SUBDIVISION COMMITTEE
METROPOLITAN AREA PLANNING COMMISSION

AGENDA ITEM NO. 5
APRIL 21, 2005

STAFF REPORT
(Preliminary Plat)

CASE NUMBER: **SUB 2005-40 -- THE WOODS ADDITION**

OWNER/APPLICANT: Maple Group, L.L.C., Attn: Jay Russell, P.O. Box 75337, Wichita, KS 67235-5337

SURVEYOR/ENGINEER: Baughman Company, P.A., Attn: Phil Meyer, 315 Ellis, Wichita, KS 67211

LOCATION: East of 151st St. West, North side of Maple

SITE SIZE: 75.30 acres

NUMBER OF LOTS

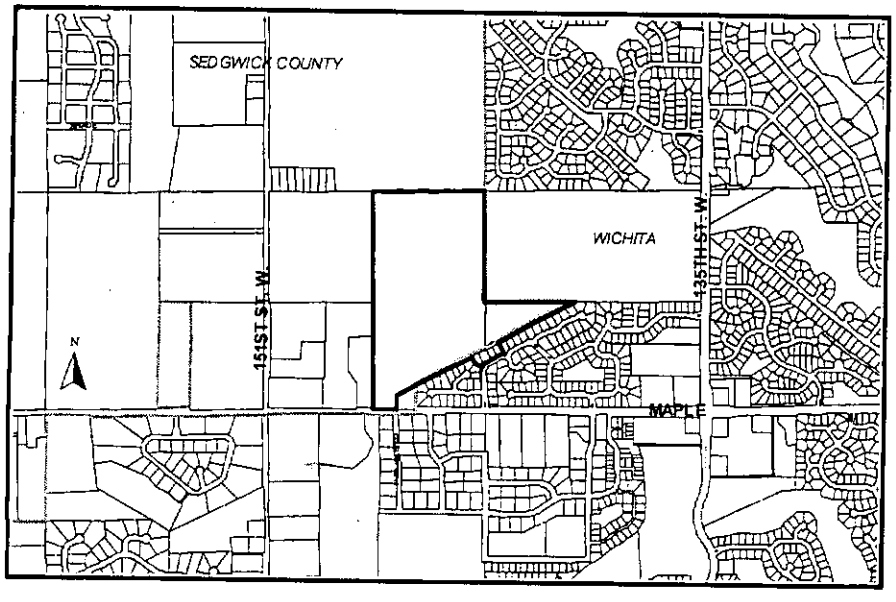
Residential:	109
Office:	
Commercial:	
Industrial:	
Total:	**109**

MINIMUM LOT AREA: 12,600 sq. ft.

CURRENT ZONING: SF-20, Single-Family Residential

PROPOSED ZONING: SF-5, Single-Family Residential

VICINITY MAP



NOTE: This site is located in the County adjoining Wichita's city limits and annexation is required. The site is currently zoned SF-20, Single-Family residential and will be converted to SF-5, Single-Family Residential upon annexation.

STAFF COMMENTS:

A. Prior to this plat being scheduled for City Council review, annexation of the property will need to be completed. Upon annexation, the property will be zoned SF-5, Single-Family Residential and allow for the lot sizes being platted.

B. The applicant shall guarantee the extension of sanitary sewer and City water to serve the lots being platted.

C. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning Department for recording.

D. **City Engineering** needs to comment on the status of the applicant's drainage concept.

E. The Applicant shall guarantee the paving of the proposed streets. The guarantee shall also provide for sidewalks on at least one side of all through, non cul-de-sac streets.

F. In accordance with the KS Wetland Mapping Conventions under the Memorandum of Understanding between the USDA-NRCS; USEPA; USACE; and USF&WS, this site has been identified as one with potential wetland hydrology. The US Army Corps of Engineers (USACE) should be contacted (316-322-8247) to have a wetland determination completed."

G. If any of the intended recreational uses for the reserves includes a swimming pool, "neighborhood swimming pool" shall be specified in the plattor's text and a site plan shall be submitted with the final plat, for review and approval by the Planning Director. The site plan shall include the information indicated in the Subdivision Regulations. Otherwise a conditional use and public hearing will be needed in the future.

H. The final plat shall state in the plattor's text the purposes of the proposed reserves as well as the ownership and maintenance responsibilities.

I. Provisions shall be made for ownership and maintenance of the proposed reserves. The applicant shall either form a lot owners' association prior to recording the plat or shall submit a covenant stating when the association will be formed, when the reserves will be deeded to the association and who is to own and maintain the reserves prior to the association taking over those responsibilities.

J. This covenant shall also provide for the Homeowners' Association to maintain the "parking strip" located between this site's south property line and driving surface for Maple.

K. For those reserves being platted for drainage purposes, the required covenant which provides for ownership and maintenance of the reserves shall grant, to the City, the authority to maintain the drainage reserves in the event the owner(s) fail to do so. The covenant shall provide for the cost of such maintenance to be charged back to the owner(s) by the governing body.

L. **City Fire Department** needs to comment on the street length of City View Ct (950 feet) in Block B. The Subdivision Regulations limit urban cul-de-sacs to 800 feet in length. ***City Fire Department requests the Applicant reduce the street length of City View Ct to the 800-ft standard and reconfigure lots at terminus or in the alternative dedicate a public street right-of-way to the south.***

M. The turnaround for City View Ct needs to be labeled as 37'R.

N. Since this plat proposes the platting of narrow street right-of-way with adjacent "15-foot street drainage and utility easements", a restrictive covenant shall be submitted which calls out restrictions for lot-owner use of these easements. Retaining walls and change of grade shall be prohibited within these easements as well as fences, earth berms and mass plantings.

O. The applicant shall submit a covenant which provides for four (4) off-street parking spaces per dwelling unit on each lot which abuts a 32-foot or 58-foot street. The covenant shall inventory the affected lots by lot and block number and shall state that the covenant runs with the land and is binding on future owners and assigns.

P. A street stub should be shown to the west in order to provide for connection with potential subdivision of the adjacent property.

Q. **GIS** needs to comment on the plat's street names. ***The southern Country View Lane Ct should be changed to Country View Ct. Country View Lane should be labeled Country View Ln. The east section of Meribeau should be City View. The west section of Meribeau should be Fawnwood. The north part (Blk A, Lot 9-27) of Country View Ln should be Fawnwood. The northern Country View Lane Ct should be Fawnwood Ct. The entire loop (Blk C, Lots 13-21) should all be Kennedy.***

R. The applicant shall submit a copy of the instrument, which establishes the pipeline easements on the property, which verifies that the easements shown are sufficient and that utilities may be located adjacent to and within the easements. Any relocation, lowering or encasement of the pipeline, required by this development, will not be at the expense of the City of Wichita.

S. The applicant's agent shall determine any setback requirements for the pipelines by researching the text of the pipeline agreements. If a setback from the pipeline easements is provided for in the pipeline easement agreements, it shall be indicated on the face of the plat.

T. The Applicant is reminded that a platting binder is required with the final plat. Approval of this plat will be subject to submittal of this binder and any relevant conditions found by such a review.

U. The plattor's text shall include language that a drainage plan has been developed for the plat and that all drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of stormwater.

V. The applicant shall install or guarantee the installation of all utilities and facilities that are applicable and described in Article 8 of the MAPC Subdivision Regulations. (Water service and fire hydrants required by Article 8 for fire protection shall be as per the direction and approval of the Chief of the Fire Department.)

W. The applicant's engineer is advised that the Register of Deeds is requiring the name(s) of the notary public, who acknowledges the signatures on this plat, to be printed beneath the notary's signature.

X. To receive mail delivery without delay, and to avoid unnecessary expense, the applicant is advised of the necessity to meet with the U.S. Postal Service Growth Management Coordinator (Phone: 316-946-4556) prior to development of the plat so that the type of delivery, and the tentative mailbox locations can be determined.

Y. The applicant is advised that various State and Federal requirements specifically but not limited to the Army Corps of Engineers, Kanopolis Project Office, Rt. 1, Box 317, Valley Center, KS 67147) for the control of soil and wind erosion and the protection of wetlands may impact how this site can be developed. It is the applicant's responsibility to contact all appropriate agencies to determine any such requirements.

Z. The owner of the subdivision should note that any construction that results in earthwork activities that will disturb one (1) acre or more of ground cover requires a Federal/State NPDES Storm Water Discharge Permit from the Kansas Department of Health and Environment in Topeka. Also, for projects located within the City of Wichita, erosion and sediment control devices must be used on ALL projects. For projects outside of the City of Wichita, but within the Wichita Metropolitan area, the owner should contact the appropriate governmental jurisdiction concerning erosion and sediment control device requirements.

AA. Perimeter closure computations shall be submitted with the final plat tracing.

BB. Recording of the plat within 30 days after approval by the City Council and/or County Commission.

CC. The representatives from the **utility companies** should be prepared to comment on the need for any additional utility easements to be platted on this property.

DD. The applicant is reminded that a compact disc (CD) shall be submitted with the final plat tracing to the Planning Department detailing this plat in digital format in AutoCAD, or sent via e-mail to MAPD (cholloway@wichita.gov). This will be used by the City and County GIS Department.

SUBDIVISION COMMITTEE
METROPOLITAN AREA PLANNING COMMISSION

AGENDA ITEM NO. 4
JUNE 2, 2005

STAFF REPORT
(Final Plat, Preliminary Plat Approved 4/21/05)

CASE NUMBER: **SUB 2005-40 -- THE WOODS ADDITION**

OWNER/APPLICANT: Maple Group, L.L.C., Attn: Jay Russell, P.O. Box 75337, Wichita, KS 67235-5337

SURVEYOR/ENGINEER: Baughman Company, P.A., Attn: Phil Meyer, 315 Ellis, Wichita, KS 67211

LOCATION: East of 151st St. West, North side of Maple

SITE SIZE: 75.30 acres

NUMBER OF LOTS

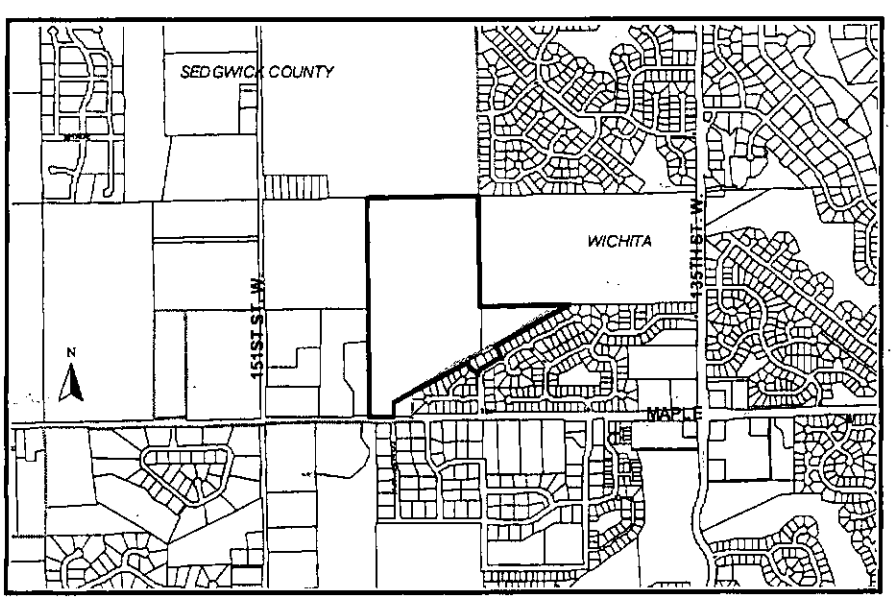
Residential:	109
Office:	
Commercial:	
Industrial:	
Total:	**109**

MINIMUM LOT AREA: 12,600 sq. ft.

CURRENT ZONING: SF-20, Single-Family Residential

PROPOSED ZONING: SF-5, Single-Family Residential

VICINITY MAP



contact the pipeline companies regarding the location of a bike path within the pipeline easement.

A bike path easement has not been included within the plat.

L. **City Fire Department** needs to comment on the street length of City View Ct (950 feet) in Block B. The Subdivision Regulations limit urban cul-de-sacs to 800 feet in length. ***City Fire Department requests the Applicant reduce the street length of City View Ct to the 800-ft standard and reconfigure lots at terminus or in the alternative dedicate a public street right-of-way to the south. The Subdivision Committee approved the plat with the 800-ft standard.***

The Applicant is appealing this condition.

M. Since this plat proposes the platting of narrow street right-of-way with adjacent "15-foot street drainage and utility easements", a restrictive covenant shall be submitted which calls out restrictions for lot-owner use of these easements. Retaining walls and change of grade shall be prohibited within these easements as well as fences, earth berms and mass plantings.

N. The applicant shall submit a covenant which provides for four (4) off-street parking spaces per dwelling unit on each lot which abuts a 32-foot or 58-foot street. The covenant shall inventory the affected lots by lot and block number and shall state that the covenant runs with the land and is binding on future owners and assigns.

O. A street stub should be shown to the west in order to provide for connection with potential subdivision of the adjacent property.

A street stub to the west has been provided as requested.

P. **GIS** needs to comment on the plat's street names. ***The street names are approved.***

Q. An onsite benchmark is needed.

R. The applicant shall submit a copy of the instrument, which establishes the pipeline easements on the property, which verifies that the easements shown are sufficient and that utilities may be located adjacent to and within the easements. Any relocation, lowering or encasement of the pipeline, required by this development, will not be at the expense of the City of Wichita.

S. The applicant's agent shall determine any setback requirements for the pipelines by researching the text of the pipeline agreements. If a setback from the pipeline easements is provided for in the pipeline easement agreements, it shall be indicated on the face of the plat.

T. The Applicant is reminded that a platting binder is required with the final plat. Approval of this plat will be subject to submittal of this binder and any relevant conditions found by such a review.

U. The plattor's text shall include language that a drainage plan has been developed for the plat and that all drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of stormwater.

NOTE: This site is located in the County adjoining Wichita's city limits and annexation is required. The site is currently zoned SF-20, Single-Family residential and will be converted to SF-5, Single-Family Residential upon annexation.

STAFF COMMENTS:

A. Prior to this plat being scheduled for City Council review, annexation of the property will need to be completed. Upon annexation, the property will be zoned SF-5, Single-Family Residential and allow for the lot sizes being platted.

B. The applicant shall guarantee the extension of sanitary sewer (main and lateral) and City water to serve the lots being platted.

C. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning Department for recording.

D. City Engineering needs to comment on the status of the applicant's drainage concept. ***An off-site drainage easement is needed.***

E. The Applicant shall guarantee the paving of the proposed streets. The guarantee shall also provide for sidewalks on at least one side of all through, non cul-de-sac streets.

F. In accordance with the KS Wetland Mapping Conventions under the Memorandum of Understanding between the USDA-NRCS; USEPA; USACE; and USF&WS, this site has been identified as one with potential wetland hydrology. The US Army Corps of Engineers (USACE) should be contacted (316-322-8247) to have a wetland determination completed."

G. If any of the intended recreational uses for the reserves includes a swimming pool, "neighborhood swimming pool" shall be specified in the plattor's text and a site plan shall be submitted with the final plat, for review and approval by the Planning Director. The site plan shall include the information indicated in the Subdivision Regulations. Otherwise a conditional use and public hearing will be needed in the future.

H. Provisions shall be made for ownership and maintenance of the proposed reserves. The applicant shall either form a lot owners' association prior to recording the plat or shall submit a covenant stating when the association will be formed, when the reserves will be deeded to the association and who is to own and maintain the reserves prior to the association taking over those responsibilities.

I. This covenant shall also provide for the Homeowners' Association to maintain the "parking strip" located between this site's south property line and driving surface for Maple.

J. For those reserves being platted for drainage purposes, the required covenant which provides for ownership and maintenance of the reserves shall grant, to the City, the authority to maintain the drainage reserves in the event the owner(s) fail to do so. The covenant shall provide for the

V. The applicant shall install or guarantee the installation of all utilities and facilities that are applicable and described in Article 8 of the MAPC Subdivision Regulations. (Water service and fire hydrants required by Article 8 for fire protection shall be as per the direction and approval of the Chief of the Fire Department.)

W. The applicant's engineer is advised that the Register of Deeds is requiring the name(s) of the notary public, who acknowledges the signatures on this plat, to be printed beneath the notary's signature.

X. To receive mail delivery without delay, and to avoid unnecessary expense, the applicant is advised of the necessity to meet with the U.S. Postal Service Growth Management Coordinator (Phone: 316-946-4556) prior to development of the plat so that the type of delivery, and the tentative mailbox locations can be determined.

Y. The applicant is advised that various State and Federal requirements specifically but not limited to the Army Corps of Engineers, Kanopolis Project Office, Rt. 1, Box 317, Valley Center, KS 67147) for the control of soil and wind erosion and the protection of wetlands may impact how this site can be developed. It is the applicant's responsibility to contact all appropriate agencies to determine any such requirements.

Z. The owner of the subdivision should note that any construction that results in earthwork activities that will disturb one (1) acre or more of ground cover requires a Federal/State NPDES Storm Water Discharge Permit from the Kansas Department of Health and Environment in Topeka. Also, for projects located within the City of Wichita, erosion and sediment control devices must be used on ALL projects. For projects outside of the City of Wichita, but within the Wichita Metropolitan area, the owner should contact the appropriate governmental jurisdiction concerning erosion and sediment control device requirements.

AA. Perimeter closure computations shall be submitted with the final plat tracing.

BB. Recording of the plat within 30 days after approval by the City Council and/or County Commission.

CC. The representatives from the **utility companies** should be prepared to comment on the need for any additional utility easements to be platted on this property.

DD. The applicant is reminded that a compact disc (CD) shall be submitted with the final plat tracing to the Planning Department detailing this plat in digital format in AutoCAD, or sent via e-mail to MAPD (cholloway@wichita.gov). This will be used by the City and County GIS Department.

