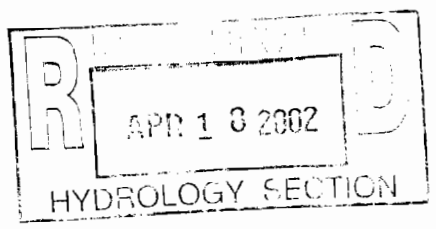
DRAINAGE REPORT

for

SEVILLE SUBDIVISION
UNIT 3
Albuquerque, New Mexico

APRIL 2002



I, Daniel S. Aguirre, do hereby certify that this report was prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Daniel S. Aguirre, P.E.
NM No. 11955

4/12/02
Date

Table of Contents

Introduction

Wilson & Company prepared this drainage report under contract to Curb West, Inc. The document provides a basis for the design of storm water conveyance systems within Seville Unit 3. The first objective of this report is to analyze the hydrologic characteristics associated with the existing and developed conditions. The second is to present the proposed storm drain design used to mitigate the storm runoff generated by Seville Unit 3.

Seville Unit 3 is located in Northwest Albuquerque and is part of the overall Seville Subdivision. Currently, the site typically slopes from west to east at average grades of 3%. It is presently undeveloped and covered with typical west mesa desert vegetation. Historically, the site drains easterly into the west branch of the Calabacillas Arroyo, then into Swinburne Dam.

Developed flows will discharge into the main branch of the Calabacillas Arroyo via a proposed storm drain system and an existing storm drain system that was constructed as part of Seville Unit 2. The west branch discharges directly into the Swinburne detention facility. This facility has been designed to provide detention for the upstream developed condition.

Project Description

The proposed development is located within the city limits of Albuquerque, New Mexico. Seville Subdivision Unit 3 is a development within the Seville Subdivision. Seville Subdivision is bounded on the south by Irving Blvd., on the east and north by the main branch of the Calabacillas Arroyo, and on the west by Universe Blvd. Seville is immediately west of the confluence of the west branch and the main stem of the Calabacillas Arroyo. Unit 3 is located in the northeastern quadrant of Seville Subdivision and is bounded on the east by Kayenta Blvd, on the south by Rio Segura Blvd., and on the north and west by the main branch of the Calabacillas Arroyo. See Exhibit A, Vicinity Map.

The current legal description of the proposed development is "Seville Subdivision Unit 3, being Tract B, Bulk Land Plat of Tracts A-1, B, C, D, E, and F, Paradise Heights, being a replat of vacated Paradise Heights Unit 6, Tract A, Paradise Heights Unit 5, Unplatted Tract 3, Paradise Heights, and a vacated portion of Westside Boulevard N.W."

Exhibit B contains the September 20, 1996, FEMA Flood Insurance Rate Maps for the area, which includes the proposed subdivision layout. The FEMA floodplain does not encroach on the subdivision in any location. Unit 3 will discharge into the main branch of the Calabacillas Arroyo, which is identified as a floodplain.

The site is located on Zone Atlas Sheet A-10-Z. See Exhibit C for site location on this Zone Atlas Sheet. Seville Subdivision Unit 3 is currently zoned R-1.

Project Background and Documents

Seville Subdivision currently includes Units 1 and 2. Unit 1 infrastructure is in place and homes are currently under construction. Unit 2 infrastructure is currently being constructed. Drainage design was approved for Units 1 and 2 in a report titled "Drainage Report for Seville Subdivision" (Easterling & Associates, Inc., June 2000). The report for Units 1 and 2 addressed the area that includes Unit 3 as future development that would discharge, in part, to the main stem of the Calabacillas Arroyo.

The TVI West Campus is currently undergoing design and review with the City of Albuquerque and Bernalillo County. The campus will be located north of the Calabacillas Arroyo west branch along the west side of Universe Blvd. TVI will construct the west half of Universe Blvd. The drainage from the west, which has historically entered Seville Subdivision across the Universe Blvd. right-of-way, will be diverted to the west branch at Universe Blvd.

Existing Conditions

(Refer to Plate 1 – Existing Conditions)

The existing site of Unit 3 typically slopes easterly at an average grade of 3%. It is presently undeveloped and covered with typical west mesa desert vegetation. Historically, the site discharges via sheet flows and minor channelization into the main stem of the Calabacillas Arroyo. The Calabacillas Arroyo discharges directly into the Swinburne detention facility. The Swinburne facility was designed to provide runoff detention of the 100-year event for contributing areas upstream of the facility. A crossing structure at the Kayenta Blvd. crossing the west branch was designed and constructed with Unit 1 of Seville Subdivision. This structure was designed to safely pass 100-year developed flows. The development of Universe Blvd. with the TVI campus, as previously discussed, will divert flows entering the Seville Subdivision site from the west to the west branch via street flow and storm drain located within the Universe Blvd. right-of-way. Shown below is a table that summarizes the findings of the hydrologic model for undeveloped conditions. Refer to Plate 1 for an illustration of existing flow conditions.

BASIN NUMBER	BASIN AREA (ACRES)	STORM RUNOFF (CFS)
1	37.83	47.14

Developed Conditions

(Refer to Plate 2 – Developed Conditions)

The developed site will consist of 199 lots of single-family housing. The east half of Kayenta Blvd., as it is adjacent to the site, will be constructed with this development. Discussions with the City Parks and Recreation Division about a park location and park dedication are currently ongoing.

Drainage under developed conditions will discharge as it has historically, to the main branch of the Calabacillas Arroyo. Flows will be conveyed to the discharge point via street flows and storm drain located within the Rio Segura rights-of-way.

The hydrologic analysis for the developed condition was completed using the Arid Lands Hydrologic Model (AHYMO) Version 1997.02 (see Appendices A & B for input and output data). Methodology outlined in Section 22.2 of the City of Albuquerque Development Process Manual was also incorporated into this analysis. Street flows have been evaluated using Flow Master by Haested Methods. Street flows were analyzed for the use of roll type curb, where capacities permitted. Inlets are located to prevent exceeding the street flow capacities per the DPM. See Appendix C for output data generated during the street capacity analysis. This output data illustrates the maximum flow capacity for a street cross-section at a given slope. Exhibit D illustrates the proposed locations for roll type curb. Storm drain design and analysis was performed using *StormCAD* by Haested Methods (see Appendix D for *StormCAD* output).

