


DRAINAGE PLAN  
**My House Addition**  
WICHITA, SEDGWICK COUNTY, KANSAS

Prepared By

 **BAUGHMAN COMPANY, P.A.**  
ENGINEERING, SURVEYING & PLANNING  
316/262-7271 FAX 316/262-0149 WICHITA, KANSAS 67211

March 1, 2004

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## NARRATIVE

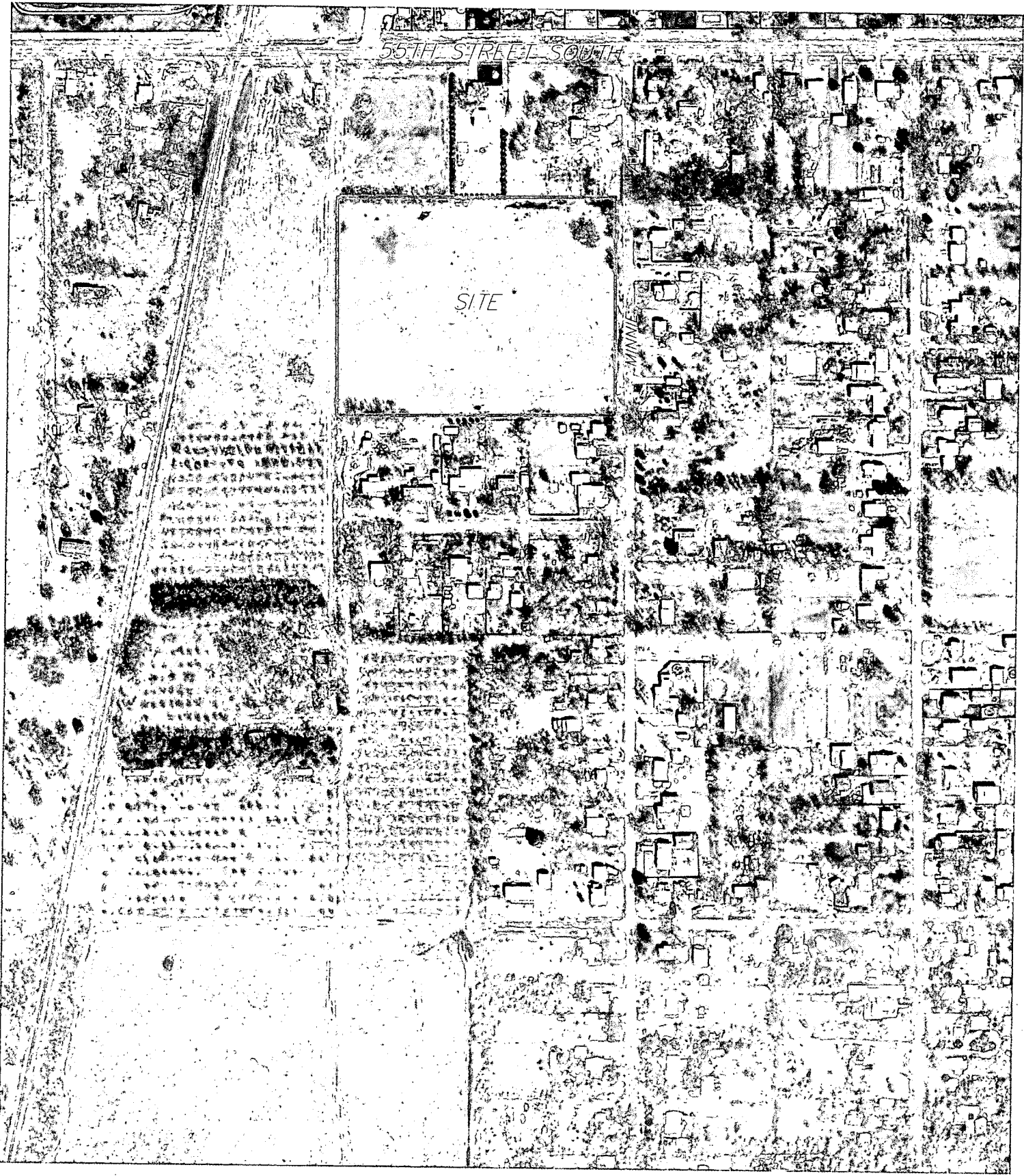
This report provides information and supporting documentation to support the "Drainage Plan" for the property located in the Northeast Quarter of Section 29, T-29-S, R-1-E in Sedgwick County, Kansas.

The "Drainage Plan" being submitted herein is intended to serve as a guide for the design of streets and storm water sewer improvements to the proposed development. Modifications to structures, pipes, etc. may be made as necessary during the final design in order to obtain the most economical design and construction possible.

