

MINISTRY OF ROADS AND HIGHWAYS (MRH)
GHANA HIGHWAY AUTHORITY (GHA)
REPUBLIC OF GHANA

**REHABILITATION OF
NATIONAL TRUNK ROAD NO.8 (PHASE 2)
IN THE REPUBLIC OF GHANA**

**OUTLINE DESIGN REPORT
DRAWINGS**

JANUARY 2015

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.**

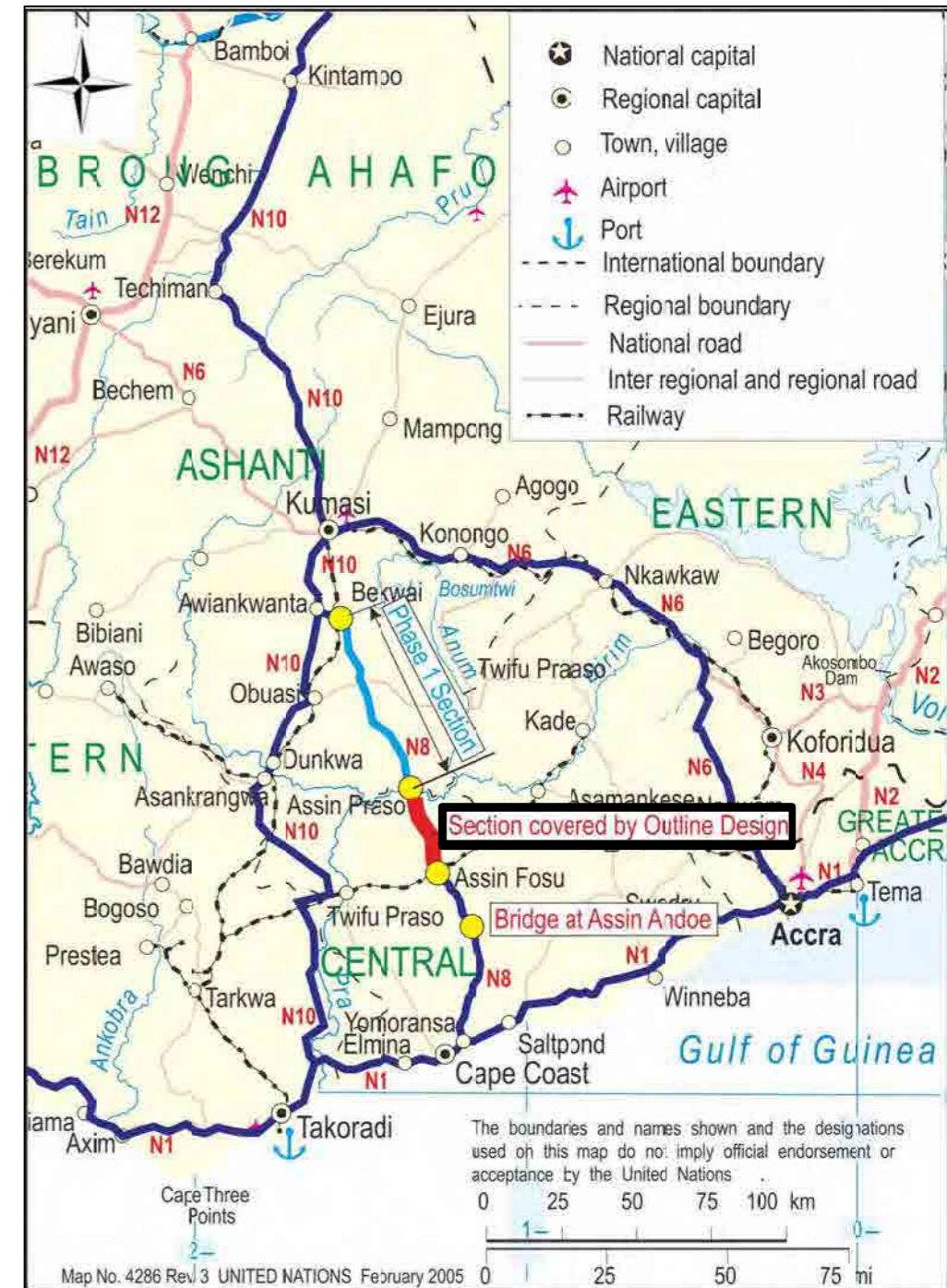
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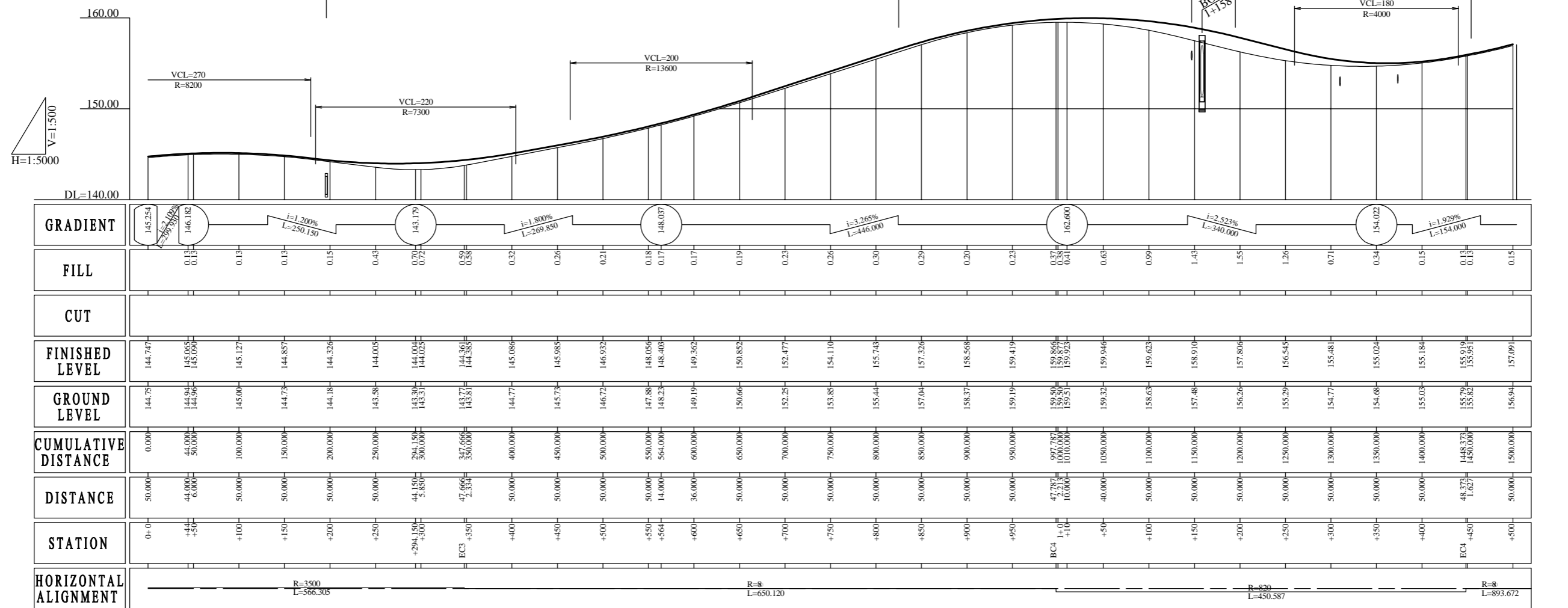
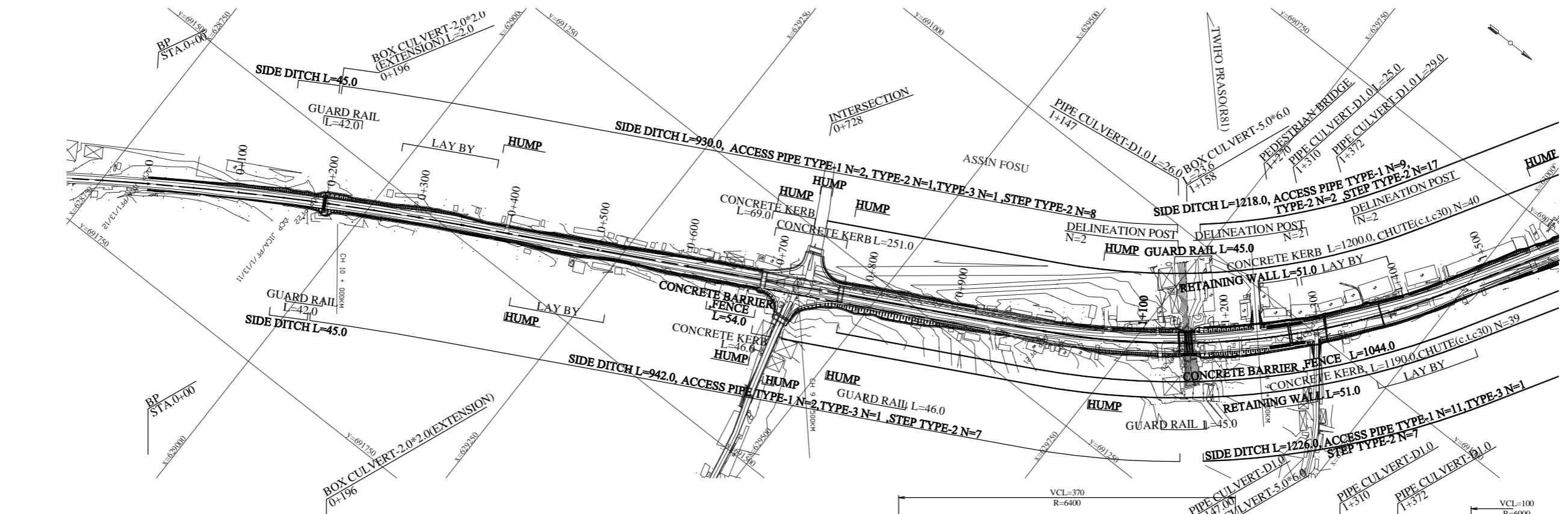
DRAWING TITLE

ROAD REHABILITATION BETWEEN ASSIN FOSU – ASSIN PRASO

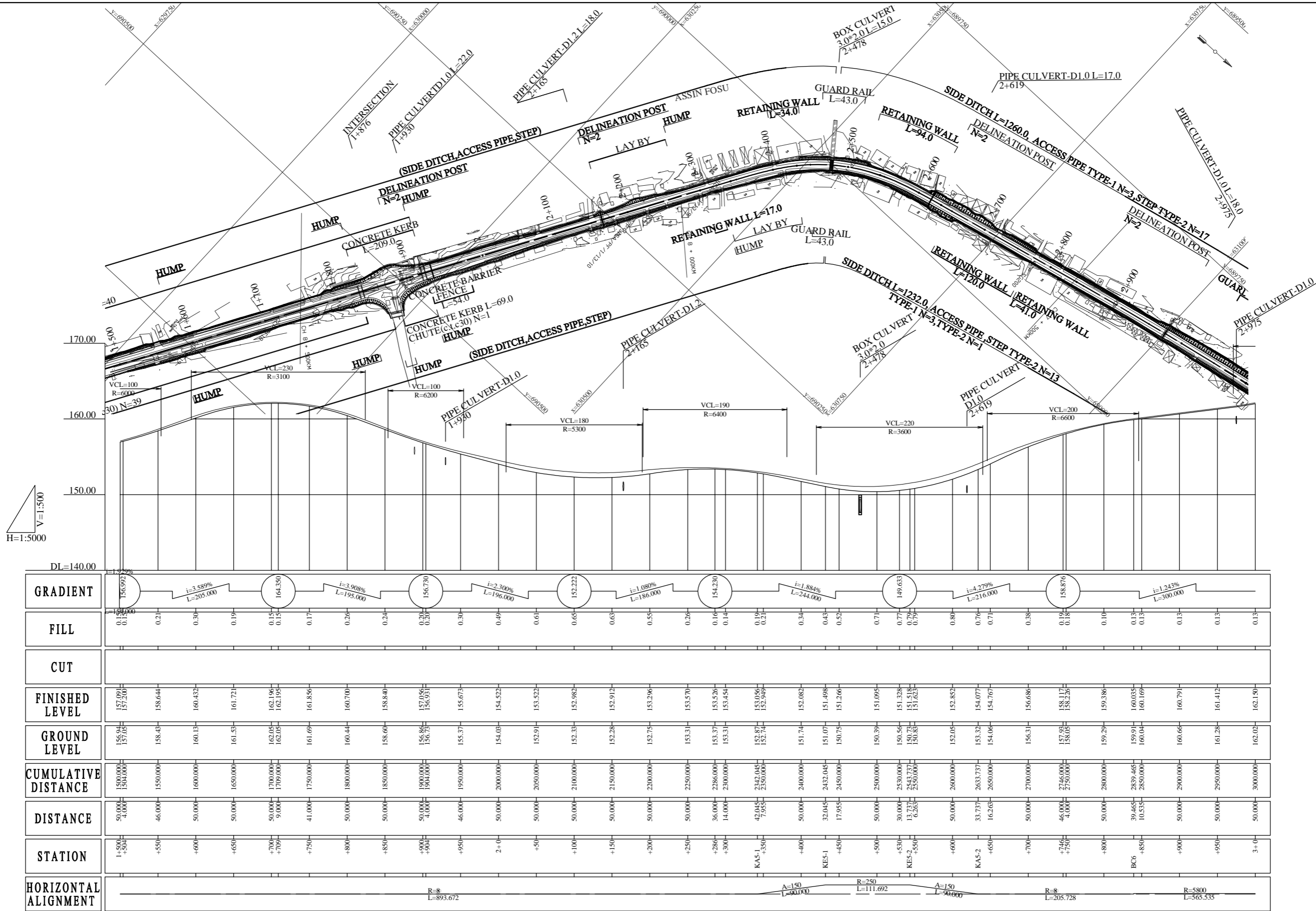
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LOCATION MAP

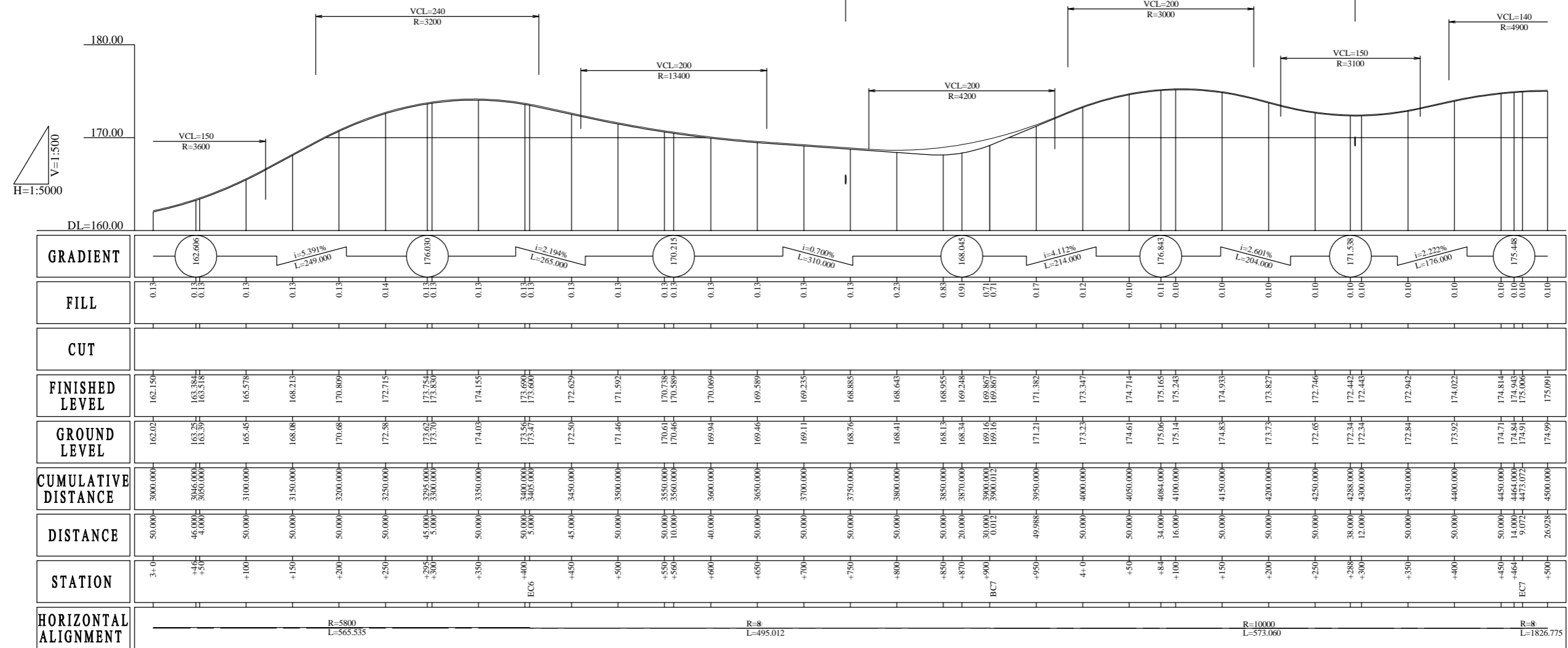
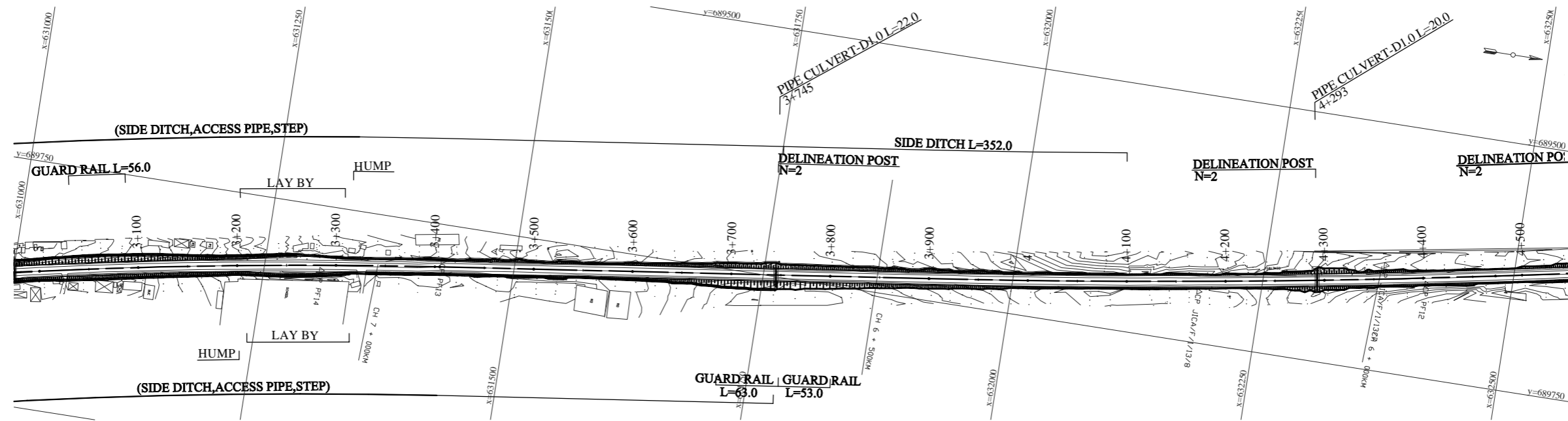




GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 02
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	PLAN AND PROFILE (1)	PREPARED BY:	
				CHECKED BY:	



GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 03
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	PLAN AND PROFILE (2)	PREPARED BY:	
				CHECKED BY:	



GHANA HIGHWAY AUTHORITY
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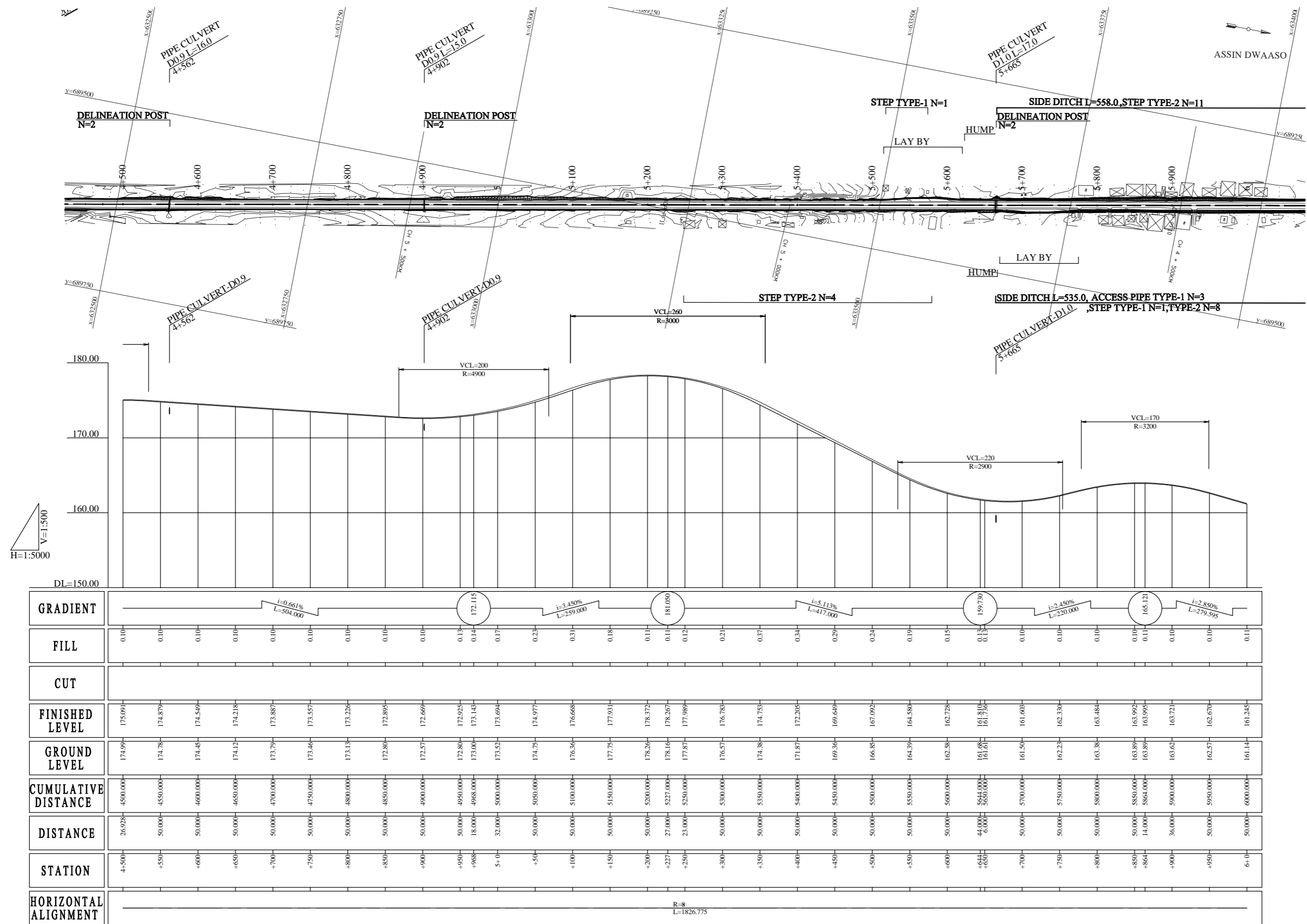
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
PLAN AND PROFILE (3)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
04



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

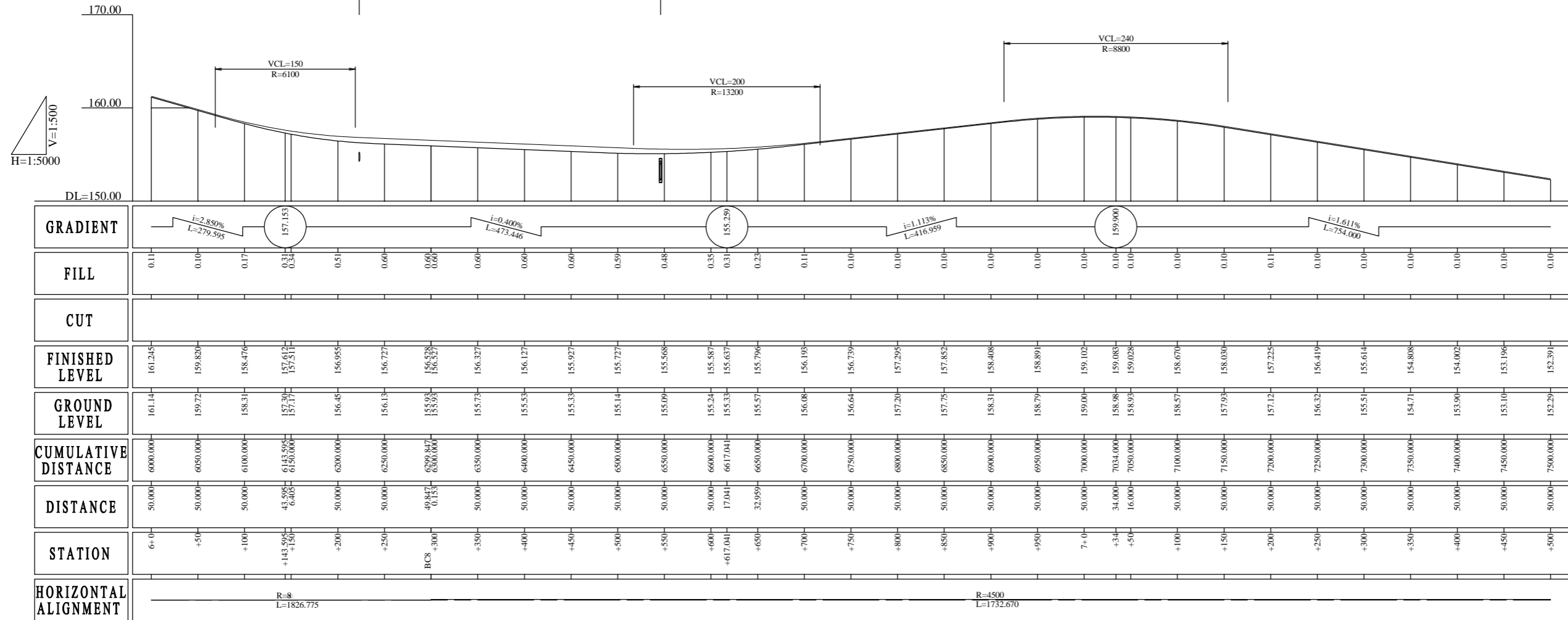
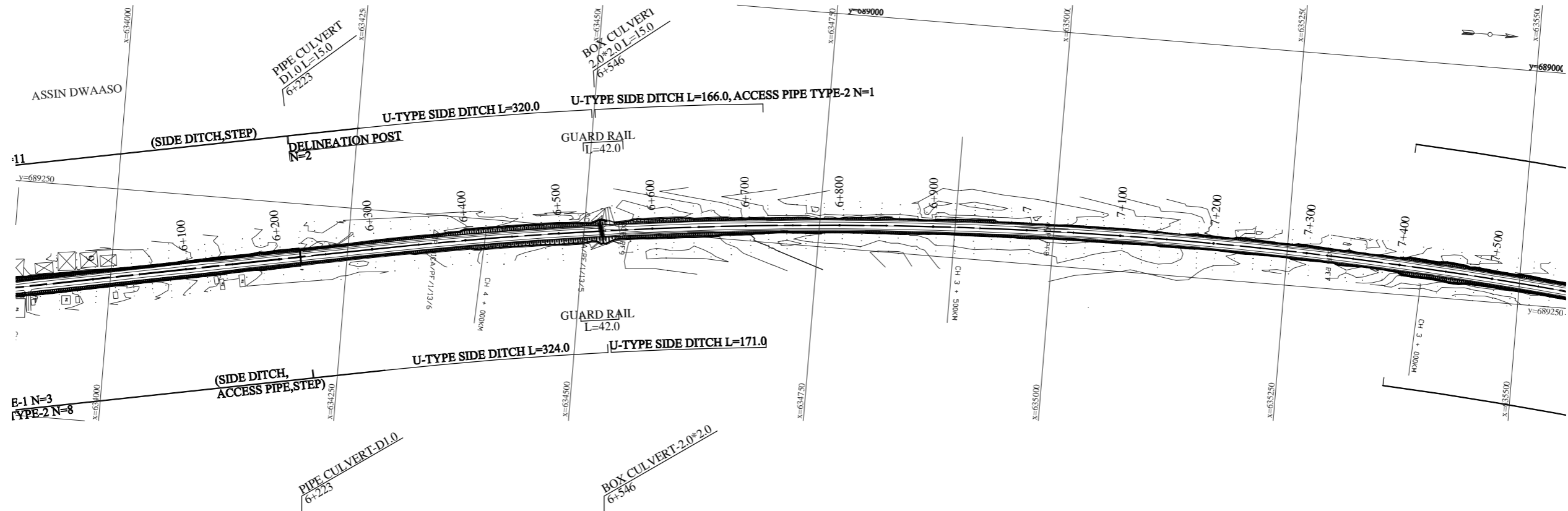
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
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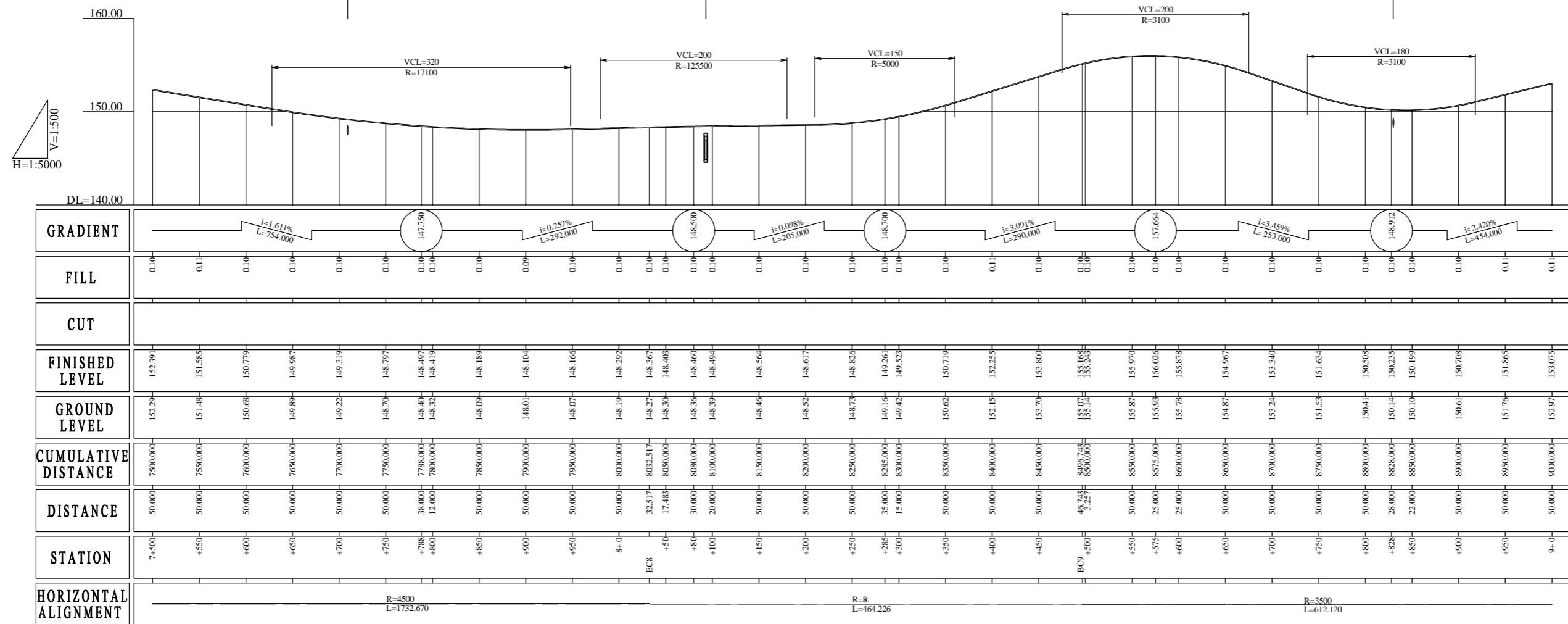
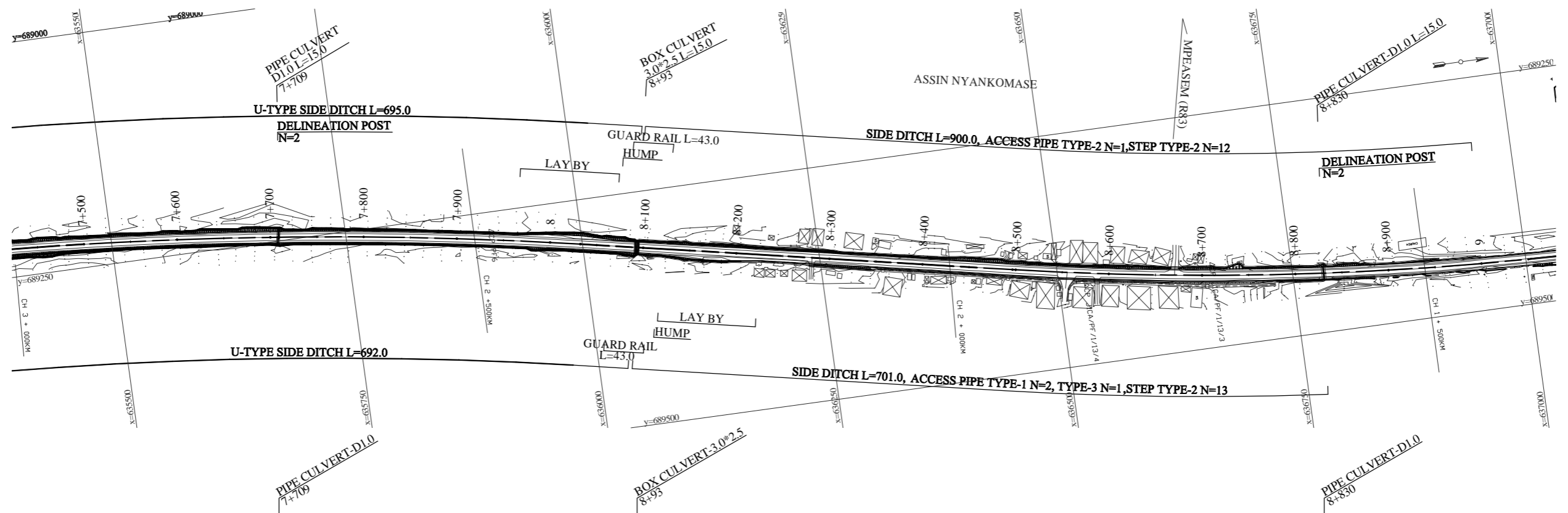
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PLAN AND PROFILE (4)

DATE:
PREPARED BY:
CHECKED BY:

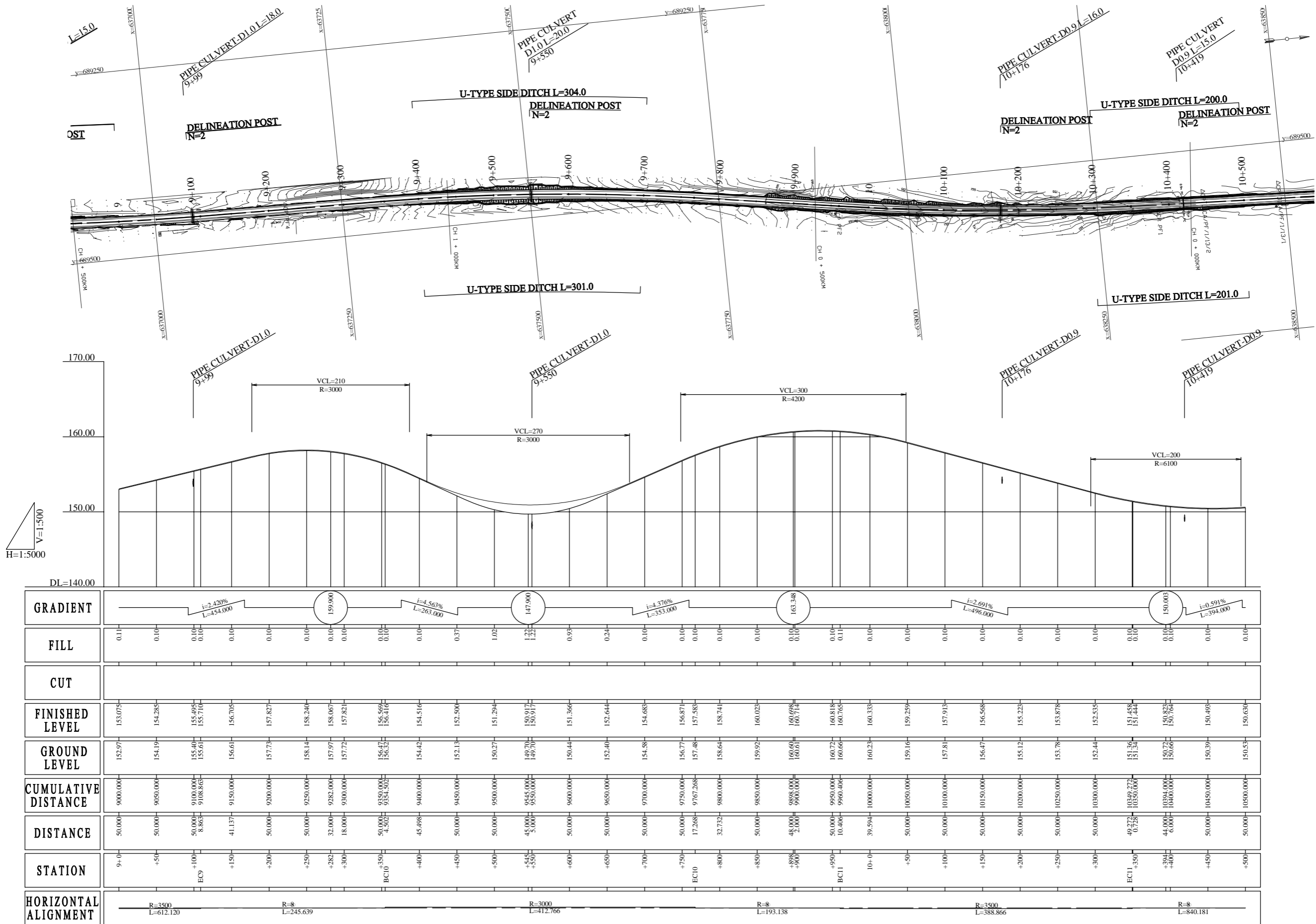
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05



GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 06
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	PLAN AND PROFILE (5)	PREPARED BY:	
				CHECKED BY:	



GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 07
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	PLAN AND PROFILE (6)	PREPARED BY:	
				CHECKED BY:	



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

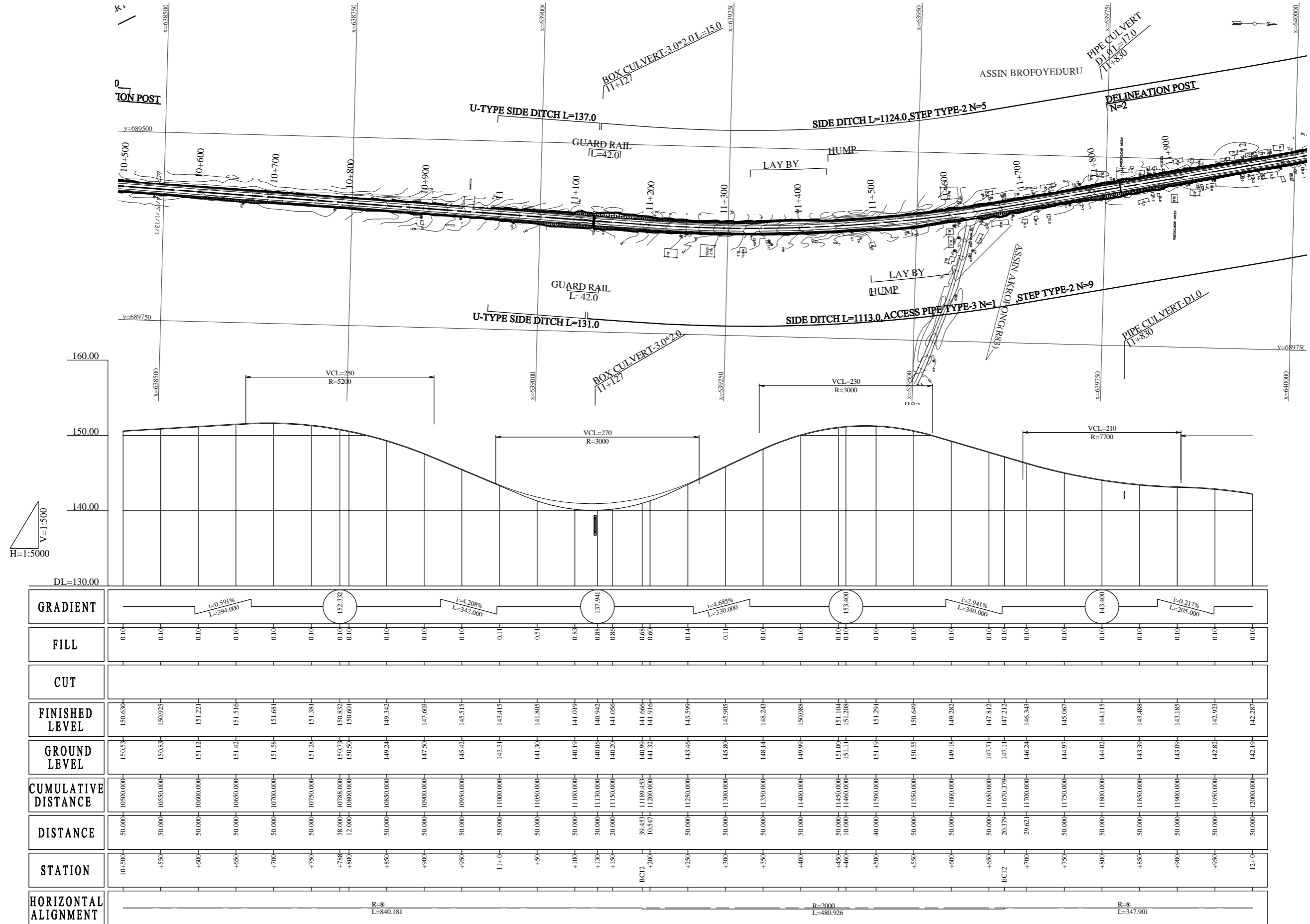
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
PLAN AND PROFILE (7)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
08



