FLOODPLAIN EVALUATION STUDY FOR MALIBU CREEK NEAR THE TAPIA WATER RECLAMATION FACILITY

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1.0 INTRODUCTION

The Tapia Water Reclamation Facility is located in Los Angeles County on the south bank of Malibu Creek, just upstream of the Malibu Canyon Road Bridge (see Figure 1.1). Across from the plant is a park which becomes partially flooded during high flows. Along the low flow channel of Malibu Creek is an intermittent corridor of willow vegetation.

A floodplain delineation study was performed by the Los Angeles County Flood Control District in 1965. This study indicated that the Tapia Water Reclamation Facility was outside of the floodplain boundary except for some storage buildings on the northwest corner of the plant (see Figure 1.2). Subsequent to this study, a floodwall was constructed on this part of the site so that the entire facility would be outside of the floodplain.

In December, 1989, Rivertech, Inc. was contacted in order to perform additional floodplain evaluation studies for Malibu Creek near the Tapia Water Reclamation Facility. The objective of this study is to provide an updated analysis of the floodplain elevation which addresses the following factors:

1. The effect of upstream development in the Malibu Creek Watershed on the design hydrology.

2. The effect of willow vegetation along the low flow channel on the floodplain elevation.

3. The effect of debris blockage at the Malibu Canyon Road bridge on the floodplain elevation.

By addressing each one of these factors, an updated floodplain boundary will be determined. This will then be compared to the existing bank elevations along the Tapia Water Reclamation Facility to determine if additional flood protection measures are required.

The structure of this report is first an outline of background information on Malibu Creek and the surrounding watershed. Second is a discussion of the design hydrology. Third is an evaluation of channel vegetation impacts. Fourth is the computation of floodplain elevations. This is followed by a list of study conclusions.

Figure 1.1 Location Map

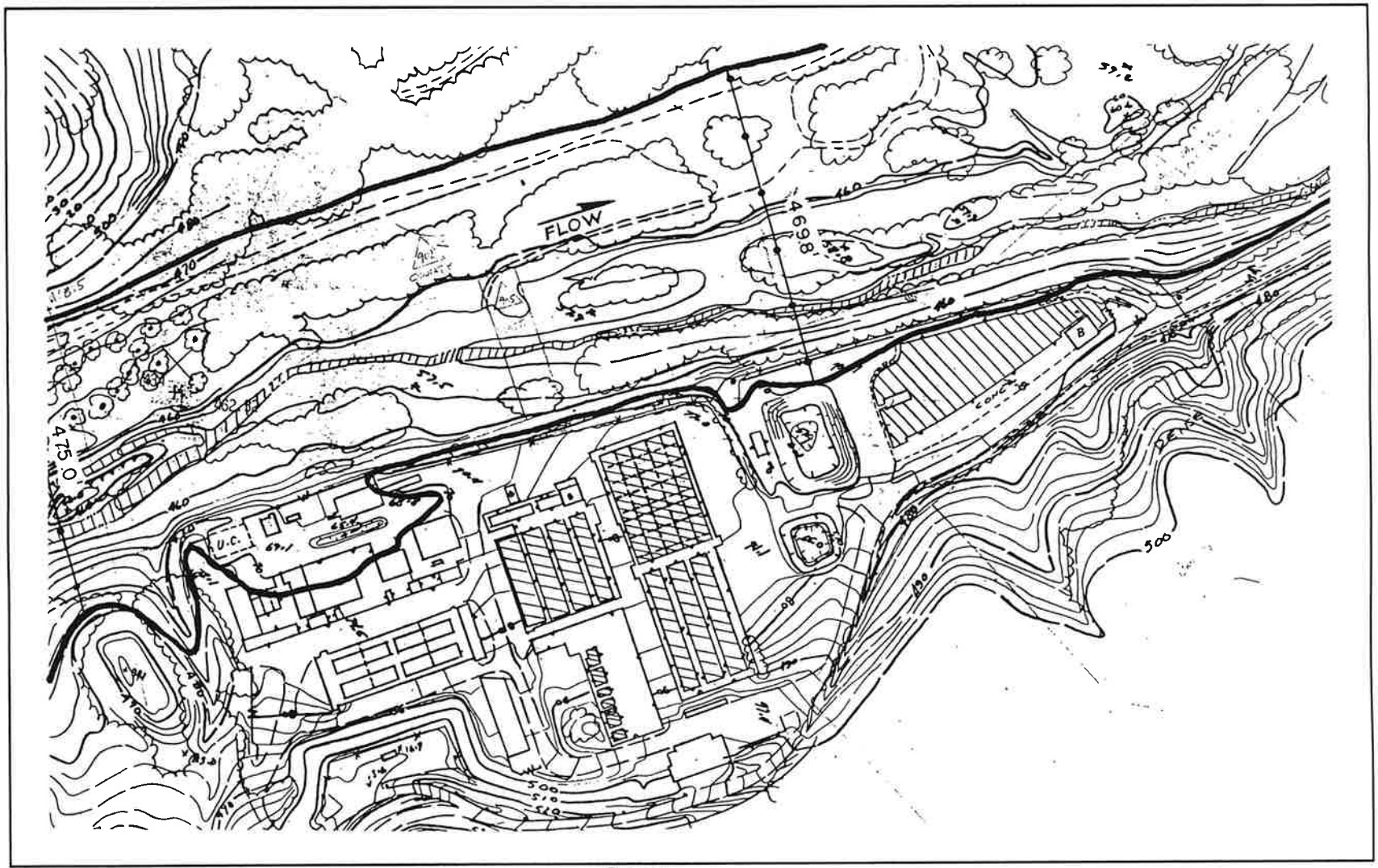


Figure 1.2 Floodplain Boundary from Los Angeles County Flood Control District.

2.0 MALIBU CREEK BACKGROUND INFORMATION

The Malibu Creek watershed covers approximately 120 square miles in Los Angeles and Ventura Counties (see Plate 1). Most of the drainage area is comprised of steep undeveloped terrain. The State Highway 101 corridor in the north part of the basin is the focus of the vast majority of the development that will occur in the watershed. The southern part of the basin is much steeper and precludes high density development. Most of this area will be left in its natural state or will have large residential lots which do not increase runoff to any significant degree.

The Tapia Water Reclamation Facility is located on the south bank of Malibu Creek just upstream of the Malibu Canyon Road bridge. The facility is approximately 5 miles upstream of the coast. Approximately 3 miles upstream of the coast is a dam and a reservoir which are completely filled with sediment deposits. The spillway crest elevation of this dam is 289 feet. All hydraulic analysis done in this study starts the dam because it acts as a hydraulic control.

Figure 2.1 shows a profile plot of the Malibu Creek streambed. The abandoned dam is the reference point for the stations on the profile plot. There are two reservoirs (Century and Malibu) upstream of the Tapia facility. Also, at approximately Station 75+00, there is a noticeable change in the slope of the riverbed. Downstream from this point, the average slope is 3.1%. Upstream from this point, the average slope is 0.5%.

Figure 2.2 shows an enlarged profile plot of the streambed in the vicinity of the Tapia facility. In general, flow depths can reach 16 to 18 feet before overtopping the south bank. The Malibu Canyon Road bridge is at Station 98+40. The bridge has three spans and two concrete piers in the channel.

Across the channel from the water reclamation facility is Tapia Park. A portion of this park is flooded during large events. The flood overbank area of the park consists of sparse perennial grasses and scattered sycamore trees. The willow vegetation in the Malibu Creek Channel does not spread to the overbank area because of park maintenance and seasonal use by park-goers.

The local watershed near the Tapia Water Reclamation Facility is effectively undeveloped. The terrain is very steep and covered with sagebrush and native grasses. Historical floods in the area occasionally remove the channel vegetation. This happened at least two times recently. Once in 1969 and again in 1983. The watershed area for Malibu Creek at the Malibu Canyon Road bridge is approximately 95 square miles. Plate 1 shows a map of the watershed boundary. the watershed is primarily in Los Angeles County with the northwest corner extending into Ventura County. The majority of land area which drains into Malibu Creek is in the Santa Monica Mountains National Recreation Area. The Highway 101 corridor is the focus of urbanization within the watershed. There are also several small

reservoirs along Malibu Creek around which residential development will congregate.

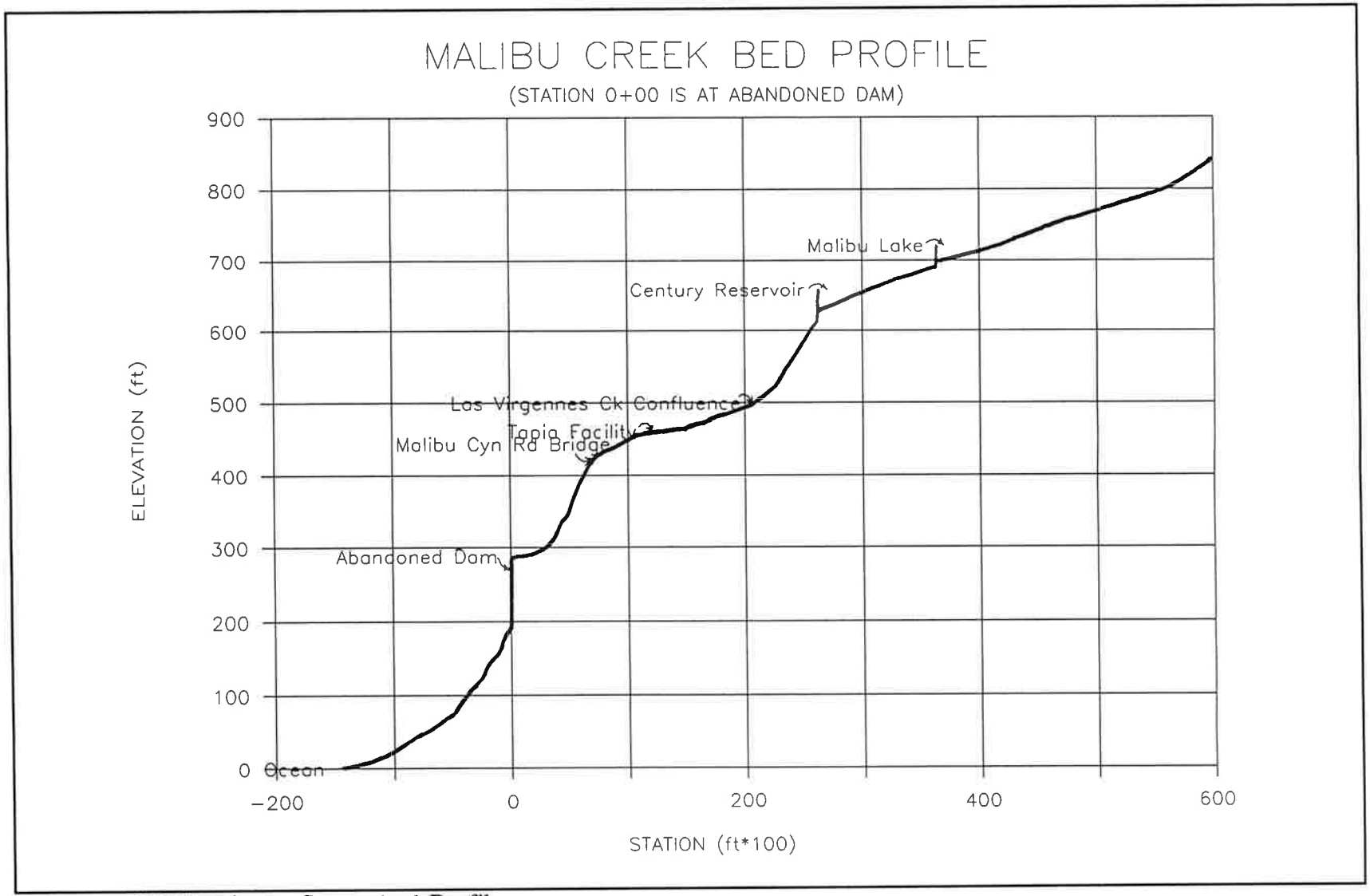


Figure 2.1 Malibu Creek Streambed Profile.

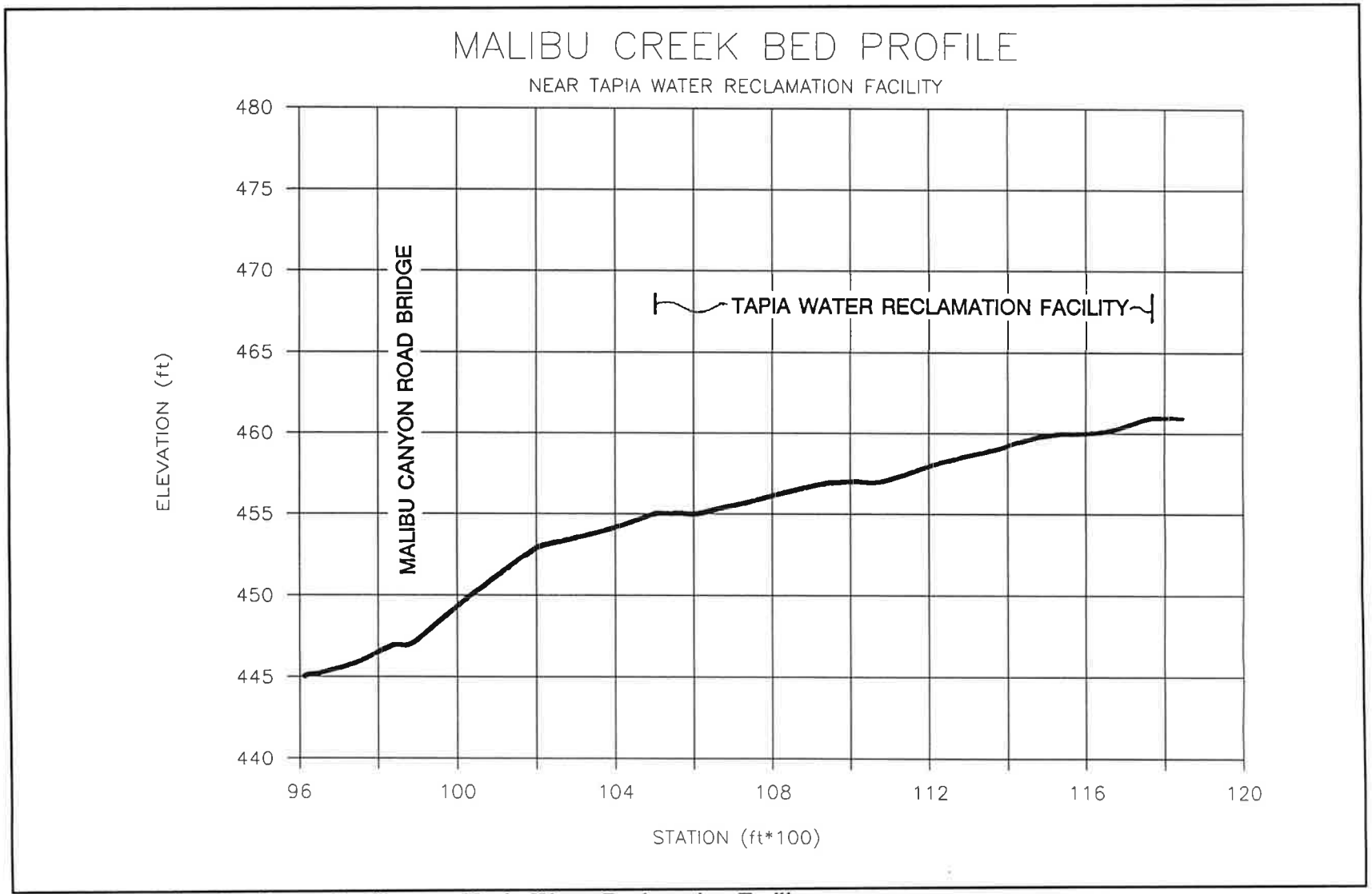


Figure 2.2 Malibu Creek Bed Profile near Tapia Water Reclamation Facility.

3.0 HYDROLOGY

As part of this study, the design hydrology was investigated. Typically, flood plain boundaries are determined using the 100-year discharge or the discharge which has a one percent probability of occurring in any particular year. This discharge is usually determined by a regression analysis of measured peak historical discharges. In Los Angeles County, the adopted design discharge is the computed runoff for the Capitol Storm Event. This storm event has an approximate 50-year recurrence interval or a two percent chance of occurring in any particular year. The peak runoff rate from this storm is know as the capitol flood. In general, the computed capitol flood discharge is much higher than the 100-year discharge determined by the regression analysis of gaged stream flow data. Before the capitol flood discharge is used for design purposes, an adjustment is made to account for increased runoff caused by a burned watershed and for flow bulking caused by entrainment of sediment.

Both the U.S. Army Corps of Engineers and the Federal Emergency Management Agency (FEMA) use the 100-year discharge for flood plain analysis. In order to arrive at a conservative determination of the floodplain boundary for Malibu Creek, and to be in conformance with Los Angeles County regulations, the burned and bulked condition capitol flood discharge will be used for this study.

3.1 Existing Studies

The Los Angeles County Flood Control District performed a floodplain study for Malibu Creek in 1965. Floodplain Map Nos. 104-ML-8 and 104-ML-9 were obtained from the county. The maps indicate that the design discharge for Malibu Creek near the Tapia Water Reclamation Facility is 41,800 cfs. this discharge was verified through a telephone conversation with Mr. Paul Cornish of the Hydrology Section, Los Angeles County Department of Public Works. The discharge includes the effects of future development in the watershed as well as the effects of burning and sediment bulking

3.2 Verification of Design Discharge

Because the hydrologic calculations referenced above are not available for public review, a simple verification study was performed using the current Los Angles County and Ventura County Land Use Plans to determine the ultimate amount of development in the watershed. Three conditions were examined: 1) The 1990 existing amount= of development, 2) The ultimate amount of development, and 3) The ultimate amount of development with burning and sediment bulking adjustments.

3.2.1 Procedures for 1990 Condition

The location of the concentration point is on Malibu Creek just above the confluence of Cold Creek. The drainage area at this point on the stream is 95.0 square miles. Malibu Creek watershed is a valley surrounded by coastal mountains. Elevations range from 460 ft. at the outlet of the basin to 2,500 ft. in the mountains.

The HEC-1 flood hydrograph package is used to develop hydrographs for the Malibu Creek Watershed. The 24-hour capitol precipitation event is calculated by using the rainfall plates in the Los Angeles county Hydrology Manual. The storm total depth was computed to be 10.0 inches. The storm pattern was taken directly from the rainfall mass curves presented in the Los Angeles County Hydrology Manual.

Loss rates for existing conditions are estimated by using the infiltration tables in the hydrology manual, which are based on different soil types and rainfall intensities. An average loss rate of 0.35 inches/hr was selected for the basin based on existing soils and land cover. Percent imperviousness under 1990 conditions in the basin was estimated at 6 percent.

The SCS unit hydrograph was utilized to transform rainfall excess into runoff. The SCS unit graph procedure requires an estimation of the watershed Lag. Lag is defined as being 60 percent of the time of concentration. (t_c):

$$\text{Lag} = 0.6\ t_c$$

The time of concentration (t_c) of the basin is estimated by evaluating the hydraulically most remote flow path in the watershed. This flow path includes overland flow, shallow channel flow, and main channel flow. The time of concentration is estimated to be 6.7 hours. Therefore, watershed Lag = 4.0 hours. Baseflow flow is assumed to be around 65 cfs at the beginning of the event. The magnitude of the baseflow will have little effect on the peak flow results for this event.

3.2.2 Procedures for Ultimate Development Condition

Future land use is estimated from the Malibu/Santa Monica development policy map and the Ventura County general Plan, south half. A new percent impervious is estimated to be approximately 20 percent of the basin. The watershed Lag is reduced to account for the increase in impervious area. The new Lag was computed as Lag = 3.6 hours. A rainfall loss rate of 0.35 in/hr is used.

The third analysis is to evaluate future land use conditions with additional assumptions that the watershed had recently experienced forest fires and sediment bulking occurs. This

assumption results in decreased loss rates. A loss rate of 0.25 inches/hr is used for this analysis.

3.2.3 Results of Hydrologic Verification

Existing and future condition models were developed with the HEC-1 flood hydrograph package. the results of the three scenarios are shown in table 3.1

Table 3.1 Peak Flow Results

1990 Conditions	Future Land Use	Future Land use Burned Watershed Sediment Bulking
32,081 cfs	36,859 cfs	41,704 cfs

A plot of the three hydrographs is shown in Figure 3.1. The HEC-1 input and output data sets are included as an appendix to this report.

3.3 February, 1980 Flood

The period of record flood occurred on Malibu Creek in mid-February, 1980. Measured streamflow at Los Angeles County Station F130-R indicated a peak instantaneous discharge of 34,000 cfs upstream in Malibu Creek adjacent to the Tapia facility and 42,000 cfs downstream from the Cold Creek confluence. The Cold Creek drainage area is approximately 10 square miles compared to 95 square for Malibu Creek but for the 1980 flood, it contributed approximately 20% of the total discharge.

3.4 Conclusion

The future land use/burned condition discharge of 41,704 cfs is in very close agreement with the 41,800 cfs computed by Los Angeles County. This study will use 41,800 cfs as the design discharge for flood plain determination. In order to incorporate measured gage data from the 1980 flood, the discharge will be increased to 52,250 cfs at the Cold Canyon confluence. This allows for an inflow from Cold Creek that is 20% of the total discharge. The total discharge includes the effects of all existing and future urbanization in the watershed as well as the effects of forest fires and sediment bulking.

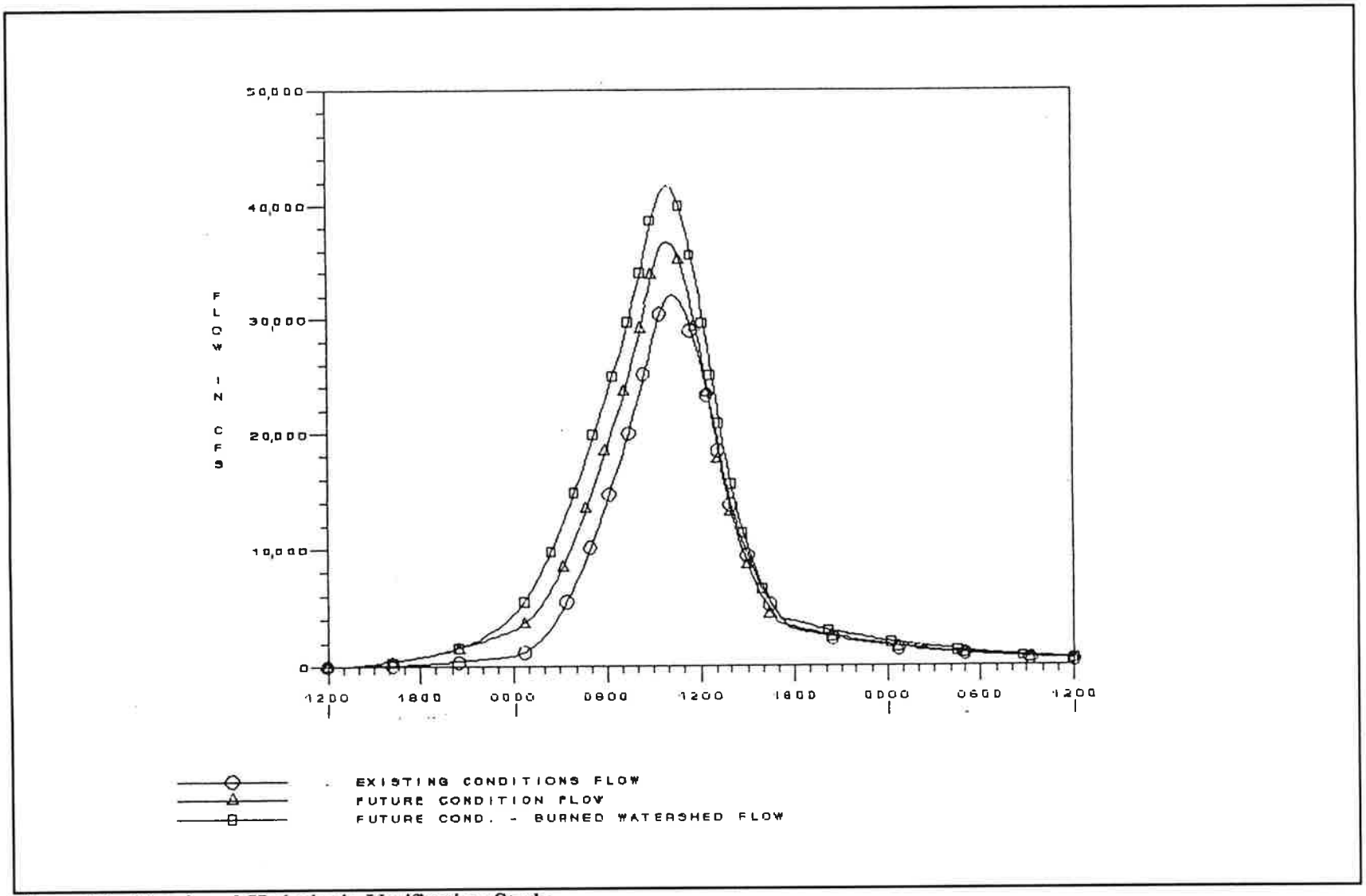


Figure 3.1 Results of Hydrologic Verification Study.

4.0 DETERMINATION OF CHANNEL ROUGHNESS

Channel roughness and related factors cause energy loss in flowing water which results in an increase in flow depth. The degree to which energy loss occurs in a channel is usually expressed as a Manning's n value. This ranges from 0.015 for a concrete channel to 0.1 or higher for a channel with dense vegetation throughout. Typically Manning's n values are determined by qualitative judgement based on field observations. For this study, a method developed by the Federal Highway Administration is used which provides a more direct and systematic technique for determining Manning's n values.

4.1 Description of Manning's n Value Determination

The technique outlined here was first described in a Federal Highway Administration report entitled Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains, prepared in 1984. The procedure is as follows:

1. Select a channel reach for study.

2. Divide the reach longitudinally into a main channel, a left, and a right flood plain overbank.

3. Select a base value n_b for a straight uniform, smooth channel in native materials.

4. Add a value n_1 to adjust for the effect of bed surface irregularities.

5. Add a value n_2 to adjust for variations in shape and size of the channel cross section.

6. Add a value n_3 to adjust for flow obstructions.

7. Add a value n_4 to adjust for vegetation other than that vegetation treated as a flow obstruction (For example, if n_3 is used to account for flow obstructions caused by trees in the channel, then n_4 needs only to account for bed contact vegetation).

8. Add a value n_5 to account for channel meandering.

9. Characterize the left and right floodplain overbank by repeating steps 3 through 8 or by using the vegetation density technique.

4.2 Description of Existing Channel Roughness Characteristics

The study reach for the detailed Manning's n determination is from the Malibu Canyon Road Bridge on the downstream end to a point approximately 200 feet upstream of the

Tapia Water Reclamation Facility. Downstream from the bridge, the channel becomes very steep and experiences supercritical flow (See Figure 2.1). Since critical depth is the minimum depth used in natural channel floodplain boundary analysis, the Manning's n values downstream of the bridge do not need to be determined to a high degree of accuracy.

Figure 4.1 shows a photograph of the study area with the water reclamation facility in the foreground. The Malibu Canyon Road Bridge is on the extreme right of the photo. The willow trees just beyond the plant are in the center of the channel. The larger trees beyond the willows are in Tapia Park which is in the Malibu Creek flood plain.

Figure 4.2 shows a close-up view of the bridge looking downstream. Currently, there is only minor vegetation growing under the bridge. A row of willow trees is growing on both sides of the low-flow channel all the way up to the bridge.

Figure 4.3 shows a typical view of the north flood plain overbank in Tapia Park. There is a clear delineation between the willow growth and the park. Figure 4.4 and 4.5 show a typical view of the main channel. Although there is dense willow growth along each edge of the low flow channel, flow is unobstructed in the center of the channel. Figure 4.6 shows an example of willow growth creating a debris blockage. This particular blockage is about 3 feet high. Such obstructions to flow are the main factor in determining the effect of vegetation on channel roughness. Figure 4.7 shows the typical soil type for both the main channel and the northern flood plain overbank. The soil is fairly compacted with a small amount of contact vegetation. Closer to the low flow channel, the soil has a higher content of gravel and rock. the southern bank along the reclamation facility has and approximate 2:1 slope and is covered with riprap.

4.3 Determination of Manning's *n* Values

For the main channel, 3 transect surveys were performed in order to determine the percentage of flow obstruction caused by the willow vegetation. The location of these transects are shown on Plate 2, the floodplain boundary maps. The percentage of maximum obstructed flow is listed below:

Transect No. 1 = 26%
Transect No. 2 = 33%
Transect No. 3 = 35%
Average Flow Obstruction = 32%

According to the technique referenced above, the adjustment to account for a flow obstruction of 32% is approximately $n_3 = 0.025$. The base n_b value for the main channel is 0.026. The channel is fairly smooth with few irregularities thus $n_1 = 0.003$. There is

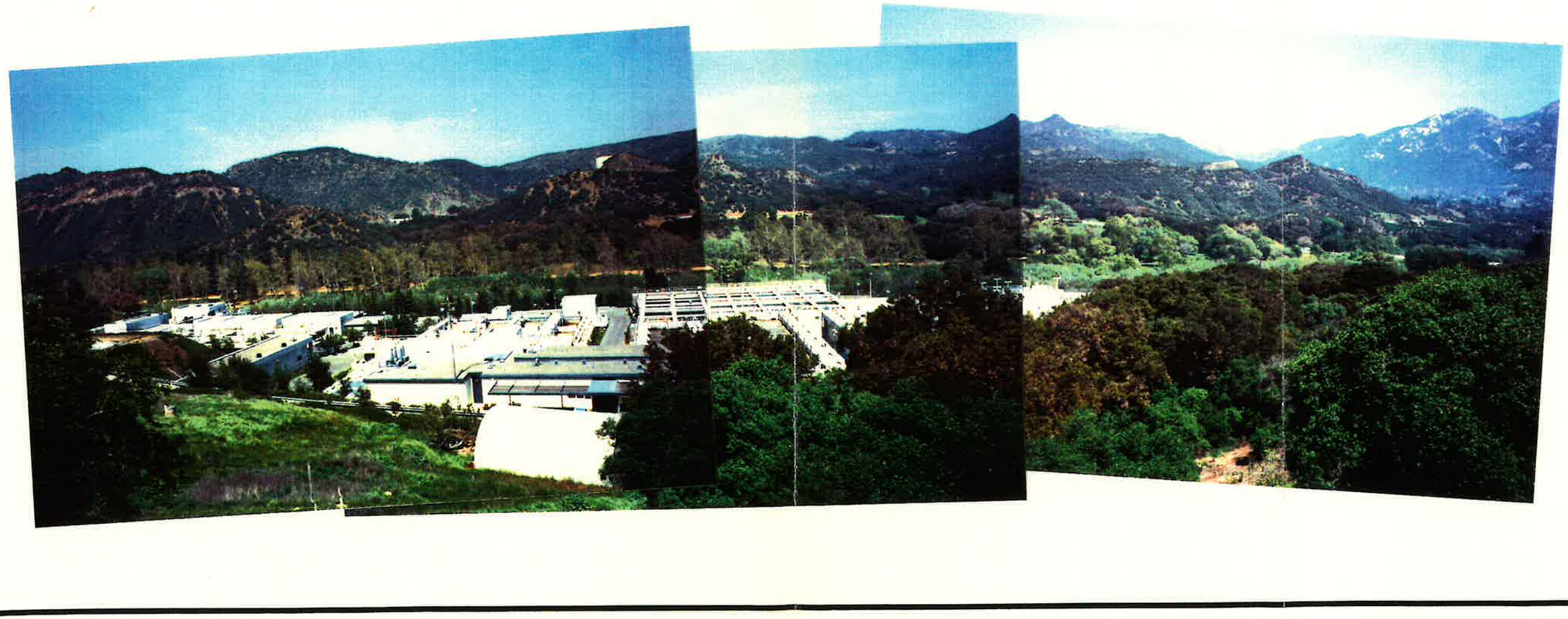


Figure 4.1 Photograph of Study Area

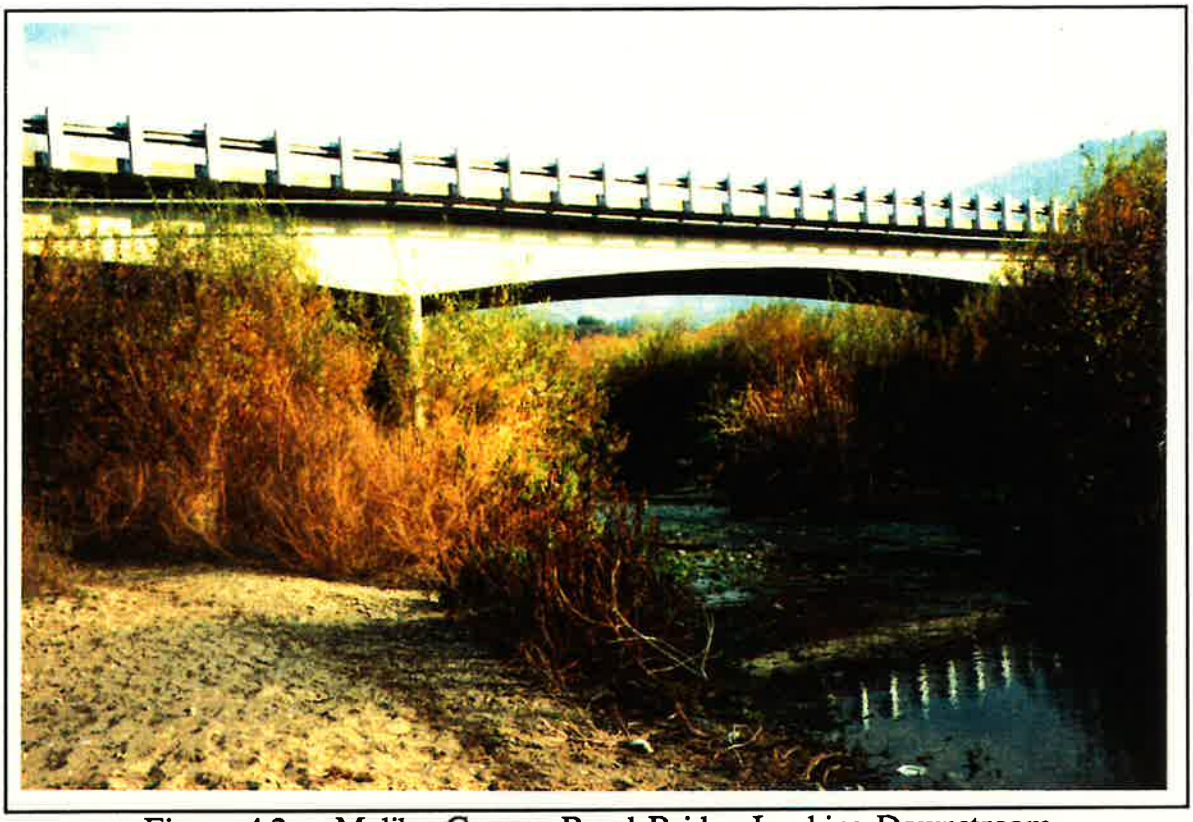


Figure 4.2 Malibu Canyon Road Bridge Looking Downstream

Figure 4.3 North Overbank Floodplain

Figure 4.4 Typical Main Channel Vegetation

Figure 4.5 Typical Main Channel Vegetation

Figure 4.6 Debris Blockage Caused by Willow Growth

Figure 4.7 Typical Overbank Soil

virtually no change in the section width, therefore n_2 = 0.0. Other than willows, the main channel has a moderate amount of contact vegetation therefore n_4 = 0.010. There is no meandering for this river so n_5 = 0.0. The total value for the existing Manning's n 0.064. Willow growth will continue to occur in the main channel. It is estimated that the value of Manning's could increase by 50% within 5 to 10 years if no large floods occur to thin out the vegetation. Thus, for future conditions, a Manning's n value of 0.10 is used for the main channel.

The south bank, along the Tapia Water Reclamation Facility is covered with riprap and has little vegetation. For existing conditions, Manning's n = 0.035. For future conditions, if vegetation begins to grow on the riprap, this value is increased by 20% to 0.042. For the north overbank/floodplain region in Tapia Park, a vegetation density method was used to account for the presence of trees. The trees were counted and their average diameter was measured. Without the trees, the base value of Manning's n = 0.033. The vegetation density method relates the percentage of floodplain area obstructed by trees to the change in roughness. This value varies from 0.008 to 0.011. Thus the total Manning's n for the north floodplain overbank varied from 0.041 to 0.044. Because the park has a maintenance program and receives heavy public use, the value of Manning's n for this area is not expected to increase in the future.

The selection of n values is summarized below:

	Existing	Future
Main Channel	0.064	0.100
South Bank	0.035	0.042
North Bank (Tapia Park)	0.041 to 0.044	0.041 to 0.044

4.4 Debris Effects at the Bridge

The County of Los Angeles requires the addition of 2 feet to the pier width of a bridge in order to account for debris accumulation in the hydraulic analysis. For high flows, the cumulative effect of debris can be accounted for by increasing the pier width. This decreases the available flow area and increases the head loss resulting in higher water surface elevations upstream. For this study, to simulate a reasonable maximum amount of debris accumulation, 4 feet is added to the width of each bridge pier for the existing conditions. For future conditions, 6 feet is added to the width of each pier to account for a potential increase in the amount of debris.

During the course of this study, the issue arose of whether or not the bridge opening can be completely blocked by debris. If this occurred, then all the water would flow over the top of the bridge roadway in a weir-like fashion and no water would go through the opening. An examination of the upstream sources of debris, the design of the bridge opening, and the flow hydraulics indicate that a complete blockage of the bridge opening at Malibu Canyon Road is extremely unlikely. First, the primary type of debris is vegetation. Even very dense vegetative debris is still permeable and will allow a substantial amount of water to flow through it. Thus it is unlikely that such debris will completely seal off the bridge opening. Large boulders could also create a blockage but the stream cannot transport boulders of sufficient size due to the flatness of the upstream channel slope. Second, the bridge consists of two fifty foot wide spans and one eighty foot wide span. In order for a debris blockage to form that can withstand the hydrostatic pressure of the flow, the probable mechanism would be for several trees of sufficient length to get caught against two bridge piers. Other debris would then get trapped against these trees eventually forming a semi-permeable wall. This process would have to happen for each of the three bridge openings. From field inspections in the upstream channel, no trees of sufficient length to block the bridge openings were found. Because of these considerations, the pier width increase method will be used to provide a realistic, conservative estimate of the effect of debris blockage at the bridge.

5.0 HYDRAULIC ANALYSIS

The computer program HEC-2 is used to determine steady state backwater profiles for both existing and future conditions. There are places within the study reach that have a supercritical flow regime. Critical depth is computed for each section in supercritical flow regimes. For flood plain determinations in natural channels, critical depth is usually the lowest flow depth used. The hydraulic analysis starts at the spillway of the abandoned reservoir (Section 0+00) at the downstream end. Malibu Canyon Road Bridge is at Section 98+40. The Tapia Water Reclamation Facility starts at Section 106+10 and ends at Section 117+60.

The design discharge of 41,800 cfs upstream of Cold Canyon and 52,250 downstream of Cold Canyon is used for both the existing and future conditions. The Manning's roughness values used in the analysis are discussed in Chapter 4. The results of the analysis are shown in Table 5.1 for existing conditions and in Table 5.2 for future conditions. The discharge, flow depth, water surface elevation, bed elevation, and mean channel flow velocity are given for each cross section. Plate 2 shows the flood boundaries for both the existing and future conditions. In general, the downstream or western part of the facility has adequate protection from floods. The upstream or east end of the facility has a low spot near Section 115.15. For both existing and future conditions, some flooding occurs. This part of the plant consists primarily of utility buildings, however, so flooding would not result in an introduction of wastewater into Malibu Creek. The maximum computed water surface elevation at the upstream end of the plant (Section 117.60) is 475.77' for existing conditions and 477.38' for ultimate conditions. Figure 5.1 shows a water surface profile plot for Malibu Creek near the Tapia Water Reclamation Facility. The water surface profile computed by Los Angeles County is also shown on this figure for comparison purposes.

5.1 High Water Mark Correlation

Based on verbal communication with water district staff, two high water mark elevations were determined for the February, 1980 flood. The first is an elevation of approximately 470' near section 100.3. This was derived from the observation that the plant access road was under 1 to 3 feet of standing water during the peak of flooding. Furthermore, the Malibu Canyon Road bridge which has a top of road elevation of 472' was not overtopped. Roll waves in the center of channel did strike the bridge and splash up onto the roadway but a general overtopping did not occur. The second high water mark location is at the upstream or west end of the plant. A photograph of the storage building in this part of the plant showed the water line about 3 feet above the finish grade elevation of 470'. This would make the high water mark approximately 473'. The ultimate condition water surface matches the downstream high water mark of 470' quite closely. It is several feet higher than the upstream high water mark of 473' however. The reason is that there was very

little in-channel vegetation during the February, 1980 flood. The ultimate condition analysis assumes that much more vegetation is in place resulting in a higher n value and therefore the computed water surface is higher than the observed upstream high water mark.

5.2 Complete Debris Blockage of the Bridge

The effect on the water surface elevation of a complete debris blockage at the bridge as discussed in Section 4.4 was analyzed as part of the scope of work for this project. The bridge roadway was treated as a critical depth weir and no water was allowed to flow through the bridge opening. The top of the bridge roadway is at an approximate elevation of 472', more than 20 feet above the channel bed. The resulting water surface elevation upstream from the bridge is virtually flat with an approximate average water surface elevation of 481'. The blocked bridge acts as a dam and creates a ponding effect upstream which results in large flow depths and very small flow velocities.

5.3 Effect of Channel Maintenance on the Water Surface Profile

In order to estimate the effect of an in-channel maintenance program two additional water surface profiles were calculated. Both assume ultimate discharge conditions. The first case is for removal of 100% of the willow tree vegetation in the channel reducing the n value from 0.100 to 0.040. The removal of trees starts at the Malibu Canyon Road bridge and ends at the upstream end of the plant. There is a decrease in water surface elevation of approximately 4 feet at the upstream end of the plant and about 1 foot at the downstream end of the plant. This profile is shown as a dash-dot line on Figure 5.1. The second case is for the removal of 50% of the willow tree vegetation in the main channel reducing the n value from 0.100 to 0.070. There is a decrease in water surface elevation of approximately 2 feet at the upstream end of the plant and less than one foot at the downstream end. For vegetation removal of 25% there is virtually no difference in computed water surface elevations when compared to the ultimate water surface with no vegetation removal. Based on this analysis, channel maintenance adjacent to the plant can reduce the water surface elevations by 2 to 4 feet at the upstream end of the plant. There is only a small effect on the water surface elevation at the downstream end of the plant.

Table 5.1 Results of Existing Conditions Hydraulic Analysis.

SECTION NUMBER	DISCHARGE (cfs)	FLOW DEPTH (ft)	WATER SURFACE ELEVATION (ft)	RIVER BED ELEVATION (ft)	CHANNEL FLOW VEL. (ft/s)
.00	52250.00	14.02	303.02	289.00	21.20
1.50	52250.00	23.37	309.37	286.00	11.40
3.00	52250.00	23.29	309.29	286.00	12.95
7.50	52250.00	20.07	308.07	288.00	21.91
14.50	52250.00	25.15	315.15	290.00	13.25
20.50	52250.00	19.99	313.99	294.00	22.51
28.00	52250.00	20.37	320.37	300.00	23.59
35.00	52250.00	20.08	328.08	308.00	23.47
43.00	52250.00	17.43	353.43	336.00	22.02
48.50	52250.00	34.78	378.78	344.00	32.69
54.25	52250.00	23.74	393.74	370.00	24.05
59.50	52250.00	21.73	413.73	392.00	23.42
65.20	52250.00	23.32	435.32	412.00	25.12
77.00	52250.00	17.98	451.98	434.00	21.78
86.00	41800.00	21.12	461.12	440.00	8.00
91.00	41800.00	18.99	460.99	442.00	13.96
93.50	41800.00	19.11	463.11	444.00	11.28
96.10	41800.00	19.12	464.12	445.00	11.04
97.00	41800.00	17.35	463.35	446.00	15.84
97.60	41800.00	17.90	463.90	446.00	16.16
98.40	41800.00	17.13	464.13	447.00	15.92
98.78	41800.00	18.21	465.21	447.00	14.78
99.33	41800.00	19.60	467.60	448.00	9.31
100.40	41800.00	18.28	468.28	450.00	7.39
102.00	41800.00	15.67	468.67	453.00	7.02
103.60	41800.00	15.00	469.00	454.00	7.55
104.95	41800.00	14.41	469.41	455.00	7.83
106.10	41800.00	14.36	469.36	455.00	8.50
107.90	41800.00	14.10	470.10	456.00	11.15
109.40	41800.00	14.17	471.17	457.00	11.09
110.65	41800.00	15.25	472.25	457.00	9.64
112.15	41800.00	14.92	472.92	458.00	10.80
113.65	41800.00	15.09	474.09	459.00	10.19
115.15	41800.00	14.89	474.89	460.00	10.11
116.45	41800.00	15.45	475.45	460.00	10.32
117.60	41800.00	14.77	475.77	461.00	11.72
118.50	41800.00	15.41	476.41	461.00	10.60

Table 5.2 Results of Ultimate Condition Hydraulic Analysis.

SECTION NUMBER	DISCHARGE (cfs)	FLOW DEPTH (ft)	WATER SURFACE ELEVATION (ft)	RIVER BED ELEVATION (ft)	CHANNEL FLOW VEL. (ft/s)
.00	52250.00	14.02	303.02	289.00	21.20
1.50	52250.00	23.79	309.79	286.00	9.66
3.00	52250.00	23.91	309.91	286.00	11.09
7.50	52250.00	22.20	310.20	288.00	17.28
14.50	52250.00	25.91	315.91	290.00	11.75
20.50	52250.00	22.78	316.78	294.00	18.07
28.00	52250.00	22.71	322.71	300.00	19.14
35.00	52250.00	21.02	329.02	308.00	21.11
43.00	52250.00	17.21	353.21	336.00	21.54
48.50	52250.00	33.28	377.28	344.00	29.75
54.25	52250.00	23.64	393.64	370.00	23.59
59.50	52250.00	21.59	413.59	392.00	22.90
65.20	52250.00	23.21	435.21	412.00	23.82
77.00	52250.00	19.58	453.58	434.00	19.03
86.00	41800.00	21.70	461.70	440.00	5.89
91.00	41800.00	20.47	462.47	442.00	11.36
93.50	41800.00	20.79	464.79	444.00	8.32
96.10	41800.00	20.99	465.99	445.00	7.92
97.00	41800.00	19.98	465.98	446.00	9.88
97.60	41800.00	20.53	466.53	446.00	10.14
98.40	41800.00	18.91	465.91	447.00	14.44
98.78	41800.00	19.82	466.82	447.00	13.65
99.33	41800.00	20.56	468.56	448.00	6.72
100.40	41800.00	19.71	469.71	450.00	5.01
102.00	41800.00	16.96	469.96	453.00	4.82
103.60	41800.00	16.31	470.31	454.00	5.22
104.95	41800.00	15.78	470.78	455.00	5.51
106.10	41800.00	15.85	470.85	455.00	4.97
107.90	41800.00	15.33	471.33	456.00	8.05
109.40	41800.00	15.56	472.56	457.00	8.01
110.65	41800.00	16.54	473.54	457.00	6.95
112.15	41800.00	16.45	474.45	458.00	7.64
113.65	41800.00	16.61	475.61	459.00	7.26
115.15	41800.00	16.44	476.44	460.00	7.15
116.45	41800.00	17.07	477.07	460.00	6.59
117.60	41800.00	16.38	477.38	461.00	7.37
118.50	41800.00	17.10	478.10	461.00	7.12

6.0 CONCLUSIONS

Based upon the results of this study the following conclusions are made.

1. The design discharge of 41,800 cfs upstream of Cold Creek and 52,250 cfs downstream of Cold Creek adequately portrays the runoff from the capitol flood with the ultimate amount of development in the Malibu Creek watershed. It also includes the effects of burns and sediment bulking.

2. The presence of willow vegetation in the Malibu Creek low-flow channel increases the computed water surface elevation above those shown on the Los Angeles County Floodplain Maps.

3. The Malibu Canyon Road bridge piers will trap debris during a flood resulting in head loss and a higher upstream water surface elevation. Complete blockage of the bridge opening by debris is unlikely, however because of the absence of trees with sufficient length to be trapped by the bridge piers.

4. For existing and ultimate conditions, the downstream (east) part of the Tapia Water Reclamation facility has sufficient protection from floods. Some flooding will occur on the upstream (west) side of the facility. This part of the plant consists primarily of utility buildings, however, so flooding would not result in an introduction of wastewater into Malibu Creek. The maximum computed water surface elevation at the upstream end of the plant (Section 117.60) is 475.77' for existing conditions and 477.38' for ultimate conditions.

5. The computed water surface profiles are in general agreement with high water marks observed during the February, 1980 flood.

6. Based on the analysis for willow tree removal, channel maintenance adjacent to the plant can reduce the water surface elevations by 2 to 4 feet at the upstream end of the plant for willow tree removal percentages of 50% and 100% respectively. There is only a small effect on the water surface elevation at the downstream end of the plant.

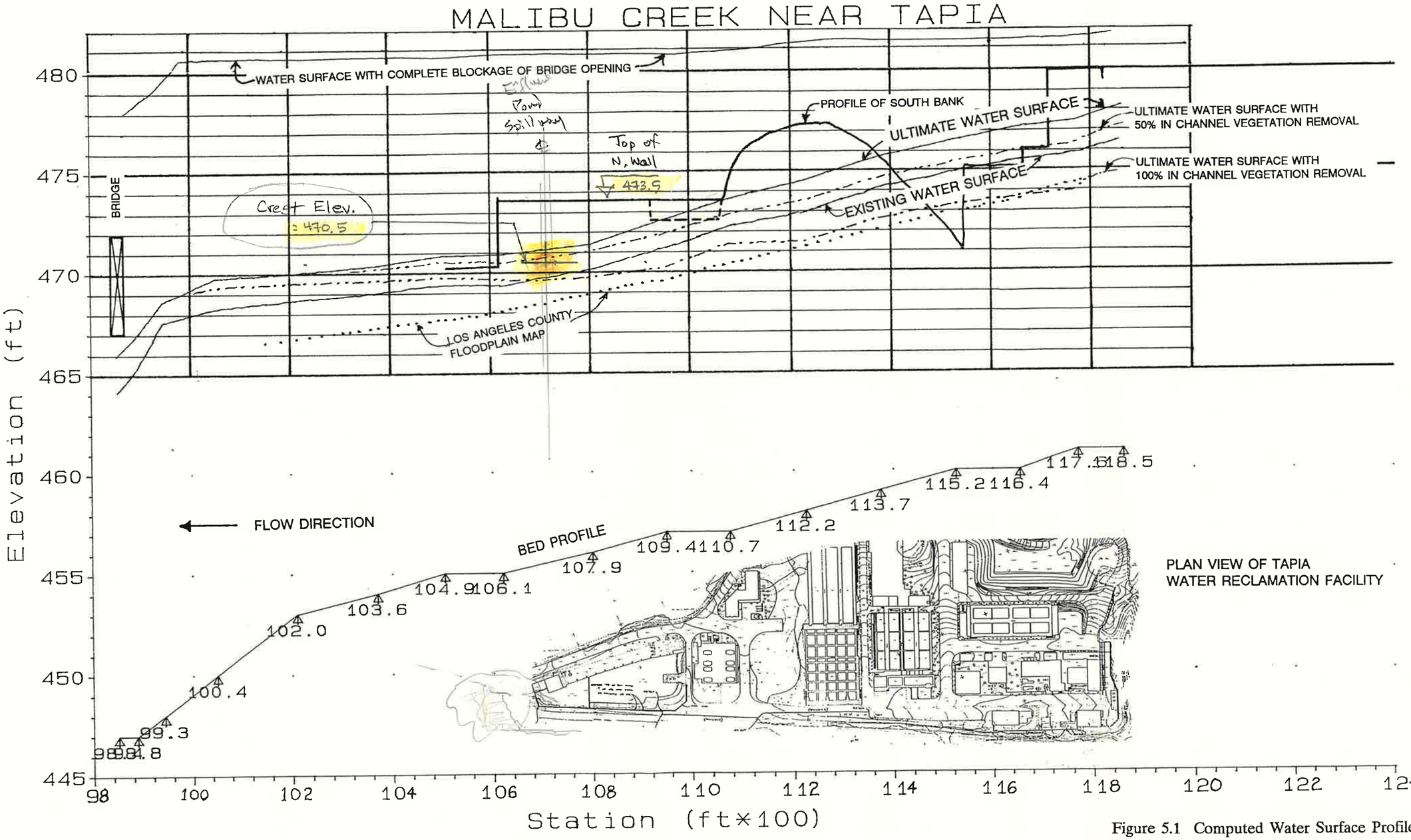
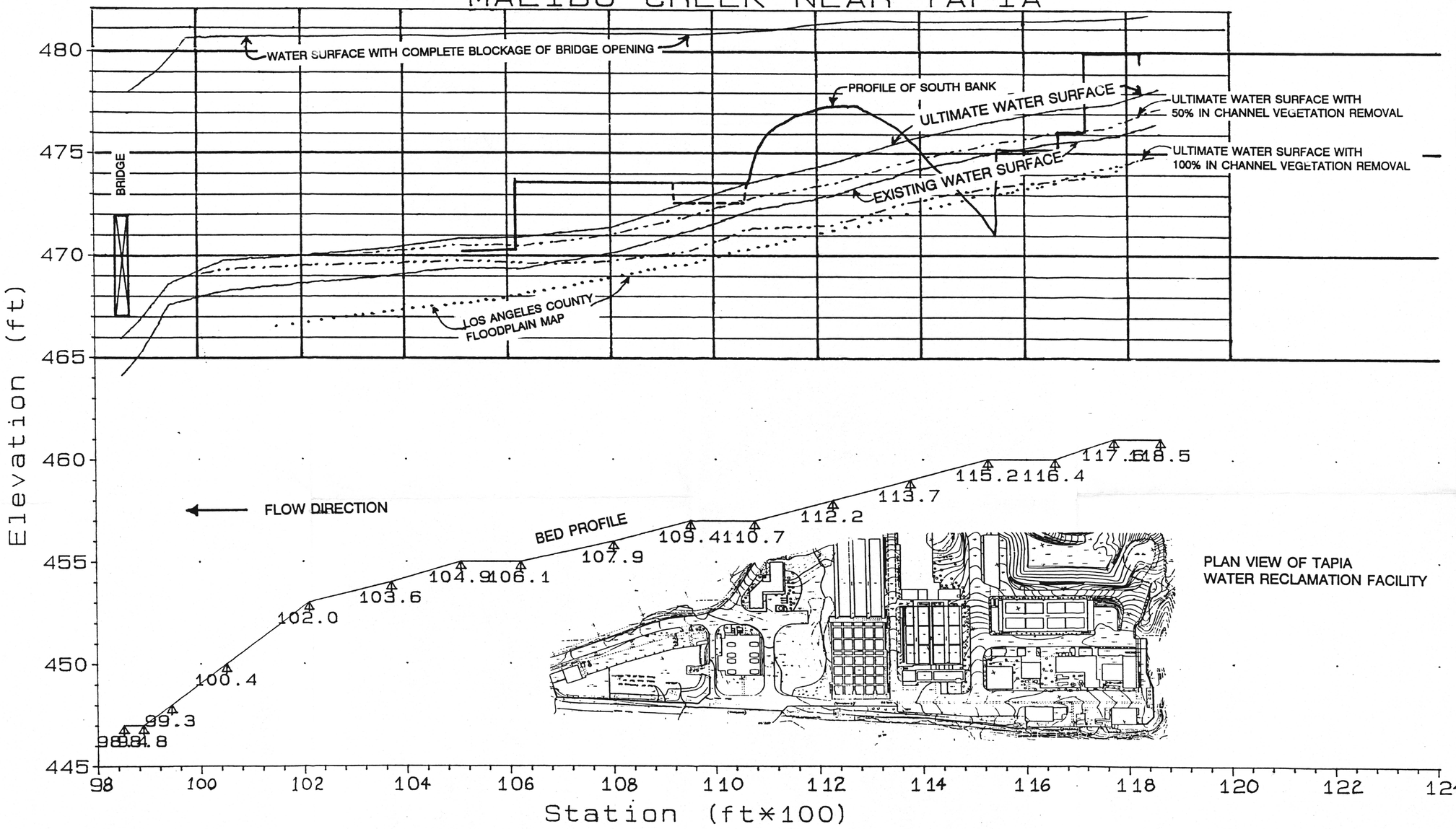


Figure 5.1 Computed Water Surface Profile Plots.

