

ENGINEERING, SURVEYING & LAND PLANNING

S R B
SAVOY, RUGGLES & BOHM, P.A.

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

JUNE 5, 2000



SAVOY, RUGGLES & BOHM, P.A.
 ENGINEERING AND SURVEYING
 924 NORTH MAIN
 WICHITA, KANSAS 67203

MEMO

Date: Monday, June 05, 2000

To: Ms. Vicky Huang
City of Wichita
City Hall - 7th Floor
Wichita, KS 67202

From: John D. Schmit, P.E.

Project: Sawmill Creek Addition
Drainage Plan

SRB Project No.: 1022P

Other Project Reference No.: _____

Description:

- Confirmation
- Transmittal
- Transmittal under separate cover by _____

Purpose:

- Approval
- Review & comment
- Use
- Other: _____
- Distribution
- Information
- Record

Enclosures/Attachments:

- Prints
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- Shop Drawings
- Other: _____

Copies	Description
2	Sawmill Creek Addition Drainage Plan & Report

Remarks: _____

Copies to: _____
 file _____

If checked below, please:

- Acknowledge receipt of enclosures
- Return enclosures to us.

Signed _____

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

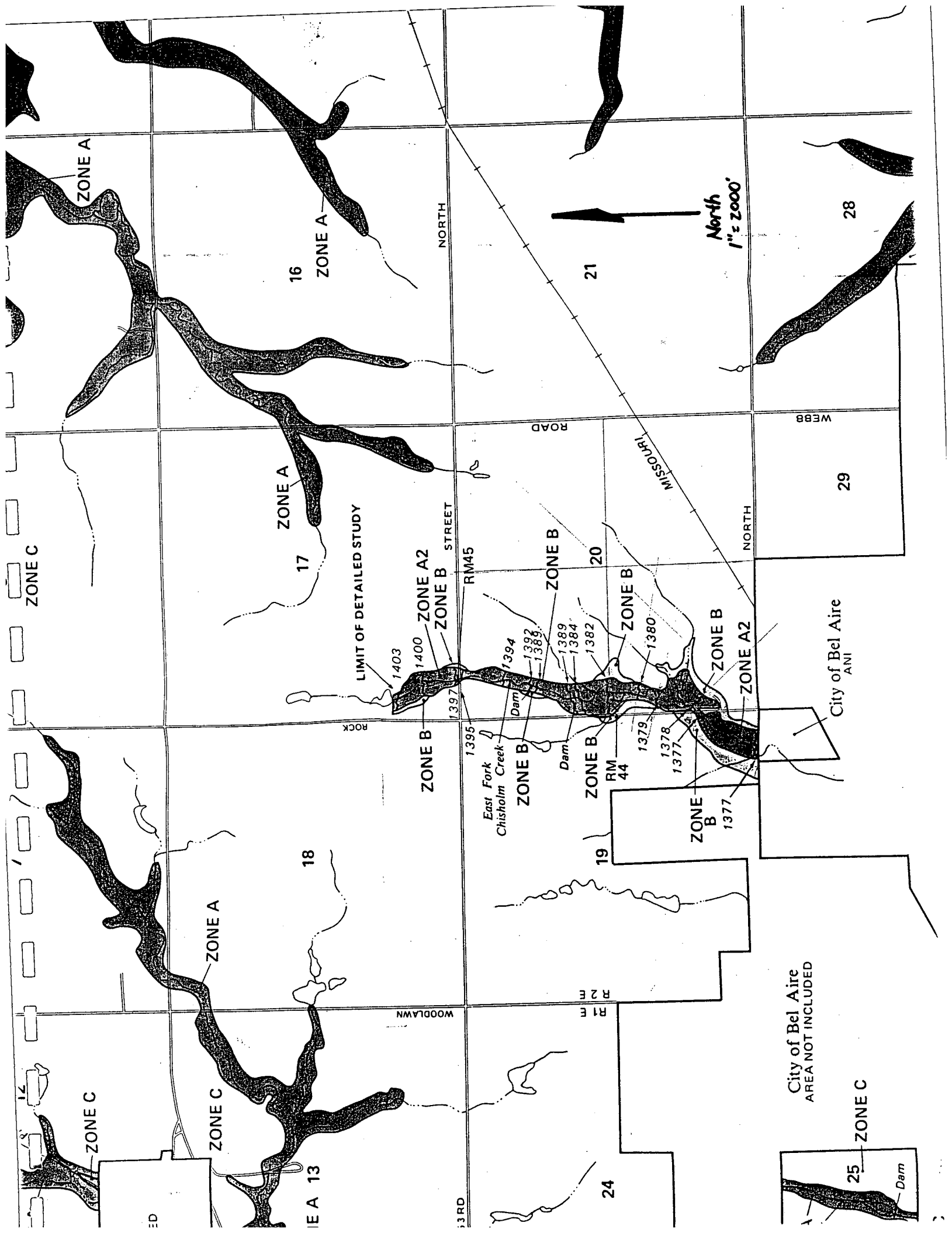
The HEC-HMS (HEC-1) computer model is used to determine the peak flow rates for the system based on system flow time, soil types, and peaking coefficients. The rational method for determining peak flows is used for the storm water sewer basins located within the plat.