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

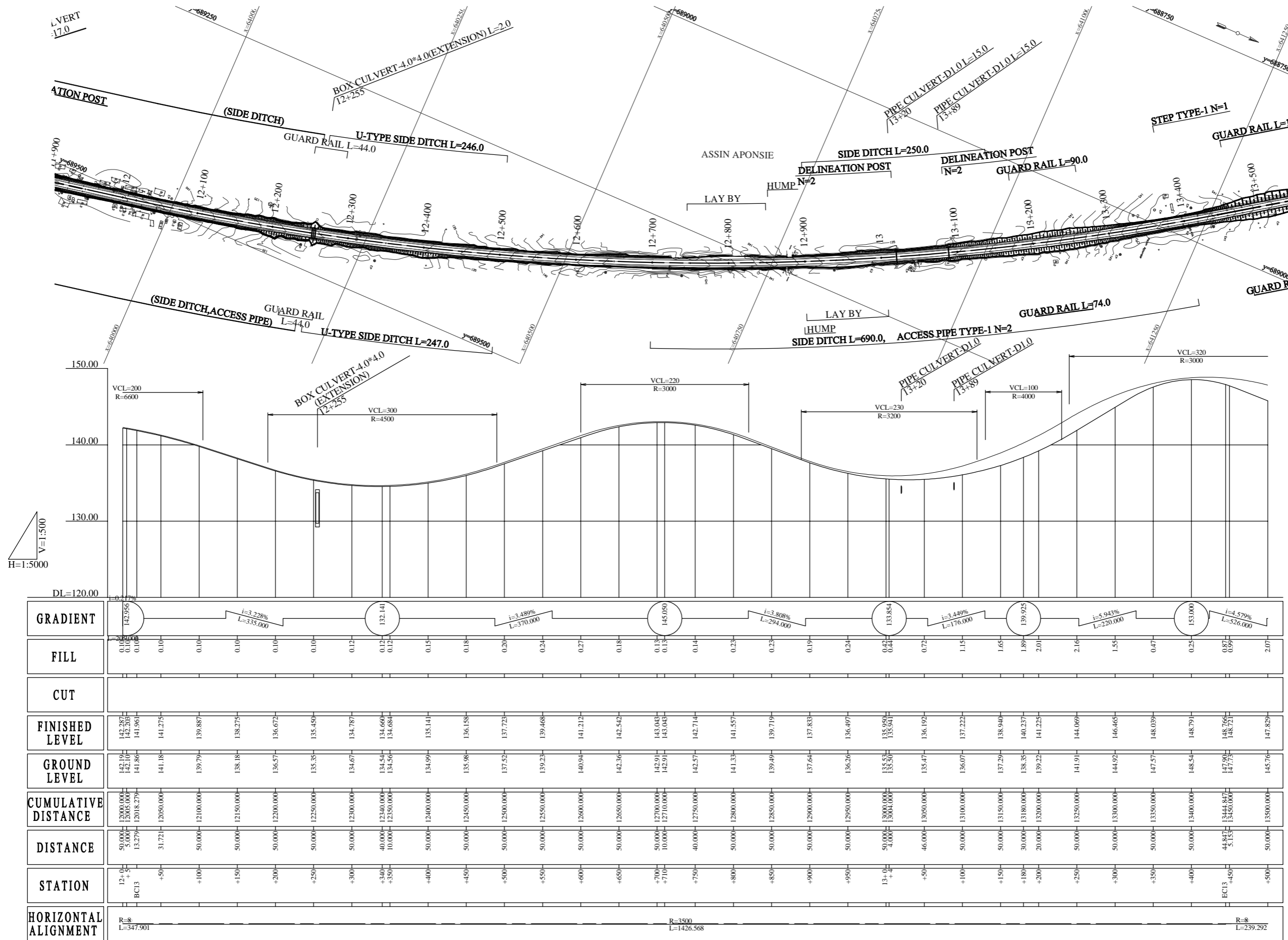
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
PLAN AND PROFILE (8)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
09



GRADIENT	142.956	i=3.228% L=335.000		132.141	i=3.489% L=370.000		145.050	i=3.808% L=294.000		133.854	i=3.449% L=176.000		139.925	i=5.943% L=220.000		153.000	i=4.579% L=526.000																					
FILL	0.10	0.10	0.10	0.10	0.10	0.12	0.12	0.15	0.18	0.20	0.24	0.27	0.18	0.13	0.13	0.14	0.23	0.23	0.19	0.24	0.42	0.44	0.72	1.15	1.65	1.89	2.01	2.16	1.55	0.47	0.25	0.87	0.99	2.07				
CUT																																						
FINISHED LEVEL	142.287	142.208	141.961	141.275	139.887	138.275	136.672	135.450	134.787	134.660	134.684	135.141	136.158	137.723	139.408	141.212	142.502	143.043	143.043	142.714	141.557	139.719	137.833	136.497	135.950	135.911	136.192	137.222	138.940	140.237	141.225	144.009	146.465	148.039	148.791	148.766	148.721	147.829
GROUND LEVEL	142.19	142.10	141.86	141.18	139.79	138.18	136.57	135.35	134.67	134.54	134.56	134.99	135.98	137.52	139.23	140.94	142.36	142.91	142.91	142.57	141.33	139.49	137.64	136.26	135.53	135.50	135.47	136.07	137.29	138.35	139.22	141.91	144.92	147.57	148.54	147.90	147.75	145.76
CUMULATIVE DISTANCE	12000.000	12005.000	12018.279	12050.000	12100.000	12150.000	12200.000	12250.000	12300.000	12340.000	12350.000	12400.000	12450.000	12500.000	12550.000	12600.000	12650.000	12700.000	12710.000	12750.000	12800.000	12850.000	12900.000	12950.000	13000.000	13004.000	13050.000	13100.000	13150.000	13180.000	13200.000	13250.000	13300.000	13350.000	13400.000	13444.847	13450.000	13500.000
DISTANCE	50.000	5.000	13.279	31.721	50.000	50.000	50.000	50.000	50.000	40.000	10.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	10.000	40.000	50.000	50.000	50.000	50.000	50.000	4.000	46.000	50.000	30.000	20.000	50.000	50.000	50.000	50.000	44.847	5.153	50.000	
STATION	12+00	+5	BC13	+50	+100	+150	+200	+250	+300	+340	+350	+400	+450	+500	+550	+600	+650	+700	+710	+750	+800	+850	+900	+950	13+00	+4	+50	+100	+150	+180	+200	+250	+300	+350	+400	EC13	+450	+500
HORIZONTAL ALIGNMENT	R=8 L=347.901										R=3500 L=1426.568										R=8 L=239.292																	

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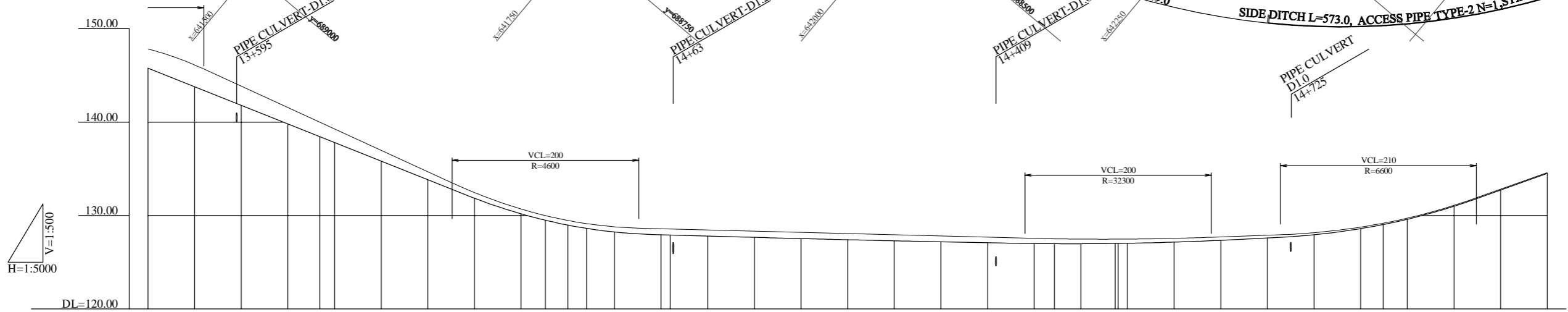
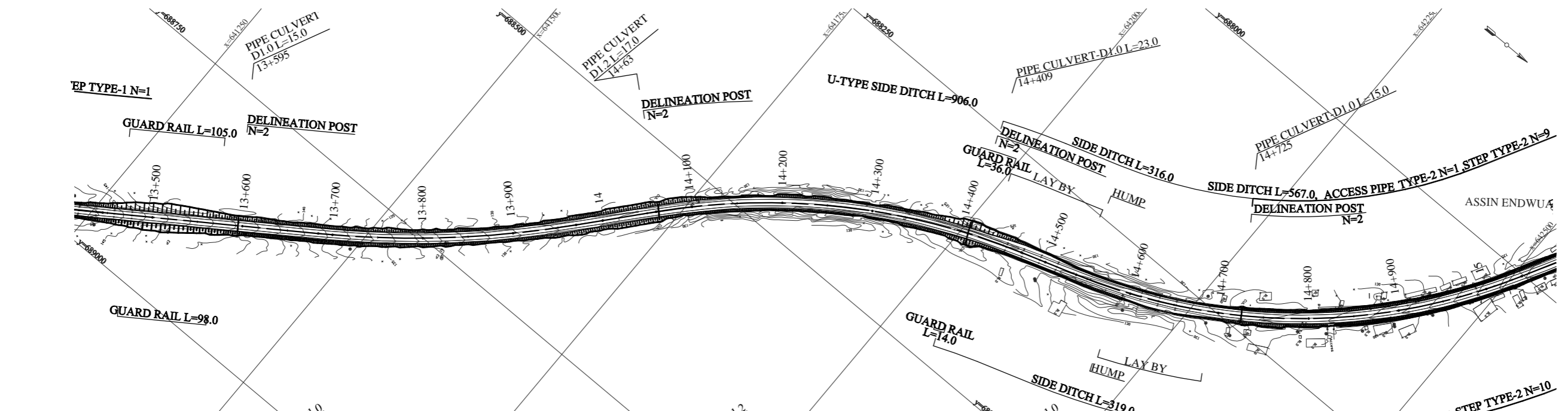
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

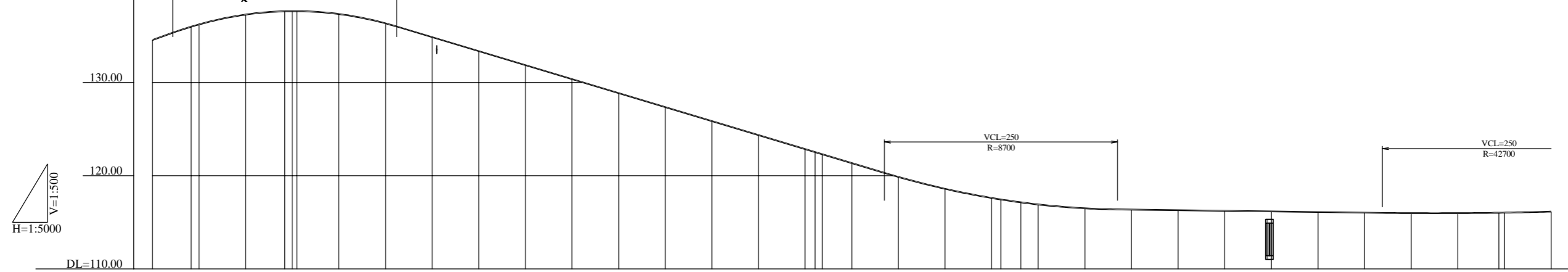
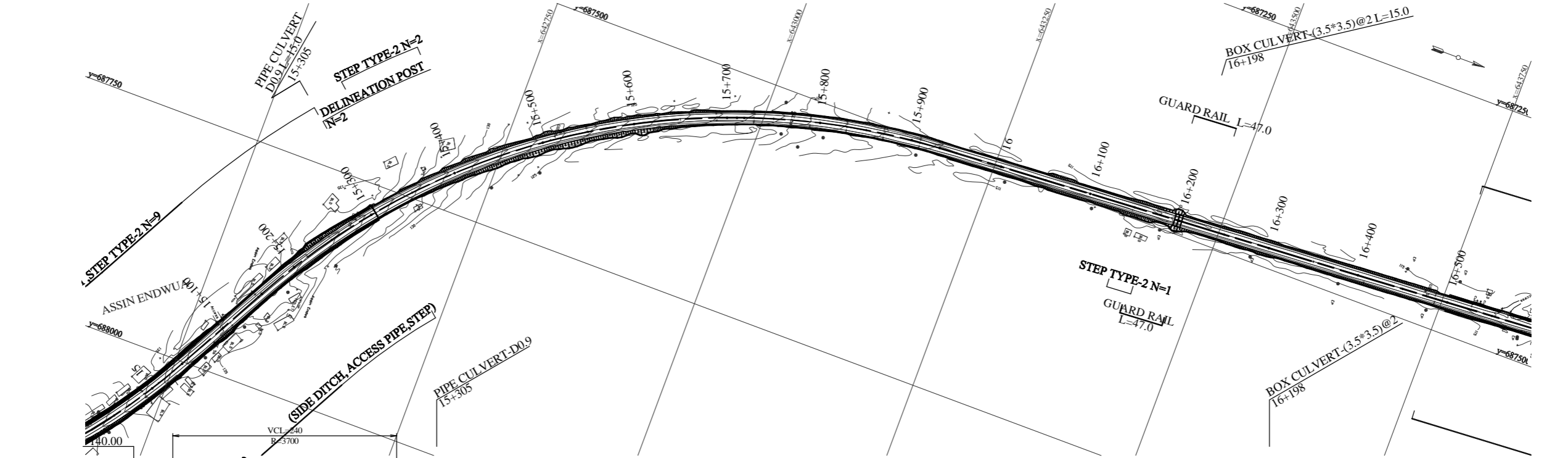
DRAWING TITLE:
PLAN AND PROFILE (9)

DATE:
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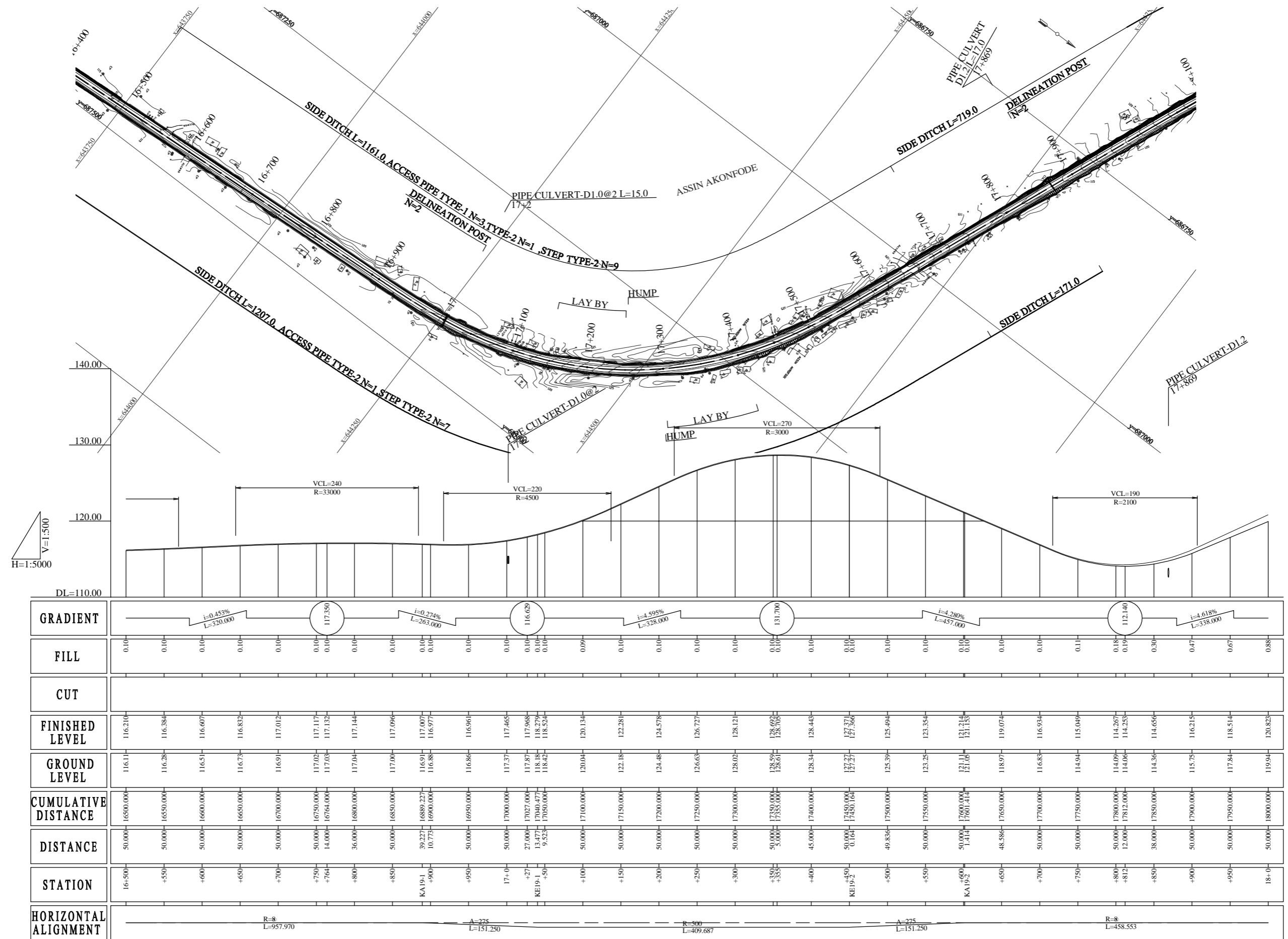
DRAWING No. :
10



DL=120.00																																							
GRADIENT	$i = -4.579\%$ $L = 526.000$ $i = 0.260\%$ $L = 614.000$ $i = -0.359\%$ $L = 284.000$ $i = 3.337\%$ $L = 318.000$ $i = 3.558\%$ $L = 318.000$																																						
FILL	2.07	2.34	2.05	1.75	1.55	1.45	1.15	0.85	0.61	0.52	0.49	0.50	0.52	0.55	0.64	0.65	0.65	0.66	0.67	0.66	0.65	0.62	0.59	0.55	0.53	0.50	0.46	0.45	0.40	0.36	0.29	0.22	0.16	0.15	0.12	0.10	0.10	0.10	
CUT																																							
FINISHED LEVEL	147.829	146.115	143.842	141.552	139.989	139.263	136.975	134.683	132.456	130.695	129.994	129.475	129.135	128.794	128.591	128.565	128.461	128.331	128.201	128.071	127.941	127.811	127.681	127.551	127.510	127.477	127.471	127.471	127.476	127.558	127.712	127.892	128.161	128.702	129.175	129.721	131.088	132.819	134.598
GROUND LEVEL	145.76	143.78	141.79	139.80	138.44	137.81	135.82	133.83	131.85	130.18	129.50	128.98	128.62	128.24	127.95	127.92	127.81	127.67	127.53	127.41	127.29	127.19	127.09	127.00	126.98	126.98	127.01	127.01	127.02	127.16	127.35	127.60	127.94	128.60	129.03	129.60	130.99	132.72	134.50
CUMULATIVE DISTANCE	13500.000	13550.000	13600.000	13650.000	13684.139	13700.000	13750.000	13800.000	13850.000	13900.000	13926.000	13950.000	13970.234	14000.000	14050.000	14059.971	14100.000	14150.000	14200.000	14250.000	14300.000	14350.000	14400.000	14450.000	14471.629	14500.000	14536.842	14540.000	14550.000	14600.000	14650.000	14700.000	14750.000	14800.000	14824.000	14850.000	14900.000	14950.000	15000.000
DISTANCE	50.000	50.000	50.000	50.000	34.139	15.861	50.000	50.000	50.000	50.000	26.000	24.000	20.234	29.766	50.000	9.971	40.029	50.000	50.000	50.000	50.000	50.000	50.000	21.629	28.371	36.842	3.158	10.000	50.000	50.000	50.000	50.000	24.000	26.000	50.000	50.000	50.000	50.000	50.000
STATION	13+500	+550	+600	+650	BC14	+700	+750	+800	+850	+900	+926	+950	EC14	14+0	+50	BC15	+100	+150	+200	+250	+300	+350	+400	+450	EC15	+500	BC16	+540	+550	+600	+650	+700	+750	+800	+824	+850	+900	+950	15+0
HORIZONTAL ALIGNMENT	$R=8$ $L=239.292$ $R=1100$ $L=286.096$ $R=8$ $L=89.737$ $R=750$ $L=411.657$ $R=8$ $L=65.214$ $R=660$ $L=504.672$																																						



GRADIENT	i=3.558% L=318.000		i=3.000% L=768.000		i=0.133% L=534.000		i=115.900																																	
FILL	0.10	0.10	0.11	0.10	0.10	0.10	0.10	0.10																																
CUT																																								
FINISHED LEVEL	134.598	136.023	137.225	137.683	137.696	137.385	136.390	134.910	133.410	131.910	130.410	128.910	127.410	125.910	124.410	122.910	117.668	117.506	117.199	116.971	116.500	116.424	116.357	116.291	116.224	116.158	116.091	116.036	116.083	116.093	116.210									
GROUND LEVEL	134.50	135.92	136.17	137.22	137.58	137.69	137.59	137.28	136.29	134.81	133.31	131.81	130.31	128.81	127.31	125.81	119.82	118.55	117.57	117.41	117.10	116.87	116.46	116.32	116.26	116.19	116.12	116.06	115.99	115.94	115.94	115.98	115.95	116.11						
CUMULATIVE DISTANCE	15000.000	15041.515	15083.030	15124.545	15166.060	15207.575	15249.090	15290.605	15332.120	15373.635	15415.150	15456.665	15498.180	15539.695	15581.210	15622.725	15664.240	15705.755	15747.270	15788.785	15830.300	15871.815	15913.330	15954.845	15996.360	16037.875	16079.390	16120.905	16162.420	16203.935	16245.450	16286.965	16328.480	16369.995	16411.510	16453.025	16494.540	16536.055	16577.570	
DISTANCE	50.000	41.515	8.485	50.000	42.000	8.000	5.114	44.886	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	10.662	7.794	31.559	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000
STATION	15+0	+50	+100	+142	+150	+200	+250	+300	+350	+400	+450	+500	+550	+600	+650	+700	+750	+800	+850	+900	+910	+950	16+0	+50	+100	+150	+200	+250	+300	+350	+400	+444	+450	+500						
HORIZONTAL ALIGNMENT	R=660 L=504.672		R=8 L=113.599		R=760 L=555.533		R=8 L=7.794		R=750 L=212.816		R=8 L=957.970																													



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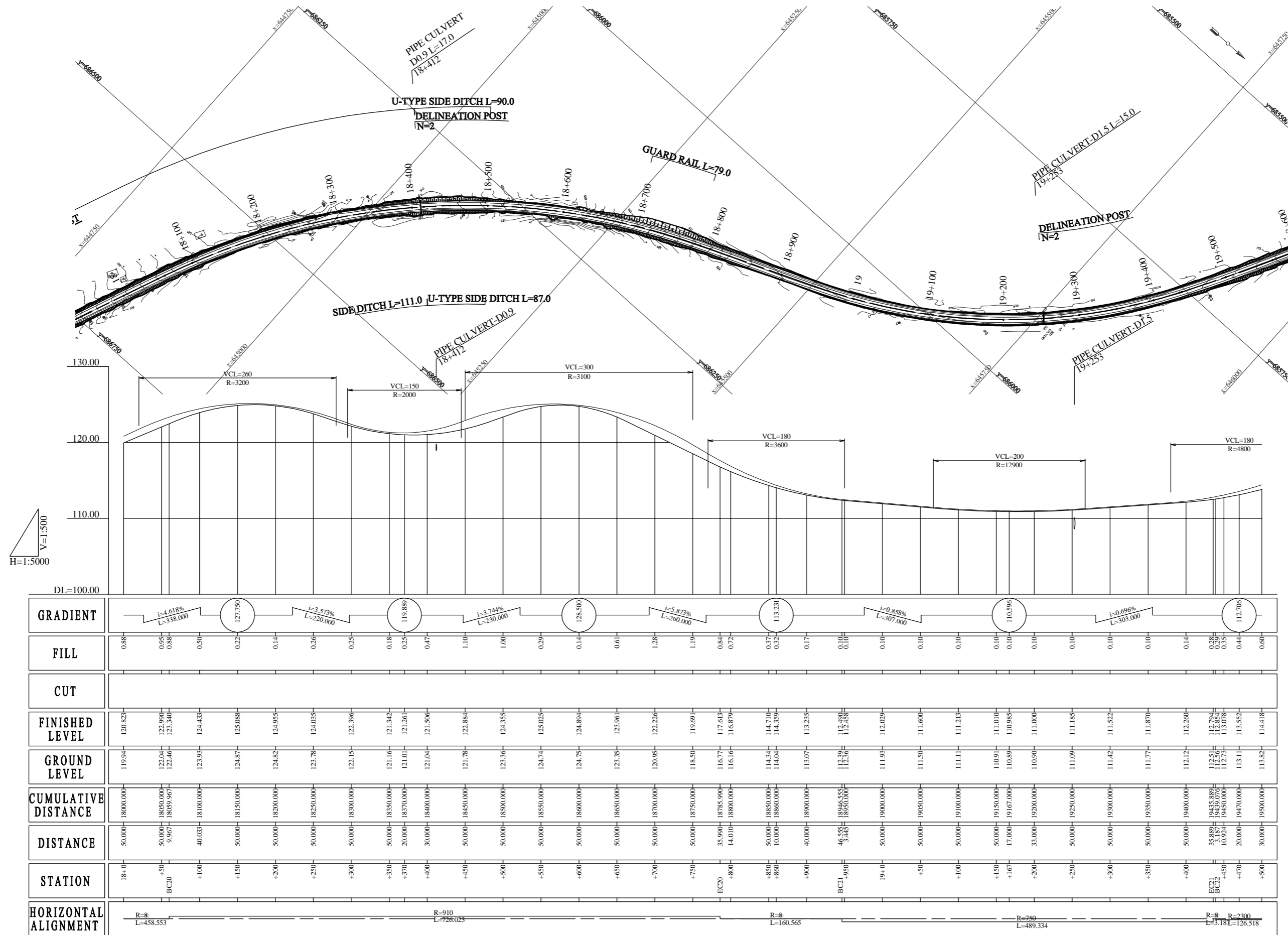
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
PLAN AND PROFILE (12)

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13



GHANA HIGHWAY AUTHORITY
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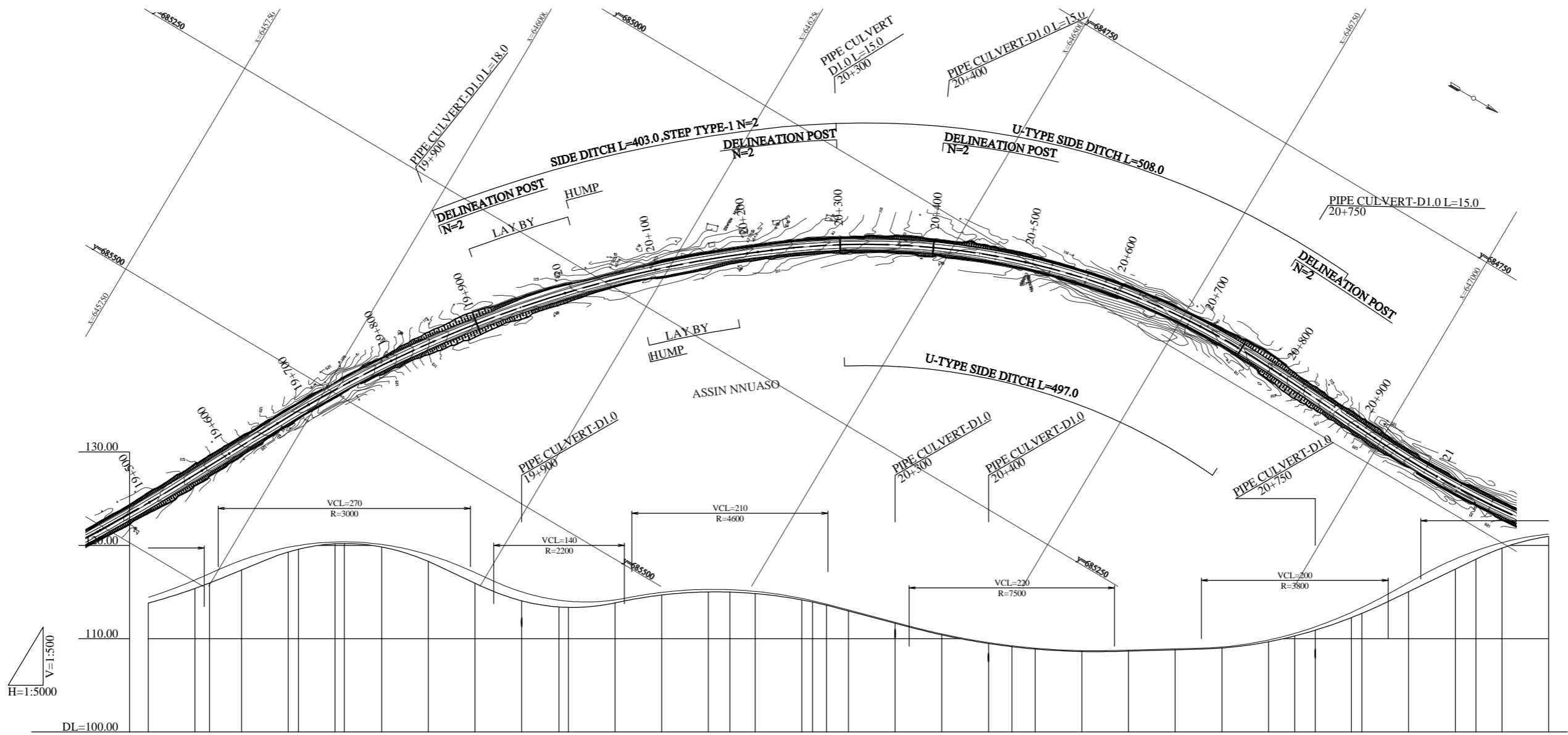
CONSULTANTS:
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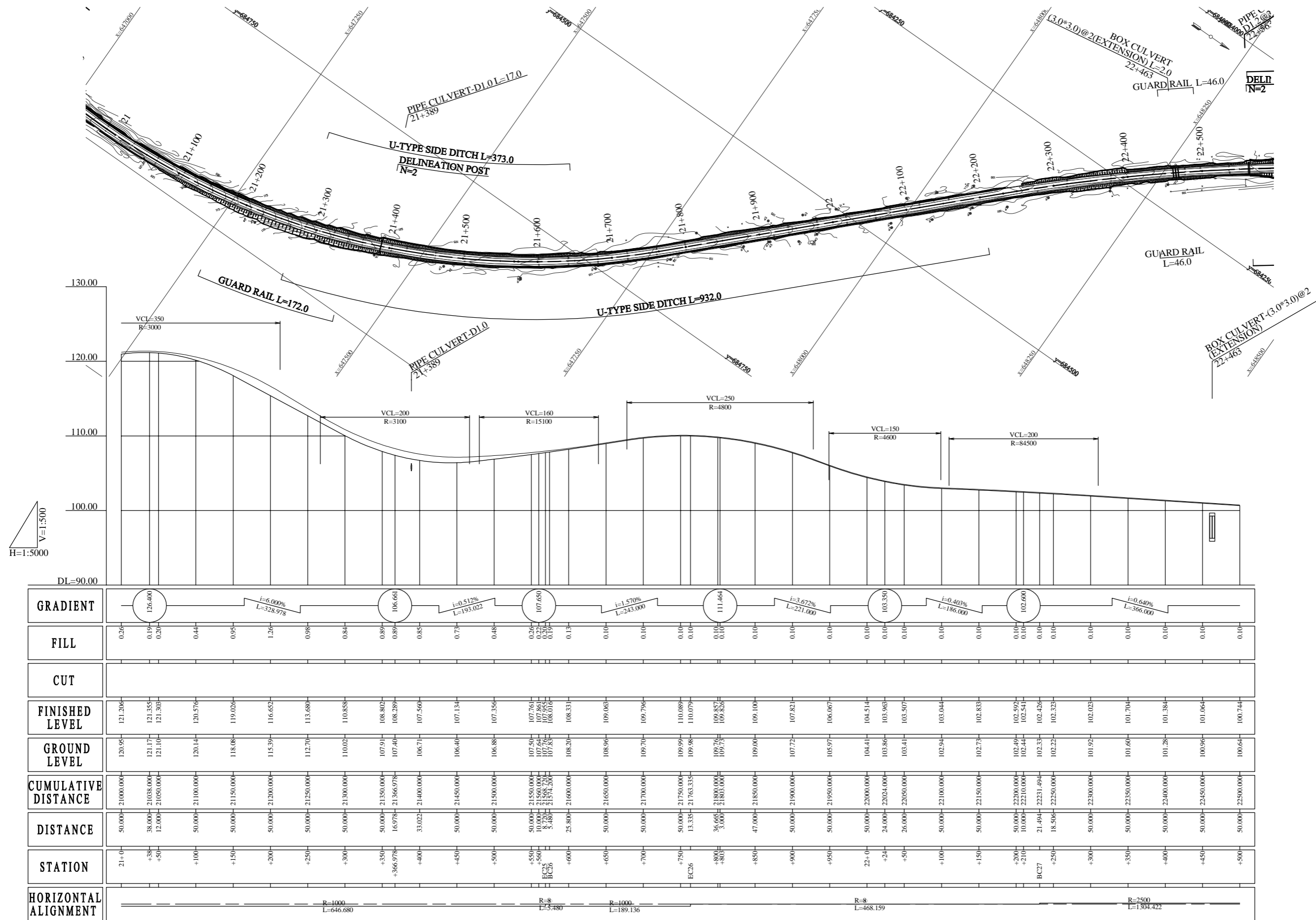
DRAWING TITLE:
PLAN AND PROFILE (13)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
14



GRADIENT																																										
FILL	0.60	0.90	1.00	1.03	0.51	0.42	0.20	0.18	0.27	0.72	1.13	0.97	0.73	0.66	0.32	0.28	0.28	0.25	0.23	0.16	0.14	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.19	0.28	0.37	0.56	0.63	0.97	1.10	0.90	0.60	0.26			
CUT																																										
FINISHED LEVEL	114.418	116.280	116.905	118.394	119.791	119.986	120.356	120.370	120.091	118.993	117.070	115.015	114.119	114.009	114.148	114.952	115.275	115.248	115.061	114.308	114.057	113.693	113.069	111.745	110.503	109.577	109.239	108.983	108.719	108.772	108.906	109.105	109.857	110.566	111.268	112.816	113.336	115.999	118.539	119.411	120.285	121.206
GROUND LEVEL	113.82	115.38	115.96	117.36	119.28	119.57	120.16	120.19	119.82	118.27	115.94	114.06	113.39	113.35	113.83	114.67	115.00	114.99	114.83	114.15	113.92	113.38	112.97	111.65	110.40	109.48	109.14	108.88	108.62	108.67	108.81	109.00	109.67	110.29	110.90	112.26	112.71	115.03	117.44	118.51	119.69	120.95
CUMULATIVE DISTANCE	19500.000	19550.000	19565.594	19600.000	19650.000	19660.951	19700.000	19710.000	19750.000	19800.000	19850.000	19900.000	19940.000	19950.000	20000.000	20050.000	20100.000	20123.000	20150.000	20200.000	20211.571	20226.424	20250.000	20300.000	20350.000	20400.000	20425.000	20450.000	20500.000	20550.000	20600.000	20650.000	20700.000	20728.000	20750.000	20788.799	20800.000	20850.000	20900.000	20922.039	20950.000	21000.000
DISTANCE	30.000	50.000	15.594	34.406	50.000	10.951	39.049	10.000	40.000	50.000	50.000	50.000	40.000	10.000	50.000	50.000	23.000	27.000	50.000	11.571	14.853	23.576	50.000	50.000	50.000	25.000	25.000	50.000	50.000	50.000	50.000	50.000	28.000	22.000	38.799	11.201	50.000	50.000	22.039	27.961	50.000	
STATION	19+500	+550	EC22	+600	+650	BC23	+700	+710	+750	+800	+850	+900	+940	+950	20+0	+50	+100	+123	+150	+200	EC23	BC24	+250	+300	+350	+400	+425	+450	+500	+550	+600	+650	+700	+728	+750	EC24	+800	+850	+900	BC25	+950	21+0
HORIZONTAL ALIGNMENT																																										



GHANA HIGHWAY AUTHORITY
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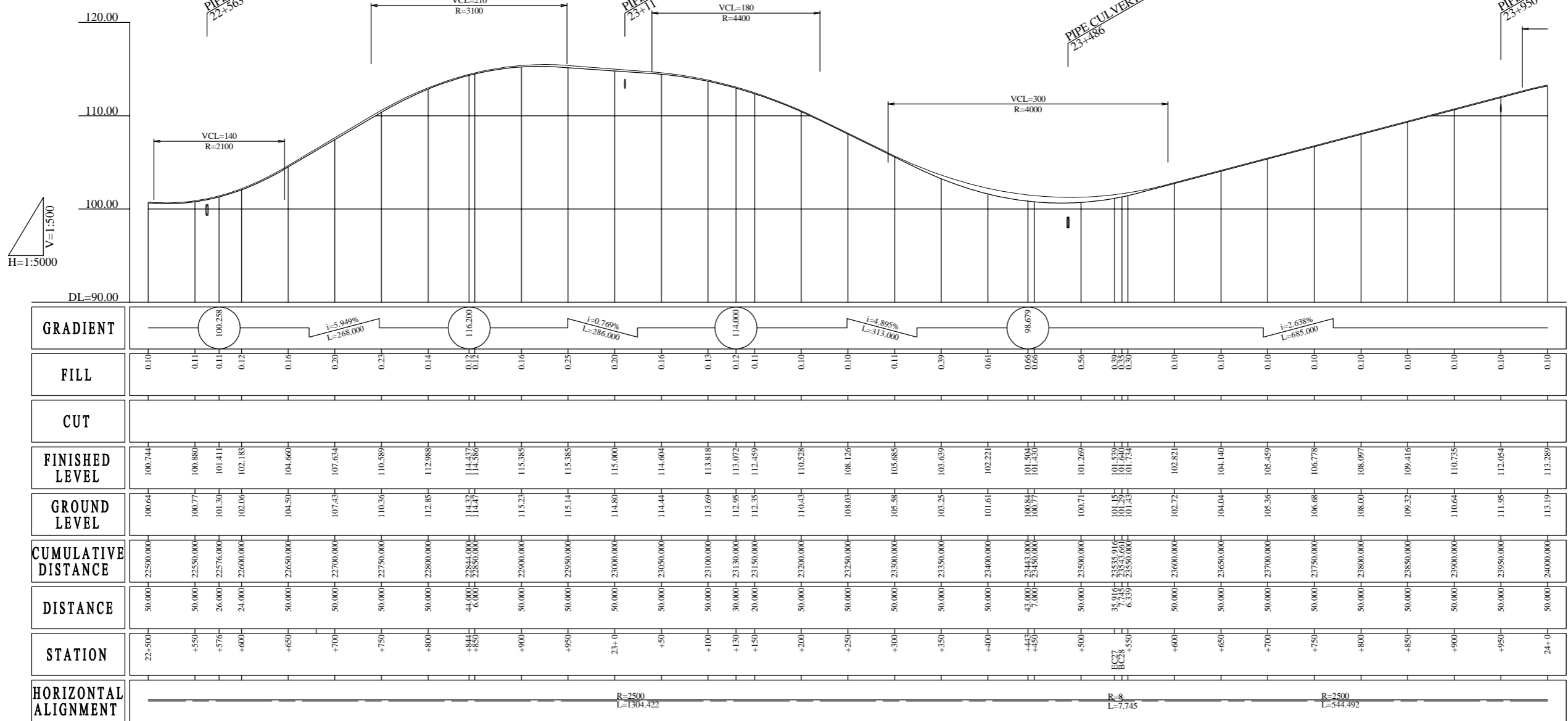
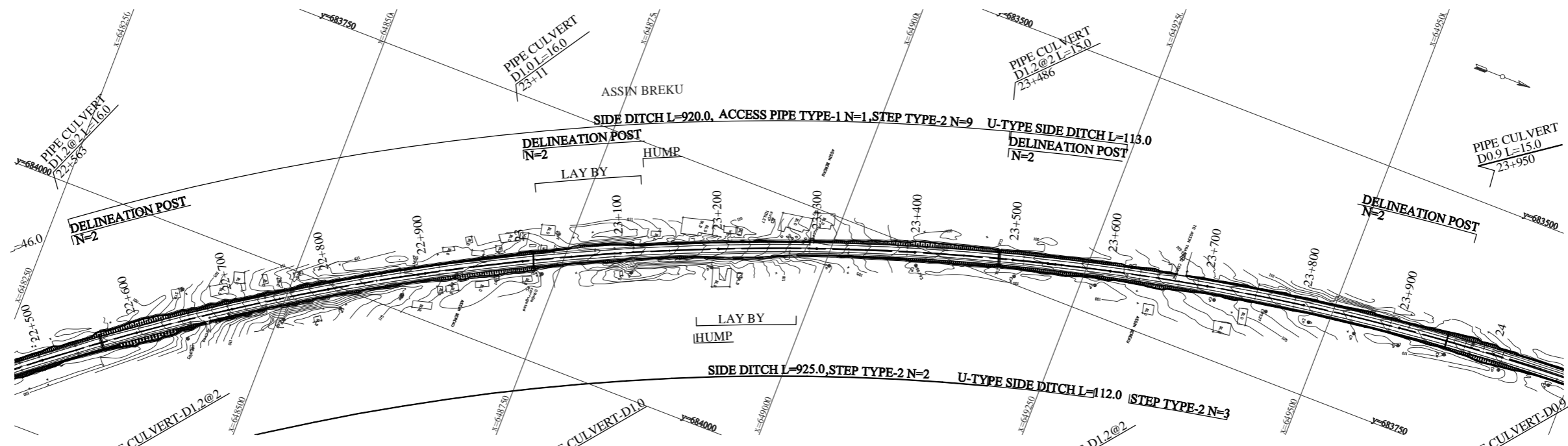
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
PLAN AND PROFILE (15)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
16



