

APPENDIX E

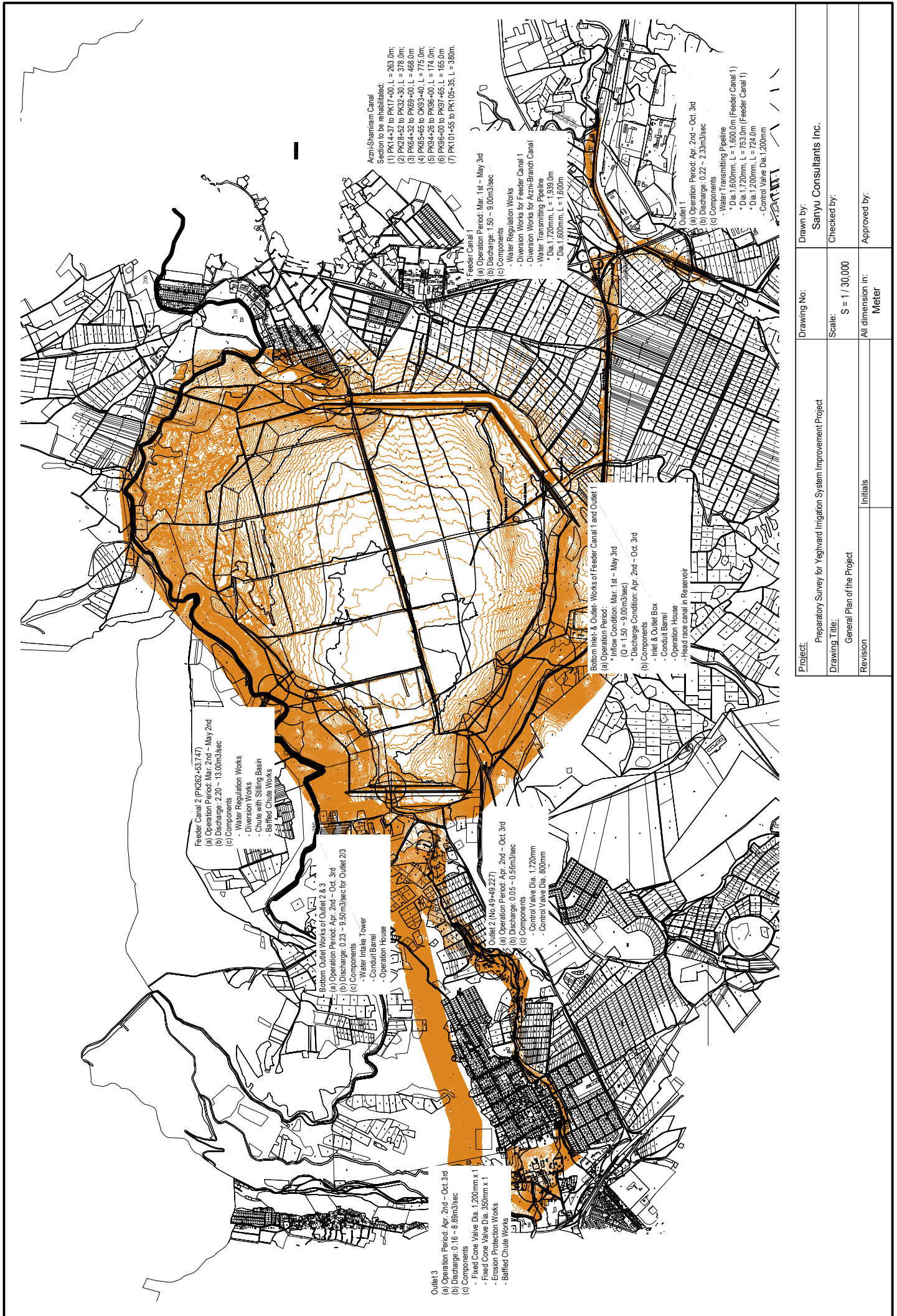
Irrigation Planning

Drawing list of related facilities for Yeghvard reservoir

DWG No.	Title of Drawings
01	General Plan of the Project
02	Main Canal, Rehabilitation Plan of the Arzni-Shamiram Irrigation Canal
04	Feeder Canal System 1, Layout of the Water Distribution System
05	Feeder Canal System 1, Longitudinal Profile of a Water Transmitting Pipeline of the Feeder Canal 1 and the Outlet 1 (1/2)
06	Feeder Canal System 1, Longitudinal Profile of a Water Transmitting Pipeline of the Feeder Canal 1 and the Outlet 1 (2/2)
07	Feeder Canal System 1, General Layout of Inlet Works
08	Feeder Canal System 1, Water Regulation Works
09	Feeder Canal System 1, Structural Drawing of the Water Regulation Works
10	Feeder Canal System 1, Water Diversion Works
11	Feeder Canal System 1, Structural Drawing of the Water Diversion Works
12	Feeder Canal System 1, Diversion Works for Arzni-Shamiram Branch Canal
13	Feeder Canal System 1, Structural Drawing of the Diversion Works for the Arzni-Shamiram Branch Canal
14	Feeder Canal System 1, Bottom Inlet- and Outlet- Works under the Dike No.2
15	Feeder Canal System 1, Structural Drawing of the Bottom Inlet- and Outlet- Works
16	Feeder Canal System 1, Structural Drawing of the Outlet 1
17	Feeder Canal System 2, General Layout of the Canal
18	Feeder Canal System 2, Structural Drawing of Water Regulation Works
19	Feeder Canal System 2, Structural Drawing of Diversion Works
20	Feeder Canal System 2, Structural Drawing of Chute with an Energy Dissipater
21	Feeder Canal System 2, Structural Drawing of the Baffled Chute
22	Outlet System, Layout of the No.1 Dike Water Distribution System of the Outlet 2 and Outlet 3
23	Outlet System, Longitudinal Profile of Water Transmitting Pipeline for Outlet 2 and Outlet 3
24	Outlet System, Structural Drawing of the Bottom Outlet Works for Outlet 2 and Outlet 3 (1/2)
25	Outlet System, Structural Drawing of the Bottom Outlet Works for Outlet 2 and Outlet 3 (2/2)
26	Outlet 2 & 3, Diversion Works for Outlet 2 for Ashtarak WUA
27	Outlet 2, Standard Drawing of the Outlet 2 for Ashtarak WUA
28	Outlet 3, Layout of the Outlet Facilities
29	Outlet 3, Fixed Cone Valve with an Energy Dissipation Chamber
30	Outlet 3, Longitudinal Profile of the Waterway from Outlet 3
31	Outlet 3, Structural Drawing of a Baffled Chute
32	Outlet 3, Structural Drawing of a Road Crossing Culvert