MALIBU CREEK NEAR TAPIA



PLAN VIEW OF TAPIA
WATER RECLAMATION FACILITY

RIVERTECH, INC.

APPENDIX 1

MALIBU CREEK HYDRAULIC ANALYSIS FOR EXISTING CHANNEL CONDITION

```
1*************************************************************        ****************************************
 *  WATER SURFACE PROFILES                                    *        *  U.S. ARMY CORPS OF ENGINEERS        :
 *  VERSION OF SEPTEMBER 1988                                 *        *  THE HYDROLOGIC ENGINEERING CENTER   :
 *  ERROR: 01,02,03                                           *        *  609 SECOND STREET, SUITE D          :
 *  UPDATED:  SEPTEMBER 1989                                  *        *  DAVIS, CALIFORNIA 95616-4687        :
 *  RUN DATE    6/14/90    TIME    6:12:55                    *        *        (916) 756-1104               :
 *************************************************************        ****************************************
```

```
                                          X     X  XXXXXXX   XXXXX              XXXXX
                                          X     X  X        X     X            X     X
                                          X     X  X        X                        X
                                          XXXXXXX  XXXX     X         XXXXX     XXXXX
                                          X     X  X        X                  X
                                          X     X  X        X     X            X
                                          X     X  XXXXXXX   XXXXX             XXXXXXX
 END OF BANNER
```


EXISTING

```
                                                                THIS RUN EXECUTED  6/14/90    6:12:55
 ******************************************************
   HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

   ERROR CORR -  01,02,03
   MODIFICATION -
 ******************************************************

 T1   MALIBU CREEK EXISTING CONDITIONS.  RIVERTECH, FEB., 1990
 T2   ALL CROSS SECTIONS LOOKING DOWNSTREAM.
 T3        MALIBU CREEK  (e)

 J1   ICHECK    INQ     NINV     IDIR     STRT    METRIC    HVINS      Q      WSEL      FQ

          0       2       0        0       -1        0        0        0      294        0

 J2   NPROF    IPLOT    PRFVS    XSECV    XSECH     FN      ALLDC     IBW    CHNIM    ITRACE

         1       0       -1        0        0        0       -1        0        0        0

 NC    0.040    0.040    0.040      0.1      0.3
 QT        1    52250
 X1     0.00        4      100      277        0        0        0
 GR      305      100      289      101      289      276      305      277

 X1     1.50        8      260      390      100      200      150
 GR      320      100      300      160      292      260      288      320      286      350
 GR      286      390      298      440      320      480

 X1     3.00        9      230      360      150      160      150
 GR      320      100      300      140      292      230      286      290      286      315
 GR      290      360      298      370      300      410      320      430

 X1     7.50        8      135      240      400      500      450
 GR      320      100      290      135      288      140      288      155      290      170
 GR      292      240      302      285      320      440

 X1    14.50        9      210      360      750      650      700
 GR      320      100      304      120      306      180      306      210      290      250
 GR      290      265      292      305      296      360      320      405

 X1    20.50        9      140      260      550      650      600
 GR      330      100      300      140      296      160      294      180      294      200
 GR      296      210      300      260      310      290      330      320

 X1    28.00        6      135      230      700      800      750
 GR      330      100      300      135      300      175      304      230      310      250
 GR      330      300
```



```
 X1    35.00        8      150      260      700      750      700
 GR      340      100      310      150      308      160      310      170      312      200
 GR      310      230      310      260      340      300

 X1    43.00        6      150      280      800      800      800
 GR      360      100      340      150      336      180      336      210      338      280
 GR      360      320

 X1    48.50        5      145      170      550      550      550
 GR      380      100      350      135      344      145      344      170      380      200

 X1    54.25        6      130      230      425      425      425
 GR      400      100      380      130      370      160      370      190      380      230
 GR      400      270

 X1    59.50        6      140      245      525      525      525
```

GR	420	100	400	140	392	160	392	205	400	245
GR	420	290								
X1	65.20	7	145	230	570	570	570			
GR	460	100	420	130	414	145	412	165	414	190
GR	420	230	460	280						
X1	77.00	6	145	285	1180	1180	1180			
GR	470	100	440	145	434	220	434	270	440	285
GR	470	370								
QT	1	41800								
NC	0.040	0.040	0.050							
X1	86.00	12	310	470	900	600	700			
GR	470	100	460	250	450	310	440	360	440	425
GR	450	470	460	490	460	520	452	570	452	760
GR	454	840	470	880						
X1	91.00	10	215	370	500	450	500			
GR	480	100	460	140	450	215	444	250	442	315
GR	442	345	450	370	463	410	464	730	480	790
X1	93.50	12	270	435	290	160	250			
GR	480	100	470	130	460	145	458	210	448	270
GR	444	330	444	395	450	435	463	470	463	685
GR	470	745	480	790						
X1	96.10	11	305	505	290	230	260			
GR	480	100	460	140	460	235	454	305	450	360
GR	445	430	445	460	456	505	460	540	470	650
GR	480	700								

X1	97.00	13	325	490	110	85	90			
GR	480	100	466	135	462	190	460	280	456	325
GR	454	355	450	435	446	465	446	485	450	490
GR	460	530	470	600	480	720				
X1	97.60	14	355	520	60	60	60			
GR	480	100	470	130	462	175	460	285	456	355
GR	454	390	454	415	452	440	446	485	446	510
GR	448	520	462	521	470	680	480	735		
X1	98.40	18	100	302	40	40	40			
GR	468	100	454	100.1	454	125	452	130	452	156
GR	468	156.1	468	162.9	452	163	450	190	448	220
GR	447	239	468	239.1	468	245.9	447	246	448	265
GR	450	275	448	301.9	468	302				
X1	98.78	0			38	38	38			
NC	0.040	0.035	0.050							
X1	99.33	16	490	645	55	55	55			
GR	480	100	472	265	470	415	468	435	455	435.1
GR	450	480	448	490	448	505	450	570	450	635
GR	448	645	448	660	462	685	466	700	470	800
GR	480	900								
NC	0.041	0.035	0.064							
X1	100.40	16	535	680	70	120	107			
GR	480	100	470	200	466	255	462	350	460	480
GR	454	500	450	535	450	570	452	595	450	680
GR	450	695	460	710	464	735	470	755	472	810
GR	480	850								
X1	102.00	14	480	670	80	160	160			
GR	480	100	472	190	462	260	460	330	458	425
GR	456	450	454	480	454	550	453	650	454	670
GR	466	710	470	720	470	760	480	780		
X1	103.60	15	475	685	130	130	160			
GR	480	100	472	210	464	260	462	290	460	395
GR	458	455	456	475	456	520	454	645	454	665
GR	456	685	460	705	468	720	468	775	480	780
X1	104.95	16	515	750	135	135	135			
GR	480	100	470	280	464	350	462	380	460	490
GR	458	515	456	600	456	640	455	675	455	685
GR	456	695	456	750	462	780	468	790	468	835
GR	480	865								

X1	106.10	13	640	695	115	115	115			
GR	480	100	472	190	470	280	466	360	460	455
GR	458	485	456	550	456	640	455	670	455	685
GR	456	695	472	725	480	726				
X1	107.90	10	340	510	160	190	180			
GR	480	100	470	140	466	195	460	320	456	340
GR	456	390	456	495	458	510	472	530	480	531
X1	109.40	14	295	485	150	150	150			
GR	480	100	468	135	466	180	462	270	460	295
GR	458	300	457	315	457	340	458	400	458	470

```
GR      460         485         470         500         472         520         480         521

X1   110.65          12         300         480         125         125         125
GR      480         100         470         140         466         195         460         275         458         300
GR      457         315         457         340         458         365         458         445         460         480
GR      470         510         480         511

NC     0.044       0.035       0.064
X1   112.15          12         355         535         150         150         150
GR      480         100         470         215         468         250         462         315         460         355
GR      458         380         458         415         460         470         462         535         476         580
GR      478         660         480         661

X1   113.65          11         295         480         150         150         150
GR      480         100         470         165         468         200         462         275         460         295
GR      459         335         459         359         460         370         462         480         474         525
GR      480         526

X1   115.15          10         280         450         150         150         150
GR      480         100         470         145         468         180         466         195         462         280
GR      460         300         460         350         462         450         470         475         480         476

X1   116.45          10         350         445         130         130         130
GR      480         100         470         170         468         195         464         280         461         350
GR      460         405         460         440         462         445         468         475         480         476

X1   117.60          10         310         395         115         115         115
GR      480         100         472         125         468         160         466         250         462         310
GR      461         340         461         370         462         395         472         435         480         436

X1   118.50          11         275         390          90          90          90
GR      480         100         472         125         468         175         468         250         466         275
GR      462         295         461         360         461         390         462         415         466         430
GR      480         460
```

1

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV	
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

```
*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

CCHV=     .100 CEHV=     .300
*SECNO  .000
3720 CRITICAL DEPTH ASSUMED
     .000    14.02   303.02   303.02   294.00   309.99     6.98      .00      .00   305.00
   52250.       0.   52250.       0.       0.  2465.       0.       0.       0.   305.00
     .00      .00    21.20      .00     .000     .040     .000     .000   289.00   100.12
  .011668       0.       0.       0.        0       16        0      .00   176.75   276.88
0
*SECNO 1.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.70

    1.500    23.37   309.37   302.41      .00   311.03     1.66      .51      .53   292.00
   52250.   11691.   31557.    9002.    1468.    2768.     986.     13.       1.     286.00
     .00     7.96    11.40     9.13     .040     .040     .040     .000   286.00   131.90
  .001599     100.     150.     200.        4       11        0      .00   328.77   460.67
0
*SECNO 3.000
    3.000    23.29   309.29   303.73      .00   311.45     2.16      .27      .15   292.00
   52250.   11721.   35717.    4813.    1283.    2758.     608.     30.       2.     290.00
     .01     9.14    12.95     7.92     .040     .040     .040     .000   286.00   121.41
  .002078     150.     150.     160.        3       19        0      .00   297.88   419.29
0
*SECNO 7.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    7.500    20.07   308.07   308.07      .00   314.52     6.44     1.60     1.28   290.00
   52250.    2212.   41140.    8898.     191.    1878.     657.     68.       5.     292.00
     .01    11.61    21.91    13.54     .040     .040     .040     .000   288.00   113.91
  .007487     400.     450.     500.        0       15        0      .00   223.39   337.30
0
1
```

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV	
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT	
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA	
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST	

```
*SECNO 14.500
```

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.84

14.500	25.15	315.15	309.59	.00	317.53	2.38	2.60	.41	306.00
52250.	7455.	42299.	2495.	961.	3192.	344.	126.	9.	296.00
.03	7.76	13.25	7.26	.040	.040	.040	.000	290.00	106.07
.002221	750.	700.	650.	3	5	0	.00	289.83	395.90

0

*SECNO 20.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

20.500	19.99	313.99	313.99	.00	321.33	7.34	2.30	1.49	300.00
52250.	1384.	47019.	3846.	130.	2088.	282.	174.	12.	300.00
.04	10.61	22.51	13.66	.040	.040	.040	.000	294.00	121.35
.008219	550.	600.	650.	0	15	0	.00	174.63	295.98

0

*SECNO 28.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

28.000	20.37	320.37	320.37	.00	328.06	7.69	6.04	.10	300.00
52250.	3116.	43055.	6080.	242.	1825.	402.	217.	15.	304.00
.05	12.87	23.59	15.13	.040	.040	.040	.000	300.00	111.24
.007851	700.	750.	800.	0	5	0	.00	164.69	275.92

0

*SECNO 35.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

35.000	20.08	328.08	328.08	.00	335.91	7.83	5.82	.04	310.00
52250.	3695.	45732.	2823.	272.	1948.	218.	257.	18.	310.00
.06	13.57	23.47	12.96	.040	.040	.040	.000	308.00	119.87
.008699	700.	700.	750.	0	5	0	.00	164.23	284.10

0

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 43.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

43.000	17.43	353.43	353.43	.00	360.42	6.99	6.85	.08	340.00
52250.	2603.	47008.	2638.	225.	2135.	216.	303.	21.	338.00
.07	11.56	22.02	12.20	.040	.040	.040	.000	336.00	116.44
.008435	800.	800.	800.	0	11	0	.00	191.61	308.05

0

*SECNO 48.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

48.500	34.78	378.78	378.78	.00	390.28	11.50	4.16	1.35	344.00
52250.	16124.	28419.	7707.	801.	869.	504.	333.	23.	344.00
.07	20.13	32.69	15.30	.040	.040	.040	.000	344.00	101.43
.006819	550.	550.	550.	0	17	0	.00	97.55	198.98

0

*SECNO 54.250

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

54.250	23.74	393.74	393.74	.00	402.23	8.49	3.11	.30	380.00
52250.	1493.	48668.	2089.	142.	2024.	189.	355.	24.	380.00
.08	10.55	24.05	11.07	.040	.040	.040	.000	370.00	109.39
.007887	425.	425.	425.	0	19	0	.00	148.08	257.48

0

*SECNO 59.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

59.500	21.73	413.73	413.73	.00	421.68	7.95	4.12	.05	400.00
52250.	2077.	47803.	2370.	188.	2042.	212.	384.	26.	400.00
.08	11.02	23.42	11.18	.040	.040	.040	.000	392.00	112.54
.007823	525.	525.	525.	0	11	0	.00	163.35	275.89

0

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 65.200

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

65.200	23.32	435.32	435.32	.00	444.33	9.01	4.58	.32	414.00
52250.	6962.	43654.	1633.	363.	1738.	147.	415.	28.	420.00
.09	19.18	25.12	11.13	.040	.040	.040	.000	412.00	118.51
.008261	570.	570.	570.	0	8	0	.00	130.65	249.16

0
*SECNO 77.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

77.000	17.98	451.98	451.98	.00	458.99	7.01	9.94	.20	440.00
52250.	1082.	48946.	2222.	108.	2247.	203.	480.	32.	440.00
.11	10.05	21.78	10.93	.040	.040	.040	.000	434.00	127.03
.008599	1180.	1180.	1180.	0	15	0	.00	191.92	318.95

0
*SECNO 86.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.89

86.000	21.12	461.12	456.27	.00	461.90	.78	2.29	.62	450.00
41800.	1786.	23228.	16786.	376.	2904.	2857.	547.	38.	450.00
.13	4.74	8.00	5.87	.040	.050	.040	.000	440.00	233.22
.001545	900.	700.	600.	3	10	0	.00	624.57	857.80

0
*SECNO 91.000

3301 HV CHANGED MORE THAN HVINS

1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .54

91.000	18.99	460.99	457.47	.00	463.77	2.78	1.27	.60	450.00
41800.	3951.	36349.	1500.	450.	2603.	186.	599.	43.	450.00
.14	8.78	13.96	8.07	.040	.050	.040	.000	442.00	138.02
.005209	500.	500.	450.	3	15	0	.00	265.79	403.81

0
*SECNO 93.500

3301 HV CHANGED MORE THAN HVINS

93.500	19.11	463.11	457.80	.00	464.87	1.76	1.00	.10	448.00
41800.	7304.	32858.	1638.	881.	2913.	255.	620.	45.	450.00
.15	8.29	11.28	6.42	.040	.050	.040	.000	444.00	140.33
.003147	290.	250.	160.	3	15	0	.00	545.61	685.94

0
*SECNO 96.100

96.100	19.12	464.12	460.91	.00	465.79	1.66	.90	.01	454.00
41800.	6532.	33301.	1967.	908.	3017.	308.	645.	48.	456.00
.16	7.20	11.04	6.39	.040	.050	.040	.000	445.00	131.75
.003739	290.	260.	230.	2	15	0	.00	453.62	585.37

0
*SECNO 97.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

97.000	17.35	463.35	463.05	.00	466.88	3.52	.53	.56	456.00
41800.	4186.	32379.	5235.	467.	2045.	374.	653.	49.	450.00
.16	8.97	15.84	14.00	.040	.050	.040	.000	446.00	171.27
.010045	110.	90.	85.	3	15	0	.00	382.26	553.53

0
*SECNO 97.600

97.600	17.90	463.90	463.71	.00	467.50	3.59	.60	.02	456.00
41800.	7415.	34233.	153.	743.	2119.	45.	657.	50.	448.00
.16	9.98	16.16	3.40	.040	.050	.040	.000	446.00	164.30
.009882	60.	60.	60.	2	8	0	.00	394.52	558.82

0
1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 98.400

3265 DIVIDED FLOW

98.400	17.13	464.13	461.64	.00	468.07	3.94	.47	.10	468.00
41800.	0.	41800.	0.	0.	2625.	0.	660.	50.	468.00
.16	.00	15.92	.00	.000	.050	.000	.000	447.00	100.03
.014062	40.	40.	40.	2	15	0	.00	188.27	301.98

0

*SECNO 98.780

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

98.780	18.21	465.21	461.64	.00	468.60	3.39	.48	.05	468.00
41800.	0.	41800.	0.	0.	2828.	0.	662.	50.	468.00
.16	.00	14.78	.00	.000	.050	.000	.000	447.00	100.02
.011327	38.	38.	38.	3	15	0	.00	188.30	301.99

0

*SECNO 99.330

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.36

99.330	19.60	467.60	459.94	.00	469.02	1.42	.22	.20	448.00
41800.	8042.	26378.	7380.	865.	2833.	695.	667.	50.	448.00
.16	9.30	9.31	10.62	.040	.050	.035	.000	448.00	435.00
.002042	55.	55.	55.	3	14	0	.00	305.00	740.01

0

*SECNO 100.400

100.400	18.28	468.28	462.97	.00	469.27	.99	.21	.04	450.00
41800.	16080.	18770.	6950.	2181.	2539.	660.	677.	51.	450.00
.17	7.37	7.39	10.53	.041	.064	.035	.000	450.00	223.79
.002231	70.	107.	120.	1	21	0	.00	525.44	749.23

0

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 102.000

102.000	15.67	468.67	463.15	.00	469.58	.91	.30	.01	454.00
41800.	18806.	19972.	3022.	2312.	2847.	356.	693.	53.	454.00
.17	8.13	7.02	8.50	.041	.064	.035	.000	453.00	213.33
.002471	80.	160.	160.	2	11	0	.00	503.34	716.67

0

*SECNO 103.600

103.600	15.00	469.00	464.27	.00	470.01	1.02	.40	.03	456.00
41800.	16603.	22015.	3182.	1937.	2914.	350.	711.	54.	456.00
.18	8.57	7.55	9.09	.041	.064	.035	.000	454.00	228.77
.003176	130.	160.	130.	0	14	0	.00	546.64	775.42

0

*SECNO 104.950

104.950	14.41	469.41	465.00	.00	470.49	1.07	.46	.02	458.00
41800.	13274.	24268.	4258.	1549.	3100.	423.	727.	56.	456.00
.18	8.57	7.83	10.07	.041	.064	.035	.000	455.00	286.83
.003648	135.	135.	135.	2	14	0	.00	551.71	838.54

0

*SECNO 106.100

3301 HV CHANGED MORE THAN HVINS

106.100	14.36	469.36	466.12	.00	471.14	1.77	.44	.21	456.00
41800.	33791.	6546.	1464.	3037.	770.	168.	739.	57.	456.00
.18	11.13	8.50	8.74	.041	.064	.035	.000	455.00	292.64
.003974	115.	115.	115.	2	15	0	.00	427.43	720.07

0

*SECNO 107.900

107.900	14.10	470.10	467.13	.00	472.05	1.95	.86	.05	456.00
41800.	14165.	26567.	1068.	1246.	2383.	105.	754.	59.	458.00
.19	11.37	11.15	10.20	.041	.064	.035	.000	456.00	139.58
.006829	160.	180.	190.	2	15	0	.00	387.71	527.29

0

*SECNO 109.400

109.400	14.17	471.17	468.34	.00	473.11	1.94	1.05	.00	460.00
41800.	12579.	28213.	1008.	1101.	2544.	99.	767.	60.	460.00
.19	11.43	11.09	10.16	.041	.064	.035	.000	457.00	125.77
.007204	150.	150.	150.	2	15	0	.00	385.88	511.65

0

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 110.650

```
  110.650    15.25   472.25   468.21      .00   473.88     1.63      .74      .03   458.00
   41800.   14628.   24819.    2353.   1315.    2574.     218.     778.     61.    460.00
      .19    11.13     9.64    10.81     .041     .064     .035     .000   457.00   131.01
  .004969     125.     125.     125.        2       15        0      .00   379.21   510.22
0
 *SECNO 112.150
  112.150    14.92   472.92   469.79      .00   474.83     1.91      .87      .08   460.00
   41800.   13742.   26038.    2020.   1178.    2411.     192.     792.     63.    462.00
      .20    11.66    10.80    10.53     .044     .064     .035     .000   458.00   181.40
  .006808     150.     150.     150.        2       15        0      .00   388.71   570.11
0
 *SECNO 113.650
  113.650    15.09   474.09   470.43      .00   475.79     1.71      .94      .02   460.00
   41800.   12967.   25936.    2897.   1176.    2546.     274.     805.     64.    462.00
      .20    11.03    10.19    10.57     .044     .064     .035     .000   459.00   138.43
  .005841     150.     150.     150.        2       15        0      .00   386.58   525.01
0
 *SECNO 115.150
  115.150    14.89   474.89   471.00      .00   476.67     1.78      .85      .02   462.00
   41800.   14506.   24378.    2915.   1304.    2411.     223.     819.     65.    462.00
      .21    11.13    10.11    13.05     .044     .064     .035     .000   460.00   123.01
  .005529     150.     150.     150.        2       19        0      .00   352.48   475.49
0
 *SECNO 116.450
  116.450    15.45   475.45   471.95      .00   477.43     1.98      .70      .06   461.00
   41800.   23019.   14816.    3965.   1975.    1435.     316.     830.     66.    462.00
      .21    11.65    10.32    12.55     .044     .064     .035     .000   460.00   131.84
  .005319     130.     130.     130.        2       15        0      .00   343.78   475.62
0
 *SECNO 117.600

3301 HV CHANGED MORE THAN HVINS

  117.600    14.77   475.77   473.39      .00   478.31     2.54      .71      .17   462.00
   41800.   22110.   14401.    5290.   1720.    1228.     352.     840.     67.    462.00
      .21    12.85    11.72    15.03     .044     .064     .035     .000   461.00   113.21
  .007248     115.     115.     115.        2       15        0      .00   322.26   435.47
0
1
    6/14/90        6:12:55                                                          PAGE   13

   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 *SECNO 118.500
  118.500    15.41   476.41   474.25      .00   478.90     2.49      .58      .01   466.00
   41800.   12434.   17798.   11567.   1217.    1680.     675.     847.     68.    461.00
      .21    10.22    10.60    17.13     .044     .064     .035     .000   461.00   111.21
  .005858      90.      90.      90.        2       15        0      .00   341.10   452.31
0
1
    6/14/90        6:12:55                                                          PAGE   14


                                                                  THIS RUN EXECUTED  6/14/90      6:13: 7

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  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
**************************************************

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

  MALIBU CREEK  (e)
SUMMARY PRINTOUT TABLE  150

      SECNO      XLCH       ELTRD      ELLC       ELMIN        Q          CWSEL      CRIWS      EG         10*KS      VCH       AREA       .01K
*      .000       .00        .00        .00       289.00    52250.00    303.02     303.02     309.99     116.68     21.20     2465.07    4837.1
*     1.500    150.00        .00        .00       286.00    52250.00    309.37     302.41     311.03      15.99     11.40     5221.97   13065.7
      3.000    150.00        .00        .00       286.00    52250.00    309.29     303.73     311.45      20.78     12.95     4649.05   11461.8
*     7.500    450.00        .00        .00       288.00    52250.00    308.07     308.07     314.52      74.87     21.91     2725.43    6038.3
*    14.500    700.00        .00        .00       290.00    52250.00    315.15     309.59     317.53      22.21     13.25     4495.95   11086.8
*    20.500    600.00        .00        .00       294.00    52250.00    313.99     313.99     321.33      82.19     22.51     2500.45    5763.5
*    28.000    750.00        .00        .00       300.00    52250.00    320.37     320.37     328.06      78.51     23.59     2468.95    5896.9
*    35.000    700.00        .00        .00       308.00    52250.00    328.08     328.08     335.91      86.99     23.47     2438.53    5601.9
*    43.000    800.00        .00        .00       336.00    52250.00    353.43     353.43     360.42      84.35     22.02     2576.87    5689.1
*    48.500    550.00        .00        .00       344.00    52250.00    378.78     378.78     390.28      68.19     32.69     2174.11    6327.5
```

*	54.250	425.00	.00	.00	370.00	52250.00	393.74	393.74	402.23	78.87	24.05	2354.06	5883.51
*	59.500	525.00	.00	.00	392.00	52250.00	413.73	413.73	421.68	78.23	23.42	2442.05	5907.45
*	65.200	570.00	.00	.00	412.00	52250.00	435.32	435.32	444.33	82.61	25.12	2247.29	5748.62
*	77.000	1180.00	.00	.00	434.00	52250.00	451.98	451.98	458.99	85.99	21.78	2558.34	5634.56
*	86.000	700.00	.00	.00	440.00	41800.00	461.12	456.27	461.90	15.45	8.00	6137.66	10635.11
*	91.000	500.00	.00	.00	442.00	41800.00	460.99	457.47	463.77	52.09	13.96	3239.40	5791.60
	93.500	250.00	.00	.00	444.00	41800.00	463.11	457.80	464.87	31.47	11.28	4049.31	7451.28

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	96.100	260.00	.00	.00	445.00	41800.00	464.12	460.91	465.79	37.39	11.04	4232.88	6835.88
*	97.000	90.00	.00	.00	446.00	41800.00	463.35	463.05	466.88	100.45	15.84	2885.43	4170.66
	97.600	60.00	.00	.00	446.00	41800.00	463.90	463.71	467.50	98.82	16.16	2906.58	4204.93
	98.400	40.00	.00	.00	447.00	41800.00	464.13	461.64	468.07	140.62	15.92	2625.31	3524.90
	98.780	38.00	.00	.00	447.00	41800.00	465.21	461.64	468.60	113.27	14.78	2827.53	3927.49
*	99.330	55.00	.00	.00	448.00	41800.00	467.60	459.94	469.02	20.42	9.31	4392.68	9249.92
	100.400	107.00	.00	.00	450.00	41800.00	468.28	462.97	469.27	22.31	7.39	5380.23	8850.01
	102.000	160.00	.00	.00	453.00	41800.00	468.67	463.15	469.58	24.71	7.02	5514.93	8408.17
	103.600	160.00	.00	.00	454.00	41800.00	469.00	464.27	470.01	31.76	7.55	5201.52	7417.38
	104.950	135.00	.00	.00	455.00	41800.00	469.41	465.00	470.49	36.48	7.83	5072.19	6920.21
	106.100	115.00	.00	.00	455.00	41800.00	469.36	466.12	471.14	39.74	8.50	3974.33	6630.76
	107.900	180.00	.00	.00	456.00	41800.00	470.10	467.13	472.05	68.29	11.15	3733.45	5058.27
	109.400	150.00	.00	.00	457.00	41800.00	471.17	468.34	473.11	72.04	11.09	3744.05	4924.87
	110.650	125.00	.00	.00	457.00	41800.00	472.25	468.21	473.88	49.69	9.64	4106.66	5929.82
	112.150	150.00	.00	.00	458.00	41800.00	472.92	469.79	474.83	68.08	10.80	3780.84	5066.08
	113.650	150.00	.00	.00	459.00	41800.00	474.09	470.43	475.79	58.41	10.19	3995.24	5469.09
	115.150	150.00	.00	.00	460.00	41800.00	474.89	471.00	476.67	55.29	10.11	3937.91	5621.47
	116.450	130.00	.00	.00	460.00	41800.00	475.45	471.95	477.43	53.19	10.32	3726.55	5731.43
	117.600	115.00	.00	.00	461.00	41800.00	475.77	473.39	478.31	72.48	11.72	3300.38	4909.84
	118.500	90.00	.00	.00	461.00	41800.00	476.41	474.25	478.90	58.58	10.60	3572.17	5461.52

MALIBU CREEK (e)
SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	.000	52250.00	303.02	.00	.00	9.02	176.75	.00
*	1.500	52250.00	309.37	.00	6.35	.00	328.77	150.00
	3.000	52250.00	309.29	.00	-.07	.00	297.88	150.00
*	7.500	52250.00	308.07	.00	-1.22	.00	223.39	450.00
*	14.500	52250.00	315.15	.00	7.07	.00	289.83	700.00
*	20.500	52250.00	313.99	.00	-1.16	.00	174.63	600.00
*	28.000	52250.00	320.37	.00	6.38	.00	164.69	750.00
*	35.000	52250.00	328.08	.00	7.71	.00	164.23	700.00
*	43.000	52250.00	353.43	.00	25.35	.00	191.61	800.00
*	48.500	52250.00	378.78	.00	25.35	.00	97.55	550.00
*	54.250	52250.00	393.74	.00	14.96	.00	148.08	425.00
*	59.500	52250.00	413.73	.00	19.99	.00	163.35	525.00
*	65.200	52250.00	435.32	.00	21.60	.00	130.65	570.00
*	77.000	52250.00	451.98	.00	16.66	.00	191.92	1180.00
*	86.000	41800.00	461.12	.00	9.14	.00	624.57	700.00

*	91.000	41800.00	460.99	.00	-.13	.00	265.79	500.00
	93.500	41800.00	463.11	.00	2.12	.00	545.61	250.00
	96.100	41800.00	464.12	.00	1.02	.00	453.62	260.00
*	97.000	41800.00	463.35	.00	-.77	.00	382.26	90.00
	97.600	41800.00	463.90	.00	.55	.00	394.52	60.00
	98.400	41800.00	464.13	.00	.23	.00	188.27	40.00
	98.780	41800.00	465.21	.00	1.08	.00	188.30	38.00
*	99.330	41800.00	467.60	.00	2.40	.00	305.00	55.00
	100.400	41800.00	468.28	.00	.68	.00	525.44	107.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
102.000	41800.00	468.67	.00	.39	.00	503.34	160.00
103.600	41800.00	469.00	.00	.33	.00	546.64	160.00
104.950	41800.00	469.41	.00	.42	.00	551.71	135.00
106.100	41800.00	469.36	.00	-.05	.00	427.43	115.00
107.900	41800.00	470.10	.00	.74	.00	387.71	180.00
109.400	41800.00	471.17	.00	1.06	.00	385.88	150.00
110.650	41800.00	472.25	.00	1.08	.00	379.21	125.00
112.150	41800.00	472.92	.00	.68	.00	388.71	150.00
113.650	41800.00	474.09	.00	1.16	.00	386.58	150.00
115.150	41800.00	474.89	.00	.80	.00	352.48	150.00
116.450	41800.00	475.45	.00	.56	.00	343.78	130.00
117.600	41800.00	475.77	.00	.32	.00	322.26	115.00
118.500	41800.00	476.41	.00	.64	.00	341.10	90.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= .000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 1.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 7.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 7.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 14.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 20.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 28.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 28.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 35.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 35.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 43.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 43.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 48.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 48.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 54.250 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 54.250 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 59.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 59.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 65.200 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 65.200 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 77.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 77.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 86.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 91.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

```
WARNING SECNO=     97.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     99.330  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

RIVERTECH, INC.

APPENDIX 2

MALIBU CREEK HYDRAULIC ANALYSIS FOR ULTIMATE CHANNEL CONDITION

```
1*************************************************
*  WATER SURFACE PROFILES                       *
*  VERSION OF SEPTEMBER 1988                    *
*  ERROR: 01,02,03                              *
*  UPDATED:  SEPTEMBER 1989                     *
*  RUN DATE     6/14/90    TIME    6:16: 2      *
*************************************************
```

```
**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*        (916) 756-1104              *
**************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                 X     X
XXXXXXX  XXXX     X          XXXXX   XXXXX
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

END OF BANNER

ULTIMATE

THIS RUN EXECUTED 6/14/90 6:16: 2

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**************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
**************************************************
```

```
T1  MALIBU CREEK ULTIMATE VEGETATION GROWTH SCENARIO.  RIVERTECH, FEB., 1990
T2  ALL CROSS SECTIONS LOOKING DOWNSTREAM.   MODIFIED 6-6-90
T3        MALIBU CREEK (F)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
        0         2         0         0        -1         0         0         0       294         0
J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
        1         0        -1         0         0         0        -1         0         0         0

NC    0.040     0.040     0.055     0.1       0.3
QT        1     52250
X1     0.00         4       100       277         0         0         0
GR      305       100       289       101       289       276       305       277

X1     1.50         8       260       390       100       200       150
GR      320       100       300       160       292       260       288       320       286       350
GR      286       390       298       440       320       480

X1     3.00         9       230       360       150       160       150
GR      320       100       300       140       292       230       286       290       286       315
GR      290       360       298       370       300       410       320       430

X1     7.50         8       135       240       400       500       450
GR      320       100       290       135       288       140       288       155       290       170
GR      292       240       302       285       320       440

X1    14.50         9       210       360       750       650       700
GR      320       100       304       120       306       180       306       210       290       250
GR      290       265       292       305       296       360       320       405

X1    20.50         9       140       260       550       650       600
GR      330       100       300       140       296       160       294       180       294       200
GR      296       210       300       260       310       290       330       320

X1    28.00         6       135       230       700       800       750
GR      330       100       300       135       300       175       304       230       310       250
GR      330       300
```



```
X1    35.00         8       150       260       700       750       700
GR      340       100       310       150       308       160       310       170       312       200
GR      310       230       310       260       340       300

X1    43.00         6       150       280       800       800       800
GR      360       100       340       150       336       180       336       210       338       280
GR      360       320

X1    48.50         5       145       170       550       550       550
GR      380       100       350       135       344       145       344       170       380       200

X1    54.25         6       130       230       425       425       425
GR      400       100       380       130       370       160       370       190       380       230
GR      400       270

X1    59.50         6       140       245       525       525       525
```

GR	420	100	400	140	392	160	392	205	400	245
GR	420	290								
X1	65.20	7	145	230	570	570	570			
GR	460	100	420	130	414	145	412	165	414	190
GR	420	230	460	280						
X1	77.00	6	145	285	1180	1180	1180			
GR	470	100	440	145	434	220	434	270	440	285
GR	470	370								
NC	.040	.040	.080							
QT	1	41800								
X1	86.00	12	310	470	900	600	700			
GR	470	100	460	250	450	310	440	360	440	425
GR	450	470	460	490	460	520	452	570	452	760
GR	454	840	470	880						
X1	91.00	10	215	370	500	450	500			
GR	480	100	460	140	450	215	444	250	442	315
GR	442	345	450	370	463	410	464	730	480	790
X1	93.50	12	270	435	290	160	250			
GR	480	100	470	130	460	145	458	210	448	270
GR	444	330	444	395	450	435	463	470	463	685
GR	470	745	480	790						
X1	96.10	11	305	505	290	230	260			
GR	480	100	460	140	460	235	454	305	450	360
GR	445	430	445	460	456	505	460	540	470	650
GR	480	700								

X1	97.00	13	325	490	110	85	90			
GR	480	100	466	135	462	190	460	280	456	325
GR	454	355	450	435	446	465	446	485	450	490
GR	460	530	470	600	480	720				
X1	97.60	14	355	520	60	60	60			
GR	480	100	470	130	462	175	460	285	456	355
GR	454	390	454	415	452	440	446	485	446	510
GR	448	520	462	521	470	680	480	735		
NC	.040	.040	.060							
X1	98.40	18	100	302	40	40	40			
GR	468	100	454	100.1	454	125	452	130	452	155
GR	468	155.1	468	163.9	452	164	450	190	448	220
GR	447	238	468	238.1	468	246.9	447	247	448	265
GR	450	275	448	301.9	468	302				
X1	98.78	0			38	38	38			
NC	.041	.042	.100							
X1	99.33	16	490	645	55	55	55			
GR	480	100	472	265	470	415	468	435	455	435.1
GR	450	480	448	490	448	505	450	570	450	635
GR	448	645	448	660	462	685	466	700	470	800
GR	480	900								
NC	0.041	0.042	0.100							
X1	100.40	16	535	680	70	120	107			
GR	480	100	470	200	466	255	462	350	460	480
GR	454	500	450	535	450	570	452	595	450	680
GR	450	695	460	710	464	735	470	755	472	810
GR	480	850								
X1	102.00	14	480	670	80	160	160			
GR	480	100	472	190	462	260	460	330	458	425
GR	456	450	454	480	454	550	453	650	454	670
GR	466	710	470	720	470	760	480	780		
X1	103.60	15	475	685	130	130	160			
GR	480	100	472	210	464	260	462	290	460	395
GR	458	455	456	475	456	520	454	645	454	665
GR	456	685	460	705	468	720	468	775	480	780
X1	104.95	16	515	750	135	135	135			
GR	480	100	470	280	464	350	462	380	460	490
GR	458	515	456	600	456	640	455	675	455	685
GR	456	695	456	750	462	780	468	790	468	835
GR	480	865								

X1	106.10	13	640	695	115	115	115			
GR	480	100	472	190	470	280	466	360	460	455
GR	458	485	456	550	456	640	455	670	455	685
GR	456	695	472	725	480	726				
X1	107.90	10	340	510	160	190	180			
GR	480	100	470	140	466	195	460	320	456	340
GR	456	390	456	495	458	510	472	530	480	531
X1	109.40	14	295	485	150	150	150			
GR	480	100	468	135	466	180	462	270	460	295

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GR     458      300      457      315      457      340      458      400      458      470
GR     460      485      470      500      472      520      480      521

X1  110.65       12      300      480      125      125      125
GR     480      100      470      140      466      195      460      275      458      300
GR     457      315      457      340      458      365      458      445      460      480
GR     470      510      480      511

NC    0.044    0.042    0.100
X1  112.15       12      355      535      150      150      150
GR     480      100      470      215      468      250      462      315      460      355
GR     458      380      458      415      460      470      462      535      476      580
GR     478      660      480      661

X1  113.65       11      295      480      150      150      150
GR     480      100      470      165      468      200      462      275      460      295
GR     459      335      459      359      460      370      462      480      474      525
GR     480      526

X1  115.15       10      280      450      150      150      150
GR     480      100      470      145      468      180      466      195      462      280
GR     460      300      460      350      462      450      470      475      480      476

X1  116.45       10      350      445      130      130      130
GR     480      100      470      170      468      195      464      280      461      350
GR     460      405      460      440      462      445      468      475      480      476

X1  117.60       10      310      395      115      115      115
GR     480      100      472      125      468      160      466      250      462      310
GR     461      340      461      370      462      395      472      435      480      436

X1  118.50       11      275      390       90       90       90
GR     480      100      472      125      468      175      468      250      466      275
GR     462      295      461      360      461      390      462      415      466      430
GR     480      460
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

```
*PROF 1

 CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

 CCHV=     .100 CEHV=     .300
 *SECNO  .000
 3720 CRITICAL DEPTH ASSUMED
     .000    14.02   303.02   303.02   294.00   309.99     6.98      .00      .00   305.00
   52250.       0.   52250.       0.       0.   2465.       0.       0.       0.   305.00
      .00      .00    21.20      .00     .000     .055     .000     .000   289.00   100.12
   .022060       0.       0.       0.        0       16        0      .00   176.75   276.88
0
 *SECNO 1.500

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.23

    1.500    23.79   309.79   302.19      .00   311.27     1.49      .73      .55   292.00
   52250.   14192.   27255.   10803.    1522.    2822.    1016.      13.       1.   286.00
      .00     9.32     9.66    10.64     .040     .055     .040     .000   286.00   130.64
   .002114      100.      150.      200.        3        8        0      .00   330.78   461.43
0
 *SECNO 3.000
    3.000    23.91   309.91   303.33      .00   311.74     1.83      .37      .10   292.00
   52250.   14661.   31495.    6094.    1351.    2839.     645.      31.       2.   290.00
      .01    10.86    11.09     9.45     .040     .055     .040     .000   286.00   120.17
   .002775      150.      150.      160.        3       19        0      .00   299.74   419.91
0
 *SECNO 7.500

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .61

    7.500    22.20   310.20   307.75      .00   314.39     4.19     1.94      .71   290.00
   52250.    2994.   36303.   12952.     238.    2101.     884.      73.       5.   292.00
      .02    12.58    17.28    14.65     .040     .055     .040     .000   288.00   111.43
   .007575      400.      450.      500.        3       15        0      .00   244.21   355.64
0
```

1

6/14/90 6:16: 2 PAGE 6

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 14.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.55

14.500	25.91	315.91	309.58	.00	317.87	1.95	3.25	.22	306.00
52250.	10090.	38861.	3300.	1041.	3307.	372.	136.	9.	296.00
.03	9.69	11.75	8.88	.040	.055	.040	.000	290.00	105.11
.003149	750.	700.	650.	3	15	0	.00	292.23	397.34

0

*SECNO 20.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .62

20.500	22.78	316.78	313.79	.00	321.60	4.82	2.88	.86	300.00
52250.	2251.	43816.	6184.	188.	2424.	388.	189.	12.	300.00
.04	11.98	18.07	15.93	.040	.055	.040	.000	294.00	117.62
.008206	550.	600.	650.	3	15	0	.00	182.56	300.18

0

*SECNO 28.000

28.000	22.71	322.71	319.99	.00	327.99	5.28	6.25	.14	300.00
52250.	4303.	39188.	8759.	301.	2048.	516.	240.	15.	304.00
.05	14.30	19.14	16.96	.040	.055	.040	.000	300.00	108.50
.008377	700.	750.	800.	3	11	0	.00	173.29	281.79

0

*SECNO 35.000

3301 HV CHANGED MORE THAN HVINS

35.000	21.02	329.02	327.90	.00	335.48	6.46	7.13	.35	310.00
52250.	5057.	43330.	3863.	301.	2052.	241.	284.	18.	310.00
.06	16.77	21.11	16.02	.040	.055	.040	.000	308.00	118.30
.012419	700.	700.	750.	2	11	0	.00	167.06	285.36

0

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 43.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

43.000	17.21	353.21	353.21	.00	360.00	6.78	11.08	.10	340.00
52250.	3387.	45411.	3451.	218.	2108.	210.	331.	21.	338.00
.07	15.52	21.54	16.40	.040	.055	.040	.000	336.00	116.96
.015537	800.	800.	800.	0	15	0	.00	190.70	307.66

0

*SECNO 48.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

48.500	33.28	377.28	377.28	.00	388.31	11.03	7.25	1.27	344.00
52250.	18657.	24757.	8836.	737.	832.	462.	360.	23.	344.00
.08	25.31	29.75	19.14	.040	.055	.040	.000	344.00	103.17
.011323	550.	550.	550.	0	17	0	.00	94.57	197.74

0

*SECNO 54.250

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

54.250	23.64	393.64	393.64	.00	401.79	8.16	5.41	.29	380.00
52250.	1981.	47498.	2771.	139.	2014.	186.	382.	24.	380.00
.09	14.20	23.59	14.90	.040	.055	.040	.000	370.00	109.55
.014444	425.	425.	425.	0	19	0	.00	147.73	257.27

0

*SECNO 59.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

59.500	21.59	413.59	413.59	.00	421.20	7.62	7.54	.05	400.00
52250.	2729.	46406.	3115.	185.	2027.	208.	410.	26.	400.00
.09	14.79	22.90	15.00	.040	.055	.040	.000	392.00	112.83
.014284	525.	525.	525.	0	11	0	.00	162.74	275.57

0

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 65.200

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

65.200	23.21	435.21	435.21	.00	443.95	8.75	8.10	.34	414.00
52250.	9004.	41152.	2094.	360.	1728.	145.	441.	28.	420.00
.10	25.02	23.82	14.49	.040	.055	.040	.000	412.00	118.59
.014148	570.	570.	570.	0	8	0	.00	130.41	249.01

0
*SECNO 77.000

3301 HV CHANGED MORE THAN HVINS

77.000	19.58	453.58	451.89	.00	458.91	5.33	14.62	.34	440.00
52250.	1705.	47043.	3502.	138.	2471.	261.	510.	33.	440.00
.12	12.33	19.03	13.40	.040	.055	.040	.000	434.00	124.63
.010939	1180.	1180.	1180.	2	15	0	.00	198.86	323.48

0
*SECNO 86.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

86.000	21.70	461.70	455.76	.00	462.36	.66	2.97	.47	450.00
41800.	2415.	17644.	21741.	423.	2997.	3082.	583.	39.	450.00
.15	5.70	5.89	7.05	.040	.080	.040	.000	440.00	224.54
.002055	900.	700.	600.	3	14	0	.00	634.70	859.24

0
*SECNO 91.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .51

91.000	20.47	462.47	457.37	.00	464.52	2.06	1.75	.42	450.00
41800.	7043.	32172.	2585.	566.	2833.	239.	639.	44.	450.00
.16	12.43	11.36	10.81	.040	.080	.040	.000	442.00	135.06
.007883	500.	500.	450.	2	19	0	.00	273.31	408.37

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 93.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

93.500	20.79	464.79	457.44	.00	465.96	1.17	1.35	.09	448.00
41800.	11279.	26542.	3979.	1101.	3190.	689.	663.	46.	450.00
.17	10.24	8.32	5.78	.040	.080	.040	.000	444.00	137.81
.003882	290.	250.	160.	3	14	0	.00	562.54	700.35

0
*SECNO 96.100

96.100	20.99	465.99	460.84	.00	467.05	1.05	1.07	.01	454.00
41800.	11258.	26866.	3677.	1235.	3391.	477.	694.	49.	456.00
.17	9.12	7.92	7.70	.040	.080	.040	.000	445.00	128.01
.004221	290.	260.	230.	2	19	0	.00	477.92	605.93

0
*SECNO 97.000

3301 HV CHANGED MORE THAN HVINS

97.000	19.98	465.98	463.08	.00	467.80	1.82	.53	.23	456.00
41800.	9527.	24469.	7803.	917.	2478.	565.	704.	50.	450.00
.18	10.38	9.88	13.81	.040	.080	.040	.000	446.00	135.19
.007742	110.	90.	85.	2	15	0	.00	436.72	571.90

0
*SECNO 97.600

97.600	20.53	466.53	463.36	.00	468.28	1.74	.47	.01	456.00
41800.	14724.	25889.	1187.	1264.	2553.	216.	709.	51.	448.00
.18	11.65	10.14	5.50	.040	.080	.040	.000	446.00	149.49
.007773	60.	60.	60.	2	15	0	.00	461.62	611.12

0
*SECNO 98.400

3265 DIVIDED FLOW

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

```
3301 HV CHANGED MORE THAN HVINS

   98.400    18.91   465.91   461.82      .00   469.15     3.24      .42      .45   468.00
   41800.       0.   41800.       0.       0.    2895.       0.     712.      51.   468.00
      .18      .00    14.44      .00     .000     .060     .000     .000   447.00   100.01
  .015101      40.     40.      40.        3       19        0      .00   184.33   301.99
0
 *SECNO 98.780

 3265 DIVIDED FLOW

   98.780    19.82   466.82   461.82      .00   469.71     2.89      .53      .03   468.00
   41800.       0.   41800.       0.       0.    3063.       0.     715.      51.   468.00
      .18      .00    13.65      .00     .000     .060     .000     .000   447.00   100.01
  .012832      38.     38.      38.        2       15        0      .00   184.36   301.99
0
 *SECNO 99.330

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.80

   99.330    20.56   468.56   461.18      .00   470.20     1.64      .36      .13   448.00
   41800.   12035.   20047.    9718.     919.    2981.     797.     720.      52.   448.00
      .18    13.10     6.72    12.19     .041     .100     .042     .000   448.00   429.44
  .003981      55.     55.      55.        3       14        0      .00   334.45   763.89
0
 *SECNO 100.400

 3301 HV CHANGED MORE THAN HVINS

  100.400    19.71   469.71   463.55      .00   470.55      .84      .28      .08   450.00
   41800.   21006.   13771.    7023.    2645.    2749.     764.     732.      53.   450.00
      .19     7.94     5.01     9.20     .041     .100     .042     .000   450.00   203.92
  .002251      70.    107.     120.        2       21        0      .00   550.12   754.05
0
1
     6/14/90        6:16: 2                                                          PAGE   11

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 *SECNO 102.000
  102.000    16.96   469.96   463.33      .00   470.85      .89      .28      .02   454.00
   41800.   23628.   14916.    3257.    2662.    3092.     418.     750.      54.   454.00
      .19     8.88     4.82     7.79     .041     .100     .042     .000   453.00   204.30
  .002556      80.    160.     160.        2       11        0      .00   515.60   719.89
0
 *SECNO 103.600
  103.600    16.31   470.31   464.35      .00   471.28      .97      .41      .02   456.00
   41800.   21454.   16662.    3684.    2267.    3191.     469.     770.      56.   456.00
      .19     9.46     5.22     7.85     .041     .100     .042     .000   454.00   220.54
  .003282     130.    160.     130.        2       14        0      .00   555.43   775.96
0
 *SECNO 104.950
  104.950    15.78   470.78   465.04      .00   471.77      .98      .48      .00   458.00
   41800.   18040.   18845.    4915.    1875.    3422.     546.     788.      58.   456.00
      .20     9.62     5.51     9.00     .041     .100     .042     .000   455.00   265.87
  .003864     135.    135.     135.        2       14        0      .00   576.09   841.96
0
 *SECNO 106.100
  106.100    15.85   470.85   466.52      .00   472.28     1.43      .38      .14   456.00
   41800.   36184.    4235.    1381.    3583.     852.     207.     802.      59.   456.00
      .20    10.10     4.97     6.68     .041     .100     .042     .000   455.00   241.62
  .002903     115.    115.     115.        2       19        0      .00   481.23   722.85
0
 *SECNO 107.900

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .61

  107.900    15.33   471.33   467.16      .00   473.15     1.82      .75      .12   456.00
   41800.   19706.   20866.    1228.    1494.    2591.     127.     819.      61.   458.00
      .21    13.19     8.05     9.68     .041     .100     .042     .000   456.00   134.69
  .007781     160.    180.     190.        2       15        0      .00   394.35   529.04
0
 *SECNO 109.400
  109.400    15.56   472.56   468.26      .00   474.34     1.78     1.19      .00   460.00
   41800.   17959.   22485.    1357.    1339.    2808.     145.     834.      62.   460.00
      .21    13.41     8.01     9.39     .041     .100     .042     .000   457.00   121.71
  .008033     150.    150.     150.        3       19        0      .00   398.36   520.07
0
1
     6/14/90        6:16: 2                                                          PAGE   12

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS    BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA    LEFT/RIGHT
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN      SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID     ENDST


