year only.
2. Why don't we make them show the 100 year flood limits for the East Fork Chisholm Creek on the plan?
3. I am bothered that there is a note on the report that says the system has been designed for the 100 year storm, but can be reduced later to the 2 year size. What does that tell us? Which is it going to be? You know it will go to the two year - so why did they bother submitting this report.

Your thoughts? Thanks.

ENGINEERING, SURVEYING & LAND PLANNING

S R & B

SAVOY, RUGGLES & BOHM, P.A.

*See Comments -
Inside Cover.*

**FINAL DRAINAGE PLAN
FOR
SAWMILL CREEK ADDITION
WICHITA,
SEDGWICK COUNTY, KANSAS**

JUNE 5, 2000

- 1- Need to show Flood Limits on Dry Plan
- 2- Detention for less than Q_{100} ?
- 3- Engr's note on reduction
- 4- (K FEMA Q_{125} for Rock Rd Outlet! (E. Fork Chisholm Creek)

INTRODUCTION

This report contains supporting documentation and calculations for the proposed storm water sewer system serving Sawmill Creek Addition. The StormCad computer model by Haestad Methods, Inc. is used in the analysis of the storm water sewer system. This model determines the peak flow rates and pipe capacities based on input data taken from survey information and the City of Wichita design criteria for drainage and storm sewer systems. The output from the analysis of the storm sewer for the 100-year frequency event can be found in this report.

HYDROLOGY

The HEC-HMS (HEC-1) computer model is used to determine the peak flow rates for the system based on system flow time, soil types, and peaking coefficients. The rational method for determining peak flows is used for the storm water sewer basins located within the plat.

HYDRAULICS

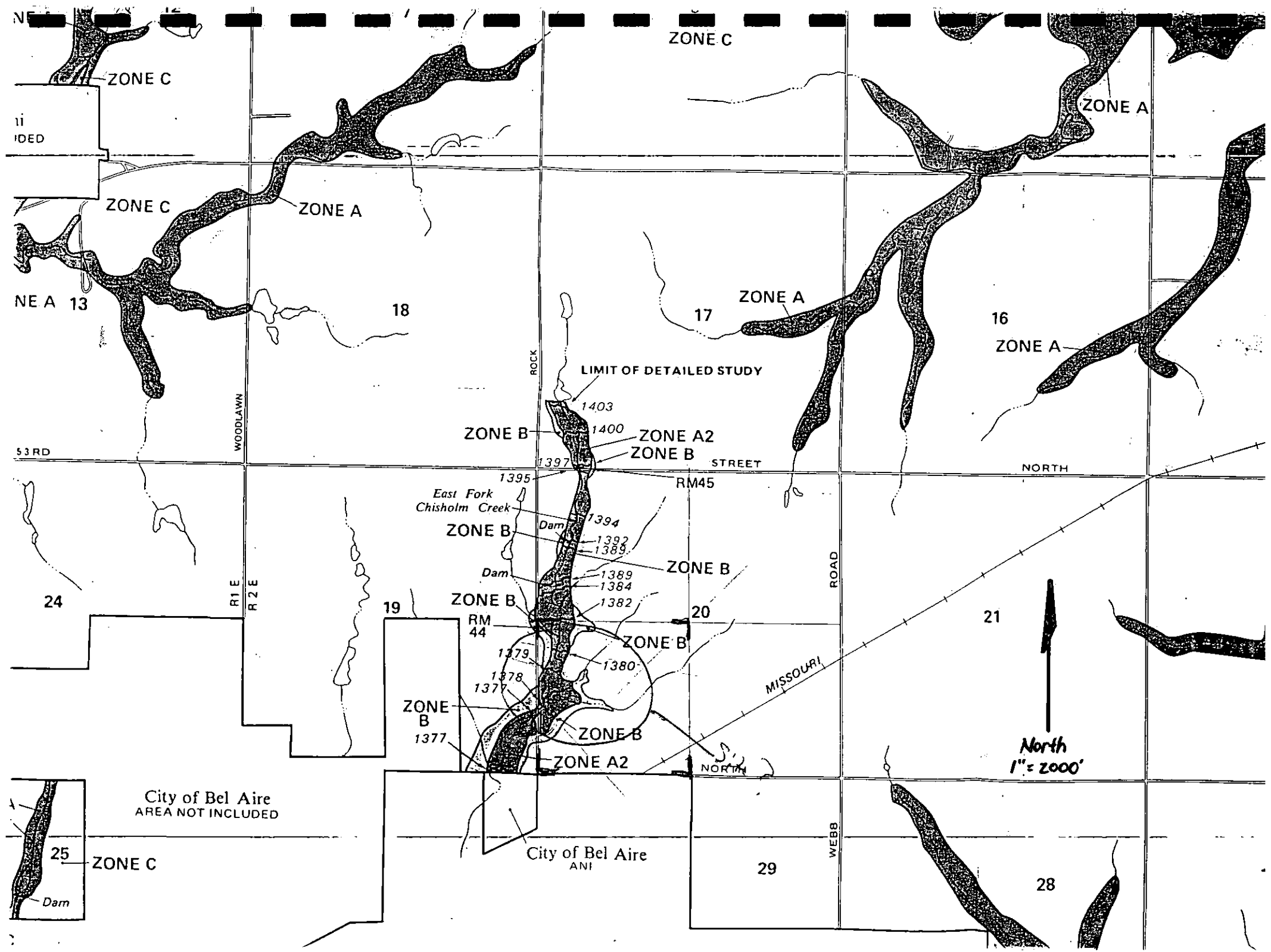
The StormCAD computer model then routes the flow rates through the pipe system to determine the hydraulic grade line of the system. The hydraulic grade line is the depth of flow in the pipes.