Storm water sewer systems within this proposed development have been designed to convey the 2-yr-rainfall event. Calculations have also been performed to check the design during the 100-yr event. A sub-division grading plan has been prepared in conjunction with the storm water sewer design. This grading plan allows for emergency outflow points during a storm event that exceeds the two-year storm event.

The site does not drain naturally in any direction effectively for development with no significant ground elevation changes. The natural drainage tends to drain south, as indicated in the quadrangle map and does not support additional runoff using current design standards. We propose to contain our development's runoff within a dry detention facility that has been sized for the 100-year - six hour storm event. The runoff will be pumped through a six inch force main from the pond's northeast corner to the 55<sup>th</sup> Street right-of-way. (See Drainage Plan) The pump will be sized to regain complete storage capacity in less than four days.

**SITE AERIAL MAP**



SCALE: 1" = 300'

# My House Addition

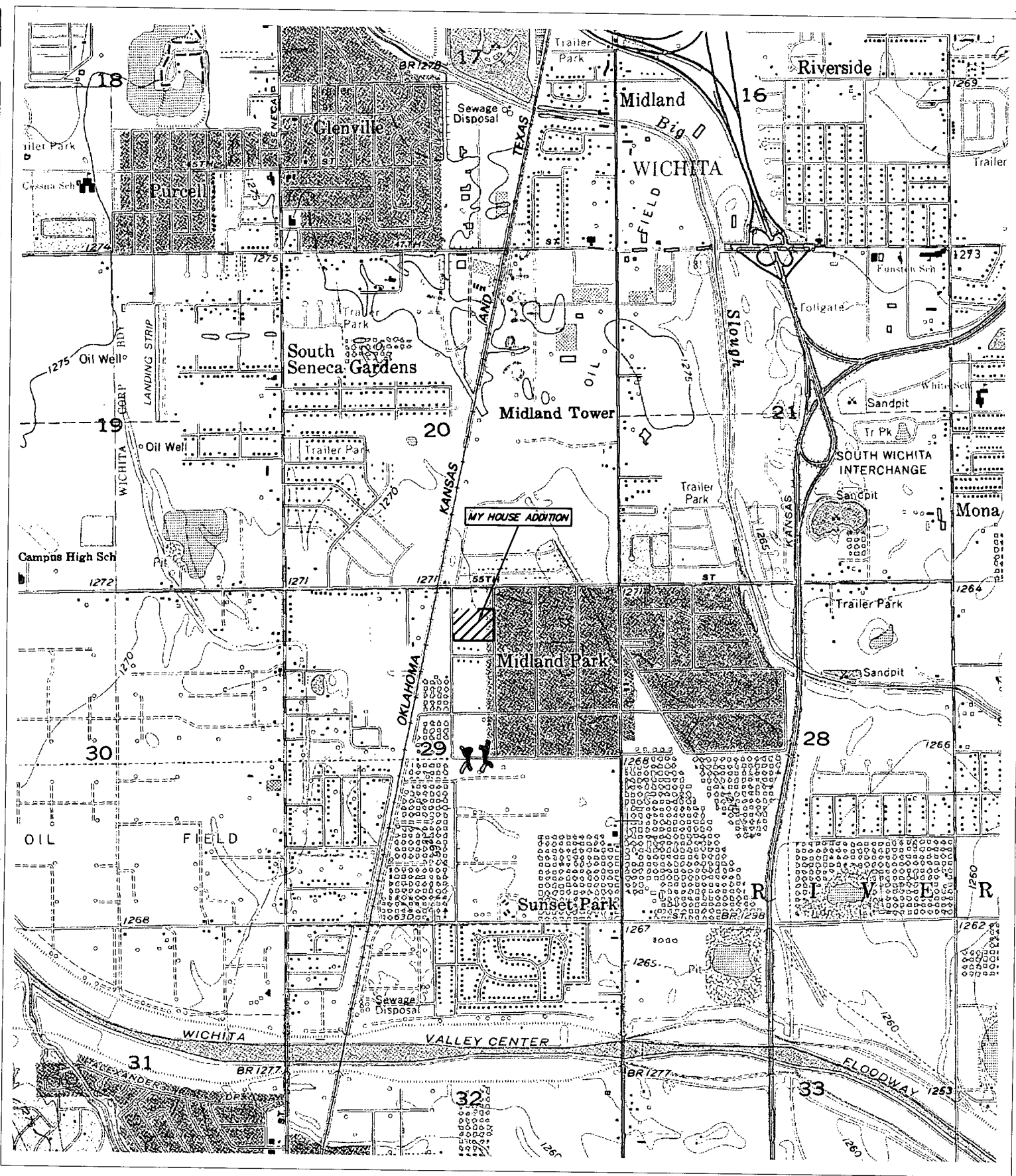
Sedgwick County, Wichita, Kansas

AERIAL LOCATION MAP



BAUGHMAN COMPANY P.A.

