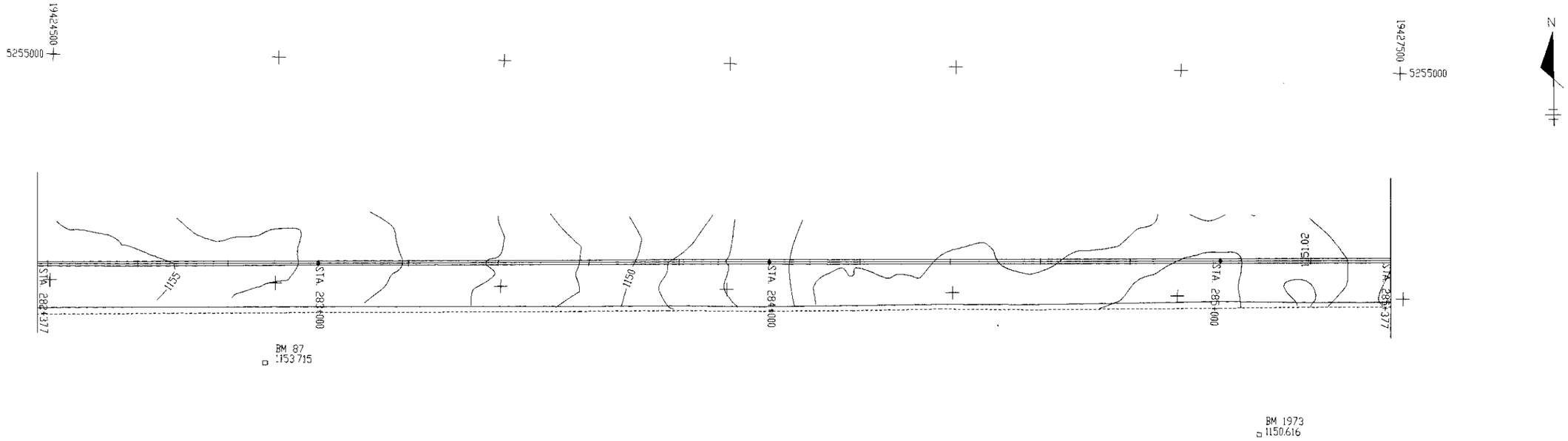
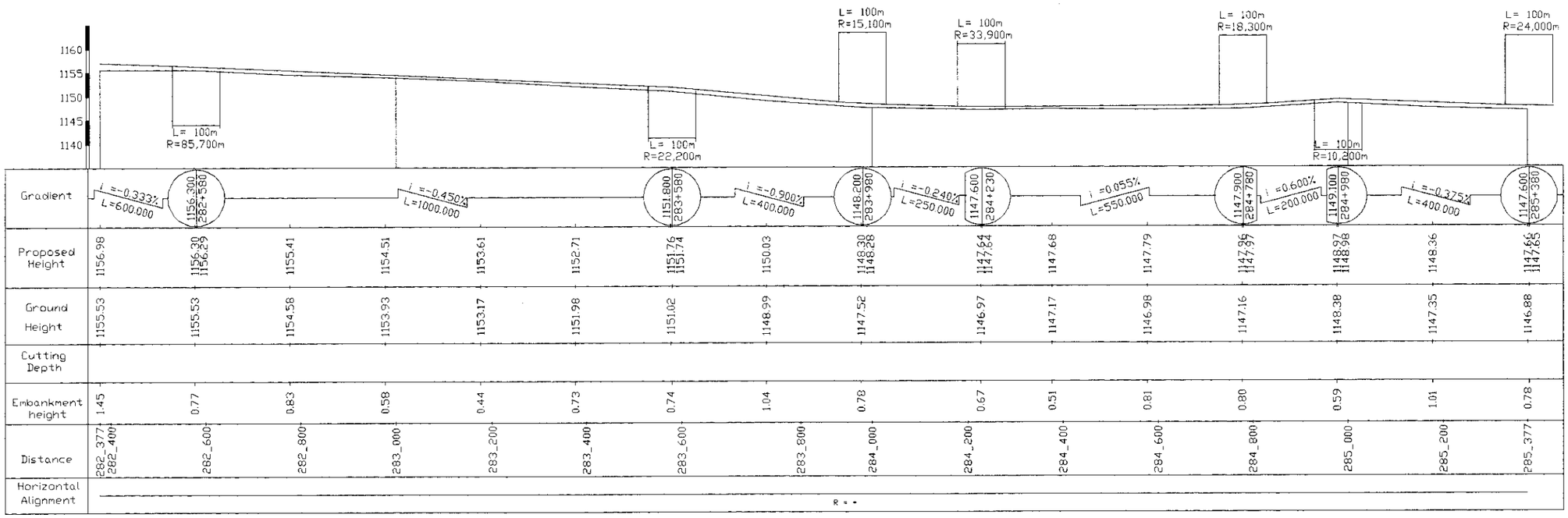
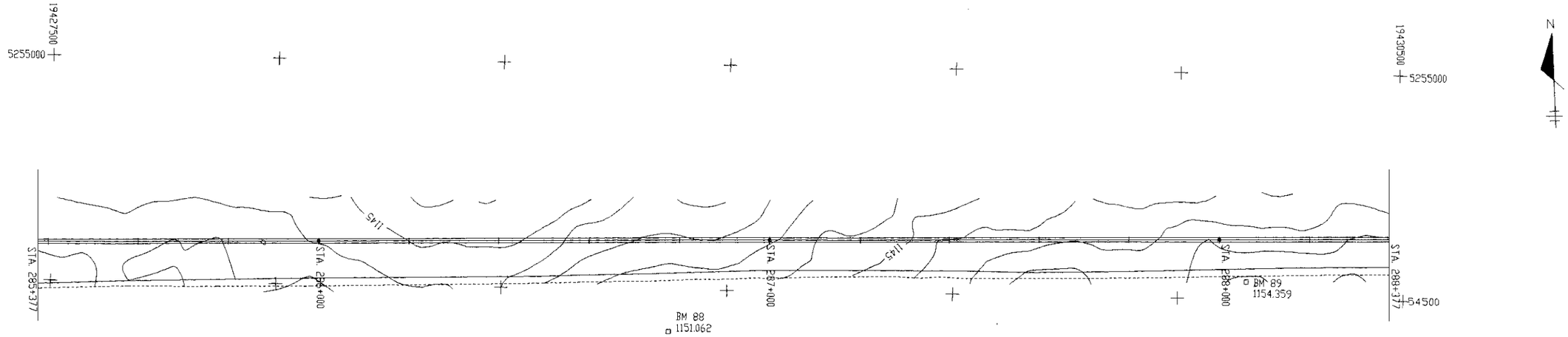
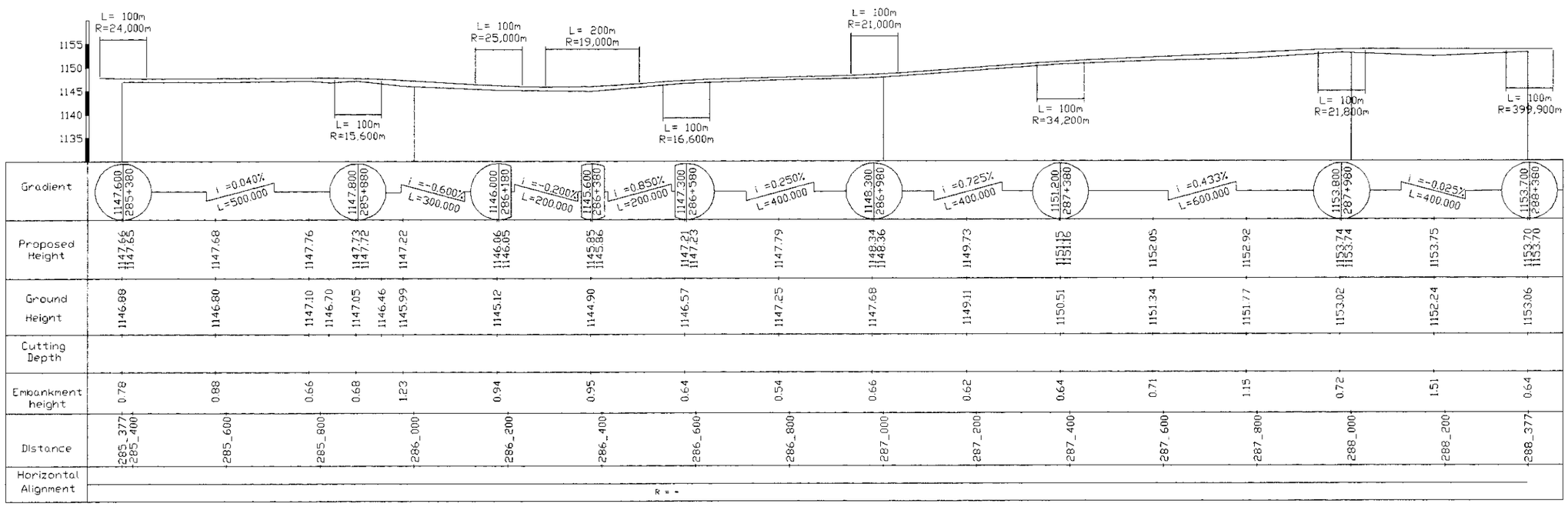




282_377 - 285_377

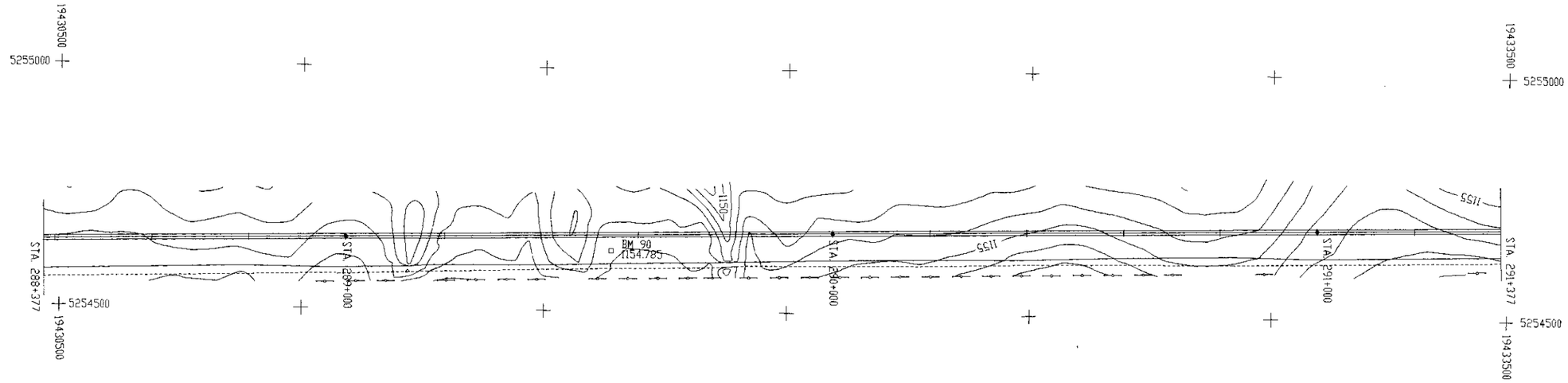
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-61

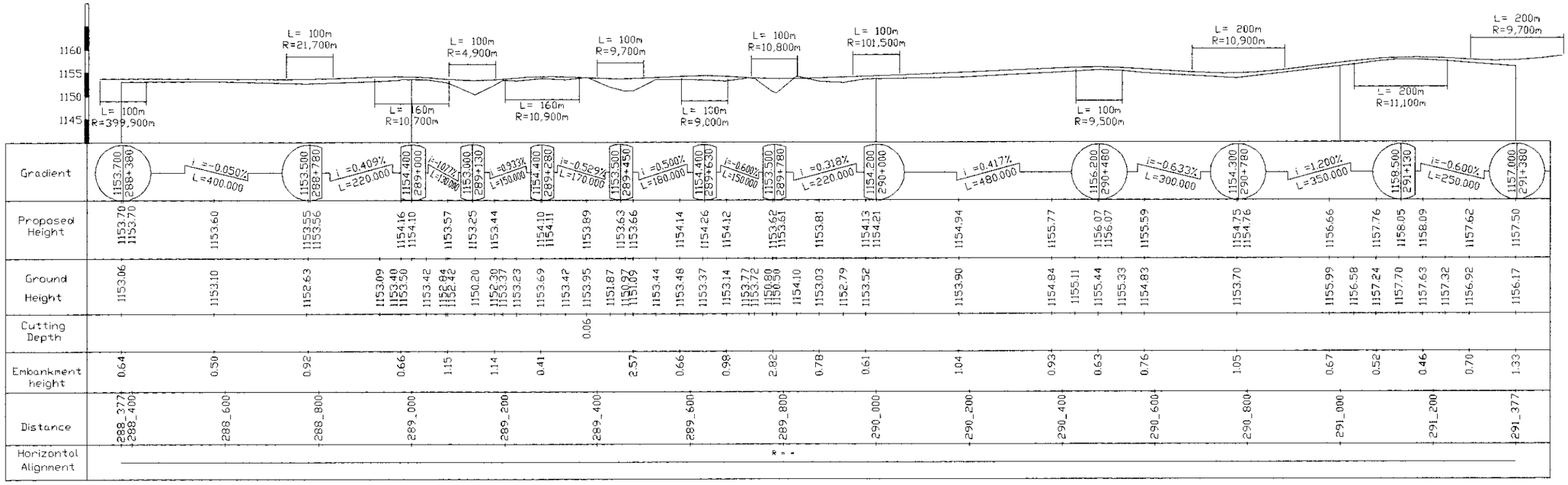




285_377 - 288_377

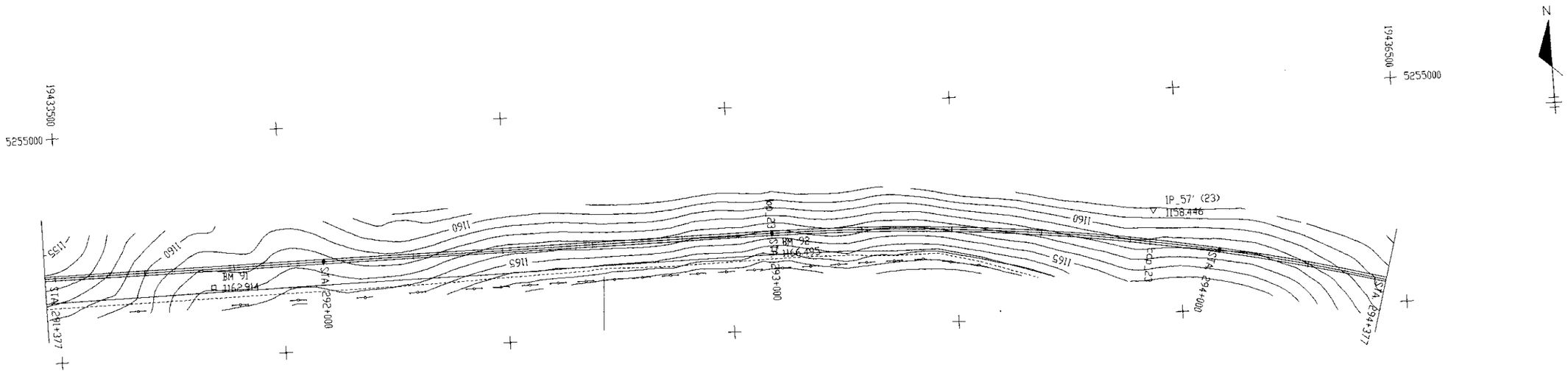
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-62

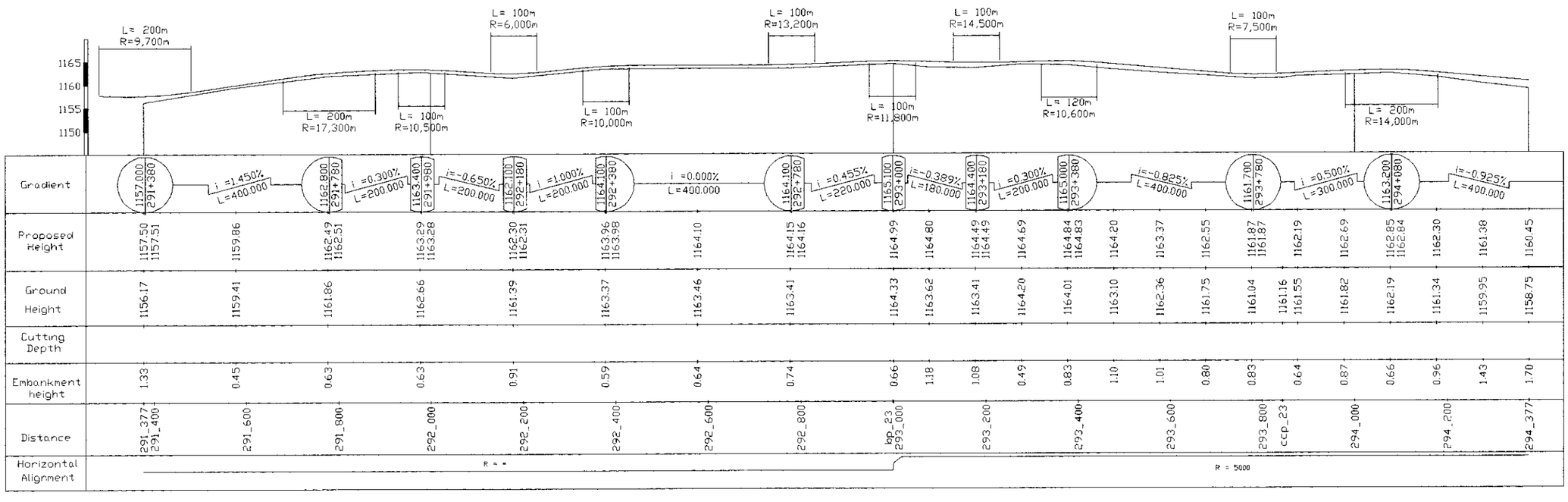




288_377 - 291_377

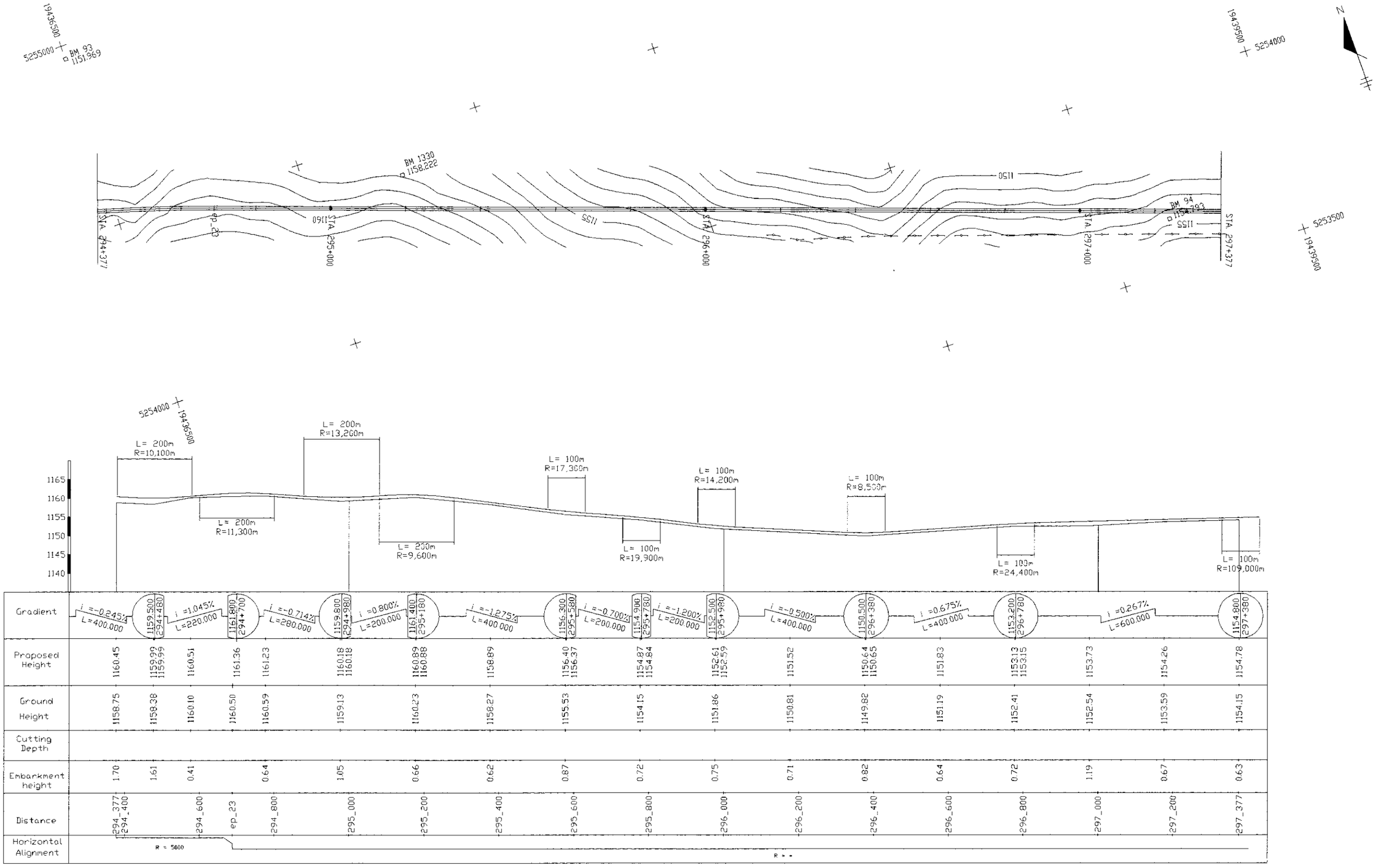
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	8-63





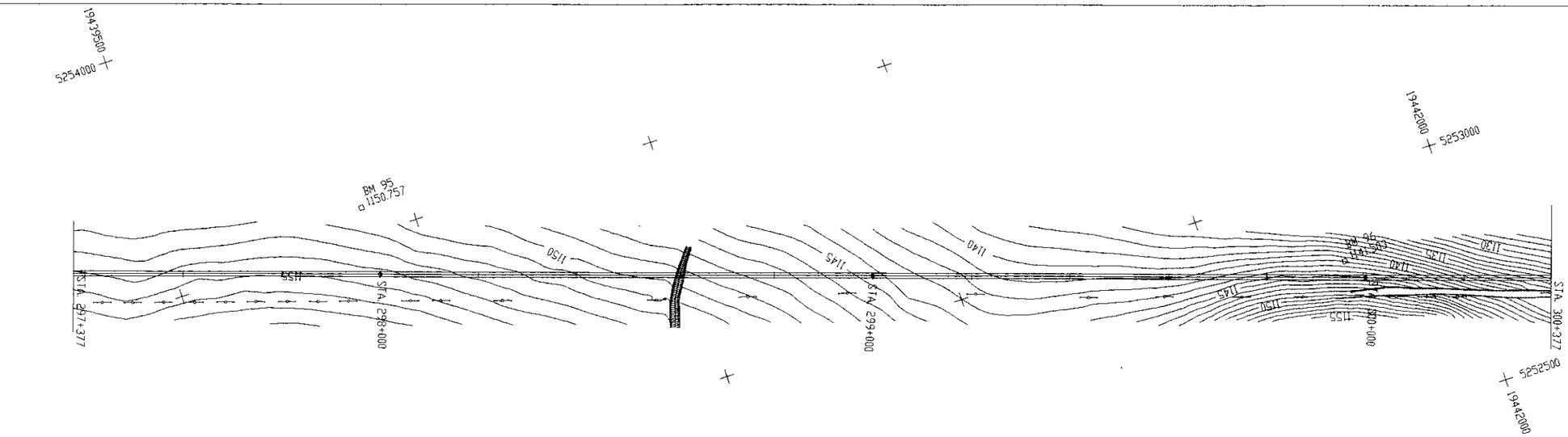
291_377 - 294_377

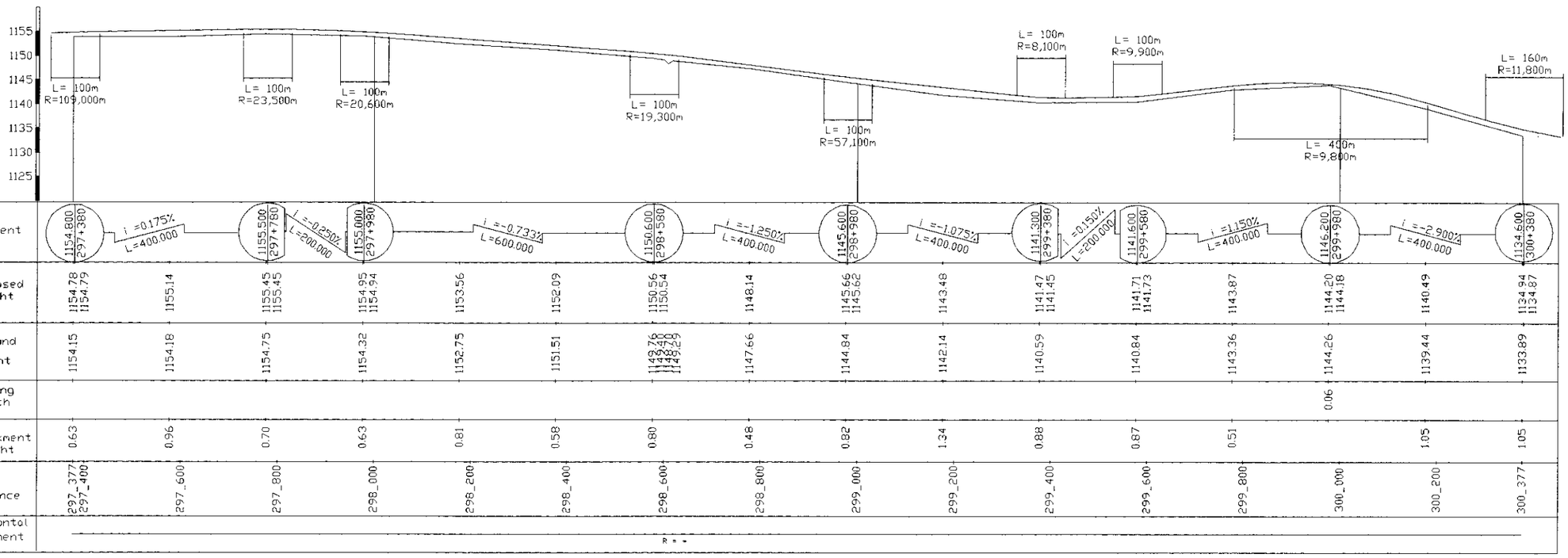
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-64