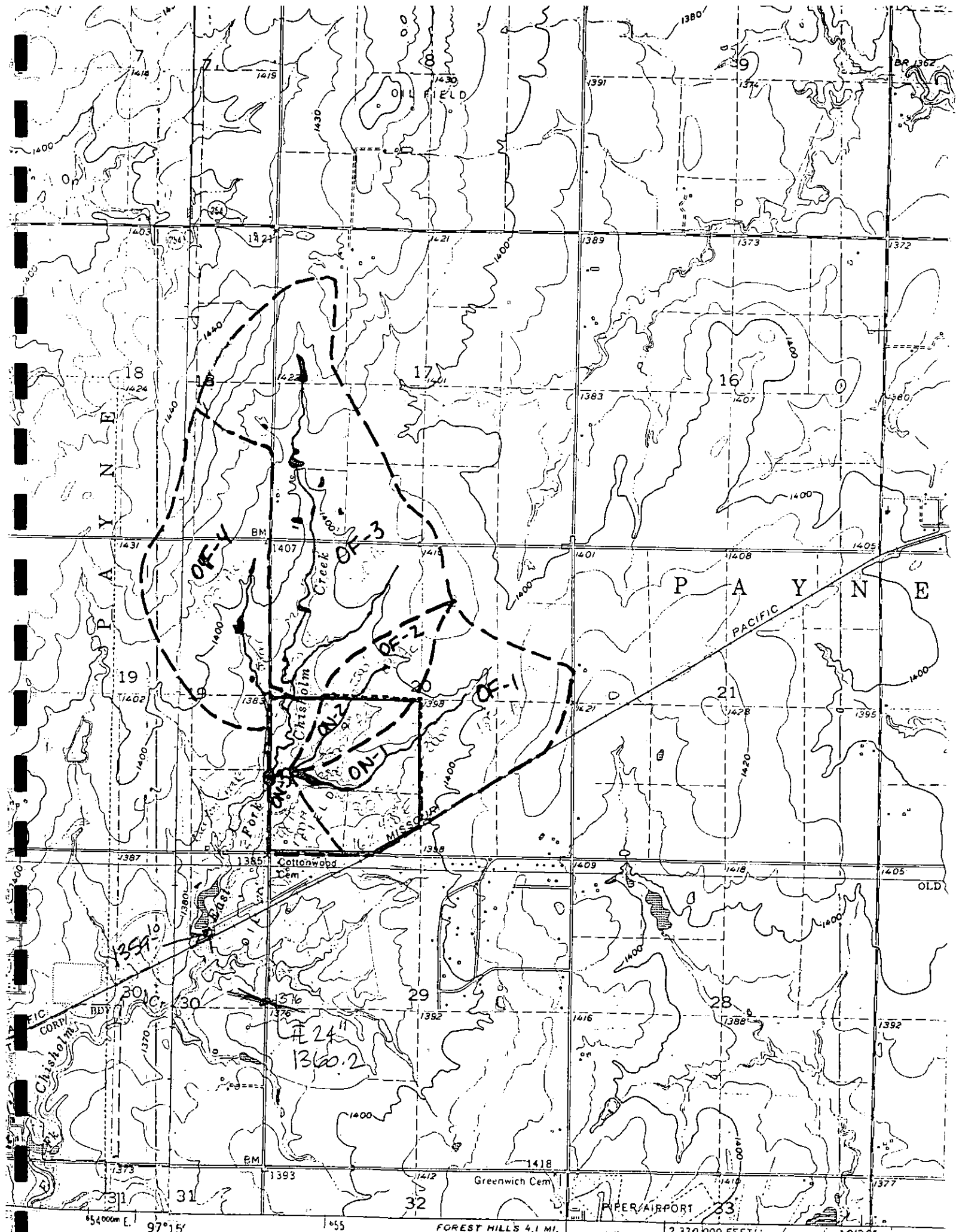
CONCLUSION

According to the analysis of the 100-year frequency storm, the proposed storm sewer and pond system will discharge less than the existing discharge at the box culvert under rock road about ¼ mile north of 45th Street North. All storm water drain systems shown on this plan are designed to carry the 100-year frequency rainfall event. The Consulting Engineer may reduce the size of pipes to the 2-year frequency rainfall event during design provided that the street and lot grading allows for conveyance of the 100-year frequency rainfall event without damage to any properties located outside the street right-of-way. All calculations shall be submitted to the City Engineer for approval prior to construction of the storm water sewer system.

Note!

What about 2, 5, 10 yr storms?





454000 E. 97°15' 1055 FOREST HILLS 4.1 MI. 12 370 000 FEET 12°30' 4.9 MI. TO L WICHITA (C)

Mapped, edited, and published by the Geological Survey

FICATION

Tulsa District Method for Estimating Snyder Parameters

The Tulsa District of the U. S. Army Corps of Engineers has developed the following equation for Snyder's watershed lag for natural watersheds in rural areas of central and northeastern Oklahoma.

$$T = 1.42 \times [(L \times Lca)/\text{sq. rt. } S]^{0.39}$$

in which:

- T = watershed lag in hours
- L = watershed length in miles
- Lca = length to centroid in miles
- S = watershed slope in feet per mile.

The range of hydrologic characteristics of the watersheds studied in developing this equation are as follows:

- Watershed Area: From 0.88 sq. mi. to 502 sq. mi.
- Watershed Slope: From 4.1 feet per mile to 82.1 feet per mile
- Watershed Length: From 1.4 miles to 60.5 miles
- Length to Centroid: From 0.6 miles to 33.0 miles

Basin Name	Area (acres)	Area (sq. mi.)	L (mi)	Lca (mi)	S (ft/mi)	T (hr)	qp (cfs/sq.mi.)	Cp (cf/sq.mi.)
OF-1	182.00	0.2844	0.57	0.23	56	0.29	1182.82	0.538
OF-2	38.00	0.0594	0.47	0.15	65	0.23	1498.62	0.527
OF-3	360.00	0.5625	1.33	0.68	39	0.67	549.26	0.575
OF-4	203.00	0.9063	1.04	0.44	57	0.48	753.58	0.559
ON-1	83.0000	1.5281	0.53	0.28	36	0.34	1031.79	0.544
ON-2	29.0000	2.9969	0.47	0.25	25	0.33	1063.44	0.543
ON-3	48.0000	5.4313	0.32	0.04	19	0.14	2258.14	0.509

Putnam Method for Estimating Snyder Parameters

A watershed lag equation for urban areas has been developed by Putnam (1972). The form of this equation, which has been verified for watersheds in and around Wichita, Kansas by the United States Geological Survey, is as follows:

$$T = 0.49 \times \text{sq.rt. } (L/\text{sq.rt. } S) \times I^{-0.57}$$

in which:

T = watershed lag in hours

L = watershed length in miles

S = watershed slope in feet per mile

I = impervious cover, expressed as a fraction.

The range of characteristics of the watersheds studied by Putnam in developing this equation are:

Watershed Area: From 0.3 square miles to 150 square miles

Ratio (L/sq.rt. S): From 0.1 to 9.0

Impervious Cover: From 0.0 to 0.3

Basin Name	Area (sq. mi.)	L (mi)	S (ft/mi)	I (ac/ac)	Ratio (L/sq.rt. S)	T (hr)	qp (cfs/sq.mi.)	Cp (cf/sq.mi.)
OF-1	0.2844	0.57	56	0.26	0.08	0.29	1184.76	0.538
OF-2	0.0594	0.47	65	0.32	0.06	0.23	1487.84	0.527
OF-3	0.5625	1.33	39	0.15	0.21	0.67	550.85	0.575
OF-4	0.3172	1.04	57	0.19	0.14	0.48	752.90	0.559
ON-1	0.1297	0.53	36	0.35	0.09	0.27	1288.32	0.534
ON-2	0.0453	0.47	25	0.35	0.09	0.27	1253.58	0.535
ON-3	0.0750	0.32	19	0.50	0.07	0.20	1680.86	0.522

HEC-RMS
(HEC-1)
DATA

SRB

SAVOY, RUGGLES & BOHM, P.A.