THE WOODS ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS

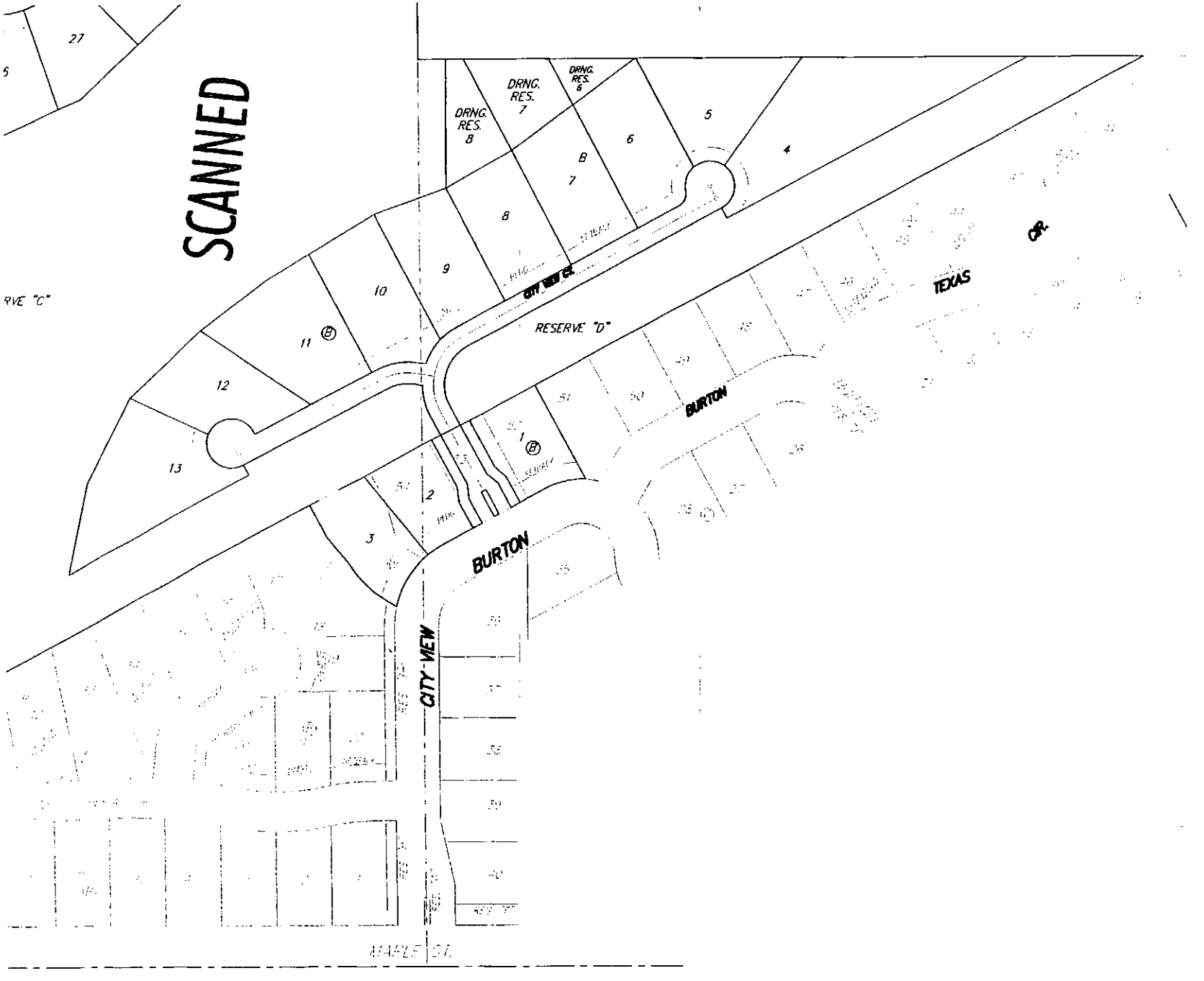
CONCEPT "A"

Baughman Company, P.A.

THE WOODS ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

CONCEPT "B"

Baughman Company, P.A.
Baughman



THE WOODS ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

CONCEPT "C"

Baughman Company, P.A.
Baughman

Baughman

TRANSMITTAL

TO: Vickie Huang	FROM: Trevor Kurth
COMPANY: City of Wichita	DATE: 6/6/05
ADDRESS:	PROJECT: The Woods
CITY/ STATE: Wichita, KS	PROJECT NUMBER:

RE:
Drainage & Grading Plan

VIA: DELIVERY

We are sending you ☒ ATTACHED ☐ UNDER SEPARATE COVER

☒ PLANS ☐ PRINTS ☐ SHOP DRAWINGS ☐ SAMPLES ☐ SPECS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ DISK ☐ OTHER

COPIES	DATE	DESCRIPTION
2	6-6-05	**The Woods Drainage Plan**
2	6-6-05	**The Woods Grading Plan**
1	6-6-05	**StormCad Calculatons**

☐ URGENT ☐ FOR APPROVAL ☐ FOR YOUR INFO ☒ FOR REVIEW & COMMENT
☐ APPROVED AS NOTED ☐ REVISE AS NOTED ☐ REVISE AND RETURN
☐ AS REQUESTED ☐ PLEASE REPLY ☐ FOR BIDS DUE ☐

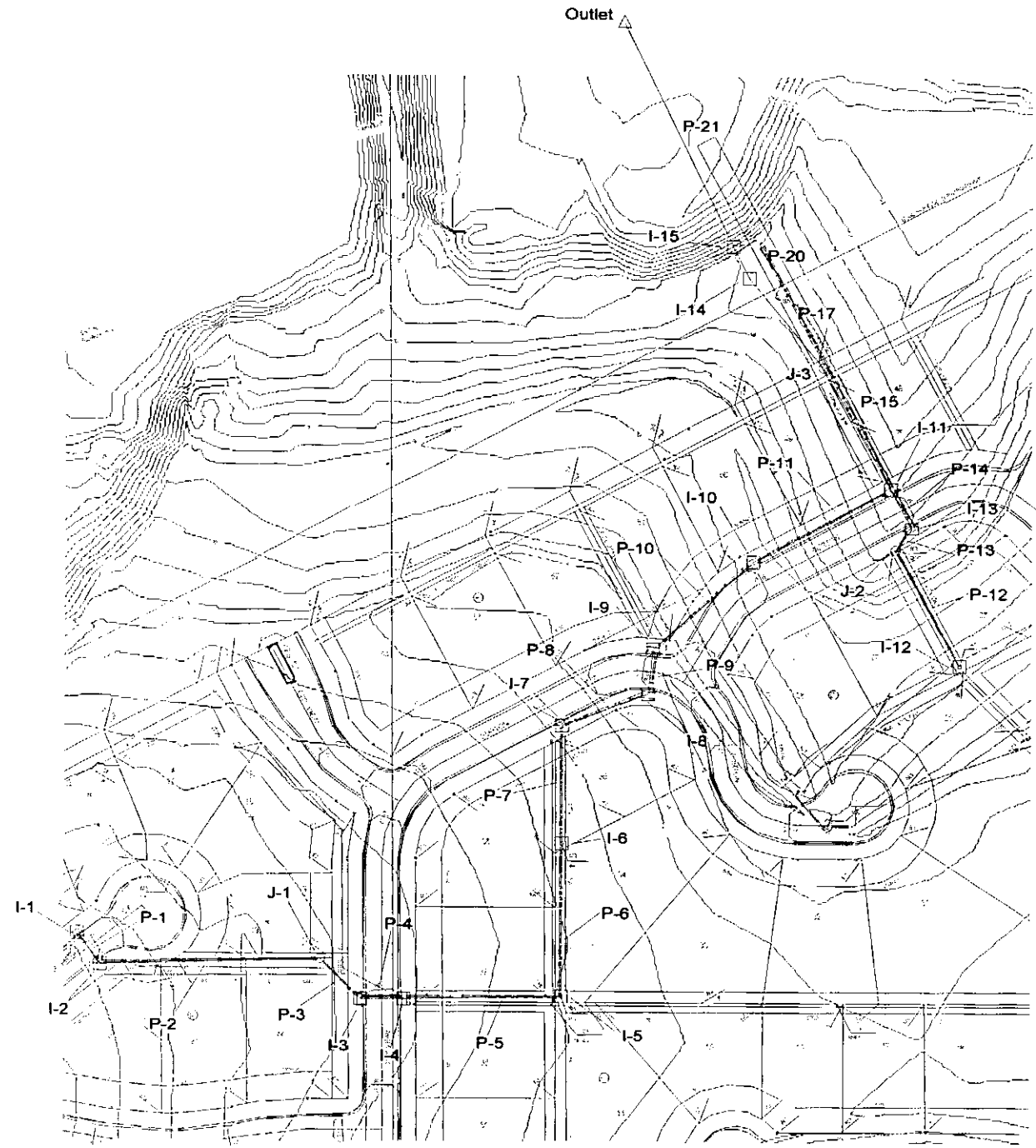
NOTES/ COMMENTS:

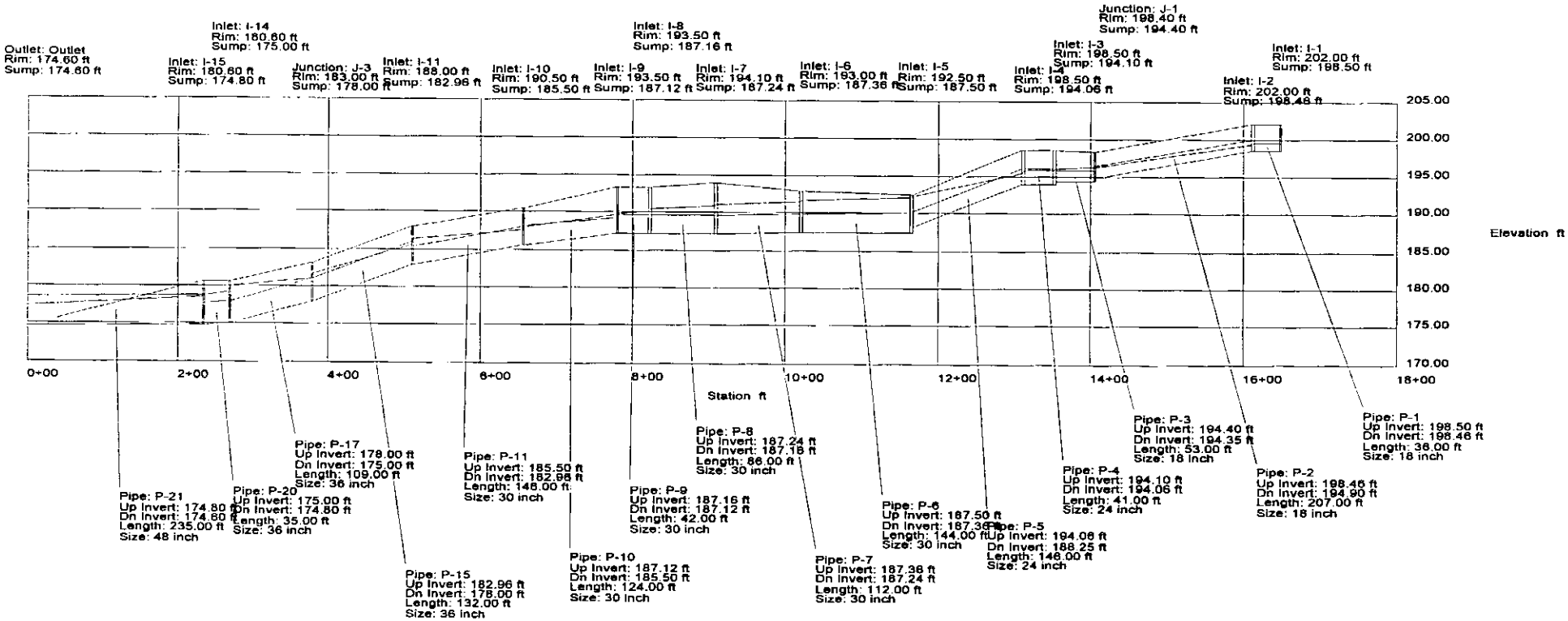
SIGNED: Trevor Kurth
Trevor R. Kurth, I.E.

