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CITY OF SCOTTSDALE ARIZONA

Report on

Hydraulic Analysis of Indian Bend Wash Greenbelt Interceptor Channel

May , 1995

KVL Consultants, Inc.

A680.701

KVL

Mr. Richard J. McGuire
CITY OF SCOTTSDALE
Capital Project Management
3939 Civic center Blvd
Scottsdale, Arizona 85251

May 2, 1995

Hydraulic Analysis of Indian Bend Wash Greenbelt Interceptor Channel

In accordance with the contract agreement, KVL Consultants, Inc. is pleased to submit three copies of the final report on the above subject.

If you have any questions, please call.

Yours truly,

Kenneth V Lewis

Kenneth V. Lewis, P.E.
KVL Consultants, Inc.

46-2.DOC, ATTACHMENTS

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1. INTRODUCTION

1.1 Authorization

The Hydraulic Analysis of the Indian Bend Wash Greenbelt Interceptor Channel was authorized by the City of Scottsdale. The City of Scottsdale retained KVL Consultants, Inc. to conduct the study.

1.2 Purpose

The purpose of the study is to determine the effect of proposed improvements to the Indian Bend Wash Greenbelt Interceptor Channel from Hayden Road to Pima Road on the original design water surface elevations and channel velocities established by the US Army Corps of Engineers (Corps).

1.3 Available Data

Significant available data for this study included:

Reference	Title
1.	Gila River Basin, Arizona, Indian Bend Wash Design Memorandum No. 4 "Feature Design for Interceptor Channel", Project Design for Indian Bend Wash. Los Angeles District, US Army Corps of Engineers, January 1980.
2.	Indian Bend Wash Interceptor Channel Contract Drawings, US Army Engineer District, Los Angeles Corps of Engineers Sheet Nos: 5-8.
3.	Addendum No.1 to Intergovernmental Agreement, City of Scottsdale and Maricopa County Flood Control District, August, 11, 1980.
4.	Plans for City of Scottsdale Public Improvements, Interceptor Channel Restoration, Phase 1, Project No. M 5704, Bid Call 95-98. Sheets 1-11 are included in this report.

2. SUMMARY AND CONCLUSIONS

Hydraulic analyses were carried out using the Corps of Engineers HEC-2 model. Models were run for:

- Original Corps channel design for Manning's n of 0.035 and 0.025.
- Proposed restoration channel design for Manning's n of 0.035 and 0.025.

It was found that water surface elevations and velocities were lower with the proposed restoration program than the original Corps design. A summary of the water surface elevations and velocities for various sections of the channel from Hayden Road to Pima Road is shown in Table 2-1.

Table 2-1 Hydraulic Summary

			---------- Manning's N= 0.035 ----------				---------- Manning's N= 0.025 ----------			
Restored Channel Station **	Design Discharge (cfs)	Invert Elevation	Corps Channel WSE	Restored Channel WSE	Corps Channel Velocity	Restored Channel Velocity	Corps Channel WSE	Restored Channel WSE	Corps Channel Velocity	Restored Channel Velocity
21	5500	1269.18	1276.90	1276.90	4.05	3.92	1276.90	1276.90	4.05	3.92
23	5500	1269.28	1277.08	1277.06	4.00	3.89	1276.99	1276.98	4.05	3.94
25	5500	1269.38	1277.25	1277.23	3.95	3.78	1277.08	1277.07	4.06	3.88
27	5500	1269.48	1277.41	1277.39	3.91	3.74	1277.16	1277.16	4.07	3.89
29	5500	1269.58	1277.57	1277.55	3.87	3.62	1277.25	1277.25	4.08	3.81
31	5500	1269.68	1277.72	1277.66	3.84	3.90	1277.34	1277.31	4.09	4.14
33	5500	1269.78	1277.87	1277.83	3.80	3.69	1277.43	1277.42	4.09	3.95
35	5500	1269.88	1278.00	1277.94	3.78	3.86	1277.51	1277.48	4.10	4.18
37	5500	1269.98	1278.12	1278.08	3.77	3.85	1277.59	1277.56	4.12	4.21
39	5500	1270.08	1278.25	1278.25	3.75	3.33	1277.67	1277.71	4.13	3.62
41	5500	1270.18	1278.39	1278.35	3.73	3.31	1277.76	1277.78	4.14	3.63
43	5500	1270.28	1278.54	1278.49	3.71	2.83	1277.87	1277.90	4.15	3.12
45	5500	1270.38	1278.69	1278.61	3.68	2.33	1277.97	1278.00	4.14	2.57
47	5500	1270.48	1278.84	1278.66	3.64	2.52	1278.08	1278.03	4.14	2.80
49	5500	1271.58	1278.97	1278.71	3.63	2.99	1278.18	1278.05	4.14	3.36
51	5500	1270.68	1279.10	1278.79	3.61	3.23	1278.27	1278.10	4.14	3.61
53	5500	1270.78	1279.22	1278.91	3.60	2.95	1278.36	1278.20	4.14	3.30
55	5500	1270.88	1279.35	1278.99	3.58	2.87	1278.46	1278.26	4.15	3.23
57	5500	1270.98	1279.47	1279.04	3.57	3.45	1278.55	1278.28	4.15	3.92
59	5500	1271.08	1279.59	1279.18	3.56	3.19	1278.65	1278.39	4.15	3.63
61	5500	1271.18	1279.68	1279.28	3.57	2.79	1278.72	1278.49	4.18	3.17
63	5500	1271.28	1279.82	1279.37	3.54	2.63	1278.83	1278.57	4.17	2.99
65	5500	1271.38	1279.93	1279.44	3.53	2.71	1278.92	1278.62	4.17	3.10
67	2590	1271.48	1280.16	1279.57	1.63	1.35	1279.21	1278.77	1.90	1.54
69	2590	1271.58	1280.19	1279.59	1.65	1.07	1279.23	1278.80	1.93	1.21
71	900	1271.68	1280.24	1279.61	0.58	0.18	1279.29	1278.82	0.67	0.21
46-1.xls										

** Note: Refer to City of Scottsdale Interceptor Channel Restoration Phase 1 Project No M 5704 for location of sections.

2. SUMMARY AND CONCLUSIONS

Hydraulic analyses were carried out using the Corps of Engineers HEC-2 model. Models were run for:

- Original Corps channel design for Manning's n of 0.035 and 0.025.
- Proposed restoration channel design for Manning's n of 0.035 and 0.025.

It was found that water surface elevations and velocities were lower with the proposed restoration program than the original Corps design. A summary of the water surface elevations and velocities for various sections of the channel from Hayden Road to Pima Road is shown in Table 2-1.

Table 2-1 Hydraulic Summary

			---------- Manning's N= 0.035 ----------				---------- Manning's N= 0.025 ----------			
Restored Channel Station **	Design Discharge (cfs)	Invert Elevation	Corps Channel WSE	Restored Channel WSE	Corps Channel Velocity	Restored Channel Velocity	Corps Channel WSE	Restored Channel WSE	Corps Channel Velocity	Restored Channel Velocity
21	5500	1269.18	1276.90	1276.90	4.05	3.92	1276.90	1276.90	4.05	3.92
23	5500	1269.28	1277.08	1277.06	4.00	3.89	1277.08	1277.06	4.00	3.89
25	5500	1269.38	1277.25	1277.23	3.95	3.78	1277.25	1277.23	3.95	3.78
27	5500	1269.48	1277.41	1277.39	3.91	3.74	1277.41	1277.39	3.91	3.74
29	5500	1269.58	1277.57	1277.55	3.87	3.62	1277.57	1277.55	3.87	3.62
31	5500	1269.68	1277.72	1277.66	3.84	3.90	1277.72	1277.66	3.84	3.90
33	5500	1269.78	1277.87	1277.83	3.80	3.69	1277.87	1277.83	3.80	3.69
35	5500	1269.88	1278.00	1277.94	3.78	3.86	1278.00	1277.94	3.78	3.86
37	5500	1269.98	1278.12	1278.08	3.77	3.85	1278.12	1278.08	3.77	3.85
39	5500	1270.08	1278.25	1278.25	3.75	3.33	1278.25	1278.25	3.75	3.33
41	5500	1270.10	1278.39	1278.35	3.73	3.30	1278.39	1278.35	3.73	3.30
43	5500	1270.28	1278.54	1278.49	3.71	2.83	1278.54	1278.49	3.71	2.83
45	5500	1270.38	1278.69	1278.60	3.68	2.33	1278.69	1278.60	3.68	2.33
47	5500	1270.40	1278.84	1278.66	3.64	2.50	1278.84	1278.66	3.64	2.50
49	5500	1271.50	1278.97	1278.70	3.63	3.26	1278.97	1278.70	3.63	3.26
51	5500	1270.68	1279.10	1278.81	3.61	3.21	1279.10	1278.81	3.61	3.21
53	5500	1270.78	1279.22	1278.93	3.60	2.94	1279.22	1278.93	3.60	2.94
55	5500	1270.88	1279.35	1279.01	3.58	2.86	1279.35	1279.01	3.58	2.86
57	5500	1270.98	1279.47	1279.07	3.57	3.44	1279.47	1279.07	3.57	3.44
59	5500	1271.08	1279.59	1279.20	3.56	3.18	1279.59	1279.20	3.56	3.18
61	5500	1271.10	1279.68	1279.30	3.57	2.78	1279.68	1279.30	3.57	2.78
63	5500	1271.28	1279.82	1279.39	3.54	2.62	1279.82	1279.39	3.54	2.62
65	5500	1271.38	1279.93	1279.45	3.53	2.70	1279.93	1279.45	3.53	2.70
67	2590	1271.48	1280.16	1279.52	1.63	2.88	1280.16	1279.52	1.63	2.88
69	2590	1271.50	1280.19	1279.67	1.65	1.06	1280.19	1279.67	1.65	1.06
71	900	1271.60	1280.24	1279.69	0.58	0.18	1280.24	1279.69	0.58	0.18
46-1.xls										

** Note: Refer to City of Scottsdale Interceptor Channel Restoration Phase 1 Project No M 5704 for location of sections.

3. HEC-2 MODEL PARAMETERS

3.1 Design Parameters

The following summarizes the design parameters used in the HEC-2 model and provides applicable references. The appropriate HEC-2 card is shown in parenthesis. All Stations refer to the Restoration Channel as shown on the plans in this report. Stations in the Corps' report (Reference 1) are noted.

