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CITY OF ALBUQUERQUE, NEW MEXICO
PUBLIC WORKS DEPARTMENT
SPECIAL ASSESSMENT DISTRICT 224

DRAINAGE REPORT

CITY OF

Albuquerque

Submitted by:

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WILSON &COMPANY

SPECIAL ASSESSMENT DISTRICT 224

ENGINEER'S DRAINAGE REPORT

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Special Assessment District 224 proposes to pave 17 roadways in the City of Albuquerque. These roadways are located at five different site locations in the city and are listed as follows:

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PURPOSE

Special Assessment District 224's proposed paving of roadways will increase storm water runoff from each of the project sites. This report analyzes existing and proposed drainage for each of the roadways and recommends improvement for the conveyance of the developed flows.

SOIL PROFILES

The soil types at each of the proposed paving sites was determined using topographical maps and project site visits. Soil types varied depending on the land use and land slope. Each basin has the respective soil type percentages listed in its summary.

REPORT FORMAT

This report has been written as a series of drainage reports. Each of the five site locations is analyzed individually. The roadways within the sites are analyzed at one or more analysis points depending on the road=s change in grade. There is a description of existing and proposed drainage conditions followed by tables with a summary of locations, soil types, drainage information, and street flow capacities. Drainage analysis was performed using the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque. Drainage basins for existing conditions as well as for the proposed roadways are shown at

the end of this report and were developed using orthographic topo maps and current surveying data. Street flow capacities were determined by using the computer program "Flowmaster" by Haestad Methods, and storm drains were designed using the computer program "Stormcad".

REFERENCES

AHYMO. Albuquerque Metropolitan Arroyo Flood Control Authority, 1994.

Development Process Manual - Volume 2, City of Albuquerque, 1993.

Drainage Report for Cactus Pointe, Bohannan-Huston, Inc., July 1994

Drainage Report for Mountain View Academy, Jeff Mortensen & Associates, Inc. November 1995.

Drainage Report for Special Assessment District 219, Mark Goodwin & Associates.

Drainage Report for Special Assessment District 197, Scanlon & Associates, 1985.

Hydraulic Analysis of Calabacillas Arroyo Culverts at Coors Road, Bohannan-Huston, Inc. February, 1995.

Mussetter Engineering Inc., Robert A. Mussetter, October 14, 1996.

Proposed Pond at the Northeast Corner of Coors Boulevard NW and Paseo-del-Norte NW, Smith Engineering Company, May 1995.

StormCad. Computer Software. Haestad Methods, Inc. 1995.

Flowmaster. Computer Software. Haestad Methods, Inc. 1995

HEC-2. Computer Software. US Army Corps of Engineers, 1990.

ASSUMPTIONS

A series of assumptions and procedures were chosen to analyze drainage for the paving sites of SAD 224. These assumptions and procedures are listed below:

1.) The design storm is a 100-year 6-hour storm. Any detention ponds are designed to hold sufficient capacity for the 100-year 24-hour storm runoff volume. Retention ponds are designed for the 100-year 10-day storm.

2.) Flows and volumes were calculated using the methodology described in Section 22.2 in the Development Process Manual, Volume II. Developed flows were calculated using basin areas, and the appropriate percentages of land treatment for each of the basins. Existing dirt roadways were considered to be land treatment "C", and paved roads are land treatment "D". The remaining area of the basins was determined for existing and proposed conditions depending on the nature of the proposed development.

3.) The proposed development was included in the assignment of area treatments A, B, C, or D. Treatment percentages for the off-site drainage basins were based on existing zoning.

4.) Flow depths in the street were computed and the cross-sectional areas for the streets are found in Appendix A. The peak flows were calculated, and the flow depth in the street was calculated based on the peak flow.

5.) None of the sites are located within a flood plain.

Volcano Cliffs

I. VOLCANO CLIFFS

EXISTING CONDITIONS:

Existing peak flows for Volcano Cliffs are listed in the Table 1.1 and shown in Plate 1. The majority of the existing peak flows are conveyed in an existing storm drain at the intersection of Montano Road and Whiteman Drive. Two small, north basins discharge to the Boca Negra Arroyo via a 27" storm drain under Tesuque Drive and a 24" storm drain under Mojave Drive. All flows generated by the recently constructed Shadow Ridge Subdivision are directed west to Atrisco Drive and therefore do not contribute to existing flows.

TABLE 1.1 - VOLCANO CLIFFS EXISTING CONDITIONS

BASIN NAME	BASIN AREA (ac)	HYDRO ZONE	A" LAND (ac)	B" LAND (ac)	C" LAND (ac)	D" LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)	Q10 (cfs)
MONTANO	47.97	1	38.38	4.80	2.40	2.40	0.57	2.27	76.61	23.36
TESUQUE	5.25	1	3.15	0.53	0.53	1.05	0.82	0.36	11.22	4.97
MOJAVE	6.19	1	1.86	1.86	0.62	1.86	1.02	0.53	16.06	8.15

PROPOSED CONDITIONS:

The two major outfalls that will be utilized for Volcano Cliffs site are the Boca Negra Arroyo which is just north of the subdivision and the Mariposa Outlet Channel. A grading and drainage plan for this site is shown in Plate 1.

The grading plan for the subdivision was designed to minimize flows to Montano Road and direct the flow from the northern portion of the site to the Boca Negra Arroyo. Flow-carrying capacity was analyzed at different analysis points for streets within the subdivision. With a maximum allowable street flow depth of 0.87 feet, proposed roads located within the subdivision all have the capacity to carry runoff from the developed areas. Refer to the hydrology summary calculations for proposed conditions in Table 1.2.

DISCHARGE TO MONTANO ROAD:

At the location of Montano Road and Whiteman Drive, a 48" storm drain has been constructed by SAD 197 to convey flows east under Montano Road to the Mariposa Outlet Channel for a distance of 4000 feet. This 48" storm drain was sized to handle a calculated 100-year flow of 88 cfs at the intersection of Whiteman Drive and Montano Road. A 30" storm drain that begins at the intersection of Crystal Street with Tesuque Drive feeds into the 48" storm drain.

Calculations in this drainage report show that at the intersection of Whiteman Drive and Montano Road, a total 100-year flow of 88 cfs will accumulate under the proposed conditions. The basin area for this flow is bounded by the south right-of-way line of Montano Road on the south side and the recently constructed Shadow Ridge Subdivision on the west side. An off-site flow of 20 cfs is collected by a series of inlets on Montano Road and discharged to the 48" storm drain, and an on-site flow of 68 cfs is collected at the intersection of Whiteman Drive and Montano Road.

Out of the 68 cfs on-site flow that discharges to the 48" storm drain, 33 cfs will be collected at Tesuque Drive and Crystal Street by an existing "A" inlet and two proposed single "A" inlets. The remaining flow will be captured by a series of two existing "A" inlets and two proposed "A" inlets along Whiteman Drive. The lots on Whiteman Drive will drain one half to the street and one half to the ponds in the back yards(see Grading and Drainage Sheets Plate 1). Refer to street capacity calculations and inlet capacity calculations in Appendix B.

DISCHARGE TO TESUQUE:

The existing 27" storm drain that runs from the intersection of Tesuque Drive and Mojave Drive to the Boca Negra Arroyo will accumulate a 100-year flow of 39 cfs. The two double "A" inlets at this location have enough capacity to convey this flow to the 27" storm drain, and the storm drain has sufficient capacity to convey the flow to the Boca Negra Arroyo. Refer to street capacity calculations and inlet capacity calculations in Appendix B.

DISCHARGE TO MOJAVE:

A larger portion of the flow for the subdivision discharges to Mojave Drive and runs east. The 100-year peak flow from both on-site and off-site at the intersection of Pojaque and Mojave is 99 cfs. The existing 24" storm drain that discharges to the Boca Negra Channel from this intersection does not have the capacity to carry this 100-year flow. This drain will remain on the north side of Mojave with one existing "C" inlet and one "C" inlet added to the north side. In addition to this a new 30" storm drain system will be added to the south side with one double "C" inlet. The new inlet will convey flow to the Boca Negra Channel through a 30" pipe. The combination of the two systems will have sufficient capacity to convey the 100 year flow of 99 cfs. Refer to street capacity calculations and inlet capacity calculations in Appendix B.

BACKYARD LOT PONDING

There is a total backyard flow of 5.28 cfs from the lots located southeast of the intersection of Kachina and Whiteman. This flow will be distributed to each of the developed ponds on the backyard lots and retained. The average peak flow per lot at this location is 0.48 cfs.

Northeast of the intersection of Kachina and Whiteman, a total backyard lot flow of 3.88 cfs is calculated. This flow will also be distributed to each of the proposed backyard lot ponds and retained. The average peak flow per lot at this location is 0.49 cfs.

REFERENCE PLATE 1

TABLE 1.2 - VOLCANO CLIFFS PROPOSED CONDITIONS

BASIN NAME	ANALYSIS POINT (STREET)	BASIN AREA (ac)	HYDRO ZONE	A* LAND (ac)	B* LAND (ac)	C* LAND (ac)	D* LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)	Q10 (cfs)
TESUQUE	1 (TESUQUE)	11.10	1	0.00	3.33	1.11	6.66	1.48	1.37	39.05	23.43
MOJAVE	2 (LITTLE JOE)	17.00	1	0.00	5.10	1.70	10.20	1.48	2.10	59.81	35.89
MOJAVE	3 (WHITEMAN)	4.89	1	0.00	1.47	0.49	2.93	1.48	0.60	17.20	10.32
MOJAVE	4 (MOJAVE)	28.19	1	0.00	8.46	2.82	16.91	1.48	3.48	99.17	59.51
MONTANO	5 (CRYSTAL)	10.10	1	0.00	4.04	1.01	5.05	1.35	1.14	33.17	19.17
MONTANO	6 (WHITEMAN)	11.20	1	0.00	5.60	0.56	5.04	1.27	1.19	35.00	19.66

Staghorn Drive

STAGHORN SUBDIVISION:

EXISTING CONDITIONS:

Existing flows for Staghorn Subdivision are listed in Table 1.3. Existing storm drains that were designed under SAD 219 to capture existing flow are located on Tesuque Drive, and basin boundaries for these flows had been devised using the topographic orthophoto maps. Basin boundaries in this drainage report were laid out using the orthographic topo maps and encompass a smaller area than was used in SAD 219 because the west basin boundaries only follow the top of the escarpment. A future berm along the top of the escarpment will be built by the Park Service to protect the escarpment. This will block flows coming from the west and reduce the future flows on to Stag Horn. The basin and storm sewer system has been designed to convey all flows from the escarpment.

TABLE 1.3 - STAGHORN DRIVE EXISTING CONDITIONS

BASIN NAME	BASIN AREA (ac)	HYDRO ZONE	A" LAND (ac)	B" LAND (ac)	C" LAND (ac)	D" LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)
TESUQUE	17.08	1	0.00	6.83	10.25	0.00	0.86	1.23	43.28
ACACIA	5.89	1	0.00	2.36	3.53	0.00	0.86	0.42	14.92
JASMINE	11.27	1	0.00	4.59	6.68	0.00	0.86	0.81	28.49

PROPOSED CONDITIONS:

The two major outfalls that will be used for Staghorn are the Boca Negra Arroyo and the Mariposa Outlet Channel. The existing storm drains downstream of the subdivisions will discharge to these channels. Similarly to Volcano Cliffs, flow from this subdivision will be conveyed to these storm drains downstream of the division by a combination of street flow, backyard channel flow, and proposed storm drain within Staghorn Drive. A future berm along the top of the escarpment will block flows coming from the west.

Runoff from the Staghorn Subdivision and the escarpment will be discharged to either of three locations including Tesuque Drive, Acacia Street, and Jasmine Street. A rectangular four-foot wide concrete channel sized to convey all developed flows from the proposed lost will be constructed along the backs of the lots east of Acacia, discharging a portion of the lot flows to Acacia Street and a portion to Jasmine Street. Due to a low spot within the proposed Staghorn Drive, a proposed storm drain will be used to collect flows from the low spot to an existing storm drainage system in Jasmine Street just north of Sonora Avenue.

The design flow that is used for this subdivision will be the 100-year developed storm flow. Refer to the hydrologic summary for proposed conditions in Table 1.4 and street capacity calculations in Appendix B.

REFERENCE PLATE 2

DISCHARGE TO JASMINE:

An existing 36" storm drain collects flows from the intersection of Jasmine Street and Sonora Avenue and conveys flows from Jasmine to a 48" storm drain on Tesuque. The 36" storm drain was sized to capture 81 cfs from Jasmine Street in SAD 219, a flow higher than a peak flow of 32 cfs that will reach this location under proposed conditions. Therefore, the system is adequate to handle the proposed flows.

Of the total proposed flow, 18 cfs will be captured handled by a 24" storm drain that will run from the low point on Staghorn Drive to a storm sewer manhole at Jasmine Street and Sonora Avenue. With the new storm drain connection, the existing 4' manhole at this location will need to be upsized to an 8' manhole. This flow of 18 cfs will be collected by one single "A" inlet on the south side of Staghorn Drive. Refer to inlet capacity calculations in Appendix B.

DISCHARGE TO ACACIA:

The proposed 17 cfs flow that discharges to Acacia Road is conveyed by street flow to the intersection of Acacia and Tesuque and then flows east along Tesuque until it is captured by storm inlets west of Sonora Avenue. The flow is conveyed to the existing 48" storm drain in Tesuque. At this location, the storm drainage system from SAD 219 was designed to carry a flow of 74 cfs whereas under proposed conditions, a peak flow of 66 cfs will reach this location. The existing 48" storm drain in Tesuque Drive leads to the Mariposa Outlet Channel.

DISCHARGE TO TESUQUE ON WESTSIDE:

The flow that discharges to Tesuque on the farwest end of Staghorn Drive will be captured by inlets that are located south of Staghorn along Tesuque which will then discharge to a 54" storm drain. This storm drain was sized to handle a flow of 166 cfs under SAD 219 of which 110 cfs is collected from Tesuque Drive. The flow is then discharged to the Boca Negra Arroyo. The calculated 100-year flow entering Tesuque Drive from Staghorn Drive is 47 cfs. The total flow of 157 cfs is less than the 166 cfs capacity, therefore the system is adequate to handle the proposed flow.

TABLE 1.4 - STAGHORN DRIVE PROPOSED CONDITIONS

BASIN NAME	ANALYSIS POINT (STREET)	BASIN AREA (ac)	HYDRO ZONE	A* LAND (ac)	B* LAND (ac)	C* LAND (ac)	D* LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)
TESUQUE	1 (STAGHORN)	17.08	1	0.00	5.43	10.25	1.40	0.97	1.38	46.56
ACACIA	2 (BKYD CHAN)	1.47	1	0.00	0.44	0.15	0.88	1.48	0.18	5.17
ACACIA	3 (ACACIA)	5.89	1	0.00	1.32	3.53	1.04	1.09	0.54	17.36
JASMINE	4 (STAGHORN)	7.01	1	0.00	2.67	4.12	0.22	0.90	0.53	18.21
JASMINE	5 (BKYD CHAN)	2.09	1	0.00	0.63	0.21	1.25	1.48	0.26	7.35
JASMINE	6 (JASMINE)	4.26	1	0.00	0.34	2.56	1.36	1.28	0.45	13.98

REFERENCE PLATE 2

Miscellaneous Streets

A. Santa Clara Avenue
B. Bice Road
C. Holly Avenue
D. Academy Street

BICE ROAD:

EXISTING CONDITIONS:

All existing runoff from the currently paved Bice Road flows west to 57 th Street by surface flow. With adjacent lots discharging runoff to Bice Road, the proposed basin boundary will remain the same. Paving of Bice Road at a constant 0.5% slope will add 1.32 cfs.

PROPOSED CONDITIONS:

Bice Road is to be asphalt paved and 32' Face/Face within the street right-of-way width. The current drainage system will remain unchanged with no impact due to the repaving, of Bice Road. The intersection of 57 th and Bice currently experiences local ponding. The main contributing factor for the runoff ponding at the intersection is the Hotel at the southwest corner discharging to the intersection. Curb returns and valley gutter will be added to the northeast and southeast corners of the intersection to convey flow to 57 th and Hanover. This will help minimize local ponding, but ponding will still occur until curb and gutter is built on 57 th from Iliff to Juniper and the Hotel stops discharing to the intersection.

Hydrologic calculations are shown in Table 1.6.

TABLE 1.6 - BICE ROAD EXISTING AND PROPOSED CONDITIONS

BASIN NAME	CONDITION	BASIN AREA (ac)	HYDRO ZONE	A" LAND (ac)	B" LAND (ac)	C" LAND (ac)	D" LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)
BICE	EXISTING	2.31	2	0.58	0.58	0.23	0.92	1.29	0.25	7.29
BICE	PROPOSED	2.31	2	0.00	0.60	0.23	1.39	1.59	0.31	8.61

REFERENCE FIGURE 2

HOLLY AVENUE

EXISTING CONDITIONS:

The existing storm drainage runoff discharges into 4 - 48" x 212' CMP's that eventually drain in a westerly direction under I-25. See Figure 3. Currently Holly Avenue is an unpaved street. Holly drains from San Pedro west to the existing 48" CMP's. Two inlets on the north west and north east corner of the intersection will be constructed with the PDN project to drain a low spot on the north east corner and to ensure that flows are not conveyed down Holly from adjacent areas. The runoff from San Pedro will be conveyed to Paseo Del Norte through the proposed storm sewer system to be constructed for PDN. The existing drainage runoff pattern within the Holly Avenue corridor will essentially remain the same.

PROPOSED CONDITIONS:

Holly Avenue is to be asphalt paved and 40' Face/Face within the street right-of-way width. A 40' radius cul-de-sac (to the north) at the terminus of Holly Avenue is to be constructed. Sidewalk culverts with a asphalt channel will be built to allow positive drainage from Holly into an existing ditch along the east frontage road of I-25, that will then convey the proposed drainage runoff into existing 4 - 48" x 212' CMP's.

TABLE 1.7 - HOLLY AVENUE EXISTING AND PROPOSED CONDITIONS

BASIN NAME	CONDITION	BASIN AREA (ac)	HYDRO ZONE	A" LAND (ac)	B" LAND (ac)	C" LAND (ac)	D" LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)
HOLLY	EXISTING	22.91	2	9.00	0.00	9.00	5.00	1.11	25.71	66.00
HOLLY	PROPOSED	22.91	2	9.00	0.00	5.00	9.00	1.29	28.05	72.00

REFERENCE FIGURE 3

ACADEMY STREET

EXISTING CONDITIONS:

Academy Street presently is an unpaved dirt street between Congress Street and Bryan Street. The street elevations on Congress Street vs. Bryan Street indicate that Academy Street drains from south to north. Reference Drainage Plate 3, Basin 105. Presently, there exists a ponding area at approximately the middle of Academy Street between Congress Street and Bryan Street. This ponding area is an unsightly condition after a rainfall.

PROPOSED CONDITIONS:

Academy Street is to be asphalt paved between Congress Street north to Bryan Street, an approximate distance of 1,125 feet. The proposed street shall consist of a 2% crown including a curb and gutter section. The street will slope to a low point in the middle of Academy. The street flows will be picked up in two type "C" inlets and conveyed to Congress Avenue via a 24" storm drain. The 24" storm drain will discharge into the existing bar ditch along Congress Avenue and continue to the Congress Pond. The pipe is located so that it can be connected to the proposed storm drain system to be installed in Congress Avenue with SAD 226.

TABLE 1.8 - ACADEMY STREET EXISTING AND PROPOSED CONDITIONS

BASIN NAME	CONDITION	BASIN AREA (ac)	HYDRO ZONE	A" LAND (ac)	B" LAND (ac)	C" LAND (ac)	D" LAND (ac)	Etotal (in)	VOLUME (ac-ft)	Q100 (cfs)
ACADEMY	EXISTING	4.50	1	3.22	0.00	0.00	1.28	0.88	0.33	9.75
ACADEMY	PROPOSED	4.50	1	1.50	0.30	0.00	3.00	1.64	0.62	17.12

REFERENCE FIGURE 4

Eagle Ranch Road

EAGLE RANCH ROAD

INTRODUCTION:

It is proposed to pave Eagle Ranch Road between Irving Boulevard and the north side of the Calabacillas Arroyo and to pave West Side Drive to the east of Eagle Ranch Road. Wilson & Company recommends a proposed drainage system for the basins in the 400 series as well as for basins 105, 106, 406, 601, and 602 where residential development for SAD 226 is proposed. The AHYMO analysis from Smith Engineering Company Proposed Pond at the Northeast Corner Coors Boulevard NW and Paseo-del-Norte was used in drainage analysis for Alternatives 1 and 2 with additions of our on-site basins and proposed storm drain to the input file.

EXISTING CONDITIONS:

North of the Cactus Hills Subdivision, there is an existing detention pond with a total storage capacity of 9.93 acre feet. The pond collects runoff from the Cactus Hills Subdivision as well as from the proposed SAD 226 site west of Congress Avenue. Refer to AHYMO calculations in Appendix A.

An RCP runs along Eagle Ranch Road from the intersection of Eagle Ranch with Paradise Boulevard and discharges into the Calabacillas Arroyo. It varies in size from 48" upstream to 60" downstream. As shown in Smith Engineering Company's report, it collects a total developed off-site flow of about 156 cfs and collects 11.35 cfs from the existing detention pond within the Cactus Hills Subdivision. The 11.35 cfs is the maximum allowable flow that the 60" pipe can carry due to insufficient capacity downstream. Existing conditions from Smith Engineering's AHYMO output show that with this maximum flow through the pond outlet during the 100-year storm, the pond overtops 147 cfs.

Under proposed conditions off-site, the existing storm drain cannot handle the required flows. The storm drain has very little cover on Eagle Ranch Road just east of Paradise Boulevard. Either some manholes will need to be capped, or the existing 48" storm drain and 54" storm drain will need to be upsized to a 60" storm drain to avoid pressure flow.

Undeveloped basins 410, 411, 412, 413, 414, and 415 discharge runoff southeast and 409 discharges to the existing 60" pipe. Existing flows are shown on the next page in Table 1.9.

PROPOSED CONDITIONS:

Under SAD 224 a new 84" storm drain will be constructed from the Calabacillas Arroyo to the crossing with the existing 60" storm drain just north of Irving, The 84" will be connected to the 60" storm drain to provide additional capacity to the system. For the current project a new 60" storm drain will be stubbed out of the 84" line parallel to the existing 60" line. The 84" line is more than sufficient to handle the developed flows from west of Eagle Ranch Road(Basins 407, 409, 413, 414, 415) while reliving the existing 60" line to allow properties west of Eagle Ranch Road(Basins 410, 411, 412) to discharge to the existing system.

In addition the 84" line is sized to handle the developed flows from the proposed SAD 226. With SAD 226 a new 60" line will be extended to the Cactus Hills Detention Pond. The new 60" outlet will give the pond sufficient capacity to convey the 100 year 24 hour event.

The proposed conditions for AHYMO is shown in Appendix A. The street hydraulics and proposed pipe

hydraulics is shown in Appendix B.

Proposed flow from the far northeast corner of the proposed Knolls of Paradise Hills will be handled by both Mountain View Academy and Cactus Pointe Subdivision. Cactus Pointe Subdivision will carry a proposed flow of 42.4 cfs from the Knolls of Paradise Hills with a 24" storm drain that intercepts the subdivision's storm drain system at Bryan Avenue and Scandalwood Place. The other flow of 33 cfs from the Knolls of Paradise Hills will discharge into Irving Boulevard by means of street flow through the Mountain View Academy. Both drainage systems will lead to an existing 60" storm drain on Irving Boulevard.

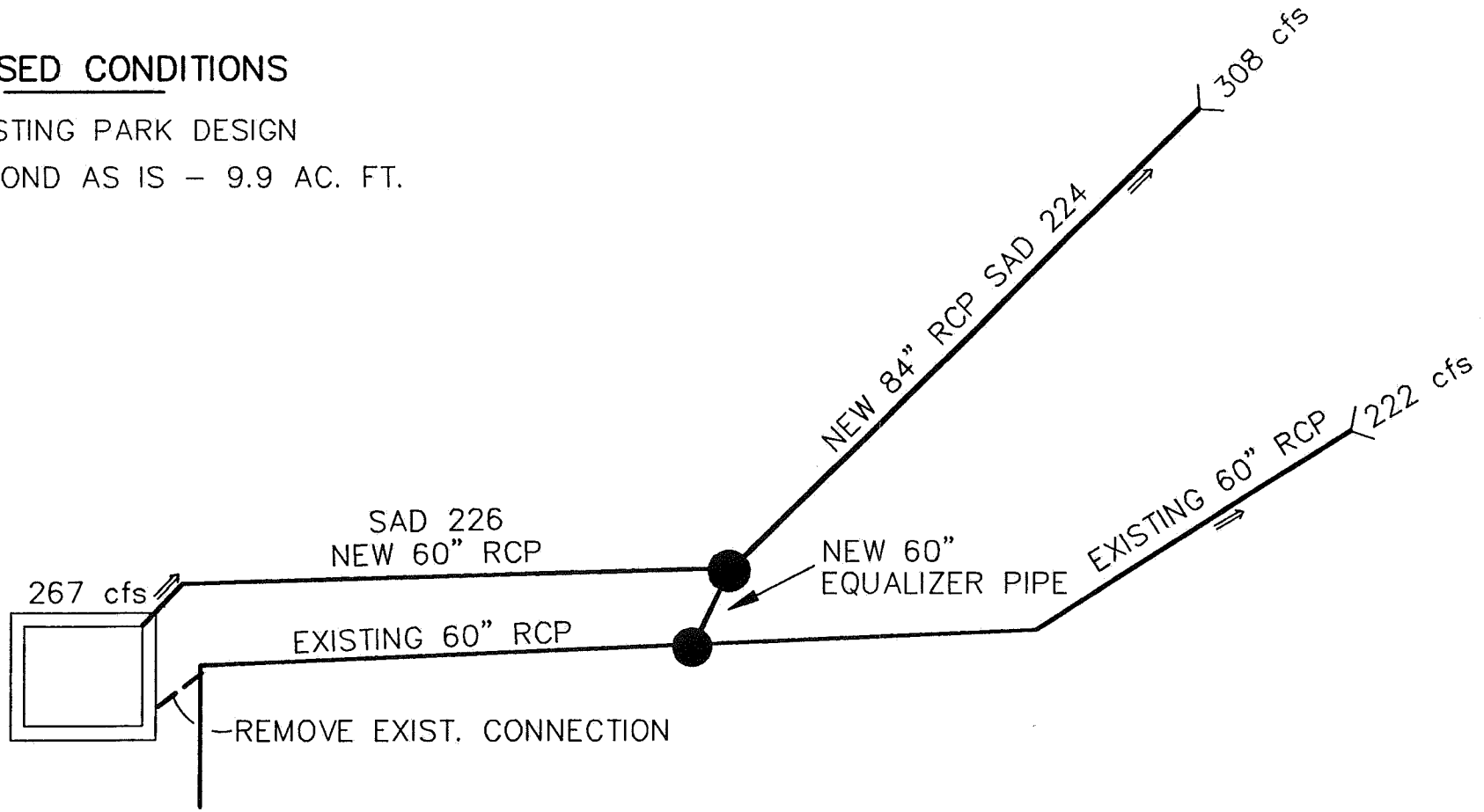
TABLE 1.9 - EAGLE RANCH ROAD - EXISTING AND PROPOSED CONDITIONS

BASIN NUMBER	BASIN AREA (sq mi)	HYDRO ZONE	Q100 Existing (cfs)	Q100 Proposed (cfs)
409	0.0098	1	21.51	26.33
410	0.0047	1	7.69	12.64
411	0.0092	1	15.03	24.72
412	0.0133	1	20.68	34.03
413	0.0156	1	25.47	41.95
414	0.0027	1	4.86	8.00
415	0.0119	1	19.44	32.01

REFERENCE PLATE 3

PROPOSED CONDITIONS

- USE EXISTING PARK DESIGN
- LEAVE POND AS IS – 9.9 AC. FT.



WILSON & COMPANY

S A D 224

DRAINAGE PLAN
EAGLE RANCH ROAD

DSGN.	DSA	DRAWN	VKL	CK.	DSA
FILE	92517	DATE	MAY 1998	SHEET	1 OF 3

92517/M/EAGLE/M217NCDR.DWG

EAGLE RANCH CROSSING OVER THE CALABACILLAS ARROYO

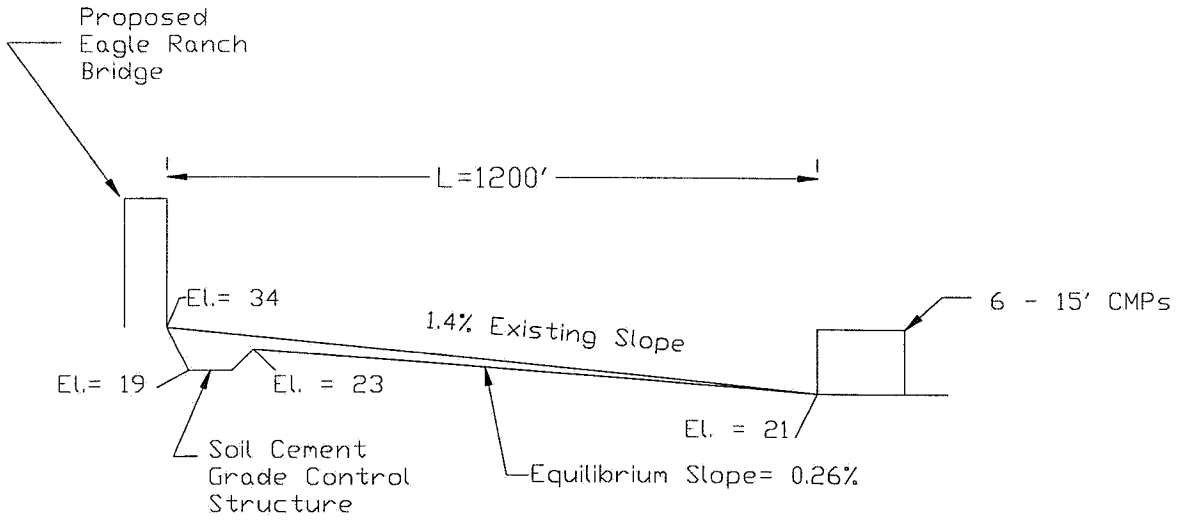
Flow passing through the Calabacillas Arroyo is 17,100 cfs at the location of the proposed crossing of Eagle Ranch Road over the arroyo. A flow of 13, 300 cfs was used in Bohannan Huston's report, A Hydraulic Analysis of Calabacillas Arroyo Culverts at Coors Road, and a flow of 3800 cfs is said by AMAFCA to flow into the Calabacillas Arroyo from the Black Diversion Channel, adding to a total flow of 17,100 cfs. The lower reach of the Calabacillas from Coors Boulevard to the Rio Grande River was designed by AMAFCA for 15,300cfs. We ;therefore, have designed the proposed crossing of Eagle Ranch Road over the arroyo for 15, 300. We have also included HEC-2 runs for 10,000 cfs, 15,300 cfs and 17,100 cfs.

The Calabacillas Arroyo has a fairly uniform cross-section through this area with a 33 foot depth, a 105' bottom width and 2:1 side slopes. Approximately 1200 feet downstream of this location in the arroyo, there are six fifteen-foot diameter culverts under Coors Road. It is proposed to construct a soil cement grade control structure within the arroyo downstream of the proposed bridge. Refer to Figure 3 below.

A HEC-2 analysis was performed to determine depth of flow and the hydraulic profile for a total distance of 2780 feet. A supercritical run was performed starting with a location 1100 feet upstream of the bridge. Normal depth in the arroyo was assumed as the starting water elevation. The HEC-2 run may be found in Appendix C.

Results from HEC-2 analysis show a 100-year flow depth at the proposed bridge location of 7.8 feet at the proposed bridge location and a velocity of 22 fps. Scour protection under the bridge will be provided due to this high velocity.

The proposal of bank protection for erosion control was recommended by Mussetter Engineering Inc. This recommendation is based on the results by Mussetter Engineering Inc. studies for AMAFCA evaluating the requirements for protecting the existing prudent line (a.k.a., the SLA line) at this location. The bank protection would start at the existing grade control #7 and continue downstream to Coors Road, a length of approximately 2500 feet. Included in this report is Mussetter Engineering Inc.'s letter, refer to "INSERT A" on the following pages.



Proposed Grade Control Structure

INSERT A

Mussetter Engineering Inc.

Consultants in
Water Resource Engineering &
Engineering Geomorphology

October 14, 1996

Mr. Steve Metro
Wilson and Company
4775 Indian School Road, N.E., Suite 200
Albuquerque, New Mexico 87110

RE: Eagle Ranch Road Grade Control Structure (MEI Project 96-00.4)

Dear Steve:

Per your request, we have evaluated your proposal to construct a grade control structure in Calabacillas Arroyo at the Eagle Ranch Bridge. In short, it is our opinion that this is an appropriate location for such a structure. We also recommend that bank protection be provided up- and downstream from the structure and bridge to prevent lateral erosion of the high channel banks in this area. The basis for this opinion is described in the following paragraphs.

As your know, we are currently evaluating the requirements for protecting the existing Prudent Line (a.k.a, the SLA Line) between Coors Road and Swinburne Dam for the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA). Our analysis of the long-term stability of the arroyo indicates that the gradient between existing Grade Control Structure (GCS) #7 and Coors Road will flatten to about 0.3% (0.32% based on the existing conditions hydrology and 0.26% for 2036 development conditions), compared to the existing gradient between the upstream side of Coors Road and GCS#7 of about 1.15%. The associated degradation at Eagle Ranch Road, which is about 1175 feet upstream of the upstream side of Coors Road, would be about 10 feet for existing conditions and 10.5 feet for 2036 conditions (**Figure 1**).

To provide a rough idea of the potential timing of the degradation, we developed a simple routing model to estimate the amount of degradation that could occur during a single, 100-year event, and the long-term rate at which the degradation may occur. The model adjusts the gradient between existing grade controls based on the difference between the transport capacity and volume of sediment delivered from the next upstream reach. The primary causes of degradation in the reach at Eagle Ranch Road are sediment trapping in Swinburne Dam and the essentially clear-water inflows from the Black Diversion channel. The effects of Swinburne Dam will not be felt immediately in this reach, because the nearly 3 mile-long reach of the arroyo upstream from the bridge must adjust first. The effects of the Black Diversion channel will occur much more quickly. In fact, there is presently an approximately 5 foot drop across GCS#6, which is located just downstream from the confluence, that has developed in response to some relatively modest flows that have occurred during the past few years.

The model results indicate that 6 to 7 feet of degradation would occur during the first 5 to 7 years after construction of the grade control structure in response to a series of "average annual" events with the existing conditions hydrology, primarily in as a result of changes associated with the Black Diversion channel. For these conditions, the effects of Swinburne Dam would be seen after 18 to 20 years, with the degradation increasing to about 8 feet after 30 years, and to about 9.5 feet after 100 years. Our analysis also indicates that the arroyo could degrade by up to 7 feet at the Eagle Ranch grade control structure during a single, existing conditions 100-year event. Using the 2036 Conditions hydrology, the degradation occurs more rapidly and is deeper. For these conditions, the degradation would reach about 5.5 feet after 4 years of average annual events, but the effects of Swinburne Dam would be seen after only about 6 years with the degradation

annual events, but the effects of Swinburne Dam would be seen after only about 6 years with the degradation increasing rapidly to about 8 feet after 15 years, 9.5 feet after 30 years and 10.5 feet after 100 years.

These results should be viewed as very approximate indications of the relative timing and magnitude of the degradation because of the assumptions that are inherent in the analysis. An important component of the analysis that contributes to the uncertainty is the use of a series of average annual events to estimate the long-term rate of adjustment. The average annual sediment transport volume was estimated by integrating the sediment transport volumes associated with the individual storm events over the flood frequency curve (see **Table 1**) using Equation 1.1 from the Design Guide (Mussetter, et. al, 1993). During a wet period with a greater than average number of large events, the adjustment may occur much more rapidly. Conversely, during a dry period with few runoff events, the adjustments may occur more slowly. Additionally, we believe that, in some cases, the magnitude of the more frequent events may be overestimated by the current hydrology procedures. Based on the observed flows in the Calabacillas Arroyo during the past decade, this appears to be this case here, and would make our estimates of the rate of degradation conservative.

Because of the degradation potential and the height of the existing banks in this reach, we believe that significant bank erosion is likely as the channel adjusts to conditions in the upstream watershed and channel. Given the proximity of the existing Prudent Line (and adjacent property improvements), we strongly recommend that bank protection be provided along both sides of the arroyo between Coors Road and at least GCS#7. **Figure 2** is a cross section of the channel approximately 800 feet upstream from Coors Road. This cross section is typical of channel in this reach. I have also shown an approximation of the channel that would result from 10 feet of degradation, with a 125 foot bottom width (the estimated dominant channel width for 2036 Conditions hydrology) and 2.5V:1H side slopes. Please note that the eroded channel shown in the figure does **not** account for any increase in channel sinuosity that may develop as the channel adjusts, and is therefore somewhat unconservative. From this figure, it is clear that the existing Prudent Line would be endangered if bank protection is not included in the channel stabilization plan for this reach.

If you have questions about the above information or need additional information, please call me.

Sincerely,

MUSSETTER ENGINEERING, INC.

Robert A. Mussetter, Ph.D., P.E.
Principal Engineer

cc: John Kelly, AMAFCA

RAM:bbv
Enclosures
ERCHRD.LTR

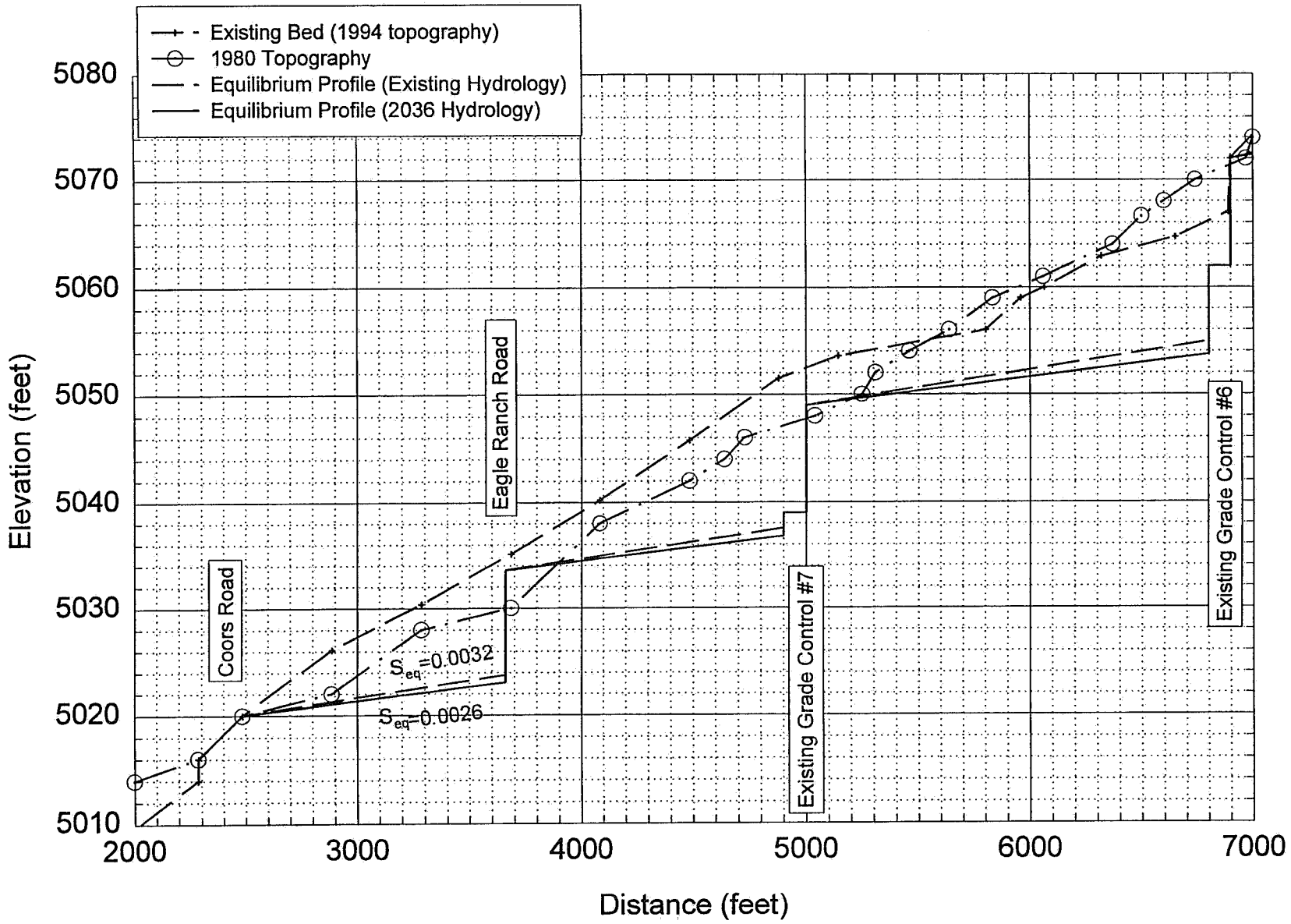


Figure 1. Calabacillas Arroyo bed profile showing existing (1994) conditions, 1980 conditions, and the estimated long-term equilibrium slope.

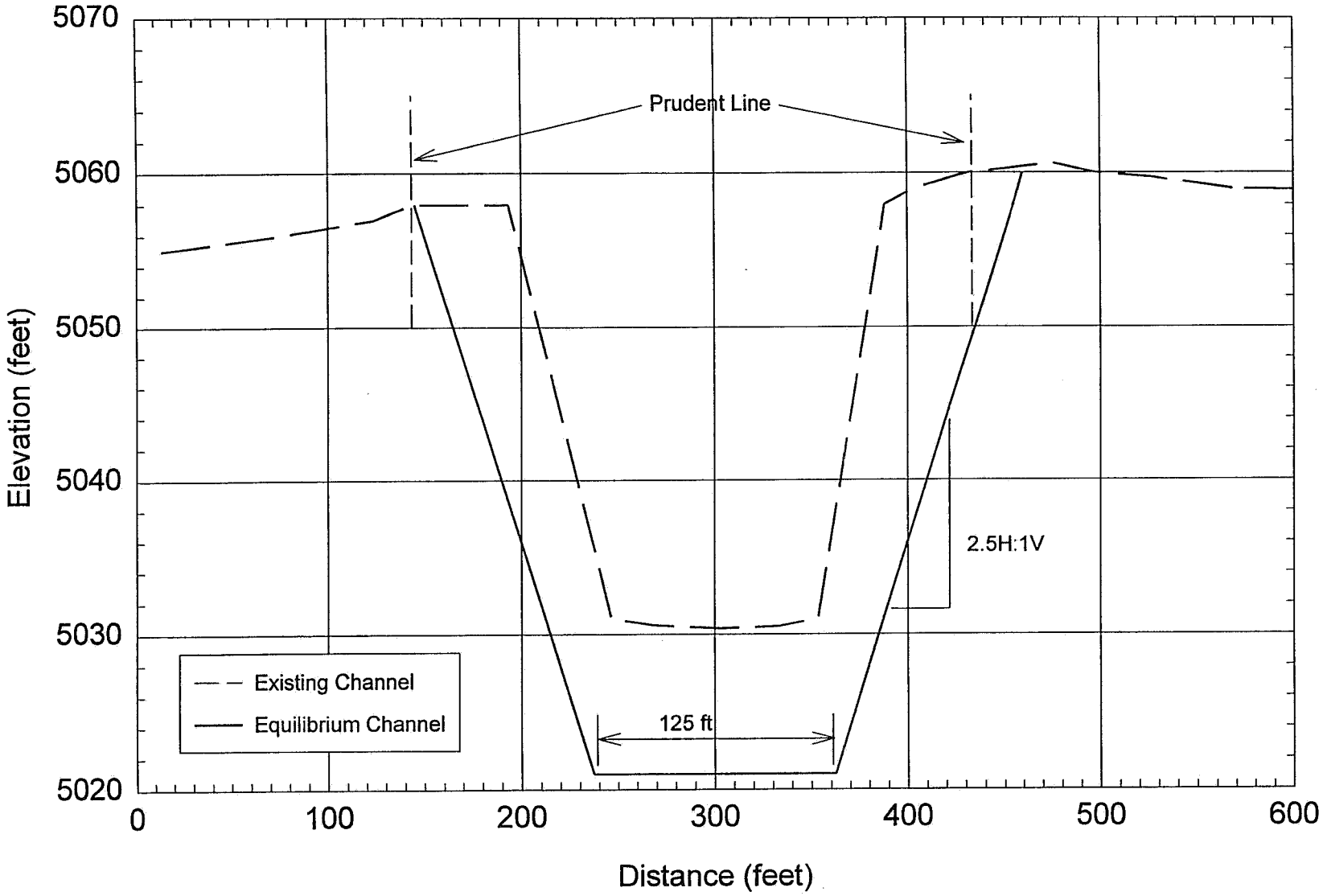


Figure 2. Typical cross section of Calabacillas Arroyo between Coors Road and GCS#7 showing approximate channel that would results from 10 feet of degradation and no additional lateral migration.

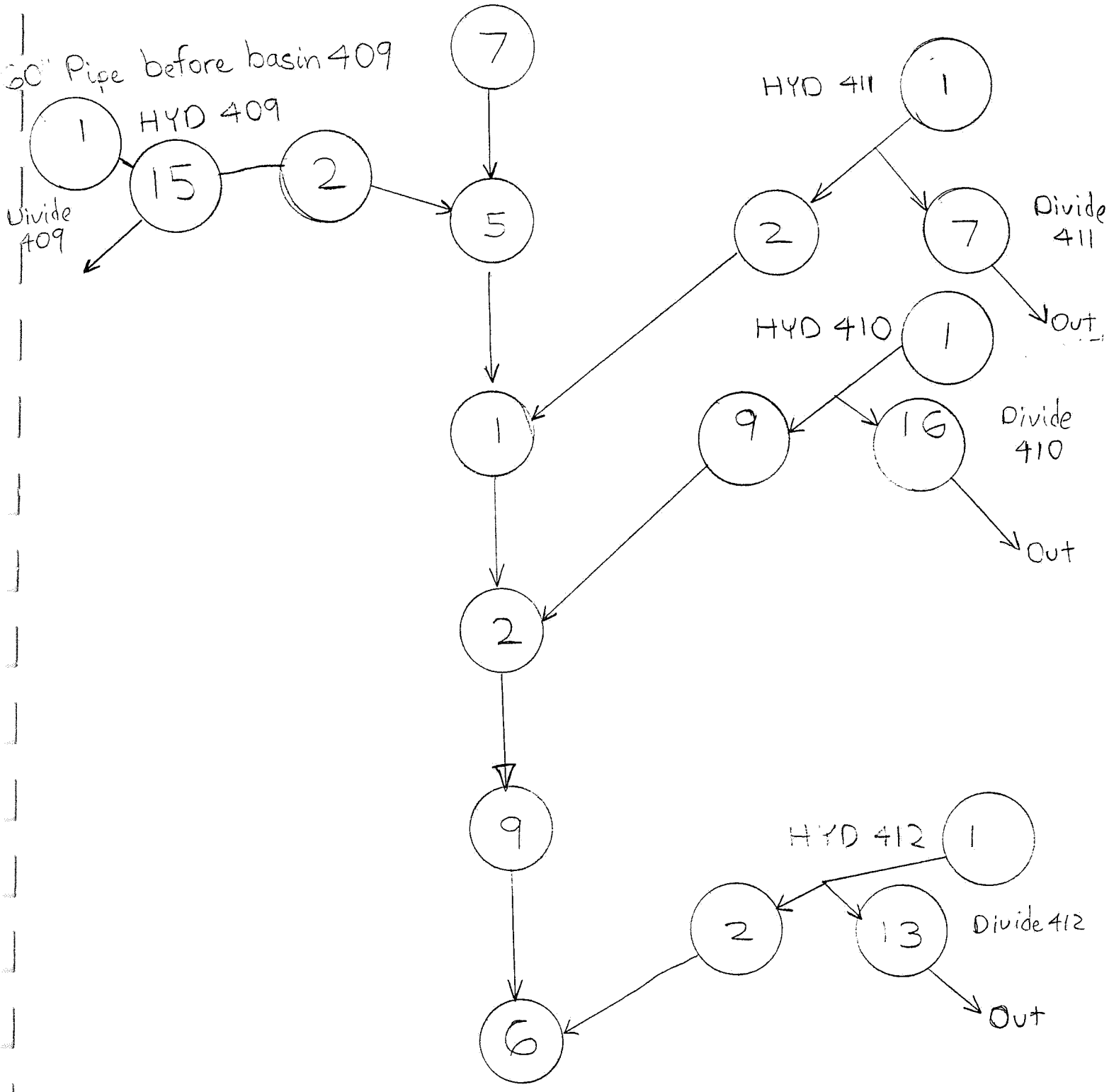
Table 1. Summary of peak discharges and storm runoff volumes for existing and 2036 conditions, Calabacillas Arroyo between Coors Boulevard and Black Diversion Channel.

Recurrence Interval (years)	Existing Conditions		2036 Conditions	
	Peak Discharge (cfs)	Runoff Volume (ac-ft)	Peak Discharge (cfs)	Runoff Volume (ac-ft)
2	1,420	500	3,440	970
5	3,070	1,190	5,420	1,720
10	4,540	1,780	7,570	2,380
25	7,060	2,550	10,330	3,200
50	9,150	3,190	12,750	3,880
100	11,550	3,860	15,210	4,590