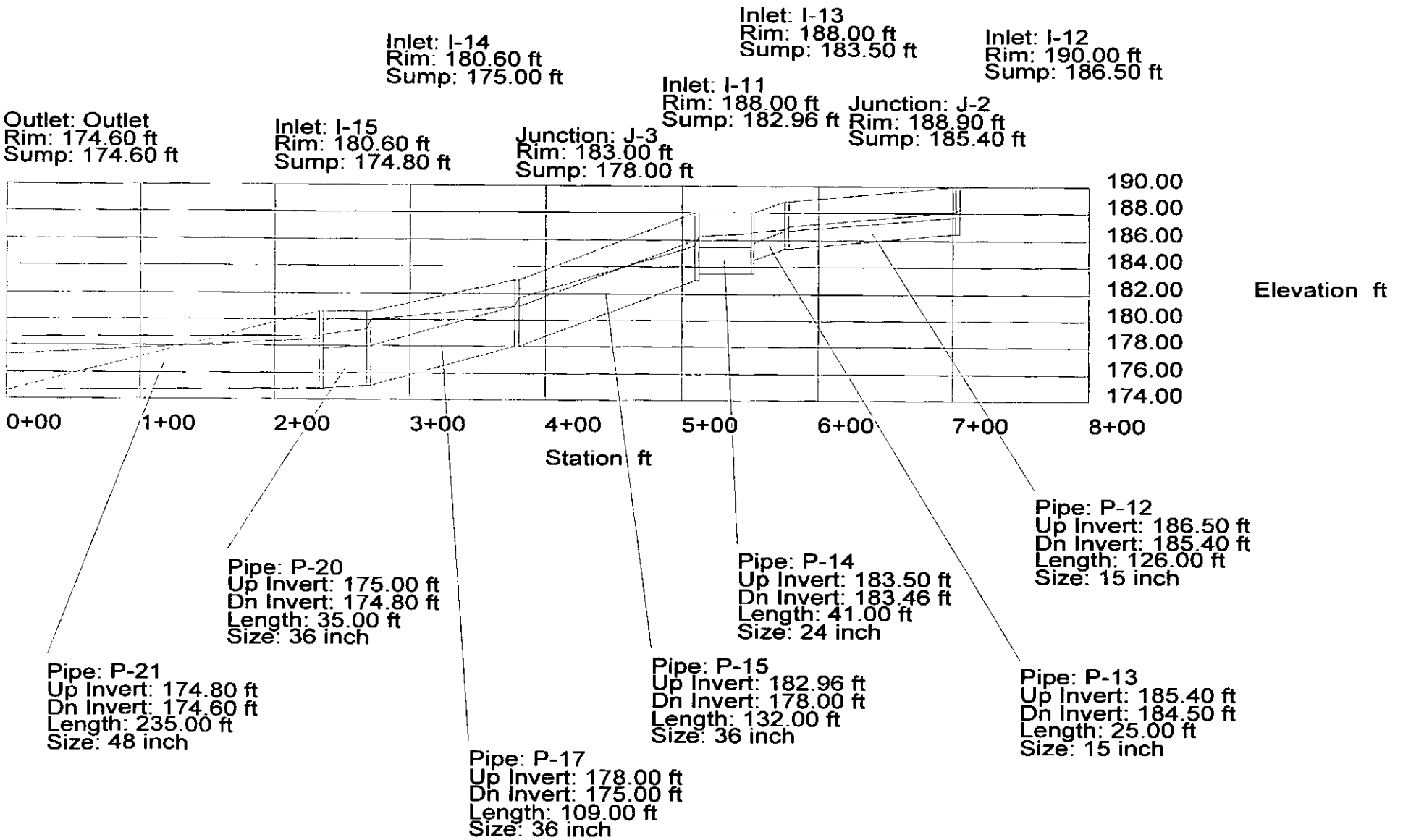
Copy: file

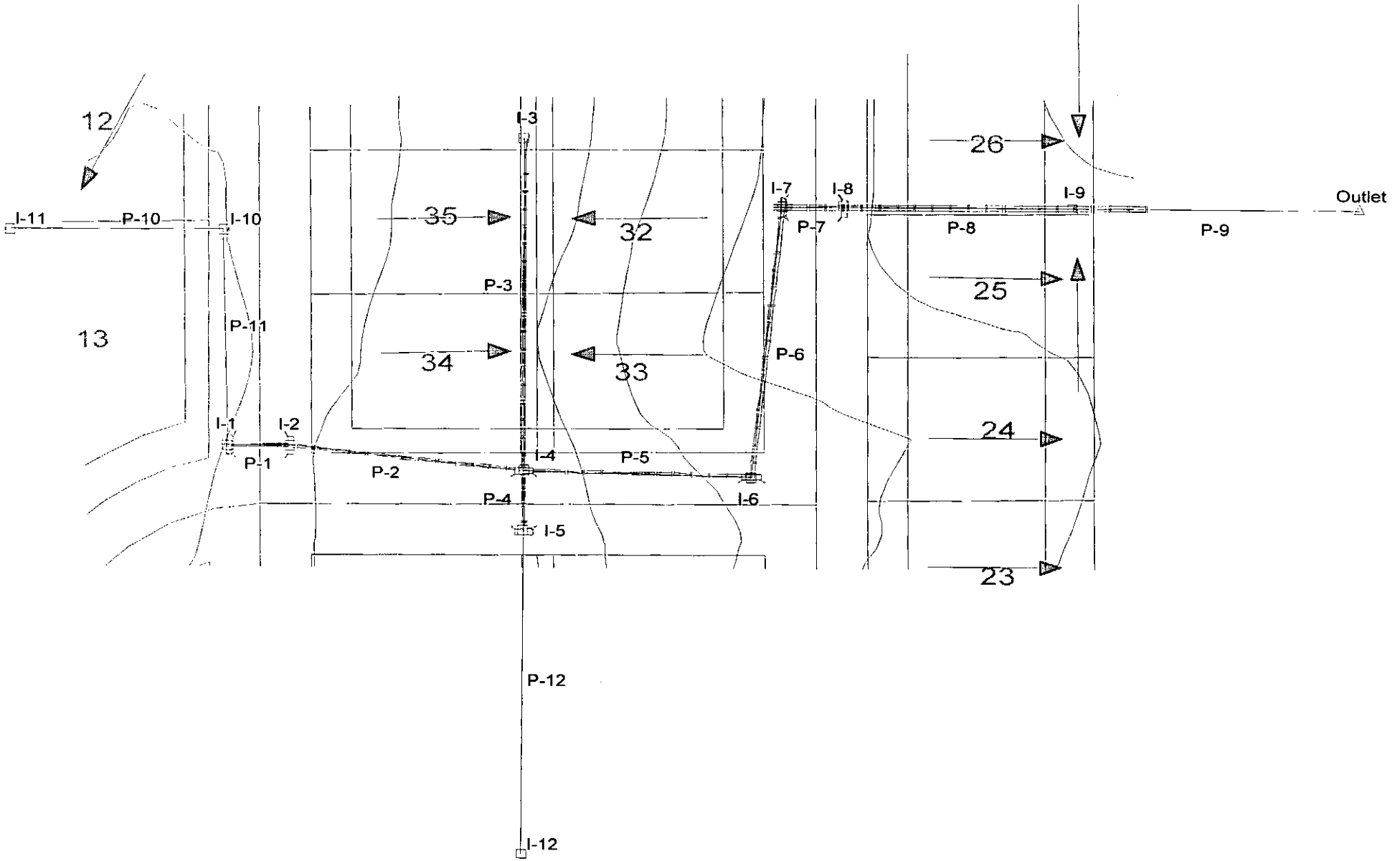
ENGINEERING
SURVEYING
PLANNING
LANDSCAPE ARCHITECTURE

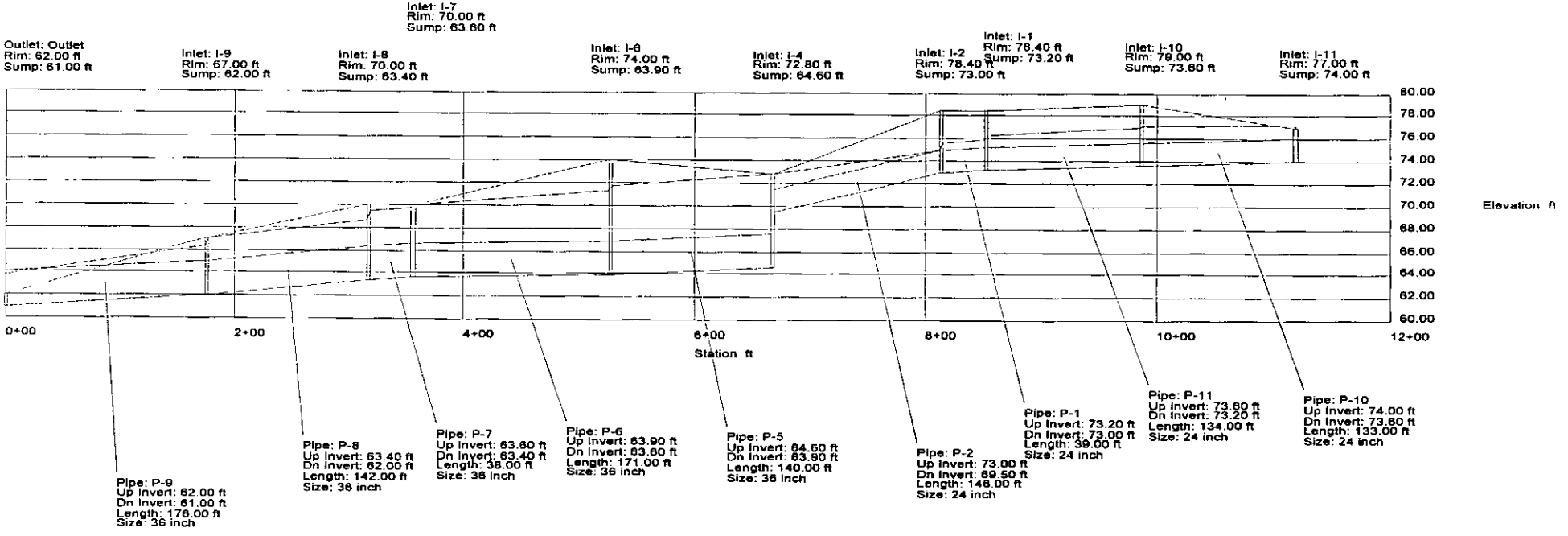
Baughman Company, P.A.
315 Ellis Street
Wichita, Kansas 67203
P 316.262.7271
F 316.262.0149

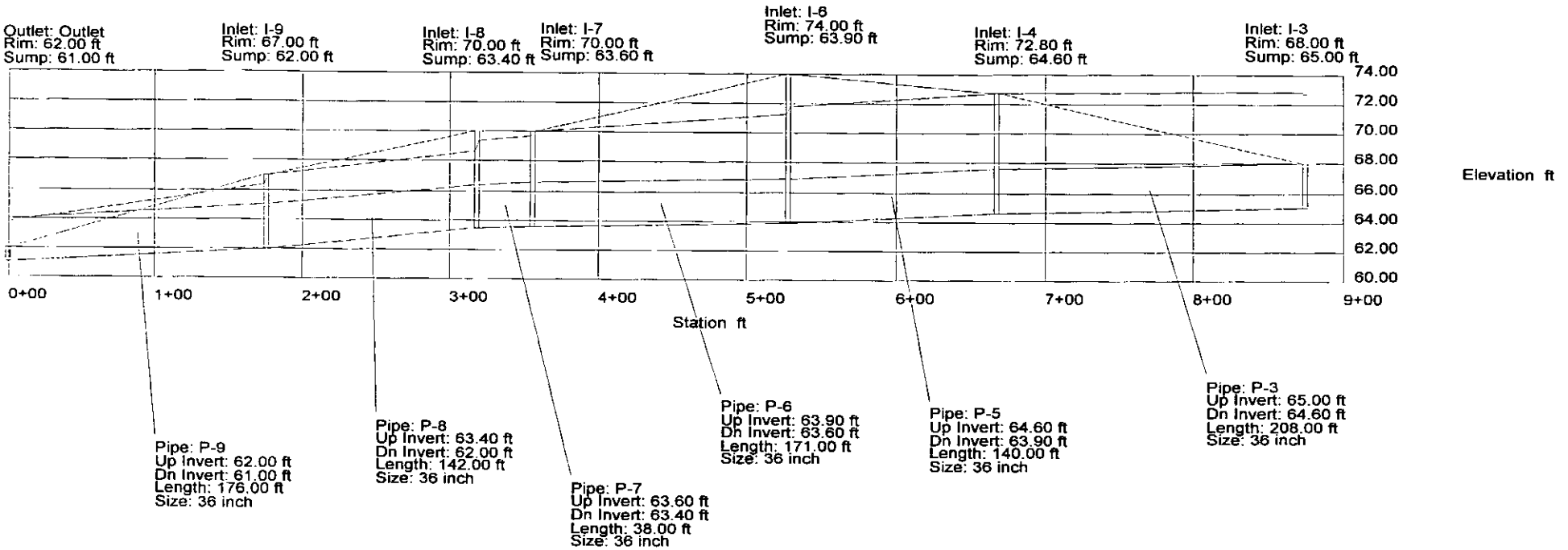

Outlet
P-21
I-15
P-20
I-14
P-17
J-3
P-15
I-11
P-11
P-14
I-10
I-13
P-10
P-13
J-2
P-12
I-9
P-8
I-12
P-9
I-7
I-8
P-7
I-6
J-1
I-1
P-1
P-4
P-6
I-2
P-2
P-3
I-3
I-4
P-5
I-5

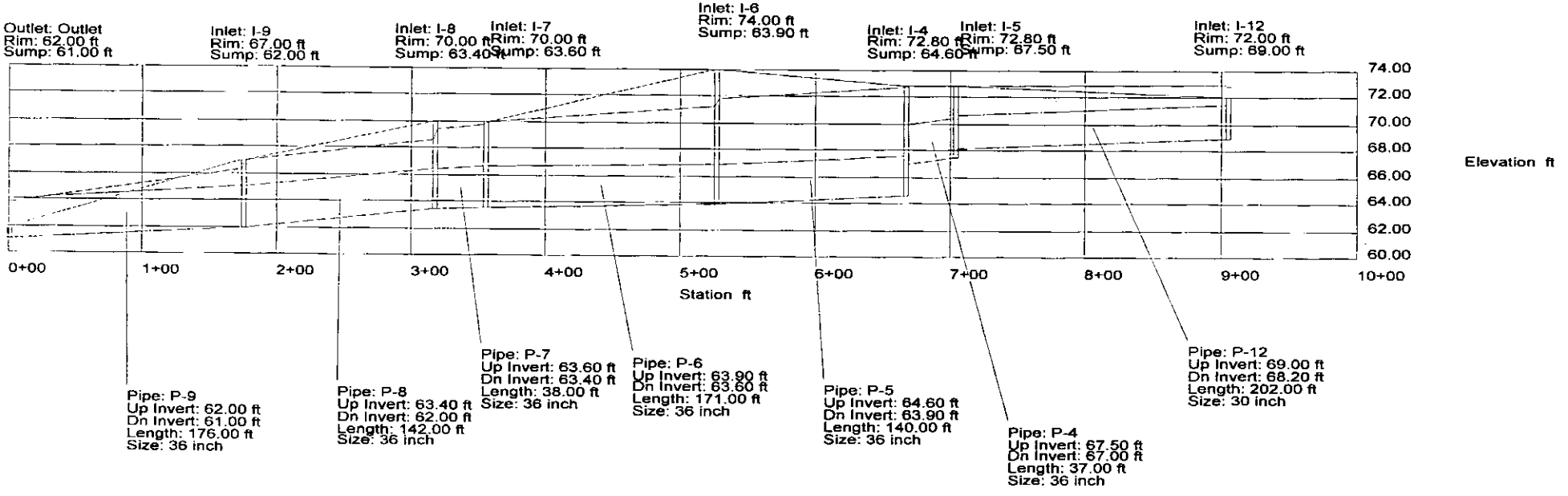


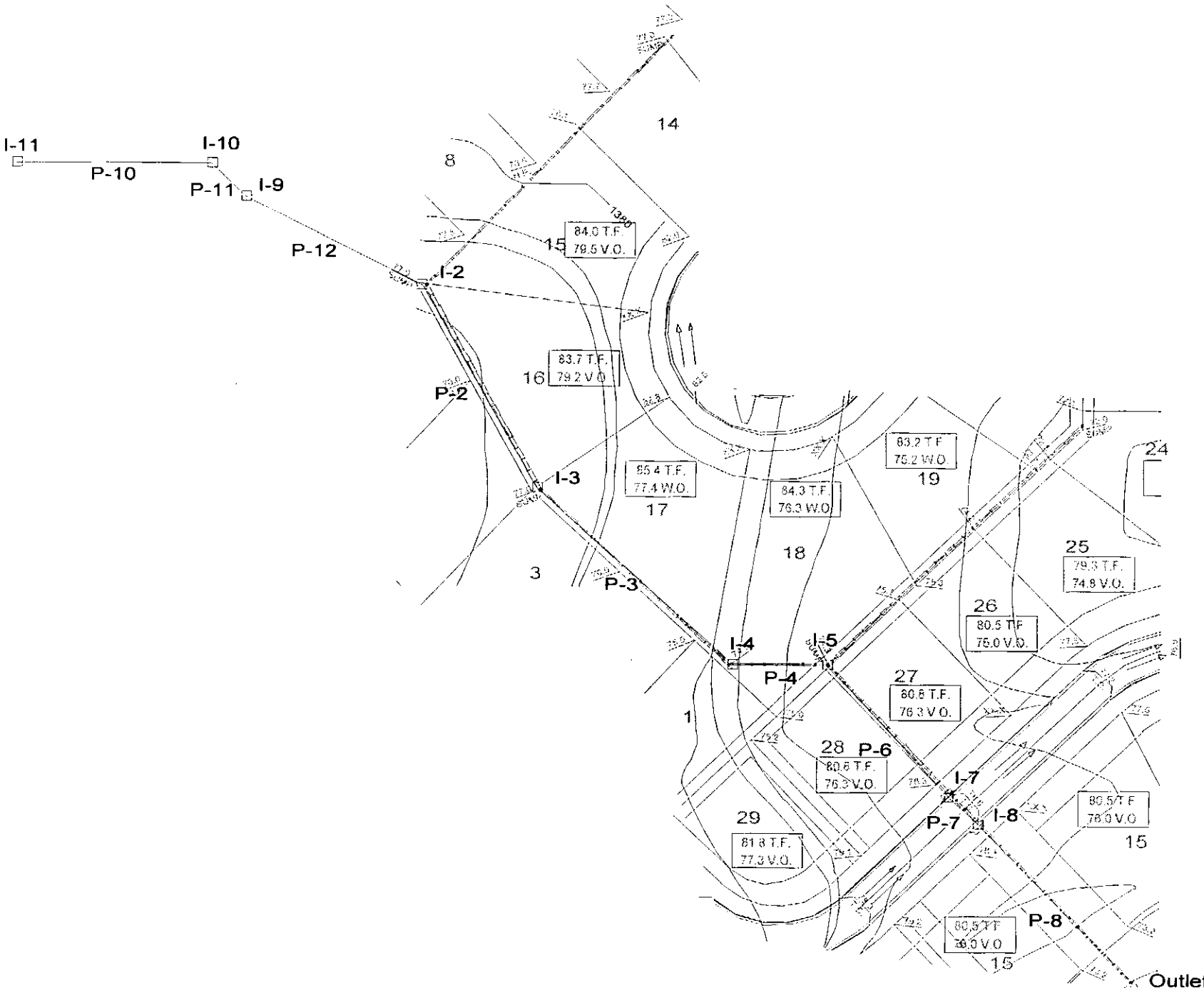

Inlet: I-13
Rim: 188.00 ft
Sump: 183.50 ft
Inlet: I-14
Rim: 180.60 ft
Sump: 175.00 ft
Inlet: I-12
Rim: 190.00 ft
Sump: 186.50 ft
Inlet: I-11
Rim: 188.00 ft
Sump: 182.96 ft
Junction: J-2
Rim: 188.90 ft
Sump: 185.40 ft
Outlet: Outlet
Rim: 174.60 ft
Sump: 174.60 ft
Inlet: I-15
Rim: 180.60 ft
Sump: 174.80 ft
Junction: J-3
Rim: 183.00 ft
Sump: 178.00 ft
190.00
188.00
186.00
184.00
182.00
180.00
178.00
176.00
174.00
Elevation ft
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
Station ft
Pipe: P-12
Up Invert: 186.50 ft
Dn Invert: 185.40 ft
Length: 126.00 ft
Size: 15 inch
Pipe: P-20
Up Invert: 175.00 ft
Dn Invert: 174.80 ft
Length: 35.00 ft
Size: 36 inch
Pipe: P-14
Up Invert: 183.50 ft
Dn Invert: 183.46 ft
Length: 41.00 ft
Size: 24 inch
Pipe: P-21
Up Invert: 174.80 ft
Dn Invert: 174.60 ft
Length: 235.00 ft
Size: 48 inch
Pipe: P-15
Up Invert: 182.96 ft
Dn Invert: 178.00 ft
Length: 132.00 ft
Size: 36 inch
Pipe: P-13
Up Invert: 185.40 ft
Dn Invert: 184.50 ft
Length: 25.00 ft
Size: 15 inch
Pipe: P-17
Up Invert: 178.00 ft
Dn Invert: 175.00 ft
Length: 109.00 ft
Size: 36 inch


12
I-3
26
I-7
I-8
I-9
Outlet
I-11
P-10
I-10
35
32
P-7
P-8
P-9
P-3
25
13
P-11
34
33
P-6
I-1
I-2
24
P-1
P-2
I-4
P-5
P-4
I-6
I-5
23
P-12
I-12




Outlet: Outlet
Rim: 62.00 ft
Sump: 61.00 ft
Inlet: I-9
Rim: 67.00 ft
Sump: 62.00 ft
Inlet: I-8
Rim: 70.00 ft
Sump: 63.40 ft
Inlet: I-7
Rim: 70.00 ft
Sump: 63.60 ft
Inlet: I-6
Rim: 74.00 ft
Sump: 63.90 ft
Inlet: I-4
Rim: 72.80 ft
Sump: 64.60 ft
Inlet: I-3
Rim: 68.00 ft
Sump: 65.00 ft
74.00
72.00
70.00
68.00
66.00
64.00
62.00
60.00
Elevation ft
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
Station ft
Pipe: P-9
Up Invert: 62.00 ft
Dn Invert: 61.00 ft
Length: 176.00 ft
Size: 36 inch
Pipe: P-8
Up Invert: 63.40 ft
Dn Invert: 62.00 ft
Length: 142.00 ft
Size: 36 inch
Pipe: P-7
Up Invert: 63.60 ft
Dn Invert: 63.40 ft
Length: 38.00 ft
Size: 36 inch
Pipe: P-6
Up Invert: 63.90 ft
Dn Invert: 63.60 ft
Length: 171.00 ft
Size: 36 inch
Pipe: P-5
Up Invert: 64.60 ft
Dn Invert: 63.90 ft
Length: 140.00 ft
Size: 36 inch
Pipe: P-3
Up Invert: 65.00 ft
Dn Invert: 64.60 ft
Length: 208.00 ft
Size: 36 inch