**USGS QUADRANGLE MAP**

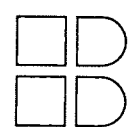


SCALE: 1" = 2000'

# My House Addition

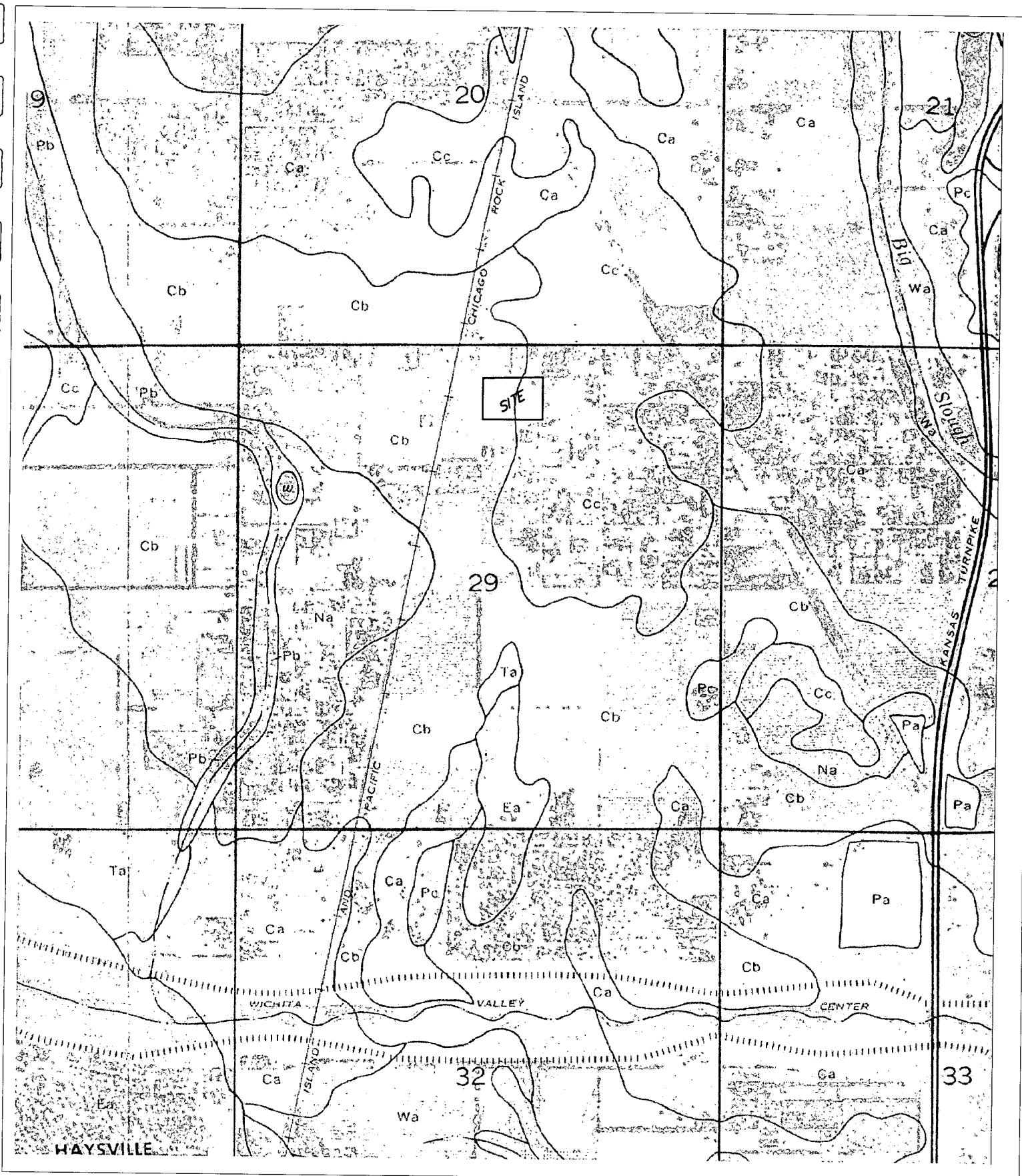
Sedgewick County, Wichita, Kansas

USGS QUADRANGLE



BAUGHMAN COMPANY P.A.

