



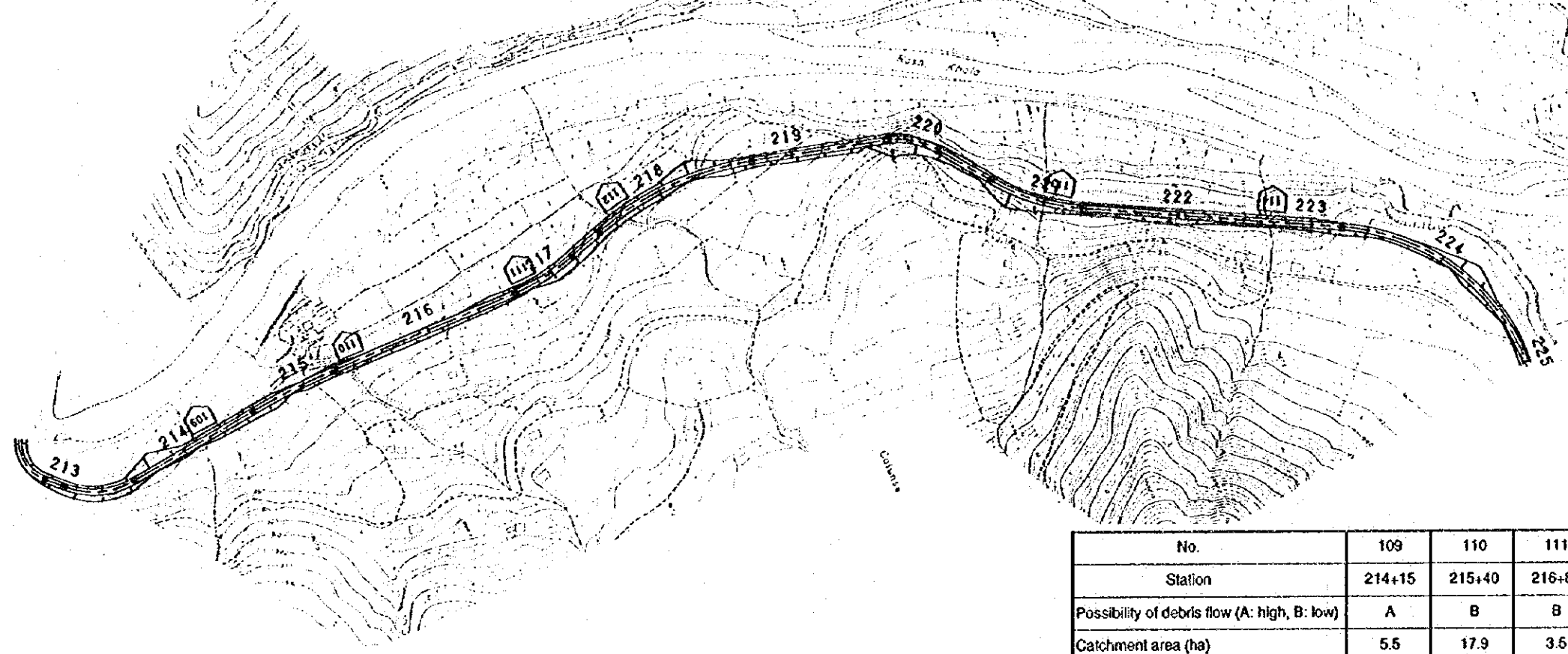
N 30455

N 30455

E 37000

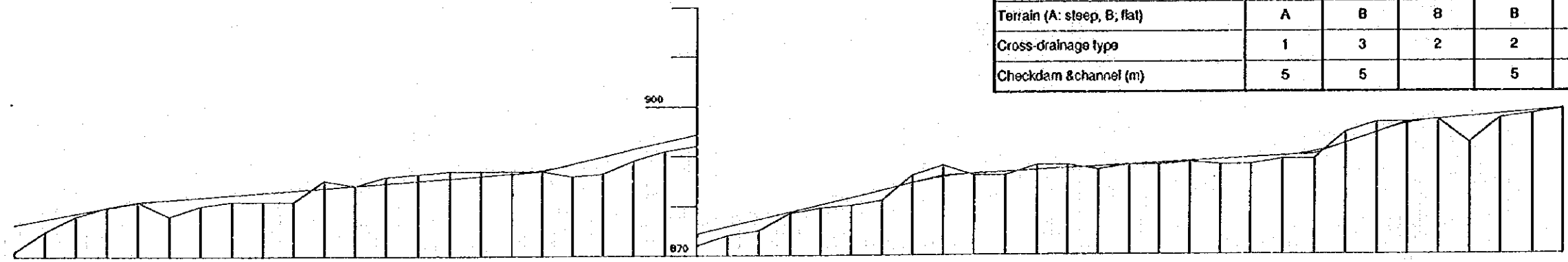
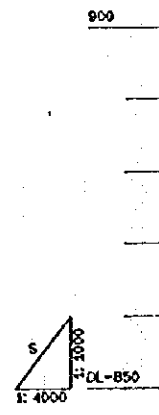
E 36950

G-1-18: Location and Type of Cross Drainage to be applied STA.212+50~STA.225+00



- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slub culvert (4m)

No.	109	110	111	112	113	114
Station	214+15	215+40	216+80	217+70	221+05	222+70
Possibility of debris flow (A: high, B: low)	A	B	B	B	B	B
Catchment area (ha)	5.5	17.9	3.5	5.6	8.1	5.9
Terrain (A: steep, B: flat)	A	B	B	B	A	A
Cross-drainage type	1	3	2	2	2	2
Checkdam & channel (m)	5	5		5	5	5



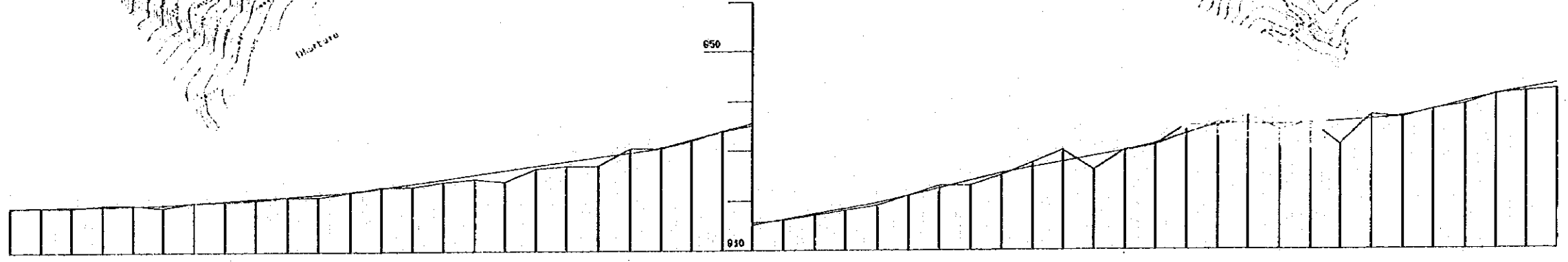
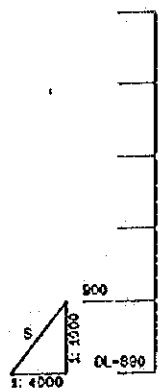
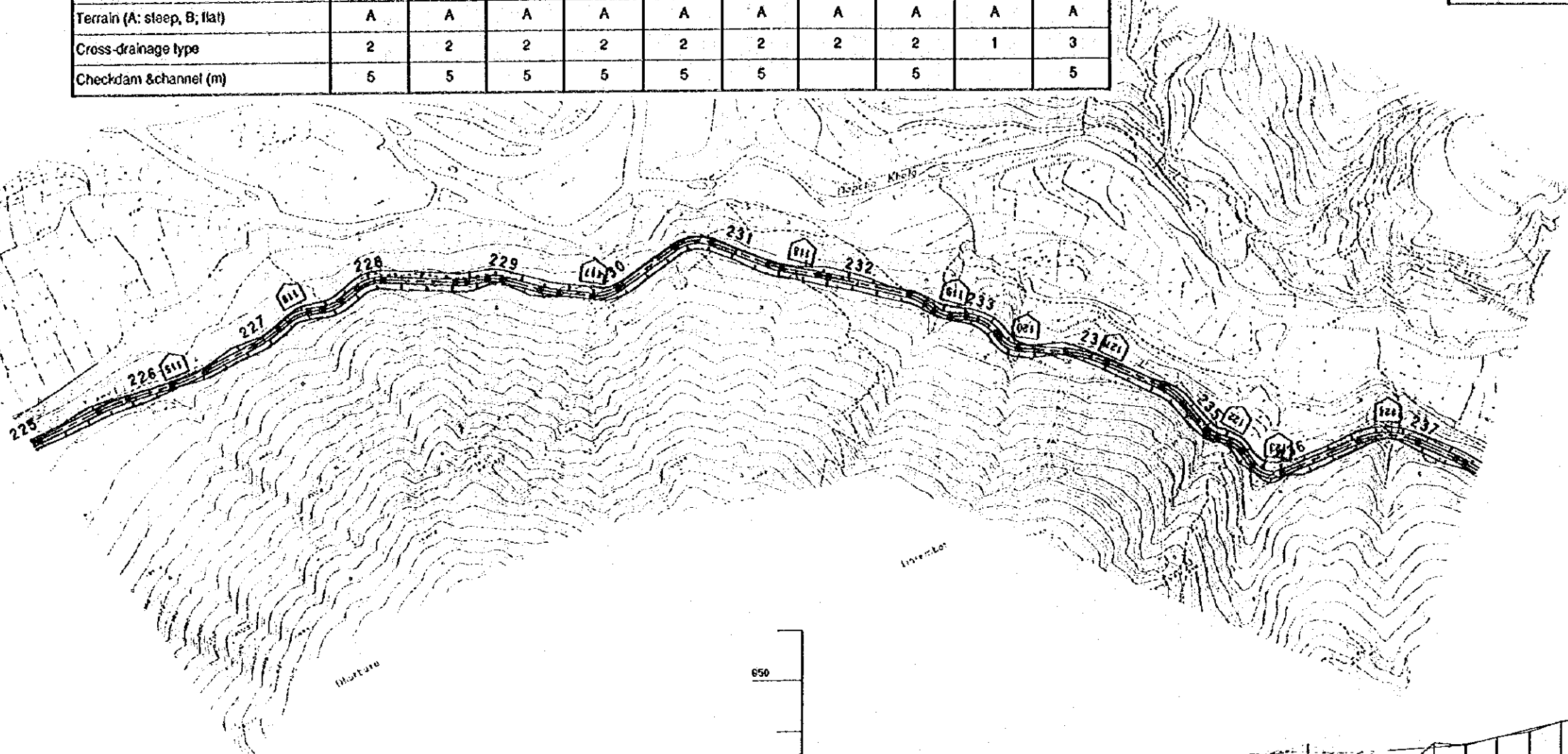
GRADE	14.87% 150m		861.00	11.86% 326m		867.00	15.85% 325m		886.00	11.53% 300m		890.00	18.87% 75m		896.50	12.00% 125m		898.00																																	
PROPOSED HEIGHT	855.33	857.50	858.57	859.63	860.62	861.45	862.36	862.65	863.31	863.77	864.23	864.80	865.15	865.82	865.08	865.54	867.25	868.45	869.92	871.36	872.65	874.31	875.77	877.25	878.09	880.15	881.82	883.05	884.54	885.72	886.33	886.87	887.00	887.53	887.87	888.00	888.33	888.87	889.00	889.57	890.45	892.17	894.33	896.06	897.00	897.50	898.00	898.50	899.00	899.50	899.90
GROUND HEIGHT	851.00	855.00	858.00	860.00	861.00	862.00	863.00	864.00	865.00	866.00	867.00	868.00	869.00	870.00	871.00	872.00	873.00	874.00	875.00	876.00	877.00	878.00	879.00	880.00	881.00	882.00	883.00	884.00	885.00	886.00	887.00	888.00	889.00	890.00	891.00	892.00	893.00	894.00	895.00	896.00	897.00	898.00	899.00	900.00	901.00	902.00	903.00	904.00	905.00	906.00	
STATION	212+80	212+75	213	213+25	213+50	213+75	214	214+25	214+50	214+75	215	215+25	215+50	215+75	216	216+25	216+50	216+75	217	217+25	217+50	217+75	218	218+25	218+50	218+75	219	219+25	219+50	220	220+25	220+50	220+75	221	221+25	221+50	221+75	222	222+25	222+50	222+75	223	223+25	223+50	223+75	224	224+25	224+50	224+75	225	
CURVE ELEMENT	R=30.00	R=60.00	L=100.29			R=500.00	L=143.65			R=160.00	R=220.00					L=100.55	R=50.00	L=44.89	R=160.00	L=183.22				R=150.00																											



No.	115	116	117	118	119	120	121	122	123	124
Station	226+25	227+35	229+75	231+50	232+75	233+45	234+00	235+25	235+80	236+75
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B	A	B
Catchment area (ha)	5.5	2.9	5.7	2.3	6.2	7.6	1.0	1.9		14.0
Terrain (A: steep, B: flat)	A	A	A	A	A	A	A	A	A	A
Cross-drainage type	2	2	2	2	2	2	2	2	1	3
Checkdam & channel (m)	5	5	5	5	5	5		5		5

- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slub culvert (4m)

G-1-19: Location and Type of Cross Drainage to be applied STA.225+00~STA.237+50

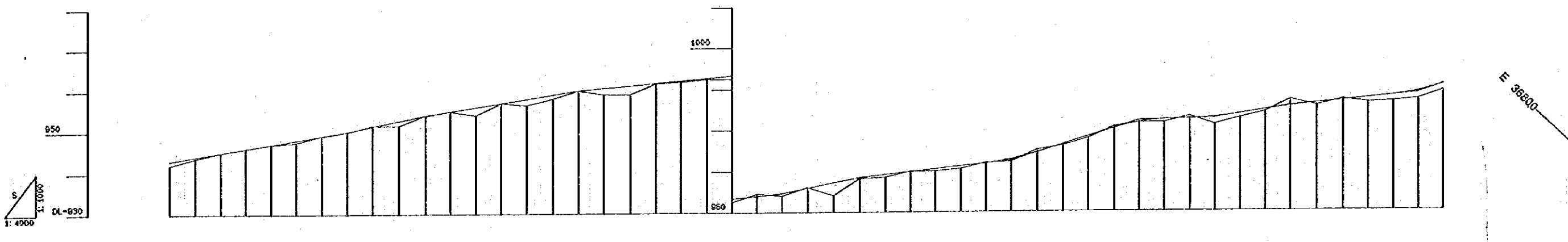
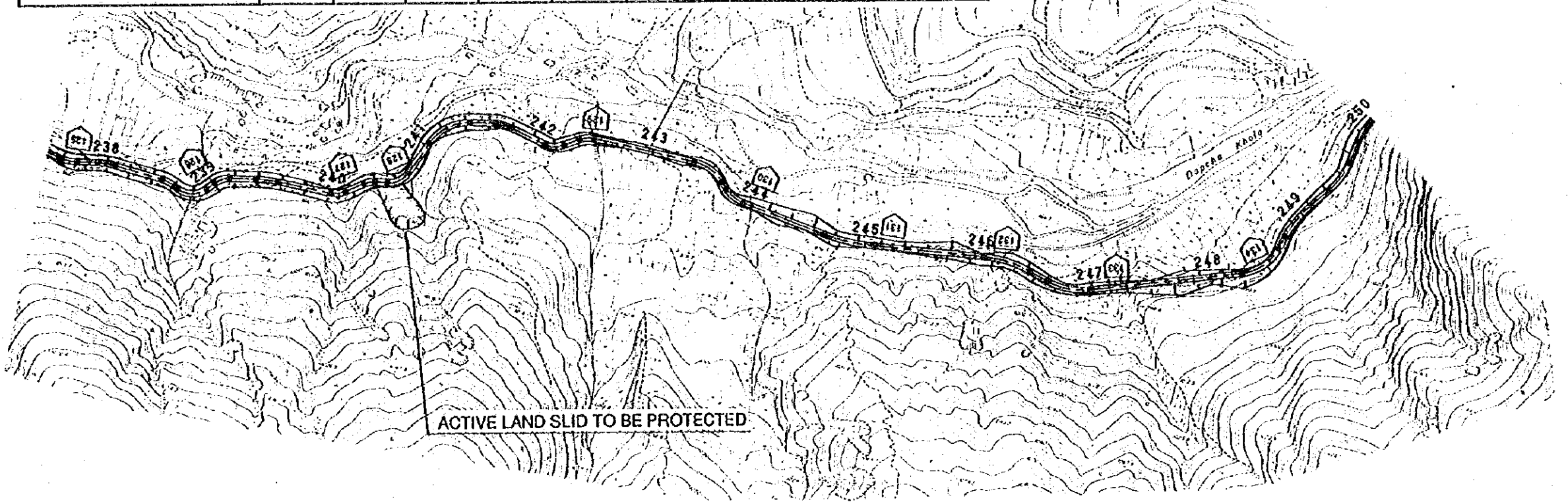


GRADE																																																								
PROPOSED HEIGHT	888.00	889.10	890.20	891.30	892.40	893.50	894.60	895.70	896.80	897.90	899.00	900.10	901.20	902.30	903.40	904.50	905.60	906.70	907.80	908.90	910.00	911.10	912.20	913.30	914.40	915.50	916.60	917.70	918.80	919.90	921.00	922.10	923.20	924.30	925.40	926.50	927.60	928.70	929.80	930.90	932.00	933.10	934.20	935.30	936.40	937.50	938.60	939.70	940.80	941.90	943.00					
GROUND HEIGHT	888.00	889.00	890.00	891.00	892.00	893.00	894.00	895.00	896.00	897.00	898.00	899.00	900.00	901.00	902.00	903.00	904.00	905.00	906.00	907.00	908.00	909.00	910.00	911.00	912.00	913.00	914.00	915.00	916.00	917.00	918.00	919.00	920.00	921.00	922.00	923.00	924.00	925.00	926.00	927.00	928.00	929.00	930.00	931.00	932.00	933.00	934.00	935.00	936.00	937.00	938.00	939.00	940.00	941.00	942.00	943.00
STATION	225	226+25	227+50	228+75	229+75	230+75	231+50	232+75	233+45	234+00	235+25	235+80	236+75	237	237+50																																									
CURVE ELEMENT	R=160.00 L=51.72		R=160.00 L=36.58		R=30.00 L=42.50		R=30.00 L=56.94		R=30.00 L=54.51		R=160.00 L=48.34		R=30.00 L=54.71		R=30.00 L=36.91		R=100.00 L=47.44		R=50.00		R=20.00		R=20.00		R=20.00		R=20.00		R=20.00		R=50.00		R=60.00																							

No.	125	126	127	128	129	130	131	132	133	134
Station	237+70	238+80	240+10	240+60	242+50	244+00	245+20	246+15	247+20	248+45
Possibility of debris flow (A: high, B: low)	B	B	A	B	A	A	B	B	A	B
Catchment area (ha)	1.3	6.9		6.5			1.6	1.8		1.5
Terrain (A: steep, B: flat)	A	A	A	A	A	A	A	A	A	A
Cross-drainage type	2	2	1	2	1	1	2	2	1	2
Checkdam & channel (m)	5	5		5			5	5		