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 $\frac{1}{4}$ 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.

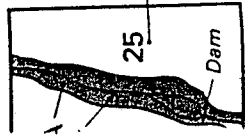


North
1" = 2000'

City of Bel Aire
AREA NOT INCLUDED

City of Bel Aire
ANI

LIMIT OF DETAILED STUDY



25 ZONE C

WE88

29

28

21

20

19

24

16

17

18

EA 13

NORTH

NORTH

WOODLAWN

ROAD

MISSOURI

STREET

RM45

RM 44

ZONE B

ZONE A2

ZONE B

ZONE B

ZONE B

ZONE B

ZONE A2

ZONE A

ZONE C

ZONE C

ZONE A

ZONE A

East Fork
Chisholm Creek

Dam

Dam

ROCK

1395

1403

1400

1394

1392

1389

1384

1382

1380

1379

1378

1377

1377

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.

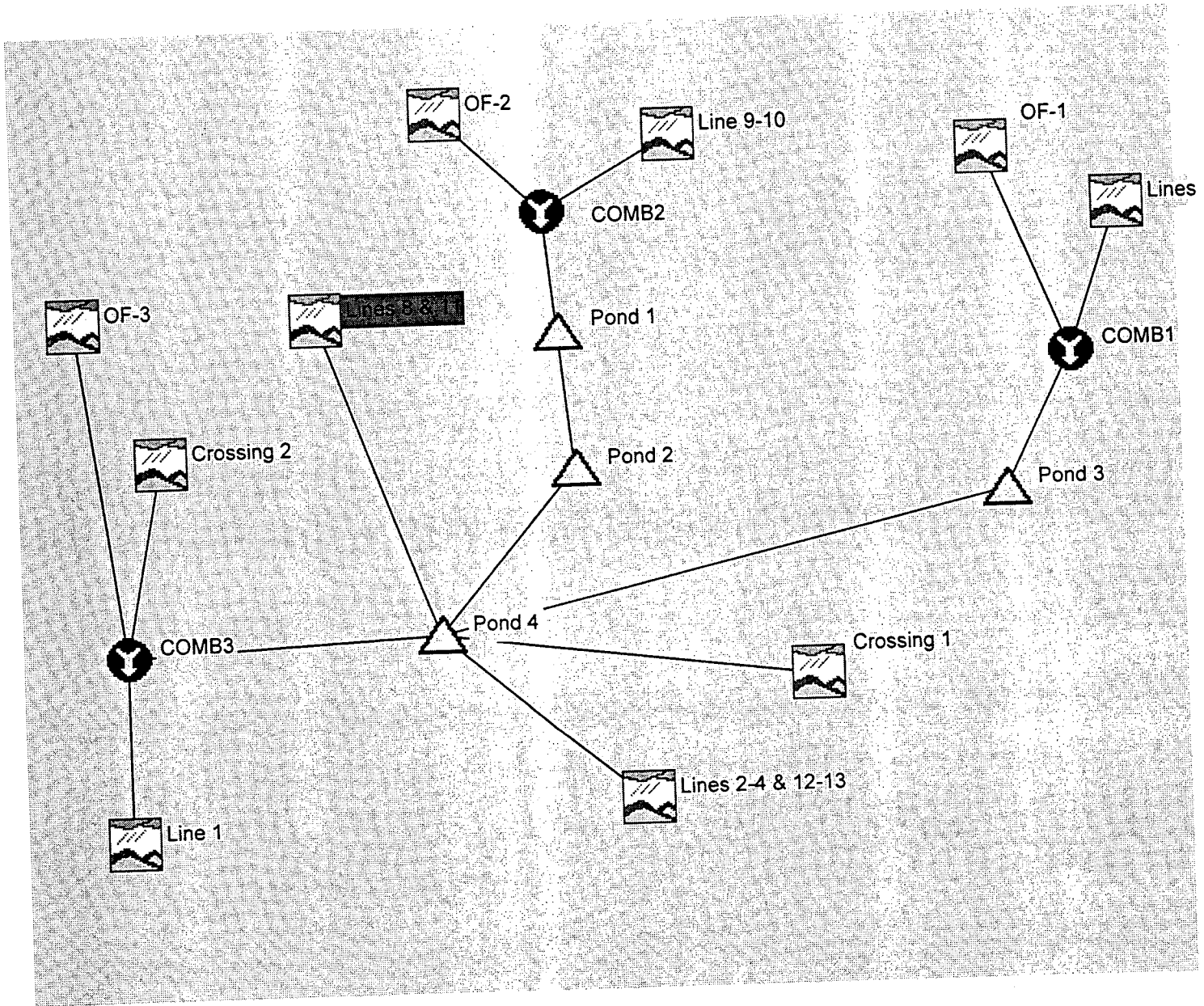
HMS * Summary of Results

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 : Wichital00
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 : Wichital00
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 : Wichital00
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