**SCS AERIAL PHOTOGRAPH**



SCALE: 1" = 1000'

# My House Addition

Sedgwick County, Kansas

SCS SOIL SURVEY



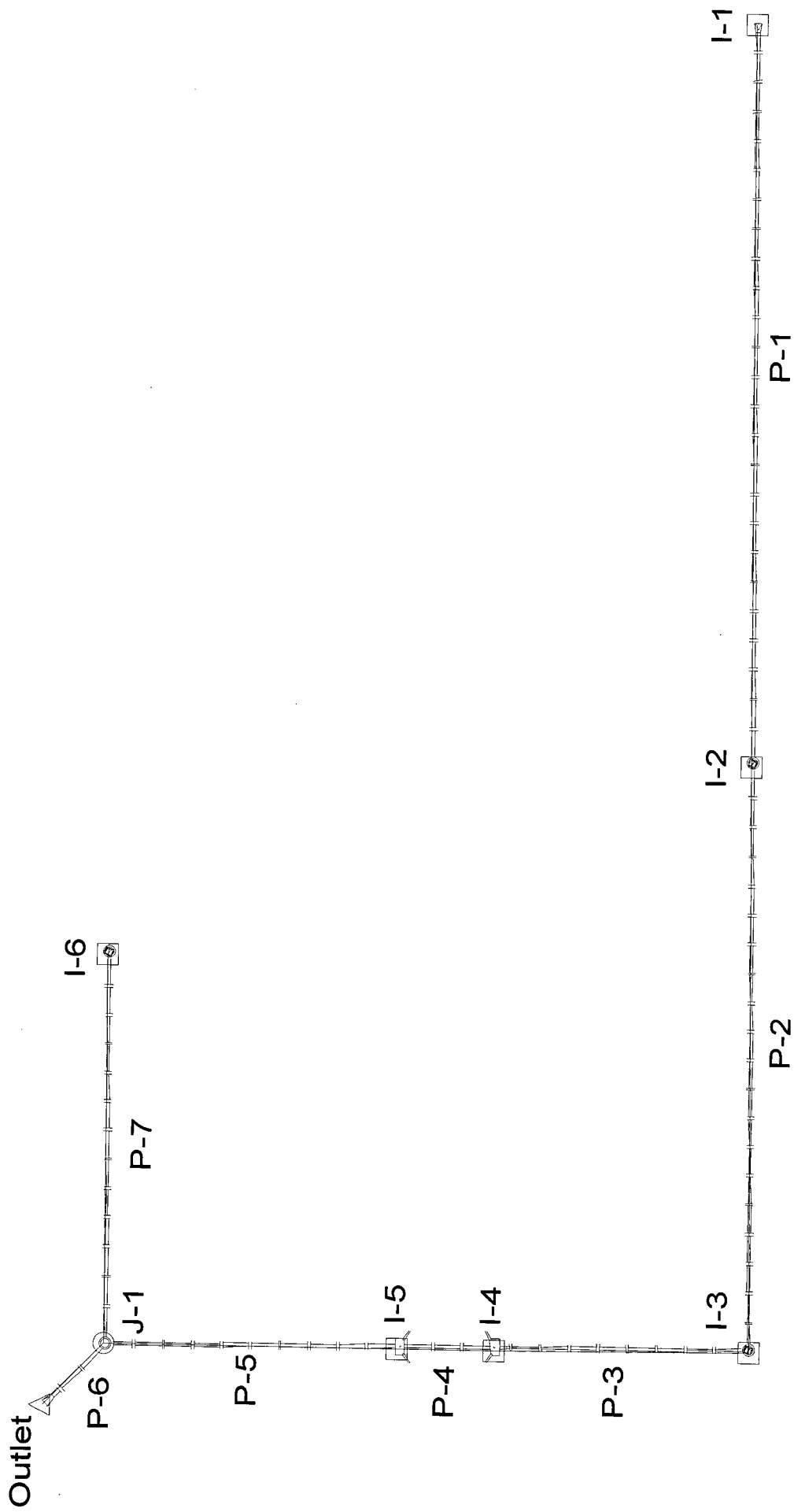
BAUGHMAN COMPANY P.A.