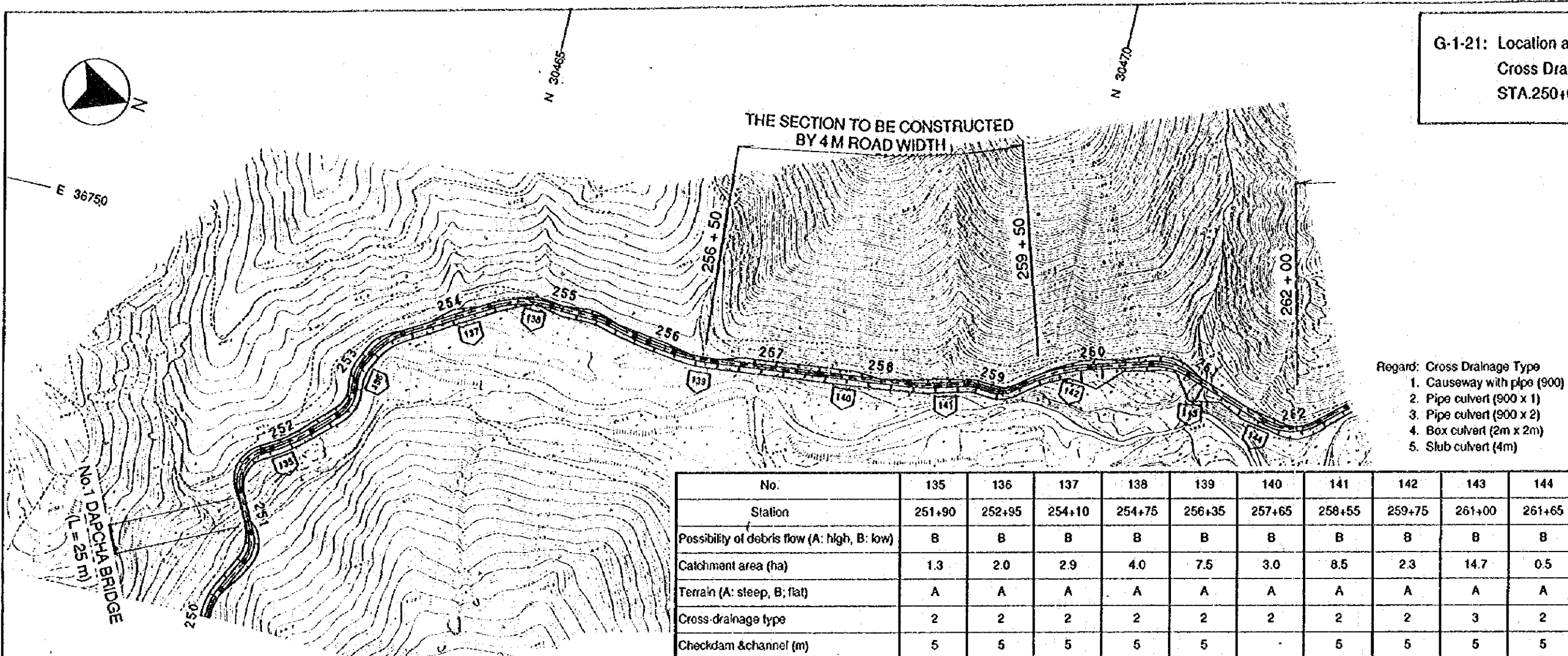
- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slub culvert (4m)

G-1-20: Location and Type of Cross Drainage to be applied STA.237+50~STA.250+00

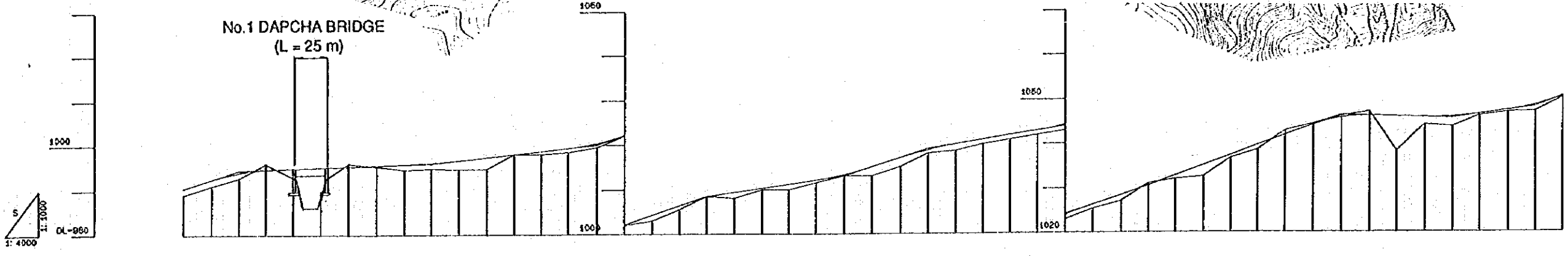


GRADE																																																		
PROPOSED HEIGHT	945.00	944.00	945.00	946.00	947.00	946.00	948.00	950.00	951.50	952.87	953.92	955.00	956.00	959.00	960.89	961.13	961.89	962.25	962.61	963.35	963.94	964.69	965.83	967.17	968.33	969.17	969.83	970.50	971.17	971.83	972.61	974.40	976.30	976.20	980.10	981.57	982.17	982.33	982.71	983.50	984.50	985.40	985.10	985.70	987.30	987.90	986.85	989.50		
GROUND HEIGHT	942.00	943.70	945.00	946.00	947.00	947.50	948.00	950.00	951.50	951.50	954.00	955.00	954.00	957.00	956.50	958.00	960.00	960.00	962.00	962.50	962.50	964.50	965.00	967.17	968.20	968.50	970.00	970.00	970.50	971.17	972.00	972.20	973.00	976.00	977.80	980.50	981.50	981.50	983.00	983.50	984.00	987.00	985.50	985.10	987.00	986.20	987.90	988.50	987.00	989.00
STATION	237+50	237+75	238	238+25	238+50	238+75	239	239+25	239+50	239+75	240	240+25	240+50	240+75	241	241+25	241+50	241+75	242	242+25	242+50	243+25	243+50	243+75	244	244+25	244+50	244+75	245	245+25	245+50	246	246+25	246+50	246+75	247	247+25	247+50	247+75	248	248+25	248+50	248+75	249	249+25	249+50	249+75	250		
CURVE ELEMENT	R=40.00		R=20.00		R=30.00		R=20.00		R=20.00		R=20.00		R=20.00		R=40.00		R=30.00		R=20.00		R=40.00		R=30.00		R=150.00		R=40.00		R=100.00		R=50.00		R=40.00		R=90.00		R=50.00		R=50.00											

G-1-21: Location and Type of Cross Drainage to be applied STA.250+00~STA.262+50



No.	135	136	137	138	139	140	141	142	143	144
Station	251+90	252+95	254+10	254+75	256+35	257+65	258+55	259+75	261+00	261+65
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B	B	B
Catchment area (ha)	1.3	2.0	2.9	4.0	7.5	3.0	8.5	2.3	14.7	0.5
Terrain (A: steep, B: flat)	A	A	A	A	A	A	A	A	A	A
Cross-drainage type	2	2	2	2	2	2	2	2	3	2
Checkdam & channel (m)	5	5	5	5	5	5	5	5	5	5



GRADE																																																																																
PROPOSED HEIGHT	989.50	992.50	984.05	984.71	984.83	985.14	985.35	985.57	985.78	986.11	986.87	984.88	987.33	988.00	988.87	988.41	989.33	999.60	1000.36	1008.50	1008.19	1009.40	1010.30	1011.20	1011.50	1012.10	1013.00	1013.28	1015.00	1017.00	1018.00	1018.75	1019.00	1018.50	1020.00	1021.00	1022.00	1023.00	1024.00	1024.89	1024.00	1025.39	1026.17	1026.33	1027.00	1031.00	1030.98	1030.00	1032.75	1032.50	1033.00	1033.00	1035.80	1037.20	1038.40	1039.50	1042.73	1041.75	1044.00	1044.00	1045.64	1046.25	1046.00	1046.00	1046.88	1044.00	1045.80	1043.50	1045.76	1046.33	1046.00	1047.17	1048.82	1047.00	1048.39	1048.00	1050.20			
GROUND HEIGHT	989.00	991.00	992.80	995.80	996.00	996.00	996.00	995.40	994.00	994.80	994.70	998.00	994.00	997.33	998.00	998.00	998.41	999.60	1002.13	1003.25	1005.50	1006.38	1008.50	1009.40	1010.00	1010.30	1011.20	1011.50	1012.10	1013.00	1013.28	1015.00	1017.00	1018.00	1018.75	1019.00	1018.50	1020.00	1021.00	1022.00	1023.00	1024.00	1024.89	1024.00	1025.39	1026.17	1026.33	1027.00	1031.00	1030.98	1030.00	1032.75	1032.50	1033.00	1033.00	1035.80	1037.20	1038.40	1039.50	1042.73	1041.75	1044.00	1044.00	1045.64	1046.25	1046.00	1046.00	1046.88	1044.00	1045.80	1043.50	1045.76	1046.33	1046.00	1047.17	1048.82	1047.00	1048.39	1048.00	1050.20
STATION	250	250+25	250+50	250+75	251	251+25	251+50	251+75	252	252+25	252+50	252+75	253	253+25	253+50	253+75	254	254+25	254+50	254+75	255	255+25	255+50	255+75	256	256+25	256+50	256+75	257	257+25	257+50	257+75	258	258+25	258+50	258+75	259	259+25	259+50	259+75	260	260+25	260+50	260+75	261	261+25	261+50	261+75	262	262+25	262+50																													
CURVE ELEMENT																																																																																

G-1-22: Location and Type of Cross Drainage to be applied STA.262+50~STA.275+00

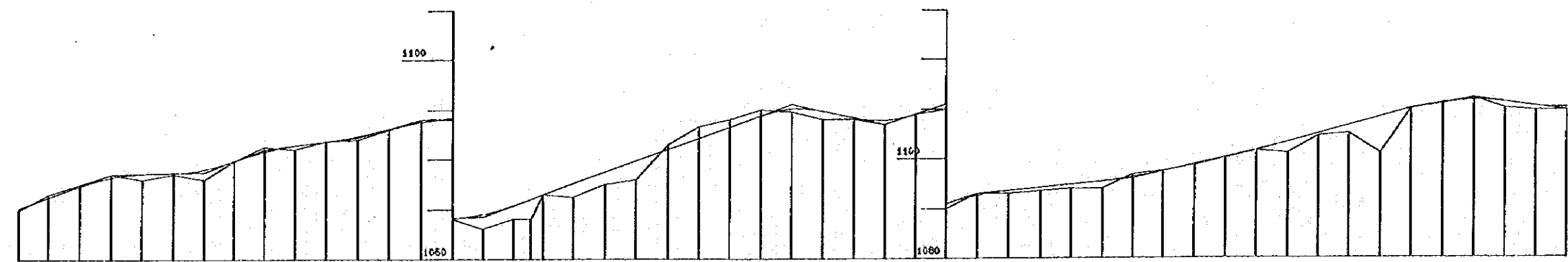
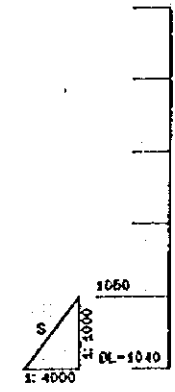


THE SECTION TO BE CONSTRUCTED BY 4 M ROAD WIDTH



No.	145	146	147	148	149	150	151	152	153	154	155
Station	262+85	263+60	264+10	266+60	266+85	268+85	270+45	271+15	272+15	273+50	274+60
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B	B	B	B
Catchment area (ha)	1.4	2.0	10.8	13.1	1.4	9.6	6.2	3.3	5.1	8.1	1.5
Terrain (A: steep, B: flat)	A	A	A	A	A	A	A	A	A	A	A
Cross-drainage type	2	2	3	3	2	3	2	2	2	2	2
Checkdam & channel (m)			5	5		5	5	5	5	5	

Regard: Cross Drainage Type  
 1. Causeway with pipe (900)  
 2. Pipe culvert (900 x 1)  
 3. Pipe culvert (900 x 2)  
 4. Box culvert (2m x 2m)  
 5. Slab culvert (4m)



GRADE																																																					
PROPOSED HEIGHT	1090.25	1092.50	1094.75	1096.48	1097.17	1097.93	1098.02	1098.75	1099.05	1099.83	1099.87	1099.75	1099.25	1098.82	1098.07	1097.96	1097.75	1097.00	1096.33	1095.85	1095.19	1094.36	1093.36	1092.75	1100.15	1101.36	1103.20	1104.30	1106.80	1108.30	1109.82	1111.00	1111.54	1112.00	1111.17	1109.50	1110.35	1109.80	1110.08														
GROUND HEIGHT	1090.00	1093.00	1095.00	1097.00	1098.00	1098.70	1099.75	1099.50	1099.85	1099.83	1099.87	1099.75	1099.25	1098.82	1098.07	1097.96	1097.75	1097.00	1096.33	1095.85	1095.19	1094.36	1093.36	1092.75	1100.15	1101.36	1103.20	1104.30	1106.80	1108.30	1109.82	1111.00	1111.54	1112.00	1111.17	1109.50	1110.35	1109.80	1110.08														
STATION	262+50	262+75	263	263+25	263+50	263+75	264	264+25	264+50	264+75	265	265+25	265+50	265+75	266	266+25	266+50	266+75	266+85	266+90	267	267+25	267+50	267+75	268	268+25	268+50	268+75	269	269+25	269+50	269+75	270	270+25	270+50	270+75	271	271+25	271+50	271+75	272	272+25	272+50	272+75	273	273+25	273+50	273+75	274	274+25	274+50	274+75	275
CURVE ELEMENT	R=60.00 R=60.00		L=42.15		L=38.95		R=405.00		R=120.00		L=102.31		R=20.00 R=50.00 R=20.00		R=40.00		R=30.00		L=39.97		R=50.00		R=50.00 R=60.00		L=127.63		R=500.00		L=85.17		R=70.00																						



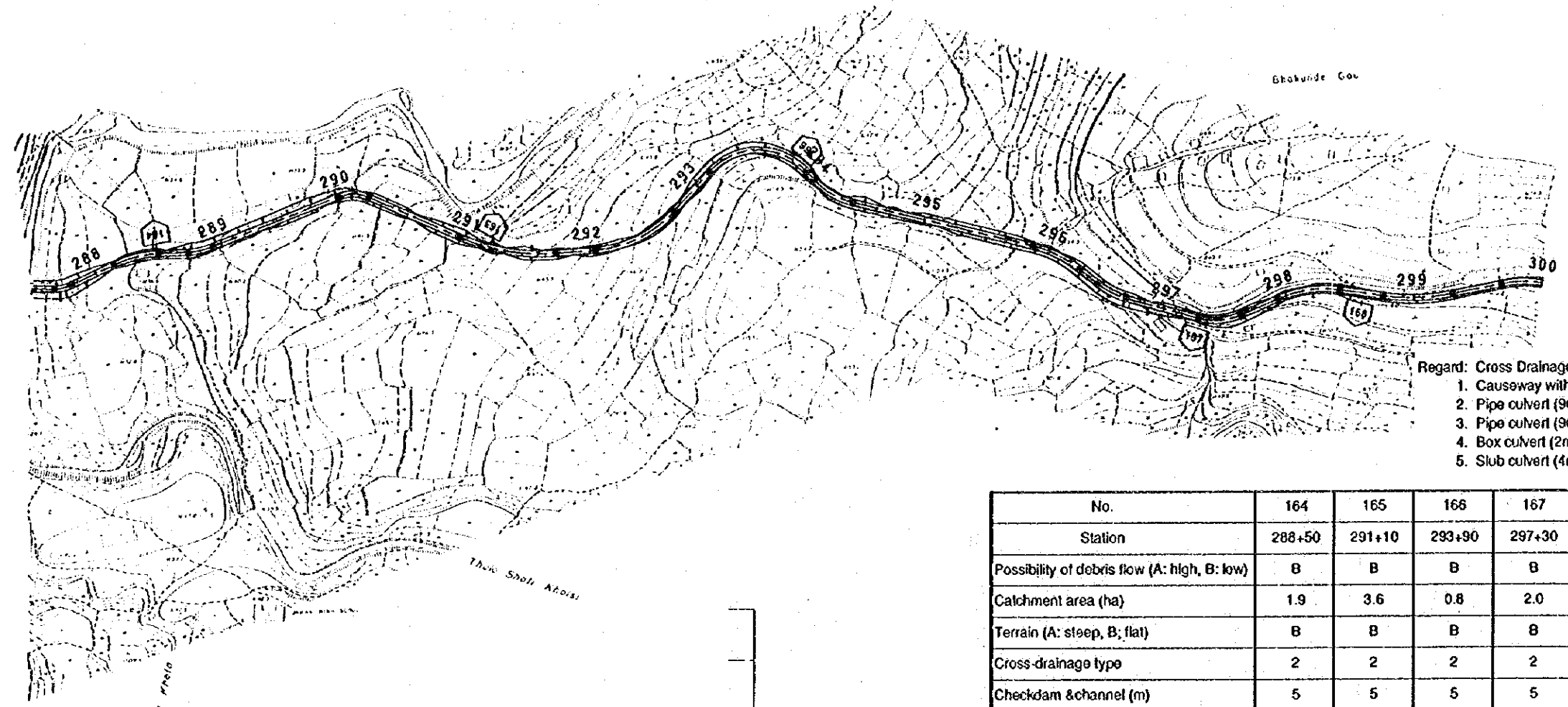




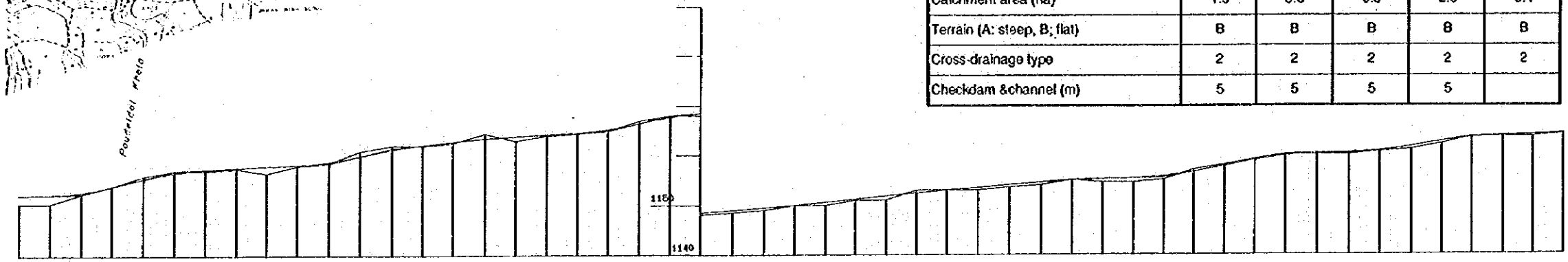
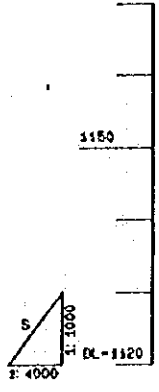
N 30495 E 36500

N 30500

G-1-24: Location and Type of Cross Drainage to be applied STA.287+50~STA.300+00



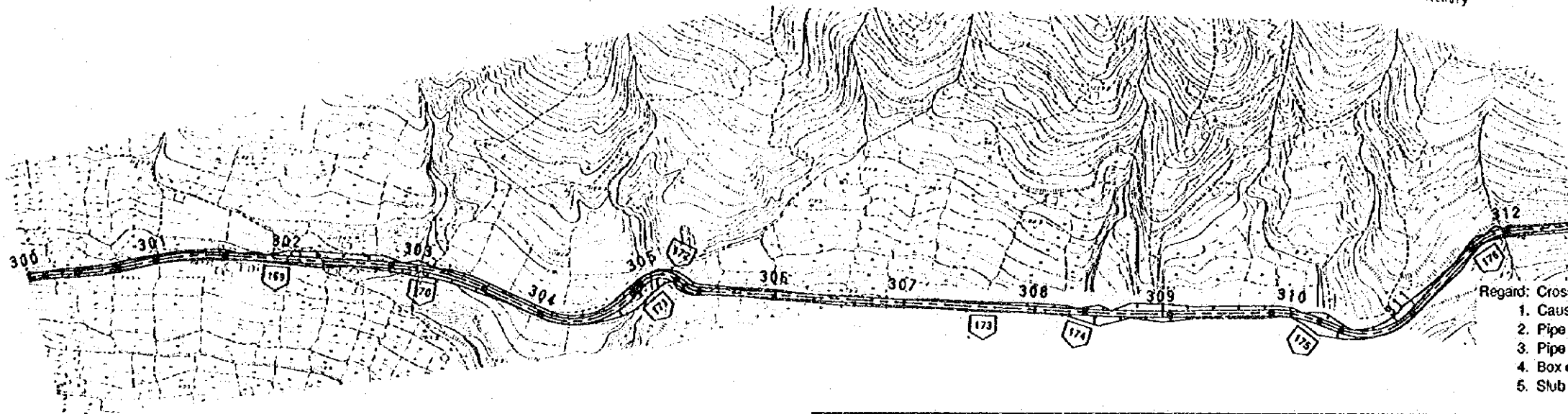
No.	164	165	166	167	168
Station	288+50	291+10	293+90	297+30	298+60
Possibility of debris flow (A: high, B: low)	B	B	B	B	B
Catchment area (ha)	1.9	3.6	0.8	2.0	3.4
Terrain (A: steep, B: flat)	B	B	B	B	B
Cross-drainage type	2	2	2	2	2
Checkdam & channel (m)	5	5	5	5	5