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

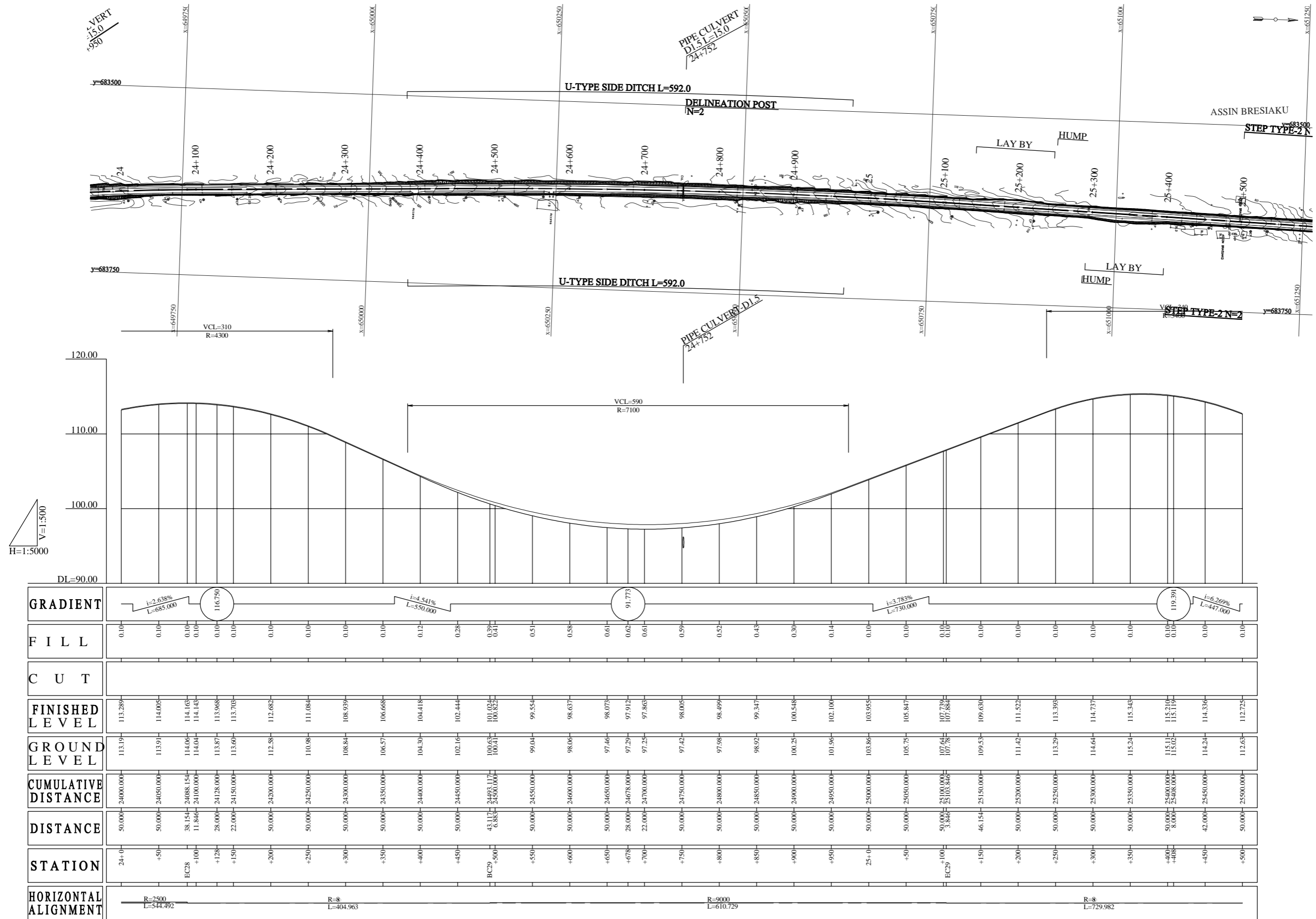
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
PLAN AND PROFILE (16)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
17



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

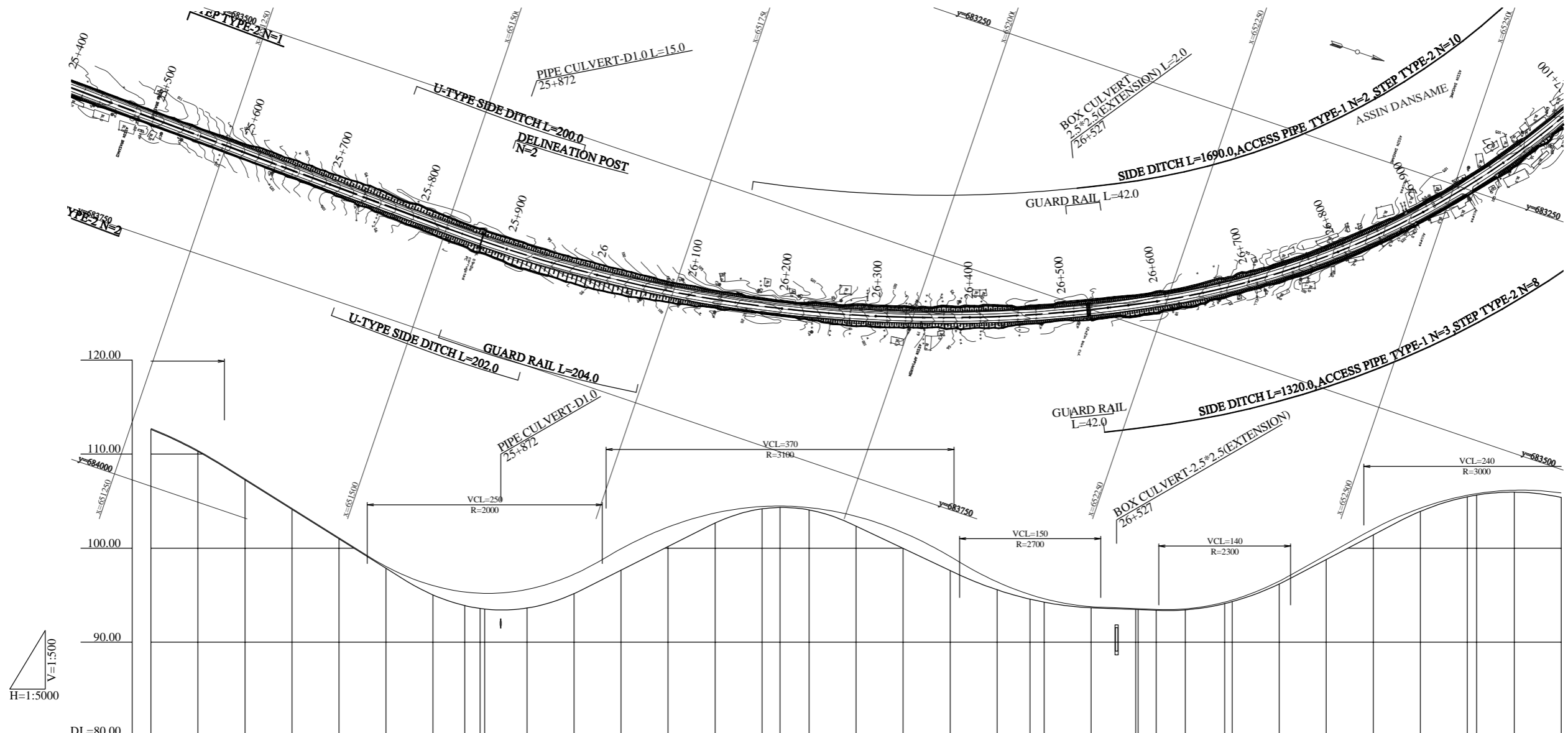
CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

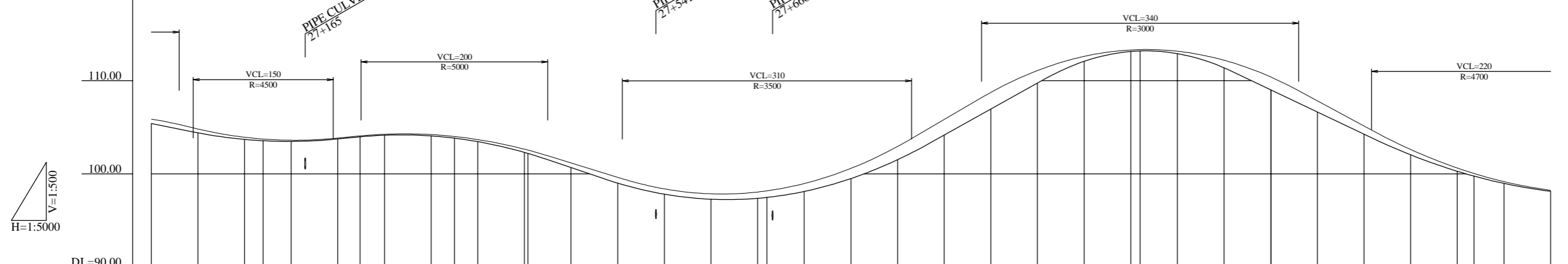
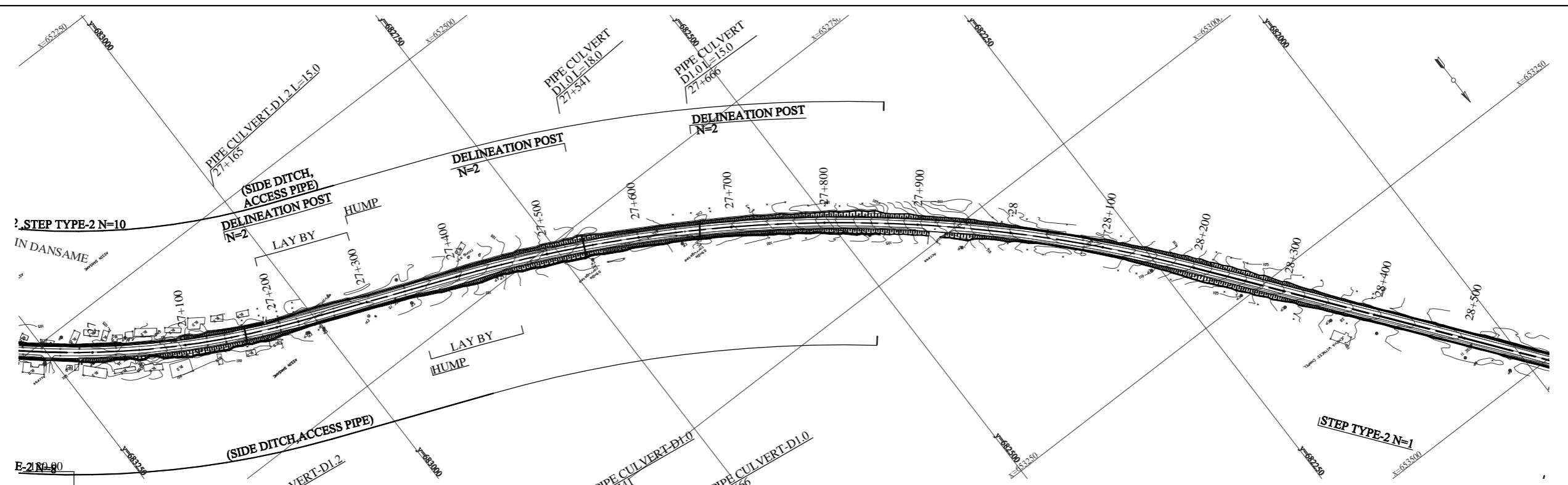
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PLAN AND PROFILE (17)

DATE:
PREPARED BY:
CHECKED BY:

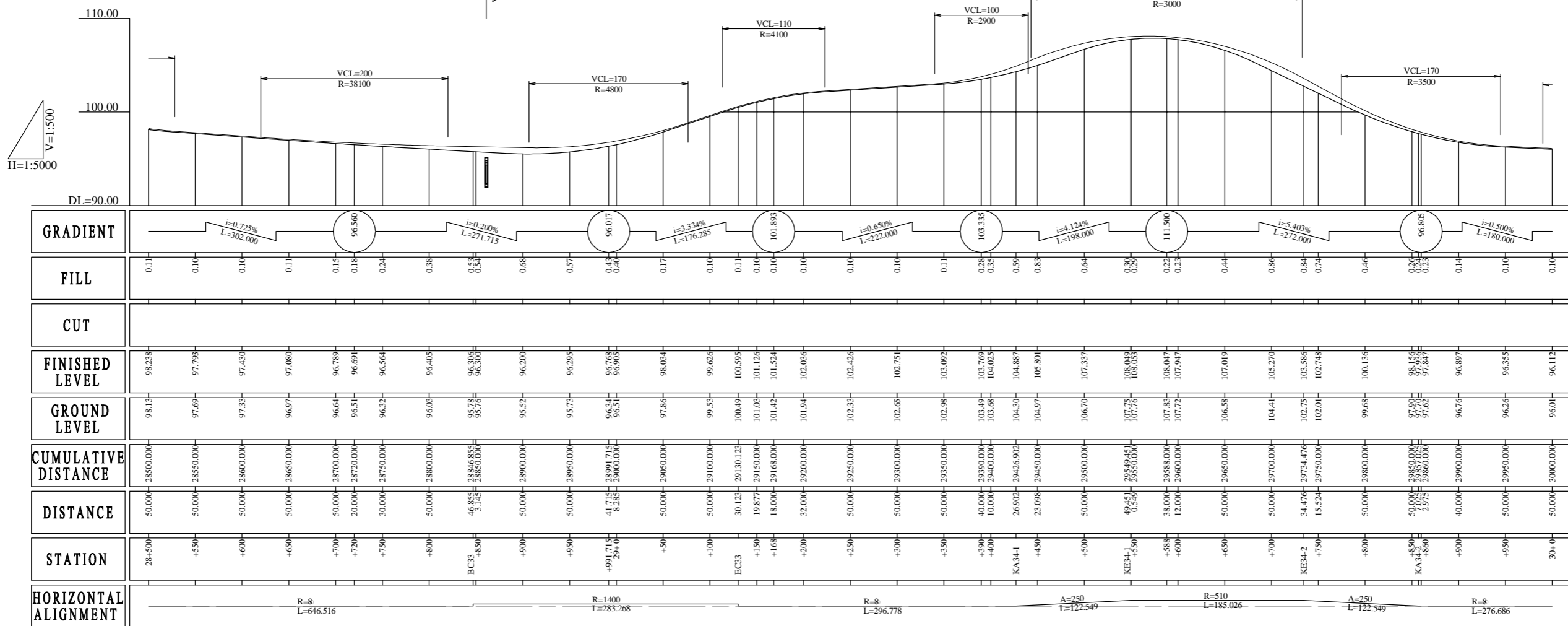
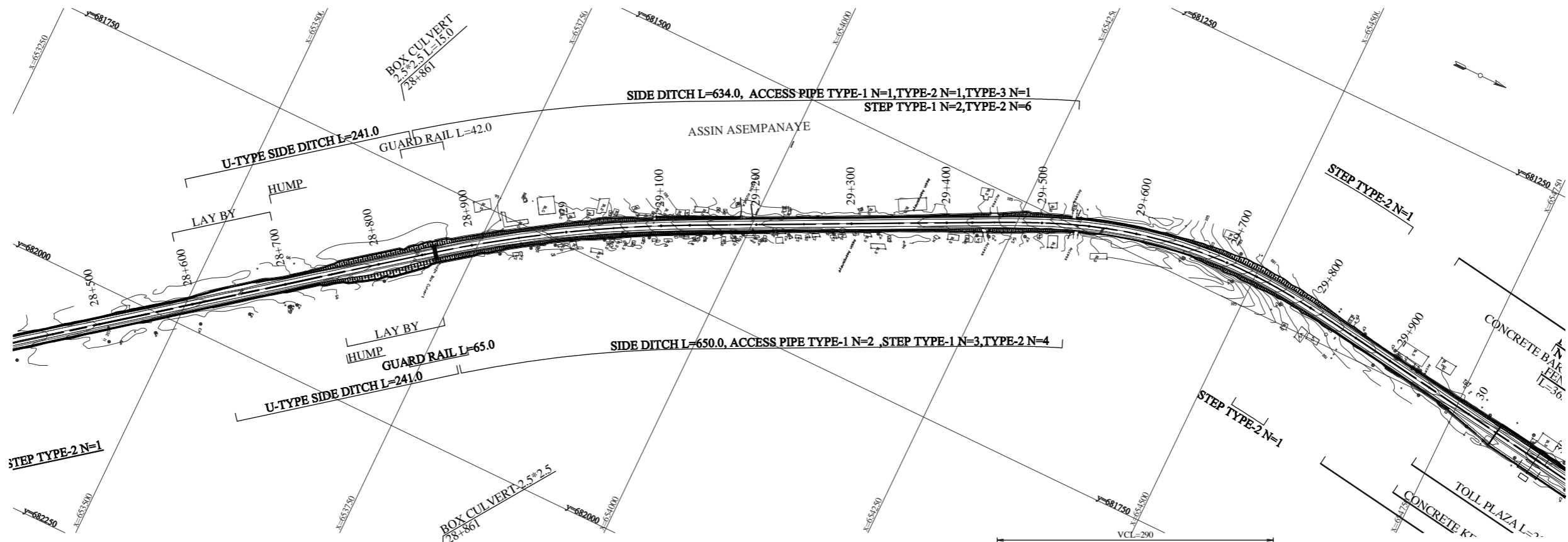
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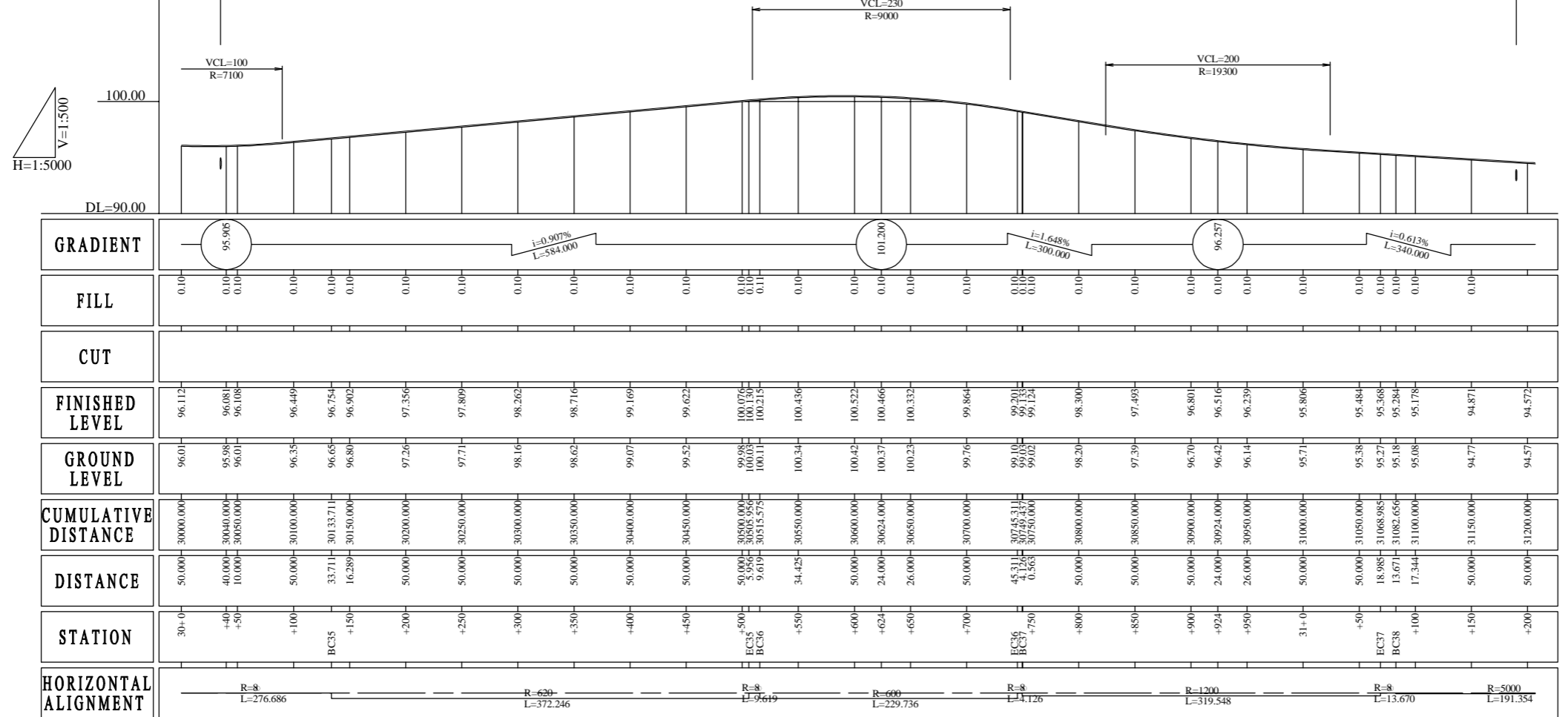
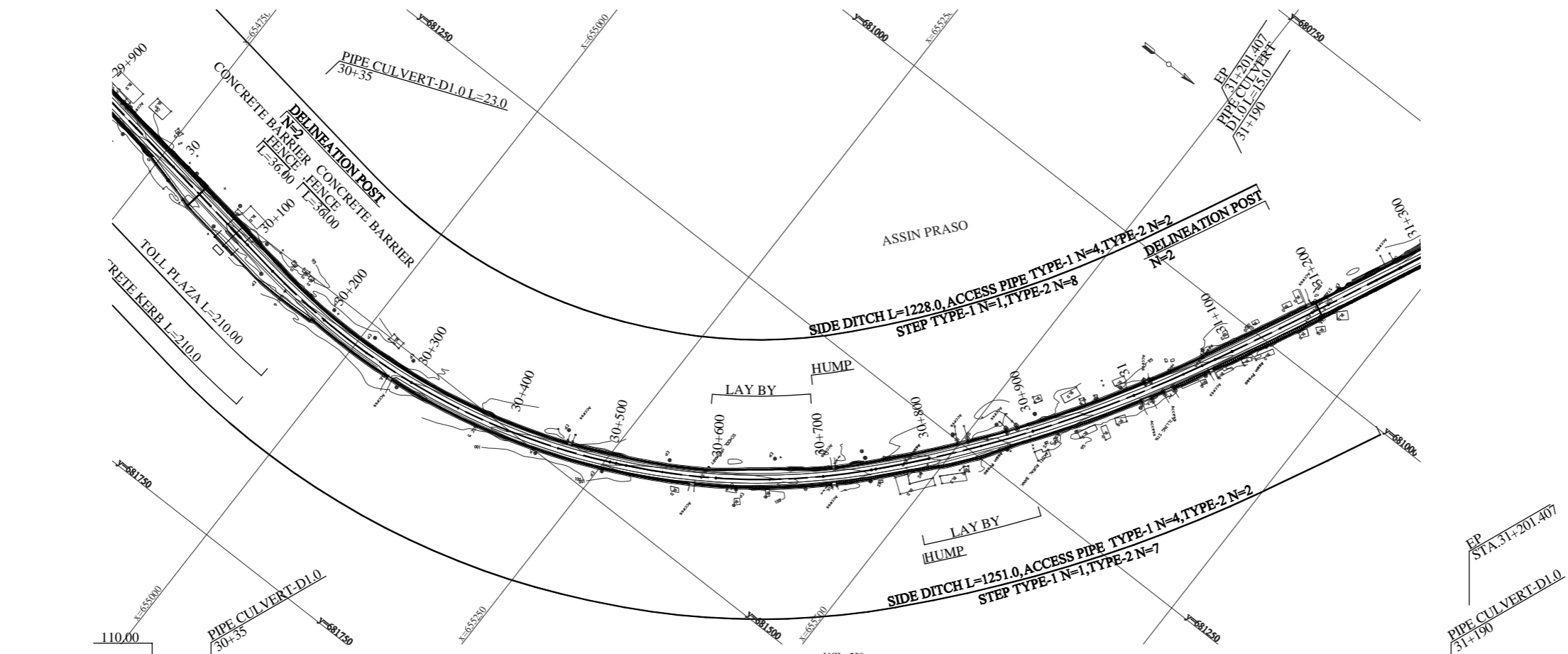


GRADIENT	$i=6.269\%$ $L=447.000$																				91.371	$i=5.933\%$ $L=314.000$																				110.000	$i=6.015\%$ $L=266.000$																				94.000	$i=0.380\%$ $L=207.000$																				93.214	$i=5.592\%$ $L=268.000$																				106.200	$i=2.429\%$ $L=210.000$																			
FILL	0.10	0.10	0.10	0.10	0.10	0.20	0.99	1.44	1.62	1.66	1.97	2.07	2.27	2.07	1.06	0.24	0.15	0.25	1.05	1.68	1.50	0.84	0.49	0.37	0.11	0.10	0.10	0.11	0.16	0.17	0.30	0.47	0.62	0.34	0.16	0.15	0.21	0.47																																																																																							
CUT																																																																																																																													
FINISHED LEVEL	112.725	110.374	107.356	104.221	101.087	98.051	96.014	95.329	95.198	95.184	95.605	97.227	99.932	102.237	103.733	104.424	104.474	104.306	103.382	101.649	99.110	96.406	95.057	94.619	93.772	93.573	93.563	93.490	93.540	94.259	94.481	96.488	99.253	102.032	104.243	105.619	105.794	106.160	105.864																																																																																						
GROUND LEVEL	112.65	110.27	107.26	104.12	100.99	97.85	95.02	93.89	93.58	93.52	95.65	95.16	97.66	100.17	102.67	104.18	104.32	104.06	102.33	99.97	97.61	95.57	94.57	94.25	93.66	93.47	93.46	93.39	93.43	94.10	94.31	96.19	98.78	101.41	103.90	105.46	105.64	105.95	105.39																																																																																						
CUMULATIVE DISTANCE	25500.000	25550.000	25600.000	25650.000	25700.000	25750.000	25800.000	25833.828	25850.000	25855.000	25900.000	25950.000	26000.000	26050.000	26100.000	26150.000	26169.000	26200.000	26250.000	26300.000	26350.000	26400.000	26435.000	26450.000	26500.000	26547.355	26550.000	26569.180	26600.000	26642.000	26650.000	26700.000	26750.000	26800.000	26850.000	26900.000	26910.000	26950.000	27000.000																																																																																						
DISTANCE	50.000	50.000	50.000	50.000	50.000	50.000	50.000	33.828	16.172	5.000	45.000	50.000	50.000	50.000	50.000	50.000	19.000	31.000	50.000	50.000	50.000	50.000	35.000	15.000	50.000	47.355	2.645	19.180	30.820	42.000	8.000	50.000	50.000	50.000	50.000	50.000	10.000	40.000	50.000																																																																																						
STATION	25+500	+550	+600	+650	+700	+750	+800	BC30	+850	+855	+900	+950	26+0	+50	+100	+150	+169	+200	+250	+300	+350	+400	+435	+450	+500	EC30	+550	BC31	+600	+642	+650	+700	+750	+800	+850	+900	+910	+950	27+0																																																																																						
HORIZONTAL ALIGNMENT	R=8 L=729.982										R=1500 L=713.526										R=8 L=21.825										R=880 L=654.602																																																																																														



GRADIENT	i=2.429% L=210.000		103.100		i=0.930% L=205.000		105.006		i=3.070% L=335.000		94.720		i=5.845% L=400.000		118.100		i=5.405% L=358.000		98.750		i=0.725% L=302.000																				
FILL	0.47	0.40	0.24	0.18	0.13	0.10	0.11	0.11	0.14	0.18	0.23	0.34	0.36	0.50	0.63	0.57	0.58	0.67	0.71	0.84	1.09	1.42	1.68	1.79	1.35	0.53	0.16	0.15	0.25	0.82	1.37	1.38	1.20	0.87	0.57	0.34	0.28	0.20	0.11		
CUT																																									
FINISHED LEVEL	105.864	104.803	103.925	103.730	103.606	103.844	104.065	104.246	104.210	104.006	103.83	103.45	103.675	102.640	102.539	101.68	99.633	98.388	97.860	98.050	98.175	98.960	100.589	102.935	105.826	108.731	111.075	112.591	113.281	113.319	113.142	112.176	110.384	110.369	107.830	105.128	102.613	100.623	100.037	99.165	98.238
GROUND LEVEL	105.39	104.40	103.69	103.55	103.48	103.74	103.96	104.14	104.07	103.83	103.45	103.67	102.30	102.18	100.67	99.00	97.82	97.28	97.38	97.47	98.12	99.50	101.52	104.15	106.94	109.73	112.06	113.12	113.17	112.89	111.36	109.01	108.59	106.63	104.26	102.04	100.28	99.76	98.97	98.13	
CUMULATIVE DISTANCE	27000.000	27050.000	27100.000	27120.000	27150.000	27200.000	27223.781	27250.000	27300.000	27325.000	27350.000	27400.000	27403.875	27450.000	27500.000	27550.000	27600.000	27650.000	27660.000	27700.000	27750.000	27800.000	27850.000	27900.000	27950.000	28000.000	28050.000	28060.000	28100.000	28150.000	28200.000	28200.340	28250.000	28300.000	28350.000	28400.000	28418.000	28450.000	28500.000		
DISTANCE	50.000	50.000	50.000	20.000	30.000	50.000	23.781	26.219	50.000	25.000	25.000	50.000	3.875	46.125	50.000	50.000	50.000	10.000	40.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	50.000	10.000	40.000	50.000	50.000	0.340	49.660	50.000	50.000	50.000	18.000	32.000	50.000		
STATION	27+0	+50	+100	+120	+150	+200	EC31	+250	+300	+325	+350	BC32	+400	+450	+500	+550	+600	+650	+660	+700	+750	+800	+850	+900	+950	28+0	+50	+60	+100	+150	EC32	+200	+250	+300	+350	+400	+418	+450	+500		
HORIZONTAL ALIGNMENT	R=880 L=654.602																						R=8 L=180.093				R=1500 L=796.465						R=8 L=646.516								

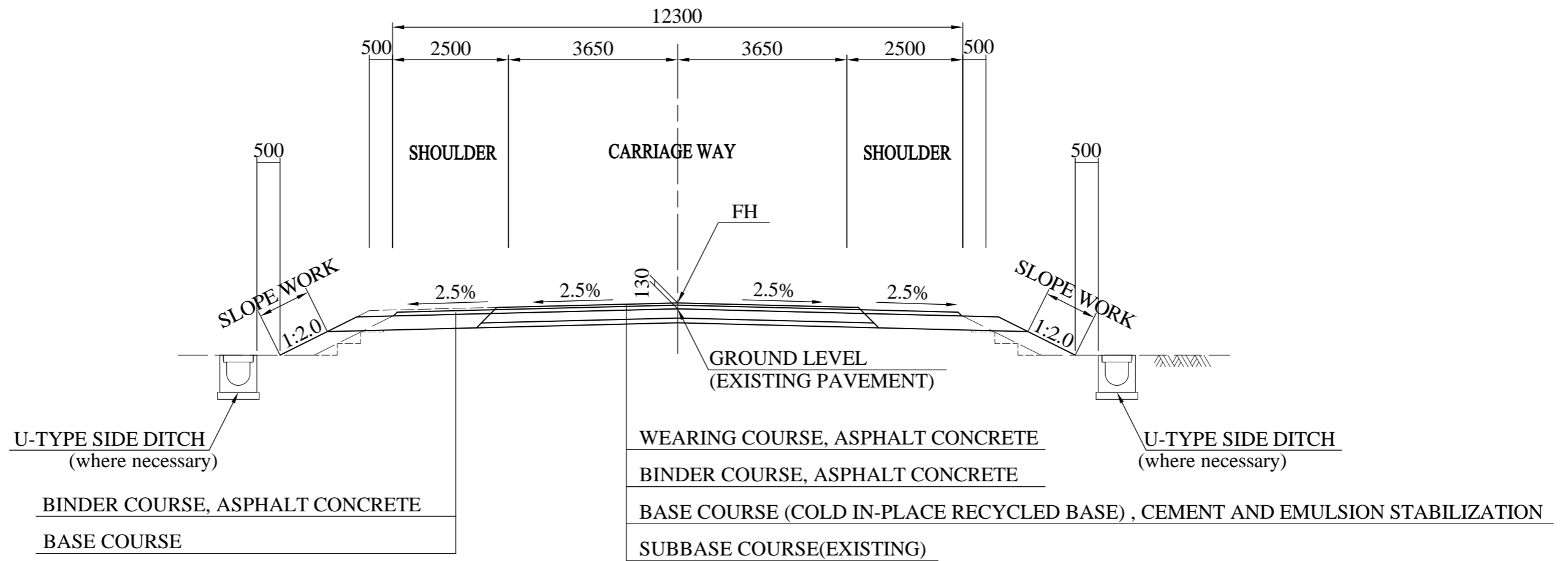




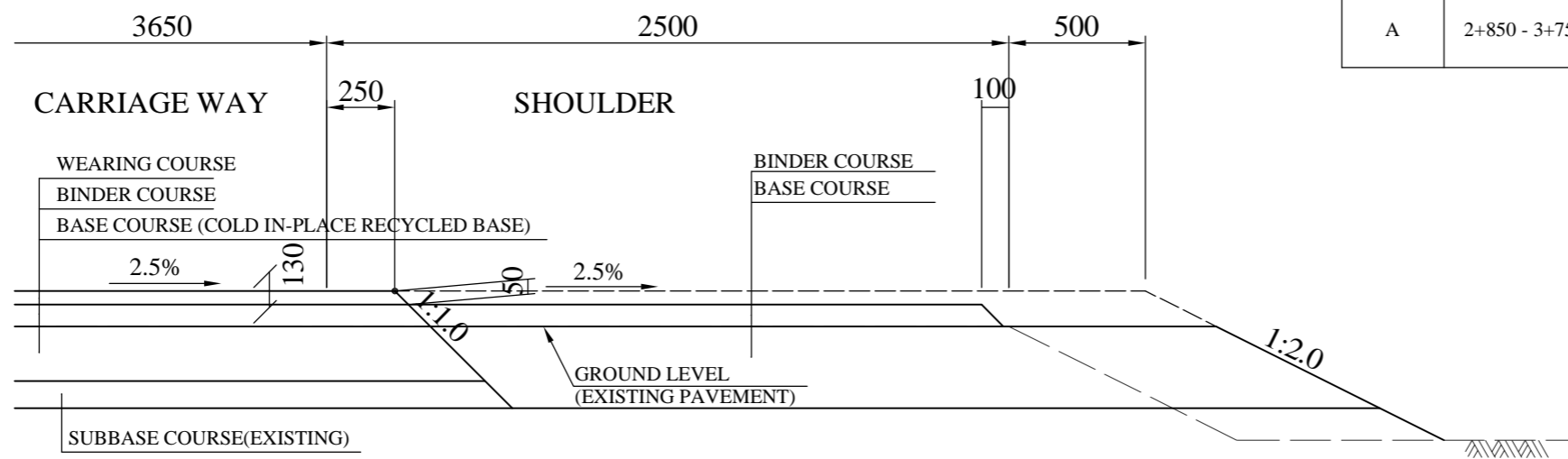
STATION	DISTANCE	CUMULATIVE DISTANCE	GROUND LEVEL	FINISHED LEVEL	CUT	FILL	GRADIENT
30+00	50.000	30000.000	96.112	96.112	0.00	0.00	95.906
+40	40.000	30040.000	95.981	96.081	0.10	0.10	
+50	10.000	30050.000	96.011	96.108	0.10	0.10	
+100	50.000	30100.000	96.351	96.449	0.10	0.10	
BC35	33.711	30133.711	96.651	96.754	0.10	0.10	
+150	16.289	30150.000	96.801	96.902	0.10	0.10	
+200	50.000	30200.000	97.261	97.356	0.10	0.10	
+250	50.000	30250.000	97.711	97.809	0.10	0.10	
+300	50.000	30300.000	98.161	98.262	0.10	0.10	
+350	50.000	30350.000	98.621	98.716	0.10	0.10	
+400	50.000	30400.000	99.071	99.169	0.10	0.10	
+450	50.000	30450.000	99.521	99.622	0.10	0.10	
+500	50.000	30500.000	99.981	100.076	0.10	0.10	
EC35	5.956	30505.956	100.031	100.130	0.10	0.10	
BC36	9.619	30515.575	100.111	100.215	0.10	0.10	
+550	34.425	30550.000	100.341	100.436	0.10	0.10	
+600	50.000	30600.000	100.421	100.522	0.10	0.10	
+624	24.000	30624.000	100.371	100.466	0.10	0.10	
+650	26.000	30650.000	100.231	100.332	0.10	0.10	
+700	50.000	30700.000	99.761	99.864	0.10	0.10	
EC36	45.311	30745.311	99.101	99.201	0.10	0.10	
BC37	0.658	30750.000	99.021	99.124	0.10	0.10	
+800	50.000	30800.000	98.201	98.300	0.10	0.10	
+850	50.000	30850.000	97.391	97.493	0.10	0.10	
+900	50.000	30900.000	96.701	96.801	0.10	0.10	
+924	24.000	30924.000	96.421	96.516	0.10	0.10	
+950	26.000	30950.000	96.141	96.239	0.10	0.10	
31+00	50.000	31000.000	95.711	95.806	0.10	0.10	
+50	50.000	31050.000	95.381	95.484	0.10	0.10	
EC37	18.985	31068.985	95.271	95.368	0.10	0.10	
BC38	13.671	31082.656	95.181	95.284	0.10	0.10	
+100	17.344	31100.000	95.081	95.178	0.10	0.10	
+150	50.000	31150.000	94.771	94.871	0.10	0.10	
+200	50.000	31200.000	94.572	94.572	0.10	0.10	
HORIZONTAL ALIGNMENT							
R=8							
L=276.686							
R=620							
L=372.246							
R=8							
L=9.619							
R=600							
L=229.736							
R=8							
L=14.126							
R=1200							
L=319.548							
R=8							
L=13.670							
R=5000							
L=191.354							

TYPICAL CROSS SECTION(1) SCALE A3 1:100

SECTION A



EDGE OF PAVEMENT SCALE A3 1:25

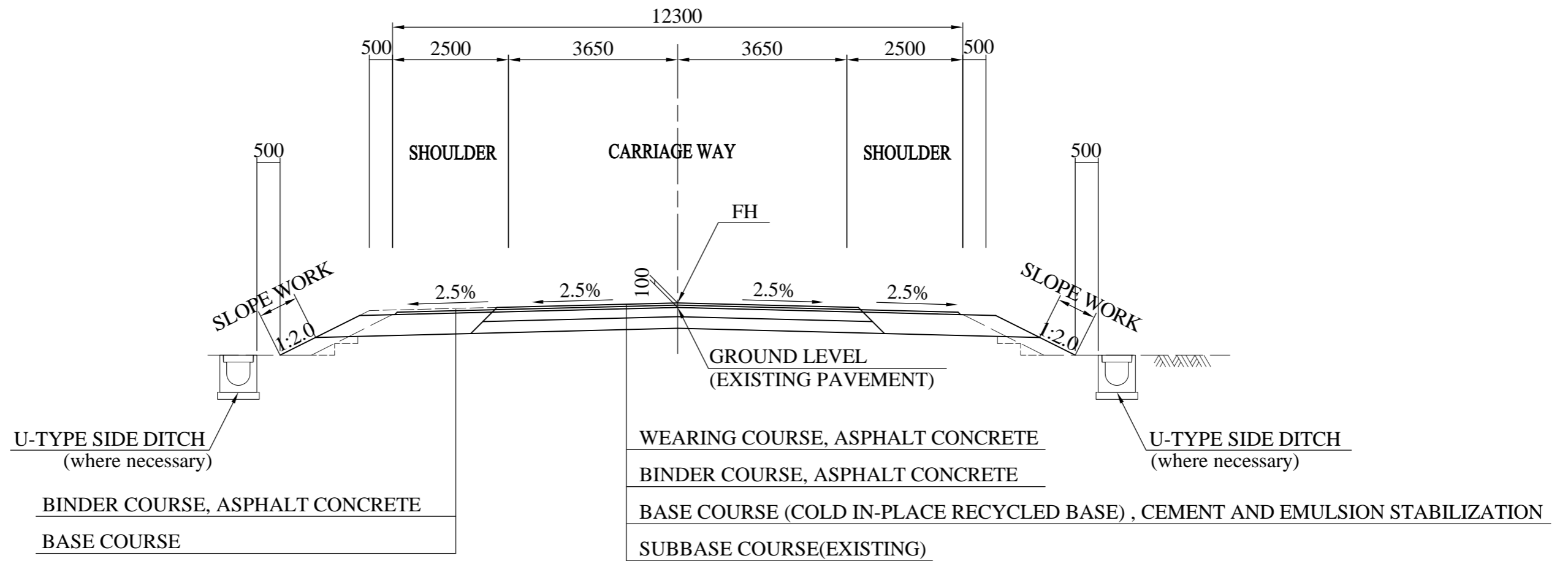


THICKNESS OF PAVEMENT LIST

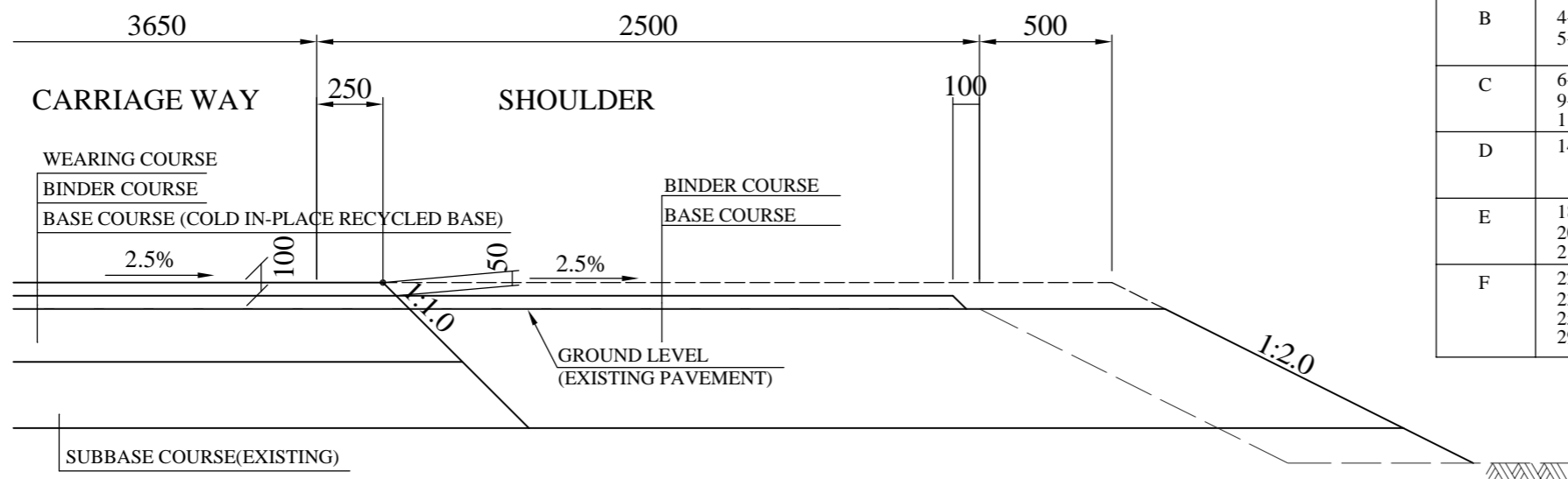
SECTION	STA.	CARRIAGE WAY				SHOULDER	
		WEARING (mm)	BINDER (mm)	BASE (IN-PLACE RECYCLED) (mm)	SUBBASE (EXISTING) (mm)	BINDER (mm)	BASE (mm)
A	2+850 - 3+750	50	80	200	100	80	300