**F.E.M.A. LOCATION MAP**



**StormCad Hydraulic Calculations**

**SWS LINE #1**



## The Node Report

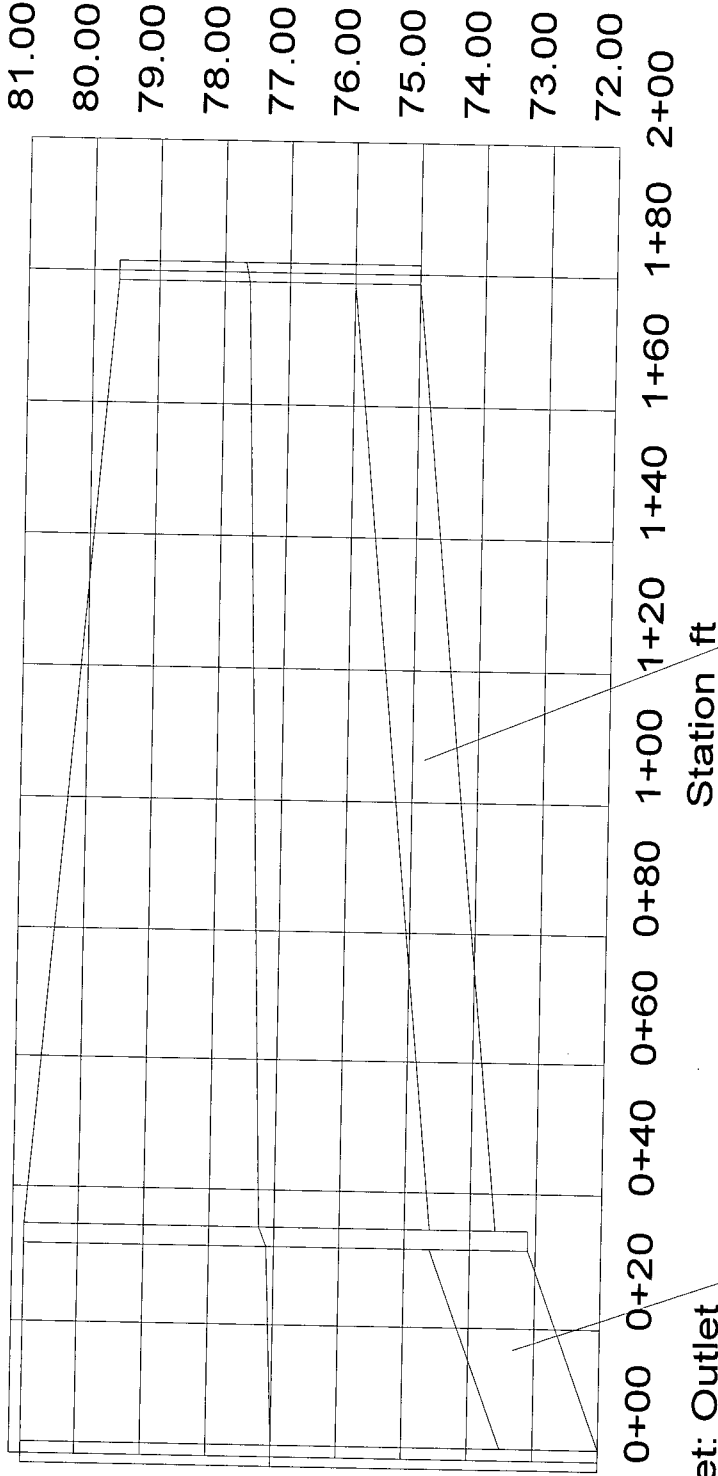
Node	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet TC (min)	System Intensity (in/hr)	Additional Flow (cfs)	Discharge (cfs)	Ground Elevation (ft)	HGL In (ft)	HGL Out (ft)
I-6	1.08	0.44	15.00	3.83	0.00	1.83	79.60	77.65	77.61
I-1	0.97	0.44	15.00	3.83	0.00	1.65	79.50	78.80	78.78
I-2	0.39	0.44	15.00	3.47	0.00	2.09	79.00	78.60	78.58
I-3	0.39	0.44	15.00	3.28	0.00	2.55	79.00	78.35	78.31
I-4	0.84	0.44	15.00	3.22	0.00	3.70	80.00	78.16	78.09
I-5	0.84	0.44	15.00	3.20	0.00	4.87	80.00	77.97	77.85
J-1	N/A	N/A	N/A	3.17	N/A	6.34	80.80	77.22	77.12
Outlet	N/A	N/A	N/A	3.16	N/A	N/A	80.80	77.00	77.00

# The Pipe Report

Pipe	Upstream Node	Downstream Node	Discharge (cfs)	Constructed Slope (ft/ft)	Length (ft)	Section Size	Roughness	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream HGL (ft)	Downstream HGL (ft)
P-7	I-6	J-1	1.83	0.009524	147.00	12 inch	0.013	75.00	73.60	79.60	80.80	77.61	77.22
P-1	I-1	I-2	1.65	0.005415	277.00	15 inch	0.013	77.50	76.00	79.50	79.00	78.78	78.60
P-2	I-2	I-3	2.09	0.004072	221.00	15 inch	0.013	75.90	75.00	79.00	79.00	78.58	78.35
P-3	I-3	I-4	2.55	0.004124	97.00	15 inch	0.013	74.90	74.50	79.00	80.00	78.31	78.16
P-4	I-4	I-5	3.70	0.005556	36.00	15 inch	0.013	74.40	74.20	80.00	80.00	78.09	77.97
P-5	I-5	J-1	4.87	0.004505	111.00	15 inch	0.013	74.10	73.60	80.00	80.80	77.85	77.22
P-6	J-1	Outlet	6.34	0.033333	33.00	18 inch	0.013	73.10	72.00	80.80	80.80	77.12	77.00