GRADE	+0.75% 200m		+5.00% 75m		+1.20% 125m		+5.00% 50m		+2.67% 75m		+1.60% 100m		+5.00% 50m		+2.00% 100m		+2.67% 75m		+4.60% 100m		+2.67% 75m		+4.00% 75m		+2.67% 75m		+1.60% 100m																								
PROPOSED HEIGHT	1130.13	1132.31	1132.83	1134.00	1135.90	1137.00	1137.50	1137.90	1138.20	1138.60	1140.00	1141.20	1142.17	1142.80	1143.43	1143.88	1144.25	1144.63	1145.28	1146.50	1147.75	1148.00	1148.50	1149.00	1150.00	1150.25	1151.25	1151.88	1152.47	1153.00	1153.50	1154.00	1154.50	1154.92	1155.17	1155.38	1155.74	1156.63	1157.75	1158.65	1159.75	1160.00	1160.17	1160.33	1160.71	1161.50	1162.50	1163.25	1163.67	1163.83	1164.13
GROUND HEIGHT	1130.00	1130.50	1132.50	1134.00	1135.00	1136.00	1137.50	1138.50	1139.20	1139.80	1141.00	1142.00	1142.17	1142.80	1143.00	1143.88	1144.00	1144.63	1145.00	1146.50	1147.00	1148.00	1148.50	1149.00	1150.00	1150.25	1151.00	1151.88	1153.00	1153.50	1154.00	1154.50	1155.00	1155.74	1156.63	1157.00	1158.65	1159.00	1159.75	1160.00	1160.17	1160.33	1160.50	1160.71	1161.00	1162.00	1163.00	1163.50	1163.83	1164.00	
STATION	287+50	287+75	288	288+25	289+50	289+75	290	290+25	290+50	290+75	291	291+25	291+50	291+75	292	292+25	292+50	292+75	293	293+25	293+50	293+75	294	294+25	294+50	294+75	295	295+25	295+50	295+75	296	296+25	296+50	296+75	297	297+25	297+50	297+75	298	298+25	298+50	298+75	299	299+25	299+50	299+75	300				
CURVE ELEMENT	R=30.00		R=90.00		R=60.00		L=104.11		R=30.00		L=75.59		R=150.00		R=90.00		L=49.97		R=60.00		L=145.08		R=90.00		L=58.13		R=60.00		R=50.00		R=50.00		R=90.00		R=150.00		R=90.00		R=90.00		R=90.00		R=90.00								

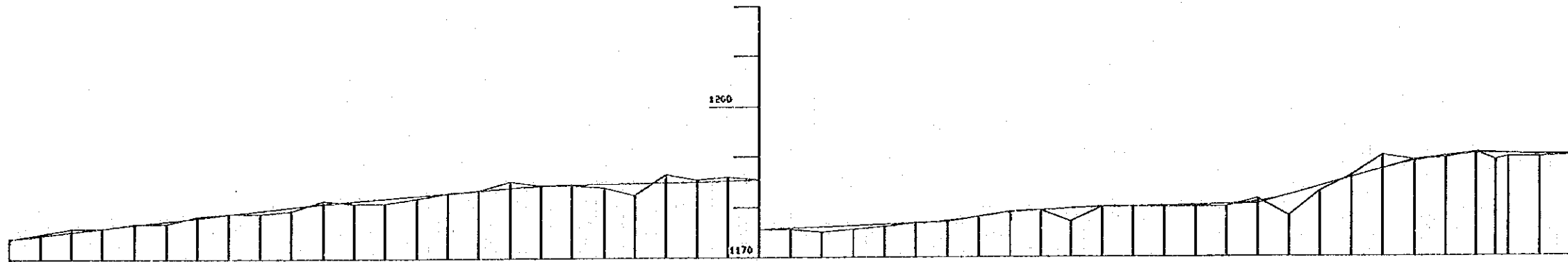


G-1-25: Location and Type of Cross Drainage to be applied STA.300+00~STA.312+50



Regard: Cross Drainage Type  
 1. Causeway with pipe (900)  
 2. Pipe culvert (900 x 1)  
 3. Pipe culvert (900 x 2)  
 4. Box culvert (2m x 2m)  
 5. Sub culvert (4m)

No.	169	170	171	172	173	174	175	176
Station	301+90	303+05	305+00	305+20	307+60	308+40	310+25	311+95
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B
Catchment area (ha)	8.5	10.3	8.7	13.8	3.7	9.5	12.9	2.1
Terrain (A: steep, B: flat)	B	B	A	B	B	B	A	A
Cross-drainage type	2	3	2	3	2	3	3	2
Checkdam & channel (m)	5	5	5	5	5	5	5	5



GRADE	12.60% 125m		12.60% 125m		12.00% 175m		10.40% 125m		11.00% 200m		4.00% 50m		11.33% 75m		10.40% 125m		16.80% 125m		2.00% 50m		-1.00% 50m			
PROPOSED HEIGHT	1184.00	1184.13	1184.70	1185.40	1186.10	1186.80	1187.50	1188.20	1188.90	1189.60	1190.30	1191.00	1191.70	1192.40	1193.10	1193.80	1194.50	1195.20	1195.90	1196.60	1197.30	1198.00		
GROUND HEIGHT	1184.00	1185.00	1186.00	1187.00	1188.00	1189.00	1190.00	1191.00	1192.00	1193.00	1194.00	1195.00	1196.00	1197.00	1198.00	1199.00	1200.00	1201.00	1202.00	1203.00	1204.00	1205.00		
STATION	300	300+25	300+50	300+75	301	301+25	301+50	301+75	302	302+25	302+50	302+75	303	303+25	303+50	303+75	304	304+25	304+50	304+75	305	305+25	305+50	
CURVE ELEMENT	R=90.00		R=200.00		L=128.62		R=200.00		L=42.35		R=20.00		L=297.97		R=1000.00		L=79.42		R=50.00		L=57.73		L=71.78	

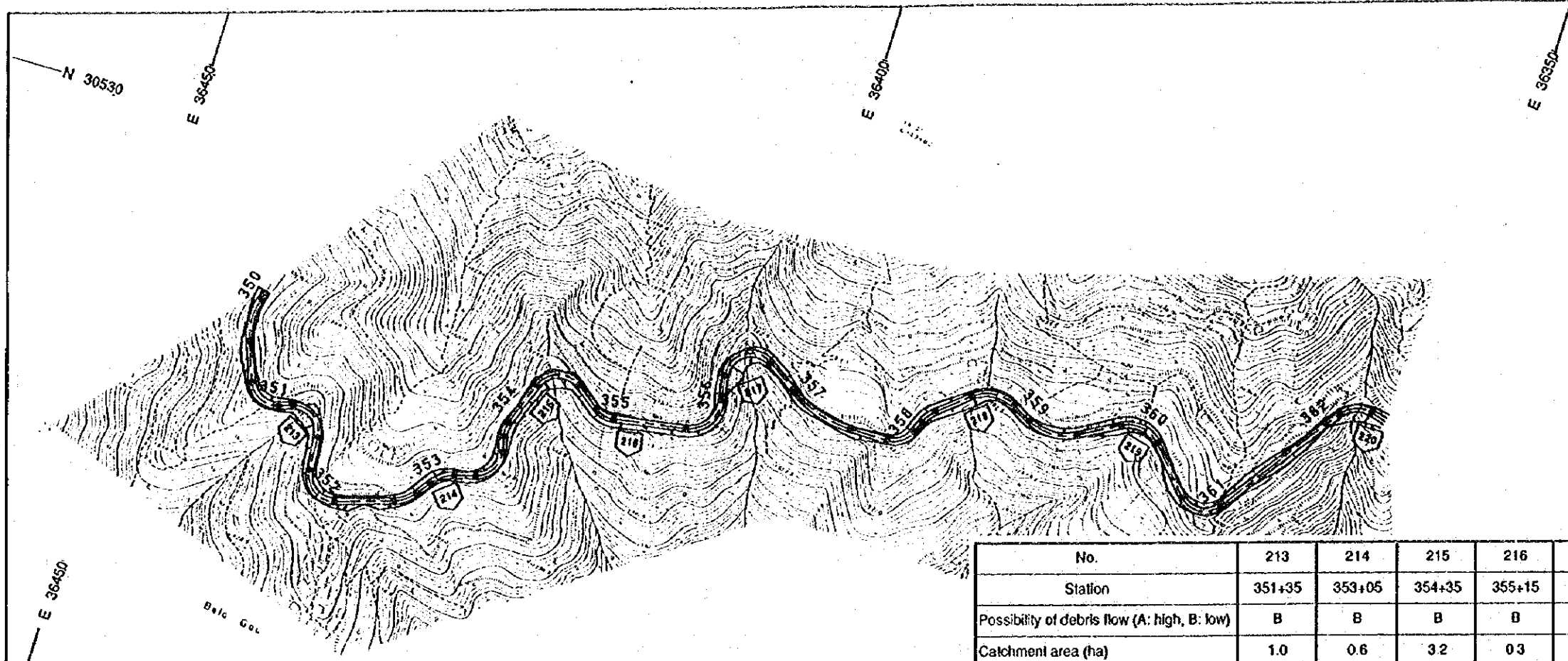






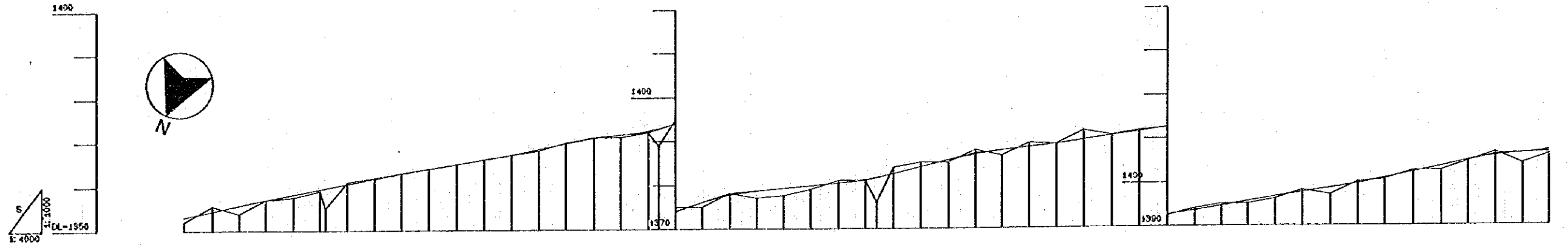


G-1-29: Location and Type of Cross Drainage to be applied STA.350+00~STA.362+50



- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slab culvert (4m)

No.	213	214	215	216	217	218	219	220
Station	351+35	353+05	354+35	355+15	356+40	358+55	360+00	362+25
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B
Catchment area (ha)	1.0	0.6	3.2	0.3	12.2	8.3	6.9	10.7
Terrain (A: steep, B: flat)	A	A	A	A	A	A	A	A
Cross-drainage type	2	2	2	2	3	2	2	3
Checkdam & channel (m)	5		5		5	5	5	5



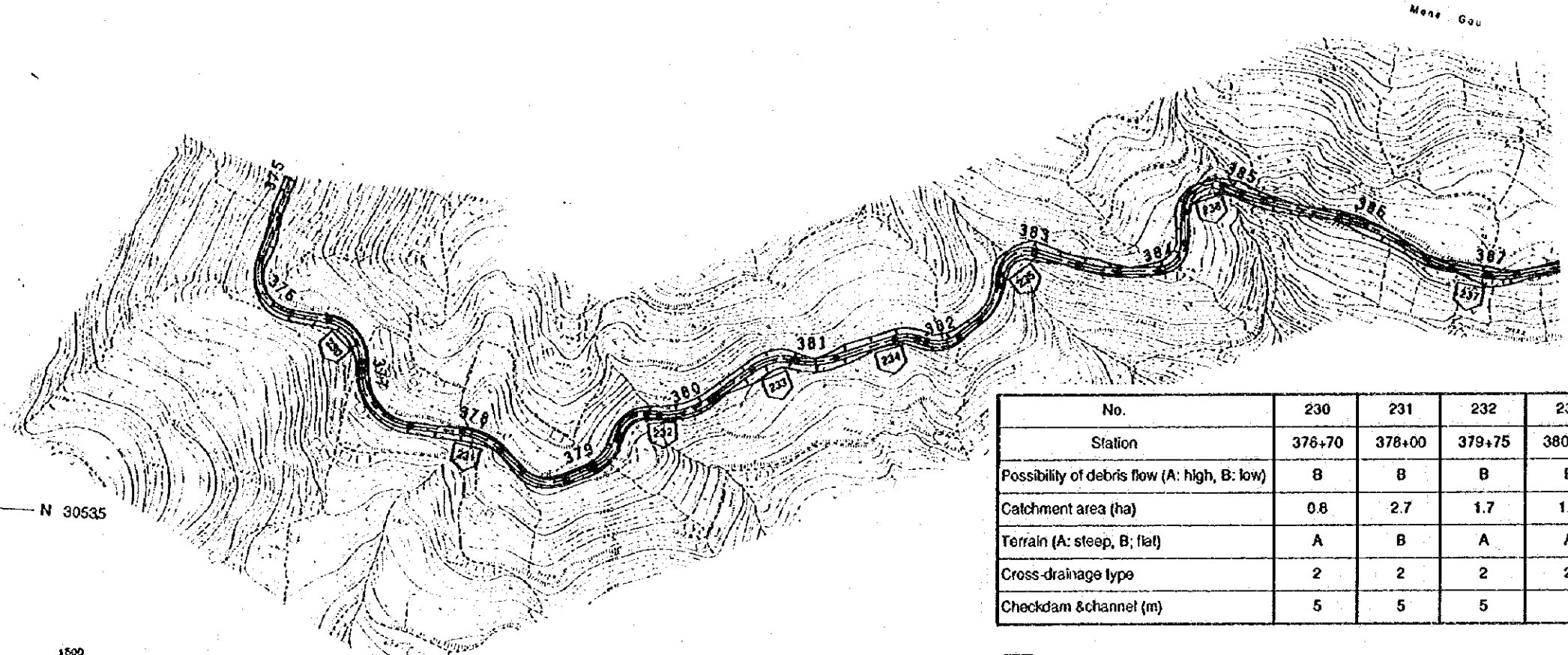
GRADE																												
PROPOSED HEIGHT	1352.10	1354.40	1357.70	1361.20	1365.00	1368.50	1372.00	1375.00	1378.00	1381.00	1384.00	1387.00	1390.00	1393.00	1396.00	1399.00	1402.00	1405.00	1408.00	1411.00								
GROUND HEIGHT	1352.00	1355.50	1359.80	1364.00	1368.00	1372.00	1376.00	1380.00	1384.00	1388.00	1392.00	1396.00	1400.00	1404.00	1408.00	1412.00	1416.00	1420.00	1424.00	1428.00								
STATION	350	350+25	350+50	350+75	351	351+50	351+75	352	352+25	352+50	352+75	353	353+25	353+50	353+75	354	354+25	354+50	354+75	355								
CURVE ELEMENT	R=20.00		R=20.00		L=47.07		R=30.00		R=20.00		L=36.65		L=57.26		R=20.00		R=25.00		R=30.00		L=34.45		L=45.68		L=117.51		R=20.00	





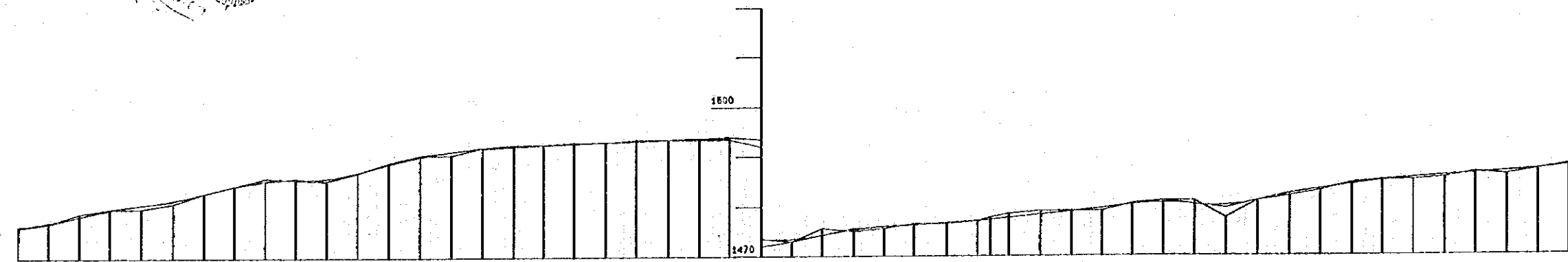
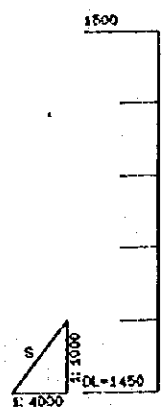


G-1-31: Location and Type of  
Cross Drainage to be applied  
STA.375+00~STA.387+50



- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slub culvert (4m)

No.	230	231	232	233	234	235	236	237
Station	376+70	378+00	379+75	380+70	381+65	382+85	384+80	386+90
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B
Catchment area (ha)	0.8	2.7	1.7	1.1	1.5	5.4	17.7	3.4
Terrain (A: steep, B: flat)	A	B	A	A	A	A	A	B
Cross-drainage type	2	2	2	2	2	2	3	2
Checkdam & channel (m)	5	5	5			5	5	5



GRADE																																																			
PROPOSED HEIGHT	1456.33	1457.21	1457.90	1458.81	1459.75	1461.00	1463.00	1465.50	1467.17	1468.83	1470.27	1471.28	1471.87	1472.25	1472.50	1472.75	1473.00	1473.25	1473.50	1473.75	1473.81	1473.84	1474.25	1474.28	1475.28	1475.86	1476.25	1476.83	1477.05	1477.27	1477.80	1478.80	1480.25	1480.62	1481.00	1481.00	1481.00	1482.33	1483.33	1484.17	1484.89	1485.40	1485.80	1485.20	1485.50	1486.50	1487.10	1487.80	1488.00		
GROUND HEIGHT	1456.20	1457.00	1458.00	1459.00	1460.00	1461.00	1462.00	1463.00	1464.00	1465.00	1466.00	1467.00	1468.00	1469.00	1470.00	1471.00	1472.00	1473.00	1474.00	1475.00	1476.00	1477.00	1478.00	1479.00	1480.00	1481.00	1482.00	1483.00	1484.00	1485.00	1486.00	1487.00	1488.00	1489.00	1490.00	1491.00	1492.00	1493.00	1494.00	1495.00	1496.00	1497.00	1498.00	1499.00	1500.00						
STATION	375	375+25	375+50	375+75	376	376+25	376+50	376+75	377	377+25	377+50	377+75	378	378+25	378+50	378+75	379	379+25	379+50	379+75	380	380+25	380+50	380+75	381	381+25	381+50	381+75	382	382+25	382+50	382+75	383	383+25	383+50	383+75	384	384+25	384+50	384+75	385	385+25	385+50	385+75	386	386+25	386+50	386+75	387	387+25	387+50
CURVE ELEMENT																																																			