Design Discharge (J1, X2)

- Design discharge Stations 21-66 = 5500 cfs (Reference 1 - Plate 9)
- Design discharge Stations 67-70 = 2590 cfs (Reference 1 - Plate 9)
- Design discharge Stations 71 = 900 cfs (Reference 1 - Plate 9)

Starting Water Surface Elevation (J1)

- Depth at Station 19+00 (Corps Station) = 7.7 feet (Reference 1 - Plate 10)
- Assumed head loss through bridge = 0.04 feet (Reference 1 - Page V-4, 3rd paragraph)
- Depth at Station 20+00 (Corps Station) = 7.74
- Invert Elevation at Station 25+00 (Corps Station) = 1269.36 (Reference 1 Plate 12)
- Slope of Corps Channel = 0.0005 (Reference 1 - Plate 10)
- Invert Elevation at Station 21+00 (Corps Station) = 1269.36 - (0.0005x400)=1269.16
- Water Surface Elevation at Station 21+00 (Corps Station) = 1269.16 + 7.74 = 1276.90
- The Corps Station 21+00 is approximately equal to the restored channel's Station 21+00.
- Starting Water Surface Elevation for HEC-2 analysis at Station 21+00 = 1276.90

Manning's N (NC)

- Left and Right overbank, N = 0.10
- Channel N for maximum water surface elevations, N = 0.035
- Channel N for maximum velocities, N = 0.025

Contraction and Expansion Coefficients (NC)

- Contraction coefficient = 0.1
- Expansion coefficient = 0.3

Channel Cross Section Data - Restored Channel (X1, GR)

- Extracted from data on plans included with this document (Reference 4)

Channel Cross Section Data - Corps' Channel (X1, GR)

- Used typical section at Station 25+00(Corps Station) (Reference 1 - Plate 12)

3.2 Model Runs

The HEC-2 model was run for the Corps Channel and the Restored Channel for Manning's N of 0.025 and 0.035. Table 3-1 shows the input model data for the restored channel and Table 3-2 shows the input data for the Corps Channel. A Manning's N for the channel of 0.035 is used in these tables.

Table 3-1 HEC-2 Model Input File
Proposed Restoration Channel

T1		City of Scottsdale								
T2		Indian Bend Wash Interceptor Channel Restoration								
T3		Manning's n=0.035								
J1	-10	0	0	0	0	0	0	5500	1276.90	0
J2	-1									
J3	38	43	42	1	26					
J5	-10	-10								
NC	0.1	0.1	0.035	0.1	0.3					
X1	21	8	20.00	300.00	0	0	0			
GR	1279.6	0.00	1279.40	20.00	1270.70	65.00	1270.00	75.00	1269.18	150
GR	1270	225	1277.5	270	1279.4	300				
X1	23	8	10.00	282.00	200	200	200			
GR	1280.0	0.00	1280.00	10.00	1271.00	65.00	1270.00	75.00	1269.28	150
GR	1270.0	218.00	1279.00	282.00	1279.20	300.00				
X1	25	8.00	0.00	290.00	200.00	200.00	200.00			
GR	1279.5	0.00	1271.00	70.00	1270.20	75.00	1269.38	150.00	1270.20	215
GR	1275.0	260.00	1280.00	290.00	1280.00	300.00				
X1	27	7.00	20.00	300.00	200.00	200.00	200.00			
GR	1279.8	0.00	1279.00	20.00	1271.00	70.00	1270.20	90.00	1269.48	150
GR	1270.2	223.00	1280.00	300.00						
X1	29	7.00	0.00	287.00	200.00	200.00	200.00			
GR	1280.0	0.00	1279.00	0.00	1270.50	72.00	1269.58	150.00	1270.50	225
GR	1280.0	287.00	1280.00	300.00						
X1	31	8.00	45.00	290.00	200.00	200.00	200.00			
GR	1280.0	0.00	1279.00	45.00	1272.50	68.00	1270.50	80.00	1269.68	150
GR	1270.5	228.00	1280.00	290.00	1280.00	300.00				
X1	33	8.00	20.00	285.00	200.00	200.00	200.00			
GR	1281.0	0.00	1281.00	20.00	1271.50	70.00	1270.50	73.00	1269.78	150
GR	1270.5	226.00	1279.00	285.00	1279.30	300.00				
X1	35	8.00	20.00	332.00	230.00	200.00	175.00			
GR	1280.0	0.00	1280.00	20.00	1271.00	75.00	1269.88	150.00	1271.00	225
GR	1279.0	275.00	1280.00	332.00	1281.00	400.00				
X1	37	7.00	20.00	275.00	225.00	200.00	175.00			
GR	1280.0	0.00	1280.00	20.00	1271.00	75.00	1269.98	150.00	1271.00	220
GR	1279	275	1280	320						
X1	39	7.00	20.00	280.00	225.00	200.00	175.00			
GR	1280.0	0.00	1280.00	20.00	1271.00	75.00	1270.08	150.00	1271.00	260
GR	1279.0	280.00	1279.00	300.00						
X1	41	10.00	15.00	270.00	200.00	200.00	200.00			
GR	1280.0	0.00	1280.00	15.00	1277.00	24.00	1277.00	35.00	1271.20	74
GR	1271.2	75.00	1270.18	150.00	1271.80	270.00	1279.00	290.00	1279.00	300.00
X1	43	7.00	50.00	378.00	180.00	200.00	220.00			
GR	1282.0	0.00	1281.00	50.00	1272.50	90.00	1270.28	250.00	1271.50	325
GR	1280.0	378.00	1280.00	400.00						
X1	45	8.00	0.00	418.00	170.00	200.00	220.00			
GR	1286.0	0.00	1286.00	5.00	1273.50	52.00	1270.38	290.00	1271.50	365
GR	1279.0	410.00	1280.00	418.00	1280.00	435.00				
X1	47	10.00	0.00	400.00	150.00	200.00	230.00			
GR	1282.0	0.00	1279.00	13.00	1279.30	20.00	1279.50	30.00	1273.00	75
GR	1273.0	76.00	1270.48	270.00	1271.50	345.00	1281.00	400.00	1281.30	420.00
X1	49	8.00	10.00	380.00	180.00	200.00	210.00			
GR	1283.0	0.00	1283.00	10.00	1276.00	93.00	1272.50	115.00	1270.58	250
GR	1271.5	325.00	1281.00	380.00	1281.50	400.00				
X1	51	7.00	25.00	385.00	200.00	200.00	200.00			
GR	1286.0	0.00	1286.00	25.00	1272.00	100.00	1270.68	200.00	1271.80	290
GR	1280.0	343.00	1283.00	385.00						
X1	53	7.00	0.00	300.00	200.00	200.00	200.00			
GR	1284.0	0.00	1284.00	6.00	1272.20	42.00	1270.78	150.00	1272.00	240

Table 3-1 HEC-2 Model Input File
Proposed Restoration Channel

T1		City of Scottsdale								
T2		Indian Bend Wash Interceptor Channel Restoration								
T3		Manning's n=0.035								
J1	-10	0	0	0	0	0	0	5500	1276.9	0
J2	-1									
J3	38	43	42	1	26					
J5	-10	-10								
NC	0.1	0.1	0.035	0.1	0.3					
X1	21	8	20	300	0	0	0			
GR	1279.6	0	1279.4	20	1270.7	65	1270	75	1269.18	150
GR	1270	225	1277.5	270	1279.4	300				
X1	23	8	10	282	200	200	200			
GR	1280	0	1280	10	1271	65	1270	75	1269.28	150
GR	1270	218	1279	282	1279.2	300				
X1	25	8	0	290	200	200	200			
GR	1279.5	0	1271	70	1270.2	75	1269.38	150	1270.2	215
GR	1275	260	1280	290	1280	300				
X1	27	7	20	300	200	200	200			
GR	1279.8	0	1279	20	1271	70	1270.2	90	1269.48	150
GR	1270.2	223	1280	300						
X1	29	7	0	287	200	200	200			
GR	1280	0	1279	0	1270.5	72	1269.58	150	1270.5	225
GR	1280	287	1280	300						
X1	31	8	45	290	200	200	200			
GR	1280	0	1279	45	1272.5	68	1270.5	80	1269.68	150
GR	1270.5	228	1280	290	1280	300				
X1	33	8	20	285	200	200	200			
GR	1281	0	1281	20	1271.5	70	1270.5	73	1269.78	150
GR	1270.5	226	1279	285	1279.3	300				
X1	35	8	20	332	230	200	175			
GR	1280	0	1280	20	1271	75	1269.88	150	1271	225
GR	1279	275	1280	332	1281	400				
X1	37	7	20	275	225	200	175			
GR	1280	0	1280	20	1271	75	1269.98	150	1271	220
GR	1279	275	1280	320						
X1	39	7	20	280	225	200	175			
GR	1280	0	1280	20	1271	75	1270.08	150	1271	260
GR	1279	280	1279	300						
X1	41	9	15	270	200	200	200			
GR	1280	0	1280	15	1277	24	1277	35	1271.2	74
GR	1270.1	150	1271.8	270	1279	290	1279	300		
X1	43	7	50	378	180	200	220			
GR	1282	0	1281	50	1272.5	90	1270.28	250	1271.5	325
GR	1280	378	1280	400						
X1	45	8	0	418	170	200	220			
GR	1286	0	1286	5	1273.5	52	1270.38	290	1271.5	365
GR	1279	410	1280	418	1280	435				
X1	47	9	0	400	150	200	230			
GR	1282	0	1279	13	1279.3	20	1279.5	30	1273	75
GR	1270.4	270	1271.5	345	1281	400	1281.3	420		
X1	49	8	10	380	180	200	210			
GR	1283	0	1283	10	1276	93	1272.5	115	1272	250
GR	1271.5	325	1281	380	1281.5	400				
X1	51	7	25	385	200	200	200			
GR	1286	0	1286	25	1272	100	1270.68	200	1271.8	290
GR	1280	343	1283	385						
X1	53	7	0	300	200	200	200			
GR	1284	0	1284	6	1272.2	42	1270.78	150	1272	240

Table 3-1 HEC-2 Model Input File
Proposed Restoration Channel

GR	1272.0	268.00	1278.00	300.00						
X1	55	6.00	15.00	340.00	200.00	200.00	200.00			
GR	1285.0	0.00	1285.00	15.00	1272.50	65.00	1270.88	200.00	1272.10	295
GR	1280	340								
X1	57	7.00	20.00	305.00	200.00	200.00	200.00			
GR	1284.0	0.00	1284.00	20.00	1272.50	63.00	1270.98	170.00	1272.00	245
GR	1281.0	305.00	1281.00	340.00						
X1	59	7.00	22.00	335.00	200.00	200.00	200.00			
GR	1286.0	0.00	1285.00	22.00	1272.80	75.00	1271.08	200.00	1272.00	275
GR	1281.8	335.00	1282.00	350.00						
X1	61	9.00	13.00	382.00	250.00	200.00	150.00			
GR	1287.0	0.00	1287.00	13.00	1284.00	26.00	1284.00	40.00	1273.50	103
GR	1271.1	280.00	1272.20	355.00	1283.00	382.00	1283.00	430.00		
X1	63	7.00	0.00	362.00	130.00	200.00	230.00			
GR	1285.0	0.00	1285.00	10.00	1273.80	70.00	1271.28	250.00	1272.20	345
GR	1280.0	362.00	1279.00	400.00						
X1	65	7.00	43.00	395.00	200.00	200.00	200.00			
GR	1287.0	0.00	1286.20	43.00	1274.20	105.00	1271.38	300.00	1272.20	380
GR	1280.0	395.00	1279.00	460.00						
X1	67	7.00	43.00	400.00	200.00	200.00	200.00			
X2	2590									
GR	1291.0	0.00	1290.00	43.00	1274.40	105.00	1271.48	300.00	1272.40	368
GR	1279.6	385.00	1280.00	400.00						
X1	69	10.00	33.00	425.00	200.00	200.00	200.00			
GR	1290.5	0.00	1290.00	33.00	1273.00	102.00	1271.80	250.00	1272.00	315
GR	1271.5	350.00	1272.50	407.00	1280.00	425.00	1279.00	500.00	1285.00	540
X1	71	8.00	0.00	855.00	200.00	200.00	200.00			
X2	900									
GR	1287.0	0.00	1281.50	110.00	1273.00	184.00	1271.80	440.00	1273.50	658
GR	1271.6	790.00	1272.70	835.00	1280.00	855.00				
EJ										
ER										