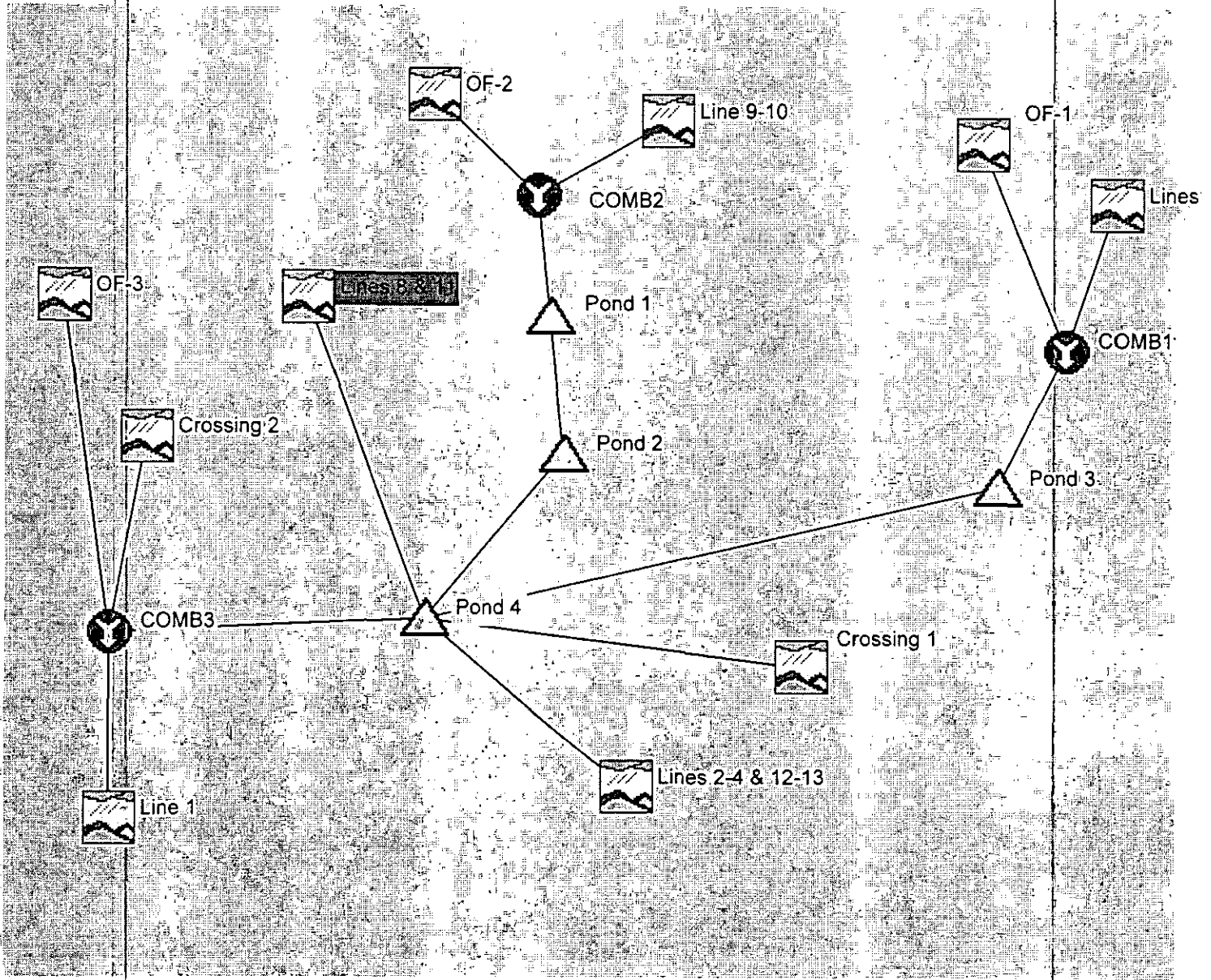
HMS * Summary of Results

Project : Sawmill

Run Name : Exist

Start of Simulation : 01Jan00 2400 Basin Model : 45rockex.hcl
 End of Simulation : 02Jan00 2400 Precip Model : Wichita100
 Execution Time : 01Jun00 1149 Control Specs : Existing

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Total Volume (ac ft)	Drainage Area (sq mi)
OF-1	600.41	02 Jan 00 1235	87.147	0.2844
ON-1	272.17	02 Jan 00 1235	39.749	0.1297
OF-2	127.10	02 Jan 00 1235	18.207	0.0594
ON-2	95.221	02 Jan 00 1235	13.884	0.0453
COMB1	1094.9	02 Jan 00 1235	158.99	0.5188
POND2	1094.9	02 Jan 00 1235	158.99	0.5188
OF-3	1146.7	02 Jan 00 1240	172.27	0.5625
ON-3	163.55	02 Jan 00 1235	22.991	0.0750
COMB3	2393.3	02 Jan 00 1240	354.25	1.1563



HMS * Summary of Results

Project : Sawmill

Run Name : Run 1

Start of Simulation : 01Jan00 2400 Basin Model : Proposed
 End of Simulation : 02Jan00 2400 Precip Model : Wichita100
 Execution Time : 01Jun00 1150 Control Specs : Proposed

Hydrologic Element	Discharge Peak (cfs)	Time of Peak	Total Volume (ac ft)	Drainage Area (sq mi)
OF-2	124.16	02 Jan 00 1220	18.214	0.0594
Line 9-10	66.201	02 Jan 00 1220	6.7516	0.02156
COMB2	190.36	02 Jan 00 1220	24.965	0.08096
Pond 1	190.37	02 Jan 00 1220	24.965	0.08096
Pond 2	190.37	02 Jan 00 1220	24.965	0.08096
OF-1	584.98	02 Jan 00 1220	87.170	0.2844
Lines 5-7	109.44	02 Jan 00 1220	11.112	0.03620
COMB1	694.43	02 Jan 00 1220	98.282	0.32060
Pond 3	694.42	02 Jan 00 1220	98.282	0.32060
Lines 8 & 11	48.118	02 Jan 00 1220	4.9071	0.01567
Lines 2-4 & 12-13	735.74	02 Jan 00 1220	75.120	0.23994
Crossing 1	22.110	02 Jan 00 1220	2.2547	0.00720
Pond 4	1690.8	02 Jan 00 1220	205.53	0.66437
OF-3	896.90	02 Jan 00 1245	172.01	0.5625
Line 1	78.144	02 Jan 00 1220	7.9697	0.02545
Crossing 2	43.082	02 Jan 00 1220	4.3936	0.01403
COMB3	2391.1	02 Jan 00 1220	389.90	1.26635

HMS * Summary of Results for Pond 1

Project : Sawmill Run Name : Run 1

Start of Simulation : 01Jan00 2400 Basin Model : Proposed
End of Simulation : 02Jan00 2400 Precip Model : Wichita100
Execution Time : 01Jun00 1503 Control Specs : Proposed

Computed Results

Peak Inflow : 190.36 (cfs) Date/Time of Peak Inflow : 02 Jan 00 1220
Peak Outflow : 190.37 (cfs) Date/Time of Peak Outflow : 02 Jan 00 1220
Total Inflow : 5.78 (in) Peak Storage : 0.0010209(ac-ft)
Total Outflow : 5.78 (in) Peak Elevation : 84.856(ft)

HMS * Summary of Results for Pond 2

Project : Sawmill Run Name : Run 1

Start of Simulation : 01Jan00 2400 Basin Model : Proposed
End of Simulation : 02Jan00 2400 Precip Model : Wichita100
Execution Time : 01Jun00 1503 Control Specs : Proposed

Computed Results

Peak Inflow : 190.37 (cfs) Date/Time of Peak Inflow : 02 Jan 00 1220
Peak Outflow : 190.37 (cfs) Date/Time of Peak Outflow : 02 Jan 00 1220
Total Inflow : 5.78 (in) Peak Storage : 0.0012801(ac-ft)
Total Outflow : 5.78 (in) Peak Elevation : 84.856(ft)

HMS * Summary of Results for Pond 3

Project : Sawmill Run Name : Run 1

Start of Simulation : 01Jan00 2400 Basin Model : Proposed
End of Simulation : 02Jan00 2400 Precip Model : Wichita100
Execution Time : 31May00 1524 Control Specs : Proposed