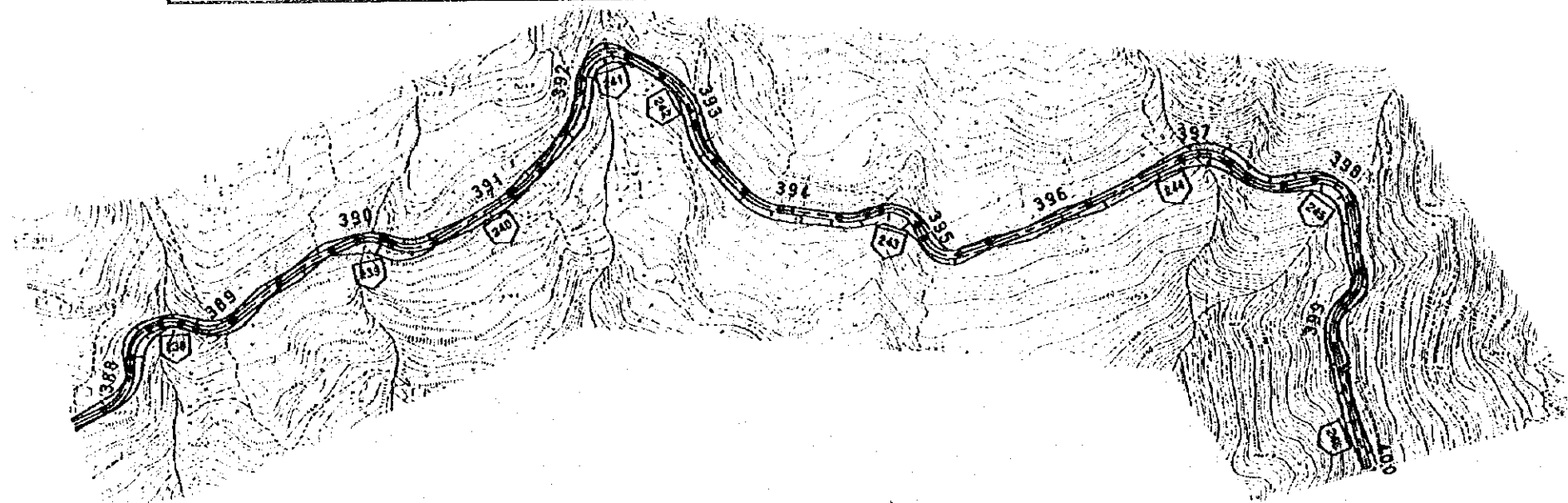


No.	238	239	240	241	242	243	244	245	246
Station	388+50	390+00	390+95	392+25	392+90	394+75	396+90	398+00	399+70
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B	B
Catchment area (ha)	14.2	6.8	1.0	21.0	1.4	12.0	14.0	12.2	4.3
Terrain (A: steep, B: flat)	A	A	A	A	A	A	A	A	A
Cross-drainage type	3	2	2	4	2	3	3	3	2
Checkdam & channel (m)	5	5	5	5		5	5	5	

N 30535

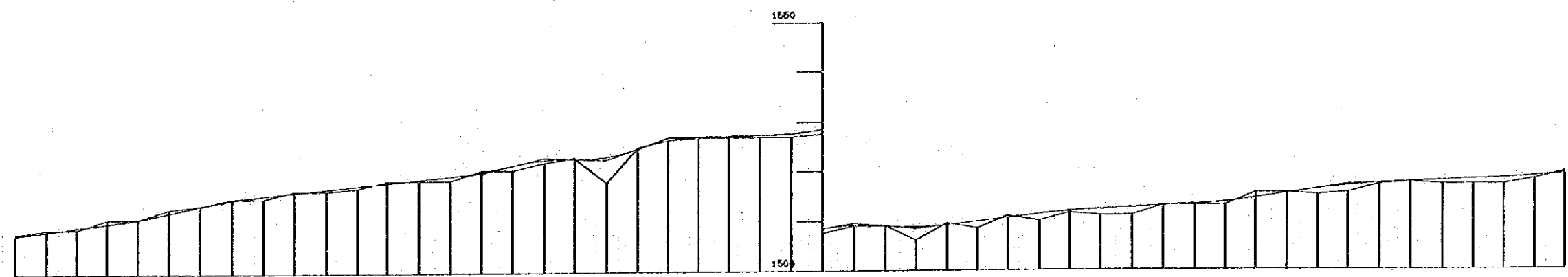
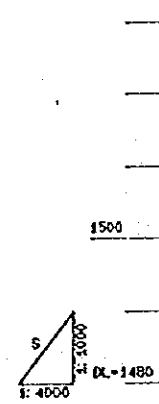
G-1-32: Location and Type of Cross Drainage to be applied STA.387+50~STA.400+00

- Regard: Cross Drainage Type
1. Causeway with pipe (300)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slab culvert (4m)



N 30535

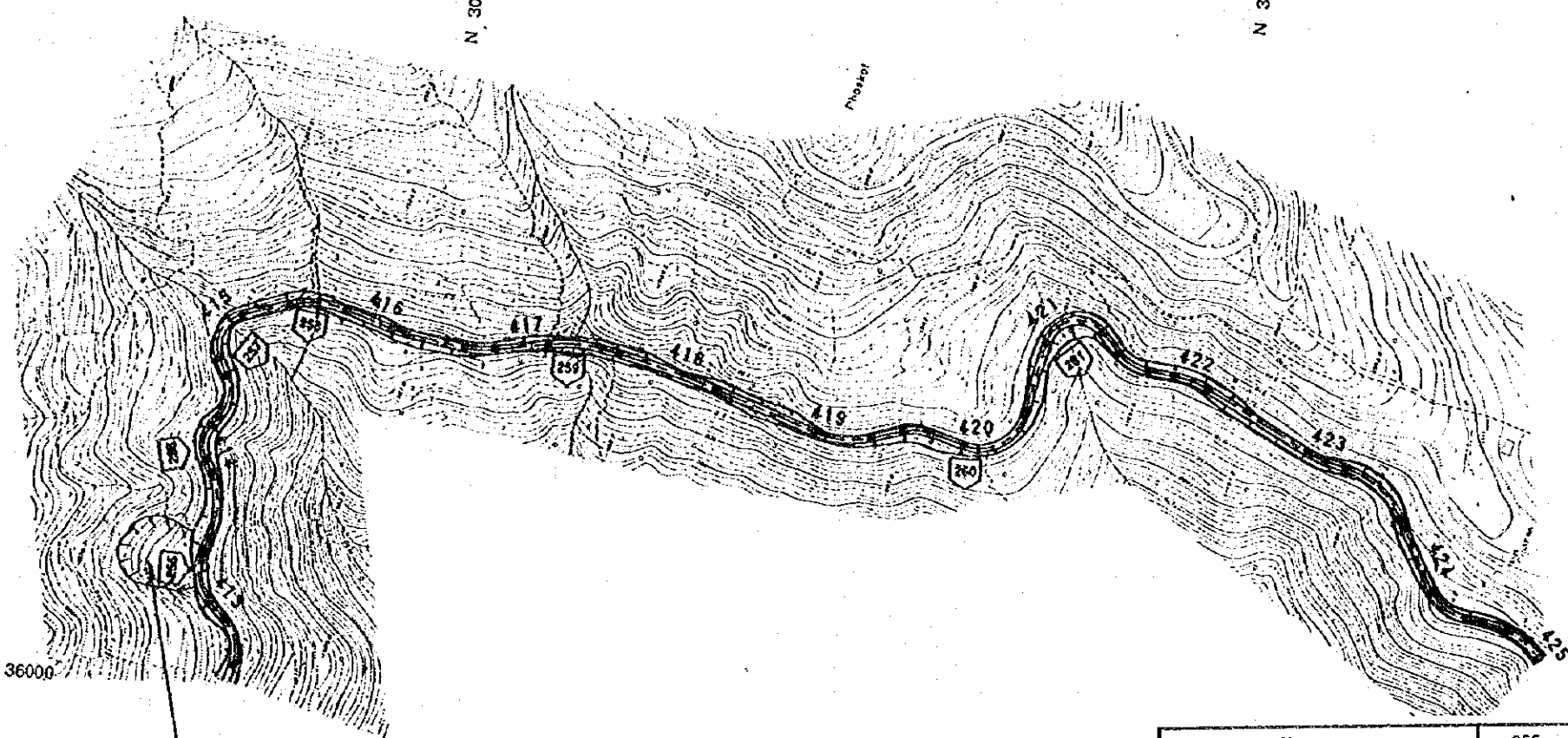
N 30530



GRADE																																																												
PROPOSED HEIGHT	1487.80	1488.80	1489.40	1490.20	1491.13	1492.35	1493.57	1494.82	1495.83	1496.25	1496.88	1497.50	1498.13	1498.75	1499.38	1500.00	1501.00	1502.06	1503.00	1502.75	1503.13	1502.50	1504.75	1506.47	1507.00	1507.13	1507.25	1507.38	1507.72	1508.50	1509.12	1509.30	1509.50	1509.80	1509.20	1509.30	1509.80	1510.00	1510.60	1511.30	1511.90	1511.90	1512.30	1512.80	1513.00	1513.20	1513.64	1514.36	1515.25	1516.13	1516.64	1517.25	1517.50	1517.50	1517.75	1518.00	1518.25	1518.60	1518.60	1519.17
GROUND HEIGHT	1488.00	1489.00	1489.40	1490.20	1491.13	1492.35	1493.57	1494.82	1495.83	1496.25	1496.88	1497.50	1498.13	1498.75	1499.38	1500.00	1501.00	1502.06	1503.00	1502.75	1503.13	1502.50	1504.75	1506.47	1507.00	1507.13	1507.25	1507.38	1507.72	1508.50	1509.12	1509.30	1509.50	1509.80	1509.20	1509.30	1509.80	1510.00	1510.60	1511.30	1511.90	1511.90	1512.30	1512.80	1513.00	1513.20	1513.64	1514.36	1515.25	1516.13	1516.64	1517.25	1517.50	1517.50	1517.75	1518.00	1518.25	1518.60	1518.60	1519.17
STATION	387+50	387+75	388	388+25	388+50	388+75	389	389+25	389+50	389+75	390	390+25	390+50	390+75	391	391+25	391+50	391+75	392	392+25	392+50	392+75	393	393+25	393+50	393+75	394	394+25	394+50	394+75	395	395+25	395+50	395+75	396	396+25	396+50	396+75	397	397+25	397+50	397+75	398	398+25	398+50	398+75	399	399+25	399+50	399+75	400									
CURVE ELEMENT																																																												



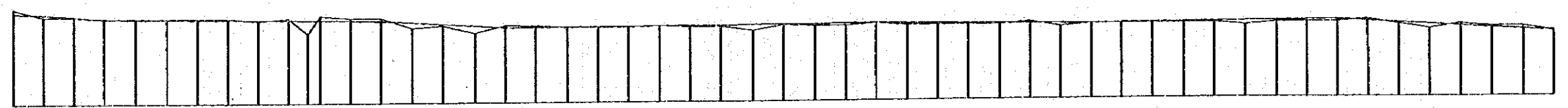
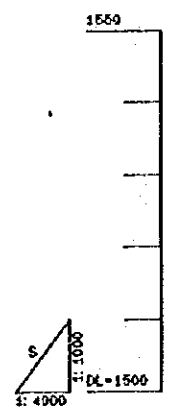
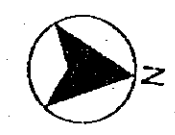
G-1-34: Location and Type of Cross Drainage to be applied STA.412+50~STA.425+00



ACTIVE LAND-SLIDE TO BE PROTECTED

- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slab culvert (4m)

No.	255	256	257	258	259	260	261
Station	413+20	414+10	414+95	415+55	417+30	419+55	421+00
Possibility of debris flow (A: high, B: low)	B	B	A	B	B	B	B
Catchment area (ha)	2.3	6.0	8.5	5.0	11.0	1.3	5.6
Terrain (A: steep, B: flat)	A	A	A	A	A	B	A
Cross-drainage type	2	2	1	2	3	2	2
Checkdam & channel (m)	5	5		5	5		5

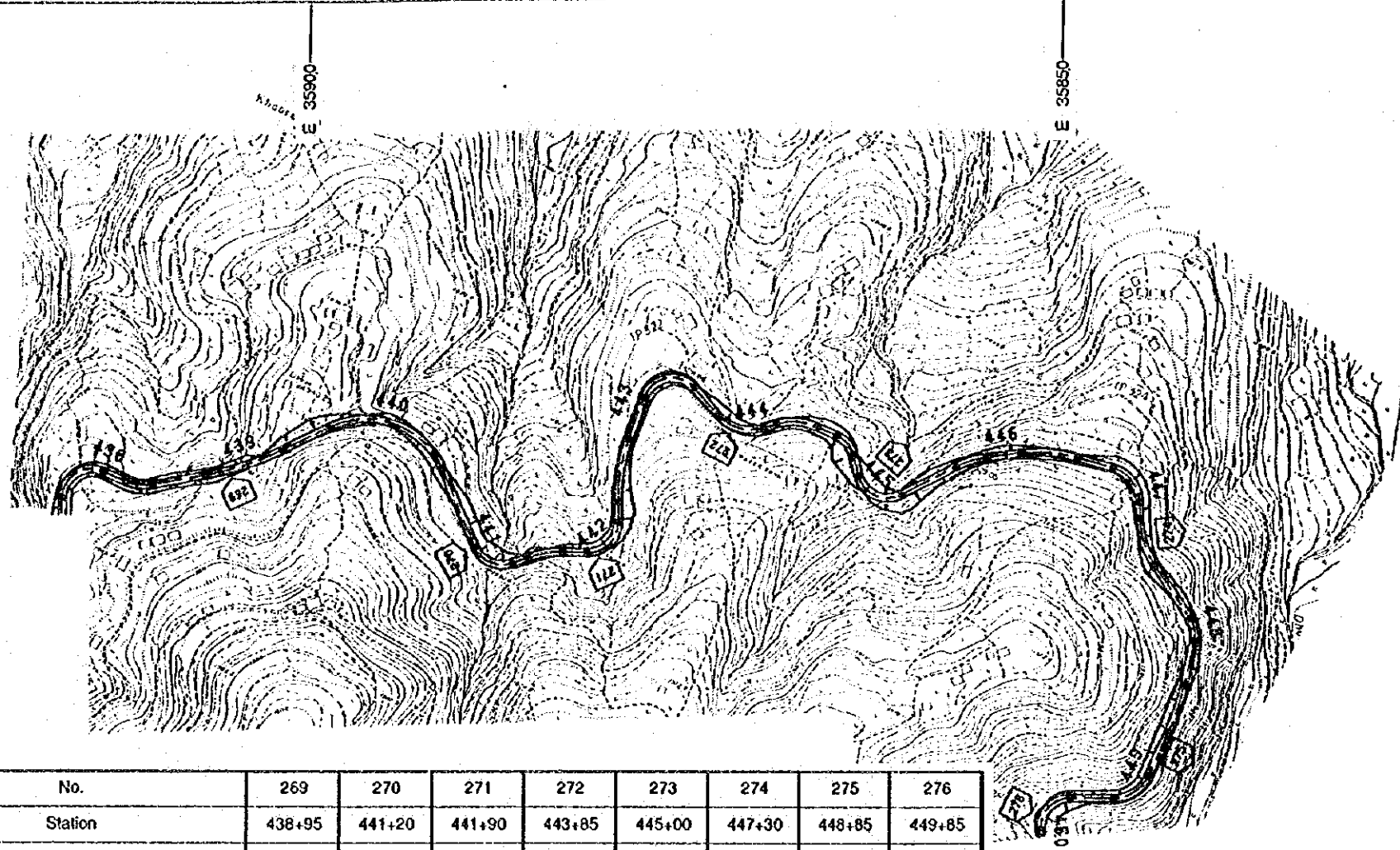


GRADE																																																				
PROPOSED HEIGHT	1518.20	1517.92	1517.50	1517.11	1516.04	1515.90	1515.83	1515.78	1515.72	1515.87	1515.83	1515.81	1515.80	1515.42	1515.13	1515.08	1515.17	1515.21	1515.25	1515.29	1515.32	1515.38	1515.42	1515.46	1515.47	1515.43	1515.39	1515.29	1515.21	1515.14	1515.07	1515.03	1515.06	1515.13	1515.19	1515.23	1515.31	1515.36	1515.44	1515.40	1515.14	1514.79	1514.43	1514.07	1513.71	1513.36	1513.10	1512.75	1512.40			
GROUND HEIGHT	1518.00	1517.50	1517.50	1517.11	1516.04	1515.80	1515.83	1515.78	1515.72	1515.87	1515.83	1515.81	1515.80	1515.42	1515.13	1515.08	1515.17	1515.21	1515.25	1515.29	1515.32	1515.38	1515.42	1515.46	1515.47	1515.43	1515.39	1515.29	1515.21	1515.14	1515.07	1515.03	1515.06	1515.13	1515.19	1515.23	1515.31	1515.36	1515.44	1515.40	1515.14	1514.79	1514.43	1514.07	1513.71	1513.36	1513.10	1512.75	1512.40			
STATION	412+00	412+75	413	413+25	413+50	413+75	414	414+25	414+50	414+75	415	415+25	415+50	415+75	416	416+25	416+50	416+75	417	417+25	417+50	417+75	418	418+25	418+50	418+75	419	419+25	419+50	419+75	420	420+25	420+50	420+75	421	421+25	421+50	421+75	422	422+25	422+50	422+75	423	423+25	423+50	423+75	424	424+25	424+50	424+75	425	
CURVE ELEMENT	R=30.00		R=50.00		R=25.00		R=20.00		R=20.00		R=60.00		L=39.25		R=60.00		L=34.45		R=90.00		R=500.00		L=58.32		R=50.00		R=30.00		L=47.63		R=20.00		R=60.00		L=75.29		R=50.00		L=51.00		R=60.00		R=30.00		R=50.00		R=30.00		R=50.00		R=60.00	



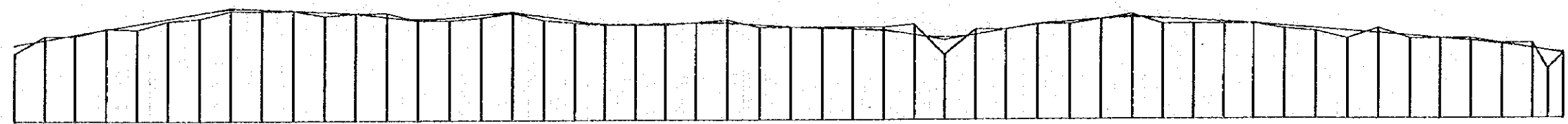


G-1-36: Location and Type of Cross Drainage to be applied STA.437+50~STA.450+00



No.	269	270	271	272	273	274	275	276
Station	438+95	441+20	441+90	443+85	445+00	447+30	448+85	449+85
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B
Catchment area (ha)	2.0	11.9	1.8	0.7	4.0	1.2	8.0	2.5
Terrain (A: steep, B: flat)	B	A	B	B	A	B	B	B
Cross-drainage type	2	3	2	2	2	2	2	2
Checkdam & channel (m)	5	5	5	5	5			5

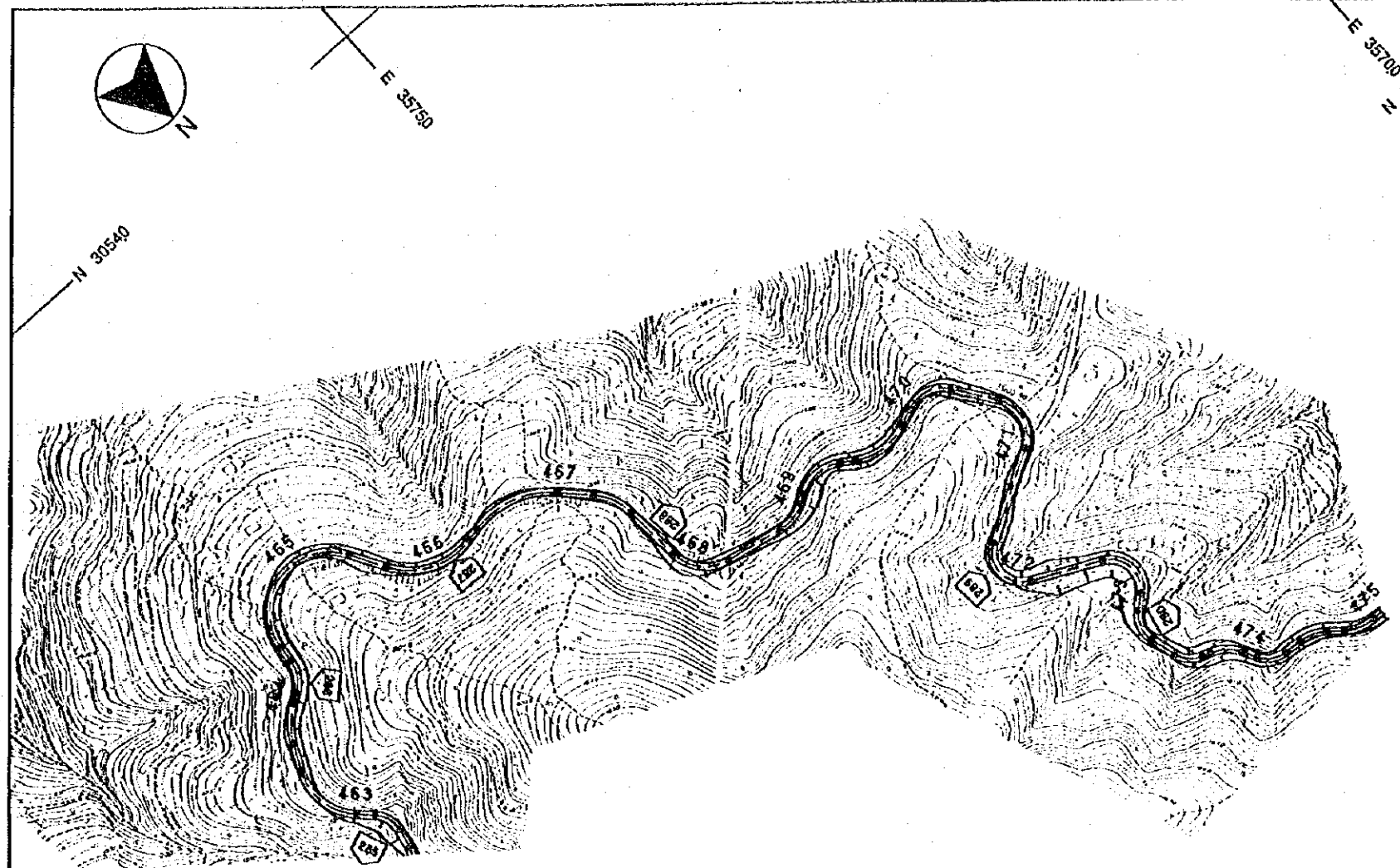
Regard: Cross Drainage Type  
 1. Causeway with pipe (900)  
 2. Pipe culvert (900 x 1)  
 3. Pipe culvert (900 x 2)  
 4. Box culvert (2m x 2m)  
 5. Slab culvert (4m)