Table 3-1 HEC-2 Model Input File
Proposed Restoration Channel

GR	1272	268	1278	300						
X1	55	6	15	340	200	200	200			
GR	1285	0	1285	15	1272.5	65	1270.88	200	1272.1	295
GR	1280	340								
X1	57	7	20	305	200	200	200			
GR	1284	0	1284	20	1272.5	63	1270.98	170	1272	245
GR	1281	305	1281	340						
X1	59	7	22	335	200	200	200			
GR	1286	0	1285	22	1272.8	75	1271.08	200	1272	275
GR	1281.8	335	1282	350						
X1	61	9	13	382	250	200	150			
GR	1287	0	1287	13	1284	26	1284	40	1273.5	103
GR	1271.1	280	1272.2	355	1283	382	1283	430		
X1	63	7	0	362	130	200	230			
GR	1285	0	1285	10	1273.8	70	1271.28	250	1272.2	345
GR	1280	362	1279	400						
X1	65	7	43	395	200	200	200			
GR	1287	0	1286.2	43	1274.2	105	1271.38	300	1272.2	380
GR	1280	395	1279	460						
X1	67	7	43	400	200	200	200			
GR	1291	0	1290	43	1274.4	105	1271.48	300	1272.4	368
GR	1279.6	385	1280	400						
X2	2590									
X1	69	10	33	425	200	200	200			
GR	1290.5	0	1290	33	1273	102	1271.8	250	1272	315
GR	1271.5	350	1272.5	407	1280	425	1279	500	1285	540
X2	900									
X1	71	8	0	855	200	200	200			
GR	1287	0	1281.5	110	1273	184	1271.8	440	1273.5	658
GR	1271.6	790	1272.7	835	1280	855				
EJ										
ER										

Table 3-2 HEC-2 Model Input File
US Army Corp Channel

T1		City of Scottsdale								
T2		Corps of Engineers Interceptor Channel								
T3		Manning's n=0.035								
J1	-10	0	0	0	0	0	0	5500	1276.9	0
J2	-1									
J3	38	43	42	1	26					
J5	-10	-10								
NC	0.1	0.1	0.035	0.1	0.3					
X1	21	5	0	300	0	0	0			
GR	1282.6	0	1270.16	75	1269.16	150	1270.16	225	1282.66	300
X1	23	5	0	300	200	200	200			
GR	1282.7	0	1270.26	75	1269.26	150	1270.26	225	1282.76	300
X1	25	5	0	300	200	200	200			
GR	1282.8	0	1270.36	75	1269.36	150	1270.36	225	1282.86	300
X1	27	5	0	300	200	200	200			
GR	1282.9	0	1270.46	75	1269.46	150	1270.46	225	1282.96	300
X1	29	5	0	300	200	200	200			
GR	1283.0	0	1270.56	75	1269.56	150	1270.56	225	1283.06	300
X1	31	5	0	300	200	200	200			
GR	1283.1	0	1270.66	75	1269.66	150	1270.66	225	1283.16	300
X1	33	5	0	300	200	200	200			
GR	1283.2	0	1270.76	75	1269.76	150	1270.76	225	1283.26	300
X1	35	5	0	300	230	200	175			
GR	1283.3	0	1270.86	75	1269.86	150	1270.86	225	1283.36	300
X1	37	5	0	300	225	200	175			
GR	1283.4	0	1270.96	75	1269.96	150	1270.96	225	1283.46	300
X1	39	5	0	300	225	200	175			
GR	1283.5	0	1271.06	75	1270.06	150	1271.06	225	1283.56	300
X1	41	5	0	300	200	200	200			
GR	1283.6	0	1271.16	75	1270.16	150	1271.16	225	1283.66	300
X1	43	5	0	300	180	200	220			
GR	1283.7	0	1271.26	75	1270.26	150	1271.26	225	1283.76	300
X1	45	5	0	300	170	200	220			
GR	1283.8	0	1271.36	75	1270.36	150	1271.36	225	1283.86	300
X1	47	5	0	300	150	200	230			
GR	1283.9	0	1271.46	75	1270.46	150	1271.46	225	1283.96	300
X1	49	5	0	300	180	200	210			
GR	1284.0	0	1271.56	75	1270.56	150	1271.56	225	1284.06	300
X1	51	5	0	300	200	200	200			
GR	1284.1	0	1271.66	75	1270.66	150	1271.66	225	1284.16	300
X1	53	5	0	300	200	200	200			
GR	1284.2	0	1271.76	75	1270.76	150	1271.76	225	1284.26	300
X1	55	5	0	300	200	200	200			
GR	1284.3	0	1271.86	75	1270.86	150	1271.86	225	1284.36	300
X1	57	5	0	300	200	200	200			
GR	1284.4	0	1271.96	75	1270.96	150	1271.96	225	1284.46	300
X1	59	5	0	300	200	200	200			
GR	1284.5	0	1272.06	75	1271.06	150	1272.06	225	1284.56	300
X1	61	5	0	300	250	200	150			
GR	1284.6	0	1272.16	75	1271.16	150	1272.16	225	1284.66	300
X1	63	5	0	300	130	200	230			
GR	1284.7	0	1272.26	75	1271.26	150	1272.26	225	1284.76	300
X1	65	5	0	300	200	200	200			
GR	1284.8	0	1272.36	75	1271.36	150	1272.36	225	1284.86	300
X1	67	5	0	300	200	200	200			
X2	2590									
GR	1284.9	0	1272.46	75	1271.46	150	1272.46	225	1284.96	300
X1	69	5	0	300	200	200	200			

Table 3-2 HEC-2 Model Input File
US Army Corp Channel

T1		City of Scottsdale								
T2		Corps of Engineers Interceptor Channel								
T3		Manning's n=0.035								
J1	-10	0	0	0	0	0	0	5500	1276.9	0
J2	-1									
J3	38	43	42	1	26					
J5	-10	-10								
NC	0.1	0.1	0.035	0.1	0.3					
X1	21	5	0	300	0	0	0			
GR	1282.6	0	1270.16	75	1269.16	150	1270.16	225	1282.66	300
X1	23	5	0	300	200	200	200			
GR	1282.7	0	1270.26	75	1269.26	150	1270.26	225	1282.76	300
X1	25	5	0	300	200	200	200			
GR	1282.8	0	1270.36	75	1269.36	150	1270.36	225	1282.86	300
X1	27	5	0	300	200	200	200			
GR	1282.9	0	1270.46	75	1269.46	150	1270.46	225	1282.96	300
X1	29	5	0	300	200	200	200			
GR	1283	0	1270.56	75	1269.56	150	1270.56	225	1283.06	300
X1	31	5	0	300	200	200	200			
GR	1283.1	0	1270.66	75	1269.66	150	1270.66	225	1283.16	300
X1	33	5	0	300	200	200	200			
GR	1283.2	0	1270.76	75	1269.76	150	1270.76	225	1283.26	300
X1	35	5	0	300	230	200	175			
GR	1283.3	0	1270.86	75	1269.86	150	1270.86	225	1283.36	300
X1	37	5	0	300	225	200	175			
GR	1283.4	0	1270.96	75	1269.96	150	1270.96	225	1283.46	300
X1	39	5	0	300	225	200	175			
GR	1283.5	0	1271.06	75	1270.06	150	1271.06	225	1283.56	300
X1	41	5	0	300	200	200	200			
GR	1283.6	0	1271.16	75	1270.16	150	1271.16	225	1283.66	300
X1	43	5	0	300	180	200	220			
GR	1283.7	0	1271.26	75	1270.26	150	1271.26	225	1283.76	300
X1	45	5	0	300	170	200	220			
GR	1283.8	0	1271.36	75	1270.36	150	1271.36	225	1283.86	300
X1	47	5	0	300	150	200	230			
GR	1283.9	0	1271.46	75	1270.46	150	1271.46	225	1283.96	300
X1	49	5	0	300	180	200	210			
GR	1284	0	1271.56	75	1270.56	150	1271.56	225	1284.06	300
X1	51	5	0	300	200	200	200			
GR	1284.1	0	1271.66	75	1270.66	150	1271.66	225	1284.16	300
X1	53	5	0	300	200	200	200			
GR	1284.2	0	1271.76	75	1270.76	150	1271.76	225	1284.26	300
X1	55	5	0	300	200	200	200			
GR	1284.3	0	1271.86	75	1270.86	150	1271.86	225	1284.36	300
X1	57	5	0	300	200	200	200			
GR	1284.4	0	1271.96	75	1270.96	150	1271.96	225	1284.46	300
X1	59	5	0	300	200	200	200			
GR	1284.5	0	1272.06	75	1271.06	150	1272.06	225	1284.56	300
X1	61	5	0	300	250	200	150			
GR	1284.6	0	1272.16	75	1271.16	150	1272.16	225	1284.66	300
X1	63	5	0	300	130	200	230			
GR	1284.7	0	1272.26	75	1271.26	150	1272.26	225	1284.76	300
X1	65	5	0	300	200	200	200			
GR	1284.8	0	1272.36	75	1271.36	150	1272.36	225	1284.86	300
X2	2590									
X1	67	5	0	300	200	200	200			
GR	1284.9	0	1272.46	75	1271.46	150	1272.46	225	1284.96	300
X1	69	5	0	300	200	200	200			

Table 3-2 HEC-2 Model Input File
US Army Corp Channel

GR	1285.0	0	1272.56	75	1271.56	150	1272.56	225	1285.06	300
X1	71	5	0	300	200	200	200			
X2	900									
GR	1285.1	0	1272.66	75	1271.66	150	1272.66	225	1285.16	300
EJ										
ER										

Table 3-2 HEC-2 Model Input File
US Army Corp Channel

GR	1285	0	1272.56	75	1271.56	150	1272.56	225	1285.06	300
X2	900									
X1	71	5	0	300	200	200	200			
GR	1285.1	0	1272.66	75	1271.66	150	1272.66	225	1285.16	300
EJ										
ER										

CITY OF SCOTTSDALE

PUBLIC IMPROVEMENTS

COUNCIL

HERBERT R. DRINKWATER, MAYOR
GREGORY S. BIELLI
JAMES BURKE
MARY MANROSS
ROBERT C. PETTYCREW
DONALD J. PRIOR
RICHARD THOMAS

CITY MANAGER

RICHARD A. BOWERS

CITY ATTORNEY

FREDDA BISMAN

CITY CLERK

SONIA ROBERTSON

"AS-BUILT" CERTIFICATION

I HEREBY CERTIFY THAT THE "AS-BUILT" IMPROVEMENTS AS SHOWN HEREON ARE LOCATED AS NOTED, AND THE LOCATIONS ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED LAND SURVEYOR _____ DATE _____

CITY OF SCOTTSDALE

REVIEWED AND RECOMMENDED APPROVAL BY:

FIRE DEPT.		GRADING & DRAINAGE	
LANDSCAPE & PLANNING		WATER & SEWER	
TRAFFIC		PAVING	

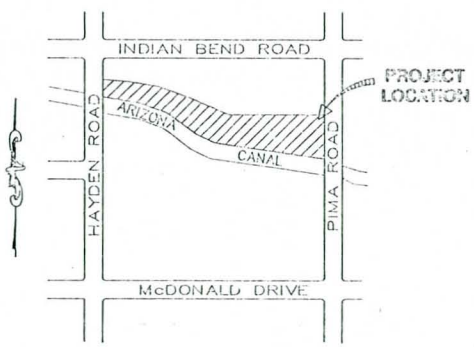
APPROVED BY:

PROJECT REVIEW MANAGER _____ DATE _____

Two working days before you dig CALL THE ARIZONA BLUE STAKES 263-1100 (Blue Stake, Inc.) CALL COLLECT

ENGINEER

INTERCEPTOR CHANNEL RESTORATION
PHASE I
PROJECT NO. M 5704
BID CALL 95-98



Vicinity Map
N.T.S.