Junction: J-1  
 Rim: 80.80 ft  
 Sump: 73.10 ft

Inlet: I-6  
 Rim: 79.60 ft  
 Sump: 75.00 ft



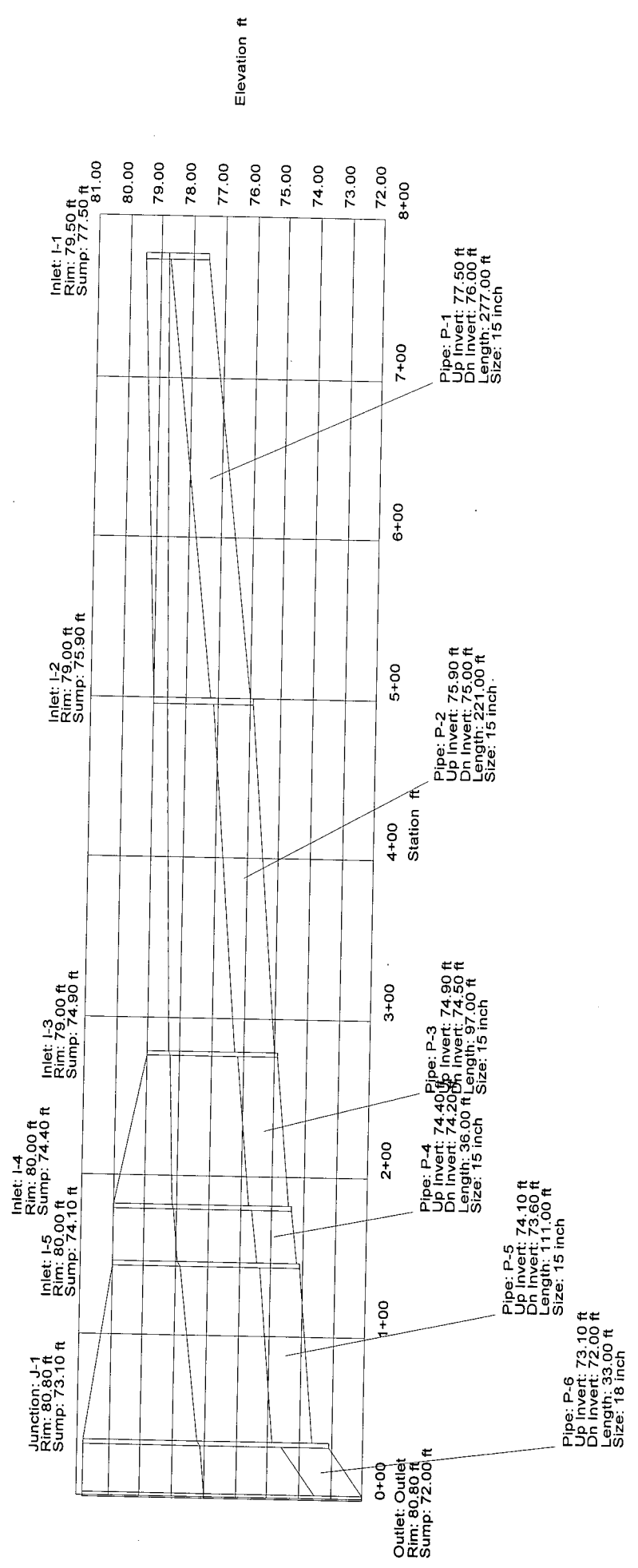
Outlet: Outlet  
 Rim: 80.80 ft  
 Sump: 72.00 ft

Pipe: P-6  
 Up Invert: 73.10 ft  
 Dn Invert: 72.00 ft  
 Length: 33.00 ft  
 Size: 18 inch

Pipe: P-7  
 Up Invert: 75.00 ft  
 Dn Invert: 73.60 ft  
 Length: 147.00 ft  
 Size: 12 inch

Elevation ft

Station ft



Junction: J-1  
Rim: 80.80 ft  
Sump: 73.10 ft

Inlet: I-4  
Rim: 80.00 ft  
Sump: 74.40 ft

Inlet: I-3  
Rim: 79.00 ft  
Sump: 74.90 ft

Inlet: I-2  
Rim: 79.00 ft  
Sump: 75.90 ft

Inlet: I-1  
Rim: 79.50 ft  
Sump: 77.50 ft

Outlet: Outlet  
Rim: 80.80 ft  
Sump: 72.00 ft

Pipe: P-5  
Up Invert: 74.10 ft  
Dn Invert: 73.60 ft  
Length: 111.00 ft  
Size: 15 inch