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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	003800	
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	003800	
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	003800	
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	003800	
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	003800	
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	003800	
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	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-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

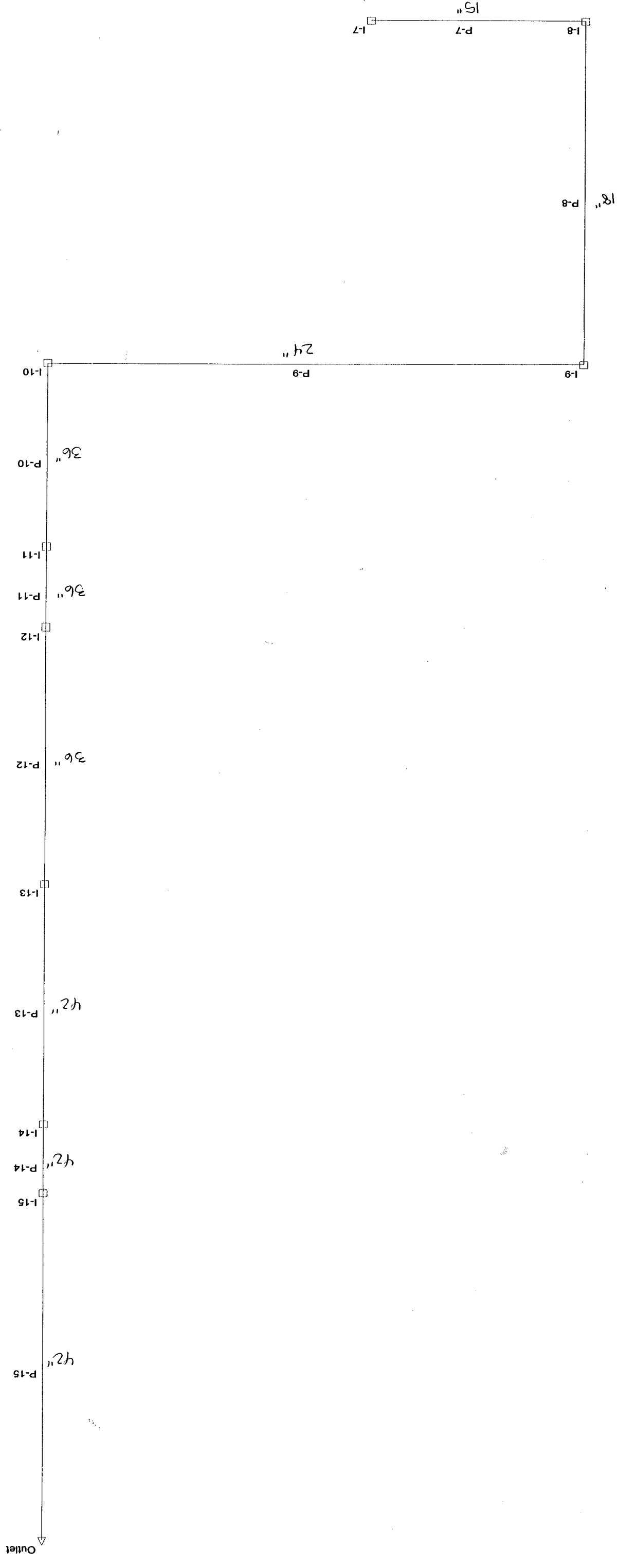
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P-53	I-49	I-50	16.20	0.00	0.00	0.00	0.00	0.00	42 inch	24.03	7.86	-6.00	-6.06	003800	
P-54	I-50	I-51	42.70	0.00	0.00	0.00	0.00	0.00	42 inch	24.03	8.54	-6.06	-6.22	003800	
P-55	I-51	Outlet	17.70	0.00	0.00	0.00	0.00	0.00	42 inch	24.03	9.70	-6.22	-6.29	003800	