TYPICAL CROSS SECTION (2) SCALE A3 1:100

SECTION B-F



EDGE OF PAVEMENT SCALE A3 1:25

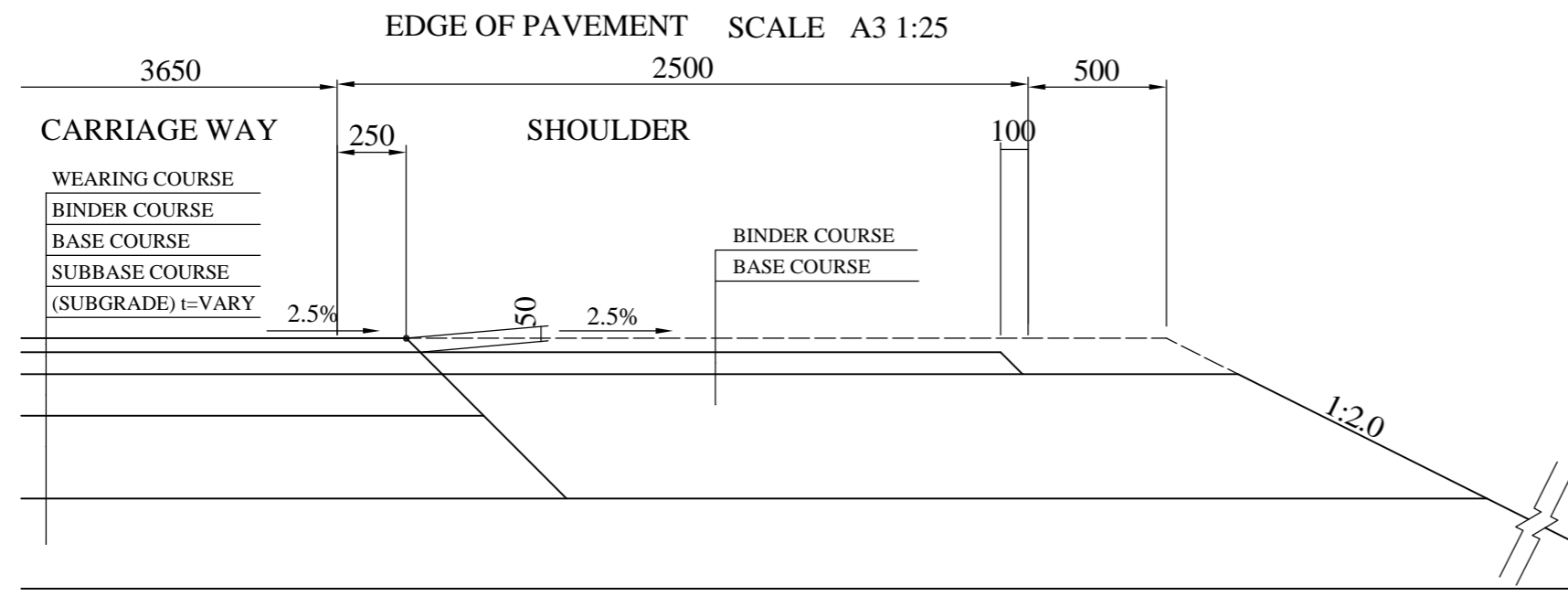
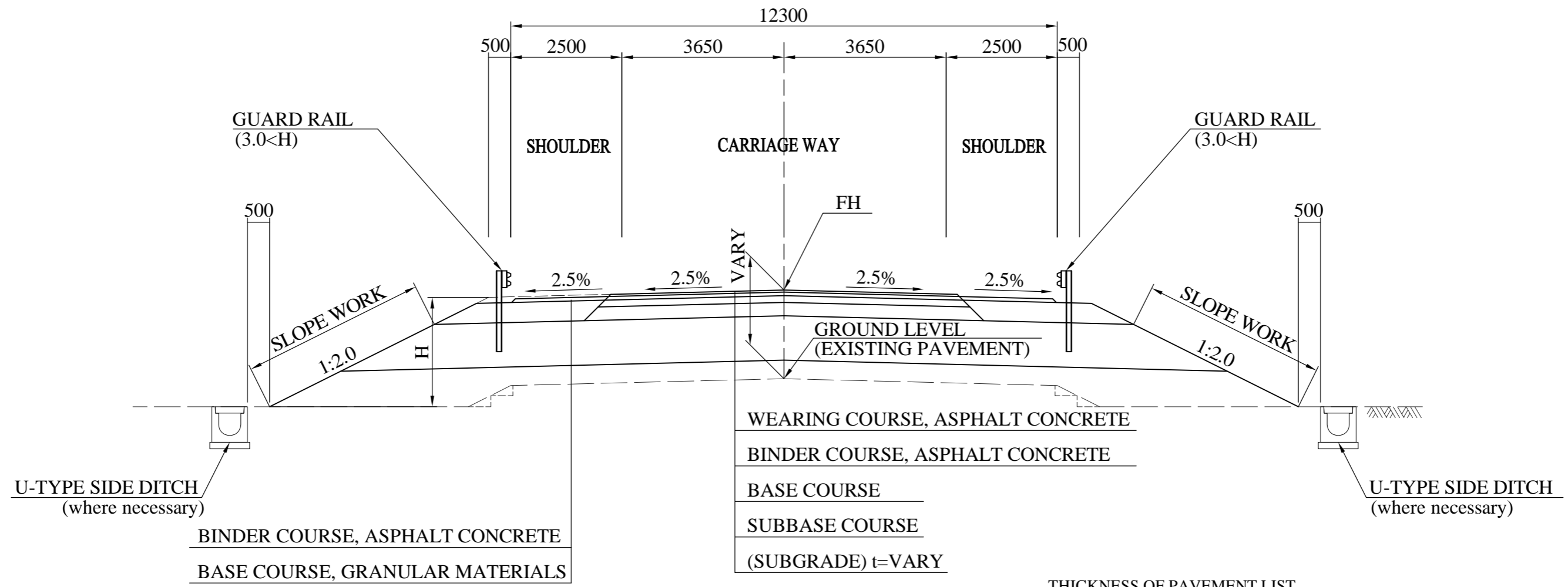


THICKNESS OF PAVEMENT LIST

SECTION	STA.	CARRIAGE WAY				SHOULDER	
		WEARING (mm)	BINDER (mm)	BASE (IN-PLACE RECYCLED) (mm)	SUBBASE (EXISTING) (mm)	BINDER (mm)	BASE (mm)
B	4+000 - 4+900 5+700 - 6+50	50	50	200	300	50	500
C	6+750 - 9+400 9+700 - 10+950 11+300 - 12+250				190		390
D	14+900 - 17+700				160		360
E	18+950 - 19+350 20+250 - 20+600 21+650 - 22+300			220	150		370
F	22+300 - 22+500 23+600 - 24+350 25+000 - 25+700 29+950 - 31+201			200	270		470

TYPICAL CROSS SECTION(3) SCALE A3 1:100

ROAD RAISING SECTION

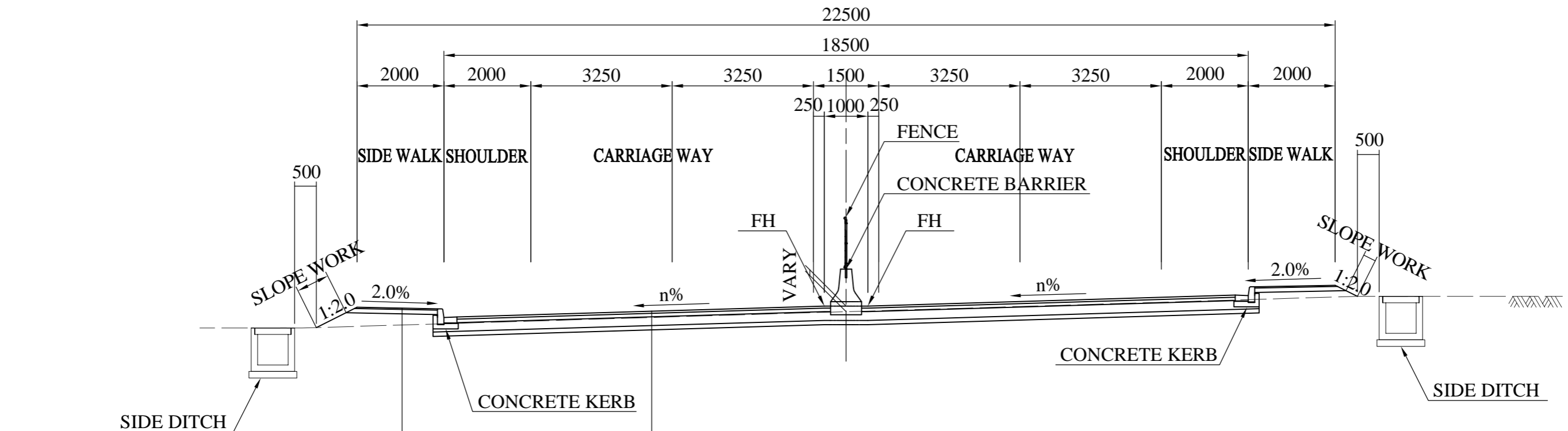


THICKNESS OF PAVEMENT LIST

SECTION	STA.	CARRIAGE WAY				SHOULDER	
		WEARING (mm)	BINDER (mm)	BASE (mm)	SUBBASE (mm)	BINDER (mm)	BASE (mm)
A	0+000 - 0+678 1+926 - 2+850	50	100	200	300	100	500
B	3+750 - 4+000 4+900 - 5+700 6+50 - 6+750		50		300	50	500
C	9+400 - 9+700 10+950 - 11+300 12+250 - 13+800		50		300	50	500
D	13+800 - 14+900		50		400	50	600
E	17+700 - 18+950 19+350 - 20+250 20+600 - 21+650		100		300	100	500
F	22+500 - 23+600 24+350 - 25+000 25+700 - 29+950		50		400	50	600

TYPICAL CROSS SECTION (4) SCALE A3 1:100

URBAN AREA SECTION (ASSIN FOSU)



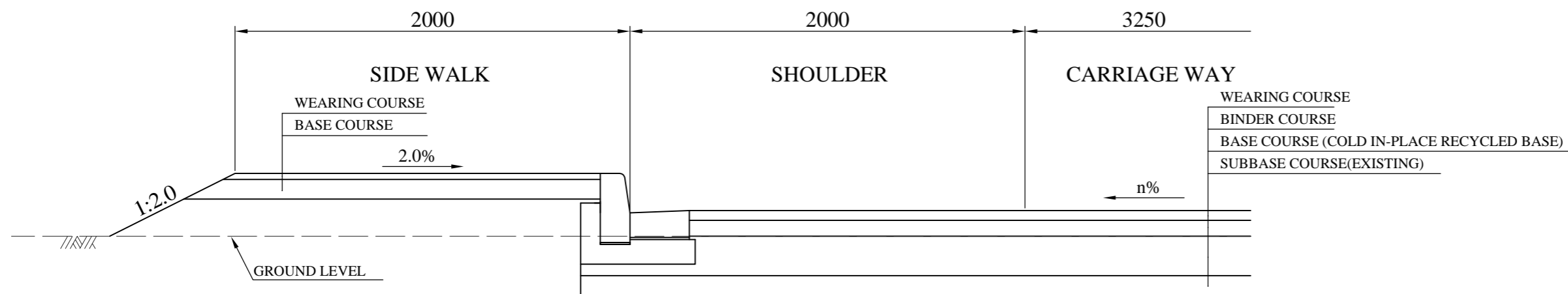
WEARING COURSE, ASPHALT CONCRETE
BASE COURSE

WEARING COURSE, ASPHALT CONCRETE
BINDER COURSE, ASPHALT CONCRETE
BASE COURSE
SUBBASE COURSE
(SUBGRADE) t=VARY

THICKNESS OF PAVEMENT LIST

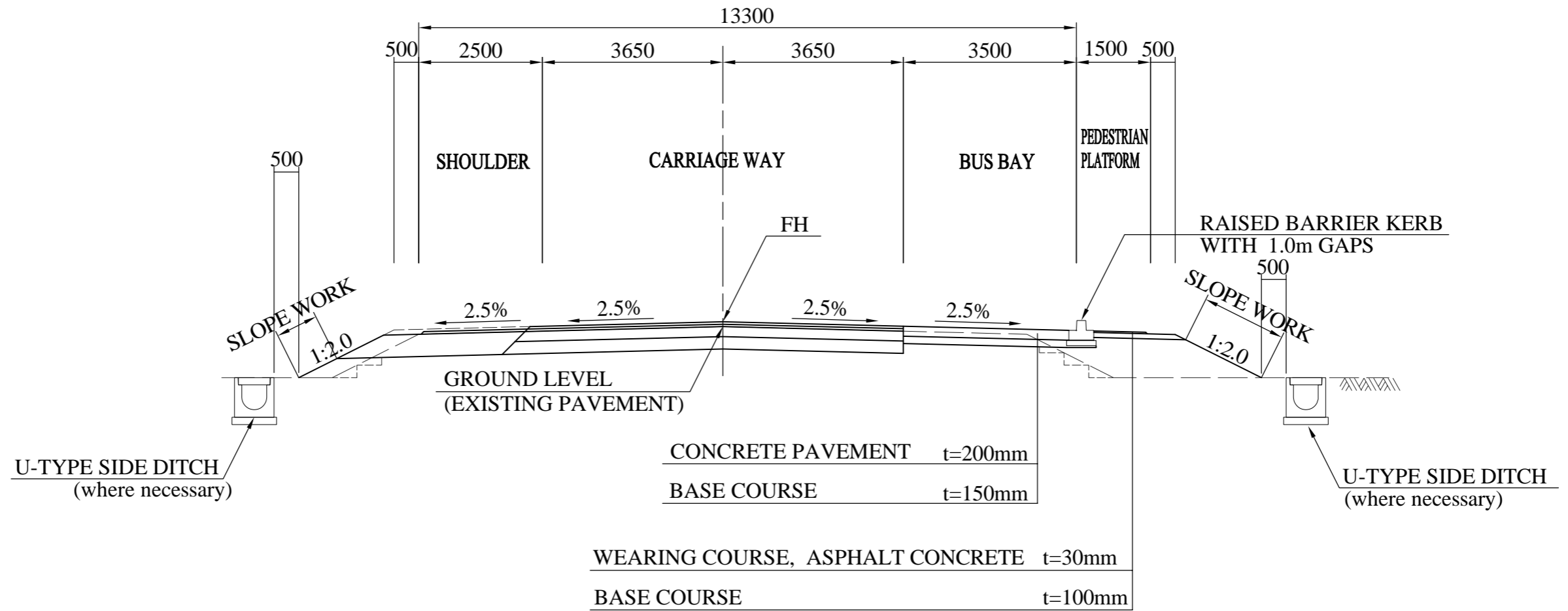
SECTION	STA.	CARRIAGE WAY, SHOULDER				SIDE WALK	
		WEARING (mm)	BINDER (mm)	BASE (mm)	SUBBASE (mm)	WEARING (mm)	BASE (mm)
A	0+678 - 1+926	50	100	200	300	30	100

EDGE OF PAVEMENT SCALE A3 1:25



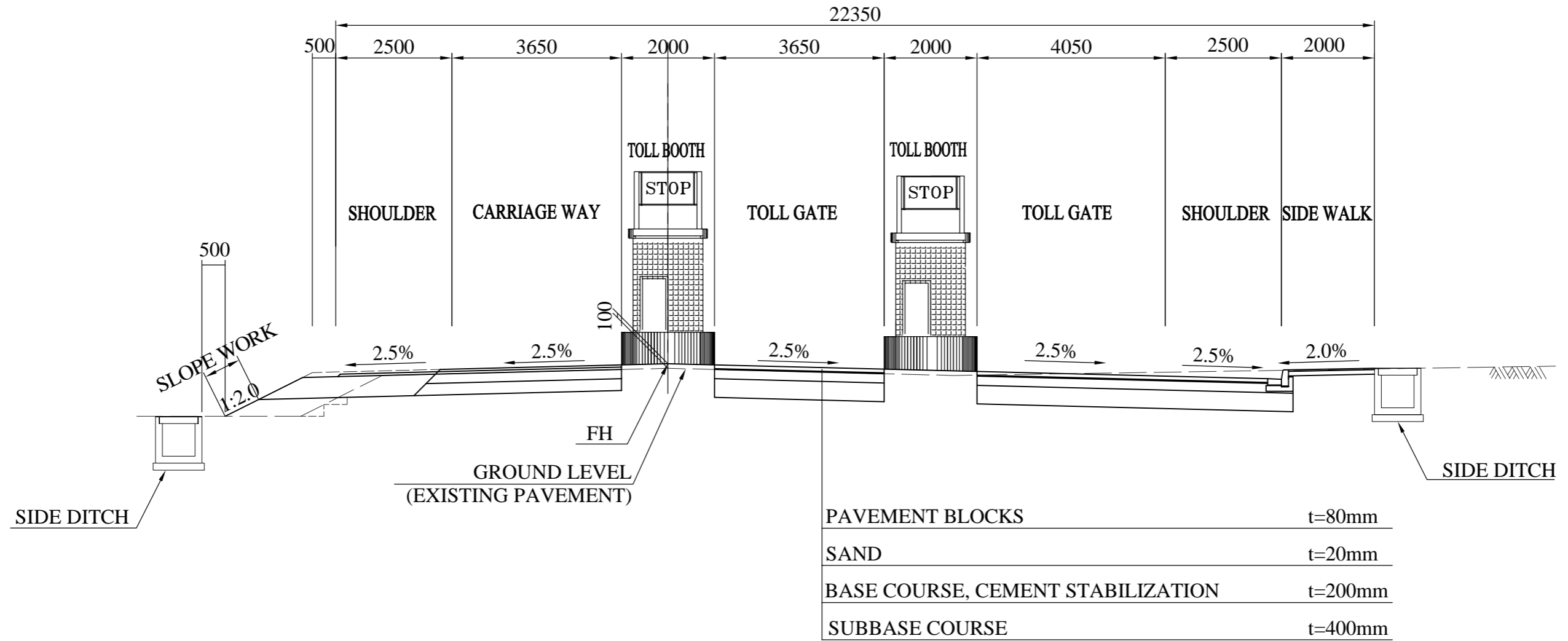
TYPICAL CROSS SECTION (5) SCALE A3 1:100

LAY BY



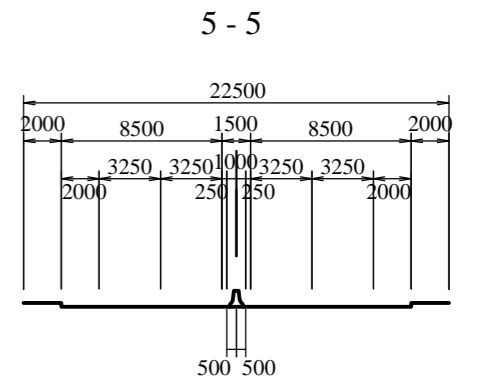
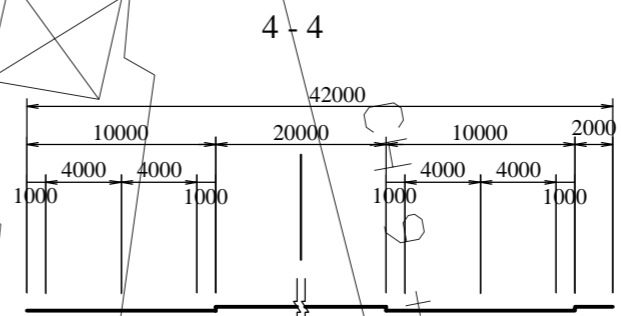
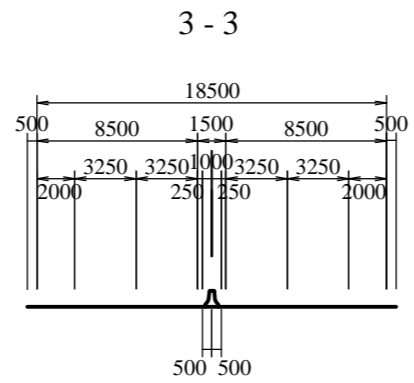
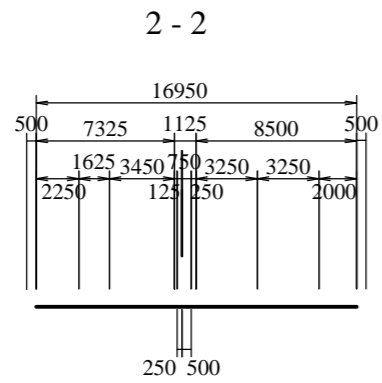
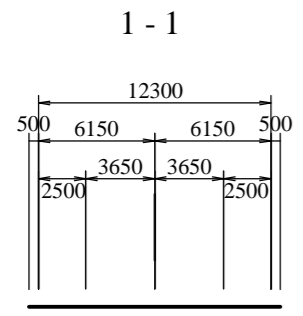
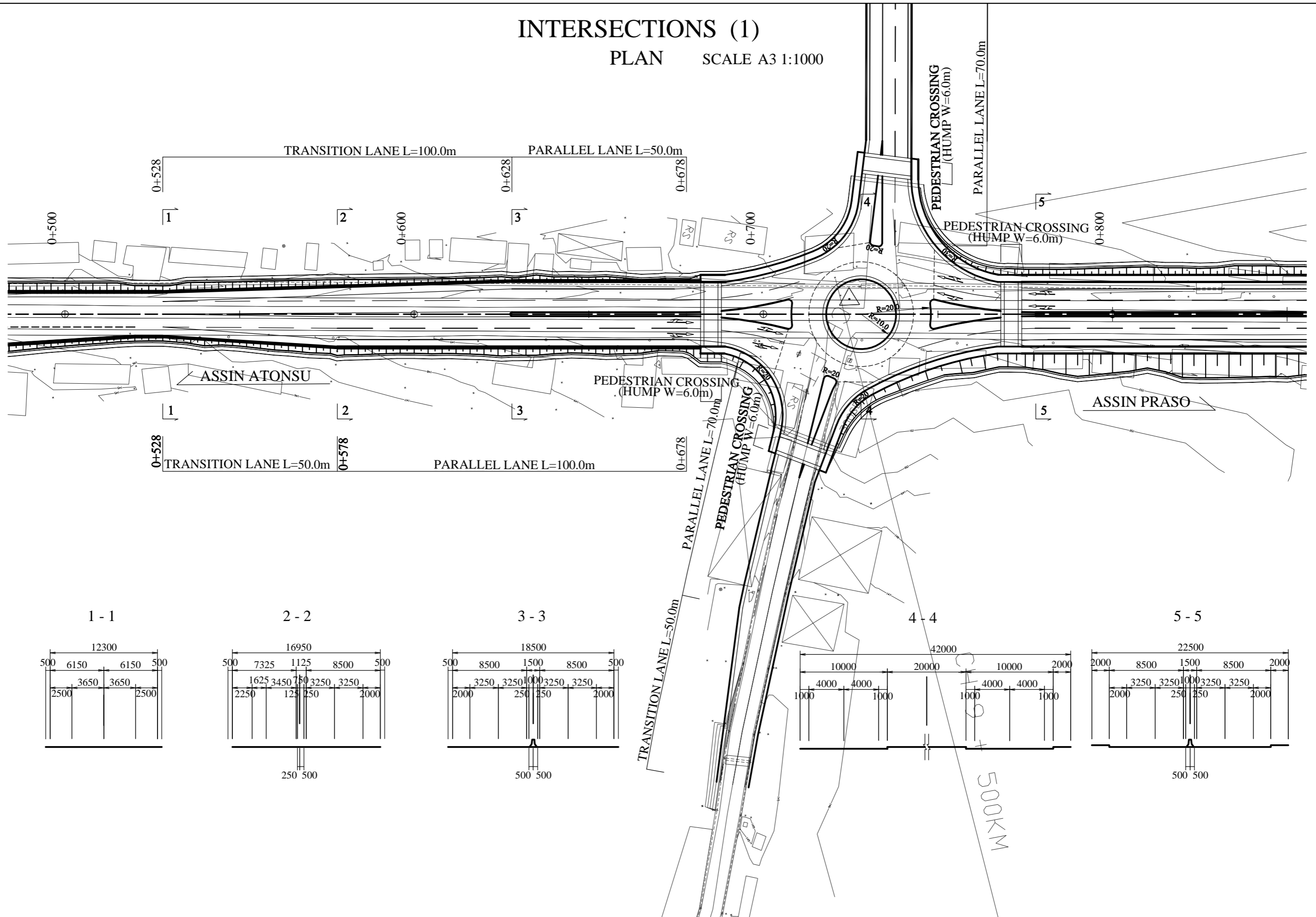
TYPICAL CROSS SECTION (6) SCALE A3 1:100

TOLL PLAZA



INTERSECTIONS (1)

PLAN SCALE A3 1:1000



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

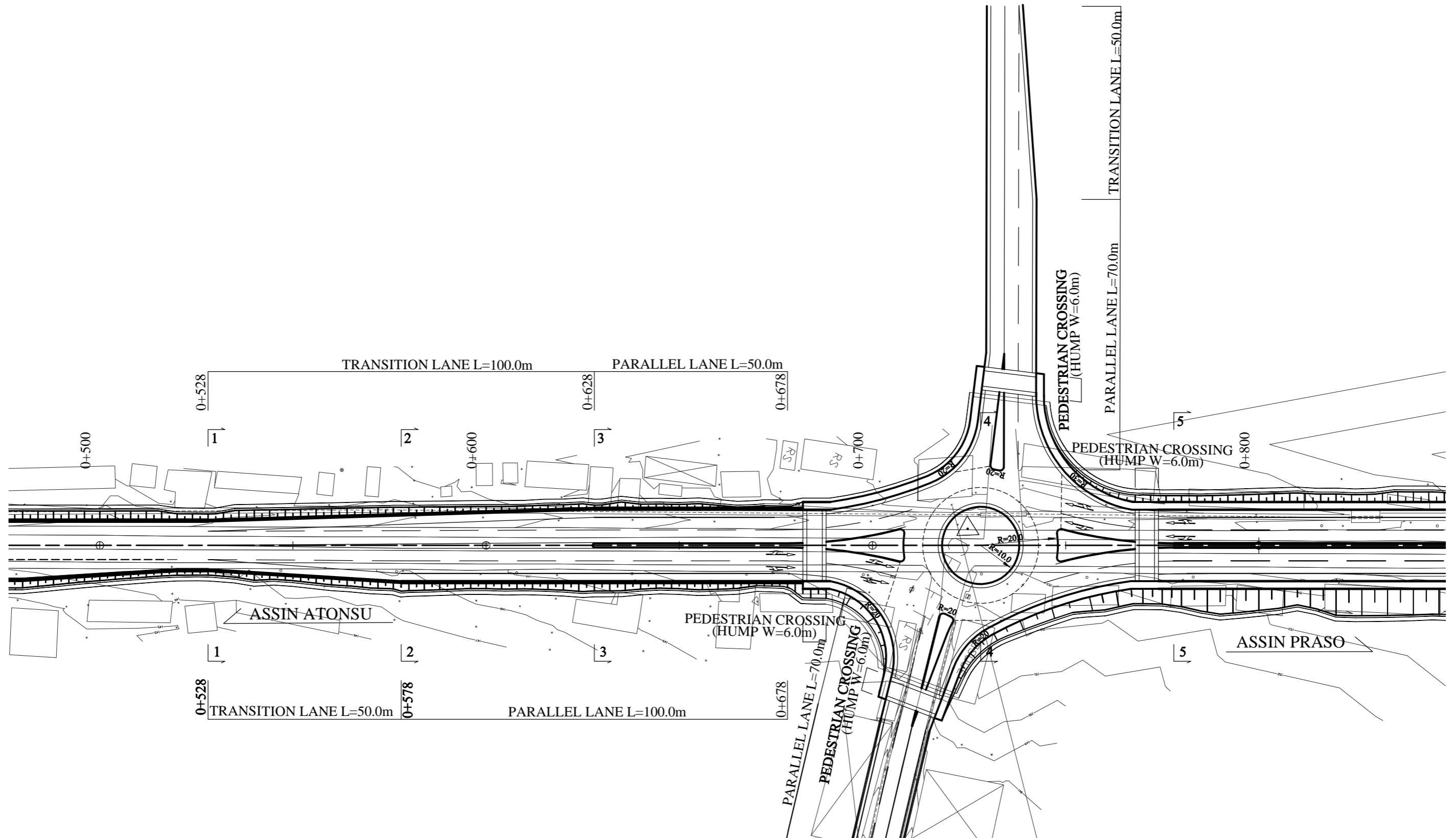
DRAWING TITLE:
INTERSECTIONS (1)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
29

INTERSECTIONS (2)

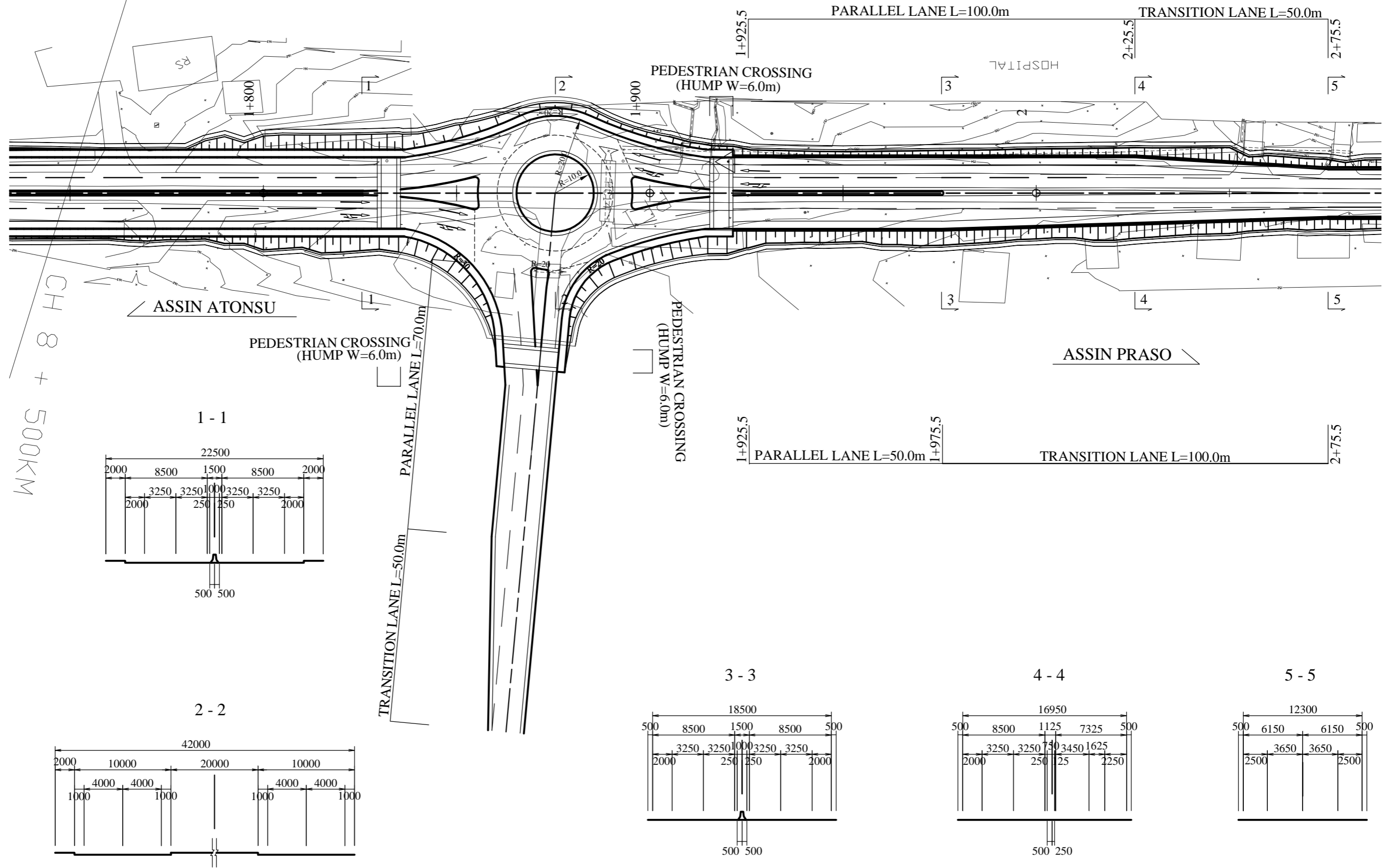
PLAN SCALE A3 1:1000



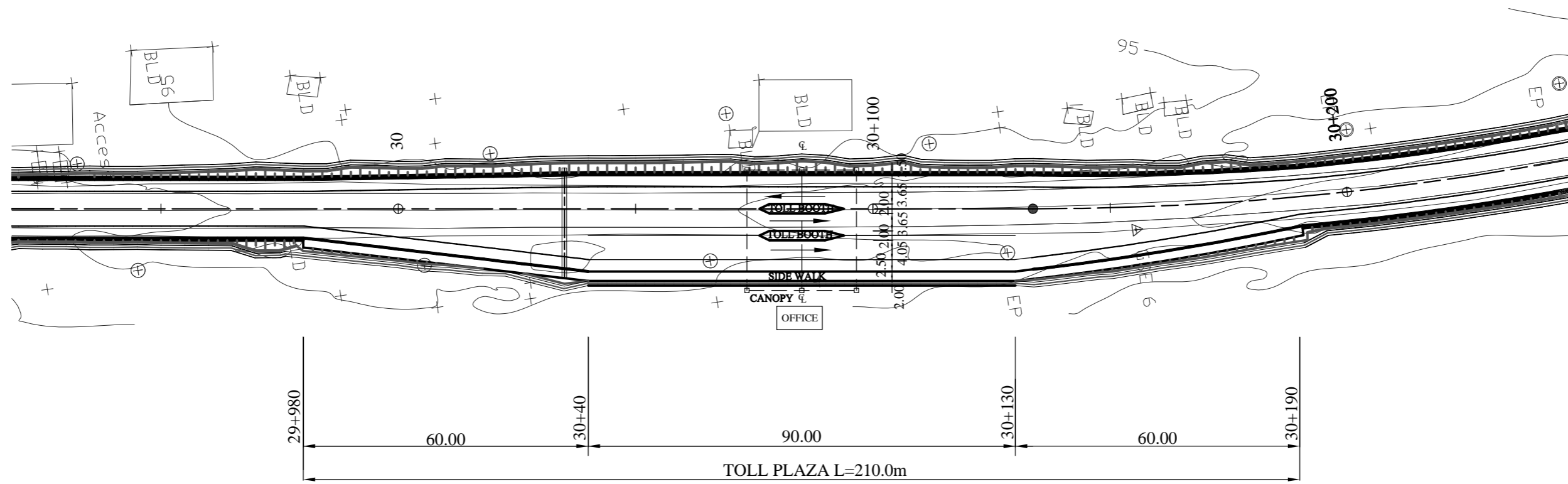
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 30
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	INTERSECTIONS (2)	PREPARED BY:	
				CHECKED BY:	

INTERSECTIONS (3)

PLAN SCALE A3 1:1000



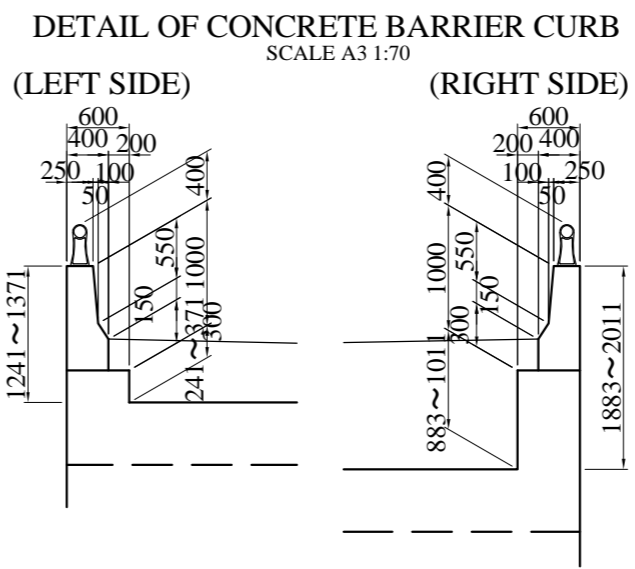
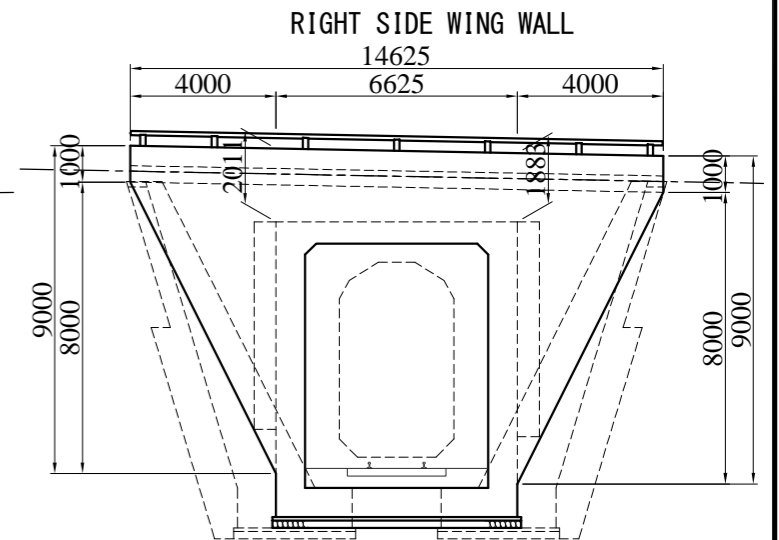
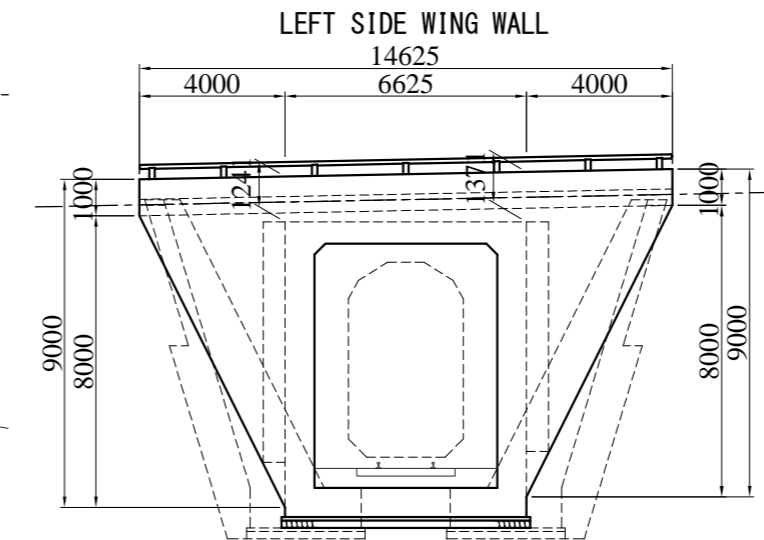
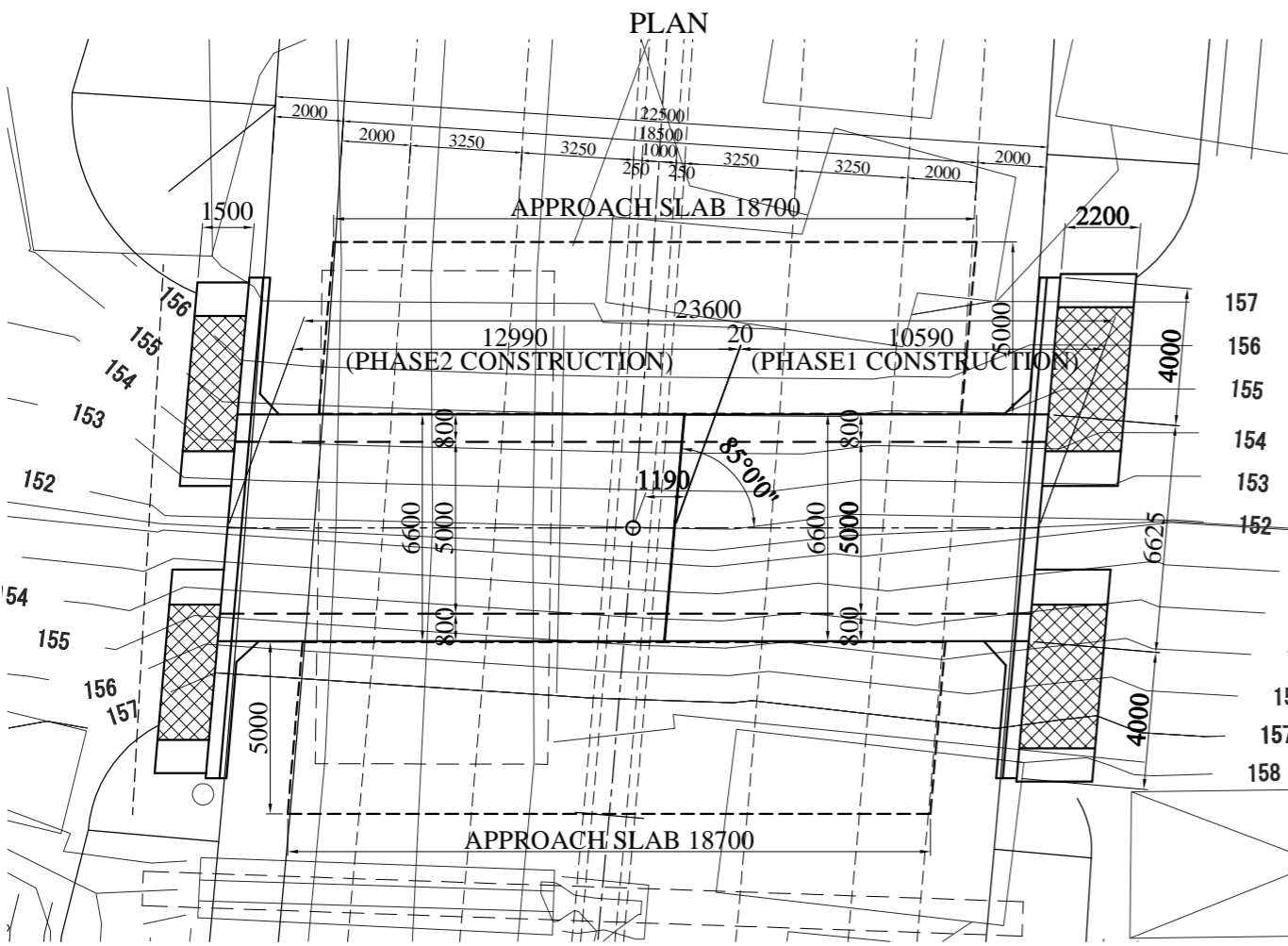
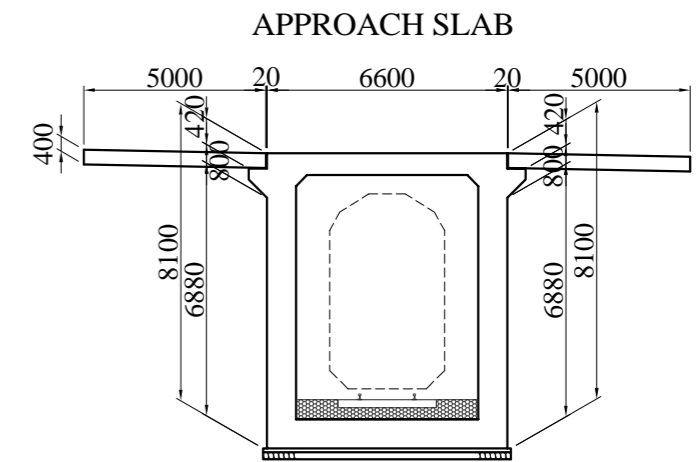
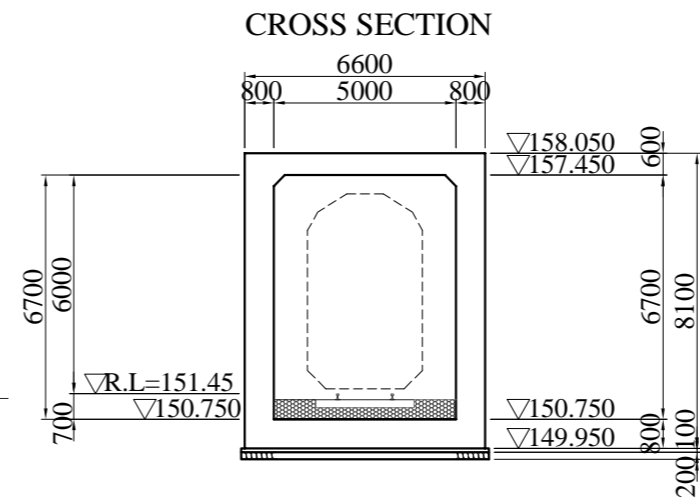
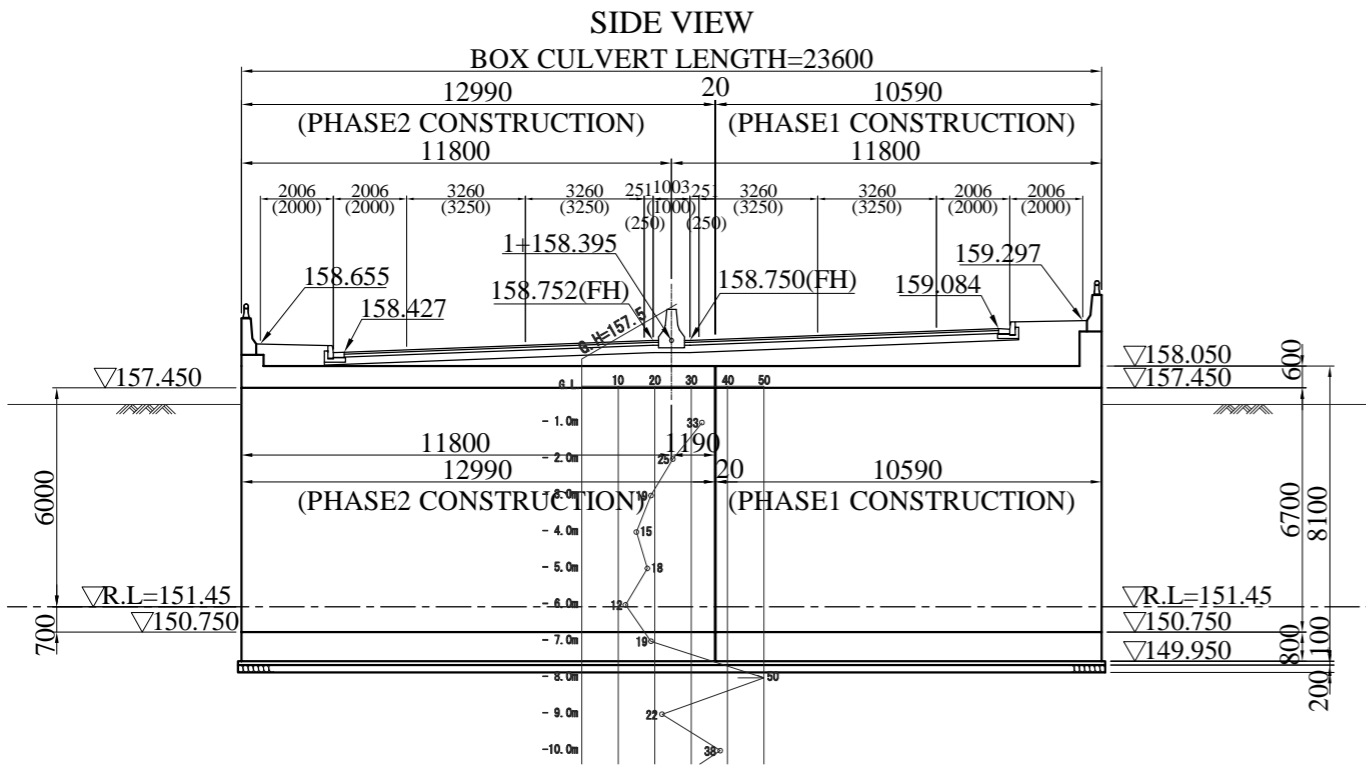
GENERAL ARRANGEMENT OF TOLL PLAZA SCALE A3 1:1000