294_377 - 297_377

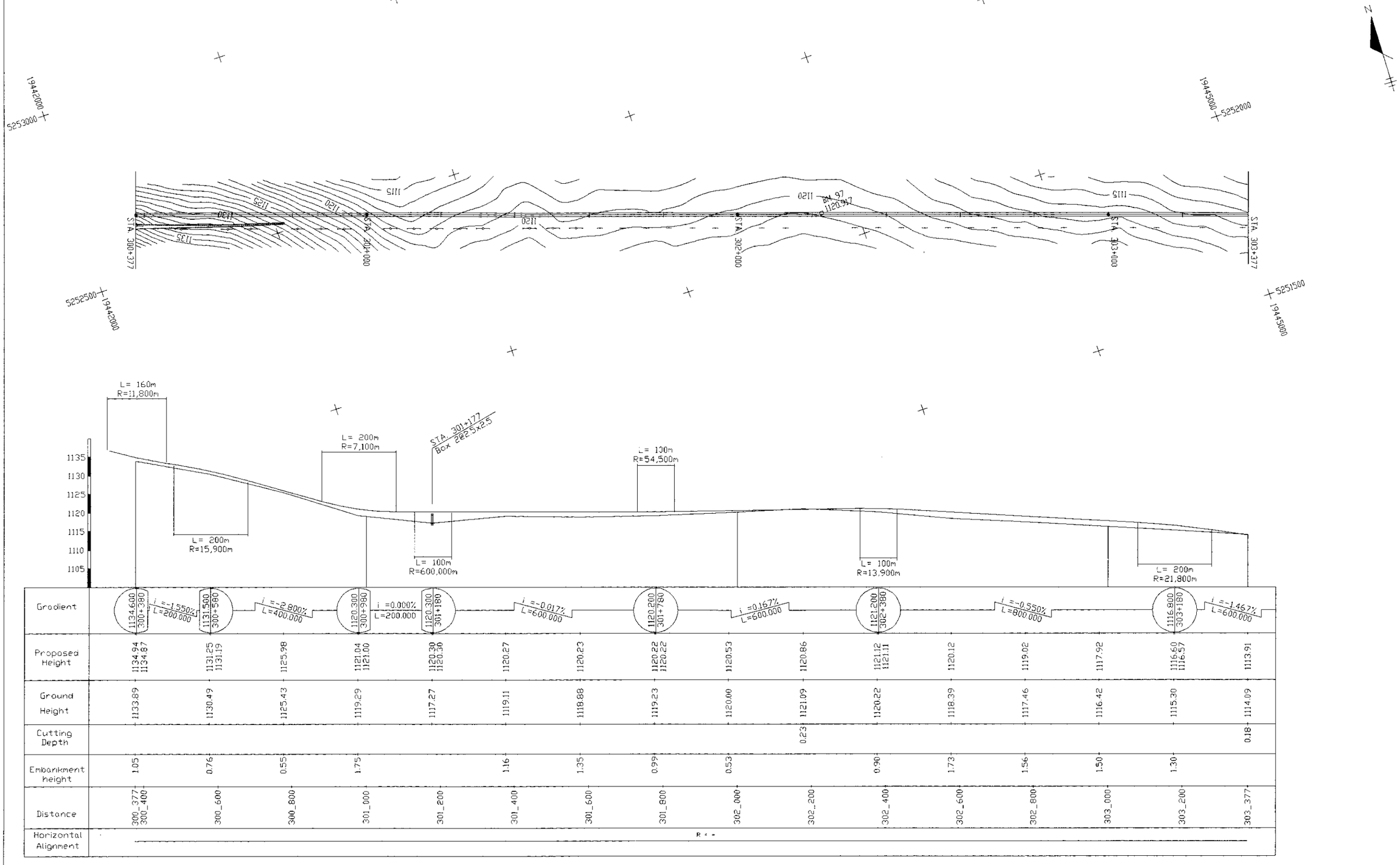
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-65





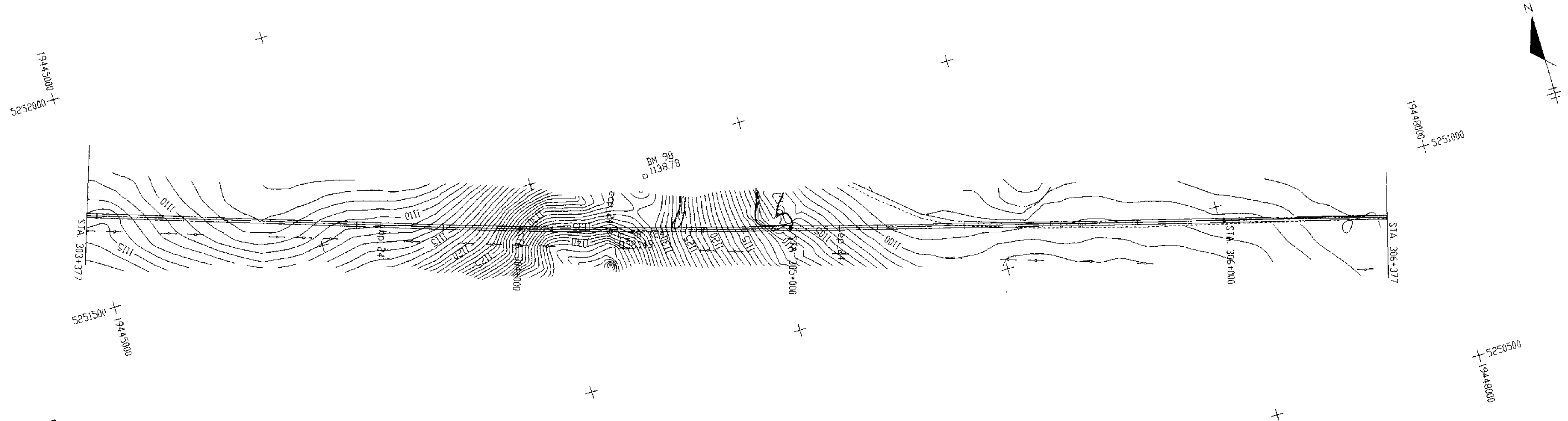
297_377 - 300_377

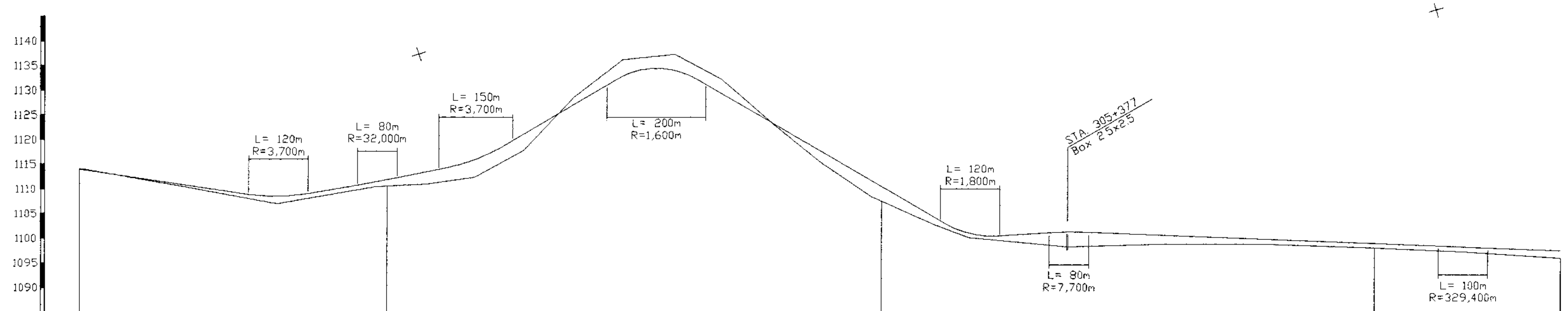
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-66



300_377 - 303_377

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-67





Gradient

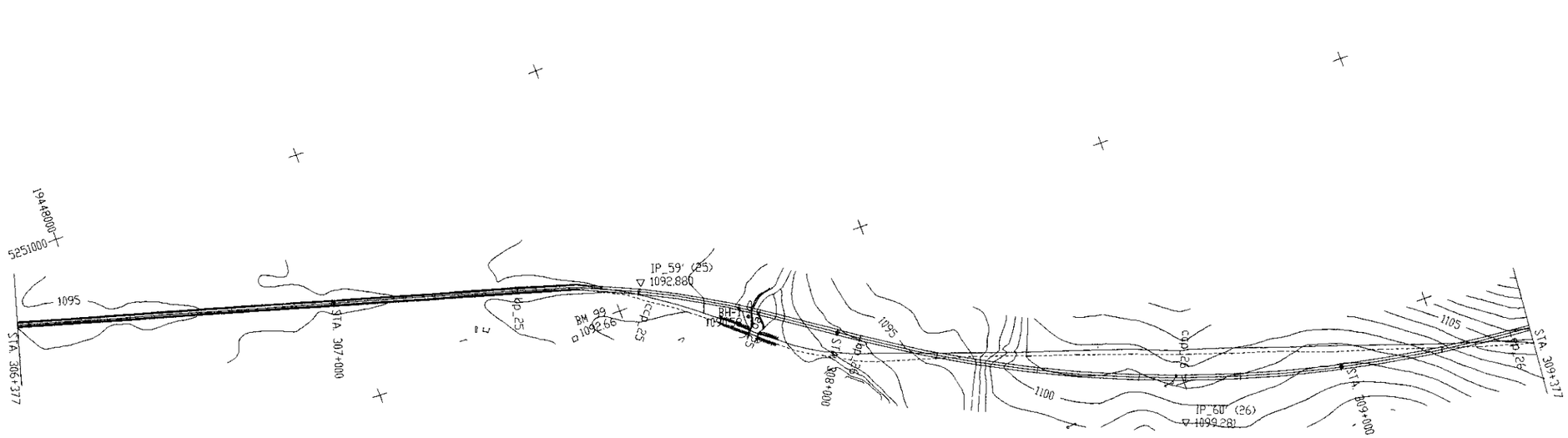
i =-1.467% L=600.000 · [1108.000 / 303+780] · i =1.750% L=200.000 · [1111.500 / 303+980] · i =2.000% L=200.000 · [1115.500 / 304+180] · i =6.000% L=360.000 · [1137.100 / 304+540] · i =-5.766% L=640.000 · [1100.200 / 305+180] · i =0.650% L=200.000 · [1101.500 / 305+380] · i =-0.387% L=800.000 · [1098.400 / 306+180] · i =-0.357% L=1,400.000

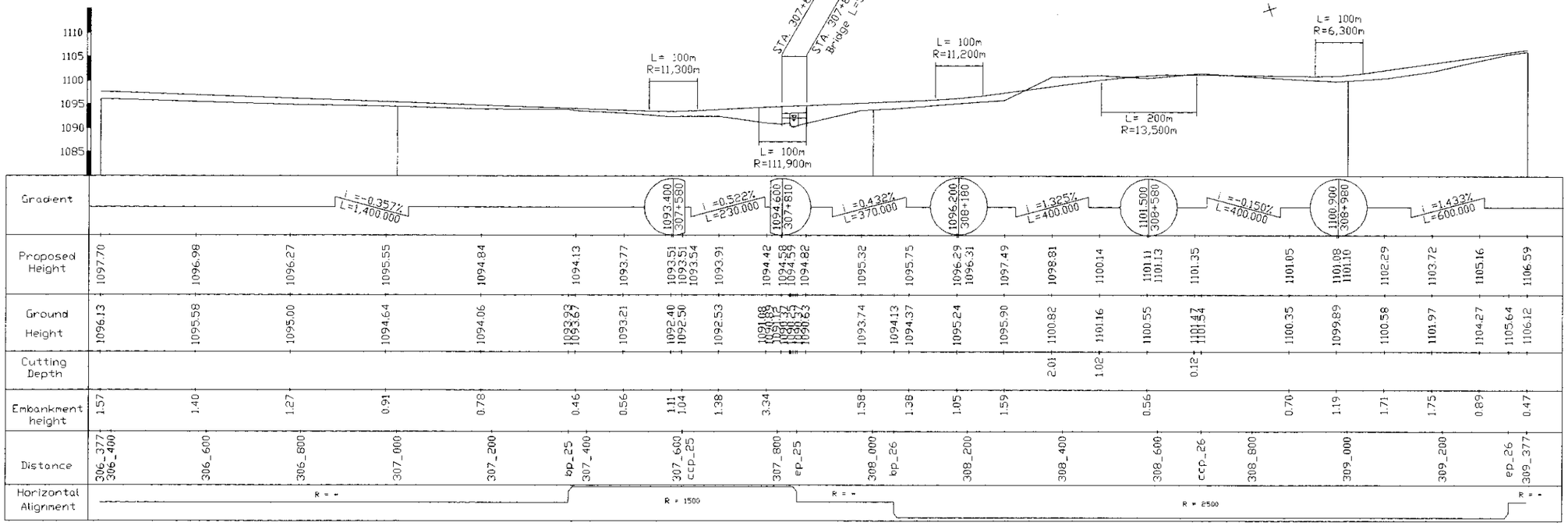
Distance	303_377 303_400	303_600	303_800	304_000	bp_24	304_200		304_400		ccp_24 304_600		304_800		305_000		ep_24	305_200	305_400	305_600	305_800	306_000	306_200	306_377
Proposed Height	1113.91	1110.98	1108.48 1108.48	1111.47 1111.53	1113.44	1116.13 1116.25	1121.32	1127.32	1132.92	1134.16 1133.80	1129.20	1123.44	1117.67	1111.90	1106.14		1101.24 1101.16	1101.39 1101.40	1100.74	1099.96	1099.19	1098.41 1098.40	1097.70
Ground	1114.09	1110.61	1106.99	1110.45	1110.86 1110.93	1112.43	1117.90	1128.51	1136.29	1137.35	1132.28	1123.60	1115.48	1108.43	1104.17	1102.63	1100.22	1098.38	1098.98	1098.91	1098.26	1097.44	1096.13
Cutting	0.18							1.19	3.37	3.55	3.08	0.16											
Embankment height		0.37	1.49	1.02	2.51	3.70	3.42						2.19	3.47	1.97		1.02		1.76	1.05	0.93	0.97	1.57

Horizontal Alignment			
	R = ∞	R = 20000	R = ∞

303_377 - 306_377

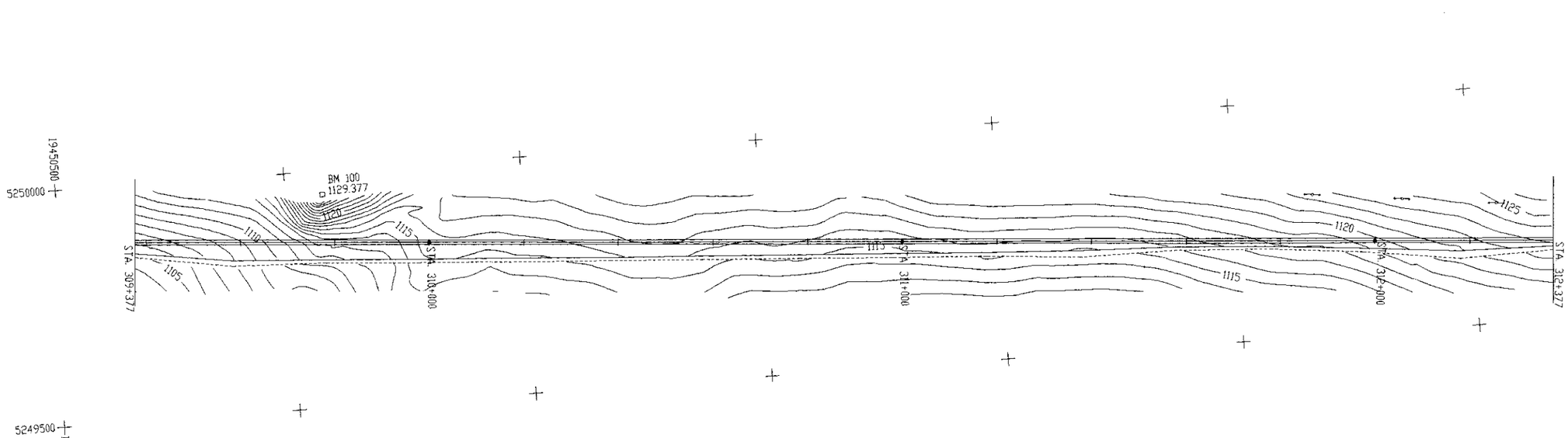
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-68





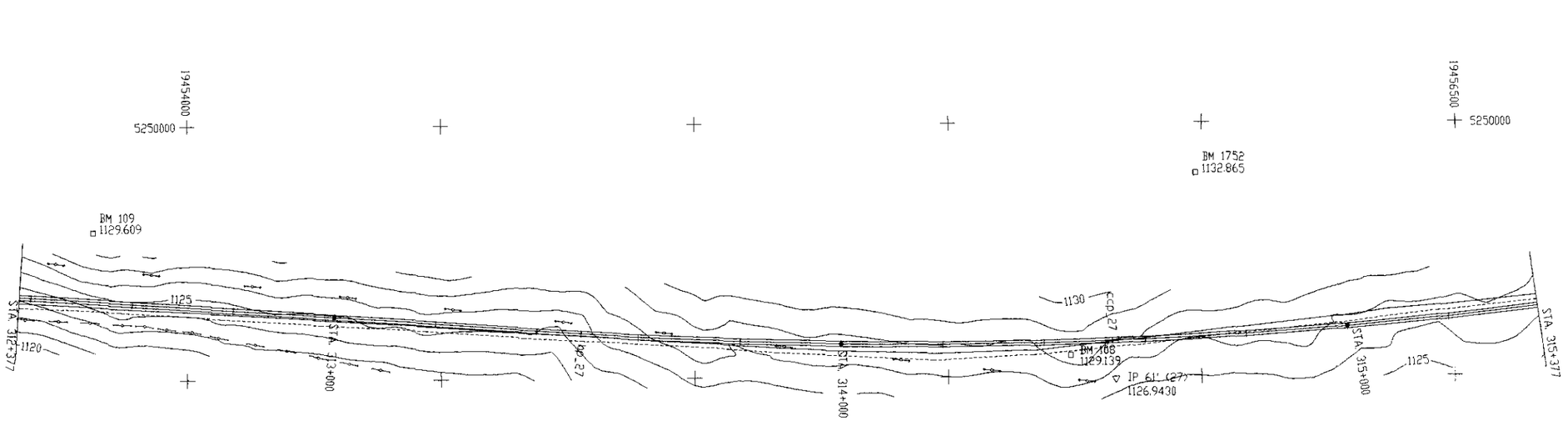
306_377 - 309_377

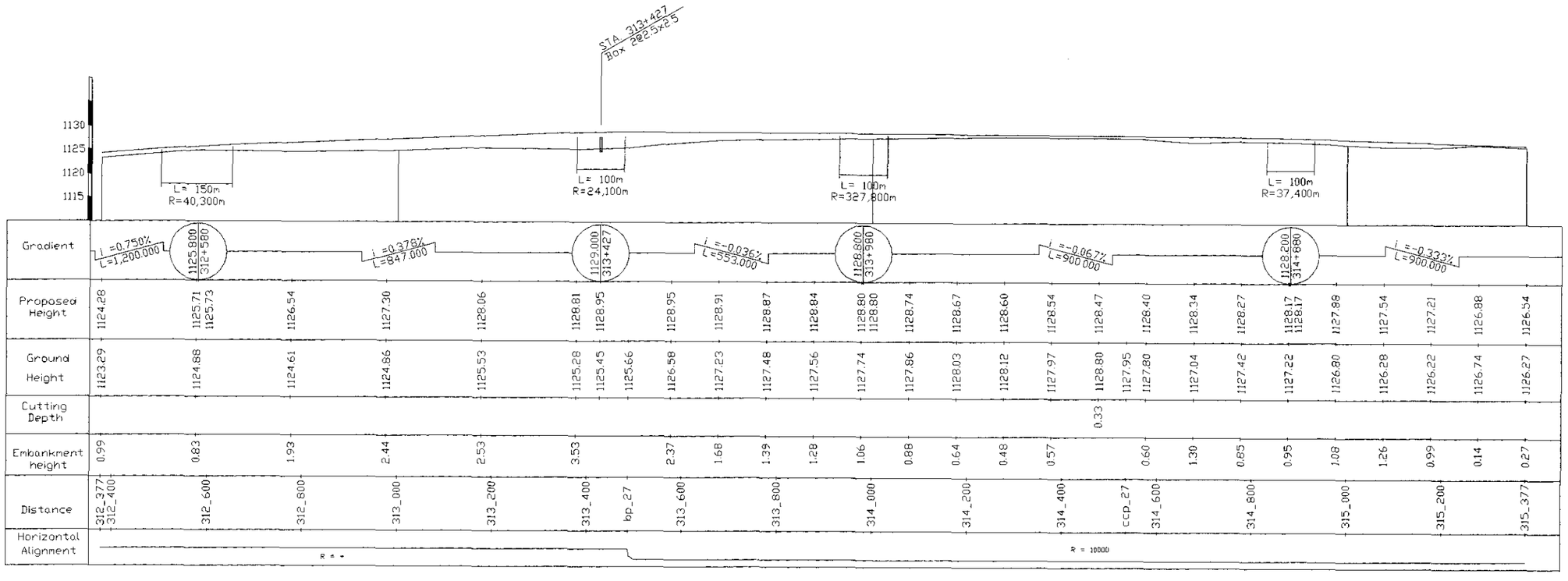
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-69



309_377 - 312_377

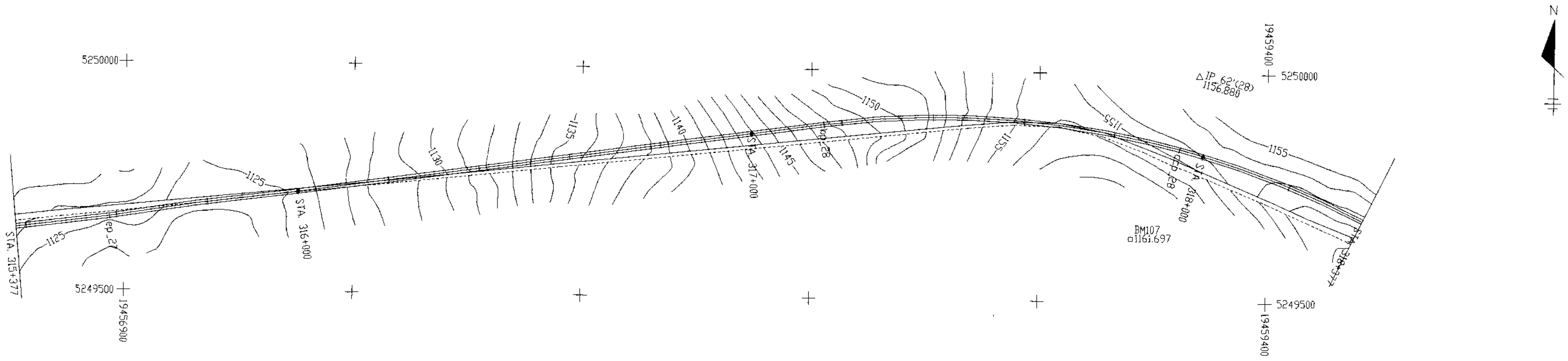
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing Title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-70

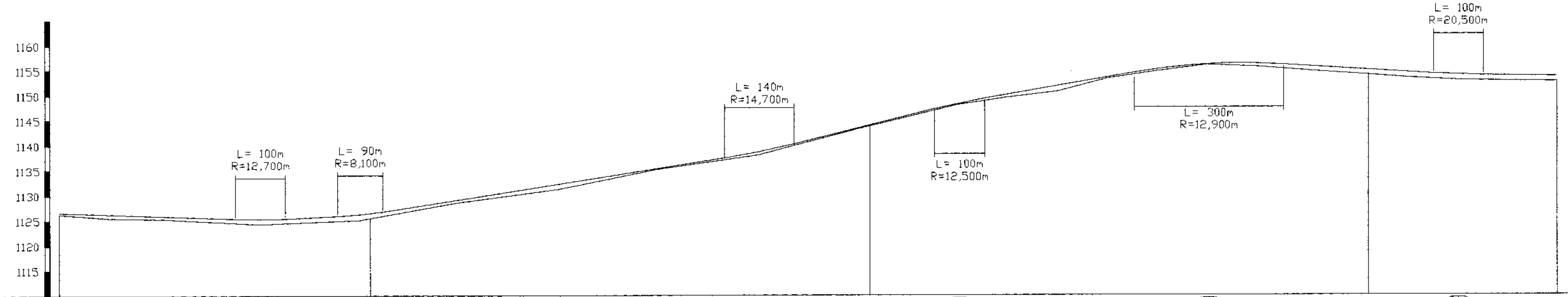




312_377 - 315_377

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-71





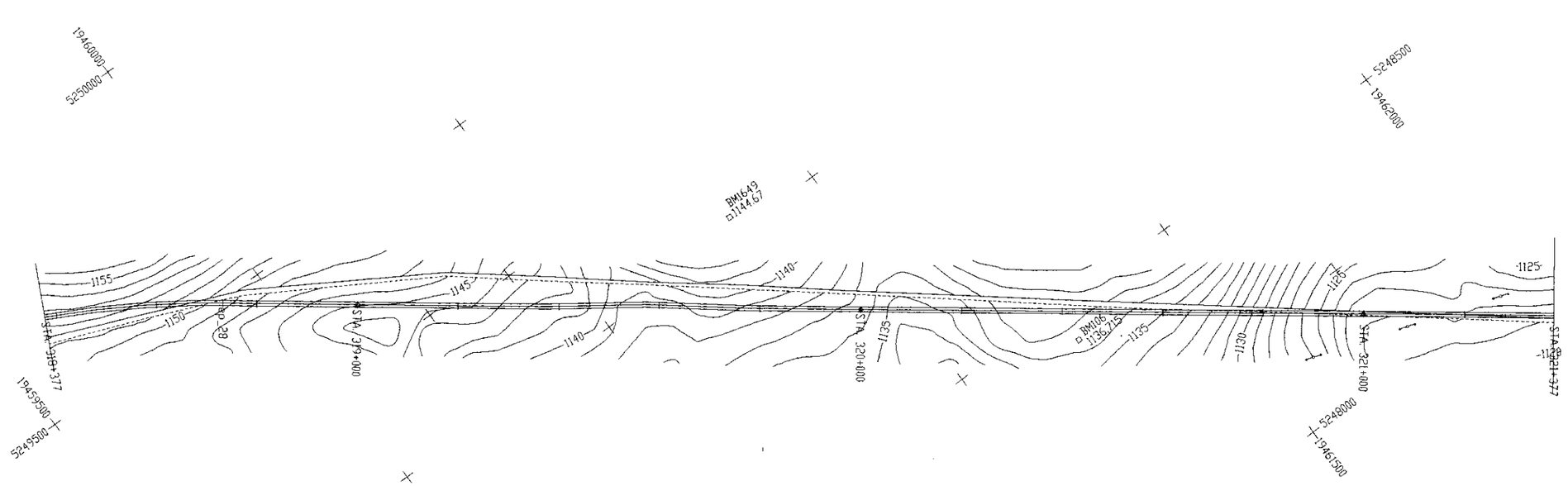
Gradient: i =-0.333% L=900.000 | 1125.200 315+780 | i =0.450% L=200.000 | 1126.100 315+980 | i =1.550% L=800.000 | 1138.500 316+780 | i =2.500% L=400.000 | 1148.500 317+180 | i =1.700% L=500.000 | 1157.000 317+680 | i =-0.620% L=500.000 | 1153.900 318+180 | i =-0.133% L=300.000