(2) Drawing list of rehabilitation plan of facilities for irrigation fields

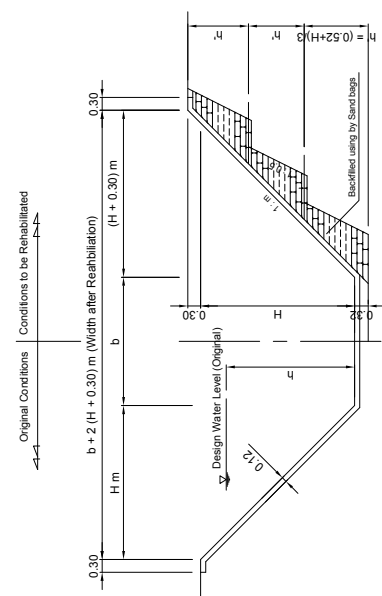
1	General Plan
2	Rehabilitation for Arzni Branch canal
3	Rehabilitation for Tkahan canal
4	Rehabilitation for Shakhi-Aru canal
5	Rehabilitation for Upper Aknalich canal
6	Upgrade for Lower Hrazdan canal
7	Standard drawing of the diversion works
8	Standard drawing of the aqueduct bridge, the water measure facility and the outlet of pipe
9	Water transmitting pipeline for Upper and Inner Aknalich canal system



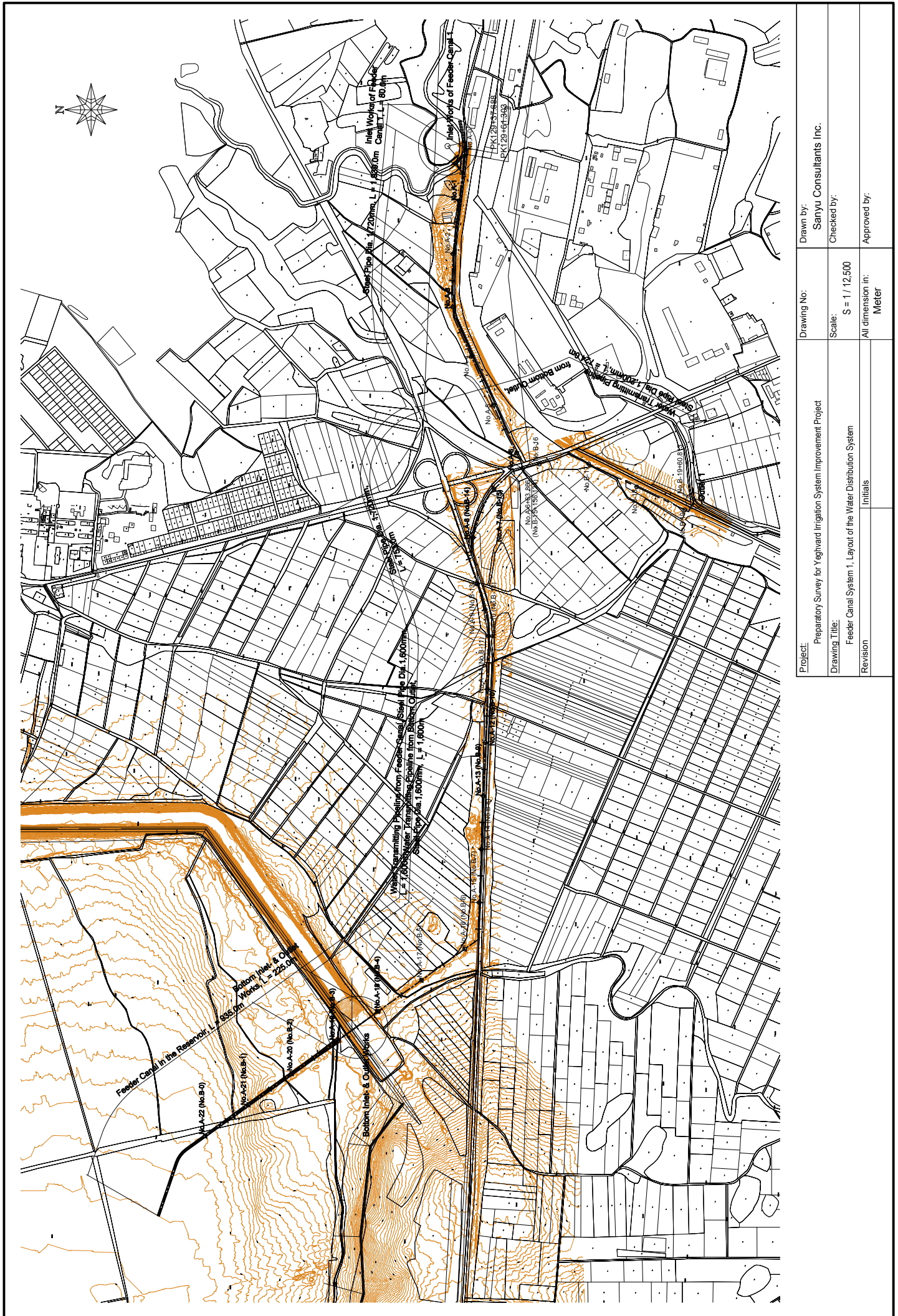
Project: Preparatory Survey for Yeghvard Irrigation System Improvement Project		Drawing No.:	Drawn by: Sanyu Consultants Inc.
Drawing Title: General Plan of the Project		Scale: S = 1 / 30,000	Checked by:
Revision:	Initials	All dimension in: Meter	Approved by:



Station	Unit	PK14+37 ~ PK17+00	PK28+52 ~ PK32+30	PK64+32 ~ PK69+00	PK85+65 ~ PK93+40	PK94+26 ~ PK96+00	PK96+00 ~ PK97+65	PK101+55 ~ PK105+35
I. Dimensions								
Distance		263.0	378.0	468.0	775.0	174.0	165.0	380.0
I-1 Width	b (m)	3.00	2.50	2.50	2.50	2.00	3.00	2.00
I-2 Height	H (m)	3.60	3.20	3.50	3.50	3.50	3.50	3.50
I-3 Canal Slope	m -	1.0	1.1	1.0	1.0	1.0	1.0	1.0
II. Hydraulic Conditions								
II-1 Design Discharge	Q, m ³ /s	28.2	28.2	28.2	28.2	28.2	28.0	26.0
II-2 Incline of Canal	i -	0.0004	0.0005	0.0004	0.0005	0.001	0.001	0.0005
II-3 Roughness Coefficient (n)	n -	0.017	0.017	0.017	0.017	0.017	0.017	0.017
II-4 Depth of Water	D, m	3.00	2.90	3.20	3.20	2.80	2.80	3.10
II-5 Area of Water Flow	A, m ²	16.00	16.50	18.24	18.24	13.44	12.32	15.81
II-6 Hydraulic radius	R, m	1.57	1.48	1.58	1.58	1.36	1.33	1.46
II-7 Flow Velocity	v, m/s	1.58	1.70	1.54	1.37	2.33	1.70	1.70