Sheet Index

Sht. No.	Description
1	COVER SHEET
2–3	PLAN SHEETS
4–13	CROSS SECTIONS

BENCHMARKS

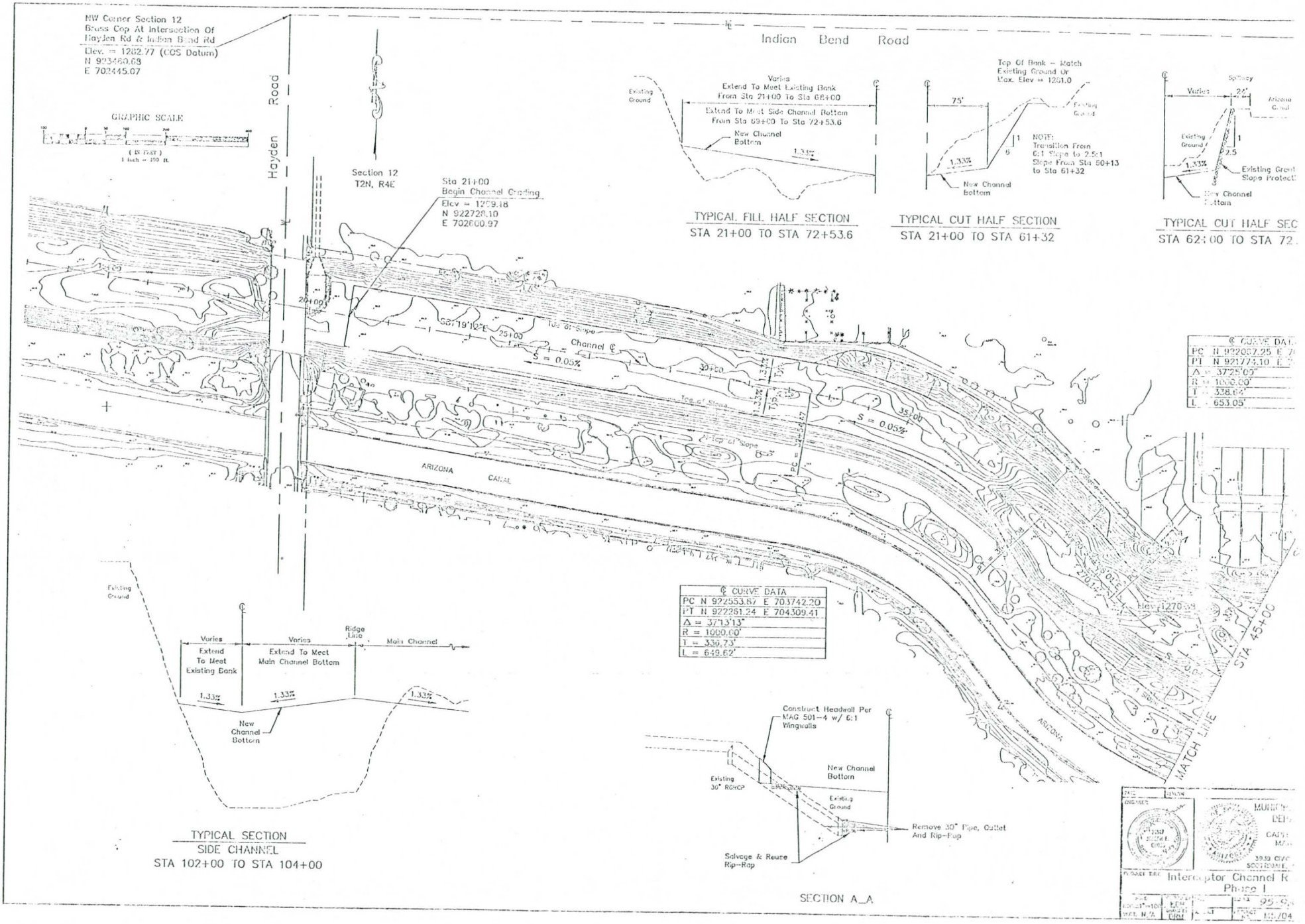
Brass Cap At The Intersection Of Hayden Rd And Indian Bend Rd
Elevation = 1282.77 (COS Datum)

Brass Cap At The Intersection Of 84th Street And Indian Bend Rd
Elevation = 1284.55 (COS Datum)

GENERAL CONSTRUCTION NOTES FOR PUBLIC WORKS CONSTRUCTION

1. All construction in the public rights-of-way or in easements granted for public use must conform to the latest Maricopa Association of Governments (MAG) Uniform Standard Specifications and Uniform Standard Details for Public Works Construction as amended by the latest version of the City of Scottsdale (COS) Supplemental Standard Specifications and Supplemental Standard Details. If there is a conflict, the latter shall govern.
2. The engineering designs on these plans are only approved by the City in scope and not in detail. If construction quantities are shown on these plans, they are not verified by the City.
3. Approval of plans is valid for six (6) months. If an encroachment permit for the construction has not been issued within six months, the plans shall be resubmitted to the City for re-approval.
4. A City Capital Project's Inspector will inspect all work indicated by the plans. Inspection of work for compliance with Uniform/National Codes, as may be indicated on the plans, will be done by a City Public Works Inspector. Notify Inspection Services 24 hours prior to starting of construction (telephone 391-5750).
5. Whenever excavation is to be done, call the "Blue Stake Center", 263-1100, two working days before excavation is to begin. The Center will see that the location of the underground utility lines is identified for the project. Call "collect" if necessary.
6. Encroachment permits are required for all work in public rights-of-way and easements granted for public purposes. An encroachment permit will be issued by the City. Copies of all permits shall be retained on site and shall be available for inspection at all times. Failure to produce the required permits will result in immediate work stoppage until the proper permit documentation is obtained.
7. All excavation and grading which is not in the public rights-of-way or not in easements granted for public use must conform to Chapter 70, Excavation and Grading, of the latest edition of the Uniform Building Code prepared by the International Conference of Building Officials. A permit for this grading must be secured from the City.

INTERCEPTOR CHANNEL RESTORATION - PHASE I
PROJECT NO. M 5704 BID CALL 95-98



NW Corner Section 12
Brass Cap At Intersection Of
Hayden Rd & Indian Bend Rd
Elev. = 1282.77 (COS Datum)
N 923460.68
E 702445.07
GRAPHIC SCALE
Hayden Road
Indian Bend Road
Section 12
T2N, R4E
Sta 21+00
Begin Channel Grading
Elev = 1269.18
N 922728.10
E 702600.97
Varies
Extend To Meet Existing Bank
From Sta 21+00 To Sta 68+00
Extend To Meet Side Channel Bottom
From Sta 69+00 To Sta 72+53.6
New Channel Bottom
1.33%
Existing Ground
TYPICAL FILL HALF SECTION
STA 21+00 TO STA 72+53.6
Top Of Bank – Match
Existing Ground Or
Max. Elev = 1281.0
75'
NOTE:
Transition From
6:1 Slope to 2.5:1
Slope From Sta 60+13
to Sta 61+32
New Channel Bottom
TYPICAL CUT HALF SECTION
STA 21+00 TO STA 61+32
Spillway
Varies
24'
Arizona Canal
Existing Ground
2.5
Existing Ground Slope Protect
New Channel Bottom
TYPICAL CUT HALF SEC
STA 62+00 TO STA 72
20+00
S87°19'12"E
25+00
Toe of Slope
Channel ℄
S = 0.05%
30+00
35+00
Top of Slope
ARIZONA CANAL
℄ CURVE DATA
PC N 922067.25 E 7
PT N 921774.10 E
Δ = 37°25'00"
R = 1000.00'
T = 338.64'
L = 653.05'
℄ CURVE DATA
PC N 922553.87 E 703742.20
PT N 922261.24 E 704309.41
Δ = 37°13'13"
R = 1000.00'
T = 336.73'
L = 649.62'
Elev 1270.38
STA 45+00
MATCH LINE
ARIZONA
Existing Ground
Varies
Extend To Meet Existing Bank
Varies
Extend To Meet Main Channel Bottom
Ridge Line
Main Channel
1.33%
New Channel Bottom
TYPICAL SECTION
SIDE CHANNEL
STA 102+00 TO STA 104+00
Construct Headwall Per MAG 501-4 w/ 6:1 Wingwalls
New Channel Bottom
Existing 30" RGRCP
Existing Ground
Remove 30" Pipe, Outlet And Rip-Rap
Salvage & Reuse Rip-Rap
SECTION A_A
Interceptor Channel R
Phase I

℄ CURVE DATA
PC N 922067.55 E 704497.41
PT N 921774.19 E 705958.02
Δ = 37°25'00"
R = 1000.00'
T = 336.64'
L = 653.05'

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

℄ CURVE DATA
PC N 921477.77 E 706363.92
PT N 921430.68 E 706473.80
Δ = 22°39'05"
R = 300.00'
T = 60.99'
L = 120.35'

NE Corner Section 12
Brass Cap At Intersection Of
Pima Rd & Indian Bend Rd

N 923429.61
E 707675.68

Section 12
T2N, R4E

SHEET G-1

STA 45+00

Elev.=1270.58

Top of Slope

Toe of Slope

Channel ℄

N61°31'01"W
1048.56'

MATCH LINE

CANAL

Sta 108+00
End Side Channel
Elev. = 1271.93
N 921913.36
E 707474.35

Pima Road

1272.0
1285.0
1279.4
1265.0
1265.0
1273.0

S = 0.05%

N50°00'00"E
100.00'

N60°00'00"E
300.00'

S77°37'E
1033.32'

70+00

72+00

72+53.6

ARIZONA CANAL

℄ CURVE DATA
PC N 921619.42 E 706105.11
PT N 921569.37 E 706231.60
Δ = 26°12'29"
R = 300.00'
T = 69.83'
L = 137.23'

Sta 68+00 Channel ℄ =
Sta 100+00 Side Channel

Elev. = 1271.53
N 921328.08
E 706968.94

Sta 72+53.6
End Channel Grading

Elev. = 1271.76
N 921236.06
E 707413.10

℄
Pima
Road

95'