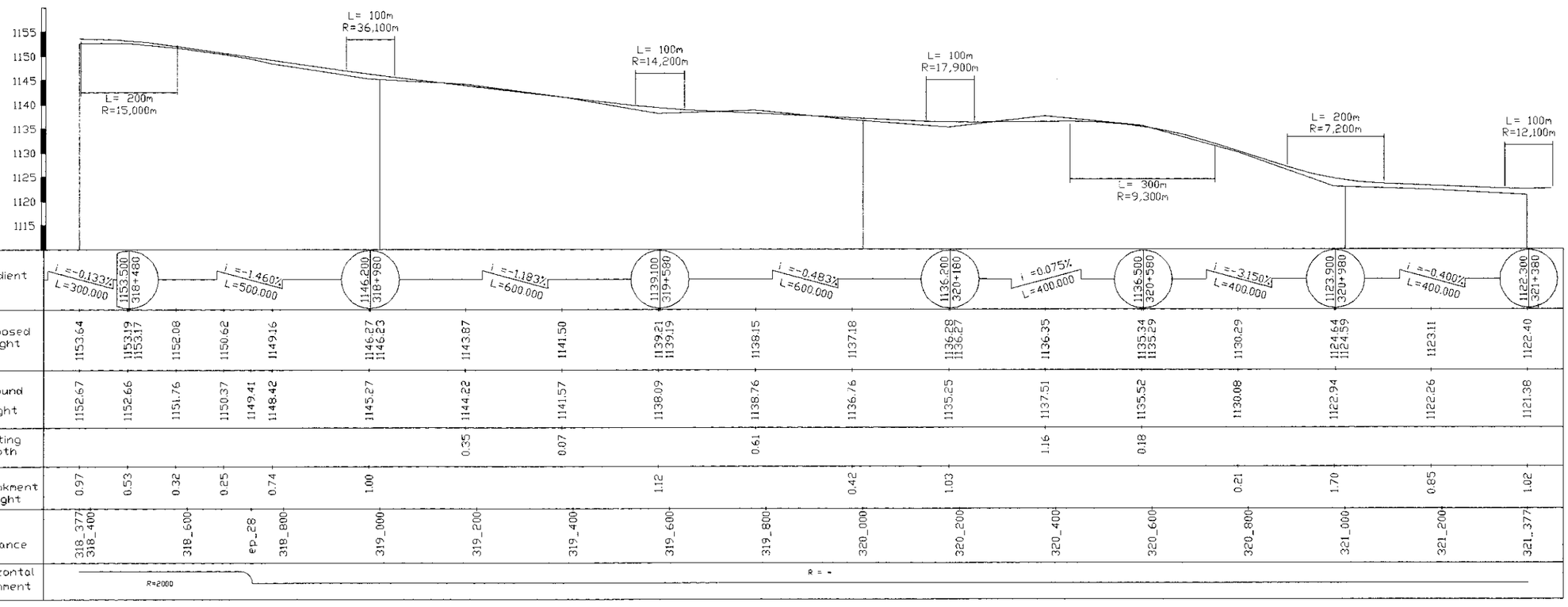
Proposed Height	1126.54	1126.21	1125.88	1125.30 1125.30	1126.19 1126.22	1129.15	1132.25	1135.35	1138.61 1138.67	1143.43	1148.34 1148.40	1150.15	1151.85	1153.55	1155.16	1156.11 1156.13	1156.29	1155.78	1155.16	1154.54	1153.97 1153.96	1153.77	1153.64
Ground Height	1126.27	1125.49	1125.35	1124.27	1125.08	1128.59	1131.26	1135.21	1137.98	1143.23	1147.62 1148.09	1149.49	1150.68	1153.37	1154.80	1156.06	1155.65	1154.86	1154.36 1154.19	1153.42	1152.91	1152.72	1152.67
Cutting Depth																							
Embankment height	0.27	0.72	0.53	1.03	1.11	0.56	0.99	0.14	0.63	0.20	0.25	0.66	1.17	0.18	0.36	0.05	0.64	0.92	0.97	1.12	1.06	1.05	0.97
Distance	315_377 315_400		ep_27 315_600	315_800	316_000	316_200	316_400	316_600	316_800	317_000	bp_28 317_200		317_400		317_600		317_800		ccp_28 318_000		318_200		318_377

Horizontal Alignment: R=10000 | R = ∞ | R=2000

315_377 - 318_377

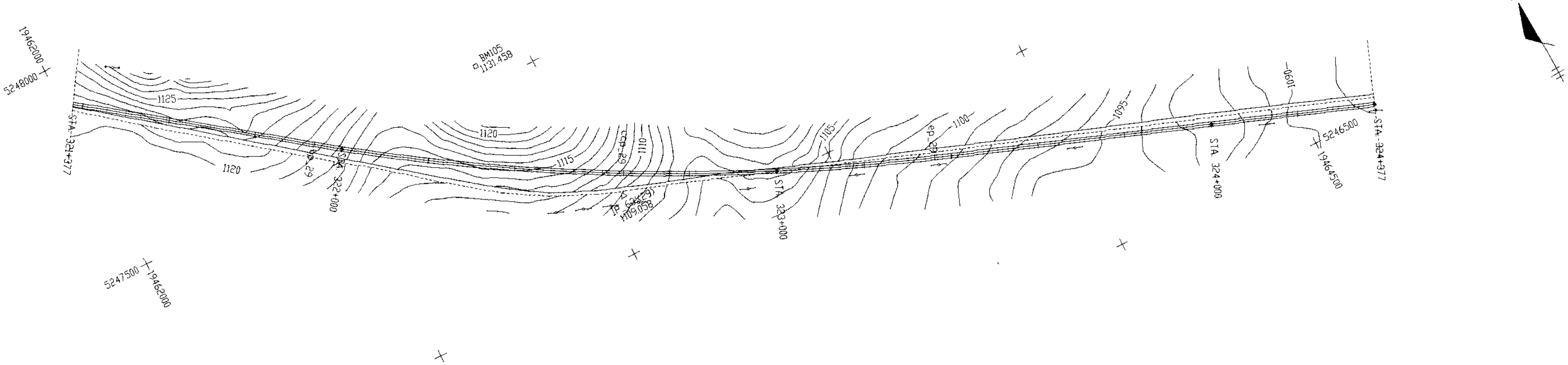
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-72

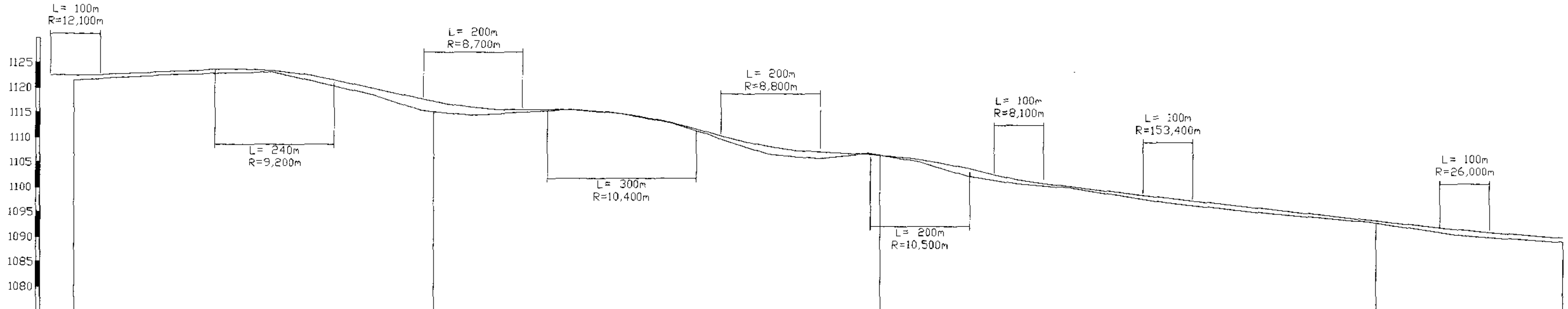




318_377 - 321_377

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	
Drawing title	Scale / No
PLAN AND PROFILE	H=1:10,000 V=1:1,000 / B-73





Gradient

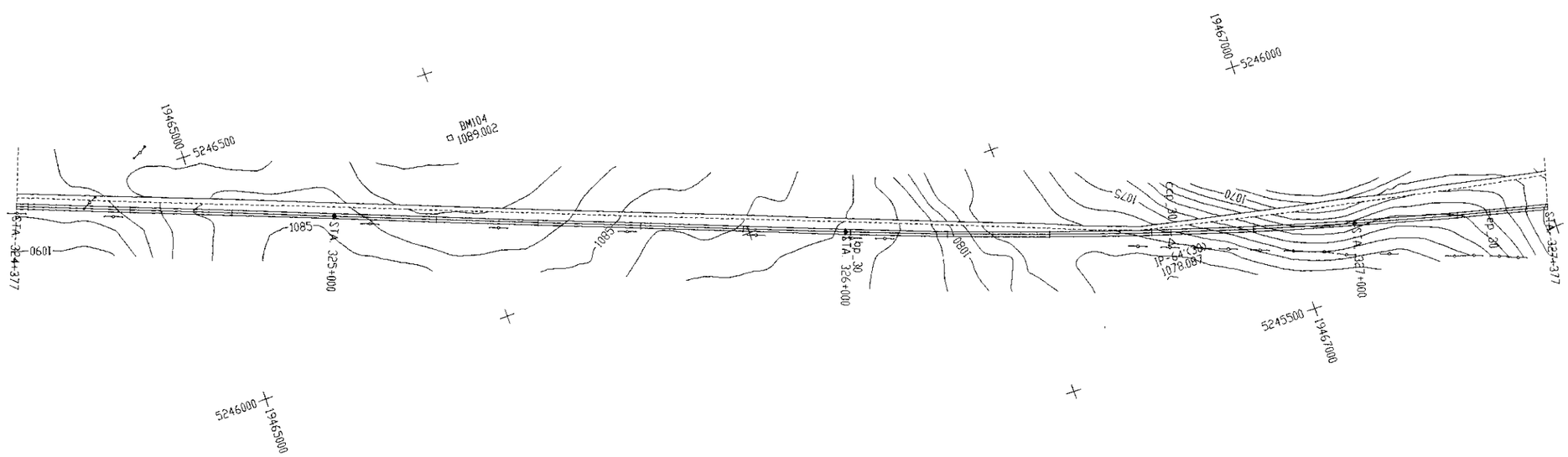
Elevation	Station	Gradient to next point	Length
1122.300	321+380	i =0.425%	L=400.000
1124.000	321+780	i =-2.175%	L=400.000
1115.300	322+180	i =0.100%	L=300.000
1115.600	322+480	i=-2.767%	L=300.000
1107.300	322+780	i=-0.500%	L=300.000
1105.800	323+080	i =-2.400%	L=200.000
1101.000	323+280	i =-1.166%	L=300.000
1097.500	323+580	i =-1.100%	L=600.000
1090.900	324+180	i =-0.717%	L=600.000

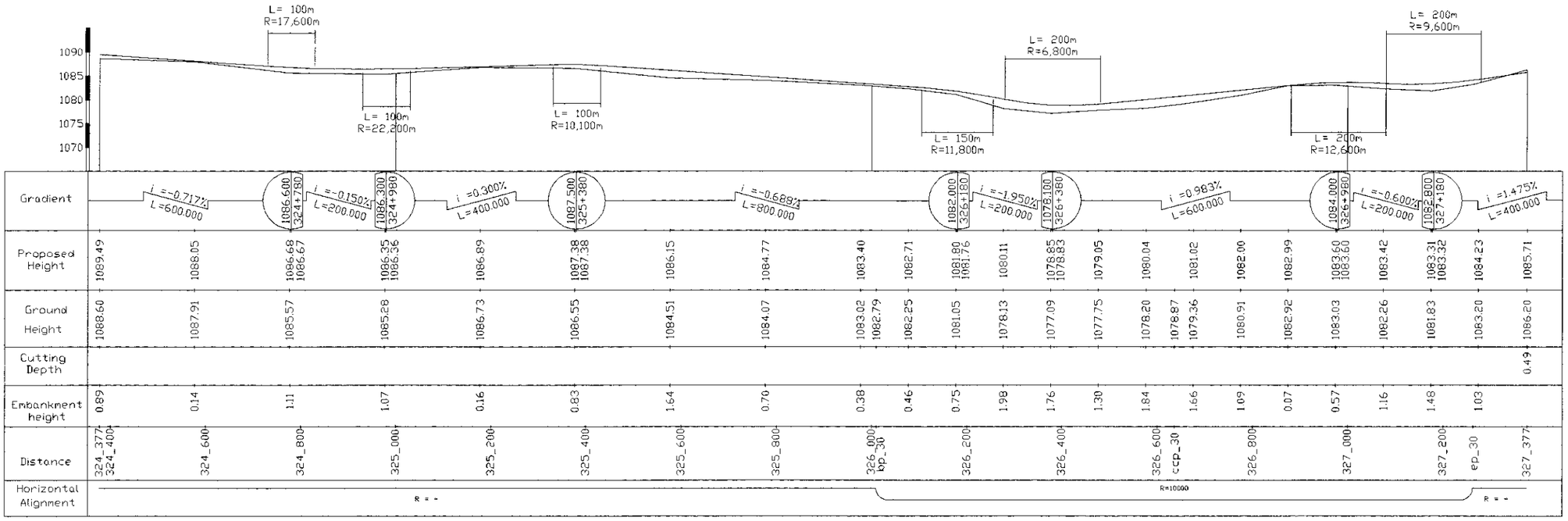
Distance	Proposed Height	Ground Height	Cutting Depth	Embankment height
321_377 / 321_400	1122.40 / 1122.40	1121.38		1.02
321_600	1123.14	1122.47		0.67
321_800	1123.25 / 1123.22	1123.01		0.24
bp_29		1119.37		
322_000	1119.72	1118.44		1.28
	1117.54	1115.21		2.33
322_200	1115.90 / 1115.87	1114.28		1.62
	1115.40	1114.84		0.56
322_400	1115.39	1115.45	0.06	
	1114.56 / 1114.53	1114.63	0.07	
322_600	1112.78	1112.77		0.01
ccp_29	1110.15	1110.53 / 1109.48		0.67
322_800	1107.92 / 1107.87	1106.33		1.59
	1106.82	1105.50		1.32
323_000	1106.32	1106.55	0.23	
	1105.37 / 1105.33	1104.87		0.50
323_200	1103.47	1101.95		1.52
	1101.21 / 1101.15	1100.37		0.84
ep_29 / 323_400	1099.87	1099.72 / 1099.59		0.28
323_600	1097.55 / 1097.51	1096.58		0.97
323_800	1095.34	1094.44		0.90
324_000	1093.13	1092.73		0.40
324_200	1090.98 / 1090.95	1089.92		1.06
324_377	1089.49	1088.60		0.89

Horizontal Alignment: R = ∞ | R=5000 | R = ∞

321_377 - 324_377

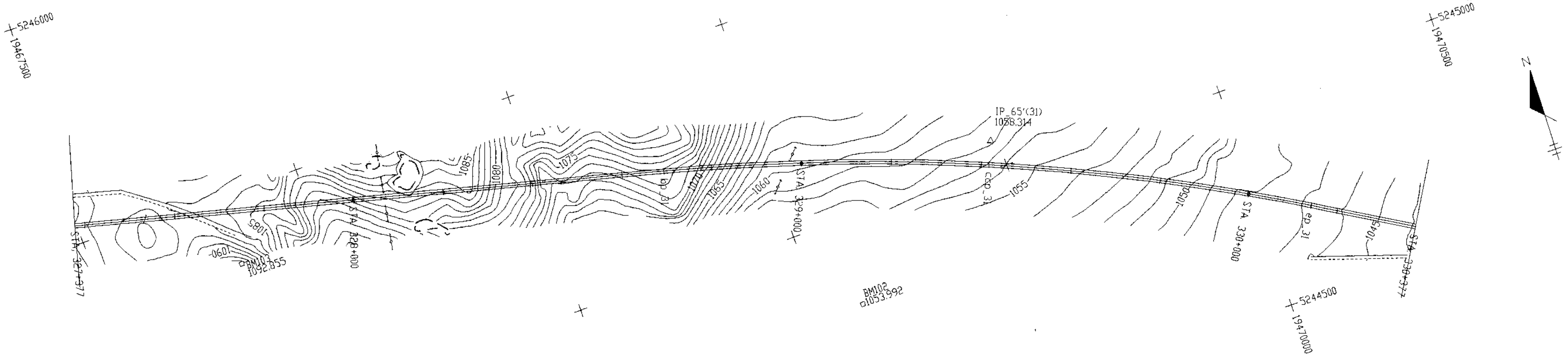
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	
Drawing title: PLAN AND PROFILE	Scale: H=1:10,000 V=1:1,000 — No: 8-74

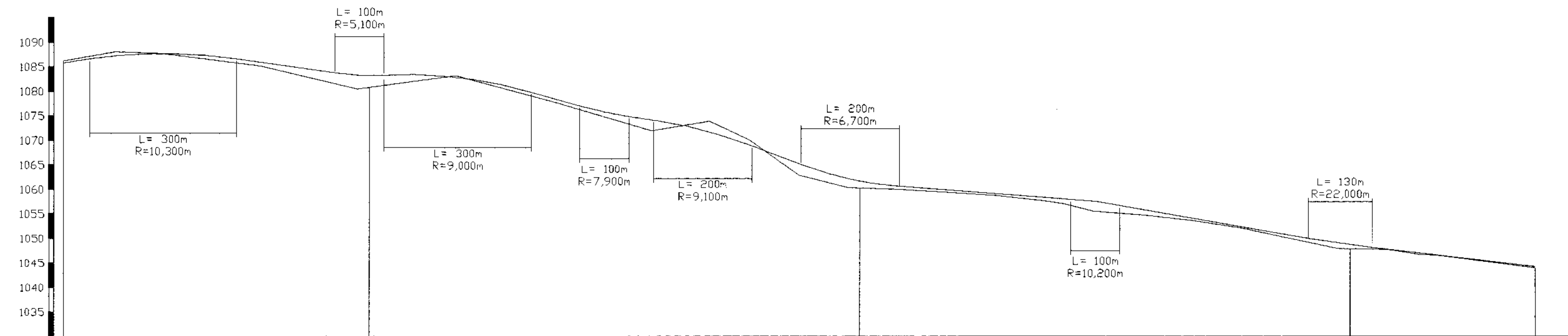




324_377 - 327_377

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-75





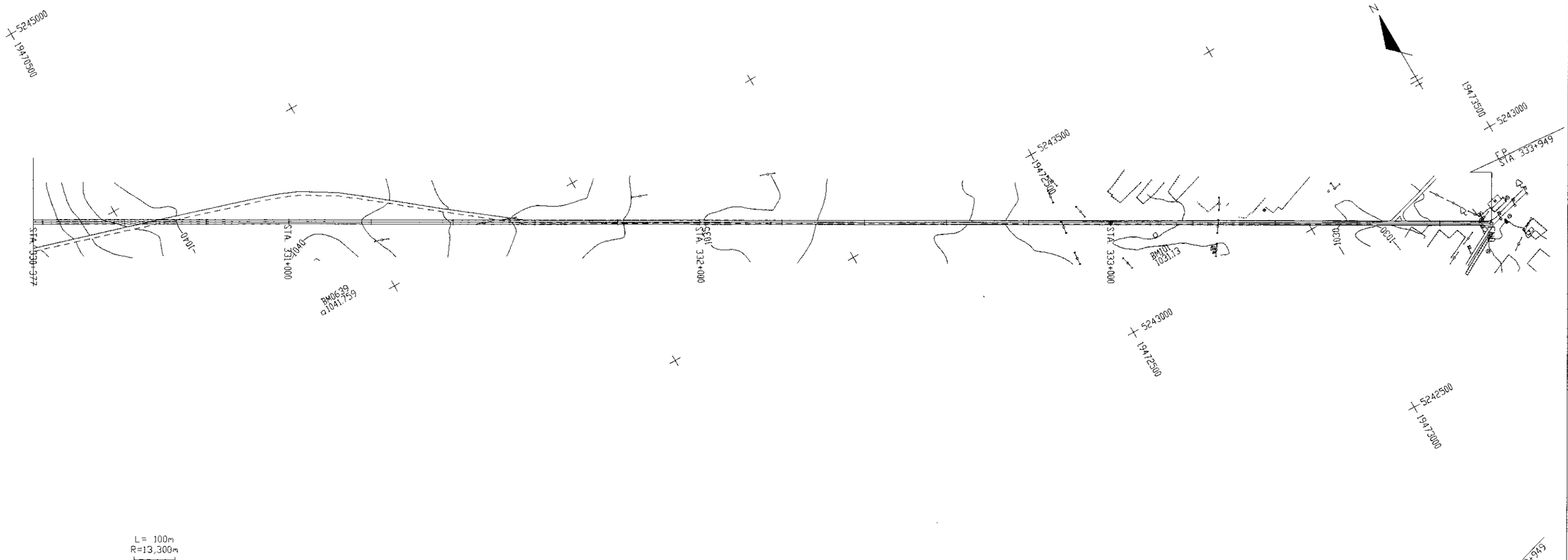
Gradient: i =1.475% L=400.000 | 1088.700 327+580 | i =-1.425% L=400.000 | 1083.000 327+980 | i =0.500% L=200.000 | 1084.000 328+180 | i =-2.800% L=300.000 | 1075.600 328+580 | i =-1.550% L=200.000 | 1072.500 328+680 | i =-3.733% L=300.000 | 1061.300 328+980 | i =-0.760% L=500.000 | 1057.500 329+480 | i =-1.740% L=500.000 | 1048.800 329+980 | i =-1.150% L=600.000

Proposed Height	Ground Height	Cutting Depth	Embankment height	Distance
1085.71	1086.20	0.49		327_377 327_400
1087.07	1088.04	0.97		
1087.61 1087.61	1087.69	0.08		327_600
1085.89	1085.14		0.75	327_800
1083.26 1083.24	1080.42		2.84	328_000
1082.80 1082.76	1083.15	0.35		328_200
1078.48	1077.82		0.66	328_400
1075.76				
1074.10	1071.83		2.27	328_600
1071.95	1073.82			kp_31
1068.88	1069.94	1.06		328_800
1065.15	1062.84		2.31	
1062.11 1062.04	1060.28		1.83	329_000
1060.56	1059.92		0.64	
1059.80	1059.32		0.48	329_200
1059.04	1058.64		0.40	
1058.28	1057.54		0.74	329_400 ccp_31
	1056.91			
1057.41 1057.38	1055.42		1.99	
1055.81	1054.69		1.12	329_600
1054.07	1053.58		0.49	
1052.33	1052.04		0.29	329_800
1050.59	1049.90		0.69	
1048.94 1048.90	1047.83		1.11	330_000
1047.68	1047.66		0.02	
	1046.65			ep_31
1046.53	1046.44		0.09	330_200
1044.23	1043.88		0.35	330_377

Horizontal Alignment: R = ∞ | R = 5000 | R = ∞

327_377 - 330_377

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-76



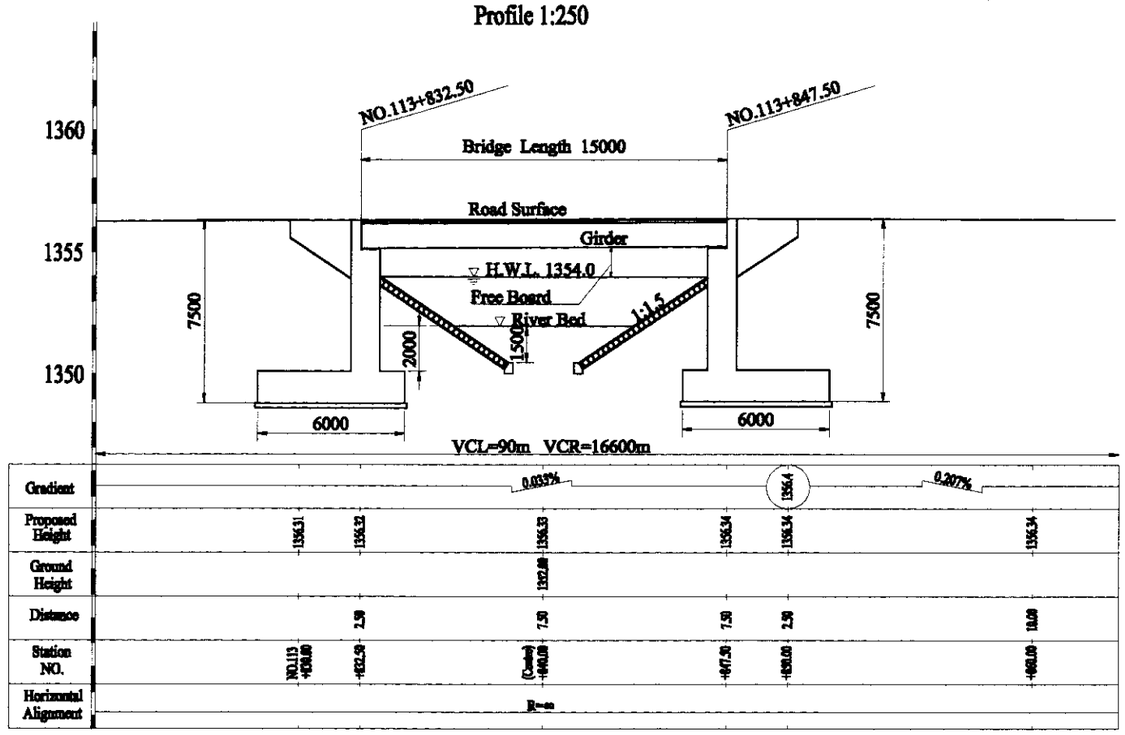
Gradient		i=-1.150% L=600.000	1041.900 330+580	i=-0.400% L=1000.000		1037.900 331+580			i=-0.433% L=1200.000			1032.700 332+780			i=-0.205% L=1169.000			1030.300 333+949
Proposed Height	1044.23	1042.02 1041.99	1041.11	1040.31	1039.51	1038.71	1037.91 1037.89	1037.05	1036.18	1035.31	1034.45	1033.58	1032.74 1032.73	1032.30	1031.88	1031.47	1031.06	1030.65	1030.30
Ground Height	1043.88	1040.91	1039.68	1039.26	1038.99	1038.12	1036.90	1036.43	1035.46	1034.86	1033.98	1033.27	1031.76	1031.15	1031.07	1030.72	1029.98	1030.07	1029.36
Cutting Depth																			
Embankment height	0.35	1.11	1.43	1.05	0.52	0.59	1.01	0.62	0.72	0.45	0.47	0.31	0.98	1.15	0.81	0.75	1.08	0.58	0.94
Distance	330_377 330_400	330_600	330_800	331_000	331_200	331_400	331_600	331_800	332_000	332_200	332_400	332_600	332_800	333_000	333_200	333_400	333_600	333_800	333_949 (END)
Horizontal Alignment	R = ∞																		