Appendix A

Eagle Ranch Hymo Runs

Existing
Developed



AHYMO - EXISTING

Eagle Ranch Existing

```
**              AHYMO - AMAFCA COORS PDM POND
*                     MAY, 1995
*             SMITH ENGINEERING COMPANY
*  ***EXISTING CONDITIONS WATERSHED - AUGUST 1995 - 100 YEAR STORM***
*  ***ADD NEW SUBDIVISION NW OF PETROGLYPH ELEM SCHOOL AT BASIN 303***
*  THE MODEL IS BROKEN UP INTO DIFFERENT SEGMENTS BASED UPON THE
*  NUMBER OF ASTERISKS.  THE CODING IS AS FOLLOWS:
*                      * * * MAJOR BASIN * * *
*                     ***** ANALYSIS POINT *****
*                        **** SUB-BASIN ****
*                      *** ADD HYDROGRAPHS ***
*                           ** ROUTING **
*                       * DIVIDE HYDROGRAPHS *
*
START                 TIME=0.0  PUNCH CODE=0 PRINT CODE=-6
*
RAINFALL              TYPE=1
                      QUARTER=0
                      ONE= 1.90 IN
                      SIX= 2.20 IN
                      DAY= 0    IN
                      DT = 0.03333 HR
*S  100-YEAR STORM
*S  ONE-HOUR=1.90
*S  SIX-HOUR=2.20
*
* * * BASIN 100 * * *
*
**** SUB-BASIN 101 ****
*S HYD 101 IS NW CORNER OF PARIDISE HILLS GOLF COURSE - RESIDENTIAL
COMPUTE NM HYD        ID=1  HYD NO = 101
                      DA= 0.0185  SQUARE MI
                               A=10
                               B=25
                               C=15
                               D=50
                      TP=0.1362  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
** ROUTE 101 THRU 103 **
*S ROUTING 101 THRU GOLF COURSE
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                      MIN ELEV=0       MAX ELEV=3
                      CH SLOPE=0.012   FP SLOPE=0.012
                      N=0.025          DIST=60
```

```
                    DIST      ELEV          DIST      ELEV
                     0        3.00           30        0
                    60        3.00
*
ROUTE MCUNGE        ID=2   HYD NO=101.02 INFLOW ID=1
                    DT=0.0  L=4600
                    NS=0  SLOPE=0.012  MATCODE=0
                    REGCODE=0       CCODE=0
PRINT HYD           ID=2   CODE=1
*
**** SUB-BASIN 102 ****
*S SUB-BASIN 102 IS NW OF PARIDISE HILLS GOLF COURSE - RESIDENTIAL
COMPUTE NM HYD      ID=1  HYD NO = 102
                    DA= 0.0373   SQUARE MI
                              A=10
                              B=25
                              C=15
                              D=50
                    TP=0.1676  HR   MASSRAIN=-1
PRINT HYD           ID=1  CODE=1
*
*
** ROUTE 102 THRU 103 **
*S OLF HYD 102.02 THRU GOLF COURSE
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                    MIN ELEV=0        MAX ELEV=3
                    CH SLOPE=0.0128  FP SLOPE=0.0128
                    N=0.025           DIST=60
                    DIST      ELEV          DIST      ELEV
                     0        3.00           30        0
                    60        3.00
*
ROUTE MCUNGE        ID=3  HYD NO=102.02 INFLOW ID=1
                    DT=0.0  L=3050
                    NS=0  SLOPE=0.0128   MATCODE=0
                    REGCODE=0       CCODE=0
PRINT HYD           ID=3  CODE=1
*
**** SUB-BASIN 103 ****
*S SUB-BASIN 103 IS PARIDISE HILLS GOLF COURSE
COMPUTE NM HYD      ID=1  HYD NO = 103
                    DA= 0.0226  SQUARE MI
                              A=1.5
                              B=80.4
                              C=10.7
```

```
                              D=7.4
                    TP=0.311  HR   MASSRAIN=-1
PRINT HYD           ID=1  CODE=1
*
*** ADD OLF HYD 103 TO OLF HYD 101.02 ***
ADD HYD             ID=4     HYD NO=103.1   ID I=1  ID II=2
PRINT HYD           ID=4     CODE=1
*
*** ADD OLF HYD 103.1 TO OLF HYD 102.02 ***
*S**** OLF HYD 103.2 IS AP #1     *****
ADD HYD             ID=2     HYD NO=103.2   ID I=4  ID II=3
PRINT HYD           ID=2     CODE=1
*
** ROUTE 103.2 THRU 104 **
*S ROUTING 103.2 ON GOLF COURSE RD AND BRYAN AVE
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                    MIN ELEV=0        MAX ELEV=0.67
                    CH SLOPE=0.0143  FP SLOPE=0.0143
                    N=0.033           DIST=48
                    DIST     ELEV          DIST      ELEV
                     0       0.67          0.1        0
                    24       0.48         47.9        0
                    48       0.67
*
ROUTE MCUNGE        ID=3   HYD NO=103.22 INFLOW ID=2
                    DT=0.0  L=2650
                    NS=0  SLOPE=0.0143   MATCODE=0
                    REGCODE=0       CCODE=0
PRINT HYD           ID=3   CODE=1
*
**** SUB-BASIN 104 ****
*S RESIDENTIAL
* SOURCE OF AREA: T.E.C. JAN, 1987 DRAINAGE REPORT, TABLE 1
COMPUTE NM HYD      ID=1  HYD NO = 104
                    DA= 0.0719  SQUARE MI
                              A=20
                              B=25
                              C=15
                              D=40
                    TP=0.2191 HR   MASSRAIN=-1
PRINT HYD           ID=1  CODE=1
*
*** ADD HYD 104 TO HYD 103.22 ***
ADD HYD             ID=2   HYD NO=104.1   ID I=1  ID II=3
PRINT HYD           ID=2   CODE=1
```

```
*
** ROUTE 104.1 THRU 105 **
*S ROUTING 104.1 ON CADDIE RD
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                      MIN ELEV=0       MAX ELEV=0.67
                      CH SLOPE=0.0368  FP SLOPE=0.0368
                      N=0.033          DIST=48
                      DIST     ELEV         DIST      ELEV
                       0       0.67          0.1        0
                      24       0.48         47.9        0
                      48       0.67
*
ROUTE MCUNGE          ID=3   HYD NO=104.12 INFLOW ID=2
                      DT=0.0  L=1850
                      NS=0  SLOPE=0.0368   MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=3   CODE=1
*
**** SUB-BASIN 105 ****
* RESIDENTIAL
* SOURCE OF AREA: T.E.C. JAN, 1987 DRAINAGE REPORT, TABLE 1
COMPUTE NM HYD        ID=1  HYD NO = 105
                      DA= 0.1027  SQUARE MI
                                A=73
                                B=10
                                C=5
                                D=12
                      TP=0.1876  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
*** ADD HYD 105 TO HYD 104.12 ***
*S**** HYD 105.1 IS AP #2     *****
ADD HYD               ID=2   HYD NO=105.1   ID I=1  ID II=3
PRINT HYD             ID=2   CODE=1
*
*S ROUTING 105.1 ON CONGRESS AVE TO EXISTING DETENTION POND
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                      MIN ELEV=0       MAX ELEV=2
                      CH SLOPE=0.0251  FP SLOPE=0.0251
                      N=0.020          DIST=48
                      DIST     ELEV         DIST      ELEV
                       0       2.00          0.1        0
                      24       0.48         47.9        0
                      48       2.00
*
```

```
ROUTE MCUNGE          ID=4   HYD NO=105.12 INFLOW ID=2
                      DT=0.0  L=1950
                      NS=0  SLOPE=0.0251   MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=4   CODE=1
*
**** SUB-BASIN 106 ****
*S SUB-BASIN 106 IS NORTH OF CONGRESS AVE - RESIDENTIAL
COMPUTE NM HYD        ID=1  HYD NO = 106
                      DA= 0.1039  SQUARE MI
                                A=80
                                B=5
                                C=5
                                D=10
                      TP=0.1904  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
**** SUB-BASIN 107 ****
* SUB-BASIN 107 IS SOUTH OF CONGRESS AVE - RESIDENTIAL
COMPUTE NM HYD        ID=2  HYD NO = 107
                      DA= 0.0291  SQUARE MI
                                A=10
                                B=29.2
                                C=15
                                D=45.8
                      TP=0.1333 HR   MASSRAIN=-1
PRINT HYD             ID=2  CODE=1
*
*S ROUTING 107 ON CONGRESS AVE TO EXISTING DETENTION POND
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                      MIN ELEV=0       MAX ELEV=0.67
                      CH SLOPE=0.0216  FP SLOPE=0.0216
                      N=0.017          DIST=48
                      DIST     ELEV          DIST      ELEV
                       0       0.67          0.1        0
                      24       0.48         47.9        0
                      48       0.67
*
ROUTE MCUNGE          ID=3   HYD NO=107.02 INFLOW ID=2
                      DT=0.0  L=925
                      NS=0  SLOPE=0.0216   MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=3   CODE=1
*
*** ADD HYD 107.02 TO HYD 105.12 ***
```

```
ADD HYD              ID=2     HYD NO=107.1   ID I=4  ID II=3
PRINT HYD            ID=2     CODE=1
*
*** ADD HYD 107.1 TO HYD 106 ***
ADD HYD              ID=3     HYD NO=107.2   ID I=1  ID II=2
PRINT HYD            ID=3     CODE=1
*
**** SUB-BASIN 108 ****
* RESIDENTIAL
COMPUTE NM HYD       ID=1  HYD NO = 108
                     DA= 0.0240  SQUARE MI
                               A=10
                               B=27.4
                               C=15
                               D=47.6
                     TP=0.1333  HR   MASSRAIN=-1
PRINT HYD            ID=1  CODE=1
*
*S ROUTING 108 ON STONE HILLS RD TO EXISTING DETENTION POND THRU CACTUS HILLS
COMPUTE RATING CURVE CID=1  VS NO=1   NO SEGS=1
                     MIN ELEV=0       MAX ELEV=0.67
                     CH SLOPE=0.04    FP SLOPE=0.04
                     N=0.017          DIST=48
                     DIST     ELEV          DIST      ELEV
                      0       0.67          0.1        0
                     24       0.48         47.9        0
                     48       0.67
*
ROUTE MCUNGE         ID=2   HYD NO=108.02 INFLOW ID=1
                     DT=0.0  L=825
                     NS=0  SLOPE=0.04     MATCODE=0
                     REGCODE=0       CCODE=0
PRINT HYD            ID=2   CODE=1
*
*** ADD HYD 108.02 TO HYD 107.2 ***
ADD HYD              ID=4     HYD NO=108.1   ID I=2  ID II=3
PRINT HYD            ID=4     CODE=1
*
**** SUB-BASIN 109 ****
*S SUB-BASIN 109 IS PART OF CACTUS HILLS AND EXISTING DET BASIN
COMPUTE NM HYD       ID=1  HYD NO = 109
                     DA= 0.0207  SQUARE MI
                               A=20
                               B=22.5
                               C=15
```

```
                                D=42.5
                          TP=0.1333  HR   MASSRAIN=-1
PRINT HYD                 ID=1  CODE=1
*
*** ADD HYD 109 TO HYD 108.1 ***
*S**** HYD 109.1 IS AP #3     *****
ADD HYD                   ID=2     HYD NO=109.1   ID I=1  ID II=4
PRINT HYD                 ID=2     CODE=1
*
*  EXISTING DETENTION BASIN IN BASIN 109
*S ROUTING RESERVOIR WITH 12" DIAM ORIFACE
* SOURCE: D.M.G. JAN, 1993 DRAINAGE REPORT, PG 24
ROUTE RESERVOIR           ID=3   HYD NO=109.RES   INFLOW=2   CODE=1
                           OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
                                0                0              5069
                              3.78             0.6143           5070
                              5.35             1.5084           5071
                              6.55             2.4797           5072
                              7.56             3.5283           5073
                              8.46             4.6542           5074
                              9.26             5.8574           5075
                             10.00             7.1379           5076
                             10.70             8.4956           5077
                             11.35             9.9306           5078
                                30             10.29            5078.25
                                63             10.65            5078.5
                               105             11.01            5078.75
                               154             11.37            5079
                               210             11.73            5079.25
                               271             12.09            5079.5
                               337             12.45            5079.75
                               408             12.81            5080
*S
*S        OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
*              0                0              5069
*            3.78             0.6143           5070
*            5.35             1.5084           5071
*            6.55             2.4797           5072
*            7.56             3.5283           5073
*            8.46             4.6542           5074
*            9.26             5.8574           5075
*           10.00             7.1379           5076
*           10.70             8.4956           5077
*S          11.35             9.9306           5078     EXISTING TOP OF POND
*             30             10.29            5078.25
```

```
*             63            10.65          5078.5
*            105            11.01          5078.75
*S           154            11.37          5079
*S           210            11.73          5079.25
*            271            12.09          5079.5
*            337            12.45          5079.75
*            408            12.81          5080
*
* DIVIDE HYD 109.RES BY MAXIMUM PIPE OUTFLOW *
DIVIDE HYD            INFLOW ID=3   Q=11.35   ID I=9    HYD NO=109.03
                                                ID II=10  HYD NO=OLF.1
PRINT HYD             ID=9  CODE=1
PRINT HYD             ID=10 CODE=1
*
* * * BASIN 200 * * *
*
**** SUB-BASIN 201 ****
* RESIDENTIAL
* SOURCE OF AREA: T.E.C. JAN, 1987 DRAINAGE REPORT, TABLE 1
COMPUTE NM HYD        ID=1  HYD NO = 201
                      DA= 0.0258  SQUARE MI
                                A=75
                                B=10
                                C=5
                                D=10
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
** ROUTE 201 THRU 202 **
*S ROUTING 201 ON CROYDEN ST TO EXISTING DETENTION POND
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                      MIN ELEV=0       MAX ELEV=0.67
                      CH SLOPE=0.0241  FP SLOPE=0.0241
                      N=0.017          DIST=48
                      DIST     ELEV         DIST      ELEV
                       0       0.67         0.1        0
                      24       0.48        47.9        0
                      48       0.67
*
ROUTE MCUNGE          ID=2   HYD NO=201.02 INFLOW ID=1
                      DT=0.0  L=1080
                      NS=0  SLOPE=0.0241   MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=2   CODE=1
*
```

```
**** SUB-BASIN 202 ****
* SOURCE OF AREA: T.E.C. JAN, 1987 DRAINAGE REPORT, BASIN E
COMPUTE NM HYD        ID=1  HYD NO = 202
                      DA= 0.0288  SQUARE MI
                                A=10
                                B=27.7
                                C=15
                                D=47.3
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
*** ADD HYD 202 TO HYD 201.02 ***
*S**** HYD 202.1 IS AP #4     *****
ADD HYD               ID=4     HYD NO=202.1   ID I=1  ID II=2
PRINT HYD             ID=4     CODE=1
*
*S EXISTING DROP INLET IN BASIN 202
* SOURCE: B.H. FEB, 1992 CACTUS RIDGE DRAINAGE REPORT, HYMO PRINTOUT
ROUTE RESERVOIR       ID=2   HYD NO=202.RES1   INFLOW=4   CODE=1
                       OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
                           0               0              5138.7
                         20.12           0.0009           5139.7
                         24.07           0.0019           5140.7
                         41.69           0.0028           5141.7
                         53.82           0.0037           5142.7
                         63.69           0.0047           5143.7
                         70.59           0.0054           5144.5
                         74.58           0.0111           5145.0
                         81.98           0.0603           5146.0
                         83.46           0.1024           5146.2
                         87.97           0.1700           5146.5
                         94.77           0.2611           5147.0
*S
*S       OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
*           0               0              5138.7
*         20.12           0.0009           5139.7
*         24.07           0.0019           5140.7
*         41.69           0.0028           5141.7
*         53.82           0.0037           5142.7
*         63.69           0.0047           5143.7
*         70.59           0.0054           5144.5
*S        74.58           0.0111           5145.0
*S        81.98           0.0603           5146.0
*         83.46           0.1024           5146.2
*         87.97           0.1700           5146.5
```

```
*          94.77            0.2611         5147.0
*
*  EXISTING DETENTION BASIN IN BASIN 401
*S ROUTING RESERVOIR WITH 21" ORIFACE
* SOURCE: B.H. FEB, 1992 CACTUS RIDGE DRAINAGE REPORT, HYMO PRINTOUT
ROUTE RESERVOIR        ID=4    HYD NO=202.RES2    INFLOW=2    CODE=1
                      OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
                           0                0              5114
                         11.58            0.0026          5115
                         16.38            0.0052          5116
                         20.06            0.0078          5117
                         23.16            0.0091          5118
                         25.89            0.0521          5119
                         28.37            0.1097          5120
                         30.64            0.1829          5121
                         32.75            0.2747          5122
                         34.74            0.3856          5123
                         36.62            0.5174          5124
                         38.41            0.6717          5125
                         40.11            0.8496          5126
                         41.76            1.03            5127
                          61              1.08            5127.25
                          94              1.13            5127.5
                         136              1.18            5127.75
                         185              1.23            5128
*S
*S       OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
*            0                0              5114
*          11.58            0.0026          5115
*          16.38            0.0052          5116
*          20.06            0.0078          5117
*          23.16            0.0091          5118
*          25.89            0.0521          5119
*          28.37            0.1097          5120
*          30.64            0.1829          5121
*          32.75            0.2747          5122
*          34.74            0.3856          5123
*          36.62            0.5174          5124
*S         38.41            0.6717          5125
*S         40.11            0.8496          5126
*          41.76            1.03            5127      EXISTING TOP OF POND
*           61              1.08            5127.25
*           94              1.13            5127.5
*          136              1.18            5127.75
*          185              1.23            5128
```

```
*
* DIVIDE HYD 202.RES2 BY MAXIMUM PIPE OUTFLOW *
DIVIDE HYD            INFLOW ID=4   Q=41.76    ID I=8    HYD NO=202.03
                                                ID II=11  HYD NO=OLF.2
PRINT HYD             ID=8  CODE=1
PRINT HYD             ID=11 CODE=1
*


*S ROUTE 202.RES2 THRU ASSUMED 36" PIPE IN PARADISE BLVD
* PIPE SIZE AND SLOPE WAS NOT DETERMINED
COMPUTE RATING CURVE  CID=1 VS NO=1 CODE=-1 SLP=0.05
                           DIAM=3 FT  N=0.015
ROUTE MCUNGE          ID=6  HYD NO=202.02  INFLOW ID=8
                      DT=0.0  L=760
                      NS=0  SLOPE=0.05     MATCODE=0
                      REGCODE=0       CCODE=0

PRINT HYD             ID=6  CODE=1
*
*
* * * BASIN 400 * * *
*
**** SUB-BASIN 401 ****
*S CACTUS RIDGE
* SOURCE OF AREA: B.H. FEB 1992 DRAINAGE REPORT
COMPUTE NM HYD        ID=1  HYD NO = 401
                      DA= 0.0236  SQUARE MI
                                A=10
                                B=22.3
                                C=15
                                D=52.7
                      TP=0.1333 HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
*** ADD HYD OLF.2 TO SUB-BASIN 401 ***
ADD HYD               ID=3     HYD NO=401.1  ID I=1  ID II=11
PRINT HYD             ID=3     CODE=1
*
* DIVIDE HYD 401 BY MAXIMUM INFLOW OF CATCH BASINS, WEST OF SUB-BASIN 401,
* ALONG PARADISE ROAD (7 CB AT 10 CFS EACH)
DIVIDE HYD            INFLOW ID=3   Q=70    ID I=4    HYD NO=CB2
                                           ID II=5    HYD NO=401.13
PRINT HYD             ID=4  CODE=1
PRINT HYD             ID=5  CODE=1
```

```
*
**** SUB-BASIN 402 ****
*S SUB-BASIN 402 IS PART OF WEST PARK APARTMENTS
* SOURCE: D.M.G. MAY 1994 DRAINAGE REPORT
COMPUTE NM HYD        ID=1  HYD NO = 402
                      DA= 0.0088  SQUARE MI
                                A=0
                                B=28.6
                                C=28.7
                                D=42.7
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
*** ADD OLF HYD 401.13 TO 402 ***
ADD HYD               ID=6     HYD NO=402.1   ID I=5  ID II=1
PRINT HYD             ID=6     CODE=1
*
*** ADD HYD CB1.2 TO HYD CB2 ***
*S**** PIPE HYD CB2.1 IS AP #6     *****
ADD HYD               ID=6     HYD NO=CB2.1   ID I=2  ID II=4
PRINT HYD             ID=6     CODE=1
*
**** SUB-BASIN 403 ****
*S SUB-BASIN 403 IS PART OF WEST PARK APARTMENTS
* SOURCE: D.M.G. MAY 1994 DRAINAGE REPORT
COMPUTE NM HYD        ID=1  HYD NO = 403
                      DA= 0.0144  SQUARE MI
                                A=0
                                B=22.9
                                C=22.9
                                D=54.2
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
* DIVIDE HYD 403 BY MAXIMUM INFLOW OF POND INLET IN WEST PARK APARTMENTS
* SOURCE OF DIVIDE IS D.M.G. MAY, 1994 DRAINAGE REPORT
*S OLF HYD 403.13 IS A NONCONTRIBUTING POND
DIVIDE HYD            INFLOW ID=1   Q=3      ID I=2    HYD NO=CB3
                                            ID II=4    HYD NO=403.13
PRINT HYD             ID=2  CODE=1
PRINT HYD             ID=4  CODE=1
*
*** ADD HYD CB2.1 TO HYD CB3 ***
ADD HYD               ID=5     HYD NO=CB3.1   ID I=6  ID II=2
PRINT HYD             ID=5     CODE=1
```

```
*
*S ROUTE CB3.1 IN 48" AND 54" PIPE BETWEEN MH # S-702 AND MH # S-732
*S Q(CAP) = 144 CFS, AT SLOPE=0.005
COMPUTE RATING CURVE  CID=1 VS NO=1 CODE=-1 SLP=0.005
                              DIAM=4.5 FT  N=0.013
ROUTE MCUNGE          ID=2  HYD NO=CB3.13  INFLOW ID=5
                      DT=0.0  L=1678
                      NS=0  SLOPE=0.005    MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=2  CODE=1
*
**** SUB-BASIN 404 ****
*S LESLIE HOMES
* SOURCE: D.M.G. JAN 1993 DRAINAGE REPORT
COMPUTE NM HYD        ID=1  HYD NO = 404
                      DA= 0.0161  SQUARE MI
                                A=10
                                B=25.1
                                C=15
                                D=49.9
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
*** ADD HYD 404 TO HYD CB3.1 ***
* ASSUME ALL SUB-BASIN 404 ENTERS SD
ADD HYD               ID=5     HYD NO=CB4.1   ID I=1  ID II=2
PRINT HYD             ID=5     CODE=1
*
*S ROUTE CB4.1 IN 60" PIPE BETWEEN MH # S-732 AND MH # S-531
*S Q(CAP) = 184 CFS, AT SLOPE=0.005
COMPUTE RATING CURVE  CID=1 VS NO=1 CODE=-1 SLP=0.005
                              DIAM=5 FT  N=0.015
ROUTE MCUNGE          ID=2  HYD NO=CB4.13  INFLOW ID=5
                      DT=0.0  L=1051
                      NS=0  SLOPE=0.005    MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=2  CODE=1
*
**** SUB-BASIN 405 ****
*S SUB-BASIN 405 IS PART OF CACTUS HILLS
* SOURCE: D.M.G. JAN 1993 DRAINAGE REPORT
COMPUTE NM HYD        ID=1  HYD NO = 405
                      DA= 0.0270  SQUARE MI
                                A=10
                                B=42
```

```
                              C=10
                              D=38
                    TP=0.1333 HR   MASSRAIN=-1
PRINT HYD           ID=1  CODE=1
*
*S  DIVIDE SUB-BASIN 405 BY REMAINING MAXIMUM PIPE CAPACITY *
DIVIDE HYD          INFLOW ID=1   Q=40    ID I=6    HYD NO=CB5
                                          ID II=7   HYD NO=405.03
PRINT HYD           ID=6  CODE=1
PRINT HYD           ID=7  CODE=1
*
*S ROUTING 405.03 TO CONGRESS AVE
COMPUTE RATING CURVE  CID=1  VS NO=1   NO SEGS=1
                    MIN ELEV=0       MAX ELEV=0.67
                    CH SLOPE=0.004  FP SLOPE=0.004
                    N=0.017          DIST=48
                    DIST     ELEV         DIST      ELEV
                     0       0.67         0.1        0
                    24       0.48        47.9        0
                    48       0.67
*
ROUTE MCUNGE        ID=15  HYD NO=405.02 INFLOW ID=7
                    DT=0.0  L=500
                    NS=0  SLOPE=0.004    MATCODE=0
                    REGCODE=0      CCODE=0
PRINT HYD           ID=15  CODE=1
*
*** ADD HYD CB5 TO HYD CB4.13 ***
* SUB-BASIN 405 HAS TRANSVERSE DRAIN WITH 36" PIPE TO 60" SD
ADD HYD             ID=5     HYD NO=CB5.1   ID I=6  ID II=2
PRINT HYD           ID=5     CODE=1
*
*S ROUTE CB5.1 IN 60" PIPE BETWEEN MH # S-531 AND MH # S-932
*S Q(CAP) = 184 CFS, AT SLOPE=0.005
COMPUTE RATING CURVE  CID=1 VS NO=1 CODE=-1 SLP=0.005
                              DIAM=5.5 FT  N=0.015
ROUTE MCUNGE        ID=2  HYD NO=CB5.13  INFLOW ID=5
                    DT=0.0  L=454
                    NS=0  SLOPE=0.005    MATCODE=0
                    REGCODE=0      CCODE=0
PRINT HYD           ID=2  CODE=1
*
*** ADD PIPE HYD CB5.13 TO 109.03 ***
*S TOTAL PIPE FLOW IN 60" SD AT DETENTION POND
*S**** PIPE HYD CB5.2 IS AP #7     *****
```

```
ADD HYD                ID=5     HYD NO=CB5.2   ID I=9  ID II=2
PRINT HYD              ID=5     CODE=1
*
*S ROUTE CB5.2 IN 60" PIPE UNTIL CUBBY HOLE DET POND
*S Q(CAP) = 233 CFS, AT SLOPE=0.008
COMPUTE RATING CURVE   CID=1 VS NO=1 CODE=-1 SLP=0.008
                       DIAM=5 FT  N=0.015
ROUTE MCUNGE           ID=2  HYD NO=CB5.23  INFLOW ID=5
                       DT=0.0  L=690
                       NS=0  SLOPE=0.008    MATCODE=0
                       REGCODE=0      CCODE=0
PRINT HYD              ID=2  CODE=1
*
**** SUB-BASIN 406 ****
*S SUB-BASIN 406 IS NORTH OF CONGRESS AVE - RESIDENTIAL
COMPUTE NM HYD         ID=1  HYD NO = 406
                       DA= 0.0107  SQUARE MI
                                 A=90
                                 B=0
                                 C=5
                                 D=5
                       TP=0.1333  HR   MASSRAIN=-1
PRINT HYD              ID=1  CODE=1
*
*** ADD OLF.1 TO HYD 405.02 ***
ADD HYD                ID=14    HYD NO=405.1  ID I=15  ID II=10
PRINT HYD              ID=14    CODE=1
*
*** ADD 405.1 TO HYD 406 ***
ADD HYD                ID=6     HYD NO=406.1  ID I=14  ID II=1
PRINT HYD              ID=6     CODE=1
*
*S ROUTING 406 ON CONGRESS AVE TO IRVING AND EAGLE RANCH ROAD
COMPUTE RATING CURVE   CID=1  VS NO=1   NO SEGS=1
                       MIN ELEV=0       MAX ELEV=3
                       CH SLOPE=0.0083  FP SLOPE=0.0083
                       N=0.017          DIST=48
                       DIST     ELEV         DIST      ELEV
                        0       3.00          0.1       0
                       24       0.48         47.9       0
                       48       3.00
*
ROUTE MCUNGE           ID=3   HYD NO=406.12 INFLOW ID=6
                       DT=0.0  L=600
                       NS=0  SLOPE=0.0083  MATCODE=0
```

```
                      REGCODE=0      CCODE=0
PRINT HYD             ID=3   CODE=1
*
**** SUB-BASIN 407 ****
*S SUB-BASIN 407 IS NORTH OF CONGRESS AVE - COMMERCIAL
* INCLUDES AREA FROM IRVING BLVD
COMPUTE NM HYD        ID=1  HYD NO = 407
                      DA= 0.0224  SQUARE MI
                                A=50
                                B=10
                                C=10
                                D=30
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
* EXISTING DETENTION BASIN IN BASIN 407
*S CUBBY HOLE DETENTION BASIN
*S ROUTING RESERVOIR WITH 12" ORIFACE
* SOURCE: D.M.G. JAN, 1993 DRAINAGE REPORT, PG 42
ROUTE RESERVOIR       ID=5   HYD NO=407.RES   INFLOW=1   CODE=1
                       OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
                            0                0              5063
                           3.78            0.0387           5064
                           5.35            0.0597           5065
                           6.55            0.0808           5066
                           7.56            0.1019           5067
                           8.46            0.1230           5068
                           9.26            0.1440           5069
                          10.00            0.1651           5070
                            29             0.170            5070.25
                            62             0.175            5070.5
                           104             0.180            5070.75
                           153             0.185            5071
*S
*S       OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
*             0                0              5063
*            3.78            0.0387           5064
*            5.35            0.0597           5065
*            6.55            0.0808           5066
*            7.56            0.1019           5067
*            8.46            0.1230           5068
*            9.26            0.1440           5069
*           10.00            0.1651           5070
*S           29               0.170            5070.25
*S           62               0.175            5070.5
```

```
*           104              0.180           5070.75
*           153              0.185           5071
*
* DIVIDE HYD 407.RES BY MAXIMUM PIPE OUTFLOW *
DIVIDE HYD            INFLOW ID=5   Q=10    ID I=7    HYD NO=407.03
                                            ID II=13  HYD NO=OLF.4
PRINT HYD             ID=7  CODE=1
PRINT HYD             ID=13 CODE=1
*
*** ADD PIPE HYD CB5.23 TO 407.RES ***
*S TOTAL PIPE FLOW IN 60" SD AT DETENTION POND
*S**** PIPE HYD CB5.3 IS AP #8     *****
ADD HYD               ID=6     HYD NO=CB5.3   ID I=7  ID II=2
PRINT HYD             ID=6     CODE=1
*
*S ROUTE CB5.3 IN 60" PIPE UNTIL BETWEEN MH # S-951 TO MH # S-962
*S Q(CAP) = 260 CFS, AT SLOPE=0.01
COMPUTE RATING CURVE  CID=1 VS NO=1 CODE=-1 SLP=0.01
                            DIAM=5 FT  N=0.015
ROUTE MCUNGE          ID=7  HYD NO=CB5.33  INFLOW ID=6
                      DT=0.0  L=739
                      NS=0  SLOPE=0.01     MATCODE=0
                      REGCODE=0       CCODE=0
PRINT HYD             ID=7  CODE=1
*
*** ADD HYD 406.12 TO HYD OLF.4 ***
ADD HYD               ID=17    HYD NO=407.1   ID I=3  ID II=13
PRINT HYD             ID=17    CODE=1
*
**** SUB-BASIN 408 ****
*S SUB-BASIN 408 IS STATE FARM INSURANCE
*S OLF GOING TO THE EAST AND DOES NOT EFFECT EAGLE RANCH SD
* SOURCE: EASTERLING FEB 1987 PLANS
COMPUTE NM HYD        ID=14  HYD NO = 408
                      DA= 0.0066  SQUARE MI
                                A=20
                                B=10
                                C=0
                                D=70
                      TP=0.1333  HR   MASSRAIN=-1
PRINT HYD             ID=14  CODE=1
*
*  EXISTING DETENTION BASIN IN SUB-BASIN 408
*S ROUTING RESERVOIR WITH 12" WEIR
* SOURCE: EASTERLING FEB, 1987 START FARM INS PLANS
```

```
ROUTE RESERVOIR       ID=18   HYD NO=408.RES   INFLOW=14   CODE=1
                       OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
                            0                0               5050.8
                          1.08             0.2198            5052.3
                          1.66             0.2931            5052.8
                          2.31             0.3663            5053.3
                          3.02             0.4396            5053.8
                           22              0.4763            5054.05
*S
*S     OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
*         0                0               5050.8
*S       1.08             0.2198            5052.3    EXISTING TOP OF POND
*        1.66             0.2931            5052.8
*S       2.31             0.3663            5053.3
*S       3.02             0.4396            5053.8
*         22              0.4763            5054.05
*
*** ADD HYD 408.RES TO HYD 407.1 ***
ADD HYD               ID=14    HYD NO=408.1   ID I=17  ID II=18
PRINT HYD             ID=14    CODE=1
*
**** SUB-BASIN 409 ****
*S SUB-BASIN 409 IS EAST OF IRVING, TRACT D
COMPUTE NM HYD        ID=1  HYD NO = 409
                      DA= 0.0098  SQUARE MI
                                A=20
                                B=10
                                C=5
                                D=60
                      TP=0.1333 HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
* DIVIDE HYD 409 BY 36" STUB OUT PIPE CAPACITY *
DIVIDE HYD            INFLOW ID=1   Q=25    ID I=2    HYD NO=CB6
                                          ID II=15   HYD NO=409.03
PRINT HYD             ID=2  CODE=1
PRINT HYD             ID=15 CODE=1
*
*** ADD HYD CB6 TO HYD CB5.33 ***
ADD HYD               ID=5     HYD NO=CB6.1   ID I=2  ID II=7
PRINT HYD             ID=5     CODE=1
*
**** SUB-BASIN 411 ****
*S SUB-BASIN 411 IS EAST OF IRVING, TRACT B
COMPUTE NM HYD        ID=1  HYD NO = 411
```

```
                    DA= 0.0092  SQUARE MI
                              A=45
                              B=5
                              C=20
                              D=30
                    TP=0.1333  HR   MASSRAIN=-1
PRINT HYD           ID=1  CODE=1
*
* DIVIDE HYD 411 BY INLET CAPACITY *
DIVIDE HYD          INFLOW ID=1   Q=10    ID I=2    HYD NO=CB7
                                          ID II=7   HYD NO=411.03
PRINT HYD           ID=2  CODE=1
PRINT HYD           ID=7  CODE=1
*
**** SUB-BASIN 410 ****
*S SUB-BASIN 410 IS EAST OF IRVING, TRACT A
COMPUTE NM HYD      ID=1  HYD NO = 410
                    DA= 0.0047  SQUARE MI
                              A=45
                              B=5
                              C=20
                              D=30
                    TP=0.1333  HR   MASSRAIN=-1
PRINT HYD           ID=1  CODE=1
*
* DIVIDE HYD 410 BY INLET CAPACITY *
DIVIDE HYD          INFLOW ID=1   Q=10    ID I=9    HYD NO=CB8
                                          ID II=16  HYD NO=410.03
PRINT HYD           ID=9  CODE=1
PRINT HYD           ID=16 CODE=1
*
*** ADD HYD 411.03 TO HYD 410.03 ***
ADD HYD             ID=3    HYD NO=411.1   ID I=7  ID II=16
PRINT HYD           ID=3    CODE=1
*
*** ADD HYD 411.1 TO HYD 409.03 ***
*S ASSUME OLF HYD 411.2 PONDS
ADD HYD             ID=16   HYD NO=411.2   ID I=3  ID II=15
PRINT HYD           ID=16   CODE=1
*
*** ADD HYD CB7 TO HYD CB6.1 ***
ADD HYD             ID=1    HYD NO=CB7.1   ID I=2  ID II=5
PRINT HYD           ID=1    CODE=1
*
*** ADD HYD CB8 TO HYD CB7.1 ***
```

```
ADD HYD               ID=2     HYD NO=CB8.1   ID I=1  ID II=9
PRINT HYD             ID=2     CODE=1
*
*S ROUTE CB7.1 IN 60" PIPE TO SUB-BASIN 411 ( JUST BEFORE CALABACILLAS ARROYO OUTFALL
*S Q(CAP) = 184 CFS, AT SLOPE=0.005
COMPUTE RATING CURVE  CID=1 VS NO=1 CODE=-1 SLP=0.005
                      DIAM=5.5 FT  N=0.013
ROUTE MCUNGE          ID=9  HYD NO=CB8.12  INFLOW ID=2
                      DT=0.0  L=1263
                      NS=0  SLOPE=0.005    MATCODE=0
                      REGCODE=0      CCODE=0
PRINT HYD             ID=9  CODE=1
*
**** SUB-BASIN 412 ****
*S SUB-BASIN 412 IS EAST OF IRVING, TRACT C-2 and C-3
COMPUTE NM HYD        ID=1  HYD NO = 412
                      DA= 0.0133  SQUARE MI
                                A=45
                                B=5
                                C=20
                                D=30
                      TP=0.1449 HR   MASSRAIN=-1
PRINT HYD             ID=1  CODE=1
*
* DIVIDE HYD 412 BY INLET CAPACITY of 24" STUB OUT *
*S OLF HYD 412.03 IS OFF-SITE FLOW TO CALAB. ARROYO
DIVIDE HYD            INFLOW ID=1   Q=10    ID I=2    HYD NO=CB9
                                          ID II=13   HYD NO=412.03
PRINT HYD             ID=2  CODE=1
PRINT HYD             ID=13  CODE=1
*
*** ADD HYD CB9 TO HYD CB8.12 ***
*S HYD CB9.1 IS TOTAL PIPE FLOW TO CALAB. ARROYO
*S****  HYD CB9.1 IS AP #9     *****
ADD HYD               ID=6     HYD NO=CB9.1   ID I=2  ID II=9
PRINT HYD             ID=6     CODE=1
*
**** SUB-BASIN 413 ****
*SUB-BASIN 413 IS WEST OF EAGLE RANCH
COMPUTE NM HYD         ID=1     HYD NO=413
                       DA=0.0156   SQUARE MI
                                 A=45
                                 B=5
                                 C=20
                                 D=30
```

```
                        TP=0.1333   HR  MASSRAIN=-1
PRINT HYD               ID=1 CODE=1
*
**** SUB-BASIN 414 ****
*SUB-BASIN 414 IS WEST OF EAGLE RANCH
COMPUTE NM HYD          ID=1     HYD NO=414
                        DA=0.00297    SQUARE MI
                                  A=45
                                  B=5
                                  C=20
                                  D=30
                         TP=0.1333 HR    MASSRAIN=-1
PRINT HYD                ID=1      CODE=1
*
****SUB-BASIN 415 ****
*SUB-BASIN 415 IS WEST OF EAGLE RANCH
COMPUTE NM HYD          ID=1     HYD NO=415
                        DA=0.0119    SQUARE MI
                                     A=45
                                     B=5
                                     C=20
                                     D=30
                        TP=0.1333 HR     MASSRAIN=-1
PRINT HYD               ID=1      CODE =1
*
**********************
**********************
*
*
FINISH
```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =05/03/1996
INPUT FILE = eagleex.dat USER NO.= S_METRO_.S94

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
*S 100-YEAR STORM										
*S ONE-HOUR=1.90										
*S SIX-HOUR=2.20										
*S HYD 101 IS NW CORNER OF PARIDISE HILLS GOLF COURSE - RESIDENTIAL										
COMPUTE NM HYD	101.00	-	1	.01850	38.23	1.320	1.33771	1.500	3.229	PER IMP= 50.00
*S ROUTING 101 THRU GOLF COURSE										
ROUTE MCUNGE	101.02	1	2	.01850	32.74	1.295	1.31285	1.933	2.765	CCODE = .1
*S SUB-BASIN 102 IS NW OF PARIDISE HILLS GOLF COURSE - RESIDENTIAL										
COMPUTE NM HYD	102.00	-	1	.03730	69.06	2.661	1.33771	1.533	2.893	PER IMP= 50.00
*S OLF HYD 102.02 THRU GOLF COURSE										
ROUTE MCUNGE	102.02	1	3	.03730	63.43	2.638	1.32590	1.766	2.657	CCODE = .1
*S SUB-BASIN 103 IS PARIDISE HILLS GOLF COURSE										
COMPUTE NM HYD	103.00	-	1	.02260	17.78	.967	.80190	1.700	1.229	PER IMP= 7.40
ADD HYD	103.10	1& 2	4	.04110	44.95	2.262	1.03188	1.900	1.709	
*S**** OLF HYD 103.2 IS AP #1 *****										
ADD HYD	103.20	4& 3	2	.07840	97.14	4.900	1.17176	1.833	1.936	
*S ROUTING 103.2 ON GOLF COURSE RD AND BRYAN AVE										
ROUTE MCUNGE	103.22	2	3	.07840	93.86	4.863	1.16291	2.100	1.871	CCODE = .1
*S RESIDENTIAL										
COMPUTE NM HYD	104.00	-	1	.07190	101.44	4.532	1.18180	1.600	2.204	PER IMP= 40.00
ADD HYD	104.10	1& 3	2	.15030	121.94	9.394	1.17194	2.066	1.268	
*S ROUTING 104.1 ON CADDIE RD										
ROUTE MCUNGE	104.12	2	3	.15030	121.60	9.394	1.17193	2.133	1.264	CCODE = .2
COMPUTE NM HYD	105.00	-	1	.10270	94.85	3.683	.67238	1.567	1.443	PER IMP= 12.00
*S**** HYD 105.1 IS AP #2 *****										
ADD HYD	105.10	1& 3	2	.25300	184.41	13.077	.96915	1.633	1.139	
*S ROUTING 105.1 ON CONGRESS AVE TO EXISTING DETENTION POND										
ROUTE MCUNGE	105.12	2	4	.25300	180.67	13.033	.96592	1.733	1.116	CCODE = .1
*S SUB-BASIN 106 IS NORTH OF CONGRESS AVE - RESIDENTIAL										
COMPUTE NM HYD	106.00	-	1	.10390	89.31	3.498	.63125	1.567	1.343	PER IMP= 10.00
COMPUTE NM HYD	107.00	-	2	.02910	59.13	1.992	1.28370	1.500	3.175	PER IMP= 45.80
*S ROUTING 107 ON CONGRESS AVE TO EXISTING DETENTION POND										
ROUTE MCUNGE	107.02	2	3	.02910	56.62	1.986	1.27977	1.567	3.040	CCODE = .1
ADD HYD	107.10	4& 3	2	.28210	217.90	15.020	.99829	1.700	1.207	
ADD HYD	107.20	1& 2	3	.38600	284.09	18.518	.89949	1.700	1.150	
COMPUTE NM HYD	108.00	-	1	.02400	49.43	1.673	1.30684	1.500	3.218	PER IMP= 47.60
*S ROUTING 108 ON STONE HILLS RD TO EXISTING DETENTION POND THRU CACTUS HILLS										
ROUTE MCUNGE	108.02	1	2	.02400	47.41	1.669	1.30394	1.567	3.086	CCODE = .1
ADD HYD	108.10	2& 3	4	.41000	319.52	20.187	.92317	1.667	1.218	
*S SUB-BASIN 109 IS PART OF CACTUS HILLS AND EXISTING DET BASIN										
COMPUTE NM HYD	109.00	-	1	.02070	39.89	1.340	1.21394	1.500	3.011	PER IMP= 42.50
*S**** HYD 109.1 IS AP #3 *****										
ADD HYD	109.10	1& 4	2	.43070	340.70	21.527	.93714	1.667	1.236	
*S ROUTING RESERVOIR WITH 12" DIAM ORIFACE										
ROUTE RESERVOIR	109.RES	2	3	.43070	158.37	21.182	.92213	2.233	.575	AC-FT= 11.398
*S										

*S OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)	
*S 11.35	9.9306	5078	EXISTING TOP OF POND
*S 154	11.37	5079	
*S 210	11.73	5079.25	

```
DIVIDE HYD          109.03    3    9       .25167      11.35     12.377     .92213    1.900     .070
                     OLF.1  AND   10       .17903     147.02      8.805     .92213    2.233    1.283
COMPUTE NM HYD      201.00    -    1       .02580      28.91       .883     .64199    1.533    1.751 PER IMP=   10.00
*S ROUTING 201 ON CROYDEN ST TO EXISTING DETENTION POND
ROUTE MCUNGE        201.02    1    2       .02580      27.69       .879     .63892    1.600    1.677 CCODE =      .1
COMPUTE NM HYD      202.00    -    1       .02880      59.18      2.001    1.30299    1.500    3.211 PER IMP=  47.30
*S**** HYD 202.1 IS AP #4     *****
ADD HYD             202.10  1& 2   4       .05460      75.52      2.881     .98918    1.533    2.161
*S EXISTING DROP INLET IN BASIN 202
ROUTE RESERVOIR   202.RES1    4    2       .05460      74.83      2.881     .98918    1.567    2.141 AC-FT=      .013
*S
*S       OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
*S         74.58             0.0111         5145.0
*S         81.98             0.0603         5146.0
*S ROUTING RESERVOIR WITH 21" ORIFACE
ROUTE RESERVOIR   202.RES2    2    4       .05460      39.06      2.881     .98918    1.766    1.118 AC-FT=      .740
*S
*S       OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
*S         38.41             0.6717          5125
*S         40.11             0.8496          5126
```