Basins 6, 7 and 8 are calculated as future development. Basin 6 is 4.50 acres and drains southerly into the proposed storm drain where the runoff is subsequently directed into the main stem of the Calabacillas Arroyo. Basin 7 is just over 3 acres in size and generates a peak flow of 11.93 cfs. This storm runoff will also drain southerly into the proposed storm drain and into the main stem of the Calabacillas Arroyo. Basin 8 is 13.39 acres and discharges a peak flow of 49.25 cfs into the same proposed storm drain system. The storm drain design for Unit 3 accommodates this future discharge.

Basins 1 through 5 include development within the boundaries of Unit 3. Collectively, these basins comprise an area of almost 21 acres, and the storm runoff generated by these will be directed southerly and collected by the proposed storm drain.

Offsite flow affecting Unit 3 is considerable and will be collected and routed into the main stem of the Calabacillas Arroyo via the proposed storm drain within Rio Segura Blvd. Shown below is a table that summarizes the findings of the hydrologic model for developed conditions. Refer to Plate 2 for an illustration of these conditions.

BASIN NUMBER	BASIN AREA (ACRES)	STORM RUNOFF (CFS)
1	3.80	14.03
2	3.79	13.98
3	4.74	17.47
4	3.79	13.98
5	4.83	17.83
6	4.50	16.62
7	3.23	11.93
8	12.29	45.25
9	0.80	2.97
10	0.29	1.08
Offsite Basin	31.62	116.56
Offsite Basin	17.09	63.00
Unit 2 Offsite Flow	See Unit 2 Drainage Report	25.00
Unit 2 Offsite Flow	See Unit 2 Drainage Report	25.00
Unit 2 Offsite Flow	See Unit 2 Drainage Report	14.20
Unit 2 Offsite Flow	See Unit 2 Drainage Report	90.30

Grading Plan

The Seville Unit 3 Grading Plan is attached as Plate 3. It illustrates the overall grading concept for the subdivision, as well as the proposed storm drain.