330_377 - 333_949

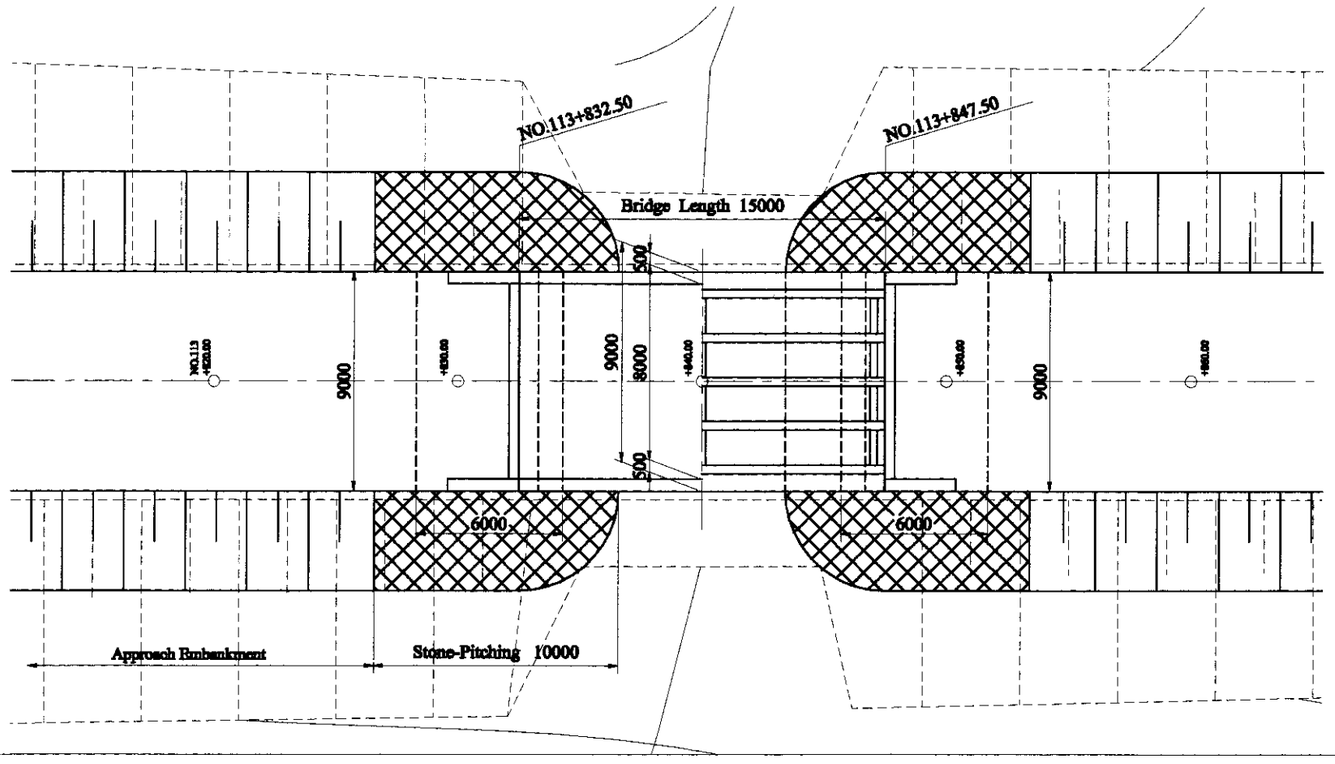
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
PLAN AND PROFILE	H=1:10,000 V=1:1,000	B-77

GENERAL VIEW OF KHUJIRT RIVER BRIDGE (B1)

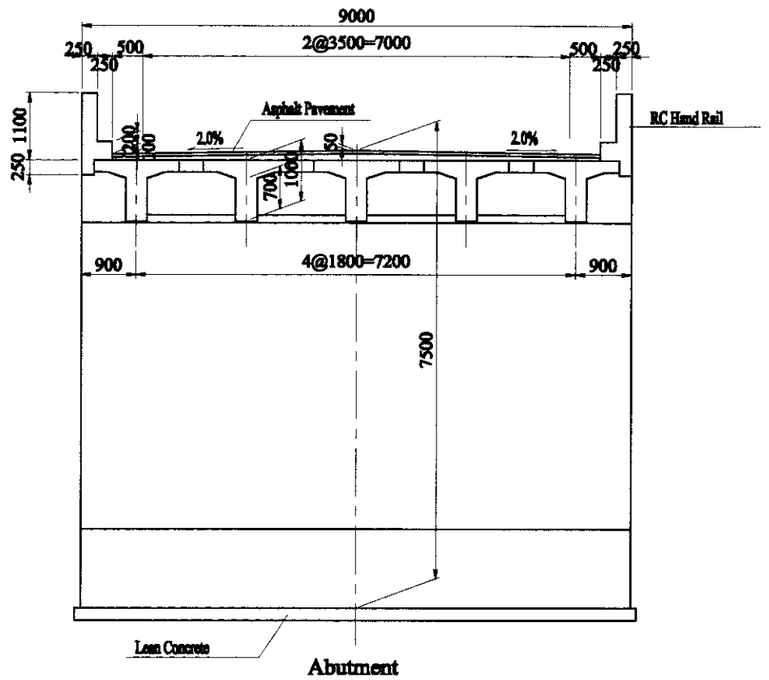
Profile 1:250



Plan 1:250

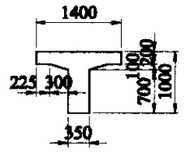


Section 1:100



Abutment

Section of Girder 1:100



DESIGN CRITERIA

GENERAL CONDITION		
Design Speed	V=100km/h	
Bridge Length	15.00m	
Total Width	9.00m	
Longitudinal Gradient	0.033% / 0.207%	
Cross-fall of Carriage way	2.0%	
Superstructure Type	RC-T Shape Girder	
Substructure Type	Abutment	RC Reversed T-Shape
Foundation Type	Spread	

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

LIST OF QUANTITY

Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Pavement	m2	120	t=5cm,Khujirt to Kherlen Br.
	Concrete Pavement	m2	—	t=5cm,σ28=240kgf/cm2,Tsenkher to Mörön Br.
	RC Hand Rail	m3	12	σ28=210kgf/cm2
	Reinforcing Bar for Rail	ton	1.0	SD295,345,390(σpy>30kgf/mm2)
	Expansion Joint	m	16	Rubber joint
Superstructure No. of Girder (5)	Concrete (for RC)	m3	53	σ28=240kgf/cm2
	Reinforcing Bar	ton	7.6	SD295,345,390(σpy>30kgf/mm2)
	Leveling Concrete	m3	10.8	σ28=240kgf/cm2
Substructure	Concrete	m3	257	σ28=210kgf/cm2
	Reinforcing Bar	ton	15.4	SD295,345,390(σpy>30kgf/mm2)
	Lean Concrete	m3	22.8	σ28=160kgf/cm2
Pile Foundation (Square 40cm)	RC Pile Length(m)	m	—	σ28=240kgf/cm2
				SD295,345,390(σpy>30kgf/mm2)
Structural Excavation	Up to 2m	m3	436	for Abutment
	Over 2m	m3	1281	
Approach Road	Earthworks	m	30	Average height 2m, width 5m
	Guide Post	no.	40	Concrete standard post
River Protection	Revetment	m2	366	Stone pitched type, slope 1:1.5
	Guide Bank	m	200	

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

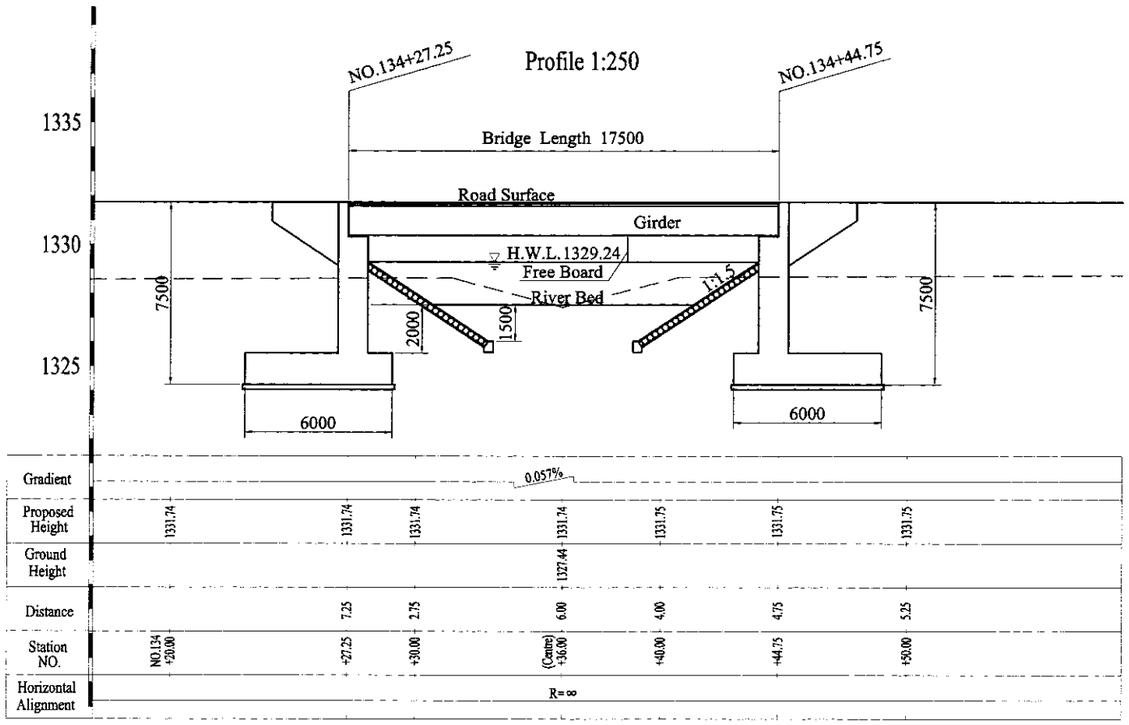
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

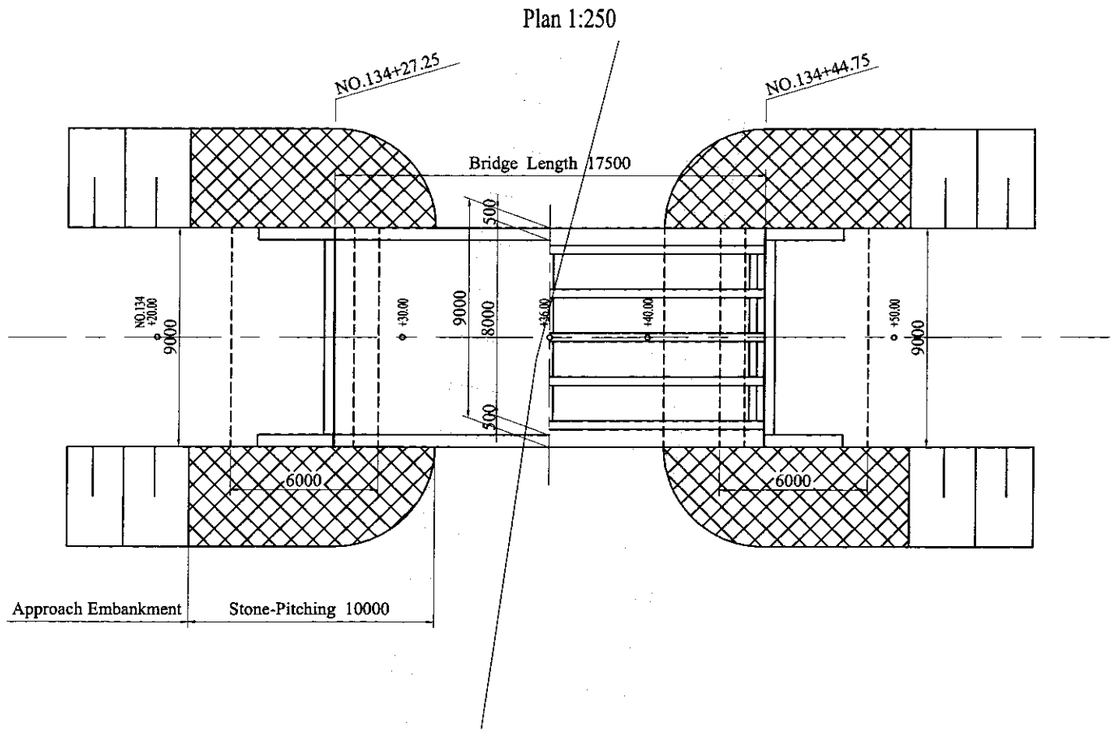
PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

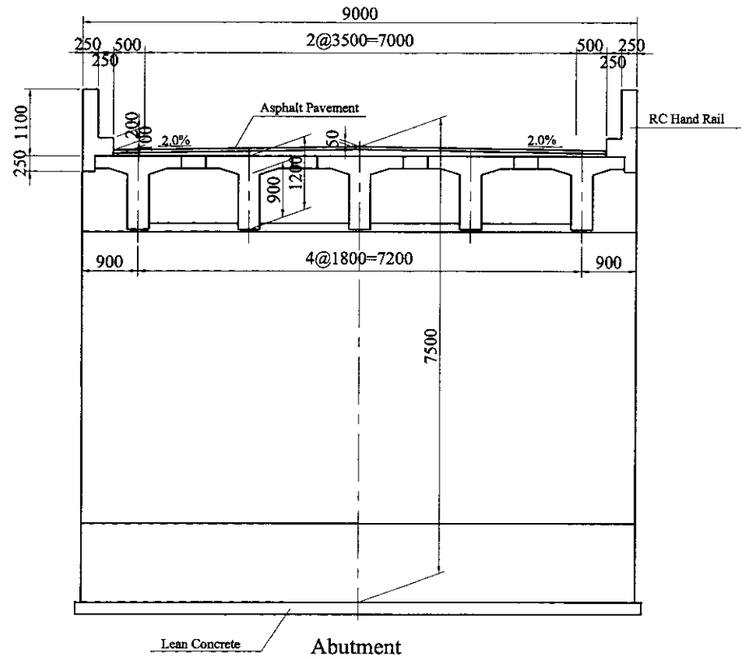
Drawing title	Scale	No.
GENERAL VIEW OF KHUJIRT RIVER BRIDGE (B1)	As shown	C-01

GENERAL VIEW OF KHUTSAA, NARIIN RIVER BRIDGE (B2)

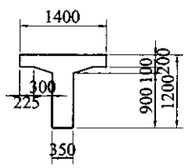




Section 1:100



Section of Girder 1:100



DESIGN CRITERIA

GENERAL CONDITION		
Design Speed	V=100km/h	
Bridge Length	17.50m	
Total Width	9.00m	
Longitudinal Gradient	0.057%	
Cross-fall of Carriage way	2.0%	
Superstructure Type	RC-T Shape Girder	
Substructure Type	Abutment	RC Reversed T-Shape
Foundation Type	Spread	

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

LIST OF QUANTITY

Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Pavement	m2	140	t=5cm,Khujirt to Kherlen Br.
	Concrete Pavement	m2	—	t=5cm,σ28=240kgf/cm2,Tsenkher to Murun Br.
	RC Hand Rail	m3	14	σ28=210kgf/cm2
	Reinforcing Bar for Rail	ton	1.1	SD295,345,390(σpy>30kgf/mm2)
	Expansion Joint	m	16	Rubber joint
Superstructure	Concrete (for RC)	m3	68	σ28=240kgf/cm2
No. of Girder (5)	Reinforcing Bar	ton	9.8	SD295,345,390(σpy>30kgf/mm2)
	Leveling Concrete	m3	12.6	σ28=240kgf/cm2
Substructure	Concrete	m3	250	σ28=210kgf/cm2
	Reinforcing Bar	ton	15.0	SD295,345,390(σpy>30kgf/mm2)
	Lean Concrete	m3	22.8	σ28=160kgf/cm2
Pile Foundation (Square 40cm)	RC Pile Length(m)	m	—	σ28=240kgf/cm2 SD295,345,390(σpy>30kgf/mm2)
Structural Excavation	Up to 2m	m3	436	for Abutment, Pier
	Over 2m	m3	1235	
Approach Road	Earthworks	m	35	Average height 2m, width 5m
	Guide Post	no.	40	Concrete standard post
River Protection	Revetment	m2	345	Stone pitched type, slope 1:1.5
	Guide Bank	m	200	

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

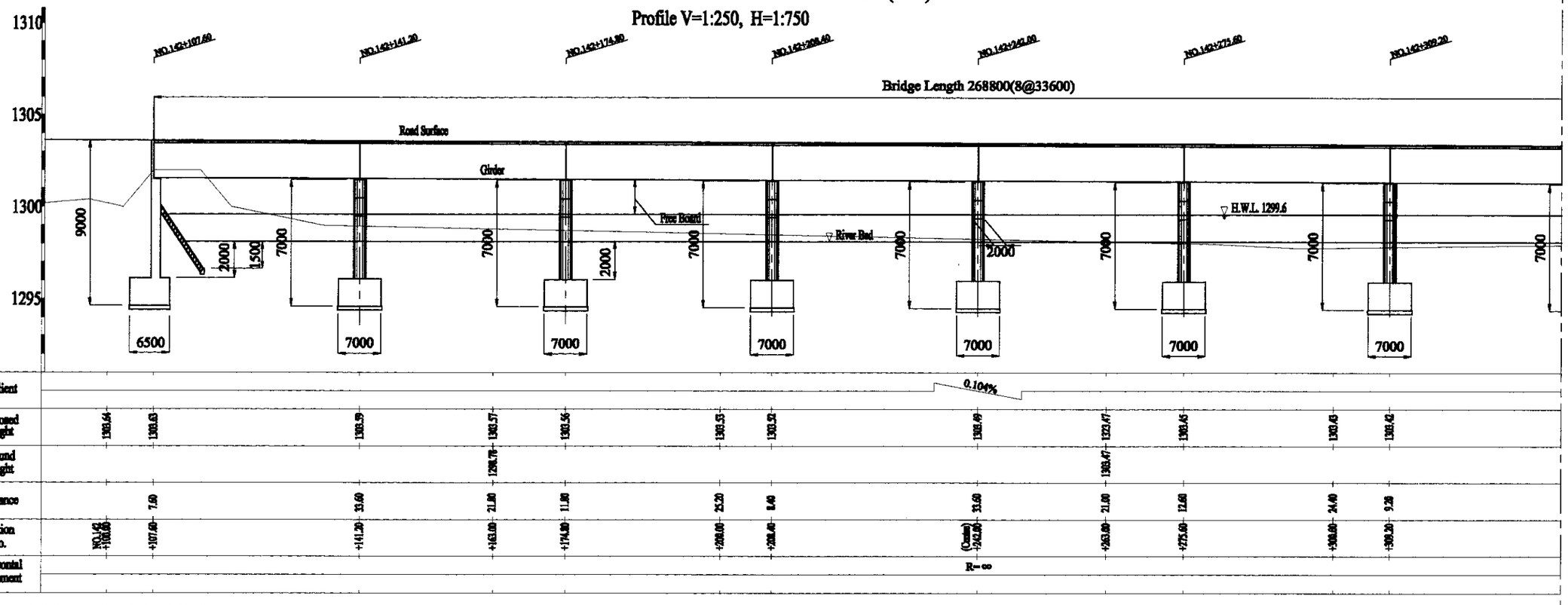
PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

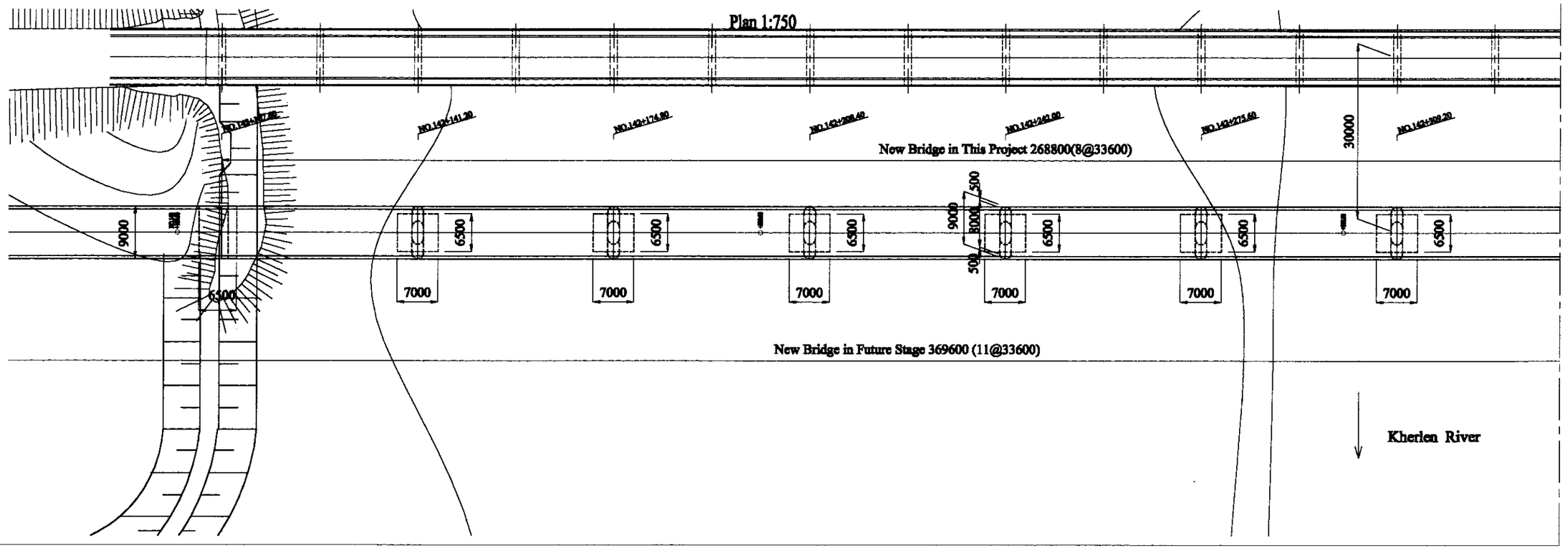
Drawing title	Scale	No.
GENERAL VIEW OF KHUTSAA, NARIIN RIVER BRIDGE (B2)	As shown	C-02

GENERAL VIEW OF KHERLEN RIVER BRIDGE (B3)