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
DIVIDE HYD	202.03	4	8	.05460	39.06	2.881	.98918	1.766	1.118	
	OLF.2	AND	11	.00000	.00	.000	.00000	-.033	.000	
*S ROUTE 202.RES2 THRU ASSUMED 36" PIPE IN PARADISE BLVD										
ROUTE MCUNGE	202.02	8	6	.05460	39.04	2.879	.98879	1.766	1.117	CCODE = .1
*S CACTUS RIDGE										
COMPUTE NM HYD	401.00	-	1	.02360	50.44	1.727	1.37242	1.500	3.340	PER IMP= 52.70
ADD HYD	401.10	1&11	3	.02360	50.44	1.727	1.37241	1.500	3.340	
DIVIDE HYD	CB2	3	4	.02360	50.44	1.727	1.37241	1.500	3.340	
	401.13	AND	5	.00000	.00	.000	.00000	-.033	.000	
*S SUB-BASIN 402 IS PART OF WEST PARK APARTMENTS										
COMPUTE NM HYD	402.00	-	1	.00880	18.66	.618	1.31644	1.500	3.314	PER IMP= 42.70
ADD HYD	402.10	5& 1	6	.00880	18.66	.618	1.31641	1.500	3.314	
*S**** PIPE HYD CB2.1 IS AP #6 *****										
ADD HYD	CB2.1	2& 4	6	.07820	121.70	4.608	1.10484	1.533	2.432	
*S SUB-BASIN 403 IS PART OF WEST PARK APARTMENTS										
COMPUTE NM HYD	403.00	-	1	.01440	32.61	1.111	1.44675	1.500	3.538	PER IMP= 54.20
*S OLF HYD 403.13 IS A NONCONTRIBUTING POND										
DIVIDE HYD	CB3	1	2	.00427	3.00	.329	1.44673	1.300	1.098	
	403.13	AND	4	.01013	29.61	.782	1.44673	1.500	4.565	
ADD HYD	CB3.1	6& 2	5	.08247	124.70	4.937	1.12253	1.533	2.363	
*S ROUTE CB3.1 IN 48" AND 54" PIPE BETWEEN MH # S-702 AND MH # S-732										
*S Q(CAP) = 144 CFS, AT SLOPE=0.005										
ROUTE MCUNGE	CB3.13	5	2	.08247	123.98	4.926	1.12009	1.567	2.349	CCODE = .2
*S LESLIE HOMES										
COMPUTE NM HYD	404.00	-	1	.01610	33.73	1.148	1.33642	1.500	3.273	PER IMP= 49.90
ADD HYD	CB4.1	1& 2	5	.09857	152.76	6.074	1.15542	1.567	2.422	
*S ROUTE CB4.1 IN 60" PIPE BETWEEN MH # S-732 AND MH # S-531										
*S Q(CAP) = 184 CFS, AT SLOPE=0.005										
ROUTE MCUNGE	CB4.13	5	2	.09857	150.55	6.060	1.15278	1.600	2.386	CCODE = .2
*S SUB-BASIN 405 IS PART OF CACTUS HILLS										
COMPUTE NM HYD	405.00	-	1	.02700	50.96	1.684	1.16945	1.500	2.949	PER IMP= 38.00
*S DIVIDE SUB-BASIN 405 BY REMAINING MAXIMUM PIPE CAPACITY *										
DIVIDE HYD	CB5	1	6	.02566	40.00	1.600	1.16944	1.467	2.436	
	405.03	AND	7	.00134	10.96	.083	1.16944	1.500	12.791	
*S ROUTING 405.03 TO CONGRESS AVE										
ROUTE MCUNGE	405.02	7	15	.00134	10.03	.083	1.16433	1.600	11.711	CCODE = .2
ADD HYD	CB5.1	6& 2	5	.12423	189.24	7.661	1.15622	1.567	2.380	
*S ROUTE CB5.1 IN 60" PIPE BETWEEN MH # S-531 AND MH # S-932										
*S Q(CAP) = 184 CFS, AT SLOPE=0.005										
ROUTE MCUNGE	CB5.13	5	2	.12423	188.89	7.655	1.15539	1.600	2.376	CCODE = .2
*S TOTAL PIPE FLOW IN 60" SD AT DETENTION POND										
*S**** PIPE HYD CB5.2 IS AP #7 *****										
ADD HYD	CB5.2	9& 2	5	.37590	196.32	20.032	.99922	1.600	.816	
*S ROUTE CB5.2 IN 60" PIPE UNTIL CUBBY HOLE DET POND										
*S Q(CAP) = 233 CFS, AT SLOPE=0.008										
ROUTE MCUNGE	CB5.23	5	2	.37590	195.49	20.019	.99857	1.600	.813	CCODE = .2
*S SUB-BASIN 406 IS NORTH OF CONGRESS AVE - RESIDENTIAL										
COMPUTE NM HYD	406.00	-	1	.01070	10.53	.311	.54481	1.533	1.538	PER IMP= 5.00
ADD HYD	405.10	15&10	14	.18037	147.02	8.888	.92393	2.233	1.274	
ADD HYD	406.10	14& 1	6	.19107	147.65	9.199	.90269	2.233	1.207	
*S ROUTING 406 ON CONGRESS AVE TO IRVING AND EAGLE RANCH ROAD										
ROUTE MCUNGE	406.12	6	3	.19107	147.37	9.176	.90045	2.266	1.205	CCODE = .2
*S SUB-BASIN 407 IS NORTH OF CONGRESS AVE - COMMERCIAL										
COMPUTE NM HYD	407.00	-	1	.02240	35.06	1.157	.96807	1.500	2.445	PER IMP= 30.00
*S CUBBY HOLE DETENTION BASIN										

```
*S ROUTING RESERVOIR WITH 12" ORIFACE
ROUTE RESERVOIR      407.RES    1    5        .02240        37.93        1.156        .96805    1.500    2.645 AC-FT=      .171
*S
*S       OUTFLOW(CFS)    STORAGE(AC-FT)    ELEV(FT)
*S           29              0.170           5070.25
*S           62              0.175           5070.5
DIVIDE HYD           407.03    5    7        .01575        10.00        .813         .96804    1.500     .992
                      OLF.4  AND   13        .00665        27.93        .343         .96804    1.500    6.562
*S TOTAL PIPE FLOW IN 60" SD AT DETENTION POND
*S**** PIPE HYD CB5.3 IS AP #8     *****
ADD HYD               CB5.3  7& 2   6        .39165       205.49       20.833        .99734    1.600     .820
*S ROUTE CB5.3 IN 60" PIPE UNTIL BETWEEN MH # S-951 TO MH # S-962
*S Q(CAP) = 260 CFS, AT SLOPE=0.01
ROUTE MCUNGE          CB5.33    6    7        .39165       204.85       20.823        .99689    1.633     .817 CCODE =      .2
ADD HYD               407.10  3&13  17        .19772       147.37        9.519        .90272    2.266    1.165
*S SUB-BASIN 408 IS STATE FARM INSURANCE
*S OLF GOING TO THE EAST AND DOES NOT EFFECT EAGLE RANCH SD
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	408.00	-	14	.00660	15.06	.539	1.53214	1.500	3.566	PER IMP= 70.00
*S ROUTING RESERVOIR WITH 12" WEIR										
ROUTE RESERVOIR	408.RES	14	18	.00660	2.40	.539	1.53121	2.100	.569	AC-FT= .376
*S										
*S OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)								
*S 1.08	0.2198	5052.3	EXISTING TOP OF POND							
*S 2.31	0.3663	5053.3								
*S 3.02	0.4396	5053.8								
ADD HYD	408.10 17&18	14		.20432	149.66	10.058	.92302	2.266	1.145	
*S SUB-BASIN 409 IS EAST OF IRVING, TRACT D										
COMPUTE NM HYD	409.00	-	1	.00980	21.51	.759	1.45309	1.500	3.429	PER IMP= 63.16
DIVIDE HYD	CB6	1	2	.00980	21.51	.759	1.45306	1.500	3.429	
	409.03	AND	15	.00000	.00	.000	.00000	-.033	.000	
ADD HYD	CB6.1	2& 7	5	.40145	218.27	21.582	1.00802	1.600	.850	
*S SUB-BASIN 411 IS EAST OF IRVING, TRACT B										
COMPUTE NM HYD	411.00	-	1	.00920	15.03	.492	1.00275	1.500	2.552	PER IMP= 30.00
DIVIDE HYD	CB7	1	2	.00828	10.00	.443	1.00272	1.433	1.886	
	411.03	AND	7	.00092	5.03	.049	1.00272	1.500	8.582	
*S SUB-BASIN 410 IS EAST OF IRVING, TRACT A										
COMPUTE NM HYD	410.00	-	1	.00470	7.69	.251	1.00274	1.500	2.555	PER IMP= 30.00
DIVIDE HYD	CB8	1	9	.00470	7.69	.251	1.00268	1.500	2.555	
	410.03	AND	16	.00000	.00	.000	.00000	-.033	.000	
ADD HYD	411.10	7&16	3	.00092	5.03	.049	1.00272	1.500	8.582	
*S ASSUME OLF HYD 411.2 PONDS										
ADD HYD	411.20	3&15	16	.00092	5.03	.049	1.00272	1.500	8.582	
ADD HYD	CB7.1	2& 5	1	.40973	228.27	22.025	1.00792	1.600	.871	
ADD HYD	CB8.1	1& 9	2	.41443	234.06	22.277	1.00786	1.600	.882	
*S ROUTE CB7.1 IN 60" PIPE TO SUB-BASIN 411 (JUST BEFORE CALABACILLAS ARROYO OU										
*S Q(CAP) = 184 CFS, AT SLOPE=0.005										
ROUTE MCUNGE	CB8.12	2	9	.41443	231.82	22.248	1.00657	1.633	.874	CCODE = .2
*S SUB-BASIN 412 IS EAST OF IRVING, TRACT C-2 and C-3										
COMPUTE NM HYD	412.00	-	1	.01330	20.68	.711	1.00275	1.533	2.429	PER IMP= 30.00
*S OLF HYD 412.03 IS OFF-SITE FLOW TO CALAB. ARROYO										
DIVIDE HYD	CB9	1	2	.01048	10.00	.560	1.00272	1.433	1.492	
	412.03	AND	13	.00282	10.68	.151	1.00272	1.533	5.906	
*S HYD CB9.1 IS TOTAL PIPE FLOW TO CALAB. ARROYO										
*S**** HYD CB9.1 IS AP #9 *****										
ADD HYD	CB9.1	2& 9	6	.42491	241.82	22.809	1.00648	1.633	.889	
*SUB-BASIN 413 IS WEST OF EAGLE RANCH										
COMPUTE NM HYD	413.00	-	1	.01560	25.47	.834	1.00275	1.500	2.551	PER IMP= 30.00
*SUB-BASIN 414 IS WEST OF EAGLE RANCH										
COMPUTE NM HYD	414.00	-	1	.00297	4.86	.159	1.00275	1.500	2.558	PER IMP= 30.00
*SUB-BASIN 415 IS WEST OF EAGLE RANCH										
COMPUTE NM HYD	415.00	-	1	.01190	19.44	.636	1.00275	1.500	2.552	PER IMP= 30.00
FINISH										

EAGLE RANCH DEVELOPED

ATTACHED UNDER SEPARATE COVER AND IS AVAILABLE UPON REQUEST

Appendix B

Street Capacity Calculations

Storm Drain Calculations

Inlet Calculations

Volocano Cliffs

100 yr

40' FF TESUQUE
Worksheet for Irregular Channel
AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 100 yr Tesuque North Mojave
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

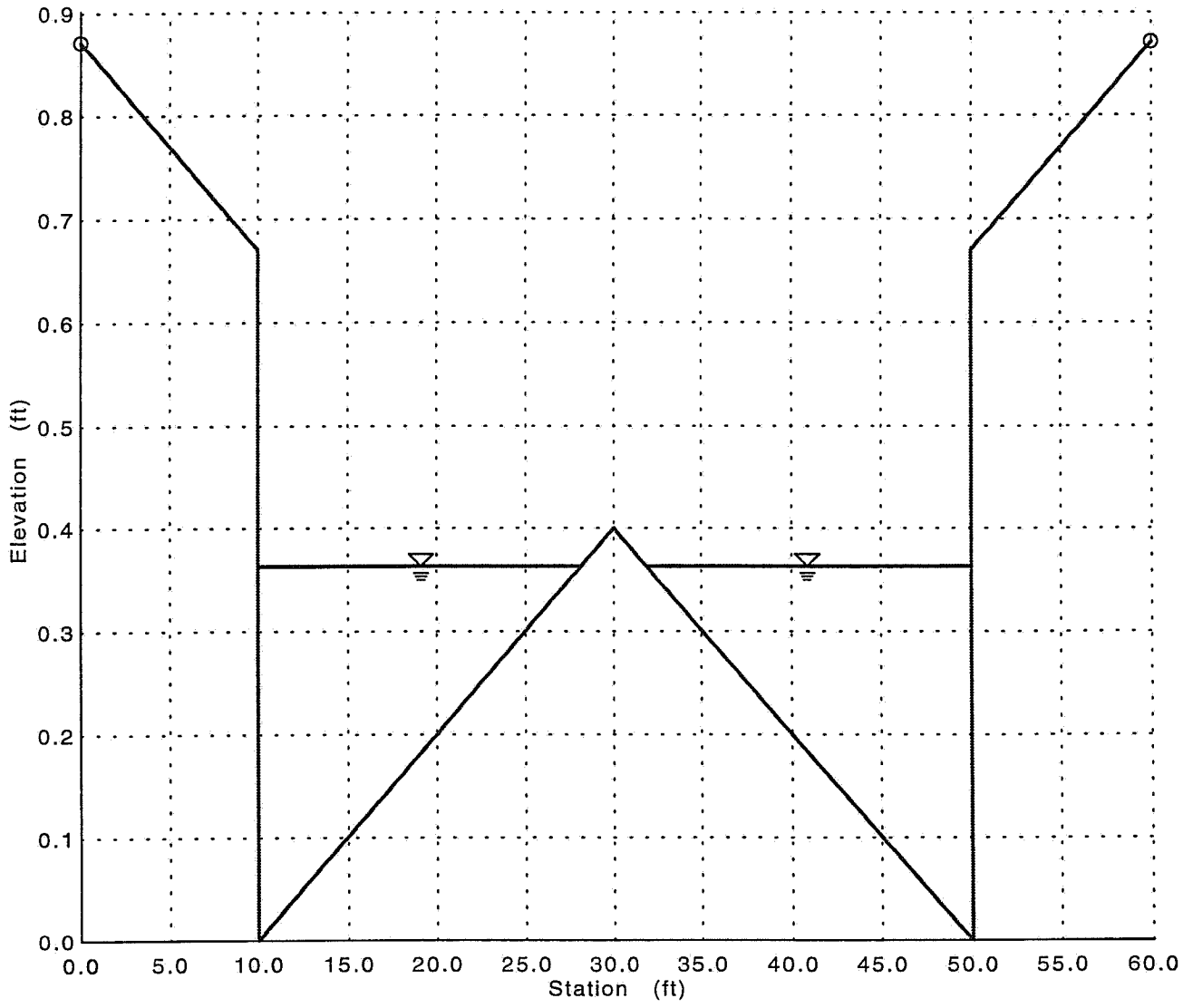
Input Data				
Channel Slope	0.045300 ft/ft ✓			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			
Discharge	39.05 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.36	ft
Flow Area	6.62	ft^2
Wetted Perimeter	37.13	ft
Top Width	36.40	ft
Height	0.36	ft
Critical Depth	0.51	ft
Critical Slope	0.006440	ft/ft
Velocity	5.90	ft/s
Velocity Head	0.54	ft
Specific Energy	0.90	ft
Froude Number	2.44	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.045300	ft/ft
Water Surface Elevation	0.36	ft
Discharge	39.05	cfs



28' FF PIMA
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF PIMA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Pima West of Tesuque

Input Data		
Channel Slope	0.018200	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

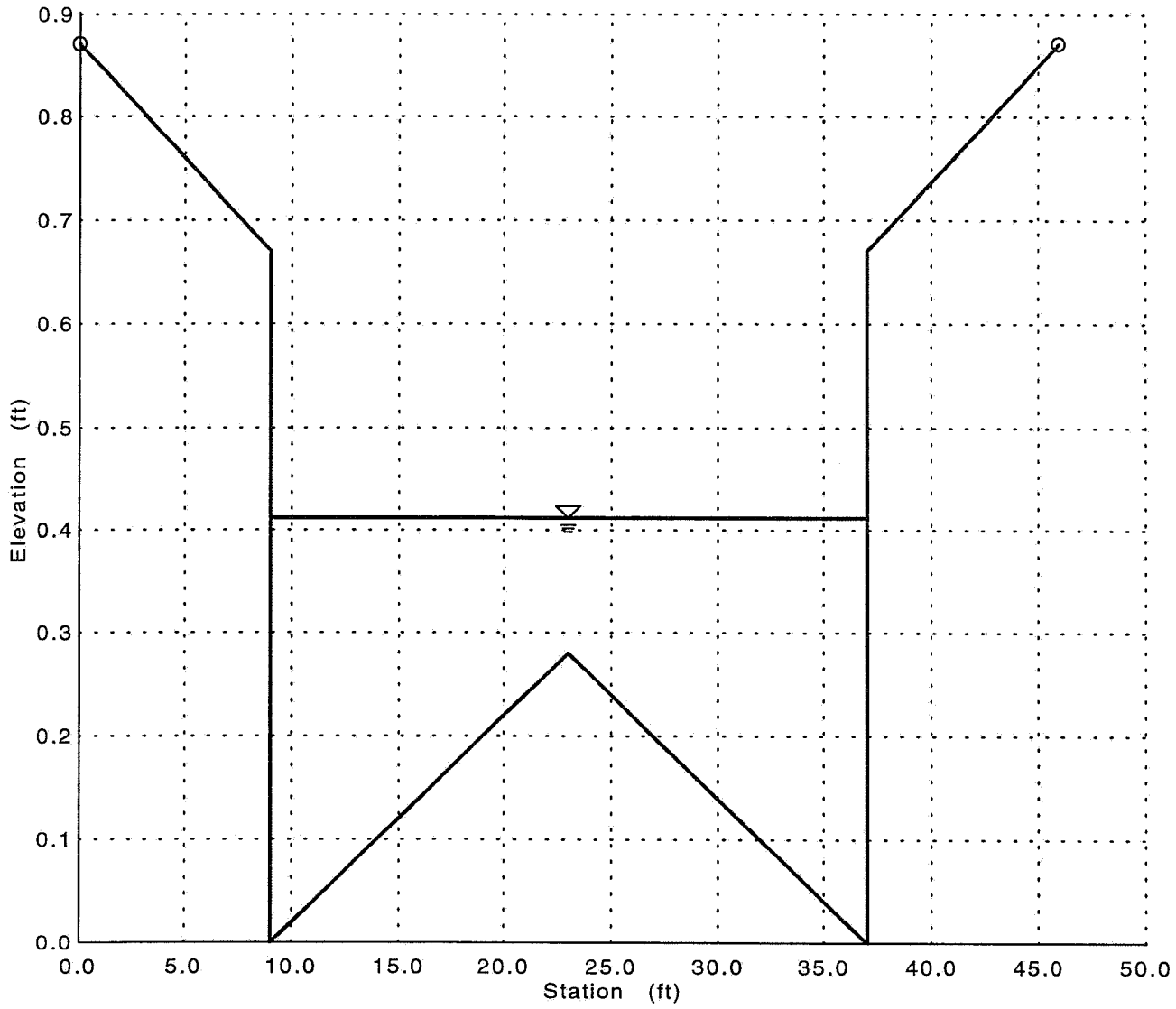
Discharge	37.15	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.41	ft
Flow Area	7.64	ft^2
Wetted Perimeter	28.83	ft
Top Width	28.00	ft
Height	0.41	ft
Critical Depth	0.52	ft
Critical Slope	0.006107	ft/ft
Velocity	4.86	ft/s
Velocity Head	0.37	ft
Specific Energy	0.78	ft
Froude Number	1.64	
Flow is supercritical.		

28' FF PIMA
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF PIMA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.018200	ft/ft
Water Surface Elevation	0.41	ft
Discharge	37.15	cfs



40' FF TESUQUE
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE HALF STREET
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.045300	ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	30.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
30.00	0.80			

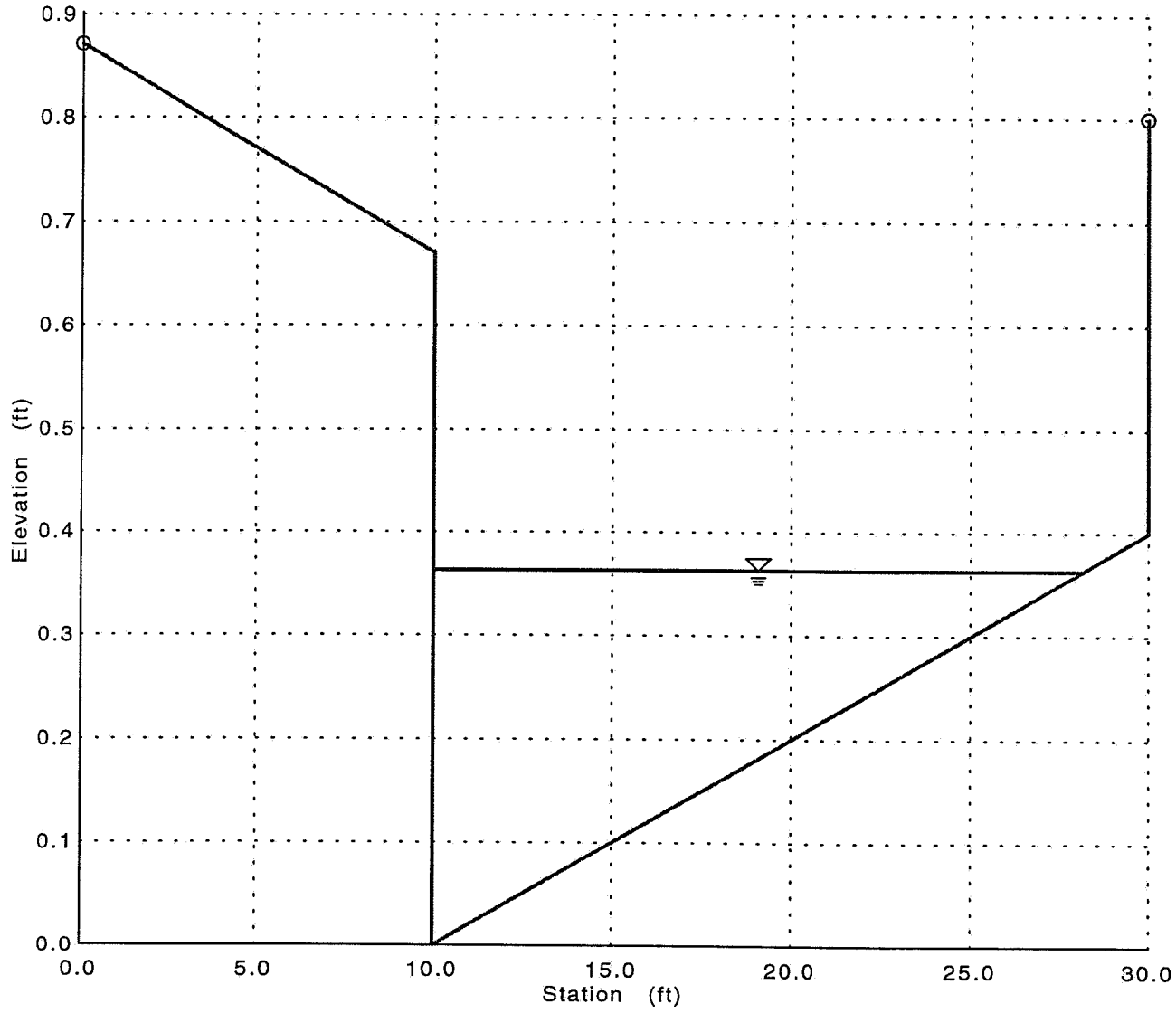
Discharge	19.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.36	ft
Flow Area	3.31	ft^2
Wetted Perimeter	18.56	ft
Top Width	18.19	ft
Height	0.36	ft
Critical Depth	0.51	ft
Critical Slope	0.006488	ft/ft
Velocity	5.89	ft/s
Velocity Head	0.54	ft
Specific Energy	0.90	ft
Froude Number	2.44	
Flow is supercritical.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE HALF STREET
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.045300	ft/ft
Water Surface Elevation	0.36	ft
Discharge	19.50	cfs



40' FF TESUQUE
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE HALF STREET
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.032300	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	30.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
30.00	0.80			

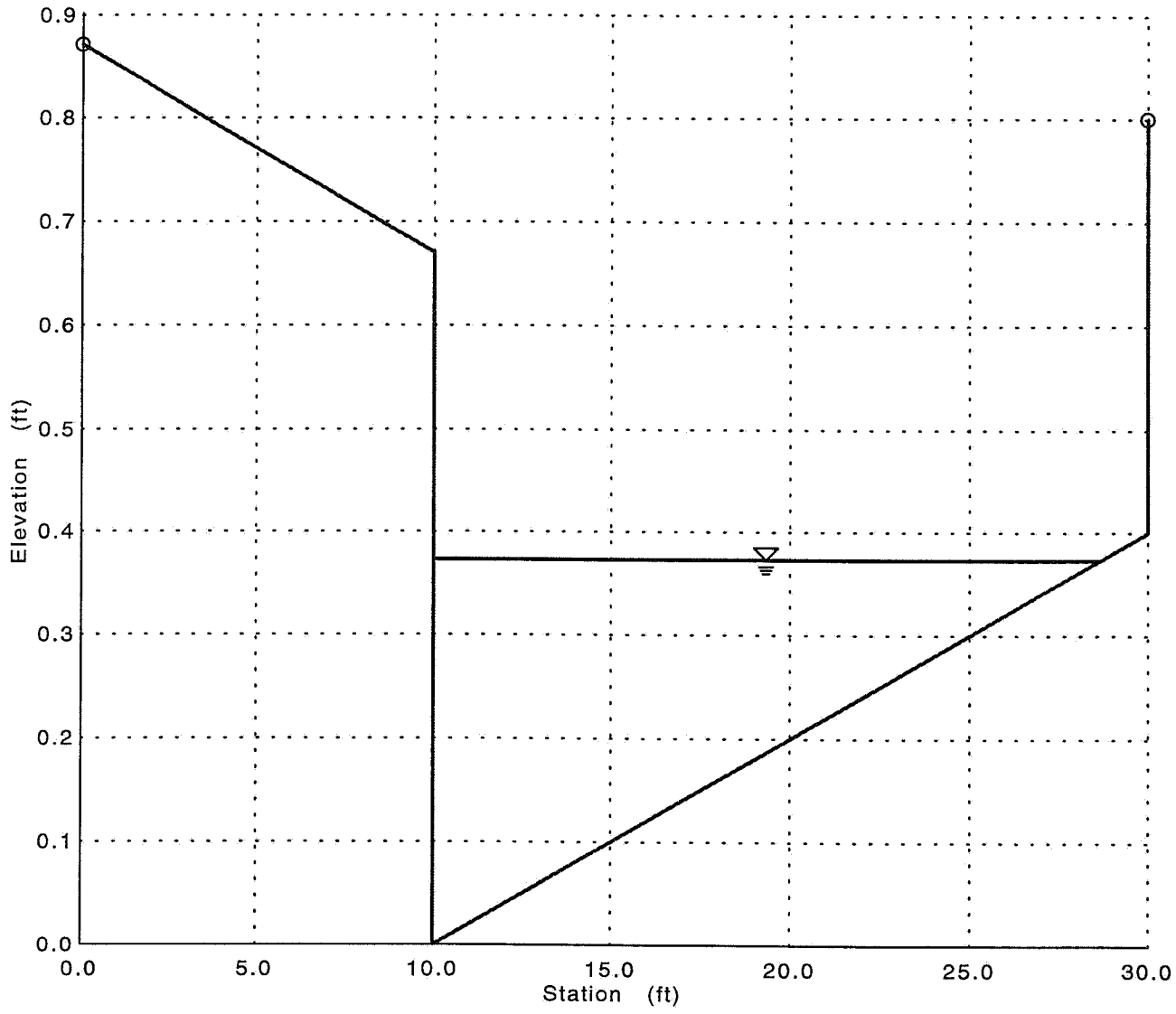
Discharge	17.65	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.37	ft
Flow Area	3.49	ft²
Wetted Perimeter	19.05	ft
Top Width	18.67	ft
Height	0.37	ft
Critical Depth	0.49	ft
Critical Slope	0.006616	ft/ft
Velocity	5.06	ft/s
Velocity Head	0.40	ft
Specific Energy	0.77	ft
Froude Number	2.07	
Flow is supercritical.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE HALF STREET
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.032300	ft/ft
Water Surface Elevation	0.37	ft
Discharge	17.65	cfs



40' FF TESUQUE
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.045300	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	19.50	cfs

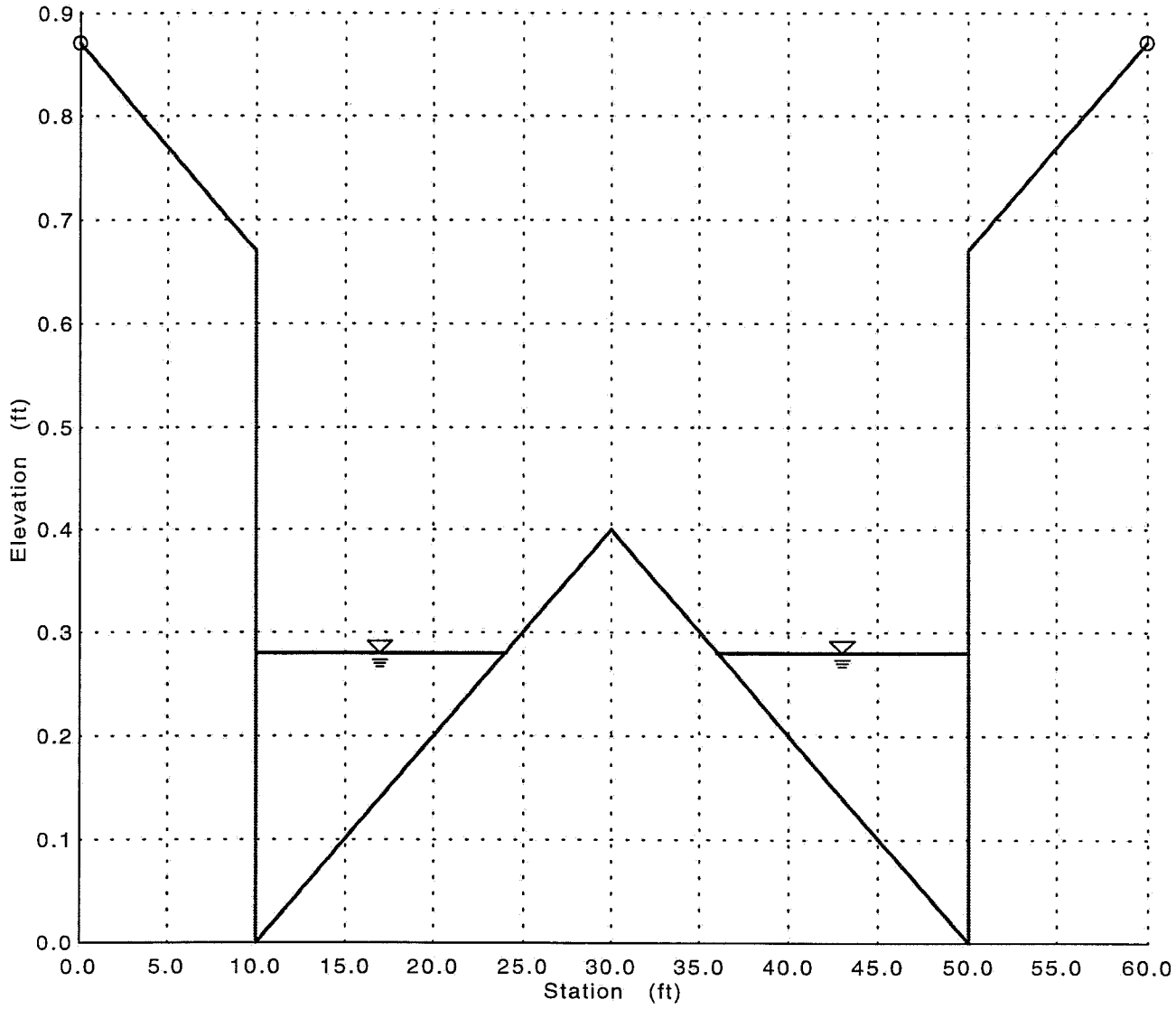
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.93	ft²
Wetted Perimeter	28.62	ft
Top Width	28.05	ft
Height	0.28	ft
Critical Depth	0.39	ft
Critical Slope	0.007436	ft/ft
Velocity	4.96	ft/s
Velocity Head	0.38	ft
Specific Energy	0.66	ft
Froude Number	2.33	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.045300	ft/ft
Water Surface Elevation	0.28	ft
Discharge	19.50	cfs



Volocano Cliffs

40' FF TESUQUE
Worksheet for Irregular Channel
AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 100 yr Between PIMA Lane + Mojave
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

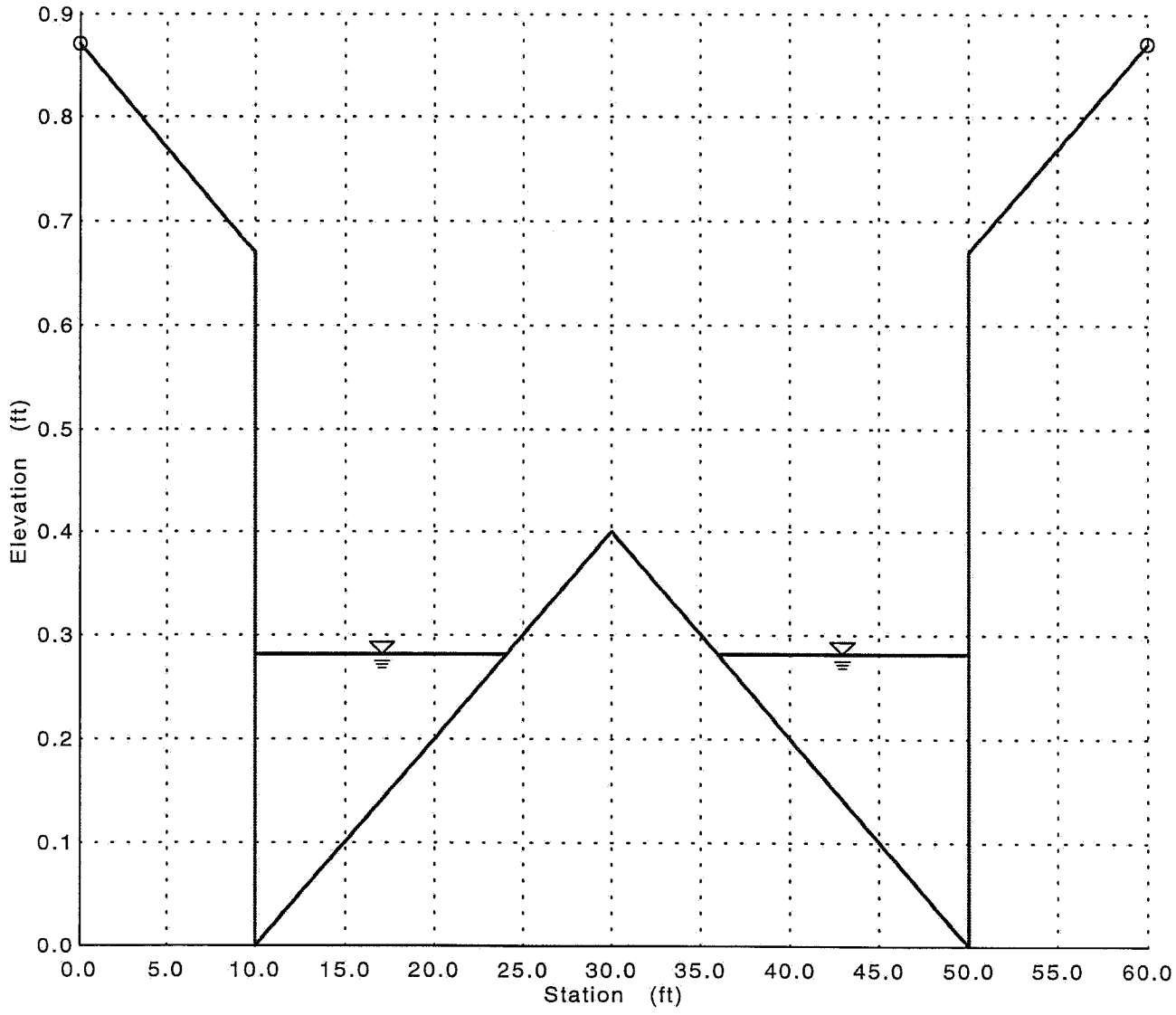
Input Data				
Channel Slope	0.045300 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			
Discharge	19.65 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.96	ft²
Wetted Perimeter	28.70	ft
Top Width	28.13	ft
Height	0.28	ft
Critical Depth	0.39	ft
Critical Slope	0.007428	ft/ft
Velocity	4.97	ft/s
Velocity Head	0.38	ft
Specific Energy	0.66	ft
Froude Number	2.33	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.045300	ft/ft
Water Surface Elevation	0.28	ft
Discharge	19.65	cfs



42' FF MOJAVE
Worksheet for Irregular Channel
AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 100yr Mojave west Tesuque
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.030000	ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	62.00	0.017
10.00	0.67			
10.00	0.00			
31.00	0.42			
52.00	0.00			
52.00	0.67			
62.00	0.87			

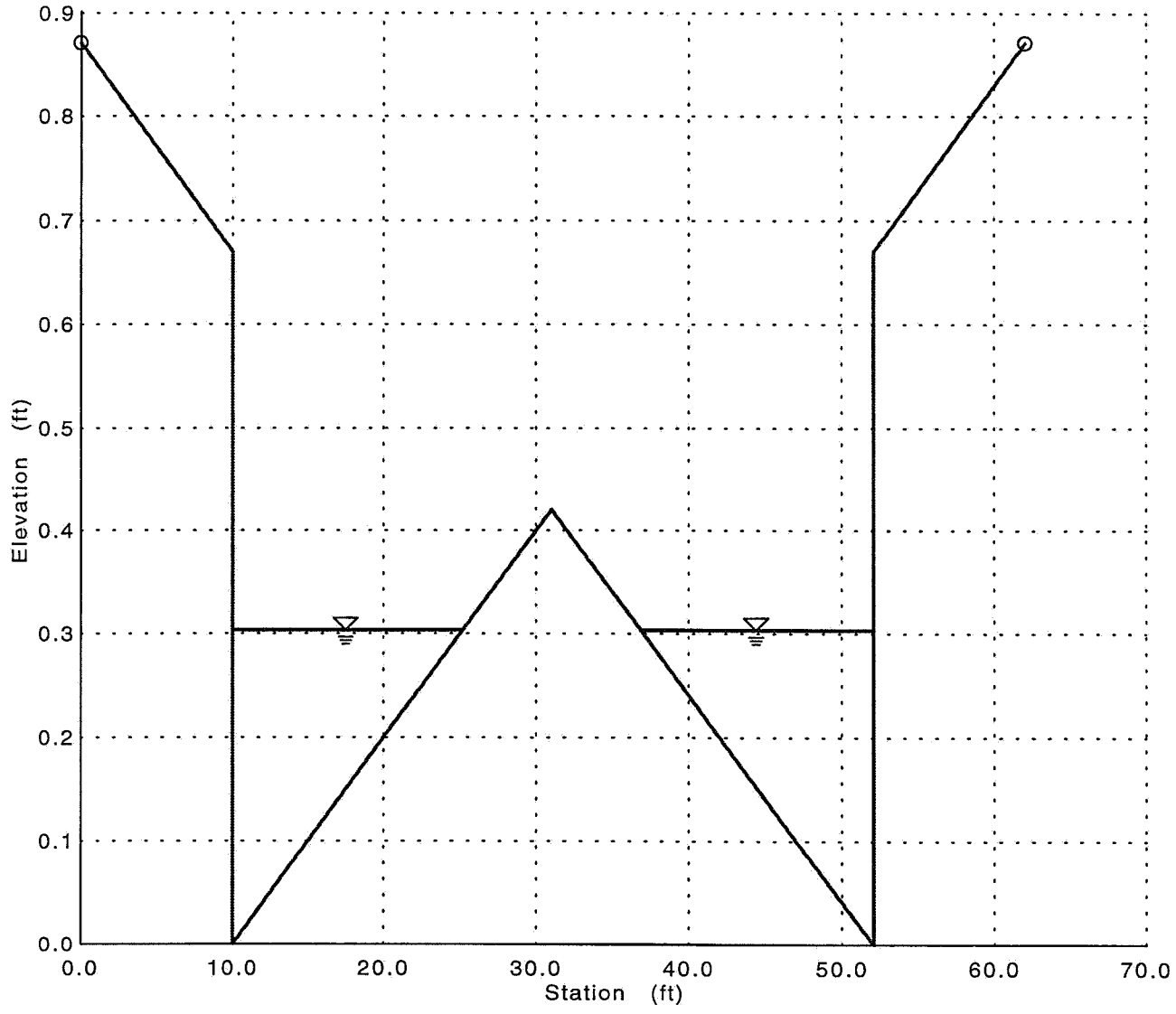
Discharge	19.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.59	ft²
Wetted Perimeter	30.92	ft
Top Width	30.31	ft
Height	0.30	ft
Critical Depth	0.39	ft
Critical Slope	0.007435	ft/ft
Velocity	4.25	ft/s
Velocity Head	0.28	ft
Specific Energy	0.58	ft
Froude Number	1.92	
Flow is supercritical.		
Flow is divided.		

42' FF MOJAVE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.030000	ft/ft
Water Surface Elevation	0.30	ft
Discharge	19.50	cfs



42' FF MOJAVE
Worksheet for Irregular Channel

API

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 100yr Mojave West Tesuque
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.080000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	62.00	0.017
10.00	0.67			
10.00	0.00			
31.00	0.42			
52.00	0.00			
52.00	0.67			
62.00	0.87			

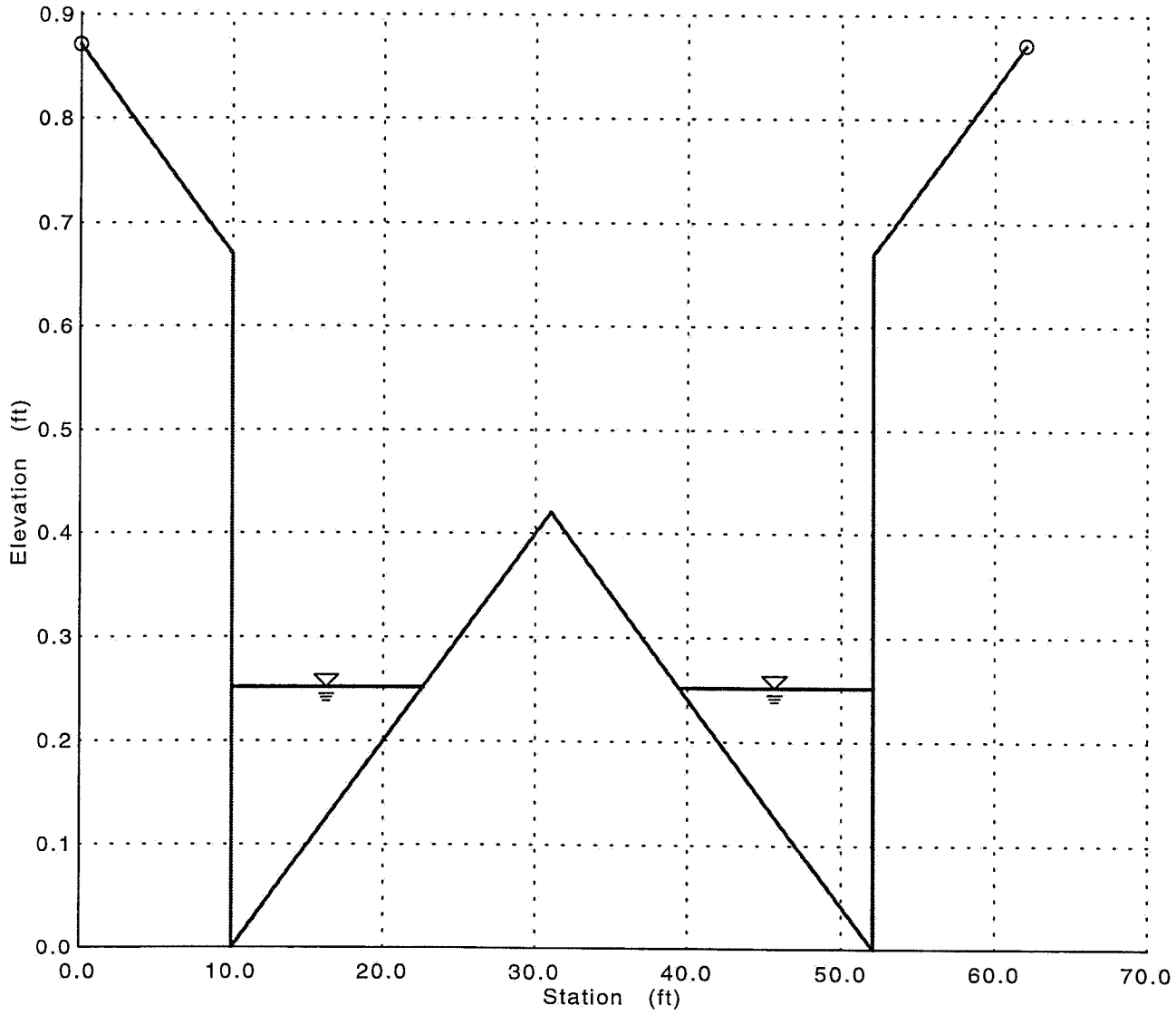
Discharge	19.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.25	ft
Flow Area	3.18	ft^2
Wetted Perimeter	25.72	ft
Top Width	25.22	ft
Height	0.25	ft
Critical Depth	0.39	ft
Critical Slope	0.007434	ft/ft
Velocity	6.13	ft/s
Velocity Head	0.58	ft
Specific Energy	0.84	ft
Froude Number	3.05	
Flow is supercritical.		
Flow is divided.		

42' FF MOJAVE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.080000	ft/ft
Water Surface Elevation	0.25	ft
Discharge	19.50	cfs



42' FF MOJAVE
Worksheet for Irregular Channel
AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 100yr Mojave West Tesuque
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

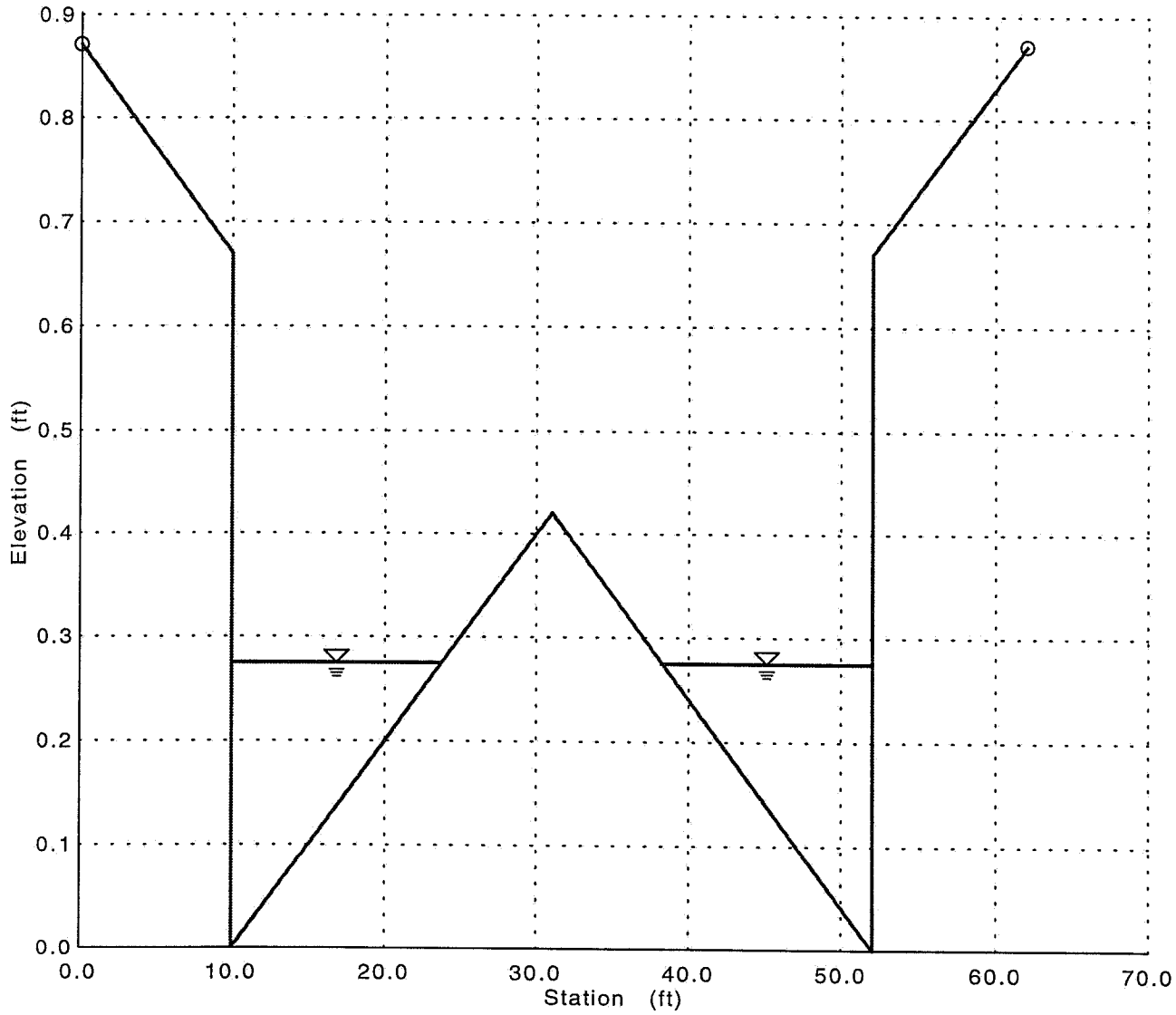
Input Data				
Channel Slope	0.050000 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	62.00	0.017
10.00	0.67			
10.00	0.00			
31.00	0.42			
52.00	0.00			
52.00	0.67			
62.00	0.87			
Discharge	19.50 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.79	ft^2
Wetted Perimeter	28.09	ft
Top Width	27.54	ft
Height	0.28	ft
Critical Depth	0.39	ft
Critical Slope	0.007435	ft/ft
Velocity	5.14	ft/s
Velocity Head	0.41	ft
Specific Energy	0.69	ft
Froude Number	2.44	
Flow is supercritical.		
Flow is divided.		

42' FF MOJAVE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.050000	ft/ft
Water Surface Elevation	0.28	ft
Discharge	19.50	cfs



28' FF LITTLE JOE
Worksheet for Irregular Channel
AP 2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Little Joe Lane from Santa Domingo to Mojave

Input Data		
Channel Slope	0.011300	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

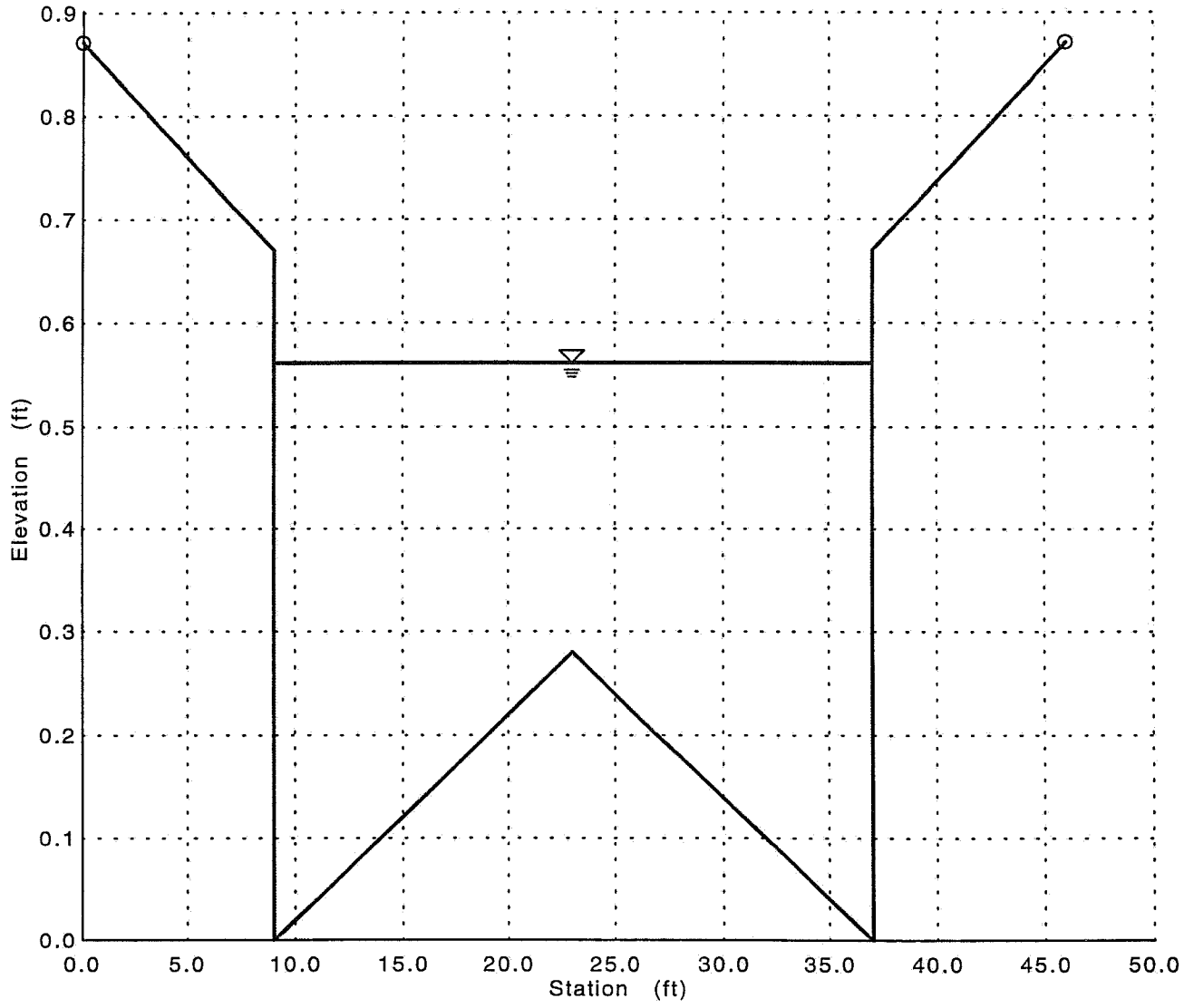
Discharge	59.81	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.56	ft
Flow Area	11.77	ft^2
Wetted Perimeter	29.13	ft
Top Width	28.00	ft
Height	0.56	ft
Critical Depth	0.66	ft
Critical Slope	0.005566	ft/ft
Velocity	5.08	ft/s
Velocity Head	0.40	ft
Specific Energy	0.96	ft
Froude Number	1.38	
Flow is supercritical.		

28' FF LITTLE JOE
Cross Section for Irregular Channel
AP 2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.011300	ft/ft
Water Surface Elevation	0.56	ft
Discharge	59.81	cfs



40' FF SANTO DOMINGO
Worksheet for Irregular Channel
APZ

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF SANTO DOMINGO 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Santo Domingo Between Tesuque and Little Joe Lane

Input Data		
Channel Slope	0.020300	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