GRADE																				
PROPOSED HEIGHT	1526.25	1526.32	1527.36	1528.45	1529.51	1530.57	1531.64	1532.70	1533.76	1534.82	1535.88	1536.94	1538.00	1539.06	1540.12	1541.18	1542.24	1543.30	1544.36	1545.42
GROUND HEIGHT	1523.00	1527.00	1527.98	1528.50	1529.50	1530.50	1531.54	1532.00	1532.40	1532.10	1531.80	1531.30	1530.70	1530.00	1529.20	1528.30	1527.25	1526.00	1524.60	1523.00
STATION	437+50	437+75	438	438+25	439+50	439+75	439	439+25	439+50	439+75	440	440+25	440+50	440+75	441	441+25	441+50	441+75	442	442+25
CURVE ELEMENT																				

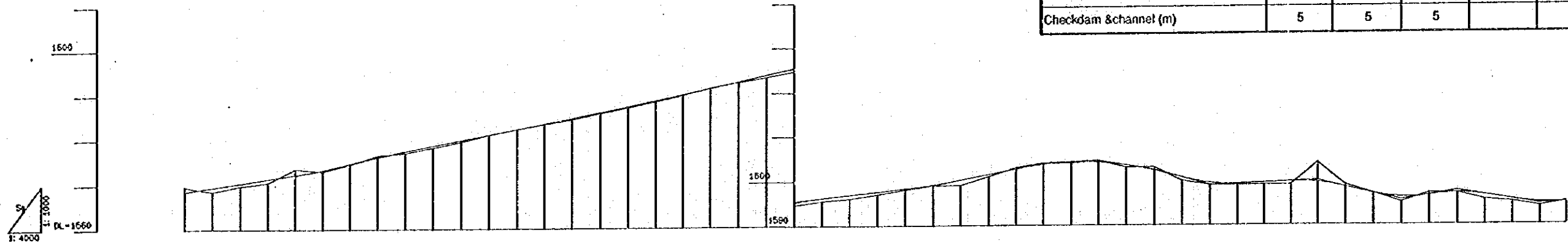


G-1-38: Location and Type of Cross Drainage to be applied STA.462+50~STA.475+00



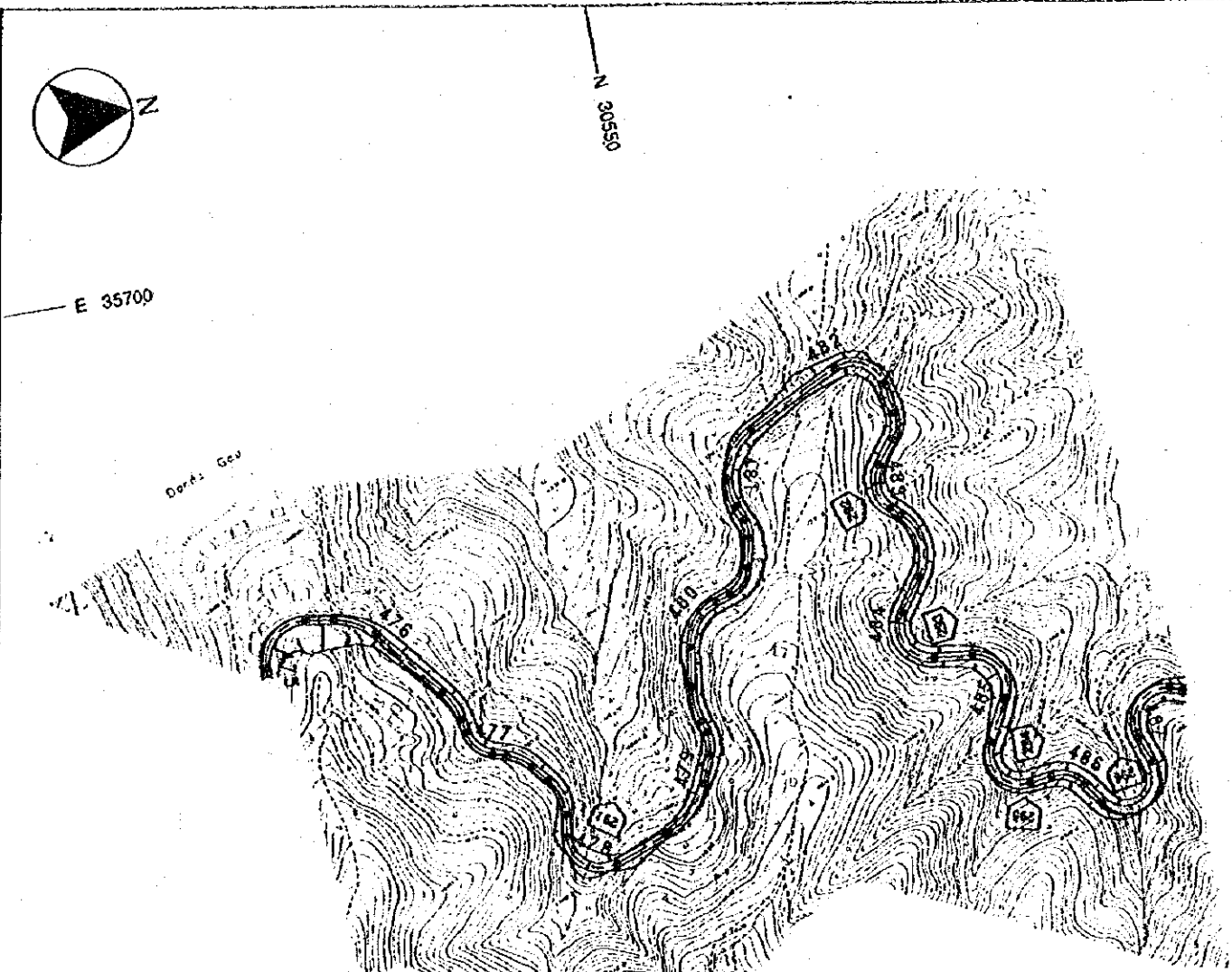
- Regard: Cross Drainage Type
- Causeway with pipe (900)
  - Pipe culvert (900 x 1)
  - Pipe culvert (900 x 2)
  - Box culvert (2m x 2m)
  - Slub culvert (4m)

No.	285	286	287	288	289	290
Station	462+75	464+15	466+25	467+70	471+80	473+15
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B
Catchment area (ha)	1.0	0.7	1.7	3.9	3.2	4.1
Terrain (A: steep, B: flat)	A	A	A	A	A	A
Cross-drainage type	2	2	2	2	2	2
Checkdam & channel (m)	5	5	5		5	5



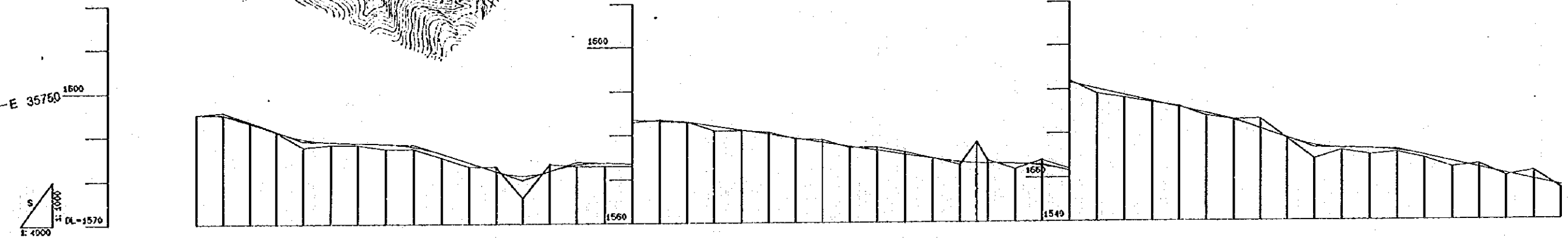
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	STATION	CURVE ELEMENT
+3.80% 1508	1508.45	1509.50	462+90	R=20.00
+3.80% 1508	1509.40	1509.50	463+75	R=20.00
+3.80% 1508	1510.35	1510.70	463	R=20.00
+3.80% 1508	1511.30	1511.50	463+25	R=40.00
+3.80% 1508	1512.25	1512.50	463+50	R=50.00
+3.80% 1508	1513.20	1513.34	463+75	R=40.00
+3.80% 1508	1514.15	1514.70	464	R=40.00
+3.80% 1508	1515.10	1515.13	464+25	R=40.00
+3.80% 1508	1516.05	1516.41	464+50	R=40.00
+3.80% 1508	1517.00	1517.83	464+75	R=40.00
+3.80% 1508	1517.95	1518.84	465	R=40.00
+3.80% 1508	1518.90	1519.06	465+25	R=40.00
+3.80% 1508	1519.85	1520.27	466	R=40.00
+3.80% 1508	1520.80	1521.49	466+25	R=40.00
+3.80% 1508	1521.75	1522.72	467	R=40.00
+3.80% 1508	1522.70	1523.30	467+25	R=40.00
+3.80% 1508	1523.65	1524.23	467+50	R=40.00
+3.80% 1508	1524.60	1525.63	467+75	R=40.00
+3.80% 1508	1525.55	1526.07	468	R=40.00
+3.80% 1508	1526.50	1527.32	468+25	R=40.00
+3.80% 1508	1527.45	1528.20	468+50	R=40.00
+3.80% 1508	1528.40	1529.30	469	R=40.00
+3.80% 1508	1529.35	1530.25	469+25	R=40.00
+3.80% 1508	1530.30	1531.14	469+50	R=40.00
+3.80% 1508	1531.25	1532.25	470	R=40.00
+3.80% 1508	1532.20	1533.27	470+25	R=20.00
+3.80% 1508	1533.15	1534.25	470+50	R=20.00
+3.80% 1508	1534.10	1534.19	471	R=20.00
+3.80% 1508	1535.05	1535.50	471+25	R=20.00
+3.80% 1508	1536.00	1536.31	471+50	R=20.00
+3.80% 1508	1536.95	1537.75	472	R=20.00
+3.80% 1508	1537.90	1538.50	472+25	R=20.00
+3.80% 1508	1538.85	1539.50	472+50	R=20.00
+3.80% 1508	1539.80	1540.56	473	R=20.00
+3.80% 1508	1540.75	1541.50	473+25	R=20.00
+3.80% 1508	1541.70	1542.50	473+50	R=20.00
+3.80% 1508	1542.65	1543.50	474	R=20.00
+3.80% 1508	1543.60	1544.50	474+25	R=20.00
+3.80% 1508	1544.55	1545.50	474+50	R=20.00
+3.80% 1508	1545.50	1546.50	475	R=20.00
+3.80% 1508	1546.45	1547.50	475+25	R=20.00
+3.80% 1508	1547.40	1548.50	475+50	R=30.00

G-1-39: Location and Type of Cross Drainage to be applied STA.475+00~STA.487+50



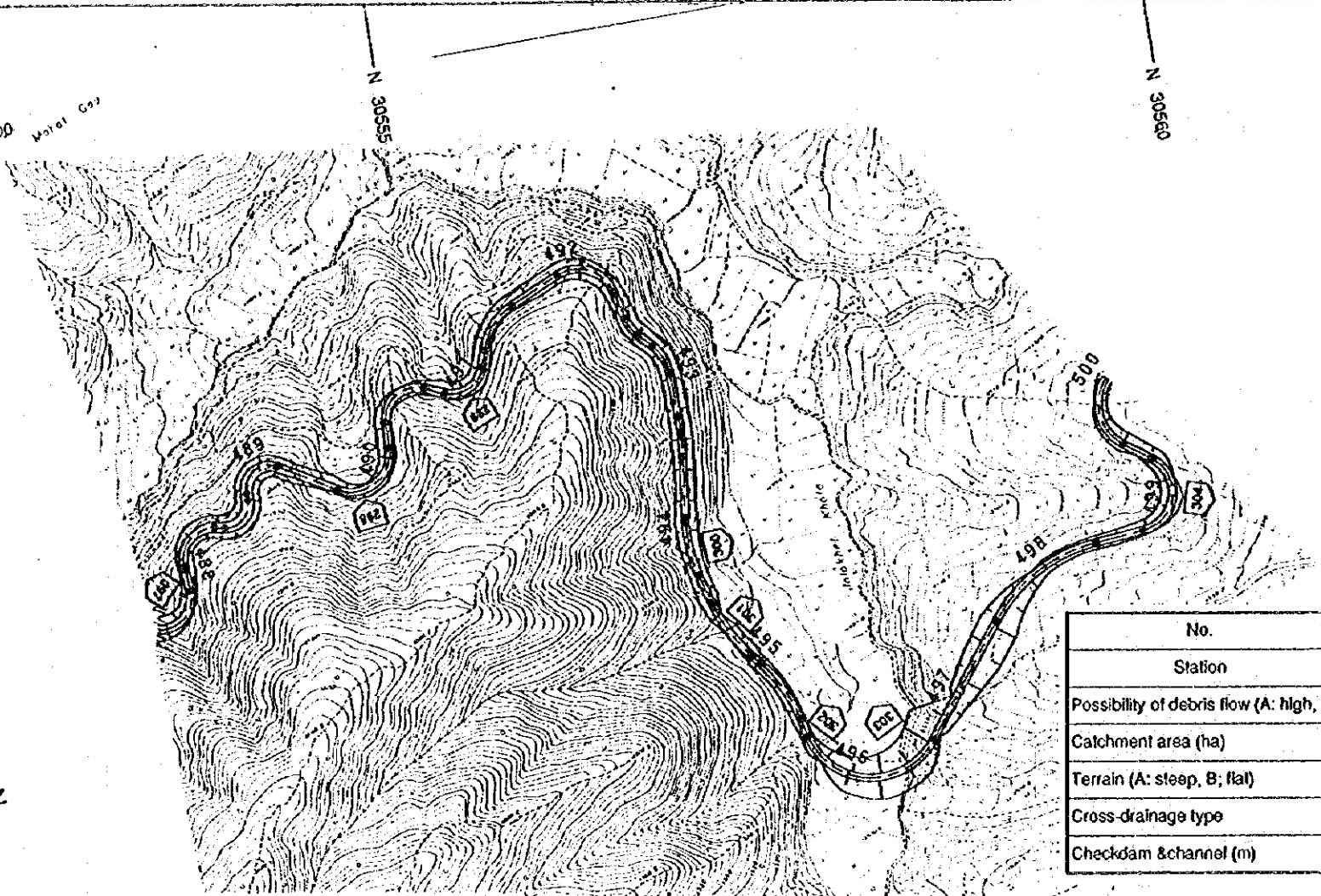
- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slub culvert (4m)

No.	291	292	293	294	295	296
Station	478+00	483+05	484+10	485+30	485+60	486+35
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B
Catchment area (ha)	11.5	0.5	1.1	1.5	7.2	8.3
Terrain (A: steep, B: flat)	A	A	A	A	A	A
Cross-drainage type	3	2	2	2	2	2
Checkdam & channel (m)		5	5	5	5	5



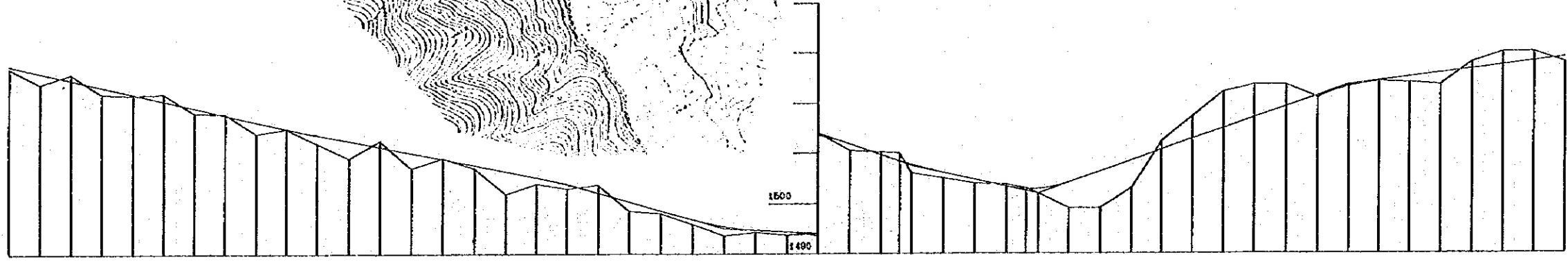
GRADE																														
PROPOSED HEIGHT	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00										
GROUND HEIGHT	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00	1595.00										
STATION	475	475+25	475+50	475+75	476	476+25	476+50	476+75	477	477+25	477+50	477+75	478	478+25	478+50	478+75	479	479+25	479+50	479+75										
CURVE ELEMENT	R=25.00		R=40.00		R=40.00		R=30.00		R=30.00		R=50.00		R=30.00		R=36.00		R=20.00		R=20.00		R=30.00		R=20.00		R=20.00		R=20.00		R=20.00	

**G-1-40: Location and Type of Cross Drainage to be applied STA.487+50~STA.500+00**



- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Slub culvert (4m)