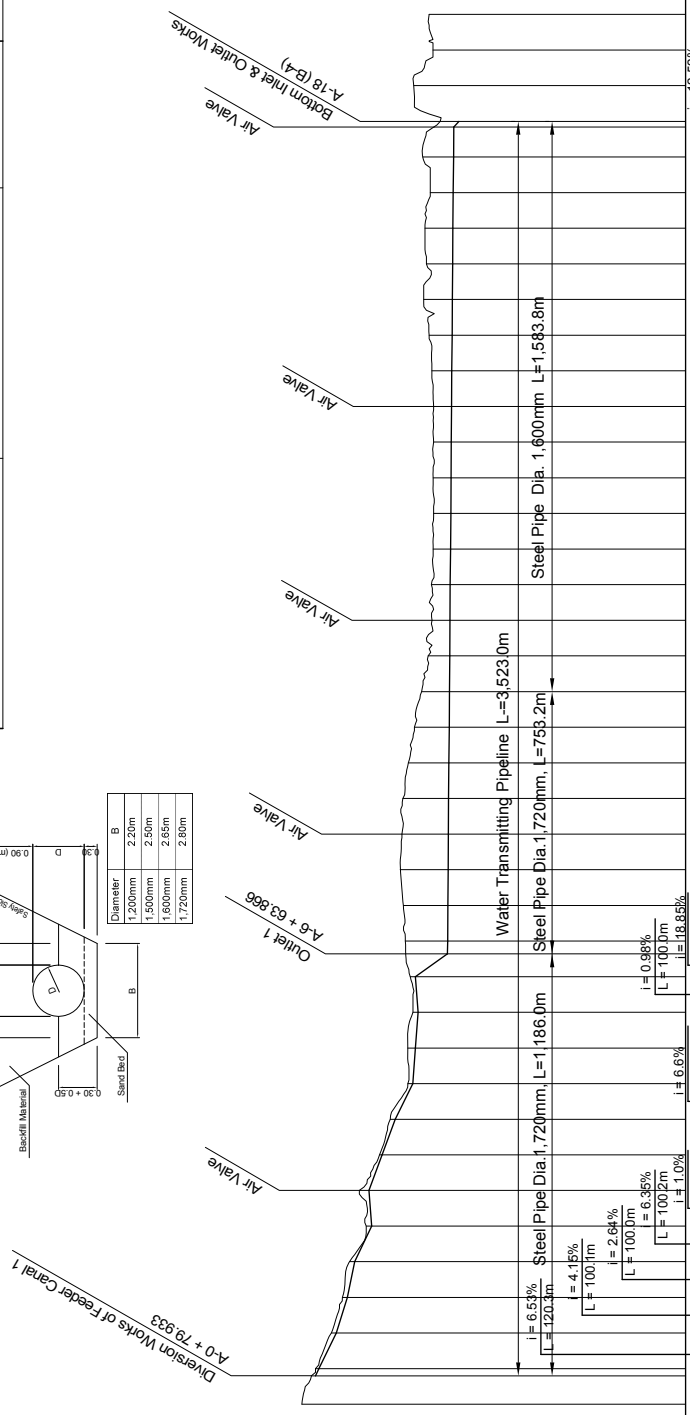
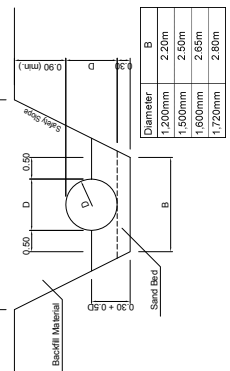


Project: Preparatory Survey for Yeghward Irrigation System Improvement Project
 Drawing Title: Main Canal, Rehabilitation Plan of the Azizi-Shamiram Irrigation Canal
 Scale: S = 1 : 25,000
 Revision: Initials
 Drawing No.:
 Checked by:
 Approved by:
 Drawn by: Saryu Consultants Inc.

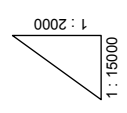


Project:	Preparatory Survey for Yeghvard Irrigation System Improvement Project	Drawing No:		Drawn by:	Sanyu Consultants Inc.
Drawing Title:	Feeder Canal System 1. Layout of the Water Distribution System	Scale:	S = 1 / 12,500	Checked by:	
Revision:	Initials	All dimension in:	Meter	Approved by:	

Project: Preparatory Survey for Yeghvard Irrigation System Improvement Project
 Drawing Title: Longitudinal Profile of a Water Transmitting Pipeline of the Feeder Canal 1 and the Outlet 1 (1/2)
 Drawing No.: Sanyu Consultants Inc.
 Scale: Indicated
 Checked by:
 Revision: Initials
 All dimension in: Meter
 Approved by:

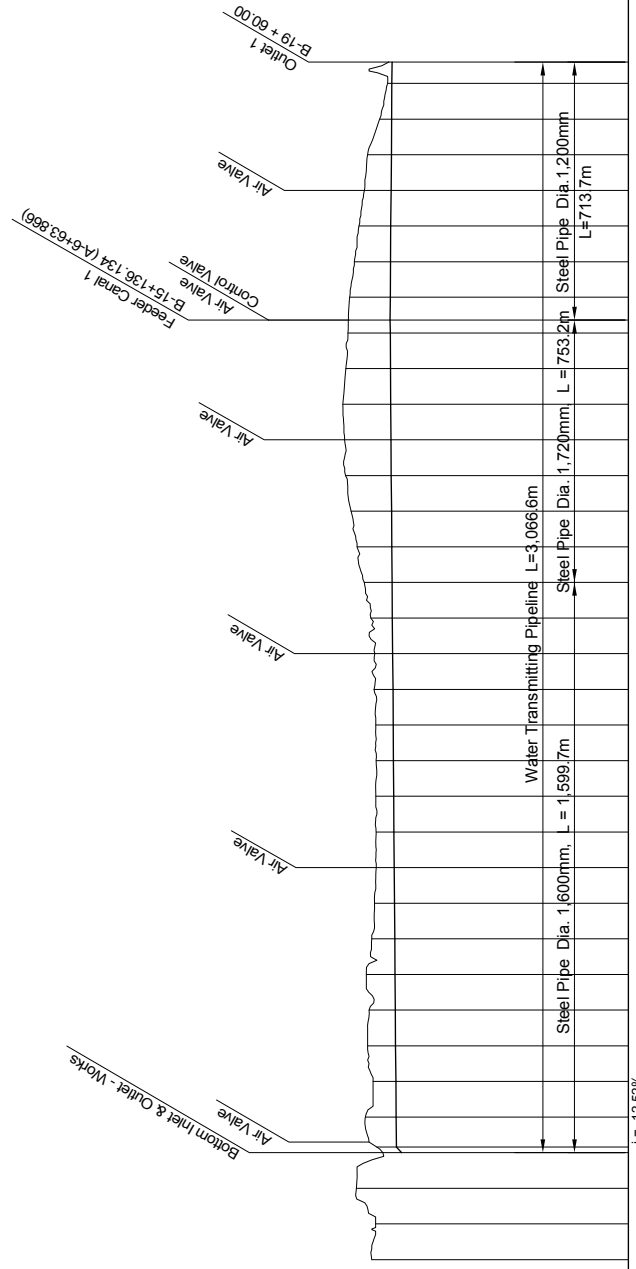


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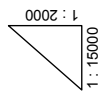