 *SECNO 110.650
```

110.650	16.54	473.54	468.81	.00	475.18	1.64	.83	.01	458.00
41800.	19551.	19507.	2742.	1537.	2808.	257.	847.	63.	460.00
.21	12.72	6.95	10.67	.041	.100	.042	.000	457.00	125.82
.005609	125.	125.	125.	0	15	0	.00	384.54	510.35

0

*SECNO 112.150

112.150	16.45	474.45	470.30	.00	476.15	1.70	.95	.02	460.00
41800.	18816.	20528.	2456.	1457.	2686.	249.	862.	65.	462.00
.22	12.91	7.64	9.86	.044	.100	.042	.000	458.00	163.81
.007205	150.	150.	150.	2	15	0	.00	411.21	575.02

0

*SECNO 113.650

113.650	16.61	475.61	470.76	.00	477.17	1.56	1.01	.01	460.00
41800.	17651.	20515.	3633.	1421.	2827.	343.	877.	66.	462.00
.22	12.42	7.26	10.60	.044	.100	.042	.000	459.00	128.54
.006290	150.	150.	150.	2	19	0	.00	396.73	525.27

0

*SECNO 115.150

115.150	16.44	476.44	471.28	.00	478.12	1.68	.91	.03	462.00
41800.	19401.	19123.	3276.	1553.	2675.	263.	893.	67.	462.00
.23	12.49	7.15	12.45	.044	.100	.042	.000	460.00	116.01
.005873	150.	150.	150.	2	19	0	.00	359.63	475.64

0

*SECNO 116.450

116.450	17.07	477.07	472.41	.00	478.81	1.74	.68	.02	461.00
41800.	27504.	10483.	3813.	2339.	1590.	366.	906.	68.	462.00
.23	11.76	6.59	10.43	.044	.100	.042	.000	460.00	120.48
.004626	130.	130.	130.	2	15	0	.00	355.28	475.76

0

*SECNO 117.600

117.600	16.38	477.38	473.72	.00	479.55	2.17	.61	.13	462.00
41800.	26393.	10063.	5344.	2041.	1365.	417.	917.	69.	462.00
.23	12.93	7.37	12.82	.044	.100	.042	.000	461.00	108.19
.006080	115.	115.	115.	2	19	0	.00	327.48	435.67

0

1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 118.500

118.500	17.10	478.10	474.52	.00	480.09	1.99	.52	.02	466.00
41800.	16831.	13349.	11620.	1499.	1874.	784.	925.	70.	461.00
.24	11.23	7.12	14.83	.044	.100	.042	.000	461.00	105.93
.005584	90.	90.	90.	2	15	0	.00	350.00	455.93

0

1

THIS RUN EXECUTED 6/14/90 6:16:15

****
HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01,02,03
MODIFICATION -
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MALIBU CREEK (F)

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	.000	.00	.00	.00	289.00	52250.00	303.02	303.02	309.99	220.60	21.20	2465.07	3517.92
*	1.500	150.00	.00	.00	286.00	52250.00	309.79	302.19	311.27	21.14	9.66	5359.83	11364.69
	3.000	150.00	.00	.00	286.00	52250.00	309.91	303.33	311.74	27.75	11.09	4834.21	9917.97
*	7.500	450.00	.00	.00	288.00	52250.00	310.20	307.75	314.39	75.75	17.28	3223.40	6003.20
*	14.500	700.00	.00	.00	290.00	52250.00	315.91	309.58	317.87	31.49	11.75	4719.38	9310.74
*	20.500	600.00	.00	.00	294.00	52250.00	316.78	313.79	321.60	82.06	18.07	3000.50	5767.77
	28.000	750.00	.00	.00	300.00	52250.00	322.71	319.99	327.99	83.77	19.14	2865.16	5708.79
	35.000	700.00	.00	.00	308.00	52250.00	329.02	327.90	335.48	124.19	21.11	2594.85	4688.58
*	43.000	800.00	.00	.00	336.00	52250.00	353.21	353.21	360.00	155.37	21.54	2536.54	4191.79
*	48.500	550.00	.00	.00	344.00	52250.00	377.28	377.28	388.31	113.23	29.75	2030.83	4910.33
*	54.250	425.00	.00	.00	370.00	52250.00	393.64	393.64	401.79	144.44	23.59	2338.98	4347.56
*	59.500	525.00	.00	.00	392.00	52250.00	413.59	413.59	421.20	142.84	22.90	2418.82	4371.75

*	65.200	570.00	.00	.00	412.00	52250.00	435.21	435.21	443.95	141.48	23.82	2231.97	4392.72
	77.000	1180.00	.00	.00	434.00	52250.00	453.58	451.89	458.91	109.39	19.03	2871.15	4995.68
*	86.000	700.00	.00	.00	440.00	41800.00	461.70	455.76	462.36	20.55	5.89	6501.96	9220.62
*	91.000	500.00	.00	.00	442.00	41800.00	462.47	457.37	464.52	78.83	11.36	3638.53	4708.05
*	93.500	250.00	.00	.00	444.00	41800.00	464.79	457.44	465.96	38.82	8.32	4980.46	6708.59

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	96.100	260.00	.00	.00	445.00	41800.00	465.99	460.84	467.05	42.21	7.92	5103.38	6433.84
	97.000	90.00	.00	.00	446.00	41800.00	465.98	463.08	467.80	77.42	9.88	3960.05	4750.72
	97.600	60.00	.00	.00	446.00	41800.00	466.53	463.36	468.28	77.73	10.14	4033.01	4741.27
	98.400	40.00	.00	.00	447.00	41800.00	465.91	461.82	469.15	151.01	14.44	2894.65	3401.51
	98.780	38.00	.00	.00	447.00	41800.00	466.82	461.82	469.71	128.32	13.65	3063.24	3690.03
*	99.330	55.00	.00	.00	448.00	41800.00	468.56	461.18	470.20	39.81	6.72	4697.03	6624.67
	100.400	107.00	.00	.00	450.00	41800.00	469.71	463.55	470.55	22.51	5.01	6157.28	8810.81
	102.000	160.00	.00	.00	453.00	41800.00	469.96	463.33	470.85	25.56	4.82	6172.06	8268.47
	103.600	160.00	.00	.00	454.00	41800.00	470.31	464.35	471.28	32.82	5.22	5927.59	7296.13
	104.950	135.00	.00	.00	455.00	41800.00	470.78	465.04	471.77	38.64	5.51	5843.31	6724.69
	106.100	115.00	.00	.00	455.00	41800.00	470.85	466.52	472.28	29.03	4.97	4642.16	7757.69
*	107.900	180.00	.00	.00	456.00	41800.00	471.33	467.16	473.15	77.81	8.05	4211.98	4738.77
	109.400	150.00	.00	.00	457.00	41800.00	472.56	468.26	474.34	80.33	8.01	4292.19	4663.73
	110.650	125.00	.00	.00	457.00	41800.00	473.54	468.81	475.18	56.09	6.95	4602.75	5581.38
	112.150	150.00	.00	.00	458.00	41800.00	474.45	470.30	476.15	72.05	7.64	4392.53	4924.59
	113.650	150.00	.00	.00	459.00	41800.00	475.61	470.76	477.17	62.90	7.26	4591.28	5270.49
	115.150	150.00	.00	.00	460.00	41800.00	476.44	471.28	478.12	58.73	7.15	4491.17	5454.24
	116.450	130.00	.00	.00	460.00	41800.00	477.07	472.41	478.81	46.26	6.59	4293.96	6145.55
	117.600	115.00	.00	.00	461.00	41800.00	477.38	473.72	479.55	60.80	7.37	3822.30	5360.84
	118.500	90.00	.00	.00	461.00	41800.00	478.10	474.52	480.09	55.84	7.12	4156.35	5593.65

MALIBU CREEK (F)

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	.000	52250.00	303.02	.00	.00	9.02	176.75	.00
*	1.500	52250.00	309.79	.00	6.77	.00	330.78	150.00
	3.000	52250.00	309.91	.00	.13	.00	299.74	150.00
*	7.500	52250.00	310.20	.00	.29	.00	244.21	450.00
*	14.500	52250.00	315.91	.00	5.71	.00	292.23	700.00
*	20.500	52250.00	316.78	.00	.87	.00	182.56	600.00
	28.000	52250.00	322.71	.00	5.93	.00	173.29	750.00
	35.000	52250.00	329.02	.00	6.30	.00	167.06	700.00
*	43.000	52250.00	353.21	.00	24.20	.00	190.70	800.00
*	48.500	52250.00	377.28	.00	24.07	.00	94.57	550.00
*	54.250	52250.00	393.64	.00	16.35	.00	147.73	425.00
*	59.500	52250.00	413.59	.00	19.95	.00	162.74	525.00
*	65.200	52250.00	435.21	.00	21.62	.00	130.41	570.00
	77.000	52250.00	453.58	.00	18.38	.00	198.86	1180.00
*	86.000	41800.00	461.70	.00	8.11	.00	634.70	700.00
*	91.000	41800.00	462.47	.00	.77	.00	273.31	500.00

*	93.500	41800.00	464.79	.00	2.32	.00	562.54	250.00
	96.100	41800.00	465.99	.00	1.20	.00	477.92	260.00
	97.000	41800.00	465.98	.00	-.01	.00	436.72	90.00
	97.600	41800.00	466.53	.00	.55	.00	461.62	60.00
	98.400	41800.00	465.91	.00	-.62	.00	184.33	40.00
	98.780	41800.00	466.82	.00	.91	.00	184.36	38.00
*	99.330	41800.00	468.56	.00	1.74	.00	334.45	55.00