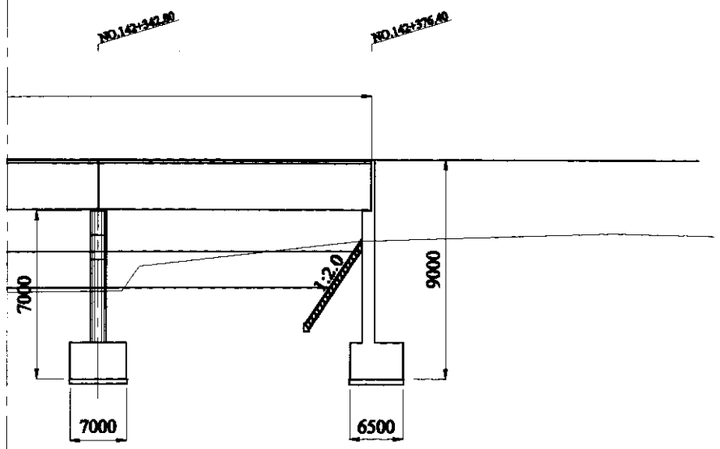
Profile V=1:250, H=1:750

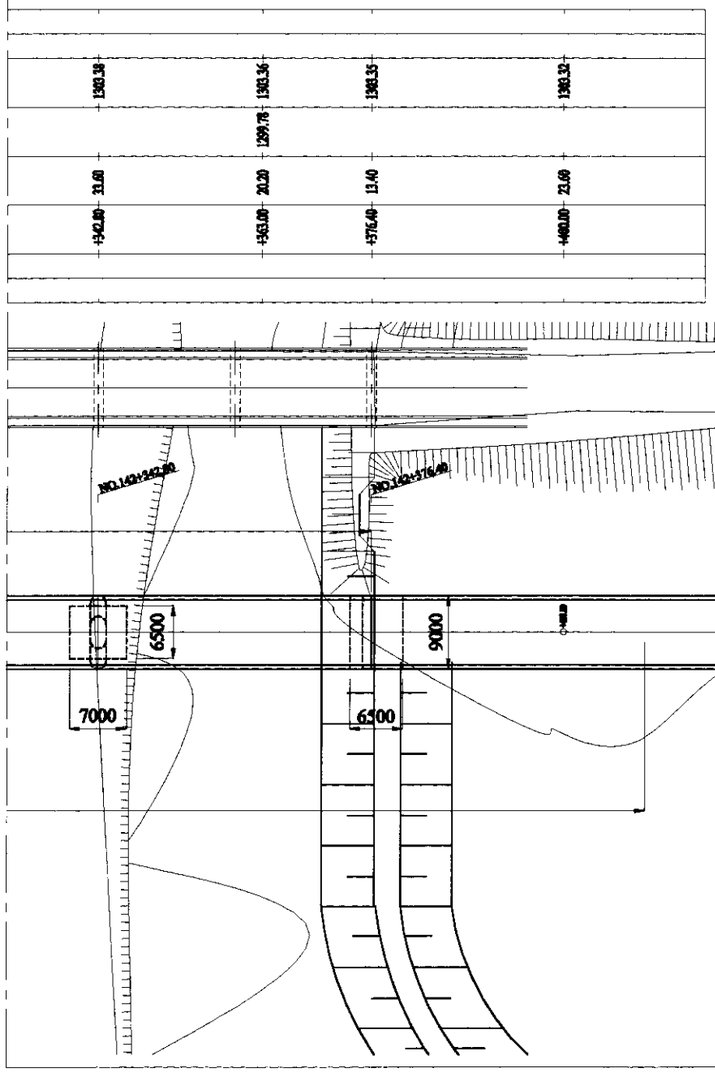


Plan 1:750

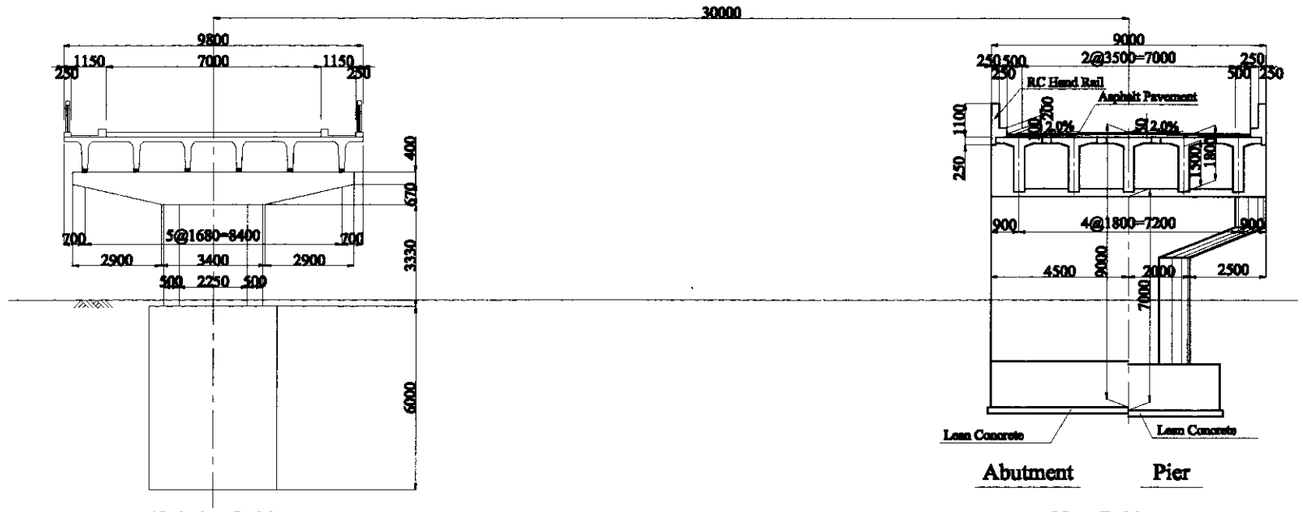


GENERAL VIEW OF KHERLEN RIVER BRIDGE (B3)

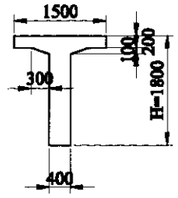




Section 1:200



Section of Girder 1:200



DESIGN CRITERIA

GENERAL CONDITION		
Design Speed	V=80km/h	
Bridge Length (Span Length)	268.80m (8@33.60m)	
Total Width	9.00m	
Longitudinal Gradient	0.104%	
Cross-fall of Carriage way	2.0%	
Superstructure Type	RC-T Shape Girder	
Substructure Type	Abutment	RC Reversed T-Shape
	Pier	RC Wall (Cantilever-beam)
Foundation Type	Spread	

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

LIST OF QUANTITY

Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Pavement	m2	2150	t=5cm,Khujirt to Kherlen Br.
	Concrete Pavement	m2	—	t=5cm,σ28=240kgf/cm2,Tsenkher to Murun Br.
	RC Hand Rail	m3	209	σ28=210kgf/cm2
	Reinforcing Bar for Rail	ton	16.7	SD295,345,390(σpy>30kgf/mm2)
	Expansion Joint	m	72	Rubber joint
Superstructure No. of Girder (40)	Concrete (for PC)	m3	1304	σ28=400kgf/cm2
	Concrete (for RC)	m3	124	σ28=240kgf/cm2
	Reinforcing Bar	ton	13.3	SD295,345,390(σpy>30kgf/mm2)
	Prestressed Cable	ton	65.2	T-12.7mm(σpy=160kgf/mm2)
	Leveling Concrete	m3	193.5	σ28=240kgf/cm2
Substructure	Concrete	m3	1194	σ28=210kgf/cm2
	Reinforcing Bar	ton	71.6	SD295,345,390(σpy>30kgf/mm2)
	Lean Concrete	m3	92.2	σ28=160kgf/cm2
Pile Foundation (Square 40cm)	RC Pile Length(m)	m	—	σ28=240kgf/cm2 SD295,345,390(σpy>30kgf/mm2)
Structural Excavation	Up to 2m	m3	460	for Abutment, Pier
	Over 2m	m3	1804	
Approach Road	Earthworks	m	1000	Average height 2m, width 5m
	Guide Post	no.	40	Concrete standard post
River Protection	Revetment	m2	141	Stone pitched type, slope 1:2
	Guide Bank	m	200	

LIST OF QUANTITY FOR REPAIR OF EXISTING BRIDE

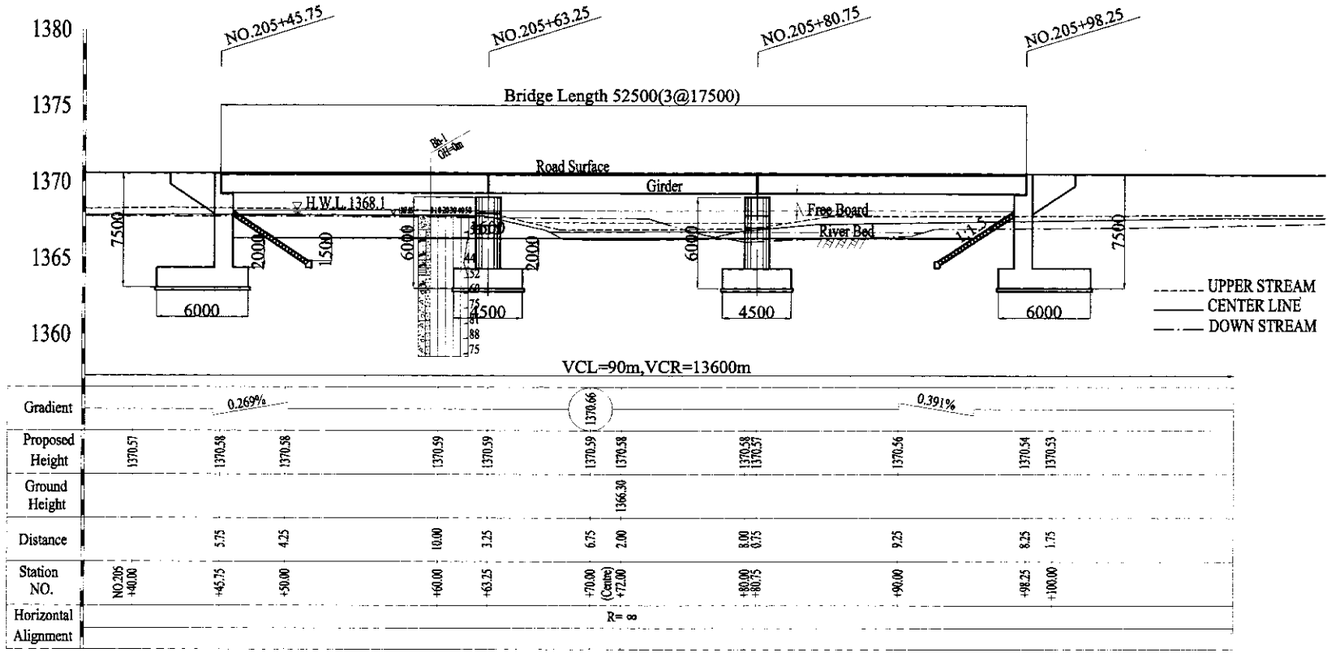
Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Overlay	m2	1882	t=3cm
	Surface Repair	m3	4	with concrete σ28=240kgf/cm2,joint parts
	Joint Repair	m	388	with asphalt material
	Hand Rail Repair	m	512	
	Hand Rail Replacement	m	26	Concrete & Reinforcing bar
Structures	Girder Crack Repair	m3	0.4	Concrete or mortar
	Pier Crack Repair	LS	0.2	Concrete or mortar
Approach	Surface Repair	m2	392	

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

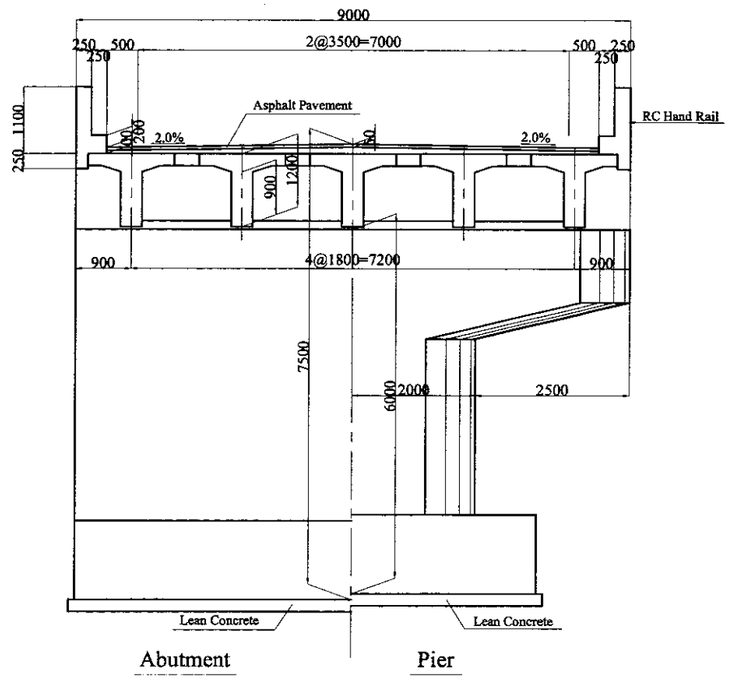
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
GENERAL VIEW OF KHERLEN RIVER BRIDGE (B3)	As shown	C-03

GENERAL VIEW OF TSENKHER RIVER BRIDGE (B4)

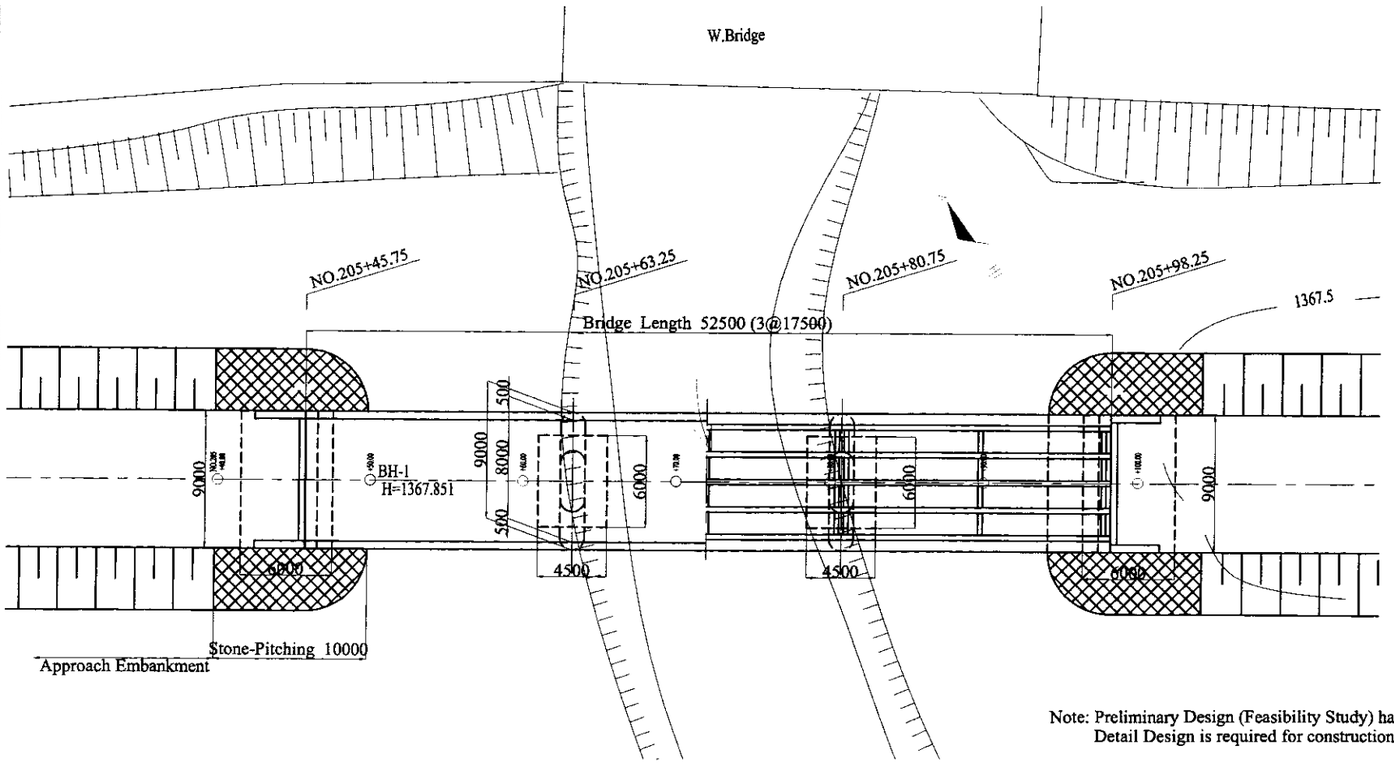
Profile 1:400



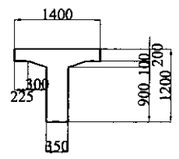
Section 1:100



Plan 1:400



Section of Girder 1:100



DESIGN CRITERIA

GENERAL CONDITION		
Design Speed	V=100km/h	
Bridge Length (Span Length)	52.50m (3@17.50m)	
Total Width	9.00m	
Longitudinal Gradient	0.269% ↗ 0.391% ↘	
Cross-fall of Carriage way	2.0%	
Superstructure Type	RC-T Shape Girder	
Substructure Type	Abutment	RC Reversed T-Shape
	Pier	RC Wall (Cantilever-beam)
Foundation Type	Spread	

LIST OF QUANTITY

Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Pavement	m2	–	t=5cm,Khujirt to Kherlen Br.
	Concrete Pavement	m2	420	t=5cm,σ28=240kgf/cm2,Tsenkher to Murun Br.
	RC Hand Rail	m3	42	σ28=210kgf/cm2
	Reinforcing Bar for Rail	ton	3.4	SD295,345,390(σpy>30kgf/mm2)
	Expansion Joint	m	32	Rubber joint
Superstructure	Concrete (for RC)	m3	204	σ28=240kgf/cm2
No. of Girder (15)	Reinforcing Bar	ton	29.3	SD295,345,390(σpy>30kgf/mm2)
	Leveling Concrete	m3	37.8	σ28=240kgf/cm2
Substructure	Concrete	m3	403	σ28=210kgf/cm2
	Reinforcing Bar	ton	24.2	SD295,345,390(σpy>30kgf/mm2)
	Lean Concrete	m3	34.5	σ28=160kgf/cm2
Pile Foundation (Square 40cm)	RC Pile Length(m)	m	–	σ28=240kgf/cm2 SD295,345,390(σpy>30kgf/mm2)
Structural Excavation	Up to 2m	m3	710	for Abutment, Pier
	Over 2m	m3	1564	
Approach Road	Earthworks	m	105	Average height 2m, width 5m
	Guide Post	no.	40	Concrete standard post
River Protection	Revetment	m2	345	Stone pitched type, slope 1:1.5
	Guide Bank	m	200	

Note: Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

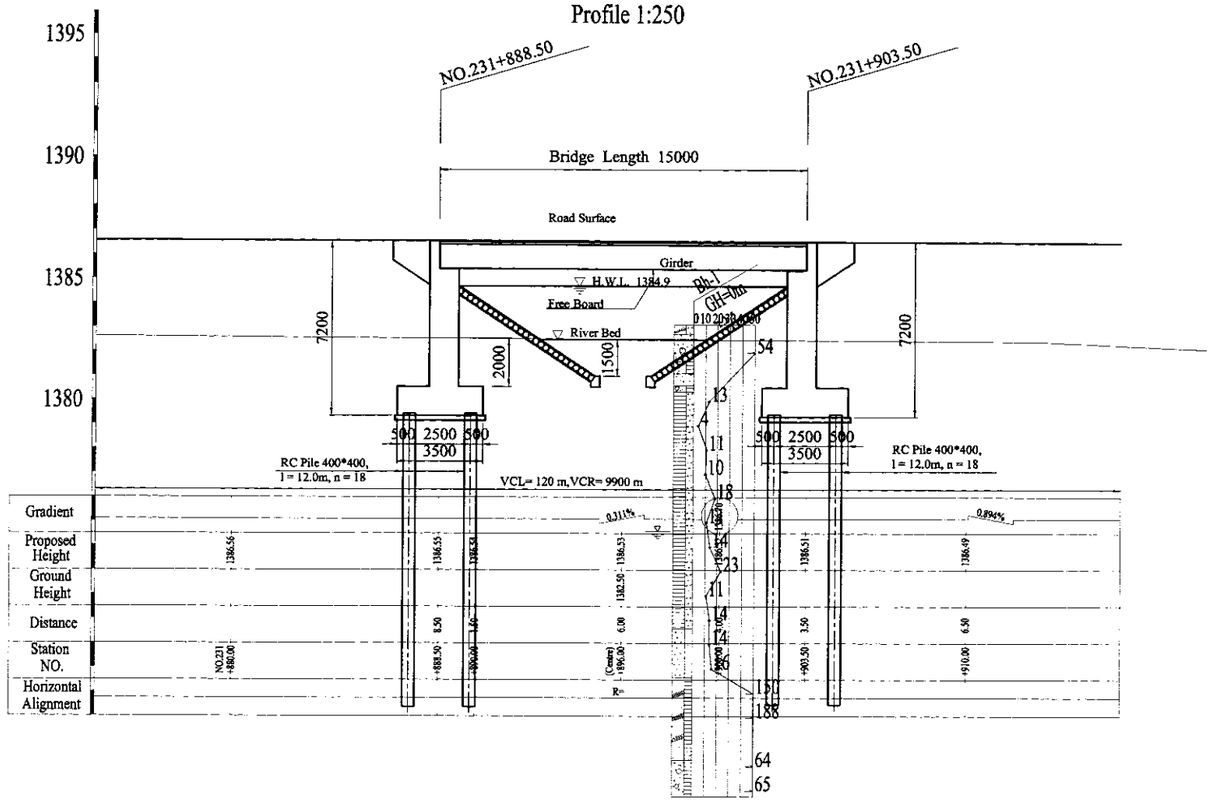
PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

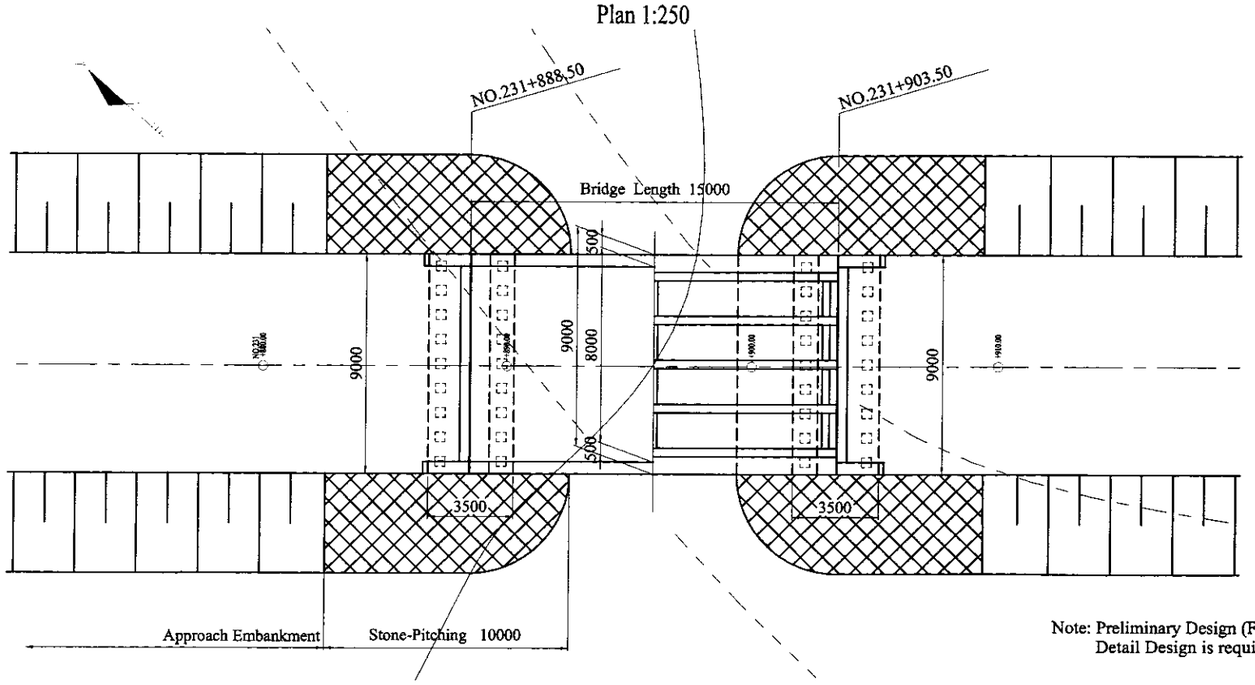
Drawing title	Scale	No.
GENERAL VIEW OF TSENKHER RIVER BRIDGE (B4)	As shown	C-04

GENERAL VIEW OF URT VALLEY BRIDGE (B5)

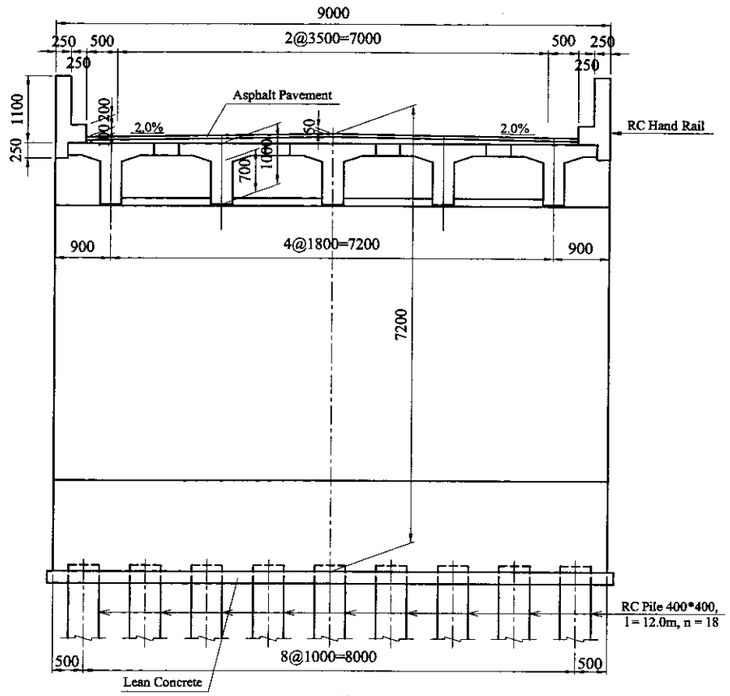
Profile 1:250



Plan 1:250

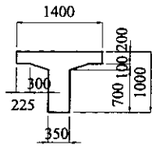


Section 1:100



Abutment

Section of Girder 1:100



DESIGN CRITERIA

GENERAL CONDITION		
Design Speed	V=100km/h	
Bridge Length	15.00m	
Total Width	9.00m	
Longitudinal Gradient	0.311% / 0.894%	
Cross-fall of Carriage way	2.0%	
Superstructure Type	RC-T Shape Girder	
Substructure Type	Abutment	RC Reversed T-Shape
Foundation Type	Spread	

LIST OF QUANTITY

Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Pavement	m2	—	t=5cm,Khujirt to Kherlen Br.
	Concrete Pavement	m2	120	t=5cm,σ28=240kgf/cm2,Tsenkher to Murun Br.
	RC Hand Rail	m3	12	σ28=210kgf/cm2
	Reinforcing Bar for Rail	ton	1.0	SD295,345,390(σpy>30kgf/mm2)
	Expansion Joint	m	16	Rubber joint
Superstructure	Concrete (for RC)	m3	53	σ28=240kgf/cm2
No. of Girder (5)	Reinforcing Bar	ton	7.6	SD295,345,390(σpy>30kgf/mm2)
	Leveling Concrete	m3	10.8	σ28=240kgf/cm2
Substructure	Concrete	m3	188	σ28=210kgf/cm2
	Reinforcing Bar	ton	11.3	SD295,345,390(σpy>30kgf/mm2)
	Lean Concrete	m3	13.6	σ28=160kgf/cm2
Pile Foundation (Square 40cm)	RC Pile Length(12.0m)	m	432	σ28=240kgf/cm2 SD295,345,390(σpy>30kgf/mm2)
Structural Excavation	Up to 2m	m3	316	for Abutment, Pier
	Over 2m	m3	944	
Approach Road	Earthworks	m	30	Average height 2m, width 5m
	Guide Post	no.	40	Concrete standard post
River Protection	Revetment	m2	335	Stone pitched type, slope 1:1.5
	Guide Bank	m	200	