Station	Distance (m)	Accumulate Distance (m)	Ground Elevation	Elevation of Pipe Center	Earth Covering	Slope (%)
A-0	0.00	0.00	1343.50	1338.48	0.66	
A-1	100.00	100.00	1340.00	1330.64	0.47	
A-2	200.00	200.00	1328.35	1326.49	1.00	
A-3	300.00	300.00	1319.50	1317.50	1.14	
A-4	400.00	400.00	1314.50	1318.50	2.64	
A-5	500.00	500.00	1304.00	1304.00	0.07	
A-6	600.00	600.00	1302.04	1302.04	1.00	
A-7	700.00	700.00	1300.00	1301.09	2.05	
A-8	800.00	800.00	1298.98	1301.12	1.00	
A-9	900.00	900.00	1298.87	1304.73	14.78	
A-10	1000.00	1000.00	1298.78	1298.09	14.93	
A-11	1100.00	1100.00	1298.78	1298.09	14.93	
A-12	1200.00	1200.00	1298.78	1298.09	14.93	
A-13	1300.00	1300.00	1298.78	1298.09	14.93	
A-14	1400.00	1400.00	1298.78	1298.09	14.93	
A-15	1500.00	1500.00	1298.78	1298.09	14.93	
A-16	1600.00	1600.00	1298.78	1298.09	14.93	
A-17	1700.00	1700.00	1298.78	1298.09	14.93	
A-18	1800.00	1800.00	1298.78	1298.09	14.93	

Project: Preparatory Survey for Yeghvard Irrigation System Improvement Project
 Drawing No.: Sanyu Consultants Inc.
 Drawing Title: Longitudinal Profile of a Water Transmitting Pipeline of the Feeder Canal 1 and the Outlet 1 (2/2)
 Scale: Indicated
 Revision: Initials
 All dimension in: Meter
 Approved by:



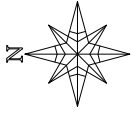
Diameter	B
1,200mm	2.20m
1,500mm	2.50m
1,600mm	2.65m
1,720mm	2.60m



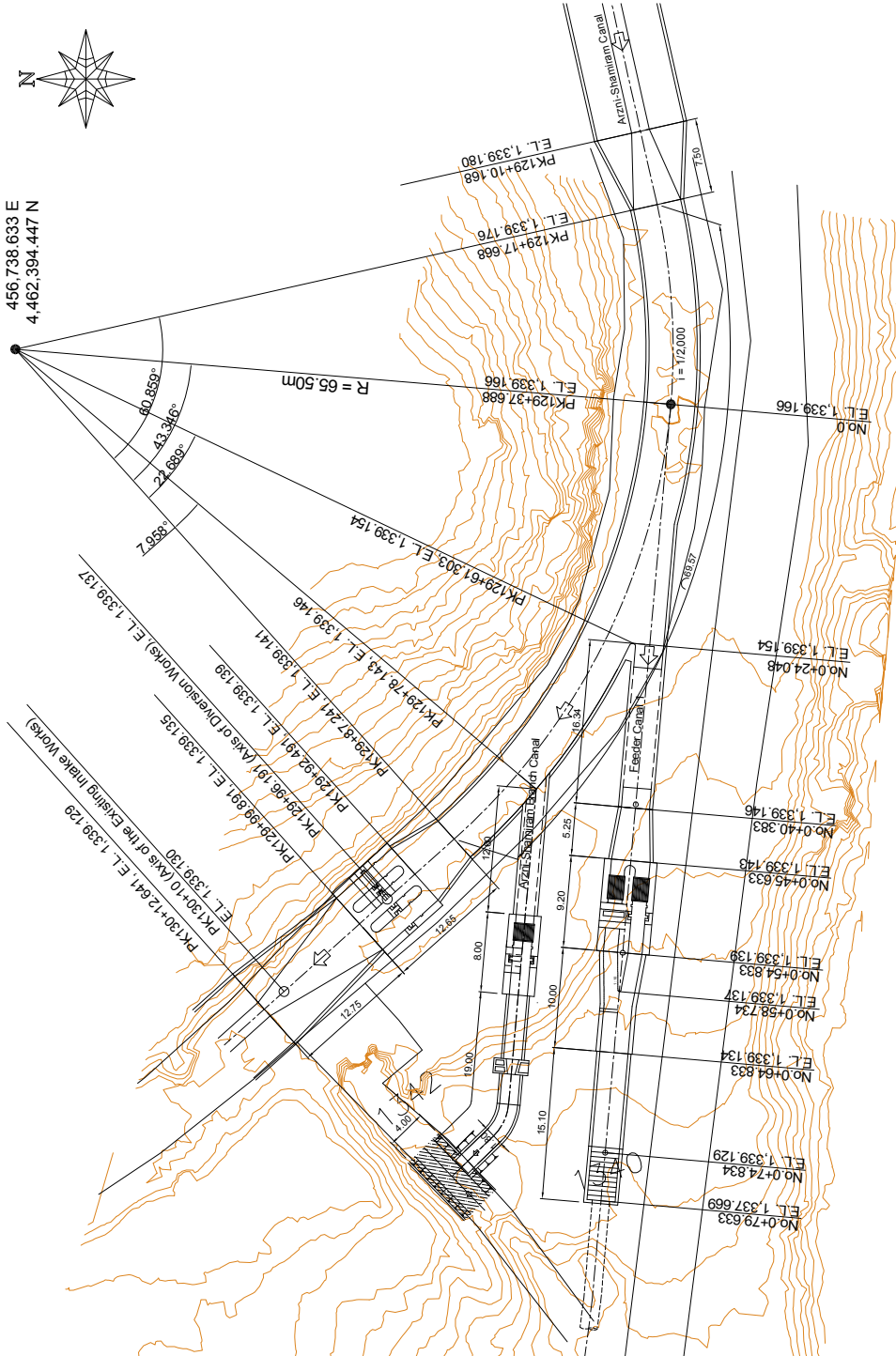
Slope (%)	Earth Covering	Elevation of Pipe Center	Ground Elevation	Accumulate Distance (m)	Distance (m)	Station
1284.80		1294.80	1294.80	0.00	100.00	B-3 (A-19)
1286.72		1291.81	1294.73	100.00	100.00	B-4 (A-18)
		1298.31	1298.31	200.00	100.00	B-5 (A-17)
		1286.95	1295.50	300.00	100.00	B-6 (A-16)
		1287.25	1297.00	400.00	100.00	B-7 (A-15)
		1287.35	1294.95	500.00	100.00	B-8 (A-14)
		1287.55	1294.29	600.00	100.00	B-9 (A-13)
		1287.75	1294.42	700.00	100.00	B-10 (A-12)
		1287.85	1294.46	800.00	100.00	B-11 (A-11)
		1288.05	1294.83	900.00	100.00	B-12 (A-10)
		1288.15	1296.29	1000.00	100.00	B-13 (A-9)
		1288.25	1296.25	1100.00	100.00	B-14 (A-8)
		1288.35	1296.25	1200.00	100.00	B-15 (A-7)
		1288.45	1296.25	1300.00	100.00	B-16
		1288.55	1296.25	1400.00	100.00	B-17
		1288.65	1296.25	1500.00	100.00	B-18
		1288.75	1296.25	1600.00	100.00	B-19
		1288.85	1296.25	1700.00	100.00	
		1288.95	1296.25	1800.00	100.00	
		1289.05	1296.25	1900.00	100.00	
		1289.15	1296.25	2000.00	100.00	
		1289.25	1296.25	2100.00	100.00	
		1289.35	1296.25	2200.00	100.00	
		1289.45	1296.25	2300.00	100.00	
		1289.55	1296.25	2400.00	100.00	
		1289.65	1296.25	2500.00	100.00	
		1289.75	1296.25	2600.00	100.00	
		1289.85	1296.25	2700.00	100.00	
		1289.95	1296.25	2800.00	100.00	
		1290.05	1296.25	2900.00	100.00	
		1290.15	1296.25	3000.00	100.00	
		1290.25	1296.25	3100.00	100.00	
		1290.35	1296.25	3200.00	100.00	
		1290.45	1296.25	3300.00	100.00	
		1290.55	1296.25	3400.00	100.00	
		1290.65	1296.25	3500.00	100.00	
		1290.75	1296.25	3600.00	100.00	