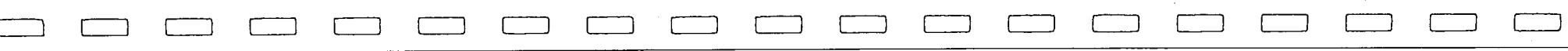
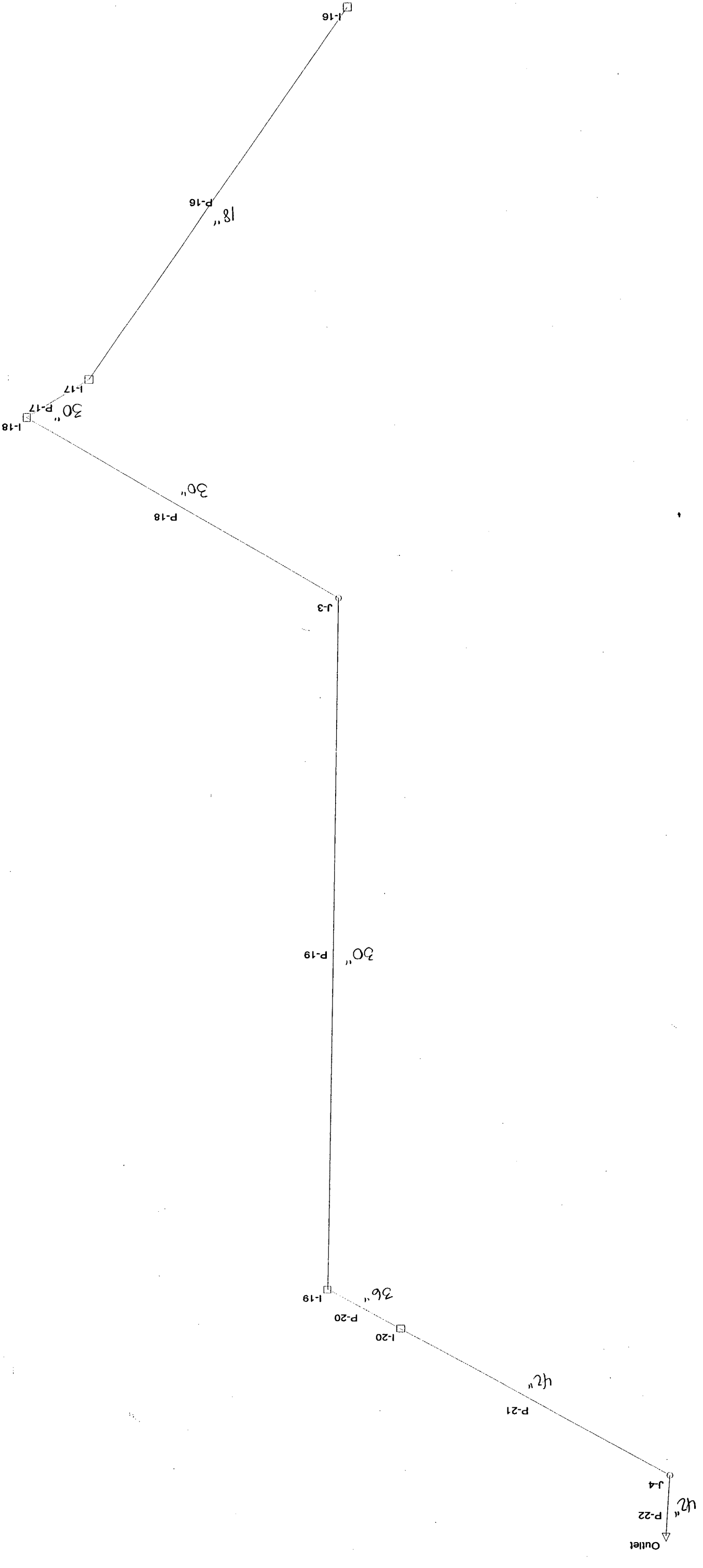
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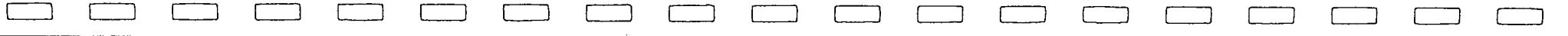
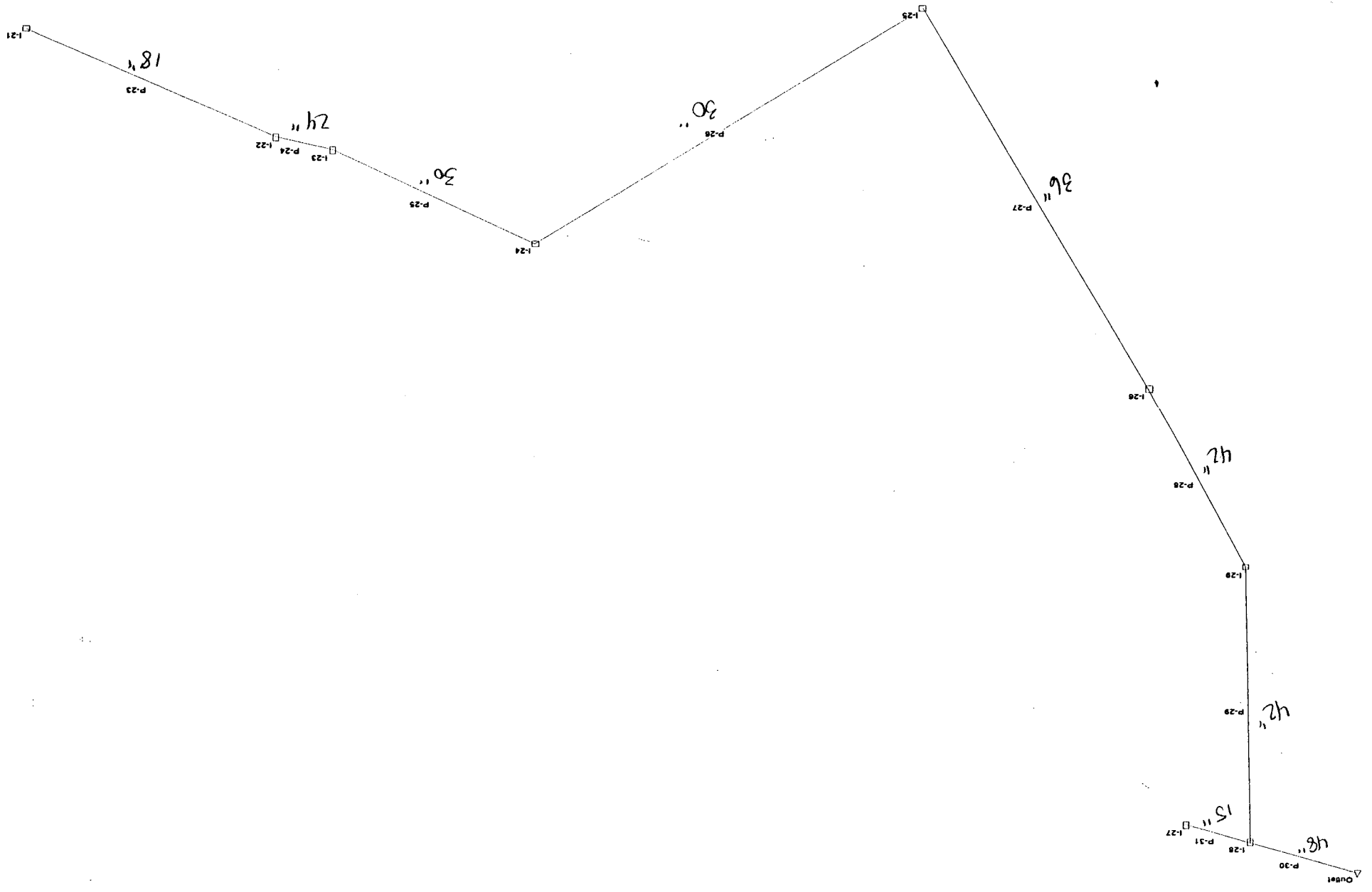
Pipe	Up Node	Dn Node	Length (ft)	Inlet A (acres)	C	Inlet CA (acres)	Tot CA (acres)	Inlet Q (cfs)	Size	Cap (cfs)	V avg (ft/s)	Up Invert (ft)	Dn Invert (ft)	S (ft/ft)	Description
P-56	I-52	Outlet	68.20	0.00	0.00	0.00	0.00	0.00	21 inch	9.77	4.87	-3.75	-4.39	0.03800	