Existing
Ground

℄

Varies

Varies

Extend
To Meet
Existing Bank

1.33%

1.33%

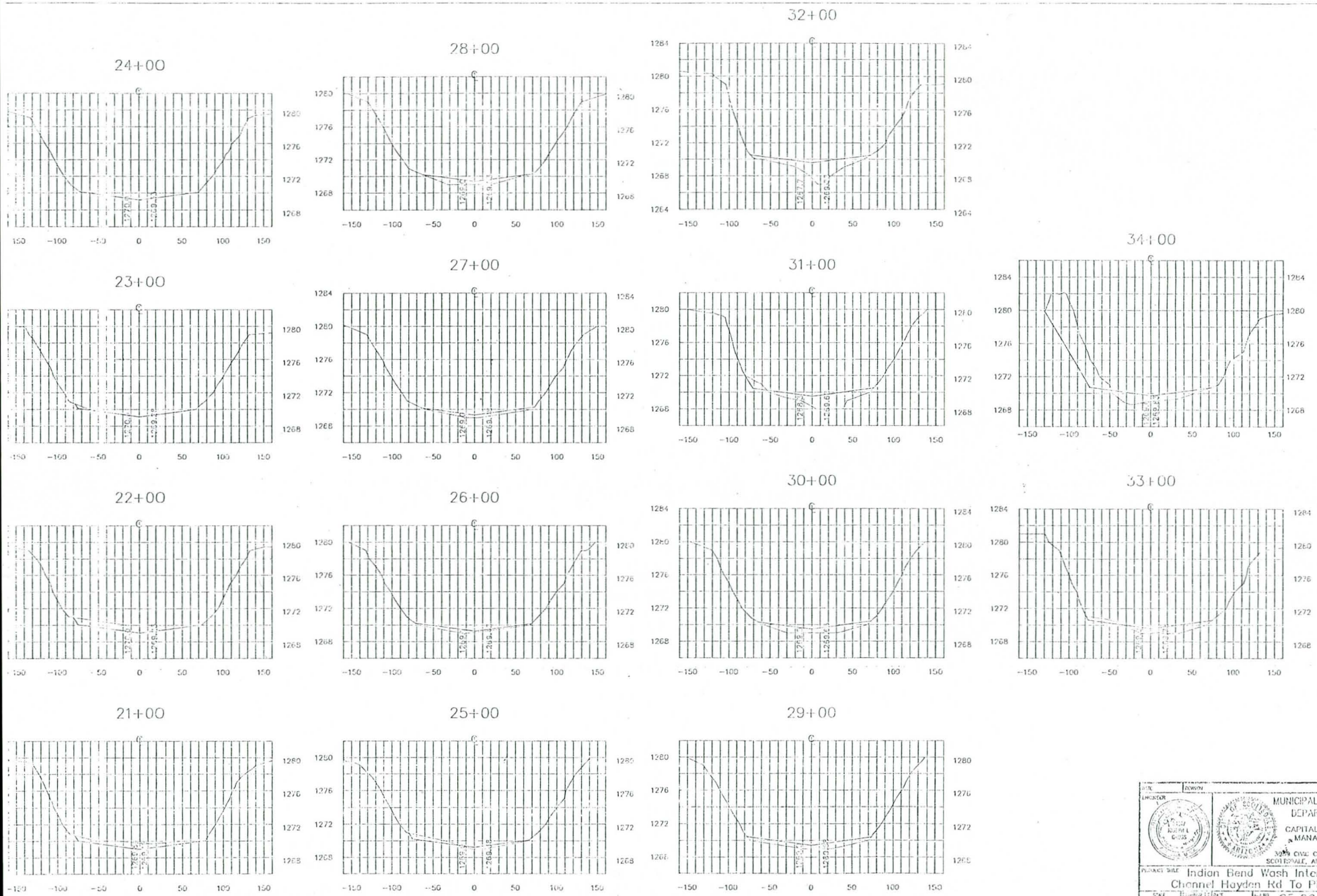
1

6

New
Channel
Bottom

TYPICAL SECTION
SIDE CHANNEL
STA 105+00 TO STA 107+00

DESIGNER	REVISION		MUNICIPAL SERVICES DEPARTMENT CAPITAL PROJECT MANAGEMENT 3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251
PROJECT TITLE	Interceptor Channel Restoration Phase I		
SCALE HORIZ. 1"=100' VERT. N/A	DESIGNED BY DGB DRAWN BY FIRM	DATE AS-BUILT	CIP NO. 95-98 SHT. G-2 PROJECT NO. M5704 3 of 13

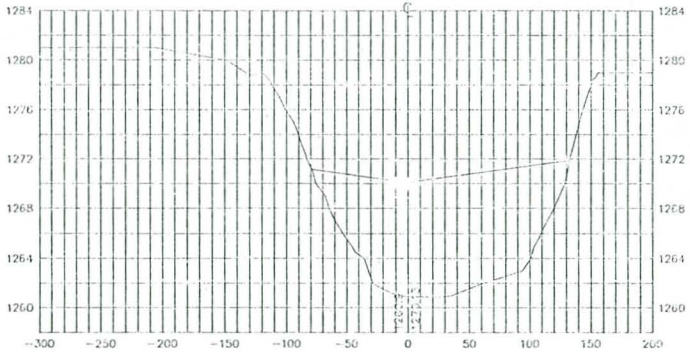


MUNICIPAL SERVICES DEPARTMENT
CAPITAL PROJECT MANAGEMENT
3939 CIVIC CENTER BLVD.
SCOTTSDALE, ARIZONA 85251

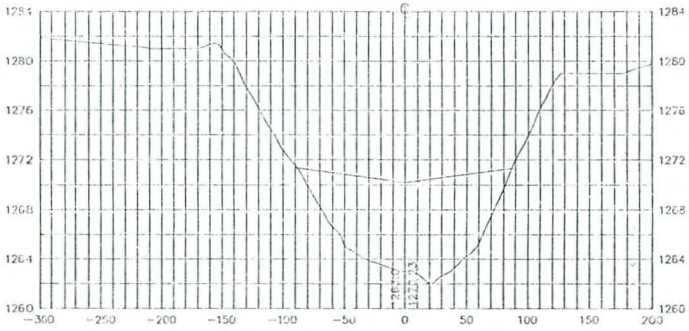
PROJECT TITLE: Indian Bend Wash Interceptor Channel Hayden Rd To Pima Rd

SCALE HORIZ. 1"=50' VERT. 1"=5'	DESIGNED BY KDR	DATE	JOB NO. 95-93	SHT. X-1
	DRAWN BY DRM	CHECKED BY	PROJECT NO. M5704	4 of 15

40+00



42+00



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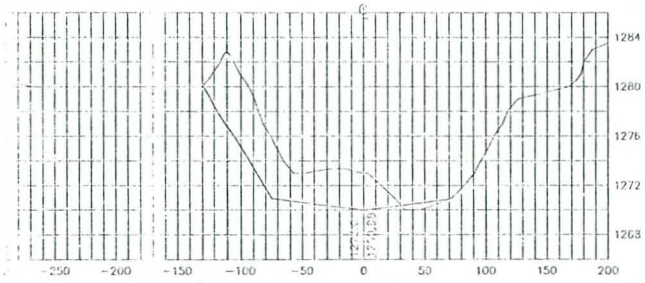

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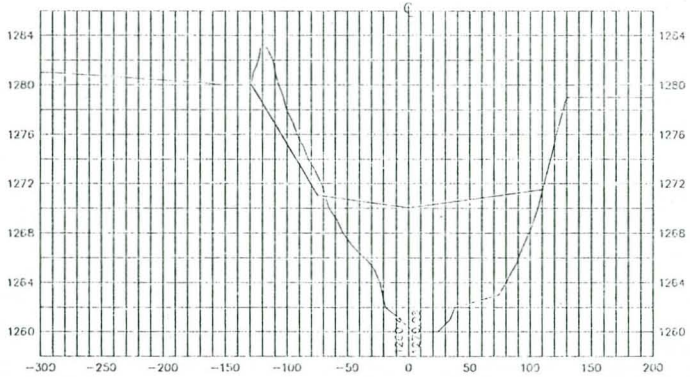

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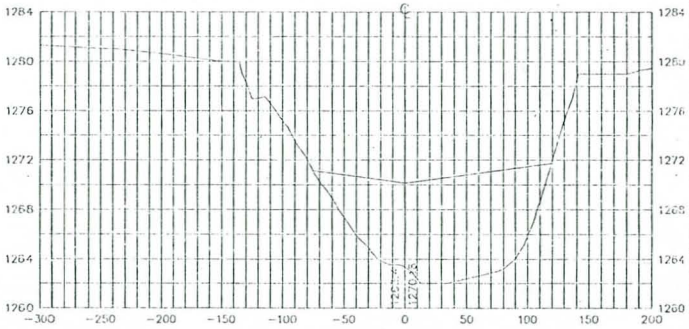

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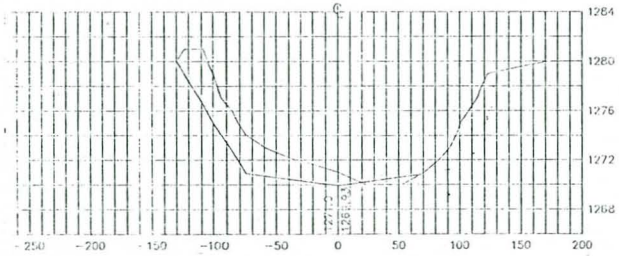

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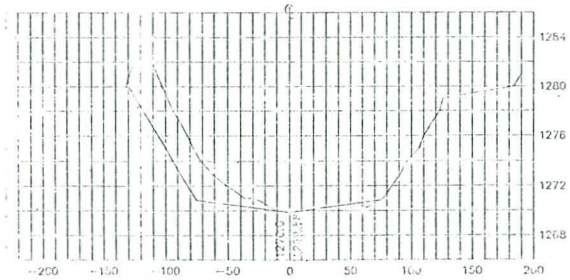

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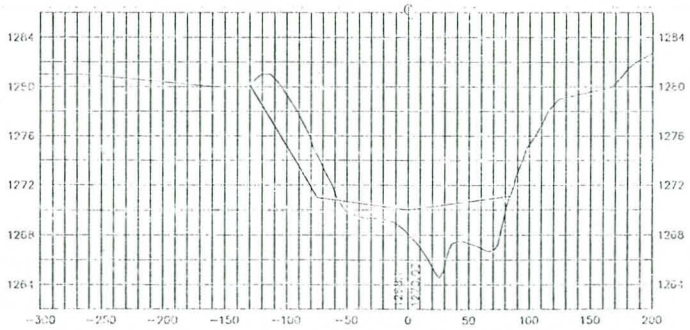
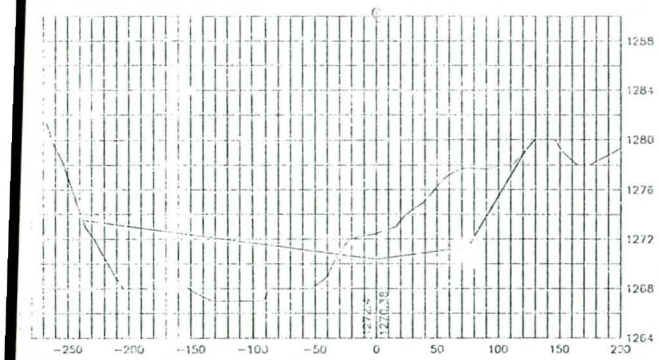


DATE	REVISION		BY
ENGINEER	MUNICIPAL SERVICES DEPARTMENT CAPITAL PROJECT MANAGEMENT 3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251		
PROJECT TITLE	Indian Bend Wash Interceptor Channel Hayden Rd To Pima Rd		
SCALE 1"=50' 1"=5'	DESIGNED T.O.B. / DRAWN DMM	CODE / ACCT. DIST.	C.I.P. NO. 95-98 / PROJECT NO. M5704	DWG. X-2 / 5 of 13