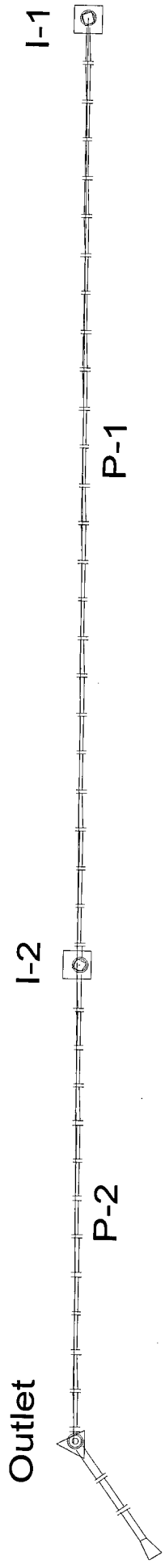
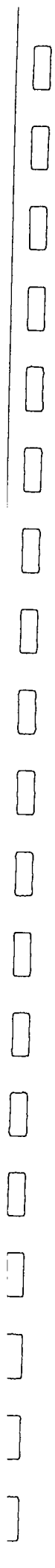
Pipe: P-6  
Up Invert: 73.10 ft  
Dn Invert: 72.00 ft  
Length: 33.00 ft  
Size: 18 inch

Pipe: P-4  
Up Invert: 74.40 ft  
Dn Invert: 74.20 ft  
Length: 36.00 ft  
Size: 15 inch

Pipe: P-2  
Up Invert: 75.90 ft  
Dn Invert: 75.00 ft  
Length: 22.10 ft  
Size: 15 inch

Pipe: P-1  
Up Invert: 77.50 ft  
Dn Invert: 76.00 ft  
Length: 277.00 ft  
Size: 15 inch

**SWS LINE #2**



## The Node Report

Node	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet TC (min)	System Intensity (in/hr)	Additional Flow (cfs)	Discharge (cfs)	Ground Elevation (ft)	HGL In (ft)	HGL Out (ft)
I-1	0.26	0.44	15.00	3.83	0.00	0.44	80.00	77.15	77.15
I-2	0.42	0.44	15.00	3.10	0.00	0.93	79.30	77.11	77.10
Outlet	N/A	N/A	N/A	2.96	N/A	N/A	80.90	77.00	77.00