Note: Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

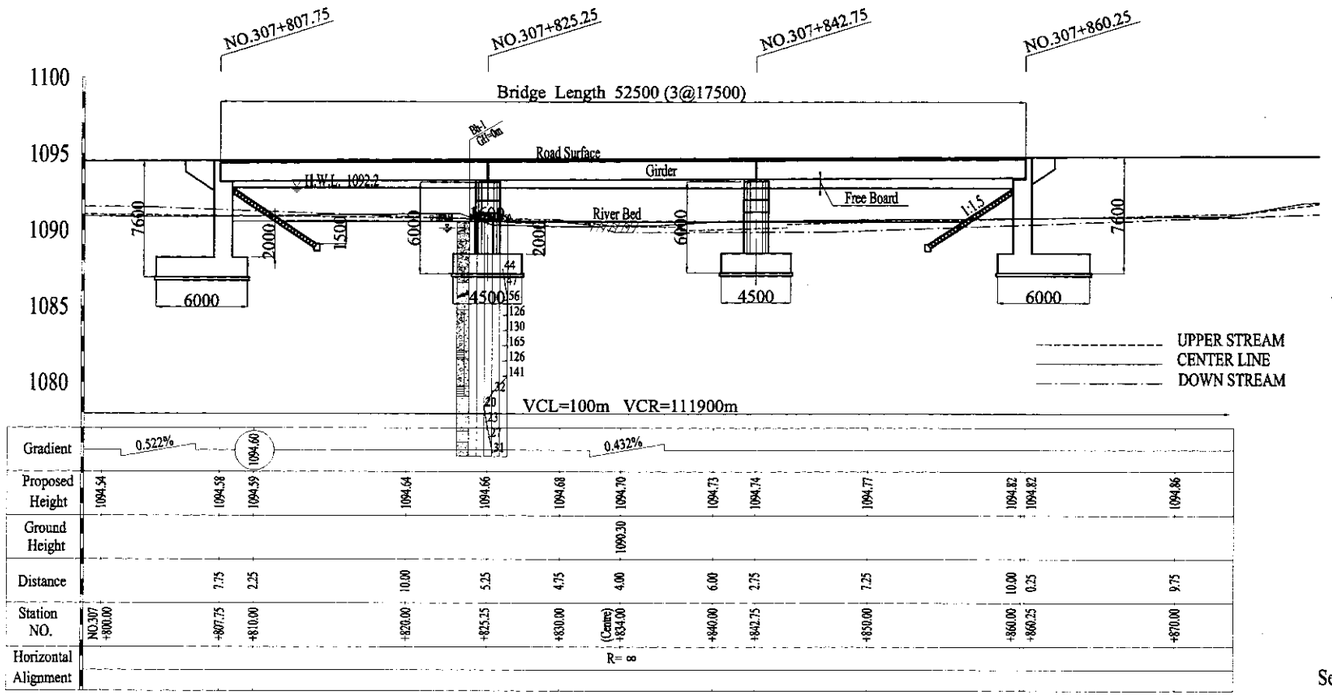
PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

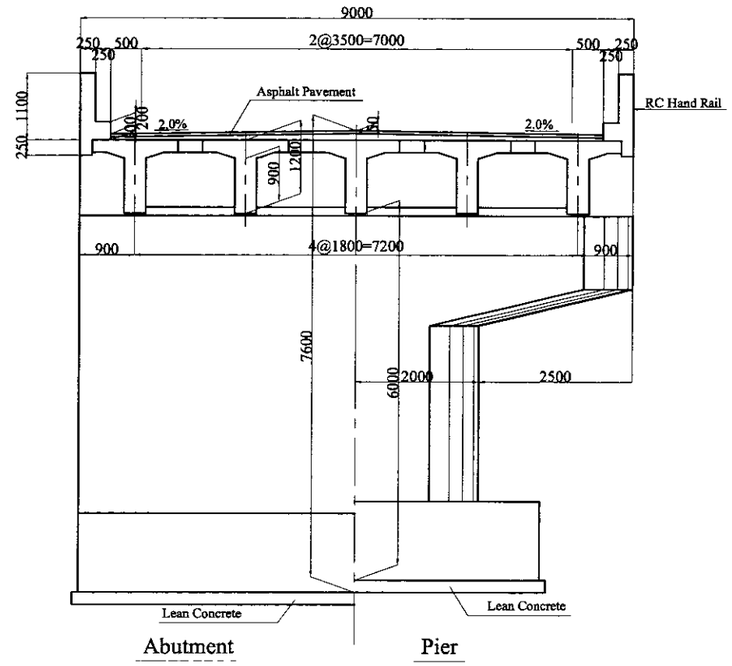
Drawing title	Scale	No.
GENERAL VIEW OF URT VALLEY BRIGDE (B5)	As shown	C-05

GENERAL VIEW OF MURUN RIVER BRIDGE (B6)

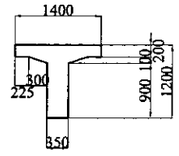
Profile 1:400



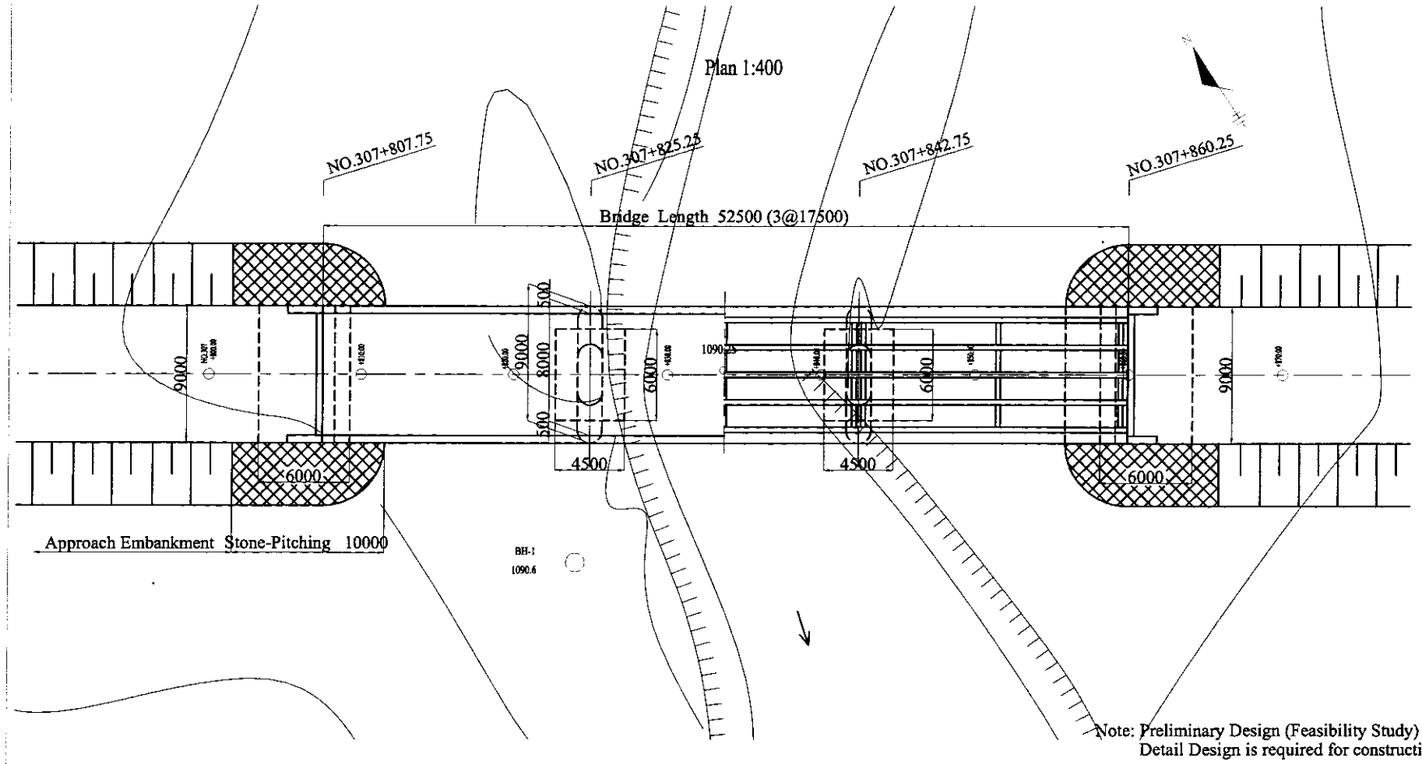
Section 1:100



Section of Girder 1:100



Plan 1:400



DESIGN CRITERIA

GENERAL CONDITION		
Design Speed	V=100km/h	
Bridge Length (Span Length)	52.50m (3@17.50m)	
Total Width	9.00m	
Longitudinal Gradient	0.522% ＼	0.432% ＼
Cross-fall of Carriage way	2.0%	
Superstructure Type	RC-T Shape Girder	
Substructure Type	Abutment	RC Reversed T-Shape
	Pier	RC Wall (Cantilever-beam)
Foundation Type	Spread	

LIST OF QUANTITY

Category	Material	Unit	Quantity	Specification
Bridge Surface	Asphalt Pavement	m2	—	t=5cm,Khujirt to Kherlen Br.
	Concrete Pavement	m2	420	t=5cm,σ28=240kgf/cm2,Tsenkher to Murun Br.
	RC Hand Rail	m3	42	σ28=210kgf/cm2
	Reinforcing Bar for Rail	ton	3.4	SD295,345,390(σpy>30kgf/mm2)
	Expansion Joint	m	32	Rubber joint
Superstructure No. of Girder (15)	Concrete (for RC)	m3	204	σ28=240kgf/cm2
	Reinforcing Bar	ton	29.3	SD295,345,390(σpy>30kgf/mm2)
	Leveling Concrete	m3	37.8	σ28=240kgf/cm2
Substructure	Concrete	m3	405	σ28=210kgf/cm2
	Reinforcing Bar	ton	24.3	SD295,345,390(σpy>30kgf/mm2)
	Lean Concrete	m3	34.5	σ28=160kgf/cm2
Pile Foundation (Square 40cm)	RC Pile Length(m)	m	—	σ28=240kgf/cm2 SD295,345,390(σpy>30kgf/mm2)
Structural Excavation	Up to 2m	m3	710	for Abutment, Pier
	Over 2m	m3	1570	
Approach Road	Earthworks	m	105	Average height 2m, width 5m
	Guide Post	no.	40	Concrete standard post
River Protection	Revetment	m2	356	Stone pitched type, slope 1:1.5
	Guide Bank	m	200	

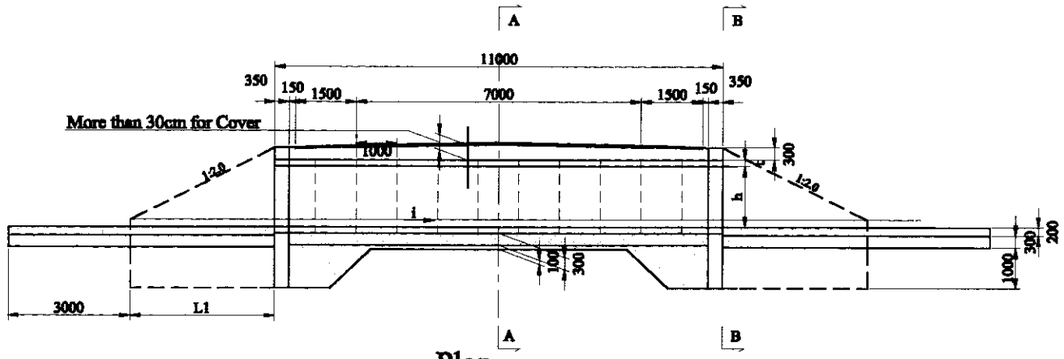
Note: Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

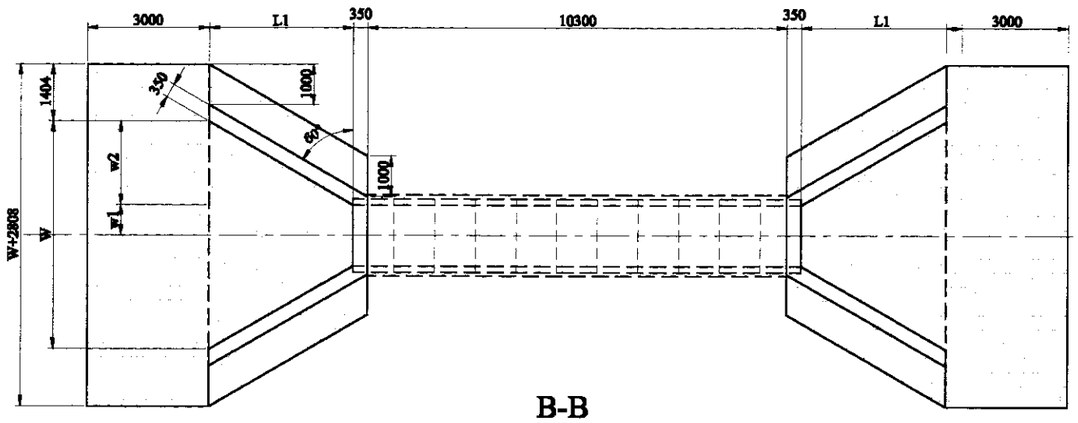
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	
Drawing title	Scale / No.
GENERAL VIEW OF MURUN RIVER BRIDGE (B6)	As shown / C-06

GENERAL VIEW OF PIPE CULVERTS

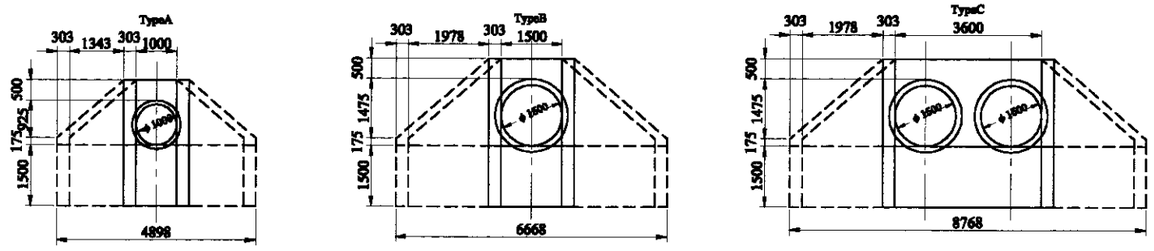
Profile 1:150



Plan

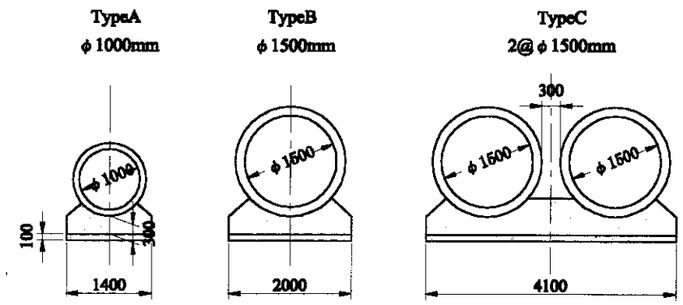


B-B



Legend
- Leveling Concrete
- Stone Pitching
- Gravel

Section A-A 1:100



List of Quantity

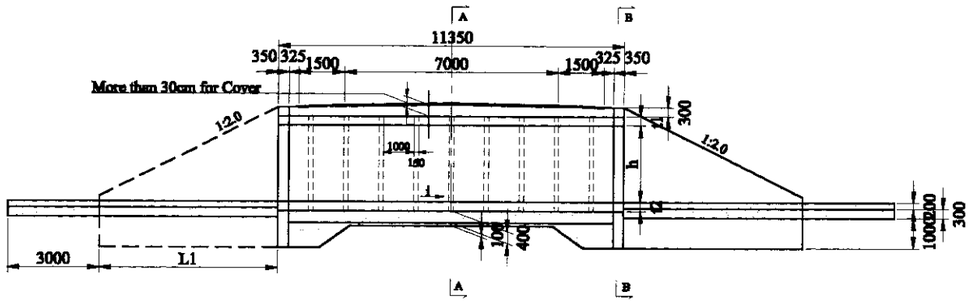
		Type-A	Type-B	Type-C
Concrete : σ28=210kgf/cm2	m3	15.74	27.05	38.89
Reinforcing Bar : SD295(σy=3000kgf/cm2)	t	0.71	1.18	1.60
Leveling Concrete σ28=160kgf/cm2	m3	8.11	13.94	27.36
Gravel	m3	23.33	33.63	50.03
Stone Pitching	m²	52.47	68.78	81.38
Excavation	m3	54.10	79.34	119.71
h	m	1.000	1.500	1.500
t	m	0.100	0.150	0.150
L1	m	2.450	3.550	3.550
W	m	3.829	5.599	7.699
w1	m	0.500	0.750	1.800
w2	m	1.415	2.050	2.050

Note: Preliminary Design (Feasibility Study) has been done for this drawing. Detail Design is required for construction of these culverts.

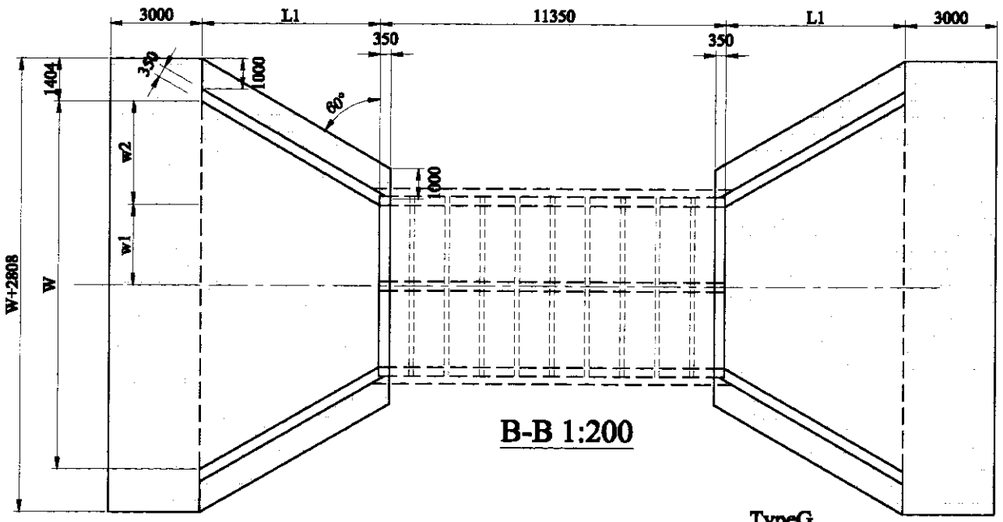
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
Drawing title	Scale	No.
GENERAL VIEW OF PIPE CULVERTS	As Shown	C-07

GENERAL VIEW OF BOX CULVERTS

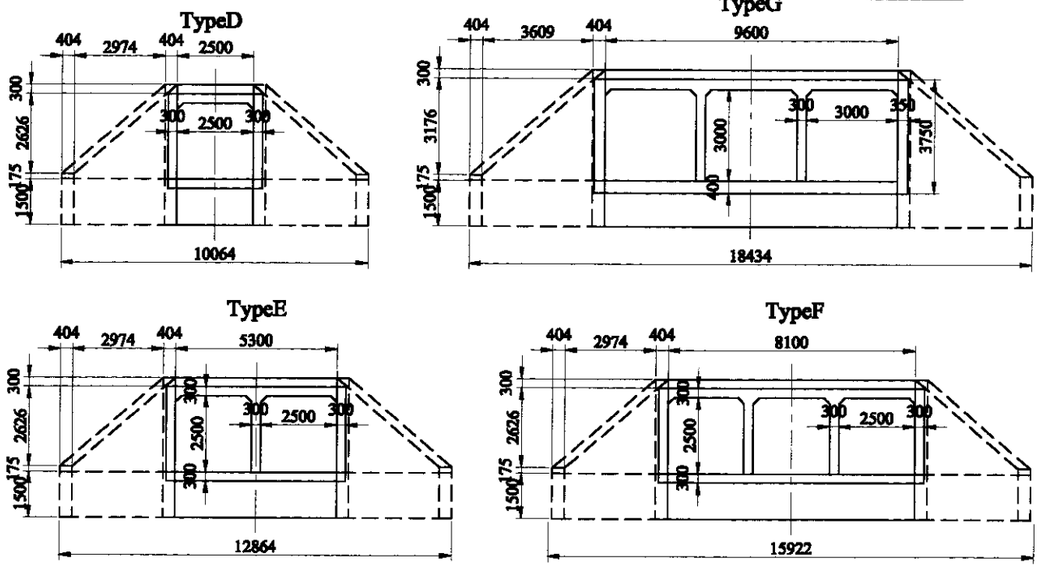
Profile 1:200



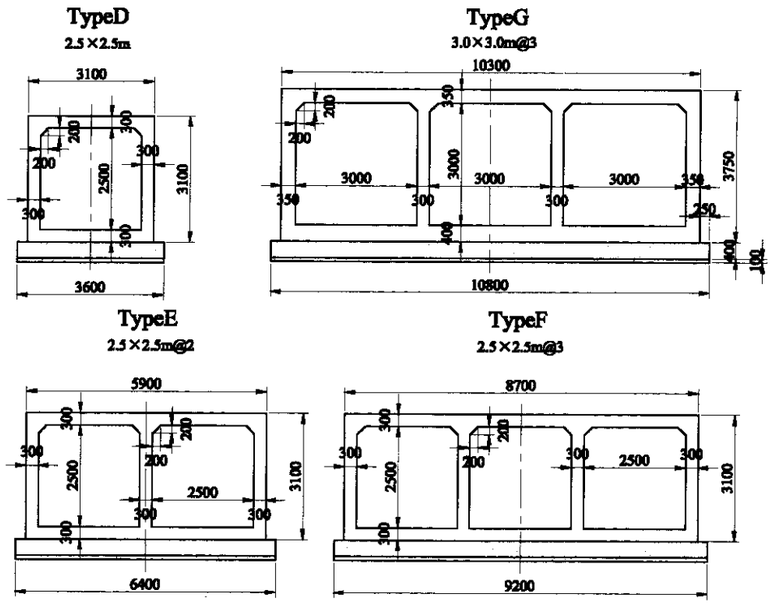
Plan 1:200



B-B 1:200



Section A-A 1:150



List of Quantity

		Type-D	Type-E	Type-F	Type-G
Concrete (Pre-cast) : σ28=210kgf/cm2	m3	34.00	58.70	83.40	117.45
Reinforcing Bar (Pre-cast) : SD295(σy=3000kgf/cm2)	t	1.70	2.94	4.17	5.87
Concrete (Cast-in-situ) : σ28=210kgf/cm2	m3	37.52	43.79	50.07	64.29
Reinforcing Bar (Cast-in-situ) : SD295(σy=3000kgf/cm2)	t	1.88	2.19	2.50	3.21
Leveling Concrete σ28=160kgf/cm2	m3	29.09	47.57	66.05	83.85
Gravel	m3	58.97	82.70	106.43	130.70
Stone Pitching	m²	98.54	115.34	132.14	153.68
Excavation	m3	130.92	182.37	233.82	286.72
h	m	2.50	2.50	2.50	3.00
t1	m	0.30	0.30	0.30	0.35
t2	m	0.30	0.30	0.30	0.40
t3	m	0.30	0.30	0.30	0.30
L1	m	5.85	5.85	5.85	6.95
W	m	9.25	12.05	14.85	17.63
w1	m	1.25	2.65	4.05	4.80
w2	m	3.38	3.38	3.38	4.01

Legend
- Leveling Concrete
- Stone Pitching
- Gravel

Note: Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of these culverts.

STATION OF BOX CULVERTS FOR THE PROJECT

No.	Station(Centre)	Type
BC1	150 +773	D
BC2	151 +770	D
BC3	154 +885	D
BC4	157 +770	E
BC5	158 +265	F
BC6	171 +313	D
BC7	171 +963	D
BC8	176 +367	E
BC9	181 +171	D
BC10	184 +370	E
BC11	187 +215	E
BC12	190 +521	E
BC13	192 +570	D
BC14	194 +970	F
BC15	196 +370	D
BC16	198 +921	E
BC17	207 +020	F
BC18	210 +677	E
BC19	214 +577	F
BC20	216 +274	E
BC21	224 +577	D
BC22	250 +377	E
BC23	259 +077	D
BC24	268 +777	F
BC25	270 +730	E
BC26	301 +177	E
BC27	305 +377	D
BC28	309 +877	D
BC29	313 +427	E

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

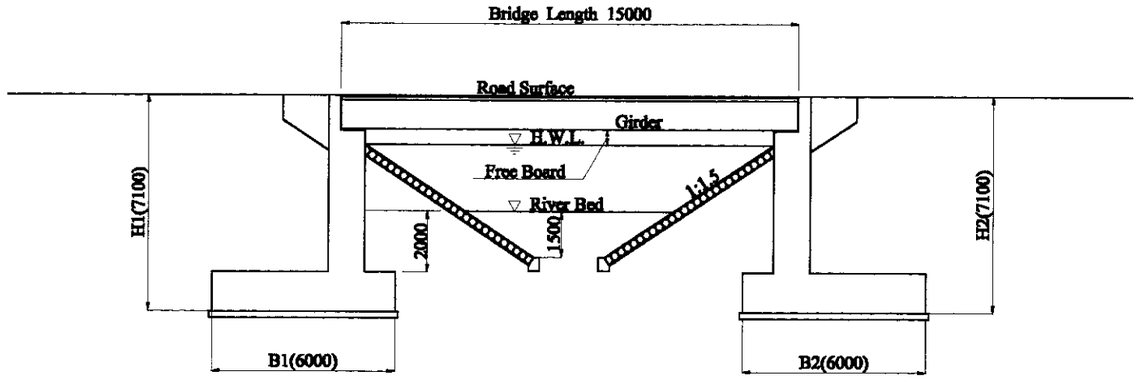
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

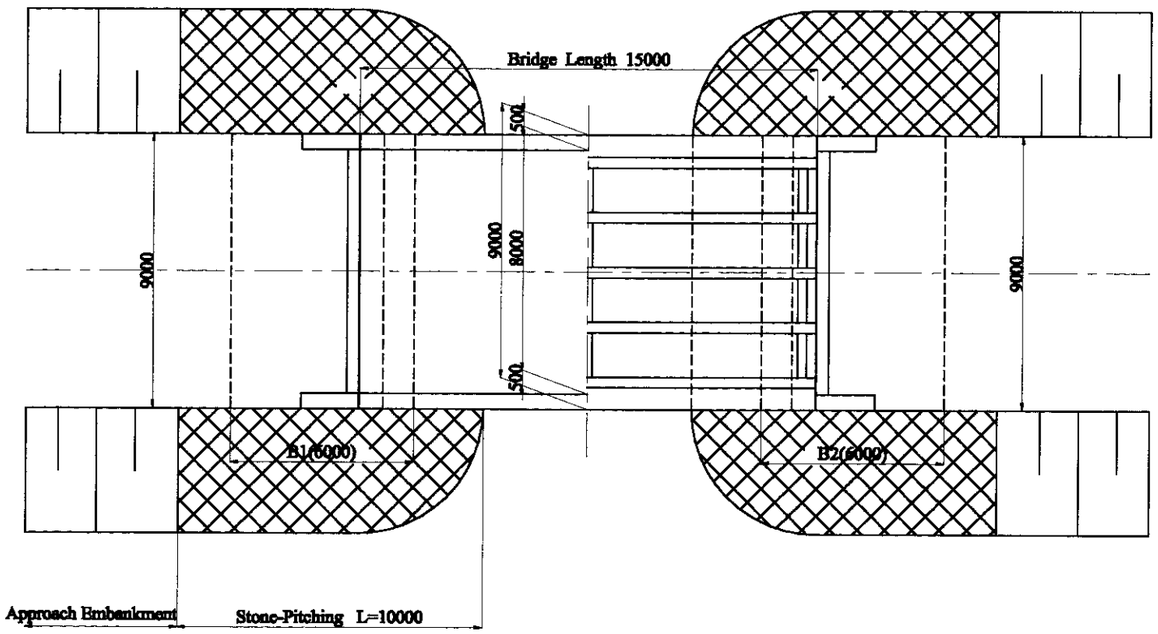
DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