45+00



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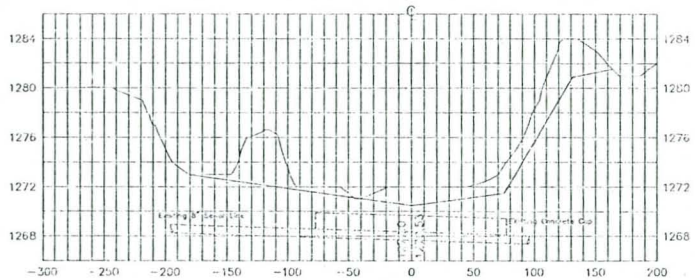

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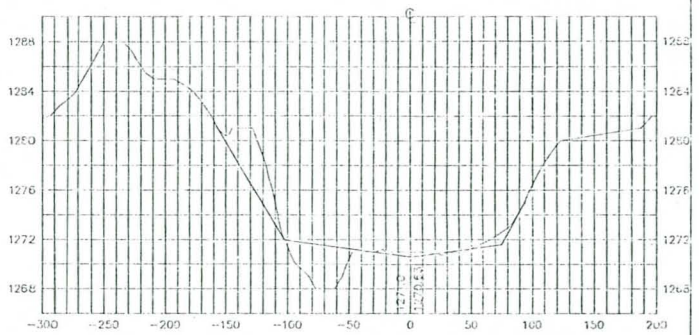

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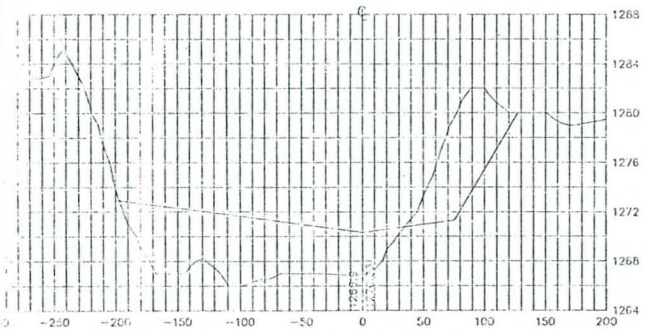

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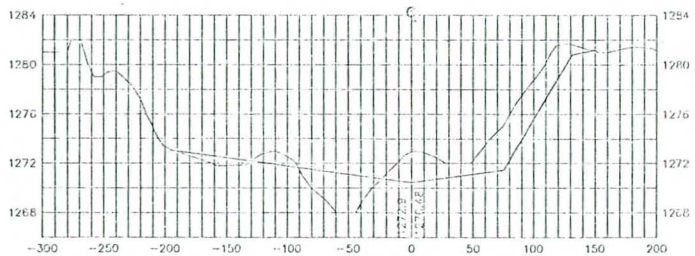

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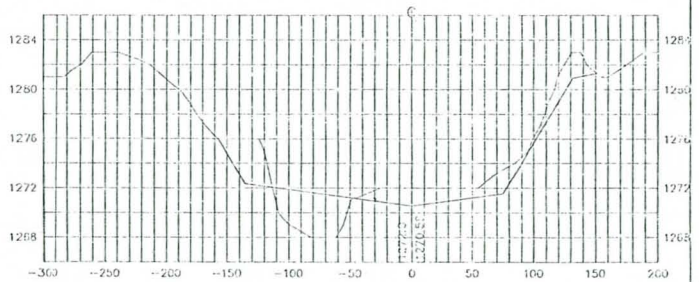

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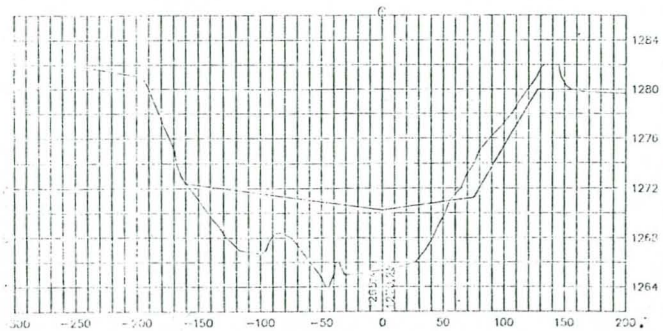

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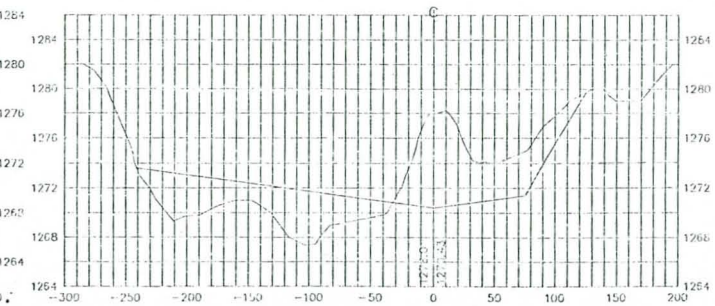
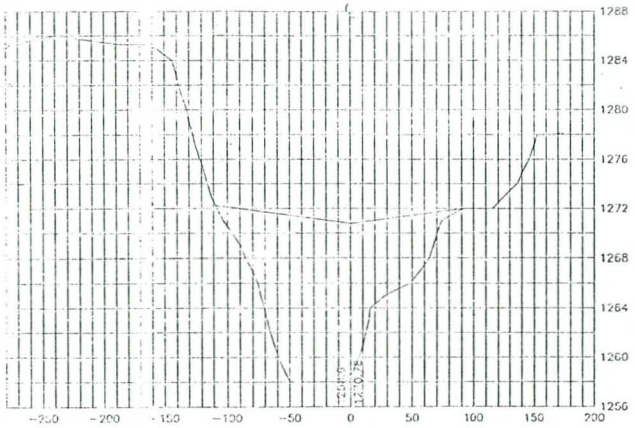


MUNICIPAL SERVICES DEPARTMENT
CAPITAL PROJECT MANAGEMENT
3939 CIVIC CENTER BLVD.
SCOTTSDALE, ARIZONA 85251

Interceptor Channel Restoration
Phase I

SCALE HORIZ. 1"=50' VERT. 1"=5'	DESIGNED BY RGM / DRAWN BY RGM	DATE 4-2-91	SHEET X-3
		PROJECT NO. M5704	6 of 13

53+00



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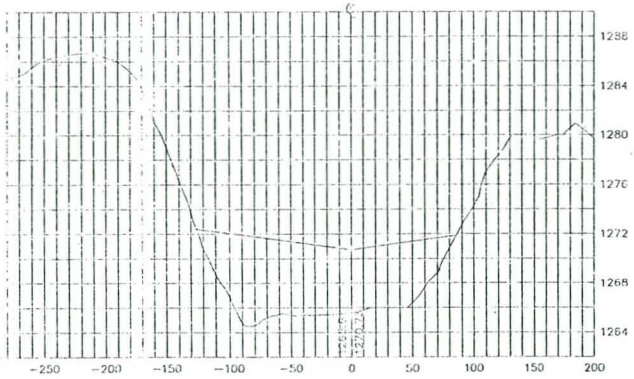

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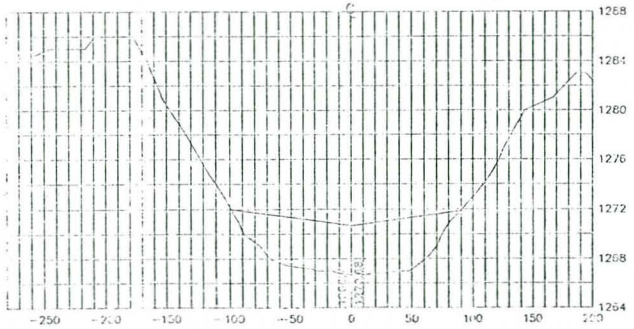

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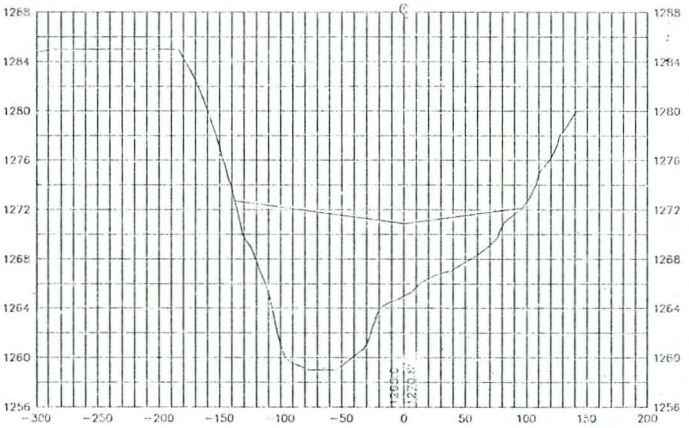

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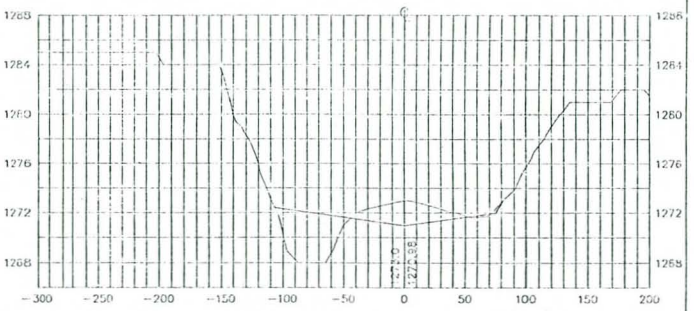
57+00



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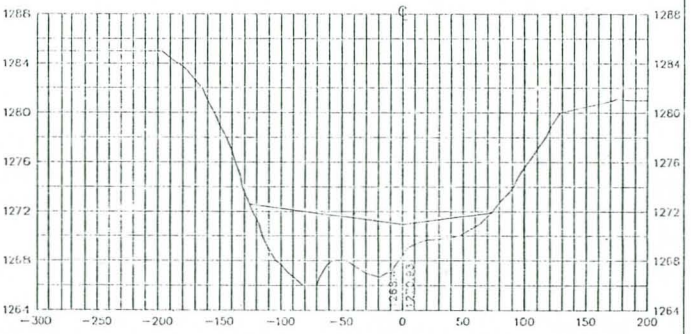
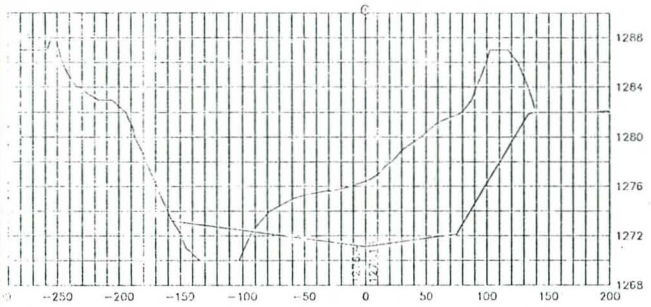


DATE	REVISION		BY
ENGINEER	MUNICIPAL SERVICES DEPARTMENT CAPITAL PROJECT MANAGEMENT 3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251		
PROJECT TITLE	Indian Bend Wash Interceptor Channel Hayden Rd To Pima Rd		
SCALE HORIZ. 1"=50' VERT. 1"=5'	DESIGNED BY KDB DRAWN BY DRM	DATE AS-BUILT	LD NO. 95-98 SH. X-4 PROJECT NO. M5704 7 of 13