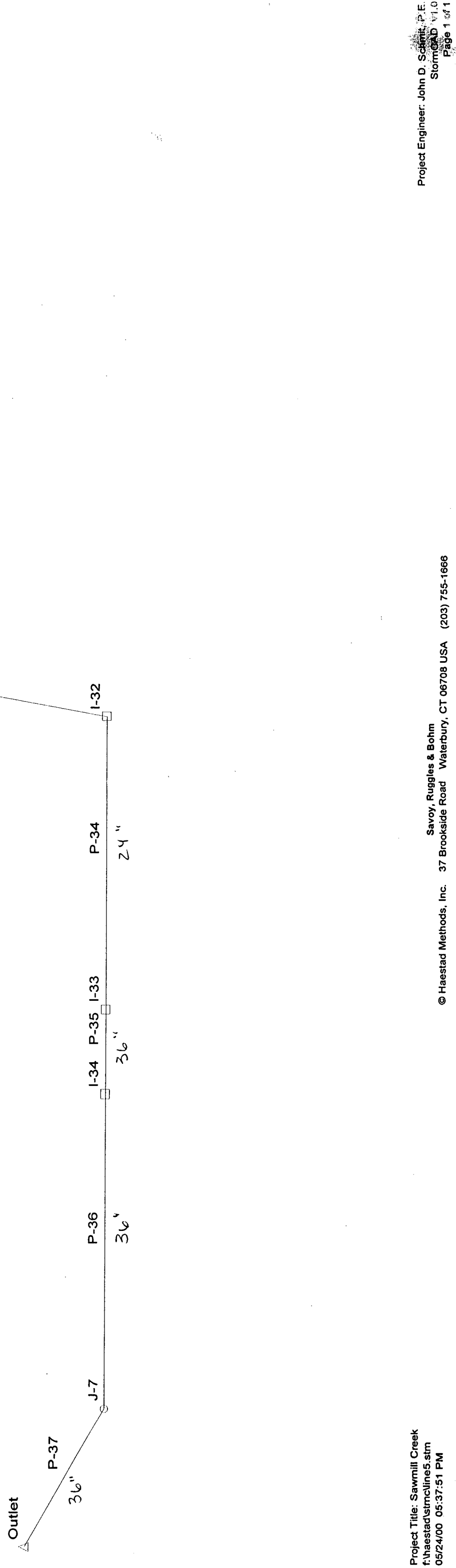
Combined Pipe/Node Report

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	003800	









Outlet

P-39

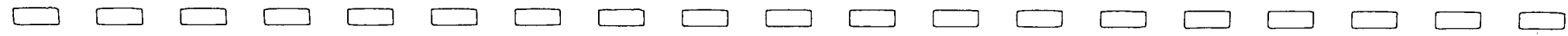
24"

I-36

P-38

24"

I-35



Outlet

30" P-42

I-39

24" P-41

I-38

18" P-40

I-37





Outlet

36" P-45

I-42 P-44 36"

I-41

P-47 30"

I-43

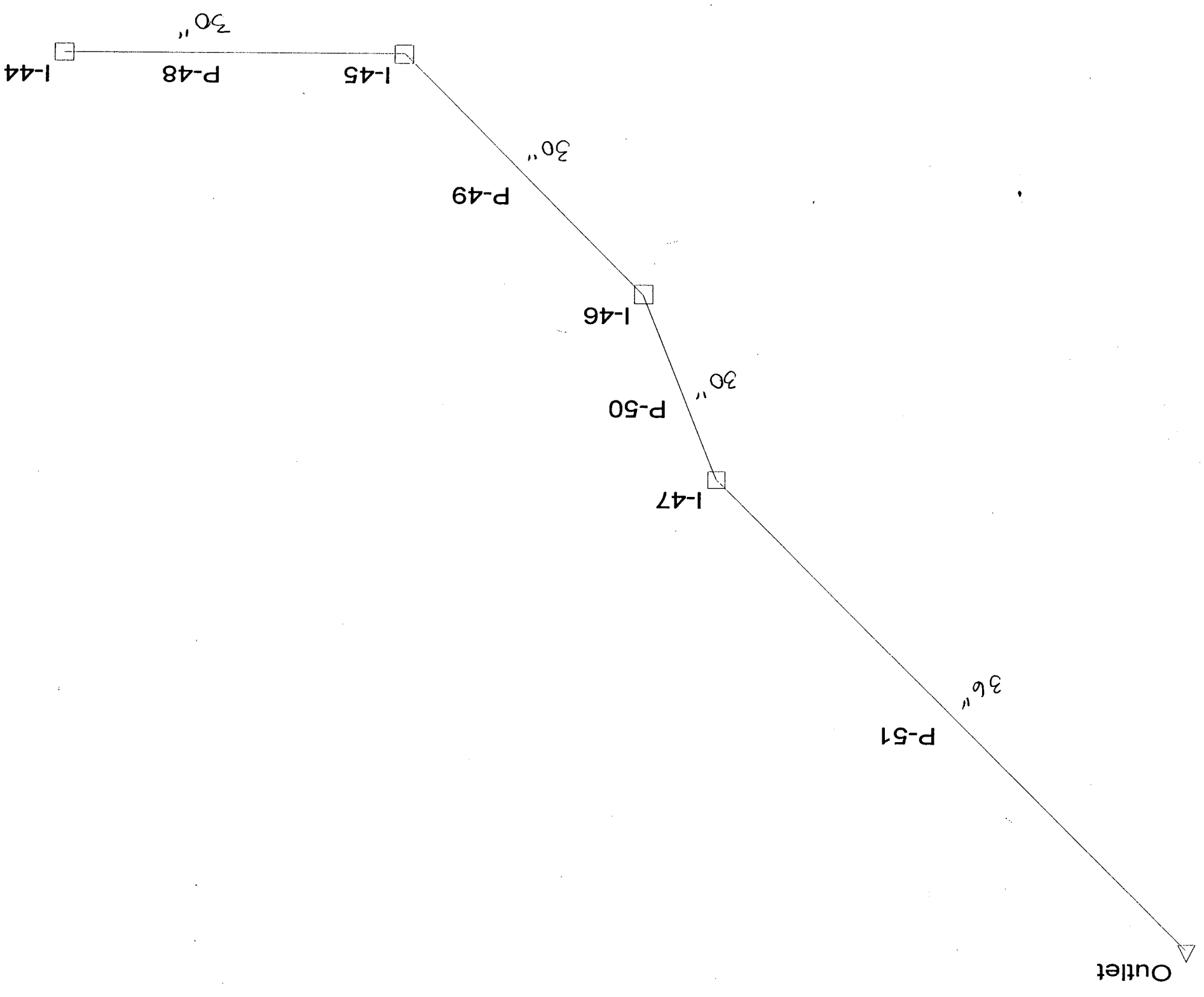
P-46 24"