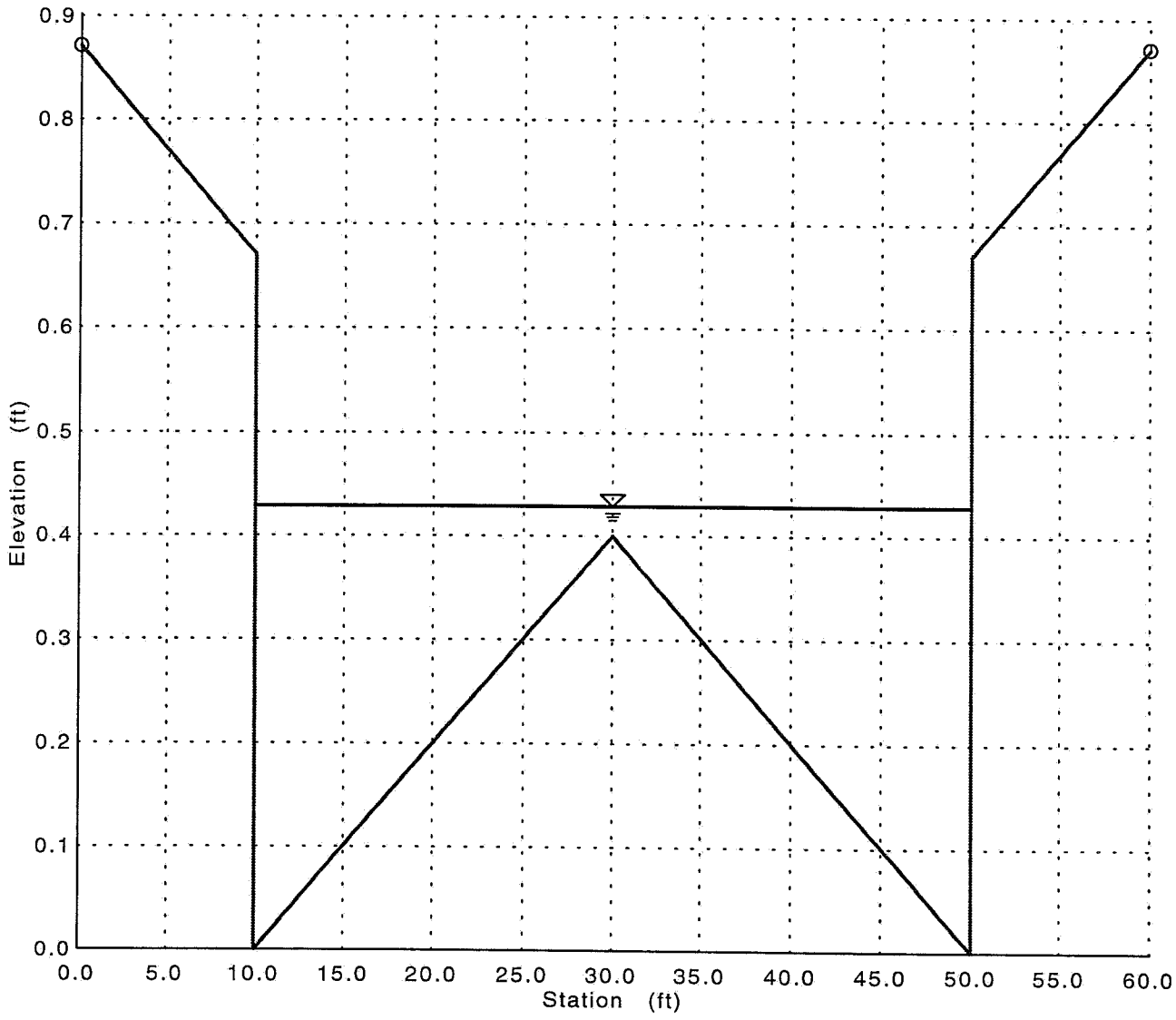
Discharge	42.30	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.43	ft
Flow Area	9.19	ft²
Wetted Perimeter	40.87	ft
Top Width	40.00	ft
Height	0.43	ft
Critical Depth	0.53	ft
Critical Slope	0.006334	ft/ft
Velocity	4.60	ft/s
Velocity Head	0.33	ft
Specific Energy	0.76	ft
Froude Number	1.69	
Flow is supercritical.		

40' FF SANTO DOMINGO
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF SANTO DOMINGO
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.020300	ft/ft
Water Surface Elevation	0.43	ft
Discharge	42.30	cfs



40' FF SANTO DOMINGO
Worksheet for Irregular Channel
A P Z

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF SANTO DOMINGO
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

100 yr Santo Domingo between Tesuque and Pima Drive.

Input Data		
Channel Slope	0.035100	ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

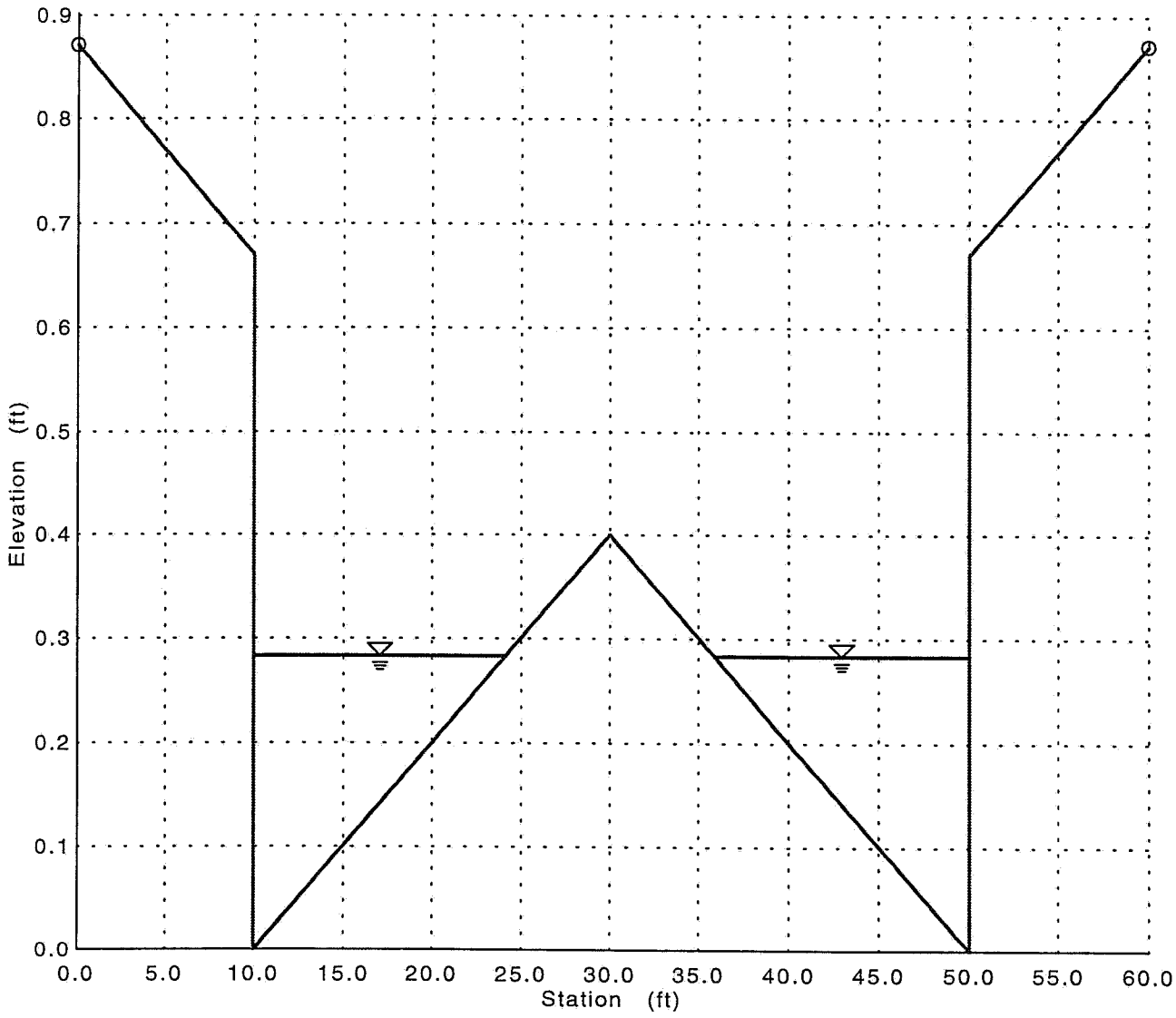
Discharge	17.66	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	4.02	ft²
Wetted Perimeter	28.93	ft
Top Width	28.35	ft
Height	0.28	ft
Critical Depth	0.38	ft
Critical Slope	0.007533	ft/ft
Velocity	4.39	ft/s
Velocity Head	0.30	ft
Specific Energy	0.58	ft
Froude Number	2.06	
Flow is supercritical.		
Flow is divided.		

40' FF SANTO DOMINGO
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF SANTO DOMINGO
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.035100	ft/ft
Water Surface Elevation	0.28	ft
Discharge	17.66	cfs



40' FF SANTO DOMINGO
Worksheet for Irregular Channel
AP 2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF SANTO DOMINGO 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Santo Domingo between Tesuque and Pima Drive

Input Data		
Channel Slope	0.010600	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

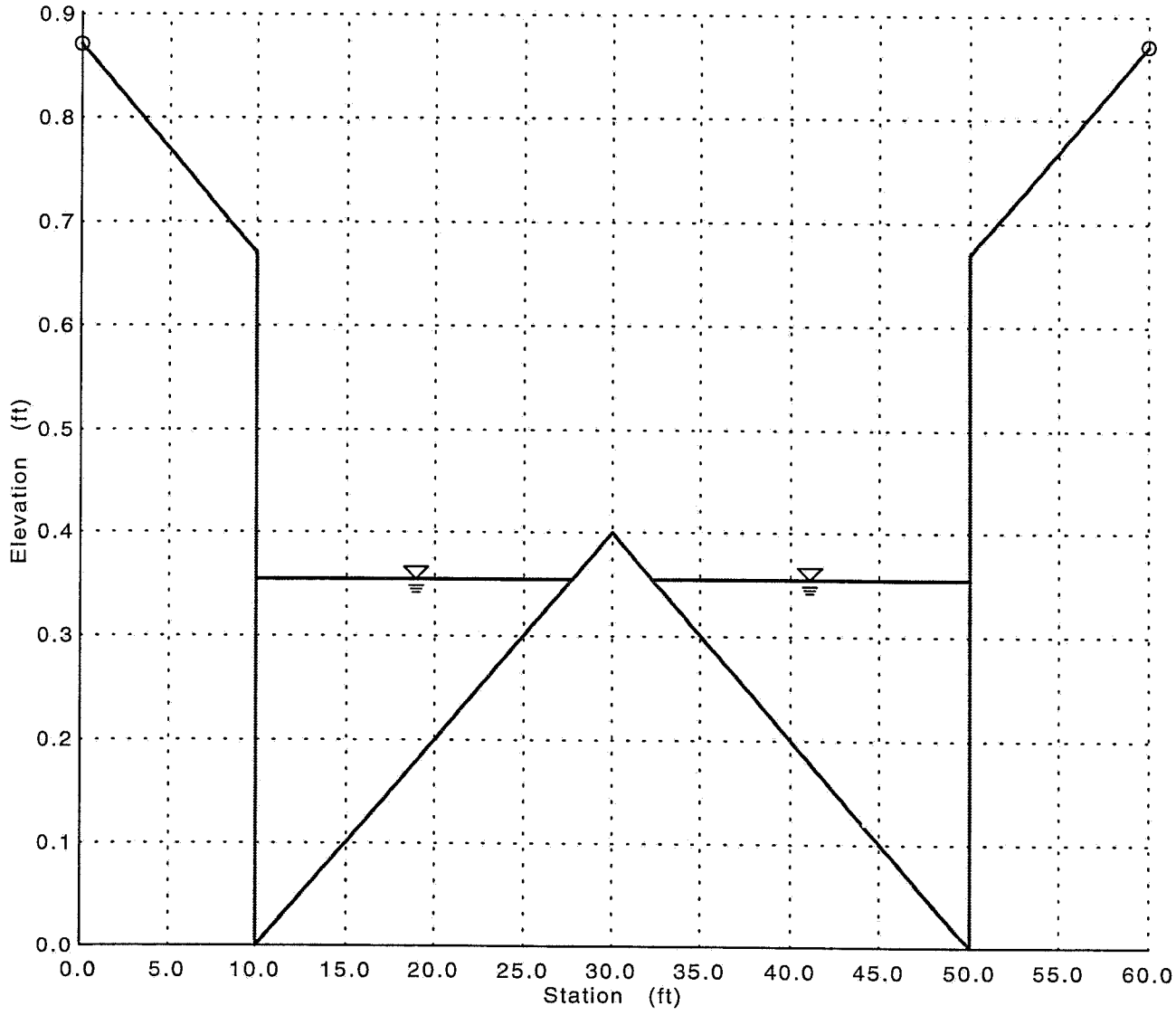
Discharge	17.66	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.35	ft
Flow Area	6.30	ft²
Wetted Perimeter	36.21	ft
Top Width	35.49	ft
Height	0.35	ft
Critical Depth	0.38	ft
Critical Slope	0.007535	ft/ft
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energy	0.48	ft
Froude Number	1.17	
Flow is supercritical.		
Flow is divided.		

40' FF SANTO DOMINGO
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF SANTO DOMINGO
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.010600	ft/ft
Water Surface Elevation	0.35	ft
Discharge	17.66	cfs



28' FF PIMA
Worksheet for Irregular Channel

AP2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF PIMA 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Pima Lane between Pima Dr & Drive and Tesuque

Input Data		
Channel Slope	0.018200	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

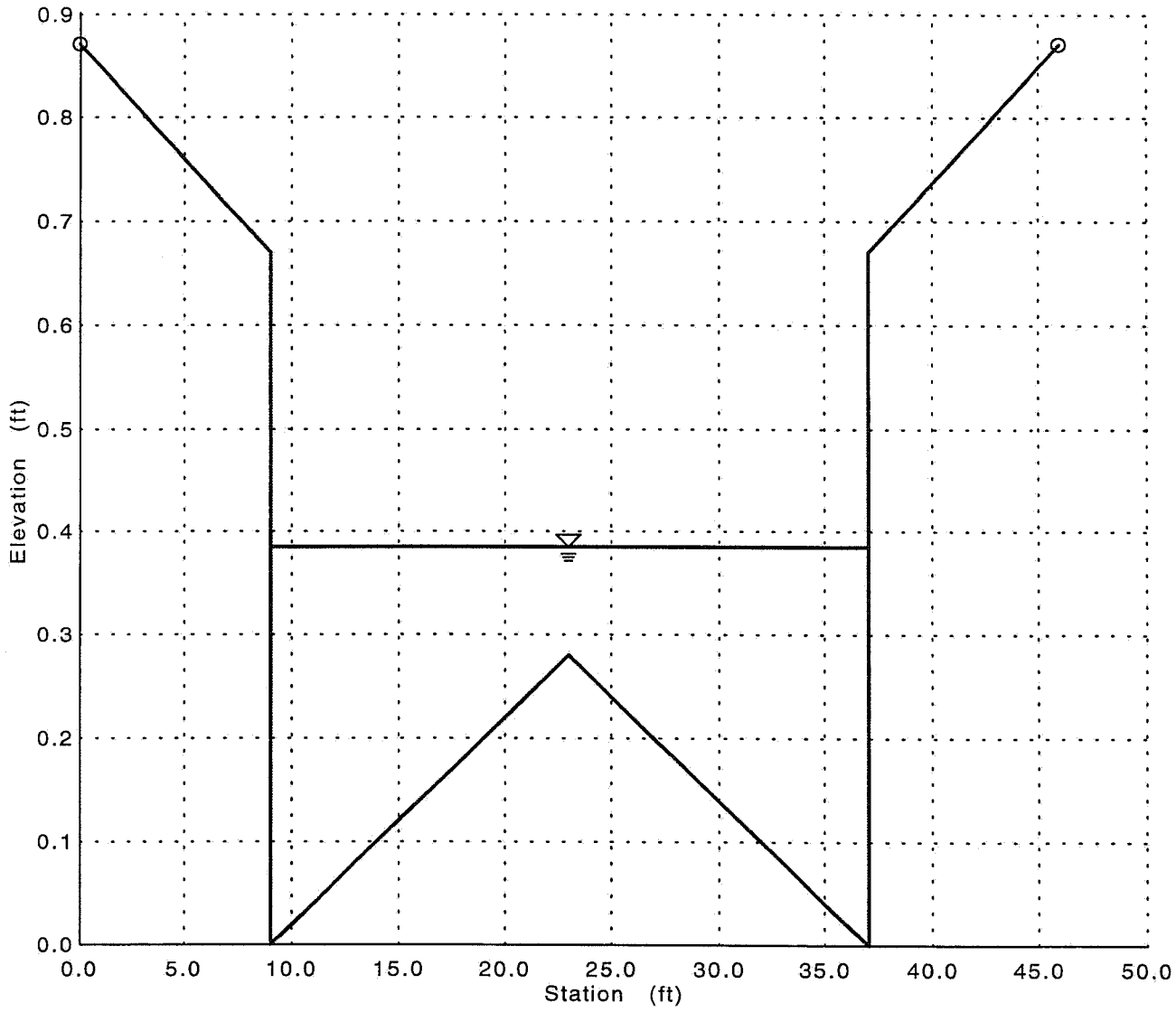
Discharge	31.15	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.39	ft
Flow Area	6.87	ft^2
Wetted Perimeter	28.78	ft
Top Width	28.00	ft
Height	0.39	ft
Critical Depth	0.48	ft
Critical Slope	0.006326	ft/ft
Velocity	4.54	ft/s
Velocity Head	0.32	ft
Specific Energy	0.71	ft
Froude Number	1.62	
Flow is supercritical.		

28' FF PIMA
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF PIMA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.018200	ft/ft
Water Surface Elevation	0.39	ft
Discharge	31.15	cfs



28' FF PIMA
Worksheet for Irregular Channel

AP 2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF PIMA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

100yr

Pima Court west of Pima Drive

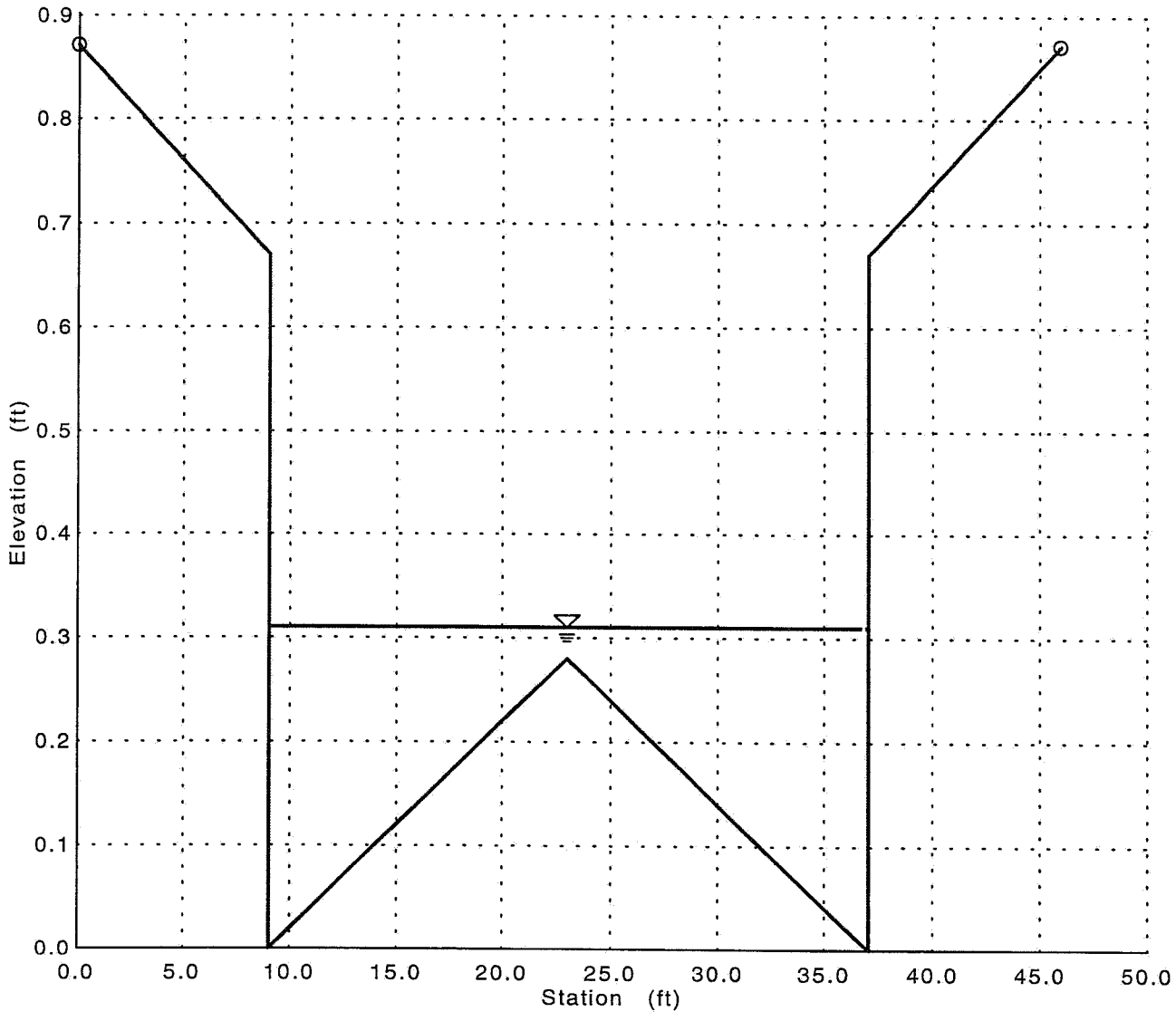
Input Data				
Channel Slope	0.022000 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			
Discharge	18.58 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.31	ft
Flow Area	4.75	ft²
Wetted Perimeter	28.62	ft
Top Width	28.00	ft
Height	0.31	ft
Critical Depth	0.38	ft
Critical Slope	0.007032	ft/ft
Velocity	3.91	ft/s
Velocity Head	0.24	ft
Specific Energy	0.55	ft
Froude Number	1.68	
Flow is supercritical.		

28' FF PIMA
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF PIMA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.022000	ft/ft
Water Surface Elevation	0.31	ft
Discharge	18.58	cfs



32' FF WHITEMAN
Worksheet for Irregular Channel
AP 3

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Whiteman Drive from Kachina Street to Mojave

Input Data		
Channel Slope	0.005500	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			

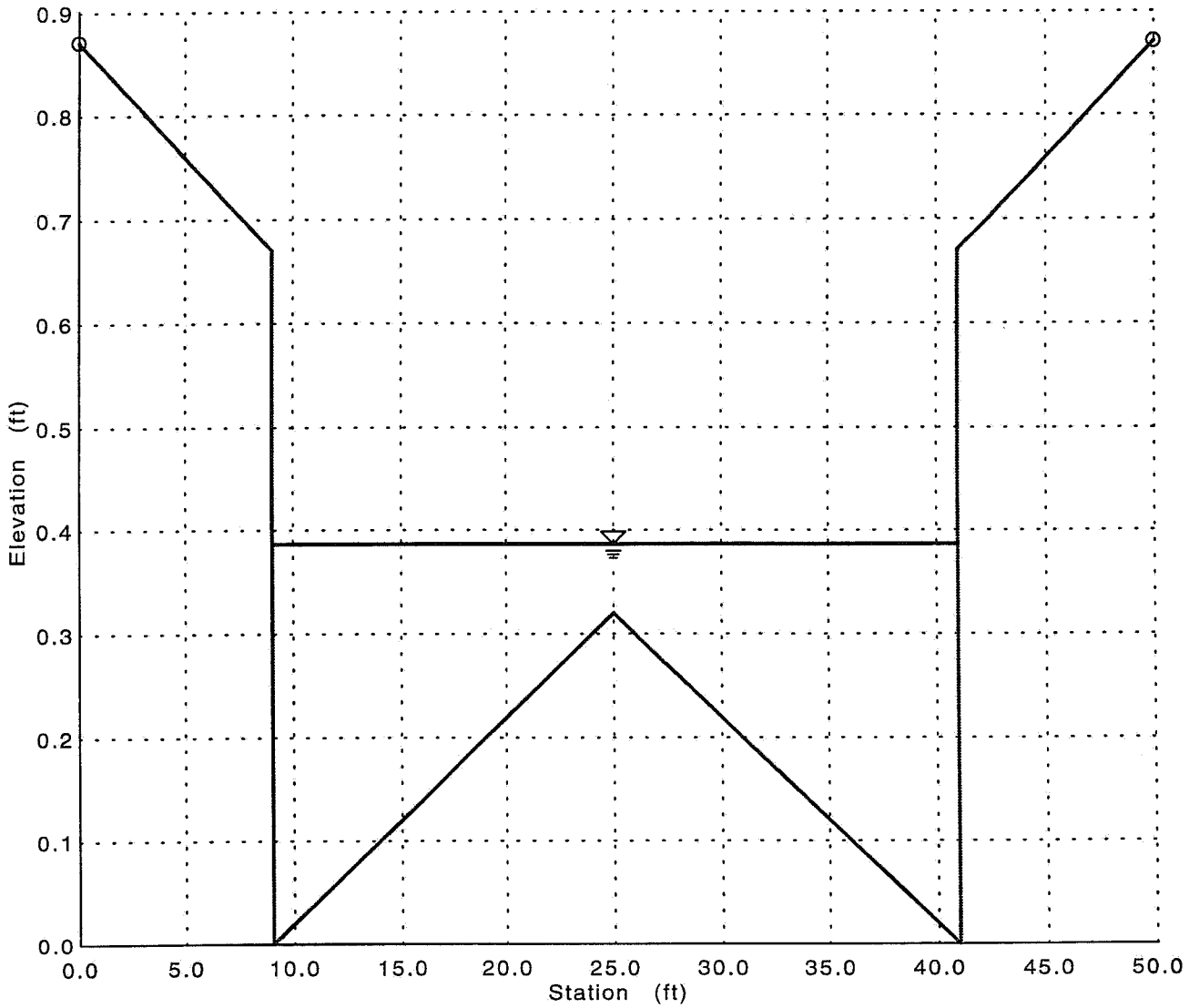
Discharge	17.20	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.39	ft
Flow Area	7.25	ft²
Wetted Perimeter	32.78	ft
Top Width	32.00	ft
Height	0.39	ft
Critical Depth	0.37	ft
Critical Slope	0.007331	ft/ft
Velocity	2.37	ft/s
Velocity Head	0.09	ft
Specific Energy	0.47	ft
Froude Number	0.88	
Flow is subcritical.		

32' FF WHITEMAN
Cross Section for Irregular Channel
AP 3

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.005500	ft/ft
Water Surface Elevation	0.39	ft
Discharge	17.20	cfs



42' FF MOJAVE
Worksheet for Irregular Channel
AP 4

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Mojave street from East of Whiteman Dr to West of Pojoaque Dr.

Input Data		
Channel Slope	0.010000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	62.00	0.017
10.00	0.67			
10.00	0.00			
31.00	0.42			
52.00	0.00			
52.00	0.67			
62.00	0.87			

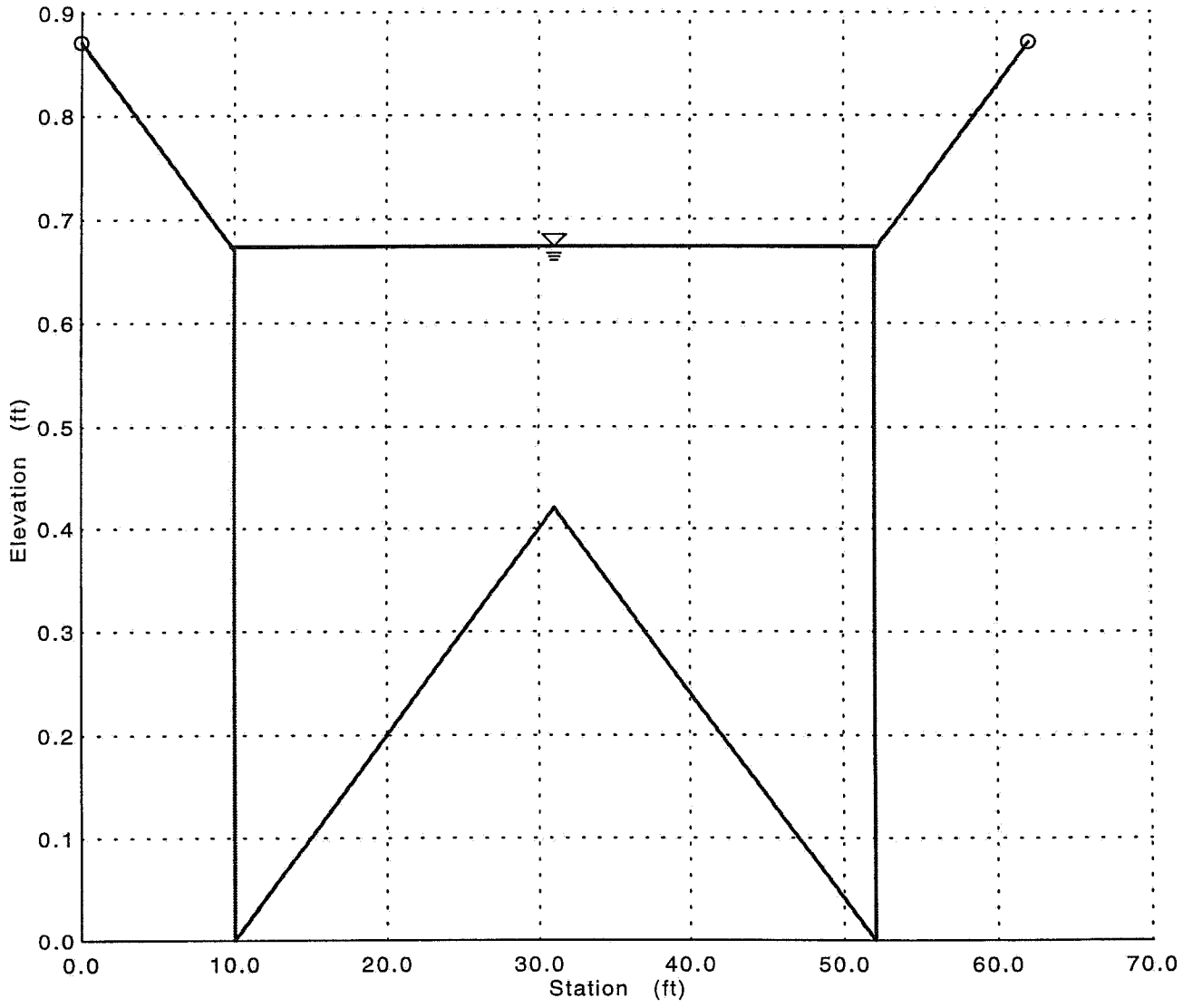
Discharge	99.17	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.67	ft
Flow Area	19.45	ft^2
Wetted Perimeter	43.66	ft
Top Width	42.31	ft
Height	0.67	ft
Critical Depth	0.80	ft
Critical Slope	0.005611	ft/ft
Velocity	5.10	ft/s
Velocity Head	0.40	ft
Specific Energy	1.08	ft
Froude Number	1.33	
Flow is supercritical.		

42' FF MOJAVE
Cross Section for Irregular Channel
AP9

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	0.67	ft
Discharge	99.17	cfs



28' FF CRYSTAL
Worksheet for Irregular Channel
APS

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Crystal st East of Tesuque

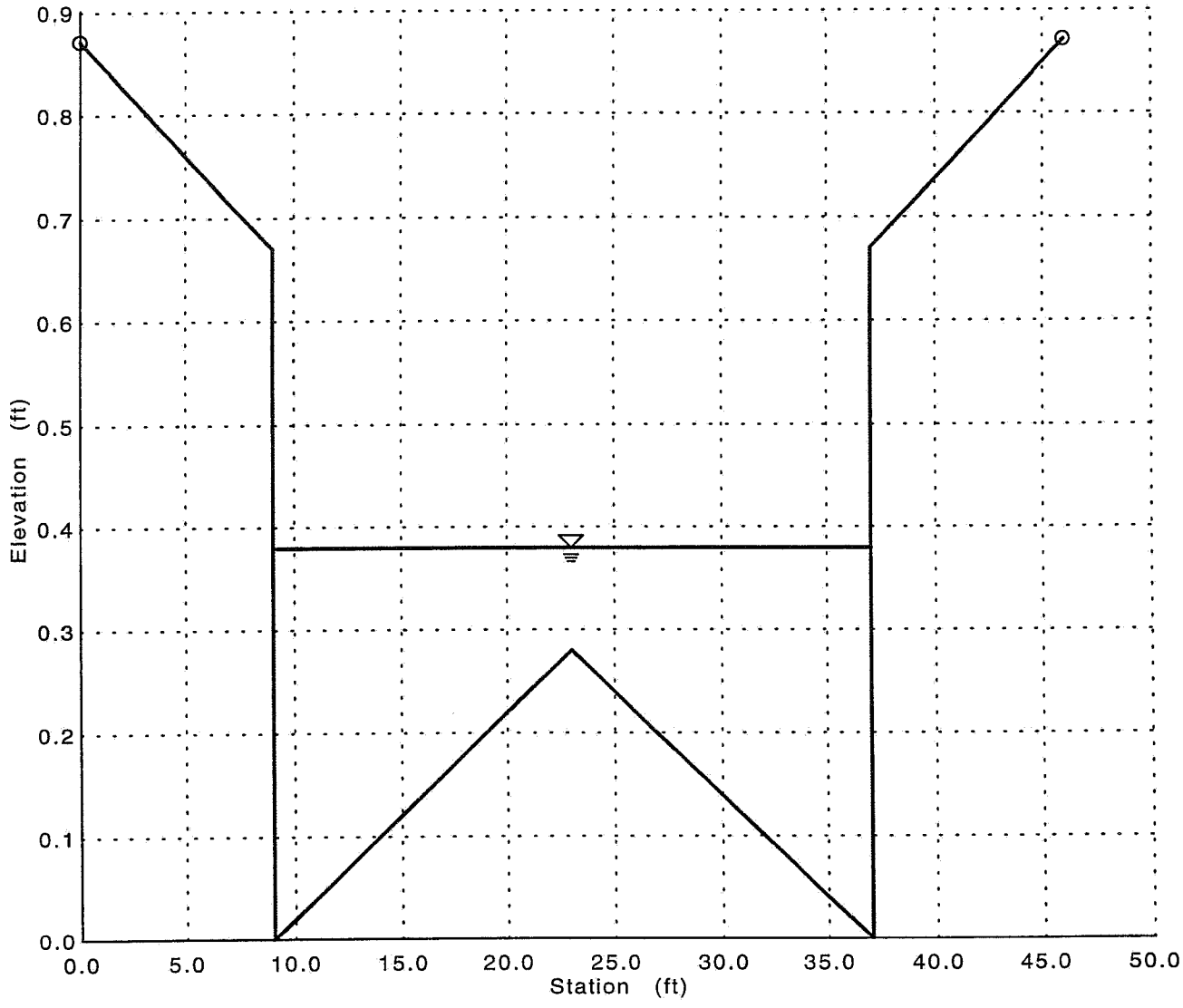
Input Data				
Channel Slope	0.022000 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			
Discharge	33.17 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.38	ft
Flow Area	6.74	ft^2
Wetted Perimeter	28.77	ft
Top Width	28.00	ft
Height	0.38	ft
Critical Depth	0.49	ft
Critical Slope	0.006247	ft/ft
Velocity	4.92	ft/s
Velocity Head	0.38	ft
Specific Energy	0.76	ft
Froude Number	1.77	
Flow is supercritical.		

28' FF CRYSTAL
Cross Section for Irregular Channel
AP5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.022000	ft/ft
Water Surface Elevation	0.38	ft
Discharge	33.17	cfs



28' FFCRYSTAL
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.029800	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

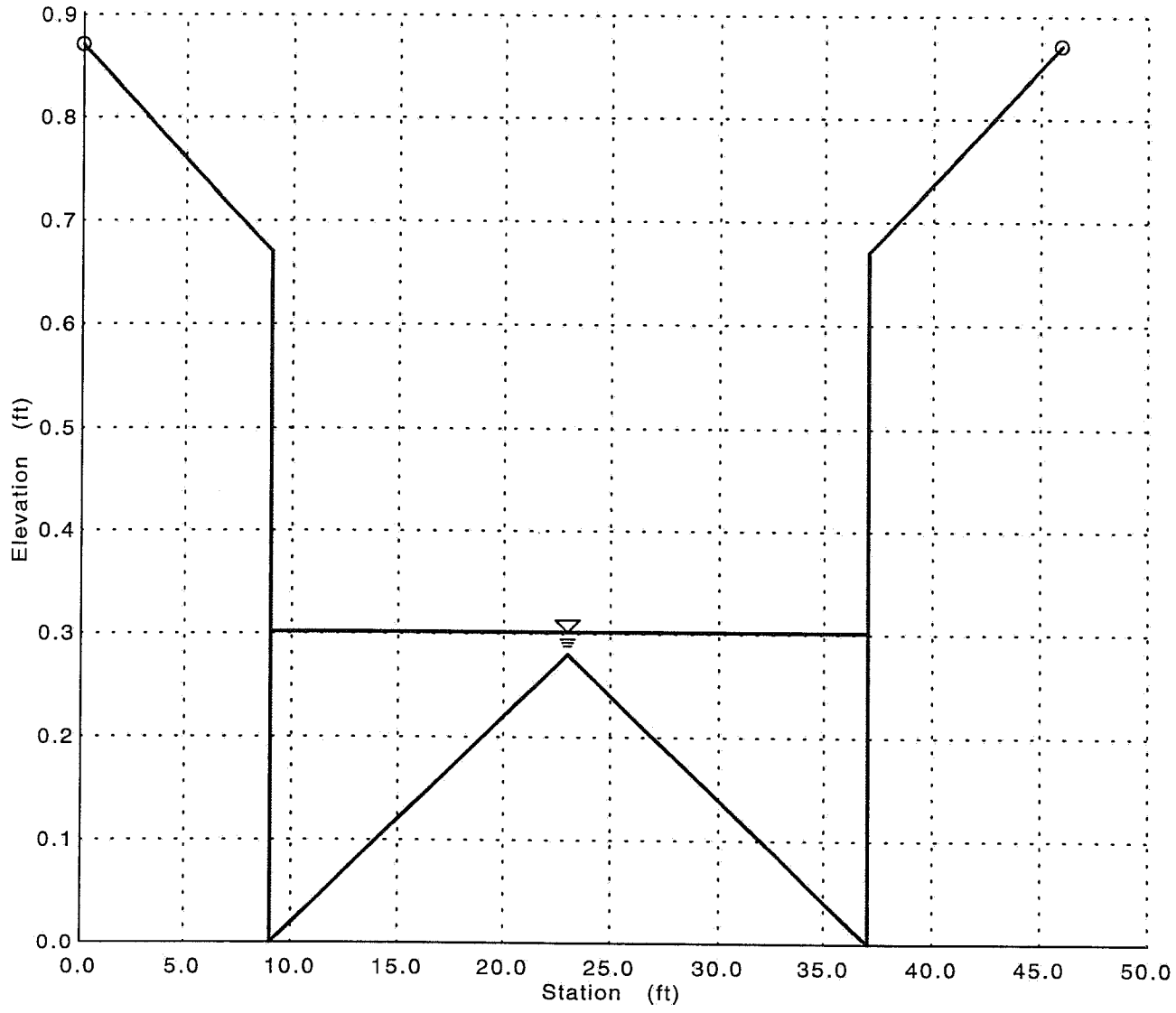
Discharge	20.00	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.53	ft^2
Wetted Perimeter	28.61	ft
Top Width	28.00	ft
Height	0.30	ft
Critical Depth	0.39	ft
Critical Slope	0.006926	ft/ft
Velocity	4.42	ft/s
Velocity Head	0.30	ft
Specific Energy	0.60	ft
Froude Number	1.94	
Flow is supercritical.		

28' FF CRYSTAL
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.029800	ft/ft
Water Surface Elevation	0.30	ft
Discharge	20.00	cfs



40' FF TESUQUE SOUTH OF CRYSTAL
Worksheet for Irregular Channel

AP 5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SOUTH CRYSTAL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Tesuque South of Crystal

100 yr

Input Data		
Channel Slope	0.018100	ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

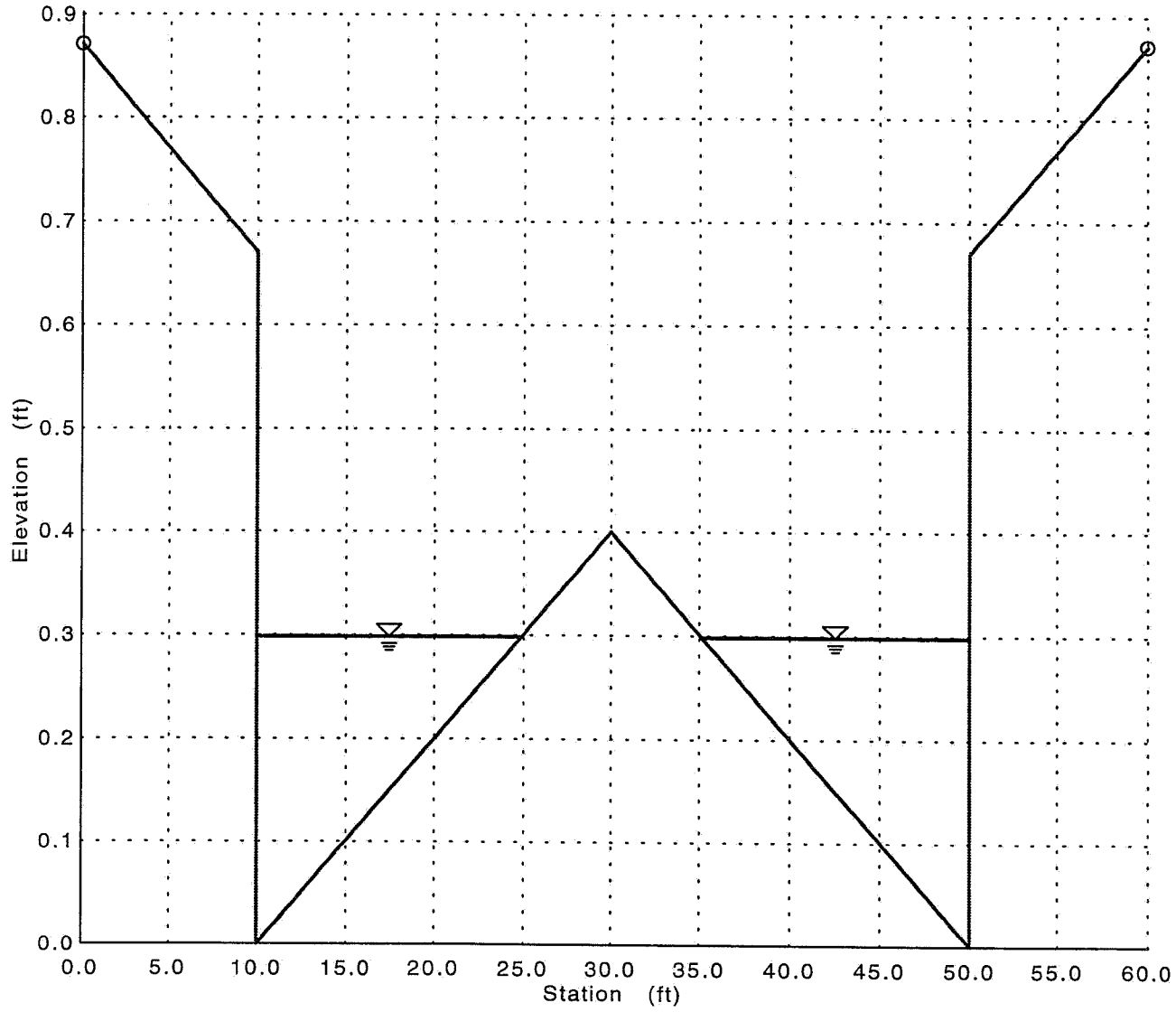
Discharge	14.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.44	ft²
Wetted Perimeter	30.42	ft
Top Width	29.81	ft
Height	0.30	ft
Critical Depth	0.35	ft
Critical Slope	0.007734	ft/ft
Velocity	3.26	ft/s
Velocity Head	0.17	ft
Specific Energy	0.46	ft
Froude Number	1.49	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE SOUTH CRYSTAL
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SOUTH CRYSTAL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.018100	ft/ft
Water Surface Elevation	0.30	ft
Discharge	14.50	cfs



40' FF TESUQUE
Worksheet for Irregular Channel
AP 5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Tesuque North Crystal

Input Data		
Channel Slope	0.026700	ft/ft
Discharge	15.50	cfs

Elevation range: 0.00 ft to 0.87 ft.

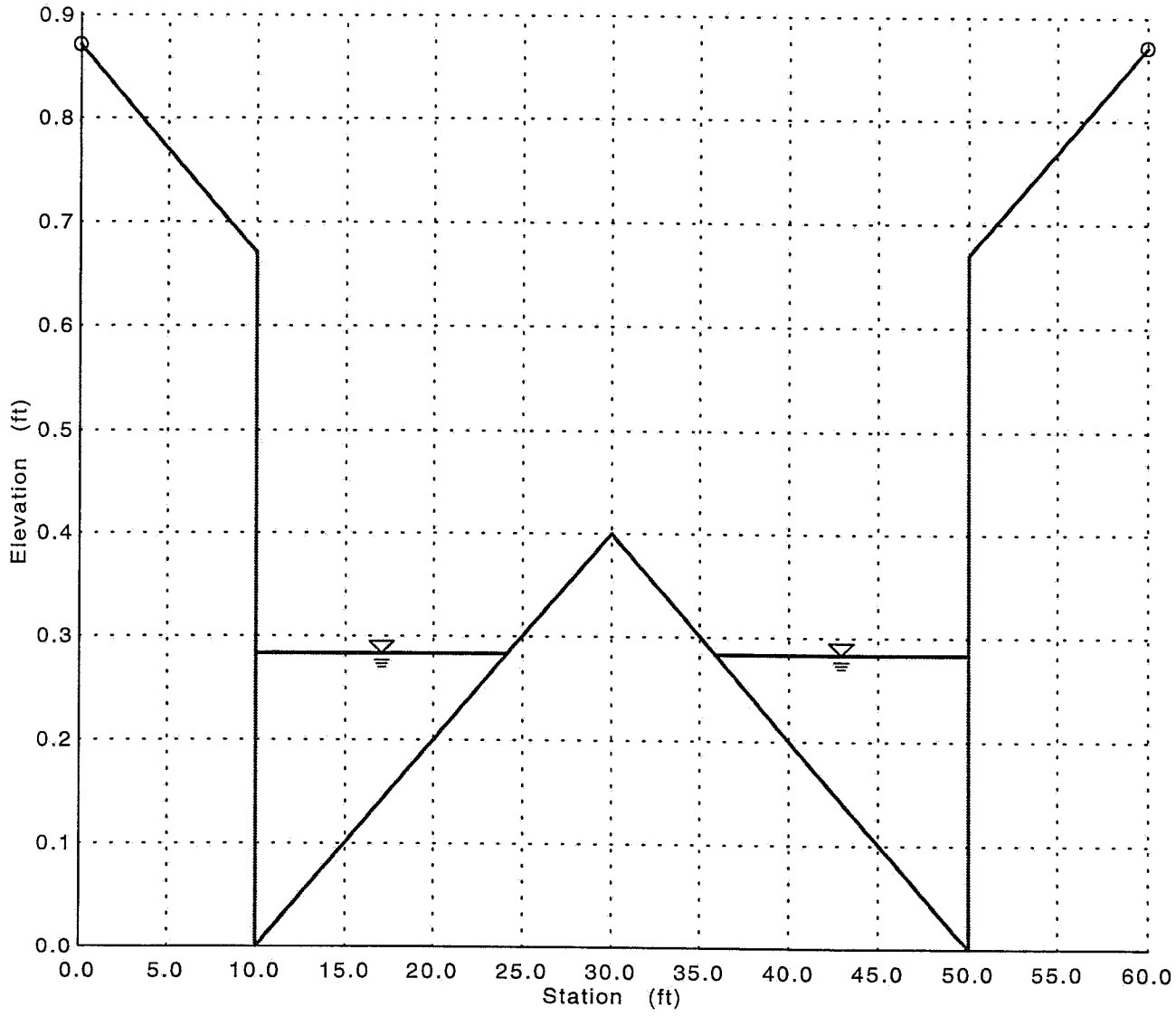
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	4.04	ft²
Wetted Perimeter	29.00	ft
Top Width	28.42	ft
Height	0.28	ft
Critical Depth	0.36	ft
Critical Slope	0.007667	ft/ft
Velocity	3.84	ft/s
Velocity Head	0.23	ft
Specific Energy	0.51	ft
Froude Number	1.79	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.026700	ft/ft
Water Surface Elevation	0.28	ft
Discharge	15.50	cfs



40' FF TESUQUE
Worksheet for Irregular Channel
AP 5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Tesuque North Crystal

Input Data		
Channel Slope	0.021800	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

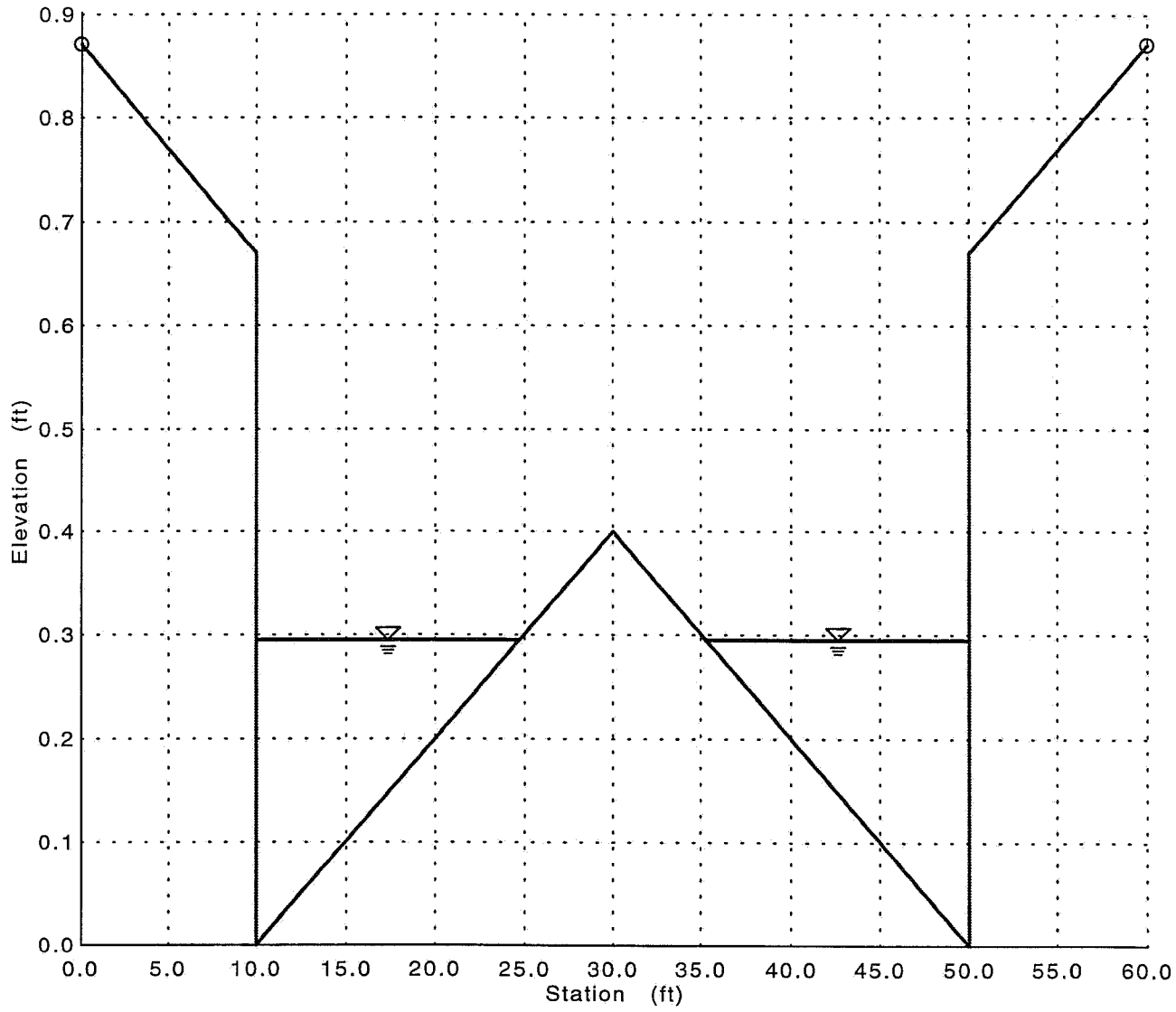
Discharge	15.50	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.36	ft²
Wetted Perimeter	30.12	ft
Top Width	29.52	ft
Height	0.30	ft
Critical Depth	0.36	ft
Critical Slope	0.007667	ft/ft
Velocity	3.56	ft/s
Velocity Head	0.20	ft
Specific Energy	0.49	ft
Froude Number	1.63	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.021800	ft/ft
Water Surface Elevation	0.30	ft
Discharge	15.50	cfs



28' FF LITTLE JOE
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Little Joe Court south of Crystal

Input Data		
Channel Slope	0.005000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	6.60	cfs

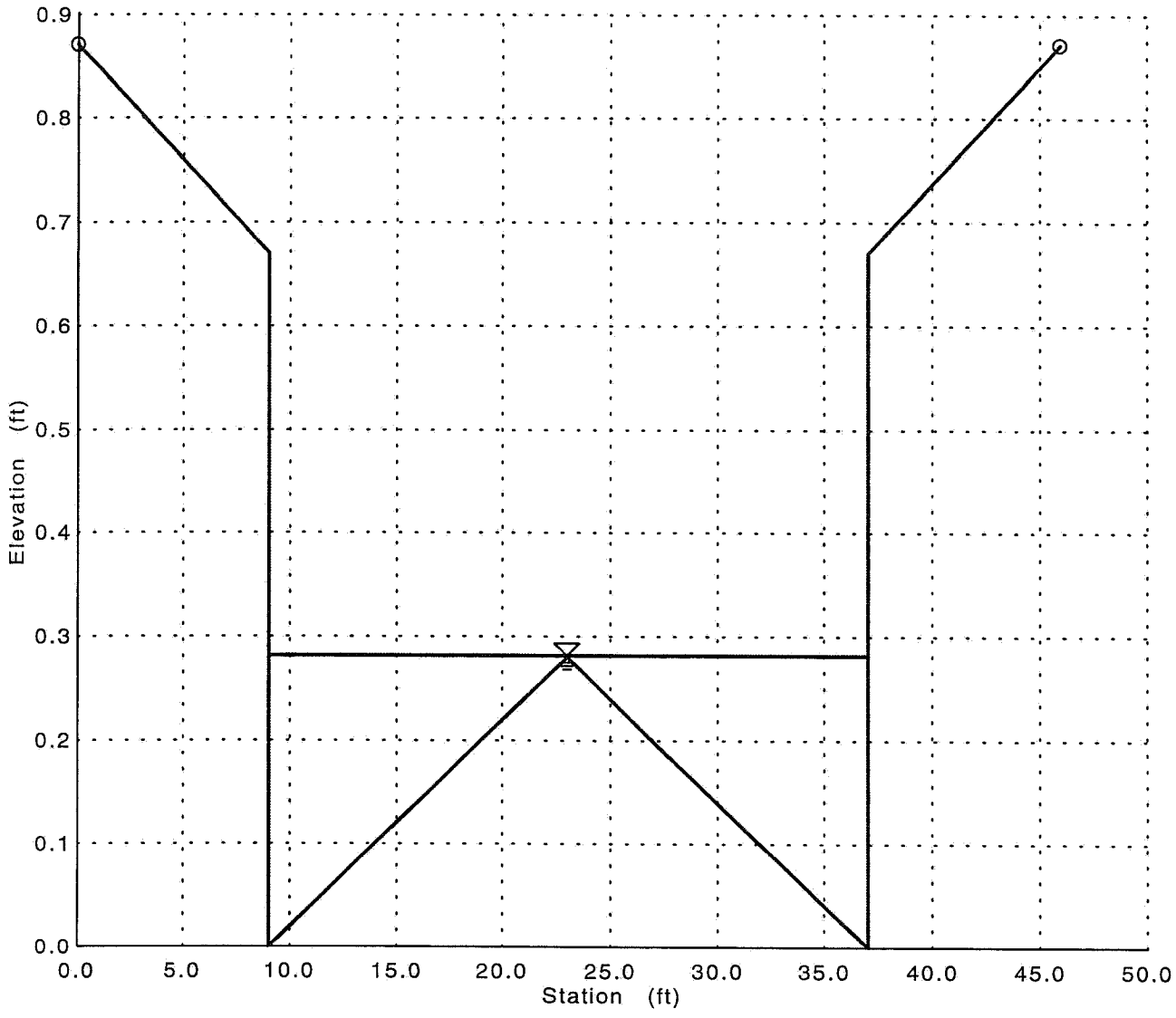
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.98	ft^2
Wetted Perimeter	28.57	ft
Top Width	28.00	ft
Height	0.28	ft
Critical Depth	0.26	ft
Critical Slope	0.008591	ft/ft
Velocity	1.66	ft/s
Velocity Head	0.04	ft
Specific Energy	0.32	ft
Froude Number	0.78	
Flow is subcritical.		

28' FF LITTLE JOE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.005000	ft/ft
Water Surface Elevation	0.28	ft
Discharge	6.60	cfs



28' FF LITTLE JOE
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Little Joe lane North of Crystal

Input Data		
Channel Slope	0.030000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	6.60	cfs

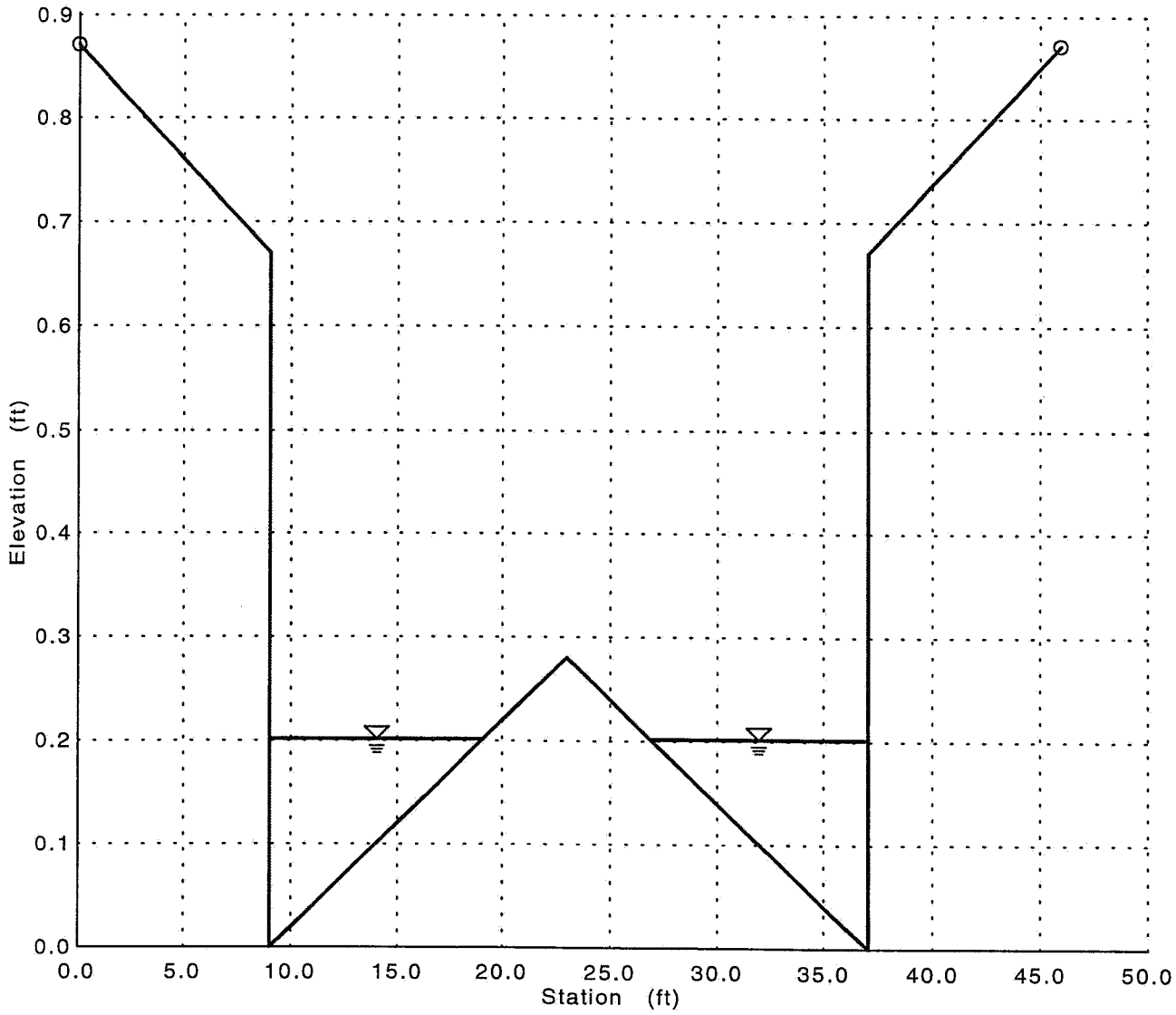
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.20	ft
Flow Area	2.04	ft^2
Wetted Perimeter	20.60	ft
Top Width	20.19	ft
Height	0.20	ft
Critical Depth	0.26	ft
Critical Slope	0.008591	ft/ft
Velocity	3.24	ft/s
Velocity Head	0.16	ft
Specific Energy	0.36	ft
Froude Number	1.80	
Flow is supercritical.		
Flow is divided.		

28' FF LITTLE JOE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.030000	ft/ft
Water Surface Elevation	0.20	ft
Discharge	6.60	cfs



28' FF CRYSTAL
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Crystal between little Joe and Whiteman

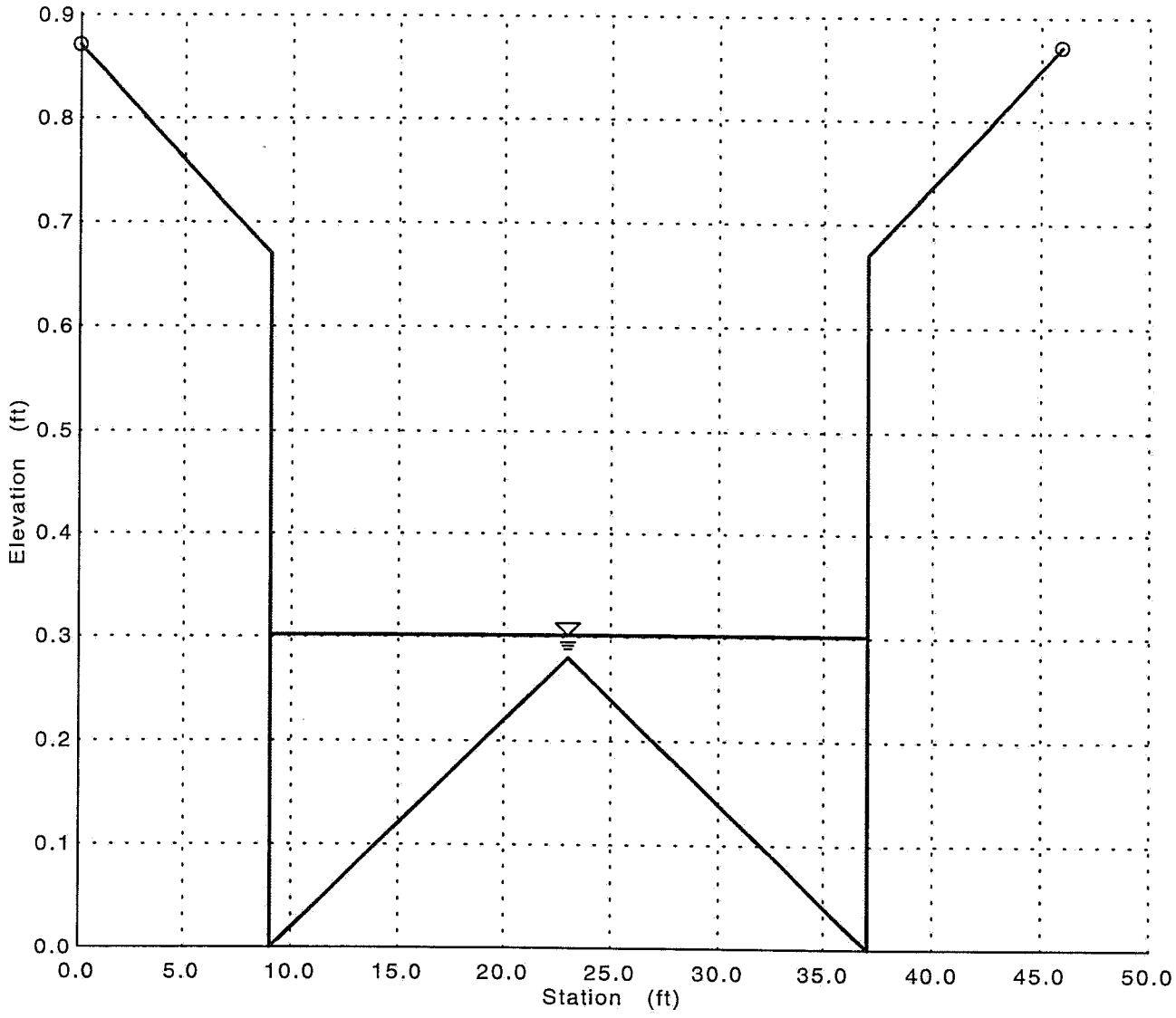
Input Data				
Channel Slope	0.022000 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			
Discharge	17.20 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.53	ft²
Wetted Perimeter	28.61	ft
Top Width	28.00	ft
Height	0.30	ft
Critical Depth	0.37	ft
Critical Slope	0.007146	ft/ft
Velocity	3.80	ft/s
Velocity Head	0.22	ft
Specific Energy	0.53	ft
Froude Number	1.66	
Flow is supercritical.		

28' FF CRYSTAL
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.022000	ft/ft
Water Surface Elevation	0.30	ft
Discharge	17.20	cfs



32' FF WHITEMAN
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Whiteman between Kachina street and Crystal street.

Input Data		
Channel Slope	0.050000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	4.60	cfs

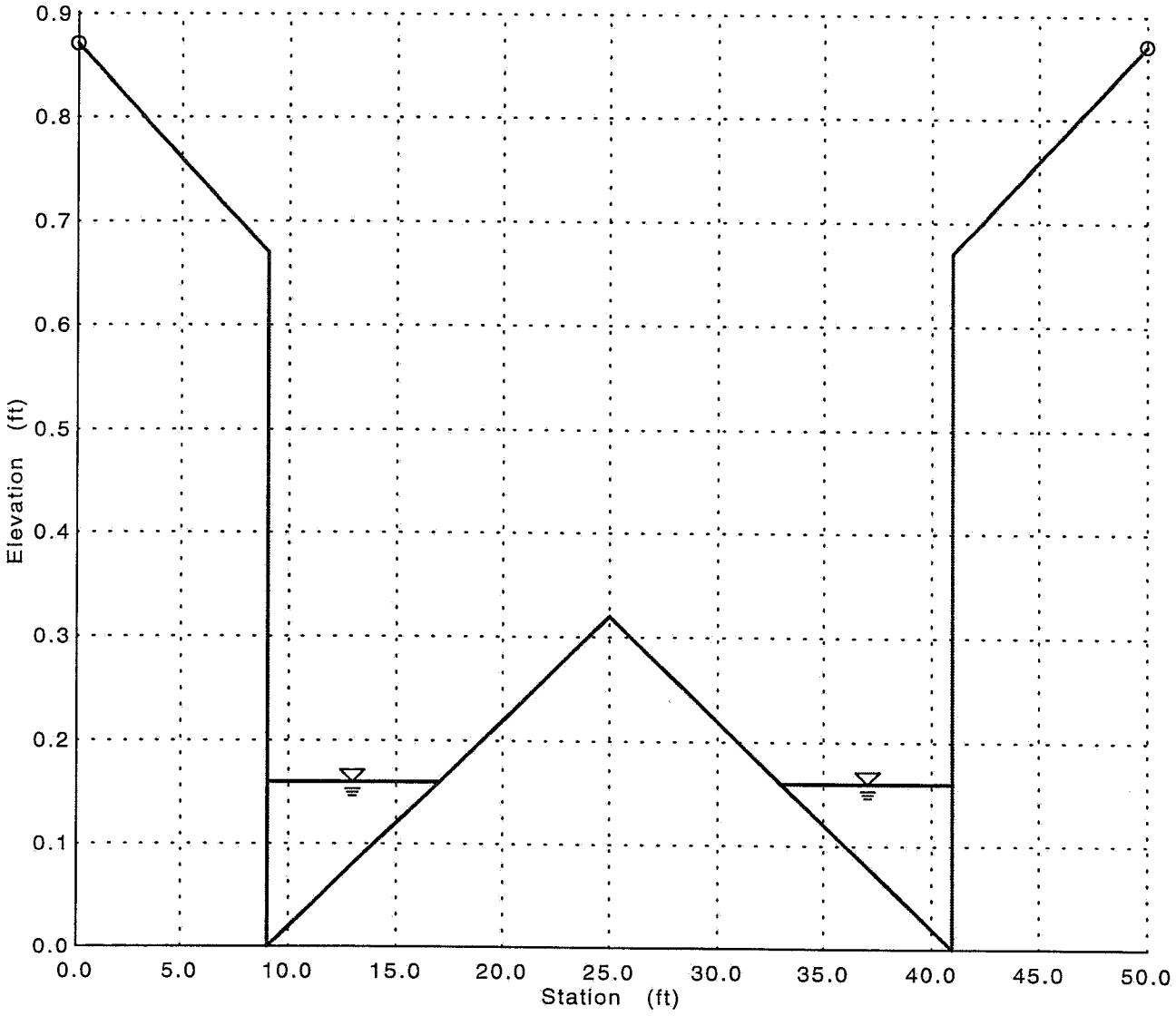
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.16	ft
Flow Area	1.28	ft²
Wetted Perimeter	16.35	ft
Top Width	16.02	ft
Height	0.16	ft
Critical Depth	0.22	ft
Critical Slope	0.009015	ft/ft
Velocity	3.58	ft/s
Velocity Head	0.20	ft
Specific Energy	0.36	ft
Froude Number	2.23	
Flow is supercritical.		
Flow is divided.		

32' FF WHITEMAN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.050000	ft/ft
Water Surface Elevation	0.16	ft
Discharge	4.60	cfs



32' FF WHITEMAN
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Whiteman South of Crystal Street.

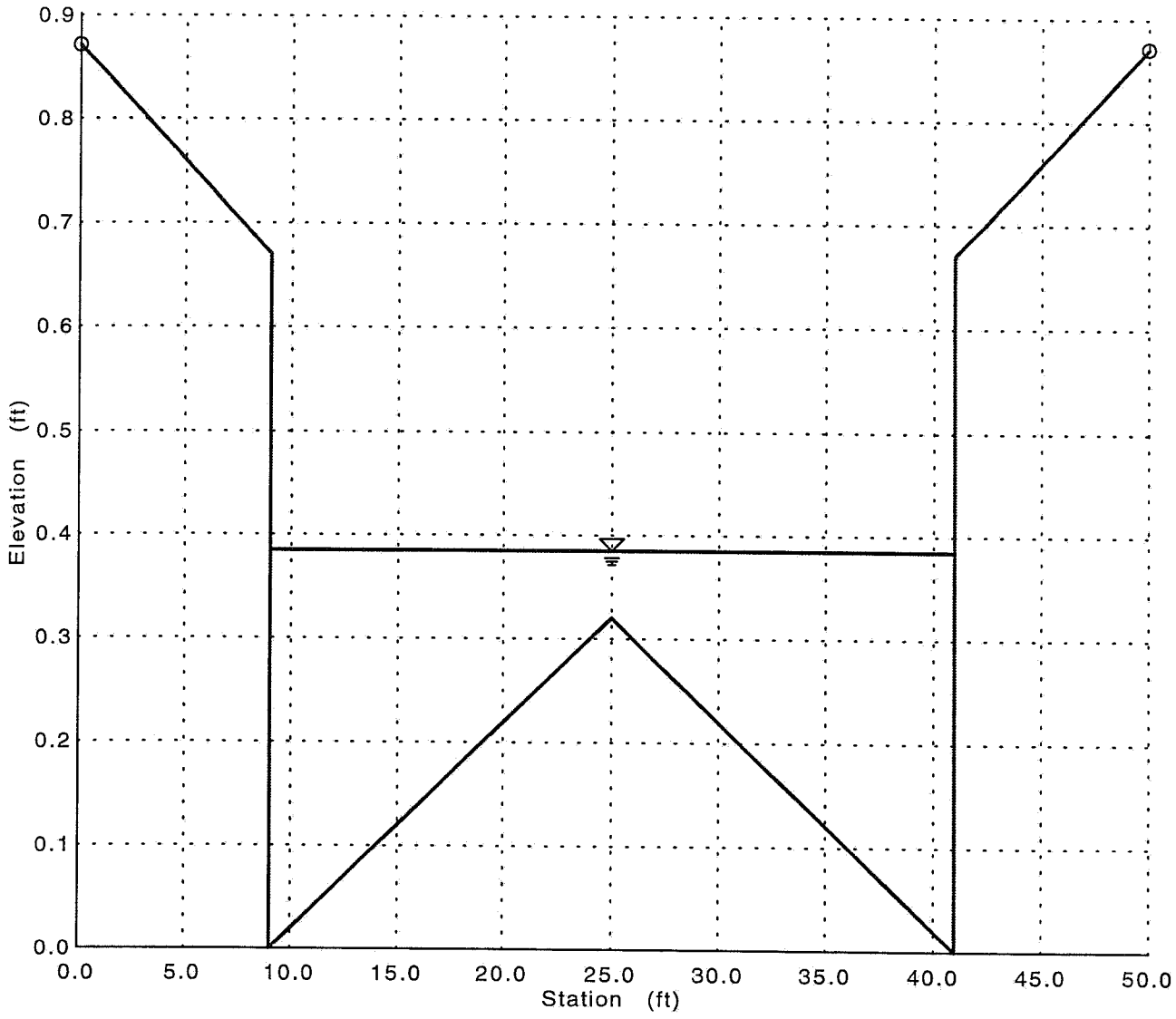
Input Data				
Channel Slope	0.008900 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			
Discharge	21.80 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.39	ft
Flow Area	7.24	ft^2
Wetted Perimeter	32.78	ft
Top Width	32.00	ft
Height	0.39	ft
Critical Depth	0.40	ft
Critical Slope	0.006974	ft/ft
Velocity	3.01	ft/s
Velocity Head	0.14	ft
Specific Energy	0.53	ft
Froude Number	1.12	
Flow is supercritical.		

32' FF WHITEMAN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.008900	ft/ft
Water Surface Elevation	0.39	ft
Discharge	21.80	cfs



32' FF WHITEMAN
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Whiteman North of Montano.

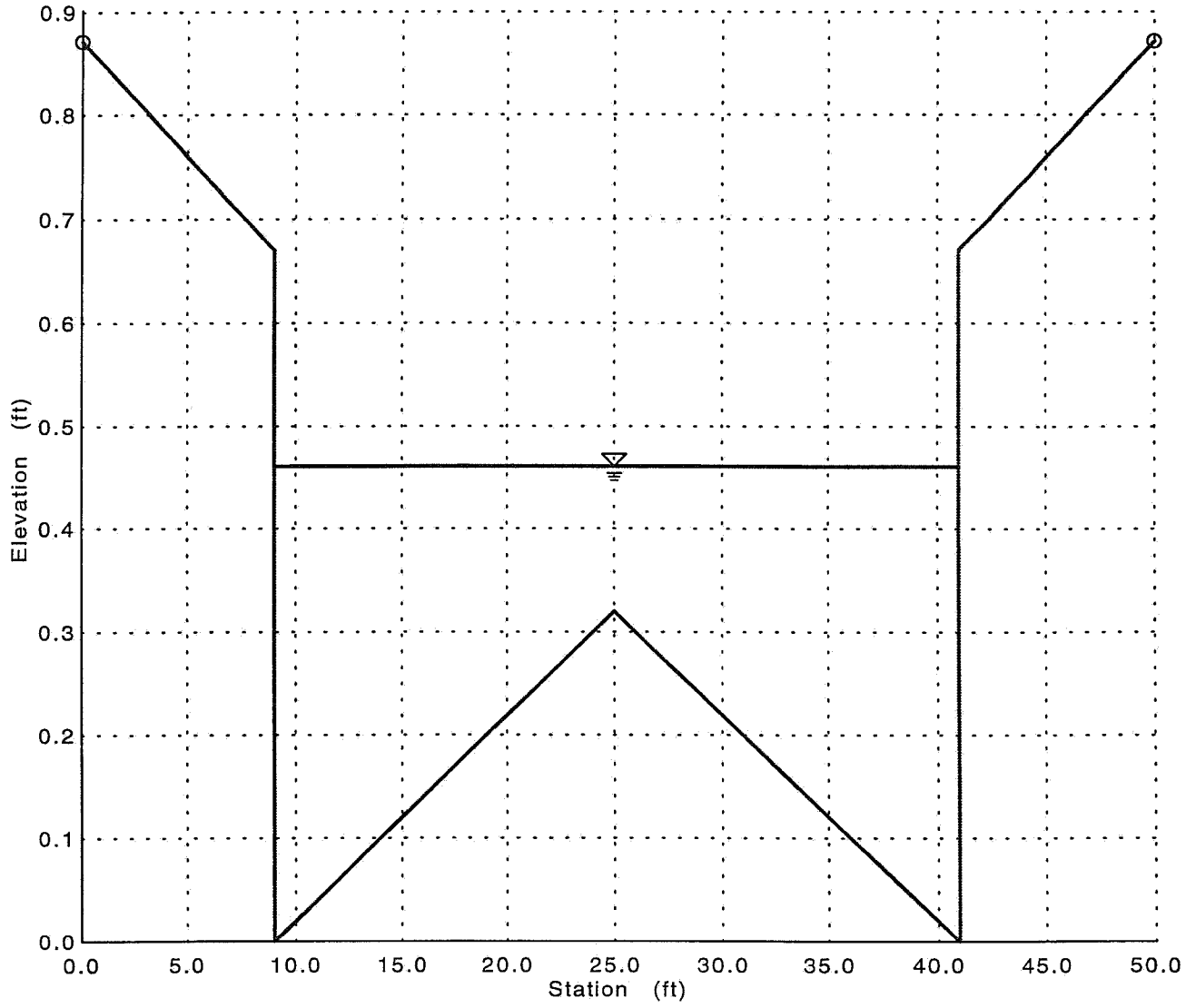
Input Data				
Channel Slope	0.008900 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			
Discharge	35.00 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.46	ft
Flow Area	9.63	ft^2
Wetted Perimeter	32.93	ft
Top Width	32.00	ft
Height	0.46	ft
Critical Depth	0.49	ft
Critical Slope	0.006324	ft/ft
Velocity	3.63	ft/s
Velocity Head	0.21	ft
Specific Energy	0.67	ft
Froude Number	1.17	
Flow is supercritical.		

32' FF WHITEMAN
Cross Section for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.008900	ft/ft
Water Surface Elevation	0.46	ft
Discharge	35.00	cfs



Volcano Cliffs
10yr

40' FF TESUQUE
Worksheet for Irregular Channel

AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 10 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope	0.045300 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			
Discharge	23.43 cfs			

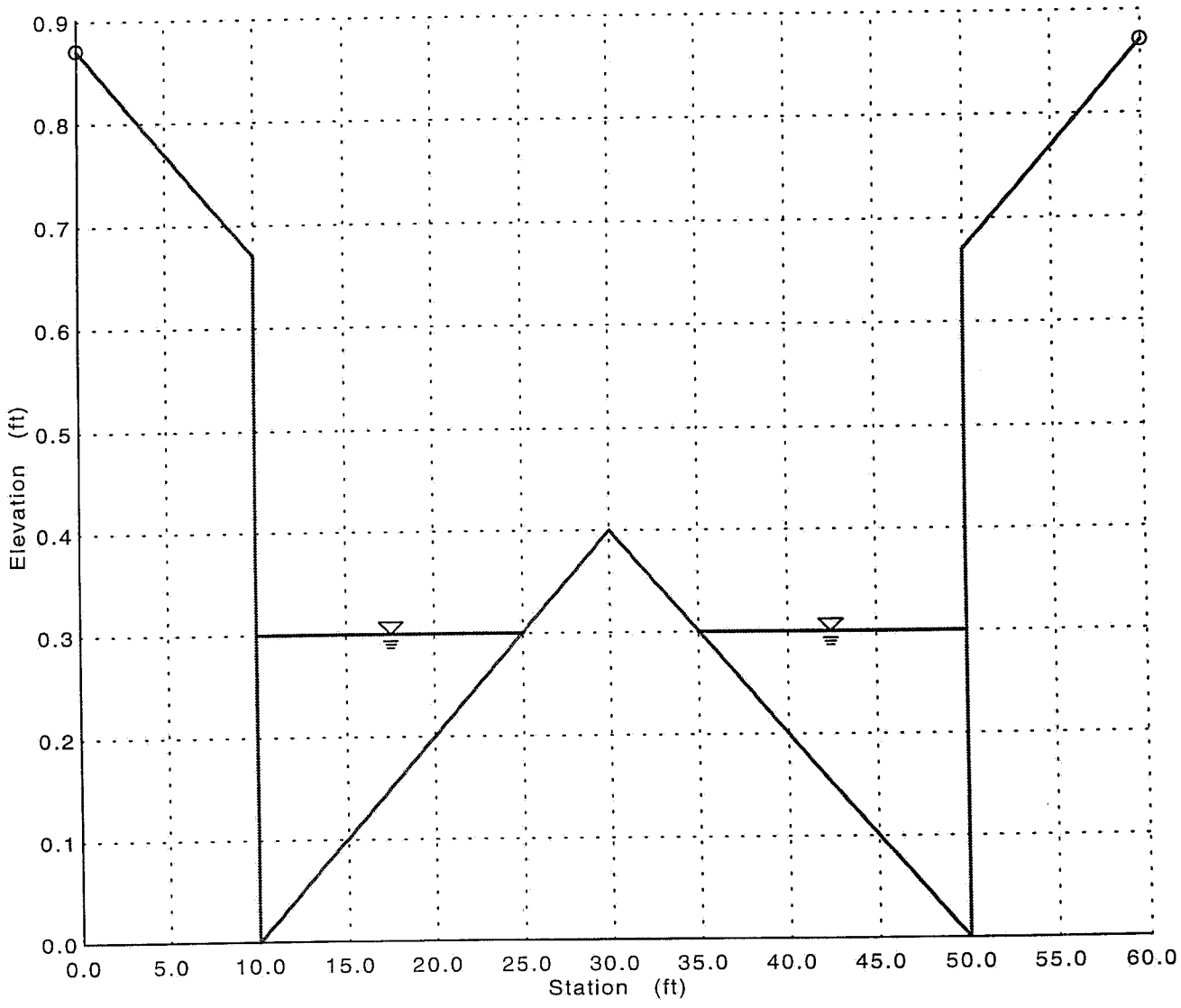
Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.52	ft²
Wetted Perimeter	30.66	ft
Top Width	30.05	ft
Height	0.30	ft
Critical Depth	0.42	ft
Critical Slope	0.007172	ft/ft
Velocity	5.19	ft/s
Velocity Head	0.42	ft
Specific Energy	0.72	ft
Froude Number	2.36	
Flow is supercritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE 10yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.045300	ft/ft
Water Surface Elevation	0.30	ft
Discharge	23.43	cfs



28' FF LITTLE JOE
Worksheet for Irregular Channel
AP2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE 10yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.011300	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	35.89	cfs

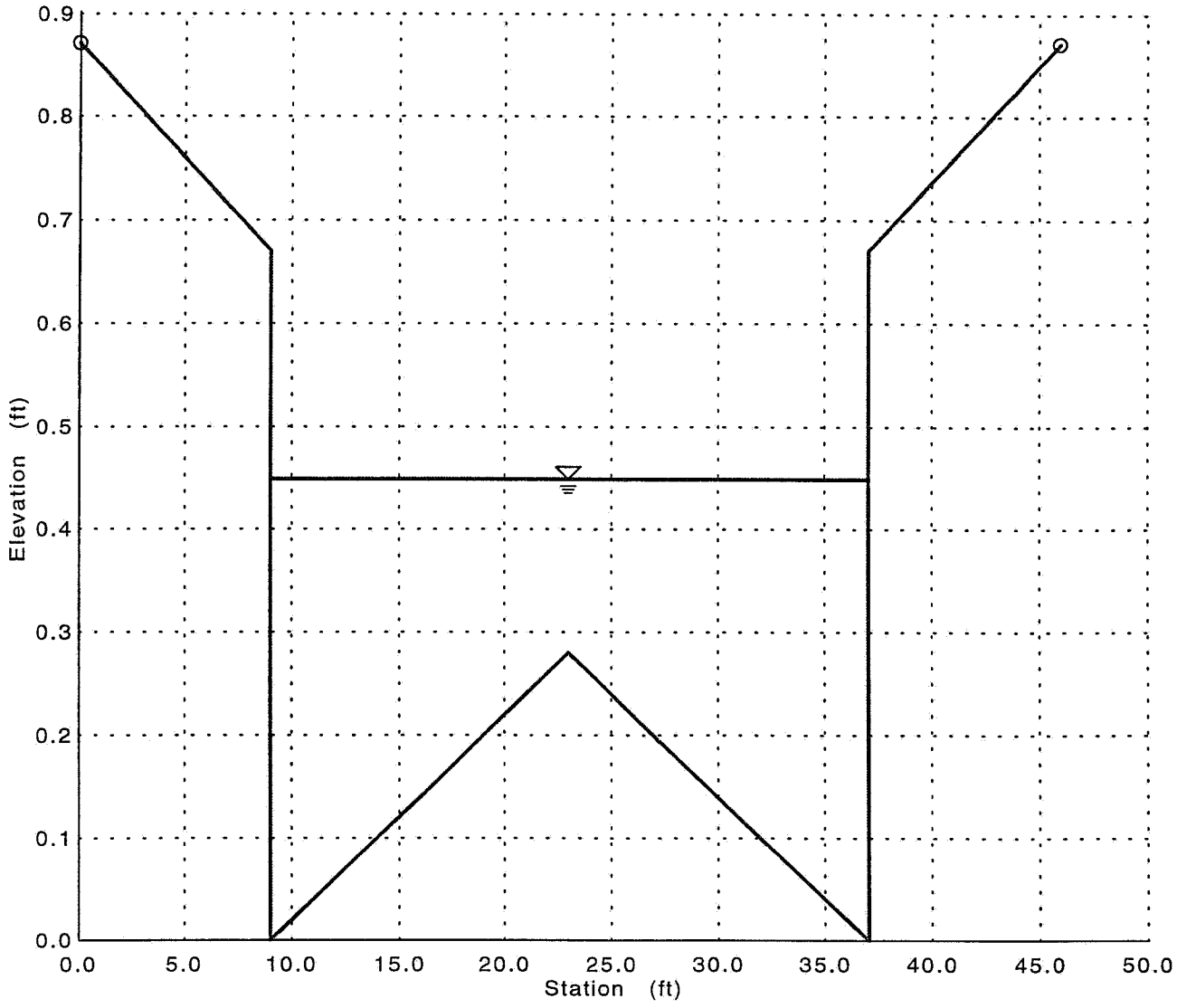
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.45	ft
Flow Area	8.64	ft²
Wetted Perimeter	28.90	ft
Top Width	28.00	ft
Height	0.45	ft
Critical Depth	0.51	ft
Critical Slope	0.006149	ft/ft
Velocity	4.15	ft/s
Velocity Head	0.27	ft
Specific Energy	0.72	ft
Froude Number	1.32	
Flow is supercritical.		

28' FF LITTLE JOE
Cross Section for Irregular Channel
AP2

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF LITTLE JOE 10yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.011300	ft/ft
Water Surface Elevation	0.45	ft
Discharge	35.89	cfs



32' FF WHITEMAN
Worksheet for Irregular Channel
AP3

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 3 10 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.005500	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	10.32	cfs

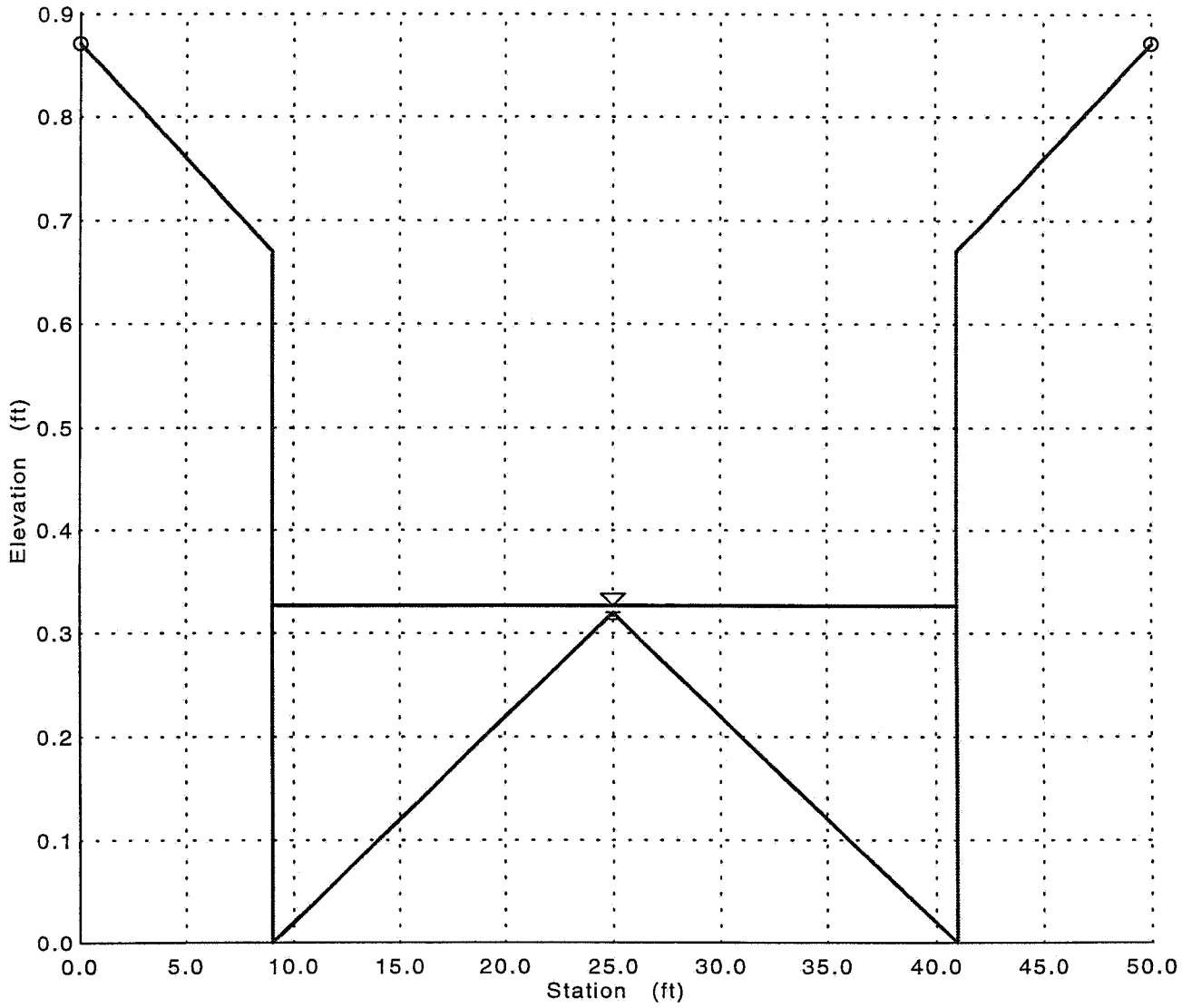
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.33	ft
Flow Area	5.33	ft²
Wetted Perimeter	32.66	ft
Top Width	32.00	ft
Height	0.33	ft
Critical Depth	0.31	ft
Critical Slope	0.008093	ft/ft
Velocity	1.94	ft/s
Velocity Head	0.06	ft
Specific Energy	0.38	ft
Froude Number	0.84	