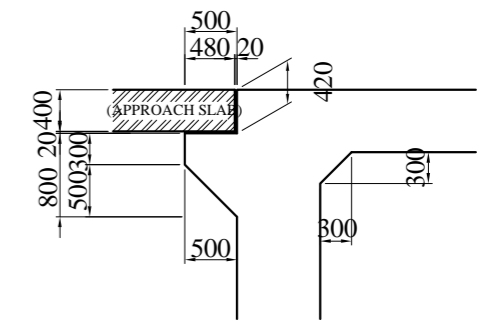
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 32
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	GENERAL ARRANGEMENT OF TOLL PLAZA	PREPARED BY:	
				CHECKED BY:	

GENERAL PLAN OF CULVERT FOR RAILWAY UNDERPASS

< BOX CULVERT No.11+58.395 > SCALE A3 1:200



DETAIL OF SUPPORT FOR APPROACH SLAB
SCALE A3 1:70

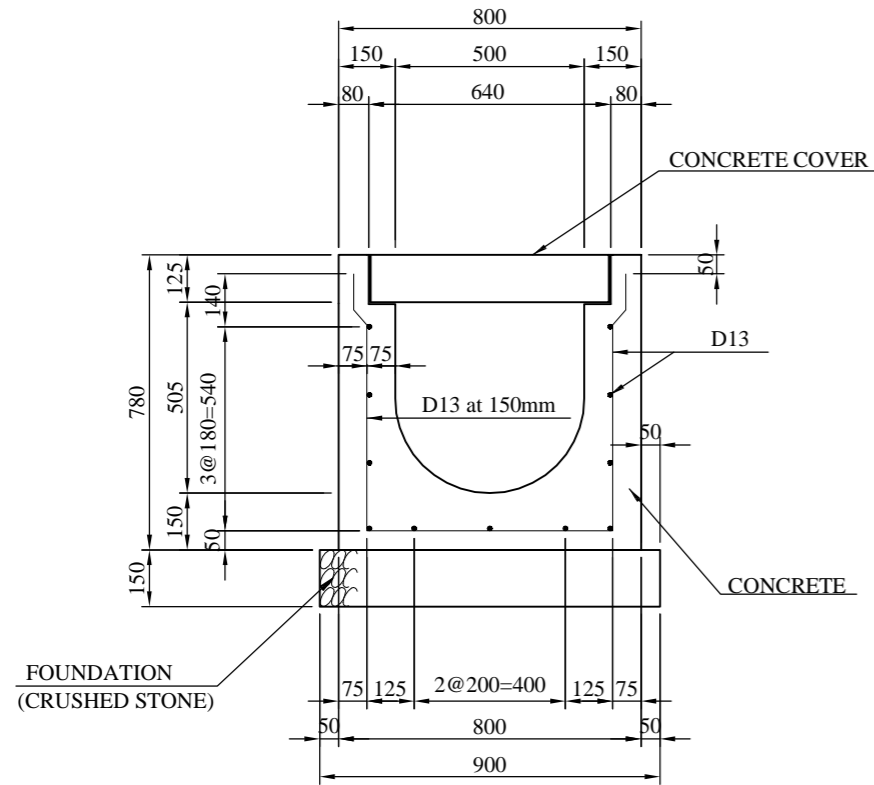


DESIGN CONDITION	
TYPE OF CULVERT	CAST-IN-PLACE BOX CULVERT
CULVERT LENGTH	23.600 m
SECTION SIZE	B=5000×H=6700
SKEW ANGLE	85°00'00"

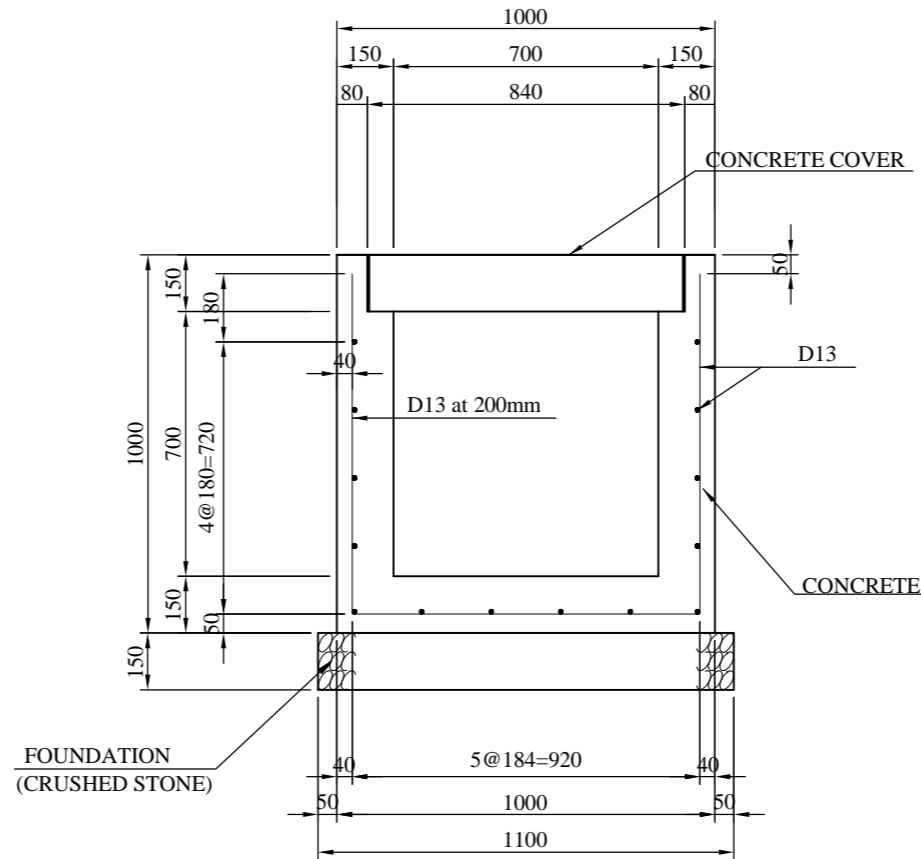
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 33
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	GENERAL VIEW (BOX CULVERT No.11+58.395)	PREPARED BY:	
				CHECKED BY:	

DRAINAGE STRUCTURE (1) SCALE A3 1:20

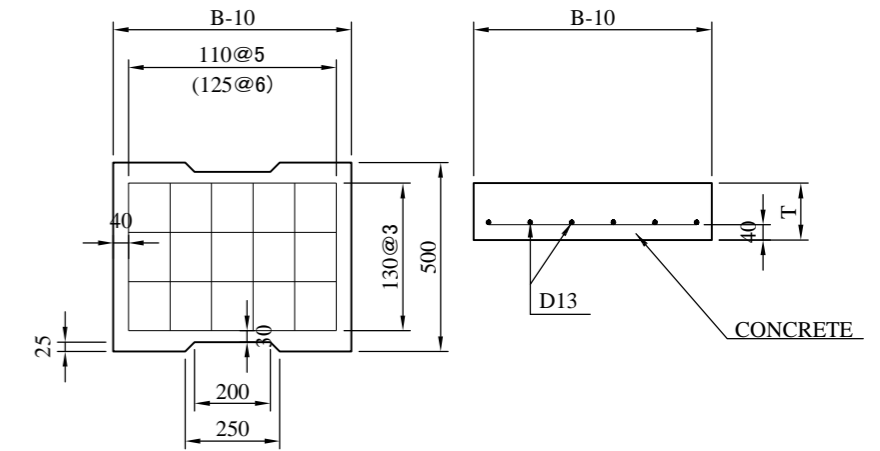
U-TYPE SIDE DITCH



SIDE DITCH



CONCRETE COVER



DIMENSION LIST

TYPE	B	T
500 x 500	640	125
700 x 700	840	150

MATERIAL LIST (U-TYPESIDE DITCH)

ITEM	STANDARD	UNIT	PER m	
			QUANTITY 500 x 500	REMARKS
CONCRETE		cu.m	0.32	
FORM		sq.m	3.89	
FOUNDATION	CRUSHED STONE	cu.m	0.14	
REINFORCING BAR	D13	kg	23.38	
CONCRETE COVER	500 x 500	nos	2.00	

MATERIAL LIST (SIDE DITCH)

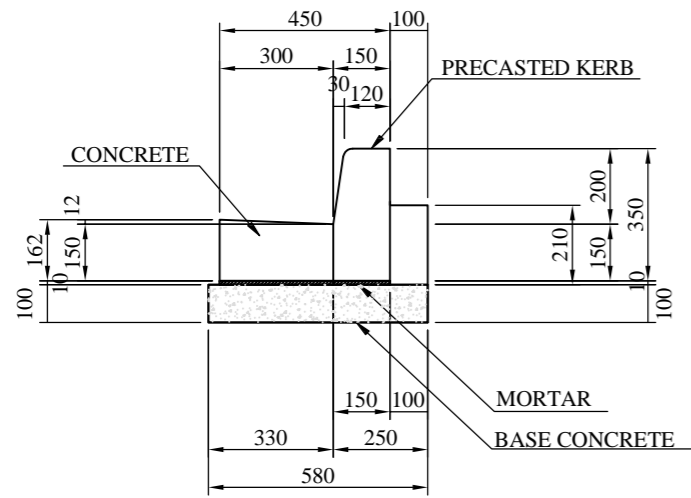
ITEM	STANDARD	UNIT	PER m	
			QUANTITY 700 x 700	REMARKS
CONCRETE		cu.m	0.38	
FORM		sq.m	3.70	
FOUNDATION	CRUSHED STONE	cu.m	0.17	
REINFORCING BAR	D13	kg	27.46	
CONCRETE COVER	700 x 700	nos	2.00	

MATERIAL LIST (CONCRETE COVER)

ITEM	STANDARD	UNIT	PER nos		
			QUANTITY 500 x 500	QUANTITY 700 x 700	REMARKS
CONCRETE		cu.m	0.03	0.05	
FORM		sq.m	0.28	0.40	
REINFORCING BAR	D13	kg	4.52	5.70	

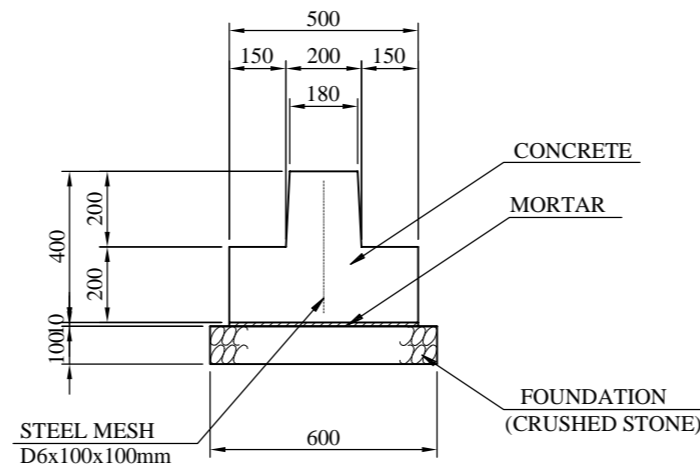
DRAINAGE STRUCTURE (2) SCALE A3 1:20

CONCRETE KERB

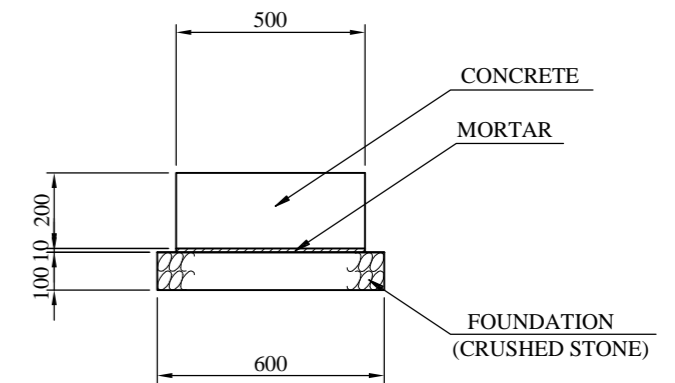


RAISED BARRIER KERB

for LAY BY



(FLAT TYPE)

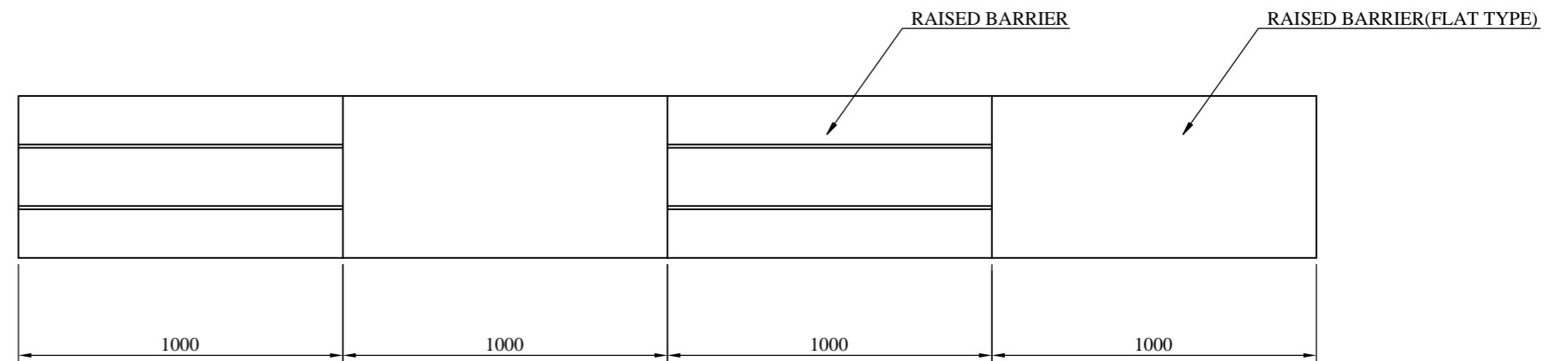


MATERIAL LIST (CONCRETE KERB)

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
CONCRETE		cu.m	0.07	
FORM		sq.m	0.37	
MORTAR		cu.m	0.005	
BASE CONCRETE		cu.m	0.06	
FORM	BASE CONCRETE	sq.m	0.20	

PER m

ARRANGEMENT PLAN



MATERIAL LIST (RAISED BARRIER KERB)

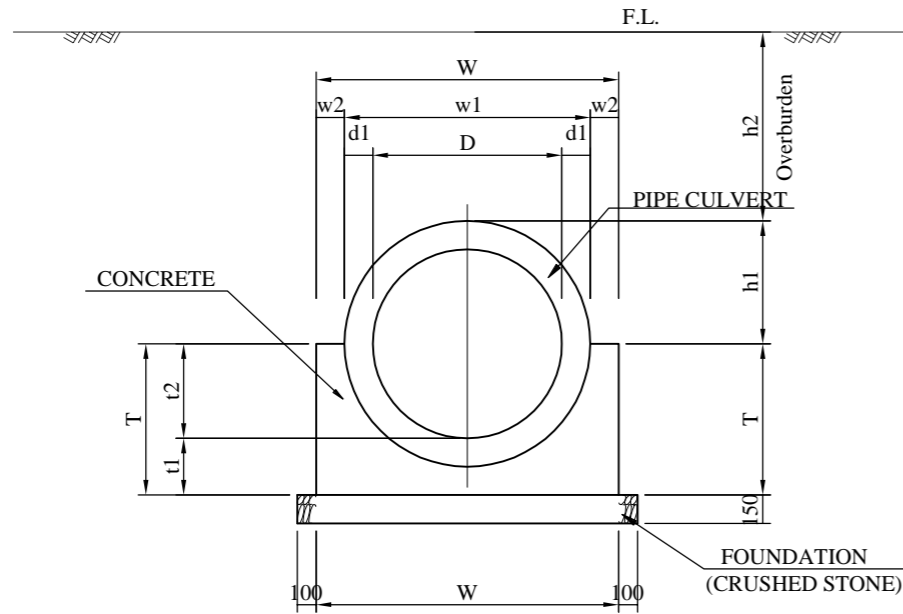
ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			STANDERD	FLAT TYPE	
CONCRETE		cu.m	0.14	0.10	
FORM		sq.m	1.38	0.60	
STEEL MESH	D6 x 100 x 100mm	kg	1.62		
MORTAR		cu.m	0.01	0.01	
FOUNDATION	CRUSHED STONE	cu.m	0.06	0.06	

PER m

DRAINAGE STRUCTURE (3) SCALE A3 1:40

PIPE CULVERT

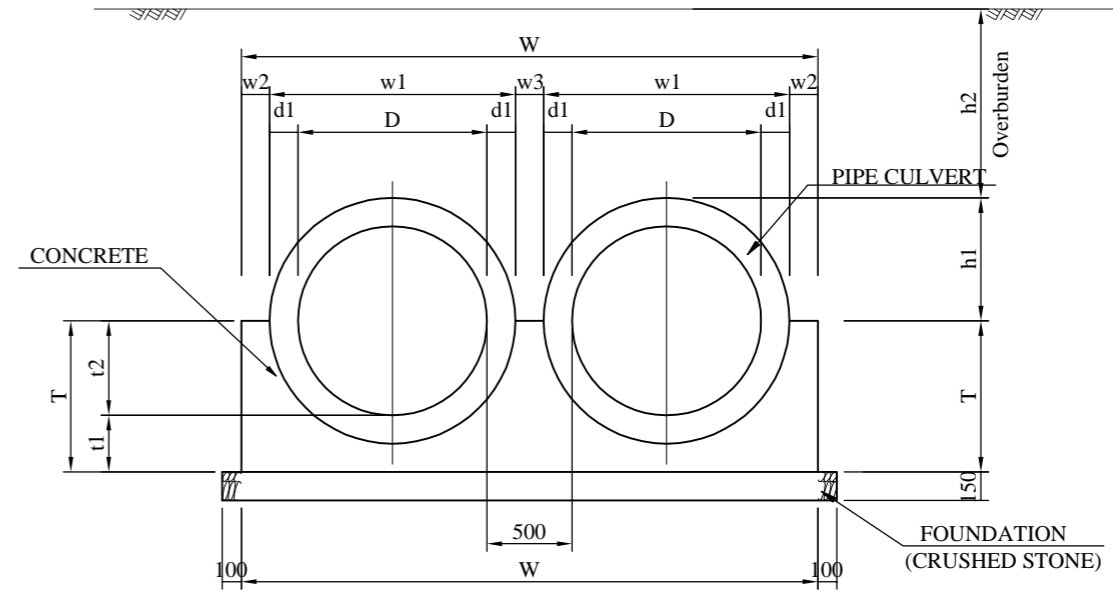
SINGLE CELL TYPE



DIMENSION LIST

D	d1	W	w1	w2	T	t1	t2	h1
900	100	1400	1100	150	700	250	450	550
1000	120	1540	1240	150	770	270	500	620
1200	140	1780	1480	150	890	290	600	740
1500	170	2140	1840	150	1070	320	750	920

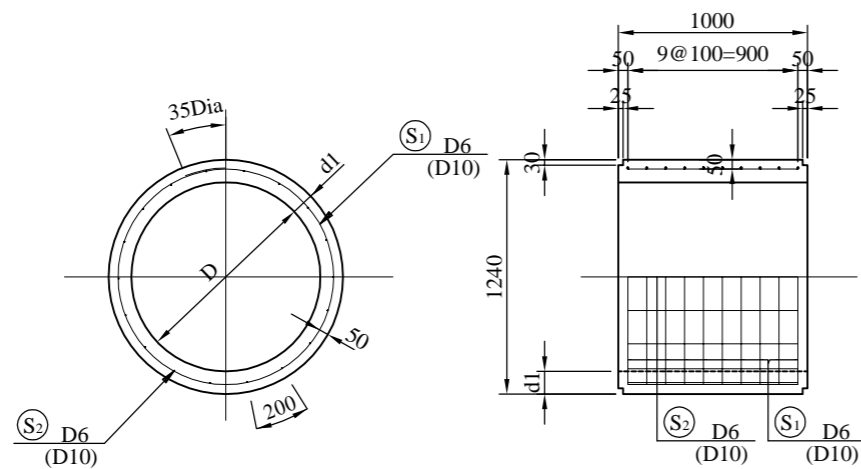
MULTI CELL TYPE



DIMENSION LIST

D	d1	W	w1	w2	w3	T	t1	t2	h1
1000	120	3040	1240	150	260	770	270	500	620
1200	140	3480	1480	150	220	890	290	600	740

REINFORCED CONCRETE PIPE



Note: () = For more than 1200mm pipe

MATERIAL LIST (SINGLE CELL TYPE)

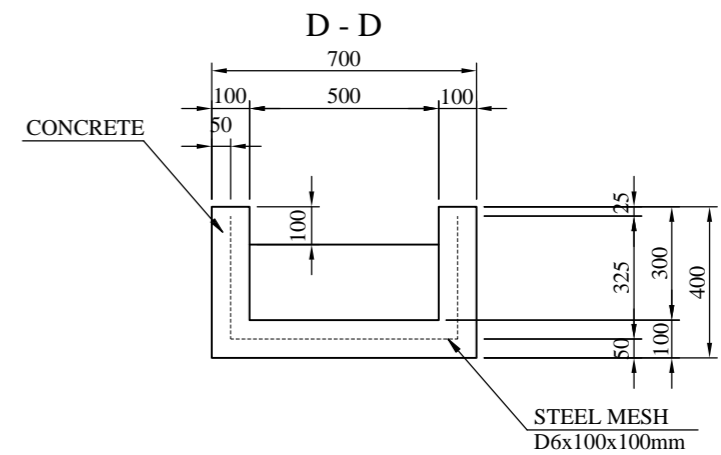
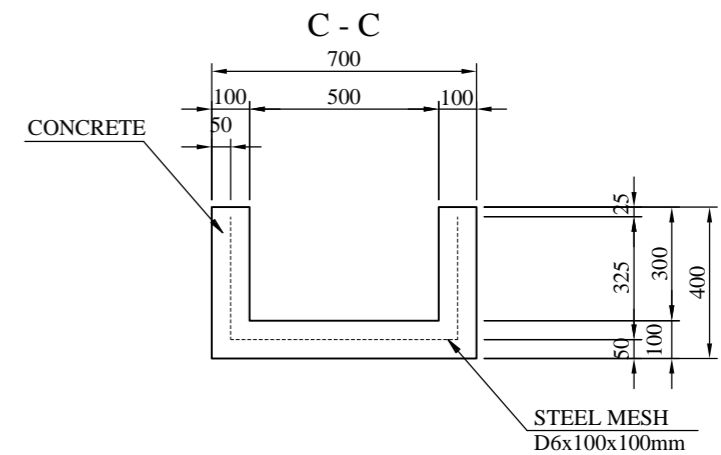
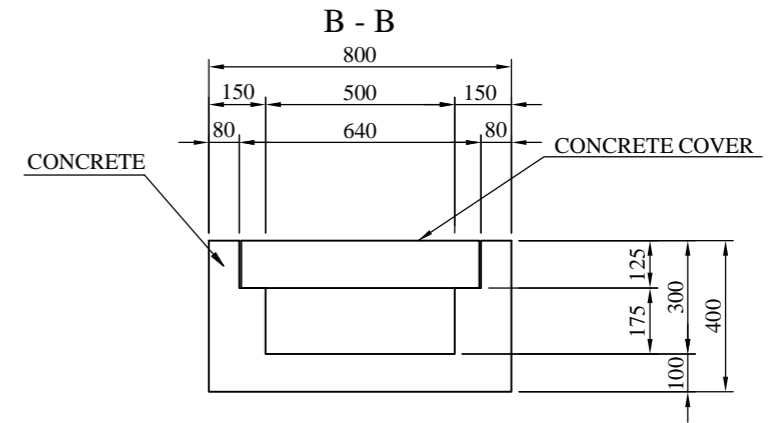
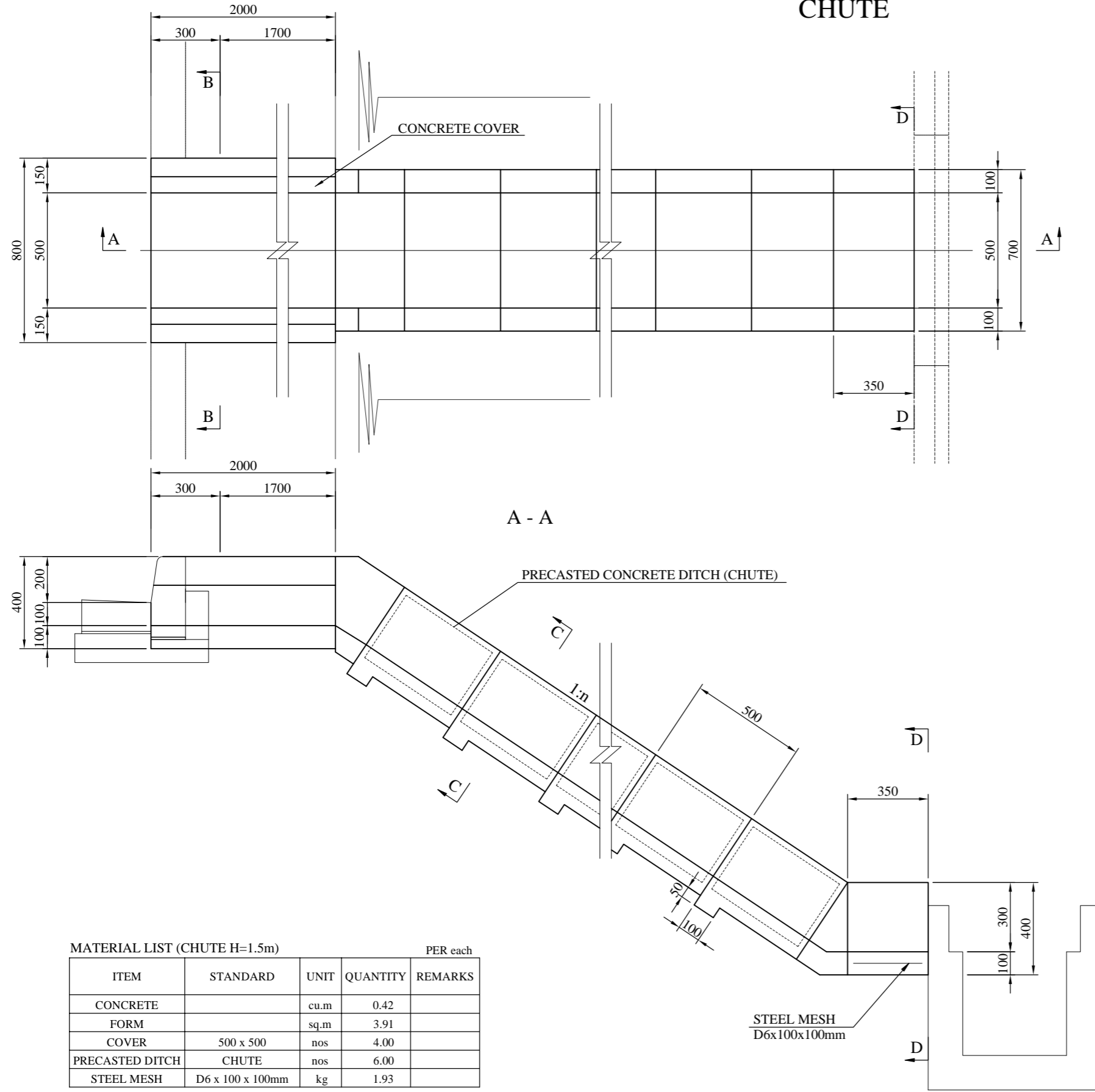
ITEM	STANDARD	UNIT	QUANTITY				REMARKS
			D900	D1000	D1200	D1500	
CONCRETE		cu.m	0.51	0.58	0.72	0.96	
FORM		sq.m	1.40	1.54	1.78	2.14	
FOUNDATION	CRUSHED STONE	cu.m	0.24	0.26	0.30	0.35	
PIPE CULVERT	φ900	nos.	1.00	—	—	—	
	φ1000	nos.	—	1.00	—	—	
	φ1200	nos.	—	—	1.00	—	
	φ1500	nos.	—	—	—	1.00	

MATERIAL LIST (MULTI CELL TYPE)

ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			D1000	D1200	
CONCRETE		cu.m	1.13	1.38	
FORM		sq.m	1.54	1.78	
FOUNDATION	CRUSHED STONE	cu.m	0.49	0.55	
PIPE CULVERT	φ1000	nos.	2.00	—	
	φ1200	nos.	—	2.00	

DRAINAGE STRUCTURE (4) CHUTE

SCALE A3 1:20

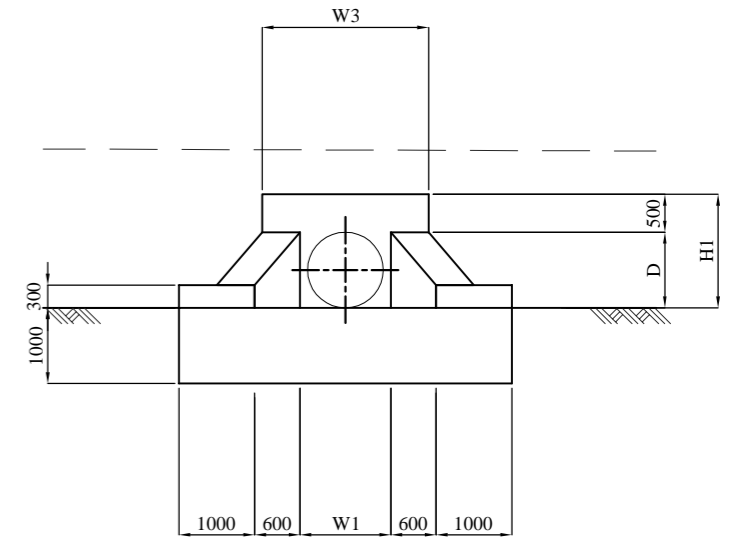
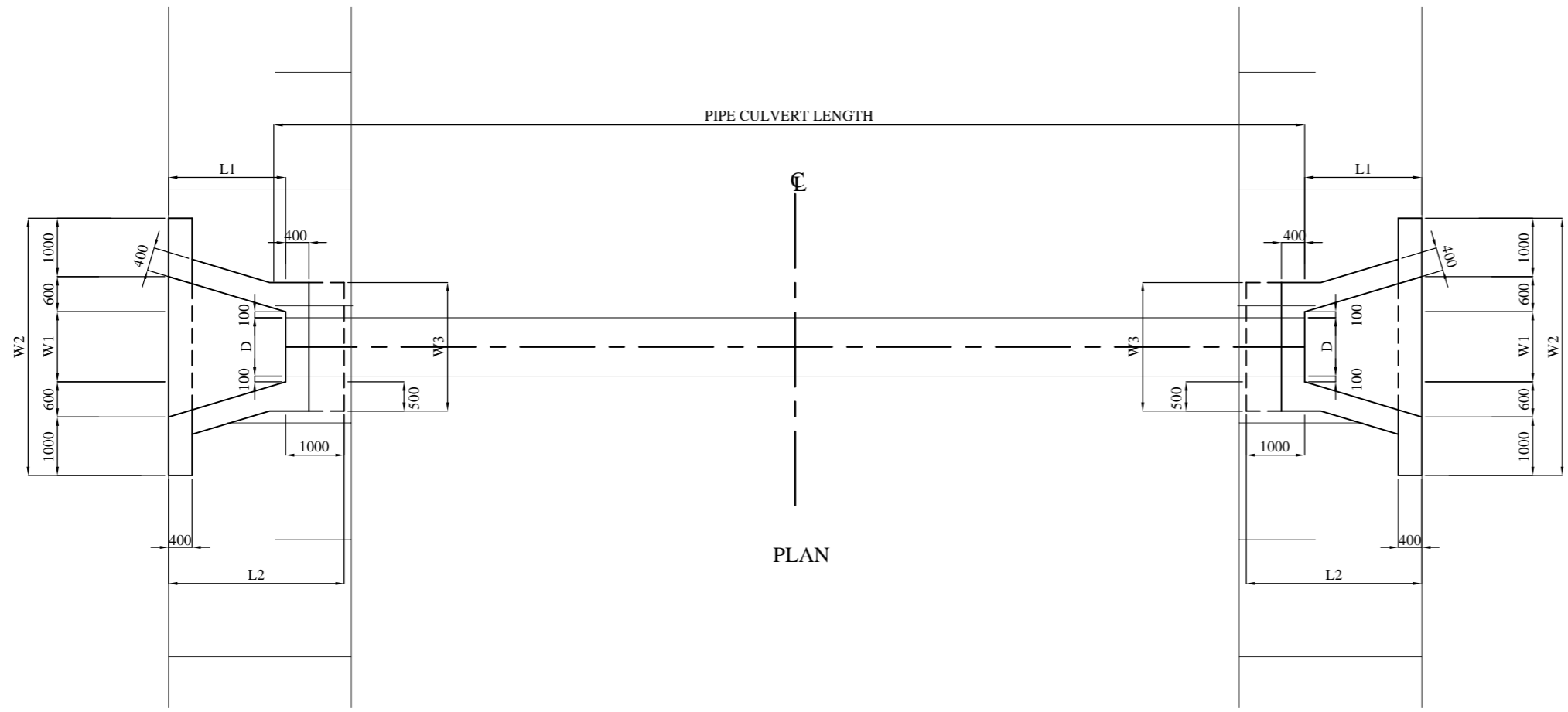


MATERIAL LIST (CHUTE H=1.5m)

ITEM	STANDARD	UNIT	QUANTITY	REMARKS	PER each
CONCRETE		cu.m	0.42		
FORM		sq.m	3.91		
COVER	500 x 500	nos	4.00		
PRECASTED DITCH	CHUTE	nos	6.00		
STEEL MESH	D6 x 100 x 100mm	kg	1.93		

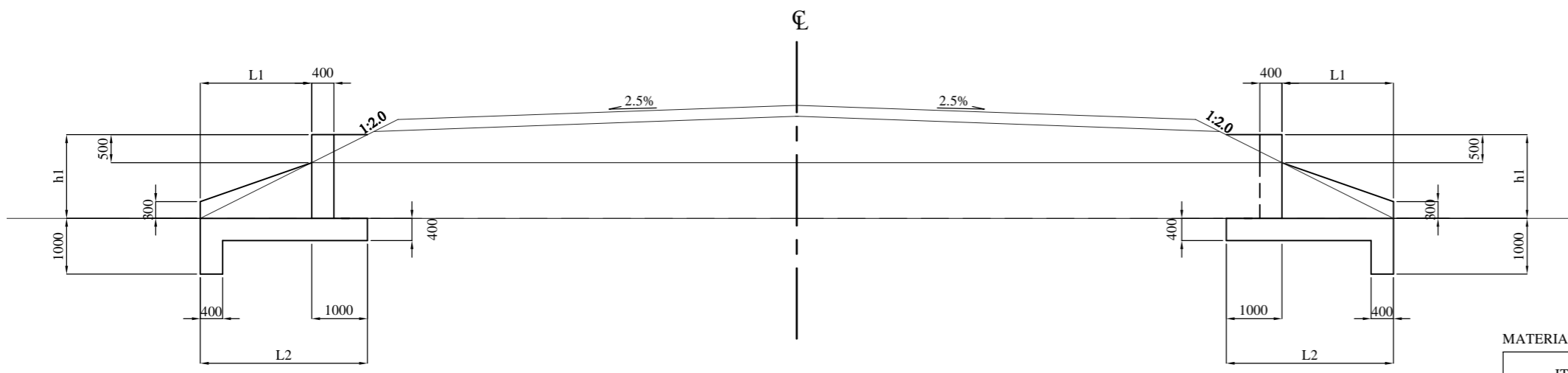
DRAINAGE STRUCTURE (5) SCALE A3 1:100

INLET OUTLET (SINGLE CELL TYPE)



DIMENSION LIST

D	L1	L2	W1	W2	W3	H1
900	1800	2800	1100	4300	2100	1400
1000	2000	3000	1200	4400	2200	1500
1200	2400	3400	1400	4600	2400	1700
1500	3000	4000	1700	4900	2700	2000



INLET

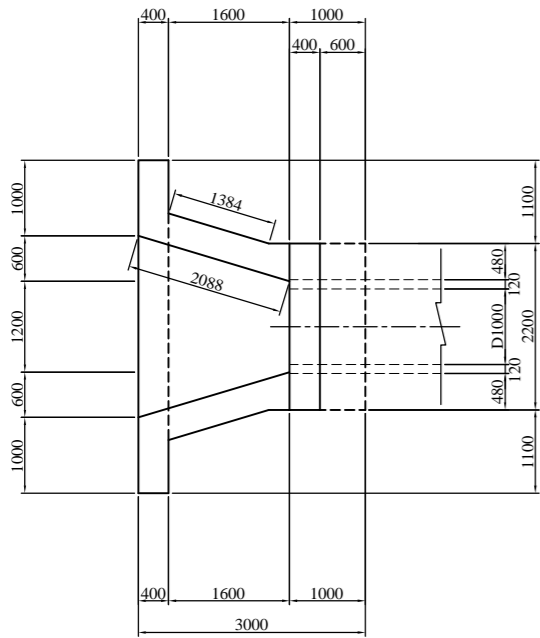
OUTLET

MATERIAL LIST (INLET OUTLET)

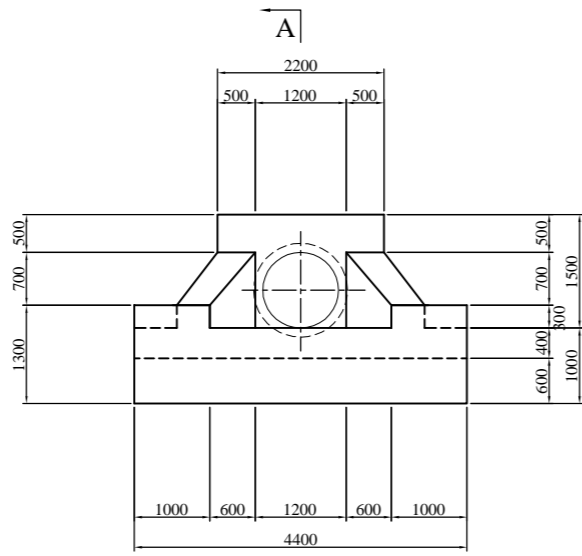
ITEM	STANDARD	UNIT	QUANTITY				REMARKS
			D900	D1000	D1200	D1500	
CONCRETE		cu.m	5.76	6.33	7.56	9.66	
FORM		sq.m	18.51	19.88	22.97	28.16	
REINFORCING BAR	D13	kg	177.24	194.70	232.58	297.05	

DRAINAGE STRUCTURE (6) SCALE A3 1:100

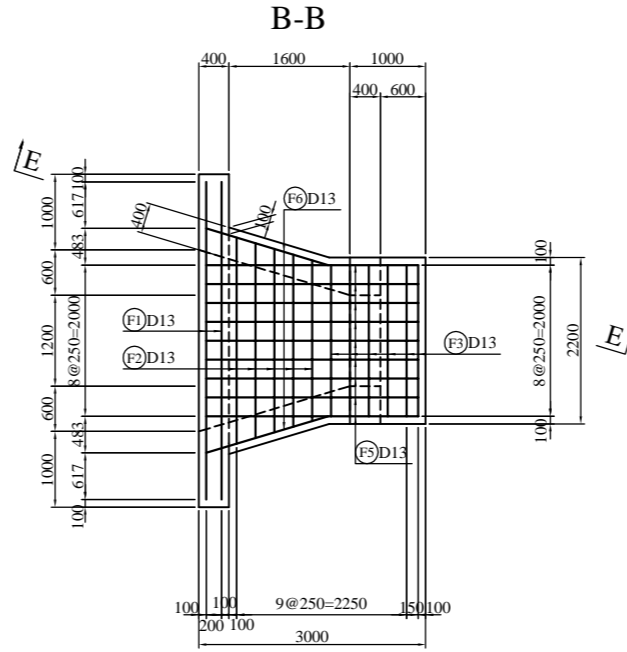
DETAIL OF INLET OUTLET (SINGLE CELL TYPE)