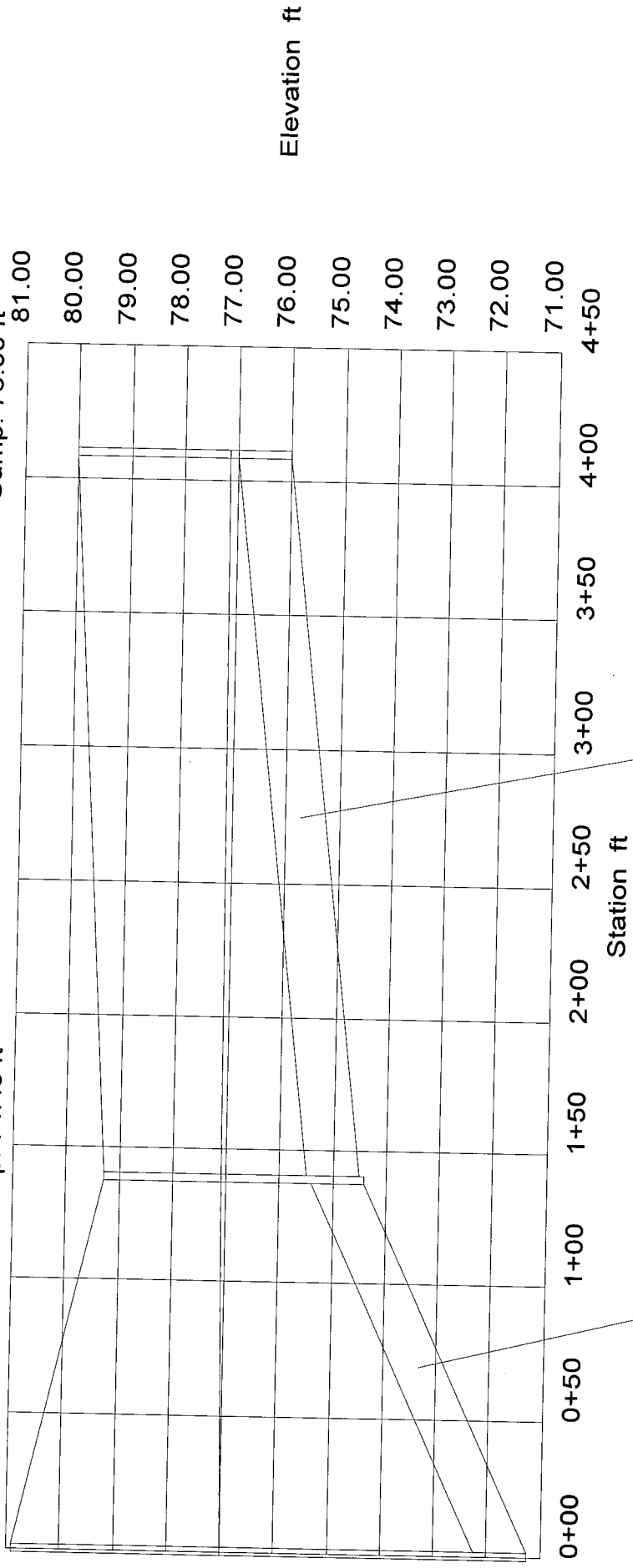
# The Pipe Report

Pipe	Upstream Node	Downstream Node	Discharge (cfs)	Constructed Slope (ft/ft)	Length (ft)	Section Size	Roughness	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream HGL (ft)	Downstream HGL (ft)
P-1	I-1	I-2	0.44	0.005535	271.00	12 inch	0.013	76.00	74.50	80.00	79.30	77.15	77.11
P-2	I-2	Outlet	0.93	0.022662	139.00	12 inch	0.013	74.40	71.25	79.30	80.90	77.10	77.00

Outlet: Outlet  
 Rim: 80.90 ft  
 Sump: 71.25 ft

Inlet: I-2  
 Rim: 79.30 ft  
 Sump: 74.40 ft

Inlet: I-1  
 Rim: 80.00 ft  
 Sump: 76.00 ft



Pipe: P-2  
 Up Invert: 74.40 ft  
 Dn Invert: 71.25 ft  
 Length: 139.00 ft  
 Size: 12 inch

Pipe: P-1  
 Up Invert: 76.00 ft  
 Dn Invert: 74.50 ft  
 Length: 271.00 ft  
 Size: 12 inch

**PondPack Hydrology Routing**  
*Storage Volume Calculation*

Type.... Master Network Summary  
 Name.... Watershed  
 File.... F:\HYDRO\PROJECTS\MY HOUSE\POND2.PPW

MASTER DESIGN STORM SUMMARY

Default Network Design Storm File, ID MY HOUSE.RNQ 6 HR STORM

Return Event	Total Depth in	Rainfall Type	RNF File	RNF ID
Dev100	6.0000	Synthetic Curve	SCSTYPES	TypeII 24hr

MASTER NETWORK SUMMARY  
 SCS Unit Hydrograph Method

(\*Node=Outfall; +Node=Diversion;)  
 (Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Storage Node ID	Return Type	Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond ac-ft
*OUT 10	JCT	100	2.476		3.1000	62.37		
SCS UH 10	AREA	100	2.476		3.1000	62.37		

Type.... SCS Unit Hyd. Summary  
Name.... SCS UH 10 Tag: Dev100  
File.... F:\HYDRO\PROJECTS\MY HOUSE\POND2.PPW  
Storm... TypeII 24hr Tag: Dev100

Page 5.03  
Event: 100 yr

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm  
Duration = 6.0000 hrs Rain Depth = 6.0000 in  
Rain Dir = C:\HAESTAD\PPKW\RAINFALL\  
Rain File -ID = SCSTYPES.RNF - TypeII 24hr  
Unit Hyd Type = Default Curvilinear  
HYG Dir = F:\HYDRO\PROJECTS\MY HOUSE\  
HYG File - ID = - SCS UH 10 Dev100  
Tc = .2500 hrs  
Drainage Area = 7.260 acres Runoff CN= 83

=====  
Computational Time Increment = .03333 hrs  
Computed Peak Time = 3.1333 hrs  
Computed Peak Flow = 62.72 cfs  
  
Time Increment for HYG File = .0500 hrs  
Peak Time, Interpolated Output = 3.1000 hrs  
Peak Flow, Interpolated Output = 62.37 cfs  
=====

DRAINAGE AREA

-----  
ID:None Selected  
CN = 83  
Area = 7.260 acres  
S = 2.0482 in  
0.2S = .4096 in

Cumulative Runoff

-----  
4.0914 in  
2.475 ac-ft

HYG Volume... 2.476 ac-ft (area under HYG curve)

\*\*\*\*\* UNIT HYDROGRAPH PARAMETERS \*\*\*\*\*

Time Concentration, Tc = .25000 hrs (ID: None Selected)  
Computational Incr, Tm = .03333 hrs = 0.20000 Tp  
  
Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)  
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))  
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 32.90 cfs  
Unit peak time Tp = .16667 hrs  
Unit receding limb, Tr = .66667 hrs  
Total unit time, Tb = .83333 hrs

**DRAINAGE PLAN**

**LOT GRADING PLAN**