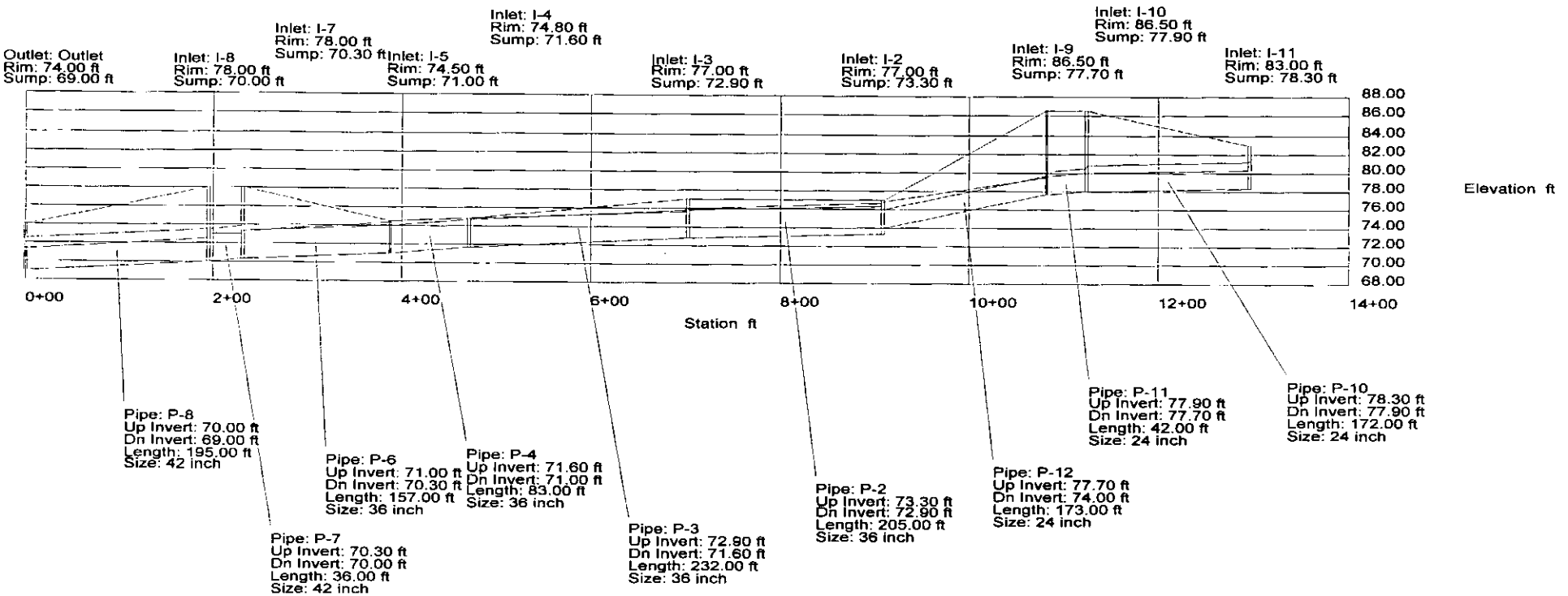


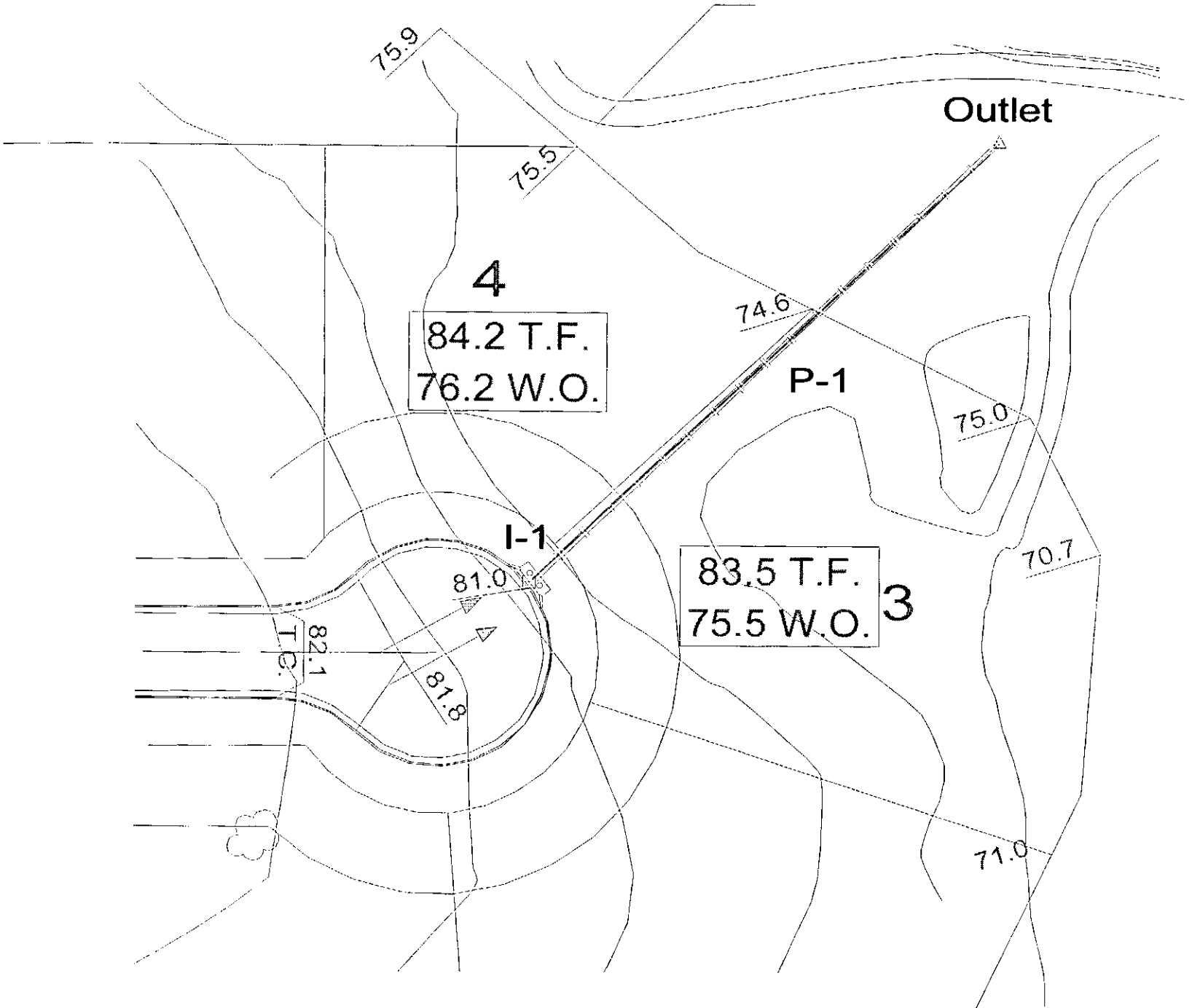


Project Title: The Woods
f:\hydro\projects\the woods\stormcad\ssy2-100.stm
06/03/05 08:47:31 AM

Baughman Company, P.A.
 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Baughman Company, P.A.
StormCAD v1.0





Project Title: The Woods
f:\hydro\projects\the woods\stormcad\sys3-100.stm
06/03/05 08:48:20 AM

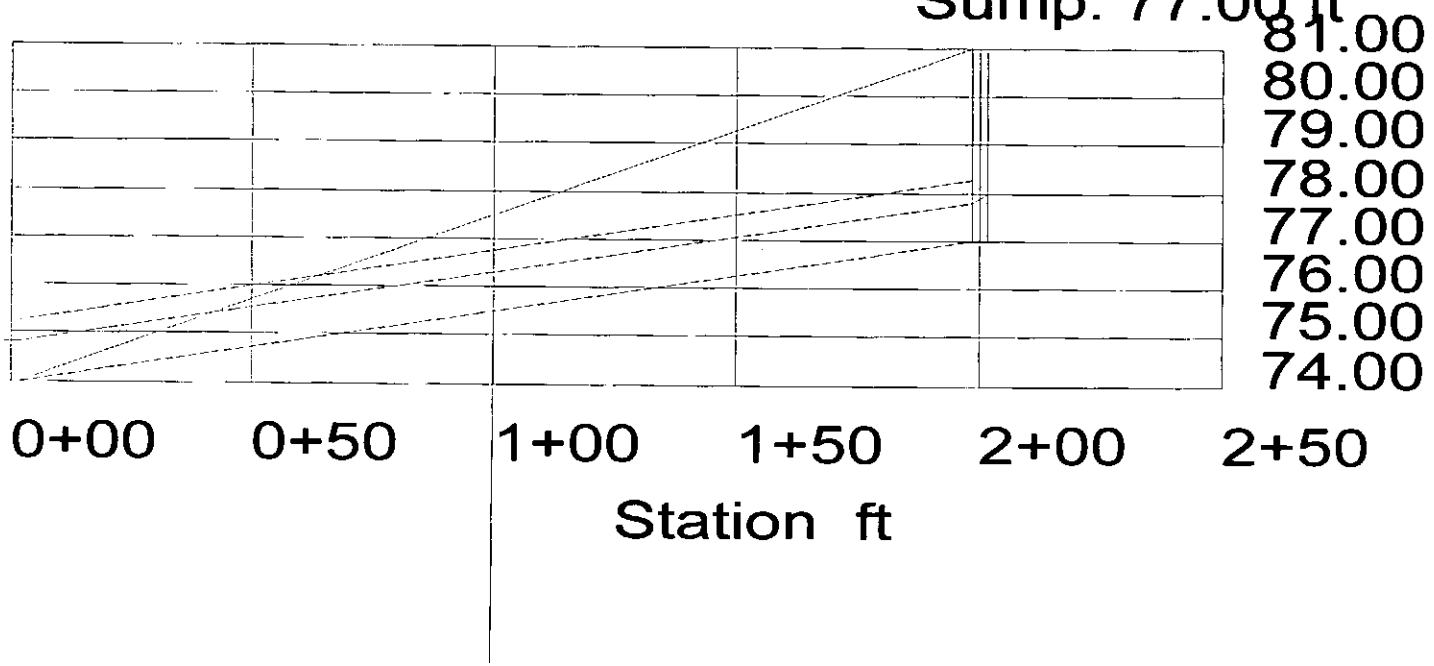
Baughman Company, P.A.

 37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Project Engineer: Baughman Company, P.A.
StormCAD v1.0

Outlet: Outlet
Rim: 74.00 ft
Sump: 74.00 ft

Inlet: I-1
Rim: 81.00 ft
Sump: 77.00 ft



Pipe: P-1
Up Invert: 77.00 ft
Dn Invert: 74.00 ft
Length: 200.00 ft
Size: 15 inch

Baughman

TRANSMITTAL

TO:	FROM:
Scott Lindebak	Trevor Kurth
COMPANY:	DATE:
City of Wichita	1-10-06
ADDRESS:	PROJECT:
7th Floor City Hall	The Woods DWR
CITY/ STATE:	PROJECT NUMBER:
Wichita, KS	

RE:
The Woods Addition DWR

VIA: DELIVERY

We are sending you ☒ ATTACHED ☐ UNDER SEPARATE COVER

☒ PLANS ☐ PRINTS ☐ SHOP DRAWINGS ☐ SAMPLES ☐ SPECS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ DISK ☐ OTHER

COPIES	DATE	DESCRIPTION
1	1-10-06	**The Woods Addition - DWR Permit**

☐ URGENT ☒ FOR APPROVAL ☐ FOR YOUR INFO ☒ FOR REVIEW & COMMENT
☐ APPROVED AS NOTED ☐ REVISE AS NOTED ☐ REVISE AND RETURN
☒ AS REQUESTED ☐ PLEASE REPLY ☐ FOR BIDS DUE ☐

NOTES/ COMMENTS:
Scott,
As we discussed and as requested, attached are the copies of the HEC-RAS modeling as well as the plan sheets for The Woods Addition that was submitted to DWR. If there is anything else let me know.

SIGNED: _____
Trevor R. Kurth, I.E.

Copy: file

ENGINEERING
SURVEYING
PLANNING
LANDSCAPE ARCHITECTURE

Baughman Company, P.A.
315 Ellis Street
Wichita, Kansas 67203
P 316.262.7271
F 316.262.0149

HEC-RAS Version 3.1.3 May 2005
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X     X
X     X  X        X           X   X    X    X    X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X                   X  X     X    X       X
X     X  X        X    X              X   X    X    X       X
X     X  XXXXXX    XXXX               X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: exist floodway
Project File : fwtrial.prj
Run Date and Time: 12/5/2005 2:31:09 PM

Project in English units

Project Description:
& R SEDGWICK COUNTY FIS
100-YR BACKWATER ANALYSIS
MIDDLE
FORK CALFSKIN CREEK
SEDGWICK COUNTY FIS
100-YR BACKWATER
ANALYSIS
MIDDLE FORK CALFSKIN CREEK

PLAN DATA

Plan Title: Plan 05
Plan File : f:\HYDRO\Projects\Shadow Woods\hecras\Floodway\FWtrial\fwtrial.p05

Geometry Title: Imported Geom blg2
Geometry File : f:\HYDRO\Projects\Shadow
Woods\hecras\Floodway\FWtrial\fwtrial.g04

Flow Title : Imported Flow 02
Flow File : f:\HYDRO\Projects\Shadow
Woods\hecras\Floodway\FWtrial\fwtrial.f02

Plan Summary Information:

Number of: Cross Sections	=	35	Multiple Openings	=	0
Culverts	=	2	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3

Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.913	PF 2	1	5500	5680
1.885	PF 2	1	5500	5640
1.866	PF 2	1	5370	5525
1.858	PF 2	1	5330.2	5601.6
1.793	PF 2	1	5270	5427
1.736	PF 2	1	5250	5355
1.655	PF 2	1	5300	5500
1.595	PF 2	1	5170	5495
1.576	PF 2	1	5200	5450
1.565	PF 2	1	5200	5450
1.525	PF 2	1	5165	5240
1.493	PF 2	1	5130	5250
1.458	PF 2	1	5295	5450
1.420	PF 2	1	5175	5500
1.385	PF 2	1	5190	5595
1.351	PF 2	1	5200	5355
1.305	PF 2	1	5227	5799
1.269	PF 2	1	5529	5685
1.263	PF 2	1	5560	5690
1.239	PF 2	1	5685	5720
1.232	PF 2	1	5538	5577
1.192	PF 2	1	5126	5241
1.173	PF 2	1	5104.2	5334
1.147	PF 2	1	5265	5383
1.103	PF 2	1	5145	5682
1.071	PF 2	1	5200	5700
.963	PF 2	1	5200	6300
.859	PF 2	1	5750	5950
0.854	PF 2	1	5800	6069.9
0.848	PF 2	1	5880	6140.9
0.845	PF 2	1	5945	6060
0.83	PF 2	1	10280	10360
0.42	PF 2	1	10330	10390
0.07	PF 2	1	10260	10525
0	PF 2	1	10334	10650

FLOW DATA

Flow Title: Imported Flow 02
Flow File : f:\HYDRO\Projects\Shadow Woods\hecras\Floodway\FWtrial\fwtrial.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
RIVER-1	Reach-1	1.913	1140	1140

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1		
Known WS = 1322.37				
RIVER-1	Reach-1	PF 2		
Known WS = 1323.37				

GEOMETRY DATA

Geometry Title: Imported Geom blg2
Geometry File : f:\HYDRO\Projects\Shadow Woods\hecras\Floodway\FWtrial\fwtrial.g04

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.913

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1380.7	5038.3	1380.8	5100.6	1379.2	5150	1378.1	5173.6	1377.5
5197.8	1377.3	5250	1376.9	5300.9	1376.6	5350	1376.1	5400	1375.7
5450	1375.2	54751374.995		5486.6	1374.9	5500	1374.6	55201374.206	
5520.3	1374.2	5528.8	1374.4	55351374.063		55501373.249		55551372.977	
5560.1	1372.7	55701373.106		55771373.393		55801373.516		5596.7	1374.2
56001373.801		5605.8	1373.1	5608	1373.81	5608.9	1374.1	56151374.173	
5650.6	1374.6	56781375.229		5698.5	1375.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5550	.07	5580	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5550	5580	100 147.84	175	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.885

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1381.1	5100	1377.9	5200	1376.9	5216	1376.8	5255.2	1374
5295.6	1373.7	5350	1374.9	5454.9	1374.2	55001373.583		5550	1372.9
5576.9	1370.7	5583.3	1370.8	5587.5	1372.2	55881372.156		5602.3	1370.9
5616	1371.2	5621.8	1372.9	56251373.055		56301373.297		56401373.781	
5663.1	1374.9	5717.8	1378.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5500	.07	5640	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5500	5640	90 100.32	120	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.866

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1381.5	5016	1381	5032.6	1380.5	5076.1	1379.2	5090.2	1378.9
5136.2	1377.6	5147.8	1377.5	5196.4	1377.2	5199.2	1377	5229	1376
5255.4	1376.1	5272.4	1375.6	5345.6	1373.8	5357.4	1373.6	5365.3	1373.4
5370	1372.67	5391.7	1369.3	5411.5	1369	5469.8	1368.6	5485.2	1370.5
5486.7	1371.5	5487.1	1371.9	5489.2	1371.8	5491.8	1371.9	5500	1372.01
55101	372.144	55151	372.211	5521.6	1372.3	55251	372.339	5574	1372.9
5577.9	1372.3	5595.51	369.959	5598.2	1369.6	5599.5	1370.2	5634.8	1374.1
5672.3	1372.1	5707.5	1380.2	5744.2	1381.3	5747.2	1381.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5370	.07	5525	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5370	5525	35	43	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.858

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1380.9	5065.1	1379.1	5148.7	1377.1	5191.8	1376.6	5254.4	1375.9
5302.5	1374.7	5330.2	1370.3	5351.9	1368.7	5358.9	1370	5408	1371.7
5454.8	1372.8	5456.8	1372.8	5481.4	1372.4	5493.6	1370.3	5505.7	1369.8
5517	1372	5563.1	1370.6	5570.4	1369.3	55731	369.517	5601.6	1371.9
5639.4	1377.5	5729.4	1382.8	5749.9	1383.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5330.2	.07	5601.6	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5330.2	5601.6	260.1	340 360.06	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.793

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1378.4	5051.6	1376.4	5097.9	1374.9	5150	1373.1	5172.9	1372.1
5178.9	1372.2	5200	1371.9	5250	1371.3	52701370.992		52751370.915	
5276	1370.9	5284.2	1370.7	5300	1371	5315.5	1371.1	5325.5	1371.2
5330.5	1371.3	5332.6	1369.7	5340.9	1368.5	5349.6	1370.3	5353.4	1370.9
54001370.686		5418.7	1370.6	5423	1370.1	54251370.248		54271370.396	
5450	1372.1	5500	1376	5539.1	1378.7	5550	1379.3	5575.5	1380.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5270	.07	5427	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5270	5427	209.1	300	311.1	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.736

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1377.3	5050	1375.8	5095.9	1373.6	5142.6	1369.9	5170.9	1370.1
5200	1370.3	5232.8	1370.8	52501369.983		5268.6	1369.1	53551370.086	
5400	1370.6	5446.6	1373.9	5459.8	1375.2	5512.9	1379.1	5518.1	1379.2
5565.5	1381.3	5616.3	1383.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5250	.07	5355	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5250	5355	433.01	430	313.04	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.655

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1376	5050	1374.7	5076.8	1374.2	5100	1373.4	5150	1372.1
5205.1	1373.1	5235.5	1370.9	5250	1370.3	5272.9	1368.9	5300	1368
5309.7	1367.3	5319	1366.9	5334.8	1365.1	53901364.042		5397.4	1363.9
5415.7	1363.5	5491.9	1363.4	55001363.912		5509.3	1364.5	5539.7	1366.5
5547.3	1367.3	5589.9	1377.9	5610.3	1378.3	5617	1378.5	5688.3	1378.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5390	.07	5500	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5390	5500	324.06	315.15	190.08	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.595

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1373.9	5005.8	1374	5028.7	1373.1	5053.3	1372.6	5071.4	1372.3
5100	1369.5	5115.4	1369.1	5143	1367.7	5149.7	1366.7	51701364.162	
5174.5	1363.6	5210.1	1363.9	5228.2	1363.9	5263.2	1363.8	5292.2	1363.5
5313.3	1363.6	5485.4	1363.5	54951364.556		5515.4	1366.8	5525.3	1369
5541.1	1369.2	5559	1370	5586.8	1371.4	5634.1	1375.4	5666.8	1377.2
5681	1378.1	5707.4	1377.6	5753.7	1378.8	5765.2	1379.2	5792.2	1380.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5170	.07	5495	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5170	5495	169	100	95	.1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.576