I-40

Project Title: Sawmill Creek
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Savoy, Ruggles & Bohm

Project Engineer: John D. Schmit, P.E.
StormCAD v1.0
Page 1 of 1

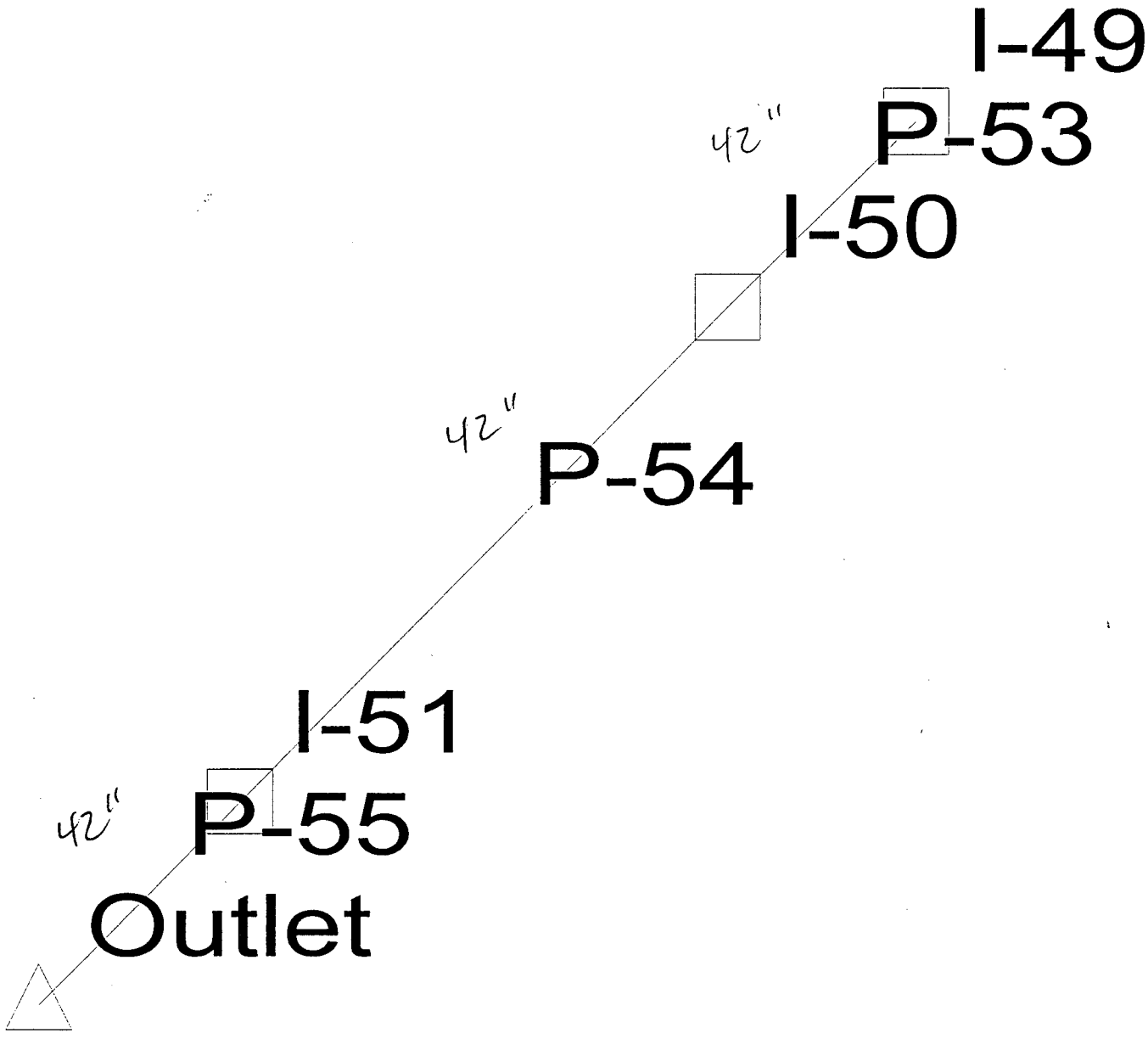


Outlet

P-52

24"