Plan



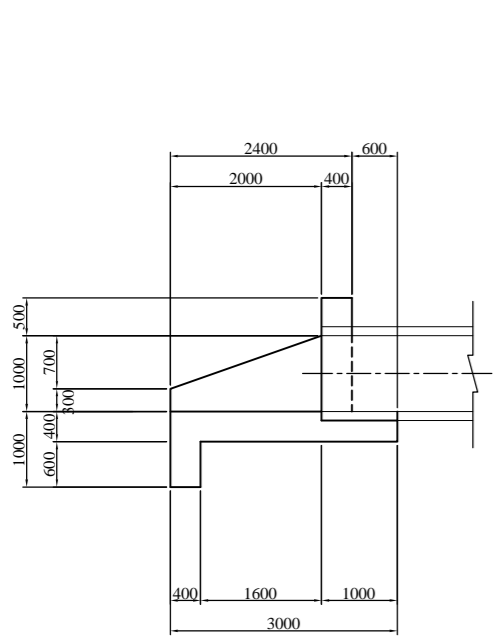
Elevation



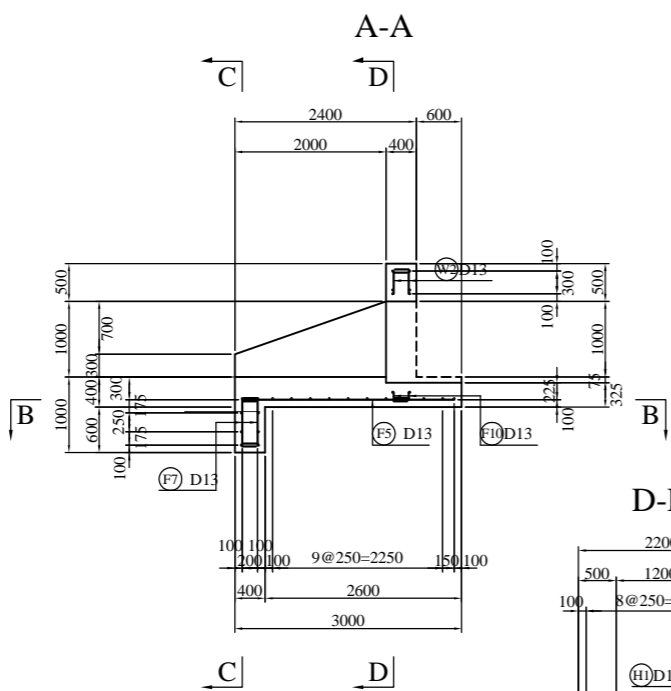
B-B

List of Bars

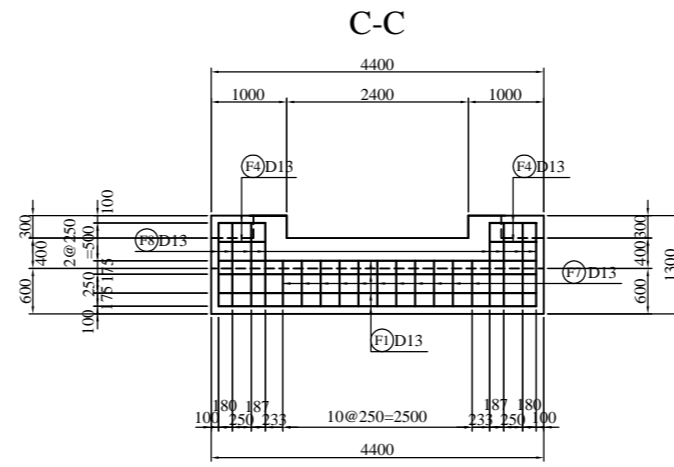
Items	Dia	Length (mm)	Unit	kg/m	Kg/Unit	Mass (kg)	Remarks
F1	D13	4200	8	0.995	4.179	12.2	—
F2	D13	2430	5	0.995	2.418	12.1	(AVE.L)
F3	D13	2000	6	0.995	1.990	11.9	—
F4	D13	620	8	0.995	0.617	4.9	—
F5	D13	2800	9	0.995	2.786	25.1	—
F6	D13	1690	2	0.995	1.682	3.4	—
F7	D13	960	22	0.995	0.955	21.0	C
F8	D13	1460	16	0.995	1.453	23.2	C
F9	D13	2060	8	0.995	2.050	16.4	C
F10	D13	360	10	0.995	0.358	3.6	L (AVE.L)
F11	D13	1040	16	0.995	1.035	16.6	L (AVE.L)
F12	D13	2300	4	0.995	2.289	9.2	—
W1	D13	450	24	0.995	0.448	10.7	(AVE.L)
W2	D13	460	10	0.995	0.458	4.6	Γ (AVE.L)
W3	D13	1270	4	0.995	1.264	5.1	(AVE.L)
W4	D13	2430	2	0.995	2.418	4.8	—
H1	D13	4950	2	0.995	4.925	9.9	O
						D13	194.7 kg
						Total	194.7 kg



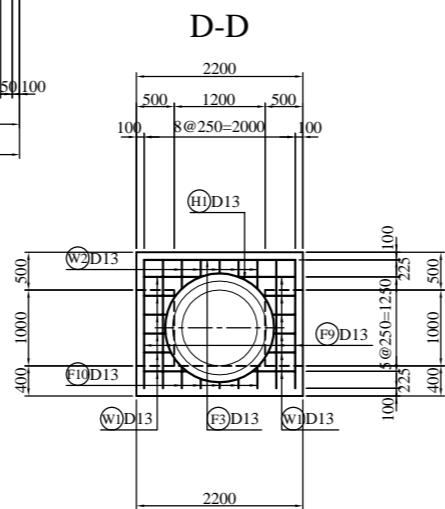
Profile



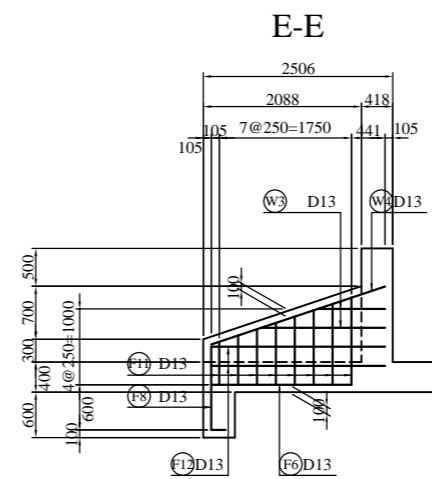
A-A



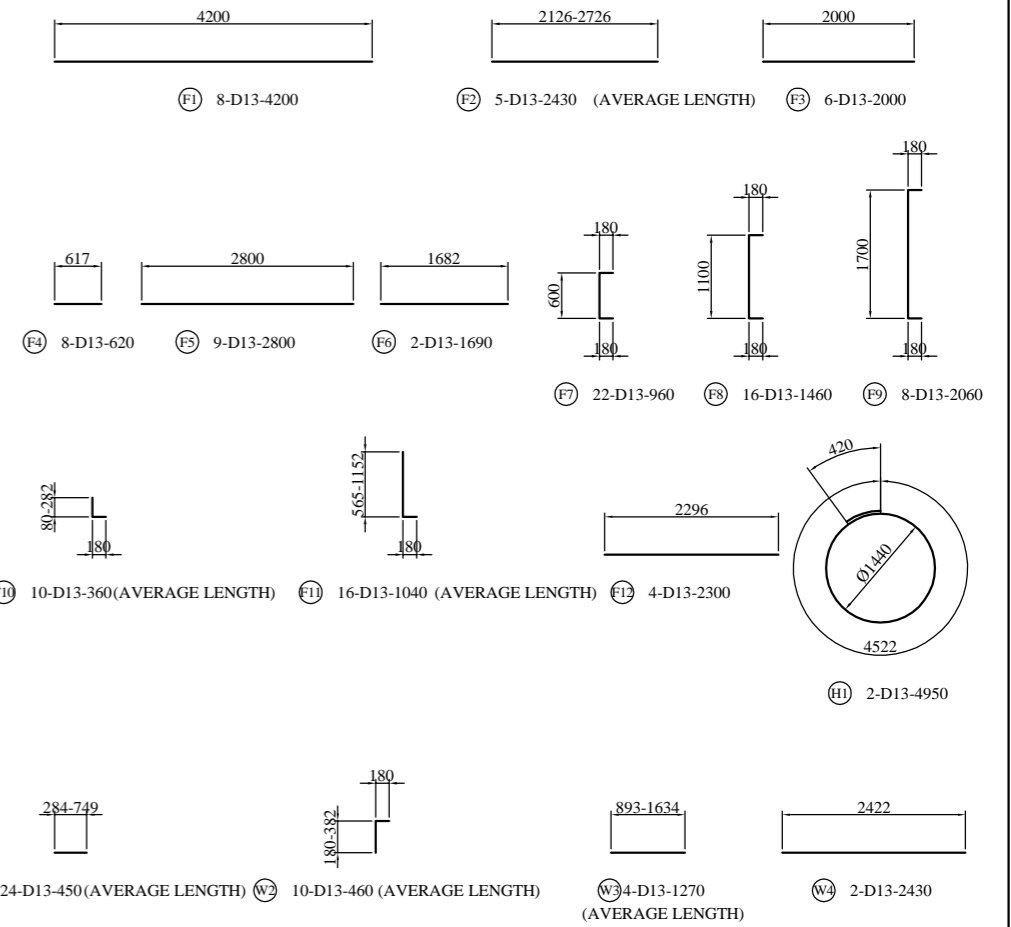
C-C



D-D



E-E

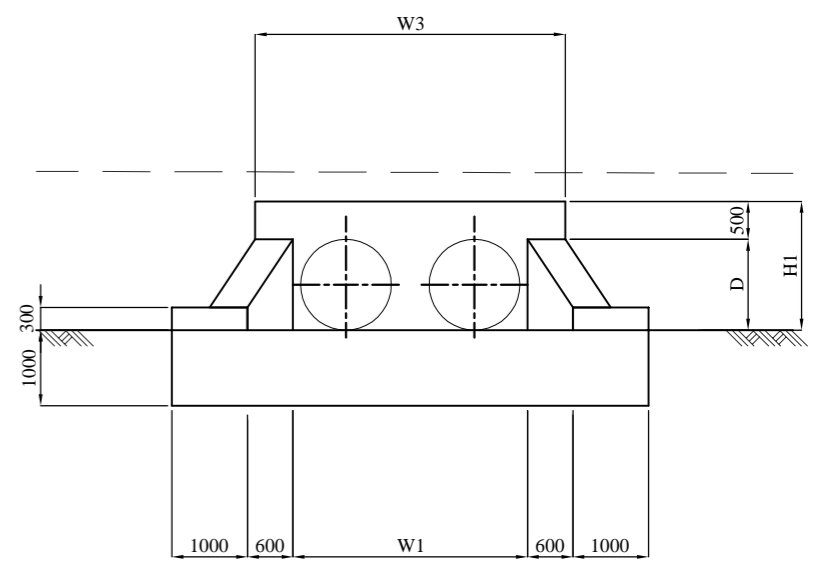
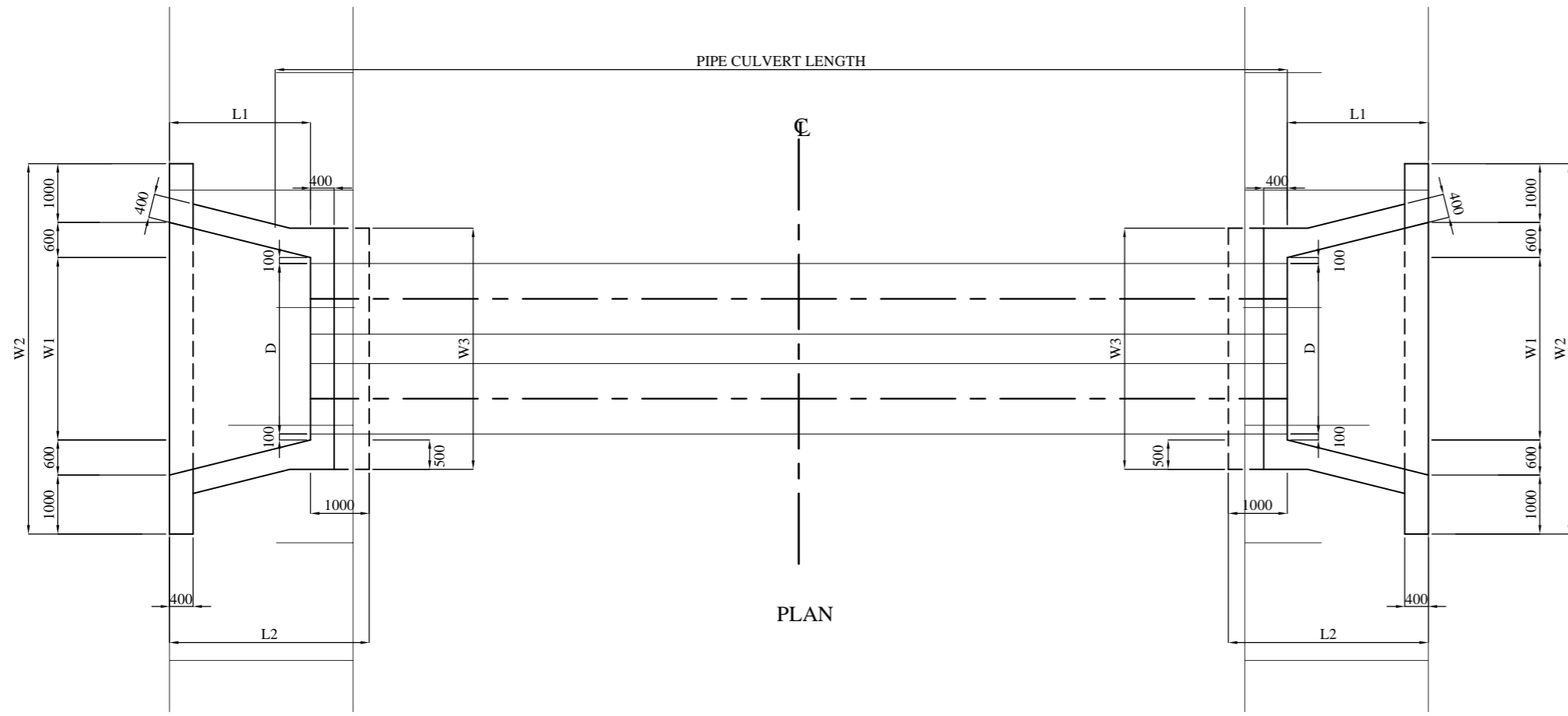


Bar arrangement (Inlet Outlet)

GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 39
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	DRAINAGE STRUCTURE (6)	PREPARED BY: CHECKED BY:	

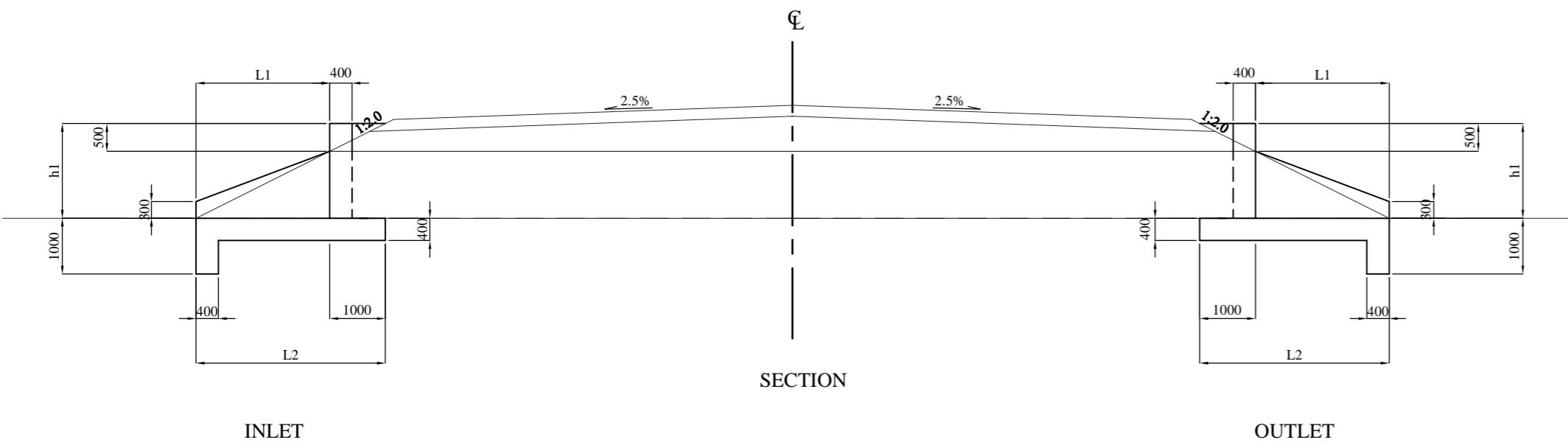
DRAINAGE STRUCTURE (7) SCALE A3 1:100

INLET OUTLET (MULTI CELL TYPE)



DIMENSION LIST

D	L1	L2	W1	W2	W3	H1
1000@2	2000	3000	2700	5900	3700	1500
1200@2	2400	3400	3100	6300	4100	1700



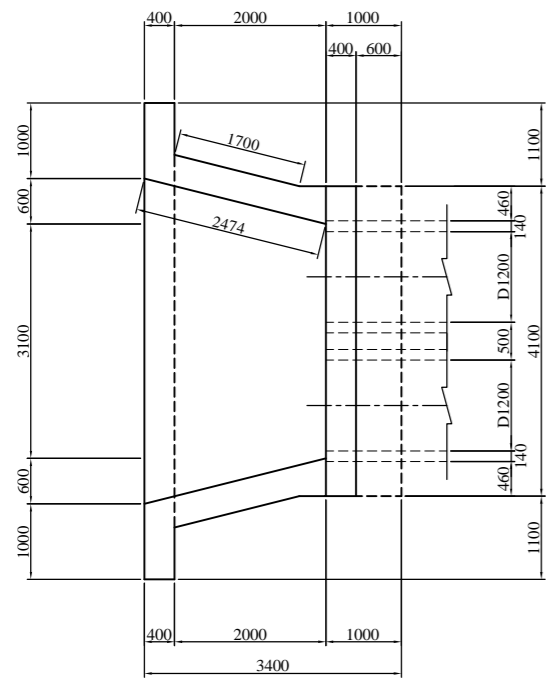
MATERIAL LIST (INLET OUTLET)

ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			D1000@2	D1200@2	
CONCRETE		cu.m	8.90	10.75	
FORM		sq.m	24.96	28.71	
REINFORCING BAR	D13	kg	277.0	334.0	

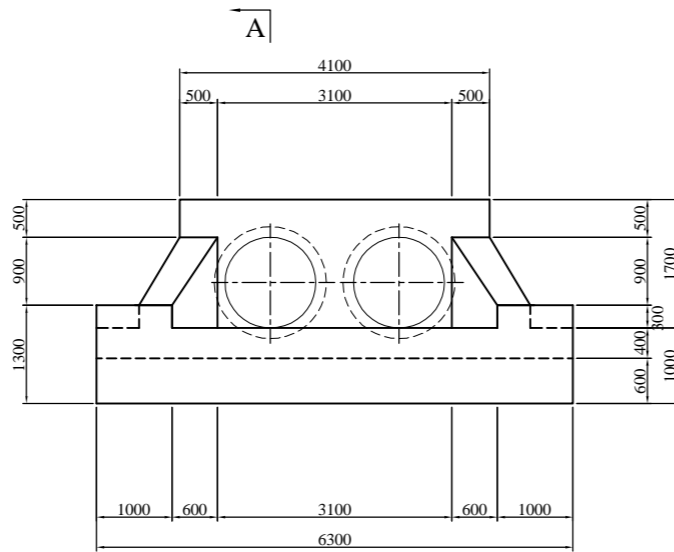
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 40
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	DRAINAGE STRUCTURE (7)	PREPARED BY:	
				CHECKED BY:	

DRAINAGE STRUCTURE (8) SCALE A3 1:100

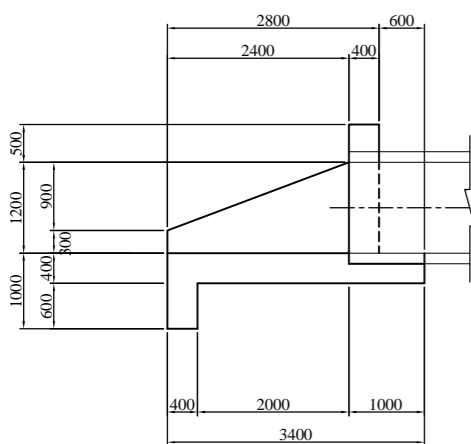
DETAIL OF INLET OUTLET (MULTI CELL TYPE)



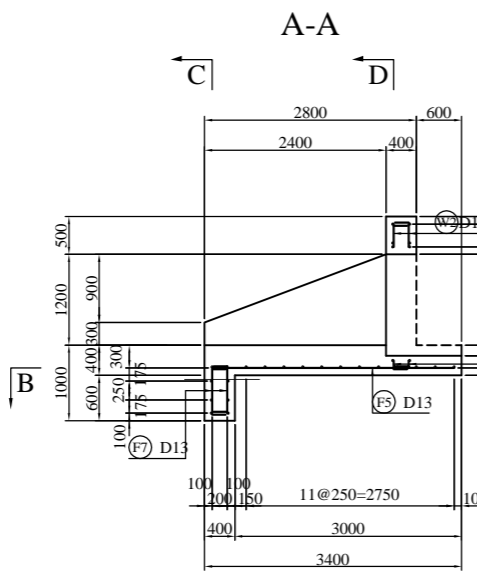
Plan



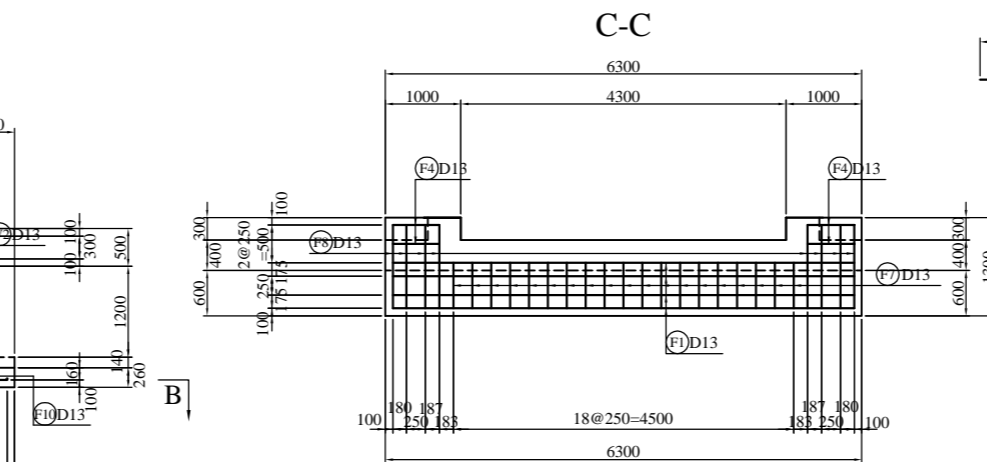
Elevation



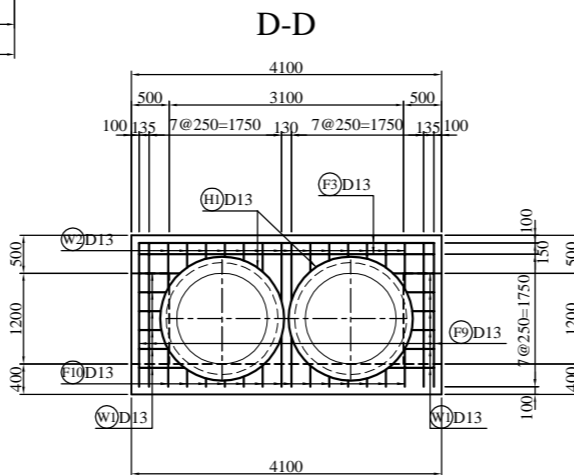
Profile



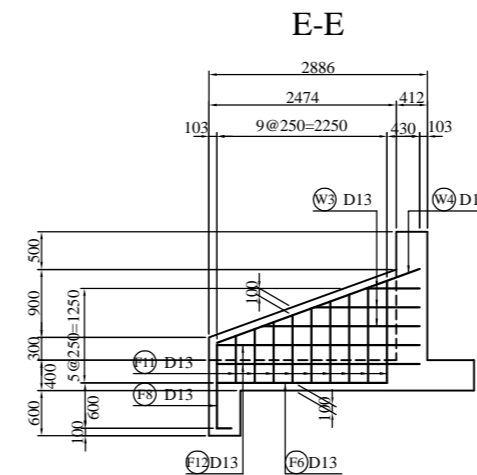
B-B



C-C



D-D

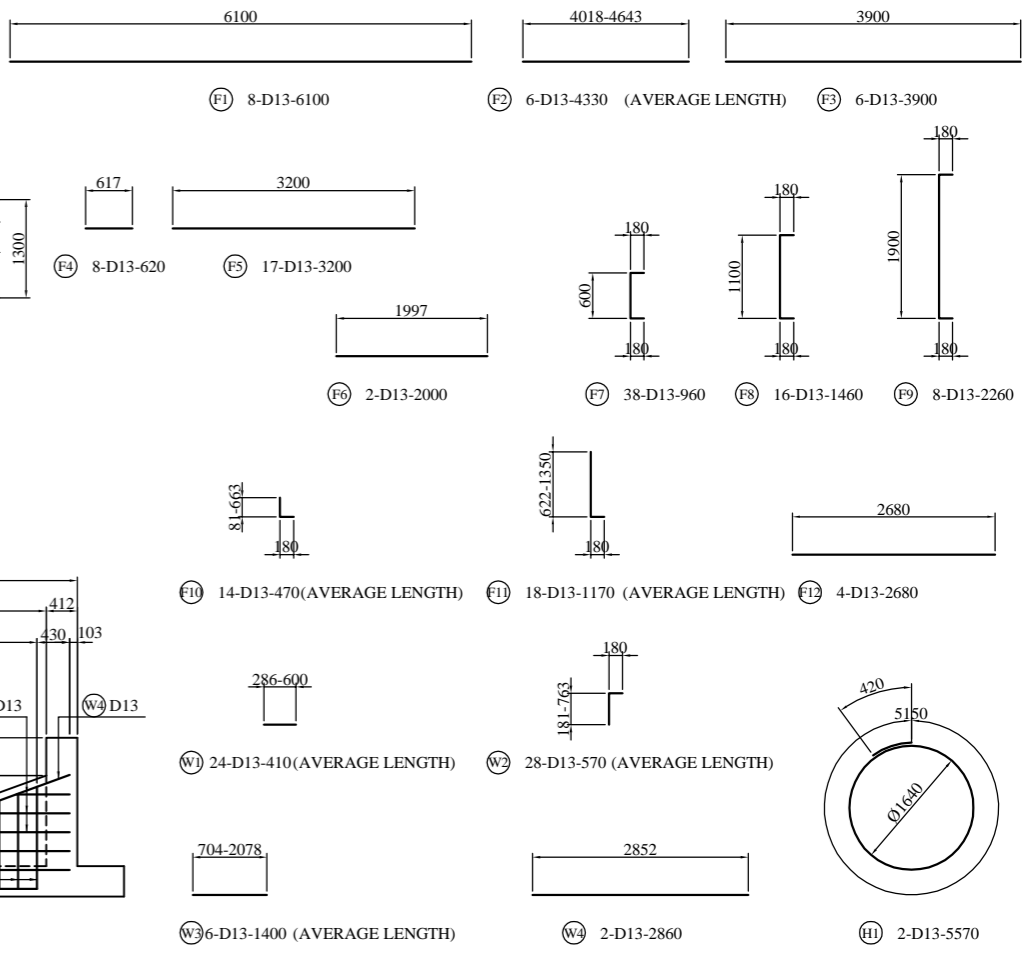


E-E

Bar arrangement (Inlet Outlet)

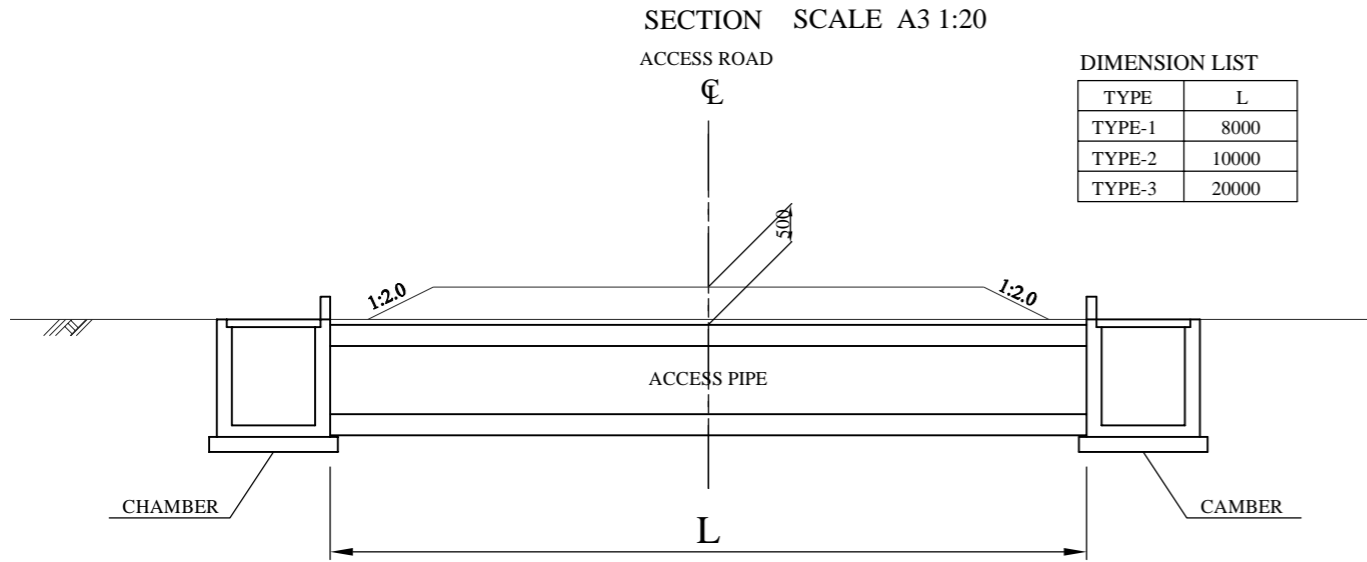
List of Bars

Items	Dia	Length (mm)	Unit	kg/m	Kg/Unit	Mass (kg)	Remarks
F1	D13	6100	8	0.995	6.070	48.6	—
F2	D13	4330	6	0.995	4.308	25.9	— (AVE.L)
F3	D13	3900	6	0.995	3.881	23.3	—
F4	D13	620	8	0.995	0.617	4.9	—
F5	D13	3200	17	0.995	3.184	54.1	—
F6	D13	2000	2	0.995	1.990	4.0	—
F7	D13	960	38	0.995	0.955	36.3	Γ
F8	D13	1460	16	0.995	1.453	23.2	Γ
F9	D13	2260	8	0.995	2.249	18.0	Γ
F10	D13	470	28	0.995	0.468	13.1	L (AVE.L)
F11	D13	1170	18	0.995	1.164	21.0	L (AVE.L)
F12	D13	2680	4	0.995	2.667	10.7	—
W1	D13	410	24	0.995	0.408	9.8	— (AVE.L)
W2	D13	570	28	0.995	0.567	15.9	Γ (AVE.L)
W3	D13	1400	6	0.995	1.393	8.4	— (AVE.L)
W4	D13	2860	2	0.995	2.846	5.7	—
H1	D13	5570	2	0.995	5.542	11.1	○
						D13	334.0 kg
						Total	334.0 kg



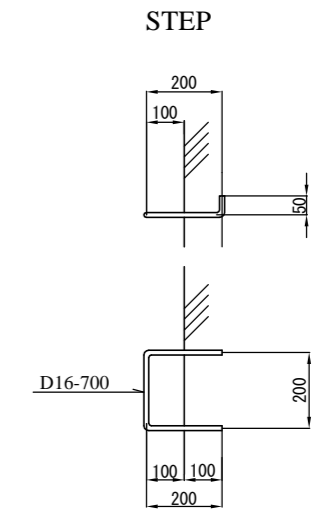
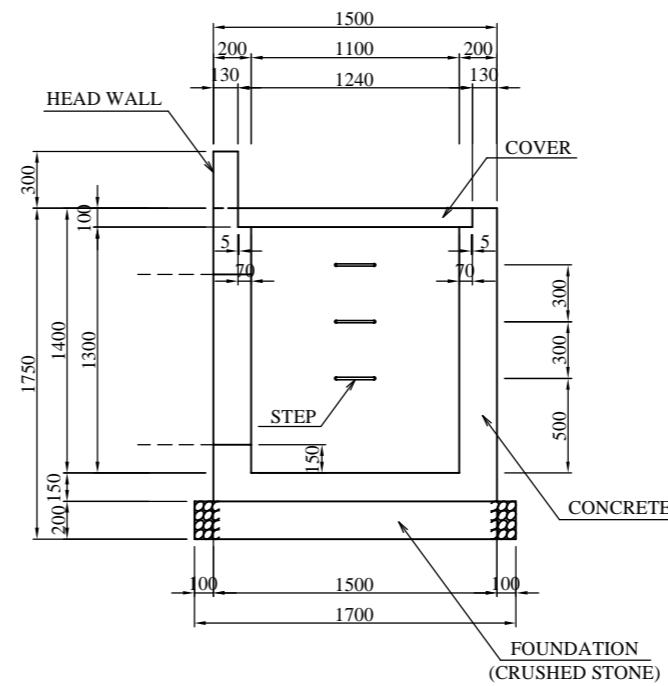
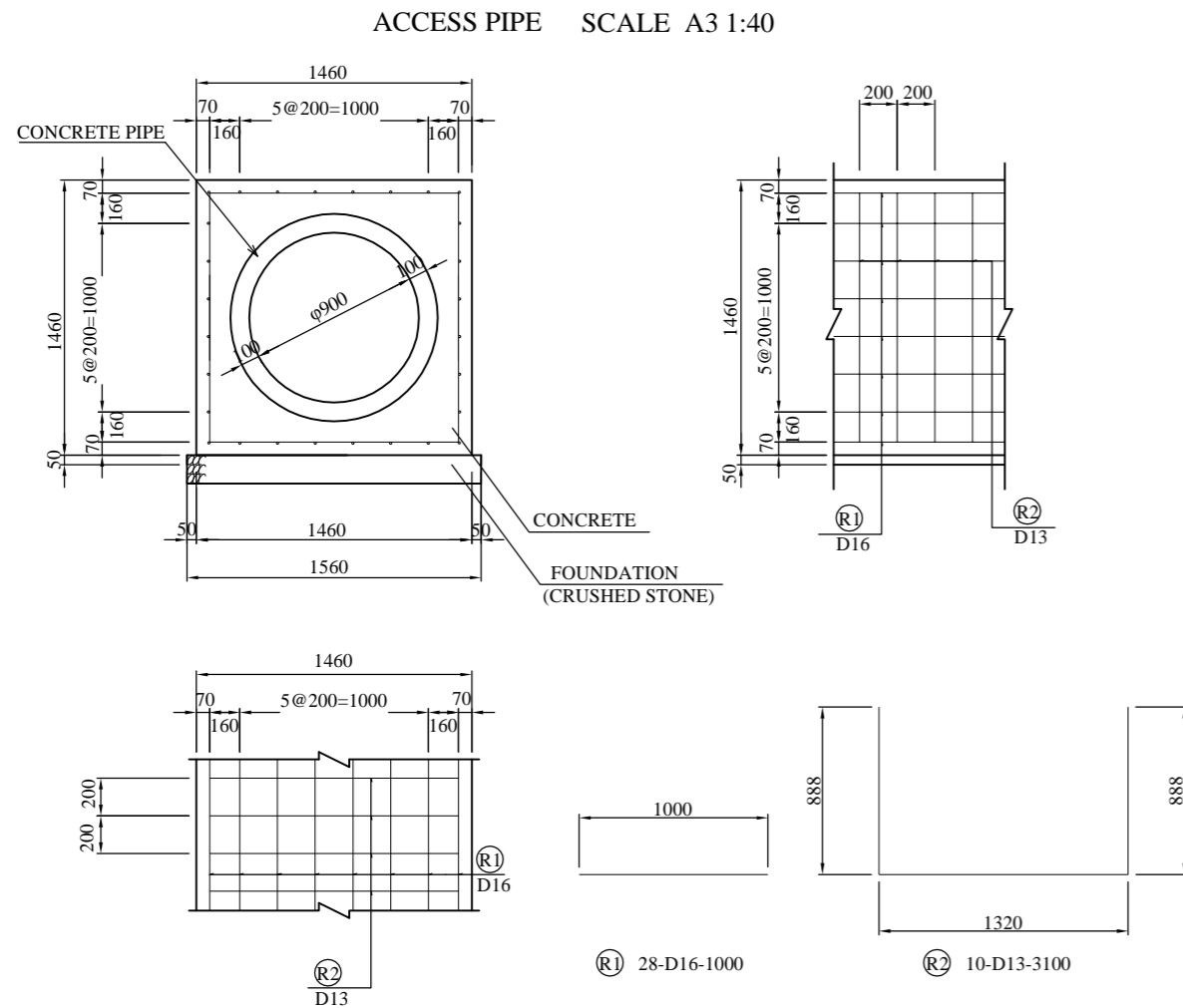
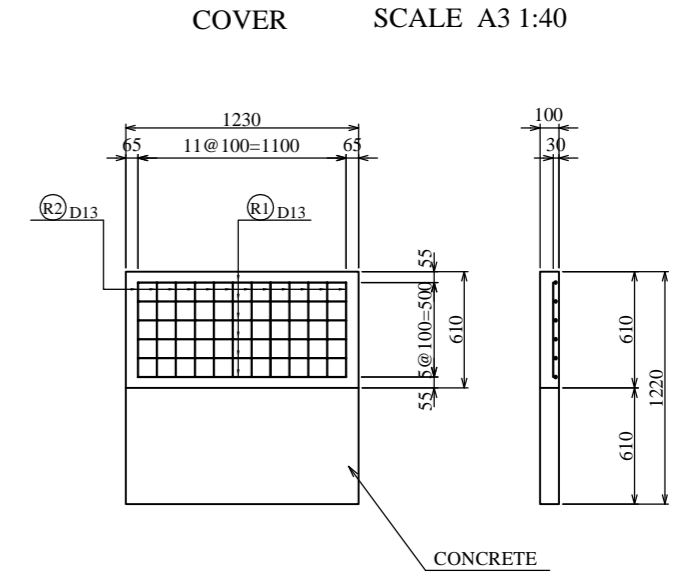
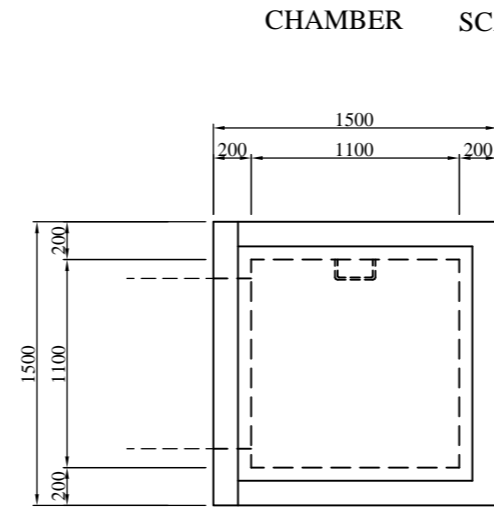
DRAINAGE STRUCTURE (9) SCALE AS SHOWN

ACCESS PIPE



DIMENSION LIST

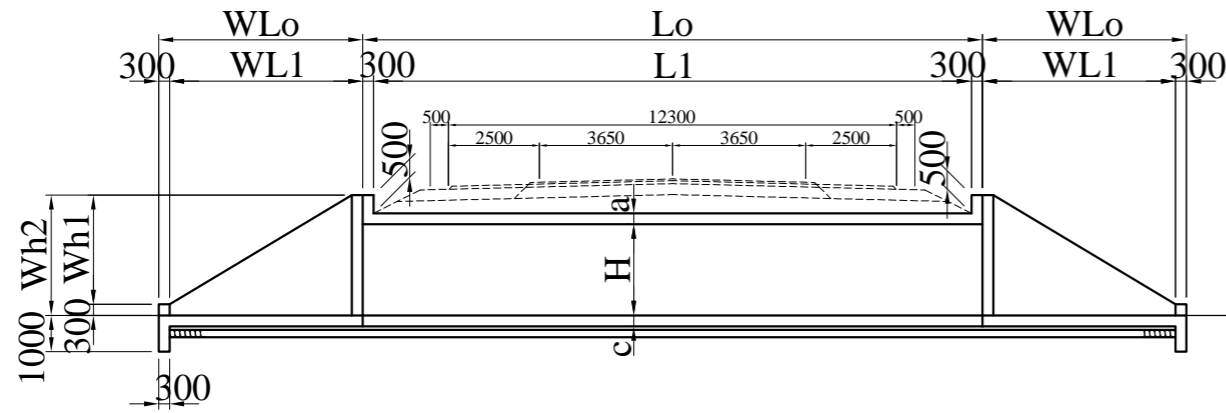
TYPE	L
TYPE-1	8000
TYPE-2	10000
TYPE-3	20000



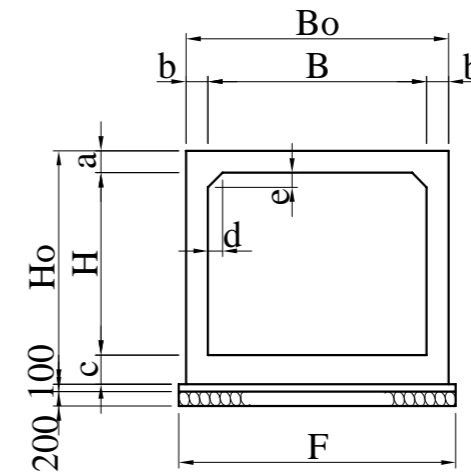
DRAINAGE STRUCTURE (10)