Computed Results

Peak Inflow : 694.43 (cfs) Date/Time of Peak Inflow : 02 Jan 00 1220
Peak Outflow : 694.42 (cfs) Date/Time of Peak Outflow : 02 Jan 00 1220
Total Inflow : 5.75 (in) Peak Storage : 0.0030543(ac-ft)
Total Outflow : 5.75 (in) Peak Elevation : 87.472(ft)

HMS * Summary of Results for Pond 4

Project : Sawmill Run Name : Run 1

Start of Simulation : 01Jan00 2400 Basin Model : Proposed
End of Simulation : 02Jan00 2400 Precip Model : Wichita100
Execution Time : 31May00 1524 Control Specs : Proposed

Computed Results

Peak Inflow : 1690.8 (cfs) Date/Time of Peak Inflow : 02 Jan 00 1220
Peak Outflow : 1690.8 (cfs) Date/Time of Peak Outflow : 02 Jan 00 1220
Total Inflow : 5.80 (in) Peak Storage : 0.0072611(ac-ft)
Total Outflow : 5.80 (in) Peak Elevation : 81.382(ft)

STORMCAD
(SWS System)
DATA

SRB

SAVOY, RUGGLES & BOHM, P.A.

DRAINAGE SUMNATION

	Area	Cum. Area	Tc	Soil Type "D"		I2	I100			Cummulative	
				C2	C100			Q2	Q100	Q2	Q100
OF-3	360.00	360.00	-	-	-	-	-	-	-	-	1119.0
A	7.16	7.16	15	0.30	0.54	3.83	7.37	8.2	28.5	8.2	1147.5
B	1.12	8.28	15	0.48	0.64	3.83	7.37	2.1	5.3	15.2	1158.1
C	0.70	8.98	15	0.48	0.64	3.83	7.37	1.3	3.3	16.5	1161.4
D	1.64	1.64	15	0.48	0.64	3.83	7.37	3.0	7.7	3.0	7.7
OF-2	38.00	38.00	-	-	-	-	-	-	-	-	125.0
ZZ	2.29	2.29	15	0.40	0.60	3.83	7.37	3.5	10.1	3.5	10.1
E	3.65	13.80	15	0.40	0.60	3.83	7.37	5.6	16.1	21.1	151.3
F	2.77	16.57	15	0.48	0.64	3.83	7.37	5.1	13.1	30.5	164.3
G	1.19	17.76	15	0.48	0.64	3.83	7.37	2.2	5.6	32.6	169.9
H	1.96	1.96	15	0.40	0.60	3.83	7.37	3.0	8.7	3.0	8.7
I	2.39	4.35	15	0.48	0.64	3.83	7.37	4.4	11.3	8.0	19.9
J	3.51	7.86	15	0.48	0.64	3.83	7.37	6.5	16.6	14.4	36.5
K	1.10	1.10	15	0.40	0.60	3.83	7.37	1.7	4.9	1.7	4.9
L	1.05	2.15	15	0.48	0.64	3.83	7.37	1.9	5.0	4.0	9.8
M	0.92	3.07	15	0.48	0.64	3.83	7.37	1.7	4.3	5.6	14.5
N	1.48	1.48	15	0.48	0.64	3.83	7.37	2.7	7.0	2.7	7.0
O	1.11	2.59	15	0.48	0.64	3.83	7.37	2.0	5.2	4.8	12.2
P	3.59	3.59	15	0.40	0.60	3.83	7.37	5.5	15.9	5.5	15.9
Q	2.48	6.07	15	0.48	0.64	3.83	7.37	4.6	11.7	11.2	28.6
R	2.23	2.23	15	0.48	0.64	3.83	7.37	4.1	10.5	4.1	10.5
S	1.24	24.41	15	0.48	0.64	3.83	7.37	2.3	5.8	44.9	115.1
T	3.37	27.78	15	0.48	0.64	3.83	7.37	6.2	15.9	51.1	131.0
U	2.65	2.65	15	0.40	0.60	3.83	7.37	4.1	11.7	4.1	11.7
V	2.96	5.61	15	0.48	0.64	3.83	7.37	5.4	14.0	10.3	26.5
W	1.40	7.01	15	0.48	0.64	3.83	7.37	2.6	6.6	12.9	33.1
X	1.28	1.28	15	0.40	0.60	3.83	7.37	2.0	5.7	2.0	5.7
Y	1.23	2.51	15	0.48	0.64	3.83	7.37	2.3	5.8	4.6	11.8
Z	0.95	3.46	15	0.48	0.64	3.83	7.37	1.7	4.5	6.4	16.3
AA	1.17	4.63	15	0.40	0.60	3.83	7.37	1.8	5.2	7.1	20.5
BB	2.81	7.44	15	0.40	0.60	3.83	7.37	4.3	12.4	11.4	32.9
CC	4.13	11.57	15	0.48	0.64	3.83	7.37	7.6	19.5	21.3	54.6
AAA	1.78	13.35	15	0.48	0.64	3.83	7.37	3.3	8.4	24.5	63.0
DD	0.65	12.22	15	0.48	0.64	3.83	7.37	1.2	3.1	22.5	57.6
EE	1.06	1.06	15	0.40	0.60	3.83	7.37	1.6	4.7	1.6	4.7
FF	2.56	3.62	15	0.48	0.64	3.83	7.37	4.7	12.1	6.7	17.1
GG	1.34	4.96	15	0.48	0.64	3.83	7.37	2.5	6.3	9.1	23.4
HH	2.65	7.61	15	0.40	0.60	3.83	7.37	4.1	11.7	11.7	33.7
II	2.87	10.48	15	0.48	0.64	3.83	7.37	5.3	13.5	19.3	49.4
JJ	1.44	1.44	15	0.40	0.60	3.83	7.37	2.2	6.4	2.2	6.4
KK	1.43	1.43	15	0.40	0.60	3.83	7.37	2.2	6.3	2.2	6.3
LL	2.18	2.18	15	0.40	0.60	3.83	7.37	3.3	9.6	3.3	9.6
MM	0.80	2.98	15	0.40	0.60	3.83	7.37	1.2	3.5	4.6	13.2
NN	1.81	4.79	15	0.48	0.64	3.83	7.37	3.3	8.5	8.8	22.6
OO	0.40	5.19	15	0.48	0.64	3.83	7.37	0.7	1.9	9.5	24.5
PP	0.68	5.87	15	0.40	0.60	3.83	7.37	1.0	3.0	9.0	26.0
QQ	0.91	6.78	15	0.48	0.64	3.83	7.37	1.7	4.3	12.5	32.0
RR	1.70	8.48	15	0.48	0.64	3.83	7.37	3.1	8.0	15.6	40.0
SS	2.37	2.37	15	0.48	0.64	3.83	7.37	4.4	11.2	4.4	11.2
TT	2.81	2.81	15	0.48	0.64	3.83	7.37	5.2	13.3	5.2	13.3
UU	2.97	2.97	15	0.40	0.60	3.83	7.37	4.6	13.1	4.6	13.1
VV	2.90	2.90	15	0.48	0.64	3.83	7.37	5.3	13.7	5.3	13.7
WW	2.37	5.27	15	0.48	0.64	3.83	7.37	4.4	11.2	9.7	24.9
OF-1	182.00	182.00	15	0.30	0.54	3.83	7.37	209.1	724.3	209.1	724.3
XX	10.50	23.17	15	0.30	0.54	3.83	7.37	12.1	41.8	26.6	92.2
YY	114.95	209.79	18	0.30	0.54	3.83	7.37	132.1	457.5	241.0	834.9