Conclusion

The analysis indicates that the proposed system is adequate to handle the storm runoff generated by the site. Wilson & Company recommends that the proposed storm drain system undergo regular maintenance activities. This should include removing debris from grate inlets, as well as removing sediment buildup within the pipe system. The future area contributing flow to the Unit 3 storm drainage system should be analyzed in greater detail at the time of development to ensure that the runoff is within the constraints of this design. The downstream condition of the Calabacillas Arroyo has been designed to accommodate developed discharge of the entire basin. Therefore, we are proposing no runoff detention with this development.

```
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  USER NO.= AHYMO-C-9803c01UNMLIB-AH

                                        FROM  TO                      PEAK
  RUNOFF                TIME TO    CFS       PAGE =   1
                         HYDROGRAPH   ID    ID          AREA      DISCHARGE
  VOLUME       RUNOFF     PEAK     PER
      COMMAND        IDENTIFICATION   NO.  NO.       (SQ MI)       (CFS)
  (AC-FT)     (INCHES)  (HOURS)    ACRE     NOTATION

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  RAIN6=     2.200
      SEDIMENT BULK
  PK BF =     1.07
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  1.548        .49106    1.533    1.246 PER IMP=     .00
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VOLUME       RUNOFF      PEAK      PER
    COMMAND        IDENTIFICATION   NO.  NO.       (SQ MI)       (CFS)
(AC-FT)     (INCHES)   (HOURS)     ACRE     NOTATION

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.608       1.53936    1.500    3.689 PER IMP=  60.00
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.486       1.53936    1.500    3.690 PER IMP=  60.00
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.620       1.53936    1.500    3.689 PER IMP=  60.00
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.578       1.53936    1.500    3.689 PER IMP=  60.00
    COMPUTE NM HYD          3.70   -     7         .00505         11.93
.415       1.53936    1.500    3.691 PER IMP=  60.00
    COMPUTE NM HYD          3.80   -     8         .01920         45.25
1.576       1.53936    1.500    3.682 PER IMP=  60.00
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.103       1.53936    1.500    3.706 PER IMP=  60.00
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(AC-FT)	(INCHES)	(HOURS)		ACRE	NOTATION		
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RAIN6=	2.200						
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.311	1.53936	1.500		3.693 PER IMP=	60.00		
COMPUTE NM HYD			3.30	-	3	.03360	79.28
2.759	1.53936	1.500		3.687 PER IMP=	60.00		
FINISH							

26f-f s=1.61%
Worksheet for Irregular Channel

LORO

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	26f-f s=1.61% ←
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.016100	ft/ft