60+00



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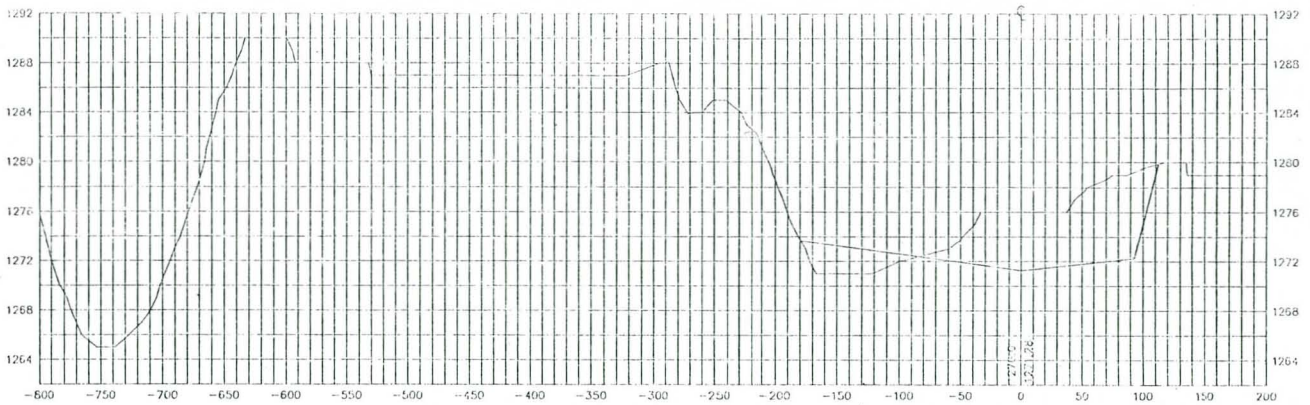

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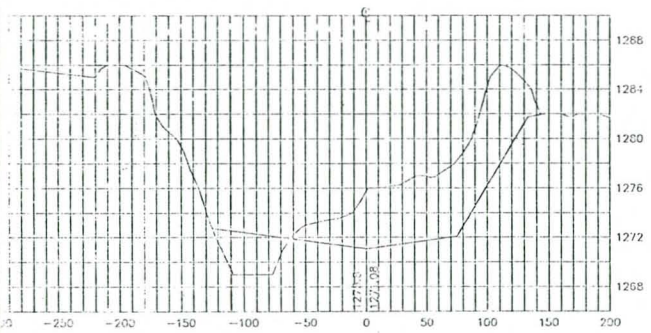

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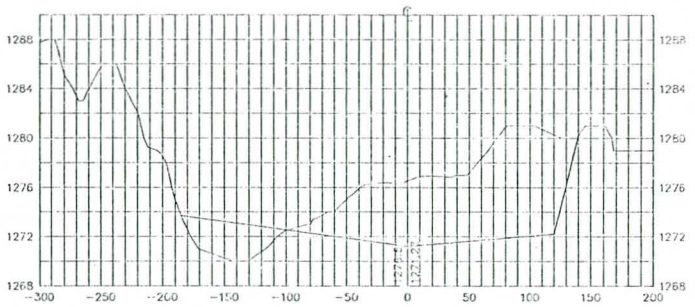

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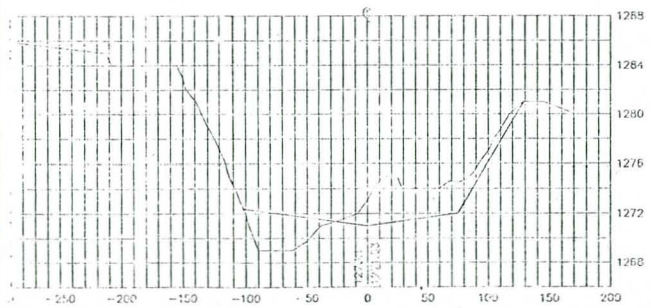

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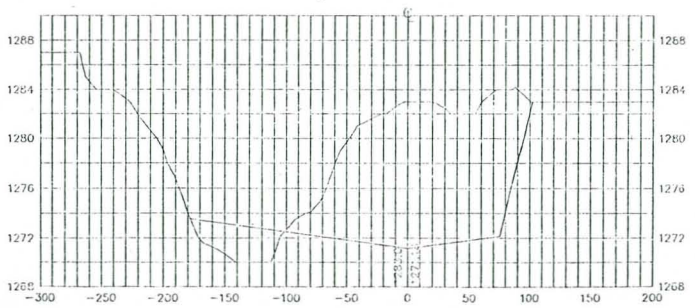
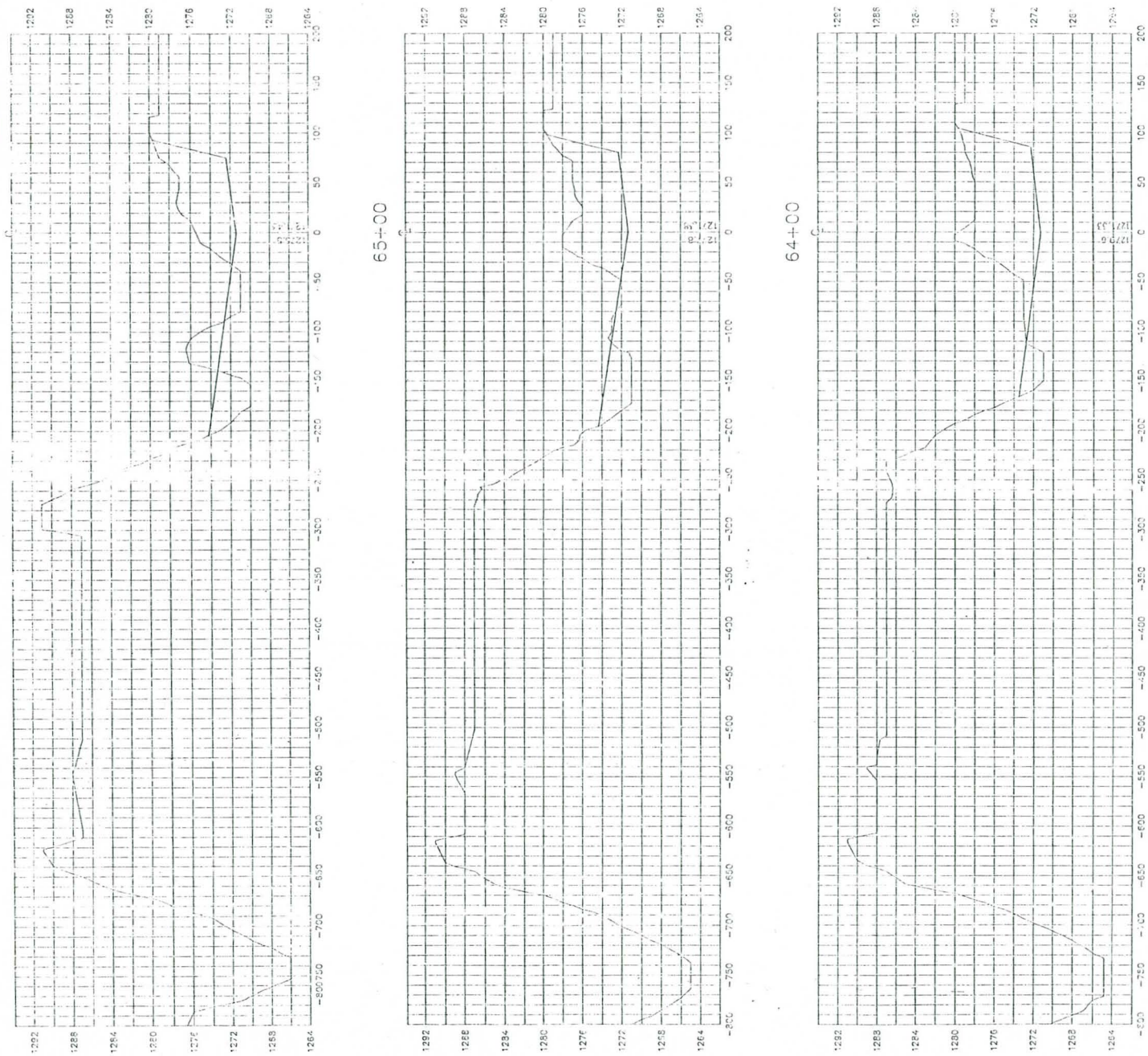


DATE	DRAWN		BY
ENGINEER		MUNICIPAL SERVICES DEPARTMENT CAPITAL PROJECT MANAGEMENT 3939 CIVIC CENTER BLVD. SCOTTSDALE, ARIZONA 85251	
PROJECT TITLE	Interceptor Channel Restoration Phase I		
SCALE HORIZ. 1"=50' VERT. 1"=5'	DESIGNED BY KDHS / DRAWN BY DGM	DATE / AS-BUILT	SHT NO. 95-98 / PROJECT NO. M5704	SHT. X-5 / 8 of 13