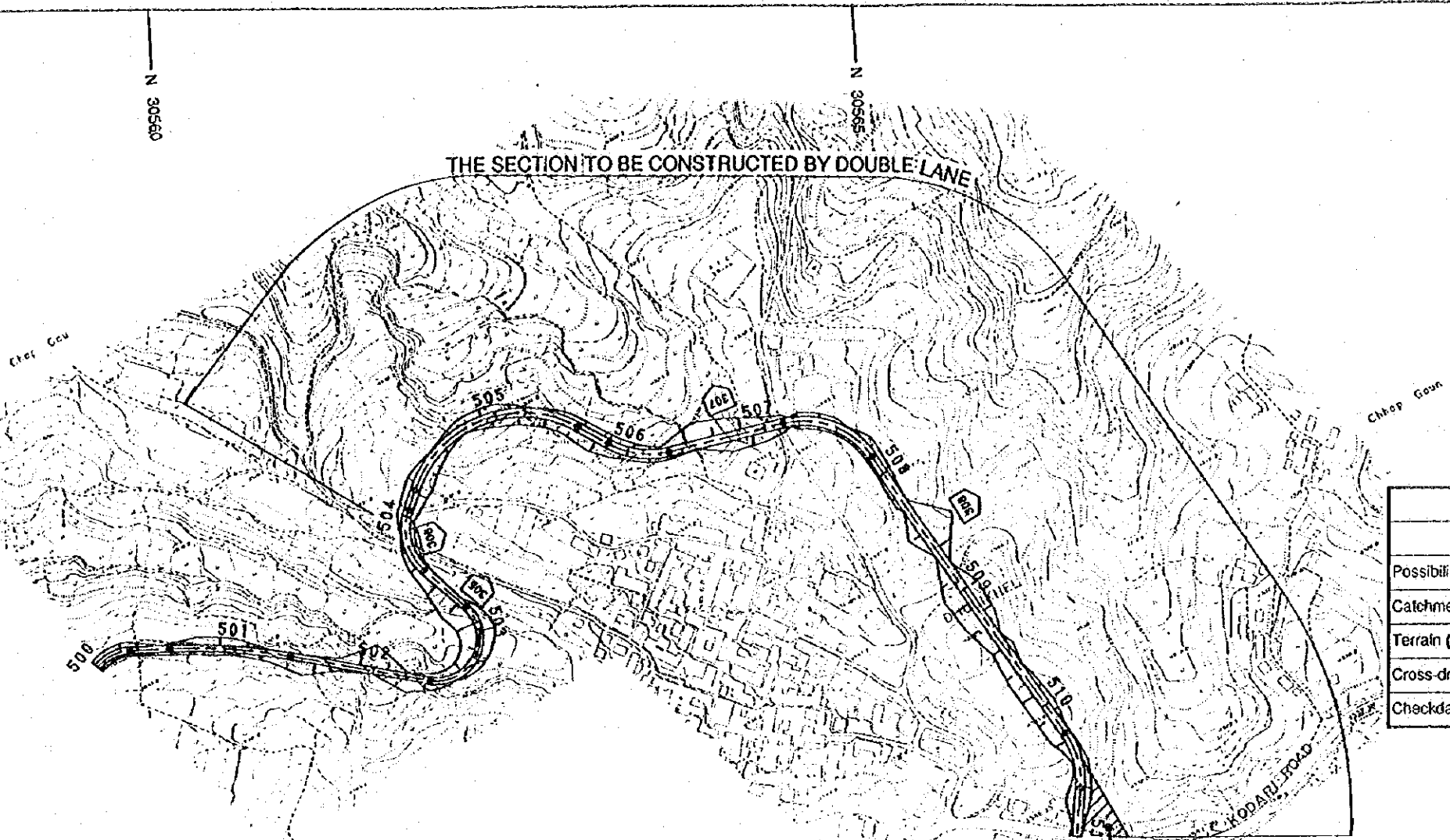
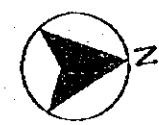
No.	297	298	299	300	301	302	303	304
Station	487+65	489+70	490+90	494+15	494+75	495+70	496+45	499+00
Possibility of debris flow (A: high, B: low)	B	B	B	B	B	B	B	B
Catchment area (ha)	1.2	1.6	1.3	1.8	4.5	5.5	24.0	3.3
Terrain (A: steep, B: flat)	A	A	A	B	B	B	B	B
Cross-drainage type	2	2	2	2	2	2	5	2
Checkdam & channel (m)	5	5	5	5	5	5		5



GRADE																																																			
PROPOSED HEIGHT	1547.00	1547.00	1546.20	1546.00	1544.80	1544.00	1542.00	1541.75	1540.80	1539.20	1538.00	1537.80	1536.40	1535.00	1533.75	1532.50	1531.30	1529.11	1528.80	1527.57	1526.44	1524.22	1523.86	1522.20	1518.50	1518.80	1515.60	1515.37	1514.00	1513.54	1511.83	1510.20	1509.57	1508.44	1508.00	1507.70	1506.13	1504.75	1503.36	1502.87	1502.88	1502.00	1504.15	1502.18	1502.28	1502.08	1502.05	1502.01	1502.39	1502.17	1502.34
GROUND HEIGHT	1547.00	1544.00	1544.80	1544.00	1542.00	1541.75	1540.80	1539.20	1538.00	1537.80	1536.40	1535.00	1533.75	1532.50	1531.30	1529.11	1528.80	1527.57	1526.44	1524.22	1523.86	1522.20	1518.50	1518.80	1515.60	1515.37	1514.00	1513.54	1511.83	1510.20	1509.57	1508.44	1508.00	1507.70	1506.13	1504.75	1503.36	1502.87	1502.88	1502.00	1504.15	1502.18	1502.28	1502.08	1502.05	1502.01	1502.39	1502.17	1502.34		
STATION	487+50	487+75	488	488+25	488+50	489+75	489	489+25	489+50	489+75	490	490+25	490+50	490+75	491	491+25	491+50	491+75	492	492+25	492+50	492+75	493	493+25	493+50	493+75	494	494+25	494+50	494+75	495	495+25	495+50	495+75	496	496+25	496+50	496+75	497	497+25	497+50	497+75	498	498+25	498+50	498+75	499	499+25	499+50	499+75	500
CURVE ELEMENT	R=20.00		R=15.00		R=15.00		R=20.00		R=20.00		R=20.00		R=20.00		R=40.00		R=25.00		R=30.00		R=25.00		R=30.00		R=150.00		R=100.00		R=100.00		R=100.00		R=100.00		R=45.00		R=100.00		R=100.00		R=45.00		R=100.00		R=100.00		R=25.00		R=30.00		R=30.00

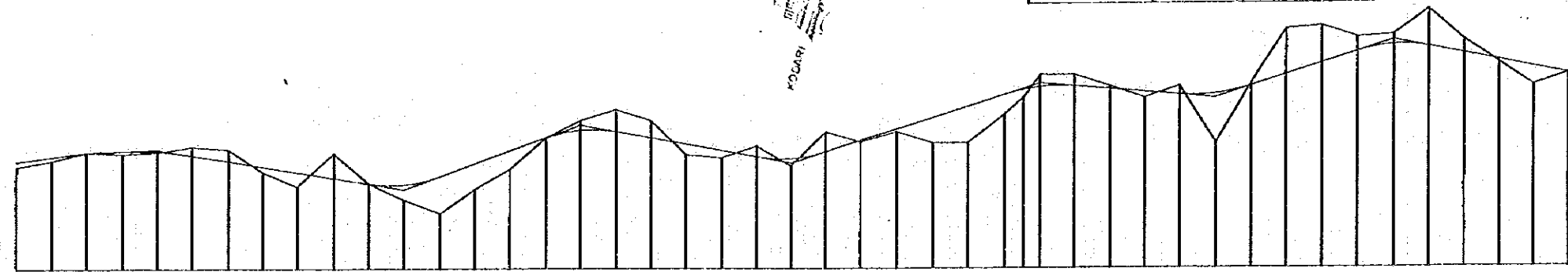
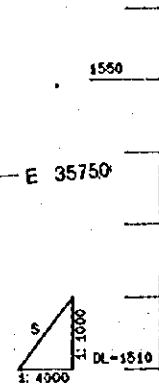


G-1-41: Location and Type of Cross Drainage to be applied STA.500+00~STA.511+00



- Regard: Cross Drainage Type
1. Causeway with pipe (900)
  2. Pipe culvert (900 x 1)
  3. Pipe culvert (900 x 2)
  4. Box culvert (2m x 2m)
  5. Stub culvert (4m)

No.	305	306	307	308
Station	503+15	503+75	506+75	508+50
Possibility of debris flow (A: high, B: low)	B	B	B	B
Catchment area (ha)	5.2	5.2	2.8	1.4
Terrain (A: steep, B: flat)	B	B	B	B
Cross-drainage type	2	2	2	2
Checkdam & channel (m)	5	5	5	5



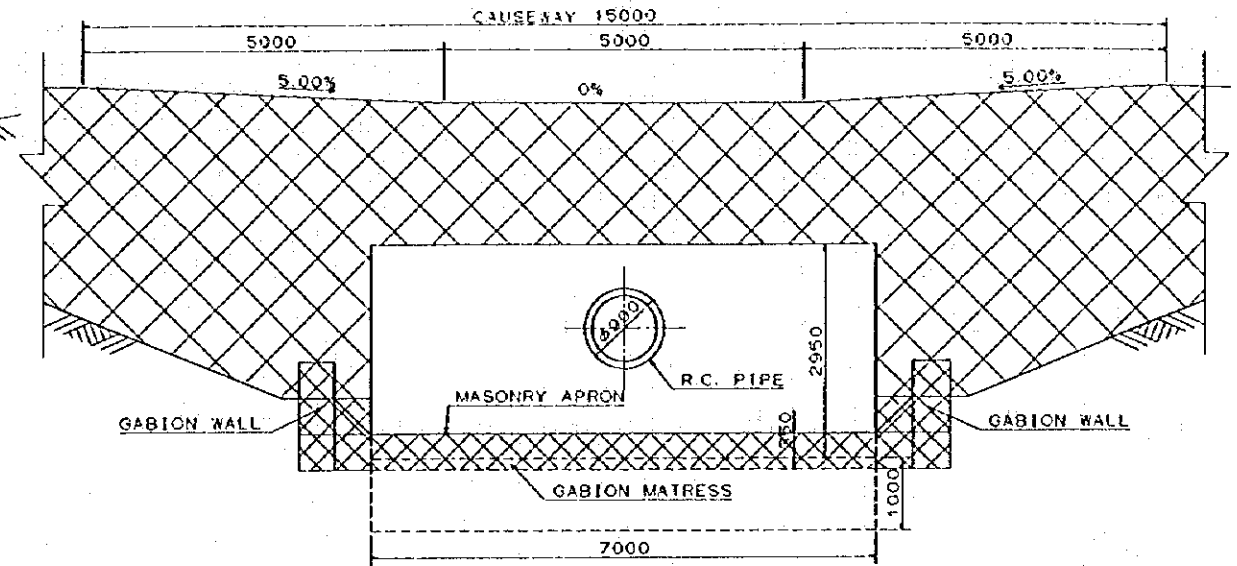
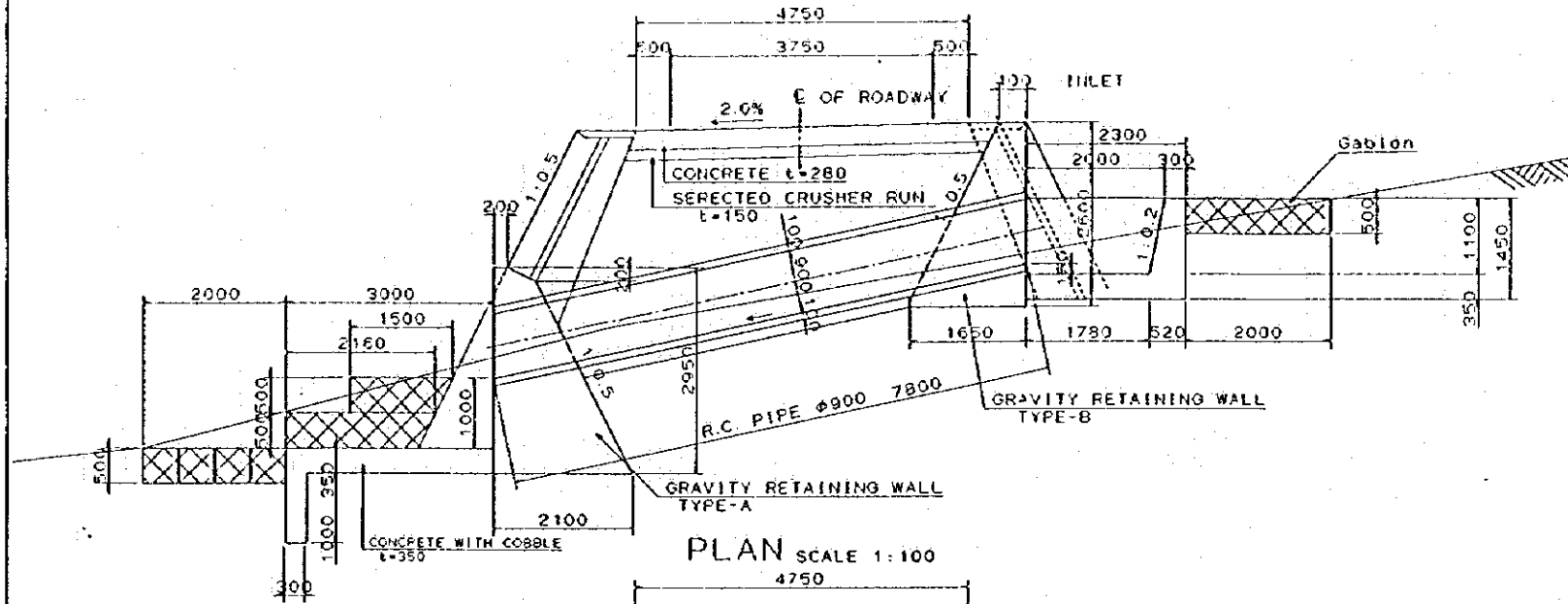
GRADE	+3.11%		+1.00%		-4.00%		+9.00%		-4.80%		+8.00%		-2.00%		+8.00%		-4.80%			
PROPOSED HEIGHT	1528.04	1529.72	1530.37	1530.75	1530.89	1531.00	1531.00	1532.81	1534.41	1534.13	1534.00	1535.90	1537.00	1540.30	1541.37	1541.87	1542.00	1541.00		
GROUND HEIGHT	1528.00	1529.00	1530.50	1530.20	1530.50	1531.50	1532.00	1532.20	1534.20	1534.13	1534.00	1535.00	1537.00	1540.00	1541.37	1541.87	1542.00	1541.00	1541.00	
STATION	500	500+25	500+50	500+75	501	501+25	501+50	501+75	502	502+25	502+50	502+75	503	503+25	503+50	503+75	504	504+25	504+50	
CURVE ELEMENT	R=30.00		R=400.00		L=101.17		R=40.00		L=49.02		R=80.00		L=83.48		R=50.00		L=239.26		R=60.00	
							R=30.00						R=50.00						L=36.23	

G-2 STANDARD PLAN OF CROSS DRAINAGES

PROFILE SCALE 1:100

TYPE-1 : CAUSEWAY WITH PIPE CULVERT (φ900 SINGLE)

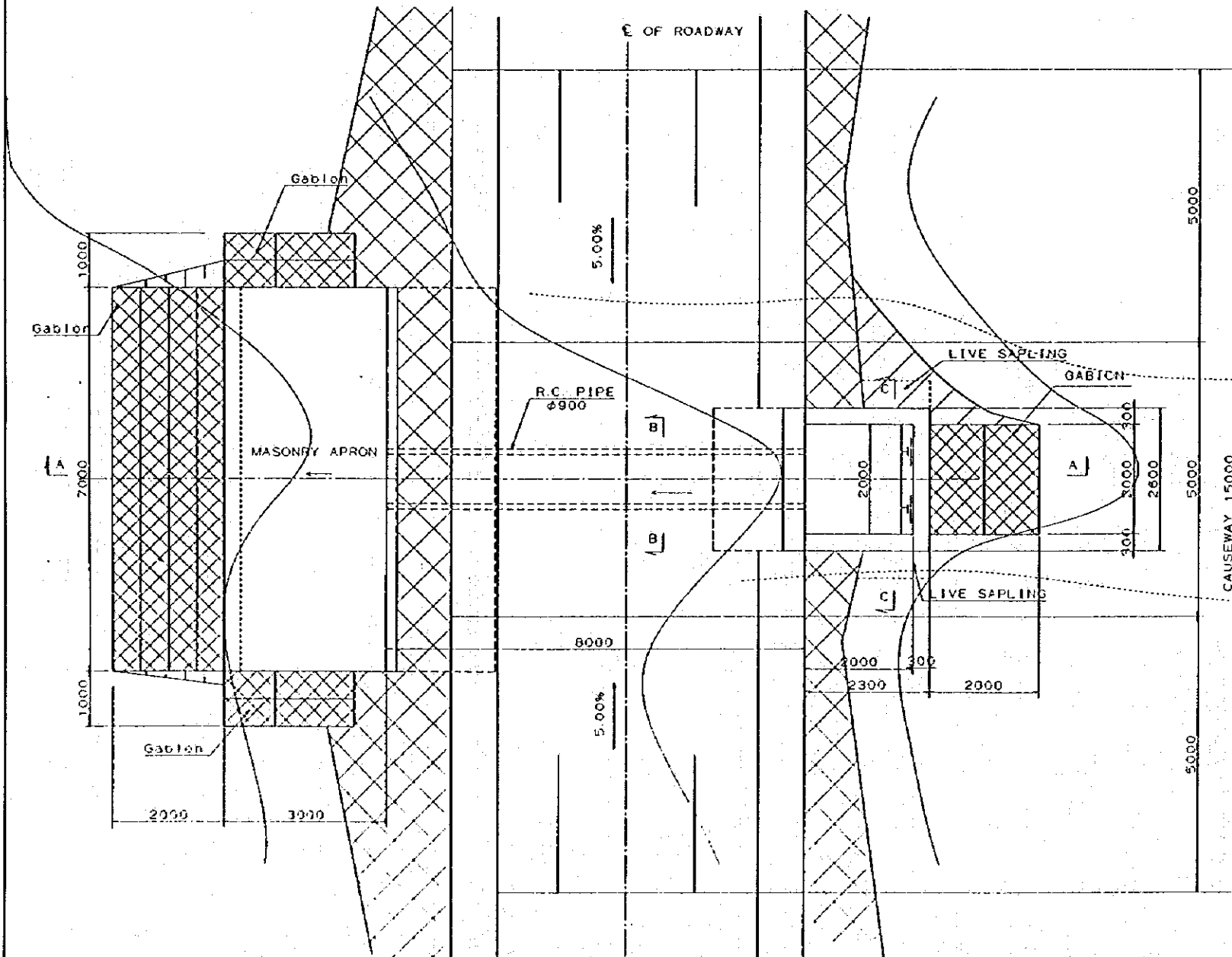
FRONT ELEVATION SCALE 1:100



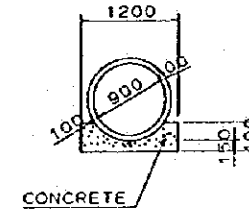
PLAN SCALE 1:100

SECTION B-B SCALE 1:100

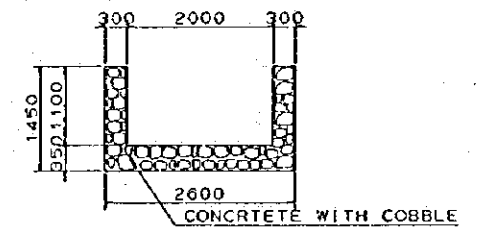
SECTION C-C SCALE 1:100



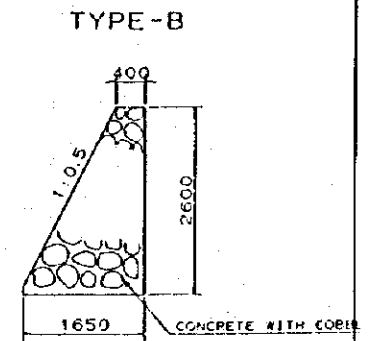
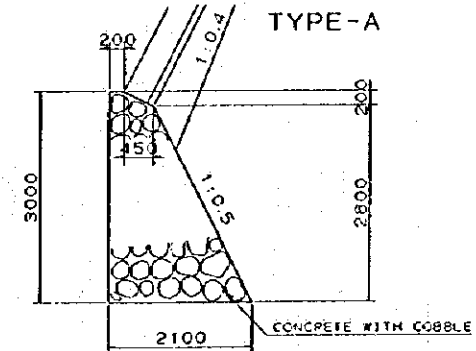
R.C. PIPE



CATCH BASIN (INLET SIDE)