Elevation range: 99.13 ft to 100.00 ft.		
Discharge	17.83	cfs

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	46.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
23.00	99.48			
34.00	99.26			
36.00	99.13			
36.20	99.80			
46.00	100.00			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.53	ft
Flow Area	4.96	ft²
Wetted Perimeter	26.85	ft
Top Width	26.24	ft
Height	0.40	ft
Critical Depth	99.59	ft
Critical Slope	0.006989	ft/ft
Velocity	3.60	ft/s
Velocity Head	0.20	ft
Specific Energy	99.73	ft
Froude Number	1.46	
Flow is supercritical.		

26f-f s=2.49%
Worksheet for Irregular Channel

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	26f-f s=2.49%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.024900	ft/ft
Discharge	21.09	cfs

Elevation range: 99.13 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	46.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
23.00	99.48			
34.00	99.26			
36.00	99.13			
36.20	99.80			
46.00	100.00			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.53	ft
Flow Area	4.81	ft²
Wetted Perimeter	26.84	ft
Top Width	26.24	ft
Height	0.40	ft
Critical Depth	99.61	ft
Critical Slope	0.006747	ft/ft
Velocity	4.38	ft/s
Velocity Head	0.30	ft
Specific Energy	99.83	ft
Froude Number	1.81	
Flow is supercritical.		

26f-f s=2.76%
Worksheet for Irregular Channel

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	26f-f s=2.76%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.027600	ft/ft
Elevation range: 99.13 ft to 100.00 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	46.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
23.00	99.48			
34.00	99.26			
36.00	99.13			
36.20	99.80			
46.00	100.00			

Discharge	17.83	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.50	ft
Flow Area	4.21	ft²
Wetted Perimeter	26.79	ft
Top Width	26.22	ft
Height	0.37	ft
Critical Depth	99.59	ft
Critical Slope	0.006989	ft/ft
Velocity	4.23	ft/s
Velocity Head	0.28	ft
Specific Energy	99.78	ft
Froude Number	1.86	
Flow is supercritical.		

28f-f s=0.93%

Worksheet for Irregular Channel

CADIZ

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=0.93%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.009300 ft/ft			
Elevation range: 99.13 ft to 100.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			
Discharge	13.98 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.54	ft
Flow Area	5.20	ft²
Wetted Perimeter	28.86	ft
Top Width	28.24	ft
Height	0.41	ft
Critical Depth	99.55	ft
Critical Slope	0.007460	ft/ft
Velocity	2.69	ft/s
Velocity Head	0.11	ft
Specific Energy	99.65	ft
Froude Number	1.10	
Flow is supercritical.		

28f-f s=1.13%
Worksheet for Irregular Channel

BILBAO

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=1.13%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.011300 ft/ft			
Elevation range: 99.13 ft to 100.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			
Discharge	17.47 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.55	ft
Flow Area	5.61	ft²
Wetted Perimeter	28.89	ft
Top Width	28.25	ft