Water Distribution Plan for Feeder Canal 1 System

		A. S. Canal - PK130		Diversion Works Canal to A. Branch		Total Discharge		A. S. Canal PK130 ~	
		(1)	(2)	(3)	(4)=(2)+(3)	(4)=(2)+(3)		(5)=(1)-(4)	(6)=(1)-(4)
Mar	1st	7.00	7.00	0.00	7.00	7.00	0.00		0.00
	2nd	15.50	9.00	0.00	9.00	9.00	0.00		6.50
	3rd	14.40	9.00	0.00	9.00	9.00	0.00		5.40
Apr	1st	22.00	9.00	0.00	9.00	9.00	0.00		13.00
	2nd	19.20	8.72	0.28	9.00	9.00	0.00		10.20
	3rd	11.20	7.84	1.16	9.00	9.00	0.00		2.20
May	1st	18.50	7.67	1.33	9.00	9.00	0.00		9.50
	2nd	15.40	8.00	1.00	9.00	9.00	0.00		6.40
	3rd	5.50	1.11	0.39	1.50	1.50	0.00		4.00

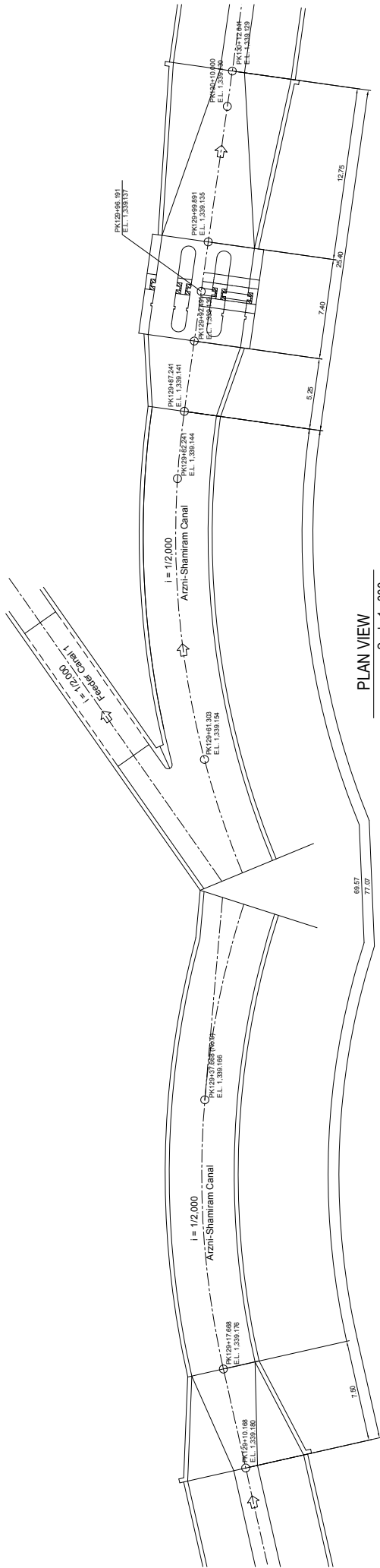


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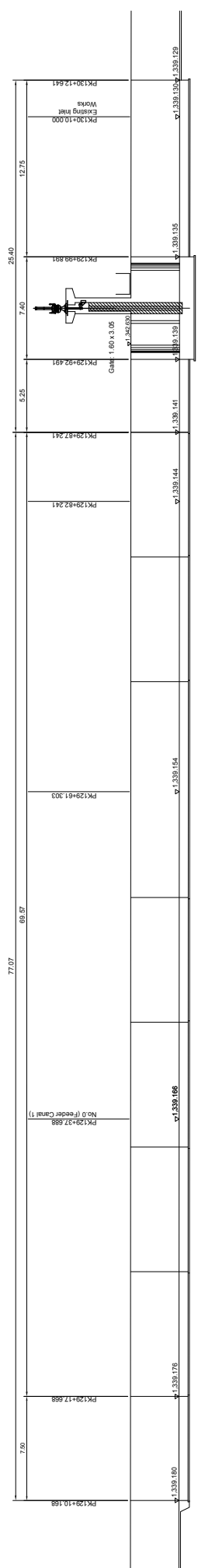