Notes:

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-5	I-5	I-6	68.40	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	4.36	-4.00	-4.26	003800	
P-6	I-6	J-2	30.00	0.00	0.00	0.00	0.00	0.00	24 inch	0.39	5.99	-4.26	-5.75	049615	
P-4	I-4	J-1	16.90	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	4.42	-4.00	-4.44	003800	
P-1	I-1	J-1	20.00	7.25	0.54	3.92	3.92	0.46	18 inch	5.65	9.49	-3.50	-3.94	022211	
P-2	J-1	J-2	43.20	N/A	N/A	N/A	3.92	N/A	30 inch	5.28	5.90	-4.94	-6.25	003800	
P-3	J-2	Outlet	97.10	N/A	N/A	N/A	3.92	N/A	42 inch	2.02	7.32	-7.25	-8.00	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-7	I-7	I-8	13.60	0.00	0.00	0.00	0.00	0.00	15 inch	3.98	2.61	-3.25	-3.68	003800	
P-8	I-8	I-9	79.90	0.00	0.00	0.00	0.00	0.00	18 inch	6.47	3.62	-3.93	-4.62	003800	
P-9	I-9	I-10	84.20	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	3.99	-4.87	-5.95	003800	
P-10	I-10	I-11	95.80	0.00	0.00	0.00	3.50	0.00	33 inch	2.60	5.21	-6.95	-7.31	003800	
P-11	I-11	I-12	42.30	0.00	0.00	0.00	3.50	0.00	36 inch	1.11	5.70	-7.56	-7.72	003800	
P-12	I-12	I-13	36.00	0.00	0.00	0.00	3.50	0.00	36 inch	1.11	6.50	-7.72	-8.24	003800	
P-13	I-13	I-14	26.70	0.00	0.00	0.00	3.50	0.00	42 inch	2.02	5.01	-8.74	-9.22	003800	
P-14	I-14	I-15	36.30	0.00	0.00	0.00	3.50	0.00	42 inch	2.02	5.47	-9.22	-9.36	003800	
P-15	I-15	Outlet	84.10	0.00	0.00	0.00	3.50	0.00	42 inch	2.02	7.70	-9.36	10.06	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-16	I-16	I-17	29.10	0.00	0.00	0.00	0.00	0.00	18 inch	6.47	3.16	-3.50	-4.37	0.03800	
P-17	I-17	I-18	36.80	0.00	0.00	0.00	0.00	0.00	27 inch	9.09	4.36	-5.12	-5.26	0.03800	
P-18	I-18	J-3	83.10	0.00	0.00	0.00	0.00	0.00	30 inch	5.28	5.27	-5.51	-6.21	0.03800	
P-19	J-3	I-19	50.70	N/A	N/A	N/A	0.00	N/A	30 inch	5.28	5.52	-6.21	-7.54	0.03800	
P-20	I-19	I-20	42.50	0.00	0.00	0.00	0.00	0.00	36 inch	1.11	6.00	-8.04	-8.20	0.03800	
P-21	I-20	J-4	55.20	0.00	0.00	0.00	0.00	0.00	42 inch	2.02	6.26	-8.70	-9.29	0.03800	
P-22	J-4	Outlet	30.30	N/A	N/A	N/A	0.00	N/A	42 inch	2.02	7.48	-9.29	-9.41	0.03800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V. avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-31	I-27	I-28	42.50	0.00	0.00	0.00	0.00	0.00	15 inch	1.60	9.93	-3.25	-8.00	111845	
P-23	I-21	I-22	76.30	0.00	0.00	0.00	0.00	0.00	18 inch	6.47	3.94	-3.50	-4.17	003800	
P-24	I-22	I-23	37.40	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	4.35	-4.67	-4.81	003800	
P-25	I-23	I-24	45.30	0.00	0.00	0.00	0.00	0.00	27 inch	9.09	4.89	-5.06	-5.61	003800	
P-26	I-24	I-25	95.20	0.00	0.00	0.00	0.00	0.00	30 inch	5.28	5.23	-5.86	-6.99	003800	
P-27	I-25	I-26	85.80	0.00	0.00	0.00	0.00	0.00	36 inch	1.11	5.69	-7.49	-8.57	003800	
P-28	I-26	I-29	31.90	0.00	0.00	0.00	0.00	0.00	42 inch	2.02	5.22	-9.07	-9.57	003800	
P-29	I-29	I-28	79.00	0.00	0.00	0.00	0.00	0.00	42 inch	2.02	6.38	-9.57	10.25	003800	
P-30	I-28	Outlet	72.20	0.00	0.00	0.00	0.00	0.00	48 inch	8.54	8.37	10.75	11.03	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-32	I-30	I-31	65.90	0.00	0.00	0.00	0.00	0.00	15 inch	3.98	3.79	-3.25	-4.26	003800	
P-33	I-31	I-32	40.50	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	3.77	-4.76	-5.29	003800	
P-34	I-32	I-33	26.60	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	4.06	-5.54	-6.03	003800	
P-35	I-33	I-34	36.30	0.00	0.00	0.00	0.00	0.00	33 inch	2.60	4.57	-6.78	-6.91	003800	
P-36	I-34	J-7	35.80	0.00	0.00	0.00	0.00	0.00	33 inch	2.60	6.45	-6.91	-7.43	003800	
P-37	J-7	Outlet	67.90	N/A	N/A	N/A	0.00	N/A	33 inch	2.60	6.98	-7.43	-7.69	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-38	I-35	I-36	42.80	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	3.53	-3.75	-3.91	003800	
P-39	I-36	Outlet	57.80	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	5.44	-4.16	-4.76	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-40	I-37	I-38	40.70	0.00	0.00	0.00	0.00	0.00	18 inch	6.47	3.98	-3.50	-4.41	003800	
P-41	I-38	I-39	36.30	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	4.29	-4.91	-5.05	003800	
P-42	I-39	Outlet	88.30	0.00	0.00	0.00	0.00	0.00	27 inch	9.09	5.58	-5.30	-6.02	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-46	I-40	I-43	89.20	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	4.18	-3.75	-5.23	003800	
P-47	I-43	I-41	28.10	0.00	0.00	0.00	0.00	0.00	27 inch	9.09	4.66	-5.73	-6.22	003800	
P-44	I-41	I-42	35.00	0.00	0.00	0.00	0.00	0.00	33 inch	2.60	5.40	-6.72	-6.85	003800	
P-45	I-42	Outlet	51.80	0.00	0.00	0.00	0.00	0.00	33 inch	2.60	6.56	-6.85	-7.43	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-48	I-44	I-45	76.60	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	3.97	-3.75	-4.04	003800	
P-49	I-45	I-46	77.00	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	4.16	-4.04	-4.33	003800	
P-50	I-46	I-47	44.80	0.00	0.00	0.00	0.00	0.00	30 inch	5.28	4.64	-5.08	-5.25	003800	
P-51	I-47	Outlet	50.10	0.00	0.00	0.00	0.00	0.00	36 inch	1.11	7.03	-5.75	-6.32	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-52	I-48	Outlet	83.50	0.00	0.00	0.00	0.00	0.00	24 inch	3.94	5.16	-4.00	-5.08	003800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-53	I-49	I-50	16.20	0.00	0.00	0.00	0.00	0.00	42 inch	24.03	7.86	-6.00	-6.06	0.03800	
P-54	I-50	I-51	42.70	0.00	0.00	0.00	0.00	0.00	42 inch	24.03	8.54	-6.06	-6.22	0.03800	
P-55	I-51	Outlet	17.70	0.00	0.00	0.00	0.00	0.00	42 inch	24.03	9.70	-6.22	-6.29	0.03800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V _{avg} (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-56	I-52	Outlet	68.20	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	4.87	-3.75	-4.39	0.03800	