Height	0.42	ft
Critical Depth	99.58	ft
Critical Slope	0.007117	ft/ft
Velocity	3.11	ft/s
Velocity Head	0.15	ft
Specific Energy	99.70	ft
Froude Number	1.23	
Flow is supercritical.		

28f-f s=1.75%
Worksheet for Irregular Channel

CAD12

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=1.75%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.017500	ft/ft

Elevation range: 99.13 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			

Discharge	21.09	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.55	ft
Flow Area	5.51	ft²
Wetted Perimeter	28.89	ft
Top Width	28.25	ft
Height	0.42	ft
Critical Depth	99.61	ft
Critical Slope	0.006840	ft/ft
Velocity	3.83	ft/s
Velocity Head	0.23	ft
Specific Energy	99.78	ft
Froude Number	1.53	
Flow is supercritical.		

28f-f s=2.00%
Worksheet for Irregular Channel

TOLEDO

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=2.00%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.020000 ft/ft			
Elevation range: 99.13 ft to 100.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			
Discharge	14.03 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.50	ft
Flow Area	4.14	ft²
Wetted Perimeter	28.77	ft
Top Width	28.20	ft
Height	0.37	ft
Critical Depth	99.55	ft
Critical Slope	0.007454	ft/ft
Velocity	3.39	ft/s
Velocity Head	0.18	ft
Specific Energy	99.68	ft
Froude Number	1.56	
Flow is supercritical.		
Flow is divided.		

28f-f s=2.22%
Worksheet for Irregular Channel

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=2.22%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.022200 ft/ft			
Elevation range: 99.13 ft to 100.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			
Discharge	11.93 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.48	ft
Flow Area	3.52	ft²
Wetted Perimeter	26.42	ft
Top Width	25.89	ft
Height	0.35	ft
Critical Depth	99.53	ft
Critical Slope	0.007716	ft/ft
Velocity	3.39	ft/s
Velocity Head	0.18	ft
Specific Energy	99.66	ft
Froude Number	1.62	
Flow is supercritical.		
Flow is divided.		

28f-f s=2.75%

Worksheet for Irregular Channel

PAMPLONA

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=2.75%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.027500 ft/ft			
Elevation range: 99.13 ft to 100.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			
Discharge	13.98 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.48	ft
Flow Area	3.66	ft²
Wetted Perimeter	26.97	ft
Top Width	26.43	ft
Height	0.35	ft
Critical Depth	99.55	ft
Critical Slope	0.007461	ft/ft
Velocity	3.82	ft/s
Velocity Head	0.23	ft
Specific Energy	99.71	ft
Froude Number	1.81	
Flow is supercritical.		
Flow is divided.		

28f-f s=3.50%
Worksheet for Irregular Channel

SEGOVIA

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	28f-f s=3.50%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.035000 ft/ft			
Elevation range: 99.13 ft to 100.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	48.00	0.017
9.80	99.80			
10.00	99.13			
12.00	99.26			
24.00	99.50			
36.00	99.26			
38.00	99.13			