<NEW CONSTRUCTION BOX CULVERT SINGLE TYPE>

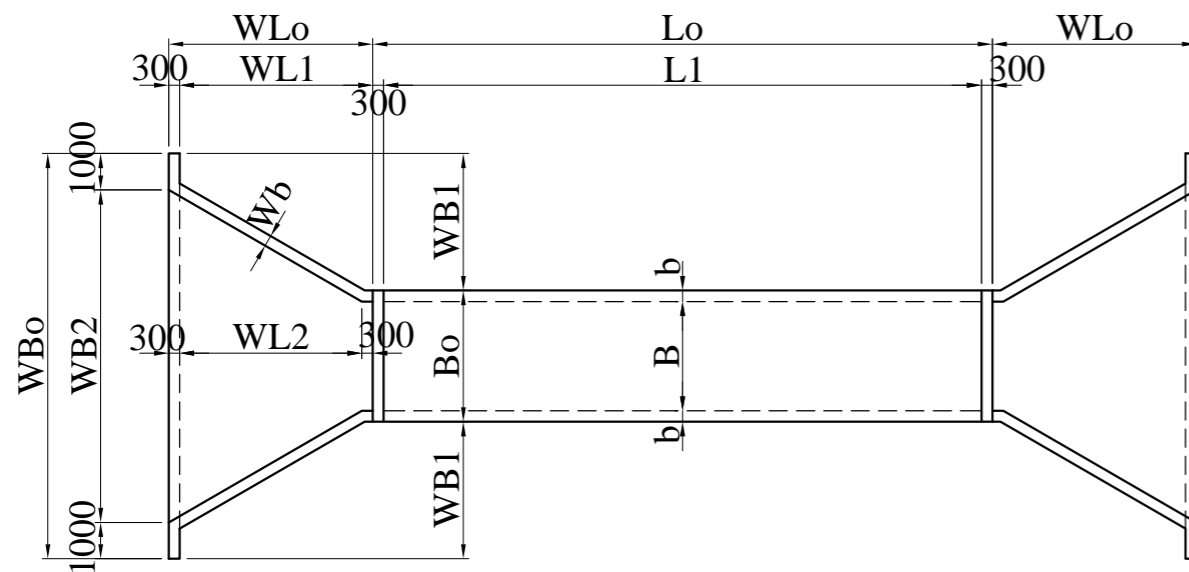
SIDE VIEW SCALE A3 1:200



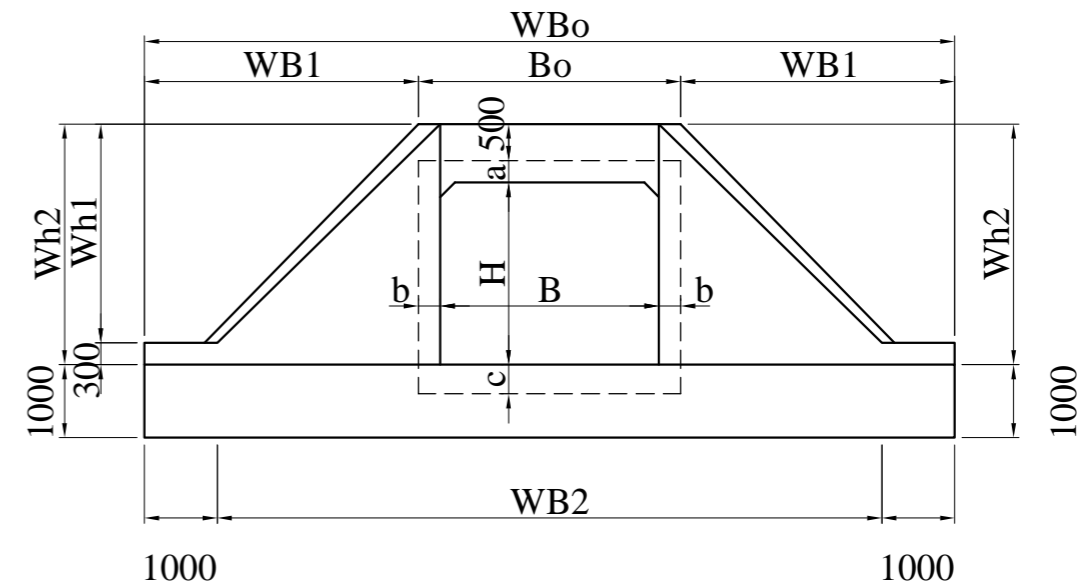
CROSS SECTION SCALE A3 1:100



PLAN SCALE A3 1:200



FRONT VIEW SCALE A3 1:100



Dimension of Box Culvert (mm)												
No.	SIZE	B	H	a	b	c	d	e	Bo	Ho	F	Lo
2+478	3000×2000	3000	2000	300	300	400	200	200	3600	2700	3800	17000
6+546	2000×2000	2000	2000	300	300	300	200	200	2600	2600	2800	17000
8+93	3000×2500	3000	2500	300	300	400	200	200	3600	3200	3800	16000
11+127	2000×2000	2000	2000	300	300	300	200	200	2600	2600	2800	18400
28+861	2500×2500	2500	2500	300	300	300	200	200	3100	3100	3300	18000

Dimension of dimension of Inlet and outlet (mm)												
No.	SIZE	B	H	WB1	WB2	WB0	Wb	WL1	WL2	WLo	Wh1	Wh2
2+478	3000×2000	3000	2000	3183	7965	9965	300	4300	4000	4600	2500	2800
6+546	2000×2000	2000	2000	3183	6965	8965	300	4300	4000	4600	2500	2800
8+93	3000×2500	3000	2500	3760	9120	11120	300	5300	5000	5600	3000	3300
11+127	2000×2000	2000	2000	3183	6965	8965	300	4300	4000	4600	2500	2800
28+861	2500×2500	2500	2500	3760	8620	10620	300	5300	5000	5600	3000	3300

DESIGN CONDITION	
TYPE OF CULVERT	CAST-IN-PLACE BOX CULVERT
LENGTH	See to the dimension table
SECTION SIZE	See to the dimension table
SKUEW ANGLE	90°00'00"

GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
DRAINAGE STRUCTURE (10)

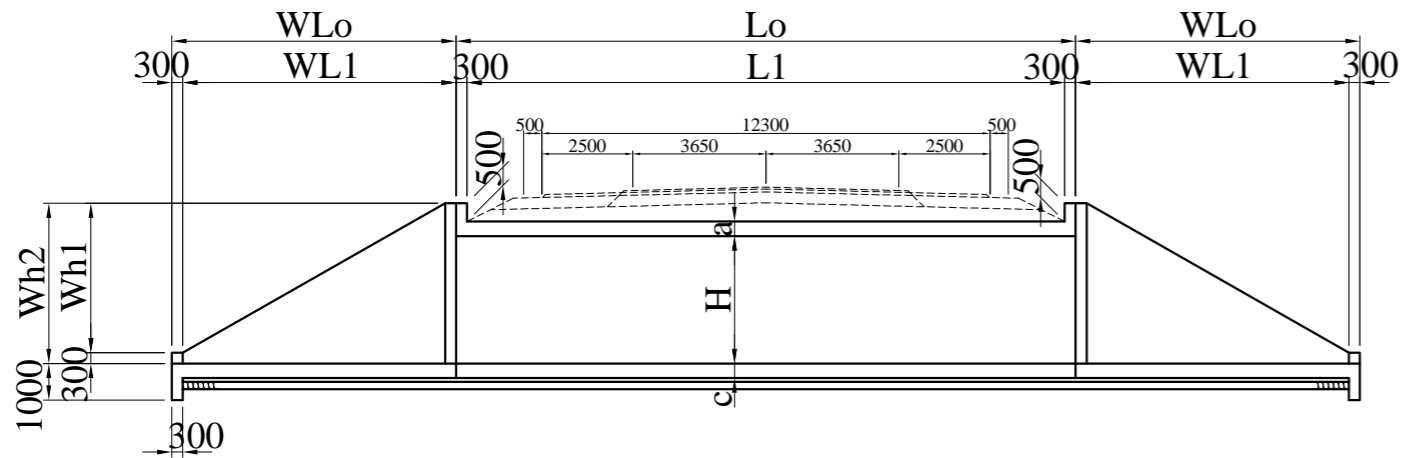
DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
43

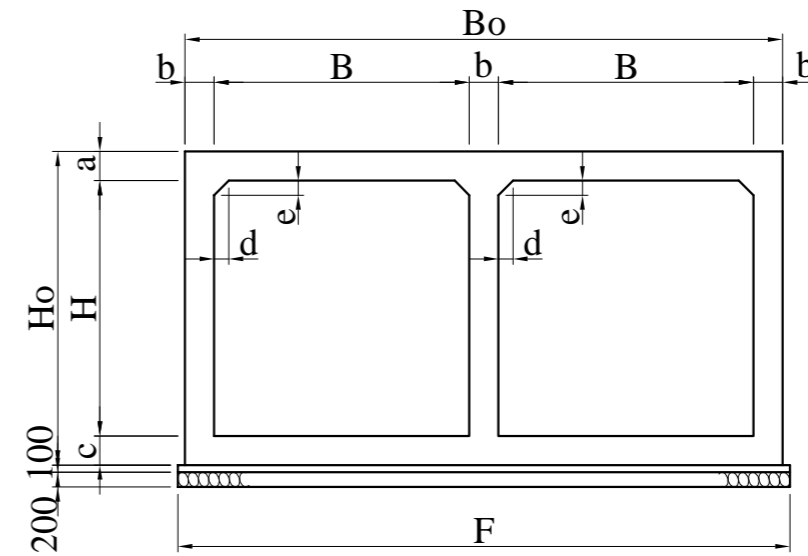
DRAINAGE STRUCTURE (11)

<NEW CONSTRUCTION BOX CULVERT DOUBLE TYPE>

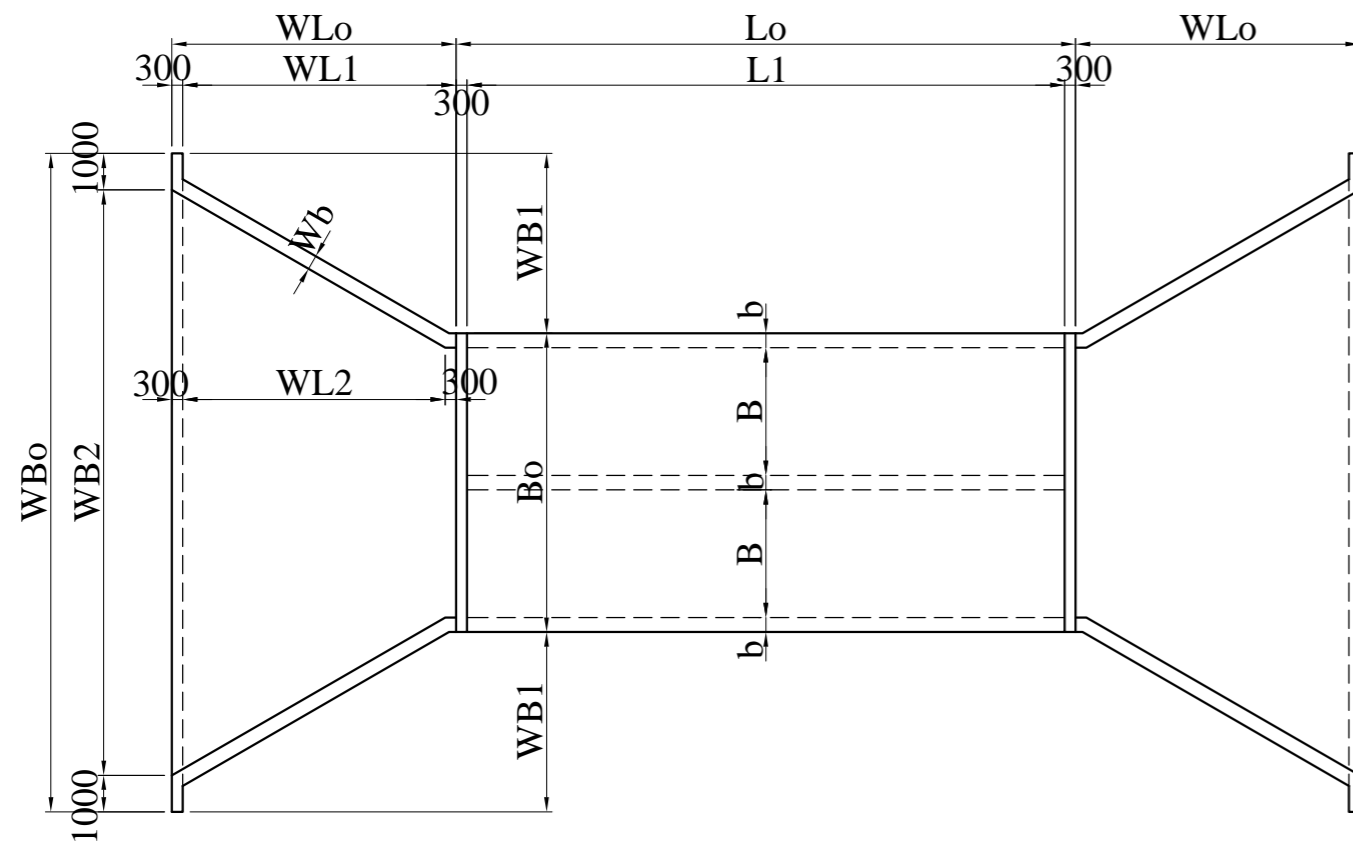
SIDE VIEW SCALE A3 1:200



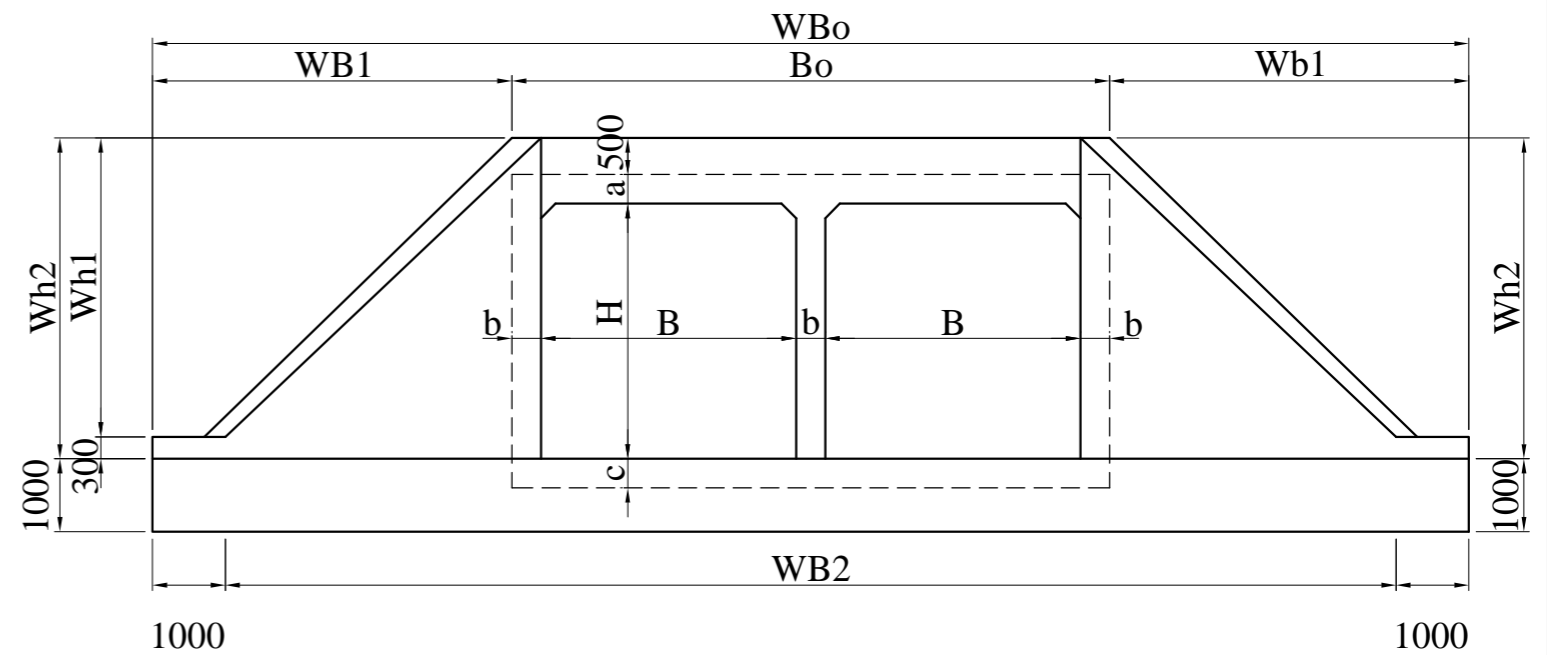
CROSS SECTION SCALE A3 1:100



PLAN SCALE A3 1:200



FRONT VIEW SCALE A3 1:100



Dimension of Box Culvert (mm)												
No.	SIZE	B	H	a	b	c	d	e	Bo	Ho	F	Lo
16+198	3500×3500	3500	3500	400	400	400	200	200	8200	4300	8400	17000

Dimension of dimension of Inlet and outlet (mm)												
No.	SIZE	B	H	WB1	WB2	WB0	Wb	WL1	WL2	WLo	Wh1	Wh2
16+198	3500×3500	3500	3500	4930	16060	18060	400	7500	7200	7800	4100	4400

DESIGN CONDITION	
TYPE OF CULVERT	CAST-IN-PLACE BOX CULVERT
LENGTH	See to the dimension table
SECTION SIZE	See to the dimension table
SKEW ANGLE	90°00'00"

GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

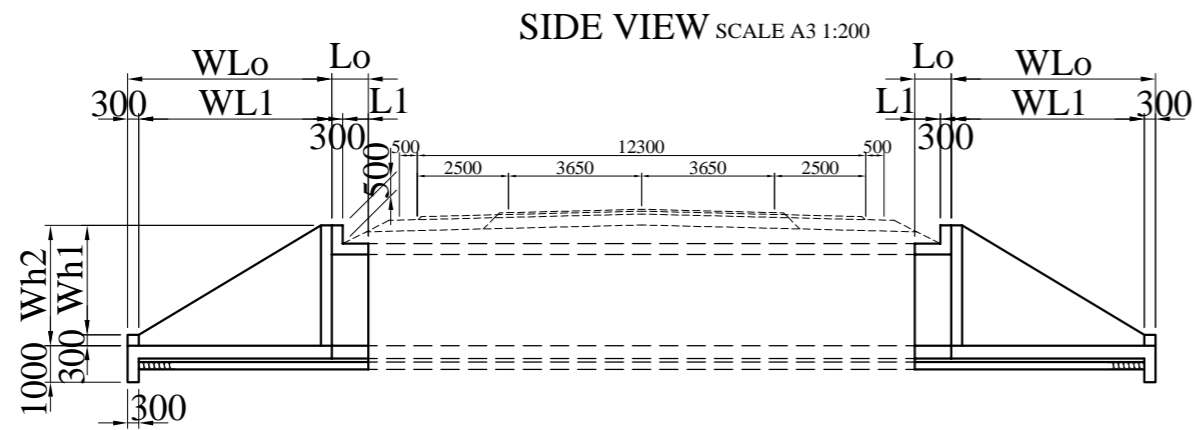
DRAWING TITLE:
DRAINAGE STRUCTURE (11)

DATE:
PREPARED BY:
CHECKED BY:

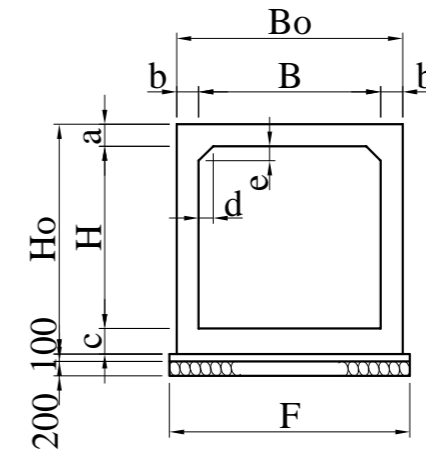
DRAWING No. :
44

DRAINAGE STRUCTURE (12)

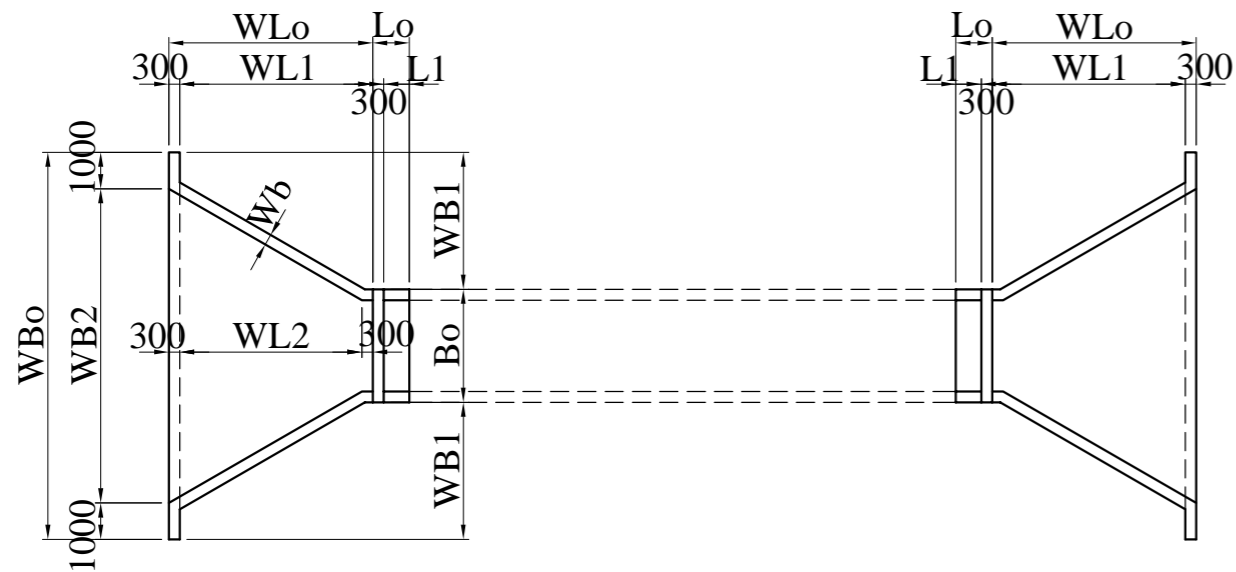
<EXTENSION BOX CULVERT SINGLE TYPE>



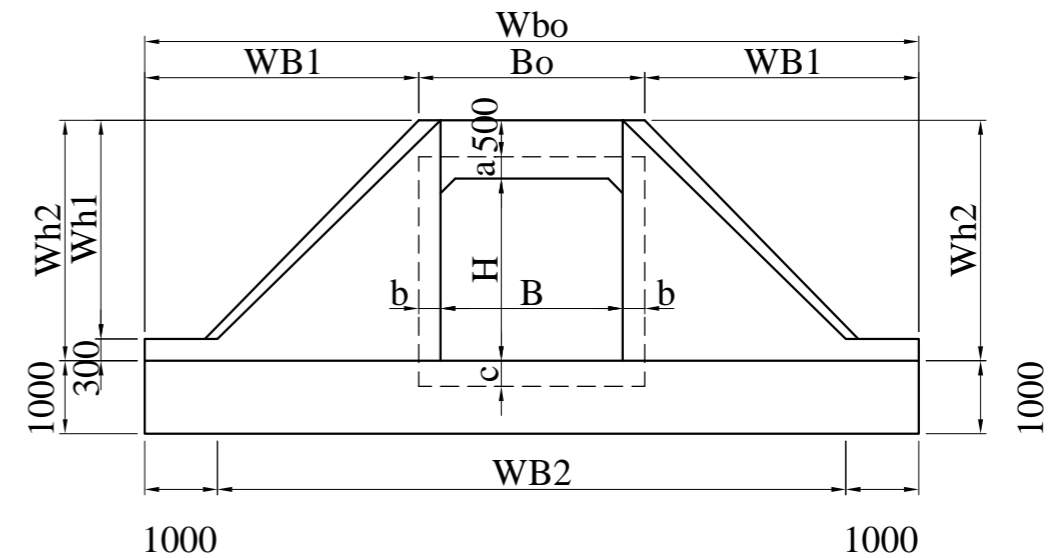
CROSS SECTION SCALE A3 1:100



PLAN SCALE A3 1:200



FRONT VIEW SCALE A3 1:100



Dimension of Box Culvert (mm)												
No.	SIZE	B	H	a	b	c	d	e	Bo	Ho	F	Lo
0+196	2000×2000	2000	2000	300	300	350	150	150	2600	2650	2800	700
12+255	4000×4000	4000	4000	400	400	500	300	300	4800	4900	5000	700
26+527	2500×2500	2500	2500	300	300	350	200	200	3100	3150	3300	1700

Dimension of dimension of Inlet and outlet (mm)												
No.	SIZE	B	H	WB1	WB2	WBo	Wb	WL1	WL2	WLo	Wh1	Wh2
0+196	2000×2000	2000	2000	3183	6965	8965	300	4300	4000	4600	2500	2800
12+255	4000×4000	4000	4000	5507	13815	15815	400	8500	8200	8800	4600	4900
26+527	2500×2500	2500	2500	3760	8620	10620	300	5300	5000	5600	3000	3300

DESIGN CONDITION	
TYPE OF CULVERT	CAST-IN-PLACE BOX CULVERT
LENGTH	See to the dimension table
SECTION SIZE	See to the dimension table
SKEW ANGLE	90°00'00"

GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
DRAINAGE STRUCTURE (12)

DATE:
PREPARED BY:
CHECKED BY:

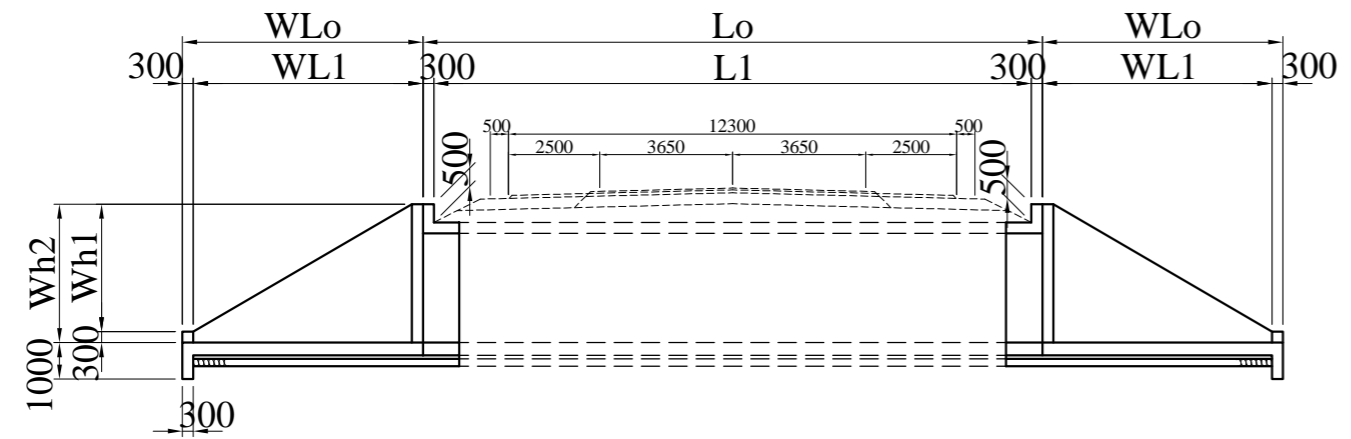
DRAWING No. :

45

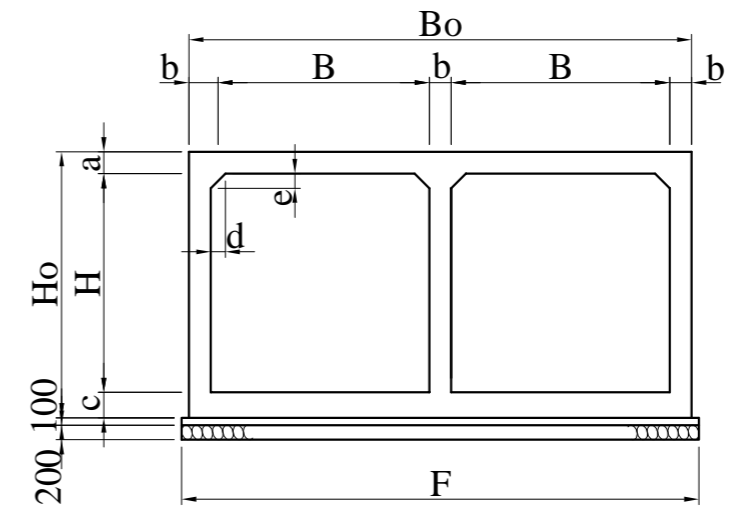
DRAINAGE STRUCTURE (13)

<EXTENSION BOX CULVERT DOUBLE TYPE>

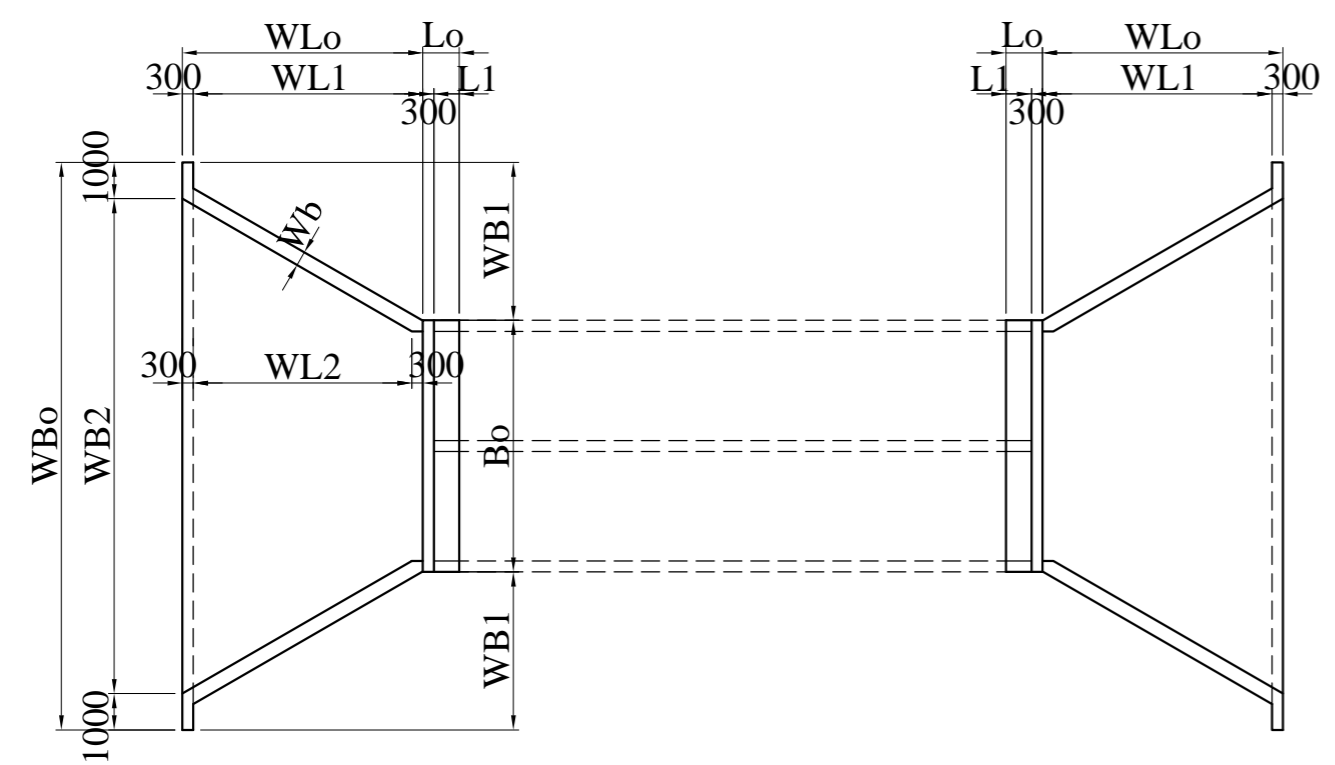
SIDE VIEW SCALE A3 1:200



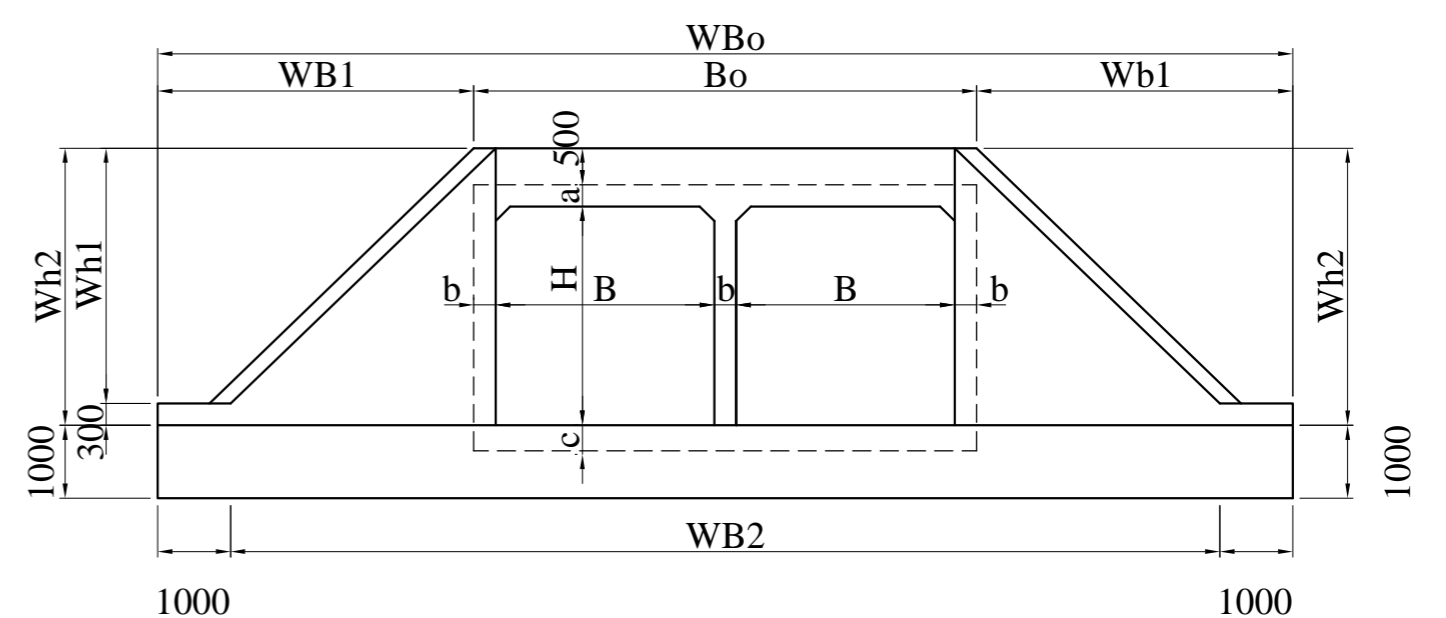
CROSS SECTION SCALE A3 1:100



PLAN SCALE A3 :200



FRONT VIEW SCALE A3 1:100



Dimension of Box Culvert (mm)													
No.	SIZE	B	H	a	b	c	d	e	Bo	Ho	F	Lo	
22+463	3000x3000	3000	3000	300	300	350	200	200	6900	3650	7100	1700	2000

Dimension of dimension of Inlet and outlet (mm)												
No.	SIZE	B	H	WB1	WB2	WB0	Wb	WL1	WL2	WLo	Wh1	Wh2
22+463	3000x3000	3000	3000	4337	13575	15575	400	6300	6000	6600	3500	3800

DESIGN CONDITION	
TYPE OF CULVERT	CAST-IN-PLACE BOX CULVERT
LENGTH	See to the dimension table
SECTION SIZE	See to the dimension table
SKEW ANGLE	90°00'00"

GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 46
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	DRAINAGE STRUCTURE (13)	PREPARED BY:	
				CHECKED BY:	

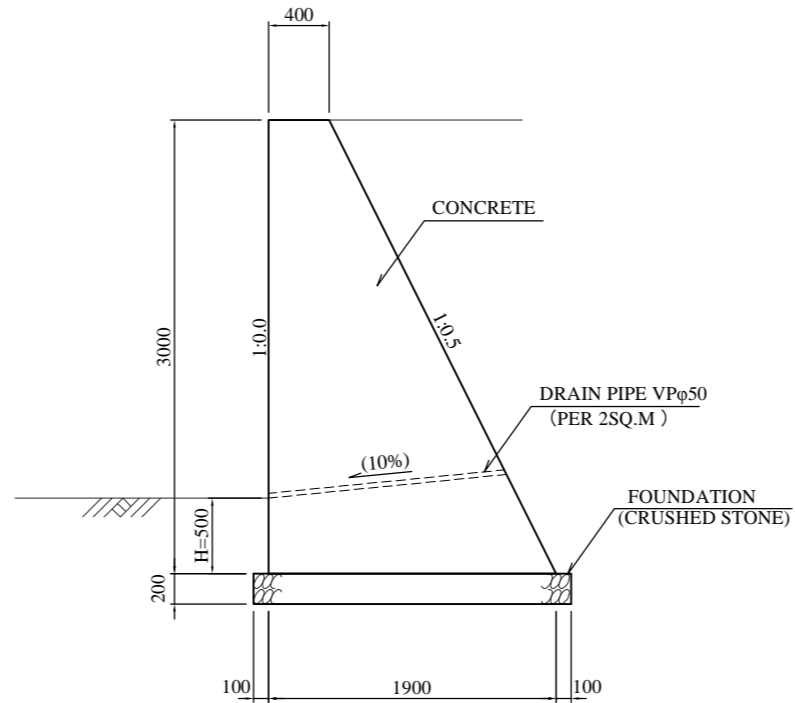
DRAINAGE STRUCTURE (14)

LOCATION OF BOX AND PIPE CULVERTS

STA.	Pipe Culvert			Box Culvert BxL			Extension Length (m)	Remarks
	Single	Double	Length (m)	Single	Double	Length (m)		
0 - 196				2.00x2.00			2.00	Existing I. 14.5
1 - 147	1.00		26.00			23.60		
1 - 158				5.00x6.00				
1 - 310	1.00		25.00					
1 - 372	1.00		29.00					
1 - 930	1.00		22.00					
2 - 165	1.20		18.00					
2 - 478				3.00x2.00		17.00		
2 - 619	1.00		17.00					
2 - 975	1.00		18.00					
3 - 745	1.00		22.00					
4 - 293	1.00		20.00					
4 - 562	0.90		16.00					
4 - 902	0.90		15.00					
5 - 665	1.00		17.00					
6 - 223	1.00		15.00					
6 - 546				2.00x2.00		17.00		
7 - 709	1.00		15.00					
8 - 93				3.00x2.50		16.00		
8 - 830	1.00		15.00					
9 - 99	1.00		18.00					
9 - 550	1.00		20.00					
10 - 176	0.90		16.00					
10 - 419	0.90		15.00					
11 - 127				2.00x2.00		19.00		
11 - 830	1.00		17.00					
12 - 255				4.00x4.00			2.00	Existing I. 14.8
13 - 20	1.00		15.00					
13 - 89	1.00		15.00					
13 - 595	1.00		15.00					
14 - 63	1.20		17.00					
14 - 409	1.00		23.00					
14 - 725	1.00		15.00					
15 - 305	0.90		15.00					
16 - 198					3.50x3.50	17.00		
17 - 2		1.00	15.00					
17 - 869	1.20		17.00					
18 - 412	0.90		17.00					
19 - 253	1.50		15.00					
19 - 900	1.00		18.00					
20 - 300	1.00		15.00					
20 - 400	1.00		15.00					
20 - 750	1.00		15.00					
21 - 389	1.00		17.00					
22 - 463					3.00x3.00		4.00	Existing I. 15.3
22 - 563		1.20	16.00					
23 - 11	1.00		16.00					
23 - 486		1.20	15.00					
23 - 950	0.90		15.00					
24 - 752	1.50		15.00					
25 - 872	1.00		15.00					
26 - 527				2.50x2.50			4.00	Existing I. 16.3
27 - 165	1.20		15.00					
27 - 541	1.00		18.00					
27 - 666	1.00		15.00					
28 - 861				2.50x2.50		18.00		
30 - 35	1.00		23.00					
31 - 190	1.00		15.00					

RETAINING WALL SCALE AS SHOWN

GRAVITY TYPE RETAINING WALL SCALE A3 1:50



MATERIAL LIST (GRAVITY WALL)

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
CONCRETE		cu.m	3.45	
FORM		sq.m	6.35	
FOUNDATION	CRUSHED STONE	cu.m	0.42	
DRAIN PIPE	VP φ50	m	1.98	

PER m

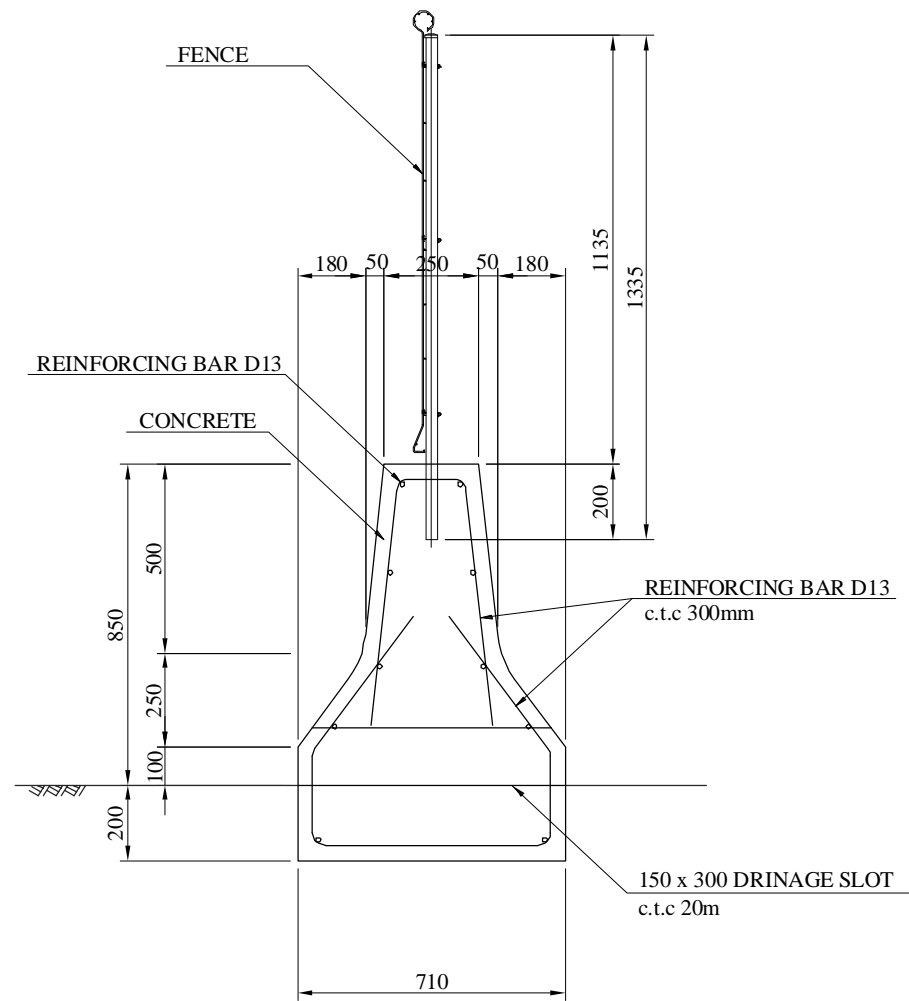
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. :
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	RETAINING WALL	PREPARED BY:	48
				CHECKED BY:	

TRAFFIC SAFETY DEVICES (1)