Drawing title	Scale	No.
GENERAL VIEW OF BOX CULVERTS	As Shown	C--08

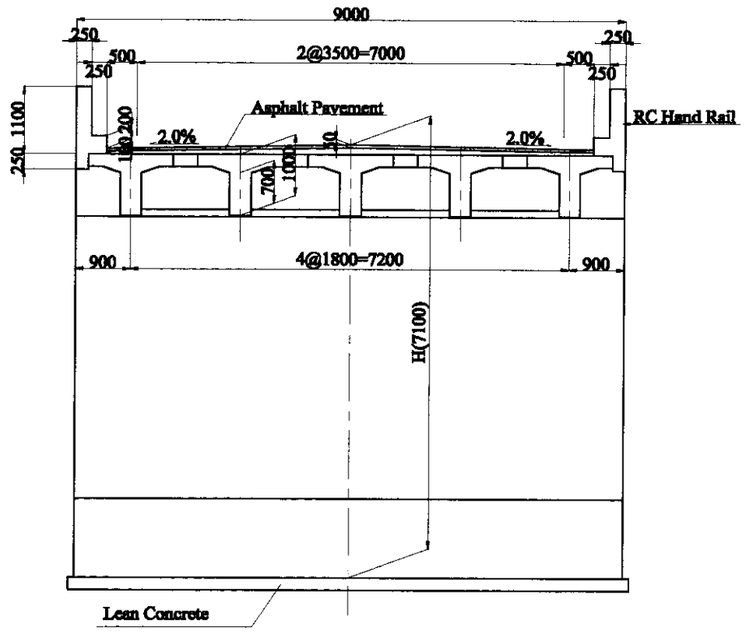
STANDARD BRIDGE NO.1: RC-T GIRDER BRIDGE
(BRIDGE LENGTH 15M)



PROFILE S=1:200

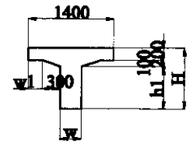


PLAN S=1:200



Abutment

SECTION S=1:100



SECTION OF GIRDER S=1:100

DIMENSION OF STANDARD RC-T GIRDER

Case	Girder Length	Girder Hight : H	h1	Girder Web : W	w1
Ⓐ	15.0	1.0	0.7	0.35	0.225
B	17.5	1.2	0.9	0.35	0.225
C	20.0	1.4	1.1	0.40	0.200
D	22.5	1.6	1.3	0.40	0.200

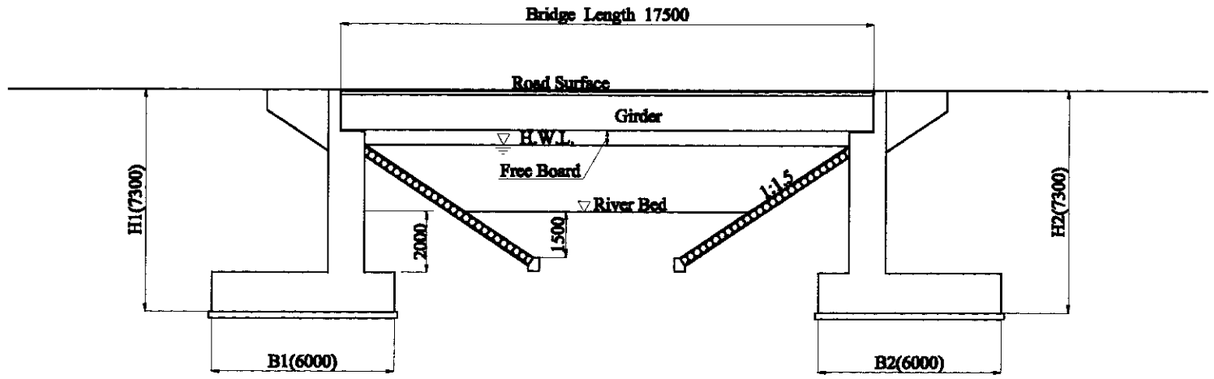
LIST OF QUANTITY (FOR RC GIRDER)

Category	Material	Unit	Quantity	Specification
Super Structure	Total Concrete	m3	65	σ28=240kgf/cm2
No. of Girder (5)	Reinforcing Bar	ton	8.3	SD295,345,390
	Leveling Concrete	m3	10.8	σ28=240kgf/cm2
	Asphalt Pavement	m2	120	t=5cm
Sub Structure	Total Concrete	m3	248	σ28=210kgf/cm2
	Reinforcing Bar	ton	14.9	SD295,345,390
	Lean Concrete	m3	22.8	σ28=160kgf/cm2
	Excavation	m3	1662	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Construction Road	m	30	Paved Standard Section

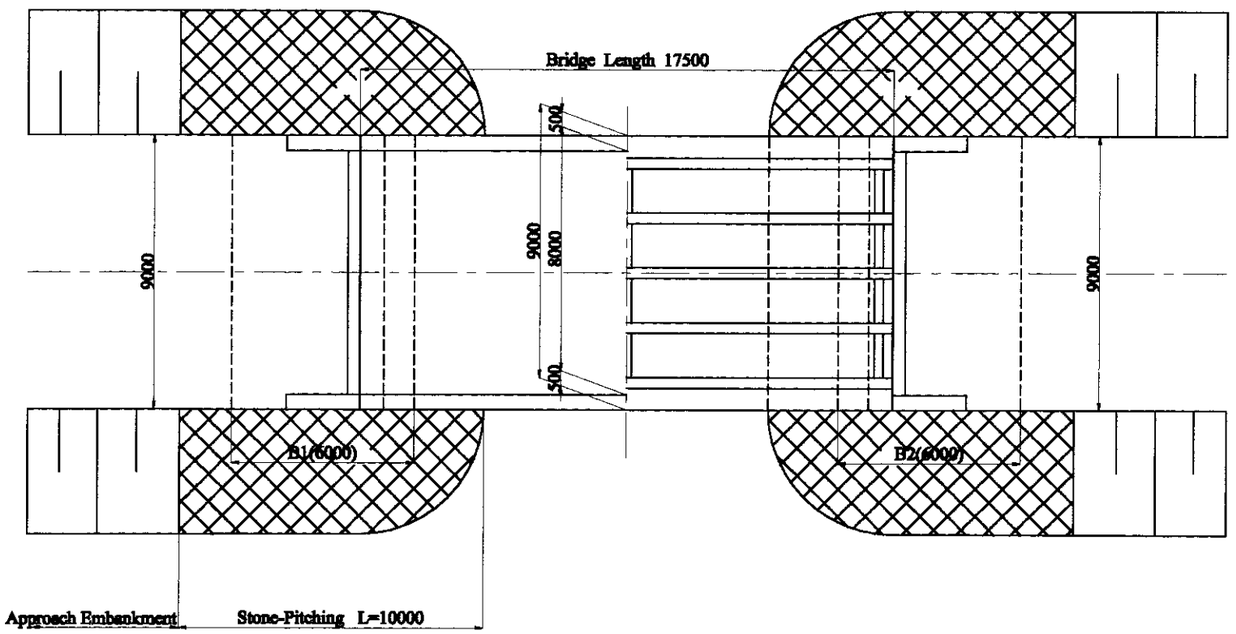
Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
STANDARD BRIDGE NO.1: RC-T GIRDER BRIDGE (BRIDGE LENGTH 15M)	As shown	C-09

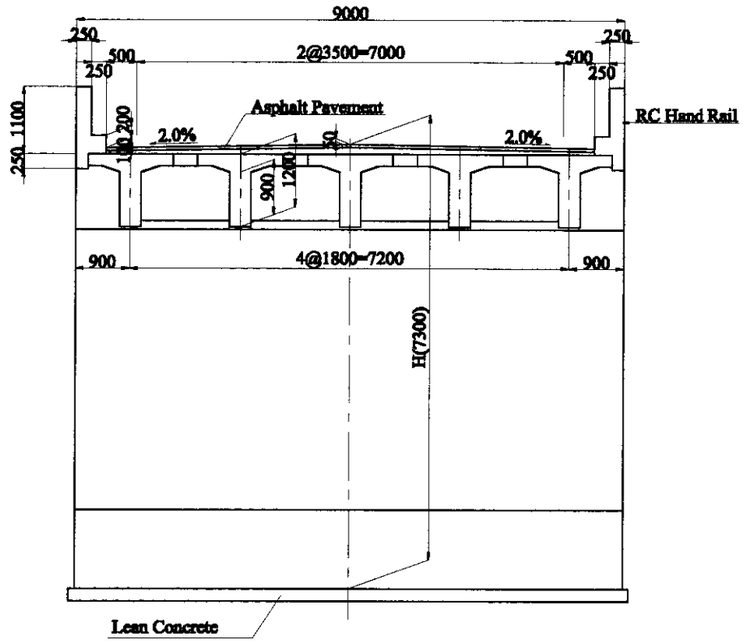
STANDARD BRIDGE NO.2: RC-T GIRDER BRIDGE
(BRIDGE LENGTH 17.5M)



PROFILE S=1:200

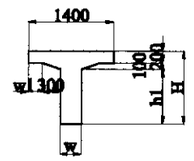


PLAN S=1:200



Abutment

SECTION S=1:100



SECTION OF GIRDER S=1:100

DIMENSION OF STANDARD RC-T GIRDER

Case	Girder Length	Girder Hight : H	h1	Girder Web : W	w1
A	15.0	1.0	0.7	0.35	0.225
B	17.5	1.2	0.9	0.35	0.225
C	20.0	1.4	1.1	0.40	0.200
D	22.5	1.6	1.3	0.40	0.200

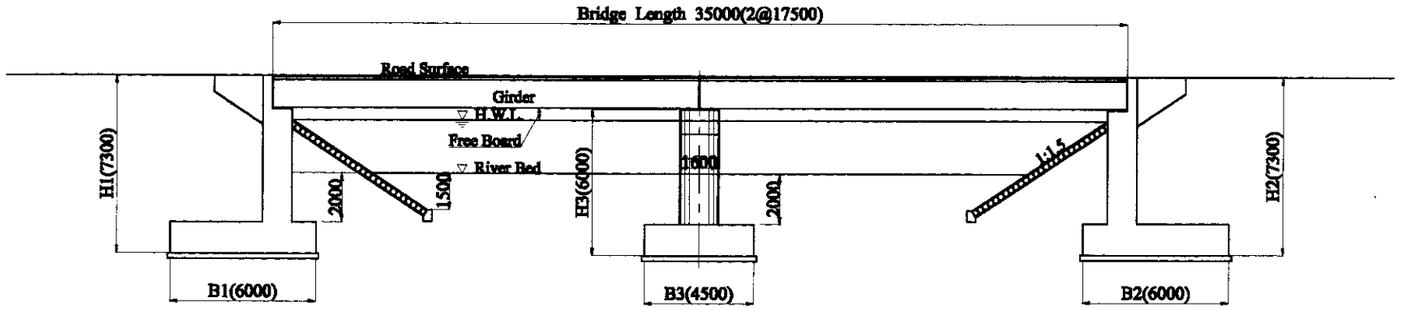
LIST OF QUANTITY (FOR RC GIRDER)

Category	Material	Unit	Quantity	Specification
Super Structure No. of Girder (5)	Total Concrete	m3	82	σ28=240kgf/cm2
	Reinforcing Bar	ton	10.6	SD295,345,390
	Leveling Concrete	m3	12.6	σ28=240kgf/cm2
	Asphalt Pavement	m2	140	t=5cm
Sub Structure	Total Concrete	m3	250	σ28=210kgf/cm2
	Reinforcing Bar	ton	15.0	SD295,345,390
	Lean Concrete	m3	22.8	σ28=160kgf/cm2
	Excavation	m3	1709	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Construction Road	m	35	Paved Standard Section

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	
Drawing title	Scale / No.
STANDARD BRIDGE NO.2: RC-T GIRDER BRIDGE (BRIDGE LENGTH 17.5M)	1:200,1:100 / C-10

STANDARD BRIDGE NO.3: RC-T GIRDER BRIDGE
(BRIDGE LENGTH 35M)



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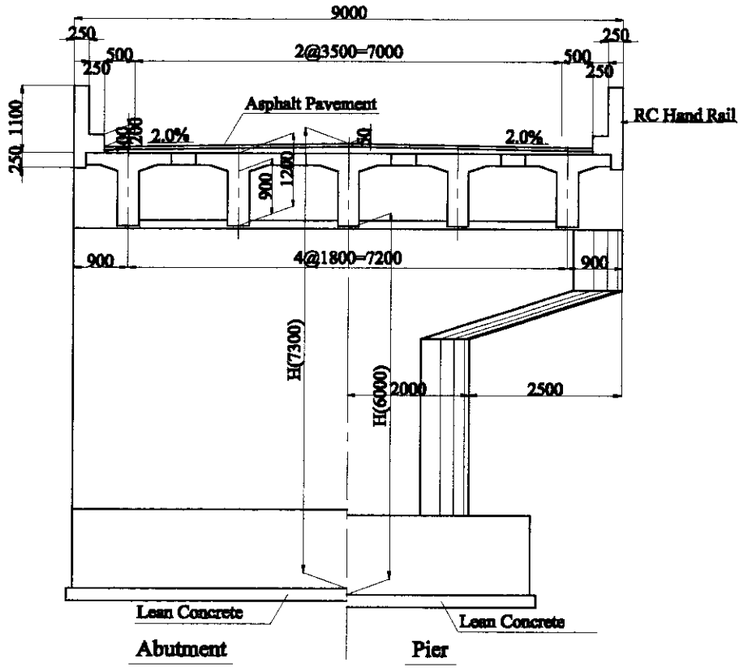
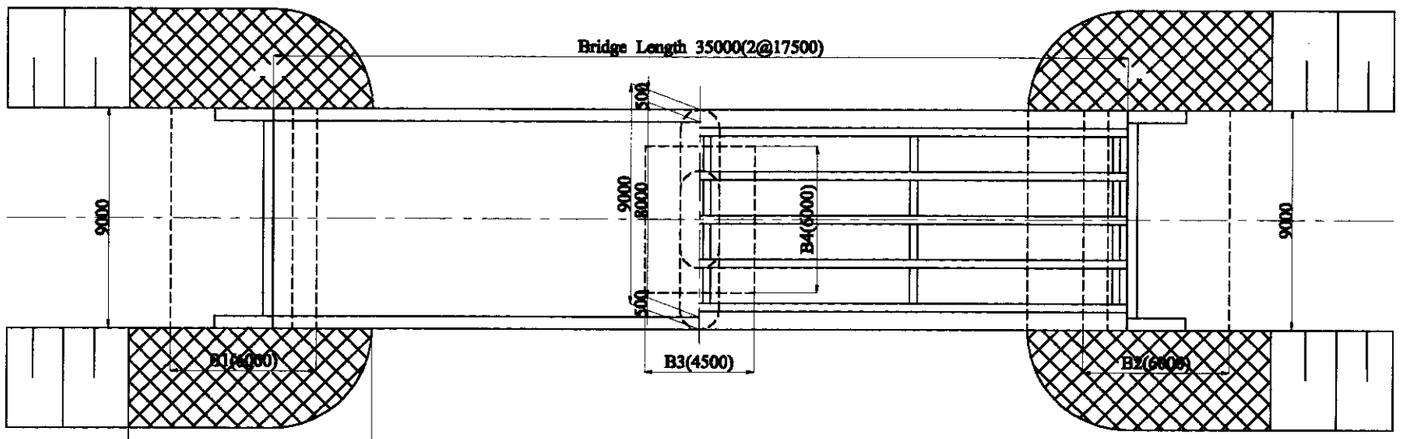
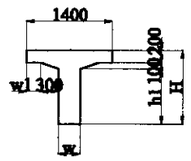


SECTION S=1:100



PLAN S=1:250



SECTION OF GIRDER S=1:100

DIMENSION OF STANDARD RC-T GIRDER

Case	Girder Length	Girder Hight : H	h1	Girder Web : W	w1
A	15.0	1.0	0.7	0.35	0.225
B	17.5	1.2	0.9	0.35	0.225
C	20.0	1.4	1.1	0.40	0.200
D	22.5	1.6	1.3	0.40	0.200

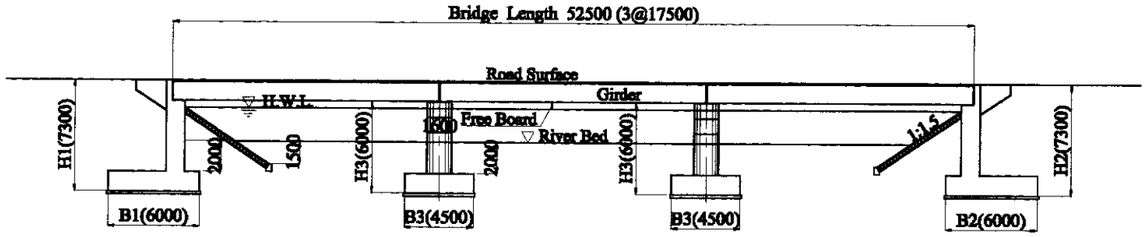
LIST OF QUANTITY (FOR RC GIRDER)

Category	Material	Unit	Quantity	Specification
Super Structure No. of Girder (10)	Total Concrete	m3	164	σ28=240kgf/cm2
	Reinforcing Bar	ton	21.2	SD295,345,390
	Leveling Concrete	m3	25.2	σ28=240kgf/cm2
	Asphalt Pavement	m2	280	t=5cm
Sub Structure	Total Concrete	m3	324	σ28=210kgf/cm2
	Reinforcing Bar	ton	19.5	SD295,345,390
	Lean Concrete	m3	28.6	σ28=160kgf/cm2
	Excavation	m3	2001	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Constructon Road	m	70	Paved Standard Section

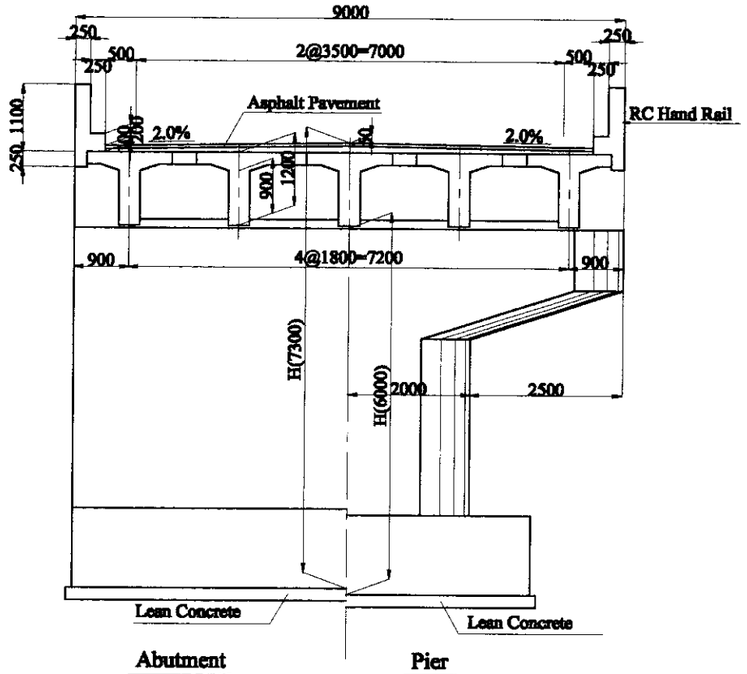
Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
STANDARD BRIDGE NO.3: RC-T GIDER BRIDGE (BRIDGE LENGTH 35M)	As shown	C-11

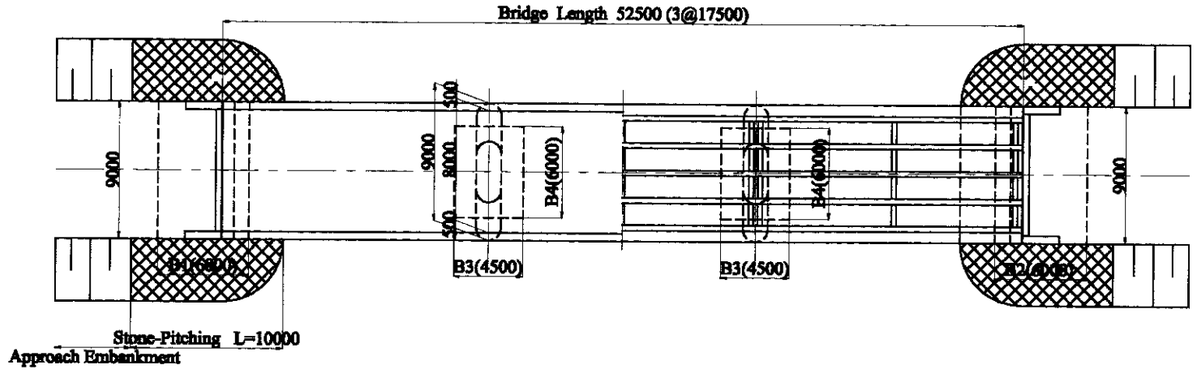
STANDARD BRIDGE NO.4: RC-T GIRDER BRIDGE
(BRIDGE LENGTH 52.5M)



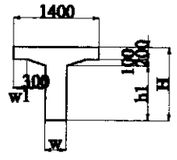
PROFILE S=1:400



SECTION S=1:100



PLAN S=1:400



SECTION OF GIRDER S=1:100

DIMENSION OF STANDARD RC-T GIRDER

Case	Girder Length	Girder Hight : H	h1	Girder Web : W	w1
A	15.0	1.0	0.7	0.35	0.225
B	17.5	1.2	0.9	0.35	0.225
C	20.0	1.4	1.1	0.40	0.200
D	22.5	1.6	1.3	0.40	0.200

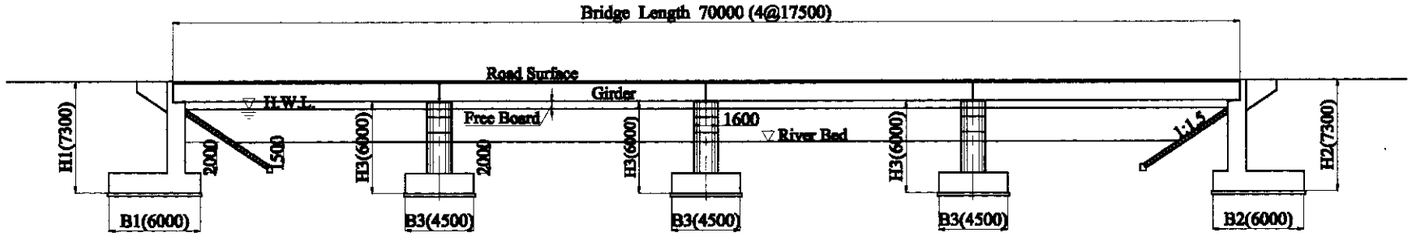
LIST OF QUANTITY (FOR RC GIRDER)

Category	Material	Unit	Quantity	Specification
Super Structure No. of Girder (15)	Total Concrete	m3	246	σ28=240kgf/cm2
	Reinforcing Bar	ton	31.9	SD295,345,390
	Level Concrete	m3	37.8	σ28=240kgf/cm2
	Asphalt Pavement	m2	420	t=5cm
Sub Structure	Total Concrete	m3	399	σ28=210kgf/cm2
	Reinforcing Bar	ton	23.9	SD295,345,390
	Lean Concrete	m3	34.5	σ28=160kgf/cm2
	Excavation	m3	2294	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Construction Road	m	105	Paved Standard Section

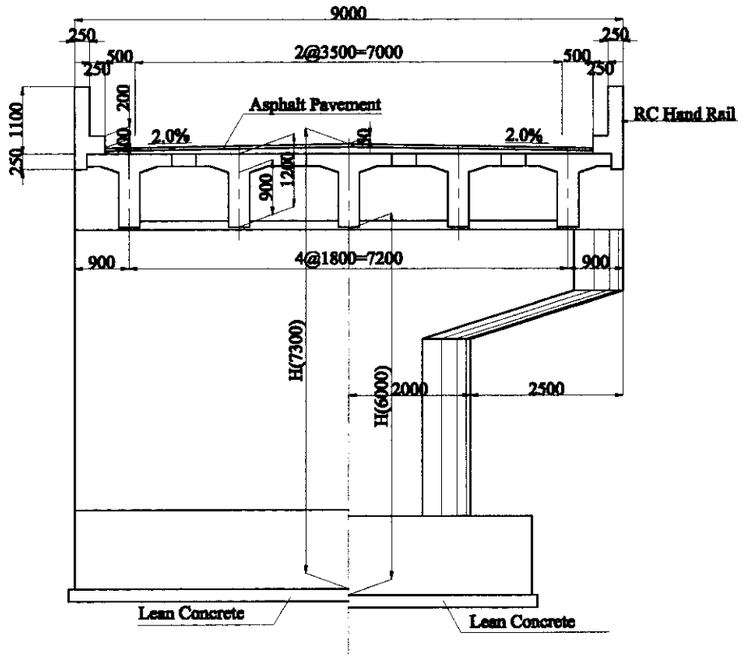
Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
STANDARD BRIDGE NO.4: RC-T GIRDER BRIDGE (BRIDGE LENGTH 52.5M)	As shown	C-12

STANDARD BRIDGE NO.5: RC-T GIRDER BRIDGE
(BRIDGE LENGTH 70M)