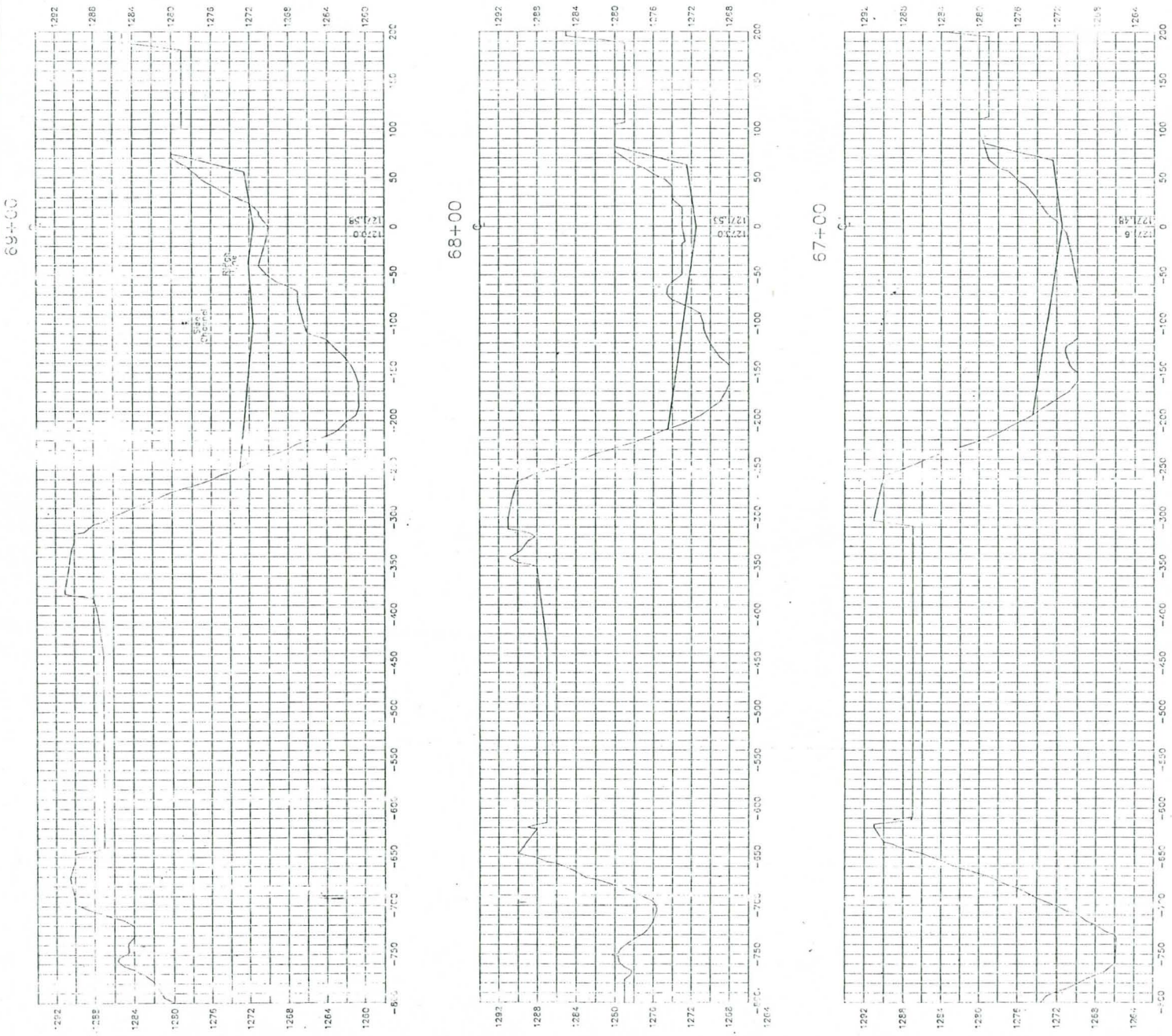
MUNICIPAL SERVICES DEPARTMENT

CAPITAL PROJECT MANAGEMENT

3939 CIVIC CENTER BLVD.
SCOTTSDALE, ARIZONA 85251

PROJECT TITLE: Interceptor Channel Restoration Phase I

SCALE	DESIGN BY	DATE	ED NO.	SHT.
HORIZ. 1"=50' VERT. 1"=5'	DRAWN BY DRM	AS-BUILT	95-98	X-6
			PROJECT NO. M5704	9 of 13



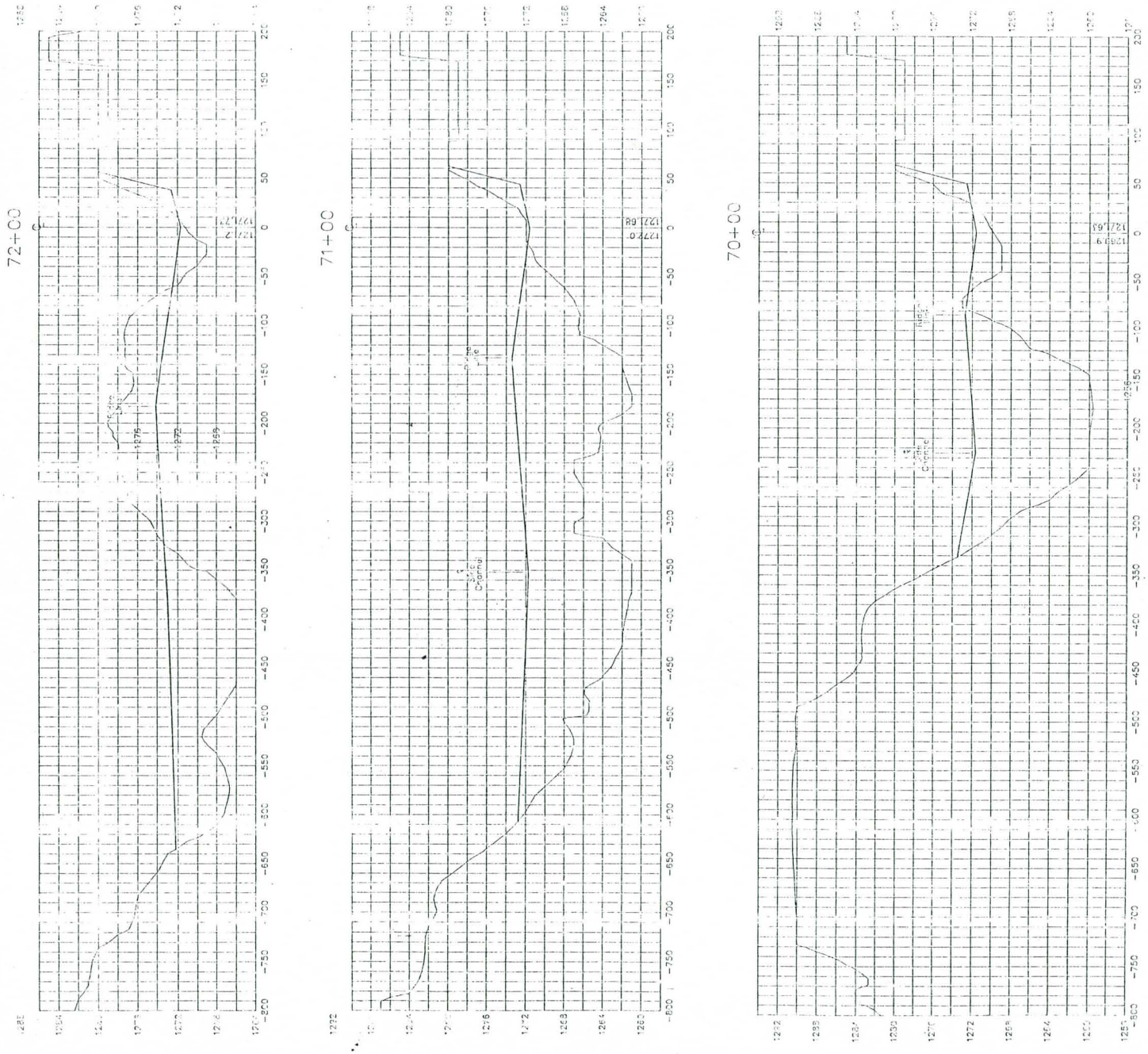
MUNICIPAL SERVICES DEPARTMENT

CAPITAL PROJECT MANAGEMENT

3939 CIVIC CENTER BLVD.
SCOTTSDALE, ARIZONA 85251

PROJECT TITLE Interceptor Channel Restoration Phase I

SCALE HORIZ. 1"=50' VERT. 1"=5'	DESIGNED BY LOH / DRAWN BY DRM	DATE / AS-BUILT	W.O. NO. 95-98 / PROJECT NO. M5704	DWG. X-7 / 10 of 13



MUNICIPAL SERVICES DEPARTMENT

CAPITAL PROJECT MANAGEMENT

3939 CIVIC CENTER BLVD.
SCOTTSDALE, ARIZONA 85251

PROJECT TITLE: Interceptor Channel Restoration Phase I

SCALE HORIZ. 1"=50' VERT. 1"=5'	DESIGNED BY KCU DRAWN BY DKM	DATE AS-BUILT	JOB NO. 95-98 PROJECT NO. M5704	SHT. X-8 11 of 13

Sagramoso ____DES
Loving ____GNL
Gamez ____EG
Stratton ____JST
McGhee ____AWM

ADMIN. DIVISION

Brozovsky ____DAB
Holappa ____KPH

Financial Services

Cuneo ____MJC
Young ____JGY
Braganza ____CDB
Henry ____LH
Gonzales ____DMG
Hannan ____LRH
Haller ____VLH
Delaney ____TDD
Munro ____AEM
Hummell ____BCH
Varadi ____GV
Zozaya ____KHZ

Admin. Services

Thiessen ____KAT
Slaughter ____CRS
Longoria ____KVL
Bejarano ____NMB
Merkevicius ____MRM
Baker ____DLB
Wong ____LDW

Contract Services

Cumberland ____LC
Silva ____HAS
Klaahsen ____DLK

Public Involvement

Phipps ____JMP
Walchuck ____SLW

Data Systems

LaMarche ____TJL
Gobins ____DLG
Jones ____DGJ
Ramos ____RRR
Sather ____JSS
Brokschmidt ____CB
Johnson ____DCJ
Bryant ____DEB

GIS - Auto Cad

Dent ____MLD
Feldman ____EMF
Bruffy ____STB
Wu ____SW
Brewer ____MRB

C & M DIVISION

Miller ____HJM
Webb ____LBW
Bell ____LDB
Rivera ____RR

Ecology

Dickens ____BAD
Townsend ____JDT

Construction

Fuller ____FBF
Shivaswamy ____HNS
DiPierro ____PAD
Lindgren ____PEL
Panasewicz ____RJP
Hughes ____JLH
Spanulescu ____LS

Work Control Center

Sutton ____OSS
Hamer ____EVH
DuBois ____ARD

Shop

Olson ____EMO
Linderman ____SL
Morford ____GCM

Public Works

Meng ____MAM
Smith ____CFS

ENG. DIVISION

Raleigh ____EAR
Combs ____RMC

Hydrology

Motamedi ____AMM
Ahouraiyan ____AA
DeVera ____MRD
Swick ____VAS
Farmer ____JMF
Mushtaq ____HM
Becher ____LCB

Civil/Structures

Lopez ____MAL
Wainwright ____CGW
Rosebraugh ____WFR
Hanumaiah ____KVH
Shapiro ____GHS
Nelson ____SRN
Crosby ____FC
Larosa ____KEL

Hydraulics

Calza ____PAC
Awumah ____KA
Shah ____RCS
Regester ____CWR
Mao ____NM
Murphy ____TMM

Data Collection

Tram ____JJT
Waters ____SDW
Lehman ____TWL
Naud ____RWN
Donaldson ____TMD
Gardner ____DEG
Klenner ____CFK
Kiefer ____TJK
Elson ____RDE
Miller ____RLM
Church ____RDC
Ontiveros ____AJO
Buruato ____ANB

REGULATORY DIVISION

Johnson ____DRJ
Gorbenko ____AG

Development Review

Tucker ____SLT
Terry ____FT
Jolayemi ____MRJ
Story ____SS
Harris ____RPH

Program Mgmt.

Nevitt ____RGN
Stewart ____JDS

Inspection/Permitting

Feuquay ____CWF
Lang ____JWL
Poppe ____WLP
Lindop ____GDL
Corder ____JAC
Gregg ____BG
Bening ____JRB
Khatiblou ____BKH

Customer Service

Yager ____SRY
Baker ____JAB
Bostwick ____LAB
Kimbell ____CAK

LAND MGMT. DIVISION

Schwartzmann ____JSM
LaMarche ____EAL
Yanez ____CLY

Prop. Acq.

McNamara ____RJM
Palmieri ____JPP
Warriner ____RLW
Hall ____HH
Franklin ____CDF

Prop.Mgmt.

Johnson ____KWJ
Adams ____GJA
Brown ____SJB

Prop. Eng.

Green ____KWG
Sanchez ____JLS
Schnyder ____MS

P&PM DIVISION

Smith ____SLS
Sanders ____DMS

Planning Teams

Perreault ____RGP
Blech ____AJB
Meinhart ____DWM
Rodzenko ____GR
Moore ____CWM
Knight ____WHK
Wass ____RDW
Fernandez ____CGF

Utility Coord.

Staedicke ____JMS

Project Mgmt.

Rerick ____DJR
Shobe ____RWS
Clement ____HSC
Ryan ____JKR

CENTRAL FILE _____

File # _____

114

Comments _____

12/21/94

114