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4900	1373.8	5000	1373	5050	1372.7	5065.9	1372.6	5100.8	1371
5134	1368.7	5143.6	1368.4	5150	1369.1	5183.5	1367.3	52001361.202	
5201.9	1360.5	5221	1360.5	5239.9	1360.5	5245.5	1360.5	5262.1	1360.5
5269.4	1360.5	5298.1	1360.5	5312.5	1368.4	5343.4	1367.6	5367.3	1367.7
5400.8	1366.6	5437.1	1366.1	54501366.508		5497.2	1368	5524.3	1369.1
5586.3	1372	5615.7	1373.3	5669.9	1375.9	5691.4	1377.7	5694	1377.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4900	.053	5200	.07	5450	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5450	116	58	174	.1 .3

CULVERT

RIVER: RIVER-1
REACH: Reach-1 RS: 1.573

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 57
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1373	0	5700	1373	0

Upstream Bridge Cross Section Data
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4900	1373.8	5000	1373	5050	1372.7	5065.9	1372.6	5100.8	1371
5134	1368.7	5143.6	1368.4	5150	1369.1	5183.5	1367.3	52001361.202	
5201.9	1360.5	5221	1360.5	5239.9	1360.5	5245.5	1360.5	5262.1	1360.5
5269.4	1360.5	5298.1	1360.5	5312.5	1368.4	5343.4	1367.6	5367.3	1367.7
5400.8	1366.6	5437.1	1366.1	54501366.508		5497.2	1368	5524.3	1369.1
5586.3	1372	5615.7	1373.3	5669.9	1375.9	5691.4	1377.7	5694	1377.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4900	.053	5200	.07	5450	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5200	5450	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1373	0	5700	1373	0

Downstream Bridge Cross Section Data
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1374.6	5073.1	1373.3	5114.4	1371.9	5142.3	1370	5161.8	1365.7
51751363.986		5184.9	1362.7	52001362.601		5245.8	1362.3	5257.7	1359.7
5280.9	1359.7	5297.2	1362.3	5313	1362.8	5333.8	1362.1	5362.3	1362.7
54001362.952		5481.8	1363.5	5496.4	1363.5	5531	1366.9	5562	1372.5
5571.8	1369.6	5600	1371.5	5648.4	1373.7	5690.3	1377.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5200	.07	5400	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5200	5400	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 1363.9
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.67	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
1	.5	57	.013	.013	0	.5	1

Upstream Elevation = 1360.5
Centerline Station = 5261.8
Downstream Elevation = 1359.5
Centerline Station = 5268

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

Q Culv Group (cfs)	34.82	Culv Full Len (ft)	57.00
# Barrels	1	Culv Vel US (ft/s)	15.90
Q Barrel (cfs)	34.82	Culv Vel DS (ft/s)	15.90
E.G. US. (ft)	1373.75	Culv Inv El Up (ft)	1360.50
W.S. US. (ft)	1373.75	Culv Inv El Dn (ft)	1359.50
E.G. DS (ft)	1364.39	Culv Frctn Ls (ft)	3.53
W.S. DS (ft)	1364.33	Culv Exit Loss (ft)	3.87
Delta EG (ft)	9.37	Culv Entr Loss (ft)	1.96
Delta WS (ft)	9.42	Q Weir (cfs)	1104.83
E.G. IC (ft)	1373.75	Weir Sta Lft (ft)	4905.72
E.G. OC (ft)	1373.75	Weir Sta Rgt (ft)	5625.17
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1362.17	Weir Max Depth (ft)	0.75
Culv WS Outlet (ft)	1361.17	Weir Avg Depth (ft)	0.70
Culv Nml Depth (ft)	1.67	Weir Flow Area (sq ft)	501.09
Culv Crt Depth (ft)	1.67	Min El Weir Flow (ft)	1373.01

Note: The normal depth exceeds the height of the culvert. The program assumes that the normal
depth is equal to the height of the culvert.
Note: Culvert critical depth exceeds the height of the culvert.

CULVERT OUTPUT Profile #PF 2 Culv Group: Culvert #1

Q Culv Group (cfs)	32.96	Culv Full Len (ft)	57.00
# Barrels	1	Culv Vel US (ft/s)	15.05
Q Barrel (cfs)	32.96	Culv Vel DS (ft/s)	15.05
E.G. US. (ft)	1373.75	Culv Inv El Up (ft)	1360.50
W.S. US. (ft)	1373.75	Culv Inv El Dn (ft)	1359.50
E.G. DS (ft)	1365.35	Culv Frctn Ls (ft)	3.17
W.S. DS (ft)	1365.32	Culv Exit Loss (ft)	3.48
Delta EG (ft)	8.40	Culv Entr Loss (ft)	1.76
Delta WS (ft)	8.43	Q Weir (cfs)	1101.20
E.G. IC (ft)	1374.16	Weir Sta Lft (ft)	4905.92
E.G. OC (ft)	1373.75	Weir Sta Rgt (ft)	5625.14
Culvert Control	Inlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1362.17	Weir Max Depth (ft)	0.75
Culv WS Outlet (ft)	1361.17	Weir Avg Depth (ft)	0.70
Culv Nml Depth (ft)	1.67	Weir Flow Area (sq ft)	499.95
Culv Crt Depth (ft)	1.67	Min El Weir Flow (ft)	1373.01

Warning: During subcritical analysis, while trying to calculate culvert and weir flow, the program could not
get a balance of energy within the specified tolerance and number of trials. The program used
the solution with the minimum error.
Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
The reported inlet energy grade answer may not be valid.
Warning: During the culvert outlet computations, the program could not balance the culvert/weir flow.
The reported outlet energy grade answer may not be valid.
Note: The normal depth exceeds the height of the culvert. The program assumes that the normal
depth is equal to the height of the culvert.
Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.565

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1374.6	5073.1	1373.3	5114.4	1371.9	5142.3	1370	5161.8	1365.7
51751363.986		5184.9	1362.7	52001362.601		5245.8	1362.3	5257.7	1359.7
5280.9	1359.7	5297.2	1362.3	5313	1362.8	5333.8	1362.1	5362.3	1362.7
54001362.952		5481.8	1363.5	5496.4	1363.5	5531	1366.9	5562	1372.5
5571.8	1369.6	5600	1371.5	5648.4	1373.7	5690.3	1377.8		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5200	.07	5400	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5400	220.08	210 267.96	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.525

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1371.7	5040.1	1368.8	5070.2	1365.3	5090.8	1364.5	5125.6	1363.8
5130	1363.82	5147.7	1363.9	5154.4	1364.3	51651363.391		5168.4	1363.1
51701362.798		51771361.475		5186.4	1359.7	52201361.182		5220.4	1361.2
52251361.212		52301361.225		52401361.251		5296.1	1361.4	5349.6	1361.2
5387.4	1361.2	5418.7	1360.3	54351363.529		54401364.519		5450	1366.5
5474.3	1371.8	5482.1	1371.7	5518.8	1371.8	5542.8	1373.6	5568.6	1374
5602.9	1376.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5165	.07	5240	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5165	5240	104.04	169.02 212.04	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.493

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1371.2	5036.7	1367.7	5053.9	1368.9	5100	1365.1	51101363.392	
51301359.976		5132.2	1359.6	52501359.688		5265.4	1359.7	5288	1360
5322.6	1362	5366.7	1363.2	5401.8	1365.2	5467	1365.3	5541.4	1366.1
5550.7	1366.5	5618.6	1370.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

5000	.053	5130	.07	5250	.051

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5130	5250		152.95	185.06 337.06	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.458

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1371.2	5041	1369.6	5102.4	1366.1	5124.8	1366.7	5180.2	1365.1
5192.7	1364.1	5231.6	1363.6	5244.3	1363.7	5269.8	1363.4	52951360.229	
5300	1359.6	5450	1361.76	5550	1363.2	5557.5	1364.2	5580.1	1365.7
5599.9	1367.6	5630.1	1370.9	5675.8	1373	5698.1	1374		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5295	.07	5450	.051

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5295	5450		158	385.2 240	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.420

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1372.4	5029.5	1371.5	5072.3	1367.9	5130.7	1364.1	5150	1363.6
51551362.985		51751360.523		5182.5	1359.6	5322.4	1359.6	53301362.037	
53351363.641		5338.3	1364.7	5343.9	1364.4	5352.9	1362.8	5379.9	1362
5392.2	1361.5	5408.2	1361.6	5428.4	1362.5	5453.1	1362.4	5477.5	1362.4
5500	1362.4	5554.8	1364	5600	1366.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5175	.07	5330	.051

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	5175	5330		213.94	185.06 173.09	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.385

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1372.4	5026.3	1371.8	5087.1	1367.7	5136	1364.5	5172.4	1361.9
51901360.148		5195.5	1359.6	55951362.738		5602.9	1362.8	5635.2	1364.4
5657.4	1365.5	5718.9	1367.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5190	.07	5595	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5190	5595	176.94	180	205.02	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.351

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5027.7	1368.9	5062.6	1368.3	5123.1	1365.9	5176	1362.2	52001360.106	
5205.8	1359.6	5350.8	1359.6	53551360.456		53651362.494		5366.5	1362.8
5408.2	1363	5459.7	1362.7	5493.1	1362.8	5562.9	1362.6	5603.8	1363.7
5628.7	1364.3	5695.5	1366.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5027.7	.053	5200	.07	5355	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5355	570	244	92	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.305

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.3	5102	1365.8	5121	1365.1	5178	1363.2	5227	1359.6
5799	1359.6	5815	1361.9	5836	1362.4	5876	1364.2	5904	1365.1
5952	1367.1	6018	1369.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5227	.07	5799	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5227	5799	89	188	155	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.269

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4

5472	1364	5525	1363.9	55291363.118		5547	1359.6	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5529	.07	5685	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5529	5685	1	30	30	.1 .3

CULVERT

RIVER: RIVER-1
REACH: Reach-1 RS: 1.266

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 29
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 21

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1369.8	0	5071	1367.4	0	5130	1364.4	0
5169	1363.4	0	5200	1364.6	0	5244	1365.6	0
5298	1365.6	0	5324	1364.6	0	5360	1364.7	0
5402	1364.4	0	5472	1364	0	5525	1363.9	0
5547	1360	0	5673	1360	0	5685	1360.2	0
5700	1362.1	0	5725	1363.3	0	5779	1364.8	0
5824	1366.5	0	5894	1368.5	0	5929	1369.1	0

Upstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	55291363.118		5547	1359.6	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5529	.07	5685	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5529	5685	.1	.3

Downstream Deck/Roadway Coordinates
num= 21

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1369.8	0	5071	1367.4	0	5130	1364.4	0
5169	1363.4	0	5200	1364.6	0	5244	1365.6	0
5298	1365.6	0	5324	1364.6	0	5360	1364.7	0
5402	1364.4	0	5472	1364	0	5525	1363.9	0
5547	1360	0	5673	1360	0	5685	1360.2	0
5700	1362.1	0	5725	1363.3	0	5779	1364.8	0
5824	1366.5	0	5894	1368.5	0	5929	1369.1	0

Downstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	5547	1359.6	5560	1359.61	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5560	.07	5673	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5560	5673	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.5	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
1	.5	29	.013	.013	0	.5	1

Upstream Elevation = 1358
Centerline Station = 5680
Downstream Elevation = 1357
Centerline Station = 5680

CULVERT OUTPUT Profile #PF 1 Culv Group: Culvert #1

Q Culv Group (cfs)	3.73	Culv Full Len (ft)	29.00
# Barrels	1	Culv Vel US (ft/s)	2.11
Q Barrel (cfs)	3.73	Culv Vel DS (ft/s)	2.11
E.G. US. (ft)	1362.08	Culv Inv El Up (ft)	1358.00
W.S. US. (ft)	1361.89	Culv Inv El Dn (ft)	1357.00
E.G. DS (ft)	1362.01	Culv Frctn Ls (ft)	0.04
W.S. DS (ft)	1361.80	Culv Exit Loss (ft)	
Delta EG (ft)	0.07	Culv Entr Loss (ft)	0.03
Delta WS (ft)	0.09	Q Weir (cfs)	1136.27
E.G. IC (ft)	1362.10	Weir Sta Lft (ft)	5535.10
E.G. OC (ft)	1362.08	Weir Sta Rgt (ft)	5700.22
Culvert Control	Outlet	Weir Submerg	0.85
Culv WS Inlet (ft)	1359.50	Weir Max Depth (ft)	2.11
Culv WS Outlet (ft)	1358.50	Weir Avg Depth (ft)	1.92
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	317.02
Culv Crt Depth (ft)	0.74	Min El Weir Flow (ft)	1360.01

CULVERT OUTPUT Profile #PF 2 Culv Group: Culvert #1

Q Culv Group (cfs)	3.34	Culv Full Len (ft)	29.00
# Barrels	1	Culv Vel US (ft/s)	1.89
Q Barrel (cfs)	3.34	Culv Vel DS (ft/s)	1.89
E.G. US. (ft)	1362.47	Culv Inv El Up (ft)	1358.00

W.S. US. (ft)	1362.33	Culv Inv El Dn (ft)	1357.00
E.G. DS (ft)	1362.41	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	1362.22	Culv Exit Loss (ft)	
Delta EG (ft)	0.06	Culv Entr Loss (ft)	0.03
Delta WS (ft)	0.11	Q Weir (cfs)	1136.67
E.G. IC (ft)	1362.46	Weir Sta Lft (ft)	5533.11
E.G. OC (ft)	1362.47	Weir Sta Rgt (ft)	5707.54
Culvert Control	Outlet	Weir Submerg	0.94
Culv WS Inlet (ft)	1359.50	Weir Max Depth (ft)	2.46
Culv WS Outlet (ft)	1358.50	Weir Avg Depth (ft)	2.16
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	376.66
Culv Crt Depth (ft)	0.70	Min El Weir Flow (ft)	1360.01

Warning: During the culvert inlet computations, the program could not balance the culvert/weir flow.
The reported inlet energy grade answer may not be valid.

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.263

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	5547	1359.6	5560	1359.61	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5560	.07	5673	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5560	5673	19.95	129	105	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.239

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5070	1367.2	5102	1366.2	5148	1364	5177	1362.7	5200	1363.7
5228	1364.3	5251	1363.7	5301	1363.7	5316	1364.3	5363	1364.2
5404	1365.4	5538	1364.5	5565	1365	5572	1365.1	5579	1363.5
5585	1362.6	5588	1362.5	5597	1363.7	5606	1364.2	5612	1364.4
5626	1365.4	5635	1365.2	5645	1363.8	56501362.961		56751358.768	
5676	1358.6	56851357.475		5700	1355.6	5711	1353.1	5720	1357.9
57251358.162		5741	1359	5752	1361.1	5764	1363.2	5777	1363.9
5831	1364.7	5840	1365						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5070	.053	5685	.07	5720	.051

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
5685 5720 50 35 20 .1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.232

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1359	5020.7	1357.6	5037.2	1357.4	5094	1352.7	5150	1351.5
5200	1351.6	5281.2	1349.9	5333.5	1350.2	5351.4	1350.6	5367.6	1351.3
5428.4	1349.9	5459.7	1352.6	5490.9	1360.4	5501.8	1359.2	55301357.058	
55351356.678		5538	1356.45	55481355.691		5549.2	1355.6	5561.5	1352.8
5574.1	1356.7	55751356.707		55771356.723		55801356.746		5587	1356.8
5612.6	1360.9	5649.6	1363.7	5676.2	1364.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5538	.07	5577	.051

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
5538 5577 249.92 210.98 216.92 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
5000	5490.9		F

Left Levee Station= 5490.9 Elevation= 1360.4

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.192

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1357	5014.6	1355.8	5033.3	1354.7	5050	1353.9	5084.9	1352.9
51261348.342		5137.2	1347.1	5235.9	1347.2	52411348.258		5249.4	1350
5267.6	1350.1	5274.2	1348.7	5283.2	1347.7	5290.3	1350.1	5294.5	1351
5321.2	1351.3	5350	1352.3	5404.9	1354.9	5426.8	1356.4	5444.1	1361.1
5515.7	1361.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5126	.07	5241	.051

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
5126 5241 182 100 123 .1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.173

INPUT
Description:

Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1356.7	5014.5	1355.4	5029.3	1353.7	5082.8	1351.5	5104.2	1351
5130.3	1349.3	5148.9	1348.5	5163.7	1347.1	5327.8	1347.1	53341348.189	
5350	1351	5359.7	1353.2	5394.3	1355.2	5420.8	1356	5440.8	1357.1
5483.1	1358.5	5496.3	1359.1	5508	1359.2	5526	1360.4	5550	1361.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5104.2	.07	5334	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5104.2	5334	195	136.95 100.05	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.147

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1353.9	5053	1351.9	5109.9	1351	5143.6	1353.1	5168.7	1350.1
5252.6	1349.8	5261.6	1348.5	52651348.158		5275.5	1347.1	5376.4	1347.1
53831348.282		5403.2	1351.9	5417.7	1354.7	5452.4	1355.1	5467.7	1356.2
5485.5	1356.7	5513	1358.5	5544.7	1359.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5265	.07	5383	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5265	5383	240	232.08 388.08	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.103

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1355.2	5034	1352.8	5048.3	1351.3	5082.2	1350	5123.8	1350.2
51451348.107		5155.2	1347.1	5404.9	1347.1	5417.8	1348.9	5447.6	1349.5
5462.8	1347.1	5632	1347.1	5672.9	1347.1	56821348.096		57001350.066	
5713.1	1351.5	5739.9	1355.9	5759.9	1359	5799.9	1362.6	5848.6	1363.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5145	.07	5682	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5145	5682	90.96	232.08 233.04	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.071

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5071.4	1357.5	5079.9	1357.2	5108.8	1351.4	5148.9	1349.4	5166.2	1350
5175.4	1350.7	52001347.843		5206.4	1347.1	5507.2	1347.1	5523.7	1349.8
5538	1349.5	5591.3	1349.6	5607.6	1349.4	5622.4	1348.1	5632.4	1348
5667.5	1348.9	5694.7	1348.6	5700	1348.8	5729.1	1349.9	5750	1350
5784.4	1350.8	5801.3	1351.5	5833.6	1352.4	5857.2	1353.5	5885.3	1356.5
5921.9	1361.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5071.4	.05	5200	.07	5700	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5700	50.04	169.02	480.06	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: .963

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5029.9	1358.7	5116.2	1350.8	51321349.849		5151.1	1348.7	5167	1350.2
5179.03	1352	5200	1352.18	5260.79	1352.7	5381	1352.7	5500.44	1352.7
6005.11	1352.7	6095.2	1352.7	6129.6	1352.9	6164.7	1349.7	6179.3	1348.6
6295	1348.8	63001348.657		6309	1348.4	6343.7	1351.6	6375.1	1352.5
6434.4	1355	6480	1356						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5029.9	.065	5200	.07	6300	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	6300	875.05	550	480.15	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: .859