	100.400	41800.00	469.71	.00	1.16	.00	550.12	107.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
102.000	41800.00	469.96	.00	.24	.00	515.60	160.00
103.600	41800.00	470.31	.00	.36	.00	555.43	160.00
104.950	41800.00	470.78	.00	.47	.00	576.09	135.00
106.100	41800.00	470.85	.00	.07	.00	481.23	115.00
* 107.900	41800.00	471.33	.00	.48	.00	394.35	180.00
109.400	41800.00	472.56	.00	1.23	.00	398.36	150.00
110.650	41800.00	473.54	.00	.99	.00	384.54	125.00
112.150	41800.00	474.45	.00	.91	.00	411.21	150.00
113.650	41800.00	475.61	.00	1.16	.00	396.73	150.00
115.150	41800.00	476.44	.00	.83	.00	359.63	150.00
116.450	41800.00	477.07	.00	.63	.00	355.28	130.00
117.600	41800.00	477.38	.00	.30	.00	327.48	115.00
118.500	41800.00	478.10	.00	.72	.00	350.00	90.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= .000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 1.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 7.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 14.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 20.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 43.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 43.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 48.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 48.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 54.250 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 54.250 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 59.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 59.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 65.200 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 65.200 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 86.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 91.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

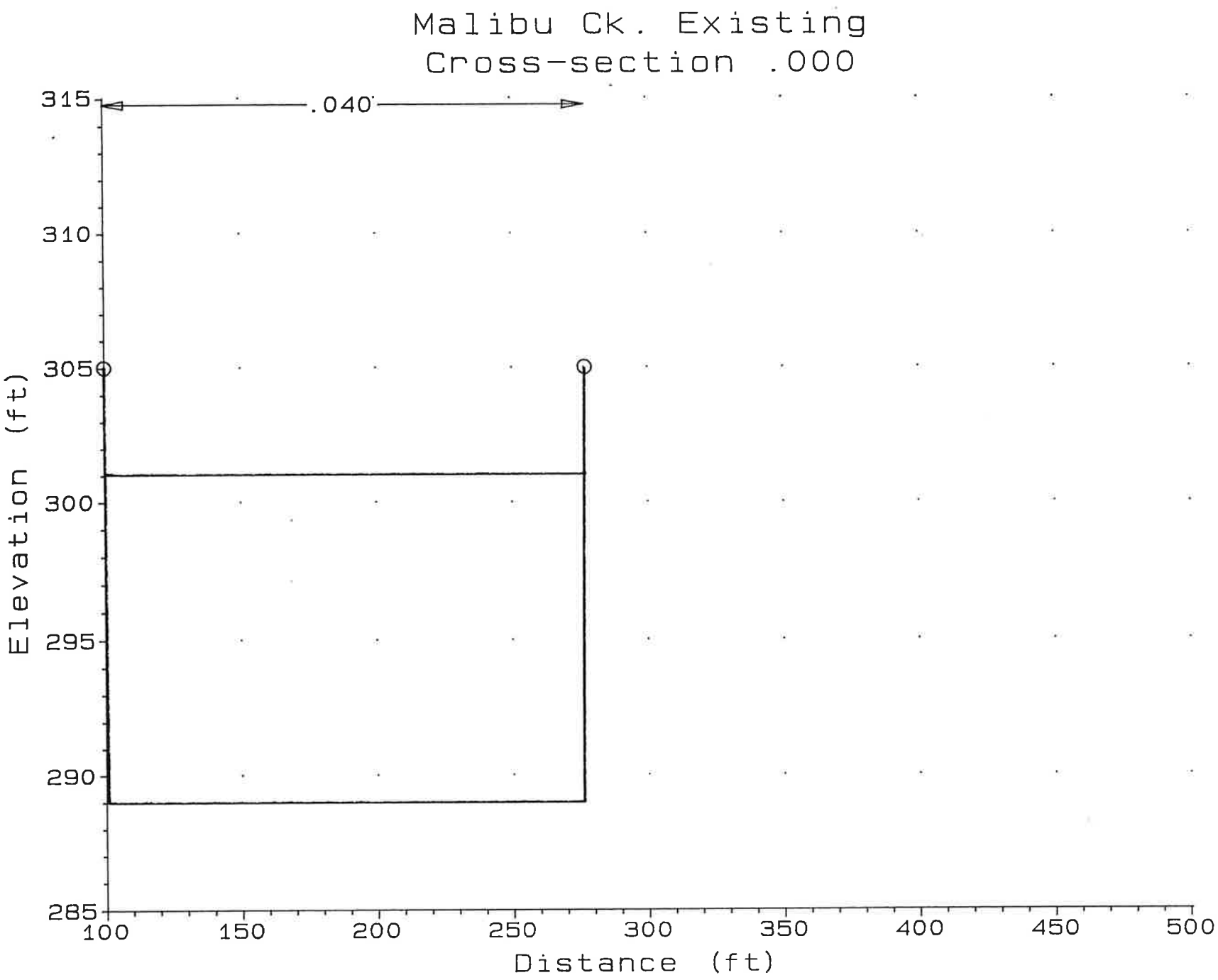
WARNING SECNO= 93.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

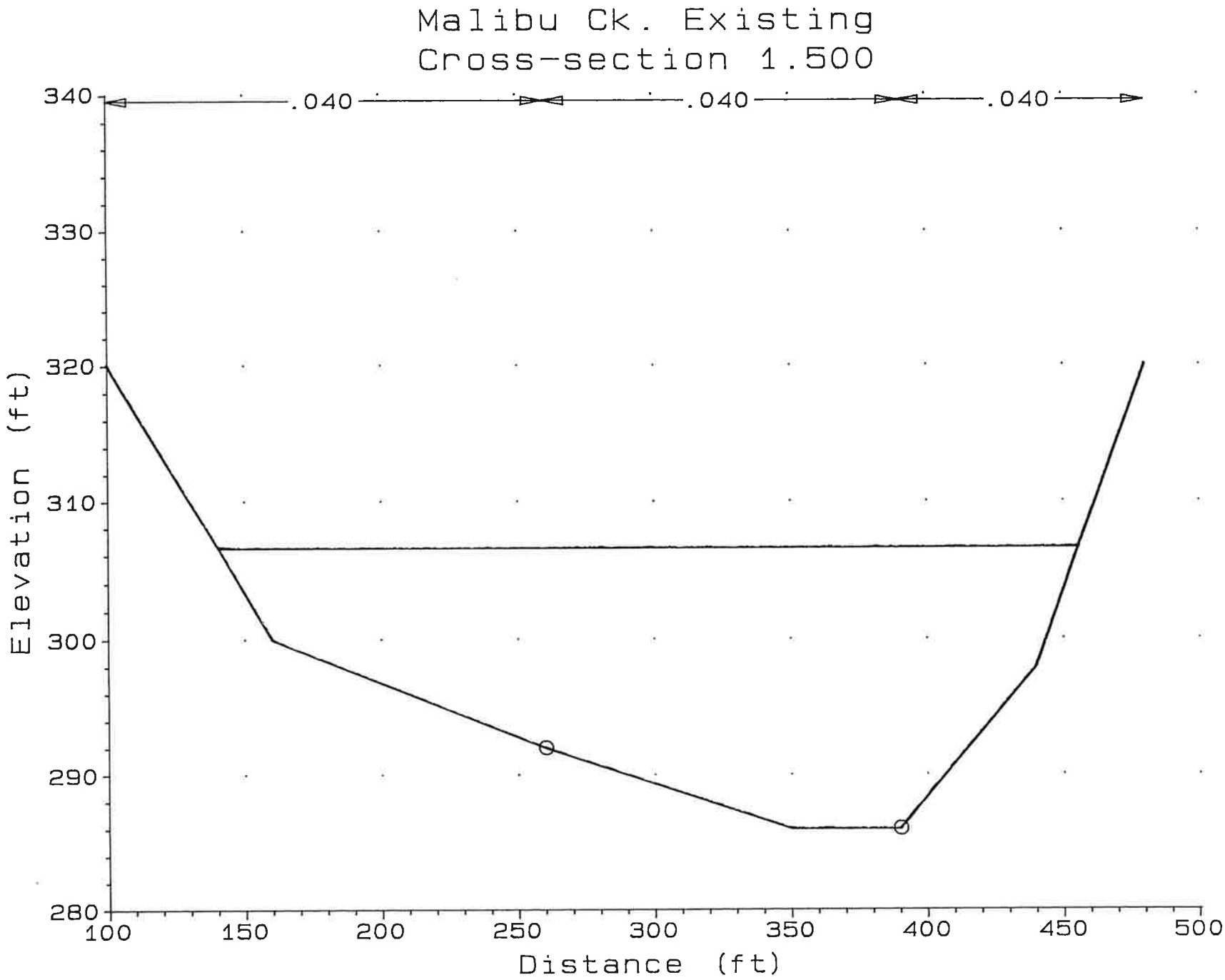
WARNING SECNO= 99.330 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

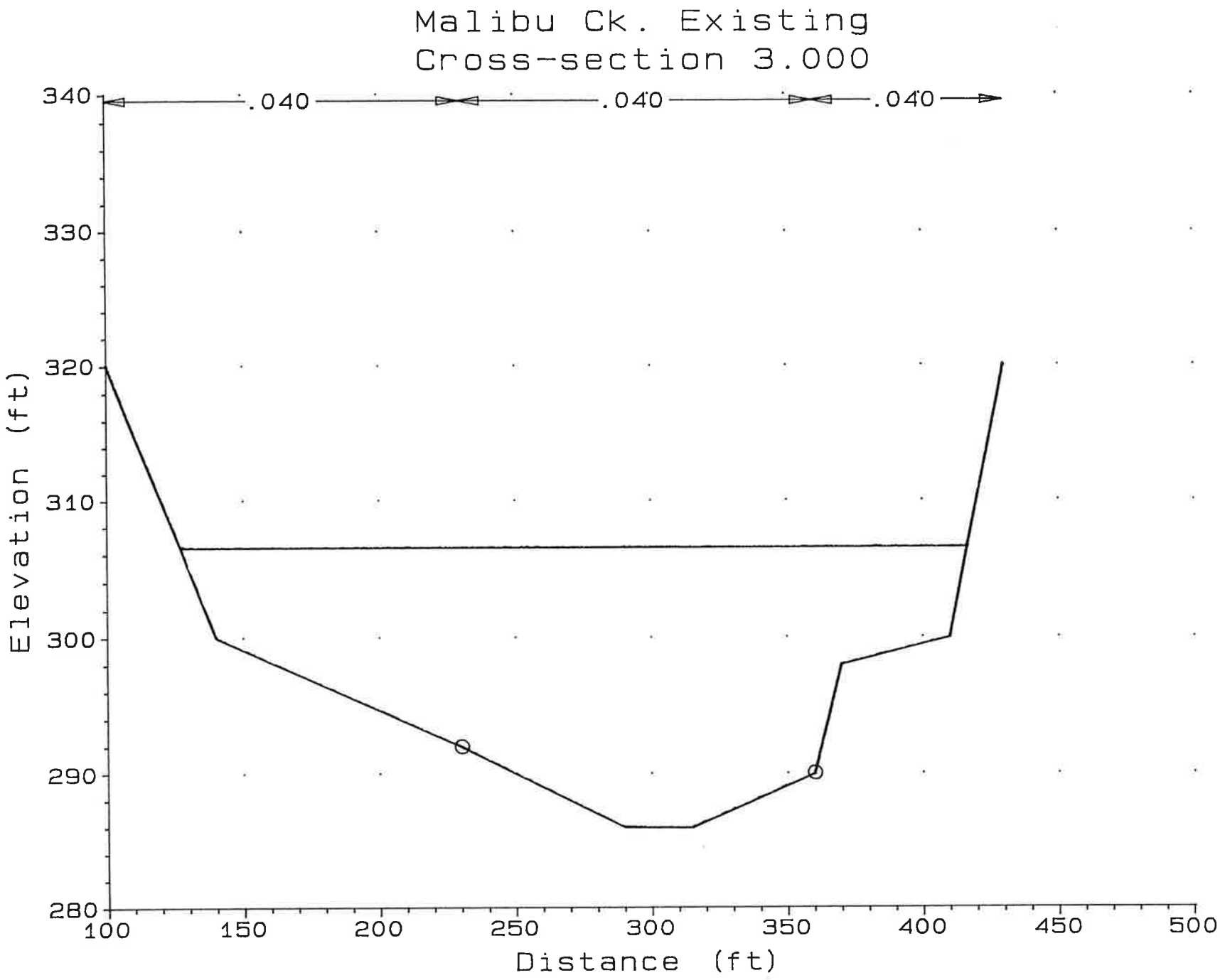
WARNING SECNO= 107.900 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

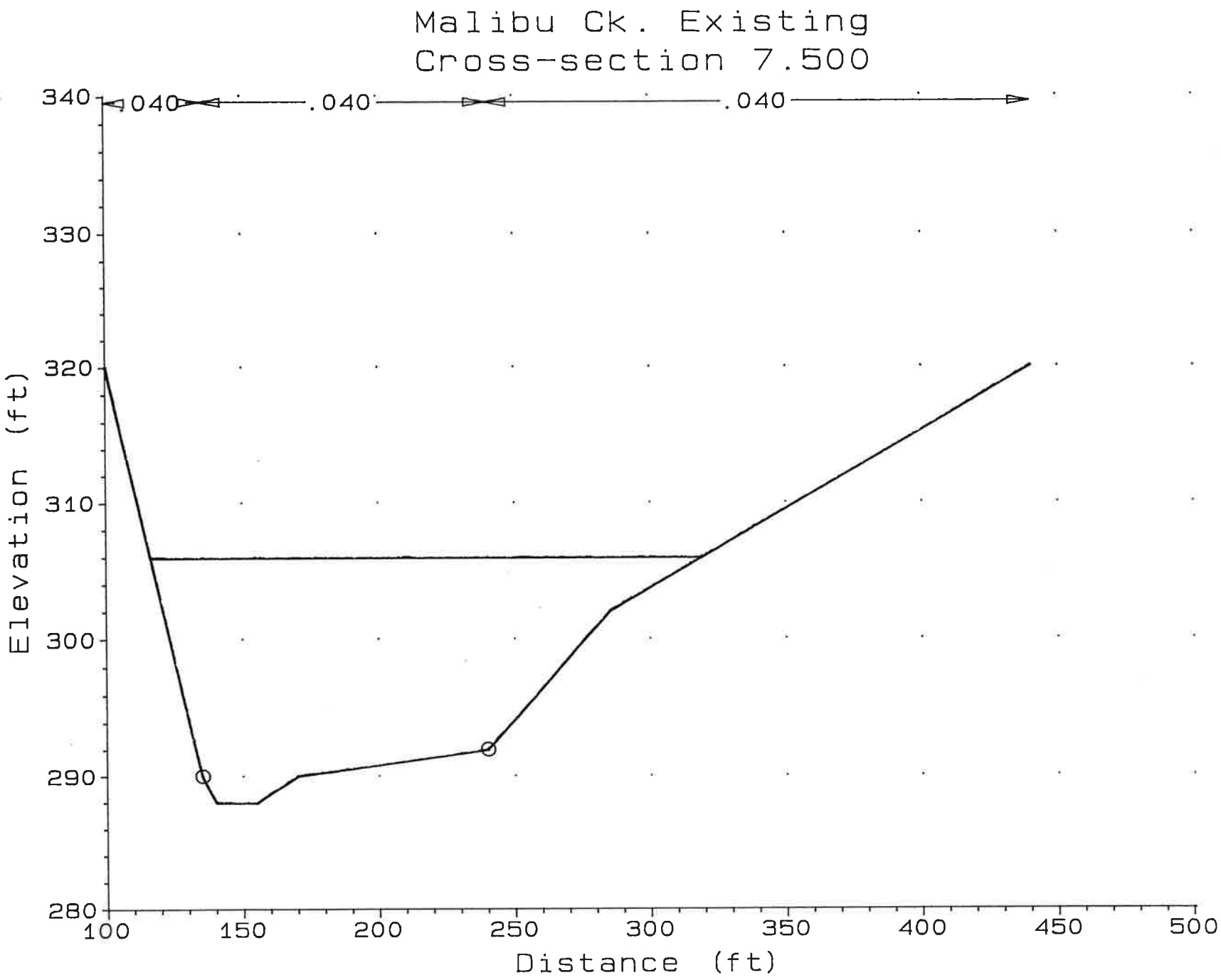
APPENDIX 3

MALIBU CREEK
CROSS SECTION PLOTS FOR
EXISTING CHANNEL CONDITION


Malibu Ck. Existing
Cross-section .000
.040
315
310
305
300
295
290
285
Elevation (ft)
100
150
200
250
300
350
400
450
500
Distance (ft)


Malibu Ck. Existing
Cross-section 1.500
.040
.040
.040
340
330
320
310
300
290
280
Elevation (ft)
100
150
200
250
300
350
400
450
500
Distance (ft)


Malibu Ck. Existing
Cross-section 3.000
.040
.040
.040
340
330
320
310
300
290
280
Elevation (ft)
100
150
200
250
300
350
400
450
500
Distance (ft)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Cross-section 7.500
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Elevation (ft)
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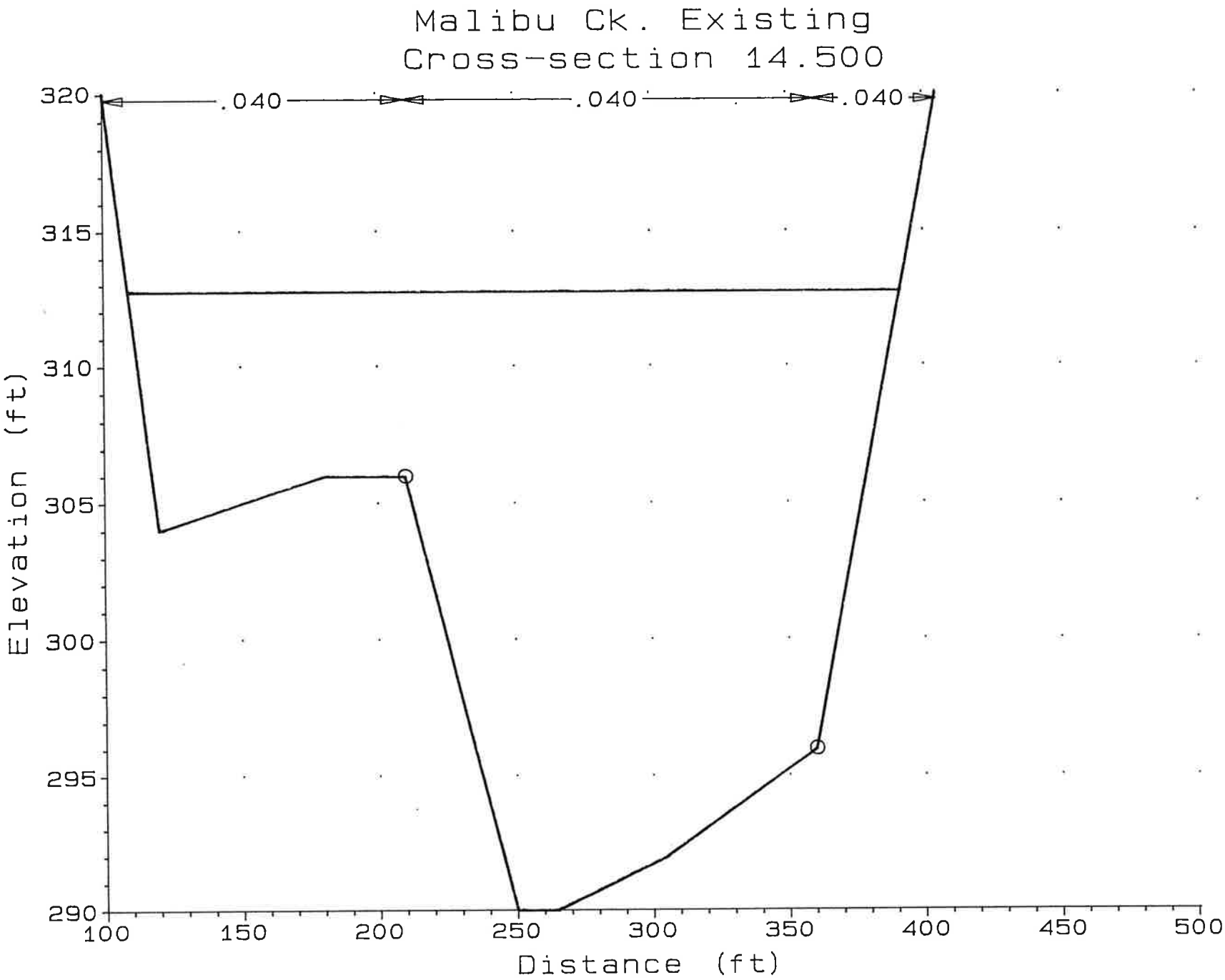
Distance (ft)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Elevation (ft)
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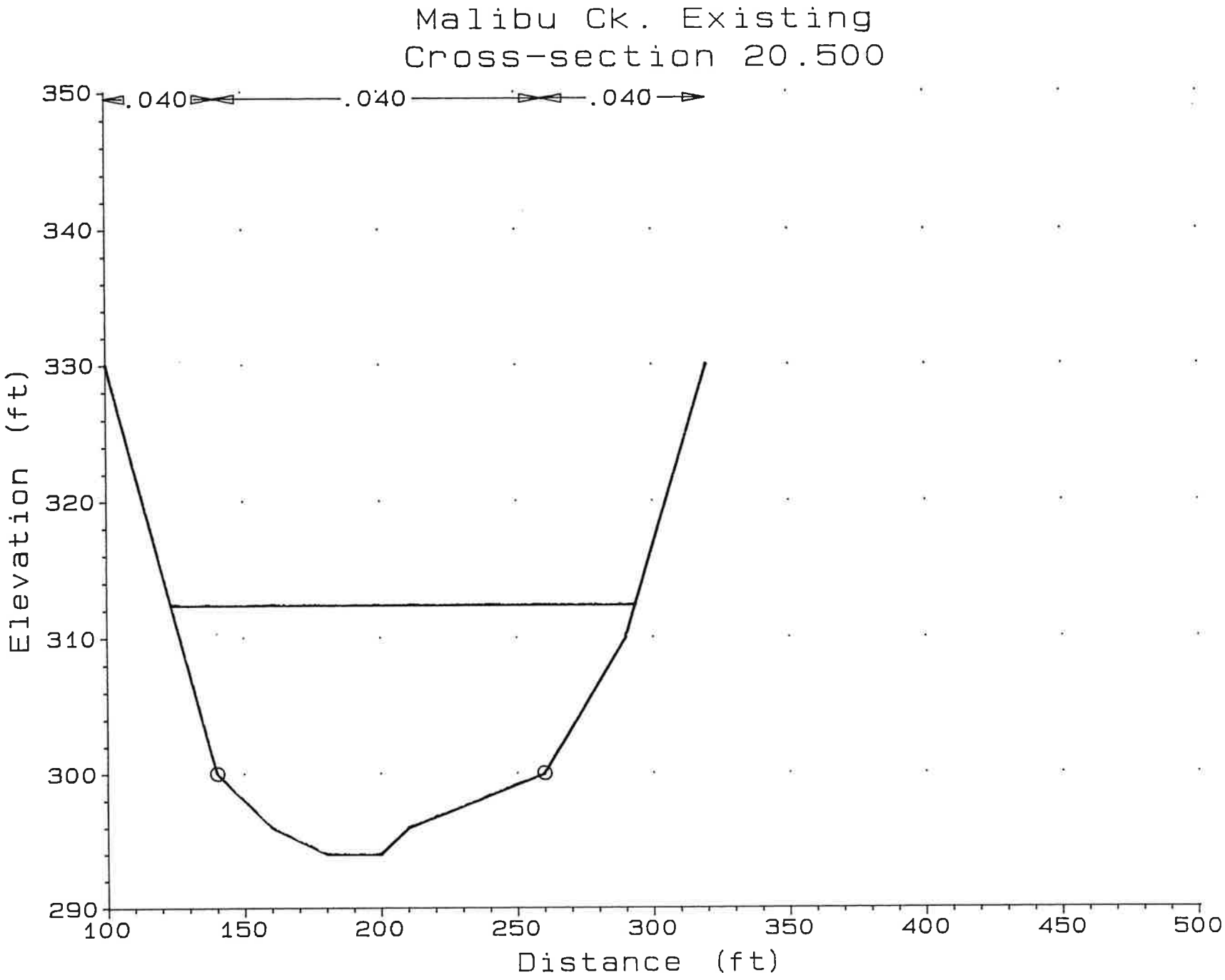
Distance (ft)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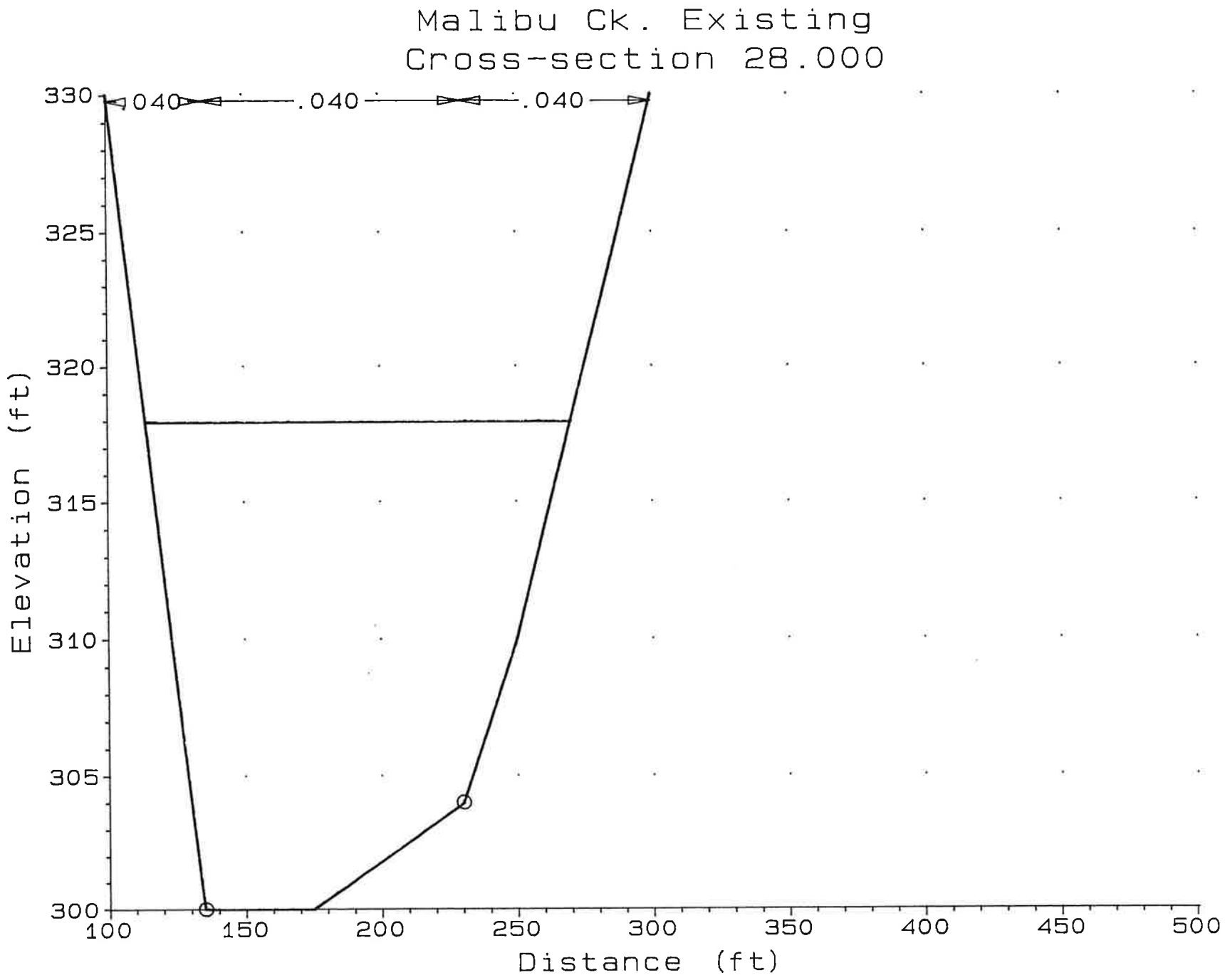
Distance (ft)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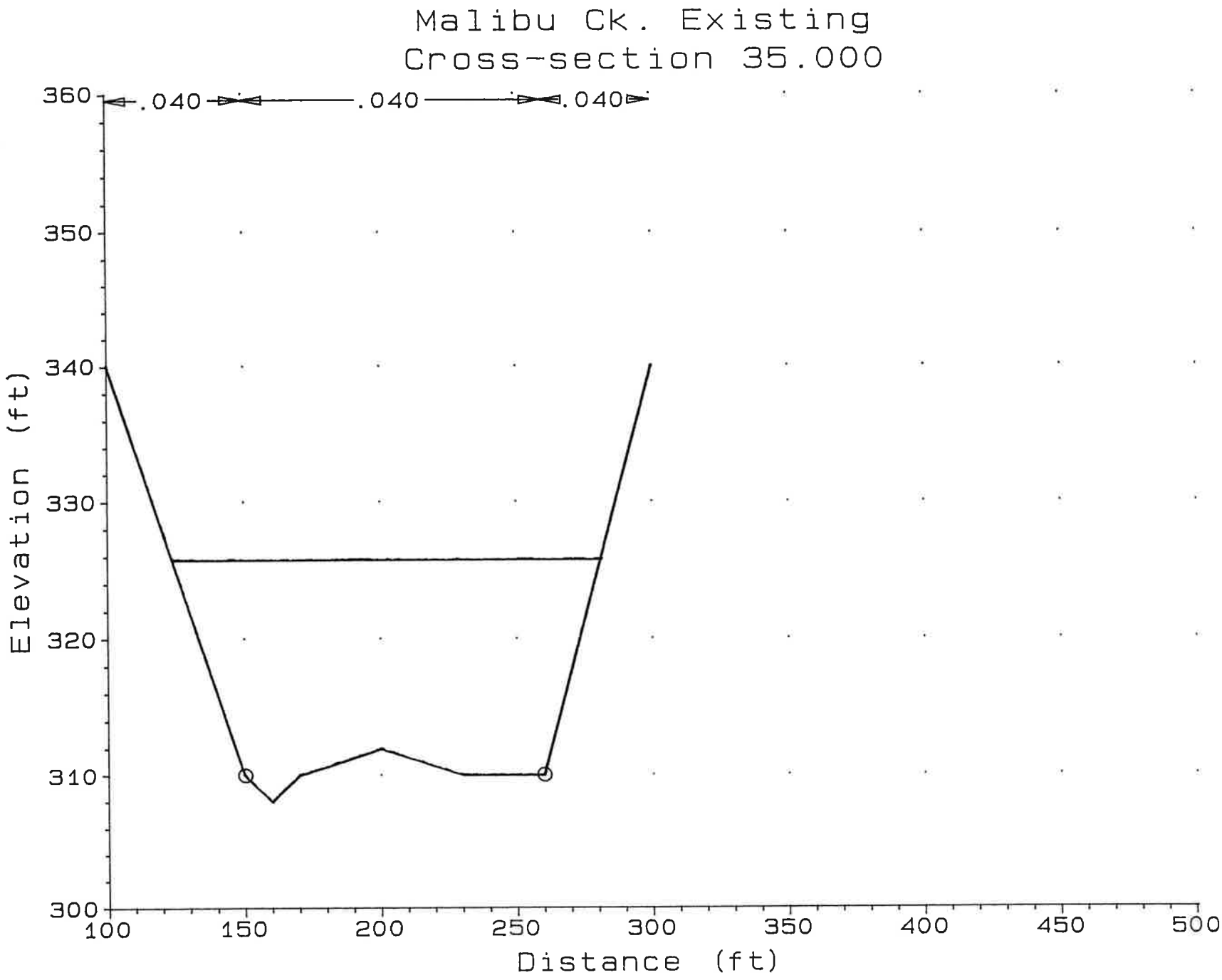
Distance (ft)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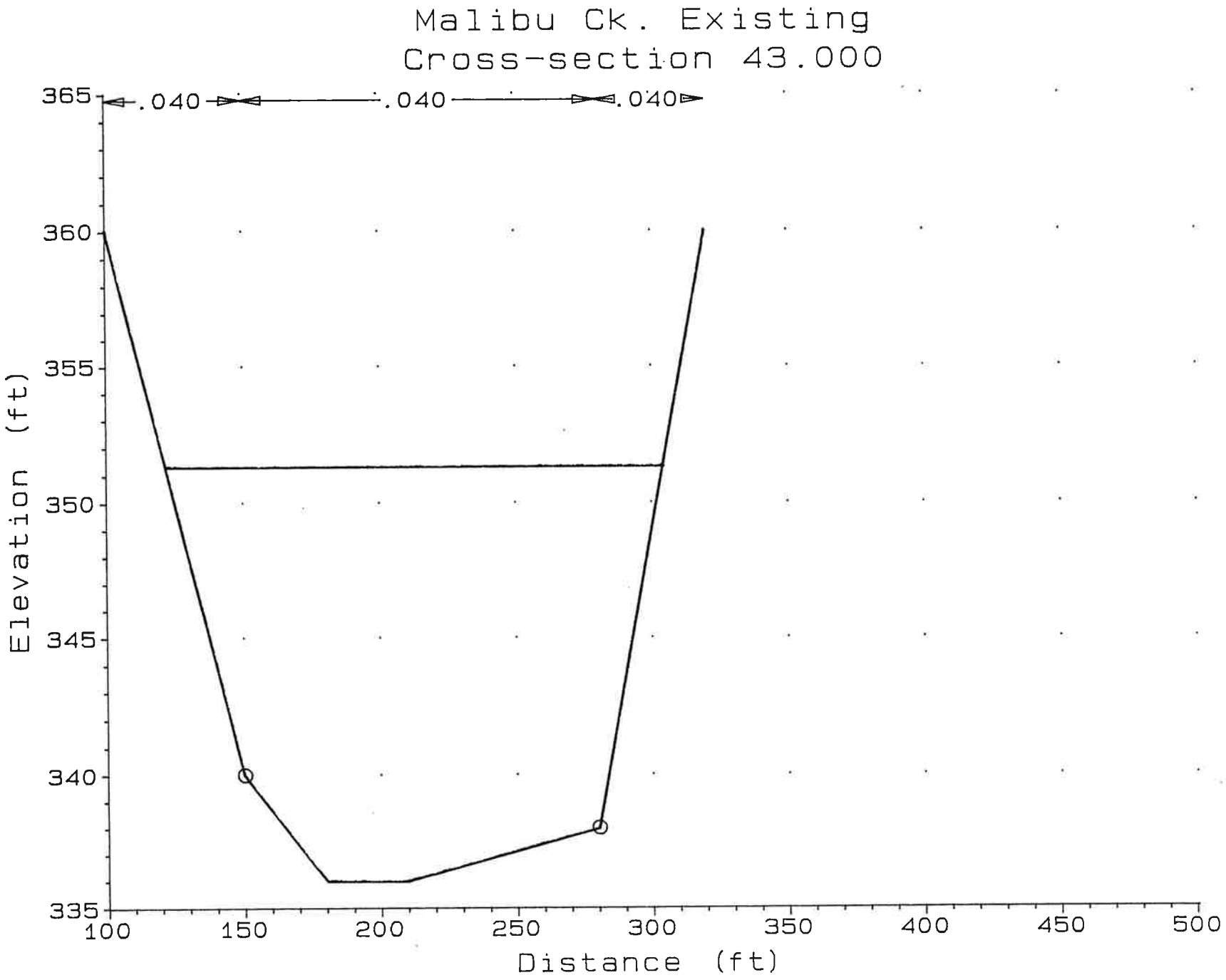
Distance (ft)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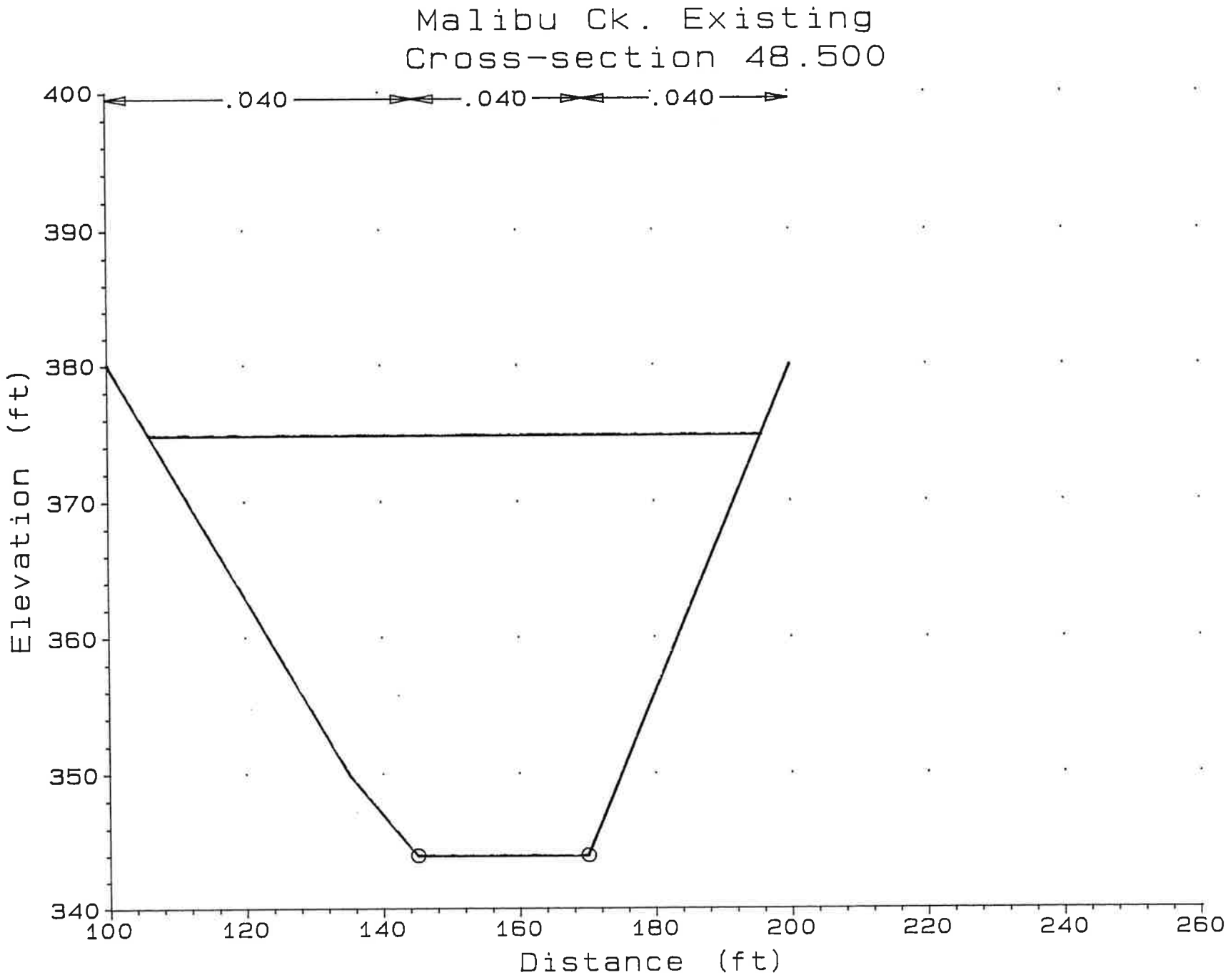
Distance (ft)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Elevation (ft)
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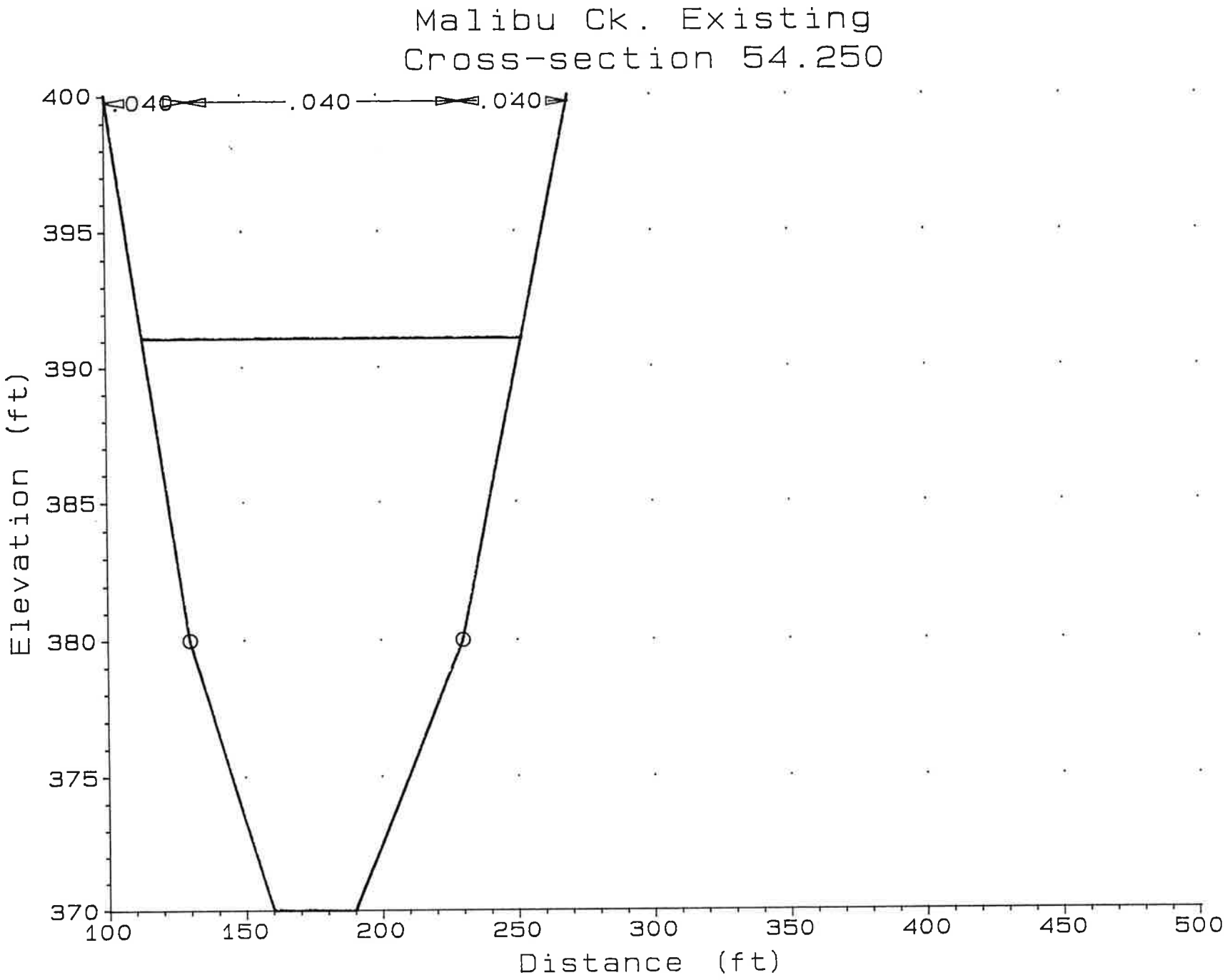
Distance (ft)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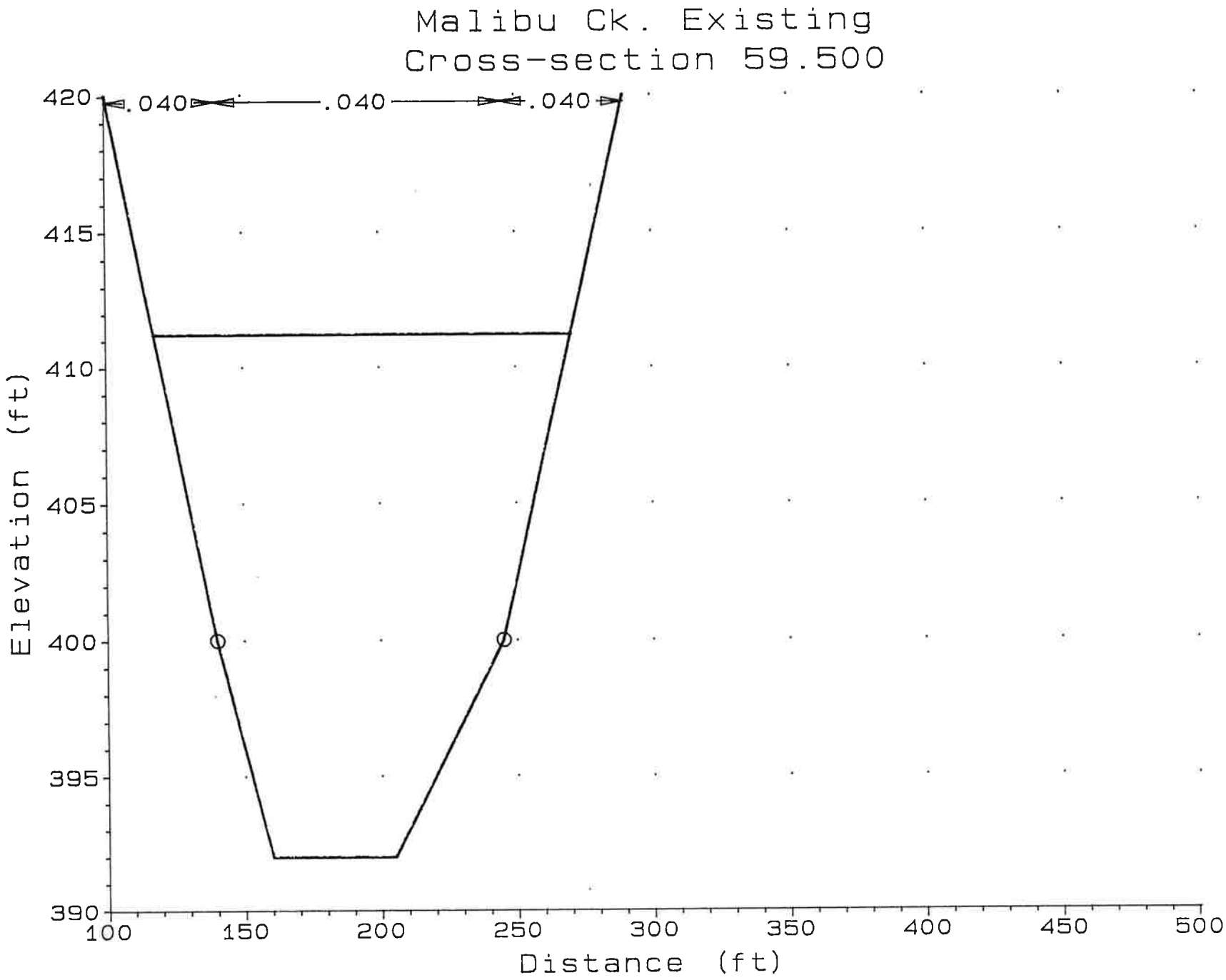
Distance (ft)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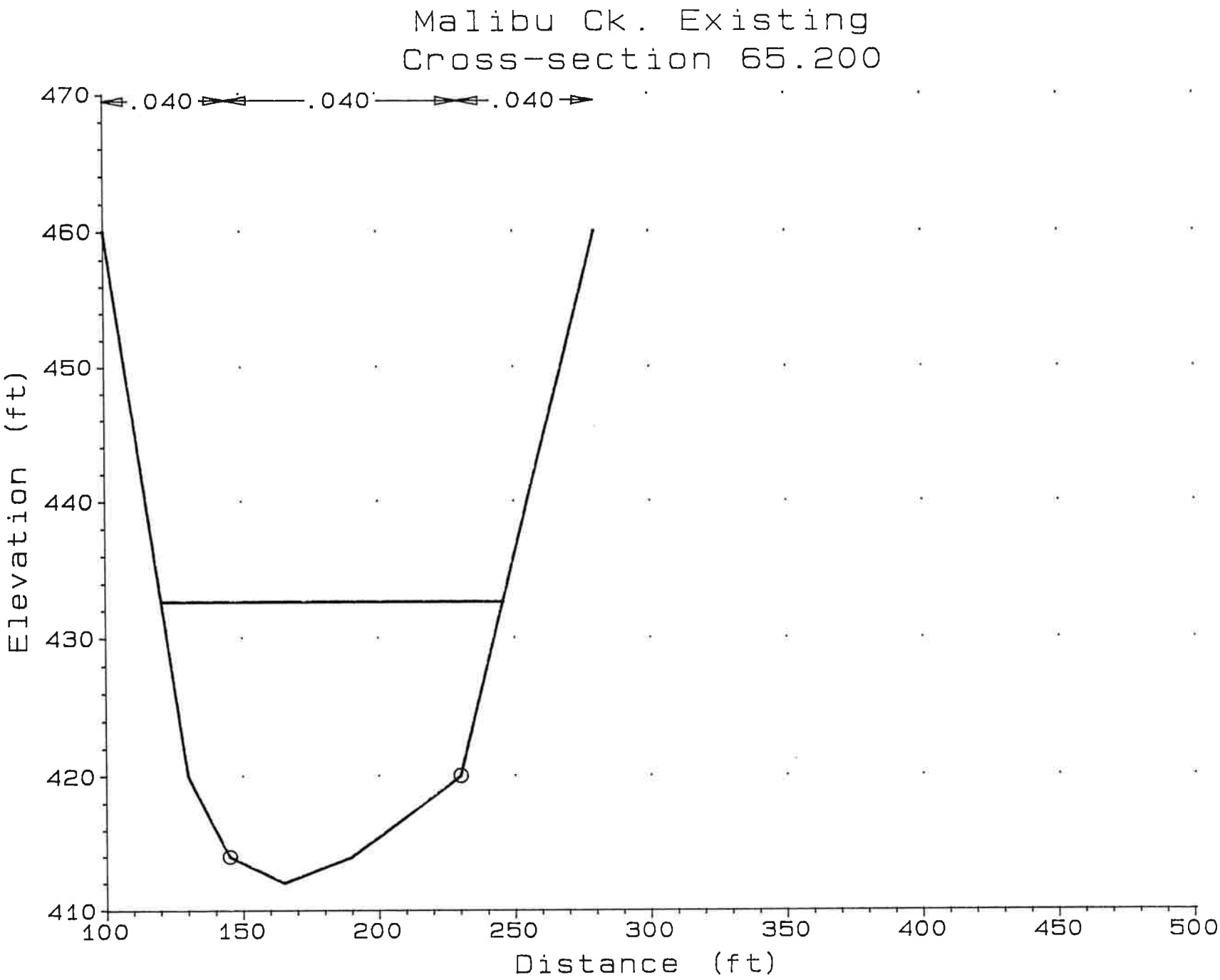
Distance (ft)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Cross-section 65.200
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Elevation (ft)
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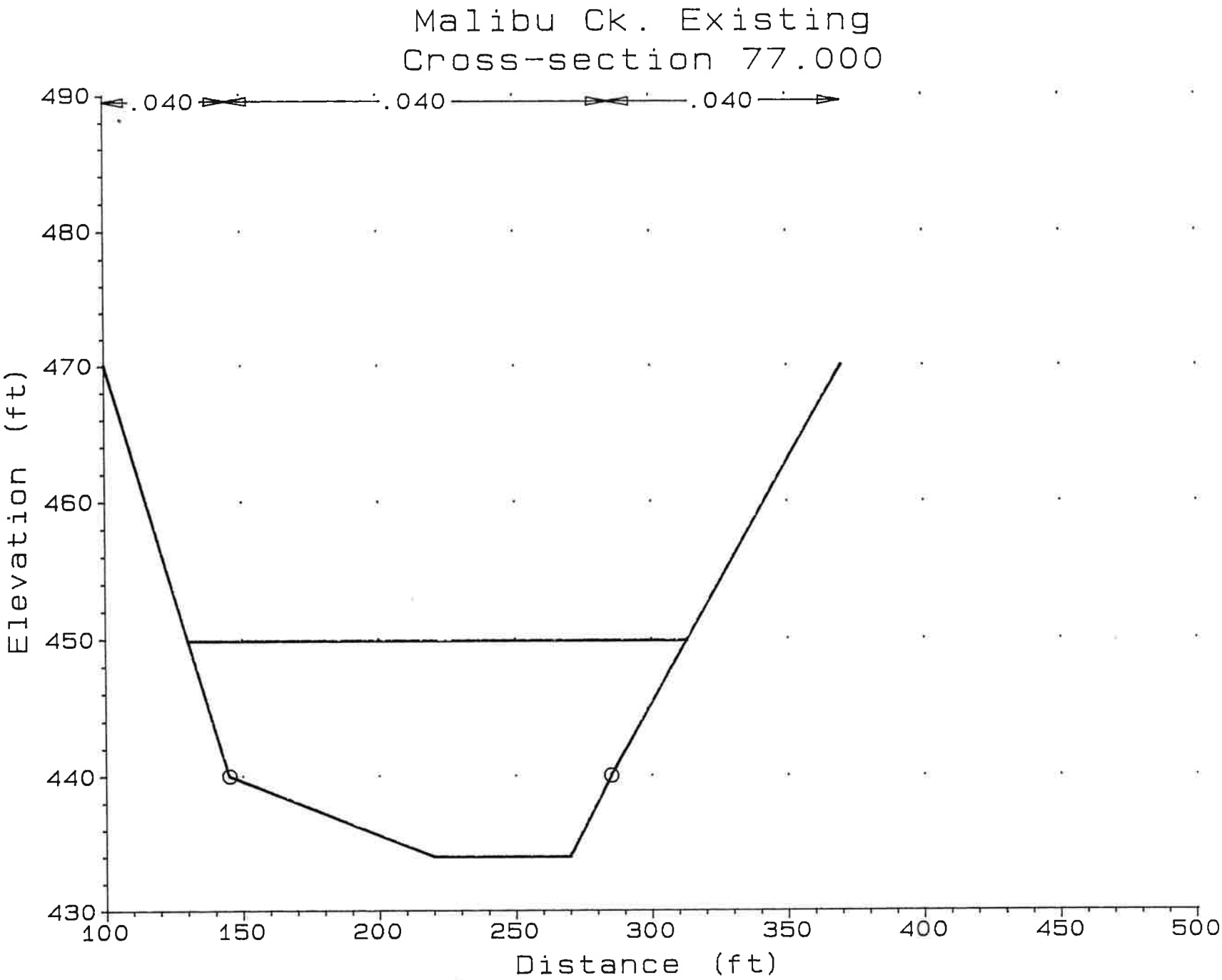
Distance (ft)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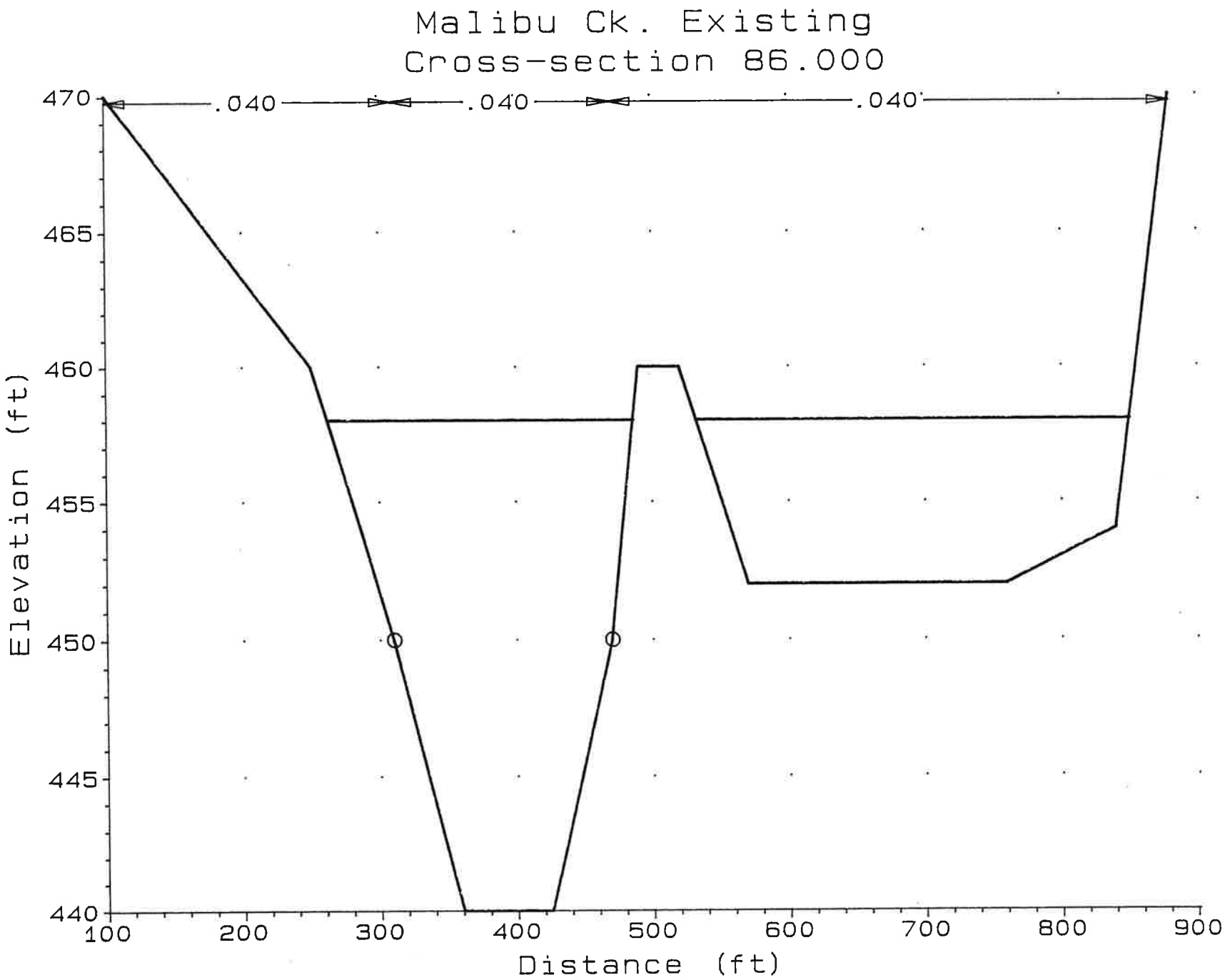
Distance (ft)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Cross-section 86.000
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Elevation (ft)
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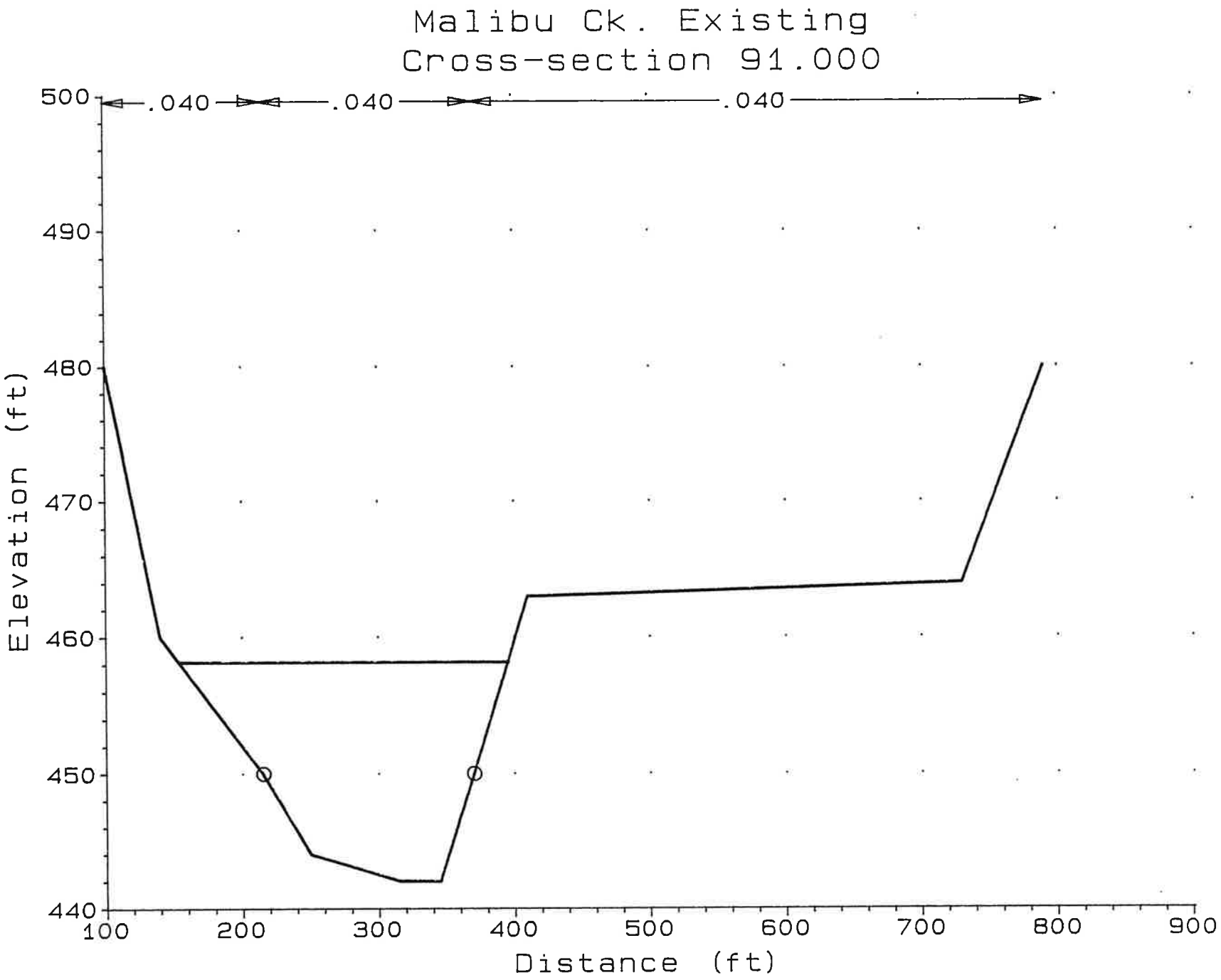
Distance (ft)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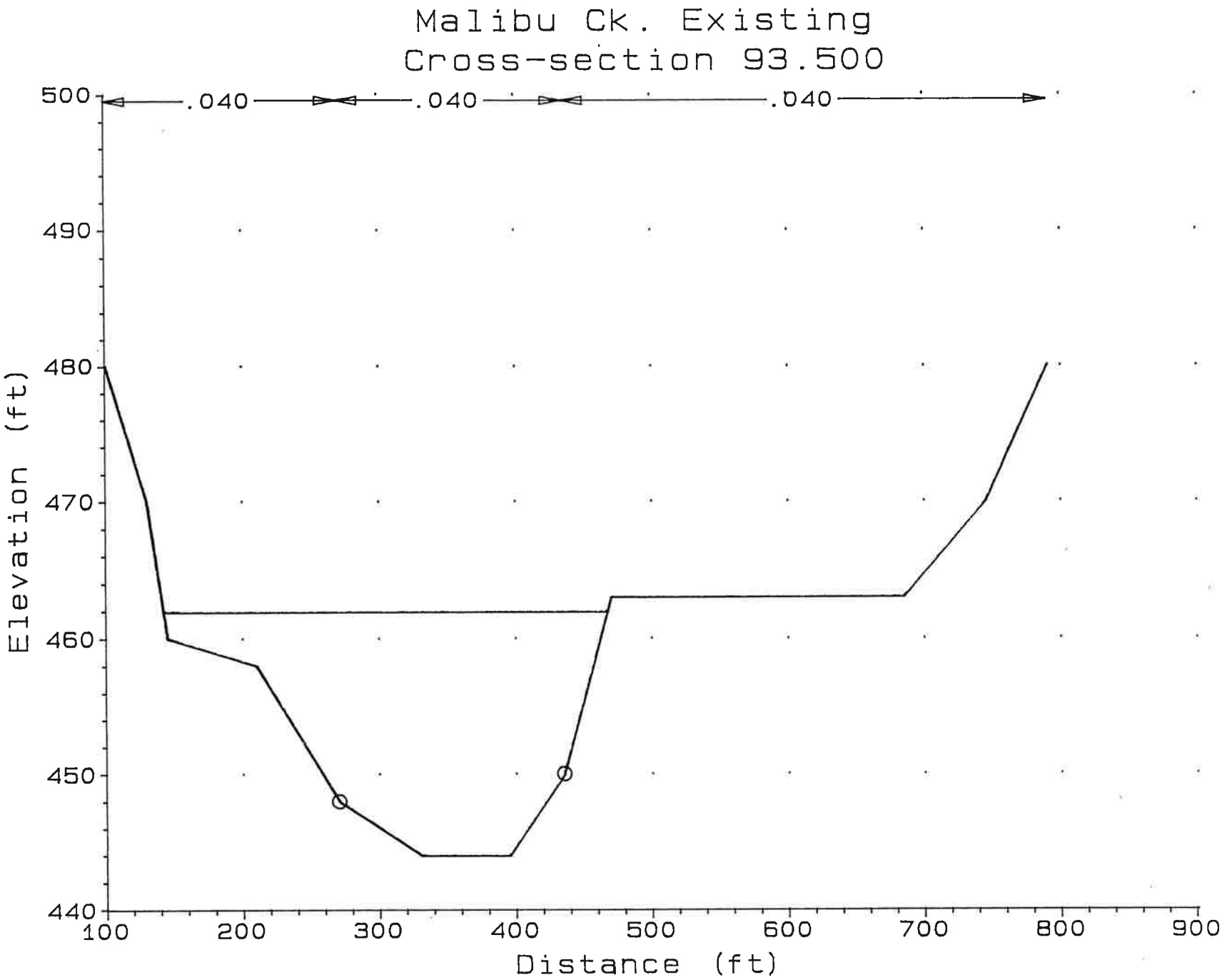
Distance (ft)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800
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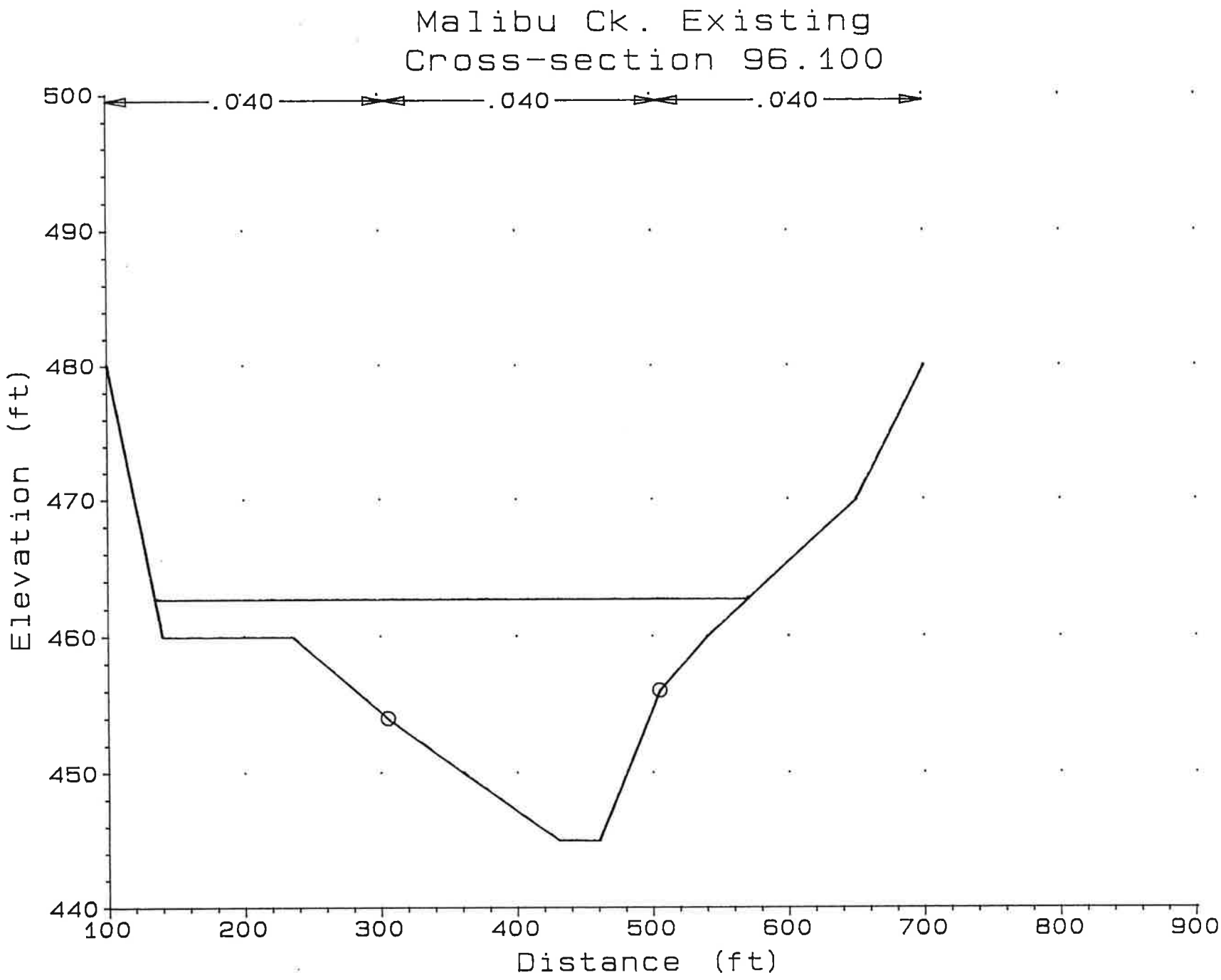
Distance (ft)


Malibu Ck. Existing
Cross-section 96.100
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Elevation (ft)
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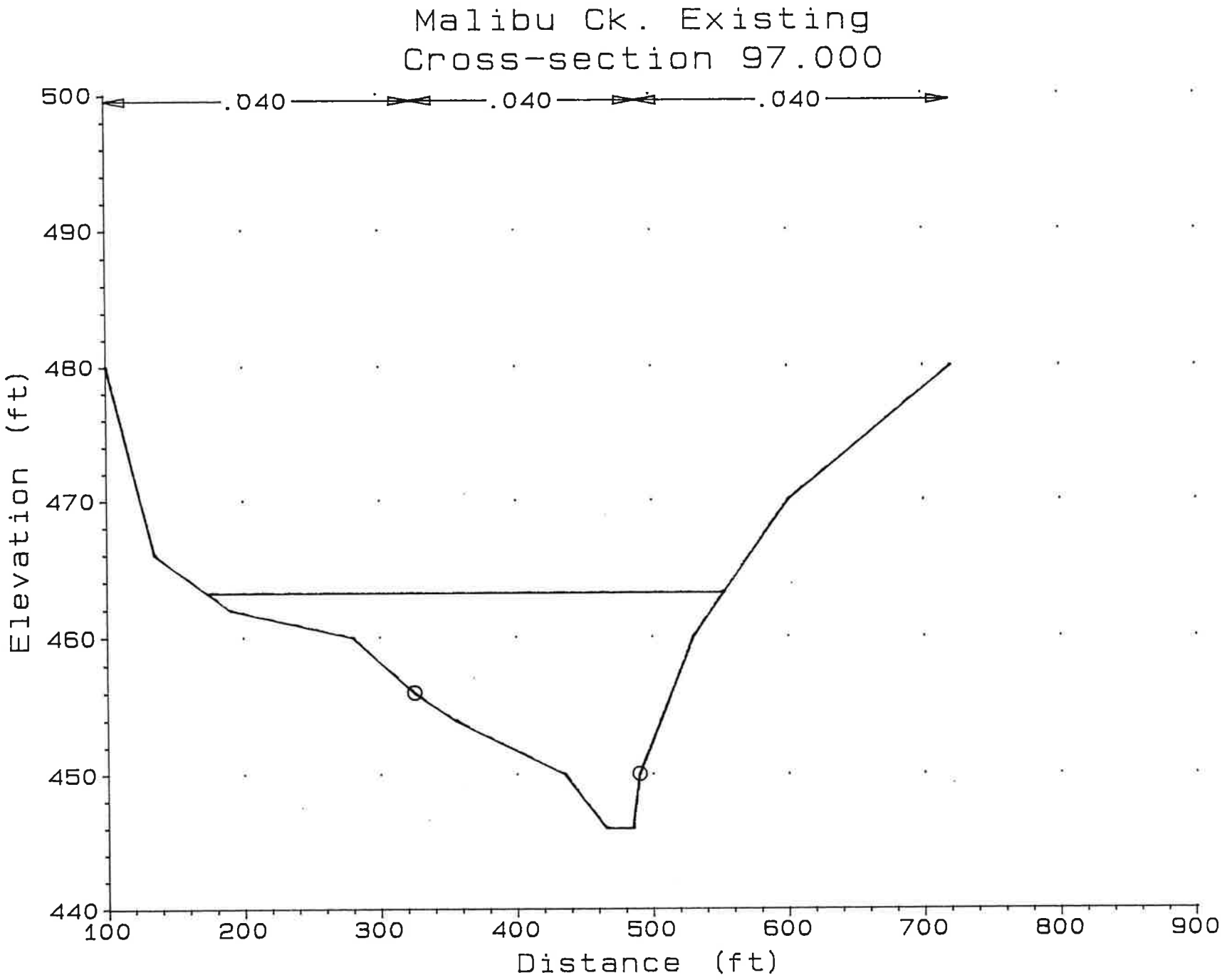
Distance (ft)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Cross-section 97.000
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.040
.040
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Elevation (ft)
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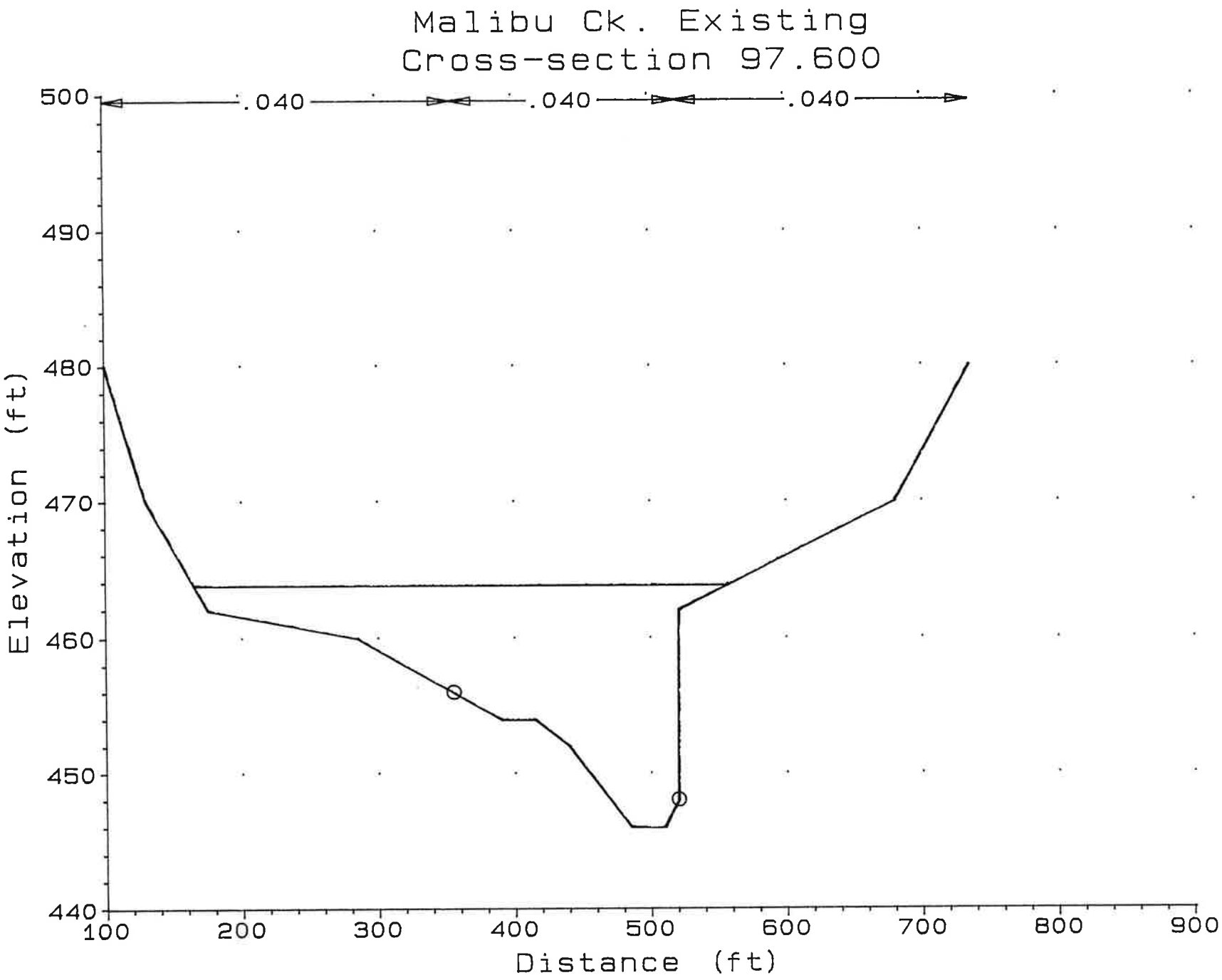
Distance (ft)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Cross-section 97.600
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Elevation (ft)
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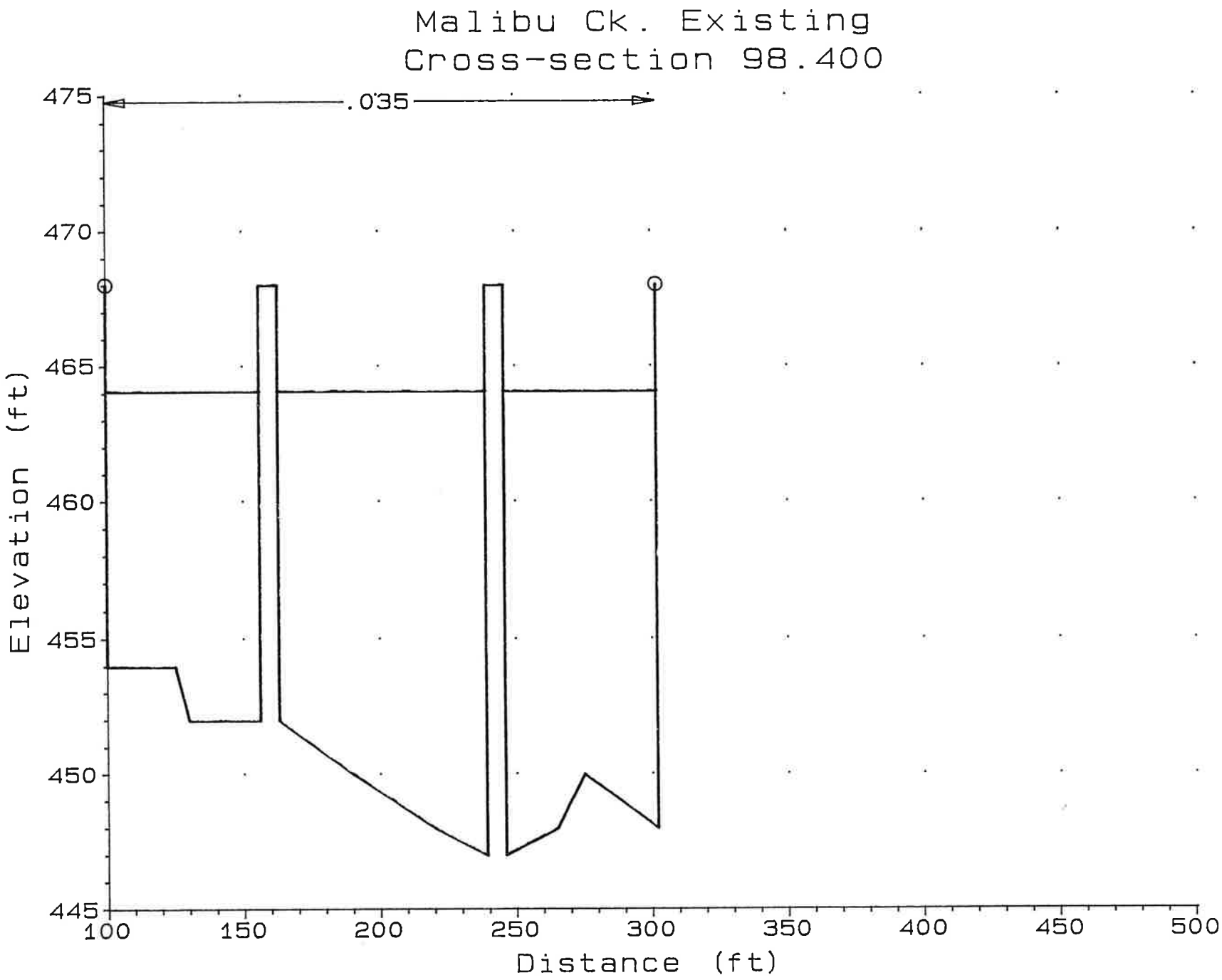
Distance (ft)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Elevation (ft)
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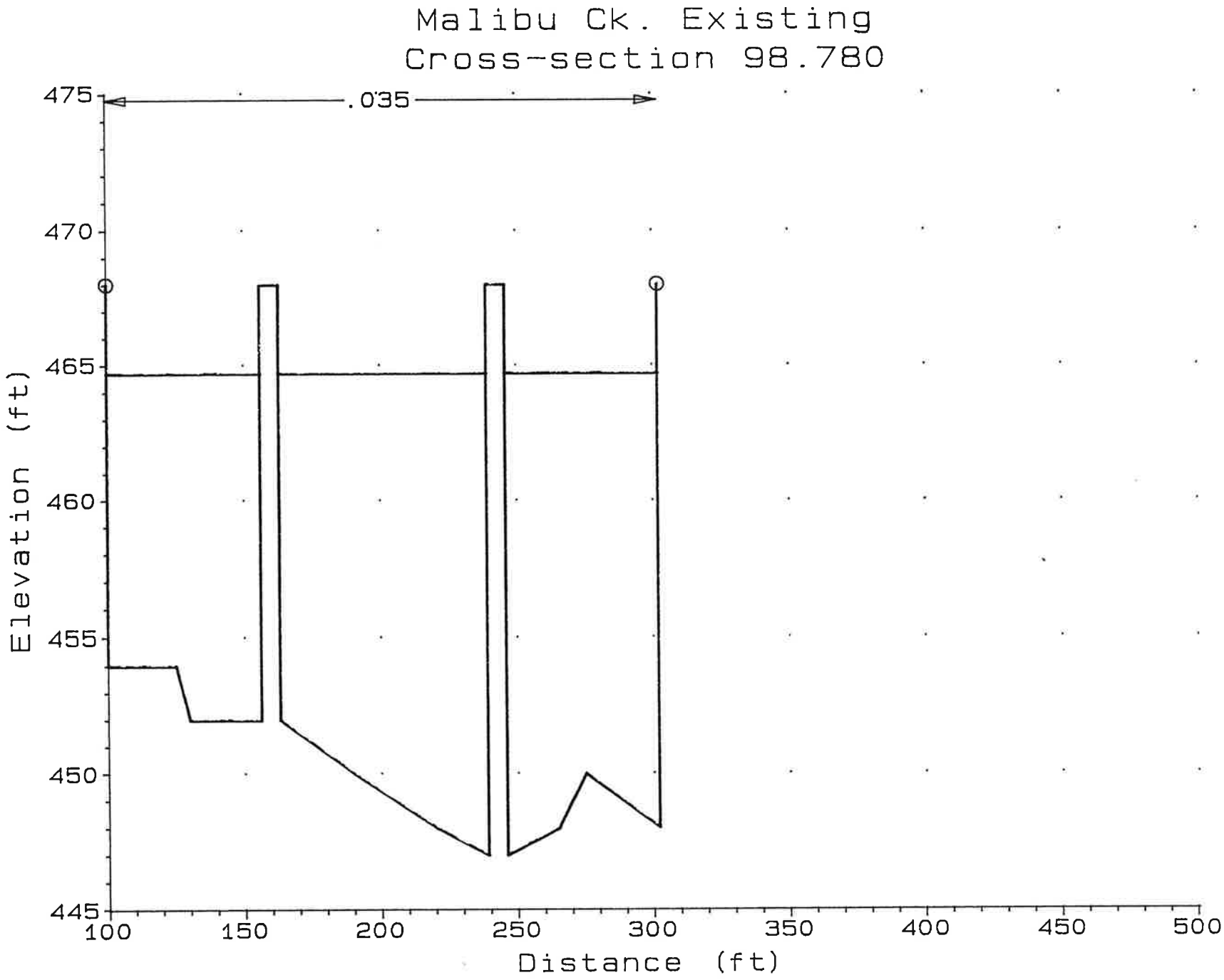
Distance (ft)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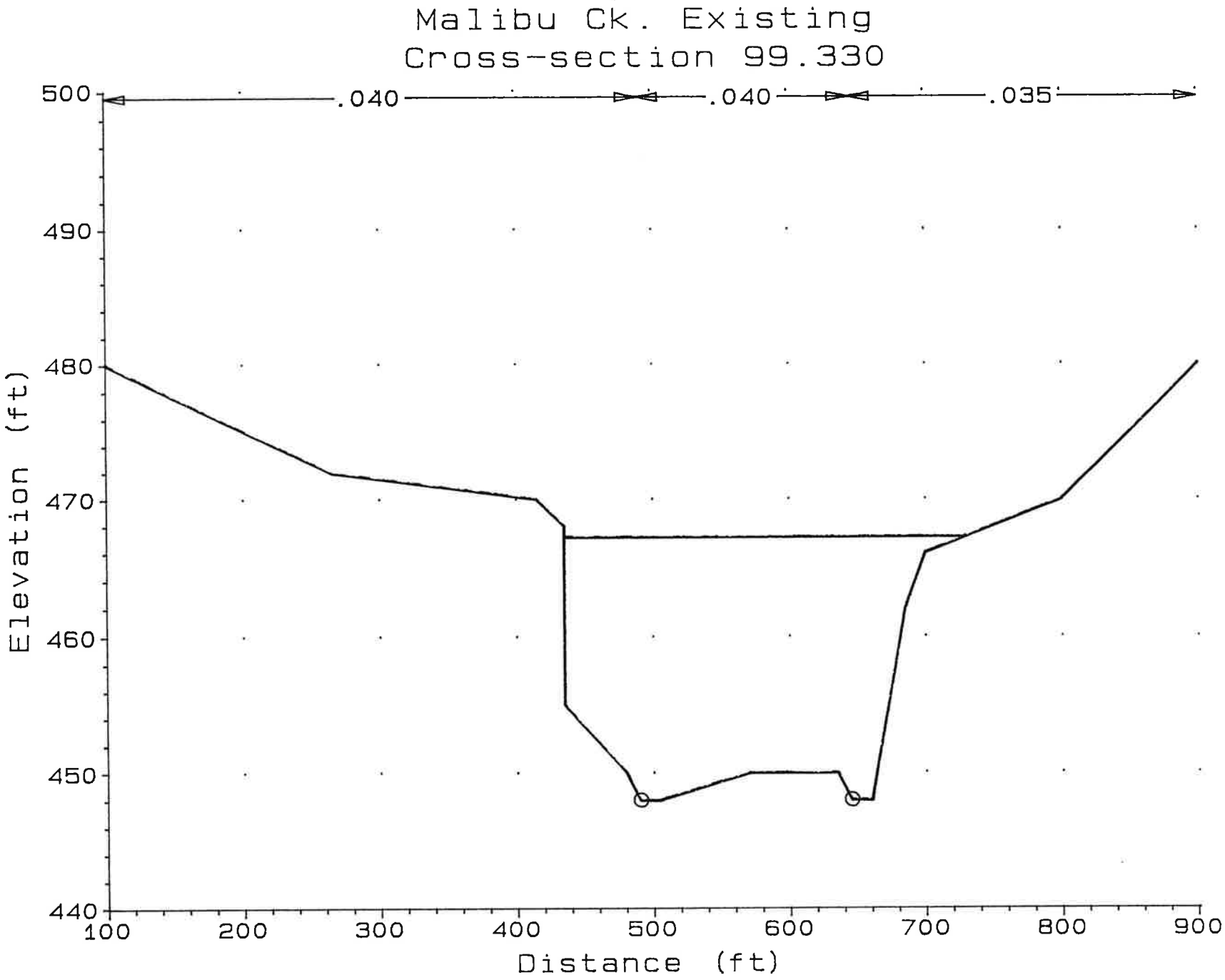
Distance (ft)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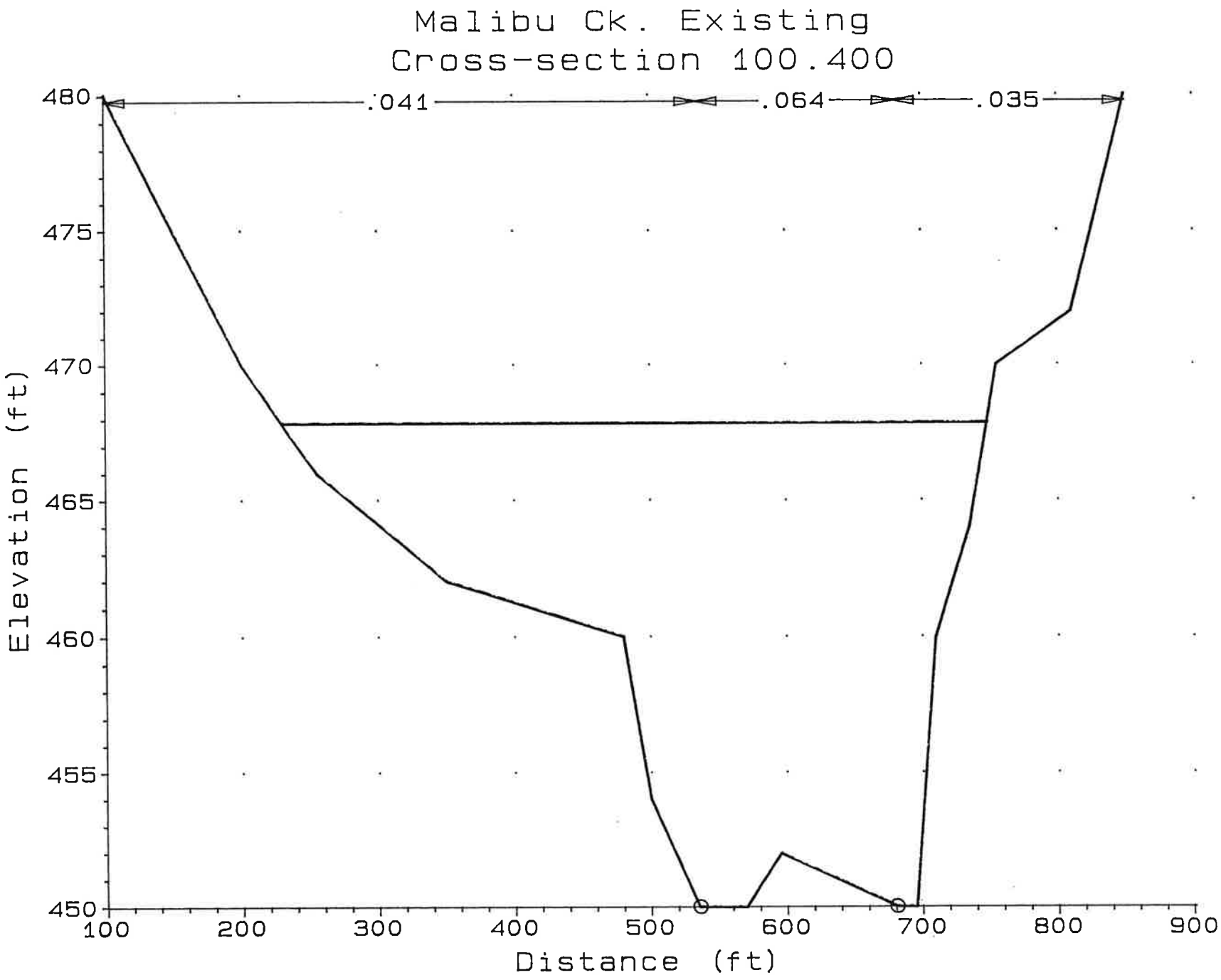
Distance (ft)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Cross-section 100.400
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Elevation (ft)
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800
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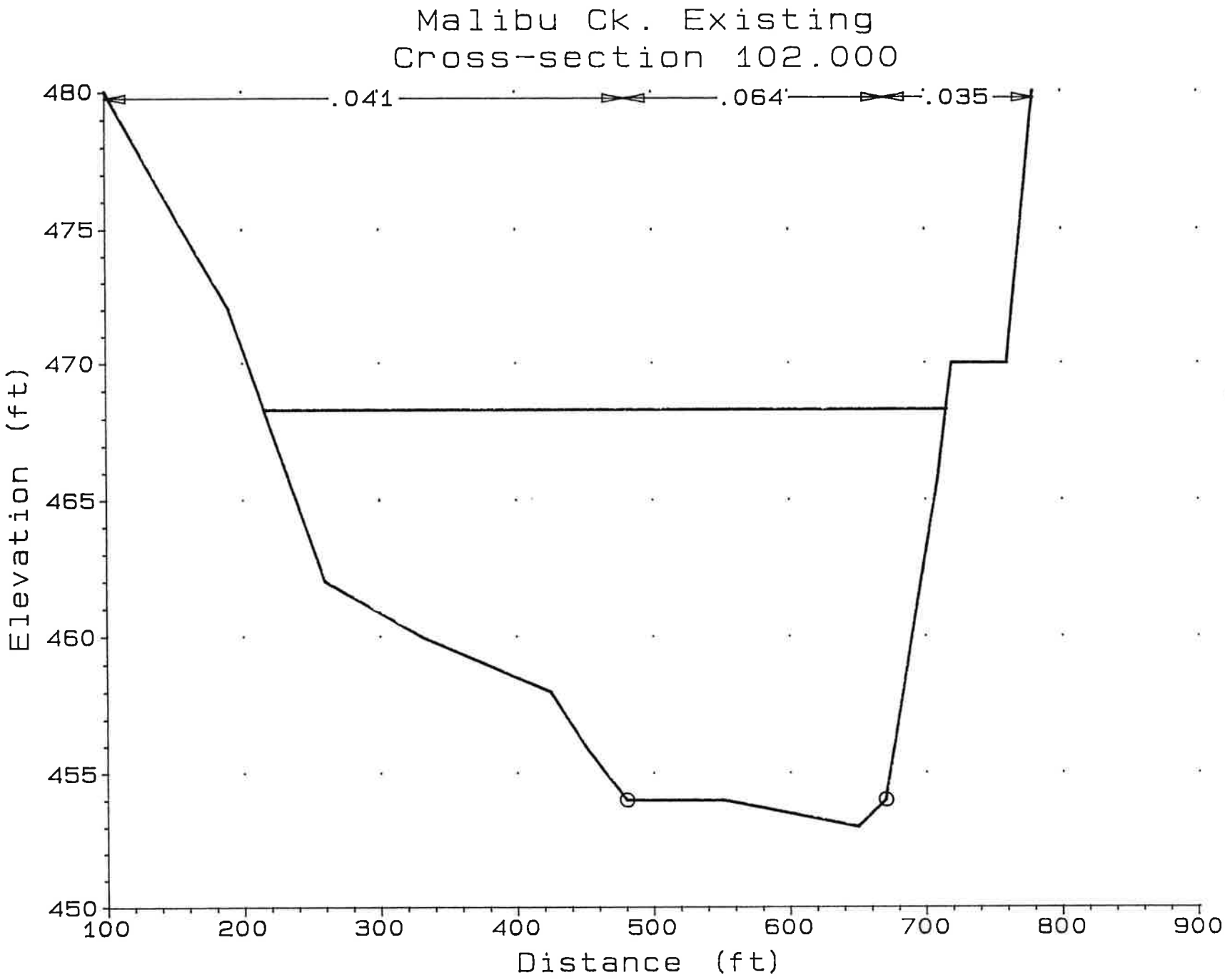
Distance (ft)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Cross-section 102.000
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.035
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Elevation (ft)
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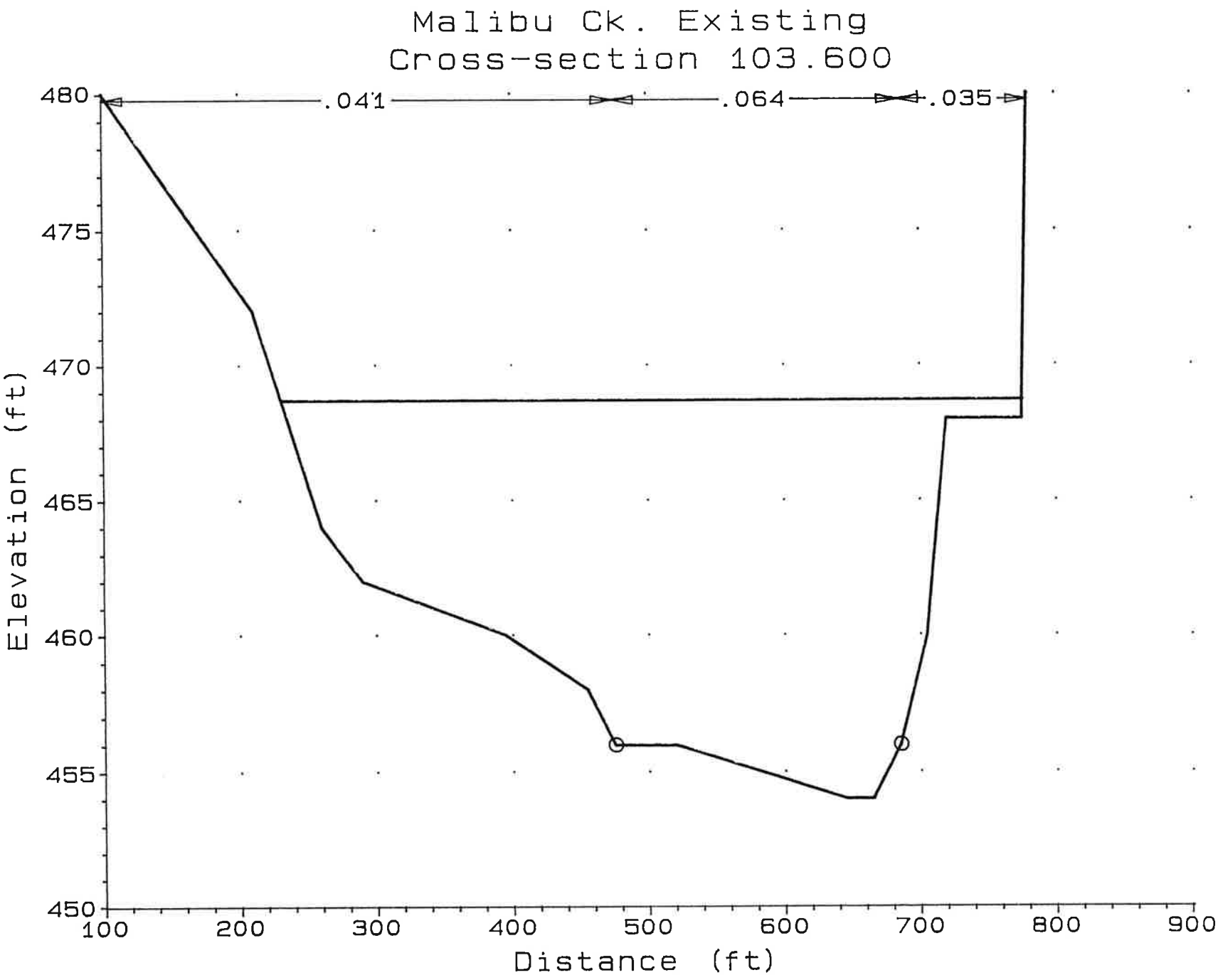