Flow is subcritical.		

32' FF WHITEMAN
Cross Section for Irregular Channel
AP 3

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 3 10yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.005500	ft/ft
Water Surface Elevation	0.33	ft
Discharge	10.32	cfs



42' FF MOJAVE
Worksheet for Irregular Channel
AP 4

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 10 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.010000	ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	62.00	0.017
10.00	0.67			
10.00	0.00			
31.00	0.42			
52.00	0.00			
52.00	0.67			
62.00	0.87			

Discharge	59.51	cfs

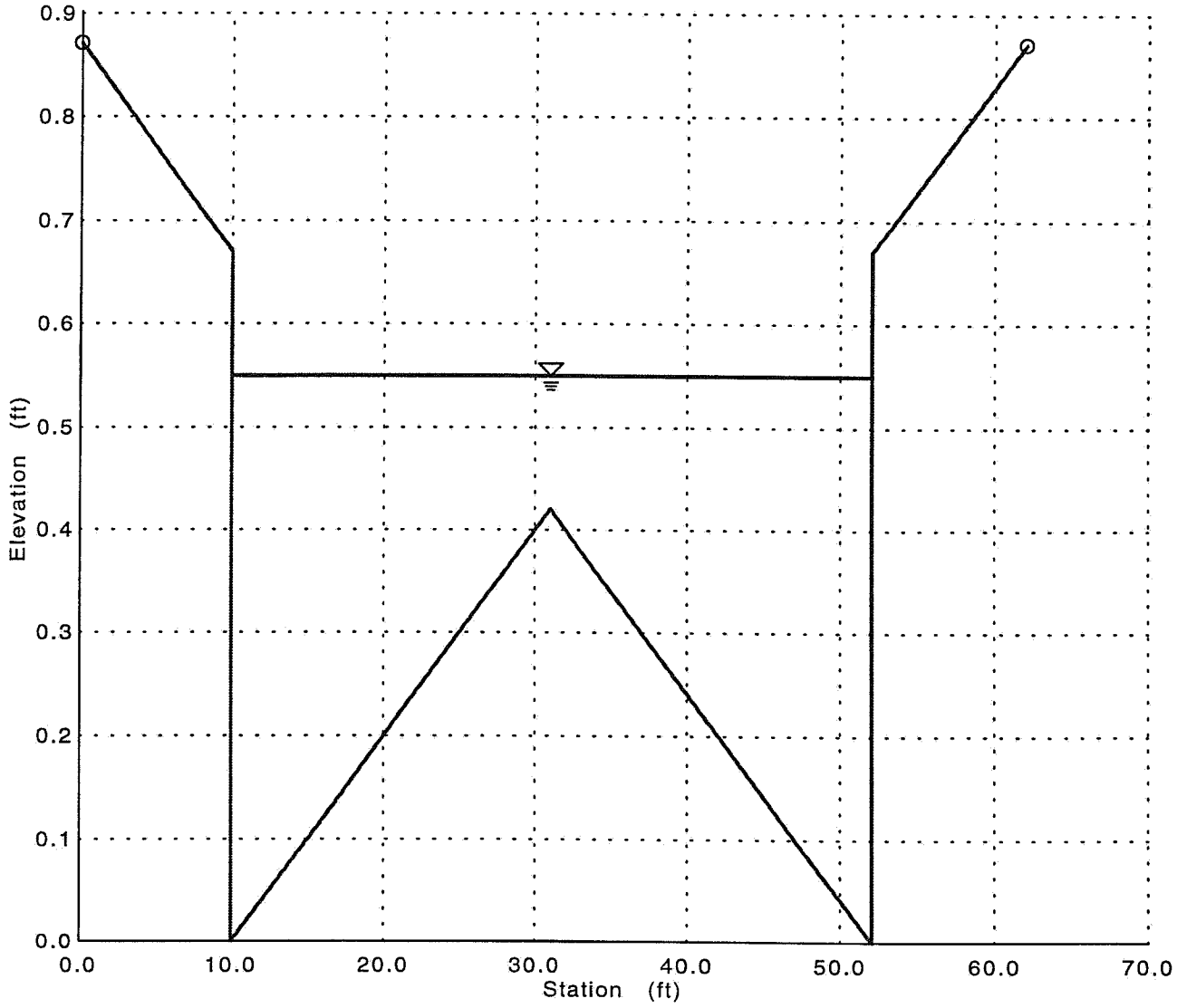
Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.55	ft
Flow Area	14.24	ft²
Wetted Perimeter	43.11	ft
Top Width	42.00	ft
Height	0.55	ft
Critical Depth	0.61	ft
Critical Slope	0.005955	ft/ft
Velocity	4.18	ft/s
Velocity Head	0.27	ft
Specific Energy	0.82	ft
Froude Number	1.26	
Flow is supercritical.		

42' FF MOJAVE
Cross Section for Irregular Channel

AP 4

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	42' FF MOJAVE 10 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	0.55	ft
Discharge	59.51	cfs



28' FF CRYSTAL
Worksheet for Irregular Channel

AP 5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL 10yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.022000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

Discharge	19.17	cfs

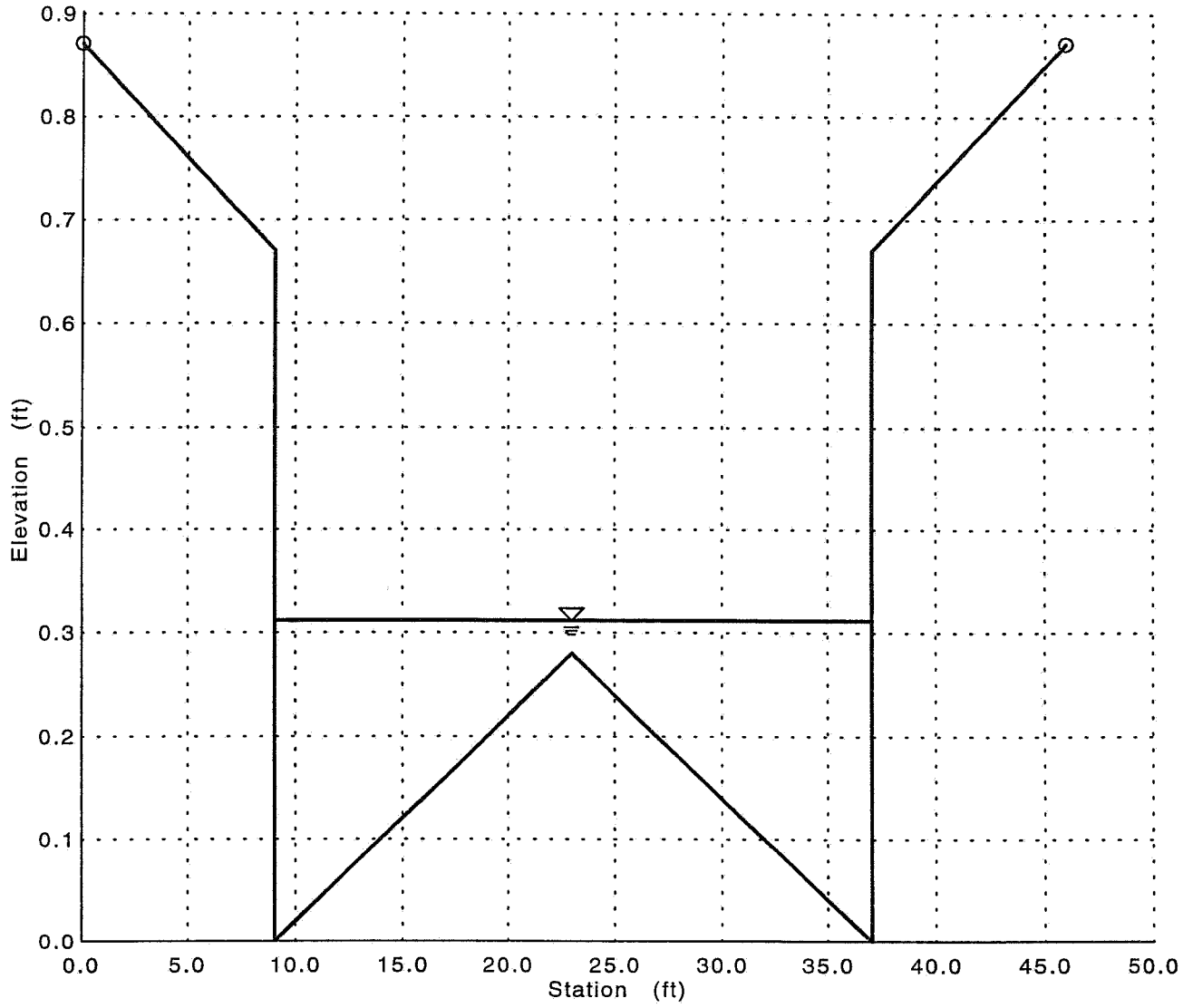
Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.31	ft
Flow Area	4.84	ft²
Wetted Perimeter	28.63	ft
Top Width	28.00	ft
Height	0.31	ft
Critical Depth	0.38	ft
Critical Slope	0.006986	ft/ft
Velocity	3.96	ft/s
Velocity Head	0.24	ft
Specific Energy	0.56	ft
Froude Number	1.68	
Flow is supercritical.		

28' FF CRYSTAL
Cross Section for Irregular Channel

AP 5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF CRYSTAL 10 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.022000	ft/ft
Water Surface Elevation	0.31	ft
Discharge	19.17	cfs



32' FF WHITEMAN
Worksheet for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6 10 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.008900	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	19.66	cfs

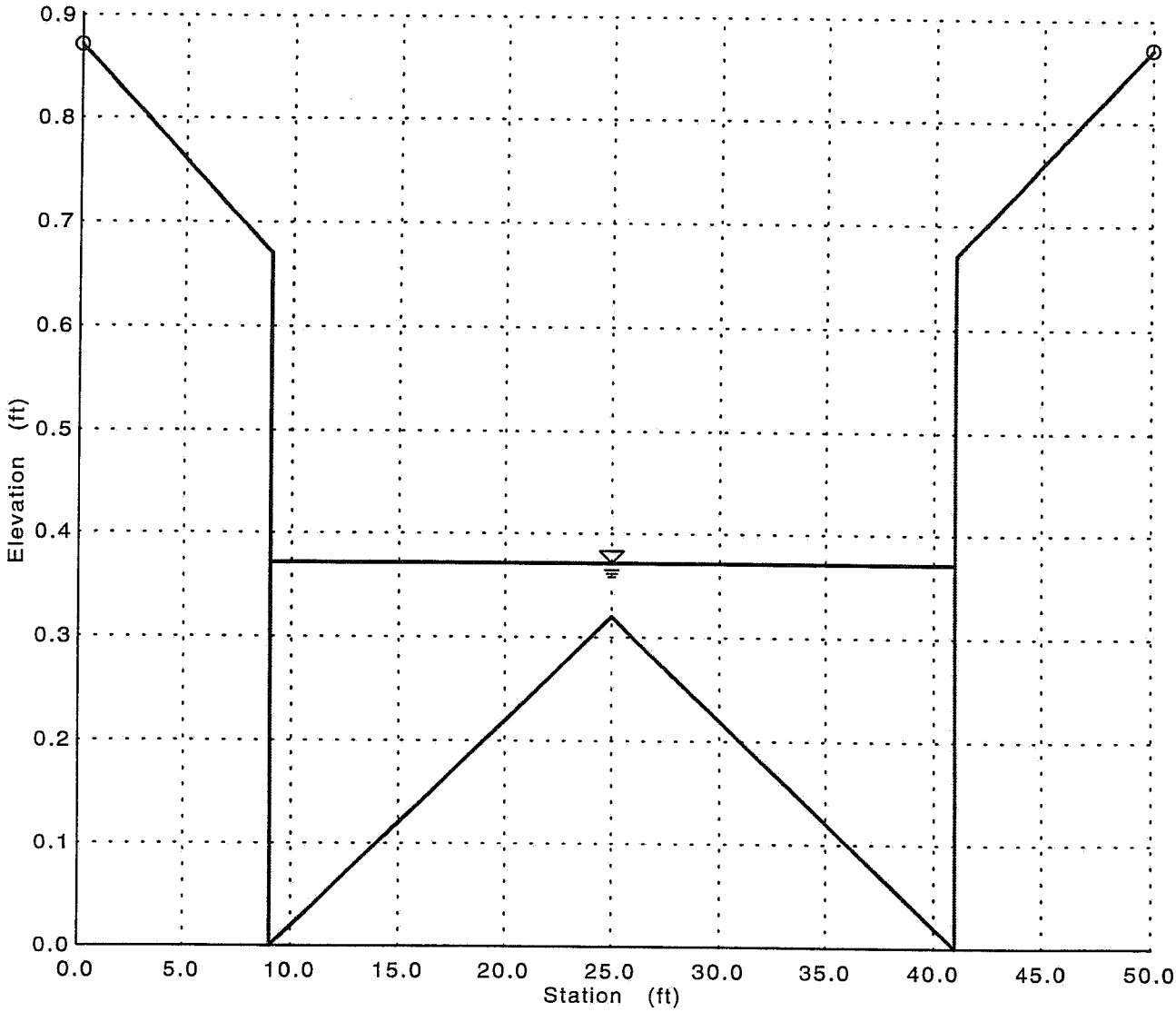
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.37	ft
Flow Area	6.80	ft²
Wetted Perimeter	32.75	ft
Top Width	32.00	ft
Height	0.37	ft
Critical Depth	0.39	ft
Critical Slope	0.007126	ft/ft
Velocity	2.89	ft/s
Velocity Head	0.13	ft
Specific Energy	0.50	ft
Froude Number	1.11	
Flow is supercritical.		

32' FF WHITEMAN
Cross Section for Irregular Channel
AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF WHITEMAN AP 6 10yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.008900	ft/ft
Water Surface Elevation	0.37	ft
Discharge	19.66	cfs



STAGHORN

28' FF STAG HORN
Worksheet for Irregular Channel

AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

stag Horn North of Acacia Street

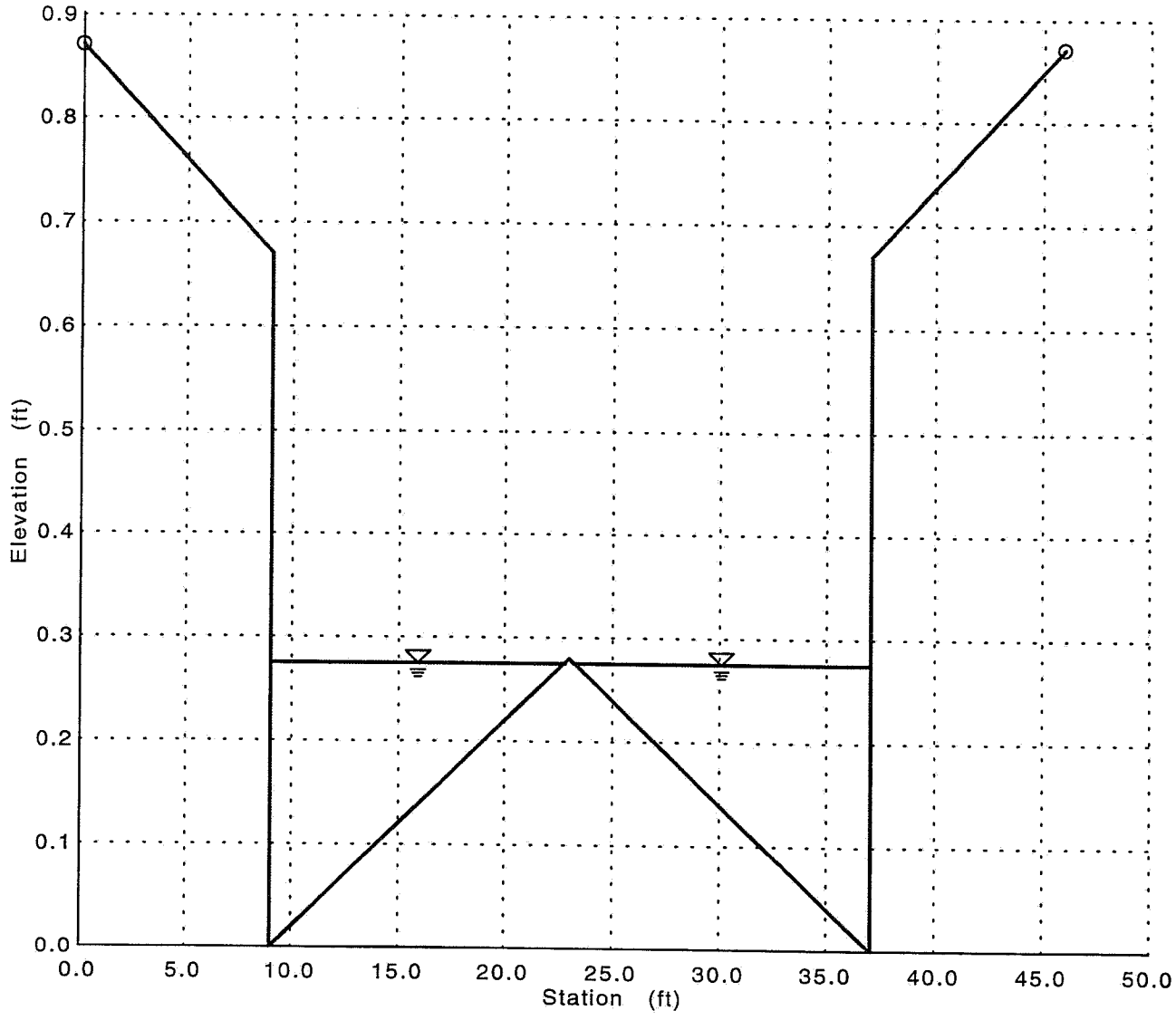
Input Data				
Channel Slope	0.039400 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			
Discharge	17.40 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.81	ft²
Wetted Perimeter	28.15	ft
Top Width	27.59	ft
Height	0.28	ft
Critical Depth	0.37	ft
Critical Slope	0.007129	ft/ft
Velocity	4.57	ft/s
Velocity Head	0.32	ft
Specific Energy	0.60	ft
Froude Number	2.17	
Flow is supercritical.		
Flow is divided.		

28' FF STAGHORN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.039400	ft/ft
Water Surface Elevation	0.28	ft
Discharge	17.40	cfs



28' FF STAG HORN
Worksheet for Irregular Channel
AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Stag Horn South of Acacia Street

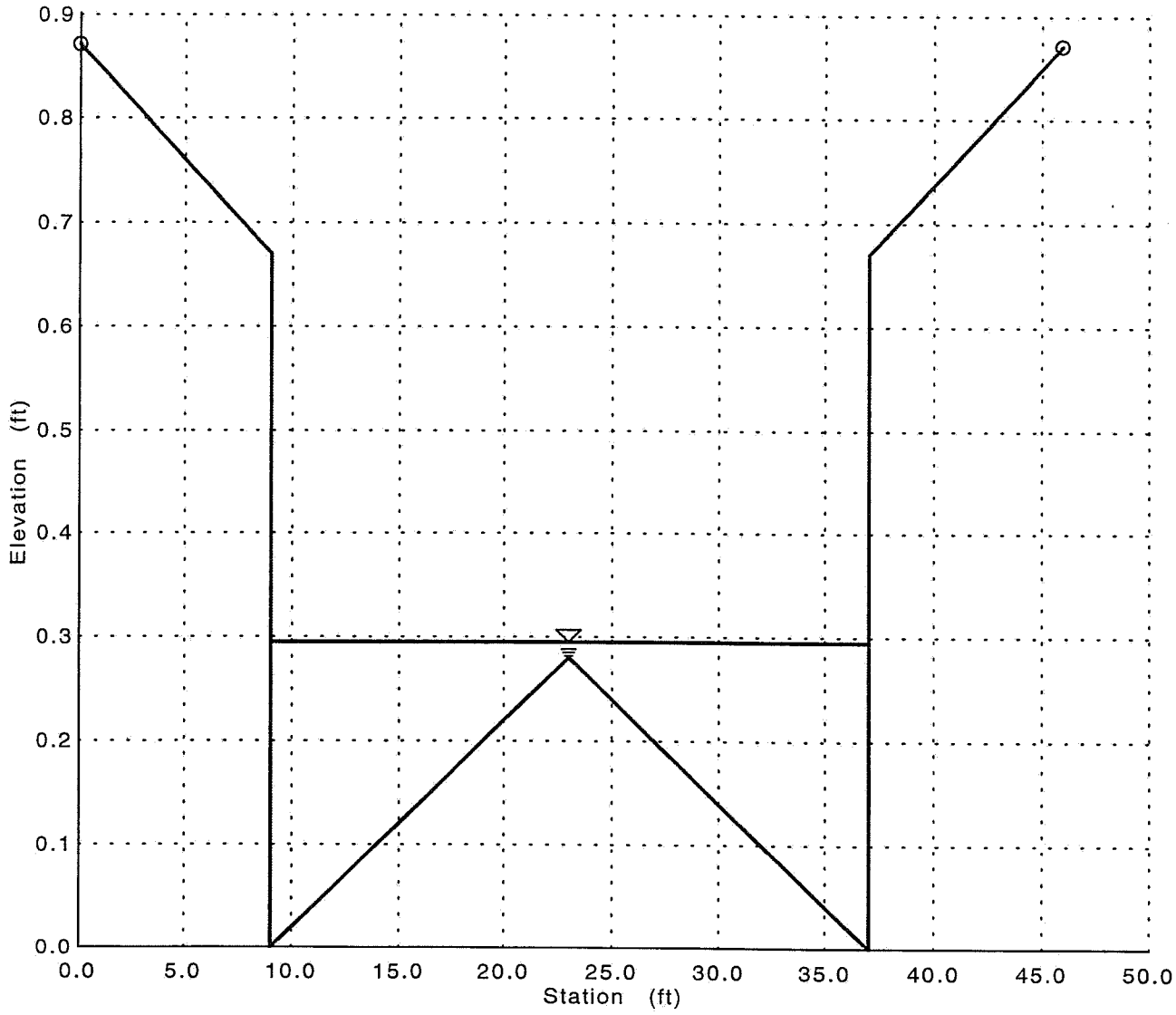
Input Data				
Channel Slope	0.042900 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			
Discharge	22.40 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.35	ft²
Wetted Perimeter	28.60	ft
Top Width	28.00	ft
Height	0.30	ft
Critical Depth	0.41	ft
Critical Slope	0.006765	ft/ft
Velocity	5.16	ft/s
Velocity Head	0.41	ft
Specific Energy	0.71	ft
Froude Number	2.31	
Flow is supercritical.		

28' FF STAGHORN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.042900	ft/ft
Water Surface Elevation	0.30	ft
Discharge	22.40	cfs



28' FF STAG HORN
Worksheet for Irregular Channel
AP 1

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Stag Horn North of Tesuque Drive

Input Data		
Channel Slope	0.005000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

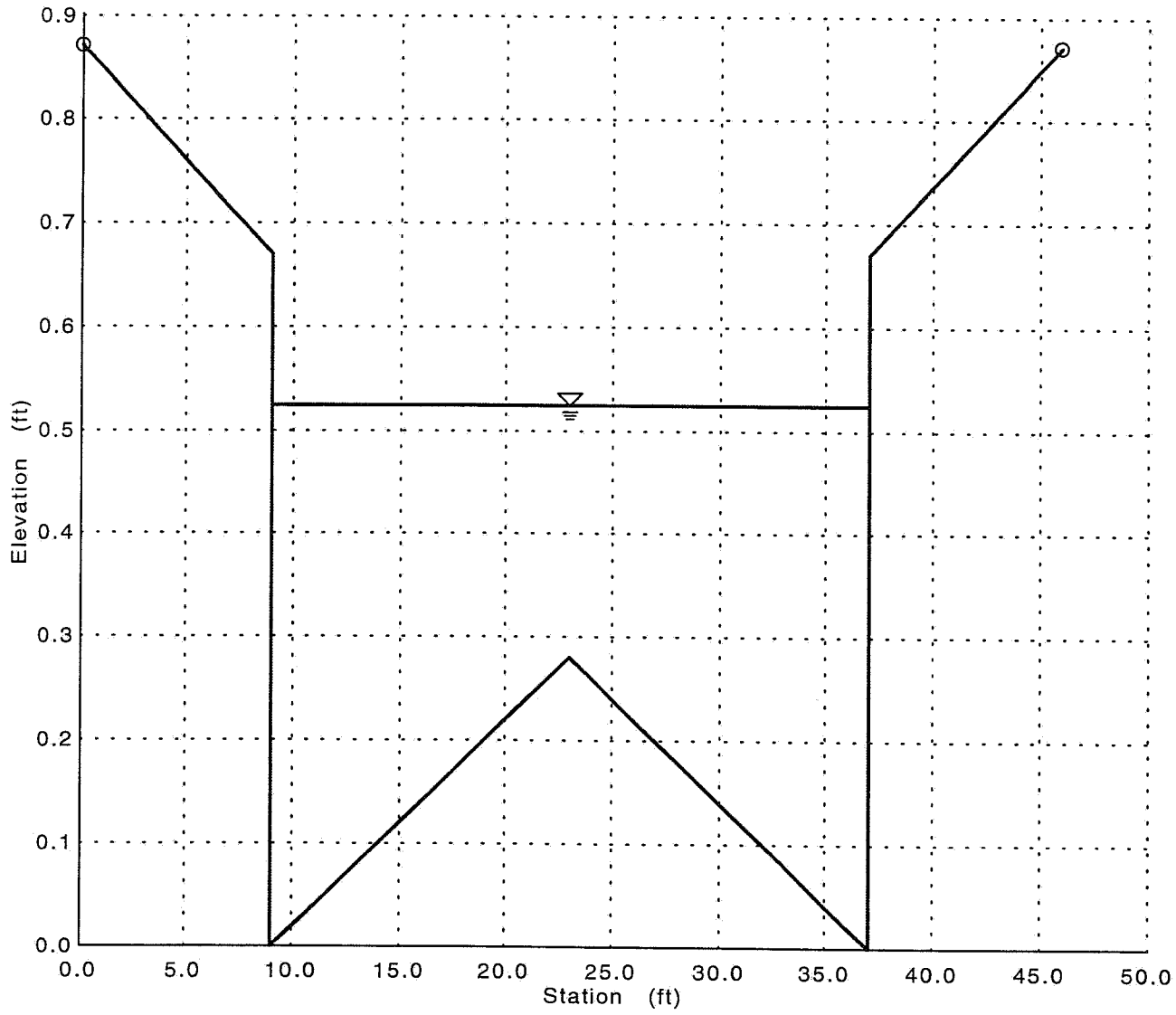
Discharge	34.40	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.52	ft
Flow Area	10.78	ft^2
Wetted Perimeter	29.06	ft
Top Width	28.00	ft
Height	0.52	ft
Critical Depth	0.50	ft
Critical Slope	0.006202	ft/ft
Velocity	3.19	ft/s
Velocity Head	0.16	ft
Specific Energy	0.68	ft
Froude Number	0.91	
Flow is subcritical.		

28' FF STAGHORN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.005000	ft/ft
Water Surface Elevation	0.52	ft
Discharge	34.40	cfs



28' FF STAG HORN
Worksheet for Irregular Channel

API

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Stag Horn at Tesuque Drive

Input Data		
Channel Slope	0.015300	ft/ft

Elevation range: 0.00 ft to 0.87 ft.

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

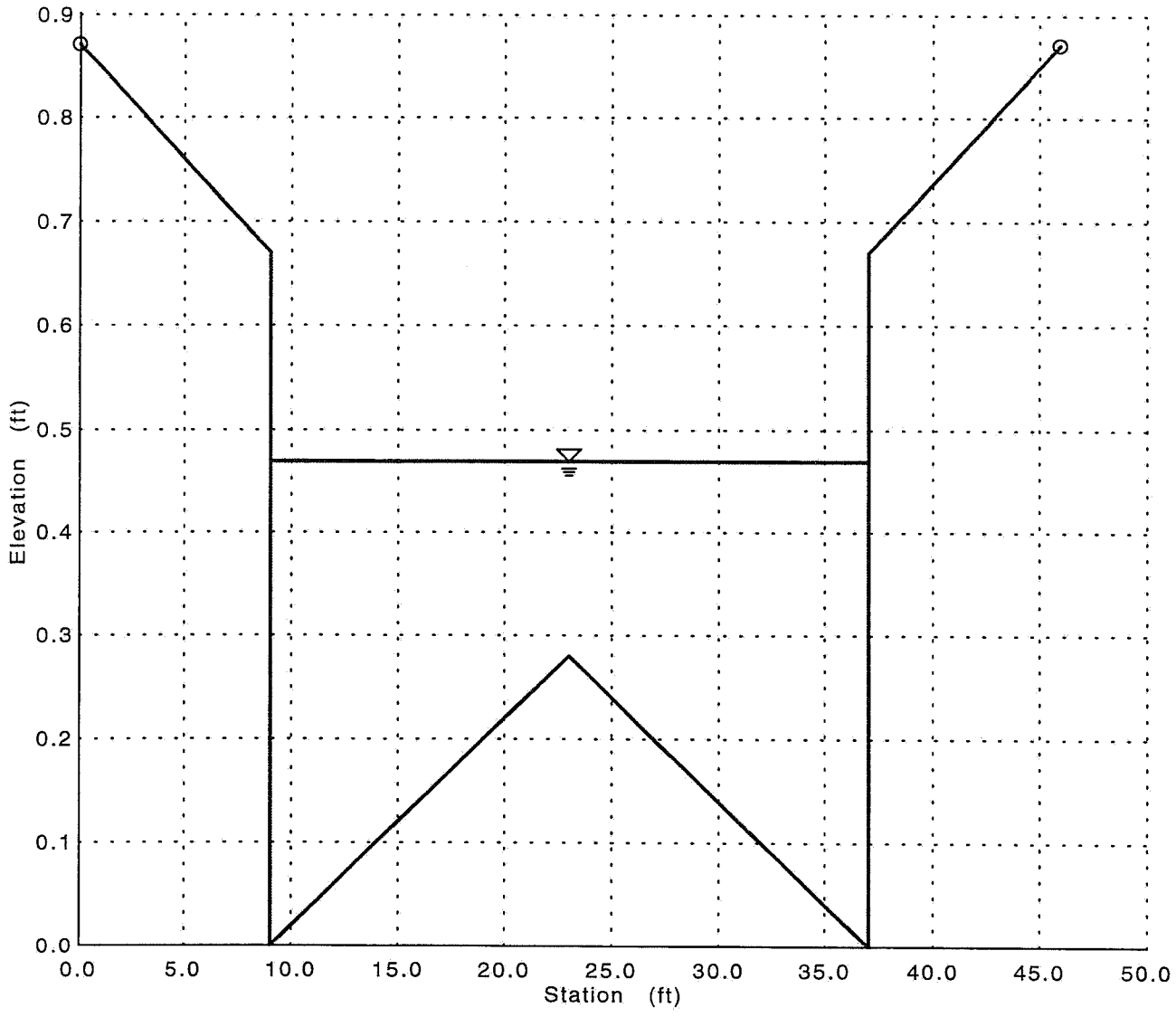
Discharge	46.60	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.47	ft
Flow Area	9.23	ft²
Wetted Perimeter	28.95	ft
Top Width	28.00	ft
Height	0.47	ft
Critical Depth	0.58	ft
Critical Slope	0.005840	ft/ft
Velocity	5.05	ft/s
Velocity Head	0.40	ft
Specific Energy	0.87	ft
Froude Number	1.55	
Flow is supercritical.		

28' FF STAGHORN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.015300	ft/ft
Water Surface Elevation	0.47	ft
Discharge	46.60	cfs



28' FF STAG HORN
Worksheet for Irregular Channel
AP 4

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Stag Horn [redacted] west of Jasmine street

Input Data		
Channel Slope	0.020300	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

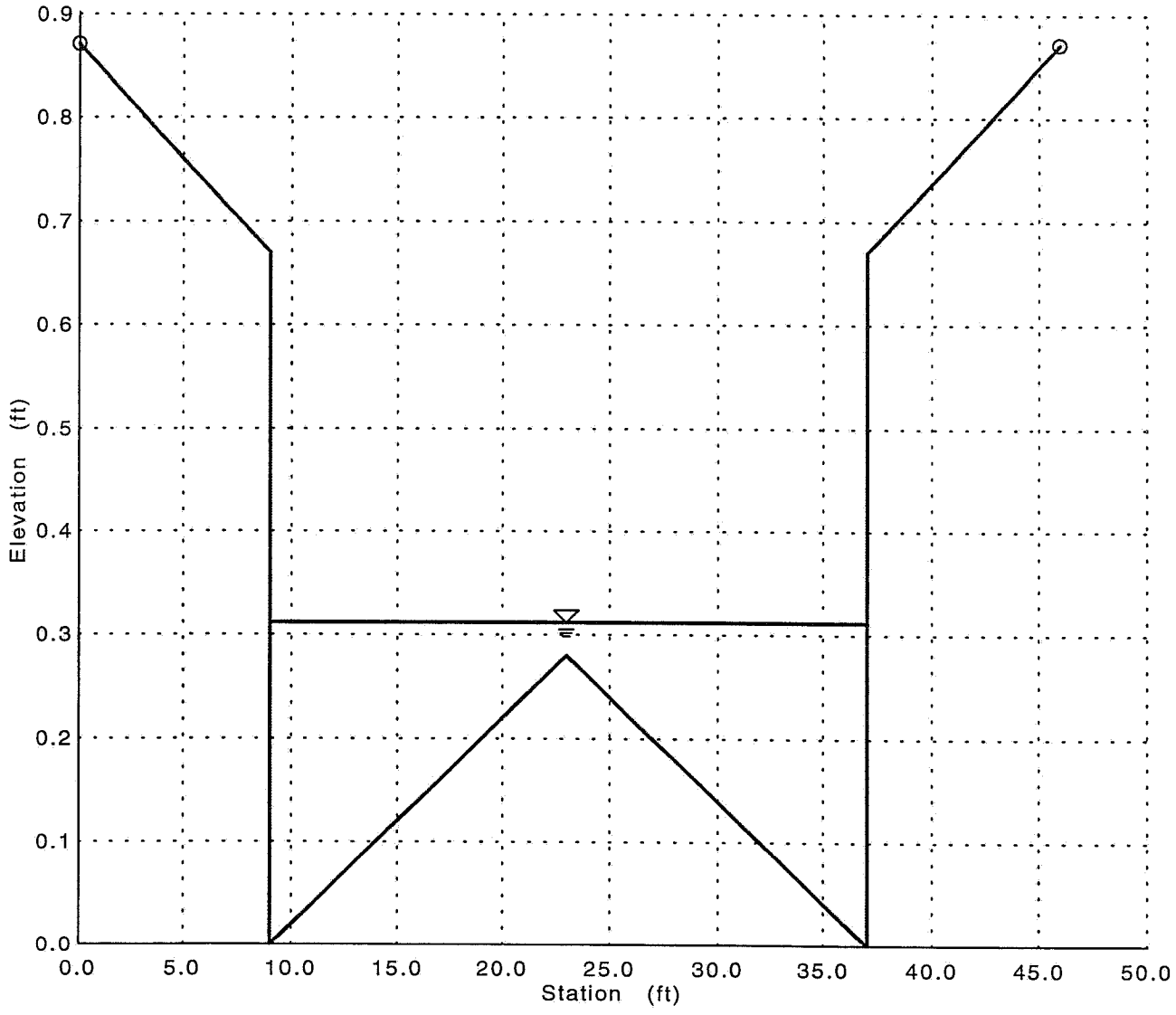
Discharge	18.20	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.31	ft
Flow Area	4.80	ft²
Wetted Perimeter	28.63	ft
Top Width	28.00	ft
Height	0.31	ft
Critical Depth	0.38	ft
Critical Slope	0.007063	ft/ft
Velocity	3.79	ft/s
Velocity Head	0.22	ft
Specific Energy	0.53	ft
Froude Number	1.61	
Flow is supercritical.		

28' FF STAGHORN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.020300	ft/ft
Water Surface Elevation	0.31	ft
Discharge	18.20	cfs



28' FF STAG HORN
Worksheet for Irregular Channel
AP 5

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Stag Horn at Jasmin Street.

Input Data		
Channel Slope	0.042800	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	46.00	0.017
9.00	0.67			
9.00	0.00			
23.00	0.28			
37.00	0.00			
37.00	0.67			
46.00	0.87			

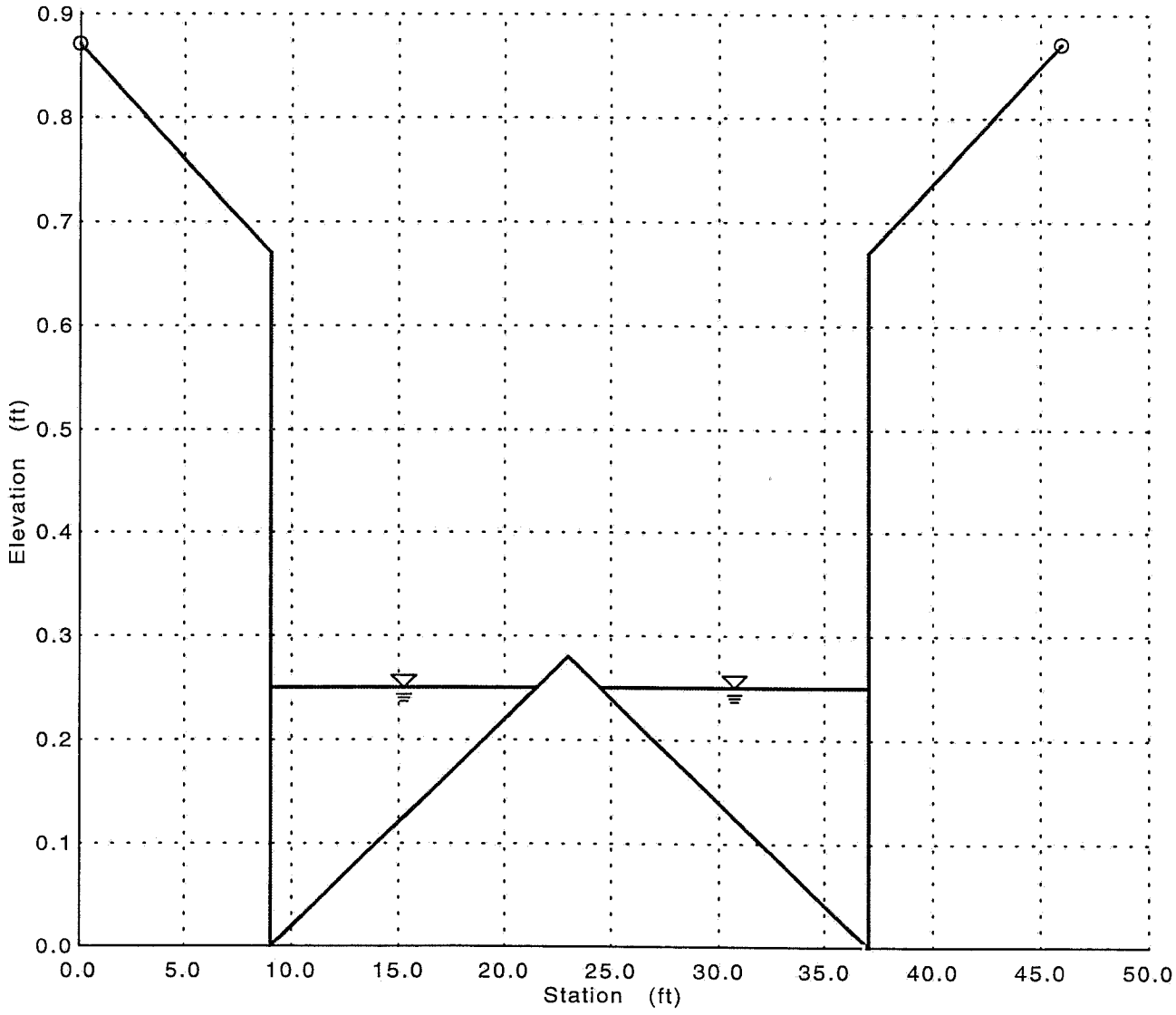
Discharge	14.00	cfs

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.25	ft
Flow Area	3.14	ft^2
Wetted Perimeter	25.55	ft
Top Width	25.04	ft
Height	0.25	ft
Critical Depth	0.34	ft
Critical Slope	0.007459	ft/ft
Velocity	4.47	ft/s
Velocity Head	0.31	ft
Specific Energy	0.56	ft
Froude Number	2.22	
Flow is supercritical.		
Flow is divided.		

28' FF STAGHORN
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	28' FF STAG HORN
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.042800	ft/ft
Water Surface Elevation	0.25	ft
Discharge	14.00	cfs



32' FF ACACIA
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF ACACIA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Acacia between stag Horn and Sonora

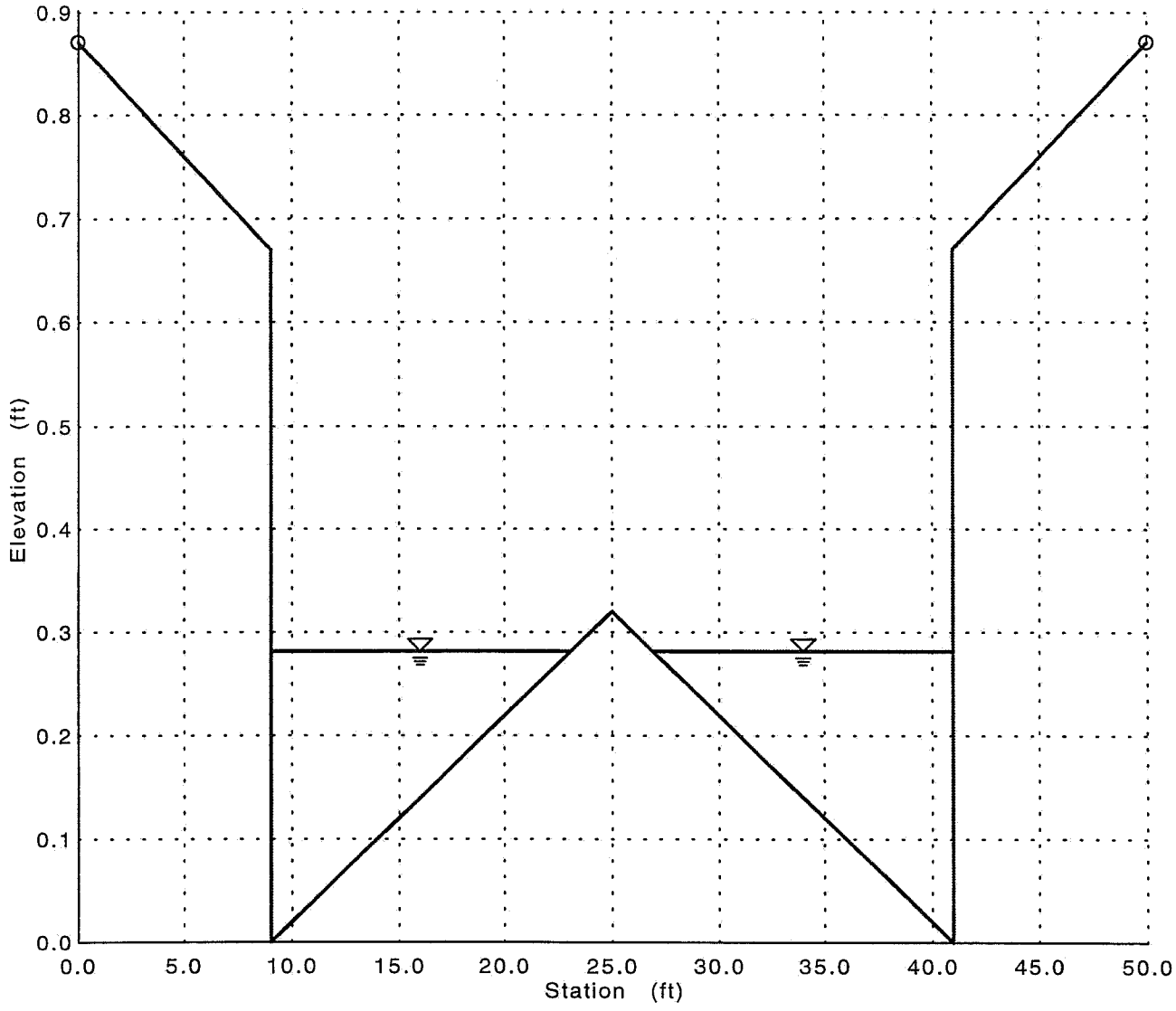
Input Data				
Channel Slope	0.059800 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			
Discharge	22.60 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.96	ft^2
Wetted Perimeter	28.71	ft
Top Width	28.14	ft
Height	0.28	ft
Critical Depth	0.41	ft
Critical Slope	0.006922	ft/ft
Velocity	5.71	ft/s
Velocity Head	0.51	ft
Specific Energy	0.79	ft
Froude Number	2.68	
Flow is supercritical.		
Flow is divided.		

32' FF ACACIA
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF ACACIA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.059800	ft/ft
Water Surface Elevation	0.28	ft
Discharge	22.60	cfs



32' FF ACACIA
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF ACACIA 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Acacia between Sonora and Tesuque

Input Data		
Channel Slope	0.040000	ft/ft
Elevation range: 0.00 ft to 0.87 ft.		
Discharge	22.60	cfs

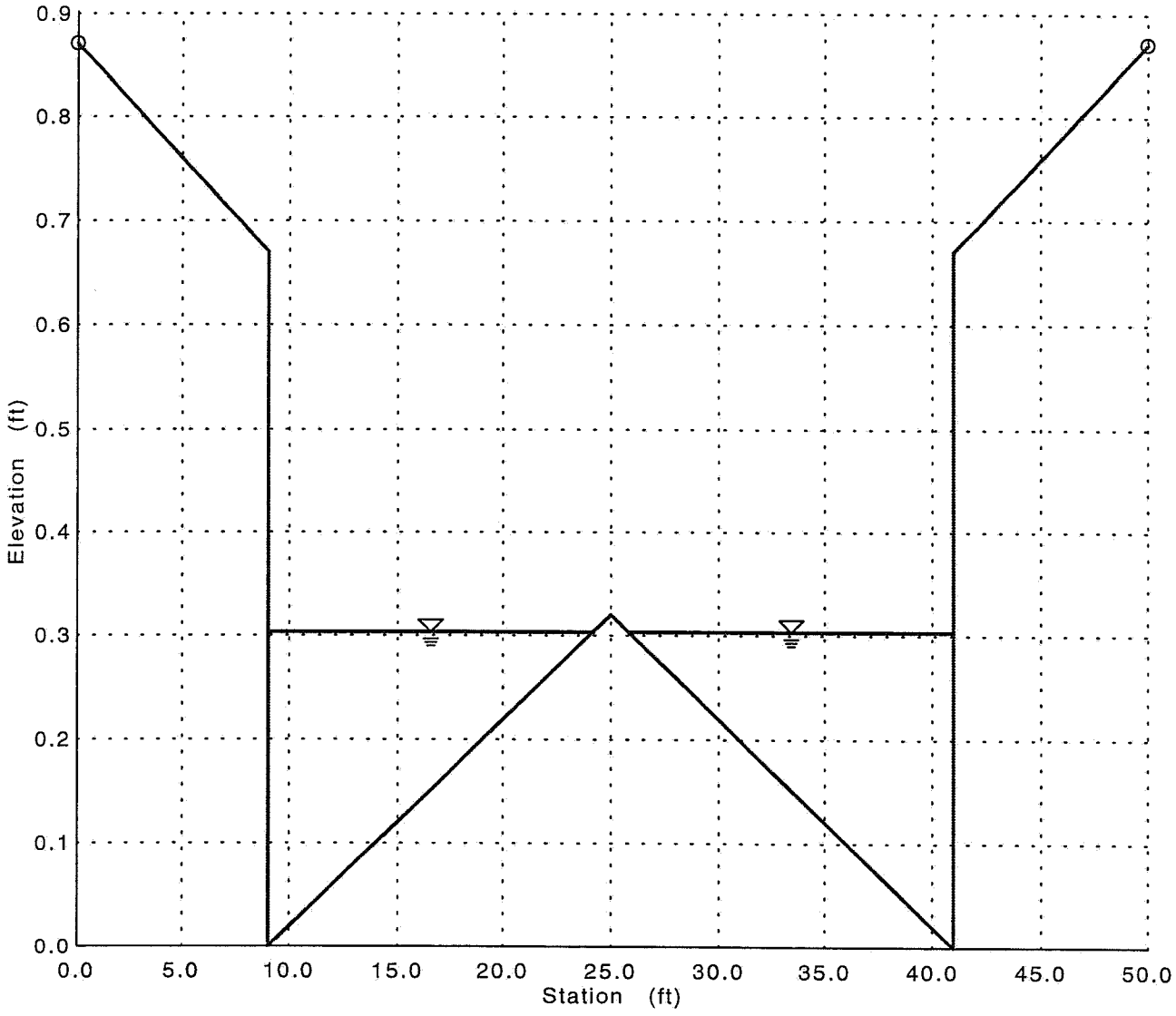
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.61	ft^2
Wetted Perimeter	30.96	ft
Top Width	30.35	ft
Height	0.30	ft
Critical Depth	0.41	ft
Critical Slope	0.006921	ft/ft
Velocity	4.91	ft/s
Velocity Head	0.37	ft
Specific Energy	0.68	ft
Froude Number	2.22	
Flow is supercritical.		
Flow is divided.		

32' FF ACACIA
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF ACACIA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.040000	ft/ft
Water Surface Elevation	0.30	ft
Discharge	22.60	cfs



32' FF JASMINE
Worksheet for Irregular Channel
APG

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF JASMINE 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Jasmine between stag Horn and Sonora

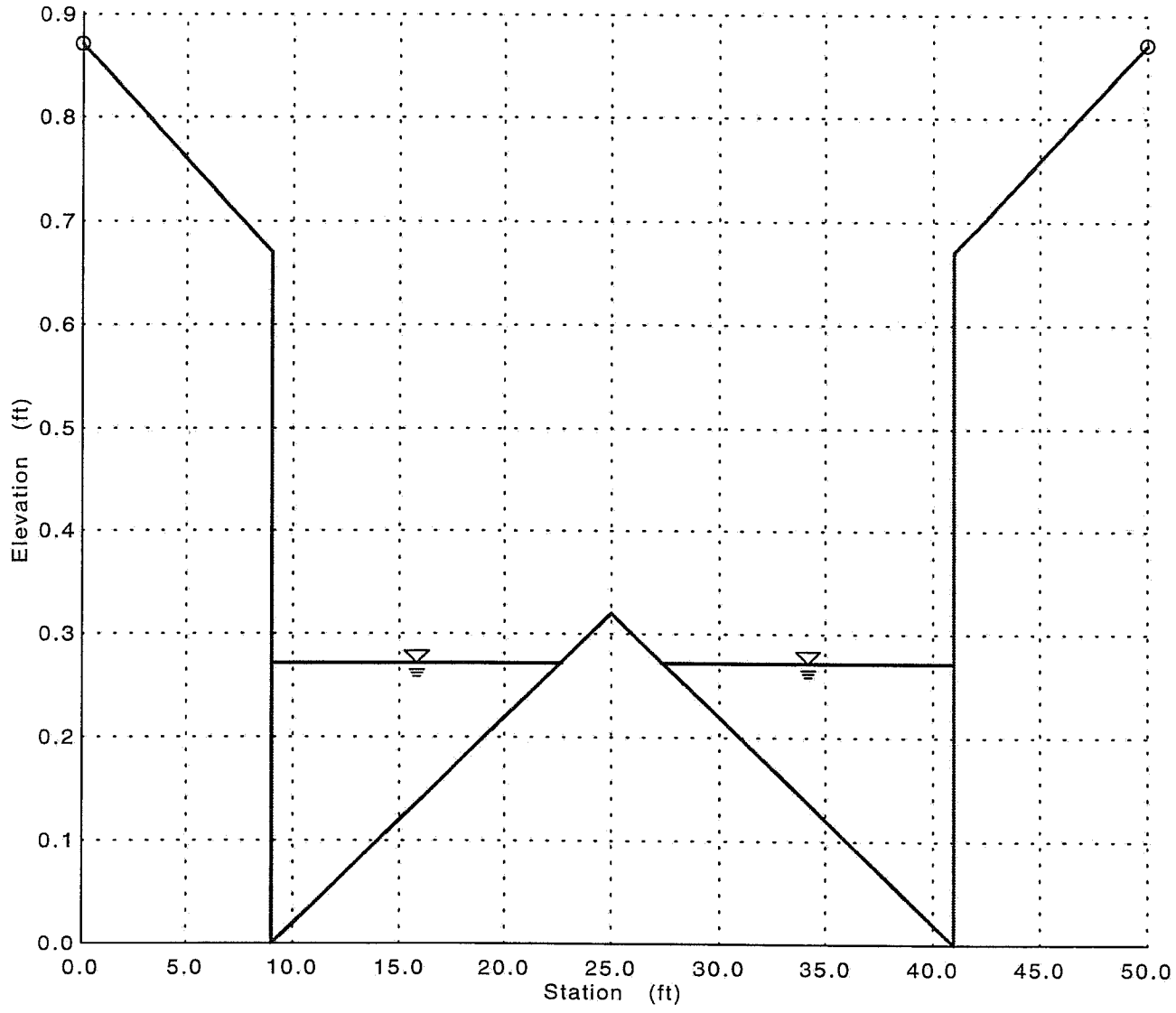
Input Data				
Channel Slope	0.063600 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			
Discharge	21.40 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.27	ft
Flow Area	3.71	ft²
Wetted Perimeter	27.81	ft
Top Width	27.26	ft
Height	0.27	ft
Critical Depth	0.40	ft
Critical Slope	0.007002	ft/ft
Velocity	5.76	ft/s
Velocity Head	0.52	ft
Specific Energy	0.79	ft
Froude Number	2.75	
Flow is supercritical.		
Flow is divided.		

32' FF JASMINE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF JASMINE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.063600	ft/ft
Water Surface Elevation	0.27	ft
Discharge	21.40	cfs



32' FF JASMINE
Worksheet for Irregular Channel

AP 6

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF JASMINE 100 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Jasmine between Sonora and Tesuque

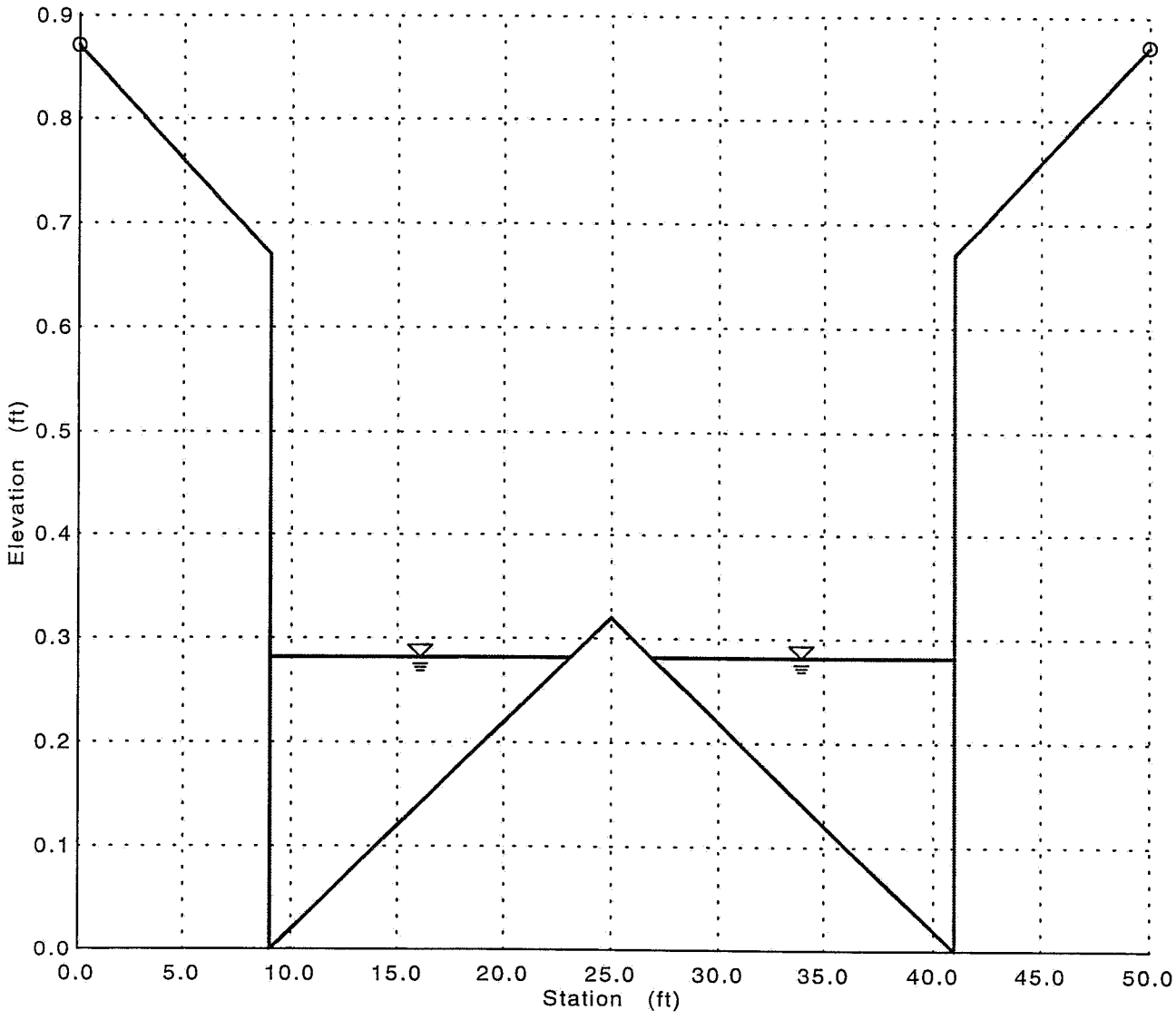
Input Data				
Channel Slope	0.053200 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	50.00	0.017
9.00	0.67			
9.00	0.00			
25.00	0.32			
41.00	0.00			
41.00	0.67			
50.00	0.87			
Discharge	21.40 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.28	ft
Flow Area	3.97	ft²
Wetted Perimeter	28.76	ft
Top Width	28.19	ft
Height	0.28	ft
Critical Depth	0.40	ft
Critical Slope	0.007001	ft/ft
Velocity	5.39	ft/s
Velocity Head	0.45	ft
Specific Energy	0.73	ft
Froude Number	2.53	
Flow is supercritical.		
Flow is divided.		

32' FF JASMINE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	32' FF JASMINE
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.053200	ft/ft
Water Surface Elevation	0.28	ft
Discharge	21.40	cfs



40' FF TESUQUE
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SH 100yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Tesuque between Stag Horn and Acacia

Input Data		
Channel Slope	0.004400	ft/ft
Discharge	7.33	cfs

Elevation range: 0.00 ft to 0.87 ft.

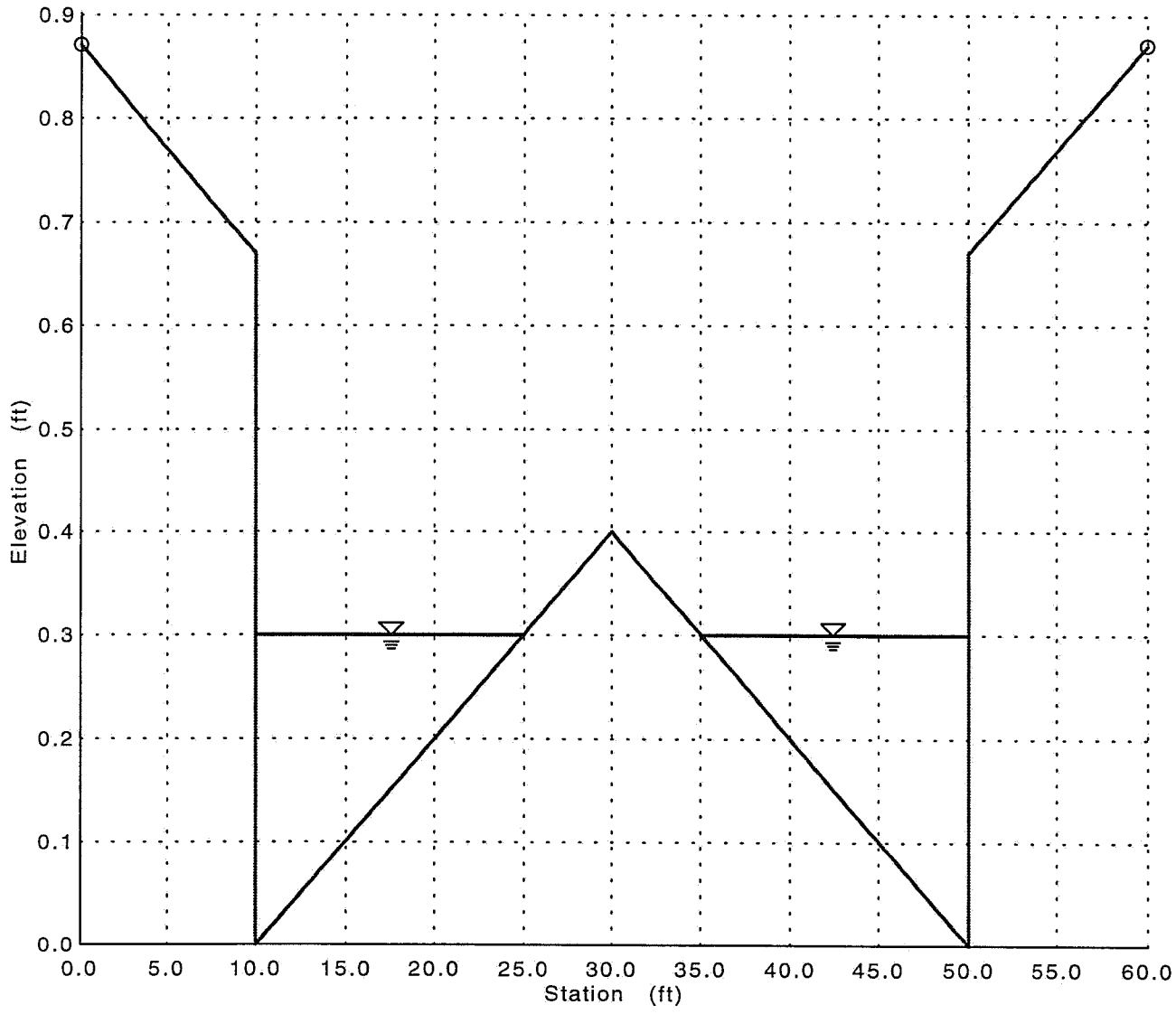
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.30	ft
Flow Area	4.53	ft²
Wetted Perimeter	30.70	ft
Top Width	30.10	ft
Height	0.30	ft
Critical Depth	0.27	ft
Critical Slope	0.008471	ft/ft
Velocity	1.62	ft/s
Velocity Head	0.04	ft
Specific Energy	0.34	ft
Froude Number	0.74	
Flow is subcritical.		
Flow is divided.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SH
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.004400	ft/ft
Water Surface Elevation	0.30	ft
Discharge	7.33	cfs



40' FF TESUQUE
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SH .06 yr
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Tesuque north of Acacia

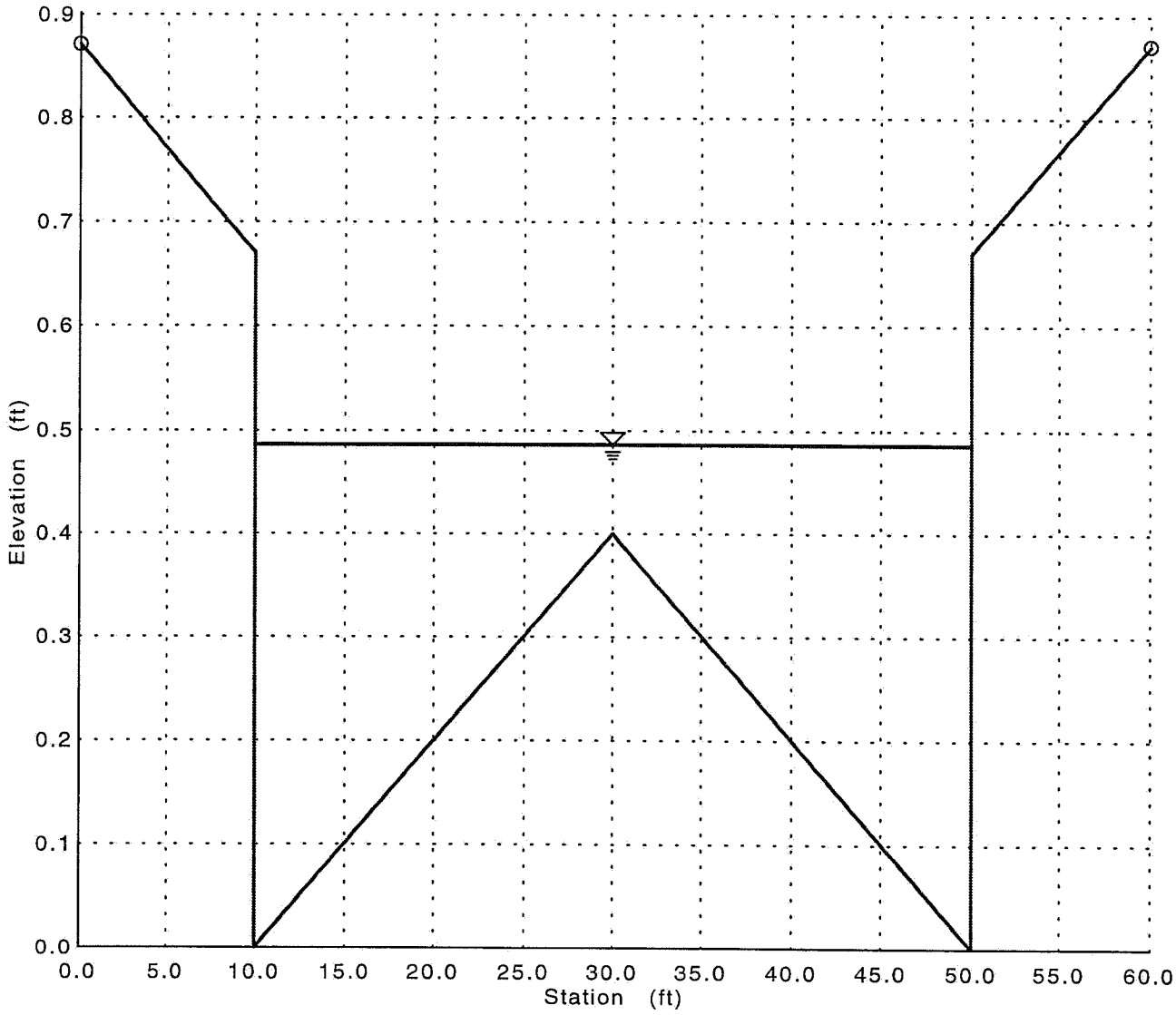
Input Data				
Channel Slope	0.004900 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			
Discharge	29.93 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.49	ft
Flow Area	11.45	ft^2
Wetted Perimeter	40.98	ft
Top Width	40.00	ft
Height	0.49	ft
Critical Depth	0.46	ft
Critical Slope	0.006810	ft/ft
Velocity	2.61	ft/s
Velocity Head	0.11	ft
Specific Energy	0.59	ft
Froude Number	0.86	
Flow is subcritical.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SH
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.004900	ft/ft
Water Surface Elevation	0.49	ft
Discharge	29.93	cfs



40' FF TESUQUE
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SH
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Tesuque and Sonora

100yr

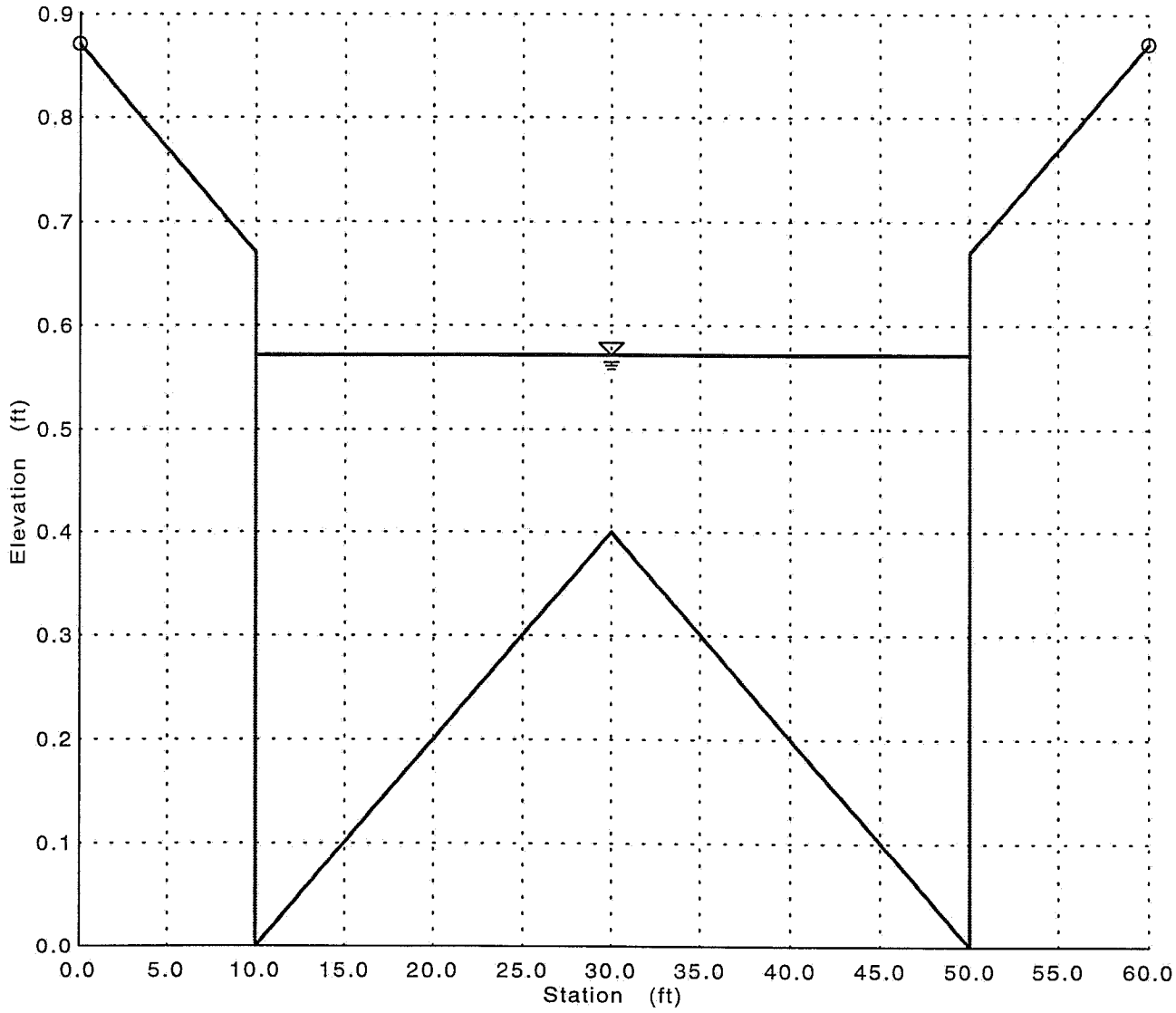
Input Data				
Channel Slope	0.010000 ft/ft			
Elevation range: 0.00 ft to 0.87 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	0.87	0.00	60.00	0.017
10.00	0.67			
10.00	0.00			
30.00	0.40			
50.00	0.00			
50.00	0.67			
60.00	0.87			
Discharge	66.00 cfs			

Results		
Wtd. Mannings Coefficient	0.017	
Water Surface Elevation	0.57	ft
Flow Area	14.88	ft²
Wetted Perimeter	41.15	ft
Top Width	40.00	ft
Height	0.57	ft
Critical Depth	0.64	ft
Critical Slope	0.005780	ft/ft
Velocity	4.44	ft/s
Velocity Head	0.31	ft
Specific Energy	0.88	ft
Froude Number	1.28	
Flow is supercritical.		

40' FF TESUQUE
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\28ftrd.fm2
Worksheet	40' FF TESUQUE SH
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.017	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	0.57	ft
Discharge	66.00	cfs



Orifice Equation:

Type "A" or "C" grate only

$$Q = CA\sqrt{2gh}$$

$C = .67$

$A = 3.37\ ft^2$ (30% Clogging)

$g = 32.2$

$$Q_{\text{grate only}} = 2.26\sqrt{64.4h}$$

Weir Equation:

Type "A" opening Only

$$Q = CLH^{3/2}$$

$C = 2.67$

$L = 6.45$

$$Q_{\text{open Typ "A"}} = 17.22h^{3/2}$$

Type "C" Single

$$Q = CLh^{3/2}$$

$C = 2.67$

$L = 2.95$

$$Q_{\text{open Type "C"}} = 6.99h^{3/2}$$

Type "C" Double

$Q = CLh^{3/2}$

$C = 2.67$

$L = 6.45$

$Q_{\text{open Dbl "C"}} = 17.22\,h^{3/2}$

Weir for grate for flow less than Curb

1- Type "A" or "C" (front and 1 side)

$Q_{\text{grate}} = CLh^{3/2} = 2.67(5.4)\,h^{3/2} = 14.5h^{3/2}$

1- Type Double "C"

$Q_{\text{grate}} = CLh^{3/2} = 2.67(9.08)\,h^{3/2} = 24.25h^{3}$

Mojave.

North Side: Existing 1-"C" add 1-"C"

$Q_{grate} = 2.26\sqrt{64.4\,h} = 2.26\sqrt{64.4(.67)} = 14.85$ cfs

$Q_{open} = 6.99(.67)^{3/2} = 3.83$ cfs

$Q_{Total\ 2\text{-}C} = 2(14.85) + 2(3.83) = 37.36$ cfs

South Side: New Line add 1-Double "C"

$Q_{grate} = 2(14.85) = 29.7$ cfs

$Q_{open} = 17.22\,h^{3/2} = 17.22(.67)^{3/2} = 9.44$ cfs

$Q_{Total\ DBL\ "C"} = 39.1$ cfs

Total North and South Side

$Q_{Total} = 76.5$ cfs

COMP. | LOC. | FILE

CK. | PROJ. | SHEET

DATE | SUBJ. | OF

WILSON & COMPANY

Tesuque / Crystal

Tesuque West side -- 1 existing "A" Inlet in Sump

$Q_{grate} = 2.26\sqrt{64.4h} = 2.26\sqrt{64.4(.67)} = 14.85$

$Q_{open} = 17.22\,h^{3/2} = 17.22(.67)^{3/2} = 9.45$

$Q_{Total} = 24.3$ cfs

Two proposed on Crystal - 2- Type "A"

$Q_{grate} = 14.5\,h^{3/2} = 14.5(.3)^{3/2} = 2.4$ cfs

$Q_{open} = 17.22\,h^{3/2} = 17.22(.3)^{3/2} = 2.8$

$Q_{TOTAL} = 5.2$ cfs

$Q_{2\text{ "A"}} = 10.4$ cfs

Q_{Total} @ Tesuque / Crystal = 34.7 cfs > 33 cfs

1 -- "A" Existing + 2- "A" Proposed

Sufficient

COMP. _____ CK. _____ DATE _____

WILSON &COMPANY

LOC. _____ FILE _____ PROJ. _____ SHEET _____ SUBJ. _____ OF _____

Whiteman / Montano

Existing 2-"A" add 2-"A"

$Q_{grate} = 14.5h^{3/2} = 14.5(.46)^{3/2} = 4.5$ cfs

$Q_{open} = 17.22h^{3/2} = 17.22(.46)^{3/2} = 5.4$ cfs

$Q_{Total} = 9.9$ cfs per type "A"

Total 4 Type "A" = 4(9.9) = 39.6 cfs > 35 cfs