GRAVITY RETAINING WALL SCALE 1:100

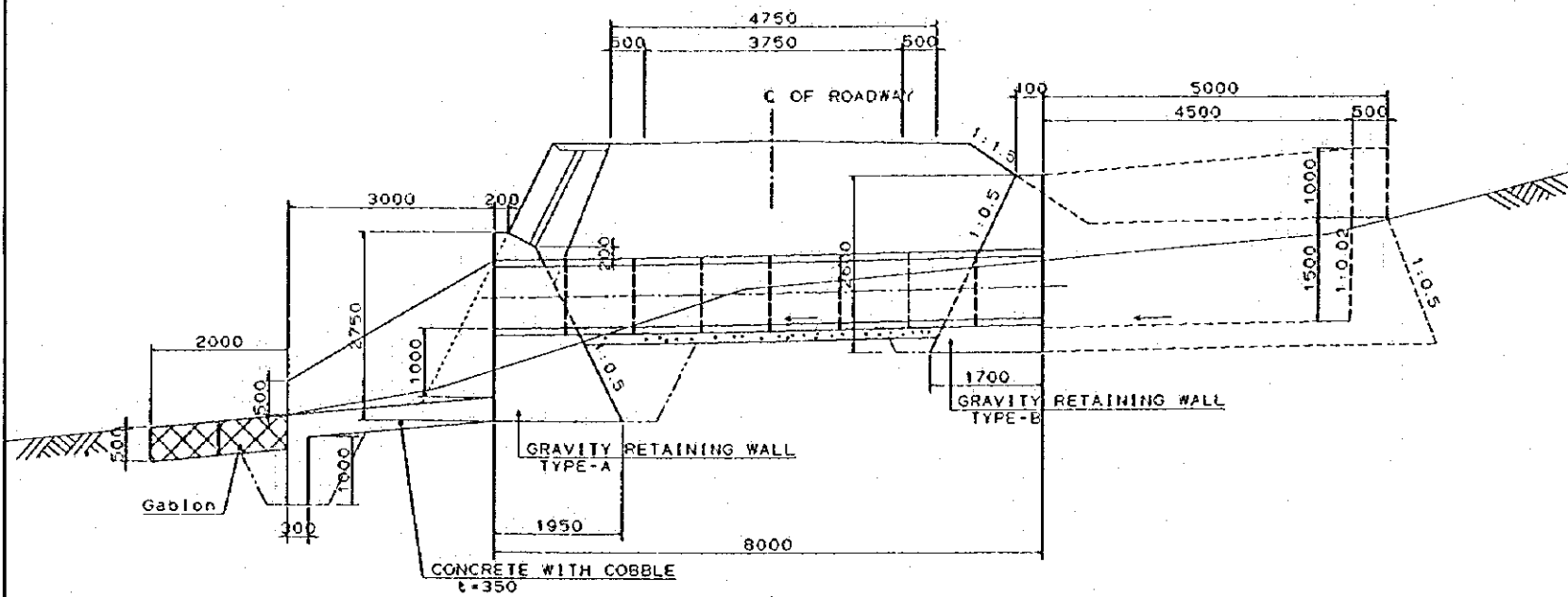


MATERIALS

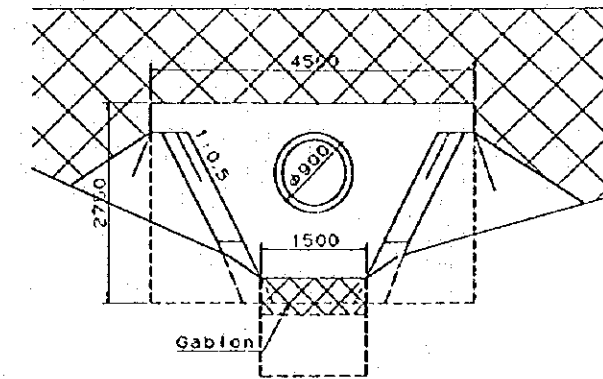
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m3	67.8	
BACKFILL		m3	15.4	
R.C. PIPE	φ900	m	7.8	
G. RETAINING WALL		m3	24.5	
CONCRETE	ack-190kg/m2	m3	2.3	
CONCRETE WITH COBBLE		m3	22.6	
FORM WORK		m2	3.9	
GABION		m3	12.7	

TYPE-2 : R.C. PIPE CULVERT (ϕ900 SINGLE)

PROFILE A-A SCALE 1:100

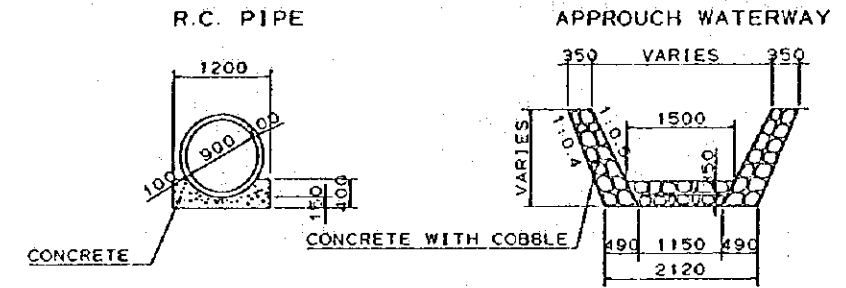


FRONT ELEVATION SCALE 1:100

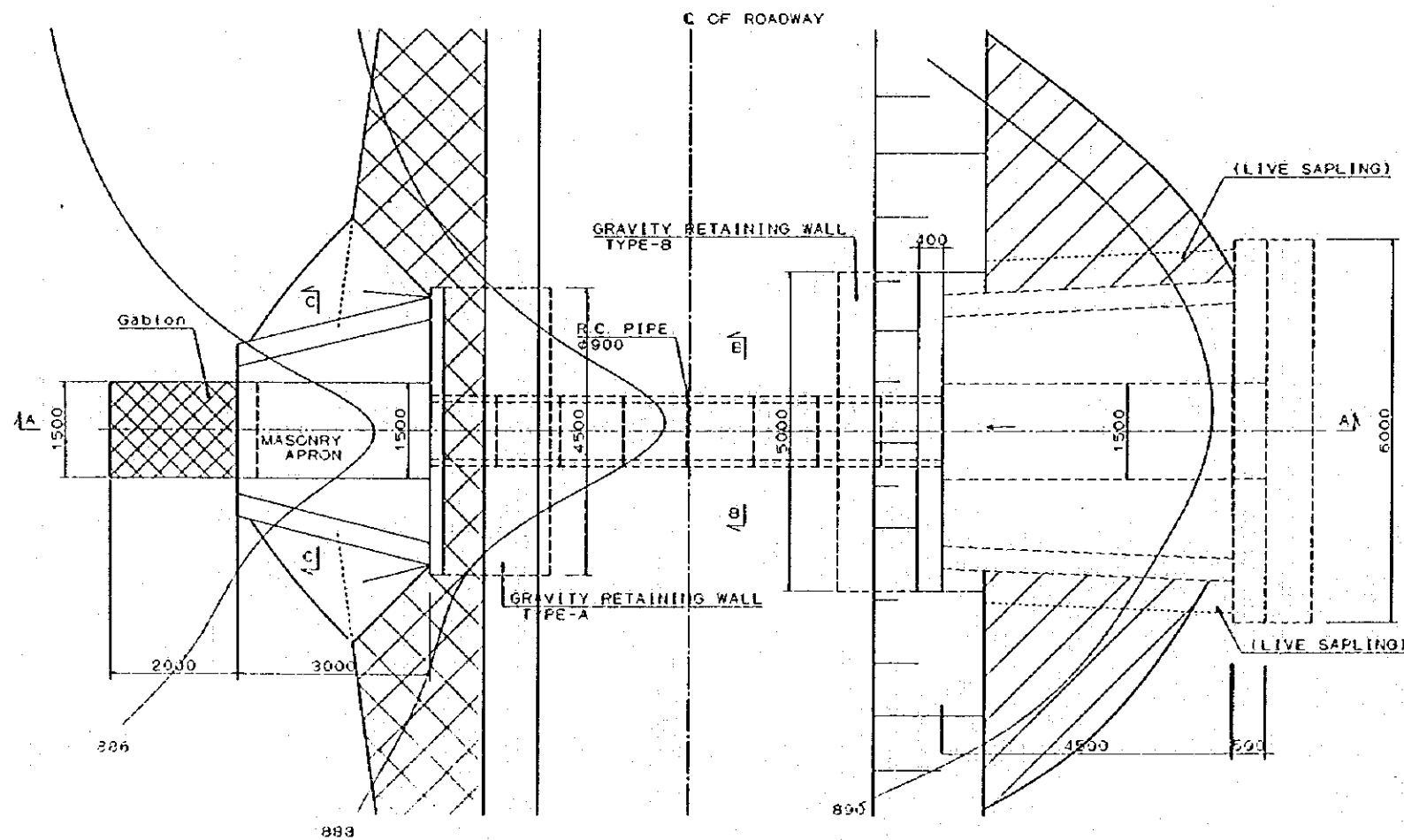


SECTION B-B SCALE 1:100

SECTION C-C SCALE 1:100



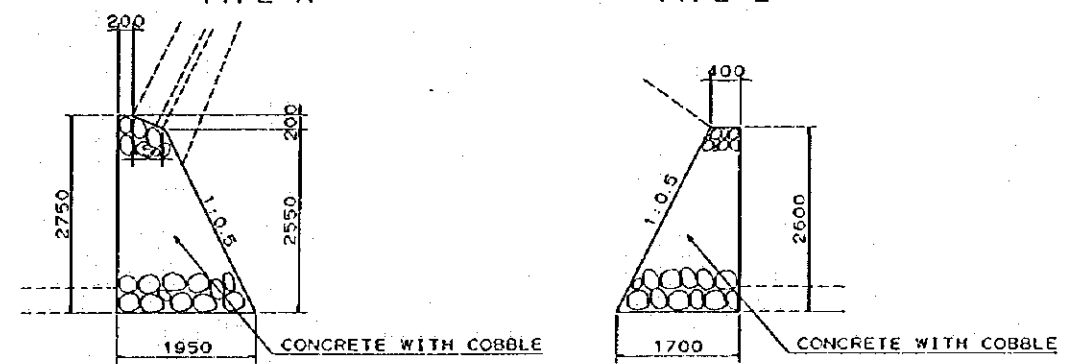
PLAN SCALE 1:100



GRAVITY RETAINING WALL SCALE 1:100

TYPE-A

TYPE-B

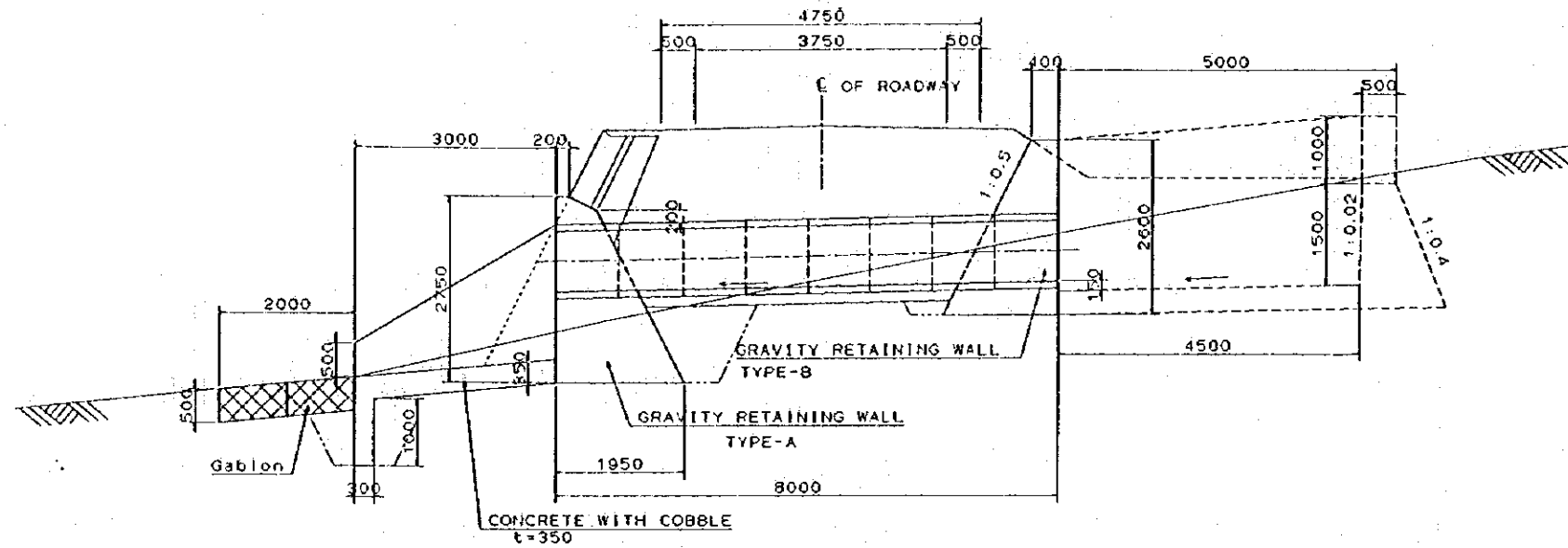


MATERIALS

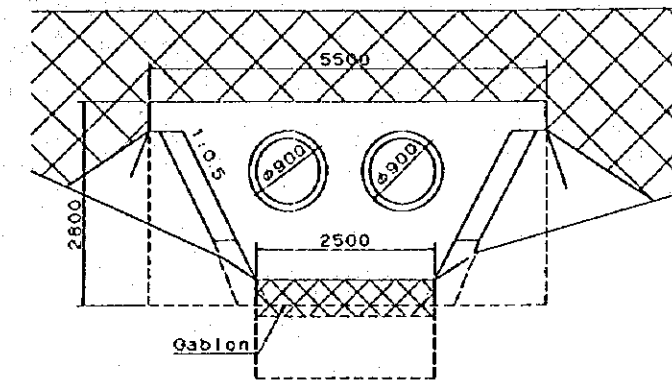
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	38.1	
BACKFILL		m <sup>3</sup>	12.8	
R.C. PIPE	ϕ900	m	8.0	
SUPPORTED WALL		m <sup>2</sup>	8.4	
GRAVITY WALL		m <sup>3</sup>	28.4	
CONCRETE	ϕck=180*/m <sup>2</sup>	m <sup>3</sup>	2.5	
CONCRETE WITH COBBLE		m <sup>3</sup>	1.8	
FORM WORK		m <sup>2</sup>	4.2	
GABION		m <sup>3</sup>	1.5	

TYPE-3 : R.C. PIPE CULVERT (φ900 DOUBLE)

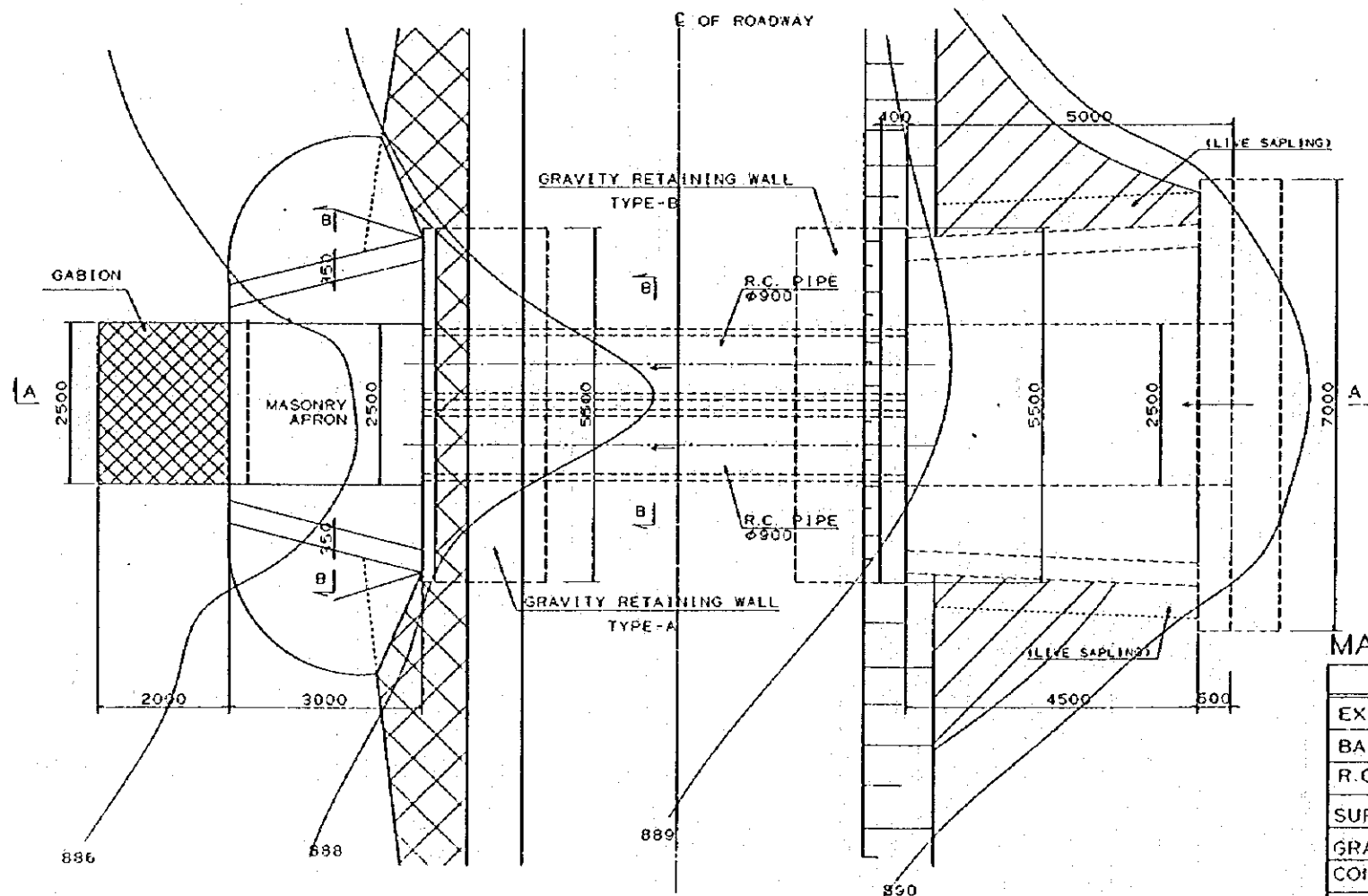
PROFILE A-A SCALE 1:100



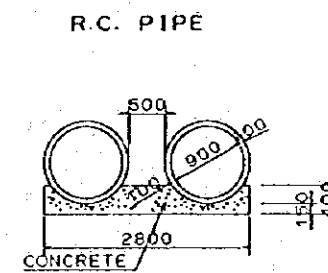
FRONT ELEVATION SCALE 1:100



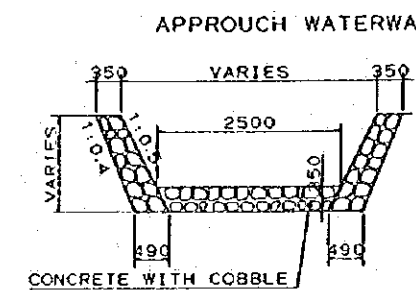
PLAN SCALE 1:100



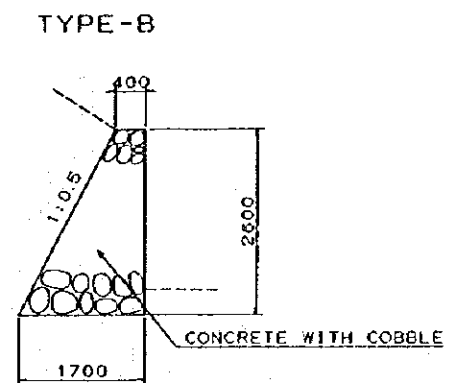
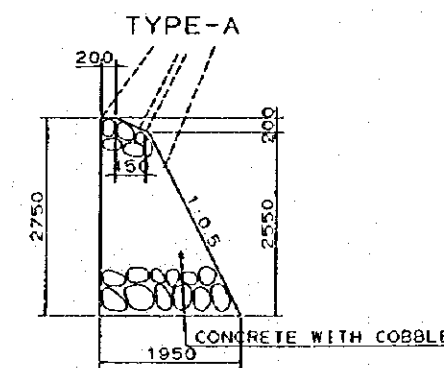
SECTION B-B SCALE 1:100