I-48



I-52

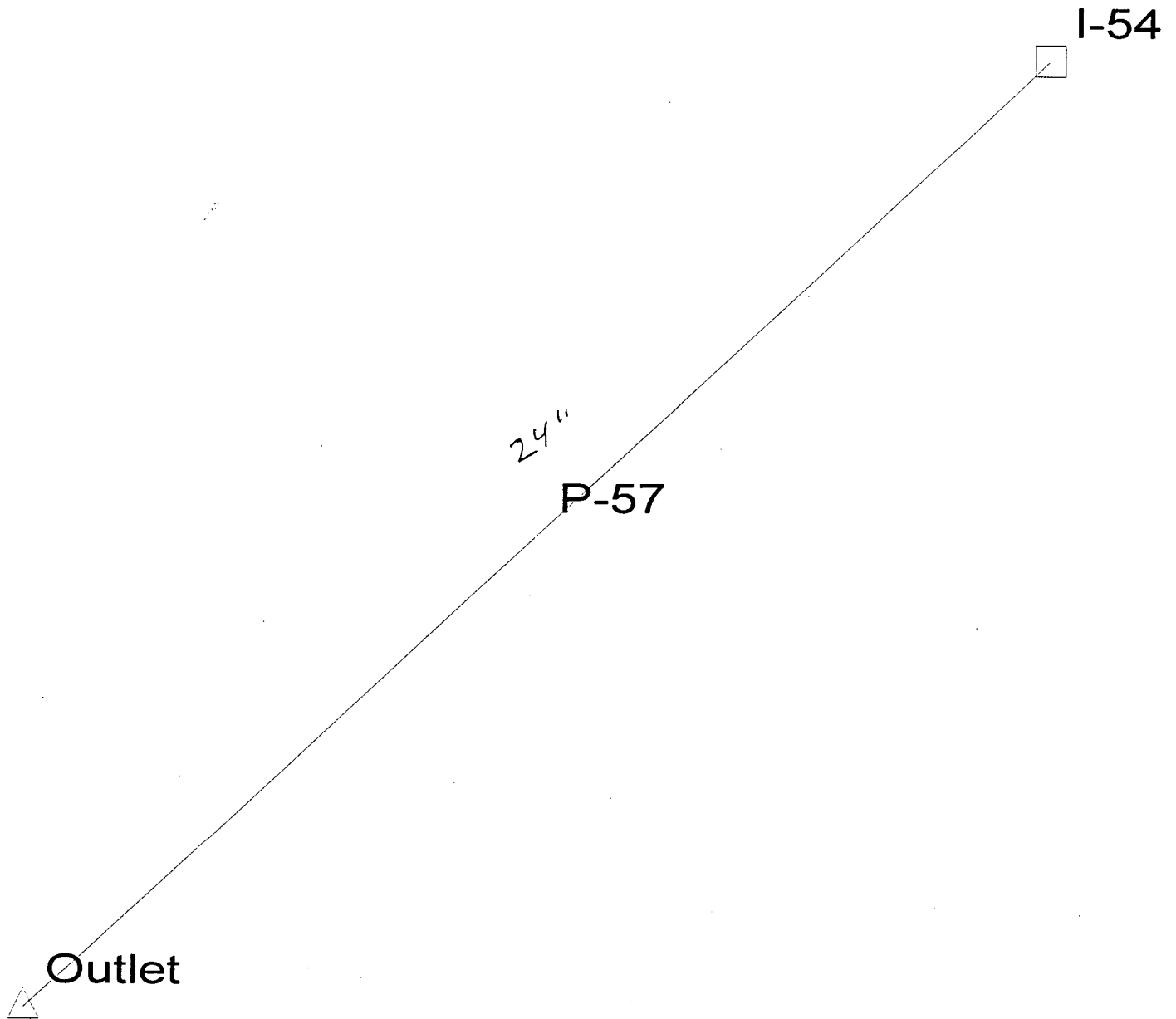


24"

P-56

Outlet





DRAINAGE PLAN

SRB

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