4 - Type "A" sufficient

COMP. | LOC. | FILE

CK. | PROJ. | SHEET

DATE | SUBJ. | OF

WILSON & COMPANY

Stag Horn West Jasmine Street

1 - Proposed Type "A" Inlet In Sump

$Q_{grate} = 2.26\sqrt{64.4h} = 2.26\sqrt{64.4(.67)} = 14.85$ cfs

$Q_{open} = 17.22h^{3/2} = 17.22(.67)^{3/2} = 9.45$ cfs

$Q_{TOTAL} = 24.3$ cfs > 18.2 cfs Inlet sufficient

COMP. | CK. | DATE | WILSON & COMPANY | LOC. | FILE | PROJ. | SHEET | SUBJ. | OF

Jasmine North Sonora: 2-Existing Double "C" Inlets West and East side, 1-Type "A" Inlet West and East Side

1- Double "C" Inlet

$Q_{grate} = 24.25\,h^{3/2} = 24.25(.27)^{3/2} = 3.4$ cfs

$Q_{open} = 17.22\,h^{3/2} = 17.22(.27)^{3/2} = 2.4$ cfs

$Q_{TOTAL\ 1\text{-}C} = 5.8$ cfs

$Q_{TOTAL\ WESTSIDE} = 2(5.8) = 11.64$ cfs (from 2-Double "C")

$Q_{TOTAL\ EAST\ SIDE} = 11.64$ cfs (from 2-Double "C")

1- Type "A" West Side

$Q_{grate} = 14.5\,h^{3/2} = 14.5(.27)^{3/2} = 2$ cfs

$Q_{open} = 17.22\,h^{3/2} = 17.22(.27)^{3/2} = 2.4$ cfs

$Q_{TOTAL\ West} = 16$ cfs > 14.4 cfs 2-Double "C", 1-Type "A" Sufficient for west side

$Q_{TOTAL\ EAST} = 16$ cfs > 7 cfs 2-Double "C", 1-Type "A" Sufficient for East Side

COMP. | LOC. | FILE

CK. | PROJ. | SHEET

DATE | SUBJ. | OF

WILSON &COMPANY

Academy : 1-Type "C" Inlet Each Side in Sump

$Q_{grate} = 2.26\sqrt{64.4h} = 2.26\sqrt{64.4(.67)} = 14.85$ cfs

$Q_{open} = 6.99 h^{3/2} = 6.99(.67)^{3/2} = 3.8$ cfs

$Q_{TOTAL} = 18.65$ cfs

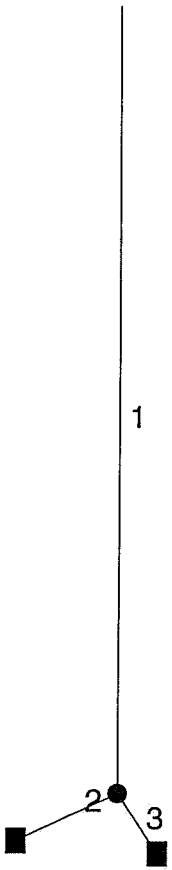
$Q_{Total} = 2(18.65) = 37.3$ cfs > 17.12 cfs

2 = "C"

2 -- Type "C" Inlets sufficient

Plan View

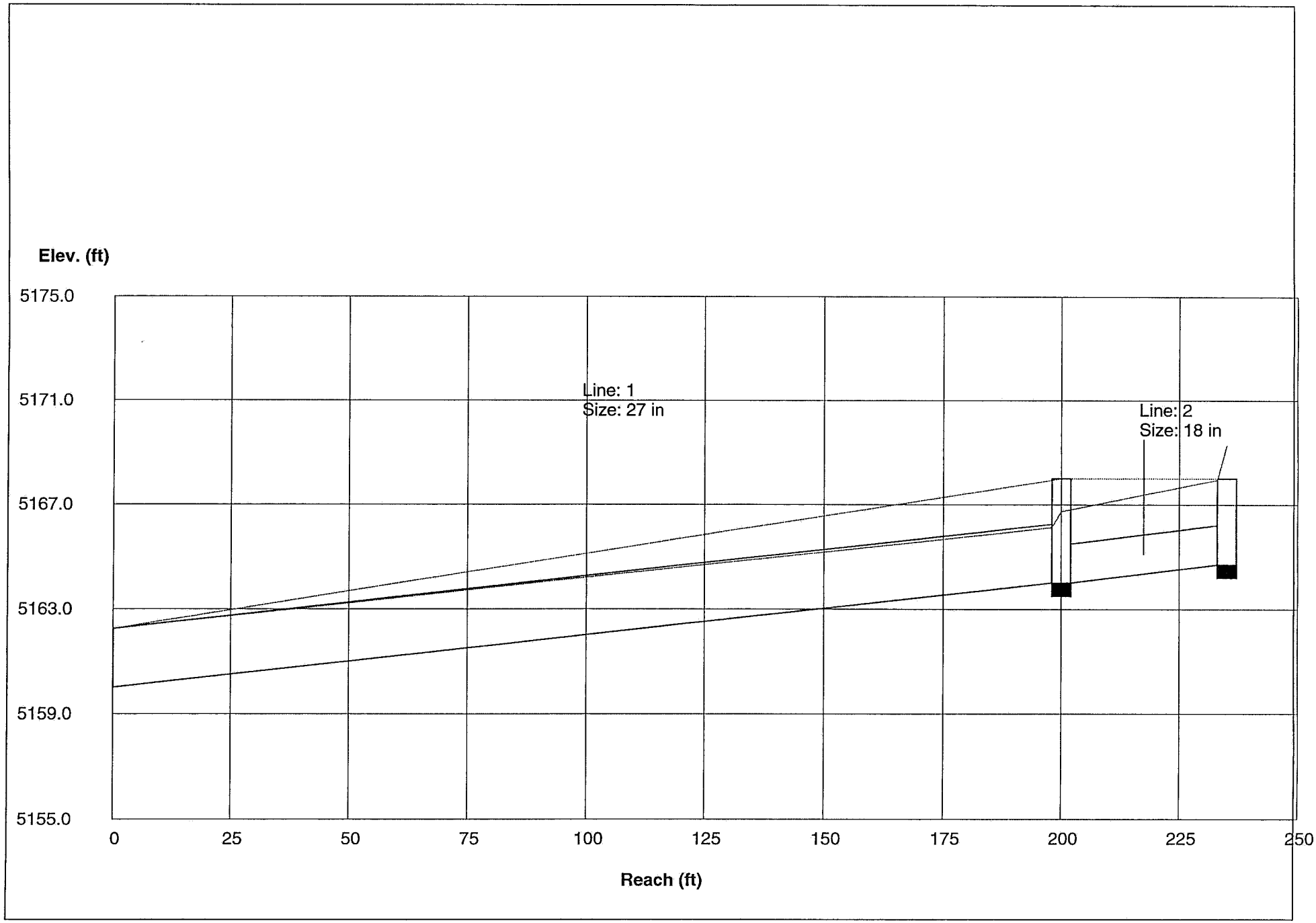
TESUQUE STORM DRAIN EXISTING



Proj. file: TESUQUE.STM	IDF file: SAMPLE.IDF	No. Lines: 3	03-23-1998

Storm Sewer Profile

Proj. file: TESUQUE.STM



Storm Sewer Summary Report

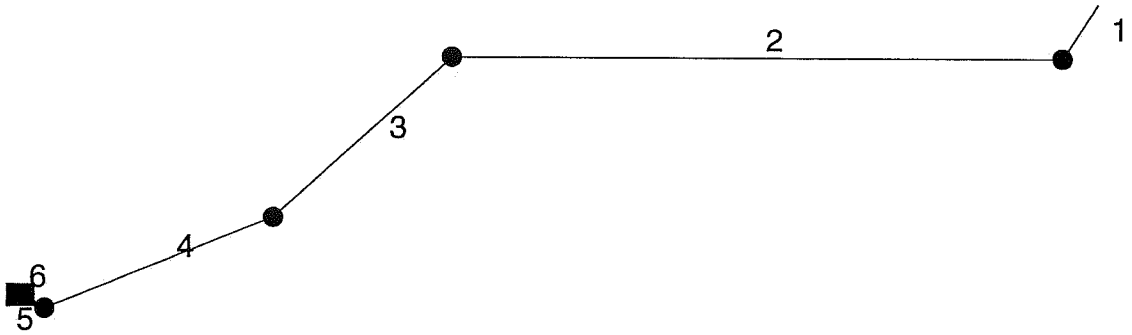
Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	39.00	27 c	200.0	5160.00	5164.00	2.000	5162.25	5166.12	0.63	End
2	2	19.50	18 c	35.0	5164.00	5164.70	2.001	5166.74*	5167.95*	1.32	1
3	3	19.50	18 c	20.0	5164.00	5164.40	2.000	5166.74*	5167.43*	1.32	1

PROJECT FILE: TESUQUE.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 3 | RUN DATE: 03-23-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Plan View

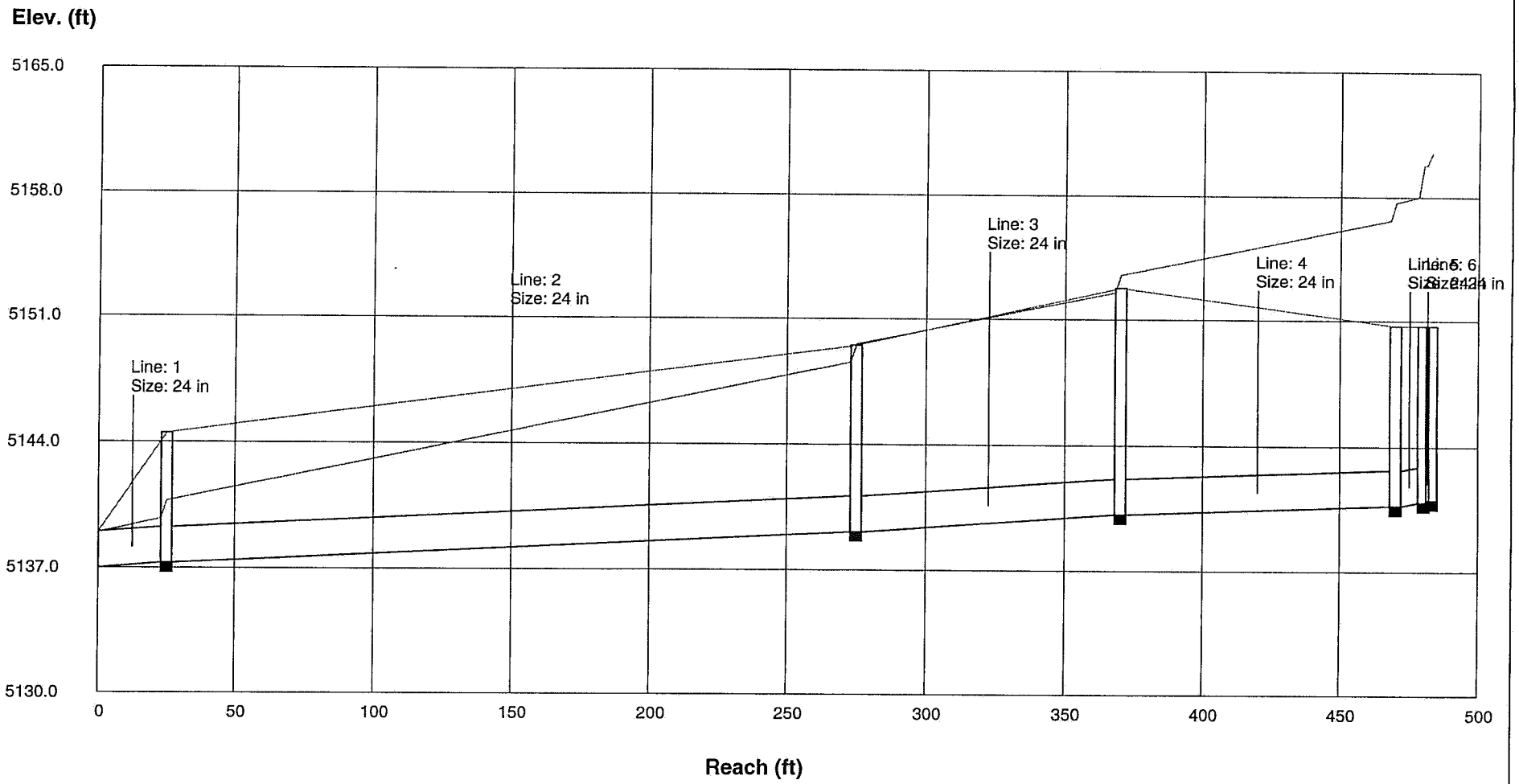
Mojave Storm Drain Existing



Proj. file: MOJPOJO.STM	IDF file: SAMPLE.IDF	No. Lines: 6	02-10-1998

Storm Sewer Profile

Proj. file: MOJPOJO.STM



Storm Sewer Summary Report

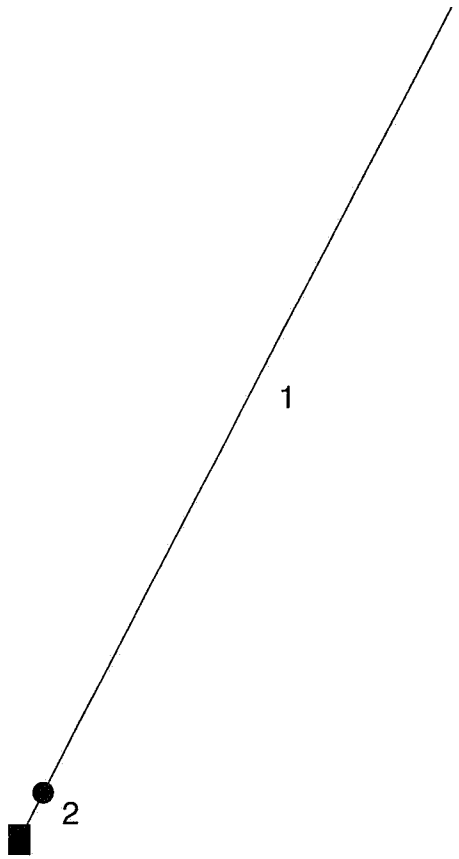
Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	40.00	24 c	25.0	5137.00	5137.26	1.039	5138.97*	5139.73*	1.01	End
2	2	40.00	24 c	250.0	5137.26	5139.12	0.744	5140.74*	5148.56*	1.01	1
3	3	40.00	24 c	95.0	5139.12	5140.15	1.084	5149.57*	5152.54*	1.01	2
4	4	40.00	24 c	100.0	5140.15	5140.69	0.540	5153.55*	5156.68*	1.01	3
5	5	40.00	24 c	10.0	5140.69	5140.89	2.002	5157.68*	5158.00*	1.76	4
6	6	25.00	24 c	3.0	5140.89	5141.01	3.988	5159.76*	5159.80*	0.69	5

PROJECT FILE: MOJPOJO.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 6 | RUN DATE: 02-11-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Plan View

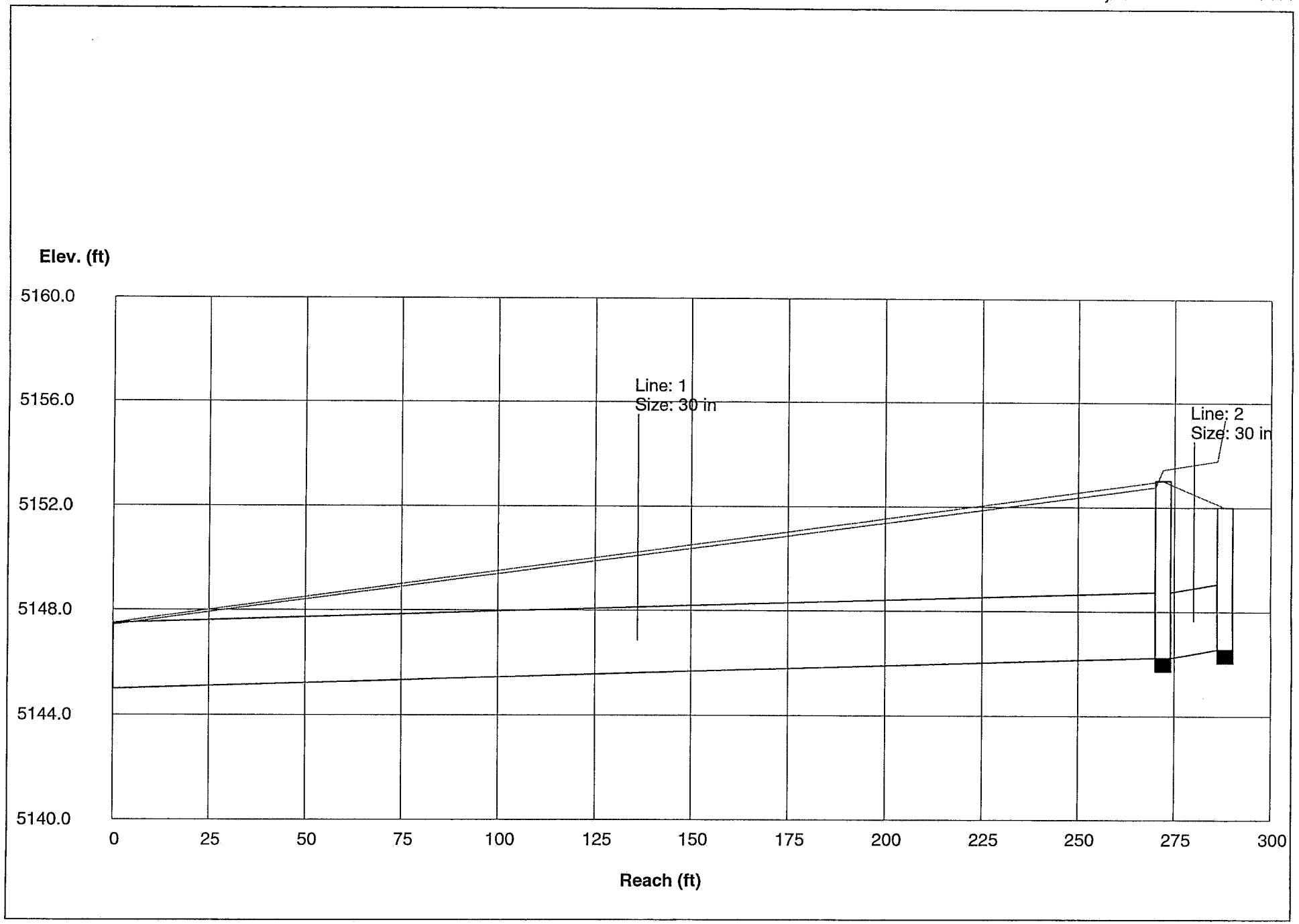
Mojave Storm Drain New



Proj. file: MOJPOJON.STM	IDF file: SAMPLE.IDF	No. Lines: 2	02-11-1998

Storm Sewer Profile

Proj. file: MOJPOJON.STM



Storm Sewer Summary Report

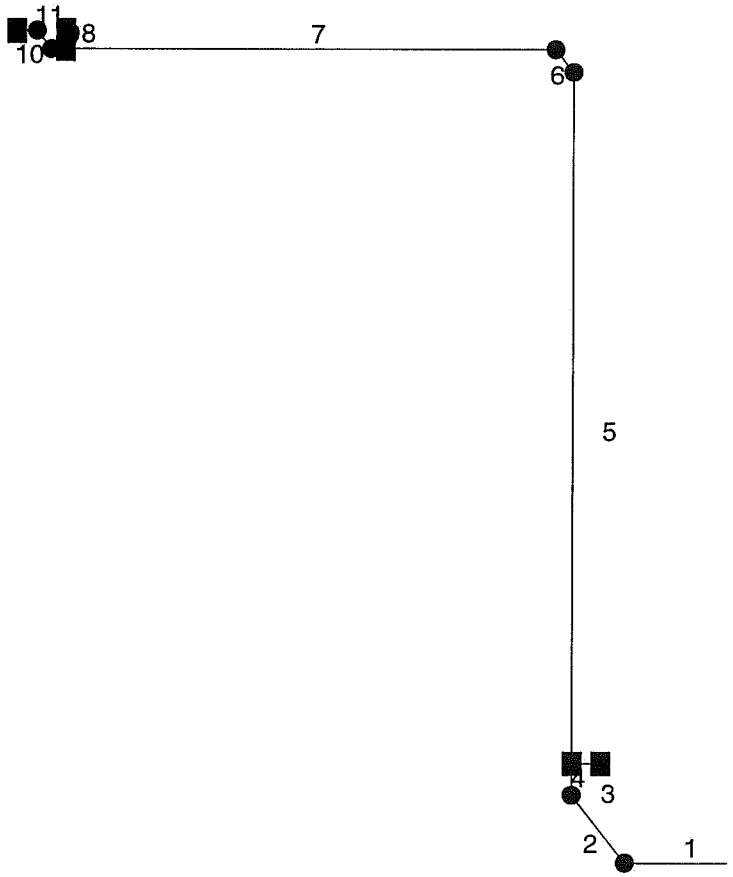
Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	59.00	30 c	272.0	5145.00	5146.25	0.460	5147.43*	5152.76*	0.67	End
2	2	59.00	30 c	16.0	5146.25	5146.57	1.999	5153.44*	5153.77*	1.57	1

PROJECT FILE: MOJPOJON.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 2 | RUN DATE: 02-11-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Plan View

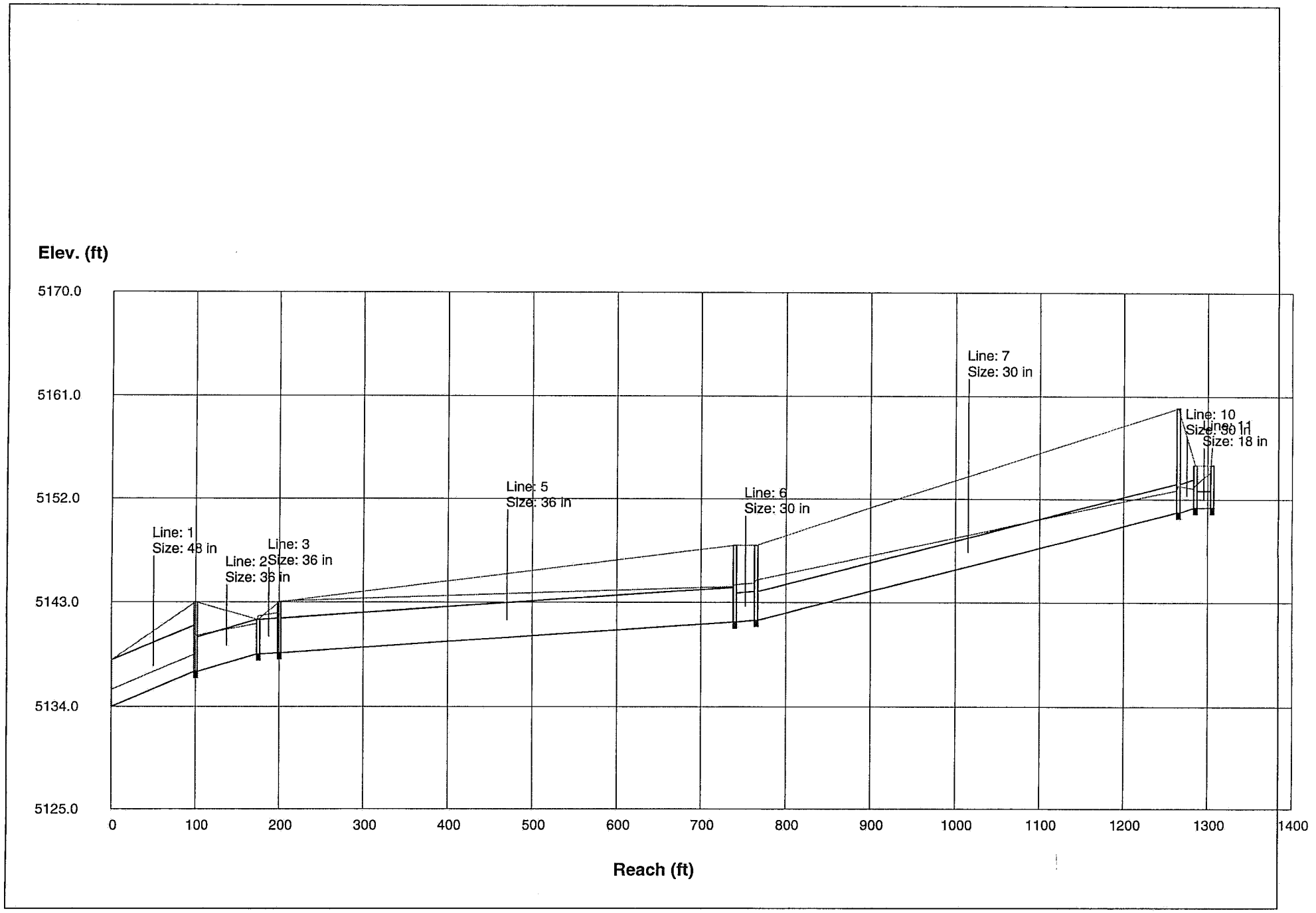
Crystal/Whiteman Existing with Proposed



Proj. file: CRYWHIMO.STM	IDF file: SAMPLE.IDF	No. Lines: 11	03-23-1998

Storm Sewer Profile

Proj. file: CRYWHIMO.STM



Storm Sewer Summary Report

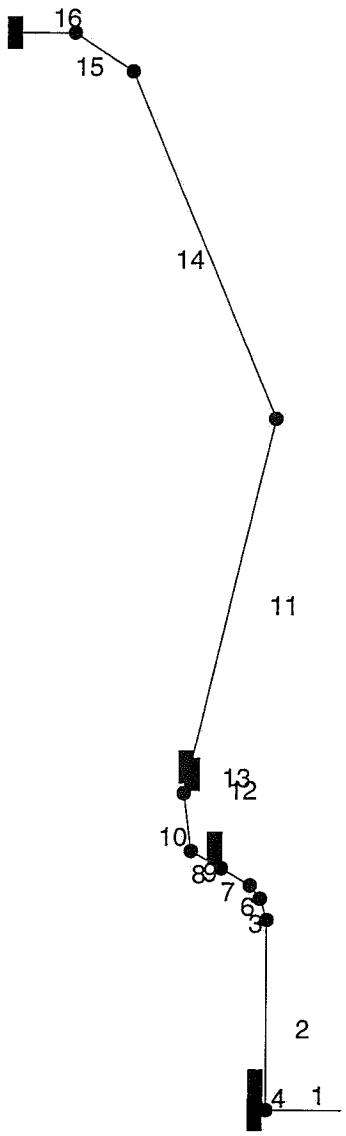
Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	68.00	48 c	100.0	5134.00	5137.00	3.000	5135.46	5138.46	1.65	End
2	2	68.00	36 c	75.0	5137.00	5138.50	2.000	5140.12	5141.16	0.66	1
3	3	68.00	36 c	25.0	5138.50	5138.62	0.480	5141.81*	5142.07*	1.01	2

PROJECT FILE: CRYWHIMO.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 11 | RUN DATE: 03-23-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Plan View

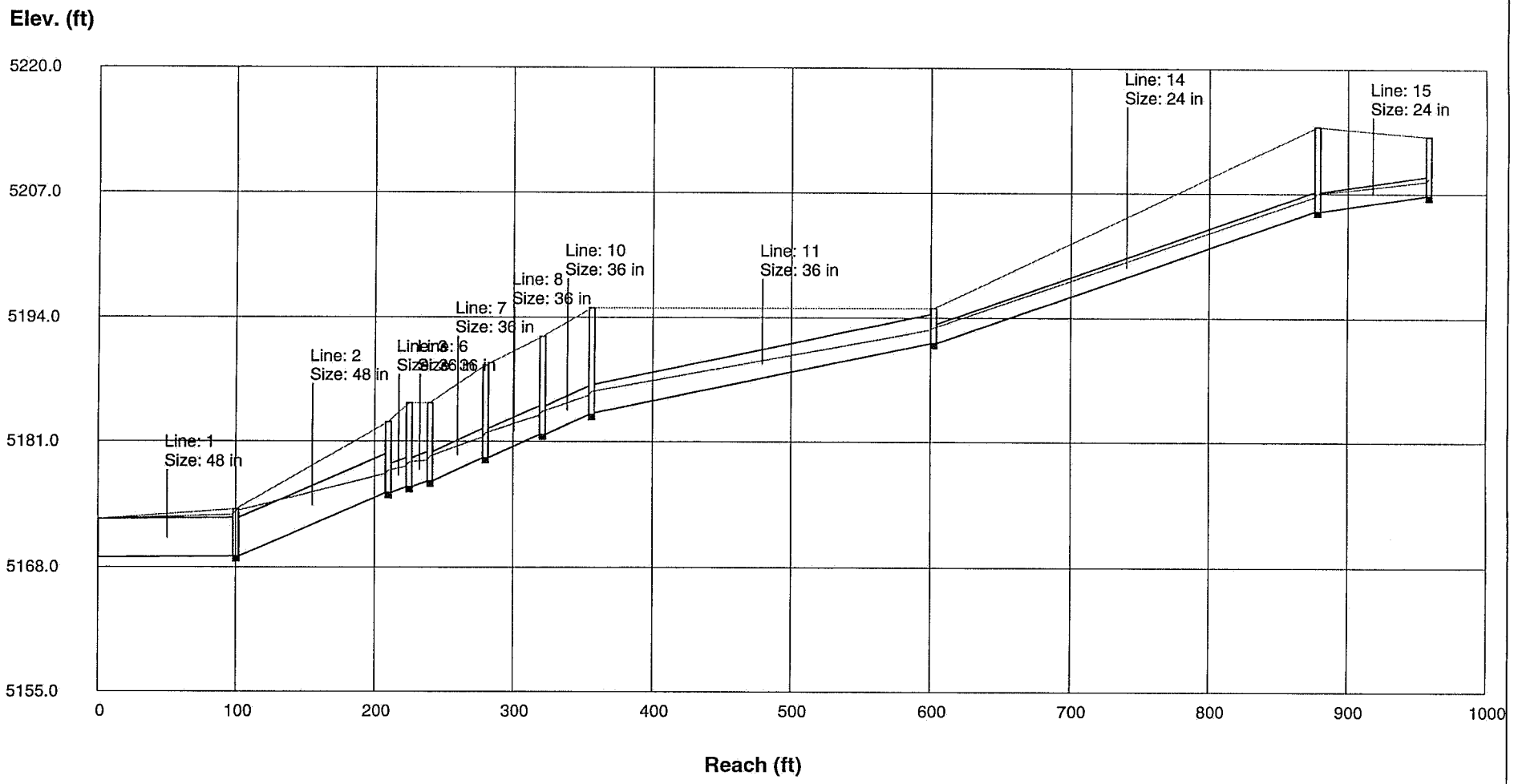
Stag Horn Existing With Proposed



Proj. file: STAG.STM	IDF file: SAMPLE.IDF	No. Lines: 16	02-12-1998

Storm Sewer Profile

Proj. file: STAG.STM



Storm Sewer Summary Report

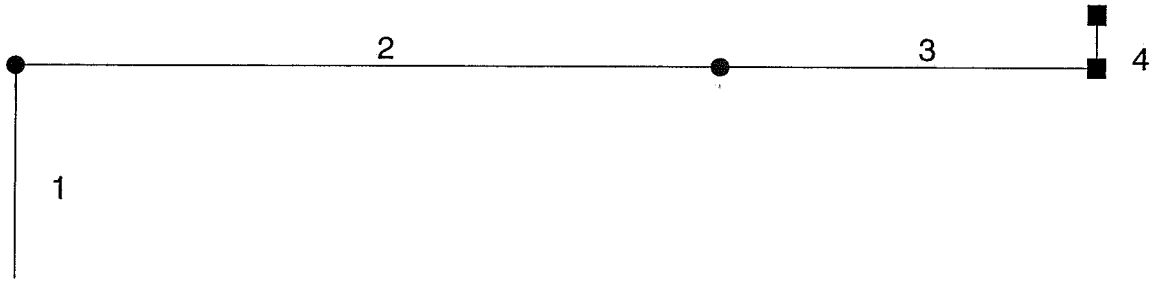
Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	94.21	48 c	100.0	5169.00	5169.11	0.110	5173.00*	5173.43*	0.35	End
2	2	44.21	48 c	110.0	5169.11	5175.71	6.000	5173.78	5177.68	0.32	1
3	3	44.21	36 c	15.0	5175.71	5176.31	4.001	5178.00	5178.43	0.43	2
4	4	25.00	24 c	15.0	5169.11	5169.41	2.002	5173.78*	5173.96*	0.69	1
5	5	25.00	24 c	20.0	5169.11	5169.51	2.000	5173.78*	5174.02*	0.69	1
6	6	44.21	36 c	15.0	5176.31	5176.91	4.001	5178.85	5179.03	0.43	3
7	7	44.21	36 c	40.0	5176.91	5179.31	6.000	5179.46	5181.43	0.43	6
8	8	40.21	36 c	41.0	5179.31	5181.71	5.853	5181.85	5183.73	0.39	7
9	9	4.00	18 c	15.0	5179.31	5179.61	1.999	5181.85*	5181.88*	0.06	7
10	10	40.21	36 c	35.0	5181.71	5183.81	6.000	5184.12	5185.83	0.39	8
11	11	18.21	36 c	246.0	5184.00	5191.38	3.000	5186.22	5192.74	0.21	10
12	12	11.00	18 c	15.0	5183.81	5184.11	1.999	5186.22*	5186.39*	0.42	10
13	13	11.00	18 c	15.0	5183.81	5184.11	1.999	5186.22*	5186.39*	0.42	10
14	14	18.21	24 c	276.0	5191.38	5205.18	5.000	5192.95	5206.69	0.32	11
15	15	18.21	24 c	80.0	5205.18	5206.78	2.000	5207.01	5208.29	0.32	14
16	16	18.21	24 c	80.0	5206.78	5208.38	2.000	5208.61	5209.89	0.56	15

PROJECT FILE: STAG.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 16 | RUN DATE: 02-12-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Plan View

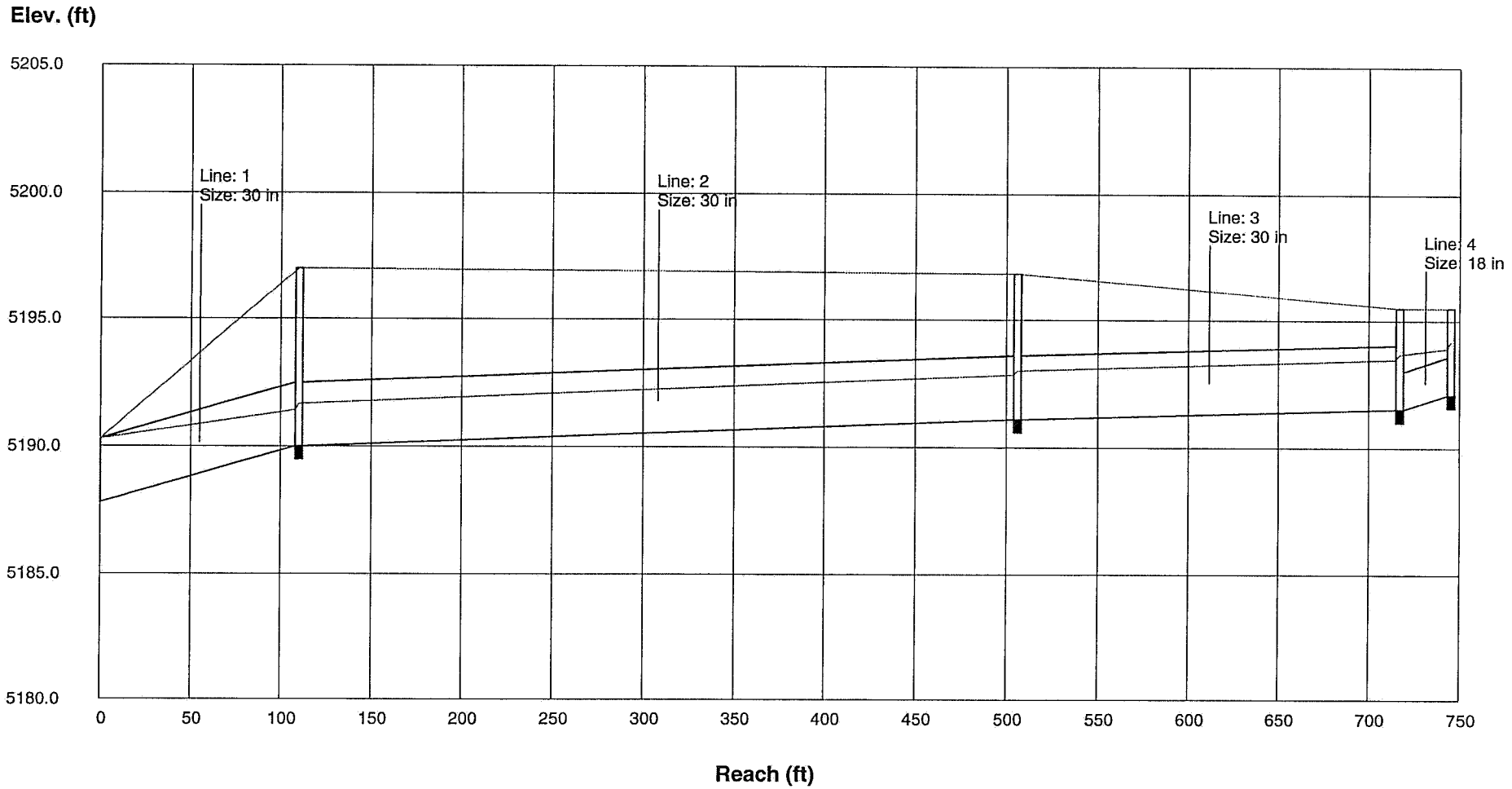
Academy Proposed



Proj. file: ACADEMY.STM	IDF file: SAMPLE.IDF	No. Lines: 4	02-11-1998

Storm Sewer Profile

Proj. file: ACADEMY.STM



Storm Sewer Summary Report

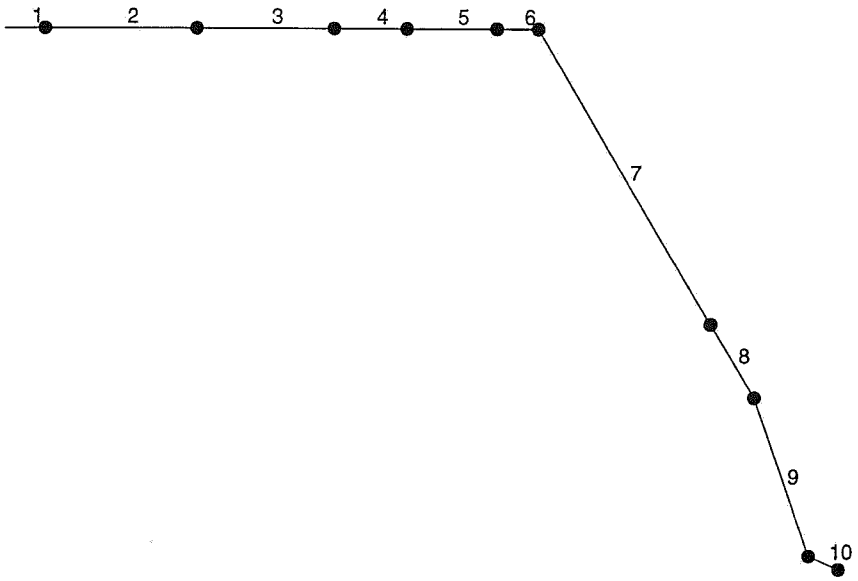
Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	1	18.00	30 c	110.0	5187.80	5190.00	2.000	5190.30	5191.42	0.24	End
2	2	18.00	30 c	396.0	5190.00	5191.10	0.278	5191.66	5192.86	0.15	1
3	3	18.00	30 c	211.0	5191.10	5191.52	0.199	5193.01	5193.48	0.21	2
4	4	9.00	18 c	28.0	5191.52	5192.08	2.000	5193.69*	5193.89*	0.28	3

PROJECT FILE: ACADEMY.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 4 | RUN DATE: 02-11-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Plan View

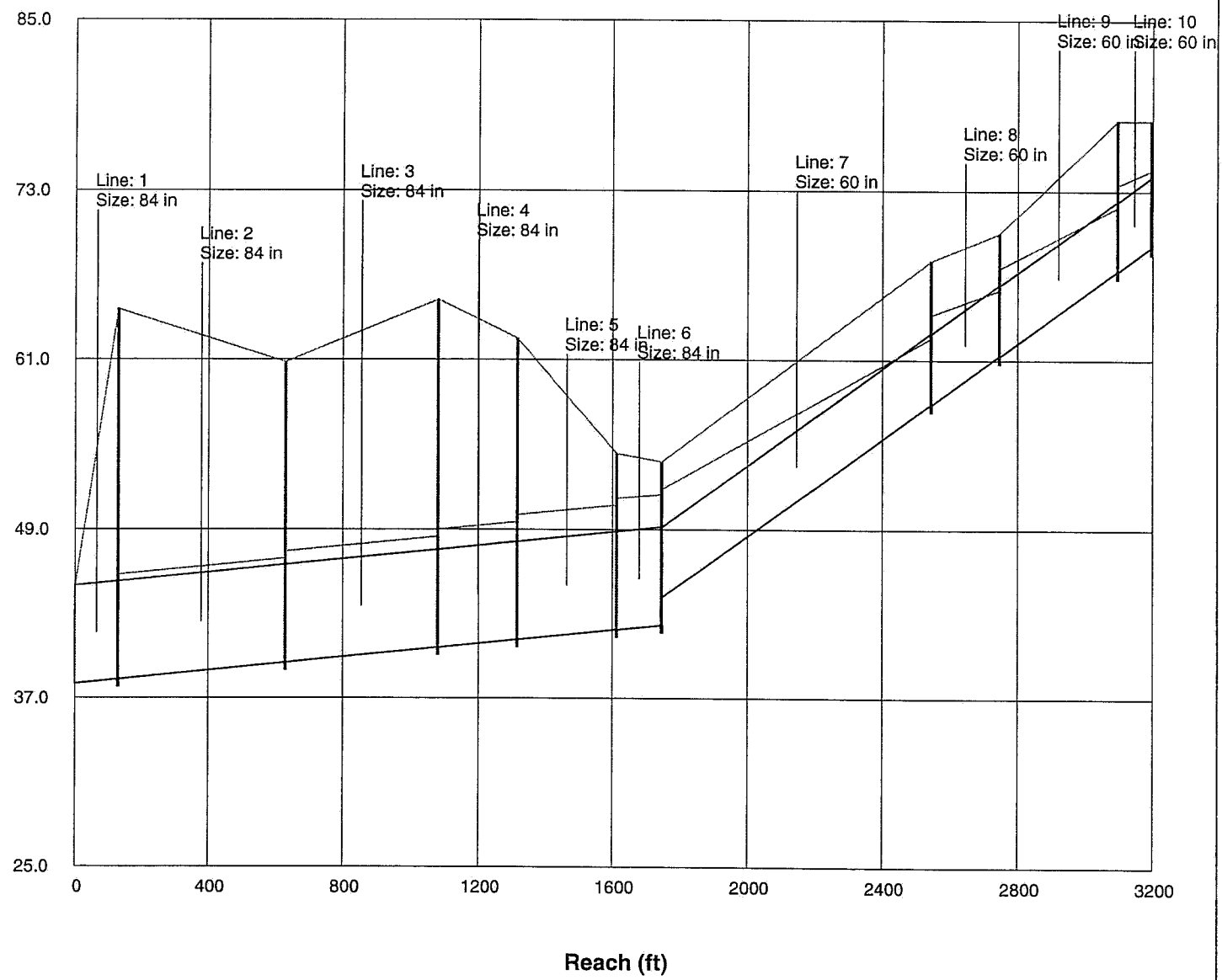
Eagle Ranch



Proj. file: EROPT1M.STM	IDF file: SAMPLE.IDF	No. Lines: 10	03-31-1998

Storm Sewer Profile

Proj. file: EROPT1M.STM



Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
1	line 1	308.00	84 c	130.0	38.00	38.31	0.238	45.00	45.29	0.50	End
2	line 2	308.00	84 c	500.0	38.31	39.51	0.240	45.79*	46.95*	0.50	1
3	line 3	308.00	84 c	450.0	39.51	40.59	0.240	47.45*	48.50*	0.50	2
4	line 4	308.00	84 c	237.0	40.59	41.16	0.241	48.99*	49.55*	0.50	3
5	line 5	308.00	84 c	296.0	41.16	41.87	0.240	50.04*	50.73*	0.50	4
6	line 6	277.00	84 c	133.0	41.87	42.19	0.241	51.23*	51.48*	0.40	5
7	line 7	277.00	60 c	800.0	44.19	57.88	1.711	51.88	62.52	1.65	6
8	line 8	267.00	60 c	200.0	57.88	61.30	1.710	64.17	65.94	1.53	7
9	line 9	267.00	60 c	350.0	61.30	67.29	1.711	67.47	71.87	1.56	8
10	line 10	267.00	60 c	100.0	67.29	69.00	1.710	73.43*	74.48*	1.44	9

PROJECT FILE: EROPT1M.STM | I-D-F FILE: SAMPLE.IDF | TOTAL NO. LINES: 10 | RUN DATE: 03-31-1998

NOTES: c = circular; e = elliptical; b = box; Return period = 5 Yrs.; * Indicates surcharge condition.

Appendix C

Calabacillas Arroyo HEC2 Runs

CALABACILLAS ARROYO AT 15,300 CFS
Worksheet for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\calabac.fm2
Worksheet	CALABACILLAS ARROYO
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

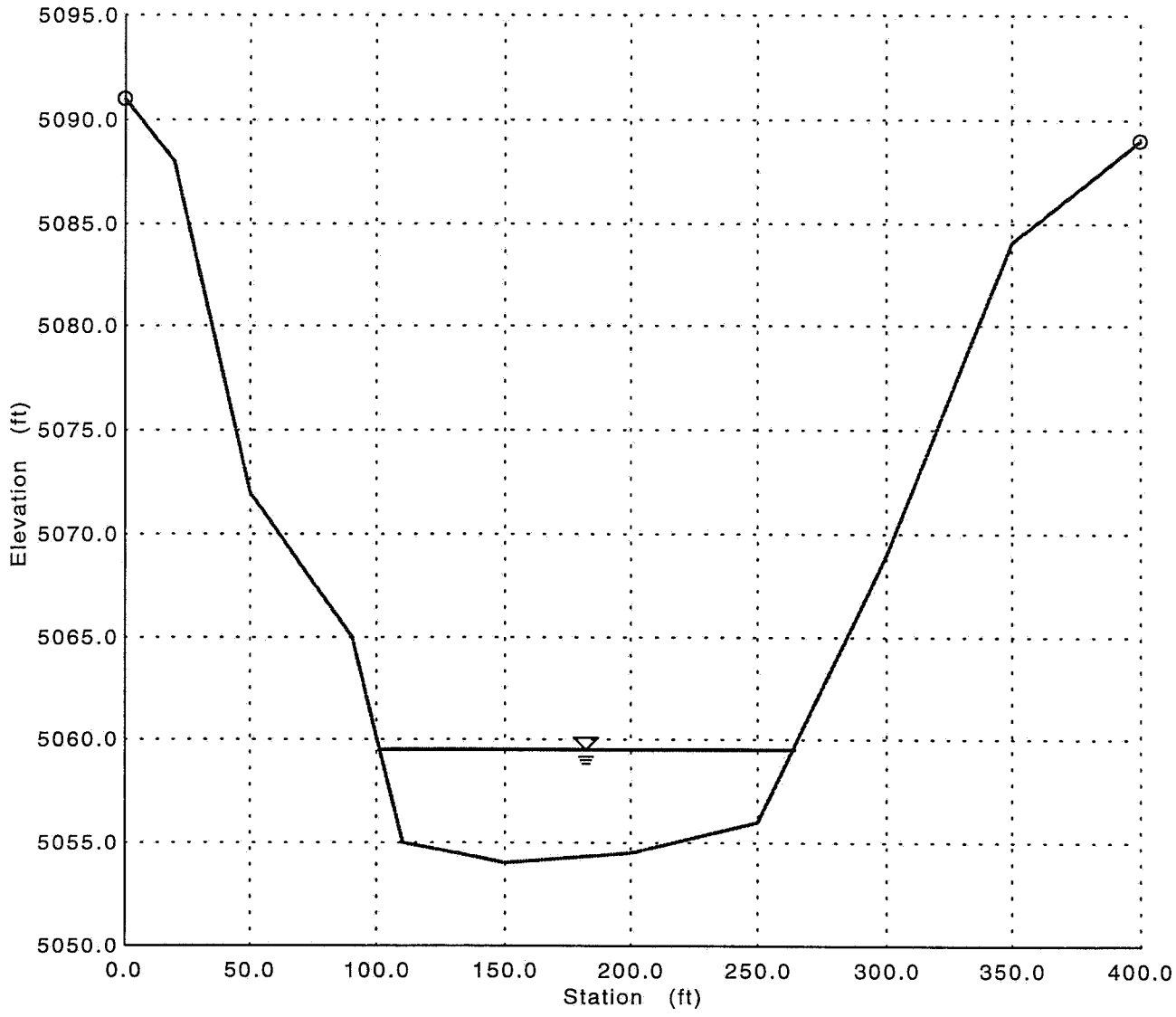
Input Data				
Channel Slope	0.017000 ft/ft			
Elevation range: 5,054.00 ft to 5,091.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	5,091.00	0.00	400.00	0.025
20.00	5,088.00			
50.00	5,072.00			
90.00	5,065.00			
110.00	5,055.00			
150.00	5,054.00			
200.00	5,054.50			
250.00	5,056.00			
300.00	5,069.00			
350.00	5,084.00			
400.00	5,089.00			
Discharge	15,300.00 cfs			

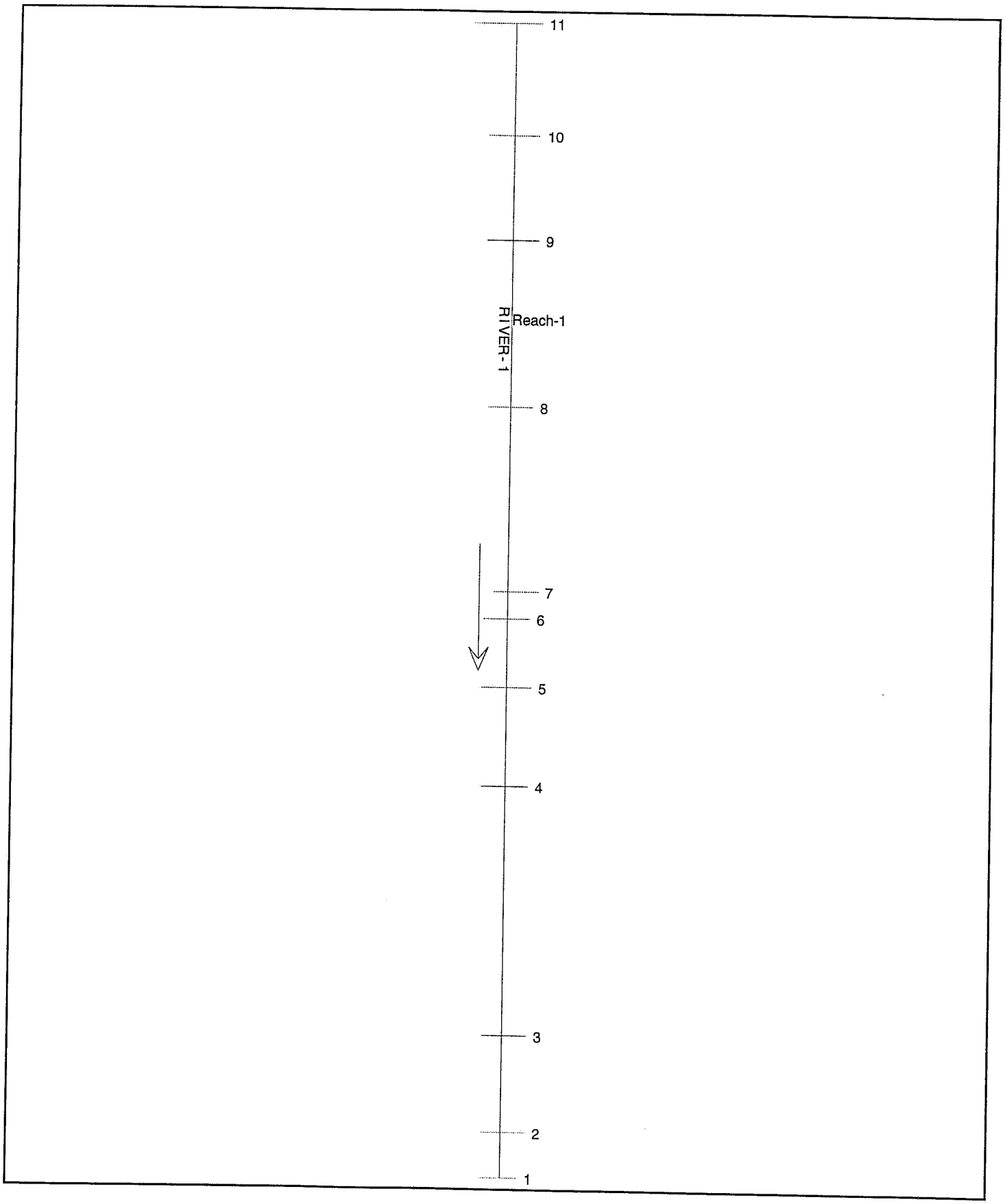
Results		
Wtd. Mannings Coefficient	0.025	
Water Surface Elevation	5,059.57	ft
Flow Area	730.58	ft²
Wetted Perimeter	164.46	ft
Top Width	162.88	ft
Height	5.57	ft
Critical Depth	5,061.66	ft
Critical Slope	0.005048	ft/ft
Velocity	20.94	ft/s
Velocity Head	6.82	ft
Specific Energy	5,066.39	ft
Froude Number	1.74	
Flow is supercritical.		

Cross Section
Cross Section for Irregular Channel

Project Description	
Project File	x:\public\projects\92517\m\drcalc\calabac.fm2
Worksheet	CALABACILLAS ARROYO
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

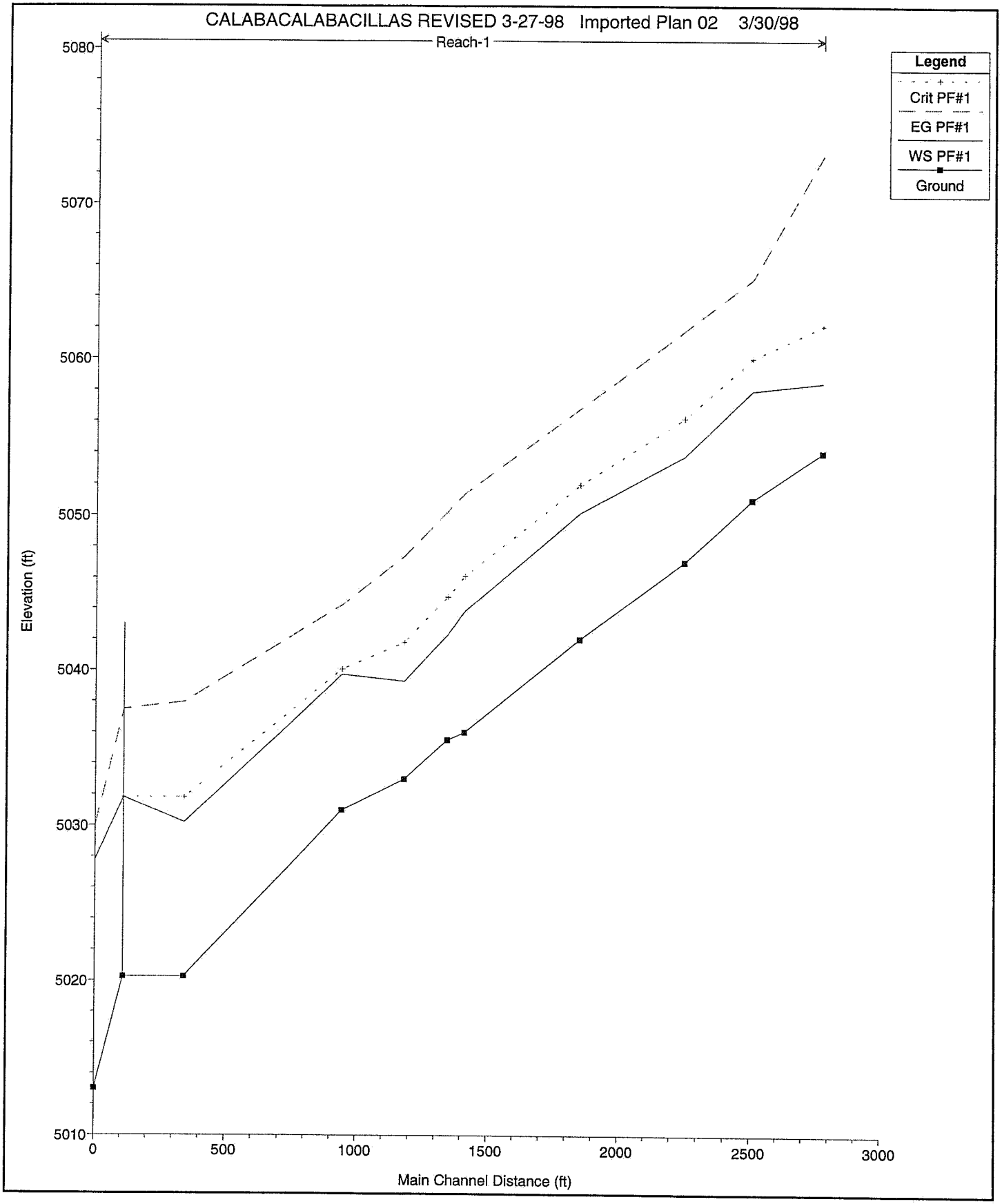
Section Data		
Wtd. Mannings Coefficient	0.025	
Channel Slope	0.017000	ft/ft
Water Surface Elevation	5,059.57	ft
Discharge	15,300.00	cfs

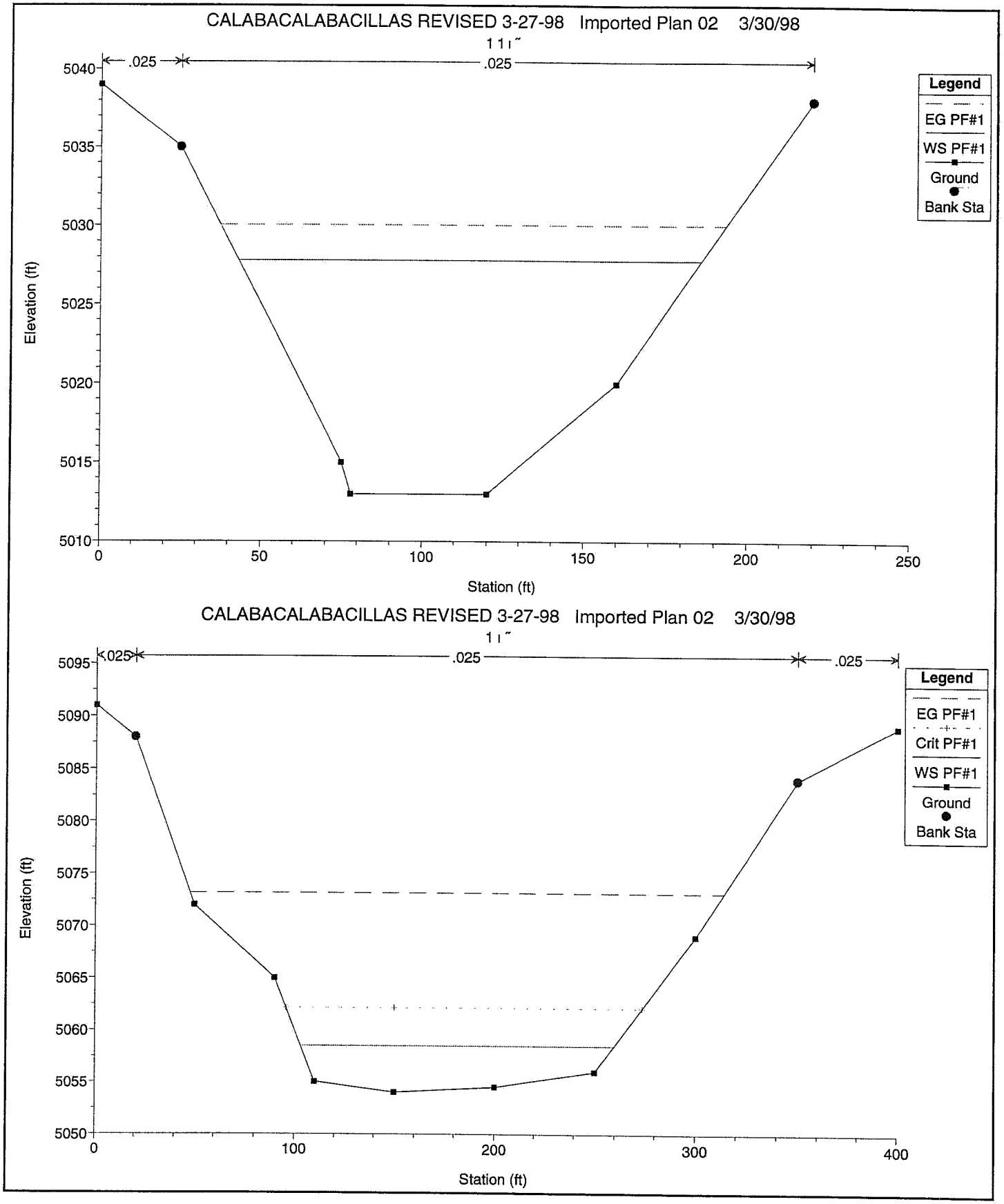


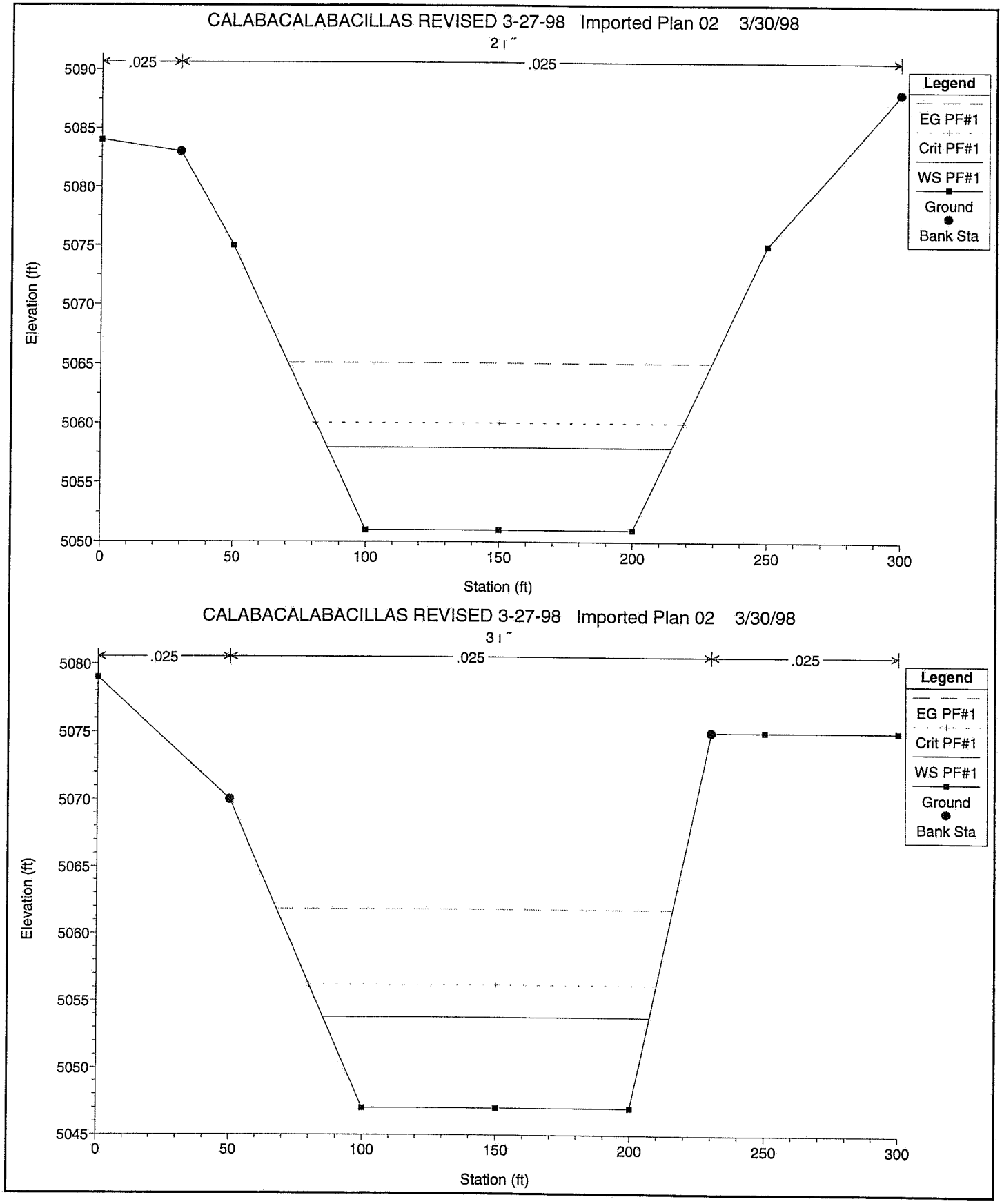

11
10
9
RIVER-1
Reach-1
8
7
6
5
4
3
2
1

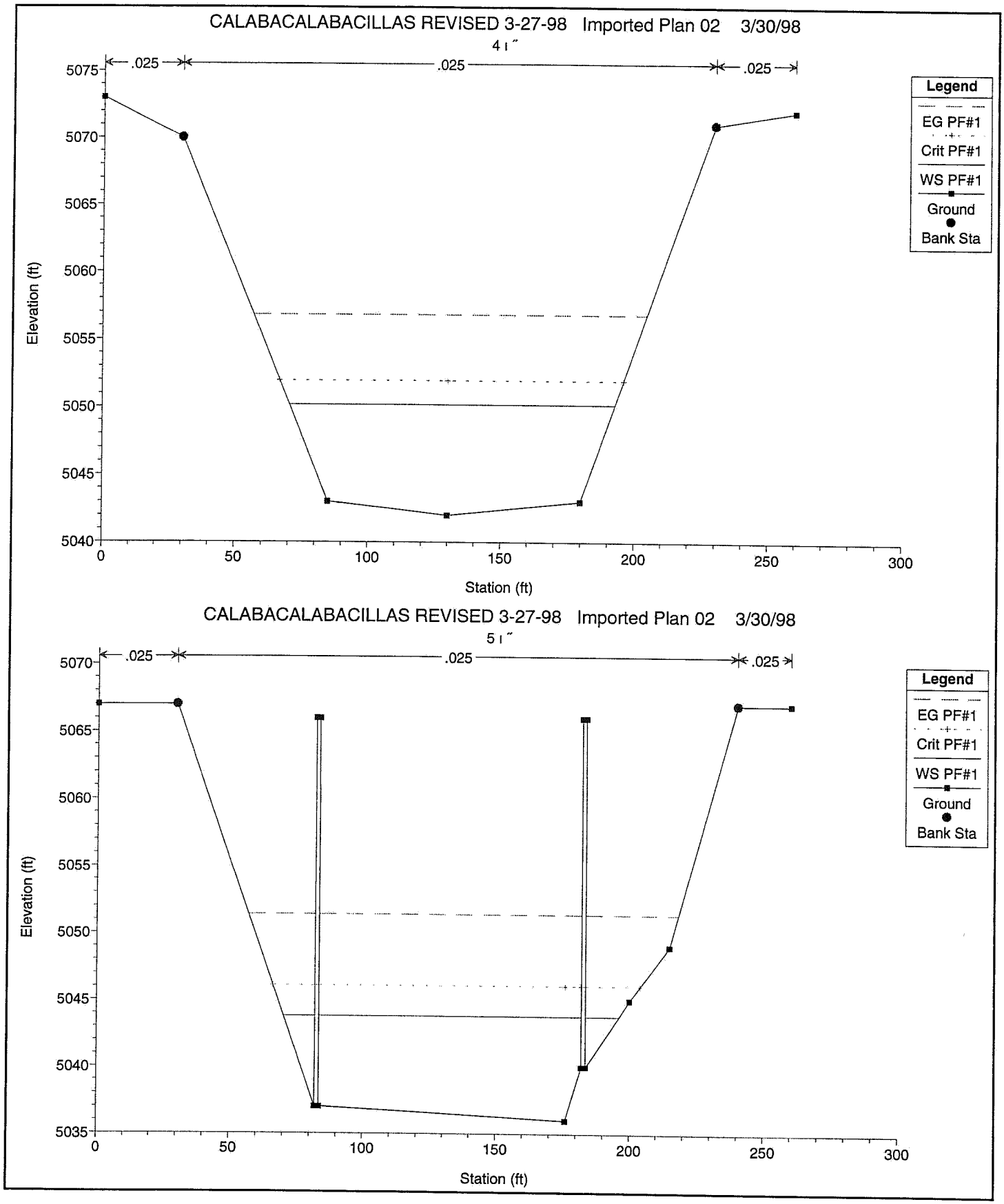
HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1

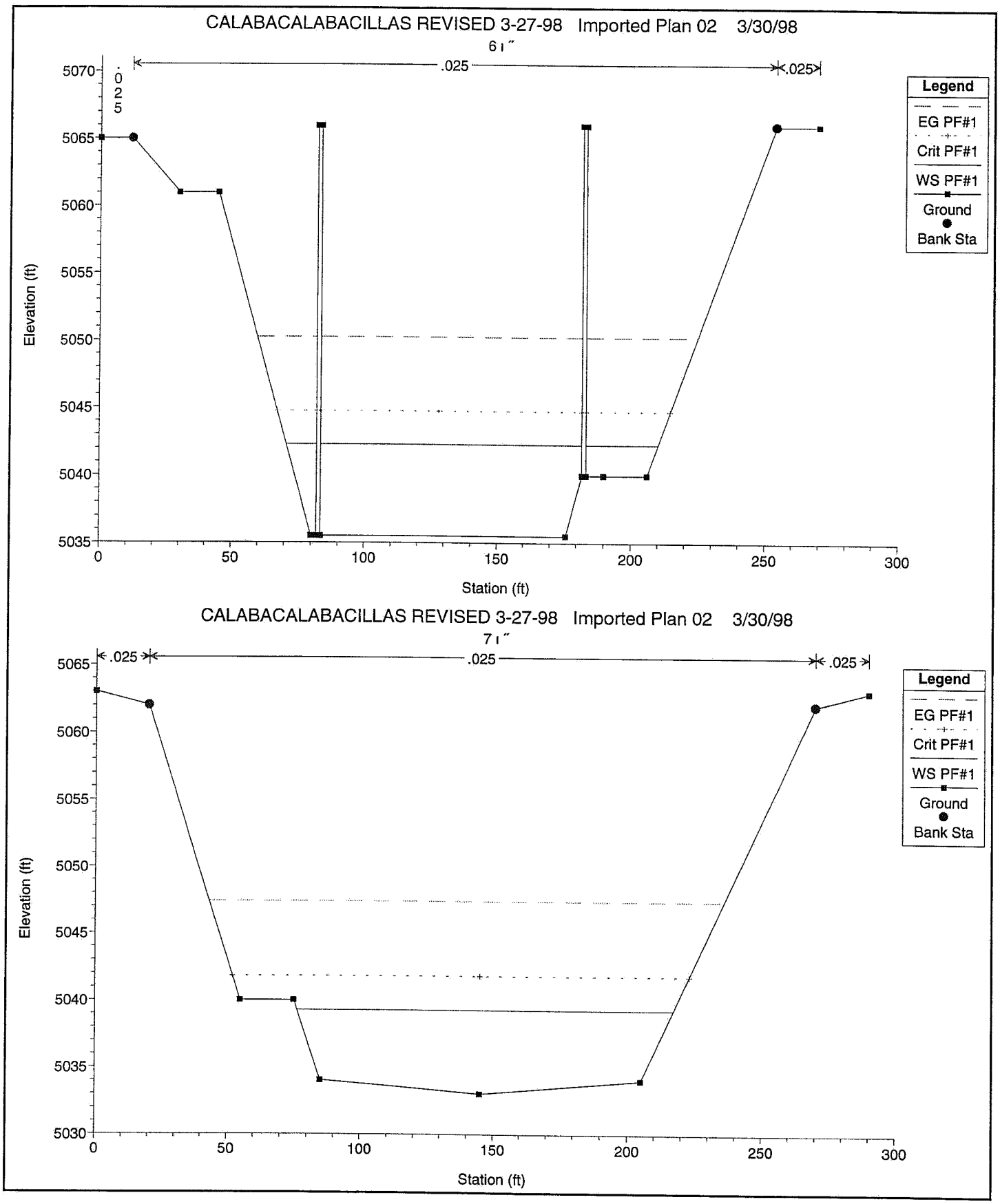
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	11	17100.00	5054.00	5058.48	5062.15	5073.16	0.049846	30.75	556.14	156.50	2.87
Reach-1	10	17100.00	5051.00	5057.96	5060.04	5065.11	0.011896	21.47	796.47	128.99	1.52
Reach-1	9	17100.00	5047.00	5053.77	5056.18	5061.81	0.013569	22.75	751.49	121.97	1.62
Reach-1	8	17100.00	5042.00	5050.16	5051.95	5056.82	0.009877	20.70	826.13	122.38	1.40
Reach-1	7	17100.00	5036.00	5043.80	5046.08	5051.40	0.015209	22.12	772.97	122.71	1.55
Reach-1	6	17100.00	5035.50	5042.27	5044.73	5050.26	0.018221	22.68	754.04	136.36	1.70
Reach-1	5	17100.00	5033.00	5039.27	5041.80	5047.39	0.016411	22.87	747.58	141.01	1.75
Reach-1	4	17100.00	5031.00	5039.71	5040.04	5044.21	0.005526	17.03	1003.96	126.35	1.06
Reach-1	3	17100.00	5020.25	5030.20	5031.82	5037.94	0.022778	22.33	765.83	79.77	1.27
Reach-1	2	17100.00	5020.25	5031.83	5031.83	5037.49	0.015344	19.09	895.81	79.78	1.00
Reach-1	1	17100.00	5013.00	5027.79		5030.04	0.002010	12.04	1419.71	142.94	0.67

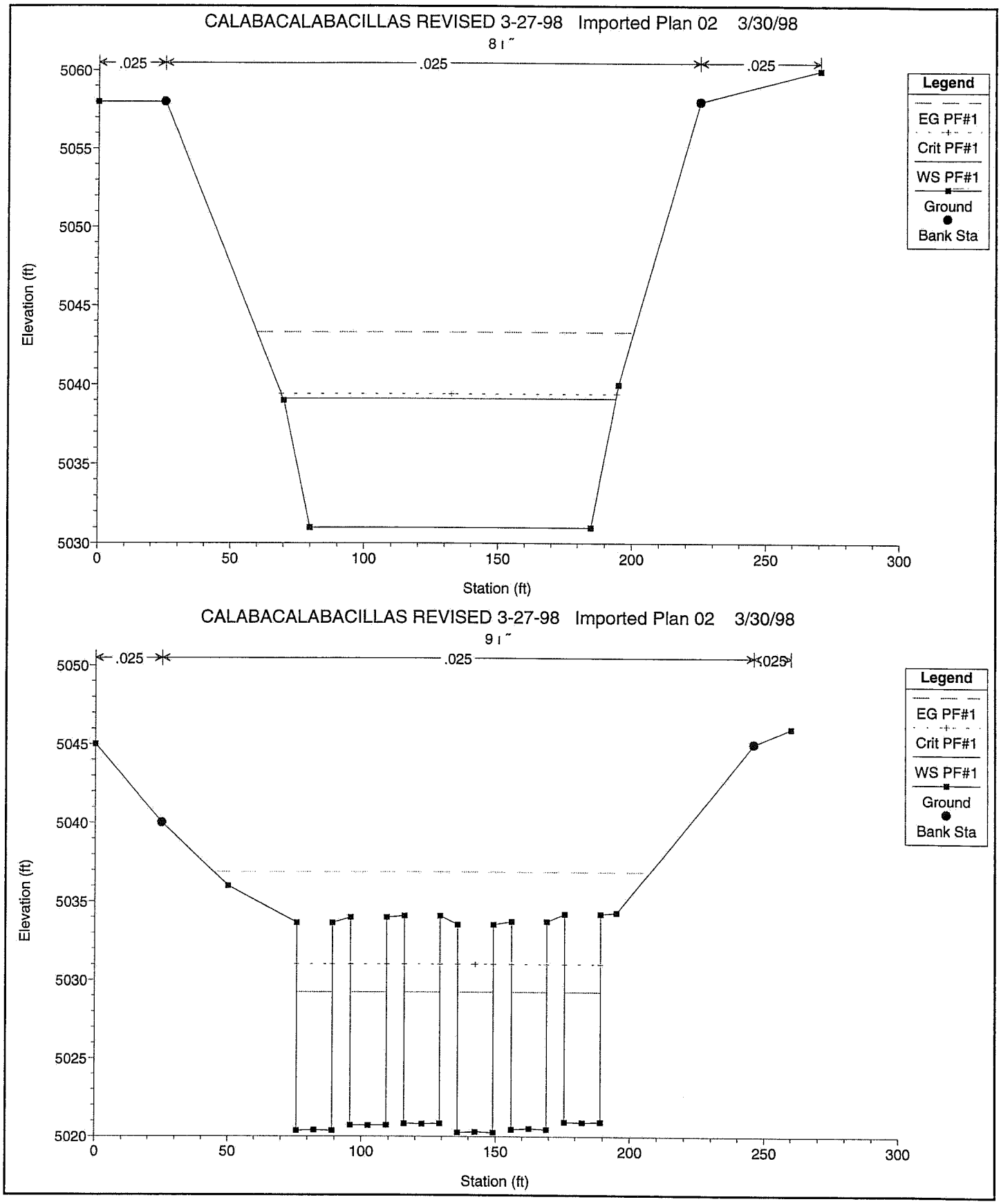

CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
Reach-1
Legend
Crit PF#1
EG PF#1
WS PF#1
Ground
Elevation (ft)
5080
5070
5060
5050
5040
5030
5020
5010
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)

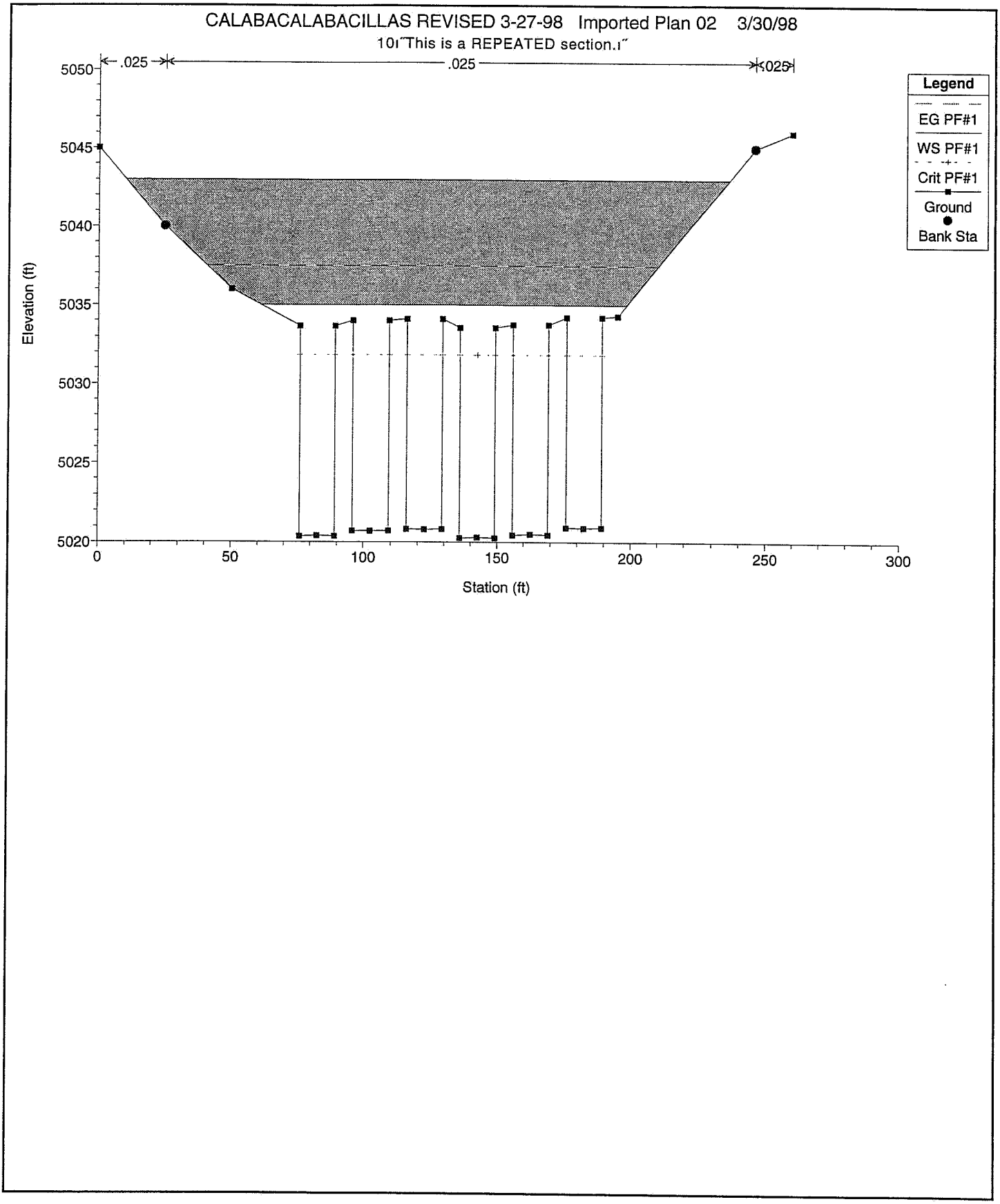

CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
.025
.025
5040
5035
5030
5025
5020
5015
5010
Elevation (ft)
0
50
100
150
200
250
Station (ft)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
.025
.025
.025
5095
5090
5085
5080
5075
5070
5065
5060
5055
5050
Elevation (ft)
0
100
200
300
400
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
2 1 "
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
5090
5085
5080
5075
5070
5065
5060
5055
5050
0
50
100
150
200
250
300
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
3 1 "
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
5080
5075
5070
5065
5060
5055
5050
5045
0
50
100
150
200
250
300


CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
41
.025
.025
.025
5075
5070
5065
5060
5055
5050
5045
5040
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
51
.025
.025
.025
5070
5065
5060
5055
5050
5045
5040
5035
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
61"
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
71"
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)


CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
8 I "
.025
.025
.025
5060
5055
5050
5045
5040
5035
5030
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
9 I "
.025
.025
.025
5050
5045
5040
5035
5030
5025
5020
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
10ı"This is a REPEATED section.ı"
.025
.025
.025
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
5050
5045
5040
5035
5030
5025
5020
0
50
100
150
200
250
300
Station (ft)

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 11 Profile: PF#1

W.S. Elev (ft)	5058.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	14.68	Wt. n-Val.		0.025	
E.G. Elev (ft)	5073.16	Reach Len. (ft)	317.00	270.00	228.00
Crit W.S. (ft)	5062.15	Flow Area (sq ft)		556.14	
E.G. Slope (ft/ft)	0.049846	Area (sq ft)		556.14	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	156.50	Top Width (ft)		156.50	
Vel Total (ft/s)	30.75	Avg. Vel. (ft/s)		30.75	
Max Chl Dpth (ft)	4.48	Hydr. Depth (ft)		3.55	
Conv. Total (cfs)	76591.6	Conv. (cfs)		76591.6	
Length Wtd. (ft)	270.00	Wetted Per. (ft)		157.67	
Min Ch El (ft)	5054.00	Shear (lb/sq ft)		10.98	
Alpha	1.00	Stream Power (lb/ft s)		337.49	
Frctn Loss (ft)		Cum Volume (acre-ft)		52.35	
C & E Loss (ft)		Cum SA (acres)		7.55	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 10 Profile: PF#1

W.S. Elev (ft)	5057.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.16	Wt. n-Val.		0.025	
E.G. Elev (ft)	5065.11	Reach Len. (ft)	225.00	253.00	285.00
Crit W.S. (ft)	5060.04	Flow Area (sq ft)		796.47	
E.G. Slope (ft/ft)	0.011896	Area (sq ft)		796.47	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	128.99	Top Width (ft)		128.99	
Vel Total (ft/s)	21.47	Avg. Vel. (ft/s)		21.47	
Max Chl Dpth (ft)	6.96	Hydr. Depth (ft)		6.17	
Conv. Total (cfs)	156780.7	Conv. (cfs)		156780.7	
Length Wtd. (ft)	253.00	Wetted Per. (ft)		132.15	
Min Ch El (ft)	5051.00	Shear (lb/sq ft)		4.48	
Alpha	1.00	Stream Power (lb/ft s)		96.10	
Frctn Loss (ft)	5.79	Cum Volume (acre-ft)		48.16	
C & E Loss (ft)	2.26	Cum SA (acres)		6.67	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 9 Profile: PF#1

W.S. Elev (ft)	5053.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.04	Wt. n-Val.		0.025	
E.G. Elev (ft)	5061.81	Reach Len. (ft)	400.00	400.00	400.00
Crit W.S. (ft)	5056.18	Flow Area (sq ft)		751.49	
E.G. Slope (ft/ft)	0.013569	Area (sq ft)		751.49	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	121.97	Top Width (ft)		121.97	
Vel Total (ft/s)	22.75	Avg. Vel. (ft/s)		22.75	
Max Chl Dpth (ft)	6.77	Hydr. Depth (ft)		6.16	
Conv. Total (cfs)	146800.6	Conv. (cfs)		146800.6	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		126.13	
Min Ch El (ft)	5047.00	Shear (lb/sq ft)		5.05	
Alpha	1.00	Stream Power (lb/ft s)		114.85	
Frctn Loss (ft)	3.21	Cum Volume (acre-ft)		43.66	
C & E Loss (ft)	0.09	Cum SA (acres)		5.94	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 8 Profile: PF#1

W.S. Elev (ft)	5050.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.65	Wt. n-Val.		0.025	
E.G. Elev (ft)	5056.82	Reach Len. (ft)	440.00	440.00	440.00
Crit W.S. (ft)	5051.95	Flow Area (sq ft)		826.13	
E.G. Slope (ft/ft)	0.009877	Area (sq ft)		826.13	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	122.38	Top Width (ft)		122.38	
Vel Total (ft/s)	20.70	Avg. Vel. (ft/s)		20.70	
Max Chl Dpth (ft)	8.16	Hydr. Depth (ft)		6.75	
Conv. Total (cfs)	172065.1	Conv. (cfs)		172065.1	
Length Wtd. (ft)	440.00	Wetted Per. (ft)		125.94	
Min Ch El (ft)	5042.00	Shear (lb/sq ft)		4.04	
Alpha	1.00	Stream Power (lb/ft s)		83.72	
Frctn Loss (ft)	4.59	Cum Volume (acre-ft)		36.42	
C & E Loss (ft)	0.42	Cum SA (acres)		4.82	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 7 Profile: PF#1

W.S. Elev (ft)	5043.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.60	Wt. n-Val.		0.025	
E.G. Elev (ft)	5051.40	Reach Len. (ft)	66.00	66.00	66.00