Distance (ft)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Elevation (ft)
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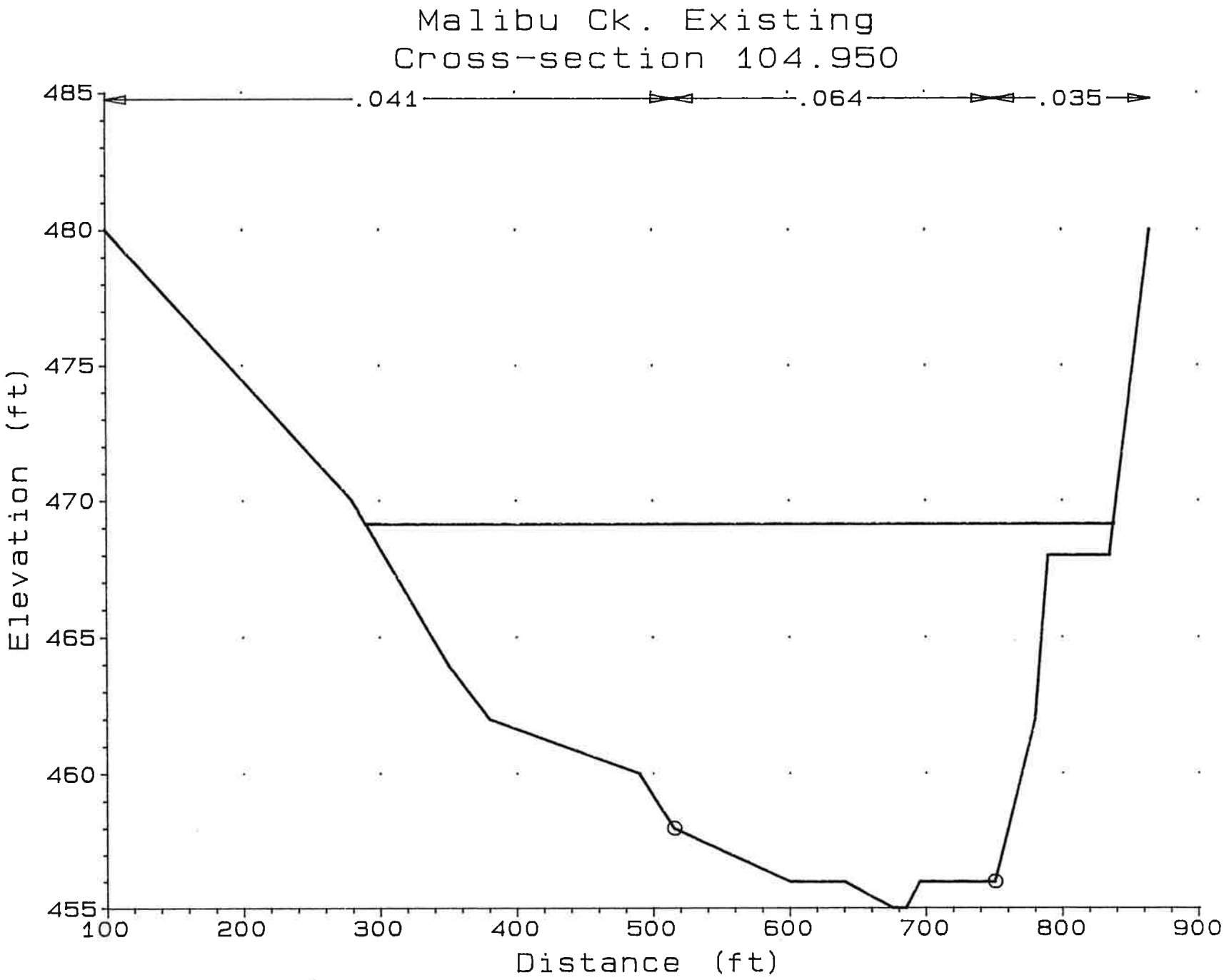
Distance (ft)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.035
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500
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700
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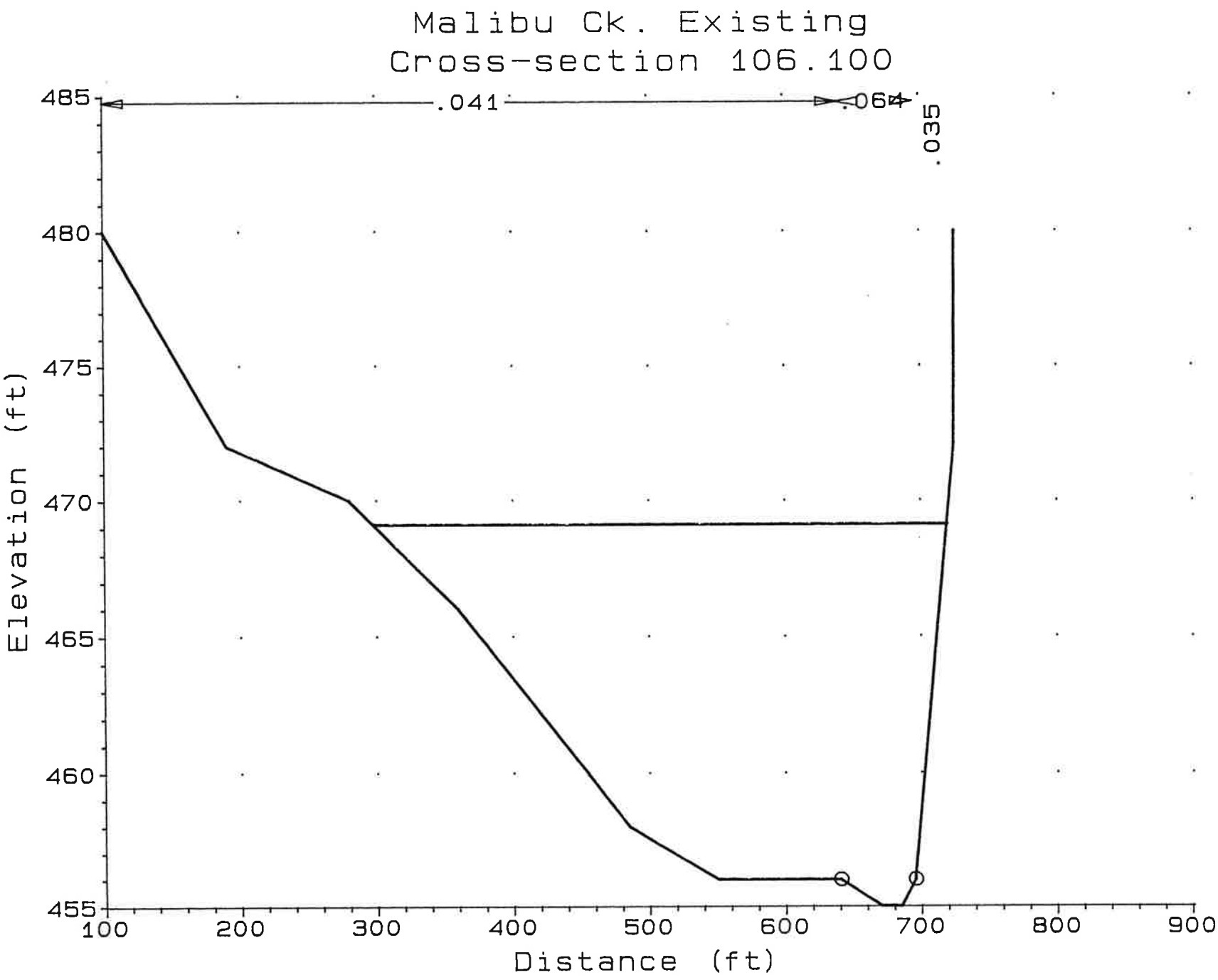
Distance (ft)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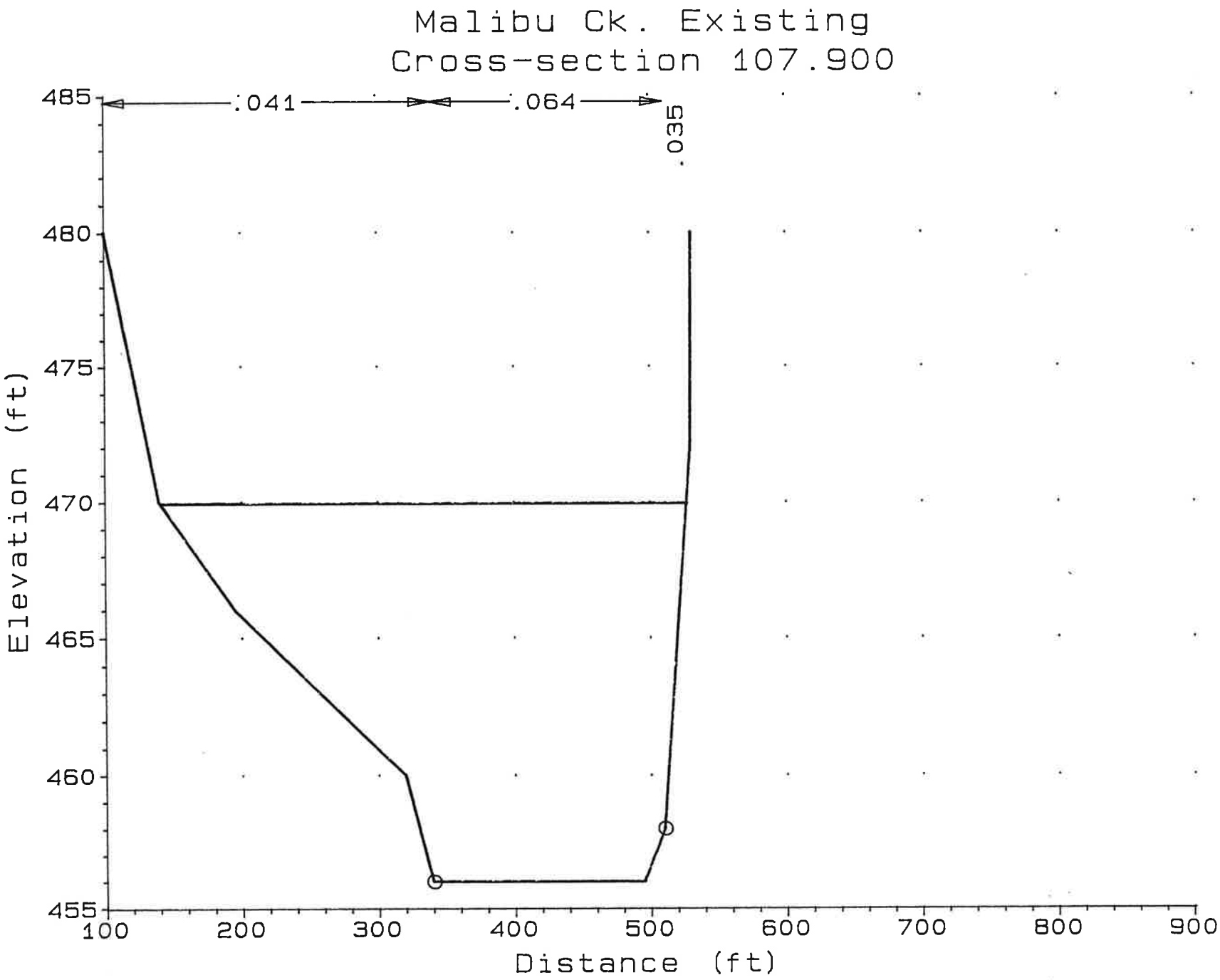
Distance (ft)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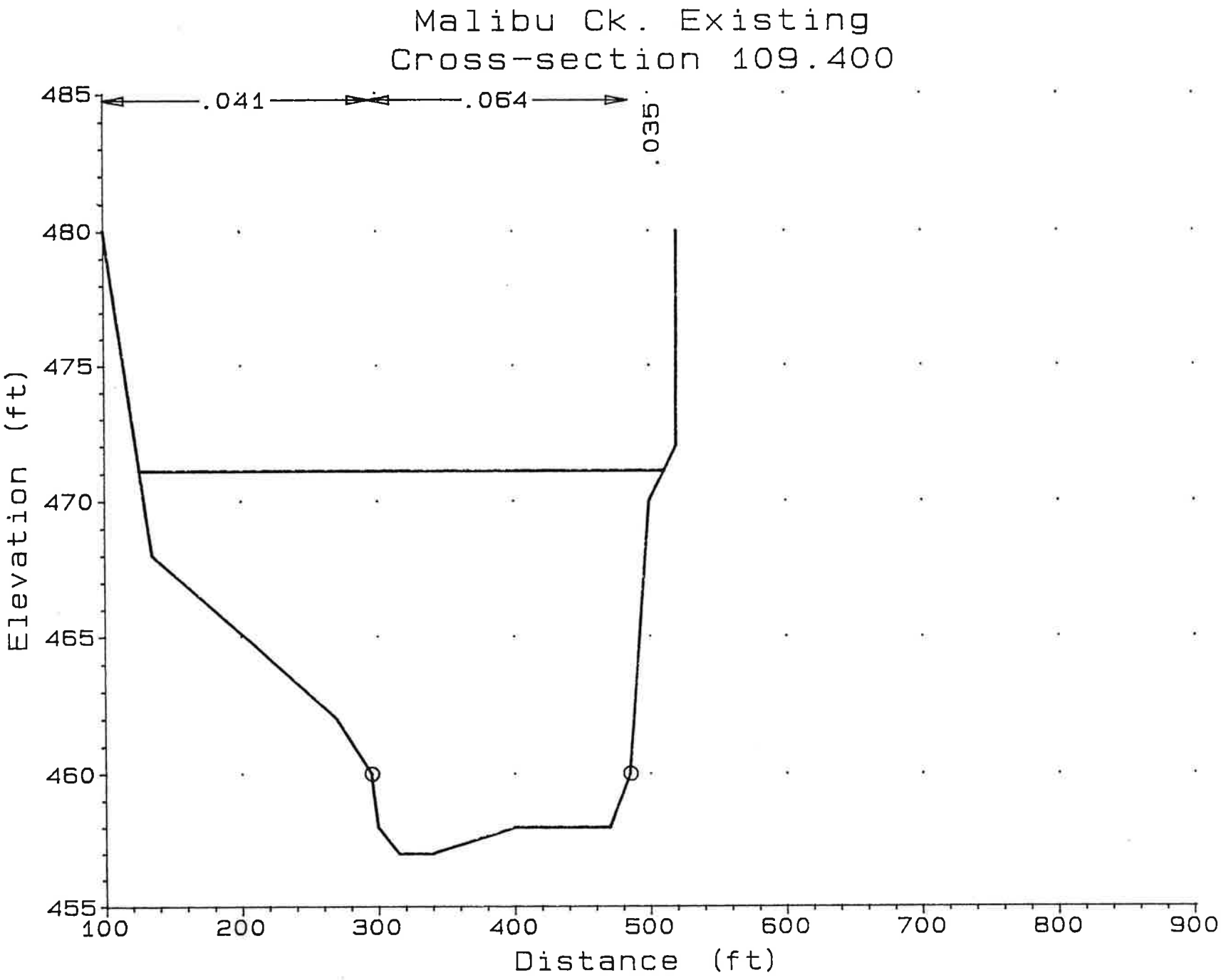
Distance (ft)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Cross-section 109.400
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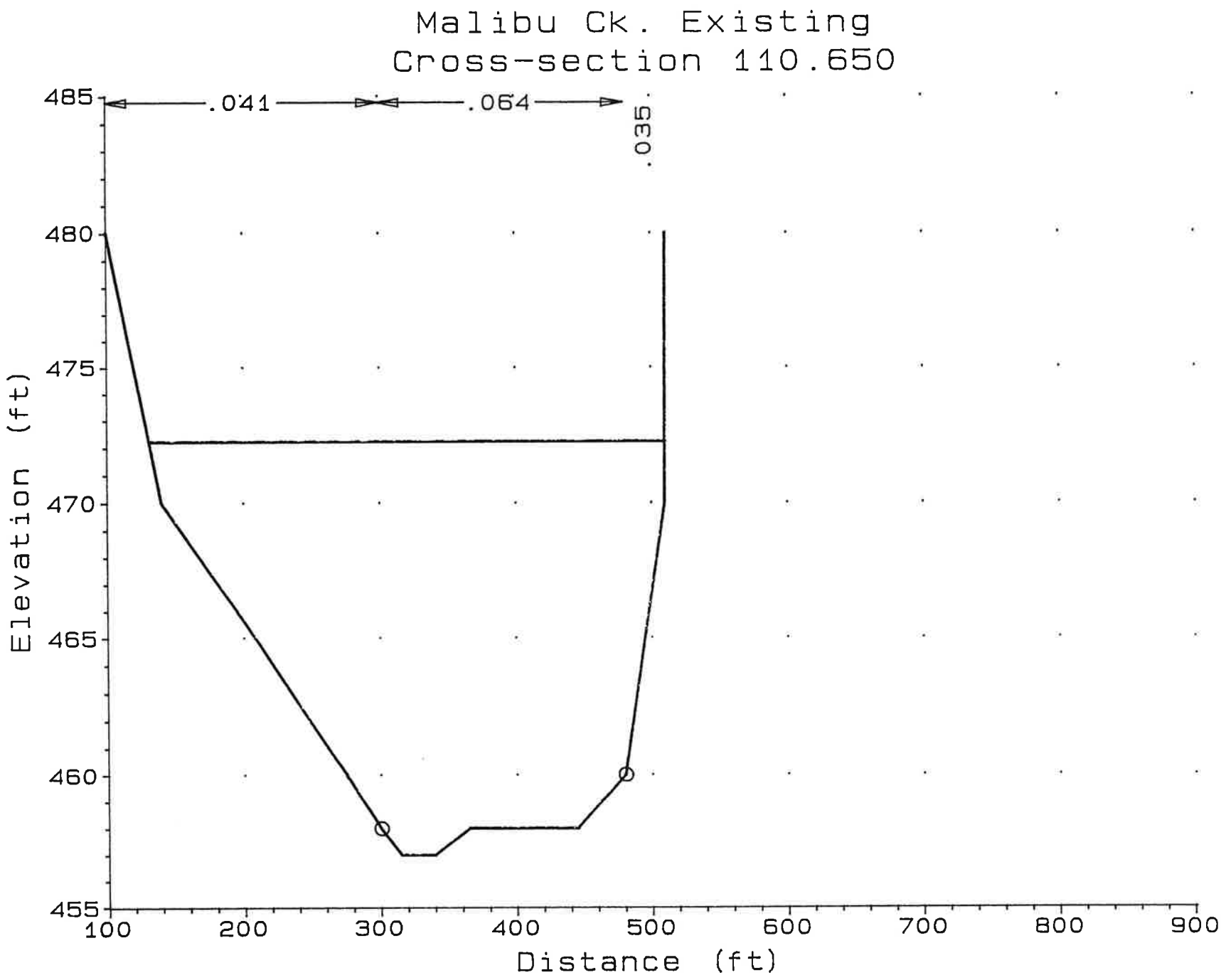
Distance (ft)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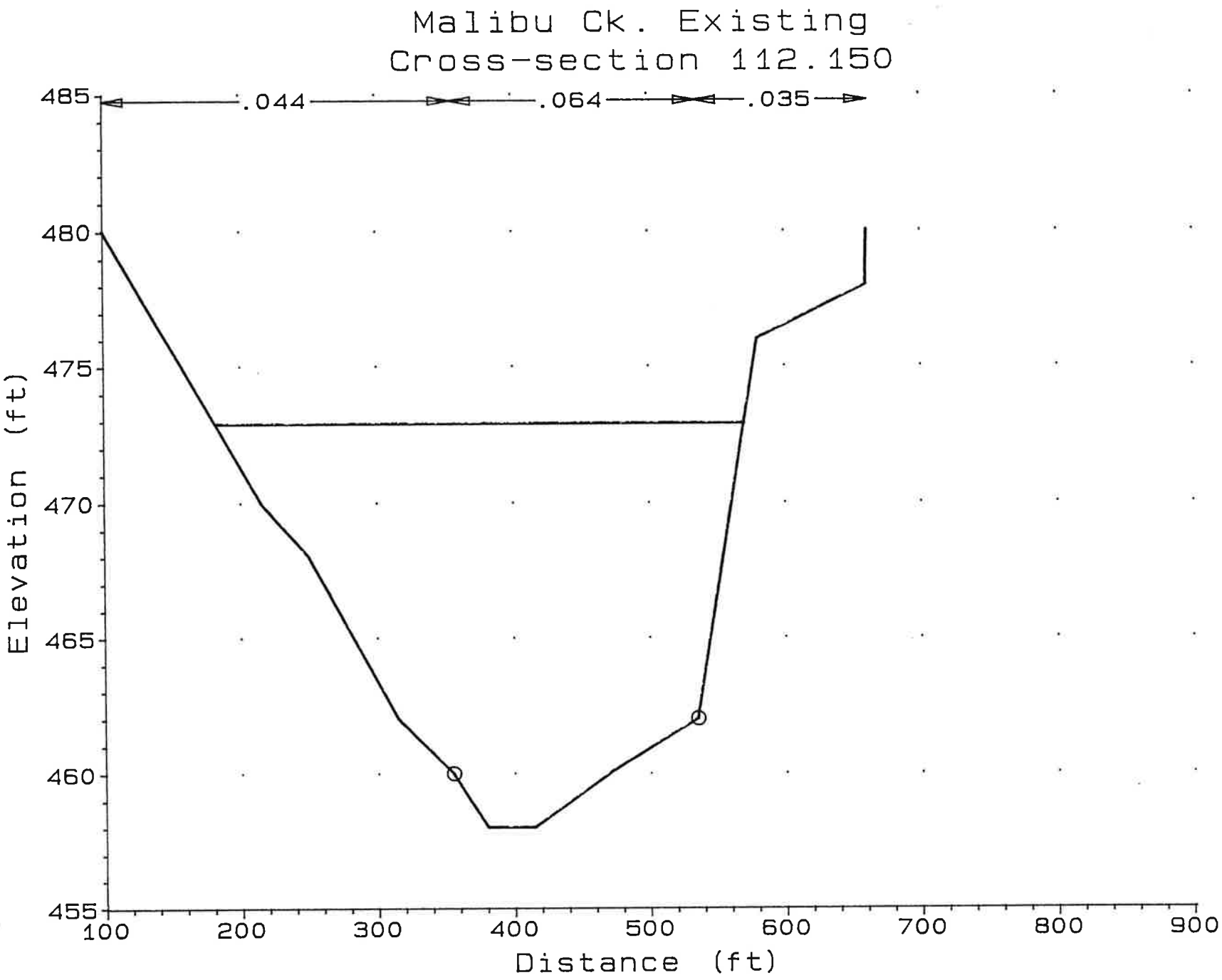
Distance (ft)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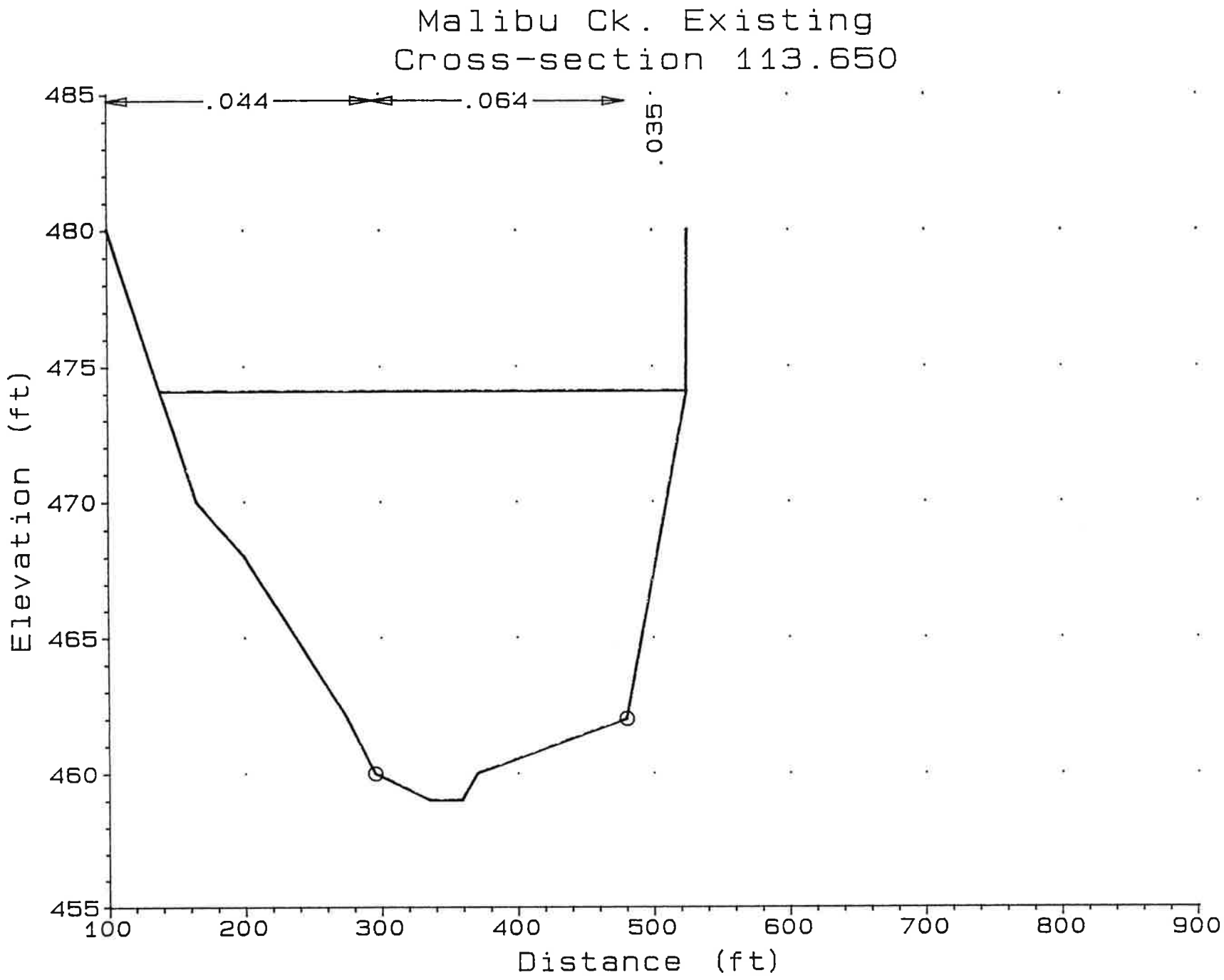
Distance (ft)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Elevation (ft)
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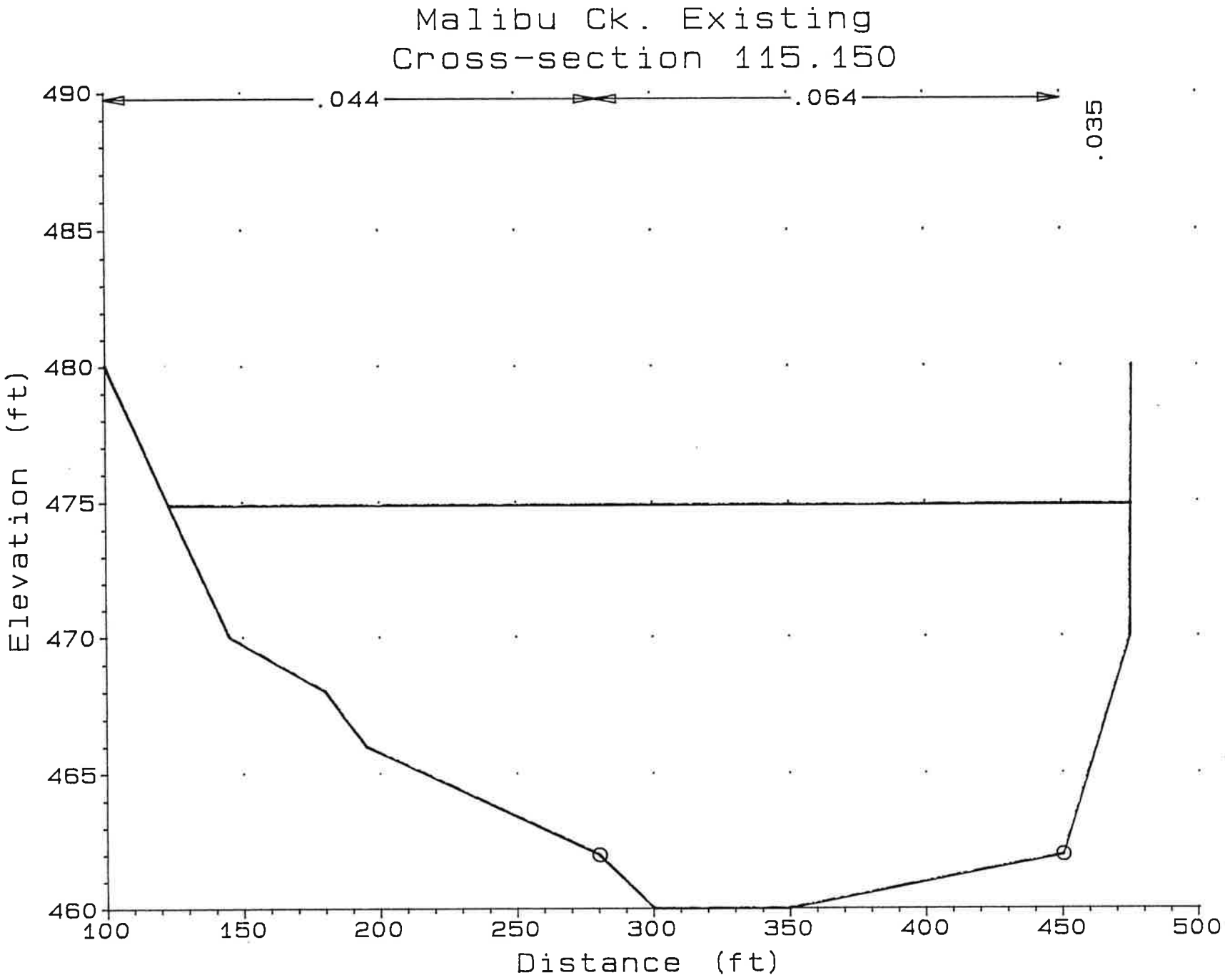
Distance (ft)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Elevation (ft)
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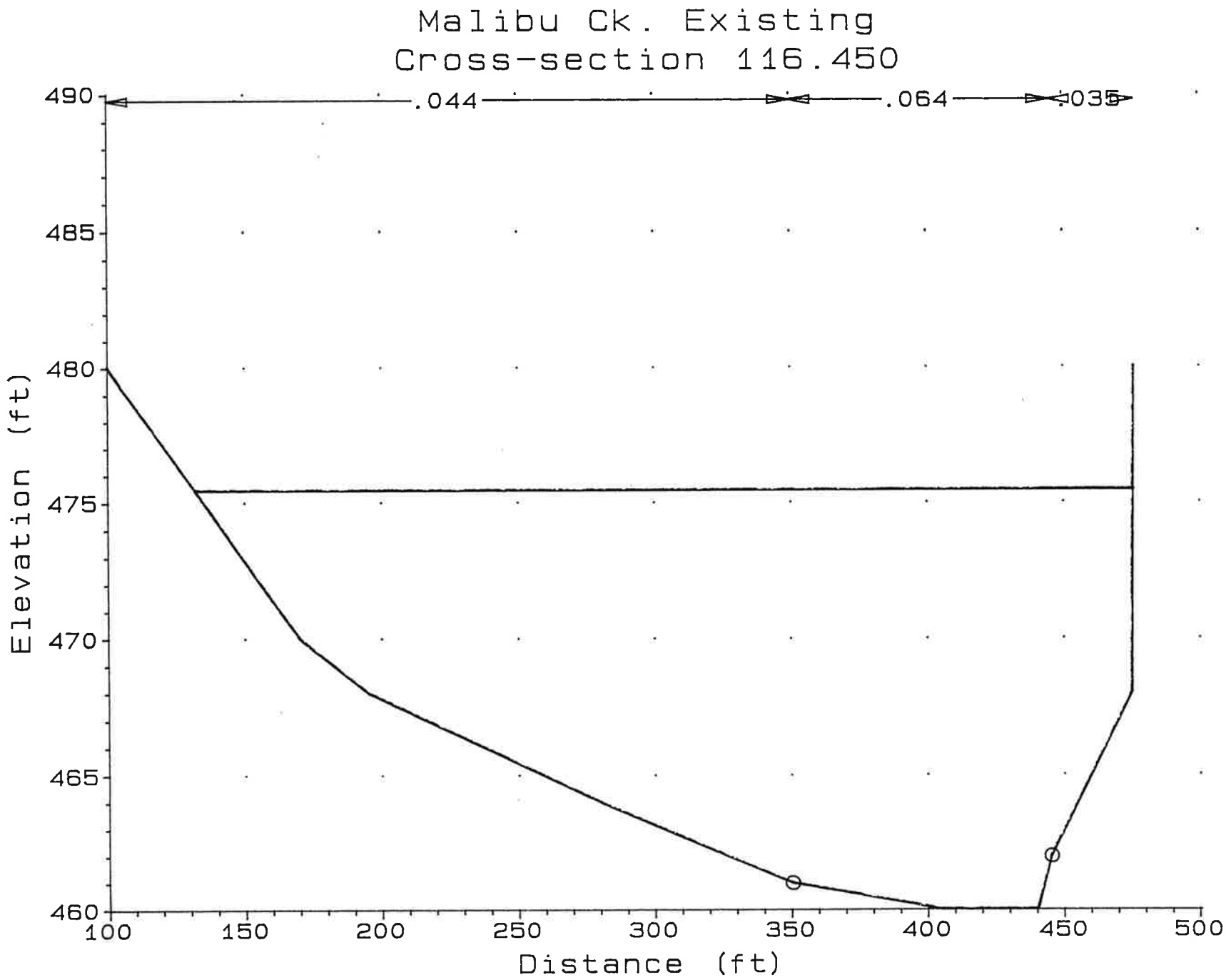
Distance (ft)


Malibu Ck. Existing
Cross-section 116.450
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Elevation (ft)
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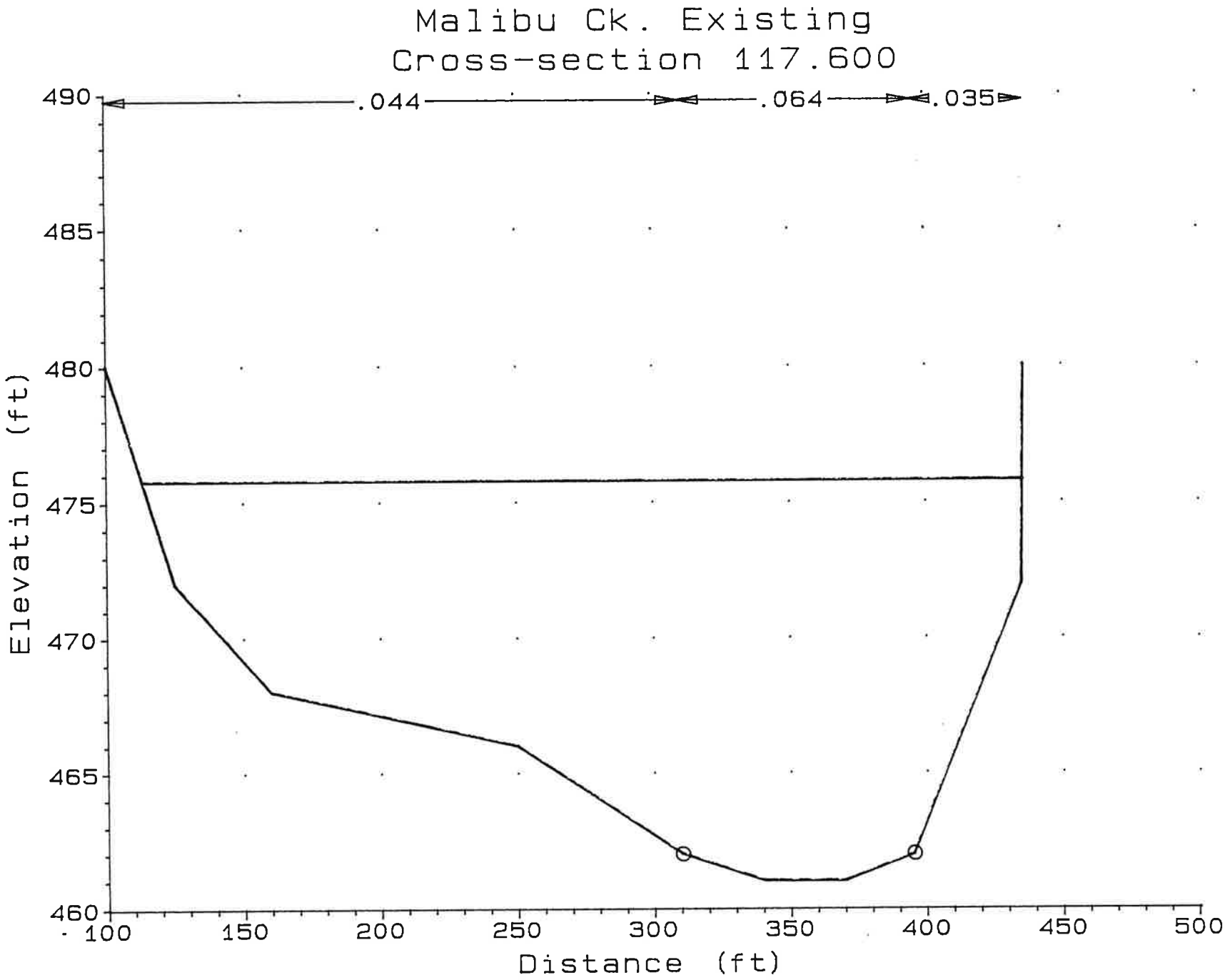
Distance (ft)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Cross-section 117.600
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Elevation (ft)
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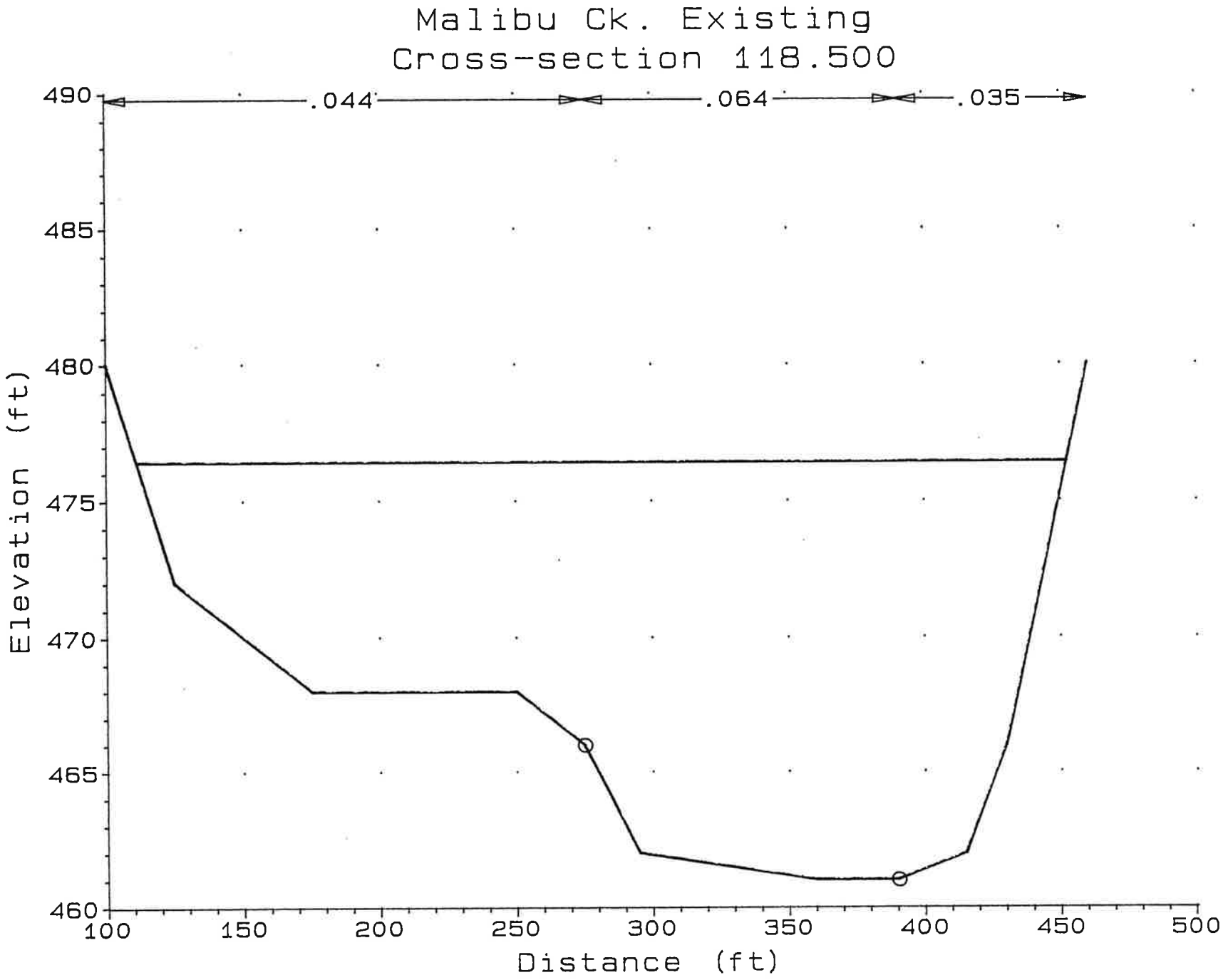
Distance (ft)


Malibu Ck. Existing
Cross-section 118.500
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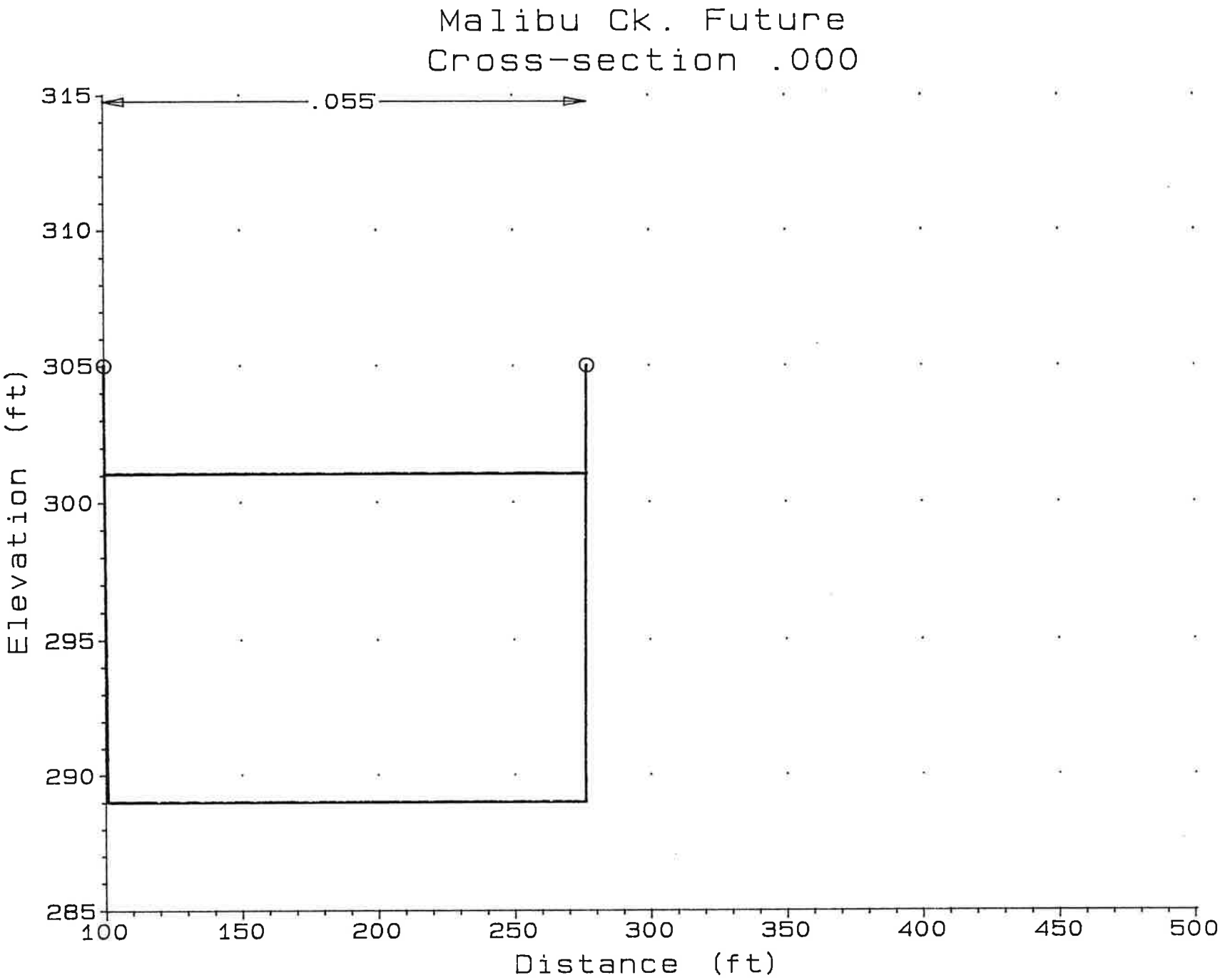
.064
.035
490
485
480
475
470
465
460
Elevation (ft)
100
150
200
250
300
350
400
450
500
Distance (ft)

RIVERTECH, INC.

APPENDIX 4

MALIBU CREEK
CROSS SECTION PLOTS FOR
ULTIMATE CHANNEL CONDITION


Malibu Ck. Future
Cross-section .000
.055
315
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295
290
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Elevation (ft)
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150
200
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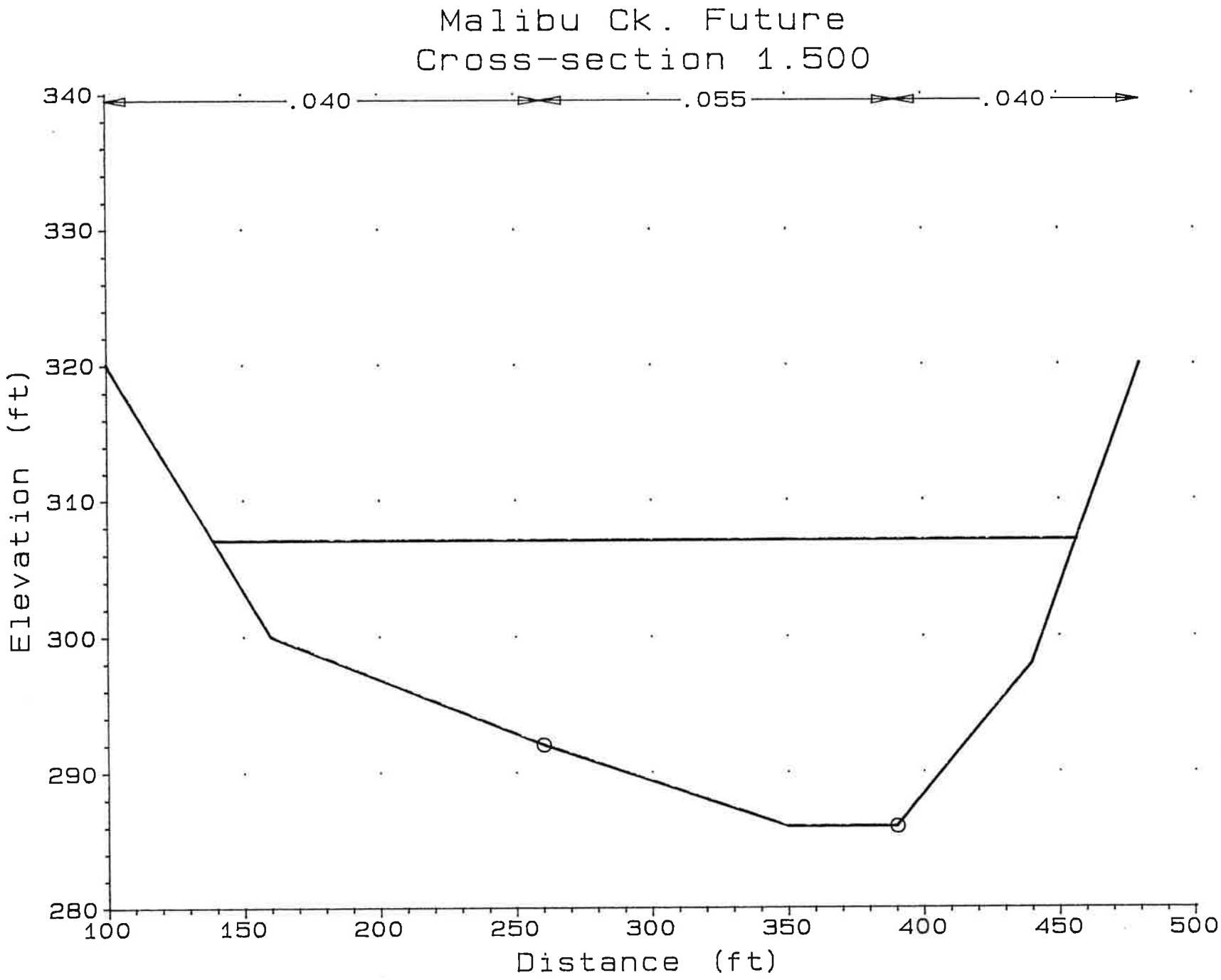
400
450
500
Distance (ft)


Malibu Ck. Future
Cross-section 1.500
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.055
.040
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Elevation (ft)
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150
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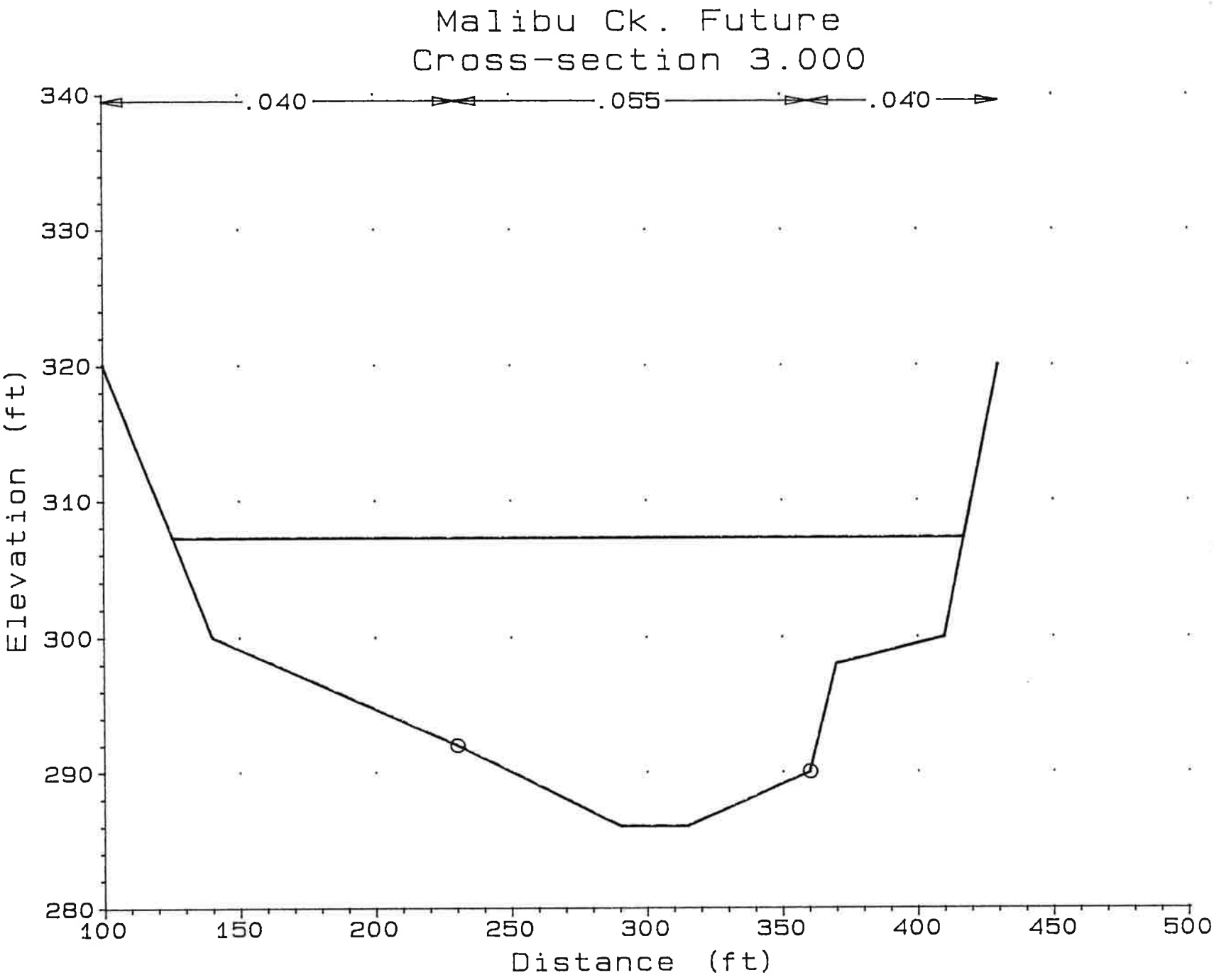
250
300
350
400
450
500
Distance (ft)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Elevation (ft)
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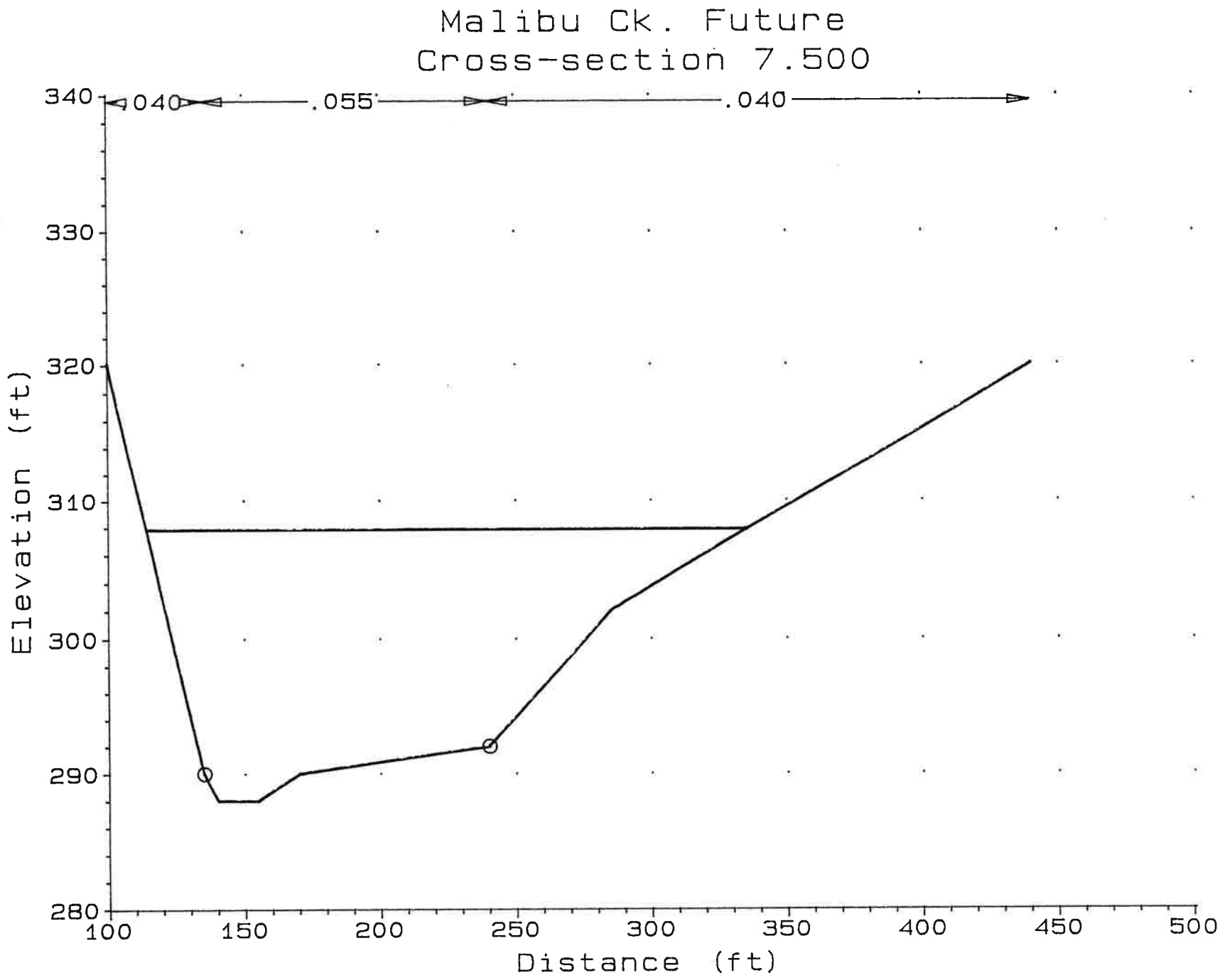
Distance (ft)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Elevation (ft)
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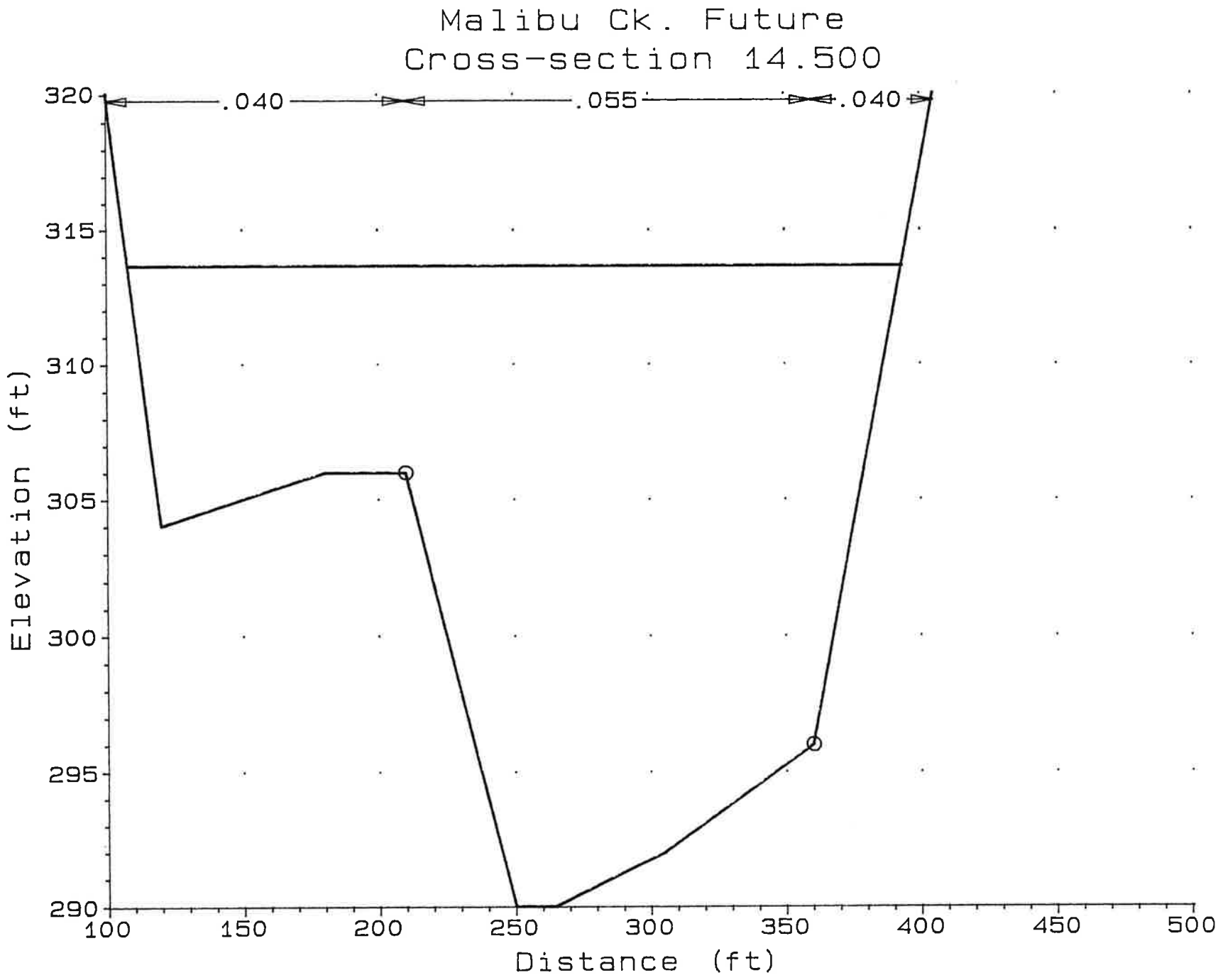
Distance (ft)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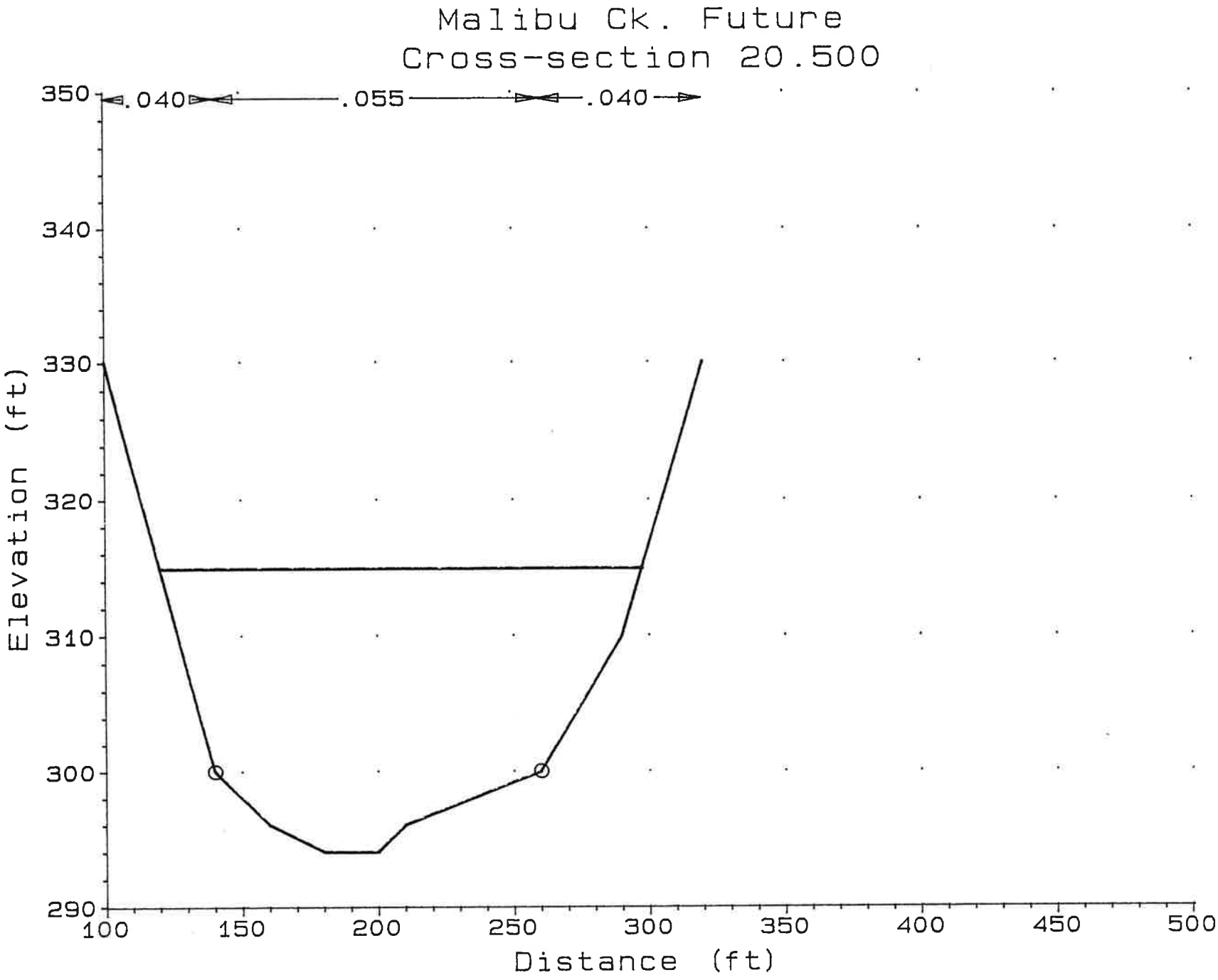
Distance (ft)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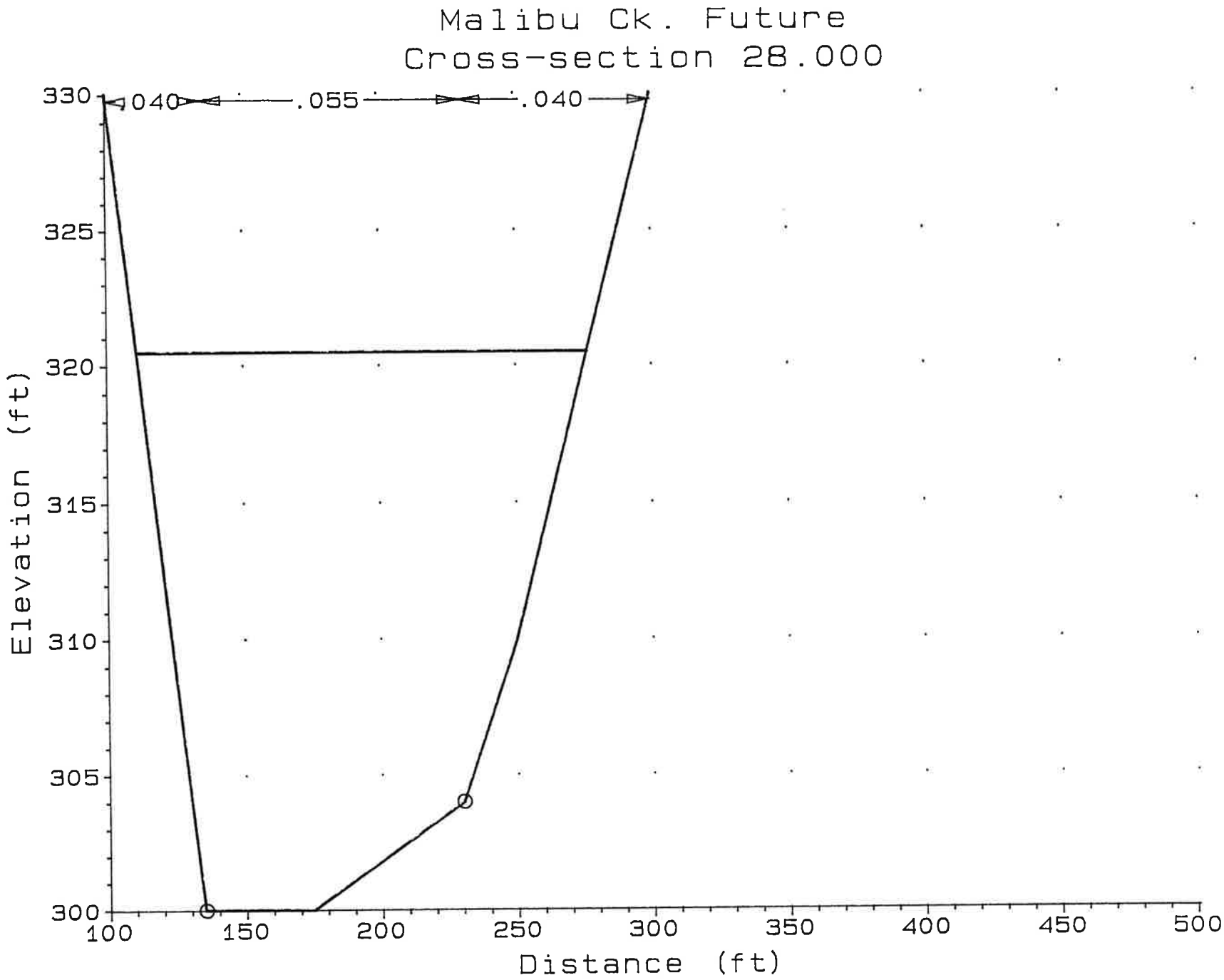
Distance (ft)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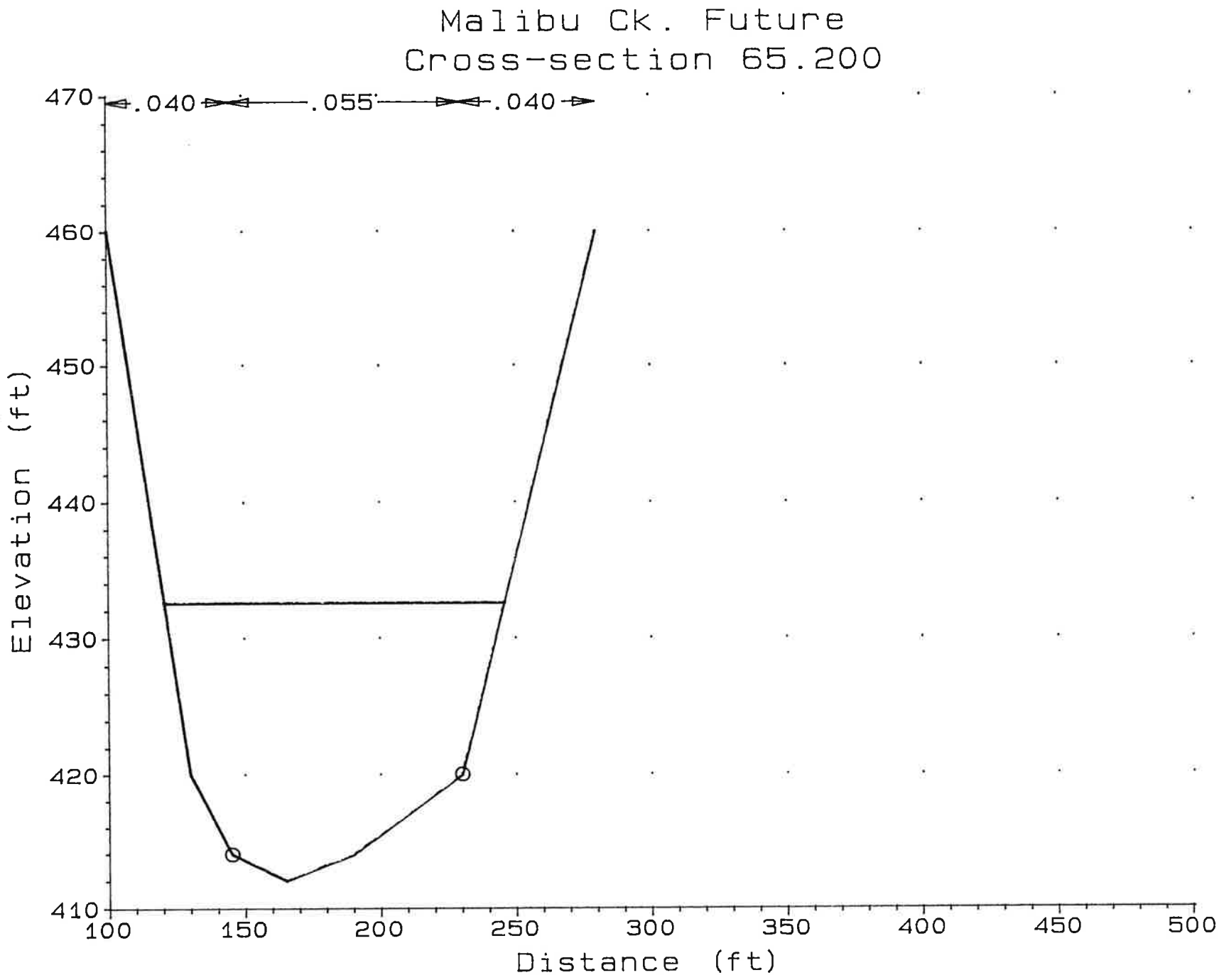
Distance (ft)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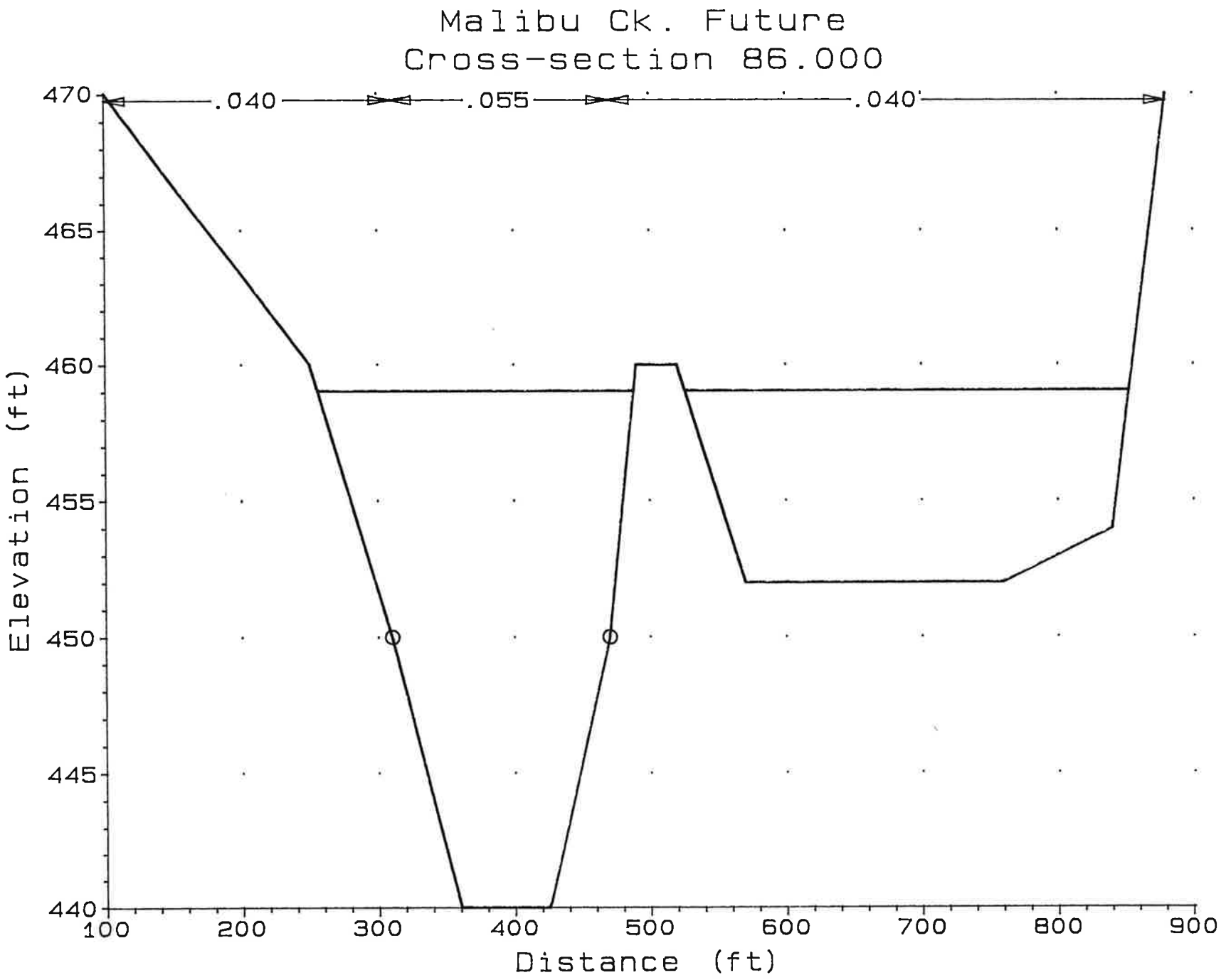
Distance (ft)


Malibu Ck. Future
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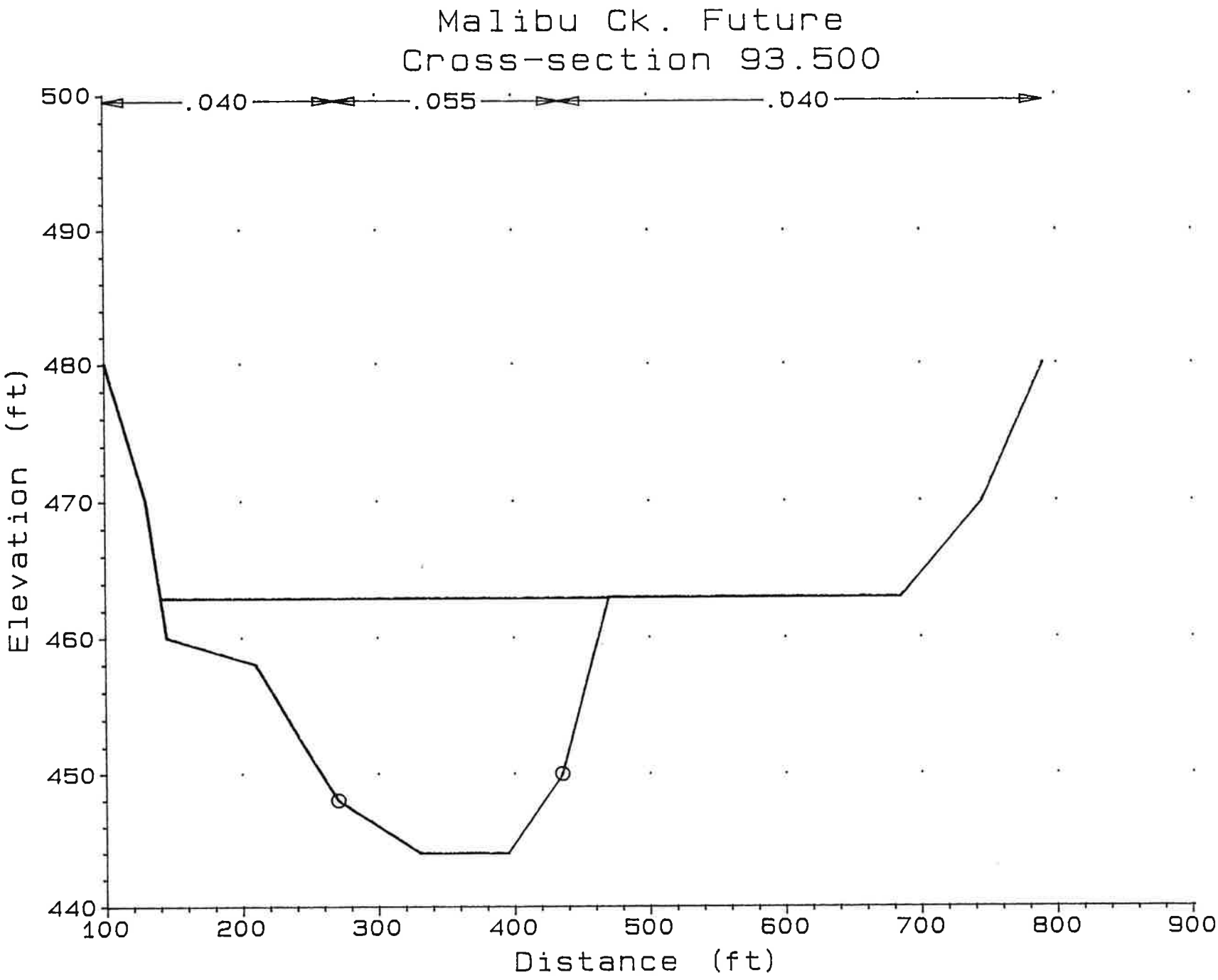
Distance (ft)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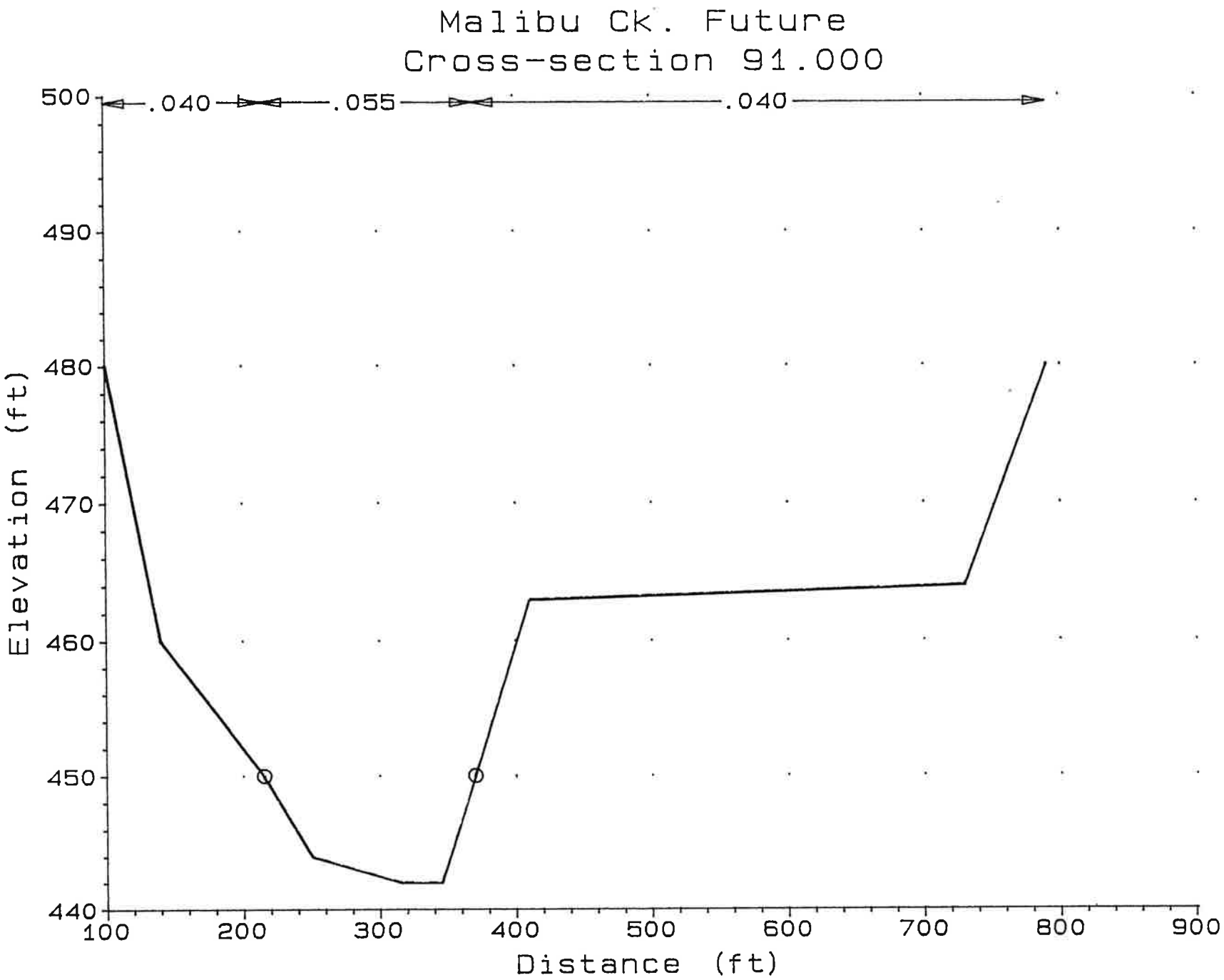
Distance (ft)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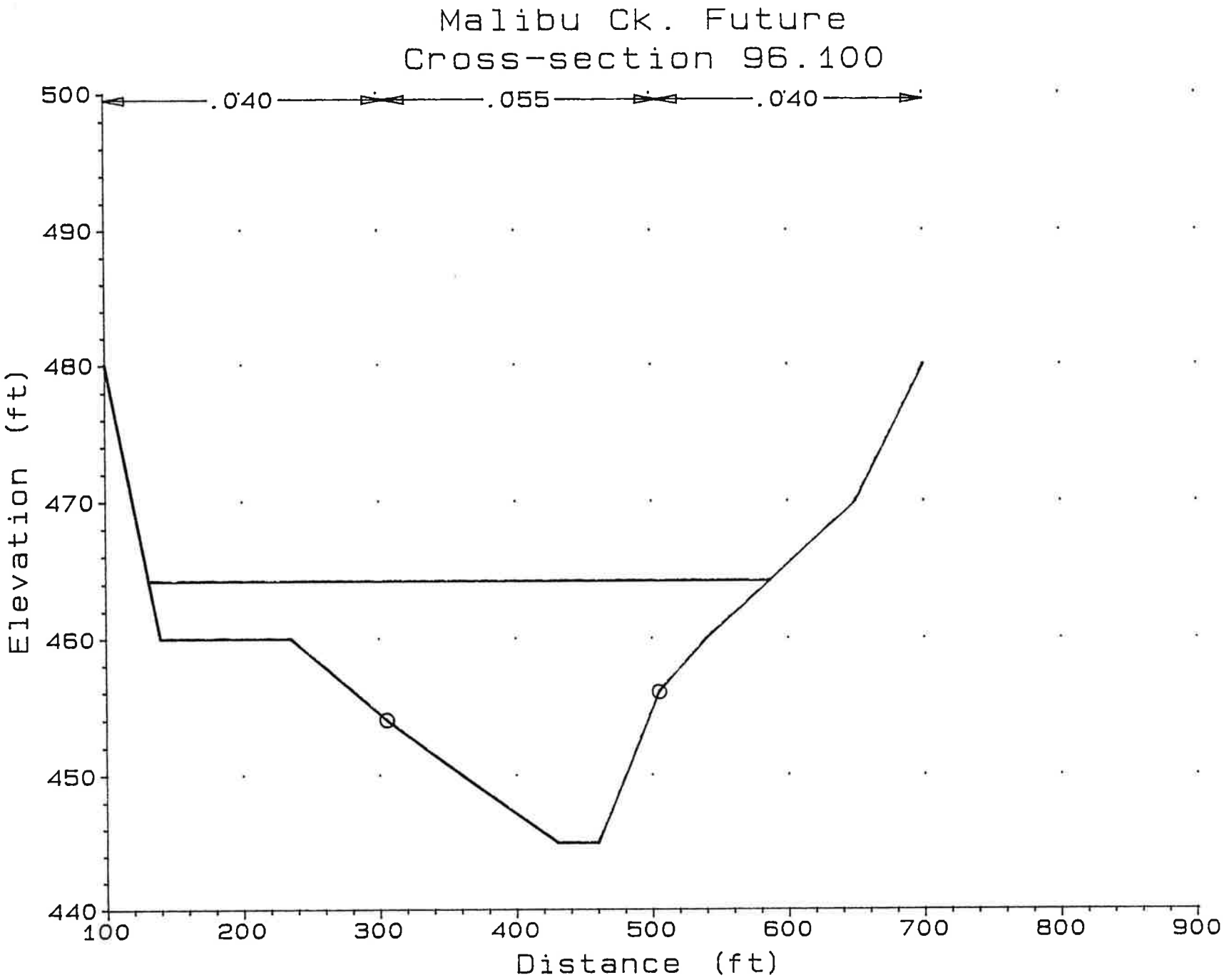
Distance (ft)


Malibu Ck. Future
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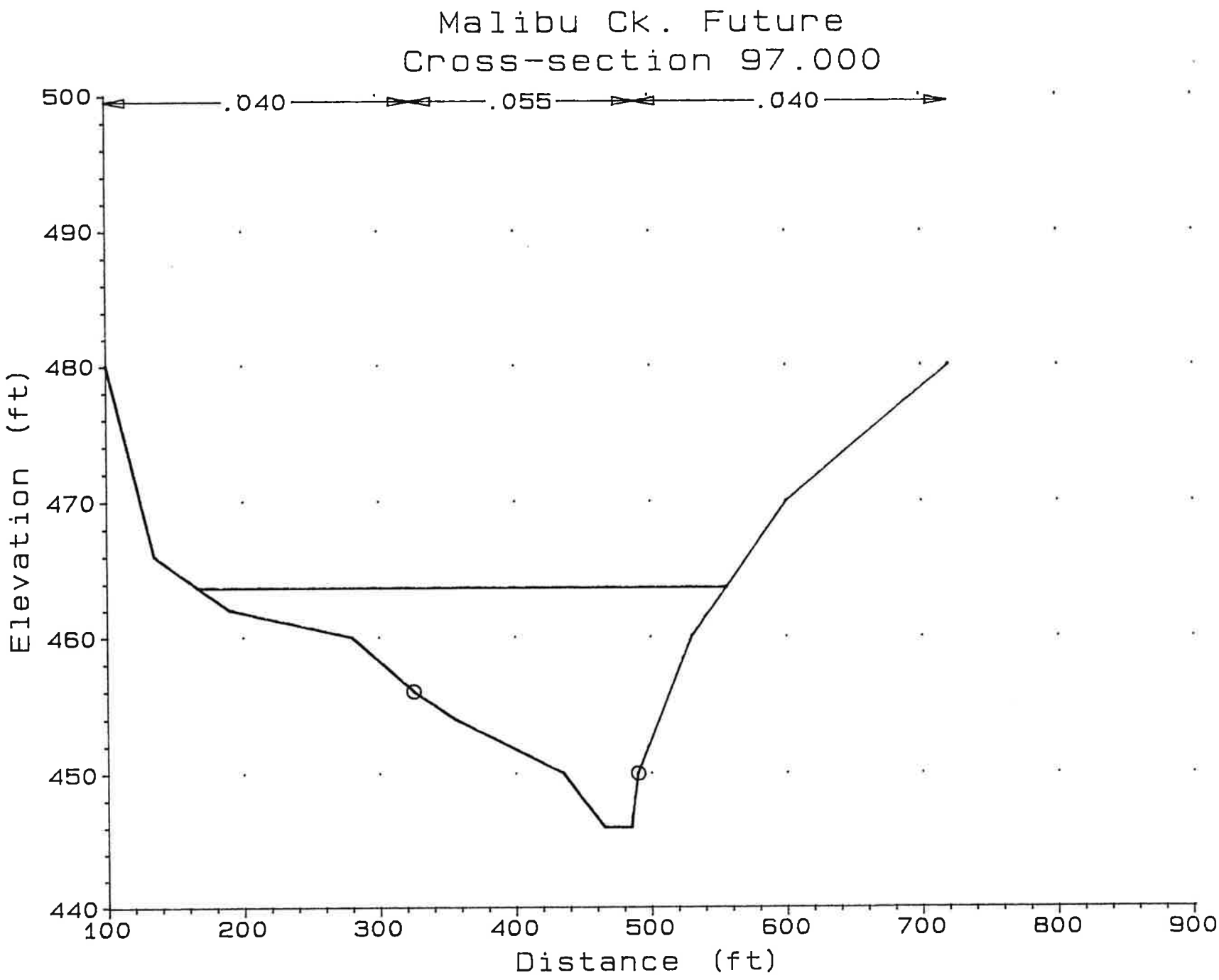
Distance (ft)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Elevation (ft)
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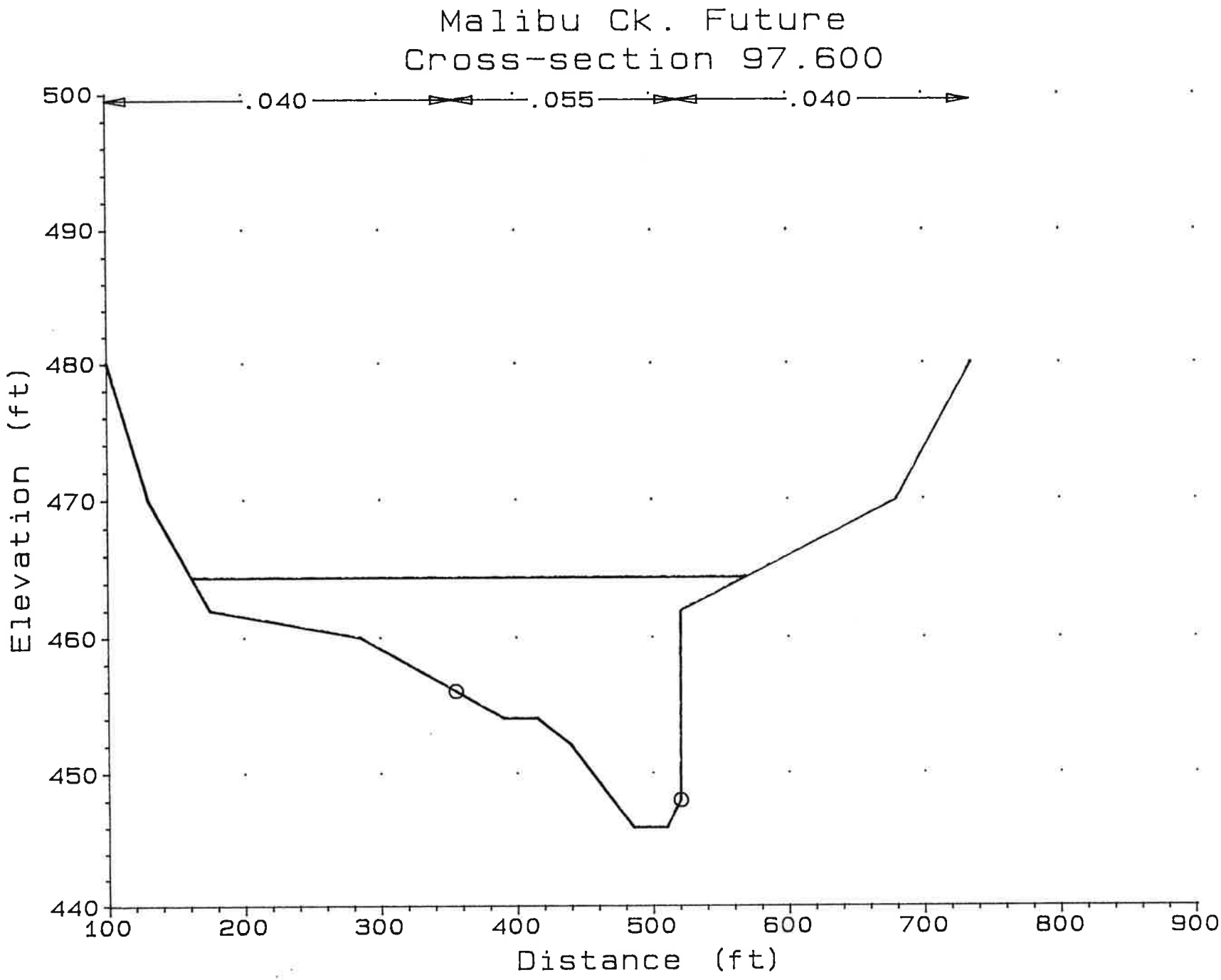
Distance (ft)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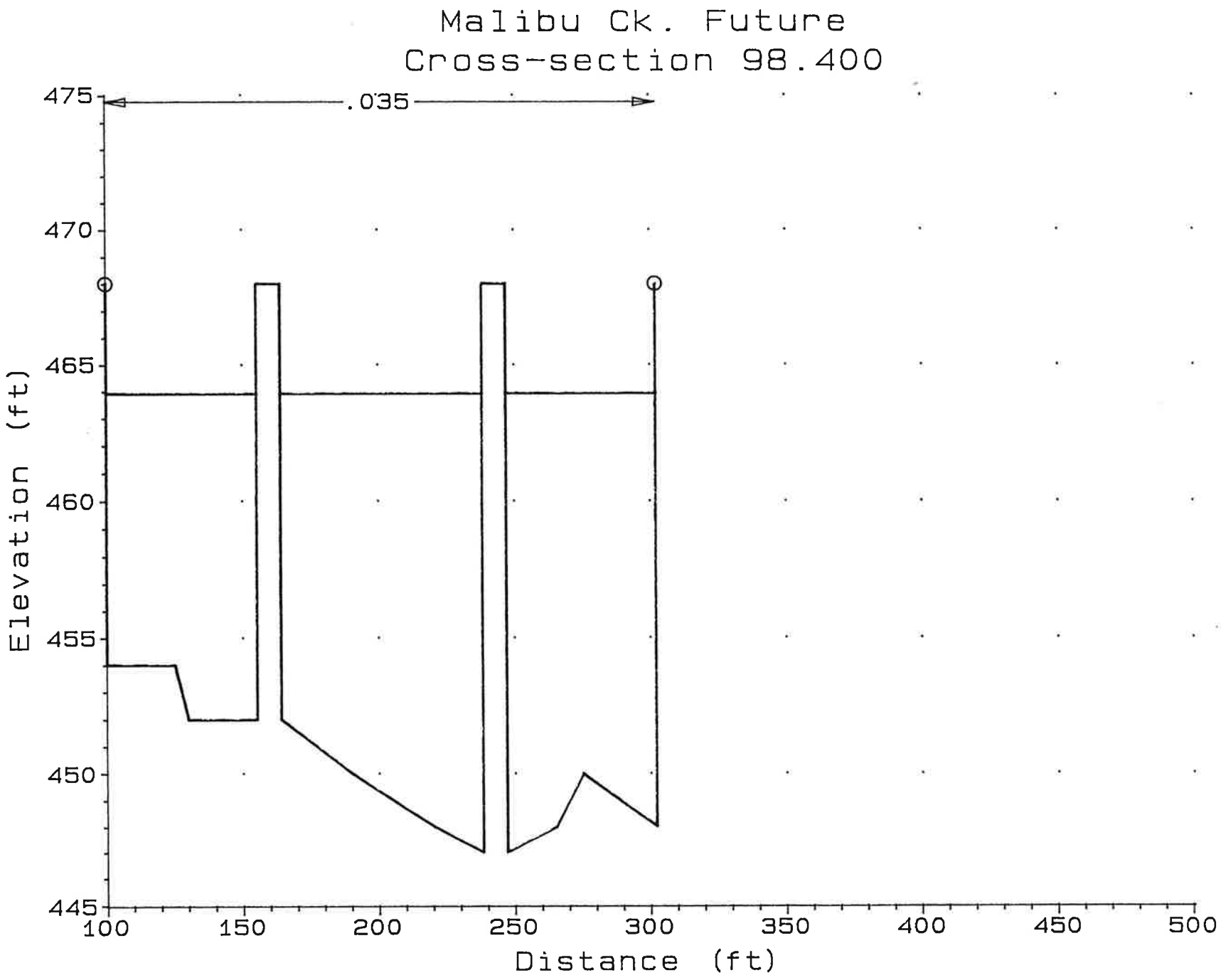
Distance (ft)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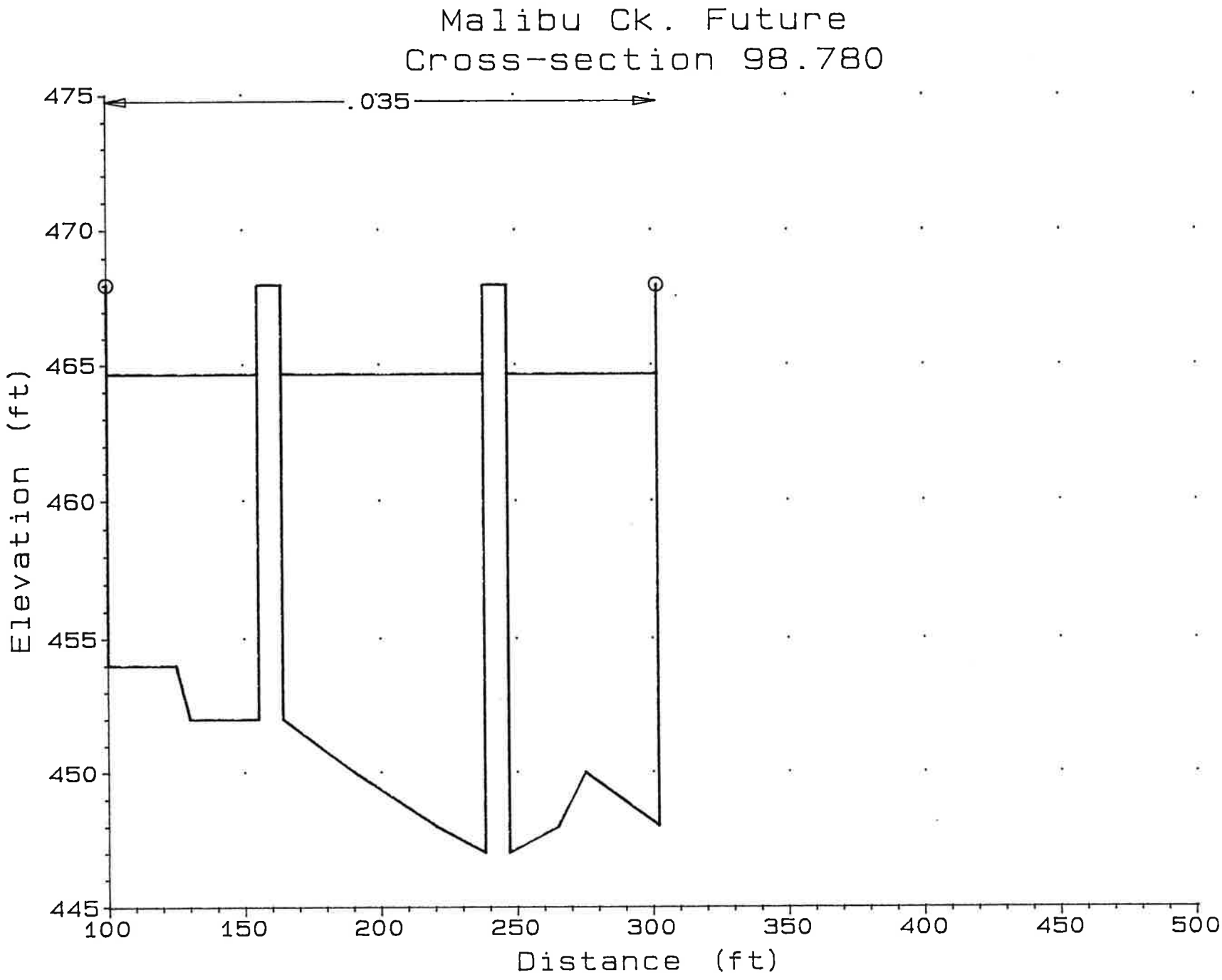
Distance (ft)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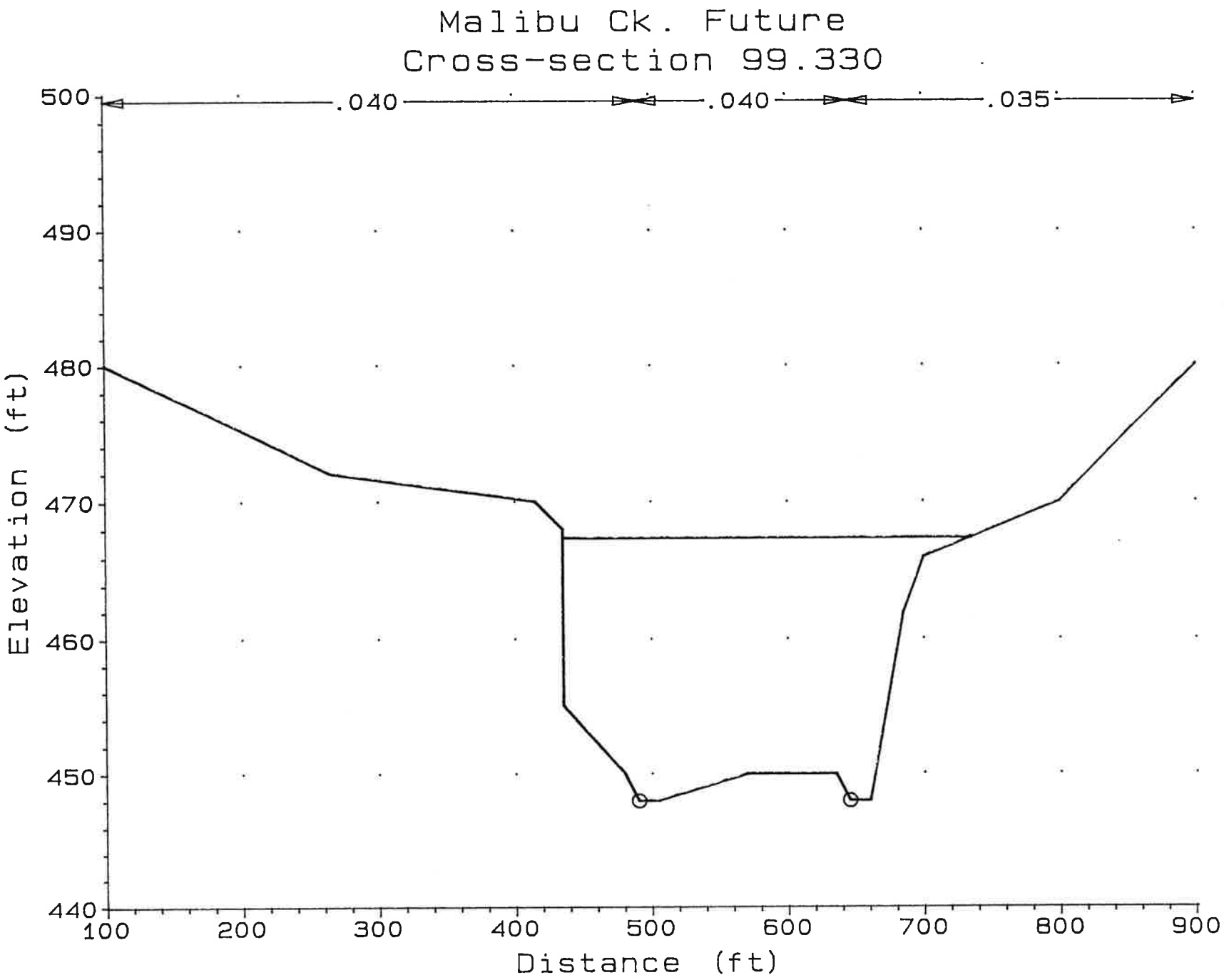
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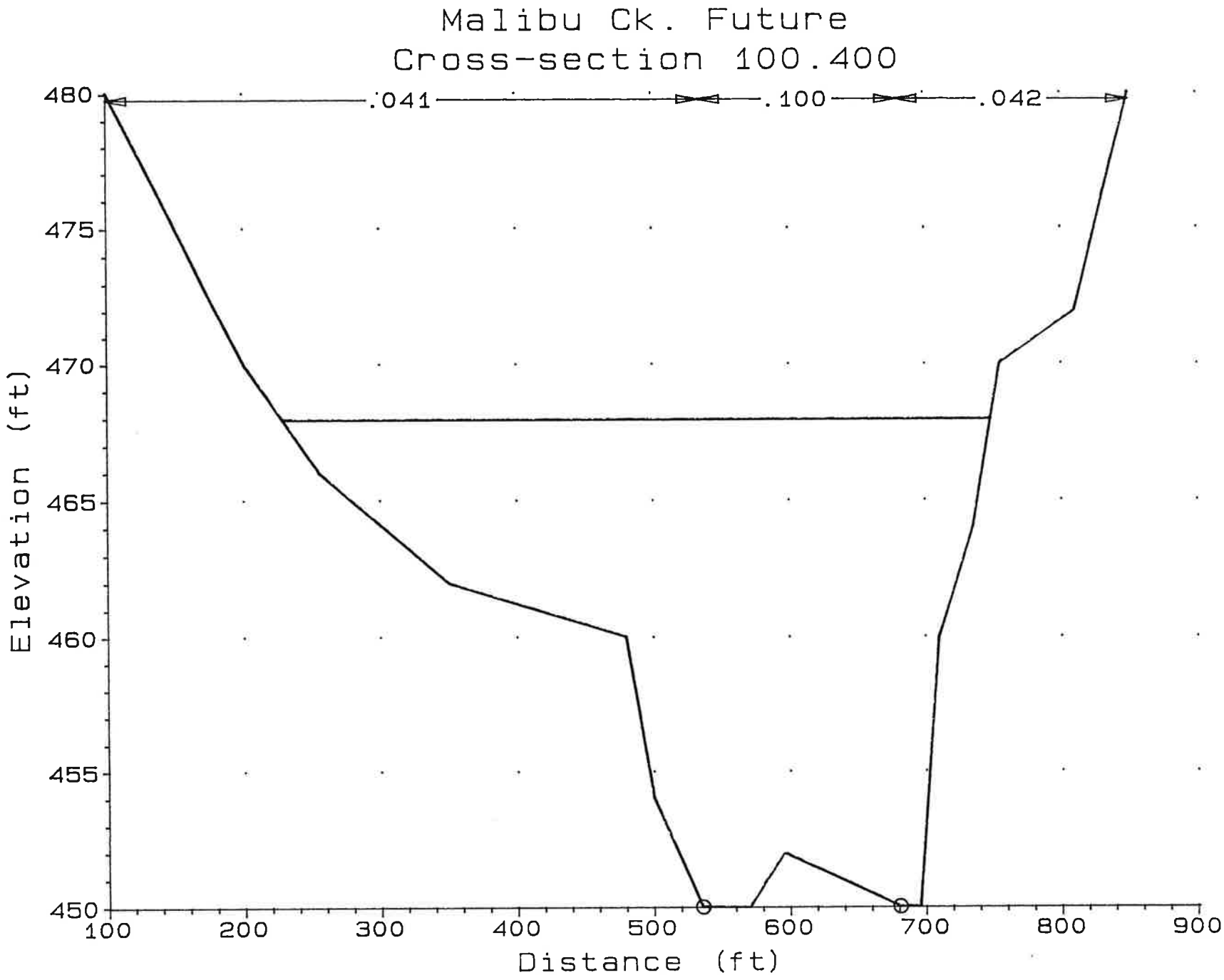
Distance (ft)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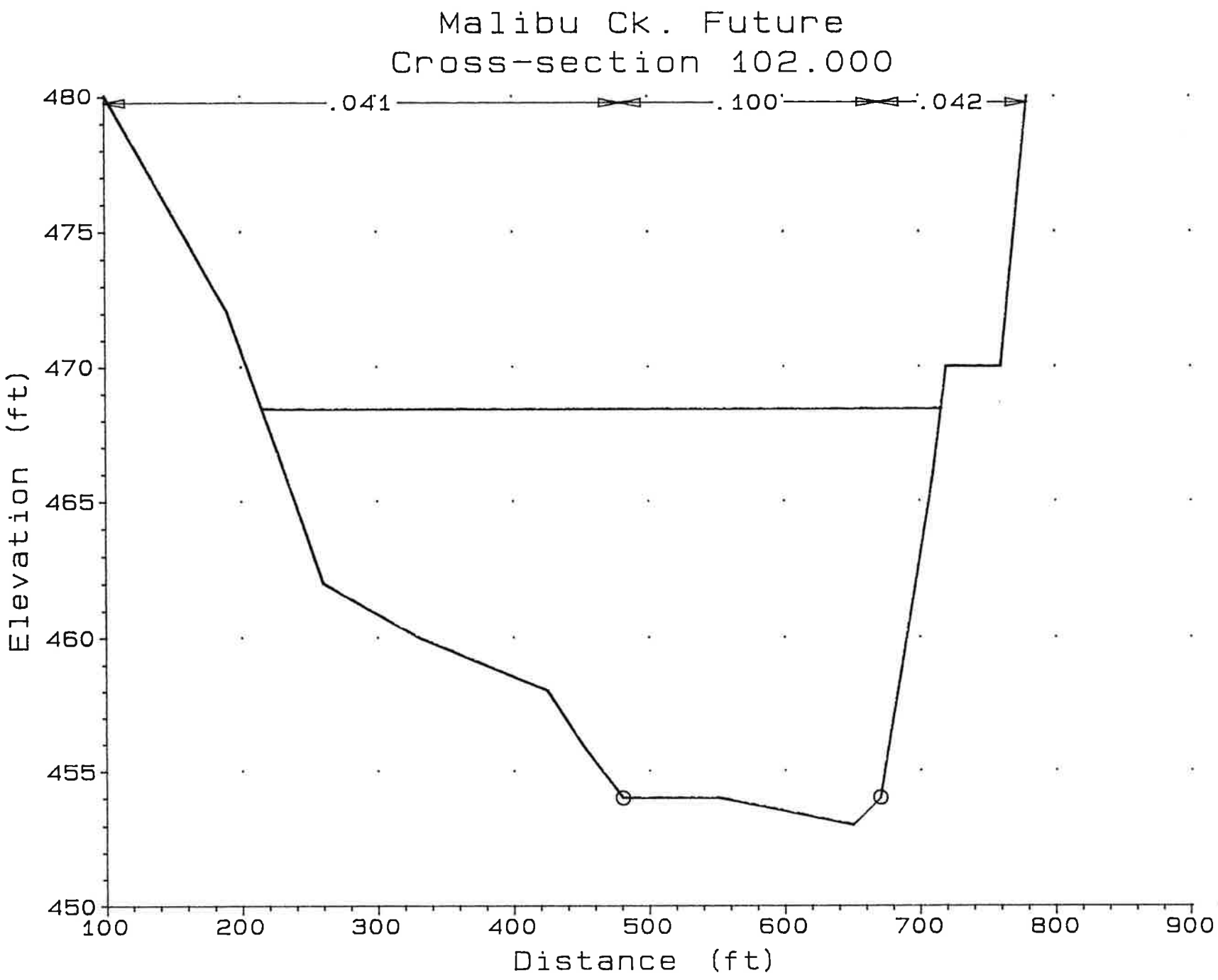
Distance (ft)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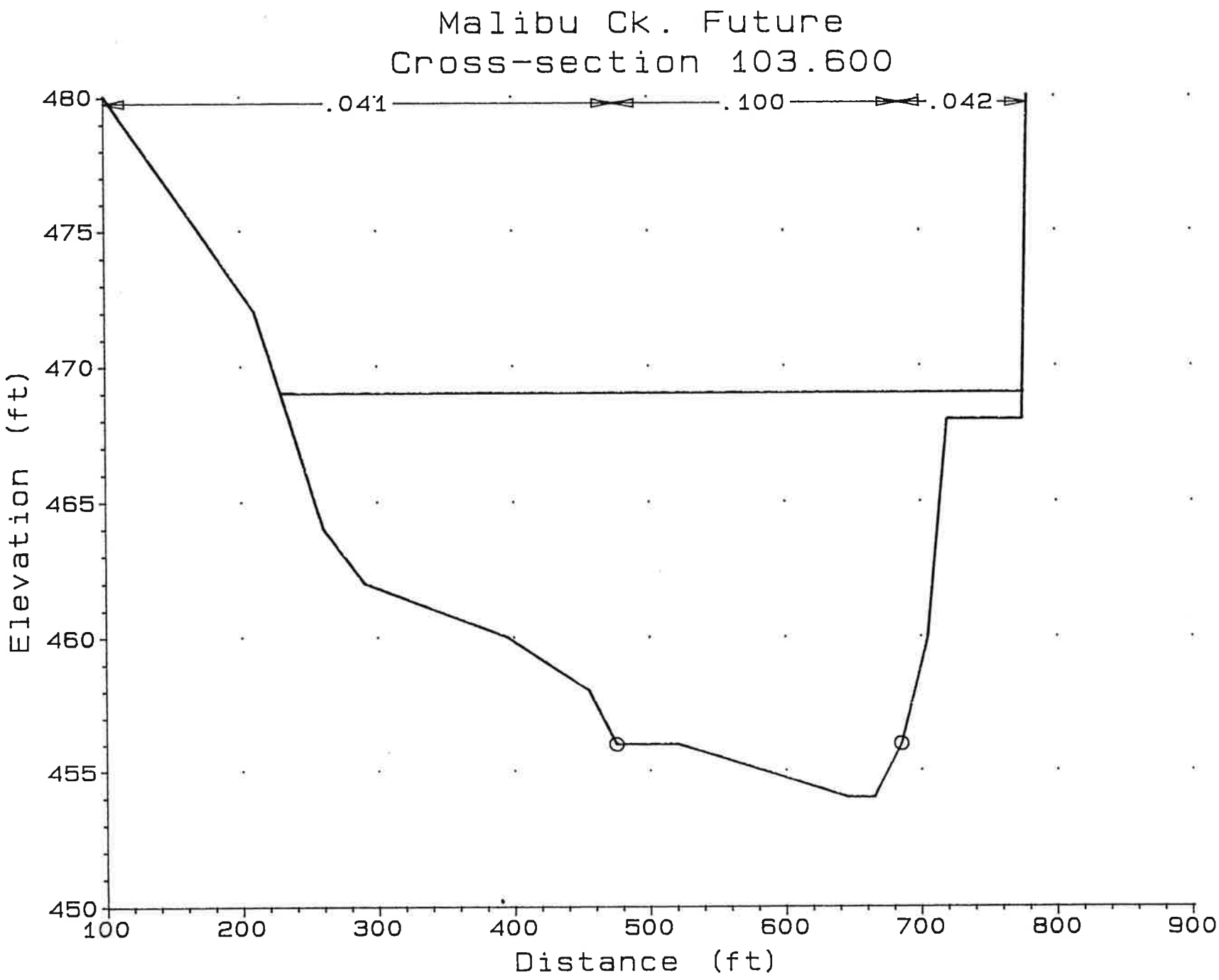
Distance (ft)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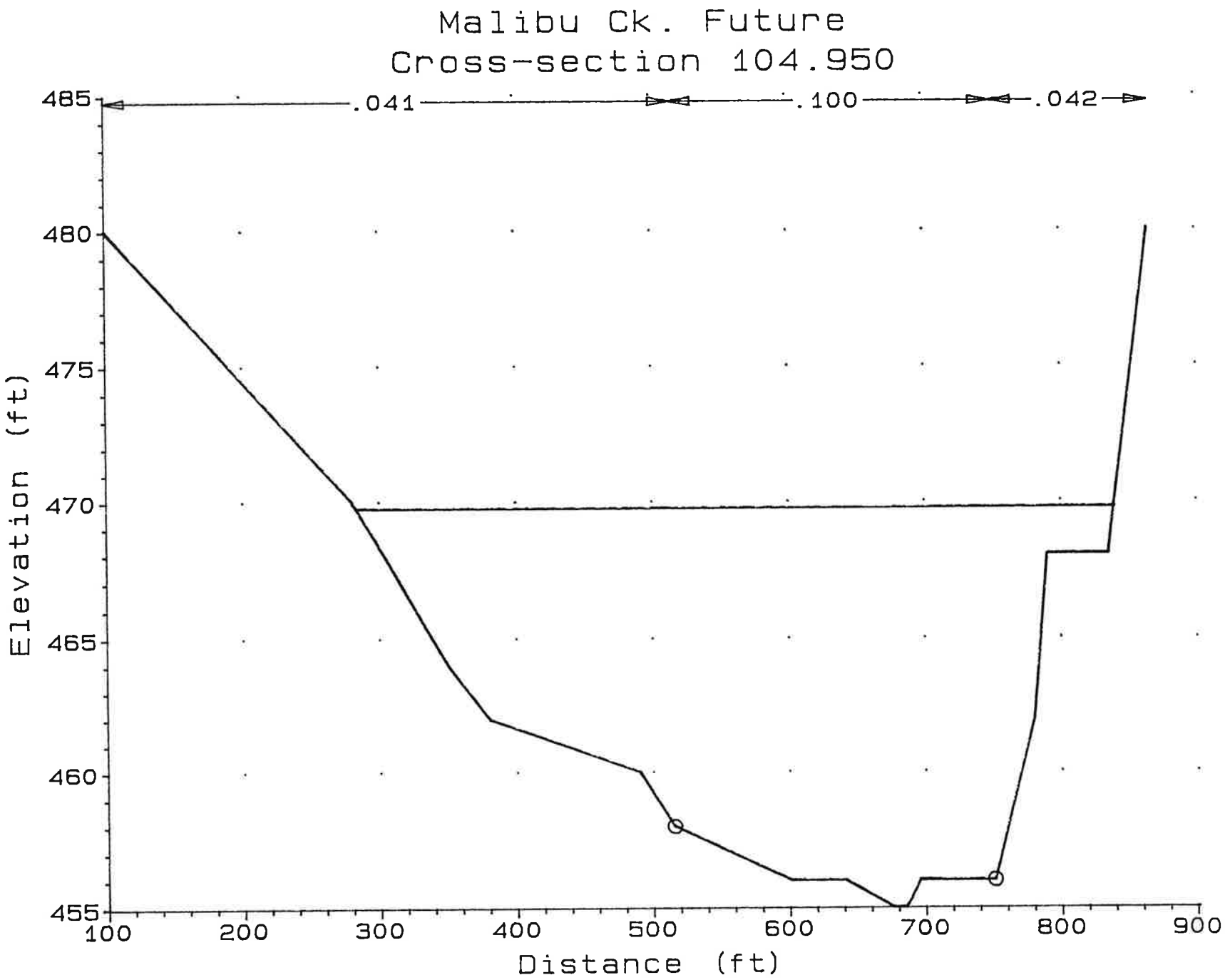
Distance (ft)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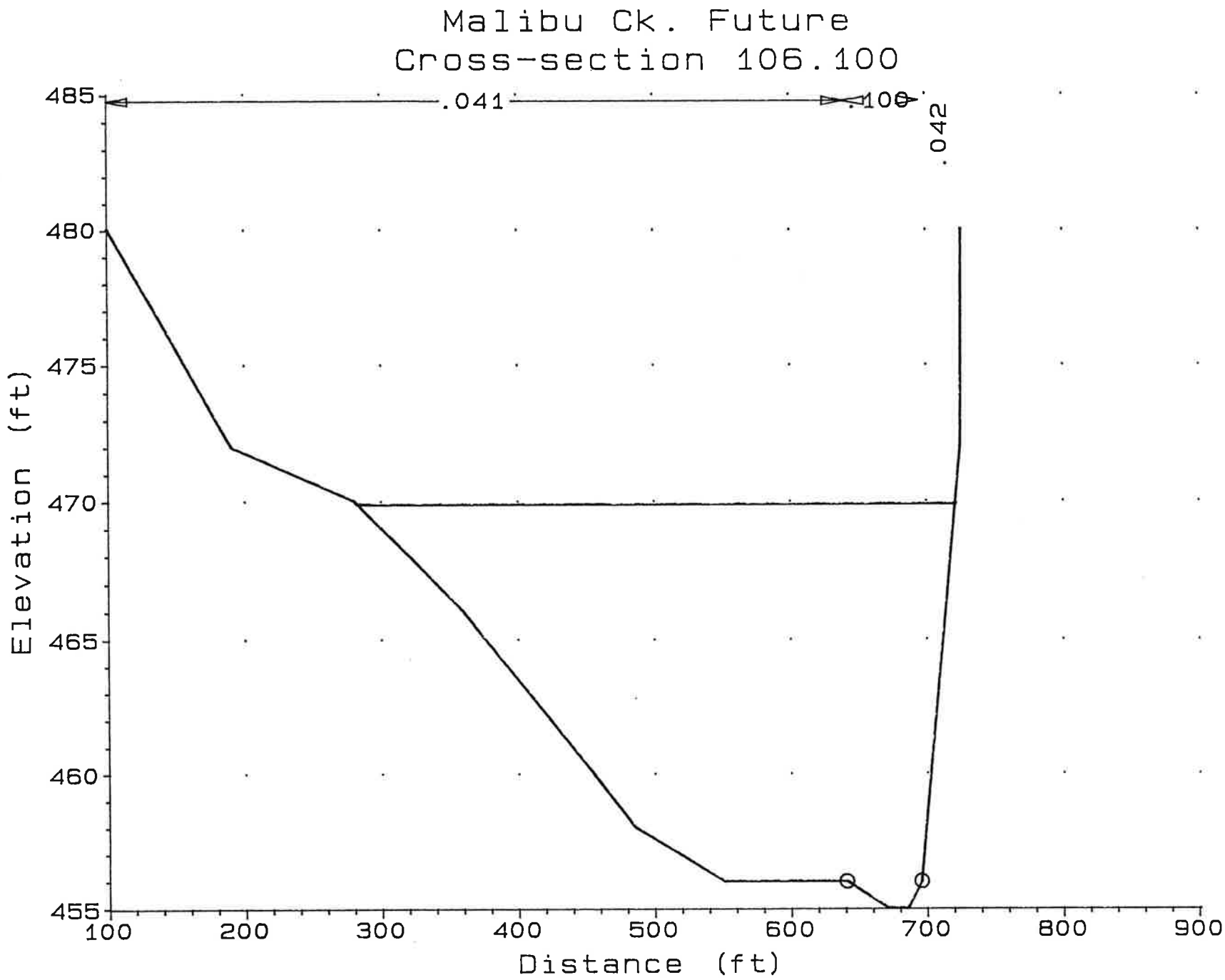
Distance (ft)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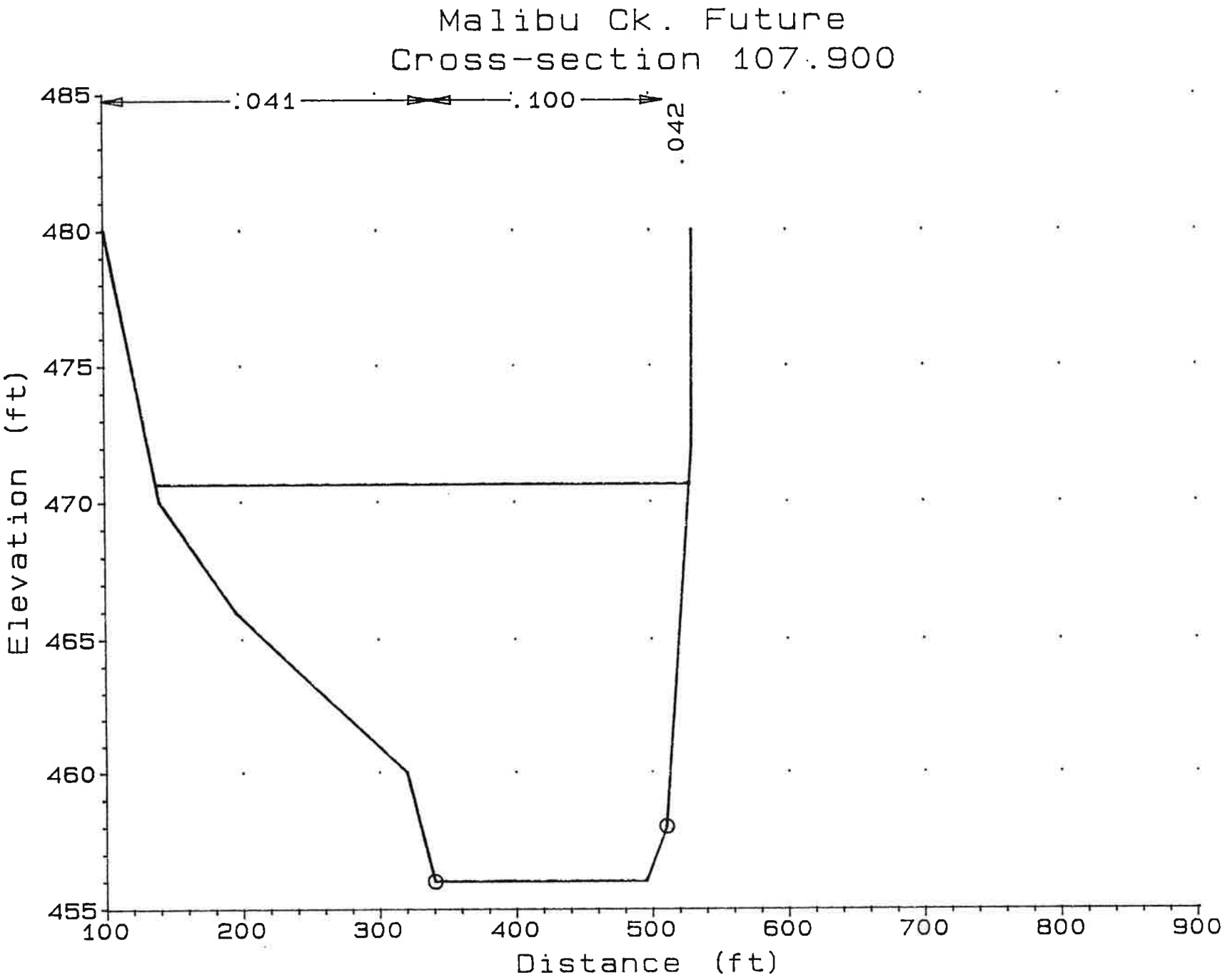
Distance (ft)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Cross-section 107.900
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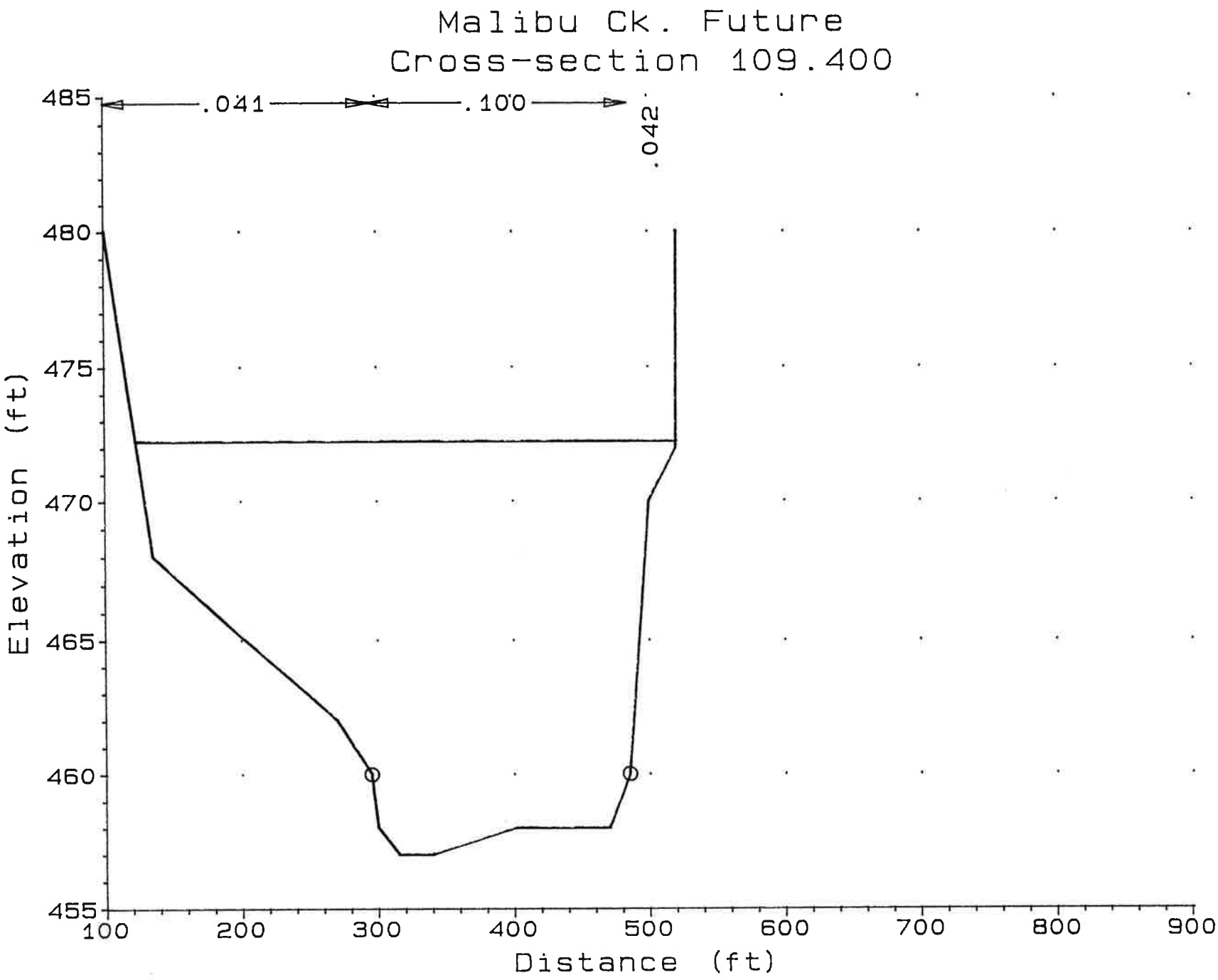
Distance (ft)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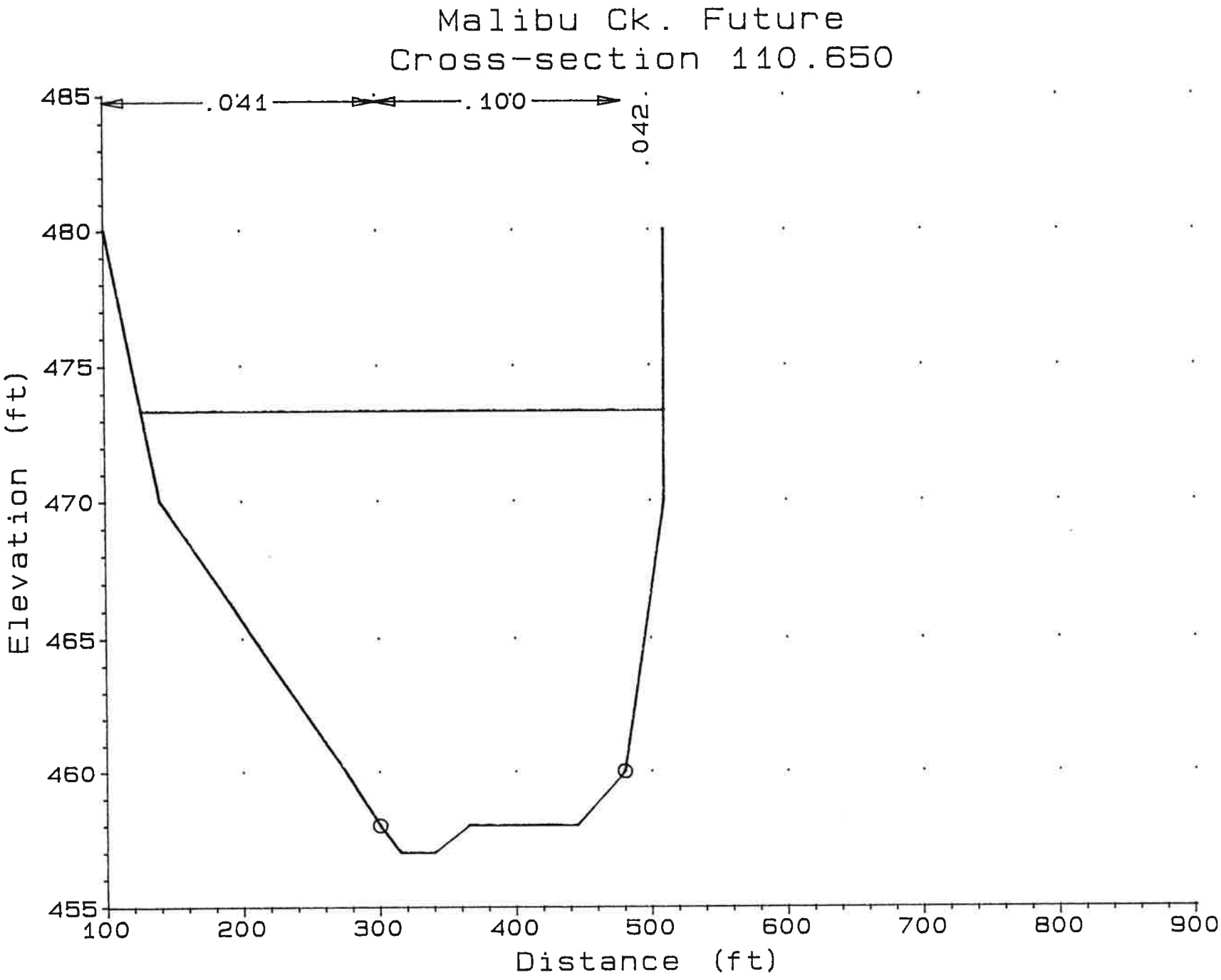
Distance (ft)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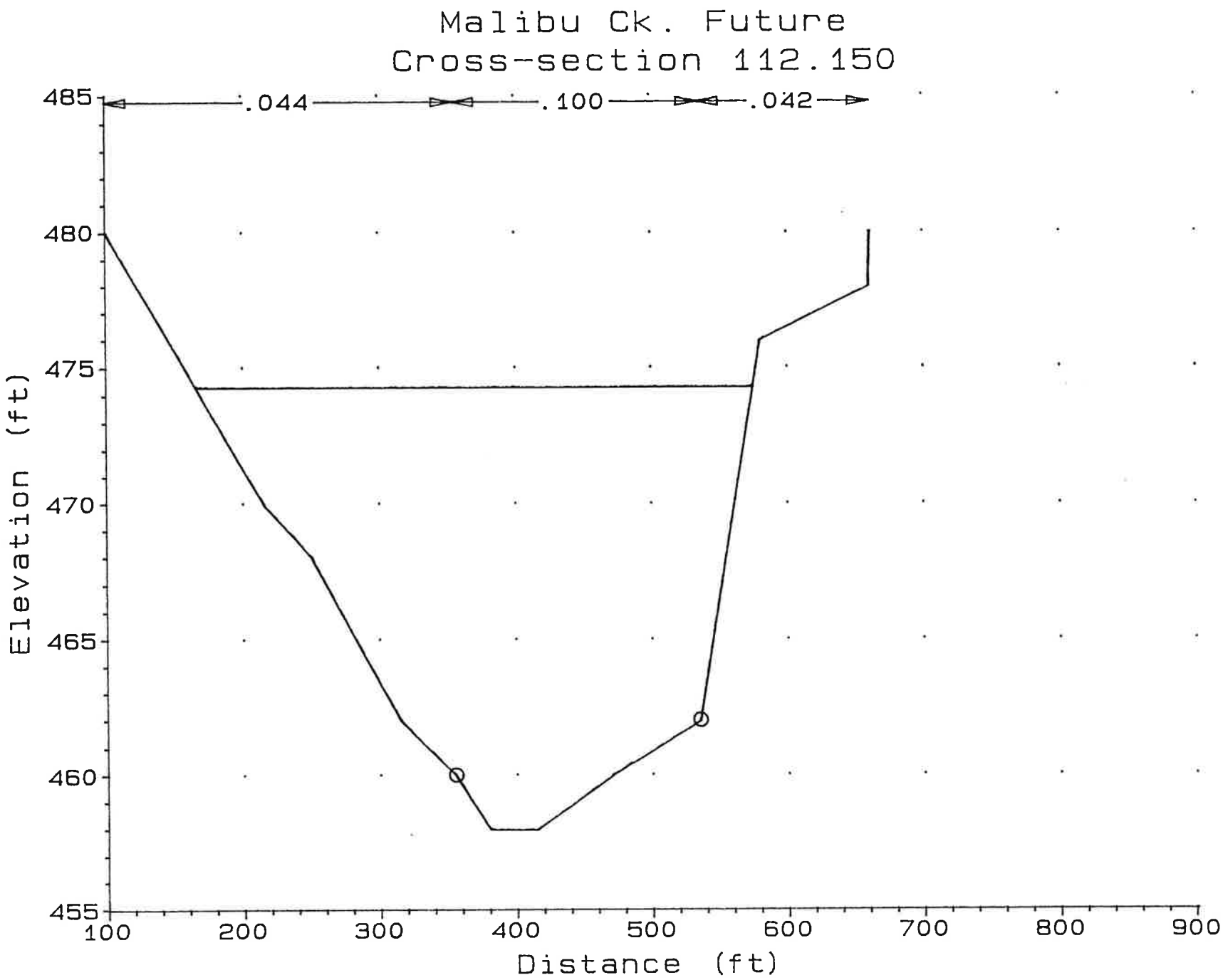
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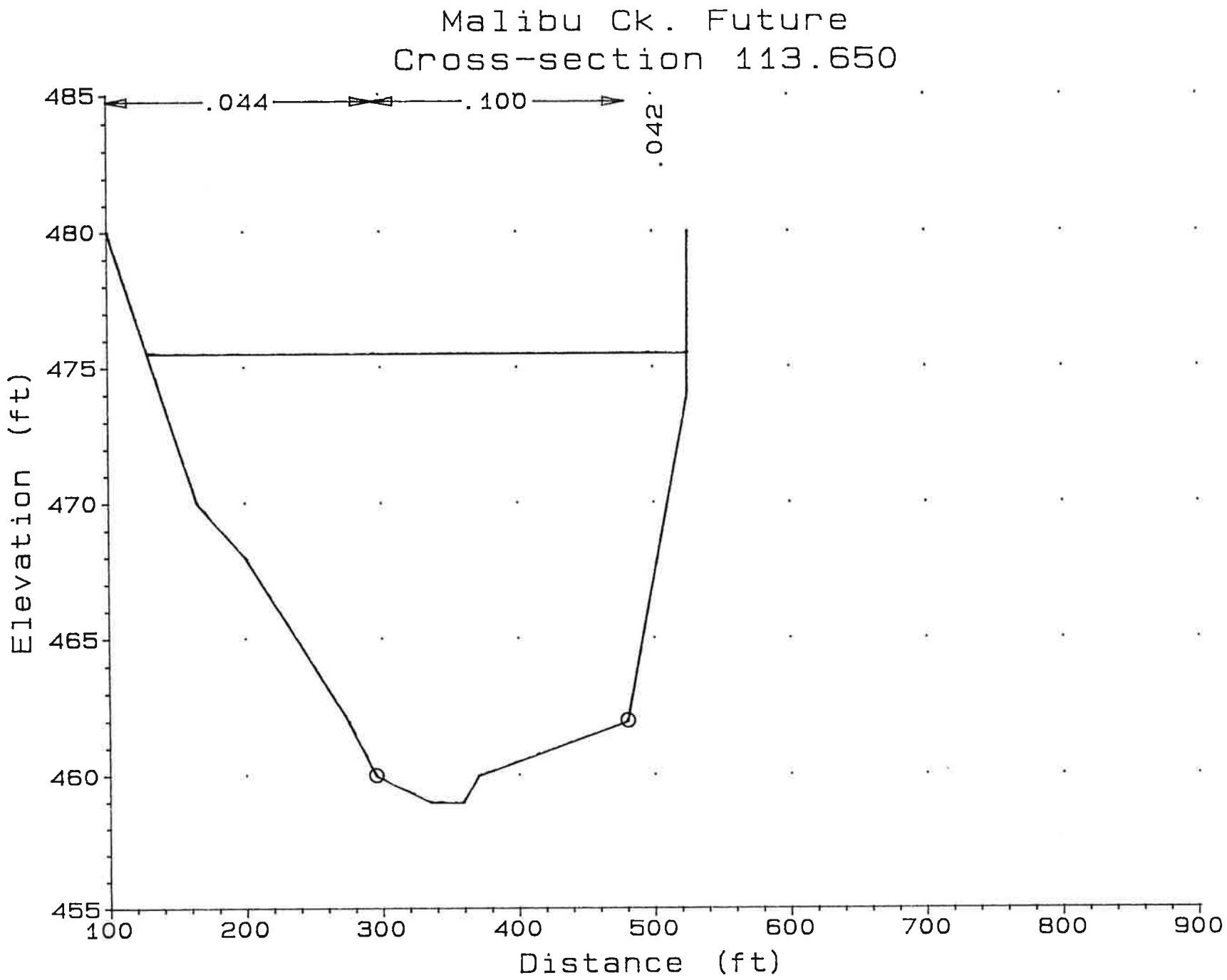
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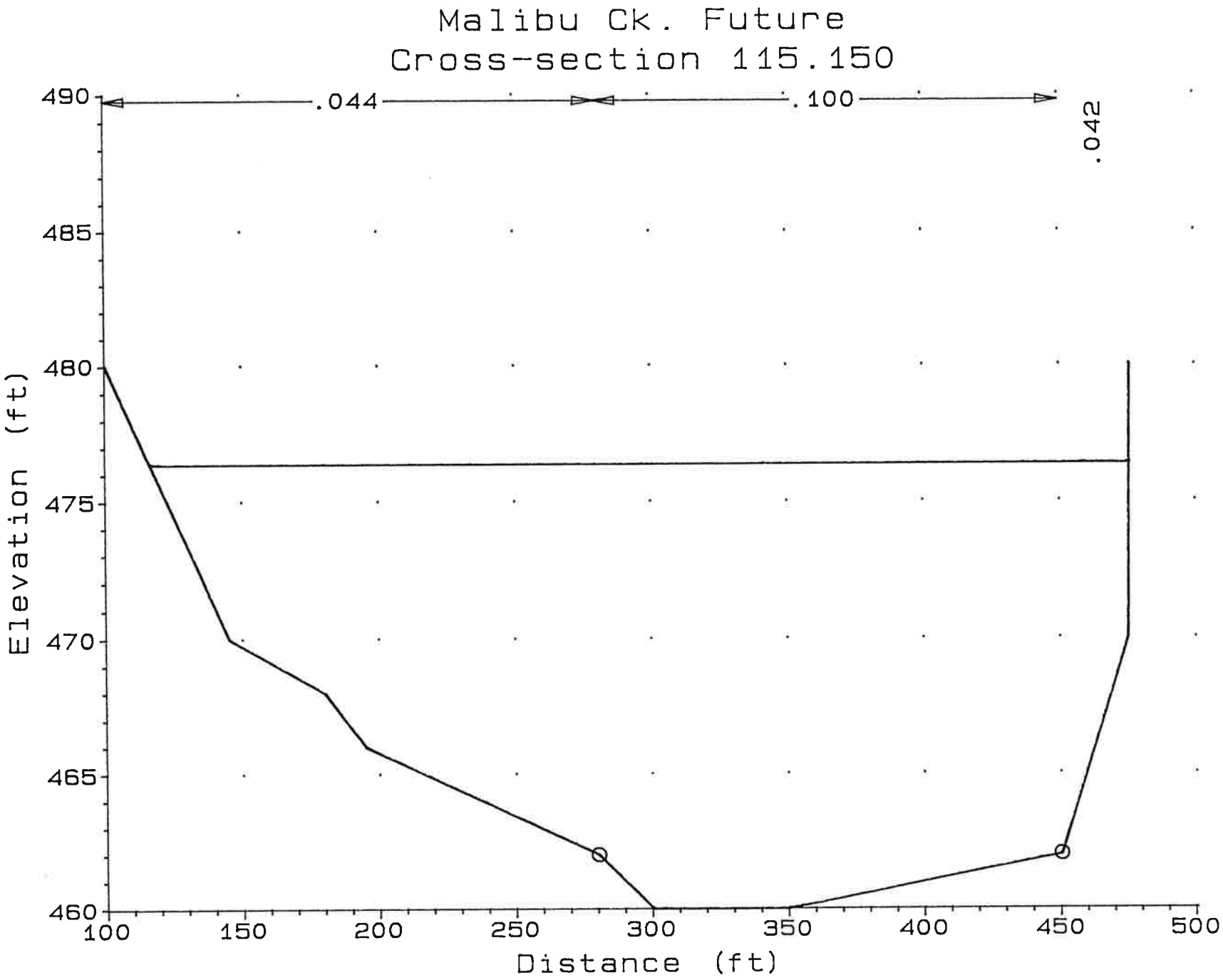
Distance (ft)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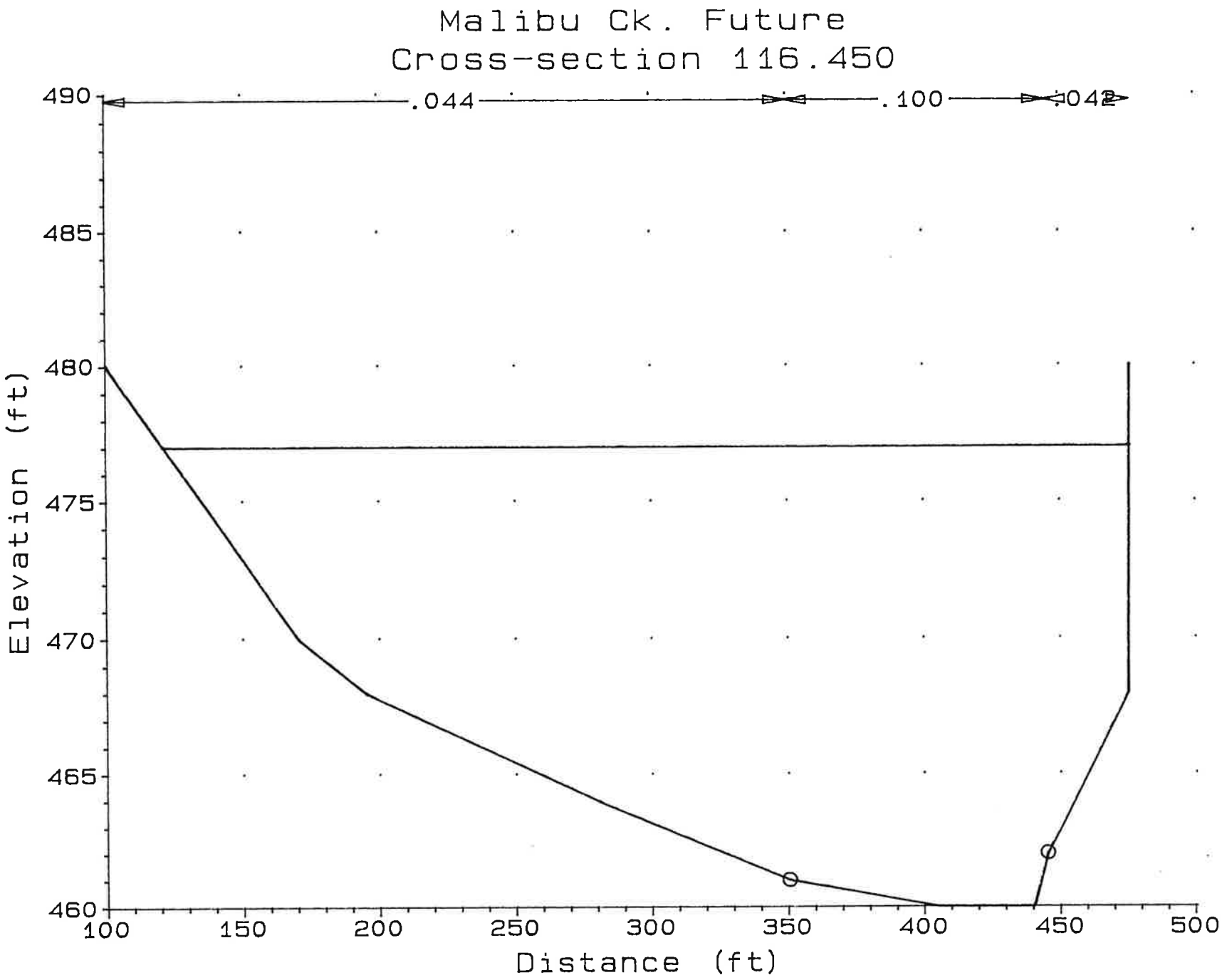
Distance (ft)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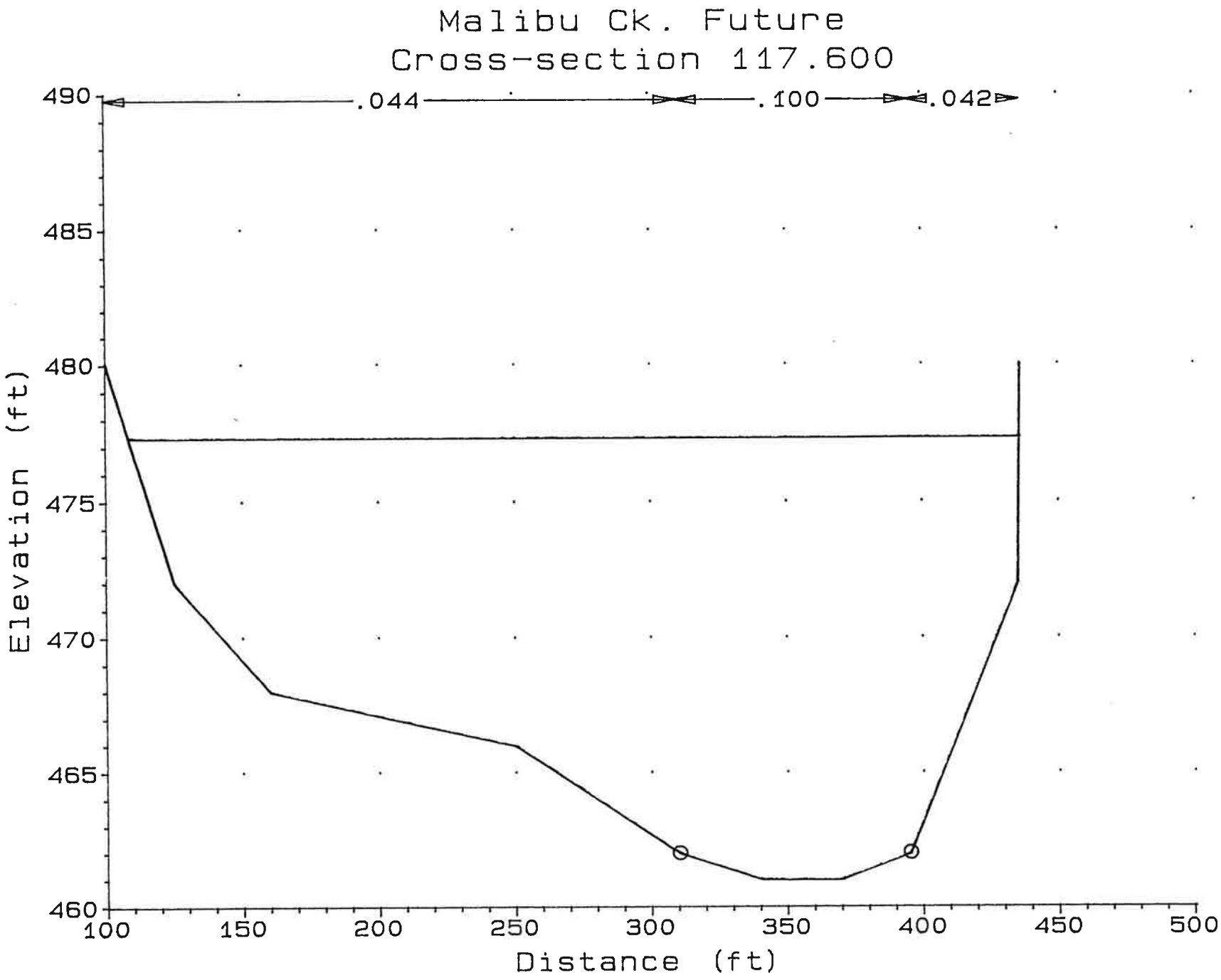
Distance (ft)


Malibu Ck. Future
Cross-section 117.600
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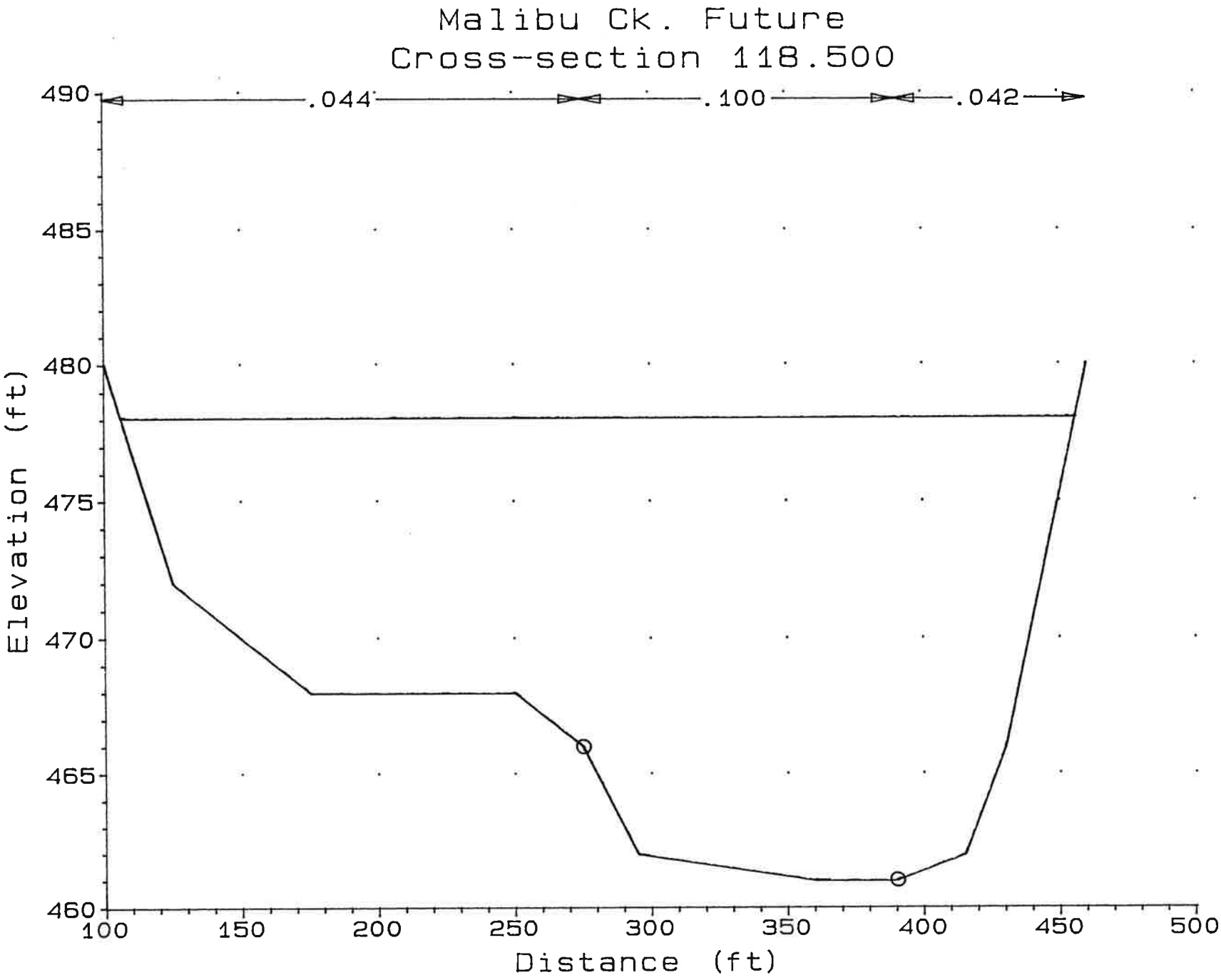
Distance (ft)


Malibu Ck. Future
Cross-section 118.500
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460
Elevation (ft)
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150
200
250
300
350
400
450
500
Distance (ft)

APPENDIX 5

MALIBU CREEK HYDRAULIC ANALYSIS FOR COMPLETE BLOCKAGE OF BRIDGE OPENING