GENERAL LAYOUT OF INLET WORKS OF FEEDER CANAL 1 SYSTEM
Scale 1 : 500

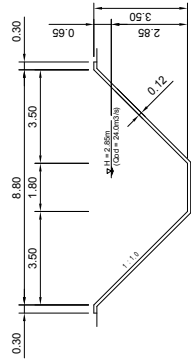
Project:	Preparatory Survey for Yeghvard Irrigation System Improvement Project	Drawing No:		Drawn by:	Saryu Consultants Inc.
Drawing Title:	Feeder Canal System 1, General Layout of Inlet Works	Scale:	Indicated	Checked by:	
Revision:		All dimension in:	Meter	Approved by:	



PLAN VIEW
Scale 1 : 300

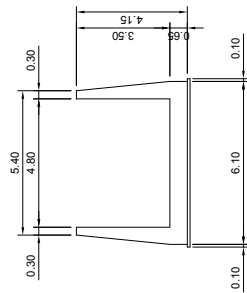


LONGITUDINAL SECTION
Scale 1 : 300



STANDARD CROSS SECTION OF ORIGINAL DESIGN
Scale 1 : 200

Design Parameter	Value
1 Design Discharge (m ³ /sec)	24.00
2 Roughness Coefficient	0.015
3 Slope of Canal	0.0005
4 Design Water Depth (m)	2.85
5 Area of Water Flow (m ²)	13.25
6 Hydraulic Radius	1.35
7 Velocity of Water Flow (m/sec)	1.81



DESIGN STANDARD CROSS SECTION OF ARZNI-SHAMIRAM CANAL
Scale 1 : 200

Design Parameter	Original	Mar 1st	2nd	3rd	Apr 1st	2nd	3rd	May 1st	2nd	3rd
1 Design Discharge (m ³ /sec)	24.00	7.00	15.50	14.40	22.00	19.20	11.20	16.50	15.40	5.50
2 Roughness Coefficient	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
3 Slope of Canal	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
4 Design Water Depth (m)	D	2.85	1.157	2.031	1.923	2.634	2.381	1.609	2.322	2.019
5 Area of Water Flow (m ²)	A	13.25	5.56	9.75	9.23	12.64	11.43	7.72	11.14	9.69
6 Hydraulic Radius	R	1.35	0.78	1.10	1.07	1.26	1.20	0.86	1.18	1.10
7 Velocity of Water Flow (m/sec)	v	1.81	1.28	1.59	1.56	1.74	1.68	1.45	1.66	1.17

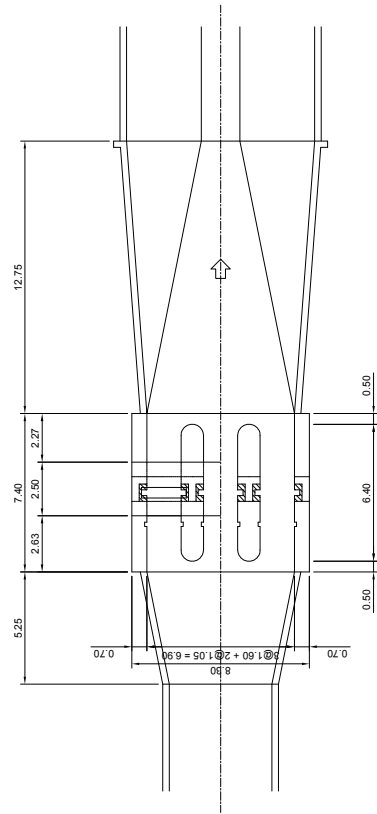
Project: Preparatory Survey for Yeghvard Irrigation System Improvement Project
 Drawing Title: Feeder Canal System 1, Water Regulation Works
 Revision: Initials

Scale: Indicated

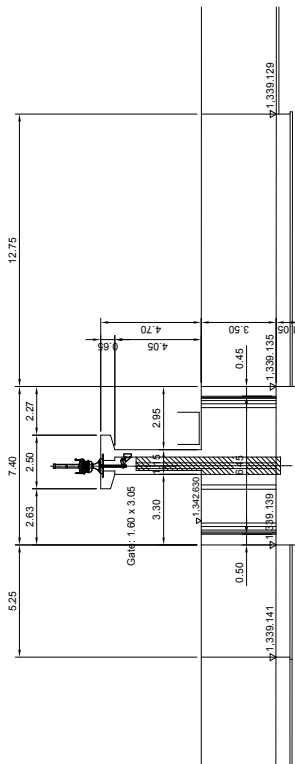
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Drawing No: _____
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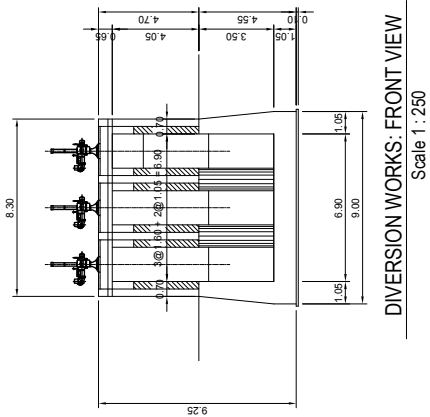
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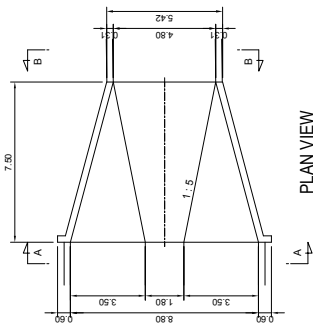
DIVERSION WORKS: PLAN VIEW
Scale 1 : 250



DIVERSION WORKS: LONGITUDINAL SECTION
Scale 1 : 250

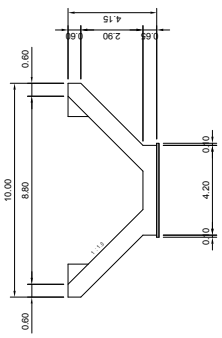


DIVERSION WORKS: FRONT VIEW
Scale 1 : 250

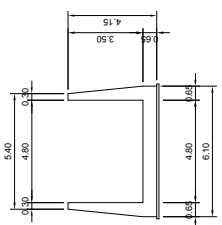


SECTION A - A

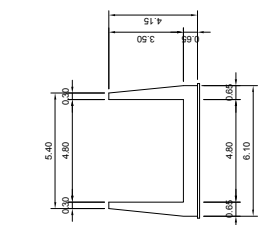
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SECTION A - A

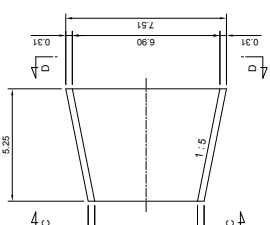


SECTION B - B

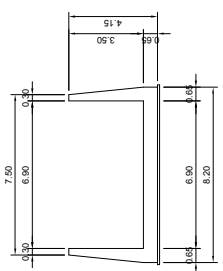


SECTION C - C

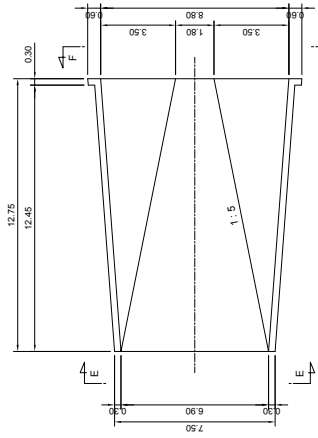
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SECTION C - C