Crit W.S. (ft)	5046.08	Flow Area (sq ft)		772.97	
E.G. Slope (ft/ft)	0.015209	Area (sq ft)		772.97	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	122.71	Top Width (ft)		122.71	
Vel Total (ft/s)	22.12	Avg. Vel. (ft/s)		22.12	
Max Chl Dpth (ft)	7.80	Hydr. Depth (ft)		6.30	
Conv. Total (cfs)	138656.3	Conv. (cfs)		138656.3	
Length Wtd. (ft)	66.00	Wetted Per. (ft)		147.43	
Min Ch El (ft)	5036.00	Shear (lb/sq ft)		4.98	
Alpha	1.00	Stream Power (lb/ft s)		110.14	
Frctn Loss (ft)	5.33	Cum Volume (acre-ft)		28.34	
C & E Loss (ft)	0.09	Cum SA (acres)		3.58	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 6 Profile: PF#1

W.S. Elev (ft)	5042.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.99	Wt. n-Val.		0.025	
E.G. Elev (ft)	5050.26	Reach Len. (ft)	190.00	165.00	145.00
Crit W.S. (ft)	5044.73	Flow Area (sq ft)		754.04	
E.G. Slope (ft/ft)	0.018221	Area (sq ft)		754.04	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	136.36	Top Width (ft)		136.36	
Vel Total (ft/s)	22.68	Avg. Vel. (ft/s)		22.68	
Max Chl Dpth (ft)	6.77	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	126680.0	Conv. (cfs)		126680.0	
Length Wtd. (ft)	165.00	Wetted Per. (ft)		158.67	
Min Ch El (ft)	5035.50	Shear (lb/sq ft)		5.41	
Alpha	1.00	Stream Power (lb/ft s)		122.59	
Frctn Loss (ft)	1.10	Cum Volume (acre-ft)		27.18	
C & E Loss (ft)	0.04	Cum SA (acres)		3.38	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 5 Profile: PF#1

W.S. Elev (ft)	5039.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	8.12	Wt. n-Val.		0.025	
E.G. Elev (ft)	5047.39	Reach Len. (ft)	220.00	237.00	255.00
Crit W.S. (ft)	5041.80	Flow Area (sq ft)		747.58	
E.G. Slope (ft/ft)	0.016411	Area (sq ft)		747.58	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	141.01	Top Width (ft)		141.01	
Vel Total (ft/s)	22.87	Avg. Vel. (ft/s)		22.87	
Max Chl Dpth (ft)	6.27	Hydr. Depth (ft)		5.30	
Conv. Total (cfs)	133484.5	Conv. (cfs)		133484.5	
Length Wtd. (ft)	237.00	Wetted Per. (ft)		143.57	
Min Ch El (ft)	5033.00	Shear (lb/sq ft)		5.33	
Alpha	1.00	Stream Power (lb/ft s)		122.02	
Frctn Loss (ft)	2.85	Cum Volume (acre-ft)		24.34	
C & E Loss (ft)	0.01	Cum SA (acres)		2.86	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 4 Profile: PF#1

W.S. Elev (ft)	5039.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.50	Wt. n-Val.		0.025	
E.G. Elev (ft)	5044.21	Reach Len. (ft)	600.00	600.00	600.00
Crit W.S. (ft)	5040.04	Flow Area (sq ft)		1003.96	
E.G. Slope (ft/ft)	0.005526	Area (sq ft)		1003.96	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	126.35	Top Width (ft)		126.35	
Vel Total (ft/s)	17.03	Avg. Vel. (ft/s)		17.03	
Max Chl Dpth (ft)	8.71	Hydr. Depth (ft)		7.95	
Conv. Total (cfs)	230039.5	Conv. (cfs)		230039.5	
Length Wtd. (ft)	600.00	Wetted Per. (ft)		132.64	
Min Ch El (ft)	5031.00	Shear (lb/sq ft)		2.61	
Alpha	1.00	Stream Power (lb/ft s)		44.47	
Frctn Loss (ft)	2.10	Cum Volume (acre-ft)		19.58	
C & E Loss (ft)	1.09	Cum SA (acres)		2.13	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 3 Profile: PF#1

W.S. Elev (ft)	5030.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.74	Wt. n-Val.		0.025	
E.G. Elev (ft)	5037.94	Reach Len. (ft)	234.00	234.00	234.00
Crit W.S. (ft)	5031.82	Flow Area (sq ft)		765.83	
E.G. Slope (ft/ft)	0.022778	Area (sq ft)		765.83	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	79.77	Top Width (ft)		79.77	
Vel Total (ft/s)	22.33	Avg. Vel. (ft/s)		22.33	
Max Chl Dpth (ft)	9.95	Hydr. Depth (ft)		9.60	
Conv. Total (cfs)	113301.6	Conv. (cfs)		113301.6	
Length Wtd. (ft)		Wetted Per. (ft)		195.01	
Min Ch El (ft)	5020.25	Shear (lb/sq ft)		5.58	
Alpha	1.00	Stream Power (lb/ft s)		124.70	
Frctn Loss (ft)	5.95	Cum Volume (acre-ft)		7.39	
C & E Loss (ft)	0.32	Cum SA (acres)		0.71	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 2 Profile: PF#1

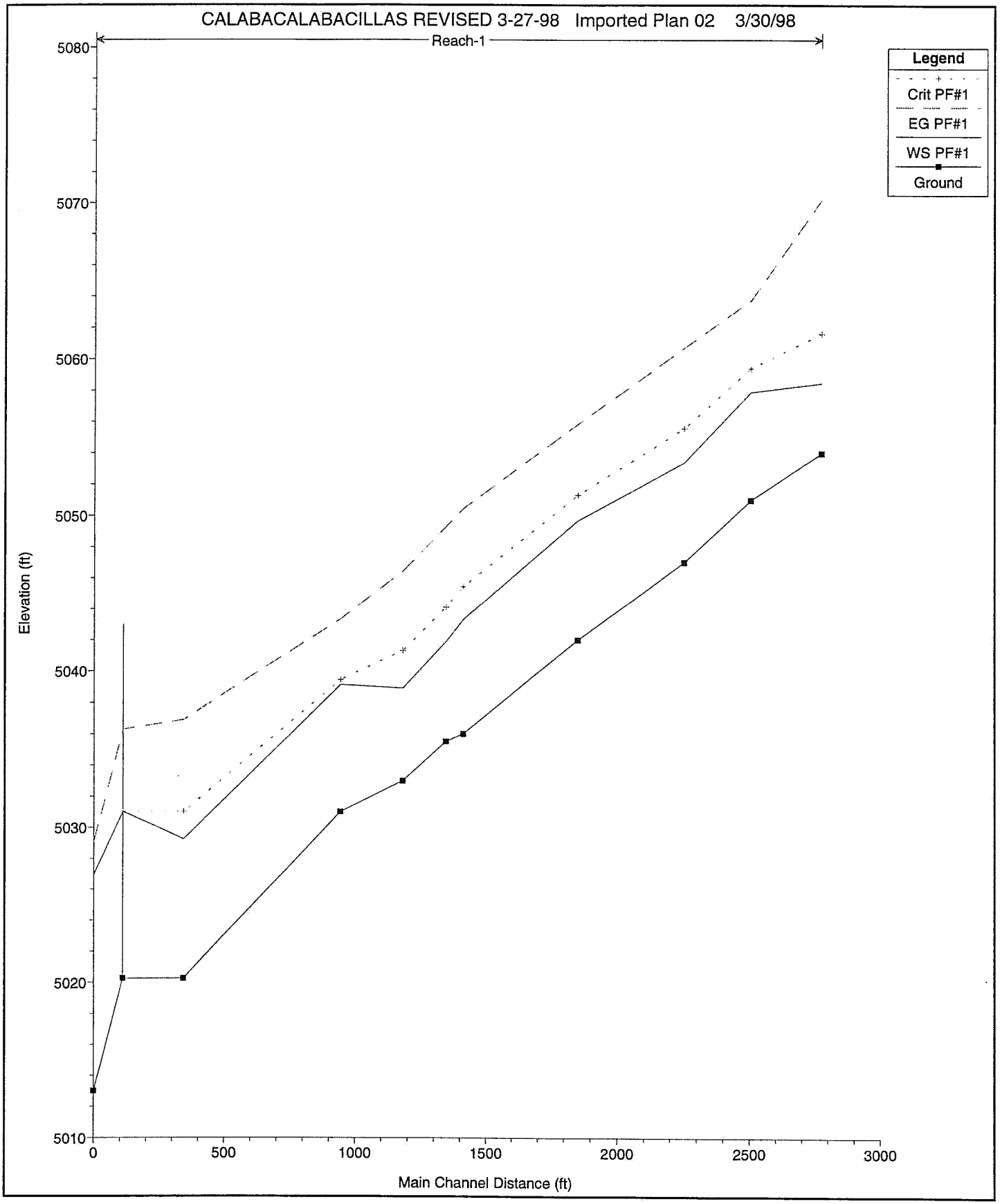
W.S. Elev (ft)	5031.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.66	Wt. n-Val.		0.025	
E.G. Elev (ft)	5037.49	Reach Len. (ft)	110.00	110.00	110.00
Crit W.S. (ft)	5031.83	Flow Area (sq ft)		895.81	
E.G. Slope (ft/ft)	0.015344	Area (sq ft)		895.81	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	79.78	Top Width (ft)		79.78	
Vel Total (ft/s)	19.09	Avg. Vel. (ft/s)		19.09	
Max Chl Dpth (ft)	11.58	Hydr. Depth (ft)		11.23	
Conv. Total (cfs)	138046.6	Conv. (cfs)		138046.6	
Length Wtd. (ft)		Wetted Per. (ft)		214.58	
Min Ch El (ft)	5020.25	Shear (lb/sq ft)		4.00	
Alpha	1.00	Stream Power (lb/ft s)		76.34	
Frctn Loss (ft)		Cum Volume (acre-ft)		2.92	
C & E Loss (ft)		Cum SA (acres)		0.28	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 1 Profile: PF#1

W.S. Elev (ft)	5027.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.25	Wt. n-Val.		0.025	
E.G. Elev (ft)	5030.04	Reach Len. (ft)			
Crit W.S. (ft)		Flow Area (sq ft)		1419.71	
E.G. Slope (ft/ft)	0.002010	Area (sq ft)		1419.71	
Q Total (cfs)	17100.00	Flow (cfs)		17100.00	
Top Width (ft)	142.94	Top Width (ft)		142.94	
Vel Total (ft/s)	12.04	Avg. Vel. (ft/s)		12.04	
Max Chl Dpth (ft)	14.79	Hydr. Depth (ft)		9.93	
Conv. Total (cfs)	381373.4	Conv. (cfs)		381373.4	
Length Wtd. (ft)		Wetted Per. (ft)		147.76	
Min Ch El (ft)	5013.00	Shear (lb/sq ft)		1.21	
Alpha	1.00	Stream Power (lb/ft s)		14.53	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	11	15300.00	5054.00	5058.48	5061.65	5070.23	0.039904	27.51	556.14	156.50	2.57
Reach-1	10	15300.00	5051.00	5057.90	5059.43	5063.74	0.009794	19.39	789.17	128.75	1.38
Reach-1	9	15300.00	5047.00	5053.38	5055.56	5060.71	0.013293	21.74	703.92	120.70	1.59
Reach-1	8	15300.00	5042.00	5049.70	5051.32	5055.84	0.009811	19.89	769.35	120.60	1.39
Reach-1	7	15300.00	5036.00	5043.31	5045.44	5050.44	0.015196	21.42	714.24	120.28	1.55
Reach-1	6	15300.00	5035.50	5041.88	5044.09	5049.29	0.018162	21.84	700.56	135.09	1.69
Reach-1	5	15300.00	5033.00	5038.89	5041.30	5046.42	0.016504	22.02	694.84	139.51	1.74
Reach-1	4	15300.00	5031.00	5039.11	5039.42	5043.32	0.005584	16.46	929.31	124.27	1.06
Reach-1	3	15300.00	5020.25	5029.24	5031.02	5036.89	0.023859	22.19	689.53	79.76	1.33
Reach-1	2	15300.00	5020.25	5031.02	5031.02	5036.28	0.014819	18.41	831.22	79.77	1.00
Reach-1	1	15300.00	5013.00	5026.98		5029.11	0.002031	11.72	1305.90	138.22	0.67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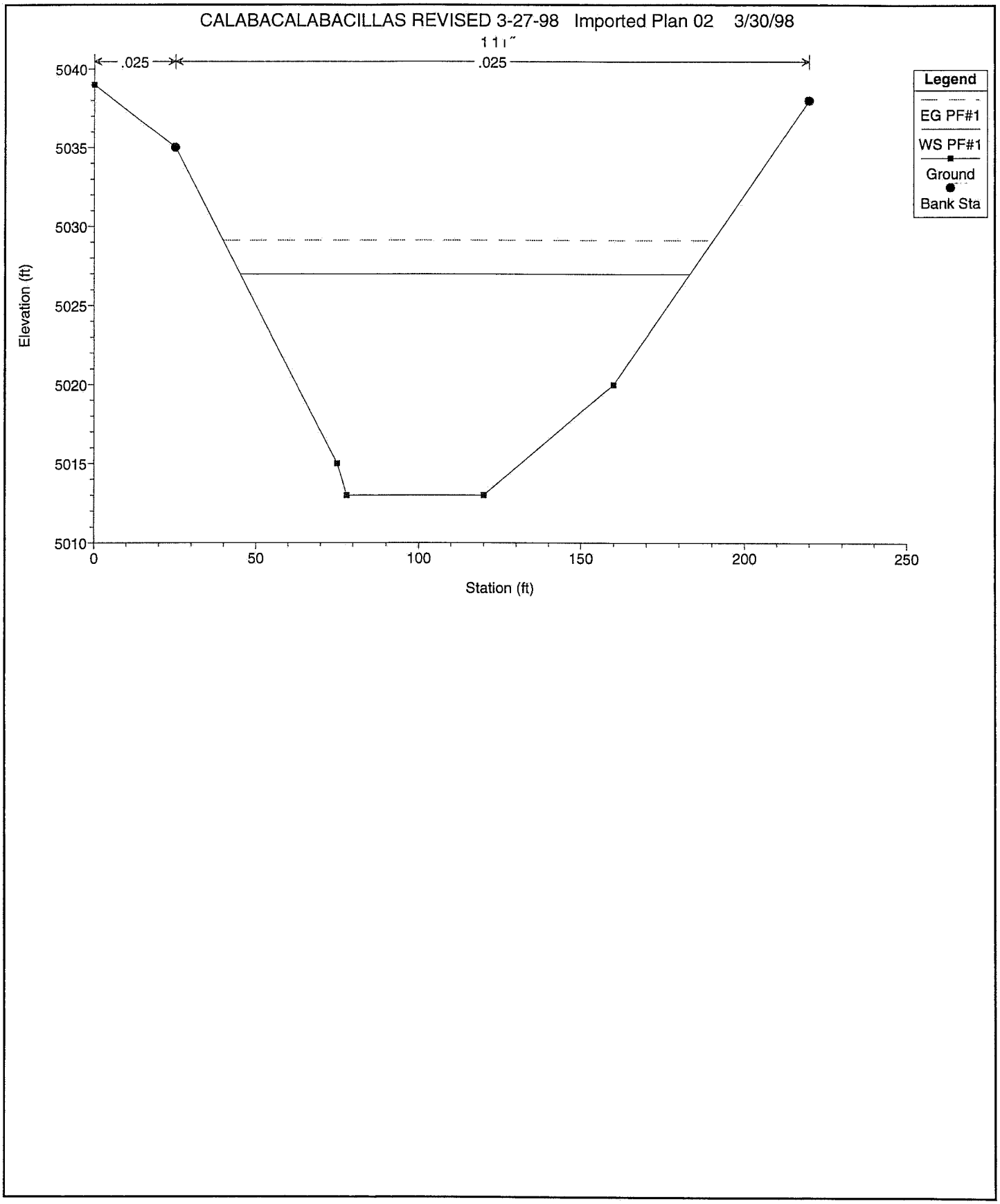
Reach-1
Legend
Crit PF#1
EG PF#1
WS PF#1
Ground
Elevation (ft)
5080
5070
5060
5050
5040
5030
5020
5010
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)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5035
5030
5025
5020
5015
5010
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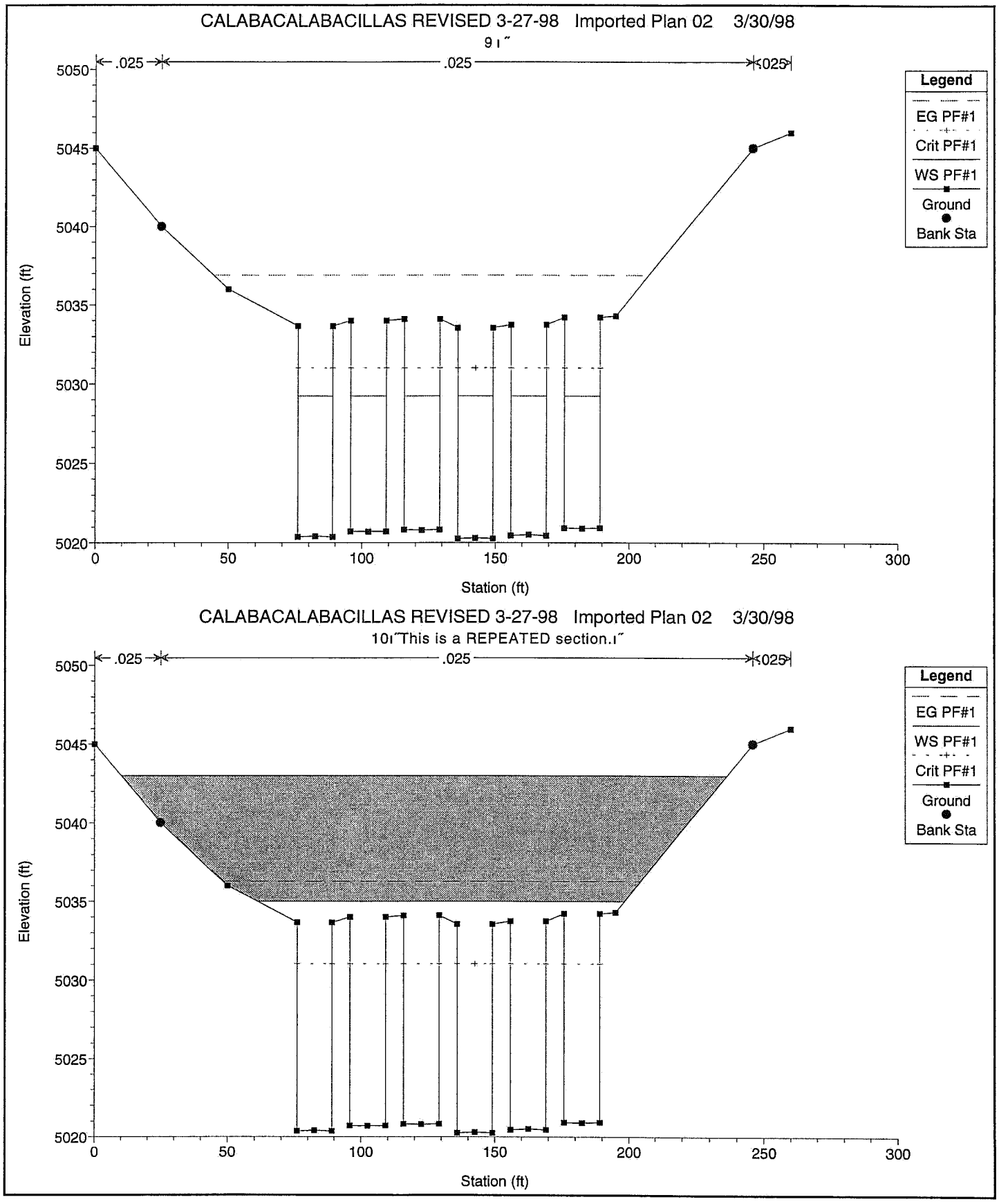
50
100
150
200
250
Station (ft)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta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9 I "
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.025
025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5050
5045
5040
5035
5030
5025
5020
0
50
100
150
200
250
300
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
10 I "This is a REPEATED section. I "
.025
.025
025
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
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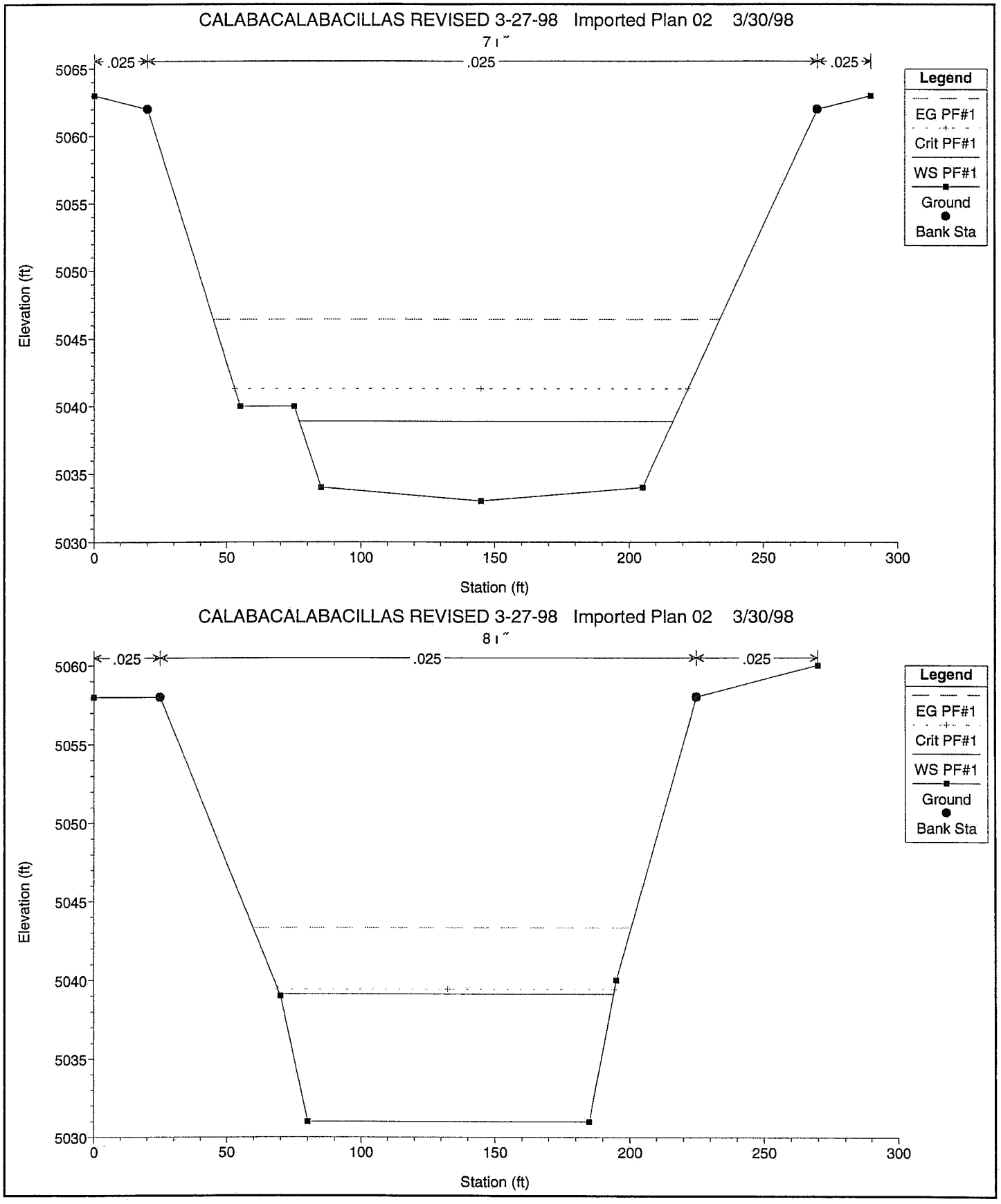
5035
5030
5025
5020
0
50
100
150
200
250
300
Station (ft)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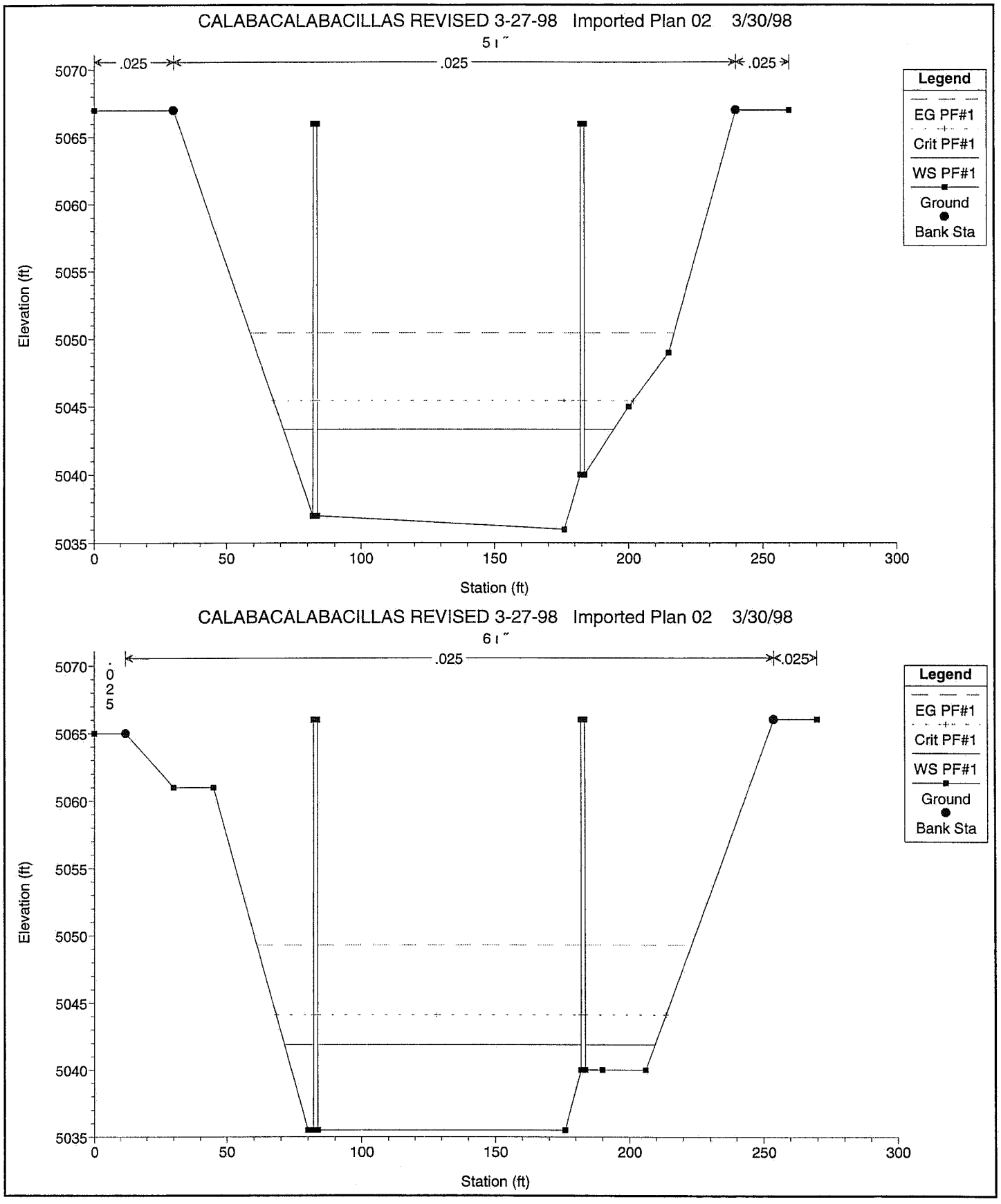
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5065
5060
5055
5050
5045
5040
5035
5030
0
50
100
150
200
250
300
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
8 1 "
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5060
5055
5050
5045
5040
5035
5030
0
50
100
150
200
250
300
Station (ft)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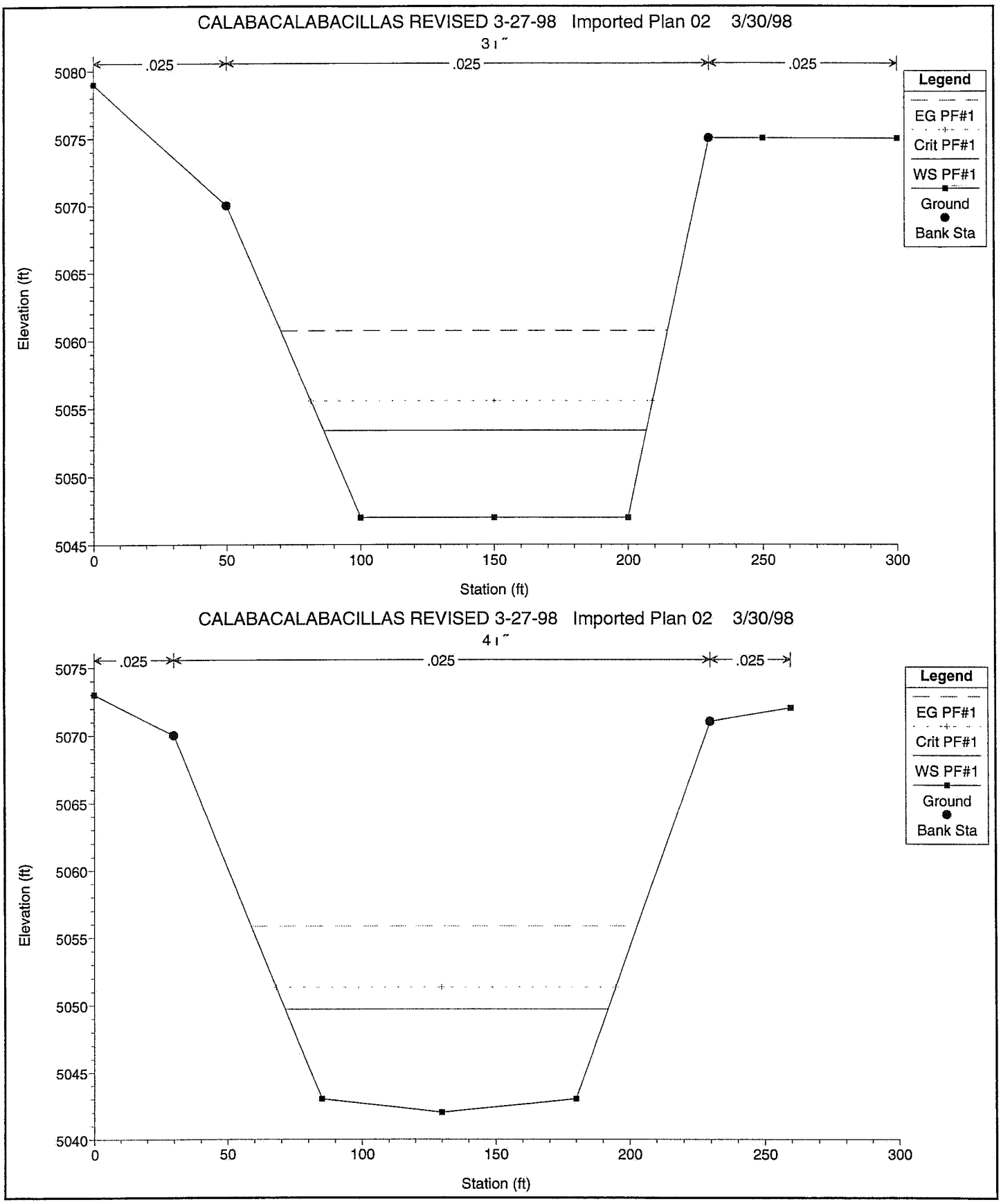
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
5070
5065
5060
5055
5050
5045
5040
5035
0
50
100
150
200
250
300
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
6 1 "
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
Station (ft)
5070
5065
5060
5055
5050
5045
5040
5035
0
50
100
150
200
250
300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31"
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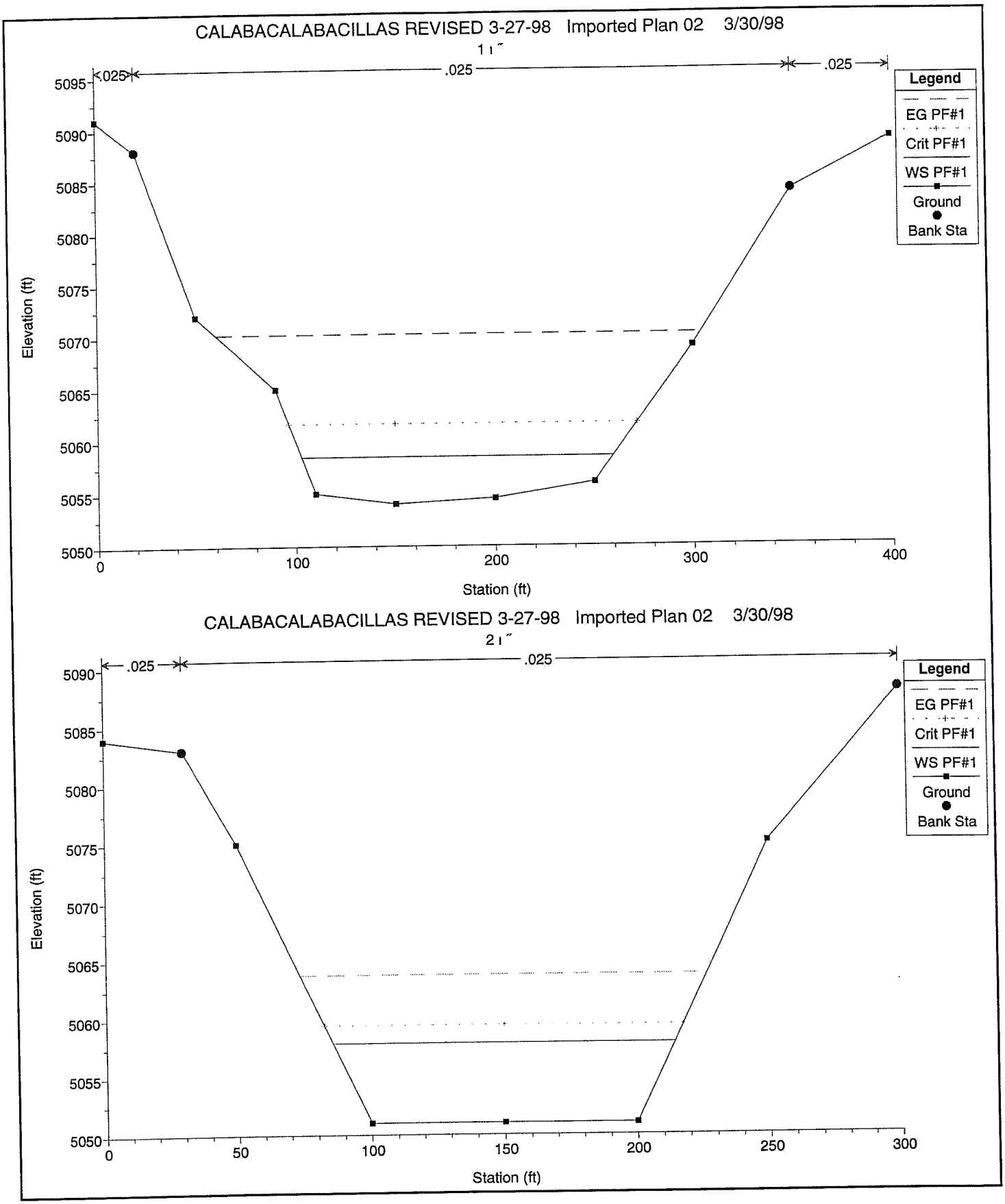
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5080
5075
5070
5065
5060
5055
5050
5045
0
50
100
150
200
250
300
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
41"
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5075
5070
5065
5060
5055
5050
5045
5040
0
50
100
150
200
250
300
Station (ft)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11"
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.025
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Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5095
5090
5085
5080
5075
5070
5065
5060
5055
5050
0
100
200
300
400
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
21"
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5090
5085
5080
5075
5070
5065
5060
5055
5050
0
50
100
150
200
250
300
Station (ft)

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 11 Profile: PF#1

W.S. Elev (ft)	5058.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.75	Wt. n-Val.		0.025	
E.G. Elev (ft)	5070.23	Reach Len. (ft)	317.00	270.00	228.00
Crit W.S. (ft)	5061.65	Flow Area (sq ft)		556.14	
E.G. Slope (ft/ft)	0.039904	Area (sq ft)		556.14	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	156.50	Top Width (ft)		156.50	
Vel Total (ft/s)	27.51	Avg. Vel. (ft/s)		27.51	
Max Chl Dpth (ft)	4.48	Hydr. Depth (ft)		3.55	
Conv. Total (cfs)	76591.6	Conv. (cfs)		76591.6	
Length Wtd. (ft)	270.00	Wetted Per. (ft)		157.67	
Min Ch El (ft)	5054.00	Shear (lb/sq ft)		8.79	
Alpha	1.00	Stream Power (lb/ft s)		241.74	
Frctn Loss (ft)		Cum Volume (acre-ft)		48.83	
C & E Loss (ft)		Cum SA (acres)		7.47	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 10 Profile: PF#1

W.S. Elev (ft)	5057.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.84	Wt. n-Val.		0.025	
E.G. Elev (ft)	5063.74	Reach Len. (ft)	225.00	253.00	285.00
Crit W.S. (ft)	5059.43	Flow Area (sq ft)		789.17	
E.G. Slope (ft/ft)	0.009794	Area (sq ft)		789.17	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	128.75	Top Width (ft)		128.75	
Vel Total (ft/s)	19.39	Avg. Vel. (ft/s)		19.39	
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)		6.13	
Conv. Total (cfs)	154597.6	Conv. (cfs)		154597.6	
Length Wtd. (ft)	253.00	Wetted Per. (ft)		131.89	
Min Ch El (ft)	5051.00	Shear (lb/sq ft)		3.66	
Alpha	1.00	Stream Power (lb/ft s)		70.93	
Frctn Loss (ft)	4.73	Cum Volume (acre-ft)		44.66	
C & E Loss (ft)	1.78	Cum SA (acres)		6.59	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 9 Profile: PF#1

W.S. Elev (ft)	5053.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.34	Wt. n-Val.		0.025	
E.G. Elev (ft)	5060.71	Reach Len. (ft)	400.00	400.00	400.00
Crit W.S. (ft)	5055.56	Flow Area (sq ft)		703.92	
E.G. Slope (ft/ft)	0.013293	Area (sq ft)		703.92	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	120.70	Top Width (ft)		120.70	
Vel Total (ft/s)	21.74	Avg. Vel. (ft/s)		21.74	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		5.83	
Conv. Total (cfs)	132703.8	Conv. (cfs)		132703.8	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		124.61	
Min Ch El (ft)	5047.00	Shear (lb/sq ft)		4.69	
Alpha	1.00	Stream Power (lb/ft s)		101.89	
Frctn Loss (ft)	2.87	Cum Volume (acre-ft)		40.32	
C & E Loss (ft)	0.15	Cum SA (acres)		5.86	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 8 Profile: PF#1

W.S. Elev (ft)	5049.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	6.14	Wt. n-Val.		0.025	
E.G. Elev (ft)	5055.84	Reach Len. (ft)	440.00	440.00	440.00
Crit W.S. (ft)	5051.32	Flow Area (sq ft)		769.35	
E.G. Slope (ft/ft)	0.009811	Area (sq ft)		769.35	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	120.60	Top Width (ft)		120.60	
Vel Total (ft/s)	19.89	Avg. Vel. (ft/s)		19.89	
Max Chl Dpth (ft)	7.70	Hydr. Depth (ft)		6.38	
Conv. Total (cfs)	154466.4	Conv. (cfs)		154466.4	
Length Wtd. (ft)	440.00	Wetted Per. (ft)		123.92	
Min Ch El (ft)	5042.00	Shear (lb/sq ft)		3.80	
Alpha	1.00	Stream Power (lb/ft s)		75.62	
Frctn Loss (ft)	4.53	Cum Volume (acre-ft)		33.56	
C & E Loss (ft)	0.36	Cum SA (acres)		4.76	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 7 Profile: PF#1

W.S. Elev (ft)	5043.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	5050.44	Reach Len. (ft)	66.00	66.00	66.00
Crit W.S. (ft)	5045.44	Flow Area (sq ft)		714.24	
E.G. Slope (ft/ft)	0.015196	Area (sq ft)		714.24	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	120.28	Top Width (ft)		120.28	
Vel Total (ft/s)	21.42	Avg. Vel. (ft/s)		21.42	
Max Chl Dpth (ft)	7.31	Hydr. Depth (ft)		5.94	
Conv. Total (cfs)	124117.4	Conv. (cfs)		124117.4	
Length Wtd. (ft)	66.00	Wetted Per. (ft)		142.87	
Min Ch El (ft)	5036.00	Shear (lb/sq ft)		4.74	
Alpha	1.00	Stream Power (lb/ft s)		101.59	
Frctn Loss (ft)	5.31	Cum Volume (acre-ft)		26.07	
C & E Loss (ft)	0.10	Cum SA (acres)		3.54	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 6 Profile: PF#1

W.S. Elev (ft)	5041.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.41	Wt. n-Val.		0.025	
E.G. Elev (ft)	5049.29	Reach Len. (ft)	190.00	165.00	145.00
Crit W.S. (ft)	5044.09	Flow Area (sq ft)		700.56	
E.G. Slope (ft/ft)	0.018162	Area (sq ft)		700.56	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	135.09	Top Width (ft)		135.09	
Vel Total (ft/s)	21.84	Avg. Vel. (ft/s)		21.84	
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		5.19	
Conv. Total (cfs)	113530.5	Conv. (cfs)		113530.5	
Length Wtd. (ft)	165.00	Wetted Per. (ft)		155.61	
Min Ch El (ft)	5035.50	Shear (lb/sq ft)		5.10	
Alpha	1.00	Stream Power (lb/ft s)		111.49	
Frctn Loss (ft)	1.10	Cum Volume (acre-ft)		24.99	
C & E Loss (ft)	0.03	Cum SA (acres)		3.35	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 5 Profile: PF#1

W.S. Elev (ft)	5038.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.53	Wt. n-Val.		0.025	
E.G. Elev (ft)	5046.42	Reach Len. (ft)	220.00	237.00	255.00
Crit W.S. (ft)	5041.30	Flow Area (sq ft)		694.84	
E.G. Slope (ft/ft)	0.016504	Area (sq ft)		694.84	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	139.51	Top Width (ft)		139.51	
Vel Total (ft/s)	22.02	Avg. Vel. (ft/s)		22.02	
Max Chl Dpth (ft)	5.89	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	119094.3	Conv. (cfs)		119094.3	
Length Wtd. (ft)	237.00	Wetted Per. (ft)		141.89	
Min Ch El (ft)	5033.00	Shear (lb/sq ft)		5.05	
Alpha	1.00	Stream Power (lb/ft s)		111.10	
Frctn Loss (ft)	2.85	Cum Volume (acre-ft)		22.35	
C & E Loss (ft)	0.01	Cum SA (acres)		2.83	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 4 Profile: PF#1

W.S. Elev (ft)	5039.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.21	Wt. n-Val.		0.025	
E.G. Elev (ft)	5043.32	Reach Len. (ft)	600.00	600.00	600.00
Crit W.S. (ft)	5039.42	Flow Area (sq ft)		929.31	
E.G. Slope (ft/ft)	0.005584	Area (sq ft)		929.31	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	124.27	Top Width (ft)		124.27	
Vel Total (ft/s)	16.46	Avg. Vel. (ft/s)		16.46	
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)		7.48	
Conv. Total (cfs)	204744.9	Conv. (cfs)		204744.9	
Length Wtd. (ft)	600.00	Wetted Per. (ft)		130.22	
Min Ch El (ft)	5031.00	Shear (lb/sq ft)		2.49	
Alpha	1.00	Stream Power (lb/ft s)		40.96	
Frctn Loss (ft)	2.11	Cum Volume (acre-ft)		17.93	
C & E Loss (ft)	1.00	Cum SA (acres)		2.11	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 3 Profile: PF#1

W.S. Elev (ft)	5029.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.65	Wt. n-Val.		0.025	
E.G. Elev (ft)	5036.89	Reach Len. (ft)	234.00	234.00	234.00
Crit W.S. (ft)	5031.02	Flow Area (sq ft)		689.53	