38.20	99.80			
48.00	100.00			
Discharge	16.62 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.49	ft
Flow Area	3.80	ft²
Wetted Perimeter	27.54	ft
Top Width	26.99	ft
Height	0.36	ft
Critical Depth	99.57	ft
Critical Slope	0.007192	ft/ft
Velocity	4.37	ft/s
Velocity Head	0.30	ft
Specific Energy	99.78	ft
Froude Number	2.05	
Flow is supercritical.		
Flow is divided.		

26roll s=1.61%
Worksheet for Irregular Channel

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	26roll s=1.61%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.016100	ft/ft

Elevation range: 99.52 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	46.00	0.017
10.00	99.80			
11.00	99.52			
12.00	99.54			
23.00	99.76			
34.00	99.54			
35.00	99.52			
36.00	99.80			
46.00	100.00			

Discharge	13.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.80	ft
Flow Area	4.16	ft²
Wetted Perimeter	26.22	ft
Top Width	26.14	ft
Height	0.28	ft
Critical Depth	99.85	ft
Critical Slope	0.007488	ft/ft
Velocity	3.25	ft/s
Velocity Head	0.16	ft
Specific Energy	99.97	ft
Froude Number	1.44	
Flow is supercritical.		

26roll s=2.49%
Worksheet for Irregular Channel

Project Description	
Project File	t:\projects\x1218051\eng\flowmaster\streetfl.fm2
Worksheet	26roll s=2.49%
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.024900	ft/ft

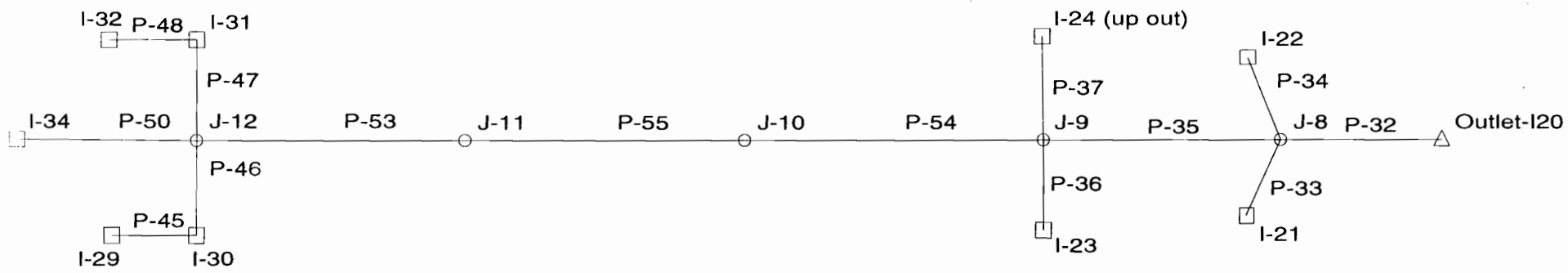
Elevation range: 99.52 ft to 100.00 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	100.00	0.00	46.00	0.017
10.00	99.80			
11.00	99.52			
12.00	99.54			
23.00	99.76			
34.00	99.54			
35.00	99.52			
36.00	99.80			
46.00	100.00			

Discharge	16.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	99.80	ft
Flow Area	4.10	ft²
Wetted Perimeter	26.08	ft
Top Width	26.00	ft
Height	0.28	ft
Critical Depth	99.88	ft
Critical Slope	0.007310	ft/ft
Velocity	4.02	ft/s
Velocity Head	0.25	ft
Specific Energy	100.05	ft
Froude Number	1.78	
Flow is supercritical.		

RIO SEGURA



Project Title: Seville Unit 3 Storm Drain
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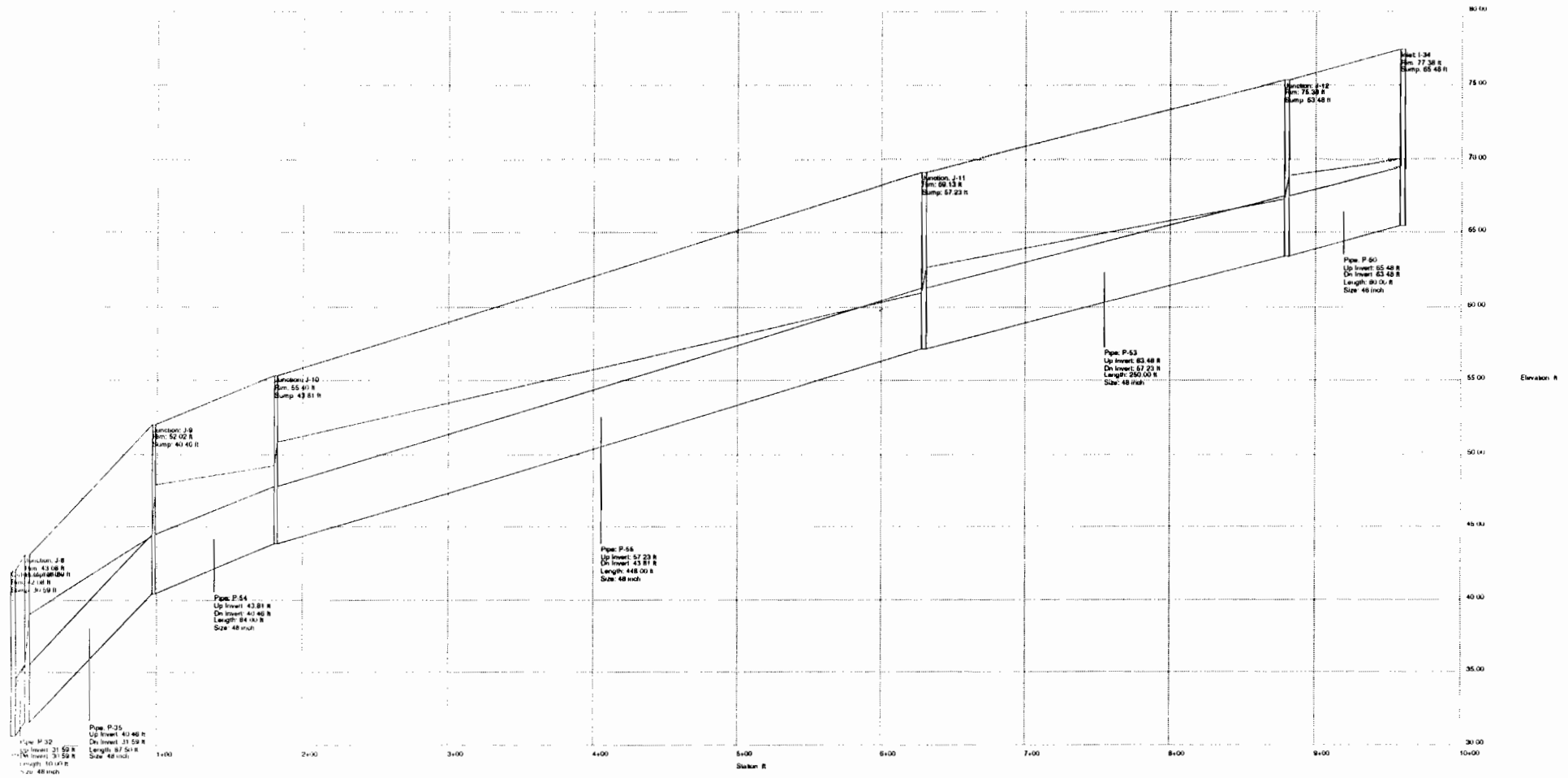
Project Engineer: rmm
StormCAD v1.0



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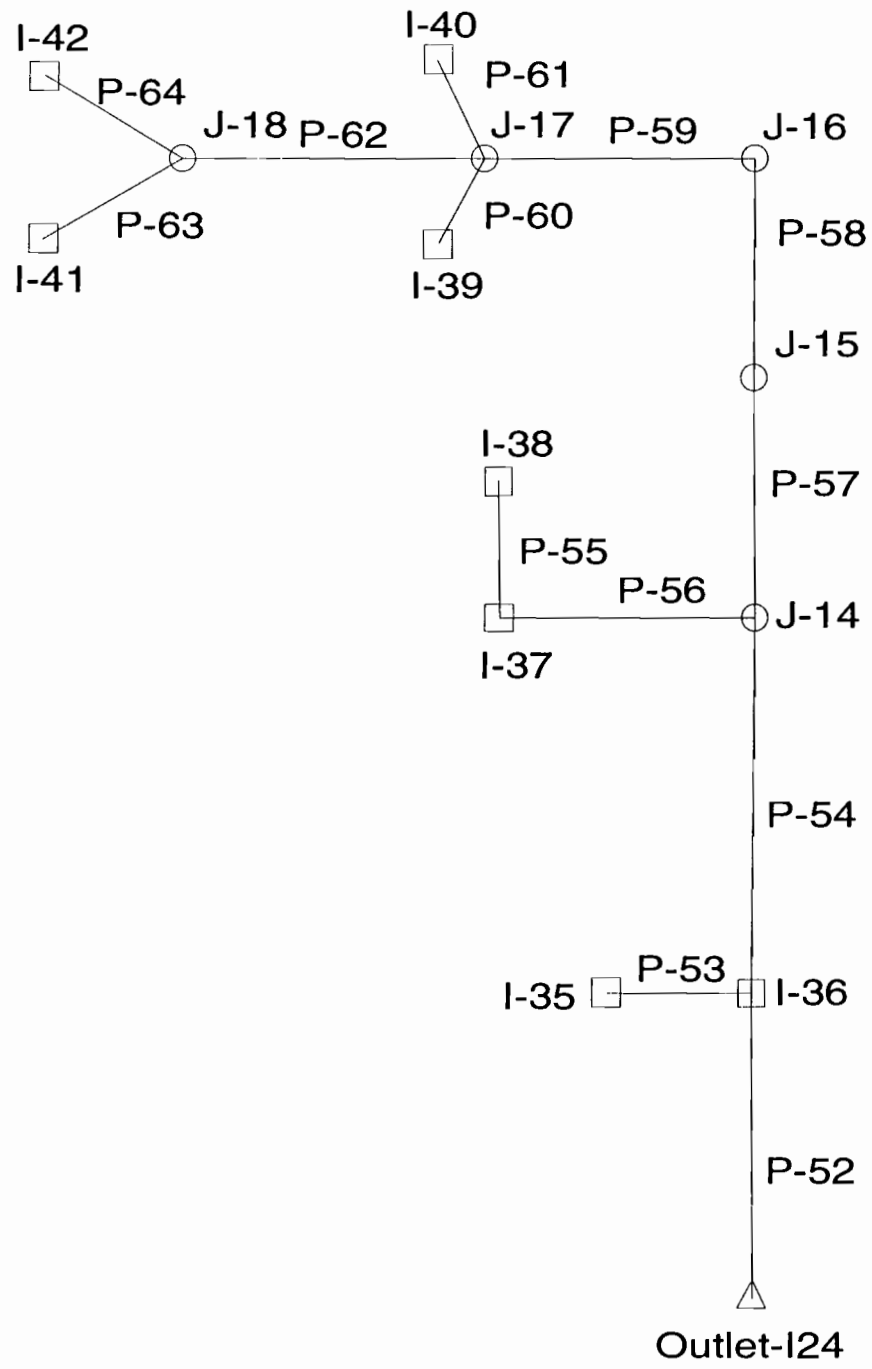
Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Description	Discharge (cfs)
P-33	I-21	J-8	16.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	0.29	38.76	38.44	0.020000		0.10
P-34	I-22	J-8	8.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	1.01	38.92	38.76	0.020000		0.10
P-50	I-34	J-12	80.00	0.00	0.00	0.00	0.00	0.00	48 inch	227.11	13.21	65.48	63.48	0.025000		166.00
P-45	I-29	I-30	24.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.29	72.68	72.20	0.020000		3.00
P-46	I-30	J-12	65.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.50	72.20	70.90	0.020000		6.00
P-48	I-32	I-31	24.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.65	72.38	71.90	0.020000		4.00
P-47	I-31	J-12	50.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	7.03	71.90	70.90	0.020000		8.00