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5215.3	1349	5229.1	1348.4	5311.1	1347.4	5383.2	1344.4	5409.1	1346
5574.3	1345.3	5644.2	1344.2	5794.7	1341.2	5805.8	1338.9	5881.8	1338.8
58851339.486		58901340.557		58951341.629		5900	1342.7	5914.5	1343.1
6000	1343.1	6050	1343.2	6150	1343.4	6250	1344.8	6355.5	1346.7
6471.8	1349.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5215.3	.05	5794.7	.07	5890	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

5794.7	5890	70	26	36	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.854

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5325.8	1348.6	5429.4	1344.4	5446.1	1345.5	5589.5	1345.2	5635.7	1344.4
5651.4	1341.6	5875.4	1339.7	6023.7	1339.2	6069.9	1340.1	6187.3	1340.6
6201.6	1343.1	6382.6	1346	6421.7	1346.4	6505.8	1349.2	6633.4	1352.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5325.8	.05	5875.4	.07	6069.9	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5875.4	6069.9	72	32	38	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.848

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5325.2	1350.3	5467.7	1344.3	5481.5	1345.3	5618.6	1344.9	5632.5	1341.6
5642.1	1343.2	5665.3	1343.1	5670.8	1342.3	5855.7	1340.9	5938.3	1340.4
5987	1339.6	6054.5	1340	6140.9	1340.7	6228.2	1341.3	6231.3	1341.8
6254	1341.9	6261.1	1340.3	6276.9	1343.1	6381.6	1344.7	6497.4	1346.5
6548.8	1348.7	6662.5	1351.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5325.2	.05	5938.3	.07	6140.9	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5938.3	6140.9	45	15	102	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.845

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5363.4	1352.3	5411.6	1349.3	5523.2	1344.2	5547.6	1345.6	5614.8	1344.9
5630.1	1341.9	5638.4	1343.6	5661.7	1343.5	5679.3	1342.6	5759.9	1341.7
5859.7	1340.4	5885	1339.6	5974.8	1338.5	5991.3	1338	6031.1	1338.2
6052.7	1339.2	6120.7	1340.6	6137.5	1339.6	6167.8	1340.9	6292	1341.3
6311.7	1342	6334.7	1342	6334.7	1342.1	6357	1343.1	6406.8	1344.4
6440	1344.4	6570.8	1346.6	6703.6	1350.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5363.4	.05	5974.8	.07	6052.7	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5974.8	6052.7	81	81	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.83

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9550	1350	9750	1345	10000	1343.1	10100	1342	10200	1340.2
10280	1337.4	10318	1336.6	10328	1335.9	10335	1335.5	10340	1336
10344	1336.6	10473	1341.4	10500	1341.4	10600	1341.3	10700	1341
11300	1345	11650	1350						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9550	.05	10318	.07	10344	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10318	10344	1649.21	2165.65 1050.28	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.42

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500	1345	10000	1333.9	10100	1332.8	10200	1331.5	10242	1331
10385	1327.8	10387	1326.2	10390	1325.3	10391	1325.8	10395	1328.5
10400	1330.6	10500	1332.5	10600	1333.2	10725	1335	11400	1340
11700	1345								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9500	.05	10385	.072	10400	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10385	10400	1300.55	1850 849.15	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.07

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8700	1335	8875	1330	9400	1325	10000	1323.5	10100	1323.3
10200	1322.8	10312	1323.3	10322	1322.1	10327	1320.7	10329	1319.1

10331	1320.6	10340	1323	10400	1323	10500	1322.8	10600	1322.5
11200	1325	12000	1330	12600	1335				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8700	.06	10312	.07	10340	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10312	10340	1499.98	370	1.11	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8900	1335	9400	1330	9540	1325	10000	1321.9	10100	1320.8
10200	1320.4	10211	1320.6	10252	1320.8	10290	1320.6	10297	1320.5
10400	1321.4	10490	1322	10600	1321.1	10621	1320.8	10629	1319.5
10638	1319.2	10647	1319.6	10650	1322.1	10750	1322.2	10900	1322.8
11015	1321.9	11600	1325	12400	1330	13000	1335		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8900	.051	10621	.068	10650	.052

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10621	10650	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	1.913	.053	.07	.051
Reach-1	1.885	.053	.07	.051
Reach-1	1.866	.053	.07	.051
Reach-1	1.858	.053	.07	.051
Reach-1	1.793	.053	.07	.051
Reach-1	1.736	.053	.07	.051
Reach-1	1.655	.053	.07	.051
Reach-1	1.595	.053	.07	.051
Reach-1	1.576	.053	.07	.051
Reach-1	1.573	Culvert		
Reach-1	1.565	.053	.07	.051
Reach-1	1.525	.053	.07	.051
Reach-1	1.493	.053	.07	.051
Reach-1	1.458	.053	.07	.051
Reach-1	1.420	.053	.07	.051
Reach-1	1.385	.053	.07	.051
Reach-1	1.351	.053	.07	.051
Reach-1	1.305	.053	.07	.051
Reach-1	1.269	.053	.07	.051
Reach-1	1.266	Culvert		
Reach-1	1.263	.053	.07	.051
Reach-1	1.239	.053	.07	.051

Reach-1	1.232	.053	.07	.051
Reach-1	1.192	.053	.07	.051
Reach-1	1.173	.053	.07	.051
Reach-1	1.147	.053	.07	.051
Reach-1	1.103	.053	.07	.051
Reach-1	1.071	.05	.07	.05
Reach-1	.963	.065	.07	.065
Reach-1	.859	.05	.07	.05
Reach-1	0.854	.05	.07	.05
Reach-1	0.848	.05	.07	.05
Reach-1	0.845	.05	.07	.05
Reach-1	0.83	.05	.07	.05
Reach-1	0.42	.05	.072	.05
Reach-1	0.07	.06	.07	.065
Reach-1	0	.051	.068	.052

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	1.913	100	147.84	175
Reach-1	1.885	90	100.32	120
Reach-1	1.866	35	43	85
Reach-1	1.858	260.1	340	360.06
Reach-1	1.793	209.1	300	311.1
Reach-1	1.736	433.01	430	313.04
Reach-1	1.655	324.06	315.15	190.08
Reach-1	1.595	169	100	95
Reach-1	1.576	116	58	174
Reach-1	1.573	Culvert		
Reach-1	1.565	220.08	210	267.96
Reach-1	1.525	104.04	169.02	212.04
Reach-1	1.493	152.95	185.06	337.06
Reach-1	1.458	158	385.2	240
Reach-1	1.420	213.94	185.06	173.09
Reach-1	1.385	176.94	180	205.02
Reach-1	1.351	570	244	92
Reach-1	1.305	89	188	155
Reach-1	1.269	1	30	30
Reach-1	1.266	Culvert		
Reach-1	1.263	19.95	129	105
Reach-1	1.239	50	35	20
Reach-1	1.232	249.92	210.98	216.92
Reach-1	1.192	182	100	123
Reach-1	1.173	195	136.95	100.05
Reach-1	1.147	240	232.08	388.08
Reach-1	1.103	90.96	232.08	233.04
Reach-1	1.071	50.04	169.02	480.06
Reach-1	.963	875.05	550	480.15
Reach-1	.859	70	26	36
Reach-1	0.854	72	32	38
Reach-1	0.848	45	15	102
Reach-1	0.845	81	81	81
Reach-1	0.83	1649.21	2165.65	1050.28
Reach-1	0.42	1300.55	1850	849.15
Reach-1	0.07	1499.98	370	1.11
Reach-1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	1.913	.1	.3
Reach-1	1.885	.1	.3
Reach-1	1.866	.1	.3
Reach-1	1.858	.1	.3
Reach-1	1.793	.1	.3
Reach-1	1.736	.1	.3
Reach-1	1.655	.1	.3
Reach-1	1.595	.1	.3
Reach-1	1.576	.1	.3
Reach-1	1.573	Culvert	
Reach-1	1.565	.1	.3
Reach-1	1.525	.1	.3
Reach-1	1.493	.1	.3
Reach-1	1.458	.1	.3
Reach-1	1.420	.1	.3
Reach-1	1.385	.1	.3
Reach-1	1.351	.1	.3
Reach-1	1.305	.1	.3
Reach-1	1.269	.1	.3
Reach-1	1.266	Culvert	
Reach-1	1.263	.1	.3
Reach-1	1.239	.1	.3
Reach-1	1.232	.1	.3
Reach-1	1.192	.1	.3
Reach-1	1.173	.1	.3
Reach-1	1.147	.1	.3
Reach-1	1.103	.1	.3
Reach-1	1.071	.1	.3
Reach-1	.963	.1	.3
Reach-1	.859	.1	.3
Reach-1	0.854	.1	.3
Reach-1	0.848	.1	.3
Reach-1	0.845	.1	.3
Reach-1	0.83	.1	.3
Reach-1	0.42	.1	.3
Reach-1	0.07	.1	.3
Reach-1	0	.1	.3

fwtrial.rep

HEC-RAS Version 3.1.2 April 2004
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X      X    X       X
X     X  X        X    X      X   X     X    X       X
X     X  XXXXXX    XXXX       X    X    X    X   XXXXX
```

PROJECT DATA
Project Title: TK-3-28-05
Project File : tk.prj
Run Date and Time: 4/22/2005 2:59:30 PM

Project in English units

Project Description:
& R SEDGWICK COUNTY FIS
10-YR BACKWATER ANALYSIS
MIDDLE FORK
CALFSKIN CREEK
SEDGWICK COUNTY FIS
10-YR BACKWATER ANALYSIS

MIDDLE FORK CALFSKIN CREEK

PLAN DATA

Plan Title: Plan 08
Plan File : f:\HYDRO\Projects\Shadow Woods\hecras\Floodway\FWtrial\tk.p08

Geometry Title: tk3-28
Geometry File : f:\HYDRO\Projects\Shadow
Woods\hecras\Floodway\FWtrial\tk.g05

Flow Title : Imported Flow 02
Flow File : f:\HYDRO\Projects\Shadow
Woods\hecras\Floodway\FWtrial\tk.f02

Plan Summary Information:

Number of: Cross Sections	=	35	Multiple Openings	=	0
Culverts	=	3	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3

Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: Between every coordinate point (HEC2 Style)
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = RIVER-1 Reach = Reach-1

RS	Profile	Method	Value1	Value2
1.913	PF 2	1	5500	5680
1.885	PF 2	1	5400	5640
1.866	PF 2	1	5370	5650
1.858	PF 2	1	5330.2	5601.6
1.793	PF 2	1	5270	5427
1.736	PF 2	1	5250	5355
1.655	PF 2	1	5300	5500
1.595	PF 2	1	5170	5495
1.576	PF 2	1	5200	5450
1.565	PF 2	1	5200	5450
1.525	PF 2	1	5165	5240
1.493	PF 2	1	5130	5250
1.458	PF 2	1	5295	5450
1.420	PF 2	1	5175	5500
1.385	PF 2	1	5190	5595
1.351	PF 2	1	5200	5355
1.305	PF 2	1	5227	5799
1.269	PF 2	1	5529	5685
1.263	PF 2	1	5560	5690
1.239	PF 2	1	5685	5720
1.232	PF 2	1	5538	5577
1.192	PF 2	1	5126	5241
1.173	PF 2	1	5104.2	5334
1.147	PF 2	1	5265	5383
1.103	PF 2	1	5145	5682
1.071	PF 2	1	5200	5700
.963	PF 2	1	5200	6300
.859	PF 2	1	5750	5950
0.854	PF 2	1	5800	6069.9
0.848	PF 2	1	5880	6140.9
0.845	PF 2	1	5945	6060
0.83	PF 2	1	10280	10360
0.42	PF 2	1	10330	10390
0.07	PF 2	1	10260	10525
0	PF 2	1	10334	10650

FLOW DATA

Flow Title: Imported Flow 02
Flow File : f:\HYDRO\Projects\Shadow Woods\hecras\Floodway\FWtrial\tk.f02

Flow Data (cfs)

River	Reach	RS	PF 1	PF 2
RIVER-1	Reach-1	1.913	1140	1140

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RIVER-1	Reach-1	PF 1		
Known WS = 1322.37				
RIVER-1	Reach-1	PF 2		
Known WS = 1323.37				

GEOMETRY DATA

Geometry Title: tk3-28
Geometry File : f:\HYDRO\Projects\Shadow Woods\hecras\Floodway\FWtrial\tk.g05

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.913

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1380.7	5038.3	1380.8	5100.6	1379.2	5150	1378.1	5173.6	1377.5
5197.8	1377.3	5250	1376.9	5300.9	1376.6	5350	1376.1	5400	1375.7
5450	1375.2	5486.6	1374.9	5500	1374.6	5520	1374.206	5520.3	1374.2
5528.8	1374.4	5550	1373.249	5560.1	1372.7	5570	1373.106	5580	1373.516
5596.7	1374.2	5599.72	1373.835	5605.8	1373.1	5608	1373.81	5608.9	1374.1
5650.6	1374.6	5698.5	1375.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5550	.07	5580	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5550	5580	125	147.8	160	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.885

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1381.1	5100	1377.9	5200	1376.9	5216	1376.8	5255.2	1374
5295.6	1373.7	5350	1374.9	5400	1374.566	5454.9	1374.2	5480	1369.5
5500	1369.5	5540	1369.5	5583.3	1369.5	5587.5	1369.5	5588	1369.5
5602.3	1369.5	5621.8	1372.9	5640	1373.781	5663.1	1374.9	5717.8	1378.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5400	.07	5640	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5400	5640	90 100.32	120	.1	.3

CULVERT

RIVER: RIVER-1
REACH: Reach-1 RS: 1.873

INPUT
Description:
Distance from Upstream XS = 20
Deck/Roadway Width = 60
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 4

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1381		5300	1378.5		5520	1377	
5710	1379.5							

Upstream Bridge Cross Section Data
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1381.1	5100	1377.9	5200	1376.9	5216	1376.8	5255.2	1374
5295.6	1373.7	5350	1374.9	5400	1374.566	5454.9	1374.2	5480	1369.5
5500	1369.5	5540	1369.5	5583.3	1369.5	5587.5	1369.5	5588	1369.5
5602.3	1369.5	5621.8	1372.9	5640	1373.781	5663.1	1374.9	5717.8	1378.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5400	.07	5640	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5400	5640	.1	.3

Downstream Deck/Roadway Coordinates
num= 4

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1381		5300	1378.5		5520	1377	
5710	1379.5							

Downstream Bridge Cross Section Data
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1381.5	5016	1381	5032.6	1380.5	5076.1	1379.2	5090.2	1378.9
5136.2	1377.6	5147.8	1377.5	5196.4	1377.2	5199.2	1377	5229	1376
5255.4	1376.1	5272.4	1375.6	5345.6	1373.8	5357.4	1373.6	5365.3	1373.4
5370	1372.67	5391.7	1369.3	5411.5	1369	5483	1368.6	5525	1368.965
5574	1369.39	5598.2	1369.6	5599.5	1370.2	5634.8	1374.1	5650	1373.289
5672.3	1372.1	5707.5	1380.2	5744.2	1381.3	5747.2	1381.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5370	.07	5650	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5370	5650	.1	.3

Upstream Embankment side slope = 4 horiz. to 1.0 vertical
Downstream Embankment side slope = 4 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 1379
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	4	10

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	10	85	.013	.013	0	.5	1

Number of Barrels = 4
Upstream Elevation = 1369.6
Centerline Stations

Sta.	Sta.	Sta.	Sta.
5500	5512	5524	5536

Downstream Elevation = 1369.5
Centerline Stations

Sta.	Sta.	Sta.	Sta.
5500	5512	5524	5536

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.866

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1381.5	5016	1381	5032.6	1380.5	5076.1	1379.2	5090.2	1378.9
5136.2	1377.6	5147.8	1377.5	5196.4	1377.2	5199.2	1377	5229	1376
5255.4	1376.1	5272.4	1375.6	5345.6	1373.8	5357.4	1373.6	5365.3	1373.4
5370	1372.67	5391.7	1369.3	5411.5	1369	5483	1368.6	55251	368.965
5574	1369.39	5598.2	1369.6	5599.5	1370.2	5634.8	1374.1	56501	373.289
5672.3	1372.1	5707.5	1380.2	5744.2	1381.3	5747.2	1381.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5370	.07	5650	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5370	5650	35	43	85	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.858

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1380.9	5065.1	1379.1	5148.7	1377.1	5191.8	1376.6	5254.4	1375.9
5302.5	1374.7	5330.2	1370.3	5351.9	1368.7	5358.9	1370	5408	1371.7

RIVER: RIVER-1
REACH: Reach-1 RS: 1.655

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1376	5050	1374.7	5076.8	1374.2	5100	1373.4	5105	1372
5113	1370	5228	1370	5235.5	1370.9	5250	1370.3	5272.9	1368.9
5300	1368	5309.7	1367.3	5319	1366.9	5334.8	1365.1	5390	1364.042
5397.4	1363.9	5415.7	1363.5	5491.9	1363.4	5500	1367.403	5509.3	1372
5534	1372	5538	1372	5542	1372	5546	1372	5550	1372
5589.9	1377.9	5610.3	1378.3	5617	1378.5	5688.3	1378.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5390	.07	5500	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5390	5500	324.06	315.15	190.08	.1	.3

Blocked Obstructions num= 1

Sta L	Sta R	Elev
5000	5700	1368

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.595

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1373.9	5005.8	1374	5028.7	1373.1	5053.3	1372.6	5071.4	1372.3
5100	1369.5	5115.4	1369.1	5143	1367.7	5149.7	1366.7	5170	1364.162
5174.5	1363.6	5210.1	1363.9	5228.2	1363.9	5263.2	1363.8	5292.2	1363.5
5313.3	1363.6	5485.4	1363.5	5495	1366.22	5515.4	1372	5525.3	1372
5541.1	1372	5559	1372	5586.8	1372	5634.1	1375.4	5666.8	1377.2
5681	1378.1	5707.4	1377.6	5753.7	1378.8	5765.2	1379.2	5792.2	1380.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5170	.07	5495	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5170	5495	169	100	95	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.576

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4900	1373.8	5000	1373	5050	1372.7	5065.9	1372.6	5100.8	1371
5134	1368.7	5143.6	1368.4	5150	1369.1	5183.5	1367.3	5200	1361.202
5201.9	1360.5	5221	1360.5	5239.9	1360.5	5245.5	1360.5	5262.1	1360.5
5269.4	1360.5	5298.1	1360.5	5312.5	1368.4	5343.4	1367.6	5367.3	1367.7
5400.8	1366.6	5437.1	1366.1	5450	1367.366	5477	1367.366	5481	1368

5485	1369	5489	1370	5493	1371	5497.2	1372	5524.3	1372
5586.3	1372	5615.7	1373.3	5669.9	1375.9	5691.4	1377.7	5694	1377.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4900	.053	5200	.07	5450	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5450	116	58	174	.1	.3

CULVERT

RIVER: RIVER-1
REACH: Reach-1 RS: 1.573

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 57
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
5000	1370	0	5700	1370	0

Upstream Bridge Cross Section Data
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4900	1373.8	5000	1373	5050	1372.7	5065.9	1372.6	5100.8	1371
5134	1368.7	5143.6	1368.4	5150	1369.1	5183.5	1367.3	52001361.202	
5201.9	1360.5	5221	1360.5	5239.9	1360.5	5245.5	1360.5	5262.1	1360.5
5269.4	1360.5	5298.1	1360.5	5312.5	1368.4	5343.4	1367.6	5367.3	1367.7
5400.8	1366.6	5437.1	1366.1	54501367.366		54771367.366		5481	1368
5485	1369	5489	1370	5493	1371	5497.2	1372	5524.3	1372
5586.3	1372	5615.7	1373.3	5669.9	1375.9	5691.4	1377.7	5694	1377.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4900	.053	5200	.07	5450	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
5200	5450	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
5000	1370	0	5700	1370	0

Downstream Bridge Cross Section Data
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1374.6	5073.1	1373.3	5114.4	1371.9	5142.3	1370	5161.8	1365.7
5184.9	1362.7	52001362.601		5245.8	1362.3	5257.7	1359.7	5280.9	1359.7
5297.2	1362.3	52981362.325		5313	1362.8	5333.8	1362.1	5362.3	1362.7
5488	1362.7	5492	1363	5496	1364	5500	1365	5520	1371
5524	1372	5648.4	1373.7	5690.3	1377.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5200	.07	5297.2	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.

5200 5297.2 .1 .3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 1363.9
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.67	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
1	.5	57	.013	.013	0	.5	

Upstream Elevation = 1360.5
Centerline Station = 5261.8
Downstream Elevation = 1359.5
Centerline Station = 5268

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.565

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1374.6	5073.1	1373.3	5114.4	1371.9	5142.3	1370	5161.8	1365.7
5184.9	1362.7	52001362.601		5245.8	1362.3	5257.7	1359.7	5280.9	1359.7
5297.2	1362.3	52981362.325		5313	1362.8	5333.8	1362.1	5362.3	1362.7
5488	1362.7	5492	1363	5496	1364	5500	1365	5520	1371
5524	1372	5648.4	1373.7	5690.3	1377.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5200	.07	5297.2	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5297.2	220.08	210	267.96	.1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.525

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1371.7	5040.1	1368.8	5070.2	1365.3	5090.8	1364.5	5125.6	1363.8
5147.7	1363.9	5154.4	1364.3	51651363.391		5168.4	1363.1	5186.4	1359.7
5220.4	1361.2	52401361.447		5284	1362	5290	1362	5294	1363
5296	1364	5300	1365	5474.3	1371.7	5482.1	1371.7	5518.8	1371.8

5542.8	1373.6	5568.6	1374	5602.9	1376.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5165	.07	5240	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5165	5240	104.04	169.02	212.04	.1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.493

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1371.2	5036.7	1367.7	5053.9	1368.9	5100	1365.1	51101363.392	
51301359.976		5132.2	1359.6	5250	1359.69	5288	1360	5304	1360
5308	1361	5312	1362	5316	1363	5320	1364	5324	1365
5401.8	1365.2	5467	1365.3	5541.4	1366.1	5550.7	1366.5	5618.6	1370.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5130	.07	5250	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5130	5250	152.95	185.06	337.06	.1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.458

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1371.2	5041	1369.6	5102.4	1366.1	5124.8	1366.7	5180.2	1365.1
5192.7	1364.1	5231.6	1363.6	5244.3	1363.7	5269.8	1363.4	52951360.229	
5300	1359.6	5450	1361.76	5550	1363.2	5557.5	1364.2	5580.1	1365.7
5599.9	1367.6	5630.1	1370.9	5675.8	1373	5698.1	1374		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5295	.07	5450	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5295	5450	158	385.2	240	.1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.420

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
    5000  1372.4  5029.5  1371.5  5072.3  1367.9  5130.7  1364.1    5150  1363.6
    51551362.985    51751360.523  5182.5  1359.6  5322.4  1359.6    53301362.037
    53351363.641  5338.3  1364.7  5343.9  1364.4  5352.9  1362.8  5379.9    1362
  5392.2  1361.5  5408.2  1361.6  5428.4  1362.5  5453.1  1362.4  5477.5  1362.4
    5500  1362.4  5554.8    1364    5600  1366.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000    .053    5175     .07    5330    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          5175    5330             213.94  185.06  173.09              .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 1.385

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    5000  1372.4  5026.3  1371.8  5087.1  1367.7    5136  1364.5  5172.4  1361.9
    51901360.148  5195.5  1359.6    55951362.738  5602.9  1362.8  5635.2  1364.4
  5657.4  1365.5  5718.9  1367.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    5000    .053    5190     .07    5595    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          5190    5595             176.94     180  205.02              .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 1.351

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  5027.7  1368.9  5062.6  1368.3  5123.1  1365.9    5176  1362.2    52001360.106
  5205.8  1359.6  5350.8  1359.6    53551360.456    53651362.494  5366.5  1362.8
  5408.2    1363  5459.7  1362.7  5493.1  1362.8  5562.9  1362.6  5603.8  1363.7
  5628.7  1364.3  5695.5  1366.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  5027.7    .053    5200     .07    5355    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          5200    5355                 570     244       92              .1       .3

CROSS SECTION


RIVER: RIVER-1
REACH: Reach-1            RS: 1.305

INPUT
```

Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.3	5102	1365.8	5121	1365.1	5178	1363.2	5227	1359.6
5799	1359.6	5815	1361.9	5836	1362.4	5876	1364.2	5904	1365.1
5952	1367.1	6018	1369.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5227	.07	5799	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5227	5799	89	188	155	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.269

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	55291363.118		5547	1359.6	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5529	.07	5685	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5529	5685	1	30	30	.1	.3

CULVERT

RIVER: RIVER-1
REACH: Reach-1 RS: 1.266

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 29
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 21

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1369.8	0	5071	1367.4	0	5130	1364.4	0
5169	1363.4	0	5200	1364.6	0	5244	1365.6	0
5298	1365.6	0	5324	1364.6	0	5360	1364.7	0
5402	1364.4	0	5472	1364	0	5525	1363.9	0
5547	1360	0	5673	1360	0	5685	1360.2	0
5700	1362.1	0	5725	1363.3	0	5779	1364.8	0
5824	1366.5	0	5894	1368.5	0	5929	1369.1	0

Upstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6

5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	55291	363.118	5547	1359.6	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5529	.07	5685	.051

Bank Sta:	Left	Right	Coeff Contr.	Expan.
	5529	5685	.1	.3

Downstream Deck/Roadway Coordinates
num= 21

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
5000	1369.8	0	5071	1367.4	0	5130	1364.4	0
5169	1363.4	0	5200	1364.6	0	5244	1365.6	0
5298	1365.6	0	5324	1364.6	0	5360	1364.7	0
5402	1364.4	0	5472	1364	0	5525	1363.9	0
5547	1360	0	5673	1360	0	5685	1360.2	0
5700	1362.1	0	5725	1363.3	0	5779	1364.8	0
5824	1366.5	0	5894	1368.5	0	5929	1369.1	0

Downstream Bridge Cross Section Data
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	5547	1359.6	5560	1359.61	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5560	.07	5673	.051

Bank Sta:	Left	Right	Coeff Contr.	Expan.
	5560	5673	.1	.3

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.5	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
1	.5	29	.013	.013	0	.5	

Upstream Elevation = 1358
Centerline Station = 5680
Downstream Elevation = 1357
Centerline Station = 5680

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.263

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1369.8	5071	1367.4	5130	1364.4	5169	1363.4	5200	1364.6
5244	1365.6	5298	1365.6	5324	1364.6	5360	1364.7	5402	1364.4
5472	1364	5525	1363.9	5547	1359.6	5560	1359.61	5673	1359.7
5685	1360.2	5700	1362.1	5725	1363.3	5779	1364.8	5824	1366.5
5894	1368.5	5929	1369.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5560	.07	5673	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5560	5673	19.95	129	105	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.239

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5070	1367.2	5102	1366.2	5148	1364	5177	1362.7	5200	1363.7
5228	1364.3	5251	1363.7	5301	1363.7	5316	1364.3	5363	1364.2
5404	1365.4	5538	1364.5	5565	1365	5572	1365.1	5579	1363.5
5585	1362.6	5588	1362.5	5597	1363.7	5606	1364.2	5612	1364.4
5626	1365.4	5635	1365.2	5645	1363.8	56501362.961		56751358.768	
5676	1358.6	56851357.475		5700	1355.6	5711	1353.1	5720	1357.9
57251358.162		5741	1359	5752	1361.1	5764	1363.2	5777	1363.9
5831	1364.7	5840	1365						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5070	.053	5685	.07	5720	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5685	5720	50	35	20	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.232

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1359	5020.7	1357.6	5037.2	1357.4	5094	1352.7	5150	1351.5
5200	1351.6	5281.2	1349.9	5333.5	1350.2	5351.4	1350.6	5367.6	1351.3
5428.4	1349.9	5459.7	1352.6	5490.9	1360.4	5501.8	1359.2	55301357.058	
55351356.678		5538	1356.45	55481355.691		5549.2	1355.6	5561.5	1352.8

5574.1	1356.7	55751356.707		55771356.723		55801356.746		5587	1356.8		
5612.6	1360.9	5649.6	1363.7	5676.2	1364.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5538	.07	5577	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5538	5577	249.92	210.98	216.92	.1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
5000	5490.9		F

Left Levee Station= 5490.9 Elevation= 1360.4

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.192

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1357	5014.6	1355.8	5033.3	1354.7	5050	1353.9	5084.9	1352.9
51261348.342		5137.2	1347.1	5235.9	1347.2	52411348.258		5249.4	1350
5267.6	1350.1	5274.2	1348.7	5283.2	1347.7	5290.3	1350.1	5294.5	1351
5321.2	1351.3	5350	1352.3	5404.9	1354.9	5426.8	1356.4	5444.1	1361.1
5515.7	1361.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5126	.07	5241	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5126	5241	182	100	123	.1 .3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.173

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1356.7	5014.5	1355.4	5029.3	1353.7	5082.8	1351.5	5104.2	1351
5130.3	1349.3	5148.9	1348.5	5163.7	1347.1	5327.8	1347.1	53341348.189	
5350	1351	5359.7	1353.2	5394.3	1355.2	5420.8	1356	5440.8	1357.1
5483.1	1358.5	5496.3	1359.1	5508	1359.2	5526	1360.4	5550	1361.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5104.2	.07	5334	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5104.2	5334	195	136.95	100.05 .1	.3

CROSS SECTION

RIVER: RIVER-1

REACH: Reach-1 RS: 1.147

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1353.9	5053	1351.9	5109.9	1351	5143.6	1353.1	5168.7	1350.1
5252.6	1349.8	5261.6	1348.5	5265	1348.158	5275.5	1347.1	5376.4	1347.1
5383	1348.282	5403.2	1351.9	5417.7	1354.7	5452.4	1355.1	5467.7	1356.2
5485.5	1356.7	5513	1358.5	5544.7	1359.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5265	.07	5383	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5265	5383	240	232.08	388.08	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.103

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5000	1355.2	5034	1352.8	5048.3	1351.3	5082.2	1350	5123.8	1350.2
5145	1348.107	5155.2	1347.1	5404.9	1347.1	5417.8	1348.9	5447.6	1349.5
5462.8	1347.1	5672.9	1347.1	5682	1348.096	5713.1	1351.5	5739.9	1355.9
5759.9	1359	5799.9	1362.6	5848.6	1363.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5000	.053	5145	.07	5682	.051

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5145	5682	90.96	232.08	233.04	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 1.071

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5071.4	1357.5	5079.9	1357.2	5108.8	1351.4	5148.9	1349.4	5166.2	1350
5175.4	1350.7	5200	1347.843	5206.4	1347.1	5507.2	1347.1	5523.7	1349.8
5538	1349.5	5591.3	1349.6	5607.6	1349.4	5622.4	1348.1	5632.4	1348
5667.5	1348.9	5694.7	1348.6	5700	1348.8	5729.1	1349.9	5750	1350
5784.4	1350.8	5801.3	1351.5	5833.6	1352.4	5857.2	1353.5	5885.3	1356.5
5921.9	1361.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5071.4	.05	5200	.07	5700	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	5700	50.04	169.02	480.06	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: .963

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5029.9	1358.7	5116.2	1350.8	51321349.849		5151.1	1348.7	5167	1350.2
5179.03	1352	5200	1352.18	5260.79	1352.7	5381	1352.7	5500.44	1352.7
6005.11	1352.7	6095.2	1352.7	6129.6	1352.9	6164.7	1349.7	6179.3	1348.6
6295	1348.8	63001348.657		6309	1348.4	6343.7	1351.6	6375.1	1352.5
6434.4	1355	6480	1356						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5029.9	.065	5200	.07	6300	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5200	6300	875.05	550 480.15	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: .859

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5215.3	1349	5229.1	1348.4	5311.1	1347.4	5383.2	1344.4	5409.1	1346
5574.3	1345.3	5644.2	1344.2	5794.7	1341.2	5805.8	1338.9	5881.8	1338.8
58851339.486		58901340.557		58951341.629		5900	1342.7	5914.5	1343.1
6000	1343.1	6050	1343.2	6150	1343.4	6250	1344.8	6355.5	1346.7
6471.8	1349.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5215.3	.05	5794.7	.07	5890	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5794.7	5890	70	26 36	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.854

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5325.8	1348.6	5429.4	1344.4	5446.1	1345.5	5589.5	1345.2	5635.7	1344.4
5651.4	1341.6	5875.4	1339.7	6023.7	1339.2	6069.9	1340.1	6187.3	1340.6
6201.6	1343.1	6382.6	1346	6421.7	1346.4	6505.8	1349.2	6633.4	1352.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

5325.8	.05	5875.4	.07	6069.9	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5875.4	6069.9	72	32	38	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.848

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5325.2	1350.3	5467.7	1344.3	5481.5	1345.3	5618.6	1344.9	5632.5	1341.6
5642.1	1343.2	5665.3	1343.1	5670.8	1342.3	5855.7	1340.9	5938.3	1340.4
5987	1339.6	6054.5	1340	6140.9	1340.7	6228.2	1341.3	6231.3	1341.8
6254	1341.9	6261.1	1340.3	6276.9	1343.1	6381.6	1344.7	6497.4	1346.5
6548.8	1348.7	6662.5	1351.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5325.2	.05	5938.3	.07	6140.9	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5938.3	6140.9	45	15	102	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.845

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
5363.4	1352.3	5411.6	1349.3	5523.2	1344.2	5547.6	1345.6	5614.8	1344.9
5630.1	1341.9	5638.4	1343.6	5661.7	1343.5	5679.3	1342.6	5759.9	1341.7
5859.7	1340.4	5885	1339.6	5974.8	1338.5	5991.3	1338	6031.1	1338.2
6052.7	1339.2	6120.7	1340.6	6137.5	1339.6	6167.8	1340.9	6292	1341.3
6311.7	1342	6334.7	1342	6334.7	1342.1	6357	1343.1	6406.8	1344.4
6440	1344.4	6570.8	1346.6	6703.6	1350.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
5363.4	.05	5974.8	.07	6052.7	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
5974.8	6052.7	81	81	81	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.83

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9550	1350	9750	1345	10000	1343.1	10100	1342	10200	1340.2

10280	1337.4	10318	1336.6	10328	1335.9	10335	1335.5	10340	1336
10344	1336.6	10473	1341.4	10500	1341.4	10600	1341.3	10700	1341
11300	1345	11650	1350						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9550	.05	10318	.07	10344	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10318	10344	1649.21	2165.65 1050.28	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.42

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500	1345	10000	1333.9	10100	1332.8	10200	1331.5	10242	1331
10385	1327.8	10387	1326.2	10390	1325.3	10391	1325.8	10395	1328.5
10400	1330.6	10500	1332.5	10600	1333.2	10725	1335	11400	1340
11700	1345								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9500	.05	10385	.072	10400	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10385	10400	1300.55	1850 849.15	.1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0.07

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8700	1335	8875	1330	9400	1325	10000	1323.5	10100	1323.3
10200	1322.8	10312	1323.3	10322	1322.1	10327	1320.7	10329	1319.1
10331	1320.6	10340	1323	10400	1323	10500	1322.8	10600	1322.5
11200	1325	12000	1330	12600	1335				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8700	.06	10312	.07	10340	.065

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10312	10340	1499.98	370	1.11 .1	.3

CROSS SECTION

RIVER: RIVER-1
REACH: Reach-1 RS: 0

INPUT
Description:

Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8900	1335	9400	1330	9540	1325	10000	1321.9	10100	1320.8
10200	1320.4	10211	1320.6	10252	1320.8	10290	1320.6	10297	1320.5
10400	1321.4	10490	1322	10600	1321.1	10621	1320.8	10629	1319.5
10638	1319.2	10647	1319.6	10650	1322.1	10750	1322.2	10900	1322.8
11015	1321.9	11600	1325	12400	1330	13000	1335		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8900	.051	10621	.068	10650	.052

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
10621	10650	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:RIVER-1