E.G. Slope (ft/ft)	0.023859	Area (sq ft)		689.53	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	79.76	Top Width (ft)		79.76	
Vel Total (ft/s)	22.19	Avg. Vel. (ft/s)		22.19	
Max Chl Dpth (ft)	8.99	Hydr. Depth (ft)		8.65	
Conv. Total (cfs)	99051.5	Conv. (cfs)		99051.5	
Length Wtd. (ft)		Wetted Per. (ft)		183.52	
Min Ch El (ft)	5020.25	Shear (lb/sq ft)		5.60	
Alpha	1.00	Stream Power (lb/ft s)		124.19	
Frctn Loss (ft)	6.09	Cum Volume (acre-ft)		6.78	
C & E Loss (ft)	0.34	Cum SA (acres)		0.70	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 2 Profile: PF#1

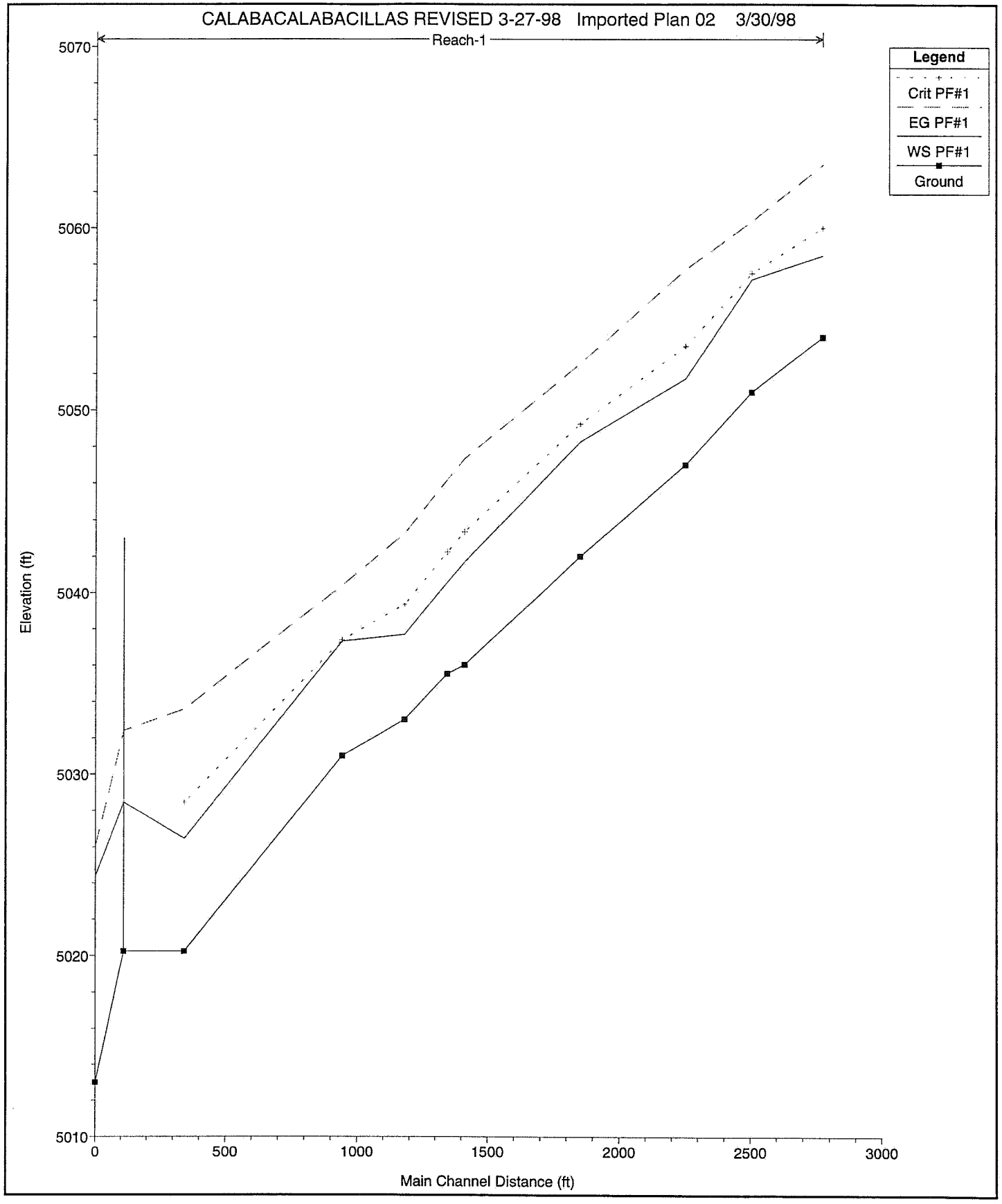
W.S. Elev (ft)	5031.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.26	Wt. n-Val.		0.025	
E.G. Elev (ft)	5036.28	Reach Len. (ft)	110.00	110.00	110.00
Crit W.S. (ft)	5031.02	Flow Area (sq ft)		831.22	
E.G. Slope (ft/ft)	0.014819	Area (sq ft)		831.22	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	79.77	Top Width (ft)		79.77	
Vel Total (ft/s)	18.41	Avg. Vel. (ft/s)		18.41	
Max Chl Dpth (ft)	10.77	Hydr. Depth (ft)		10.42	
Conv. Total (cfs)	125683.4	Conv. (cfs)		125683.4	
Length Wtd. (ft)		Wetted Per. (ft)		204.86	
Min Ch El (ft)	5020.25	Shear (lb/sq ft)		3.75	
Alpha	1.00	Stream Power (lb/ft s)		69.10	
Frctn Loss (ft)		Cum Volume (acre-ft)		2.70	
C & E Loss (ft)		Cum SA (acres)		0.28	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 1 Profile: PF#1

W.S. Elev (ft)	5026.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.13	Wt. n-Val.		0.025	
E.G. Elev (ft)	5029.11	Reach Len. (ft)			
Crit W.S. (ft)		Flow Area (sq ft)		1305.90	
E.G. Slope (ft/ft)	0.002031	Area (sq ft)		1305.90	
Q Total (cfs)	15300.00	Flow (cfs)		15300.00	
Top Width (ft)	138.22	Top Width (ft)		138.22	
Vel Total (ft/s)	11.72	Avg. Vel. (ft/s)		11.72	
Max Chl Dpth (ft)	13.98	Hydr. Depth (ft)		9.45	
Conv. Total (cfs)	339492.3	Conv. (cfs)		339492.3	
Length Wtd. (ft)		Wetted Per. (ft)		142.76	
Min Ch El (ft)	5013.00	Shear (lb/sq ft)		1.16	
Alpha	1.00	Stream Power (lb/ft s)		13.59	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	11	10000.00	5054.00	5058.48	5060.01	5063.50	0.017047	17.98	556.14	156.50	1.68
Reach-1	10	10000.00	5051.00	5057.16	5057.50	5060.38	0.006185	14.40	694.46	125.65	1.08
Reach-1	9	10000.00	5047.00	5051.73	5053.51	5057.72	0.015595	19.64	509.08	115.34	1.65
Reach-1	8	10000.00	5042.00	5048.26	5049.24	5052.57	0.008980	16.68	599.66	115.09	1.29
Reach-1	7	10000.00	5036.00	5041.68	5043.35	5047.32	0.015570	19.05	524.92	112.09	1.55
Reach-1	6	10000.00	5035.50	5040.57	5042.23	5046.18	0.018406	19.01	526.11	130.84	1.67
Reach-1	5	10000.00	5033.00	5037.67	5039.34	5043.25	0.016756	18.95	527.58	134.65	1.69
Reach-1	4	10000.00	5031.00	5037.30	5037.38	5040.39	0.005559	14.12	708.16	119.87	1.02
Reach-1	3	10000.00	5020.25	5026.46	5028.45	5033.57	0.028505	21.40	467.35	79.73	1.56
Reach-1	2	10000.00	5020.25	5028.45	5028.45	5032.41	0.013098	15.97	626.01	79.75	1.00
Reach-1	1	10000.00	5013.00	5024.41		5026.06	0.002000	10.31	969.61	123.21	0.65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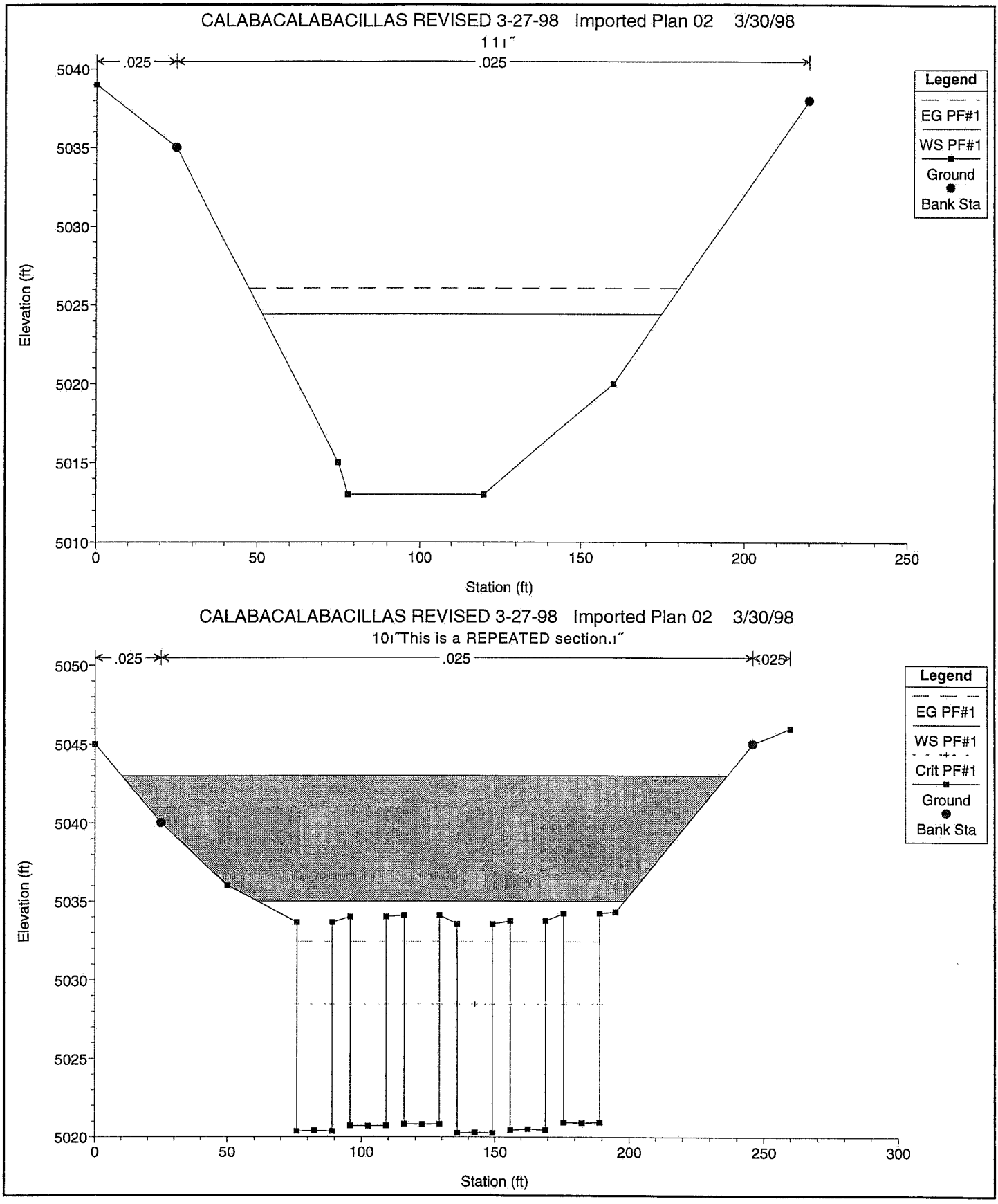
Reach-1
Legend
Crit PF#1
EG PF#1
WS PF#1
Ground
Elevation (ft)
5070
5060
5050
5040
5030
5020
5010
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)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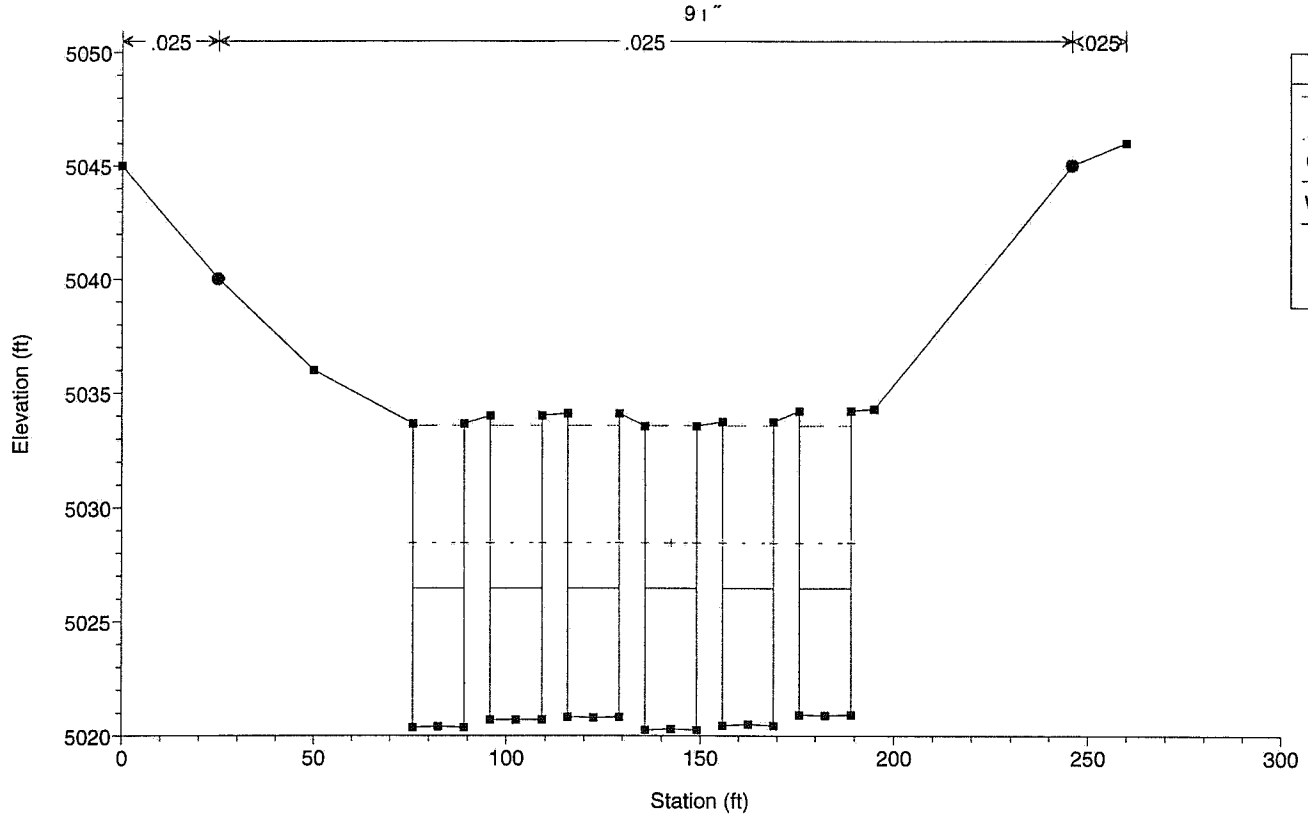
111"
.025
.025
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5040
5035
5030
5025
5020
5015
5010
0
50
100
150
200
250
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
101"This is a REPEATED section.1"
.025
.025
.025
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (ft)
5050
5045
5040
5035
5030
5025
5020
0
50
100
150
200
250
300
Station (ft)

CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98



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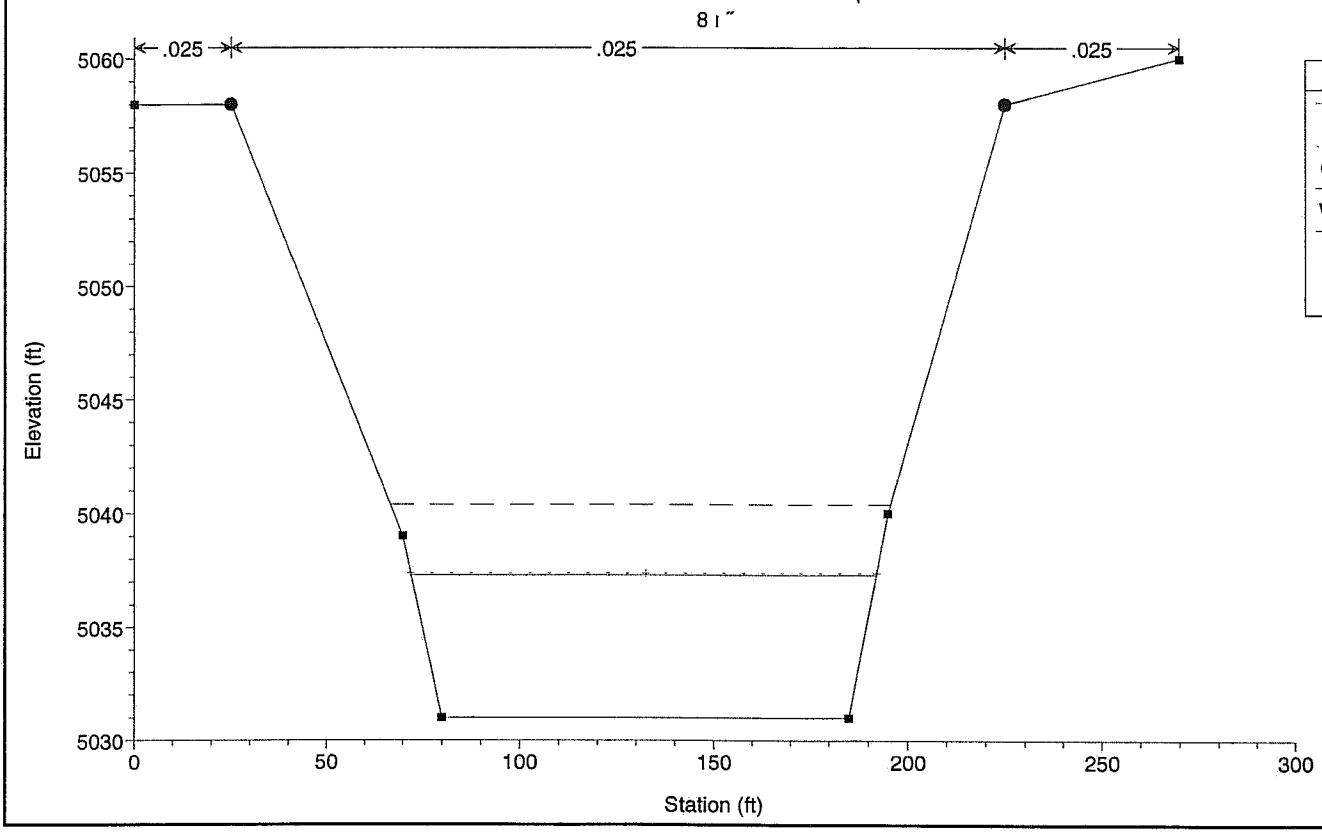

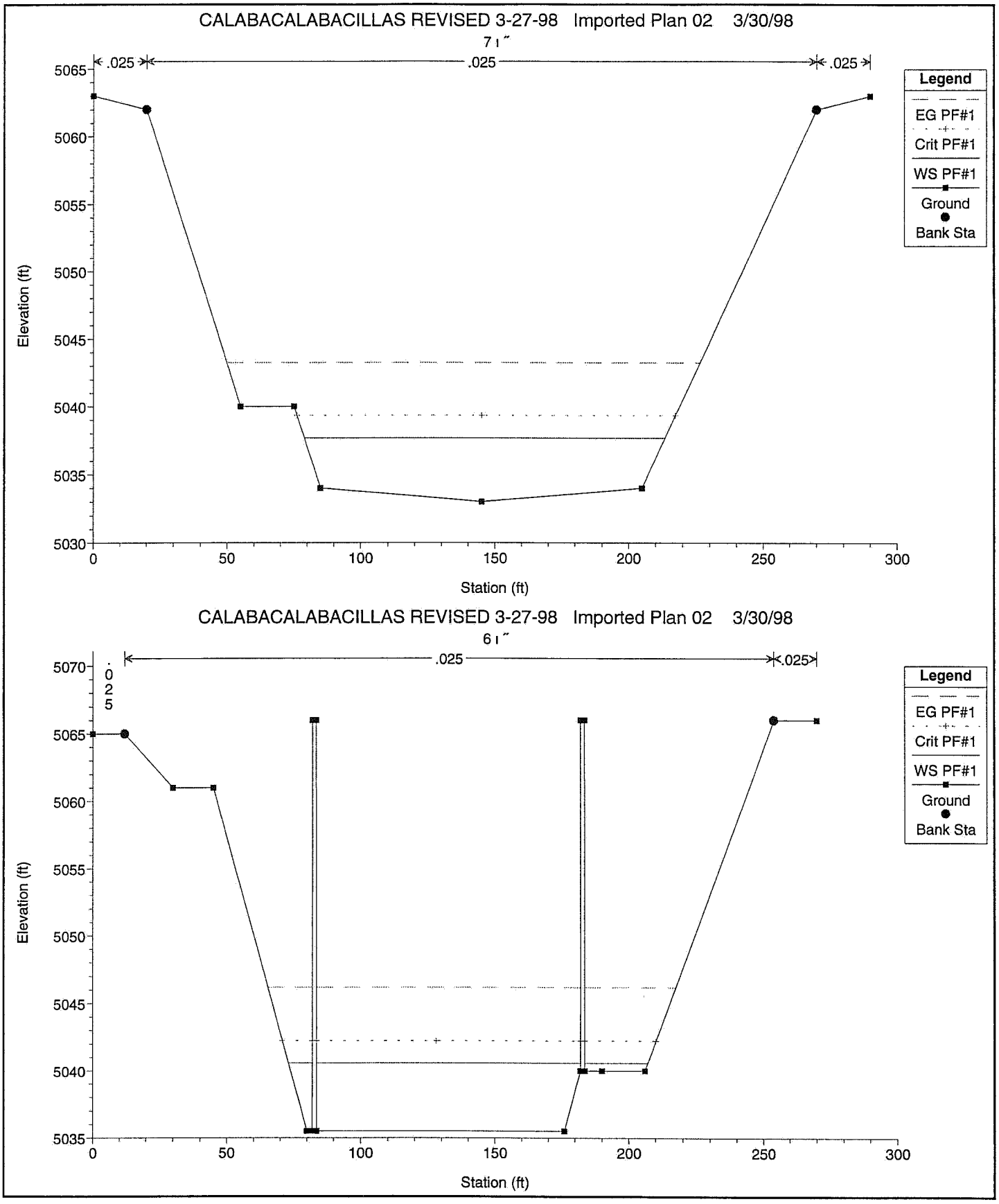
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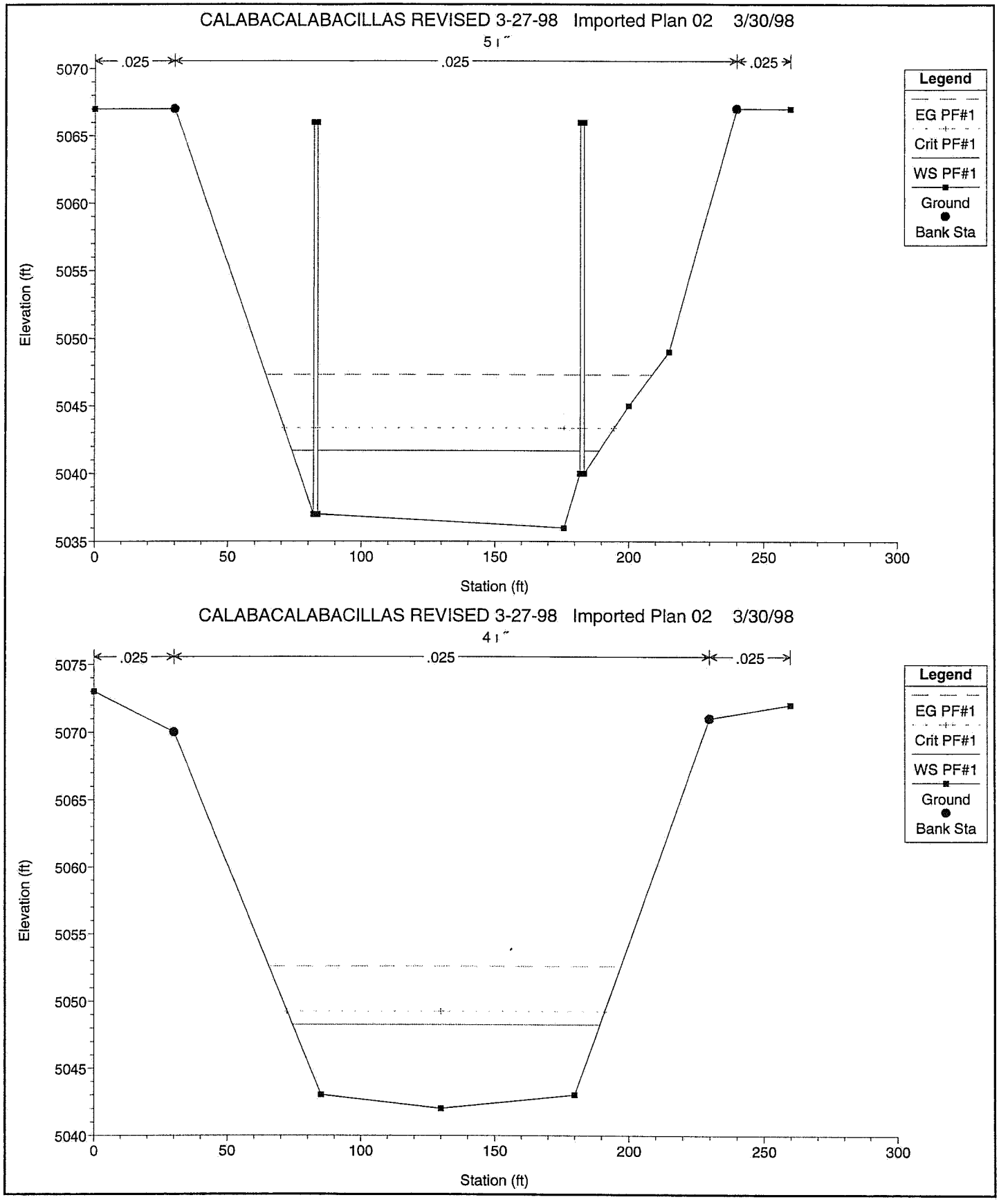
71"
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5065
5060
5055
5050
5045
5040
5035
5030
0
50
100
150
200
250
300
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
61"
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5070
5065
5060
5055
5050
5045
5040
5035
0
50
100
150
200
250
300
Station (ft)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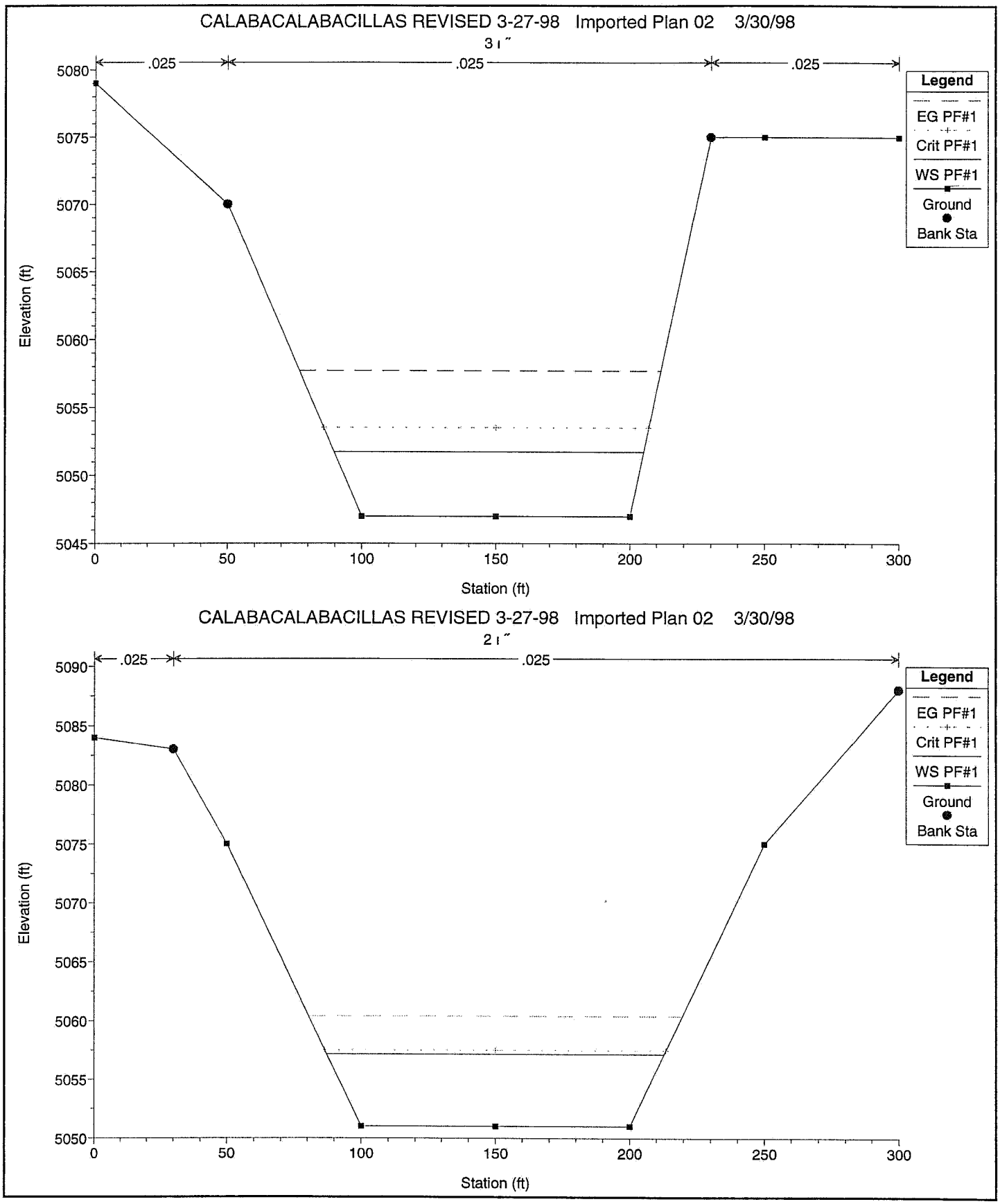
5 I "
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5070
5065
5060
5055
5050
5045
5040
5035
0
50
100
150
200
250
300
Station (ft)
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
4 I "
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5075
5070
5065
5060
5055
5050
5045
5040
0
50
100
150
200
250
300
Station (ft)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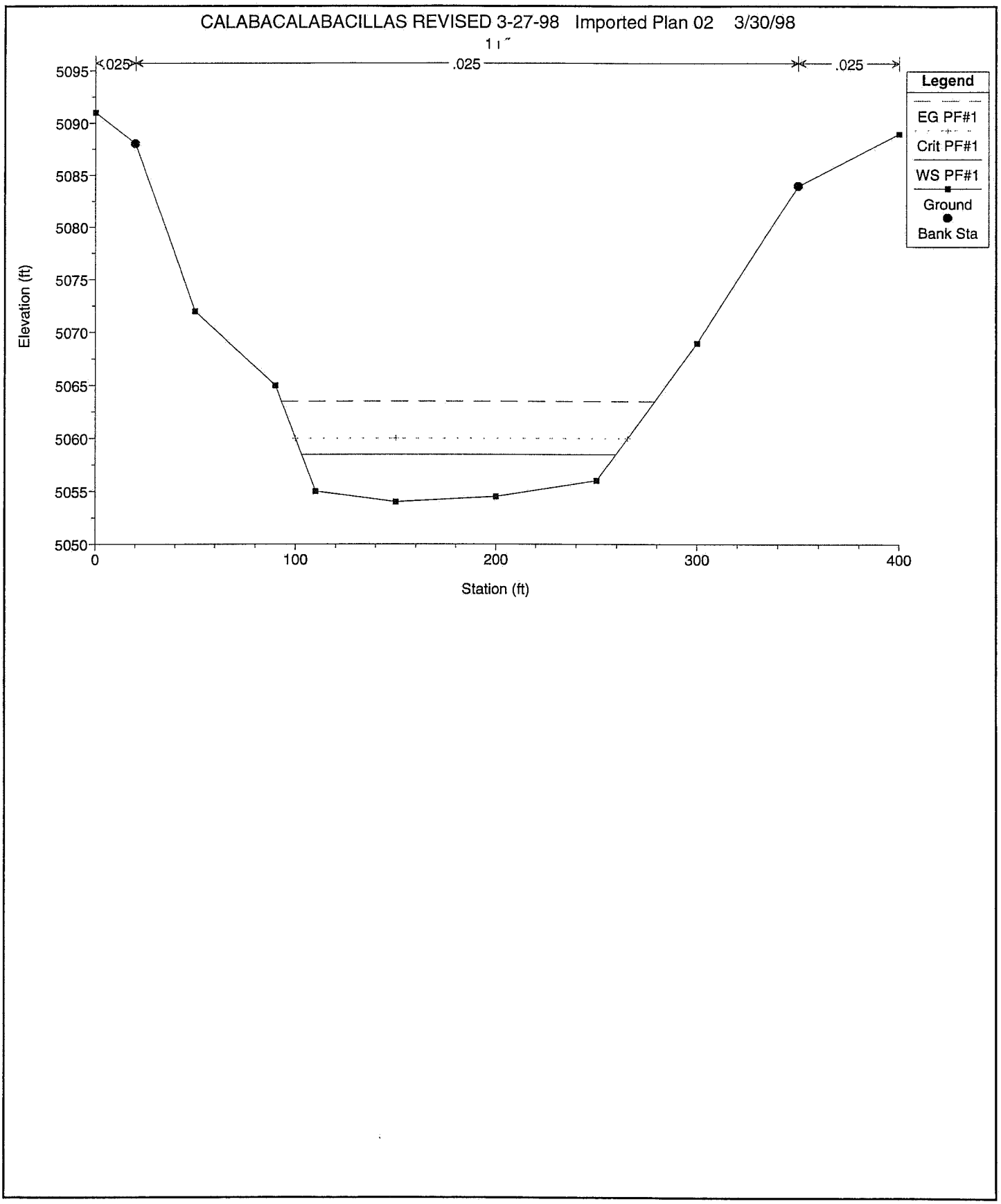
31"
.025
.025
.025
5080
5075
5070
5065
5060
5055
5050
5045
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
21"
.025
.025
5090
5085
5080
5075
5070
5065
5060
5055
5050
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


CALABACALABACILLAS REVISED 3-27-98 Imported Plan 02 3/30/98
.025
.025
.025
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (ft)
5095
5090
5085
5080
5075
5070
5065
5060
5055
5050
0
100
200
300
400
Station (ft)

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 11 Profile: PF#1

W.S. Elev (ft)	5058.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.02	Wt. n-Val.		0.025	
E.G. Elev (ft)	5063.50	Reach Len. (ft)	317.00	270.00	228.00
Crit W.S. (ft)	5060.01	Flow Area (sq ft)		556.14	
E.G. Slope (ft/ft)	0.017047	Area (sq ft)		556.14	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	156.50	Top Width (ft)		156.50	
Vel Total (ft/s)	17.98	Avg. Vel. (ft/s)		17.98	
Max Chl Dpth (ft)	4.48	Hydr. Depth (ft)		3.55	
Conv. Total (cfs)	76591.6	Conv. (cfs)		76591.6	
Length Wtd. (ft)	270.00	Wetted Per. (ft)		157.67	
Min Ch El (ft)	5054.00	Shear (lb/sq ft)		3.75	
Alpha	1.00	Stream Power (lb/ft s)		67.49	
Frctn Loss (ft)		Cum Volume (acre-ft)		37.34	
C & E Loss (ft)		Cum SA (acres)		7.22	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 10 Profile: PF#1

W.S. Elev (ft)	5057.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.22	Wt. n-Val.		0.025	
E.G. Elev (ft)	5060.38	Reach Len. (ft)	225.00	253.00	285.00
Crit W.S. (ft)	5057.50	Flow Area (sq ft)		694.46	
E.G. Slope (ft/ft)	0.006185	Area (sq ft)		694.46	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	125.65	Top Width (ft)		125.65	
Vel Total (ft/s)	14.40	Avg. Vel. (ft/s)		14.40	
Max Chl Dpth (ft)	6.16	Hydr. Depth (ft)		5.53	
Conv. Total (cfs)	127149.3	Conv. (cfs)		127149.3	
Length Wtd. (ft)	253.00	Wetted Per. (ft)		128.45	
Min Ch El (ft)	5051.00	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)		30.06	
Frctn Loss (ft)	2.59	Cum Volume (acre-ft)		33.47	
C & E Loss (ft)	0.54	Cum SA (acres)		6.34	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 9 Profile: PF#1

W.S. Elev (ft)	5051.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.99	Wt. n-Val.		0.025	
E.G. Elev (ft)	5057.72	Reach Len. (ft)	400.00	400.00	400.00
Crit W.S. (ft)	5053.51	Flow Area (sq ft)		509.08	
E.G. Slope (ft/ft)	0.015595	Area (sq ft)		509.08	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	115.34	Top Width (ft)		115.34	
Vel Total (ft/s)	19.64	Avg. Vel. (ft/s)		19.64	
Max Chl Dpth (ft)	4.73	Hydr. Depth (ft)		4.41	
Conv. Total (cfs)	80077.4	Conv. (cfs)		80077.4	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		118.24	
Min Ch El (ft)	5047.00	Shear (lb/sq ft)		4.19	
Alpha	1.00	Stream Power (lb/ft s)		82.34	
Frctn Loss (ft)	2.36	Cum Volume (acre-ft)		29.97	
C & E Loss (ft)	0.28	Cum SA (acres)		5.64	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 8 Profile: PF#1

W.S. Elev (ft)	5048.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.32	Wt. n-Val.		0.025	
E.G. Elev (ft)	5052.57	Reach Len. (ft)	440.00	440.00	440.00
Crit W.S. (ft)	5049.24	Flow Area (sq ft)		599.66	
E.G. Slope (ft/ft)	0.008980	Area (sq ft)		599.66	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	115.09	Top Width (ft)		115.09	
Vel Total (ft/s)	16.68	Avg. Vel. (ft/s)		16.68	
Max Chl Dpth (ft)	6.26	Hydr. Depth (ft)		5.21	
Conv. Total (cfs)	105527.5	Conv. (cfs)		105527.5	
Length Wtd. (ft)	440.00	Wetted Per. (ft)		117.71	
Min Ch El (ft)	5042.00	Shear (lb/sq ft)		2.86	
Alpha	1.00	Stream Power (lb/ft s)		47.63	
Frctn Loss (ft)	4.64	Cum Volume (acre-ft)		24.88	
C & E Loss (ft)	0.50	Cum SA (acres)		4.59	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 7 Profile: PF#1

W.S. Elev (ft)	5041.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.64	Wt. n-Val.		0.025	
E.G. Elev (ft)	5047.32	Reach Len. (ft)	66.00	66.00	66.00
Crit W.S. (ft)	5043.35	Flow Area (sq ft)		524.92	
E.G. Slope (ft/ft)	0.015570	Area (sq ft)		524.92	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	112.09	Top Width (ft)		112.09	
Vel Total (ft/s)	19.05	Avg. Vel. (ft/s)		19.05	
Max Chl Dpth (ft)	5.68	Hydr. Depth (ft)		4.68	
Conv. Total (cfs)	80141.6	Conv. (cfs)		80141.6	
Length Wtd. (ft)	66.00	Wetted Per. (ft)		127.51	
Min Ch El (ft)	5036.00	Shear (lb/sq ft)		4.00	
Alpha	1.00	Stream Power (lb/ft s)		76.23	
Frctn Loss (ft)	5.11	Cum Volume (acre-ft)		19.20	
C & E Loss (ft)	0.13	Cum SA (acres)		3.44	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 6 Profile: PF#1

W.S. Elev (ft)	5040.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.61	Wt. n-Val.		0.025	
E.G. Elev (ft)	5046.18	Reach Len. (ft)	190.00	165.00	145.00
Crit W.S. (ft)	5042.23	Flow Area (sq ft)		526.11	
E.G. Slope (ft/ft)	0.018406	Area (sq ft)		526.11	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	130.84	Top Width (ft)		130.84	
Vel Total (ft/s)	19.01	Avg. Vel. (ft/s)		19.01	
Max Chl Dpth (ft)	5.07	Hydr. Depth (ft)		4.02	
Conv. Total (cfs)	73709.8	Conv. (cfs)		73709.8	
Length Wtd. (ft)	165.00	Wetted Per. (ft)		145.37	
Min Ch El (ft)	5035.50	Shear (lb/sq ft)		4.16	
Alpha	1.00	Stream Power (lb/ft s)		79.04	
Frctn Loss (ft)	1.12	Cum Volume (acre-ft)		18.40	
C & E Loss (ft)	0.00	Cum SA (acres)		3.25	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 5 Profile: PF#1

W.S. Elev (ft)	5037.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.58	Wt. n-Val.		0.025	
E.G. Elev (ft)	5043.25	Reach Len. (ft)	220.00	237.00	255.00
Crit W.S. (ft)	5039.34	Flow Area (sq ft)		527.58	
E.G. Slope (ft/ft)	0.016756	Area (sq ft)		527.58	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	134.65	Top Width (ft)		134.65	
Vel Total (ft/s)	18.95	Avg. Vel. (ft/s)		18.95	
Max Chl Dpth (ft)	4.67	Hydr. Depth (ft)		3.92	
Conv. Total (cfs)	77251.8	Conv. (cfs)		77251.8	
Length Wtd. (ft)	237.00	Wetted Per. (ft)		136.44	
Min Ch El (ft)	5033.00	Shear (lb/sq ft)		4.05	
Alpha	1.00	Stream Power (lb/ft s)		76.67	
Frctn Loss (ft)	2.90	Cum Volume (acre-ft)		16.41	
C & E Loss (ft)	0.00	Cum SA (acres)		2.75	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 4 Profile: PF#1

W.S. Elev (ft)	5037.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.10	Wt. n-Val.		0.025	
E.G. Elev (ft)	5040.39	Reach Len. (ft)	600.00	600.00	600.00
Crit W.S. (ft)	5037.38	Flow Area (sq ft)		708.16	
E.G. Slope (ft/ft)	0.005559	Area (sq ft)		708.16	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	119.87	Top Width (ft)		119.87	
Vel Total (ft/s)	14.12	Avg. Vel. (ft/s)		14.12	
Max Chl Dpth (ft)	6.30	Hydr. Depth (ft)		5.91	
Conv. Total (cfs)	134121.4	Conv. (cfs)		134121.4	
Length Wtd. (ft)	600.00	Wetted Per. (ft)		124.50	
Min Ch El (ft)	5031.00	Shear (lb/sq ft)		1.97	
Alpha	1.00	Stream Power (lb/ft s)		27.88	
Frctn Loss (ft)	2.12	Cum Volume (acre-ft)		13.05	
C & E Loss (ft)	0.75	Cum SA (acres)		2.06	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 3 Profile: PF#1

W.S. Elev (ft)	5026.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.11	Wt. n-Val.		0.025	
E.G. Elev (ft)	5033.57	Reach Len. (ft)	234.00	234.00	234.00
Crit W.S. (ft)	5028.45	Flow Area (sq ft)		467.35	
E.G. Slope (ft/ft)	0.028505	Area (sq ft)		467.35	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	79.73	Top Width (ft)		79.73	
Vel Total (ft/s)	21.40	Avg. Vel. (ft/s)		21.40	
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)		5.86	
Conv. Total (cfs)	59229.4	Conv. (cfs)		59229.4	
Length Wtd. (ft)		Wetted Per. (ft)		150.10	
Min Ch El (ft)	5020.25	Shear (lb/sq ft)		5.54	
Alpha	1.00	Stream Power (lb/ft s)		118.56	
Frctn Loss (ft)	6.42	Cum Volume (acre-ft)		4.95	
C & E Loss (ft)	0.40	Cum SA (acres)		0.68	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 2 Profile: PF#1

W.S. Elev (ft)	5028.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.96	Wt. n-Val.		0.025	
E.G. Elev (ft)	5032.41	Reach Len. (ft)	110.00	110.00	110.00
Crit W.S. (ft)	5028.45	Flow Area (sq ft)		626.01	
E.G. Slope (ft/ft)	0.013098	Area (sq ft)		626.01	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	79.75	Top Width (ft)		79.75	
Vel Total (ft/s)	15.97	Avg. Vel. (ft/s)		15.97	
Max Chl Dpth (ft)	8.20	Hydr. Depth (ft)		7.85	
Conv. Total (cfs)	87378.3	Conv. (cfs)		87378.3	
Length Wtd. (ft)		Wetted Per. (ft)		173.96	
Min Ch El (ft)	5020.25	Shear (lb/sq ft)		2.94	
Alpha	1.00	Stream Power (lb/ft s)		47.01	
Frctn Loss (ft)		Cum Volume (acre-ft)		2.01	
C & E Loss (ft)		Cum SA (acres)		0.26	

Plan: Imported Pla River: RIVER-1 Reach:Reach-1 Riv Sta: 1 Profile: PF#1

W.S. Elev (ft)	5024.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.65	Wt. n-Val.		0.025	
E.G. Elev (ft)	5026.06	Reach Len. (ft)			
Crit W.S. (ft)		Flow Area (sq ft)		969.61	
E.G. Slope (ft/ft)	0.002000	Area (sq ft)		969.61	
Q Total (cfs)	10000.00	Flow (cfs)		10000.00	
Top Width (ft)	123.21	Top Width (ft)		123.21	
Vel Total (ft/s)	10.31	Avg. Vel. (ft/s)		10.31	
Max Chl Dpth (ft)	11.41	Hydr. Depth (ft)		7.87	
Conv. Total (cfs)	223589.2	Conv. (cfs)		223589.2	
Length Wtd. (ft)		Wetted Per. (ft)		126.88	
Min Ch El (ft)	5013.00	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		9.84	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Figure 1, Santa Clara & Aztec
Figure 2, Bice Road
Figure 3, Holly Avenue

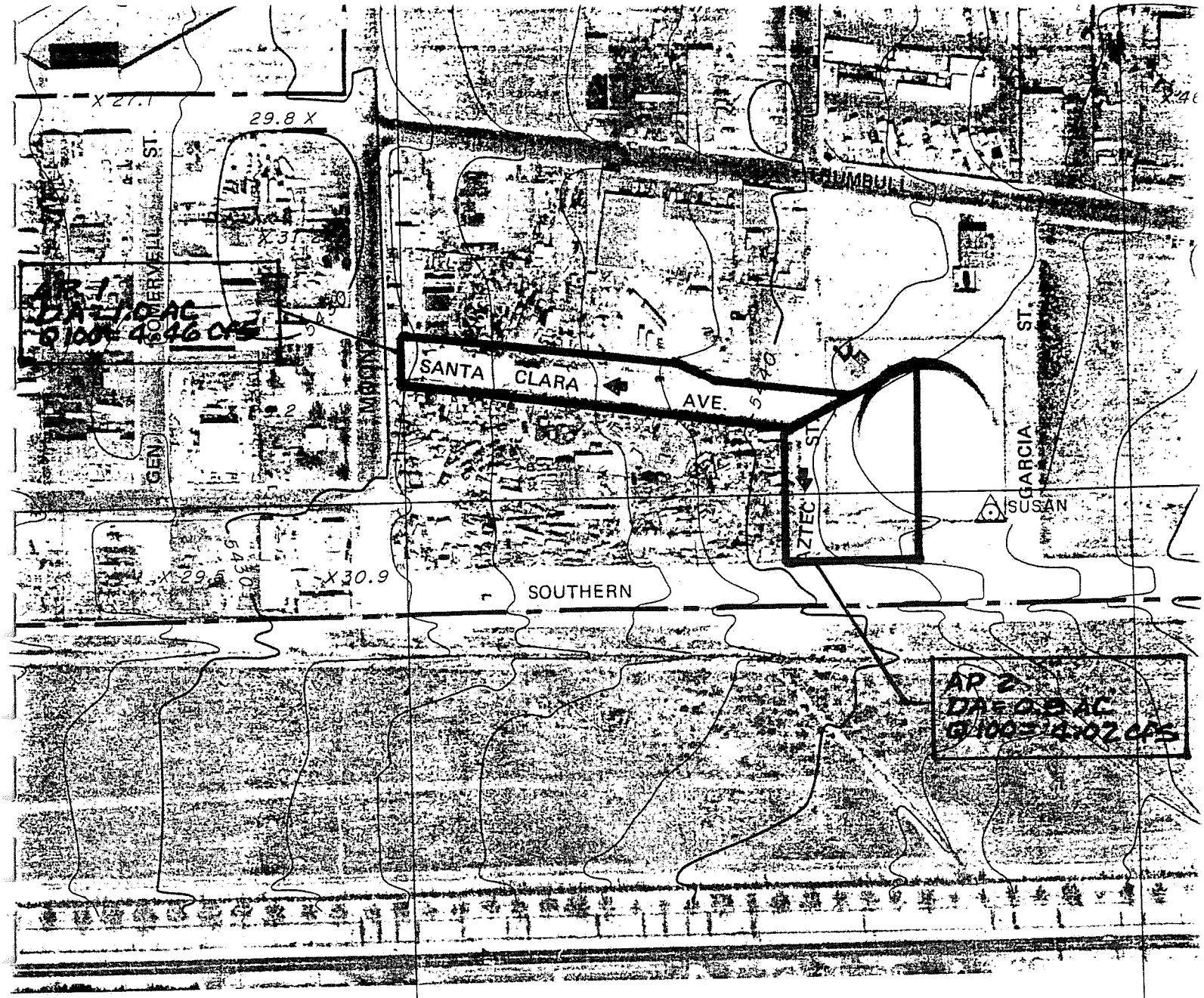


FIGURE 1
SANTA CLARA & AZTEC

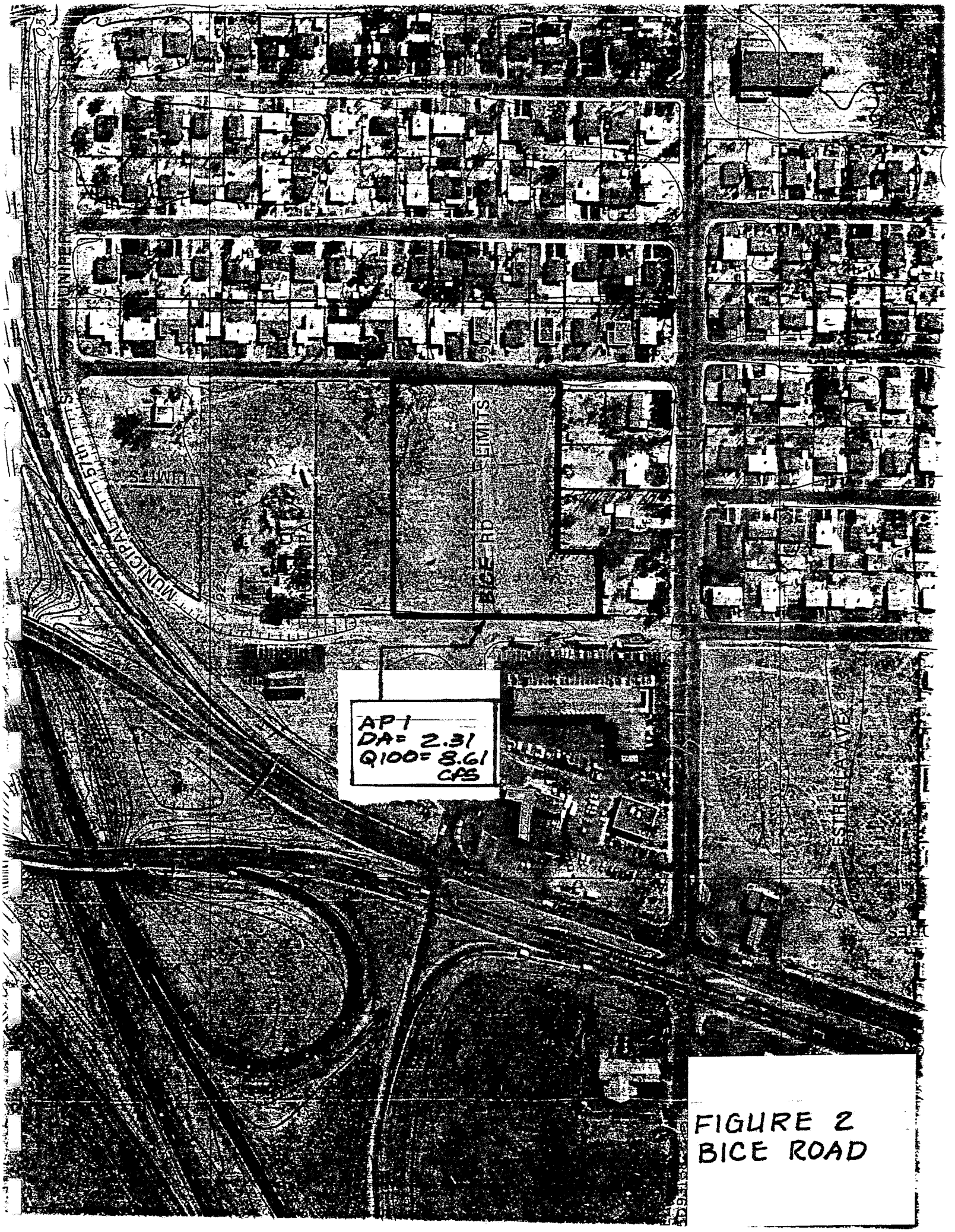


FIGURE 2
BICE ROAD

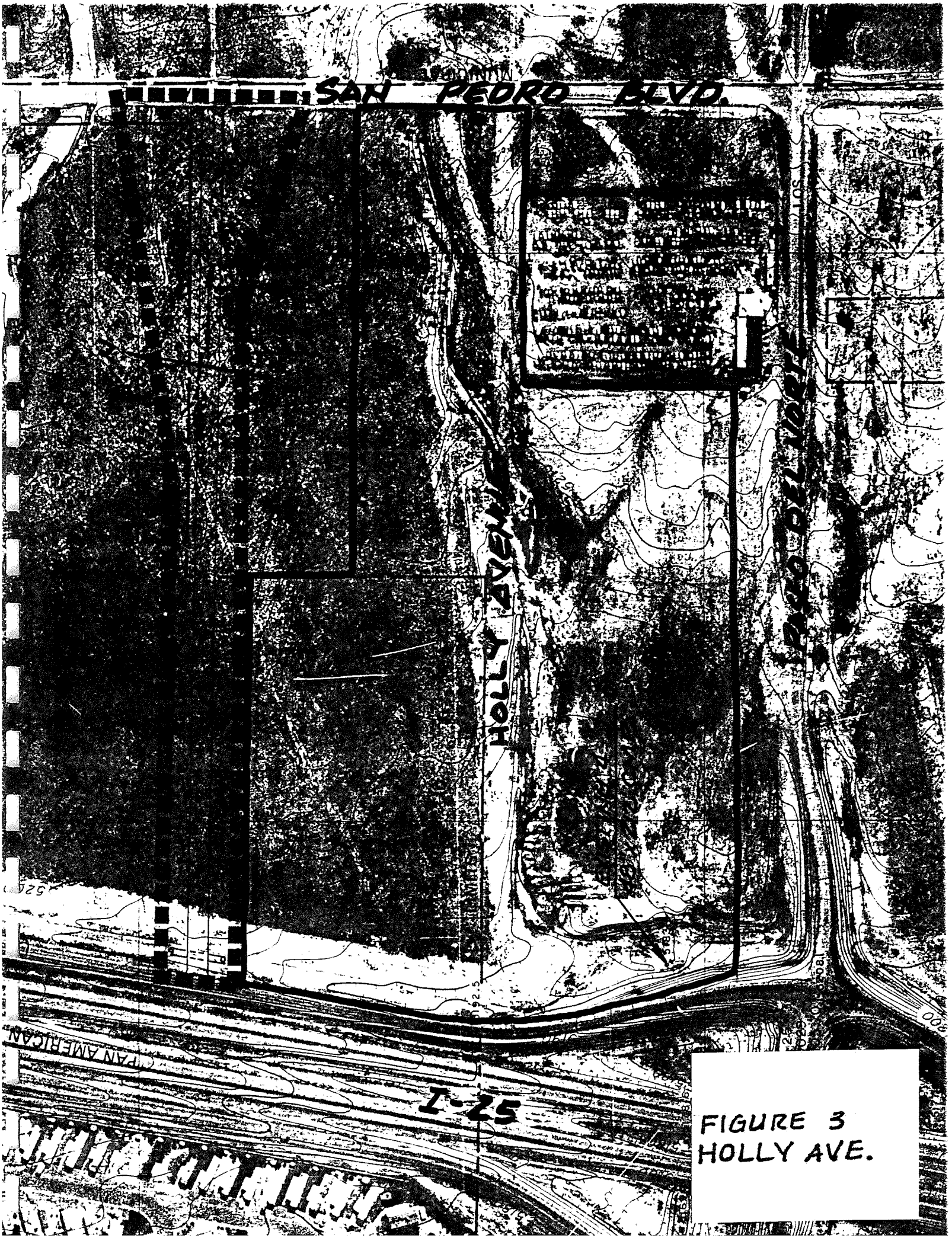


FIGURE 3
HOLLY AVE.

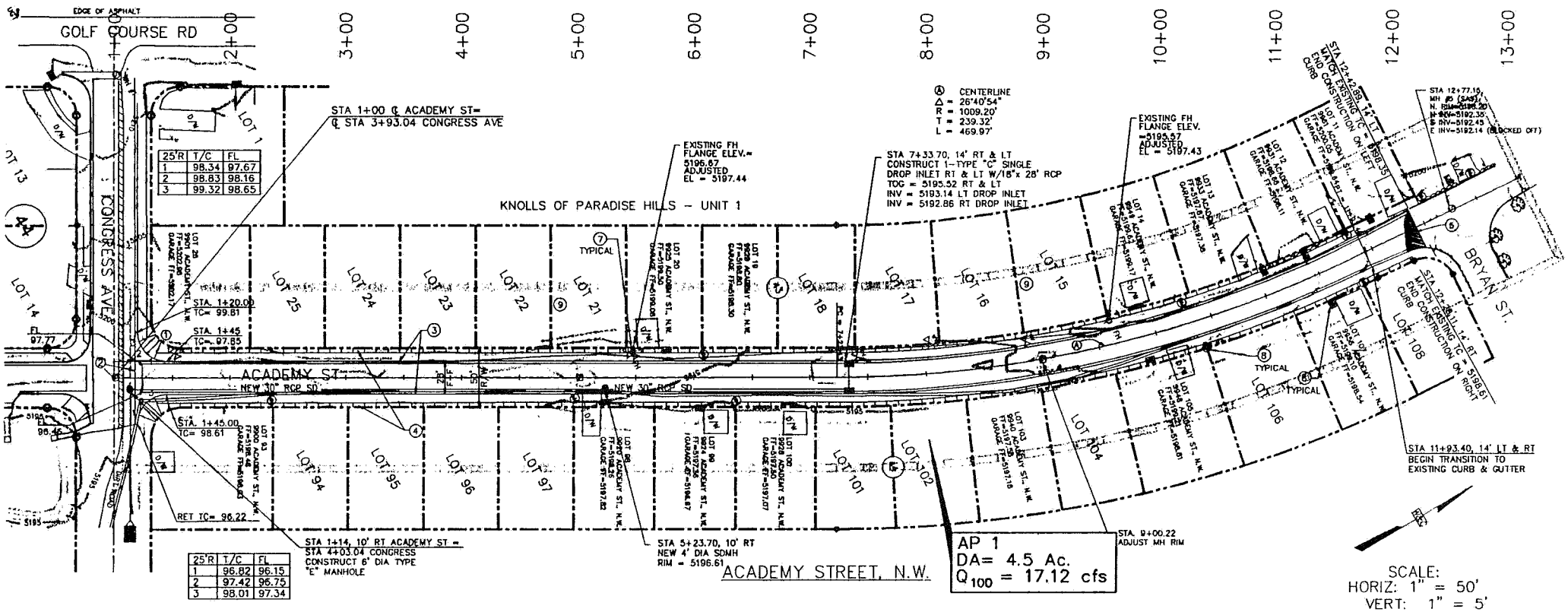

EDGE OF ASPHALT
GOLF COURSE RD
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
13+00
CONGRESS AVE.
STA 1+00 ℄ ACADEMY ST=
℄ STA 3+93.04 CONGRESS AVE
25'R T/C FL
1 98.34 97.67
2 98.83 98.16
3 99.32 98.65
KNOLLS OF PARADISE HILLS - UNIT 1
CENTERLINE
Δ = 26°40'54"
R = 1009.20'
T = 239.32'
L = 469.97'
EXISTING FH FLANGE ELEV.= 5196.67 ADJUSTED EL = 5197.44
STA 7+33.70, 14' RT & LT
CONSTRUCT 1-TYPE "C" SINGLE DROP INLET RT & LT W/18"x 28' RCP
TOG = 5195.52 RT & LT
INV = 5193.14 LT DROP INLET
INV = 5192.86 RT DROP INLET
EXISTING FH FLANGE ELEV. =5193.97 ADJUSTED EL = 5197.43
STA 12+40.89 MATCH EXISTING C & G END CONSTRUCTION ON LEFT
STA 12+77.10 MH #5 (SAN) N. RIM=5196.20 N INV=5192.35 S INV=5192.45 E INV=5192.14 (BLOCKED OFF)
STA 12+81.14 RT MATCH EXISTING C & G END CONSTRUCTION ON RIGHT
BRYAN ST.
ACADEMY ST.
NEW 30" RCP SD
STA 1+20.00 TC= 99.81
STA 1+45 TC= 97.85
STA 1+45.00 TC= 98.61
RET TC= 96.22
STA 1+14, 10' RT ACADEMY ST = STA 4+03.04 CONGRESS CONSTRUCT 6' DIA TYPE "E" MANHOLE
25'R T/C FL
1 96.82 96.15
2 97.42 96.75
3 98.01 97.34
STA 5+23.70, 10' RT NEW 4' DIA SDMH RIM = 5196.61
ACADEMY STREET, N.W.
AP 1
DA= 4.5 Ac.
Q100 = 17.12 cfs
STA. 9+00.22 ADJUST MH RIM
STA 11+93.40, 14' LT & RT BEGIN TRANSITION TO EXISTING CURB & GUTTER
TYPICAL
LOT 108
LOT 106
LOT 104
LOT 102
LOT 101
LOT 97
LOT 96
LOT 95
LOT 94
LOT 25
LOT 24
LOT 23
LOT 22
LOT 21
LOT 18
LOT 17
LOT 16
LOT 15
LOT 14
LOT 13
LOT 1
SCALE:
HORIZ: 1" = 50'
VERT: 1" = 5'

Plate 1, Volcano Cliffs Subdivision
Plate 2, Staghorn Drive
Plate 3, Eagle Ranch Road
Plate 4, Grade Control Structure