P-53	J-12	J-11	250.00	N/A	N/A	N/A	0.00	N/A	48 inch	227.11	14.49	63.48	57.23	0.025000		180.00
P-55	J-11	J-10	148.00	N/A	N/A	N/A	0.00	N/A	48 inch	248.60	14.49	57.23	43.81	0.029955		180.00
P-54	J-10	J-9	84.00	N/A	N/A	N/A	0.00	N/A	48 inch	286.84	14.32	43.81	40.46	0.039881		180.00
P-36	I-23	J-9	39.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	14.16	48.16	47.38	0.020000		25.00
P-37	I-24 (up	J-9	39.00	0.00	0.00	0.00	0.00	0.00	36 inch	194.30	8.63	43.77	40.46	0.084872		61.00
P-35	J-9	J-8	87.50	N/A	N/A	N/A	0.00	N/A	48 inch	457.32	21.19	40.46	31.59	0.101371		266.00
P-32	J-8	Outlet-I20	10.00	N/A	N/A	N/A	0.00	N/A	48 inch	454.22	22.08	31.59	30.59	0.100000		266.20



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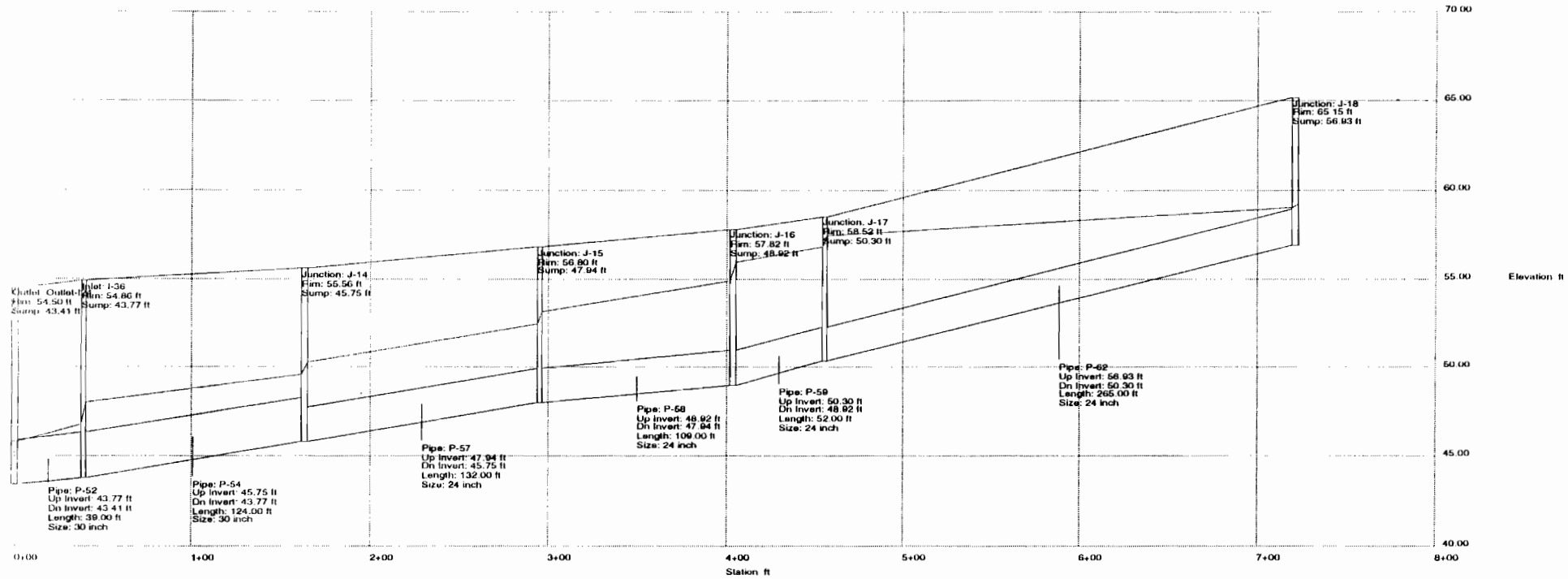

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Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Description	Discharge (cfs)
P-60	I-39	J-17	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.40	54.28	54.04	0.020000		6.00
P-61	I-40	J-17	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.40	54.28	54.04	0.020000		6.00
P-63	I-41	J-18	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.70	60.91	60.67	0.020000		8.50
P-64	I-42	J-18	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.70	60.91	60.67	0.020000		8.50
P-62	J-18	J-17	265.00	N/A	N/A	N/A	0.00	N/A	24 inch	35.78	5.41	56.93	50.30	0.025019		17.00
P-59	J-17	J-16	52.00	N/A	N/A	N/A	0.00	N/A	24 inch	36.85	9.23	50.30	48.92	0.026538		29.00
P-58	J-16	J-15	109.00	N/A	N/A	N/A	0.00	N/A	24 inch	21.45	9.23	48.92	47.94	0.008991		29.00
P-57	J-15	J-14	132.00	N/A	N/A	N/A	0.00	N/A	24 inch	29.14	9.23	47.94	45.75	0.016591		29.00
P-55	I-38	I-37	22.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	5.09	52.38	51.94	0.020000		9.00
P-56	I-37	J-14	51.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	10.24	51.94	50.92	0.020000		18.00
P-54	J-14	I-36	124.00	N/A	N/A	N/A	0.00	N/A	30 inch	51.83	9.57	45.75	43.77	0.015968		47.00
P-53	I-35	I-36	23.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.48	50.86	50.40	0.020000		7.00
P-52	I-36	Outlet-I24	39.00	0.00	0.00	0.00	0.00	0.00	30 inch	39.41	12.51	43.77	43.41	0.009231		61.00

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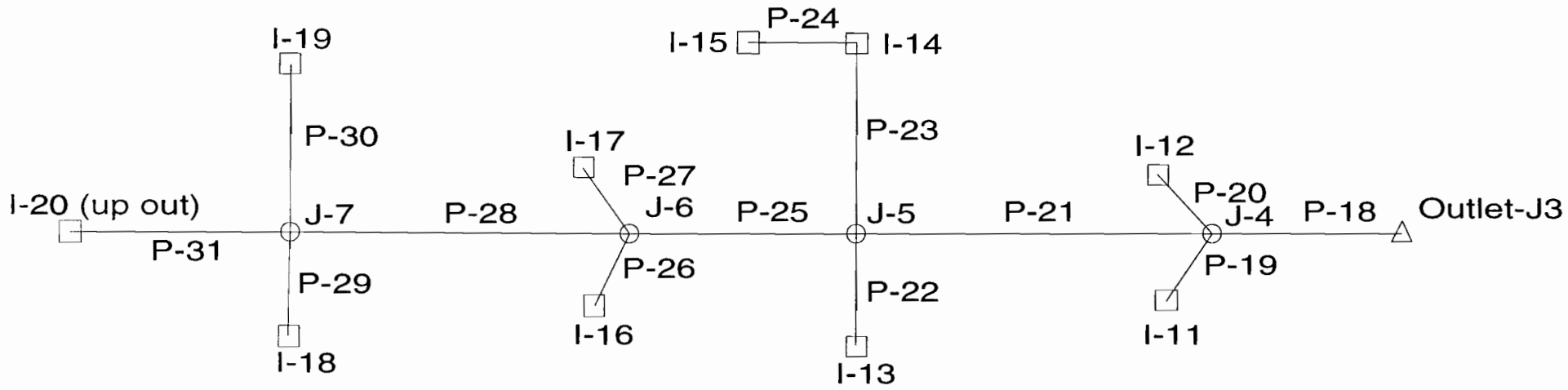

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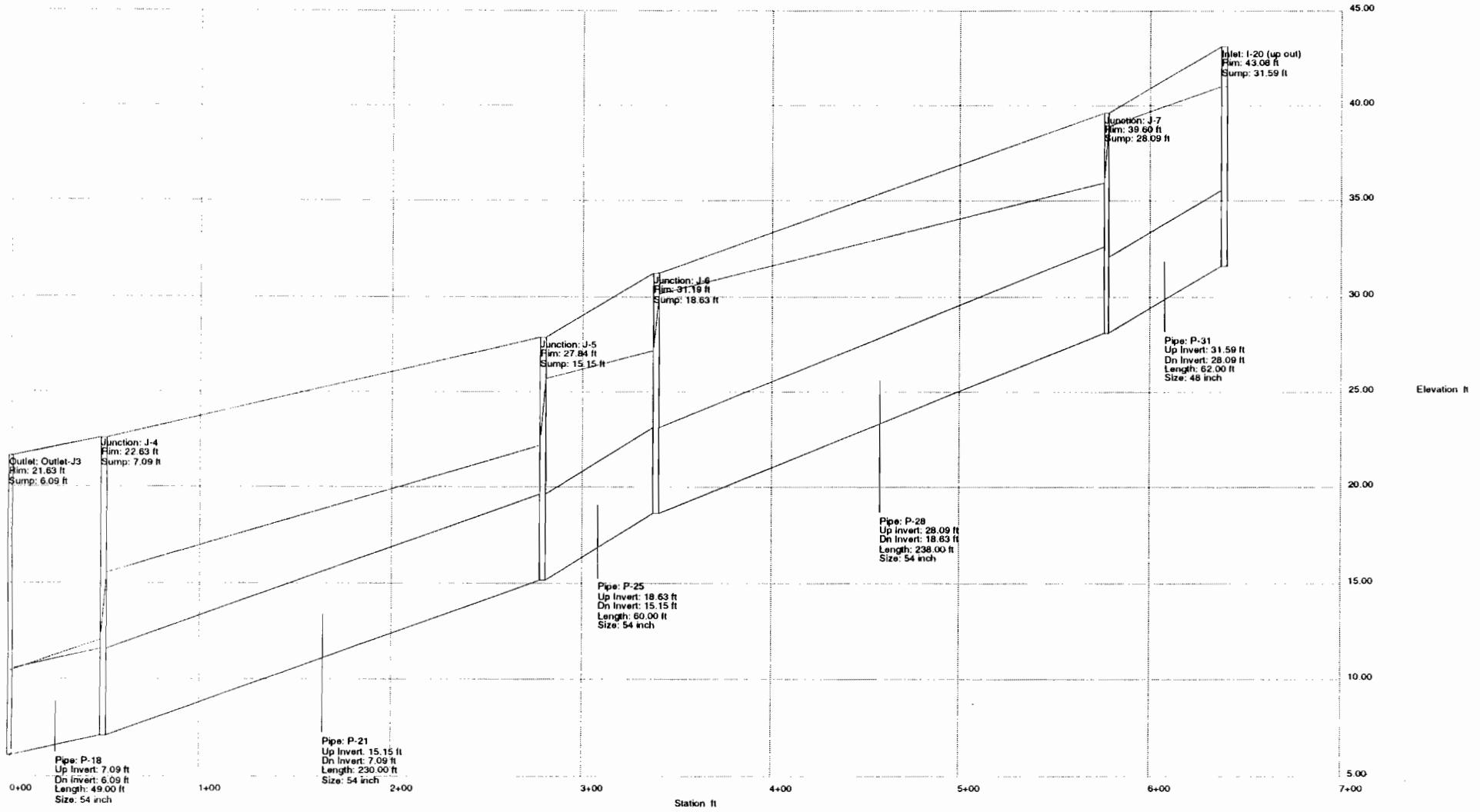

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Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Description	Discharge (cfs)
P-22	I-13	J-5	42.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	8.04	23.00	22.16	0.020000		14.20
P-24	I-15	I-14	24.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.96	24.86	24.38	0.020000		7.00
P-23	I-14	J-5	37.00	0.00	0.00	0.00	0.00	0.00	18 inch	17.44	7.92	24.38	23.36	0.027568		14.00
P-26	I-16	J-6	26.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	0.06	26.67	26.15	0.020000		0.10
P-29	I-18	J-7	36.00	0.00	0.00	0.00	0.00	0.00	24 inch	53.32	7.96	32.88	30.88	0.055556		25.00