Combined Pipe/Node Report

Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-57	I-54	Outlet	84.20	0.00	0.00	-0.00	0.00	0.00	24 inch	3.94	5.21	-4.00	-4.70	0.03800	

Outlet

42" P-3

J-2 P-6 I-6

24"

24" P-5

I-5

30" P-2

J-1

P-4

I-4

P-1

24"

18"

I-1

Outlet

42" P-15

42" P-14
I-15
I-14

42" P-13

I-13

36" P-12

I-12

36" P-11

I-11

36" P-10

I-10

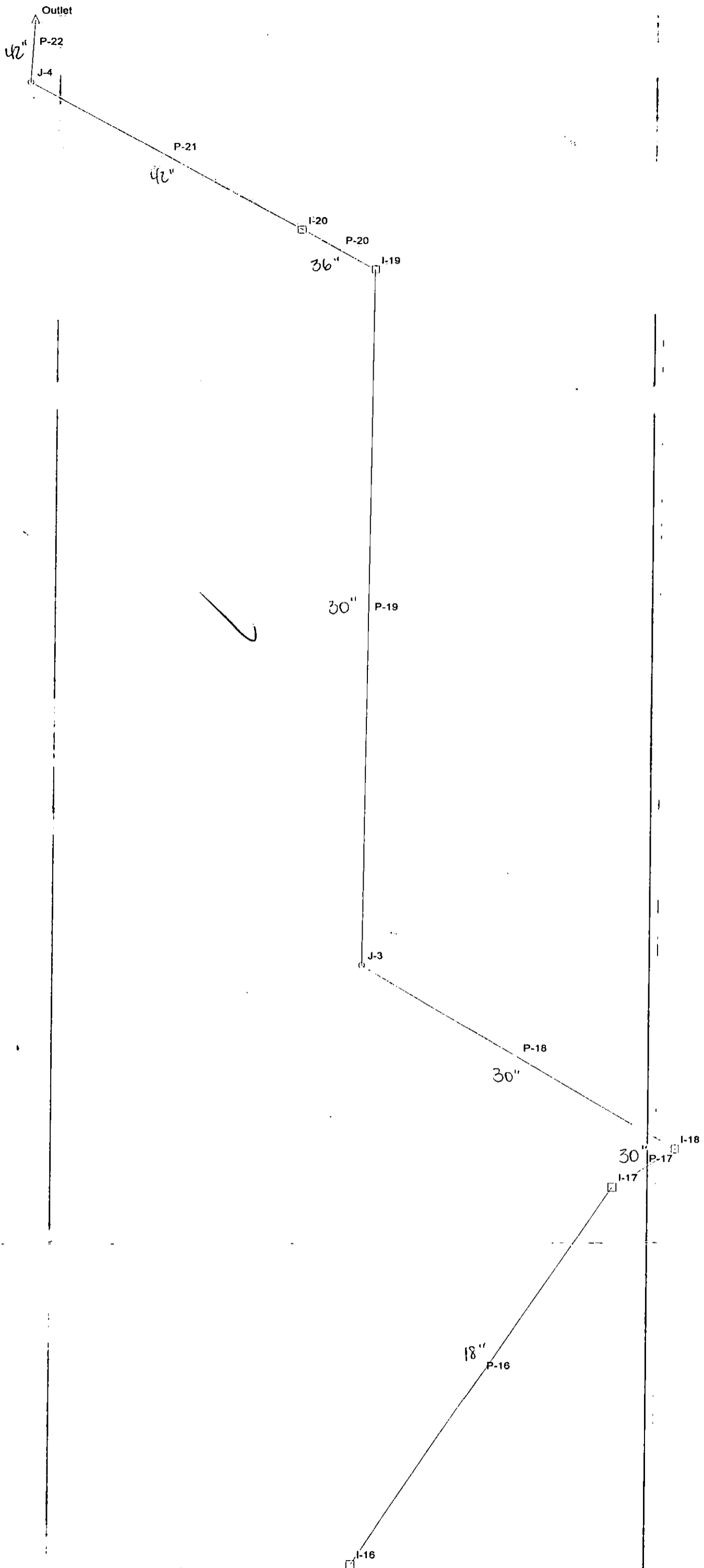
P-9
24"