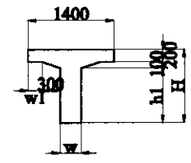


PROFILE S=1:400

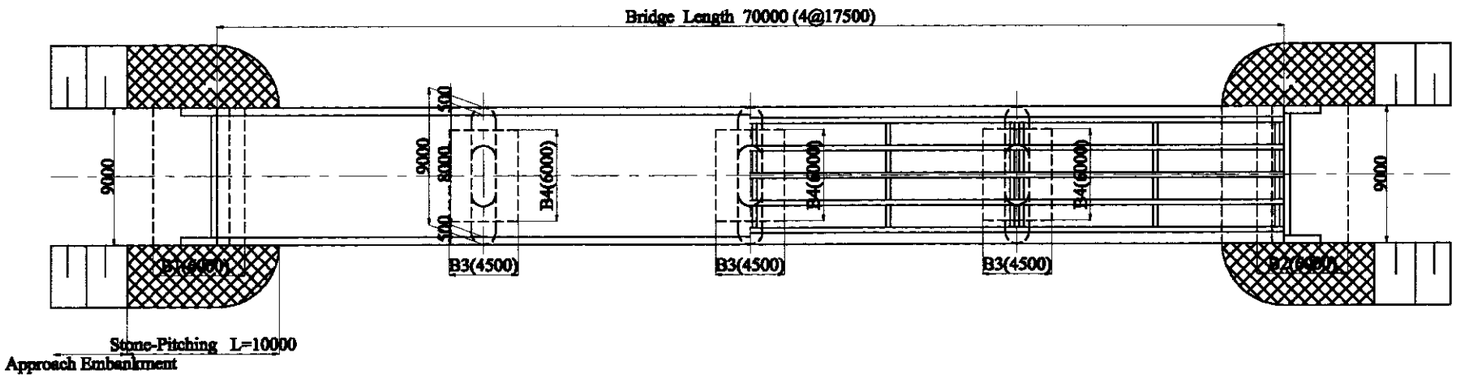


Abutment Pier

SECTION S=1:100



SECTION OF GIRDER S=1:100



PLAN S=1:400

DIMENSION OF STANDARD RC-T GIRDER

Case	Girder Length	Girder Hight : H	h1	Girder Web : W	w1
A	15.0	1.0	0.7	0.35	0.225
Ⓑ	17.5	1.2	0.9	0.35	0.225
C	20.0	1.4	1.1	0.40	0.200
D	22.5	1.6	1.3	0.40	0.200

LIST OF QUANTITY (FOR RC GIRDER)

Category	Material	Unit	Quantity	Specification
Super Structure No. of Girder (20)	Total Concrete	m3	328	σ28=240kgf/cm2
	Reinforcing Bar	ton	42.5	SD295,345,390
	Leveling Concrete	m3	50.4	σ28=240kgf/cm2
	Asphalt Pavement	m2	560	t=5cm
Sub Structure	Total Concrete	m3	473	σ28=210kgf/cm2
	Reinforcing Bar	ton	28.4	SD295,345,390
	Lean Concrete	m3	40.3	σ28=160kgf/cm2
	Excavation	m3	2586	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Construction Road	m	140	Paved Standard Section

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

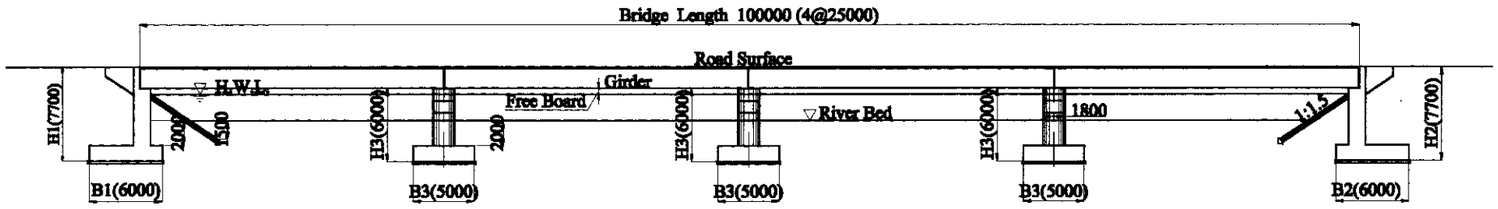
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

Drawing title	Scale	No.
STANDARD BRIDGE NO.5: RC-T GIRDER BRIDGE (BRIDGE LENGTH 70M)	As shown	C-13

STANDARD BRIDGE NO.6: PC-T GIRDER BRIDGE
(BRIDGE LENGTH 100M)



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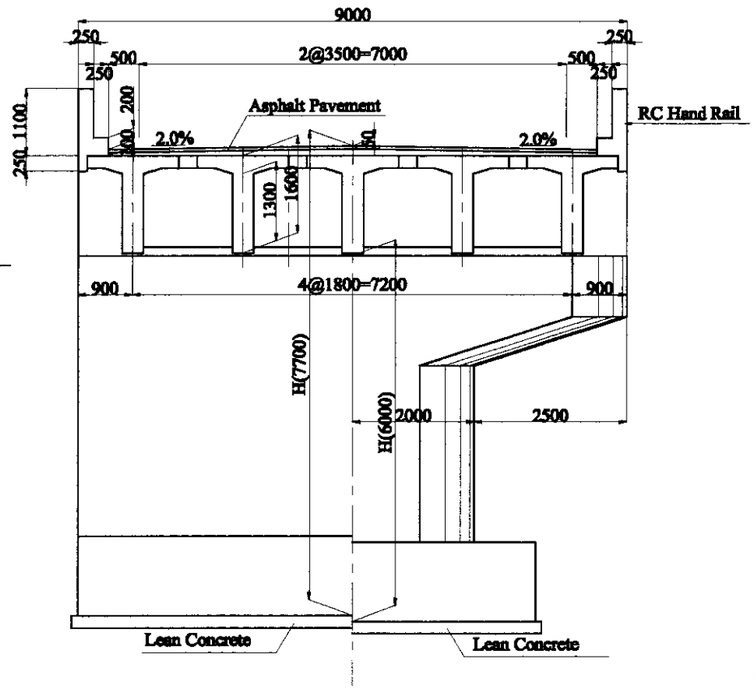
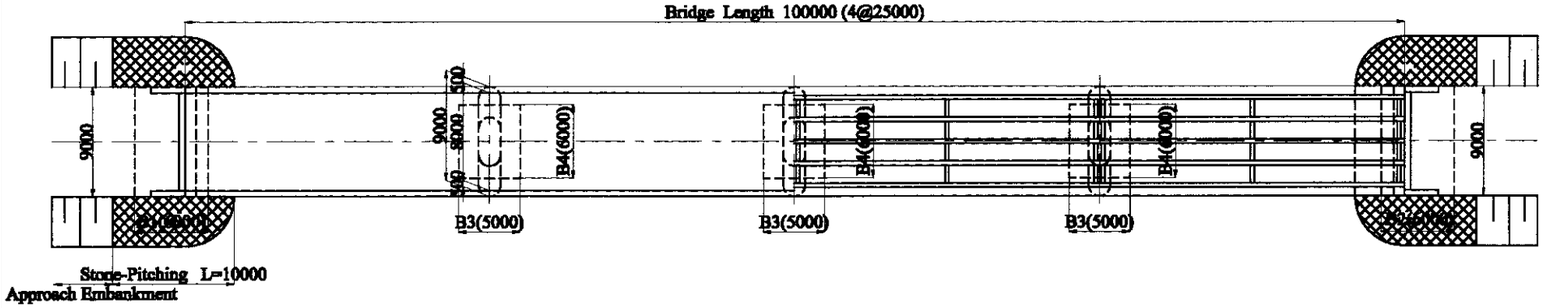
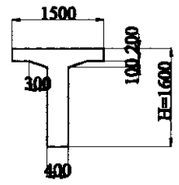


Abutment Pier

SECTION S=1:100



PLAN S=1:500



SECTION OF GIRDER S=1:100

DIMENSION OF STANDARD PC-T GIRDER

Girder Length	Girder Hight : H
25m	1.60m
30m	1.80m
35m	2.00m

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

LIST OF QUANTITY (FOR PC GIRDER)

Category	Material	Unit	Quantity	Specification
Super Structure No. of Girder (20)	Total Concrete	m3	445	σ28=400kgf/cm2
	Other Concrete	m3	127	σ28=240kgf/cm2
	Reinforcing Bar	ton	15.3	SD295,345,390
	PC Cable	ton	22.3	T-12.7mm(σpy=160kgf/mm2)
	Leveling Concrete	m3	72.0	σ28=240kgf/cm2
	Asphalt Pavement	m2	800	t=5cm
Sub Structure	Total Concrete	m3	522	σ28=210kgf/cm2
	Reinforcing Bar	ton	31.3	SD295,345,390
	Lean Concrete	m3	42.2	σ28=160kgf/cm2
	Excavation	m3	2734	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Construction Road	m	200	Paved Standard Section

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA

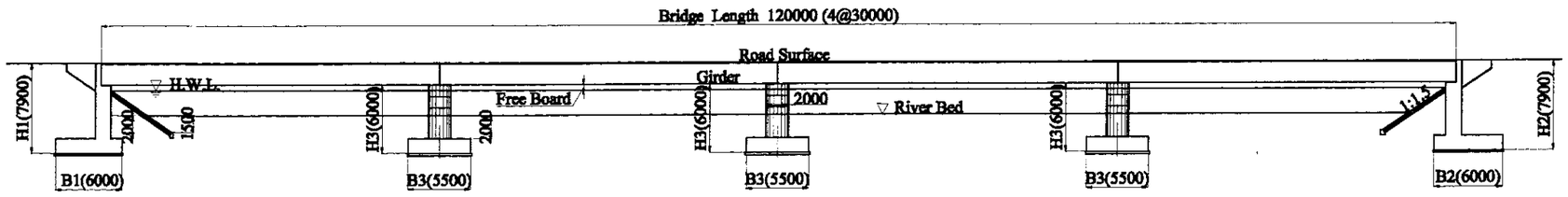
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

PACIFIC CONSULTANTS INTERNATIONAL
JAPAN OVERSEAS CONSULTANTS

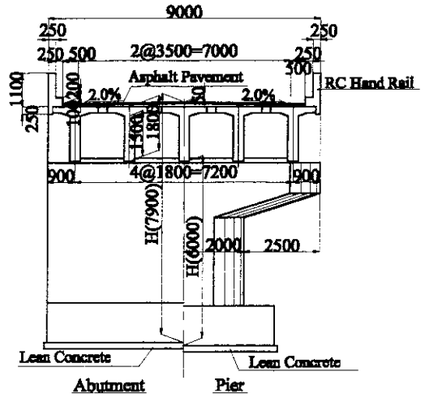
DEPARTMENT OF ROADS,
MINISTRY OF INFRASTRUCTURE,
THE GOVERNMENT OF MONGOLIA

Drawing title	Scale	No.
STANDARD BRIDGE NO.6: PC-T GIRDER BRIDGE (BRIDGE LENGTH 100M)	As shown	C-14

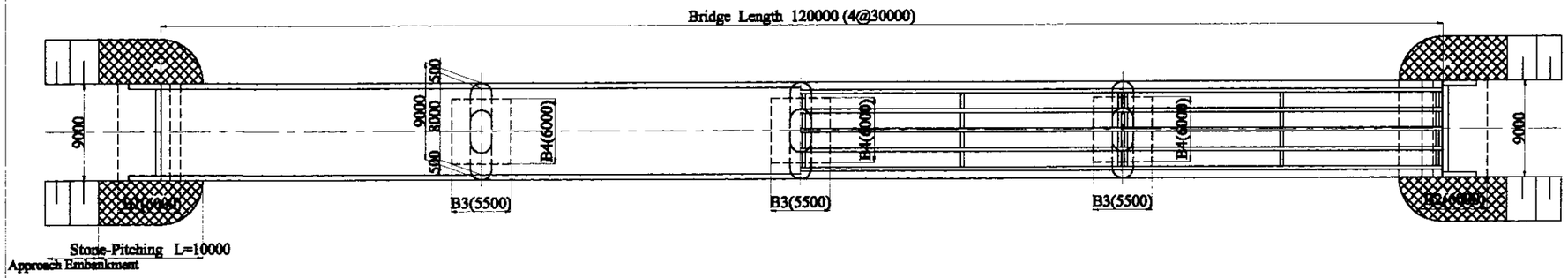
STANDARD BRIDGE NO.7: PC-T GIRDER BRIDGE
(BRIDGE LENGTH 120M)



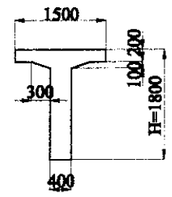
PROFILE S=1:500



SECTION S=1:200



PLAN S=1:500



SECTION OF GIRDER S=1:100

DIMENSION OF STANDARD PC-T GIRDER

Girder Length	Girder Hight : H
25m	1.60m
30m	1.80m
35m	2.00m

LIST OF QUANTITY (FOR PC GIRDER)

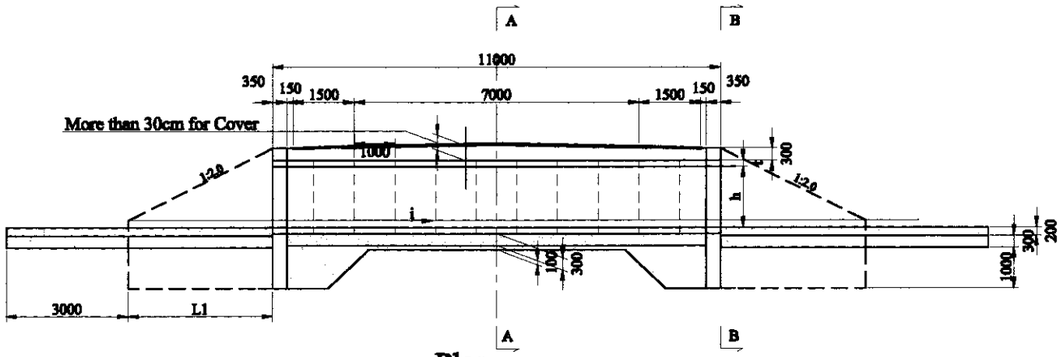
Category	Material	Unit	Quantity	Specification
Super Structure No. of Girder (20)	Total Concrete	m3	582	σ28=400kgf/cm2
	Other Concrete	m3	152	σ28=240kgf/cm2
	Reinforcing Bar	ton	18.2	SD295,345,390
	PC Cable	ton	29.1	T-12.7mm(σpy=160kgf/mm2)
	Leveling Concrete	m3	86.4	σ28=240kgf/cm2
	Asphalt Pavement	m2	960	t=5cm
Sub Structure	Total Concrete	m3	549	σ28=210kgf/cm2
	Reinforcing Bar	ton	32.9	SD295,345,390
	Lean Concrete	m3	44.0	σ28=160kgf/cm2
	Excavation	m3	2834	Gravel
Embankment	Revetment	m2	386	Stone Pitched Embankment
	Access Construction Road	m	240	Paved Standard Section

Note : Preliminary Design (Feasibility Study) has been done for this drawing.
Detail Design is required for construction of this bridge.

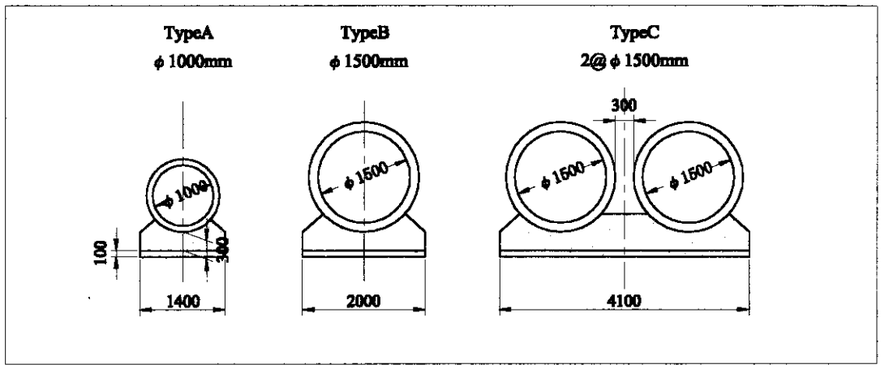
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS	
Drawing title	Scale / No.
STANDARD BRIDGE NO.7: PC-T GIRDER BRIDGE (BRIDGE LENGTH 120M)	As shown / C-15

GENERAL VIEW OF STANDARD PIPE CULVERTS

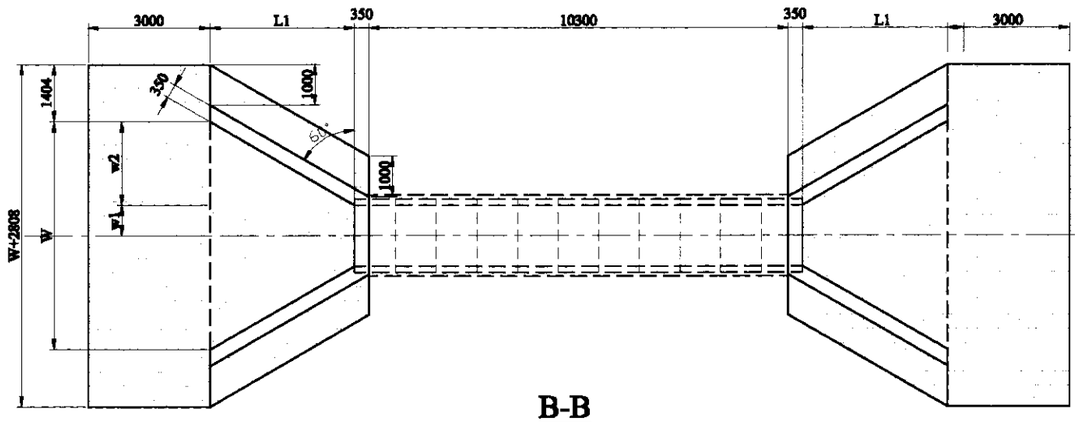
Profile 1:150



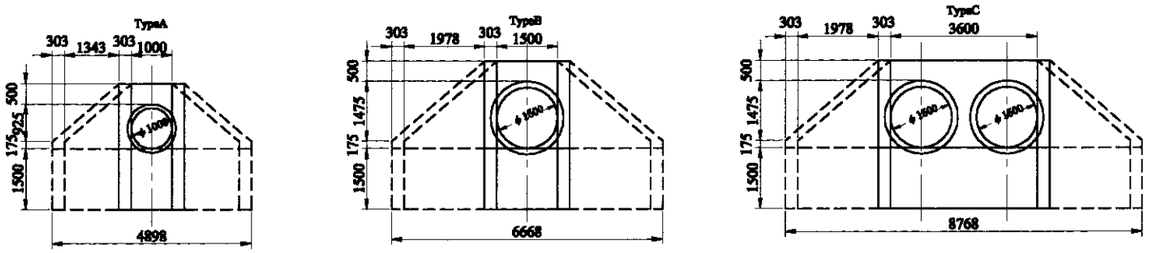
Section A-A 1:100



Plan



B-B



Legend
- Leveling Concrete
- Stone Pitching
- Gravel

List of Quantity

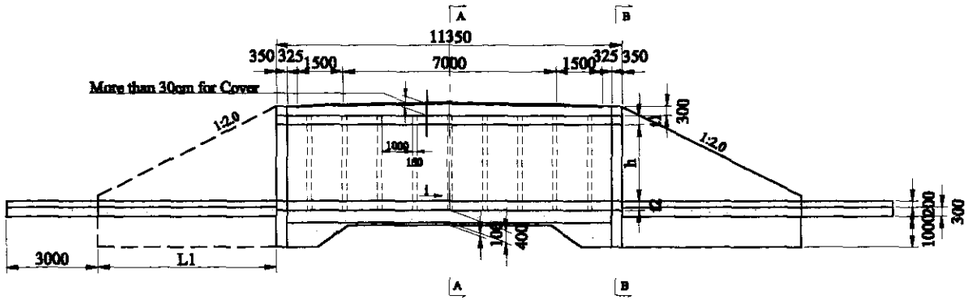
		Type-A	Type-B	Type-C
Concrete : σ28=210kgf/cm2	m3	15.74	27.05	38.89
Reinforcing Bar : SD295(σy=3000kgf/cm2)	t	0.71	1.18	1.60
Leveling Concrete σ28=160kgf/cm2	m3	8.11	13.94	27.36
Gravel	m3	23.33	33.63	50.03
Stone Pitching	m²	52.47	68.78	81.38
Excavation	m3	54.10	79.34	119.71
h	m	1.000	1.500	1.500
t	m	0.100	0.150	0.150
L1	m	2.450	3.550	3.550
W	m	3.829	5.599	7.699
w1	m	0.500	0.750	1.800
w2	m	1.415	2.050	2.050

Note: Preliminary Design (Feasibility Study) has been done for this drawing. Detail Design is required for construction of these culverts.

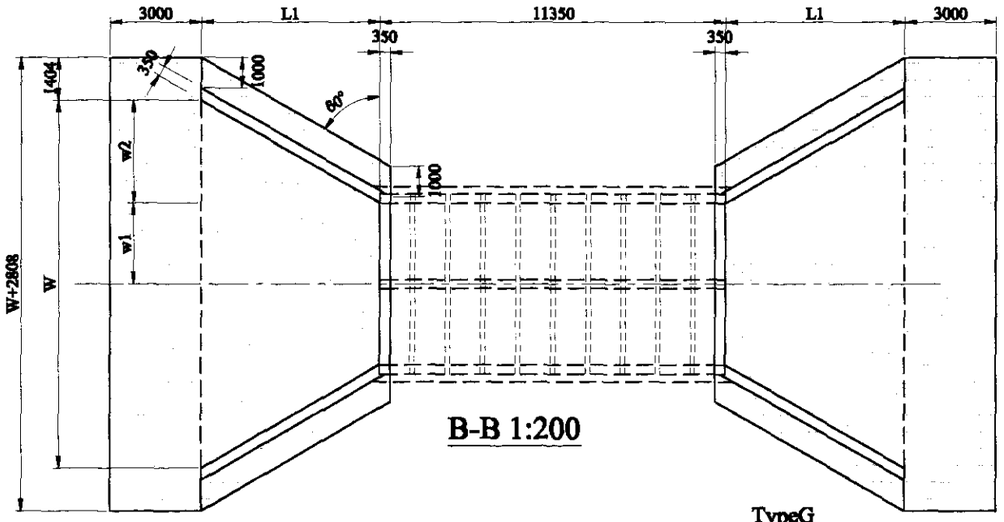
THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	DEPARTMENT OF ROADS, MINISTRY OF INFRASTRUCTURE, THE GOVERNMENT OF MONGOLIA	
PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
GENERAL VIEW OF STANDARD PIPE CULVERTS	As Shown	C-16

GENERAL VIEW OF STANDARD BOX CULVERTS

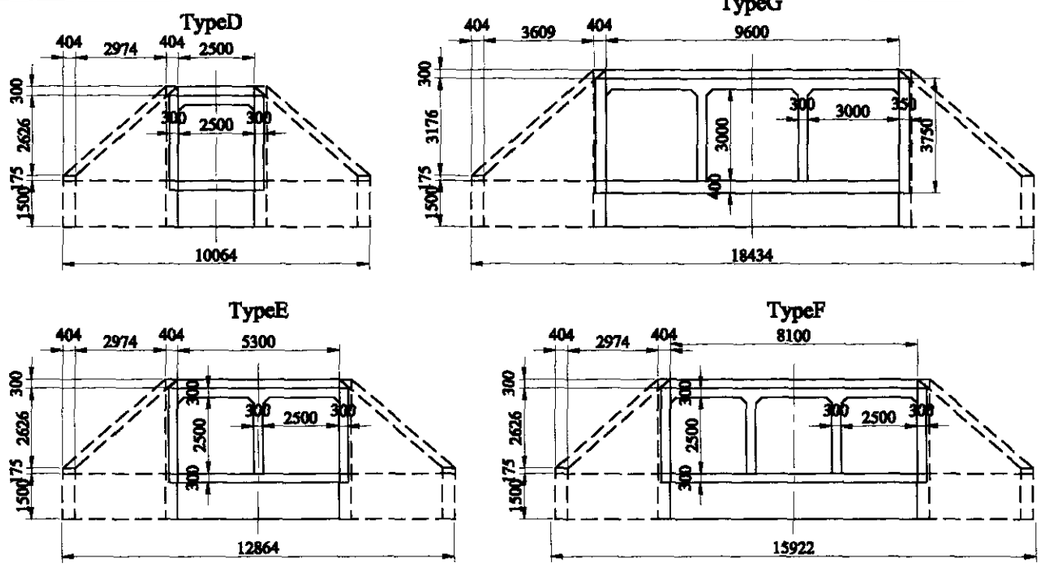
Profile 1:200



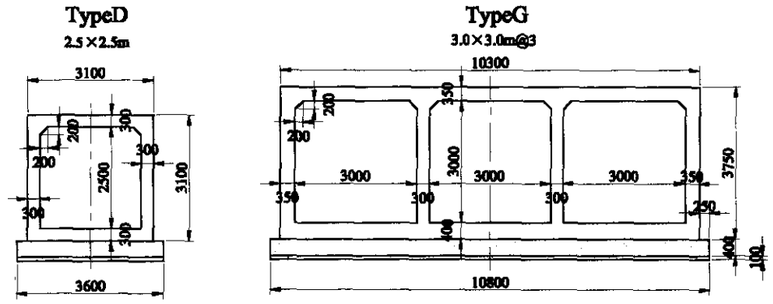
Plan 1:200



B-B 1:200



Section A-A 1:150



Legend
- Leveling Concrete
- Stone Pitching
- Gravel

List of Quantity

		Type-D	Type-E	Type-F	Type-G
Concrete (Pre-cast) : σ'28=210kgf/cm2	m3	34.00	58.70	83.40	117.45
Reinforcing Bar (Pre-cast) : SD295(σ'y=3000kgf/cm2)	t	1.70	2.94	4.17	5.87
Concrete (Cast-in-situ) : σ'28=210kgf/cm2	m3	37.52	43.79	50.07	64.29
Reinforcing Bar (Cast-in-situ) : SD295(σ'y=3000kgf/cm2)	t	1.88	2.19	2.50	3.21
Leveling Concrete σ'28=160kgf/cm2	m3	29.09	47.57	66.05	83.85
Gravel	m3	58.97	82.70	106.43	130.70
Stone Pitching	m	98.54	115.34	132.14	153.68
Excavation	m3	130.92	182.37	233.82	286.72
h	m	2.50	2.50	2.50	3.00
t1	m	0.30	0.30	0.30	0.35
t2	m	0.30	0.30	0.30	0.40
t3	m	0.30	0.30	0.30	0.30
L1	m	5.85	5.85	5.85	6.95
W	m	9.25	12.05	14.85	17.63
w1	m	1.25	2.65	4.05	4.80
w2	m	3.38	3.38	3.38	4.01

Note: Preliminary Design (Feasibility Study) has been done for this drawing. Detail Design is required for construction of these culverts.

THE FEASIBILITY STUDY ON CONSTRUCTION OF EASTERN ARTERIAL ROAD IN MONGOLIA		
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PACIFIC CONSULTANTS INTERNATIONAL JAPAN OVERSEAS CONSULTANTS		
Drawing title	Scale	No.
GENERAL VIEW OF STANDARD BOX CULVERTS	As Shown	C-17