```
1*************************************************
*  WATER SURFACE PROFILES                       *
*  VERSION OF SEPTEMBER 1988                    *
*  ERROR: 01,02,03                              *
*  UPDATED:  SEPTEMBER 1989                     *
*  RUN DATE     4/30/90    TIME     8:54:53      *
*************************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*        (916) 756-1104                 *
*****************************************
```

```
X     X  XXXXXXX   XXXXX            XXXXX
X     X  X        X     X          X     X
X     X  X        X                      X
XXXXXXX  XXXX     X          XXXXX   XXXXX
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX            XXXXXXX
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END OF BANNER

THIS RUN EXECUTED 4/30/90 8:54:53

```
*************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
*************************************************
```

```
T1  MALIBU CREEK ULTIMATE VEGETATION GROWTH SCENARIO.  RIVERTECH, FEB., 1990
T2  ALL CROSS SECTIONS LOOKING DOWNSTREAM. **complete blockage at bridge**
T3        MALIBU CREEK (u)
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ	
	0	2	0	0	-1	0	0	0	294	0	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE	
	1	0	-1	0	0	0	-1	0	0	0	
NC	0.040	0.040	0.055	0.1	0.3						
QT	1	41800									
X1	0.00	4	100	277	0	0	0				
GR	305	100	289	101	289	276	305	277			
X1	1.50	8	260	390	100	200	150				
GR	320	100	300	160	292	260	288	320	286	350	
GR	286	390	298	440	320	480					
X1	3.00	9	230	360	150	160	150				
GR	320	100	300	140	292	230	286	290	286	315	
GR	290	360	298	370	300	410	320	430			
X1	7.50	8	135	240	400	500	450				
GR	320	100	290	135	288	140	288	155	290	170	
GR	292	240	302	285	320	440					
X1	14.50	9	210	360	750	650	700				
GR	320	100	304	120	306	180	306	210	290	250	
GR	290	265	292	305	296	360	320	405			
X1	20.50	9	140	260	550	650	600				
GR	330	100	300	140	296	160	294	180	294	200	
GR	296	210	300	260	310	290	330	320			
X1	28.00	6	135	230	700	800	750				
GR	330	100	300	135	300	175	304	230	310	250	
GR	330	300									

X1	35.00	8	150	260	700	750	700				
GR	340	100	310	150	308	160	310	170	312	200	
GR	310	230	310	260	340	300					
X1	43.00	6	150	280	800	800	800				
GR	360	100	340	150	336	180	336	210	338	280	
GR	360	320									
X1	48.50	5	145	170	550	550	550				
GR	380	100	350	135	344	145	344	170	380	200	
X1	54.25	6	130	230	425	425	425				
GR	400	100	380	130	370	160	370	190	380	230	
GR	400	270									
X1	59.50	6	140	245	525	525	525				

GR	420	100	400	140	392	160	392	205	400	245
GR	420	290								
X1	65.20	7	145	230	570	570	570			
GR	460	100	420	130	414	145	412	165	414	190
GR	420	230	460	280						
X1	77.00	6	145	285	1180	1180	1180			
GR	470	100	440	145	434	220	434	270	440	285
GR	470	370								
X1	86.00	12	310	470	900	600	700			
GR	470	100	460	250	450	310	440	360	440	425
GR	450	470	460	490	460	520	452	570	452	760
GR	454	840	470	880						
X1	91.00	10	215	370	500	450	500			
GR	480	100	460	140	450	215	444	250	442	315
GR	442	345	450	370	463	410	464	730	480	790
X1	93.50	12	270	435	290	160	250			
GR	480	100	470	130	460	145	458	210	448	270
GR	444	330	444	395	450	435	463	470	463	685
GR	470	745	480	790						
X1	96.10	11	305	505	290	230	260			
GR	480	100	460	140	460	235	454	305	450	360
GR	445	430	445	460	456	505	460	540	470	650
GR	480	700								
X1	97.00	13	325	490	110	85	90			
GR	480	100	466	135	462	190	460	280	456	325
GR	454	355	450	435	446	465	446	485	450	490
GR	460	530	470	600	480	720				

X1	97.60	14	355	520	60	60	60			
GR	480	100	470	130	462	175	460	285	456	355
GR	454	390	454	415	452	440	446	485	446	510
GR	448	520	462	521	470	680	480	735		
NC	.020	.020	.020							
X1	98.40	7	100	870	40	40	40			
GR	480	100	472	185	471	270	472	510	474	650
GR	476	720	480	870						
X1	98.78	0			38	38	38			
NC	0.040	0.035	0.040							
X1	99.33	16	490	645	55	55	55			
GR	480	100	472	265	470	415	468	435	455	435.1
GR	450	480	448	490	448	505	450	570	450	635
GR	448	645	448	660	462	685	466	700	470	800
GR	480	900								
NC	0.041	0.042	0.100							
X1	100.40	16	535	680	70	120	107			
GR	480	100	470	200	466	255	462	350	460	480
GR	454	500	450	535	450	570	452	595	450	680
GR	450	695	460	710	464	735	470	755	472	810
GR	480	850								
X1	102.00	14	480	670	80	160	160			
GR	480	100	472	190	462	260	460	330	458	425
GR	456	450	454	480	454	550	453	650	454	670
GR	466	710	470	720	470	760	480	780		
X1	103.60	15	475	685	130	130	160			
GR	480	100	472	210	464	260	462	290	460	395
GR	458	455	456	475	456	520	454	645	454	665
GR	456	685	460	705	468	720	468	775	480	780
X1	104.95	16	515	750	135	135	135			
GR	480	100	470	280	464	350	462	380	460	490
GR	458	515	456	600	456	640	455	675	455	685
GR	456	695	456	750	462	780	468	790	468	835
GR	480	865								
X1	106.10	13	640	695	115	115	115			
GR	480	100	472	190	470	280	466	360	460	455
GR	458	485	456	550	456	640	455	670	455	685
GR	456	695	472	725	480	726				
X1	107.90	10	340	510	160	190	180			
GR	480	100	470	140	466	195	460	320	456	340
GR	456	390	456	495	458	510	472	530	480	531

X1	109.40	14	295	485	150	150	150			
GR	480	100	468	135	466	180	462	270	460	295
GR	458	300	457	315	457	340	458	400	458	470
GR	460	485	470	500	472	520	480	521		
X1	110.65	12	300	480	125	125	125			

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GR      480       100       470       140       466       195       460       275       458       300
GR      457       315       457       340       458       365       458       445       460       480
GR      470       510       480       511

NC    0.044     0.042     0.100
X1   112.15        12       355       535       150       150       150
GR      480       100       470       215       468       250       462       315       460       355
GR      458       380       458       415       460       470       462       535       476       580
GR      478       660       480       661

X1   113.65        11       295       480       150       150       150
GR      480       100       470       165       468       200       462       275       460       295
GR      459       335       459       359       460       370       462       480       474       525
GR      480       526

X1   115.15        10       280       450       150       150       150
GR      480       100       470       145       468       180       466       195       462       280
GR      460       300       460       350       462       450       470       475       480       476

X1   116.45        10       350       445       130       130       130
GR      480       100       470       170       468       195       464       280       461       350
GR      460       405       460       440       462       445       468       475       480       476

X1   117.60        10       310       395       115       115       115
GR      480       100       472       125       468       160       466       250       462       310
GR      461       340       461       370       462       395       472       435       480       436

X1   118.50        11       275       390        90        90        90
GR      480       100       472       125       468       175       468       250       466       275
GR      462       295       461       360       461       390       462       415       466       430
GR      480       460

1                                                                                              PAGE     5
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 *PROF 1

 CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

 CCHV=     .100 CEHV=     .300
 *SECNO  .000
 3720 CRITICAL DEPTH ASSUMED
     .000     12.04    301.04    301.04    294.00    307.10      6.06       .00       .00    305.00
   41800.        0.     41800.        0.        0.     2117.        0.        0.        0.    305.00
     .00       .00     19.75       .00      .000      .055      .000      .000    289.00    100.25
  .022856        0.        0.        0.         0        16         0       .00    176.51    276.75
0
 *SECNO 1.500

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.08

    1.500     21.00    307.00    300.67       .00    308.38      1.38       .82       .47    292.00
   41800.     10190.    23118.     8491.     1174.     2461.      824.       11.        1.    286.00
     .00        8.68      9.40     10.31      .040      .055      .040      .000    286.00    138.99
  .002402       100.      150.      200.         3        11         0       .00    317.38    456.37
0
 *SECNO 3.000
    3.000     21.20    307.20    301.89       .00    308.89      1.69       .42       .09    292.00
   41800.     10725.    26894.     4181.     1059.     2485.      486.       26.        2.    290.00
     .01       10.13     10.82      8.61      .040      .055      .040      .000    286.00    125.61
  .003153       150.      150.      160.         2        19         0       .00    291.58    417.19
0
 *SECNO 7.500

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .62

    7.500     19.83    307.83    305.66       .00    311.72      3.89      2.16       .66    290.00
   41800.     2236.     30649.     8914.      186.     1853.      634.       60.        5.    292.00
     .02       12.05     16.54     14.06      .040      .055      .040      .000    288.00    114.19
  .008219       400.      450.      500.         2        15         0       .00    221.04    335.23
0
1                                                                                              PAGE     6
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 *SECNO 14.500

 3301 HV CHANGED MORE THAN HVINS
```