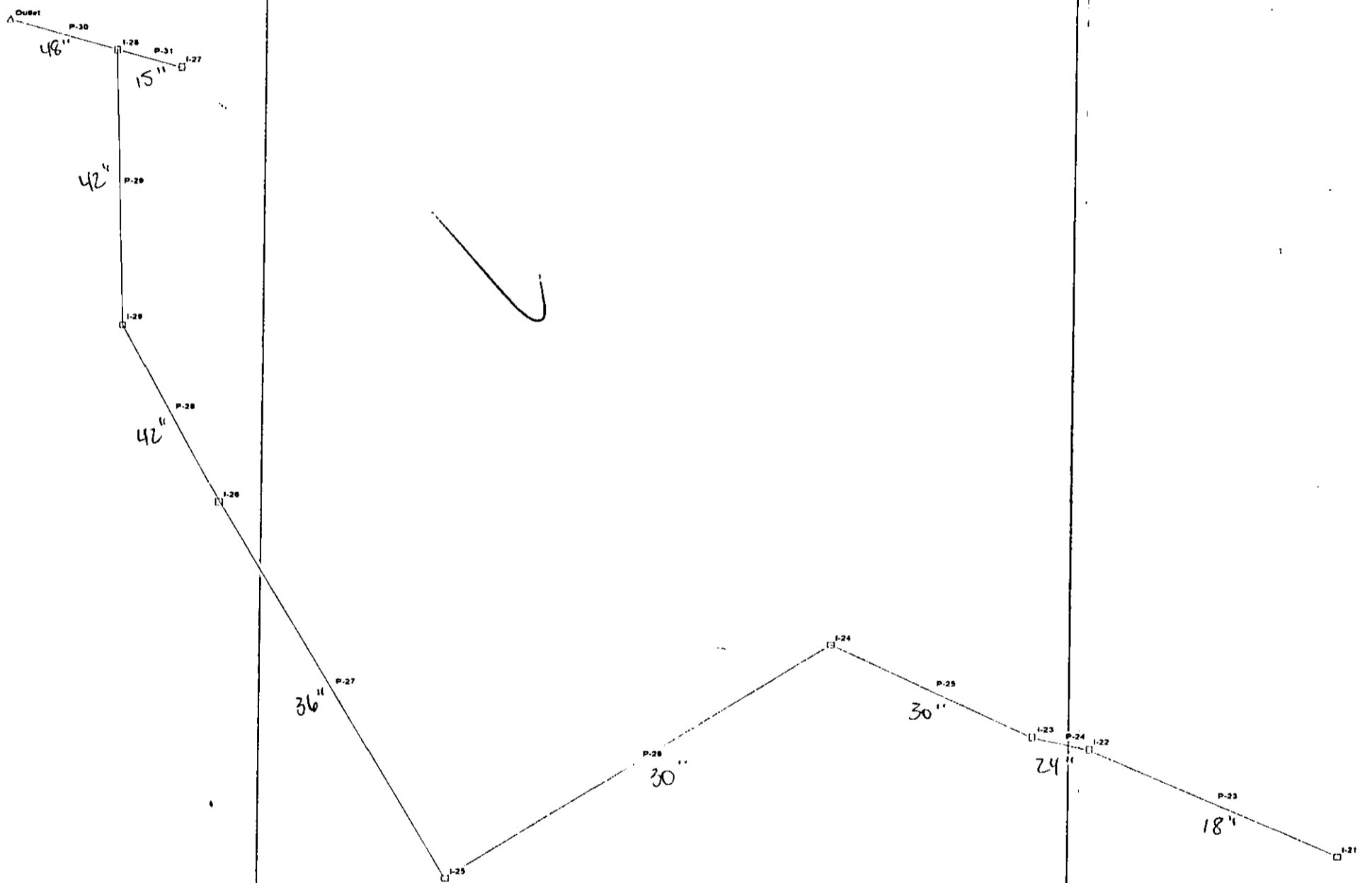
I-9

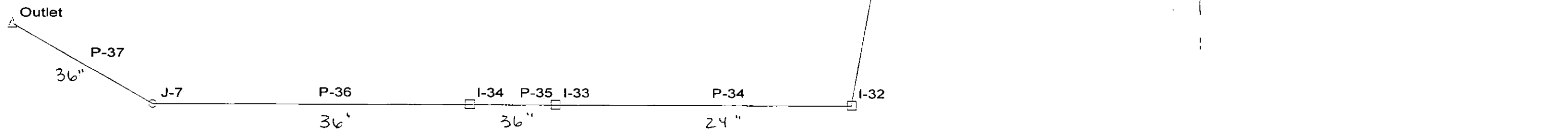
8" P-8

I-8 P-7 I-7
15"









I-35



P-38

24"

I-36



P-39

24"