Reach	River Sta.	n1	n2	n3
Reach-1	1.913	.053	.07	.051
Reach-1	1.885	.053	.07	.051
Reach-1	1.873	Culvert		
Reach-1	1.866	.053	.07	.051
Reach-1	1.858	.053	.07	.051
Reach-1	1.793	.053	.07	.051
Reach-1	1.736	.053	.07	.051
Reach-1	1.655	.053	.07	.051
Reach-1	1.595	.053	.07	.051
Reach-1	1.576	.053	.07	.051
Reach-1	1.573	Culvert		
Reach-1	1.565	.053	.07	.051
Reach-1	1.525	.053	.07	.051
Reach-1	1.493	.053	.07	.051
Reach-1	1.458	.053	.07	.051
Reach-1	1.420	.053	.07	.051
Reach-1	1.385	.053	.07	.051
Reach-1	1.351	.053	.07	.051
Reach-1	1.305	.053	.07	.051
Reach-1	1.269	.053	.07	.051
Reach-1	1.266	Culvert		
Reach-1	1.263	.053	.07	.051
Reach-1	1.239	.053	.07	.051
Reach-1	1.232	.053	.07	.051
Reach-1	1.192	.053	.07	.051
Reach-1	1.173	.053	.07	.051
Reach-1	1.147	.053	.07	.051
Reach-1	1.103	.053	.07	.051
Reach-1	1.071	.05	.07	.05
Reach-1	.963	.065	.07	.065
Reach-1	.859	.05	.07	.05
Reach-1	0.854	.05	.07	.05
Reach-1	0.848	.05	.07	.05
Reach-1	0.845	.05	.07	.05
Reach-1	0.83	.05	.07	.05
Reach-1	0.42	.05	.072	.05
Reach-1	0.07	.06	.07	.065
Reach-1	0	.051	.068	.052

SUMMARY OF REACH LENGTHS

River: RIVER-1

Reach	River Sta.	Left	Channel	Right
Reach-1	1.913	125	147.8	160
Reach-1	1.885	90	100.32	120
Reach-1	1.873	Culvert		
Reach-1	1.866	35	43	85
Reach-1	1.858	260.1	340	360.06
Reach-1	1.793	209.1	300	311.1
Reach-1	1.736	433.01	430	313.04
Reach-1	1.655	324.06	315.15	190.08
Reach-1	1.595	169	100	95
Reach-1	1.576	116	58	174
Reach-1	1.573	Culvert		
Reach-1	1.565	220.08	210	267.96
Reach-1	1.525	104.04	169.02	212.04
Reach-1	1.493	152.95	185.06	337.06
Reach-1	1.458	158	385.2	240
Reach-1	1.420	213.94	185.06	173.09
Reach-1	1.385	176.94	180	205.02
Reach-1	1.351	570	244	92
Reach-1	1.305	89	188	155
Reach-1	1.269	1	30	30
Reach-1	1.266	Culvert		
Reach-1	1.263	19.95	129	105
Reach-1	1.239	50	35	20
Reach-1	1.232	249.92	210.98	216.92
Reach-1	1.192	182	100	123
Reach-1	1.173	195	136.95	100.05
Reach-1	1.147	240	232.08	388.08
Reach-1	1.103	90.96	232.08	233.04
Reach-1	1.071	50.04	169.02	480.06
Reach-1	.963	875.05	550	480.15
Reach-1	.859	70	26	36
Reach-1	0.854	72	32	38
Reach-1	0.848	45	15	102
Reach-1	0.845	81	81	81
Reach-1	0.83	1649.21	2165.65	1050.28
Reach-1	0.42	1300.55	1850	849.15
Reach-1	0.07	1499.98	370	1.11
Reach-1	0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RIVER-1

Reach	River Sta.	Contr.	Expan.
Reach-1	1.913	.1	.3
Reach-1	1.885	.1	.3
Reach-1	1.873	Culvert	
Reach-1	1.866	.1	.3
Reach-1	1.858	.1	.3
Reach-1	1.793	.1	.3
Reach-1	1.736	.1	.3

Reach-1	1.655	.1	.3
Reach-1	1.595	.1	.3
Reach-1	1.576	.1	.3
Reach-1	1.573	Culvert	
Reach-1	1.565	.1	.3
Reach-1	1.525	.1	.3
Reach-1	1.493	.1	.3
Reach-1	1.458	.1	.3
Reach-1	1.420	.1	.3
Reach-1	1.385	.1	.3
Reach-1	1.351	.1	.3
Reach-1	1.305	.1	.3
Reach-1	1.269	.1	.3
Reach-1	1.266	Culvert	
Reach-1	1.263	.1	.3
Reach-1	1.239	.1	.3
Reach-1	1.232	.1	.3
Reach-1	1.192	.1	.3
Reach-1	1.173	.1	.3
Reach-1	1.147	.1	.3
Reach-1	1.103	.1	.3
Reach-1	1.071	.1	.3
Reach-1	.963	.1	.3
Reach-1	.859	.1	.3
Reach-1	0.854	.1	.3
Reach-1	0.848	.1	.3
Reach-1	0.845	.1	.3
Reach-1	0.83	.1	.3
Reach-1	0.42	.1	.3
Reach-1	0.07	.1	.3
Reach-1	0	.1	.3

Profile Output Table - Encroachment 1

Reach	River Sta	Profile		W.S. Elev	Prof Delta WS	E.G. Elev	
Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
(ft)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)
Reach-1	1.913	PF 1		1375.19			1375.66
224.79	301.03	393.94	445.04		5550.00	5580.00	
Reach-1	1.913	PF 2		1375.76	0.57		1375.98
180.00	301.58	318.65	519.77	5500.00	5550.00	5580.00	5680.00
Reach-1	1.885	PF 1		1375.11			1375.13
426.93	70.66	1059.63	9.71		5400.00	5640.00	
Reach-1	1.885	PF 2		1375.76	0.65		1375.77
240.00		1140.00		5400.00	5400.00	5640.00	5640.00

Reach-1	1.873			Culvert			
Reach-1	1.866	PF 1		1373.74			1373.76
320.15	1.80	1122.32	15.88		5370.00	5650.00	
Reach-1	1.866	PF 2		1374.39		0.65	1374.40
280.00		1140.00		5370.00	5370.00	5650.00	
5650.00							
Reach-1	1.858	PF 1		1373.69			1373.72
304.79	55.69	1073.01	11.30		5330.20	5601.60	
Reach-1	1.858	PF 2		1374.35		0.67	1374.38
271.40		1140.00		5330.20	5330.20	5601.60	
5601.60							
Reach-1	1.793	PF 1		1372.90			1372.97
305.60	259.68	782.37	97.95		5270.00	5427.00	
Reach-1	1.793	PF 2		1373.84		0.94	1373.92
157.00		1140.00		5270.00	5270.00	5427.00	
5427.00							
Reach-1	1.736	PF 1		1371.70			1371.80
295.75	423.63	549.98	166.40		5250.00	5355.00	
Reach-1	1.736	PF 2		1372.25		0.54	1372.50
105.00		1140.00		5250.00	5250.00	5355.00	
5355.00							
Reach-1	1.655	PF 1		1371.09			1371.12
398.82	703.50	420.56	15.94		5390.00	5500.00	
Reach-1	1.655	PF 2		1371.43		0.34	1371.48
200.00	592.25	547.75		5300.00	5390.00	5500.00	
5500.00							
Reach-1	1.595	PF 1		1371.08			1371.08
428.30	92.78	1035.79	11.43		5170.00	5495.00	
Reach-1	1.595	PF 2		1371.44		0.35	1371.44
325.00		1140.00		5170.00	5170.00	5495.00	
5495.00							
Reach-1	1.576	PF 1		1371.08			1371.08
394.14	146.16	928.93	64.91		5200.00	5450.00	

Reach-1	1.576	PF 2		1371.43		0.35	1371.43
250.00		1140.00		5200.00	5200.00	5450.00	
5450.00							
Reach-1	1.573			Culvert			
Reach-1	1.565	PF 1		1364.67			1364.70
328.91	56.64	478.95	604.41		5200.00	5297.20	
Reach-1	1.565	PF 2		1365.25		0.59	1365.29
250.00		526.97	613.03	5200.00	5200.00	5297.20	
5450.00							
Reach-1	1.525	PF 1		1364.07			1364.24
177.89	7.48	703.34	429.18		5165.00	5240.00	
Reach-1	1.525	PF 2		1364.58		0.51	1364.87
75.00		1140.00		5165.00	5165.00	5240.00	
5240.00							
Reach-1	1.493	PF 1		1363.94			1363.97
212.98	50.54	673.57	415.89		5130.00	5250.00	
Reach-1	1.493	PF 2		1364.28		0.34	1364.34
120.00		1140.00		5130.00	5130.00	5250.00	
5250.00							
Reach-1	1.458	PF 1		1363.73			1363.78
332.17	87.19	879.11	173.70		5295.00	5450.00	
Reach-1	1.458	PF 2		1363.94		0.22	1364.02
155.00		1140.00		5295.00	5295.00	5450.00	
5450.00							
Reach-1	1.420	PF 1		1363.24			1363.28
359.25	37.10	933.17	169.73		5175.00	5330.00	
Reach-1	1.420	PF 2		1363.39		0.15	1363.43
309.67		946.11	193.89	5175.00	5175.00	5330.00	
5500.00							
Reach-1	1.385	PF 1		1362.96			1362.99
448.51	74.85	1064.42	0.73		5190.00	5595.00	
Reach-1	1.385	PF 2		1363.15		0.19	1363.18
405.00		1140.00		5190.00	5190.00	5595.00	

5595.00

Reach-1	1.351	PF 1		1362.42			1362.51
191.70	58.03	1066.34	15.62		5200.00	5355.00	
Reach-1	1.351	PF 2		1362.67		0.26	1362.76
155.00		1140.00		5200.00	5200.00	5355.00	
5355.00							
Reach-1	1.305	PF 1		1362.29			1362.30
641.19	29.11	1093.84	17.04		5227.00	5799.00	
Reach-1	1.305	PF 2		1362.59		0.30	1362.60
572.00		1140.00		5227.00	5227.00	5799.00	
5799.00							
Reach-1	1.269	PF 1		1361.95			1362.13
163.85		1109.62	30.38		5529.00	5685.00	
Reach-1	1.269	PF 2		1362.33		0.38	1362.47
151.98		1140.00		5529.00	5529.00	5685.00	
5685.00							
Reach-1	1.266			Culvert			
Reach-1	1.263	PF 1		1361.81			1362.01
162.01	170.20	847.94	121.85		5560.00	5673.00	
Reach-1	1.263	PF 2		1362.22		0.41	1362.41
130.00		993.93	146.07	5560.00	5560.00	5673.00	
5690.00							
Reach-1	1.239	PF 1		1359.16			1360.13
69.20	53.90	1023.74	62.36		5685.00	5720.00	
Reach-1	1.239	PF 2		1359.91		0.74	1360.79
35.00		1140.00		5685.00	5685.00	5720.00	
5720.00							
Reach-1	1.232	PF 1		1358.05			1359.00
77.80	87.55	948.39	104.07		5538.00	5577.00	
Reach-1	1.232	PF 2		1358.08		0.04	1359.56
39.00		1140.00		5538.00	5538.00	5577.00	
5577.00							

Reach-1	1.192	PF 1		1351.21			1351.27
212.67	49.62	919.85	170.53		5126.00	5241.00	
Reach-1	1.192	PF 2		1351.39		0.18	1351.47
115.00		1140.00		5126.00	5126.00	5241.00	
5241.00							
Reach-1	1.173	PF 1		1351.12			1351.15
251.25	0.03	1113.23	26.74		5104.20	5334.00	
Reach-1	1.173	PF 2		1351.31		0.20	1351.34
229.80		1140.00		5104.20	5104.20	5334.00	
5334.00							
Reach-1	1.147	PF 1		1350.91			1350.98
235.71	143.66	967.65	28.69		5265.00	5383.00	
Reach-1	1.147	PF 2		1351.07		0.16	1351.17
118.00		1140.00		5265.00	5265.00	5383.00	
5383.00							
Reach-1	1.103	PF 1		1350.87			1350.88
647.95	27.37	1098.01	14.62		5145.00	5682.00	
Reach-1	1.103	PF 2		1351.06		0.19	1351.06
537.00		1140.00		5145.00	5145.00	5682.00	
5682.00							
Reach-1	1.071	PF 1		1350.83			1350.84
664.89	43.52	1057.90	38.59		5200.00	5700.00	
Reach-1	1.071	PF 2		1351.02		0.19	1351.03
500.00		1140.00		5200.00	5200.00	5700.00	
5700.00							
Reach-1	.963	PF 1		1350.47			1350.67
222.22	124.32	870.43	145.25		5200.00	6300.00	
Reach-1	.963	PF 2		1350.51		0.04	1350.85
144.15		1140.00		5200.00	5200.00	6300.00	
6300.00							
Reach-1	.859	PF 1		1341.53			1341.89
116.56	3.11	1131.88	5.01		5794.70	5890.00	
Reach-1	.859	PF 2		1341.79		0.25	1342.07
130.53	11.88	1119.76	8.36	5750.00	5794.70	5890.00	
5950.00							

Reach-1	0.854	PF 1		1341.62			1341.66
541.89	277.50	632.49	230.00		5875.40	6069.90	
Reach-1	0.854	PF 2		1341.79		0.17	1341.85
269.90	295.83	844.17		5800.00	5875.40	6069.90	
6069.90							
Reach-1	0.848	PF 1		1341.07			1341.41
367.72	134.39	973.42	32.20		5938.30	6140.90	
Reach-1	0.848	PF 2		1341.41		0.34	1341.61
260.90	177.32	962.68		5880.00	5938.30	6140.90	
6140.90							
Reach-1	0.845	PF 1		1340.32			1340.53
273.30	457.04	597.34	85.62		5974.80	6052.70	
Reach-1	0.845	PF 2		1341.14		0.82	1341.35
115.00	313.27	782.81	43.93	5945.00	5974.80	6052.70	
6060.00							
Reach-1	0.83	PF 1		1340.01			1340.10
230.10	529.10	278.33	332.56		10318.00	10344.00	
Reach-1	0.83	PF 2		1340.82		0.81	1341.00
80.00	526.85	398.91	214.24	10280.00	10318.00	10344.00	
10360.00							
Reach-1	0.42	PF 1		1330.61			1331.02
141.21	890.94	249.06	0.00		10385.00	10400.00	
Reach-1	0.42	PF 2		1331.22		0.61	1331.89
60.00	1040.36	99.64		10330.00	10385.00	10400.00	
10390.00							
Reach-1	0.07	PF 1		1324.03			1324.05
1176.88	343.10	112.59	684.31		10312.00	10340.00	
Reach-1	0.07	PF 2		1324.97		0.94	1325.03
265.00	177.45	213.25	749.29	10260.00	10312.00	10340.00	
10525.00							
Reach-1	0	PF 1		1322.37			1322.40
1010.98	1004.89	112.30	22.80		10621.00	10650.00	
Reach-1	0	PF 2		1323.37		1.00	1323.42
316.00	943.73	196.27		10334.00	10621.00	10650.00	
10650.00							

CLOSURE

CLOSURE - THE WOODS ADDITION

PT 01 North: 21360.5493 East : 18288.7679
Line Course: N 00-22-54 W Length: 2625.7100
PT 02 North: 23986.2011 East : 18271.2772
Line Course: N 89-44-59 E Length: 1307.7700
PT 03 North: 23991.9136 East : 19579.0348
Line Course: S 00-23-56 E Length: 1315.6800
PT 04 North: 22676.2655 East : 19588.1944
Line Course: N 89-54-54 E Length: 1058.5200
PT 05 North: 22677.8359 East : 20646.7132
Line Course: S 61-26-23 W Length: 257.3300
PT 06 North: 22554.8107 East : 20420.6965
Line Course: S 62-08-18 W Length: 311.5200
PT 07 North: 22409.2255 East : 20145.2884
Line Course: S 62-29-46 W Length: 208.0900
PT 08 North: 22313.1277 East : 19960.7168
Line Course: S 62-18-22 W Length: 103.8700
PT 09 North: 22264.8543 East : 19868.7458
Line Course: S 61-33-15 W Length: 126.6900
PT 10 North: 22204.5084 East : 19757.3514
Line Course: S 28-16-55 E Length: 156.1800
PT 11 North: 22066.9721 East : 19831.3511
Curve Length: 61.3347 Radius: 112.0000
Delta: 31-22-37 Tangent: 31.4573
Chord: 60.5707 Course: S 77-24-23 W
Course In: S 03-05-42 W Course Out: N 28-16-55 W
RP North: 21955.1355 East : 19825.3041
PT 12 End North: 22053.7657 East : 19772.2373
Line Course: S 61-43-05 W Length: 171.1900
PT 13 North: 21972.6540 East : 19621.4828
Curve Length: 115.4791 Radius: 132.0000
Delta: 50-07-29 Tangent: 61.7276
Chord: 111.8315 Course: S 36-39-21 W
Course In: S 28-16-55 E Course Out: N 78-24-24 W
RP North: 21856.4113 East : 19684.0258
PT 14 End North: 21882.9385 East : 19554.7188
Line Course: N 57-32-53 W Length: 25.0900
PT 15 North: 21896.4016 East : 19533.5468
Curve Length: 67.7235 Radius: 147.0000
Delta: 26-23-47 Tangent: 34.4738
Chord: 67.1265 Course: N 44-21-00 W
Course In: N 32-27-07 E Course Out: S 58-50-54 W
RP North: 22020.4464 East : 19612.4258
PT 16 End North: 21944.4025 East : 19486.6231
Line Course: N 39-14-32 W Length: 52.7300
PT 17 North: 21985.2407 East : 19453.2661
Line Course: N 28-04-35 W Length: 51.6900
PT 18 North: 22030.8479 East : 19428.9382
Line Course: S 62-46-07 W Length: 21.0700
PT 19 North: 22021.2066 East : 19410.2035
Line Course: S 61-50-13 W Length: 158.9000
PT 20 North: 21946.2086 East : 19270.1160
Line Course: S 59-08-55 W Length: 52.9400
PT 21 North: 21919.0603 East : 19224.6670
Line Course: S 62-08-45 W Length: 53.5000
PT 22 North: 21894.0638 East : 19177.3655
Line Course: S 59-43-15 W Length: 66.5600
PT 23 North: 21860.5034 East : 19119.8857
Line Course: S 62-05-39 W Length: 157.2600
PT 24 North: 21786.9026 East : 18980.9122
Line Course: S 60-27-50 W Length: 58.9700
PT 25 North: 21757.8320 East : 18929.6057

CLOSURE

Line	Course: S 62-21-03 W	Length: 101.5500
PT 26	North: 21710.7071	East : 18839.6521
Line	Course: S 61-22-37 W	Length: 106.7900
PT 27	North: 21659.5499	East : 18745.9129
Line	Course: S 61-00-46 W	Length: 132.5000
PT 28	North: 21595.3384	East : 18630.0114
Line	Course: S 62-01-37 W	Length: 63.8700
PT 29	North: 21565.3798	East : 18573.6035
Line	Course: S 00-00-01 E	Length: 204.8200
PT 30	North: 21360.5598	East : 18573.6045
Line	Course: S 89-59-59 W	Length: 284.8200
PT 01	North: 21360.5584	East : 18288.7845