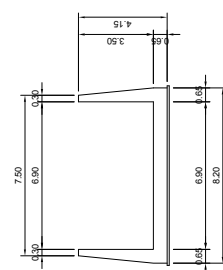


SECTION D - D

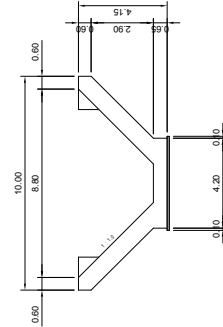


SECTION E - E

TRANSITION: PK129+99.891 ~ PK139+12.641
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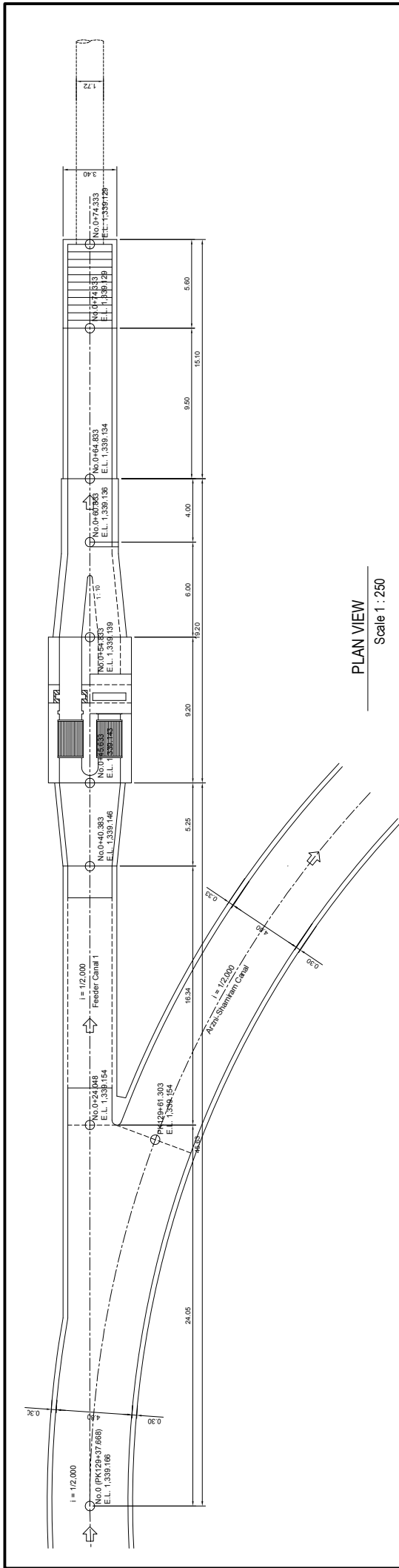


SECTION E - E

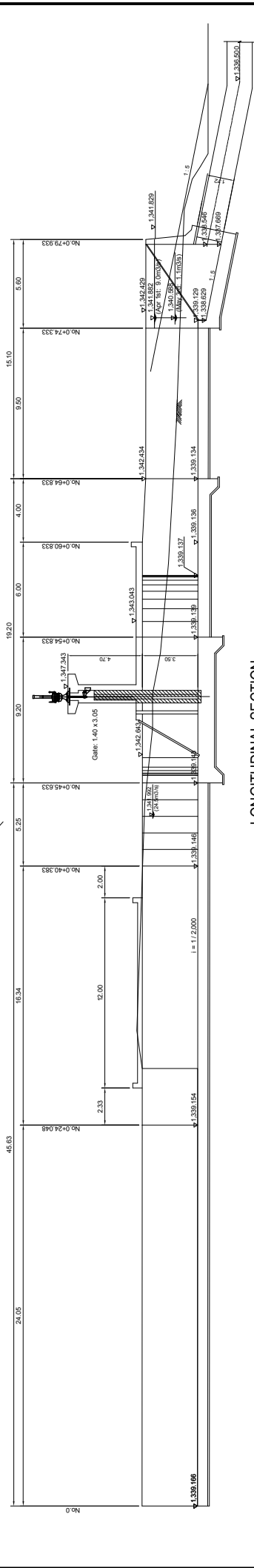


SECTION F - F

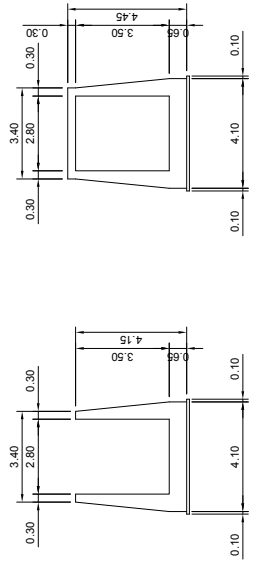
Project:	Preparatory Survey for Yeghvard Irrigation System Improvement Project	Drawing No:	Sanyu Consultants Inc.
Drawing Title:	Feeder Canal System 1, Structural Drawing of the Water Regulation Works	Scale:	Indicated
Revision:	Initials	All dimension in:	Meter
		Checked by:	
		Approved by:	