Outlet



I-37



18" P-40

I-38



24" P-41

I-39



30" P-42

Outlet



Outlet

36"
P-45

36"
I-42 P-44 I-41

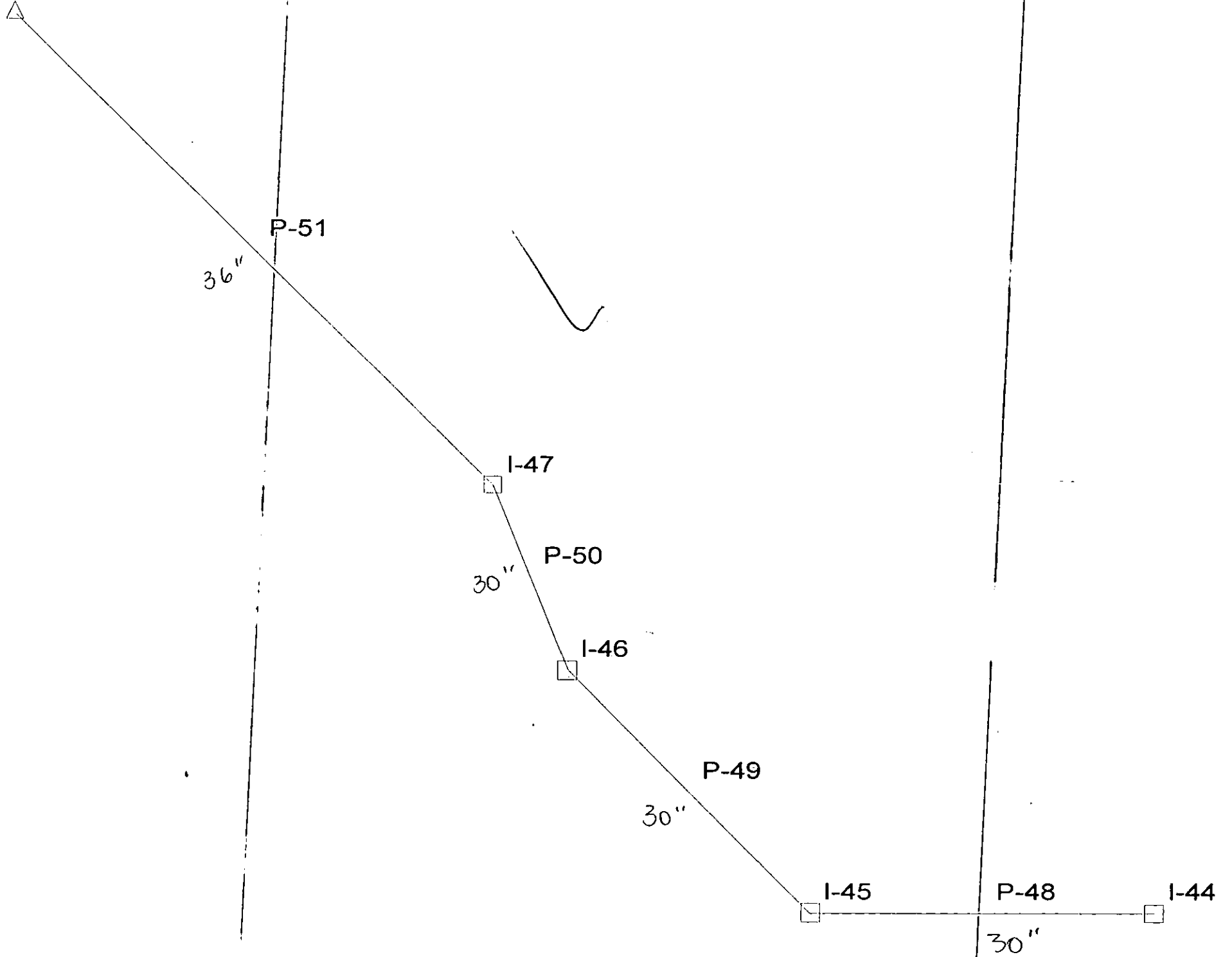
30"
P-47

I-43

24"
P-46

I-40

Outlet

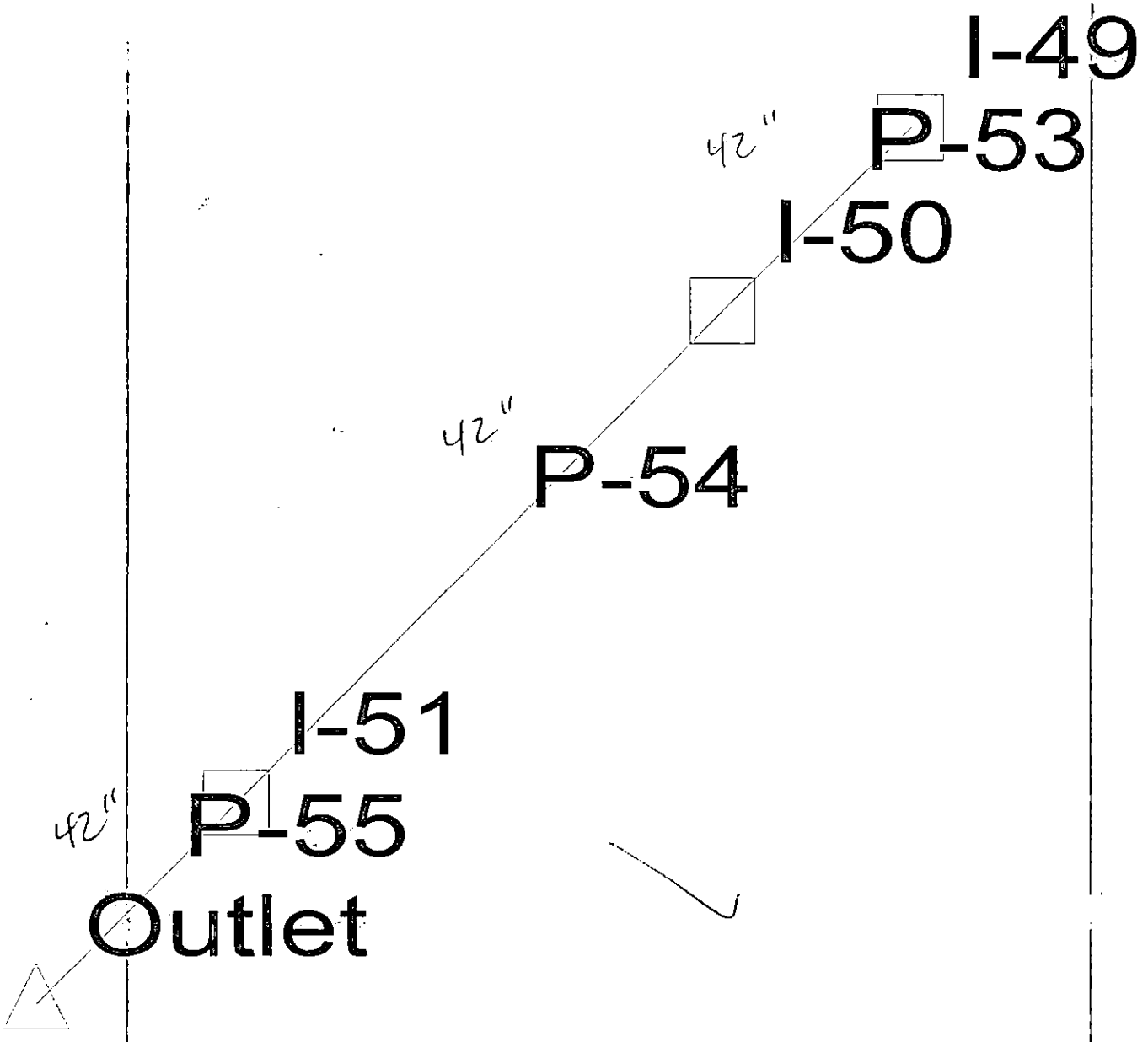


Outlet

P-52

I-48

24"

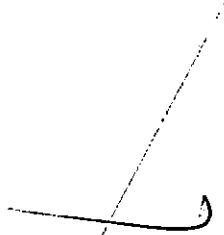


I-52



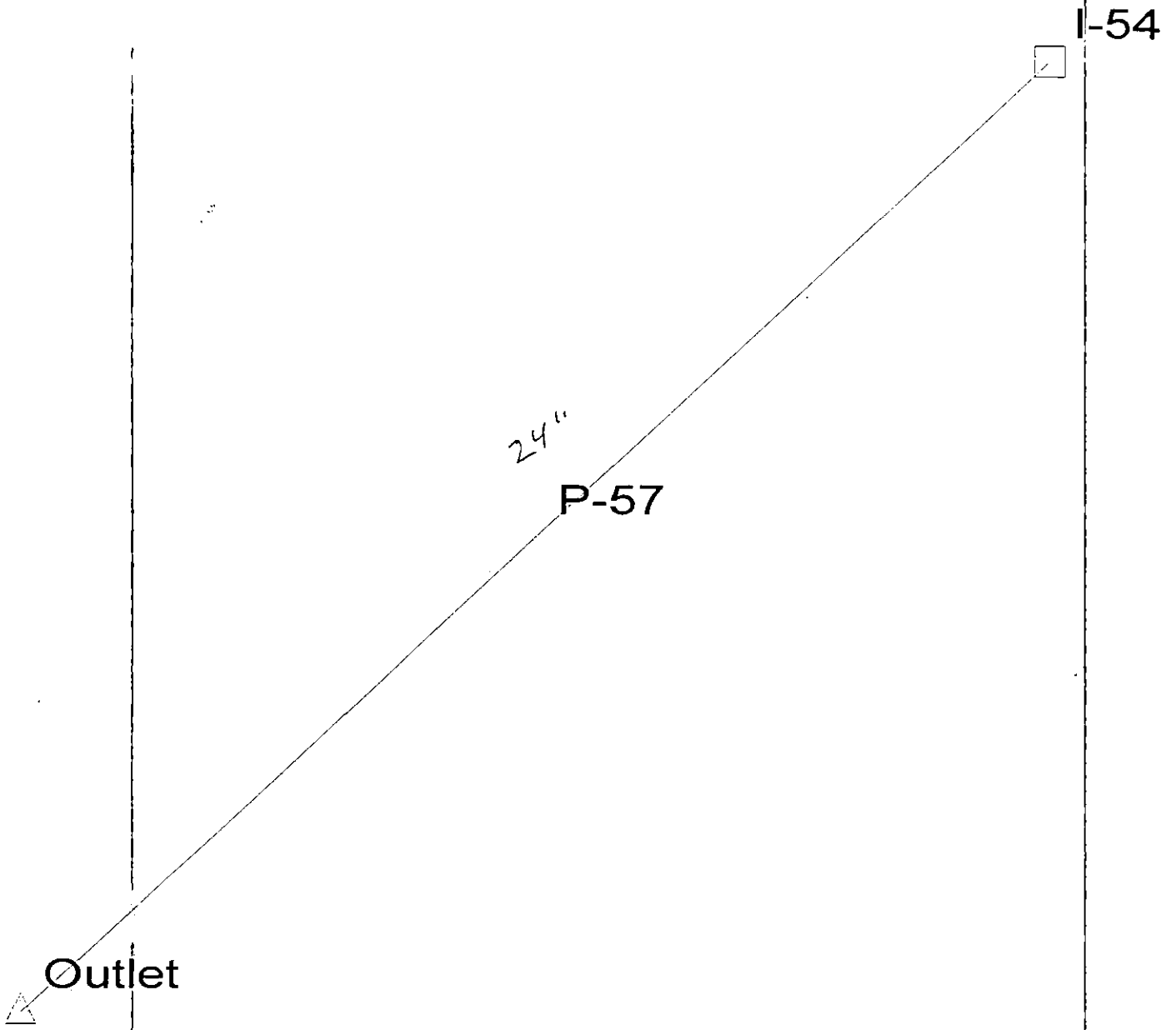
24"

P-56



Outlet





DRAINAGE PLAN

SRB

SAVOY, RUGGLES & BOHMI, P.A.