P-31	I-20 (up ou	J-7	62.00	0.00	0.00	0.00	0.00	0.00	48 inch	341.27	21.17	31.59	28.09	0.056452		266.00
P-30	I-19	J-7	37.00	0.00	0.00	0.00	0.00	0.00	24 inch	61.89	5.56	30.86	28.09	0.074865		17.47
P-28	J-7	J-6	238.00	N/A	N/A	N/A	0.00	N/A	54 inch	392.04	19.40	28.09	18.63	0.039748		308.47
P-27	I-17	J-6	8.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	0.06	27.03	26.87	0.020000		0.10
P-25	J-6	J-5	60.00	N/A	N/A	N/A	0.00	N/A	54 inch	473.57	19.41	18.63	15.15	0.058000		308.67
P-21	J-5	J-4	230.00	N/A	N/A	N/A	0.00	N/A	54 inch	368.11	21.18	15.15	7.09	0.035043		336.87
P-19	I-11	J-4	26.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	1.99	18.11	17.59	0.020000		0.10
P-20	I-12	J-4	8.00	0.00	0.00	0.00	0.00	0.00	18 inch	37.87	3.09	18.47	17.43	0.130000		0.10
P-18	J-4	Outlet-J3	49.00	N/A	N/A	N/A	0.00	N/A	54 inch	280.91	21.23	7.09	6.09	0.020408		337.07

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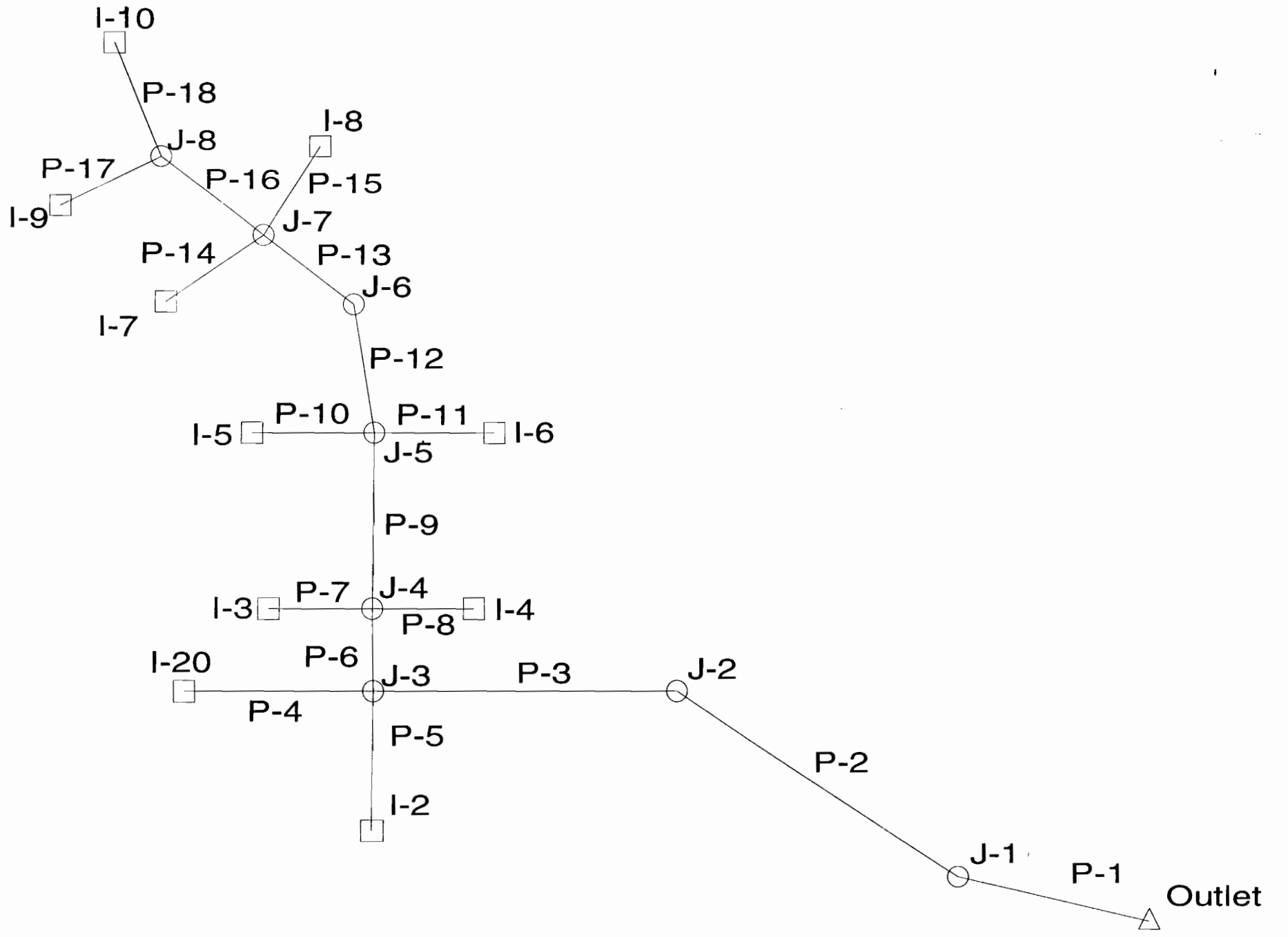

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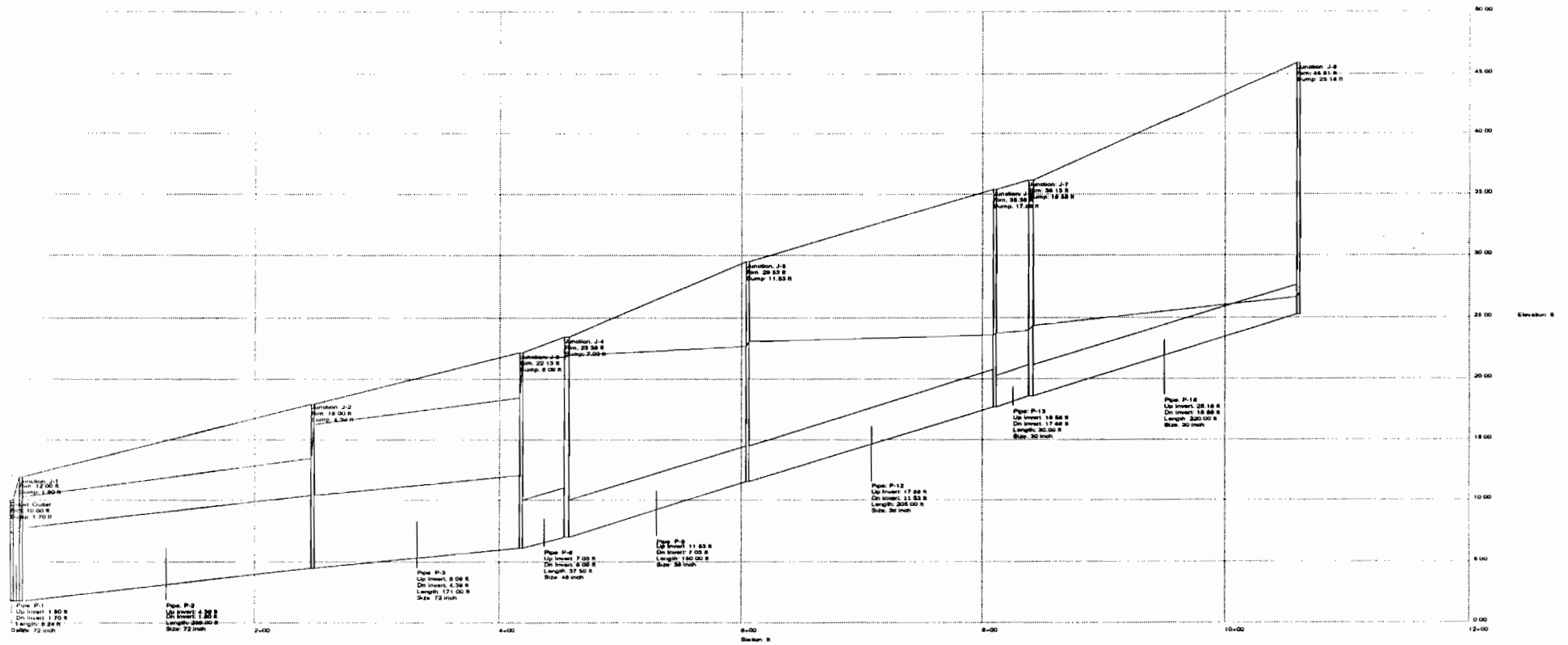
Project Engineer: rmm
StormCAD v1.0



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Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Weighted Roughness Coefficient	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Description	Discharge (cfs)
P-4	I-20	J-3	10.00	0.00	0.00	0.00	0.00	0.00	66 inch	474.88	14.20	6.29	6.09	0.020000		337.41
P-5	I-2	J-3	26.00	0.00	0.00	0.00	0.00	0.00	54 inch	439.70	5.68	7.39	6.09	0.050000		90.30
P-10	I-5	J-5	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.10	25.29	25.05	0.020000		6.50
P-11	I-6	J-5	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.10	25.29	25.05	0.020000		6.50
P-14	I-7	J-7	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.40	31.89	31.65	0.020000		7.50
P-15	I-8	J-7	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	6.40	31.89	31.65	0.020000		7.50
P-17	I-9	J-8	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	7.00	39.42	39.18	0.020000		9.50
P-18	I-10	J-8	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	7.00	39.42	39.18	0.020000		9.50
P-16	J-8	J-7	220.00	N/A	N/A	N/A	0.00	N/A	30 inch	71.04	5.08	25.18	18.58	0.030000		19.00
P-13	J-7	J-6	30.00	N/A	N/A	N/A	0.00	N/A	30 inch	71.04	6.93	18.58	17.68	0.030000		34.00
P-12	J-6	J-5	205.00	N/A	N/A	N/A	0.00	N/A	36 inch	115.52	4.81	17.68	11.53	0.030000		34.00
P-9	J-5	J-4	150.00	N/A	N/A	N/A	0.00	N/A	36 inch	115.52	6.65	11.53	7.03	0.030000		47.00
P-8	I-4	J-4	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.20	18.14	17.90	0.020000		5.66
P-7	I-3	J-4	12.00	0.00	0.00	0.00	0.00	0.00	18 inch	14.85	3.20	18.14	17.90	0.020000		5.66
P-6	J-4	J-3	37.50	N/A	N/A	N/A	0.00	N/A	48 inch	227.41	4.64	7.03	6.09	0.025067		58.32
P-3	J-3	J-2	171.00	N/A	N/A	N/A	0.00	N/A	72 inch	422.25	17.19	6.09	4.39	0.009942		486.03
P-2	J-2	J-1	239.00	N/A	N/A	N/A	0.00	N/A	72 inch	440.85	17.19	4.39	1.80	0.010837		486.03
P-1	J-1	Outlet	8.24	N/A	N/A	N/A	0.00	N/A	72 inch	466.52	17.62	1.80	1.70	0.012136		486.03

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