PLAN VIEW
Scale 1 : 250



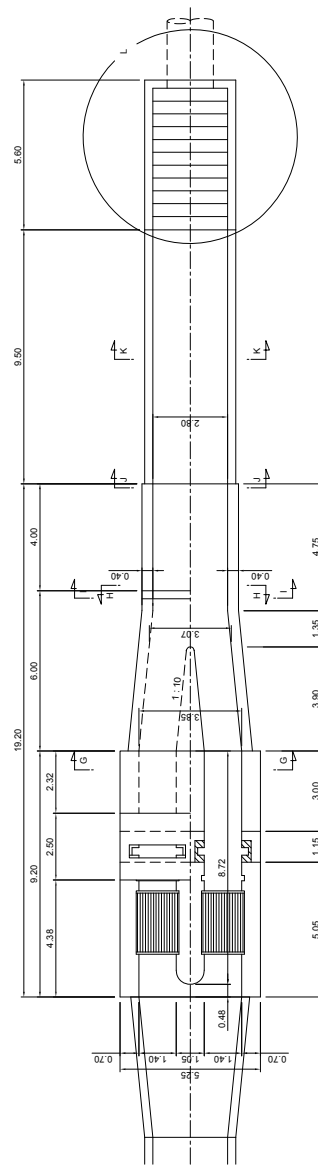
LONGITUDINAL SECTION
Scale 1 : 250



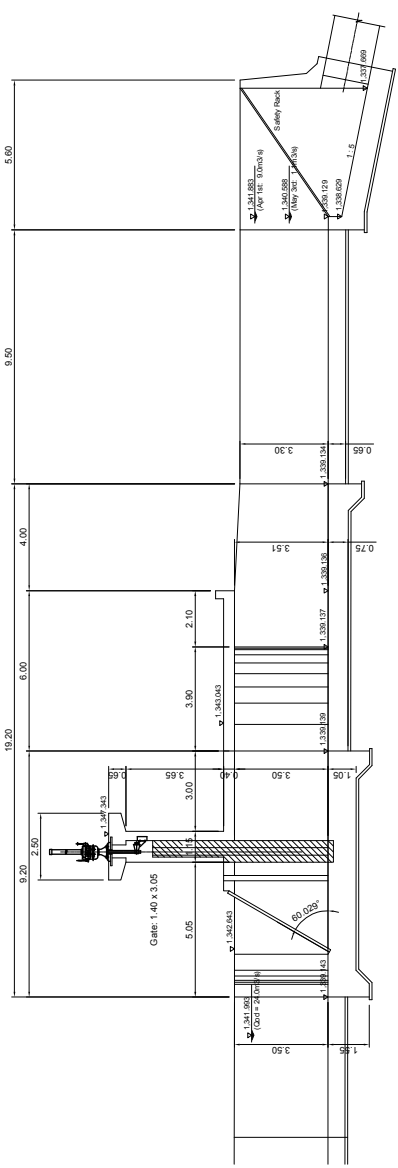
DESIGN STANDARD CROSS SECTION OF FEEDER CANAL 1 WITHOUT GATE OPERATION OF DIVERSION WORKS
Scale 1 : 200

Design Parameter	Mar 1st	2nd	3rd	Apr 1st	2nd	3rd	May 1st	2nd	3rd
1 Design Discharge (m ³ /sec)	Qod	7.00	9.00	9.00	9.00	8.72	7.84	8.00	1.11
2 Roughness Coefficient	n	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
3 Slope of Canal	i	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
4 Design Water Depth (m)	D	1.923	2.346	2.346	2.346	2.105	2.075	2.148	0.511
5 Area of Water Flow (m ²)	A	5.38	6.57	6.57	6.57	6.41	5.89	6.01	1.43
6 Hydraulic Radius	R	0.81	0.88	0.88	0.88	0.87	0.84	0.84	0.37
7 Velocity of Water Flow (m/sec)	V	1.3	1.37	1.37	1.37	1.36	1.32	1.32	0.77

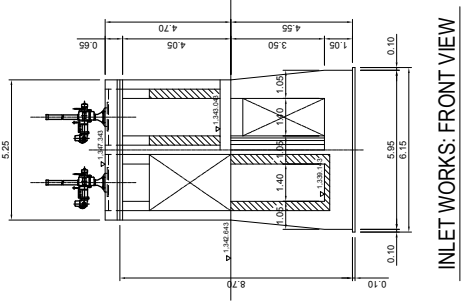
Project:	Preparatory Survey for Yeghvard Irrigation System Improvement Project	Drawing No:		Drawn by:	Saryu Consultants Inc.
Drawing Title:	Feeder Canal System 1, Water Diversion Works	Scale:	Indicated	Checked by:	
Revision:	Initials	All dimension in:	Meter	Approved by:	



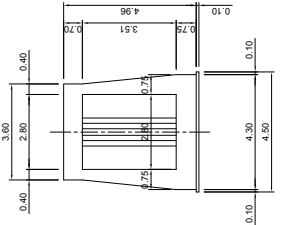
INLET WORKS: PLAN VIEW



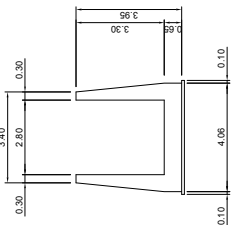
INLET WORKS: LONGITUDINAL SECTION



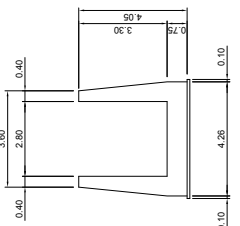
INLET WORKS: FRONT VIEW



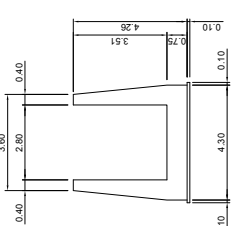
SECTION G - G



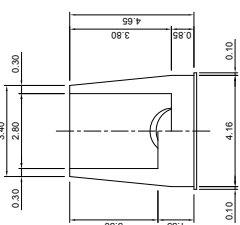
SECTION K - K



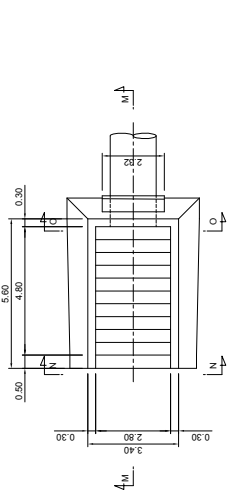
SECTION J - J



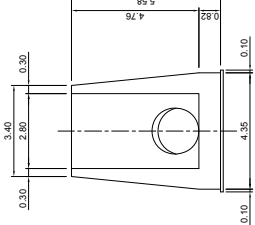
SECTION I - I



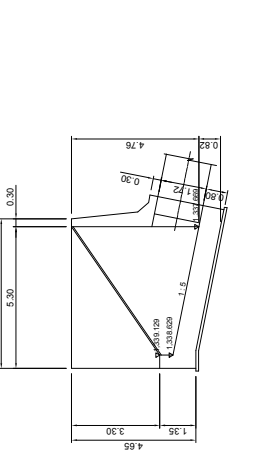
SECTION N - N



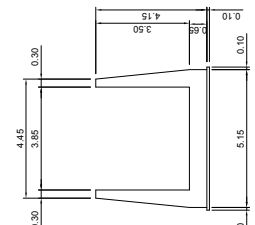
DETAIL L



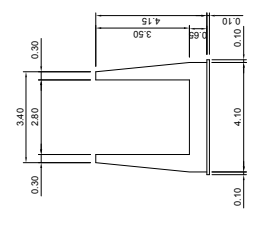
SECTION O - O



SECTION M - M



SECTION Q - Q



SECTION P - P

TRANSITION No.0-40.383 ~ No.0-45.633

Project:	Preparatory Survey for Yeghvard Irrigation Improvement Project	Drawing No:	Drawn by:
Drawing Title:	Feeder Canal System 1, Structural Drawing of the Water Diversion Works	Scale:	1 : 200
Revision	Initials	All dimension in:	Meter
		Checked by:	Sanyu Consultants Inc.
		Approved by:	