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

14.500	23.62	313.62	307.97	.00	315.33	1.71	3.40	.22	306.00
41800.	6733.	32664.	2404.	804.	2963.	291.	115.	9.	296.00
.03	8.38	11.02	8.26	.040	.055	.040	.000	290.00	107.97
.003207	750.	700.	650.	2	11	0	.00	285.07	393.04

0
*SECNO 20.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

20.500	20.90	314.90	311.73	.00	318.82	3.92	2.83	.66	300.00
41800.	1577.	35843.	4380.	148.	2198.	315.	161.	12.	300.00
.05	10.66	16.31	13.91	.040	.055	.040	.000	294.00	120.13
.007615	550.	600.	650.	3	15	0	.00	177.22	297.35

0
*SECNO 28.000

3301 HV CHANGED MORE THAN HVINS

28.000	20.46	320.46	317.64	.00	324.95	4.49	5.96	.17	300.00
41800.	3224.	32273.	6303.	244.	1834.	406.	205.	15.	304.00
.06	13.20	17.60	15.53	.040	.055	.040	.000	300.00	111.13
.008212	700.	750.	800.	3	15	0	.00	165.02	276.15

0
*SECNO 35.000

3301 HV CHANGED MORE THAN HVINS

35.000	18.79	326.79	325.59	.00	332.37	5.58	7.10	.33	310.00
41800.	3659.	35346.	2795.	235.	1808.	188.	243.	17.	310.00
.07	15.56	19.55	14.86	.040	.055	.040	.000	308.00	122.00
.012612	700.	700.	750.	2	15	0	.00	160.39	282.40

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 43.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

43.000	15.14	351.14	351.14	.00	357.17	6.03	11.48	.14	340.00
41800.	2209.	37190.	2401.	155.	1838.	157.	284.	21.	338.00
.08	14.25	20.24	15.31	.040	.055	.040	.000	336.00	122.16
.016460	800.	800.	800.	0	15	0	.00	181.72	303.88

0
*SECNO 48.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

48.500	29.69	373.69	373.69	.00	383.69	10.00	7.59	1.19	344.00
41800.	14350.	20822.	6629.	594.	742.	367.	308.	22.	344.00
.09	24.15	28.05	18.05	.040	.055	.040	.000	344.00	107.36
.011725	550.	550.	550.	0	17	0	.00	87.38	194.74

0
*SECNO 54.250

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

54.250	21.05	391.05	391.05	.00	398.38	7.34	5.69	.27	380.00
41800.	1167.	39001.	1632.	92.	1755.	122.	326.	23.	380.00
.09	12.75	22.23	13.38	.040	.055	.040	.000	370.00	113.43
.015409	425.	425.	425.	0	19	0	.00	138.66	252.09

0
*SECNO 59.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

59.500	19.15	411.15	411.15	.00	418.02	6.86	8.03	.05	400.00
41800.	1663.	38239.	1898.	124.	1771.	140.	350.	25.	400.00
.10	13.37	21.59	13.56	.040	.055	.040	.000	392.00	117.69
.015200	525.	525.	525.	0	11	0	.00	152.40	270.09

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 65.200

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

65.200	20.57	432.57	432.57	.00	440.32	7.75	8.59	.27	414.00
41800.	6948.	33556.	1296.	293.	1503.	99.	376.	27.	420.00
.11	23.73	22.32	13.12	.040	.055	.040	.000	412.00	120.57
.014950	570.	570.	570.	0	8	0	.00	125.14	245.71

0
*SECNO 77.000

3301 HV CHANGED MORE THAN HVINS

77.000	17.32	451.32	449.82	.00	456.06	4.73	15.44	.30	440.00
41800.	1080.	38501.	2218.	96.	2156.	182.	434.	31.	440.00
.12	11.22	17.86	12.20	.040	.055	.040	.000	434.00	128.01
.011550	1180.	1180.	1180.	2	15	0	.00	189.09	317.10