SECTION C-C SCALE 1:100



GRAVITY RETAINING WALL SCALE 1:100



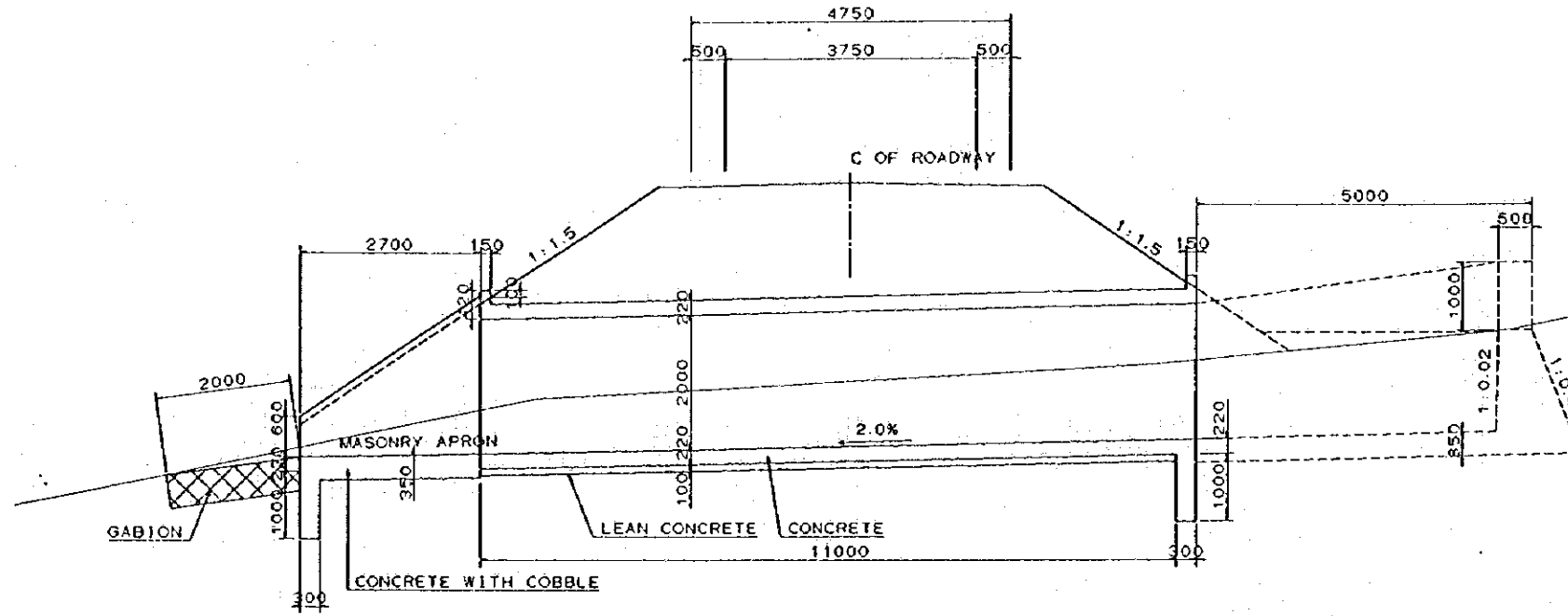
MATERIALS

ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	49.8	
BACKFILL		m <sup>3</sup>	15.5	
R.C. PIPE	φ900	m	8.0	
SUPPORTED WALL		m <sup>2</sup>	8.4	
GRAVITY WALL		m <sup>3</sup>	33.7	
CONCRETE	σ <sub>ck</sub> = 180 kg/m <sup>2</sup>	m <sup>3</sup>	4.8	
CONCRETE WITH COBBLE		m <sup>3</sup>	3.2	
FORM WORK		m <sup>2</sup>	6.4	
GABION		m <sup>3</sup>	2.5	

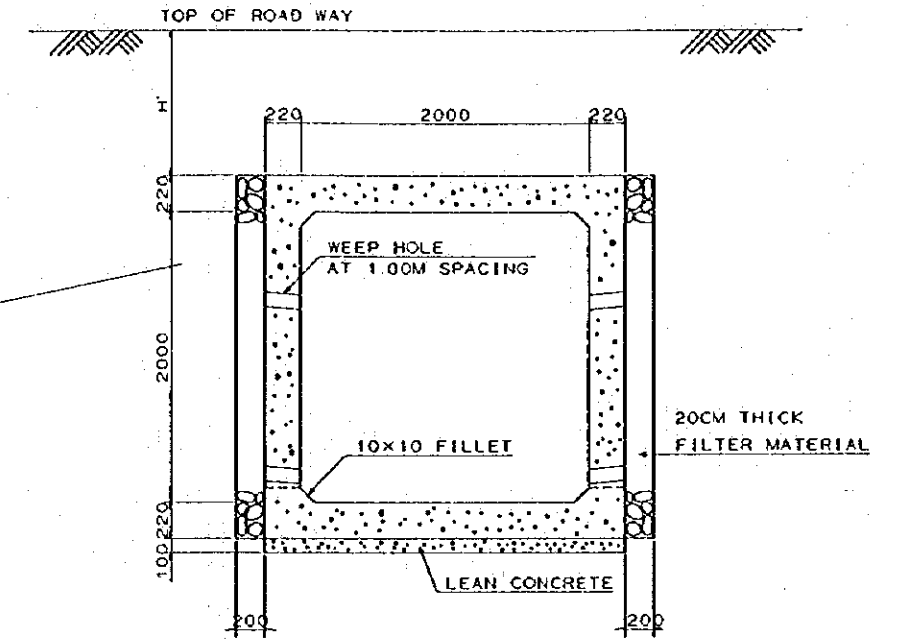


TYPE-4 : BOX CULVERT (2.00m×2.00m)

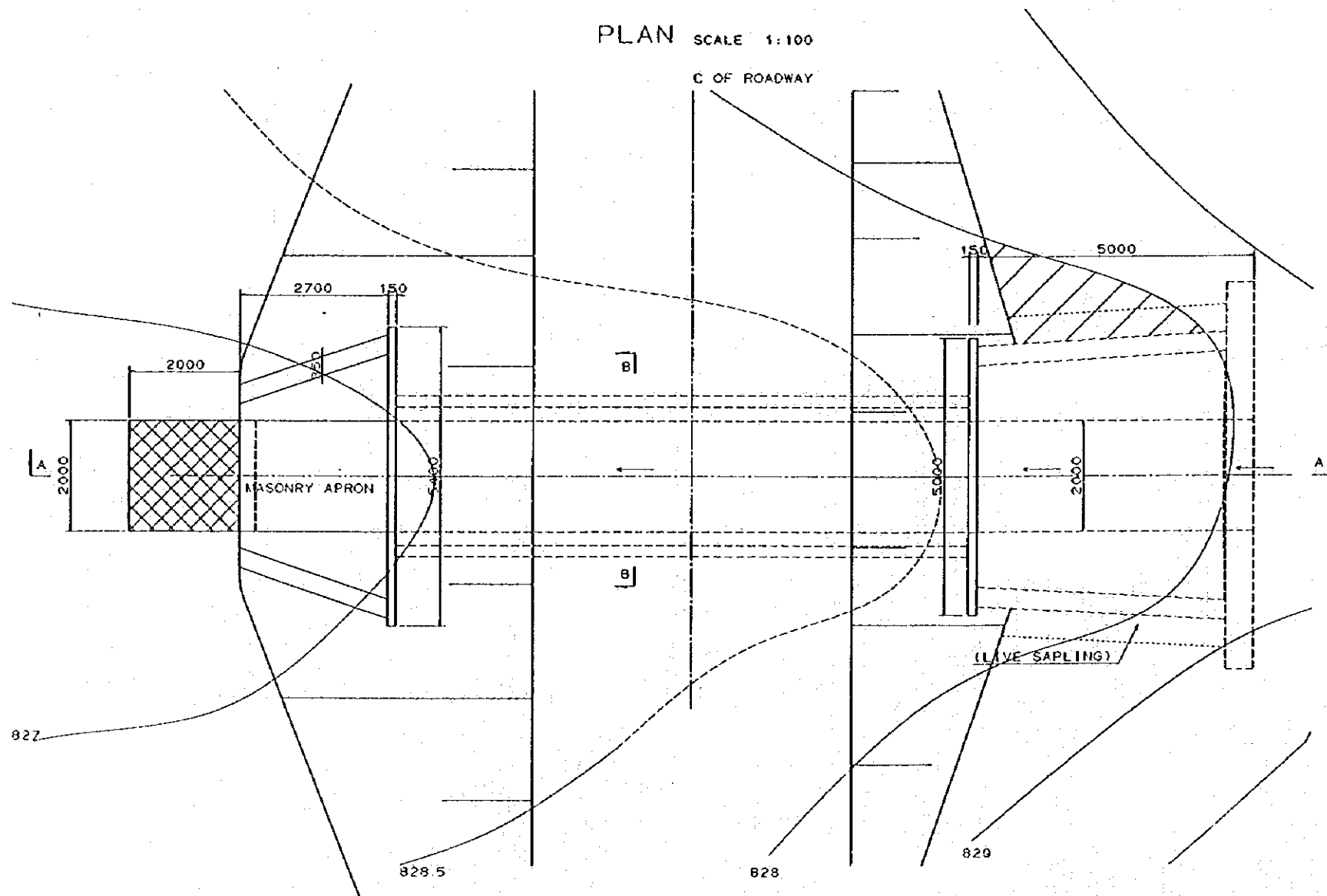
PROFILE A-A SCALE 1:100



SECTION B-B SCALE 1:50



PLAN SCALE 1:100

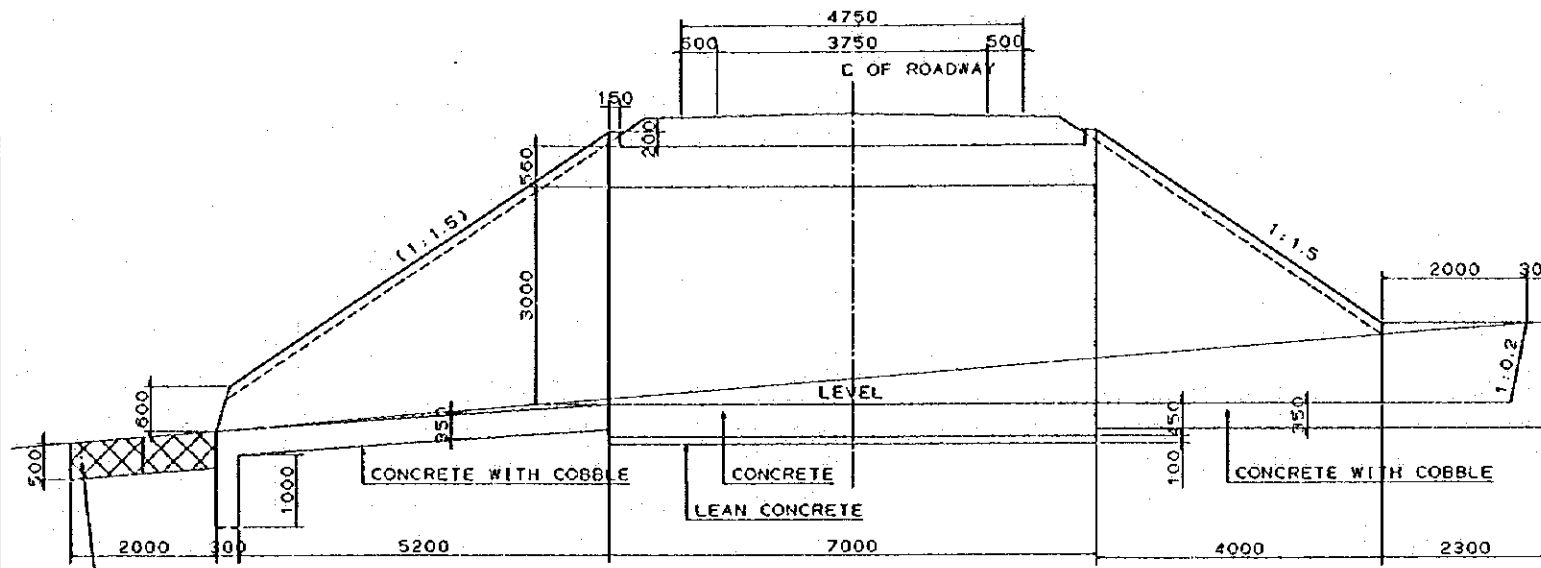


MATERIALS

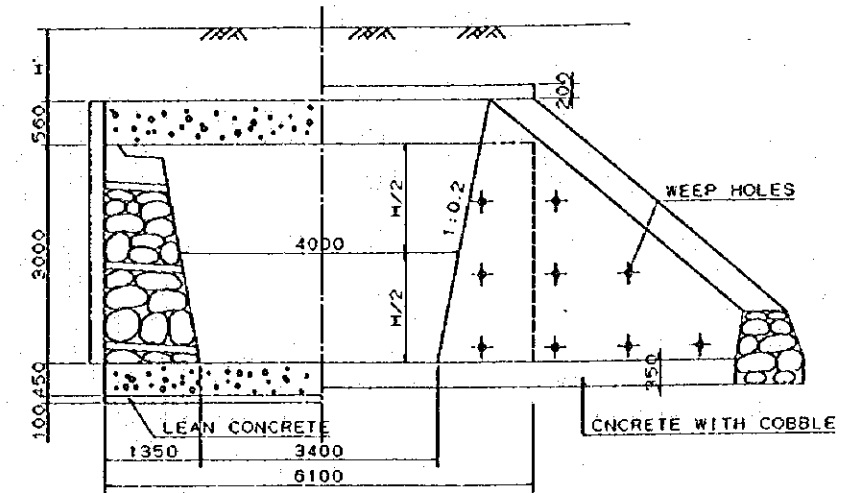
ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	117.6	
BACKFILL		m <sup>3</sup>	72.0	
SUPPORT WALL		m <sup>2</sup>	9.1	
LEAN CONCRETE	σck=180kg/m <sup>2</sup>	m <sup>3</sup>	2.7	
CONCRETE WITH COBBLE		m <sup>3</sup>	2.3	
CONCRETE	σck=240kg/m <sup>2</sup>	m <sup>3</sup>	29.1	
FORM WORK		m <sup>2</sup>	180.1	
FORM WORK	LEAN CONCRETE	m <sup>2</sup>	2.2	
REINFORCEMENT BAR	φ10	t	3.8	
SUPPORT		m <sup>3</sup>	45.2	
GABION		m <sup>3</sup>	2.0	

# TYPE-5 : SLAB CULVERT (4.00m SINGLE)

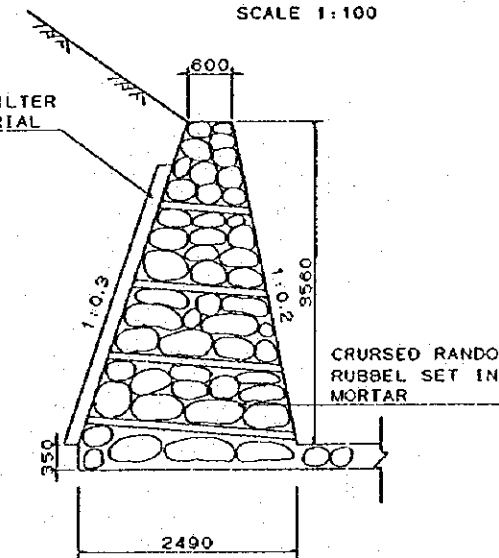
SECTION A-A SCALE 1:100



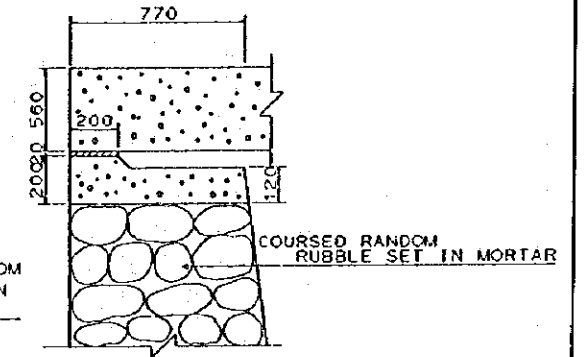
SECTION B-B SCALE 1:100



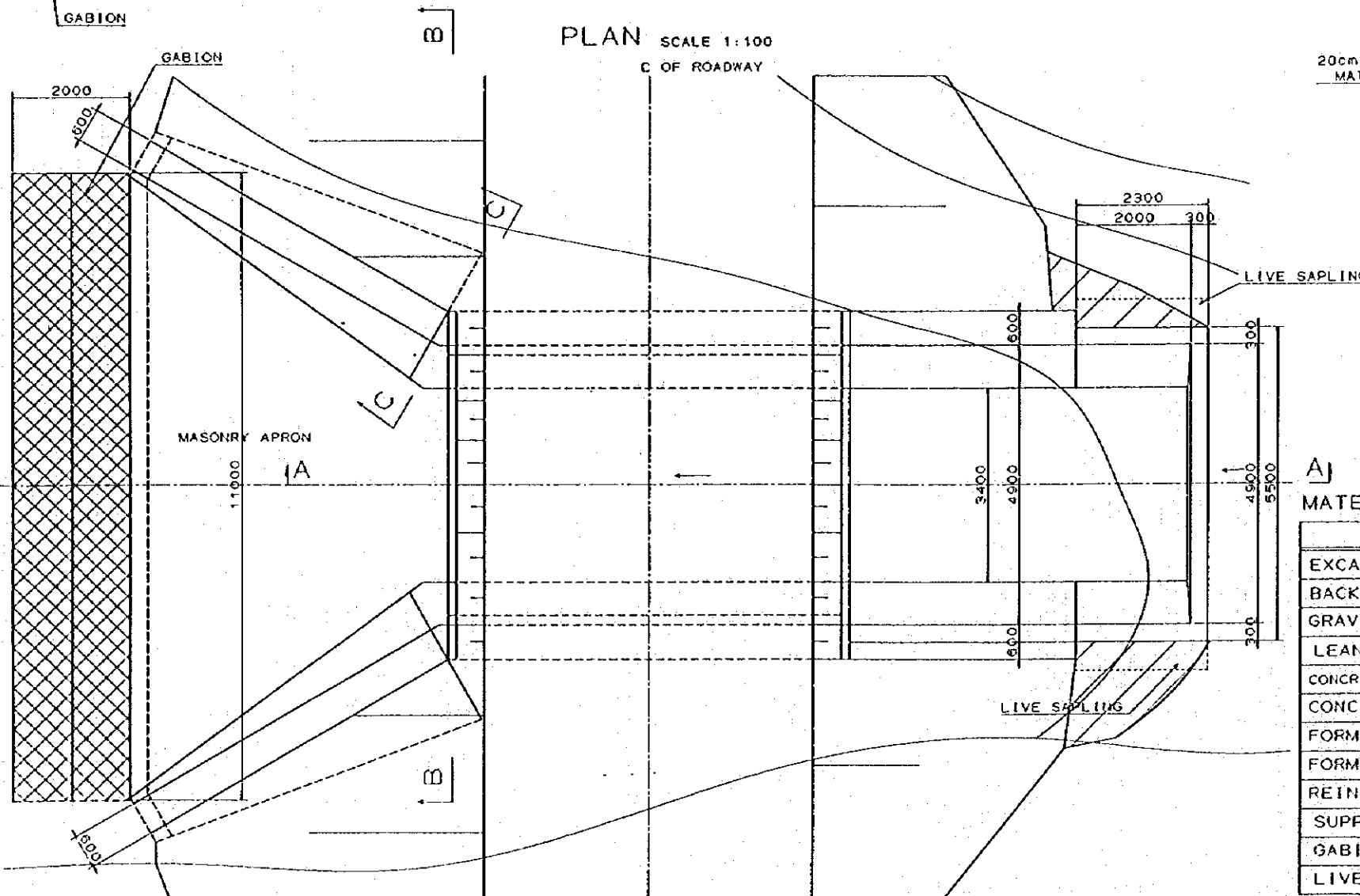
SECTION C-C SCALE 1:100



DETAIL AT R.C. SEAT SCALE 1:30



PLAN SCALE 1:100



A) MATERIALS

ITEM	CLASS	UNIT	QUANTITY	REMARKS
EXCAVATION		m <sup>3</sup>	147.3	
BACKFILL		m <sup>3</sup>	81.1	
GRAVITY WALL		m <sup>3</sup>	95.1	
LEAN CONCRETE	σck=180kg/m <sup>2</sup>	m <sup>3</sup>	4.7	
CONCRETE WITH COBBLE		m <sup>3</sup>	36.1	
CONCRETE	σck=240kg/m <sup>2</sup>	m <sup>3</sup>	45.3	
FORM WORK	LEAN CONC	m <sup>2</sup>	1.4	
FORM WORK		m <sup>2</sup>	51.1	
REINFORCEMENT BAR		t	4.5	
SUPPORT		m <sup>3</sup>	84.0	
GABION		m <sup>3</sup>	11.0	
LIVE SAPLING		m <sup>2</sup>	4.1	