0
*SECNO 86.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

86.000	19.03	459.03	456.17	.00	460.25	1.21	3.84	.35	450.00
41800.	1415.	25180.	15204.	245.	2571.	2088.	491.	37.	450.00
.15	5.78	9.80	7.28	.040	.055	.040	.000	440.00	255.79
.003298	900.	700.	600.	3	10	0	.00	558.85	852.59

0
*SECNO 91.000

3301 HV CHANGED MORE THAN HVINS

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

91.000	18.00	460.00	457.52	.00	463.24	3.24	2.38	.61	450.00
41800.	3602.	36762.	1437.	375.	2451.	154.	535.	41.	450.00
.16	9.60	15.00	9.33	.040	.055	.040	.000	442.00	139.99
.007887	500.	500.	450.	3	16	0	.00	260.79	400.78

0
*SECNO 93.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

93.500	18.95	462.95	457.72	.00	464.72	1.78	1.34	.15	448.00
41800.	7749.	32331.	1720.	860.	2886.	226.	555.	43.	450.00
.16	9.01	11.20	7.62	.040	.055	.040	.000	444.00	140.58
.003804	290.	250.	160.	3	15	0	.00	329.27	469.85

0
*SECNO 96.100

96.100	19.22	464.22	460.91	.00	465.80	1.58	1.06	.02	454.00
41800.	7142.	32499.	2159.	925.	3037.	316.	581.	46.	456.00
.17	7.72	10.70	6.83	.040	.055	.040	.000	445.00	131.55
.004215	290.	260.	230.	2	15	0	.00	454.91	586.47

0
*SECNO 97.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .64

97.000	17.70	463.70	463.02	.00	466.85	3.15	.58	.47	456.00
41800.	4925.	31165.	5710.	520.	2101.	396.	588.	46.	450.00
.17	9.47	14.83	14.41	.040	.055	.040	.000	446.00	166.58
.010286	110.	90.	85.	3	15	0	.00	389.34	555.92

0
1 PAGE 10

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 97.600

97.600	18.39	464.39	463.69	.00	467.46	3.07	.60	.01	456.00
41800.	8756.	32785.	258.	835.	2198.	66.	593.	47.	448.00
.17	10.49	14.91	3.92	.040	.055	.040	.000	446.00	161.59
.009702	60.	60.	60.	3	5	0	.00	406.79	568.38

0

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*SECNO 98.400

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   98.400     7.02   478.02   478.02      .00   480.51     2.49      .22      .06   480.00
   41800.       0.   41800.       0.       0.     3303.      0.     596.      47.   480.00
      .17      .00    12.65      .00      .000    .020     .000     .000   471.00   121.02
   .003492    40.      40.      40.        0       18        0      .00   674.78   795.81
0
*SECNO 98.780

3301 HV CHANGED MORE THAN HVINS

   98.780     7.92   478.92   478.03      .00   480.68     1.76      .10      .07   480.00
   41800.       0.   41800.       0.       0.     3928.      0.     599.      48.   480.00
      .17      .00    10.64      .00      .000    .020     .000     .000   471.00   111.49
   .002129    38.      38.      38.        6        5        0      .00   717.95   829.44
0
*SECNO 99.330
3280 CROSS SECTION      99.33 EXTENDED        .64 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.87

   99.330    32.64   480.64   459.87      .00   480.86      .22      .02      .15   448.00
   41800.   10127.   21375.   10298.   4027.     4855.    3209.     609.      49.   448.00
      .18     2.51     4.40     3.21     .040      .040     .035     .000   448.00   100.00
   .000143    55.      55.      55.        2       14        0      .00   800.00   900.00
0
1                                                                                    PAGE   11
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 100.400
3280 CROSS SECTION     100.40 EXTENDED        .71 FEET

   100.400    30.71   480.71   463.55      .00   480.88      .17      .02      .00   450.00
   41800.   25040.    8982.    7779.    6898.     4343.    2310.     636.      51.   450.00
      .19     3.63     2.07     3.37     .041      .100     .042     .000   450.00   100.00
   .000208    70.     107.     120.        2       18        0      .00   750.00   850.00
0
*SECNO 102.000
3280 CROSS SECTION     102.00 EXTENDED        .71 FEET

   102.000    27.71   480.71   463.33      .00   480.91      .21      .03      .01   454.00
   41800.   25664.   10972.    5165.    6189.     5135.    1498.     673.      53.   454.00
      .20     4.15     2.14     3.45     .041      .100     .042     .000   453.00   100.00
   .000255    80.     160.     160.        2       22        0      .00   680.00   780.00
0
*SECNO 103.600
3280 CROSS SECTION     103.60 EXTENDED        .74 FEET

   103.600    26.74   480.74   464.35      .00   480.96      .22      .04      .00   456.00
   41800.   24011.   12198.    5591.    5543.     5381.    1440.     714.      55.   456.00
      .21     4.33     2.27     3.88     .041      .100     .042     .000   454.00   100.00
   .000308   130.     160.     130.        0       22        0      .00   680.00   780.00
0
*SECNO 104.950
3280 CROSS SECTION     104.95 EXTENDED        .80 FEET

   104.950    25.80   480.80   465.04      .00   481.00      .21      .04      .00   458.00
   41800.   21961.   13435.    6404.    5265.     5774.    1591.     753.      57.   456.00
      .22     4.17     2.33     4.02     .041      .100     .042     .000   455.00   100.00
   .000343   135.     135.     135.        2       22        0      .00   765.00   865.00
0
*SECNO 106.100
3280 CROSS SECTION     106.10 EXTENDED        .78 FEET

   106.100    25.78   480.78   466.53      .00   481.06      .28      .04      .02   456.00
   41800.   36865.    3086.    1849.    8454.     1398.     508.     783.      59.   456.00
      .22     4.36     2.21     3.64     .041      .100     .042     .000   455.00   100.00
   .000296   115.     115.     115.        2       14        0      .00   626.00   726.00
0
1                                                                                    PAGE   12
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*SECNO 107.900
3280 CROSS SECTION     107.90 EXTENDED        .69 FEET

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .59
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  107.900    24.69   480.69   467.14      .00   481.21      .53      .08      .08   456.00
   41800.    24573.   15434.    1792.   3590.    4182.    318.     819.      61.    458.00
     .23      6.85     3.69     5.63     .041     .100    .042     .000   456.00   100.00
 .000863      160.     180.     190.        2       14       0      .00   431.00   531.00
0
 *SECNO 109.400
 3280 CROSS SECTION     109.40 EXTENDED        .77 FEET

  109.400    23.78   480.78   468.26      .00   481.38      .60      .15      .02   460.00
   41800.    21652.   17532.    2616.   2861.    4369.    437.     846.      62.    460.00
     .24      7.57     4.01     5.99     .041     .100    .042     .000   457.00   100.00
 .001119      150.     150.     150.        0       18       0      .00   421.00   521.00
0
 *SECNO 110.650
 3280 CROSS SECTION     110.65 EXTENDED        .91 FEET

  110.650    23.90   480.90   468.80      .00   481.53      .63      .14      .01   458.00
   41800.    22191.   16231.    3378.   2926.    4133.    483.     868.      63.    460.00
     .24      7.58     3.93     6.99     .041     .100    .042     .000   457.00   100.00
 .001071      125.     125.     125.        0        8       0      .00   411.00   511.00
0
 *SECNO 112.150
 3280 CROSS SECTION     112.15 EXTENDED        1.18 FEET

  112.150    23.18   481.18   470.28      .00   481.71      .53      .18      .01   460.00
   41800.    20985.   16140.    4676.   2996.    3897.    885.     894.      65.    462.00
     .25      7.01     4.14     5.29     .044     .100    .042     .000   458.00   100.00
 .001288      150.     150.     150.        2       11       0      .00   561.00   661.00
0
 *SECNO 113.650
 3280 CROSS SECTION     113.65 EXTENDED        1.28 FEET

  113.650    22.28   481.28   470.82      .00   481.98      .70      .22      .05   460.00
   41800.    19603.   17547.    4650.   2464.    3876.    602.     919.      67.    462.00
     .26      7.95     4.53     7.73     .044     .100    .042     .000   459.00   100.00
 .001607      150.     150.     150.        2        8       0      .00   426.00   526.00
0
1
    4/30/90         8:54:53                                                          PAGE   13

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST


 *SECNO 115.150
 3280 CROSS SECTION     115.15 EXTENDED        1.43 FEET

  115.150    21.43   481.43   471.34      .00   482.28      .86      .26      .05   462.00
   41800.    21194.   17061.    3545.   2422.    3522.    392.     942.      68.    462.00
     .26      8.75     4.84     9.04     .044     .100    .042     .000   460.00   100.00
 .001868      150.     150.     150.        2        8       0      .00   376.00   476.00
0
 *SECNO 116.450
 3280 CROSS SECTION     116.45 EXTENDED        1.63 FEET

  116.450    21.63   481.63   472.45      .00   482.52      .89      .23      .01   461.00
   41800.    28841.    9281.    3678.   3447.    2022.    506.     961.      69.    462.00
     .27      8.37     4.59     7.26     .044     .100    .042     .000   460.00   100.00
 .001626      130.     130.     130.        2       11       0      .00   376.00   476.00
0
 *SECNO 117.600
 3280 CROSS SECTION     117.60 EXTENDED        1.65 FEET

  117.600    20.65   481.65   473.72      .00   482.81     1.16      .21      .08   462.00
   41800.    27364.    8818.    5618.   2927.    1728.    592.     975.      70.    462.00
     .27      9.35     5.10     9.49     .044     .100    .042     .000   461.00   100.00
 .002126      115.     115.     115.        2       14       0      .00   336.00   436.00
0
 *SECNO 118.500
 3280 CROSS SECTION     118.50 EXTENDED        1.91 FEET

  118.500    20.91   481.91   474.55      .00   483.02     1.11      .20      .01   466.00
   41800.    18808.   11930.   11062.   2159.    2312.   1046.     986.      71.    461.00
     .28      8.71     5.16    10.57     .044     .100    .042     .000   461.00   100.00
 .002216       90.      90.      90.        2       14       0      .00   360.00   460.00
0
1
    4/30/90         8:54:53                                                          PAGE   14


                                                                  THIS RUN EXECUTED  4/30/90      8:55: 6

 ****************************************************
   HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

   ERROR CORR -  01,02,03
   MODIFICATION -
 ****************************************************

 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

   MALIBU CREEK (u)
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SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	.000	.00	.00	.00	289.00	41800.00	301.04	301.04	307.10	228.56	19.75	2116.66	2764.90
*	1.500	150.00	.00	.00	286.00	41800.00	307.00	300.67	308.38	24.02	9.40	4458.41	8528.78
	3.000	150.00	.00	.00	286.00	41800.00	307.20	301.89	308.89	31.53	10.82	4030.00	7443.97
*	7.500	450.00	.00	.00	288.00	41800.00	307.83	305.66	311.72	82.19	16.54	2672.03	4610.57
*	14.500	700.00	.00	.00	290.00	41800.00	313.62	307.97	315.33	32.07	11.02	4058.32	7381.19
*	20.500	600.00	.00	.00	294.00	41800.00	314.90	311.73	318.82	76.15	16.31	2660.95	4789.98
	28.000	750.00	.00	.00	300.00	41800.00	320.46	317.64	324.95	82.12	17.60	2483.71	4612.70
	35.000	700.00	.00	.00	308.00	41800.00	326.79	325.59	332.37	126.12	19.55	2231.04	3722.09
*	43.000	800.00	.00	.00	336.00	41800.00	351.14	351.14	357.17	164.60	20.24	2149.60	3258.07
*	48.500	550.00	.00	.00	344.00	41800.00	373.69	373.69	383.69	117.25	28.05	1703.69	3860.26
*	54.250	425.00	.00	.00	370.00	41800.00	391.05	391.05	398.38	154.09	22.23	1968.17	3367.38
*	59.500	525.00	.00	.00	392.00	41800.00	411.15	411.15	418.02	152.00	21.59	2035.35	3390.46
*	65.200	570.00	.00	.00	412.00	41800.00	432.57	432.57	440.32	149.50	22.32	1895.03	3418.64
	77.000	1180.00	.00	.00	434.00	41800.00	451.32	449.82	456.06	115.50	17.86	2434.19	3889.46
*	86.000	700.00	.00	.00	440.00	41800.00	459.03	456.17	460.25	32.98	9.80	4903.32	7278.88
*	91.000	500.00	.00	.00	442.00	41800.00	460.00	457.52	463.24	78.87	15.00	2979.93	4706.88
*	93.500	250.00	.00	.00	444.00	41800.00	462.95	457.72	464.72	38.04	11.20	3971.11	6777.20

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	96.100	260.00	.00	.00	445.00	41800.00	464.22	460.91	465.80	42.15	10.70	4278.14	6438.18
*	97.000	90.00	.00	.00	446.00	41800.00	463.70	463.02	466.85	102.86	14.83	3017.01	4121.49
	97.600	60.00	.00	.00	446.00	41800.00	464.39	463.69	467.46	97.02	14.91	3099.29	4243.71
*	98.400	40.00	.00	.00	471.00	41800.00	478.02	478.02	480.51	34.92	12.65	3303.24	7073.70
	98.780	38.00	.00	.00	471.00	41800.00	478.92	478.03	480.68	21.29	10.64	3927.88	9058.29
*	99.330	55.00	.00	.00	448.00	41800.00	480.64	459.87	480.86	1.43	4.40	12090.66	35011.86
	100.400	107.00	.00	.00	450.00	41800.00	480.71	463.55	480.88	2.08	2.07	13550.96	28953.42
	102.000	160.00	.00	.00	453.00	41800.00	480.71	463.33	480.91	2.55	2.14	12821.84	26177.83
	103.600	160.00	.00	.00	454.00	41800.00	480.74	464.35	480.96	3.08	2.27	12363.90	23807.36
	104.950	135.00	.00	.00	455.00	41800.00	480.80	465.04	481.00	3.43	2.33	12630.97	22561.34
	106.100	115.00	.00	.00	455.00	41800.00	480.78	466.53	481.06	2.96	2.21	10360.18	24313.98
*	107.900	180.00	.00	.00	456.00	41800.00	480.69	467.14	481.21	8.63	3.69	8089.83	14228.17
	109.400	150.00	.00	.00	457.00	41800.00	480.78	468.26	481.38	11.19	4.01	7667.01	12495.92
	110.650	125.00	.00	.00	457.00	41800.00	480.90	468.80	481.53	10.71	3.93	7542.18	12773.48
	112.150	150.00	.00	.00	458.00	41800.00	481.18	470.28	481.71	12.88	4.14	7777.27	11645.99
	113.650	150.00	.00	.00	459.00	41800.00	481.28	470.82	481.98	16.07	4.53	6942.53	10426.94
	115.150	150.00	.00	.00	460.00	41800.00	481.43	471.34	482.28	18.68	4.84	6336.01	9670.48
	116.450	130.00	.00	.00	460.00	41800.00	481.63	472.45	482.52	16.26	4.59	5975.29	10366.06
	117.600	115.00	.00	.00	461.00	41800.00	481.65	473.72	482.81	21.26	5.10	5247.00	9065.43
	118.500	90.00	.00	.00	461.00	41800.00	481.91	474.55	483.02	22.16	5.16	5516.79	8879.51

MALIBU CREEK (u)

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	.000	41800.00	301.04	.00	.00	7.04	176.51	.00
*	1.500	41800.00	307.00	.00	5.96	.00	317.38	150.00

	3.000	41800.00	307.20	.00	.19	.00	291.58	150.00
*	7.500	41800.00	307.83	.00	.63	.00	221.04	450.00
*	14.500	41800.00	313.62	.00	5.79	.00	285.07	700.00
*	20.500	41800.00	314.90	.00	1.28	.00	177.22	600.00
	28.000	41800.00	320.46	.00	5.56	.00	165.02	750.00
	35.000	41800.00	326.79	.00	6.33	.00	160.39	700.00
*	43.000	41800.00	351.14	.00	24.34	.00	181.72	800.00
*	48.500	41800.00	373.69	.00	22.55	.00	87.38	550.00
*	54.250	41800.00	391.05	.00	17.36	.00	138.66	425.00
*	59.500	41800.00	411.15	.00	20.11	.00	152.40	525.00
*	65.200	41800.00	432.57	.00	21.42	.00	125.14	570.00
	77.000	41800.00	451.32	.00	18.75	.00	189.09	1180.00
*	86.000	41800.00	459.03	.00	7.71	.00	558.85	700.00
*	91.000	41800.00	460.00	.00	.96	.00	260.79	500.00
*	93.500	41800.00	462.95	.00	2.95	.00	329.27	250.00
	96.100	41800.00	464.22	.00	1.28	.00	454.91	260.00
*	97.000	41800.00	463.70	.00	-.52	.00	389.34	90.00
	97.600	41800.00	464.39	.00	.69	.00	406.79	60.00
*	98.400	41800.00	478.02	.00	13.63	.00	674.78	40.00
	98.780	41800.00	478.92	.00	.90	.00	717.95	38.00
*	99.330	41800.00	480.64	.00	1.72	.00	800.00	55.00
	100.400	41800.00	480.71	.00	.07	.00	750.00	107.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	102.000	41800.00	480.71	.00	.00	.00	680.00	160.00
	103.600	41800.00	480.74	.00	.03	.00	680.00	160.00
	104.950	41800.00	480.80	.00	.06	.00	765.00	135.00
	106.100	41800.00	480.78	.00	-.01	.00	626.00	115.00
*	107.900	41800.00	480.69	.00	-.10	.00	431.00	180.00
	109.400	41800.00	480.78	.00	.10	.00	421.00	150.00
	110.650	41800.00	480.90	.00	.12	.00	411.00	125.00
	112.150	41800.00	481.18	.00	.28	.00	561.00	150.00
	113.650	41800.00	481.28	.00	.10	.00	426.00	150.00
	115.150	41800.00	481.43	.00	.15	.00	376.00	150.00
	116.450	41800.00	481.63	.00	.20	.00	376.00	130.00
	117.600	41800.00	481.65	.00	.03	.00	336.00	115.00
	118.500	41800.00	481.91	.00	.25	.00	360.00	90.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= .000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 1.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 7.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 14.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 20.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 43.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 43.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 48.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 48.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=     54.250  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     54.250  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     59.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     59.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     65.200  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     65.200  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     86.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     91.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     93.500  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     97.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     98.400  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     98.400  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     99.330  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    107.900  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

APPENDIX 5

MALIBU CREEK HYDRAULIC ANALYSIS FOR COMPLETE BLOCKAGE OF BRIDGE OPENING

```
1*************************************************
*  WATER SURFACE PROFILES                       *
*  VERSION OF SEPTEMBER 1988                    *
*  ERROR: 01,02,03                              *
*  UPDATED:  SEPTEMBER 1989                     *
*  RUN DATE     4/30/90    TIME     8:54:53      *
*************************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*        (916) 756-1104                 *
*****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                 X
XXXXXXX  XXXX     X           XXXXX   XXXXX
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

END OF BANNER

THIS RUN EXECUTED 4/30/90 8:54:53

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*************************************************
  HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

  ERROR CORR -  01,02,03
  MODIFICATION -
*************************************************
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T1 MALIBU CREEK ULTIMATE VEGETATION GROWTH SCENARIO. RIVERTECH, FEB., 1990
T2 ALL CROSS SECTIONS LOOKING DOWNSTREAM. **complete blockage at bridge**
T3 MALIBU CREEK (u)

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ	
	0	2	0	0	-1	0	0	0	294	0	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE	
	1	0	-1	0	0	0	-1	0	0	0	
NC	0.040	0.040	0.055	0.1	0.3						
QT	1	41800									
X1	0.00	4	100	277	0	0	0				
GR	305	100	289	101	289	276	305	277			
X1	1.50	8	260	390	100	200	150				
GR	320	100	300	160	292	260	288	320	286	350	
GR	286	390	298	440	320	480					
X1	3.00	9	230	360	150	160	150				
GR	320	100	300	140	292	230	286	290	286	315	
GR	290	360	298	370	300	410	320	430			
X1	7.50	8	135	240	400	500	450				
GR	320	100	290	135	288	140	288	155	290	170	
GR	292	240	302	285	320	440					
X1	14.50	9	210	360	750	650	700				
GR	320	100	304	120	306	180	306	210	290	250	
GR	290	265	292	305	296	360	320	405			
X1	20.50	9	140	260	550	650	600				
GR	330	100	300	140	296	160	294	180	294	200	
GR	296	210	300	260	310	290	330	320			
X1	28.00	6	135	230	700	800	750				
GR	330	100	300	135	300	175	304	230	310	250	
GR	330	300									

X1	35.00	8	150	260	700	750	700			
GR	340	100	310	150	308	160	310	170	312	200
GR	310	230	310	260	340	300				
X1	43.00	6	150	280	800	800	800			
GR	360	100	340	150	336	180	336	210	338	280
GR	360	320								
X1	48.50	5	145	170	550	550	550			
GR	380	100	350	135	344	145	344	170	380	200
X1	54.25	6	130	230	425	425	425			
GR	400	100	380	130	370	160	370	190	380	230
GR	400	270								
X1	59.50	6	140	245	525	525	525			

GR	420	100	400	140	392	160	392	205	400	245
GR	420	290								
X1	65.20	7	145	230	570	570	570	165	414	190
GR	460	100	420	130	414	145	412			
GR	420	230	460	280						
X1	77.00	6	145	285	1180	1180	1180	270	440	285
GR	470	100	440	145	434	220	434			
GR	470	370								
X1	86.00	12	310	470	900	600	700	360	440	425
GR	470	100	460	250	450	310	440	570	452	760
GR	450	470	460	490	460	520	452			
GR	454	840	470	880						
X1	91.00	10	215	370	500	450	500	250	442	315
GR	480	100	460	140	450	215	444	730	480	790
GR	442	345	450	370	463	410	464			
X1	93.50	12	270	435	290	160	250	210	448	270
GR	480	100	470	130	460	145	458	470	463	685
GR	444	330	444	395	450	435	463			
GR	470	745	480	790						
X1	96.10	11	305	505	290	230	260	305	450	360
GR	480	100	460	140	460	235	454	540	470	650
GR	445	430	445	460	456	505	460			
GR	480	700								
X1	97.00	13	325	490	110	85	90	280	456	325
GR	480	100	466	135	462	190	460	485	450	490
GR	454	355	450	435	446	465	446			
GR	460	530	470	600	480	720				

X1	97.60	14	355	520	60	60	60	285	456	355
GR	480	100	470	130	462	175	460	485	446	510
GR	454	390	454	415	452	440	446	735		
GR	448	520	462	521	470	680	480			
NC	.020	.020	.020							
X1	98.40	7	100	870	40	40	40	510	474	650
GR	480	100	472	185	471	270	472			
GR	476	720	480	870						
X1	98.78	0			38	38	38			
NC	0.040	0.035	0.040							
X1	99.33	16	490	645	55	55	55	435	455	435.1
GR	480	100	472	265	470	415	468	570	450	635
GR	450	480	448	490	448	505	450	700	470	800
GR	448	645	448	660	462	685	466			
GR	480	900								
NC	0.041	0.042	0.100							
X1	100.40	16	535	680	70	120	107	350	460	480
GR	480	100	470	200	466	255	462	595	450	680
GR	454	500	450	535	450	570	452	755	472	810
GR	450	695	460	710	464	735	470			
GR	480	850								
X1	102.00	14	480	670	80	160	160	330	458	425
GR	480	100	472	190	462	260	460	650	454	670
GR	456	450	454	480	454	550	453	780		
GR	466	710	470	720	470	760	480			
X1	103.60	15	475	685	130	130	160	290	460	395
GR	480	100	472	210	464	260	462	645	454	665
GR	458	455	456	475	456	520	454	775	480	780
GR	456	685	460	705	468	720	468			
X1	104.95	16	515	750	135	135	135	380	460	490
GR	480	100	470	280	464	350	462	675	455	685
GR	458	515	456	600	456	640	455	790	468	835
GR	456	695	456	750	462	780	468			
GR	480	865								
X1	106.10	13	640	695	115	115	115	360	460	455
GR	480	100	472	190	470	280	466	670	455	685
GR	458	485	456	550	456	640	455			
GR	456	695	472	725	480	726				
X1	107.90	10	340	510	160	190	180	320	456	340
GR	480	100	470	140	466	195	460	530	480	531
GR	456	390	456	495	458	510	472			

X1	109.40	14	295	485	150	150	150	270	460	295
GR	480	100	468	135	466	180	462	400	458	470
GR	458	300	457	315	457	340	458	521		
GR	460	485	470	500	472	520	480			
X1	110.65	12	300	480	125	125	125			

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GR     480      100      470      140      466      195      460      275      458      300
GR     457      315      457      340      458      365      458      445      460      480
GR     470      510      480      511

NC   0.044    0.042    0.100
X1   112.15       12      355      535      150      150      150
GR     480      100      470      215      468      250      462      315      460      355
GR     458      380      458      415      460      470      462      535      476      580
GR     478      660      480      661

X1   113.65       11      295      480      150      150      150
GR     480      100      470      165      468      200      462      275      460      295
GR     459      335      459      359      460      370      462      480      474      525
GR     480      526

X1   115.15       10      280      450      150      150      150
GR     480      100      470      145      468      180      466      195      462      280
GR     460      300      460      350      462      450      470      475      480      476

X1   116.45       10      350      445      130      130      130
GR     480      100      470      170      468      195      464      280      461      350
GR     460      405      460      440      462      445      468      475      480      476

X1   117.60       10      310      395      115      115      115
GR     480      100      472      125      468      160      466      250      462      310
GR     461      340      461      370      462      395      472      435      480      436

X1   118.50       11      275      390       90       90       90
GR     480      100      472      125      468      175      468      250      466      275
GR     462      295      461      360      461      390      462      415      466      430
GR     480      460
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

*PROF 1

 CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
0

 CCHV=     .100 CEHV=     .300
 *SECNO  .000
 3720 CRITICAL DEPTH ASSUMED
      .000     12.04    301.04    301.04    294.00    307.10      6.06       .00       .00    305.00
    41800.        0.    41800.        0.        0.      2117.        0.        0.        0.    305.00
      .00       .00     19.75       .00      .000      .055      .000      .000    289.00    100.25
   .022856        0.        0.        0.         0        16         0       .00    176.51    276.75
0
 *SECNO 1.500

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.08

     1.500     21.00    307.00    300.67       .00    308.38      1.38       .82       .47    292.00
    41800.     10190.    23118.     8491.     1174.     2461.      824.       11.        1.    286.00
       .00      8.68      9.40     10.31      .040      .055      .040      .000    286.00    138.99
   .002402       100.      150.      200.         3        11         0       .00    317.38    456.37
0
 *SECNO 3.000
     3.000     21.20    307.20    301.89       .00    308.89      1.69       .42       .09    292.00
    41800.     10725.    26894.     4181.     1059.     2485.      486.       26.        2.    290.00
       .01      10.13     10.82      8.61      .040      .055      .040      .000    286.00    125.61
   .003153       150.      150.      160.         2        19         0       .00    291.58    417.19
0
 *SECNO 7.500

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .62

     7.500     19.83    307.83    305.66       .00    311.72      3.89      2.16       .66    290.00
    41800.     2236.     30649.     8914.      186.     1853.      634.       60.        5.    292.00
       .02     12.05     16.54     14.06      .040      .055      .040      .000    288.00    114.19
   .008219       400.      450.      500.         2        15         0       .00    221.04    335.23
0
1
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA     LEFT/RIGHT
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN       SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID      ENDST

 *SECNO 14.500

 3301 HV CHANGED MORE THAN HVINS
```

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

14.500	23.62	313.62	307.97	.00	315.33	1.71	3.40	.22	306.00
41800.	6733.	32664.	2404.	804.	2963.	291.	115.	9.	296.00
.03	8.38	11.02	8.26	.040	.055	.040	.000	290.00	107.97
.003207	750.	700.	650.	2	11	0	.00	285.07	393.04

0
*SECNO 20.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

20.500	20.90	314.90	311.73	.00	318.82	3.92	2.83	.66	300.00
41800.	1577.	35843.	4380.	148.	2198.	315.	161.	12.	300.00
.05	10.66	16.31	13.91	.040	.055	.040	.000	294.00	120.13
.007615	550.	600.	650.	3	15	0	.00	177.22	297.35

0
*SECNO 28.000

3301 HV CHANGED MORE THAN HVINS

28.000	20.46	320.46	317.64	.00	324.95	4.49	5.96	.17	300.00
41800.	3224.	32273.	6303.	244.	1834.	406.	205.	15.	304.00
.06	13.20	17.60	15.53	.040	.055	.040	.000	300.00	111.13
.008212	700.	750.	800.	3	15	0	.00	165.02	276.15

0
*SECNO 35.000

3301 HV CHANGED MORE THAN HVINS

35.000	18.79	326.79	325.59	.00	332.37	5.58	7.10	.33	310.00
41800.	3659.	35346.	2795.	235.	1808.	188.	243.	17.	310.00
.07	15.56	19.55	14.86	.040	.055	.040	.000	308.00	122.00
.012612	700.	700.	750.	2	15	0	.00	160.39	282.40

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 43.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

43.000	15.14	351.14	351.14	.00	357.17	6.03	11.48	.14	340.00
41800.	2209.	37190.	2401.	155.	1838.	157.	284.	21.	338.00
.08	14.25	20.24	15.31	.040	.055	.040	.000	336.00	122.16
.016460	800.	800.	800.	0	15	0	.00	181.72	303.88

0
*SECNO 48.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

48.500	29.69	373.69	373.69	.00	383.69	10.00	7.59	1.19	344.00
41800.	14350.	20822.	6629.	594.	742.	367.	308.	22.	344.00
.09	24.15	28.05	18.05	.040	.055	.040	.000	344.00	107.36
.011725	550.	550.	550.	0	17	0	.00	87.38	194.74

0
*SECNO 54.250

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

54.250	21.05	391.05	391.05	.00	398.38	7.34	5.69	.27	380.00
41800.	1167.	39001.	1632.	92.	1755.	122.	326.	23.	380.00
.09	12.75	22.23	13.38	.040	.055	.040	.000	370.00	113.43
.015409	425.	425.	425.	0	19	0	.00	138.66	252.09

0
*SECNO 59.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

59.500	19.15	411.15	411.15	.00	418.02	6.86	8.03	.05	400.00
41800.	1663.	38239.	1898.	124.	1771.	140.	350.	25.	400.00
.10	13.37	21.59	13.56	.040	.055	.040	.000	392.00	117.69
.015200	525.	525.	525.	0	11	0	.00	152.40	270.09

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 65.200

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

65.200	20.57	432.57	432.57	.00	440.32	7.75	8.59	.27	414.00
41800.	6948.	33556.	1296.	293.	1503.	99.	376.	27.	420.00
.11	23.73	22.32	13.12	.040	.055	.040	.000	412.00	120.57
.014950	570.	570.	570.	0	8	0	.00	125.14	245.71

0
*SECNO 77.000

3301 HV CHANGED MORE THAN HVINS

77.000	17.32	451.32	449.82	.00	456.06	4.73	15.44	.30	440.00
41800.	1080.	38501.	2218.	96.	2156.	182.	434.	31.	440.00
.12	11.22	17.86	12.20	.040	.055	.040	.000	434.00	128.01
.011550	1180.	1180.	1180.	2	15	0	.00	189.09	317.10

0
*SECNO 86.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.87

86.000	19.03	459.03	456.17	.00	460.25	1.21	3.84	.35	450.00
41800.	1415.	25180.	15204.	245.	2571.	2088.	491.	37.	450.00
.15	5.78	9.80	7.28	.040	.055	.040	.000	440.00	255.79
.003298	900.	700.	600.	3	10	0	.00	558.85	852.59

0
*SECNO 91.000

3301 HV CHANGED MORE THAN HVINS

1 PAGE 9

4/30/90 8:54:53

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .65

91.000	18.00	460.00	457.52	.00	463.24	3.24	2.38	.61	450.00
41800.	3602.	36762.	1437.	375.	2451.	154.	535.	41.	450.00
.16	9.60	15.00	9.33	.040	.055	.040	.000	442.00	139.99
.007887	500.	500.	450.	3	16	0	.00	260.79	400.78

0
*SECNO 93.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

93.500	18.95	462.95	457.72	.00	464.72	1.78	1.34	.15	448.00
41800.	7749.	32331.	1720.	860.	2886.	226.	555.	43.	450.00
.16	9.01	11.20	7.62	.040	.055	.040	.000	444.00	140.58
.003804	290.	250.	160.	3	15	0	.00	329.27	469.85

0
*SECNO 96.100

96.100	19.22	464.22	460.91	.00	465.80	1.58	1.06	.02	454.00
41800.	7142.	32499.	2159.	925.	3037.	316.	581.	46.	456.00
.17	7.72	10.70	6.83	.040	.055	.040	.000	445.00	131.55
.004215	290.	260.	230.	2	15	0	.00	454.91	586.47

0
*SECNO 97.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .64

97.000	17.70	463.70	463.02	.00	466.85	3.15	.58	.47	456.00
41800.	4925.	31165.	5710.	520.	2101.	396.	588.	46.	450.00
.17	9.47	14.83	14.41	.040	.055	.040	.000	446.00	166.58
.010286	110.	90.	85.	3	15	0	.00	389.34	555.92

0
1 PAGE 10

4/30/90 8:54:53

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 97.600

97.600	18.39	464.39	463.69	.00	467.46	3.07	.60	.01	456.00
41800.	8756.	32785.	258.	835.	2198.	66.	593.	47.	448.00
.17	10.49	14.91	3.92	.040	.055	.040	.000	446.00	161.59
.009702	60.	60.	60.	3	5	0	.00	406.79	568.38

0

*SECNO 98.400

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

98.400	7.02	478.02	478.02	.00	480.51	2.49	.22	.06	480.00
41800.	0.	41800.	0.	0.	3303.	0.	596.	47.	480.00
.17	.00	12.65	.00	.000	.020	.000	.000	471.00	121.02
.003492	40.	40.	40.	0	18	0	.00	674.78	795.81

0
*SECNO 98.780

3301 HV CHANGED MORE THAN HVINS

98.780	7.92	478.92	478.03	.00	480.68	1.76	.10	.07	480.00
41800.	0.	41800.	0.	0.	3928.	0.	599.	48.	480.00
.17	.00	10.64	.00	.000	.020	.000	.000	471.00	111.49
.002129	38.	38.	38.	6	5	0	.00	717.95	829.44

0
*SECNO 99.330
3280 CROSS SECTION 99.33 EXTENDED .64 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.87

99.330	32.64	480.64	459.87	.00	480.86	.22	.02	.15	448.00
41800.	10127.	21375.	10298.	4027.	4855.	3209.	609.	49.	448.00
.18	2.51	4.40	3.21	.040	.040	.035	.000	448.00	100.00
.000143	55.	55.	55.	2	14	0	.00	800.00	900.00

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 100.400
3280 CROSS SECTION 100.40 EXTENDED .71 FEET

100.400	30.71	480.71	463.55	.00	480.88	.17	.02	.00	450.00
41800.	25040.	8982.	7779.	6898.	4343.	2310.	636.	51.	450.00
.19	3.63	2.07	3.37	.041	.100	.042	.000	450.00	100.00
.000208	70.	107.	120.	2	18	0	.00	750.00	850.00

0
*SECNO 102.000
3280 CROSS SECTION 102.00 EXTENDED .71 FEET

102.000	27.71	480.71	463.33	.00	480.91	.21	.03	.01	454.00
41800.	25664.	10972.	5165.	6189.	5135.	1498.	673.	53.	454.00
.20	4.15	2.14	3.45	.041	.100	.042	.000	453.00	100.00
.000255	80.	160.	160.	2	22	0	.00	680.00	780.00

0
*SECNO 103.600
3280 CROSS SECTION 103.60 EXTENDED .74 FEET

103.600	26.74	480.74	464.35	.00	480.96	.22	.04	.00	456.00
41800.	24011.	12198.	5591.	5543.	5381.	1440.	714.	55.	456.00
.21	4.33	2.27	3.88	.041	.100	.042	.000	454.00	100.00
.000308	130.	160.	130.	0	22	0	.00	680.00	780.00

0
*SECNO 104.950
3280 CROSS SECTION 104.95 EXTENDED .80 FEET

104.950	25.80	480.80	465.04	.00	481.00	.21	.04	.00	458.00
41800.	21961.	13435.	6404.	5265.	5774.	1591.	753.	57.	456.00
.22	4.17	2.33	4.02	.041	.100	.042	.000	455.00	100.00
.000343	135.	135.	135.	2	22	0	.00	765.00	865.00

0
*SECNO 106.100
3280 CROSS SECTION 106.10 EXTENDED .78 FEET

106.100	25.78	480.78	466.53	.00	481.06	.28	.04	.02	456.00
41800.	36865.	3086.	1849.	8454.	1398.	508.	783.	59.	456.00
.22	4.36	2.21	3.64	.041	.100	.042	.000	455.00	100.00
.000296	115.	115.	115.	2	14	0	.00	626.00	726.00

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 107.900
3280 CROSS SECTION 107.90 EXTENDED .69 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .59

107.900	24.69	480.69	467.14	.00	481.21	.53	.08	.08	456.00
41800.	24573.	15434.	1792.	3590.	4182.	318.	819.	61.	458.00
.23	6.85	3.69	5.63	.041	.100	.042	.000	456.00	100.00
.000863	160.	180.	190.	2	14	0	.00	431.00	531.00

0
*SECNO 109.400
3280 CROSS SECTION 109.40 EXTENDED .77 FEET

109.400	23.78	480.78	468.26	.00	481.38	.60	.15	.02	460.00
41800.	21652.	17532.	2616.	2861.	4369.	437.	846.	62.	460.00
.24	7.57	4.01	5.99	.041	.100	.042	.000	457.00	100.00
.001119	150.	150.	150.	0	18	0	.00	421.00	521.00

0
*SECNO 110.650
3280 CROSS SECTION 110.65 EXTENDED .91 FEET

110.650	23.90	480.90	468.80	.00	481.53	.63	.14	.01	458.00
41800.	22191.	16231.	3378.	2926.	4133.	483.	868.	63.	460.00
.24	7.58	3.93	6.99	.041	.100	.042	.000	457.00	100.00
.001071	125.	125.	125.	0	8	0	.00	411.00	511.00

0
*SECNO 112.150
3280 CROSS SECTION 112.15 EXTENDED 1.18 FEET

112.150	23.18	481.18	470.28	.00	481.71	.53	.18	.01	460.00
41800.	20985.	16140.	4676.	2996.	3897.	885.	894.	65.	462.00
.25	7.01	4.14	5.29	.044	.100	.042	.000	458.00	100.00
.001288	150.	150.	150.	2	11	0	.00	561.00	661.00

0
*SECNO 113.650
3280 CROSS SECTION 113.65 EXTENDED 1.28 FEET

113.650	22.28	481.28	470.82	.00	481.98	.70	.22	.05	460.00
41800.	19603.	17547.	4650.	2464.	3876.	602.	919.	67.	462.00
.26	7.95	4.53	7.73	.044	.100	.042	.000	459.00	100.00
.001607	150.	150.	150.	2	8	0	.00	426.00	526.00

0
1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 115.150
3280 CROSS SECTION 115.15 EXTENDED 1.43 FEET

115.150	21.43	481.43	471.34	.00	482.28	.86	.26	.05	462.00
41800.	21194.	17061.	3545.	2422.	3522.	392.	942.	68.	462.00
.26	8.75	4.84	9.04	.044	.100	.042	.000	460.00	100.00
.001868	150.	150.	150.	2	8	0	.00	376.00	476.00

0
*SECNO 116.450
3280 CROSS SECTION 116.45 EXTENDED 1.63 FEET

116.450	21.63	481.63	472.45	.00	482.52	.89	.23	.01	461.00
41800.	28841.	9281.	3678.	3447.	2022.	506.	961.	69.	462.00
.27	8.37	4.59	7.26	.044	.100	.042	.000	460.00	100.00
.001626	130.	130.	130.	2	11	0	.00	376.00	476.00

0
*SECNO 117.600
3280 CROSS SECTION 117.60 EXTENDED 1.65 FEET

117.600	20.65	481.65	473.72	.00	482.81	1.16	.21	.08	462.00
41800.	27364.	8818.	5618.	2927.	1728.	592.	975.	70.	462.00
.27	9.35	5.10	9.49	.044	.100	.042	.000	461.00	100.00
.002126	115.	115.	115.	2	14	0	.00	336.00	436.00

0
*SECNO 118.500
3280 CROSS SECTION 118.50 EXTENDED 1.91 FEET

118.500	20.91	481.91	474.55	.00	483.02	1.11	.20	.01	466.00
41800.	18808.	11930.	11062.	2159.	2312.	1046.	986.	71.	461.00
.28	8.71	5.16	10.57	.044	.100	.042	.000	461.00	100.00
.002216	90.	90.	90.	2	14	0	.00	360.00	460.00

0
1

THIS RUN EXECUTED 4/30/90 8:55: 6

****
HEC2 RELEASE DATED SEP 88 UPDATED SEPT 1989

ERROR CORR - 01,02,03
MODIFICATION -
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MALIBU CREEK (u)

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	.000	.00	.00	.00	289.00	41800.00	301.04	301.04	307.10	228.56	19.75	2116.66	2764.90
*	1.500	150.00	.00	.00	286.00	41800.00	307.00	300.67	308.38	24.02	9.40	4458.41	8528.78
	3.000	150.00	.00	.00	286.00	41800.00	307.20	301.89	308.89	31.53	10.82	4030.00	7443.97
*	7.500	450.00	.00	.00	288.00	41800.00	307.83	305.66	311.72	82.19	16.54	2672.03	4610.57
*	14.500	700.00	.00	.00	290.00	41800.00	313.62	307.97	315.33	32.07	11.02	4058.32	7381.19
*	20.500	600.00	.00	.00	294.00	41800.00	314.90	311.73	318.82	76.15	16.31	2660.95	4789.98
	28.000	750.00	.00	.00	300.00	41800.00	320.46	317.64	324.95	82.12	17.60	2483.71	4612.70
	35.000	700.00	.00	.00	308.00	41800.00	326.79	325.59	332.37	126.12	19.55	2231.04	3722.09
*	43.000	800.00	.00	.00	336.00	41800.00	351.14	351.14	357.17	164.60	20.24	2149.60	3258.07
*	48.500	550.00	.00	.00	344.00	41800.00	373.69	373.69	383.69	117.25	28.05	1703.69	3860.26
*	54.250	425.00	.00	.00	370.00	41800.00	391.05	391.05	398.38	154.09	22.23	1968.17	3367.38
*	59.500	525.00	.00	.00	392.00	41800.00	411.15	411.15	418.02	152.00	21.59	2035.35	3390.46
*	65.200	570.00	.00	.00	412.00	41800.00	432.57	432.57	440.32	149.50	22.32	1895.03	3418.64
	77.000	1180.00	.00	.00	434.00	41800.00	451.32	449.82	456.06	115.50	17.86	2434.19	3889.46
*	86.000	700.00	.00	.00	440.00	41800.00	459.03	456.17	460.25	32.98	9.80	4903.32	7278.88
*	91.000	500.00	.00	.00	442.00	41800.00	460.00	457.52	463.24	78.87	15.00	2979.93	4706.88
*	93.500	250.00	.00	.00	444.00	41800.00	462.95	457.72	464.72	38.04	11.20	3971.11	6777.20

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	96.100	260.00	.00	.00	445.00	41800.00	464.22	460.91	465.80	42.15	10.70	4278.14	6438.18
*	97.000	90.00	.00	.00	446.00	41800.00	463.70	463.02	466.85	102.86	14.83	3017.01	4121.49
	97.600	60.00	.00	.00	446.00	41800.00	464.39	463.69	467.46	97.02	14.91	3099.29	4243.71
*	98.400	40.00	.00	.00	471.00	41800.00	478.02	478.02	480.51	34.92	12.65	3303.24	7073.70
	98.780	38.00	.00	.00	471.00	41800.00	478.92	478.03	480.68	21.29	10.64	3927.88	9058.29
*	99.330	55.00	.00	.00	448.00	41800.00	480.64	459.87	480.86	1.43	4.40	12090.66	35011.86
	100.400	107.00	.00	.00	450.00	41800.00	480.71	463.55	480.88	2.08	2.07	13550.96	28953.42
	102.000	160.00	.00	.00	453.00	41800.00	480.71	463.33	480.91	2.55	2.14	12821.84	26177.83
	103.600	160.00	.00	.00	454.00	41800.00	480.74	464.35	480.96	3.08	2.27	12363.90	23807.36
	104.950	135.00	.00	.00	455.00	41800.00	480.80	465.04	481.00	3.43	2.33	12630.97	22561.34
	106.100	115.00	.00	.00	455.00	41800.00	480.78	466.53	481.06	2.96	2.21	10360.18	24313.98
*	107.900	180.00	.00	.00	456.00	41800.00	480.69	467.14	481.21	8.63	3.69	8089.83	14228.17
	109.400	150.00	.00	.00	457.00	41800.00	480.78	468.26	481.38	11.19	4.01	7667.01	12495.92
	110.650	125.00	.00	.00	457.00	41800.00	480.90	468.80	481.53	10.71	3.93	7542.18	12773.48
	112.150	150.00	.00	.00	458.00	41800.00	481.18	470.28	481.71	12.88	4.14	7777.27	11645.99
	113.650	150.00	.00	.00	459.00	41800.00	481.28	470.82	481.98	16.07	4.53	6942.53	10426.94
	115.150	150.00	.00	.00	460.00	41800.00	481.43	471.34	482.28	18.68	4.84	6336.01	9670.48
	116.450	130.00	.00	.00	460.00	41800.00	481.63	472.45	482.52	16.26	4.59	5975.29	10366.06
	117.600	115.00	.00	.00	461.00	41800.00	481.65	473.72	482.81	21.26	5.10	5247.00	9065.43
	118.500	90.00	.00	.00	461.00	41800.00	481.91	474.55	483.02	22.16	5.16	5516.79	8879.51

MALIBU CREEK (U)

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	.000	41800.00	301.04	.00	.00	7.04	176.51	.00
*	1.500	41800.00	307.00	.00	5.96	.00	317.38	150.00

	3.000	41800.00	307.20	.00	.19	.00	291.58	150.00
*	7.500	41800.00	307.83	.00	.63	.00	221.04	450.00
*	14.500	41800.00	313.62	.00	5.79	.00	285.07	700.00
*	20.500	41800.00	314.90	.00	1.28	.00	177.22	600.00
	28.000	41800.00	320.46	.00	5.56	.00	165.02	750.00
	35.000	41800.00	326.79	.00	6.33	.00	160.39	700.00
*	43.000	41800.00	351.14	.00	24.34	.00	181.72	800.00
*	48.500	41800.00	373.69	.00	22.55	.00	87.38	550.00
*	54.250	41800.00	391.05	.00	17.36	.00	138.66	425.00
*	59.500	41800.00	411.15	.00	20.11	.00	152.40	525.00
*	65.200	41800.00	432.57	.00	21.42	.00	125.14	570.00
	77.000	41800.00	451.32	.00	18.75	.00	189.09	1180.00
*	86.000	41800.00	459.03	.00	7.71	.00	558.85	700.00
*	91.000	41800.00	460.00	.00	.96	.00	260.79	500.00
*	93.500	41800.00	462.95	.00	2.95	.00	329.27	250.00
	96.100	41800.00	464.22	.00	1.28	.00	454.91	260.00
*	97.000	41800.00	463.70	.00	-.52	.00	389.34	90.00
	97.600	41800.00	464.39	.00	.69	.00	406.79	60.00
*	98.400	41800.00	478.02	.00	13.63	.00	674.78	40.00
	98.780	41800.00	478.92	.00	.90	.00	717.95	38.00
*	99.330	41800.00	480.64	.00	1.72	.00	800.00	55.00
	100.400	41800.00	480.71	.00	.07	.00	750.00	107.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	102.000	41800.00	480.71	.00	.00	.00	680.00	160.00
	103.600	41800.00	480.74	.00	.03	.00	680.00	160.00
	104.950	41800.00	480.80	.00	.06	.00	765.00	135.00
	106.100	41800.00	480.78	.00	-.01	.00	626.00	115.00
*	107.900	41800.00	480.69	.00	-.10	.00	431.00	180.00
	109.400	41800.00	480.78	.00	.10	.00	421.00	150.00
	110.650	41800.00	480.90	.00	.12	.00	411.00	125.00
	112.150	41800.00	481.18	.00	.28	.00	561.00	150.00
	113.650	41800.00	481.28	.00	.10	.00	426.00	150.00
	115.150	41800.00	481.43	.00	.15	.00	376.00	150.00
	116.450	41800.00	481.63	.00	.20	.00	376.00	130.00
	117.600	41800.00	481.65	.00	.03	.00	336.00	115.00
	118.500	41800.00	481.91	.00	.25	.00	360.00	90.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= .000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 1.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 7.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 14.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 20.500 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 43.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 43.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 48.500 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 48.500 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=     54.250  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     54.250  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     59.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     59.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     65.200  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     65.200  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     86.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     91.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     93.500  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     97.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     98.400  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     98.400  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     99.330  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    107.900  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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KATSURA ENGINEERS
Photo Date: 05-11-89
Map Scale: 1" = 40'
prepared by
Advanced Digital Maps, Inc
858-569-7838
Job 906
RIVERTECH INC
PLATE 2
TITLE:
FLOODPLAIN
BASE MAP
FOR MALIBU
CREEK NEAR
THE TAPIA WATER
RECLAMATION
FACILITY
SHEET 1 OF 2
MATCH LINE
STA. 110+65
STA. 107+90
STA. 106+10
STA. 104+95
STA. 103+60
STA. 102+00
STA. 100+40
STA. 98+40
STA. 97+60
STA. 97+00
STA. 96+10
STA. 93+50
STA. 91+00
TRANSECT NO. 2
TRANSECT NO. 1
OBSTRUCTIONS = 25%
PARK OVERBANK: MANNING'S n = 0.41 (n=0.041 existing)
NUMBER OF TREES = 37
AVERAGE TRUNK DIAMETER = 1.9 ft.
NUMBER OF TREES = 59
AVERAGE TRUNK DIAMETER = 3.5 ft.
WILLOW VEGETATION: MANNING'S n = 0.100 (n=0.064 existing)
RIPRAP: MANNING'S n = 0.042 (n=0.035 existing)
FLOW DIRECTION
LEGEND
EXISTING CONDITION FLOOD BOUNDARY
ULTIMATE CONDITION FLOOD BOUNDARY
SCALE: 1" = 40'

106074

RAISE EXISTING FLOODWALL

PROPOSED FLOODWALL

PILASTERS @ 12" CC AVERAGE

103 C △ 475.85

REV	DATE	BY	DESCRIPTION	REV	DATE	BY	DESCRIPTION

SCALE:

DESIGNED

DRAWN

CHECKED

SUBMITTED

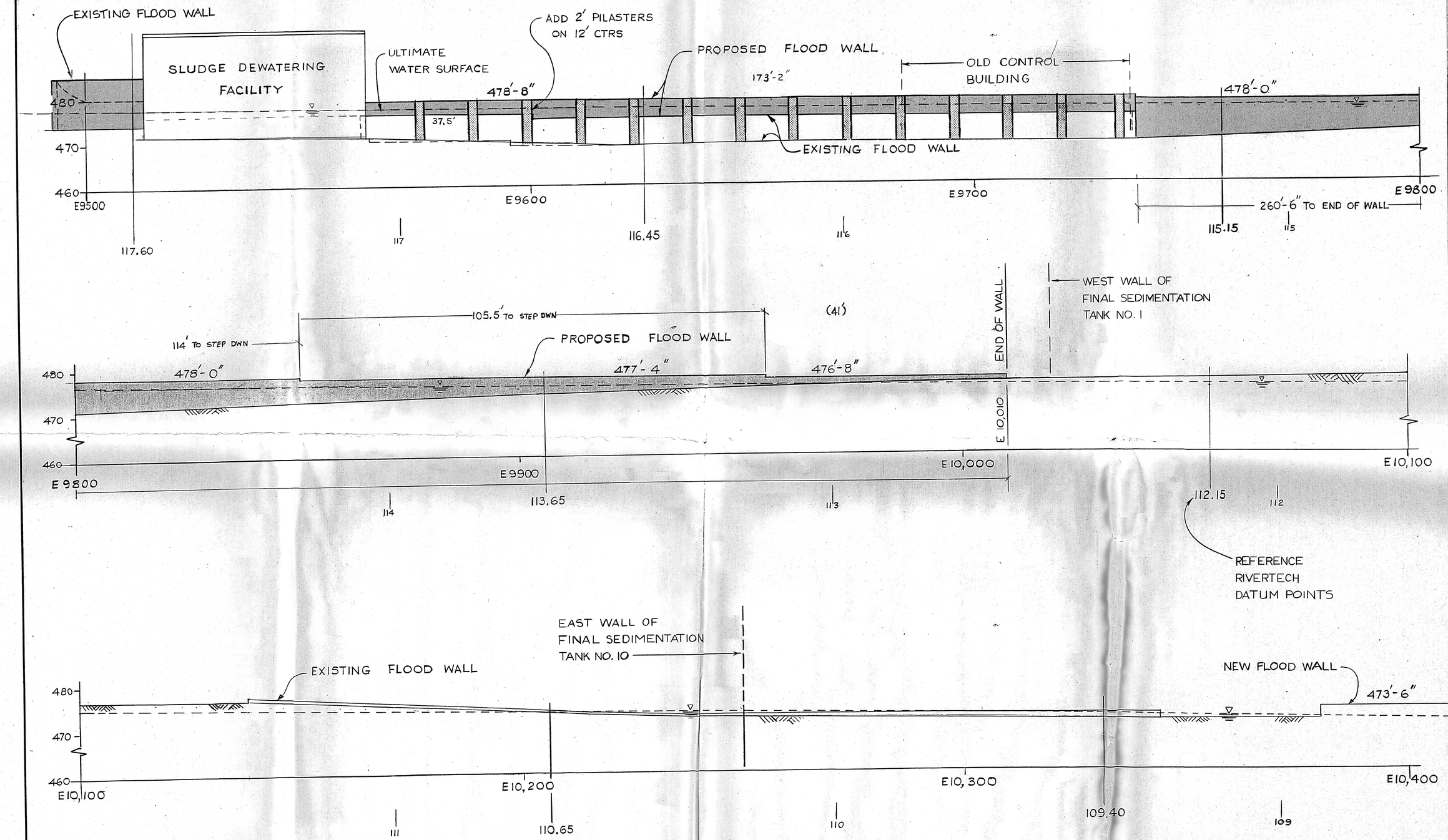
KATSURA CONSULTING ENGINEERS R.C.E. NO. 14038 DATE:

KATSURA CONSULTING ENGINEERS
Ventura, California

LAS VIRGENES MWD / TRIUNFO CSD
TAPIA WRF – REGIONAL FACILITIES EXPANSION IV
SOLIDS SEPARATION & SECONDARY TREATMENT

SHEET

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A30516



REV	DATE	BY	DESCRIPTION	REV	DATE	BY	DESCRIPTION

SCALE:

DESIGNED

DRAWN

CHECKED

SUBMITTED

KATSURA CONSULTING ENGINEERS

14038

R.C.E. NO. DATE

KATSURA CONSULTING ENGINEERS
Ventura, California

LAS VIRGENES MWD / TRIUNFO CSD
TAPIA WRF - REGIONAL FACILITIES EXPANSION IV
SOLIDS SEPARATION & SECONDARY TREATMENT

EXISTING AND PROPOSED FLOODWALL PROFILE

SHEET