TRAFFIC FURNITURE

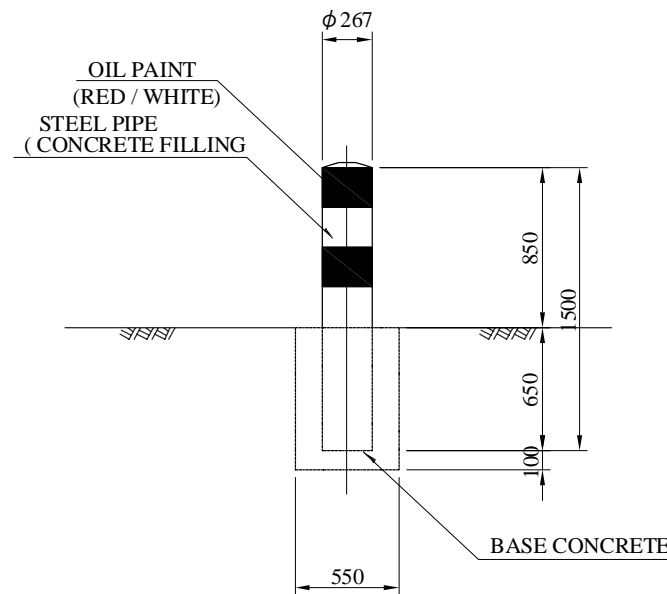
SCALE AS SHOWN

CONCRETE BARRIER SCALE A3 1:20



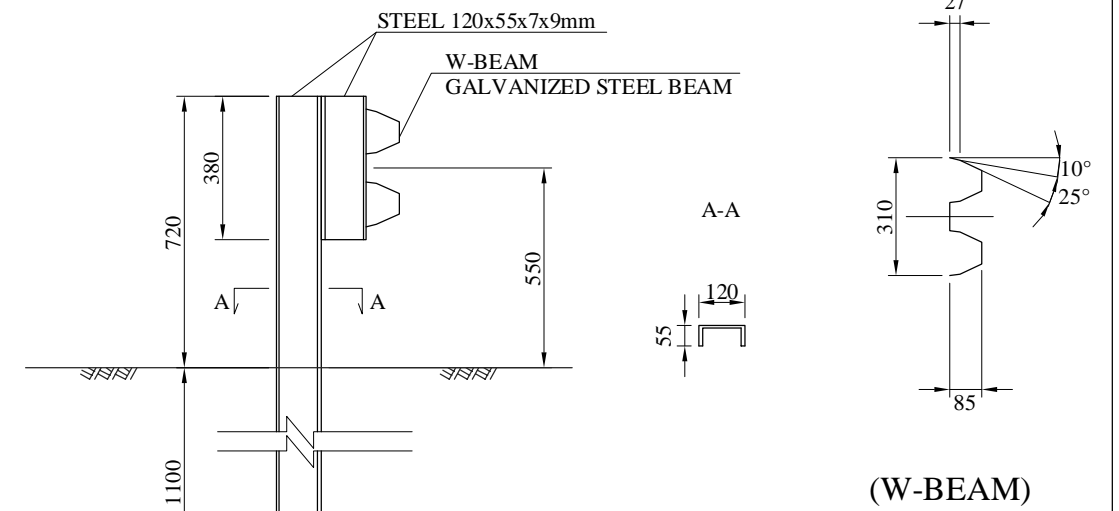
ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			STANDARD	SLOT	
CONCRETE		cu.m	0.50	0.46	
FORM		sq.m	3.21	3.85	
REINFORCING BAR	D13	kg	22.73	22.73	
FENCE	H=1.10m	m	1.00	1.00	

DELINEATION POST SCALE A3 1:40



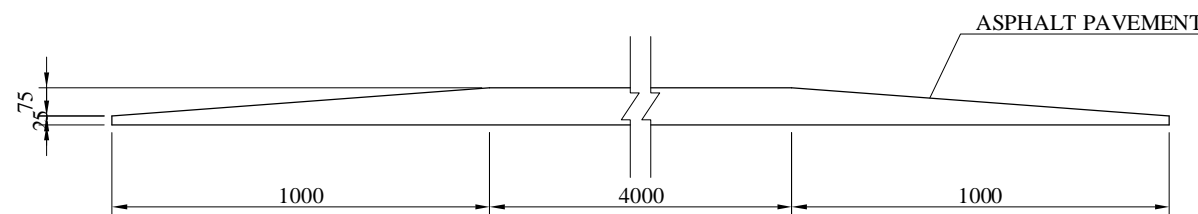
ITEM	STANDARD	UNIT	QUANTITY	REMARKS
STEEL PIPE	φ267	m	1.50	
CONCRETE	FILLING	cu.m	0.08	
	BASE CONCRETE	cu.m	0.19	
OIL PAINT		sq.m	0.71	

GUARD RAIL SCALE A3 1:20



ITEM	STANDARD	UNIT	QUANTITY	REMARKS
GUARD RAIL		m	1.00	

HUMP SCALE A3 1:20



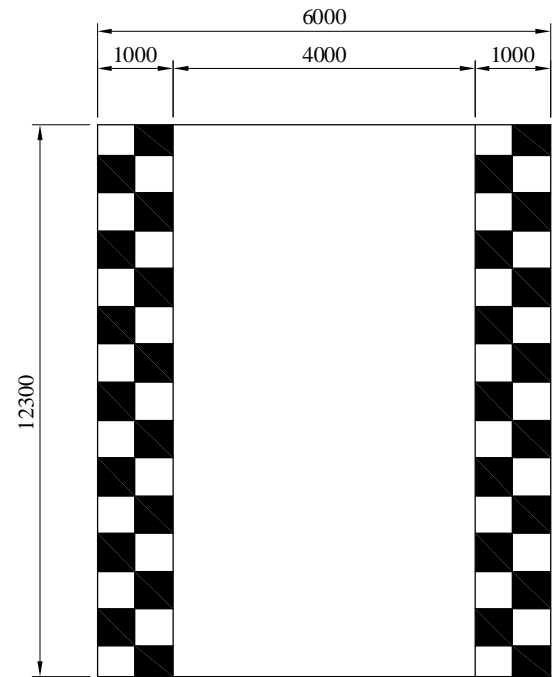
ITEM	STANDARD	UNIT	QUANTITY	REMARKS
ASPHALT PAVEMENT		cu.m	6.46	W=12.3m

TRAFFIC SAFETY DEVICES (2)

TRAFFIC MARKING

SCALE AS SHOWN

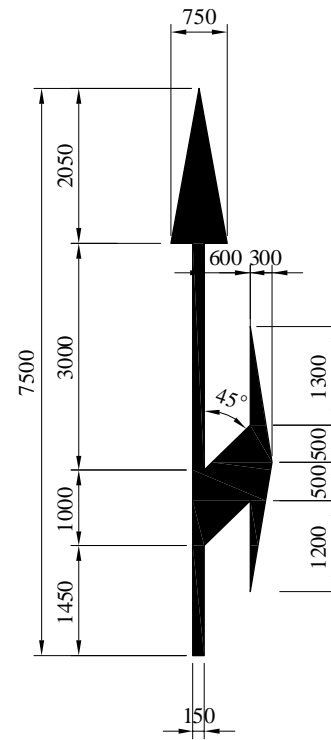
PEDESTRIAN-CROSSING(HUMP) SCALE A3 1:100



a=12.3m²/each

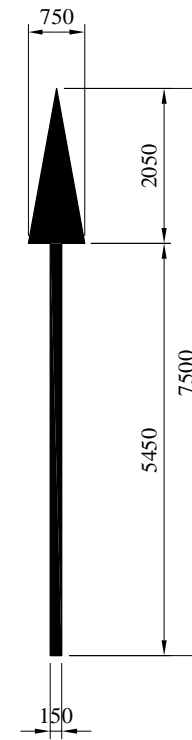
ARROW MARK SCALE A3 1:100

STRAIGHT-TURN



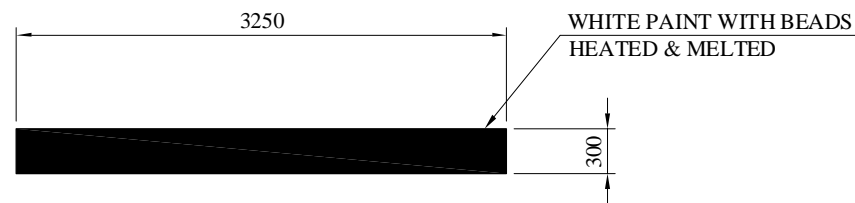
a=2.7m²/each

STRAIGHT



a=1.6m²/each

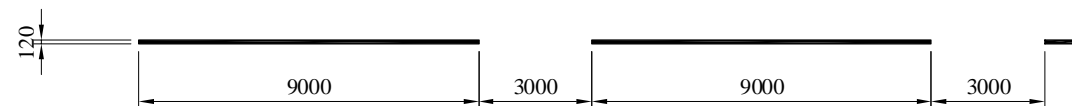
STOP LINE SCALE A3 1:50



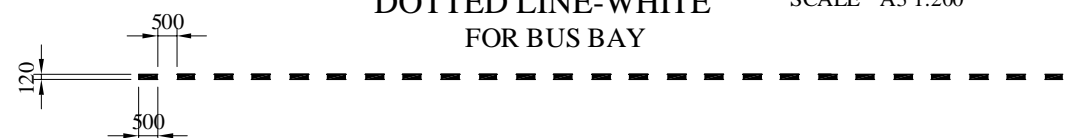
CONTINUOUS LINE -WHITE SCALE A3 1:200



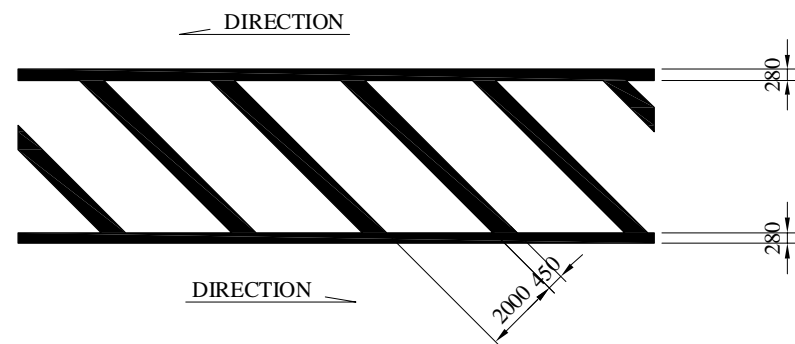
DASHED LINE -WHITE SCALE A3 1:200
FOR SPEED 80Km/h



DOTTED LINE-WHITE SCALE A3 1:200
FOR BUS BAY



ZEBRA MARKING SCALE A3 1:200

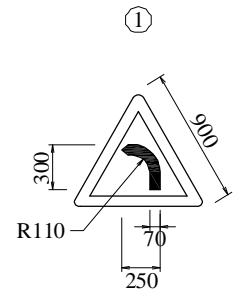


TRAFFIC SAFETY DEVICES (3)

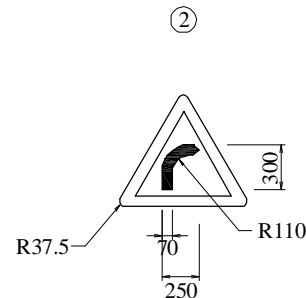
SCALE AS SHOWN

TRAFFIC SIGN

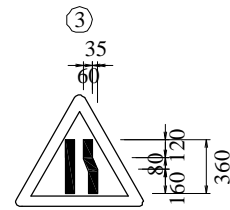
SIGN POST DETAILS SCALE A3 1:40



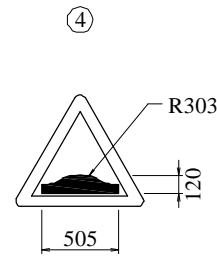
LEFT BEND
WS 1



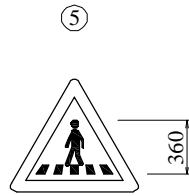
RIGHT BEND
WS 2



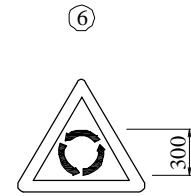
CARRIAGEWAY NARROWS
(FROM RIGHT)
WS 9



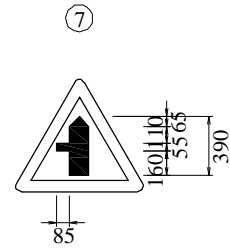
HUMP
WS 14



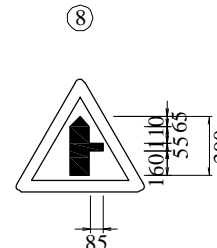
PEDESTRIAN CROSSING
WS 19



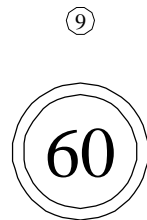
ROUNDBOUT
WS 33



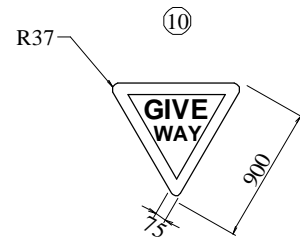
MINOR ROAD FROM LEFT
WS 36



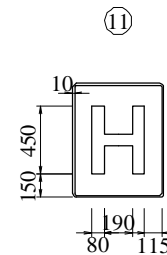
MINOR ROAD FROM RIGHT
WS 37



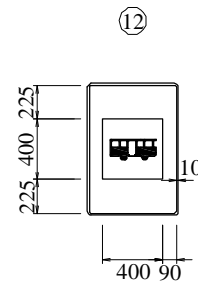
MAXIMUM SPEED LIMIT AS SHOWN
PS 22



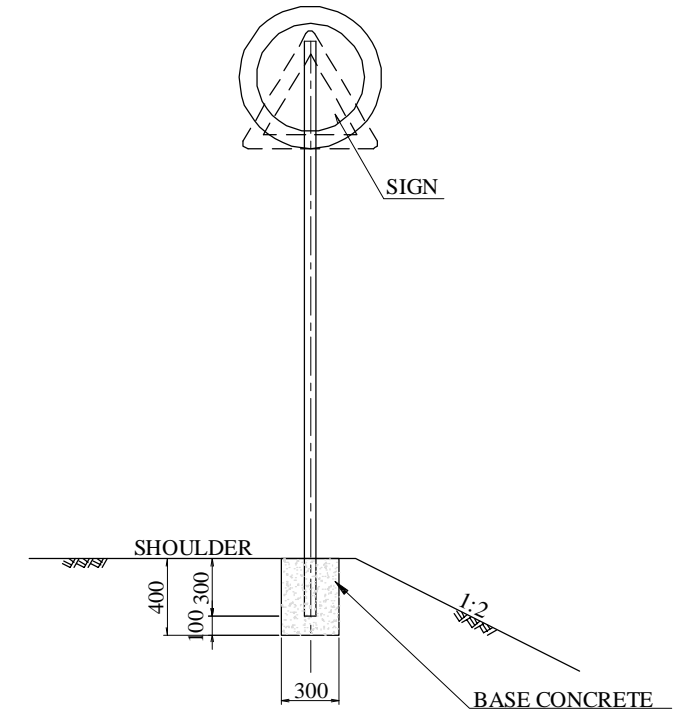
GIVEWAY MAJOR ROAD AHEAD
MS 13



HOSPITAL
IS 2



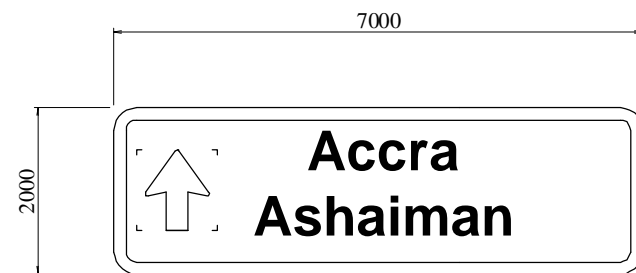
BUS STOP / TERMINAL
IS 11



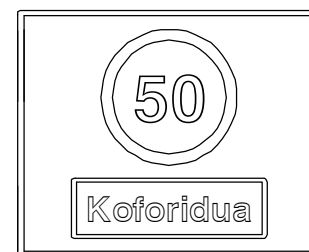
Note: The size, shape and dimensions of Road Signs shall be in accordance to The Standard of Ghana

MATERIAL LIST (SIGN POST)

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
BASE CONCRETE		cu.m	0.04	
SIGN POST		nos	1.00	



ADVANCE DIRECTION SIGNS



TOWN GATE

TRAFFIC SAFETY DEVICES (4)

TRAFFIC SIGN

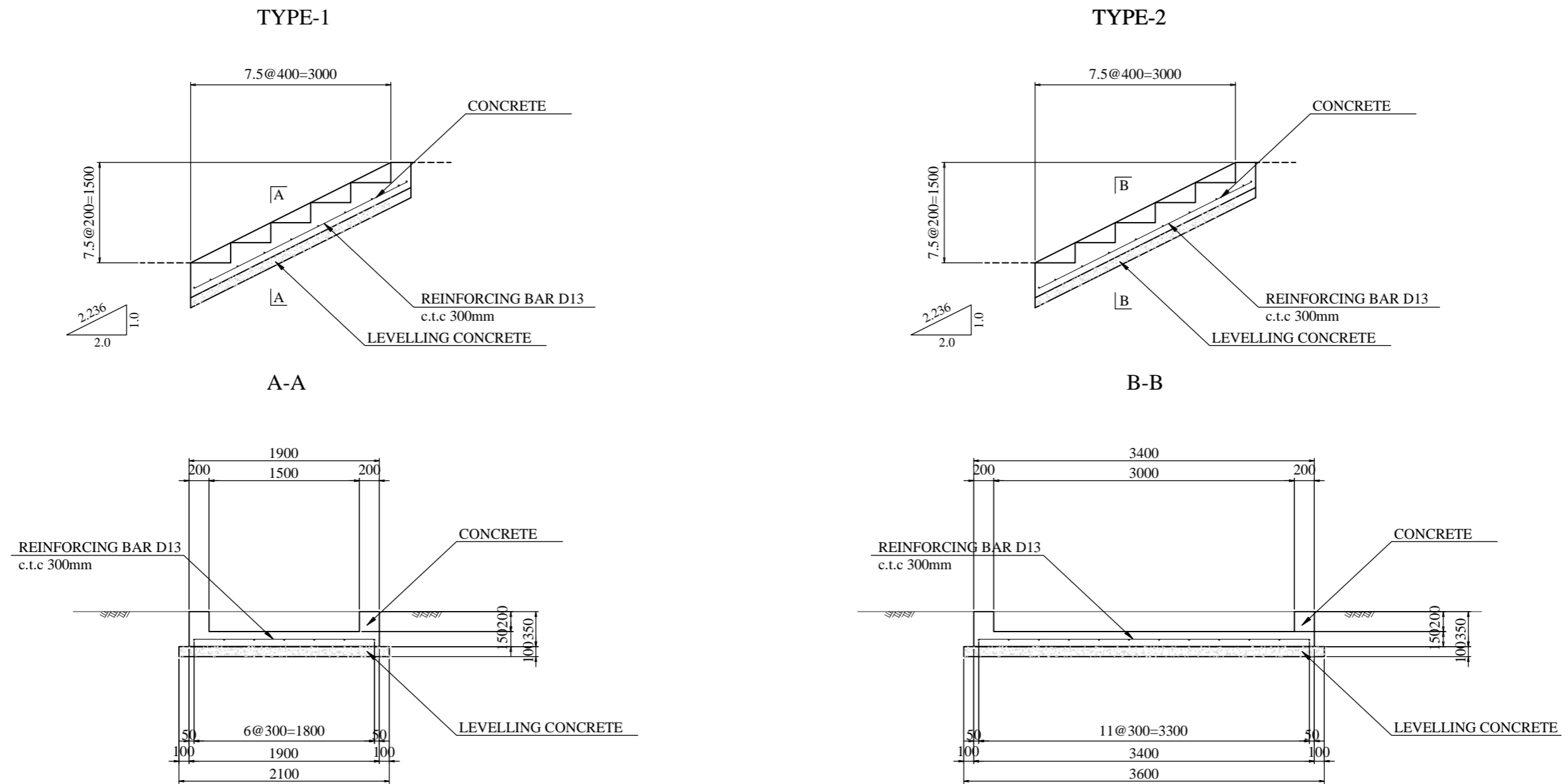
(TRAFFIC SIGN) (1)																	(TRAFFIC SIGN) (2)																									
SECTION	STATION	DIRECTION	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	ADVANCE DIRECTION SIGNS	TOWN GATE	REMARKS	SECTION	STATION	DIRECTION	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	ADVANCE DIRECTION SIGNS	TOWN GATE	REMARKS							
A	0 + 150	R															1	C	7 + 0	LR																	2					
	0 + 320	L												1					8 + 0	LR																	2					
	0 + 370	L				1	1												8 + 90	R																		1				
	0 + 410	R				1	1												8 + 100	LR				2	2													2				
	0 + 470	R												1					8 + 670	LR								1	1						1							
	0 + 500	LR															2		9 + 0	LR																		2				
	0 + 728	LR				1	4	4	4										10 + 0	LR																			2			
	1 + 0	LR																		11 + 0	LR																			2		
	1 + 235	L												1					11 + 130	R																				2		
	2 + 280	L				1	1												11 + 470	LR																				2		
	1 + 350	L																		11 + 630	LR								1	1											1	
	1 + 400	R																		12 + 0	LR																				2	
	1 + 460	R					1	1												12 + 260	L																				1	
	1 + 876	LR				1	3	3	3											12 + 700	R																					1
	2 + 0	LR																			12 + 870	LR					2	2														2
	2 + 100	L																			13 + 0	LR																				2
	2 + 220	L																			13 + 400	L																				1
	2 + 280	L					1	1																																		
	2 + 300	R																			14 + 0	LR																				2
	2 + 330	R						1	1											14 + 410	R																					1
2 + 380	R																		14 + 560	LR					2	2														2		
2 + 700	L																		15 + 0	LR																					2	
3 + 0	LR																		15 + 300	L																				1		
3 + 200	R						1	1										16 + 0	LR																					2		
3 + 260	LR																		16 + 500	R																					1	
3 + 310	L						1	1										17 + 0	LR																					2		
4 + 0	LR																		17 + 270	LR						2	2													2		
4 + 100	L																																							1		
5 + 0	LR																		18 + 0	LR																					2	
5 + 650	LR							2	2										18 + 400	L																					1	
6 + 0	LR																		19 + 0	LR																					2	
6 + 220	L																		19 + 900	R																					1	
SUB TOTAL			1	1	2	17	17	7	0	1	12	1	1	10			2	SUB TOTAL			6	0	0	12	12	0	2	2	32	2	0	12	0	12	0	12	16					
TOTAL			1	1	2	17	17	7	0	1	12	1	1	10			2	TOTAL			1	1	2	29	29	7	2	3	44	3	1	22	2	16	162							

TRAFFIC SAFETY DEVICES (5)

TRAFFIC SIGN

(TRAFFIC SIGN) (3)																		
SECTION	STATION	DIRECTION	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	ADVANCE DIRECTION SIGNS	TOWNSGATE	REMARKS	
F	22 + 560	R															1	
	23 + 0	LR										2						
	23 + 150	LR				2	2							2				
	23 + 490	L															1	
	24 + 0	LR										2						
	25 + 0	LR										2						
	25 + 270	LR				2	2							2				
	26 + 0	LR										2						
	26 + 150	R																1
	27 + 0	LR										2						
	27 + 320	LR				2	2								2			
	27 + 860	L																1
	28 + 0	LR										2						
	28 + 600	R																1
	28 + 720	LR				2	2								2			
	29 + 0	LR										2						
	29 + 550	L																1
	29 + 900	LR														2		1
30 + 0	LR										2							
30 + 750	LR				2	2								2				
31 + 0	LR										2							
31 + 200	L																1	
SUB TOTAL			0	0	0	10	10	0	0	0	18	0	0	10	2		8	TOTAL
TOTAL			1	1	2	39	39	7	2	3	62	3	1	32	4		24	220

STEP SCALE A3 1:50



MATERIAL LIST (STEP) PER each

ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			TYPE1	TYPE2	
CONCRETE		cu.m	1.55	2.67	
FORM		sq.m	4.95	7.20	
REINFORCING BAR	D13	kg	44.85	79.45	
LEVELING Co		cu.m	0.63	1.08	
FORM	LEVELING Co	sq.m	1.02	1.32	

GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

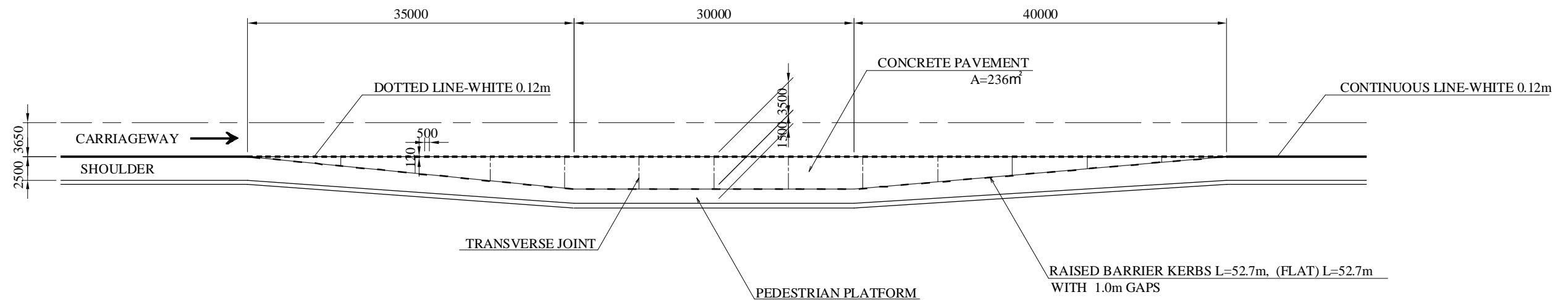
PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
STEP

DATE:
PREPARED BY:
CHECKED BY:

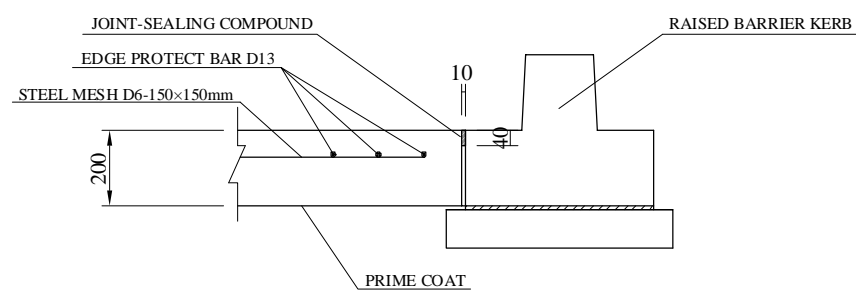
DRAWING No. :
54

BUS STOP SCALE A3 1:500

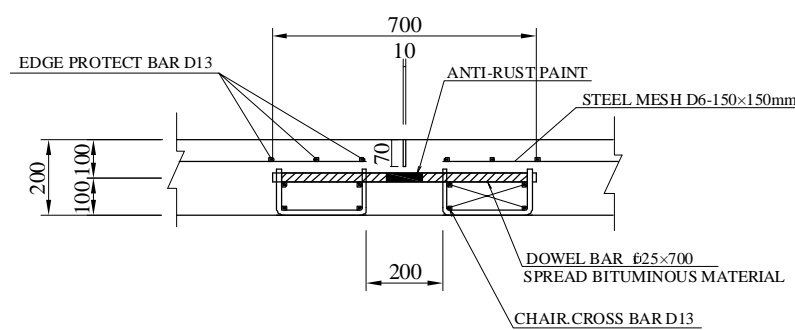


DETAIL OF JOINT SCALE A3 1:20

LONGITUDINAL JOINT



TRANSVERSE JOINT



MATERIAL LIST (BUS BAY)

ITEM	STANDARD	UNIT	QUANTITY	PER each	REMARKS
CONCRETE		cu.m	47.25		
FORM		sq.m	42.07		
STEEL MESH	D6-150x150mm	kg	812.70		
REINFORCING BAR	D13	kg	1255.61		
JOINT	TRANSVERSE	m	28.10		
	LONGITUDINAL	m	210.32		

MATERIAL LIST (JOINT)

ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			TRANSVERSE	LONGITUDINAL	
REINFORCING BAR	$\phi 25$	kg	91.63	—	
	D13	kg	25.17	—	
	TOTAL	kg	116.80	—	
CUTTER	t=70	m	10.00	—	
SEALING COMPOUND	t=70	cu.m	—	0.004	
BOARD	t=70	sq.m	—	1.60	

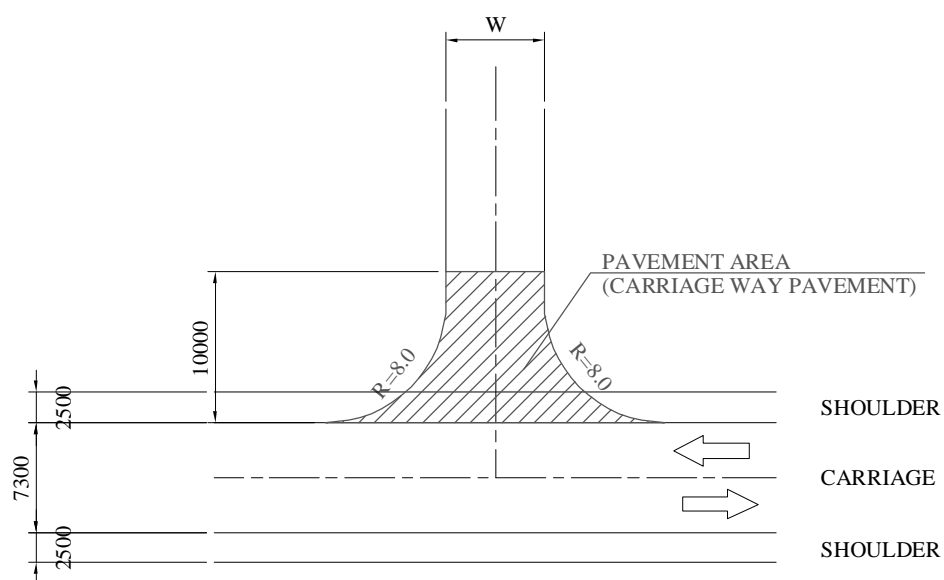
LOCATION OF BUS BAY

COMMUNITY	LHS	RHS
ASSIN FOSU	0+323	0+468
	1+348	1+400
	2+223	2+378
(SCHOOL)	3+259	
ASSIN DWAASO	5+570	5+720
ASSIN NYANKOMASE	8+020	8+170
ASSIN BROFOYEDURU	11+390	11+540
ASSIN APONSIEU	12+800	12+950
ASSIN ENDWUA	14+487	14+637
ASSIN AKONFODE	17+200	17+350
ASSIN NNUASO	19+975	20+125
ASSIN BREKU	23+075	23+225
ASSIN BRESIAKU	25+195	25+345
ASSIN DANSAME	27+250	27+400
ASSIN ASEMPANAYE	28+650	28+800
ASSIN PRASO	30+645	30+830

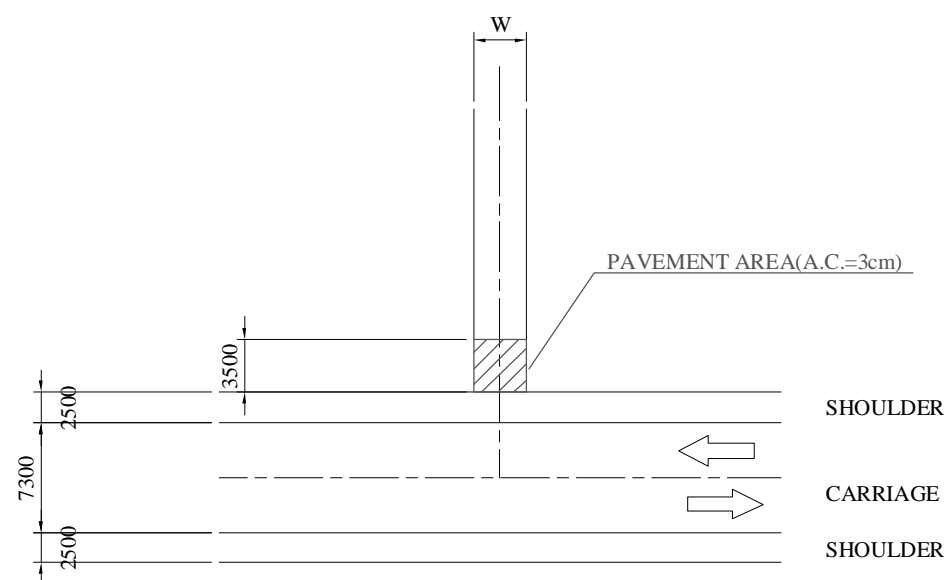
THREE-LEG INTERSECTIONS

SCALE A3 1:500

APPROACH TYPE

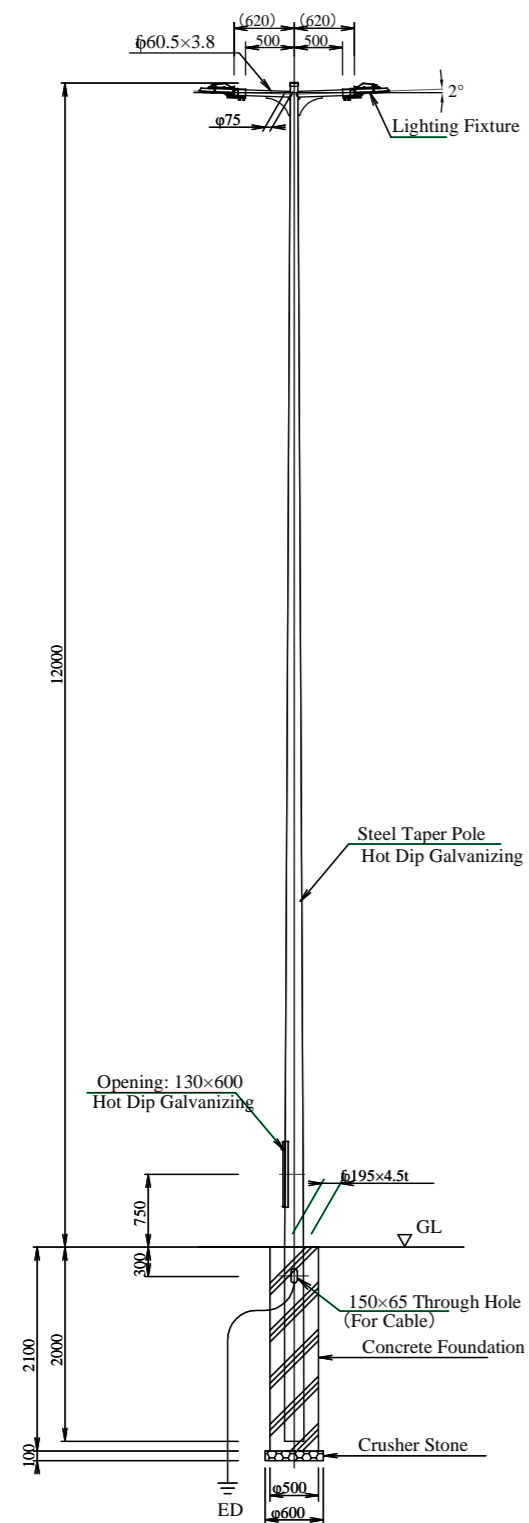


ENTRANCE TYPE

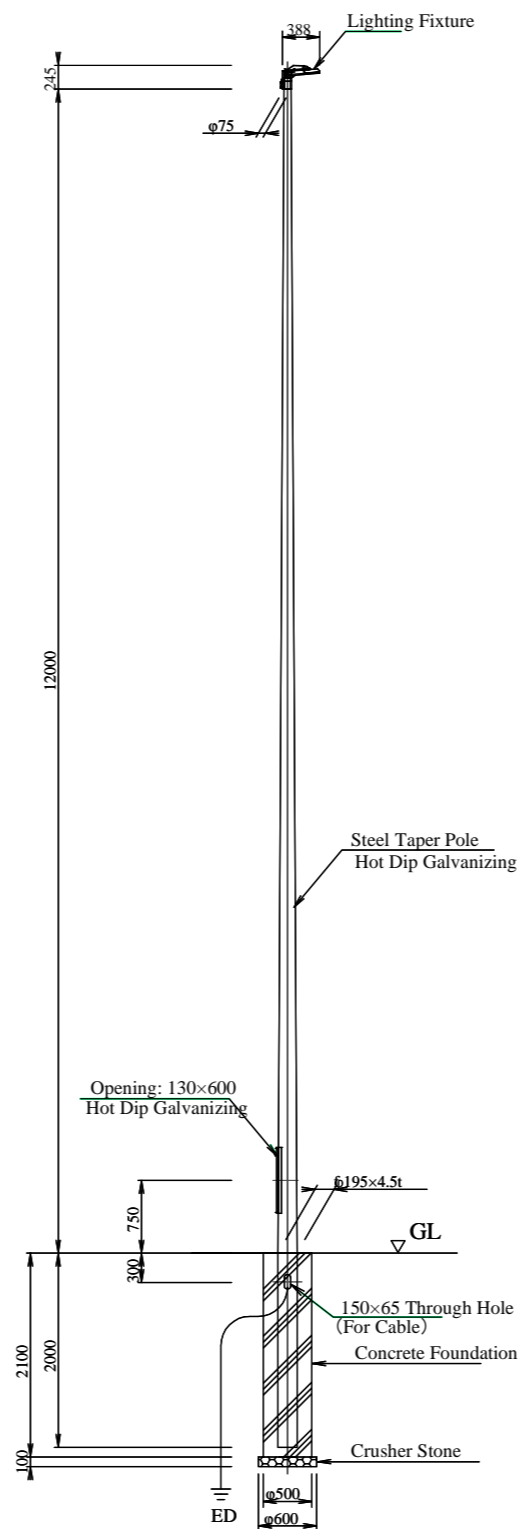


STREET LIGHTING

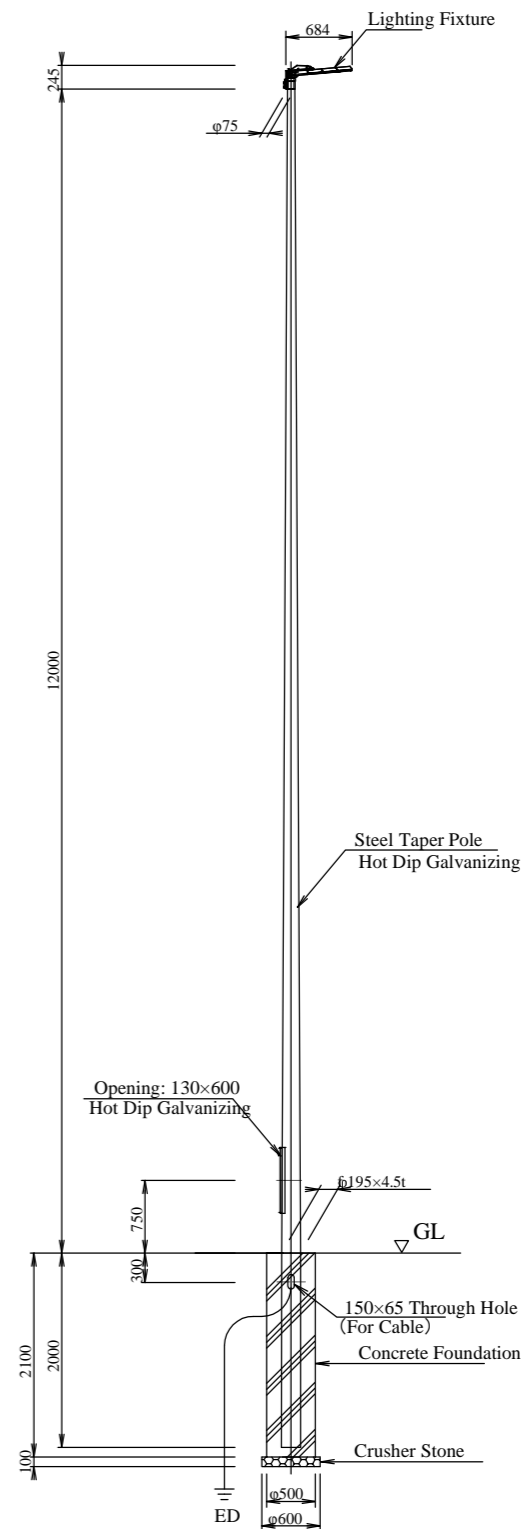
DUALISED FOUR-LANE SECTION
(AT THE CENTRE)



TWO-LANE SECTION
(AT ONE SIDE)
TOLL-PLAZA



INTERSECTION
(AT ROUNDABOUT)



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
STREET LIGHTING

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
57

ANCILLARY WORK

MONUMENT



MATERIAL LIST

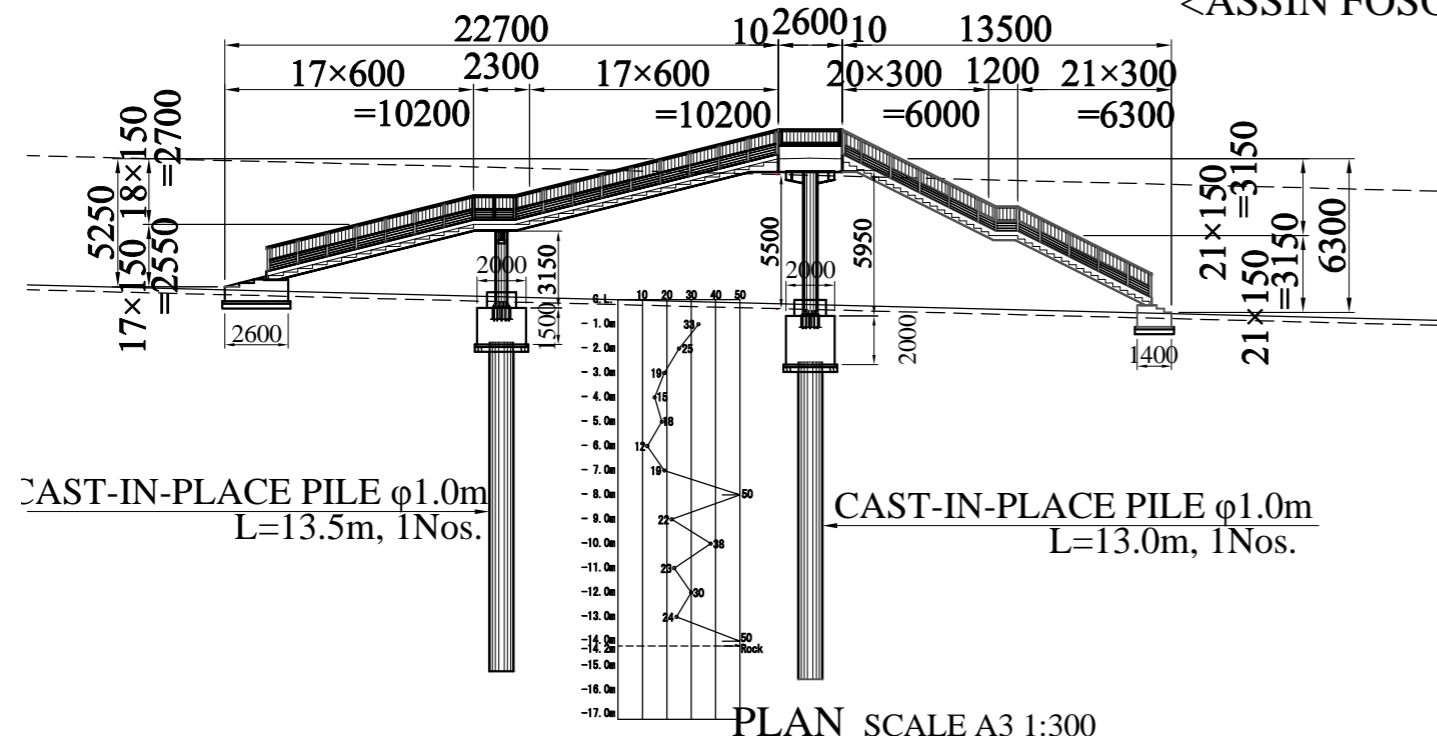
PER each

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
MONUMENT	W800 x H600	nos.	1.00	

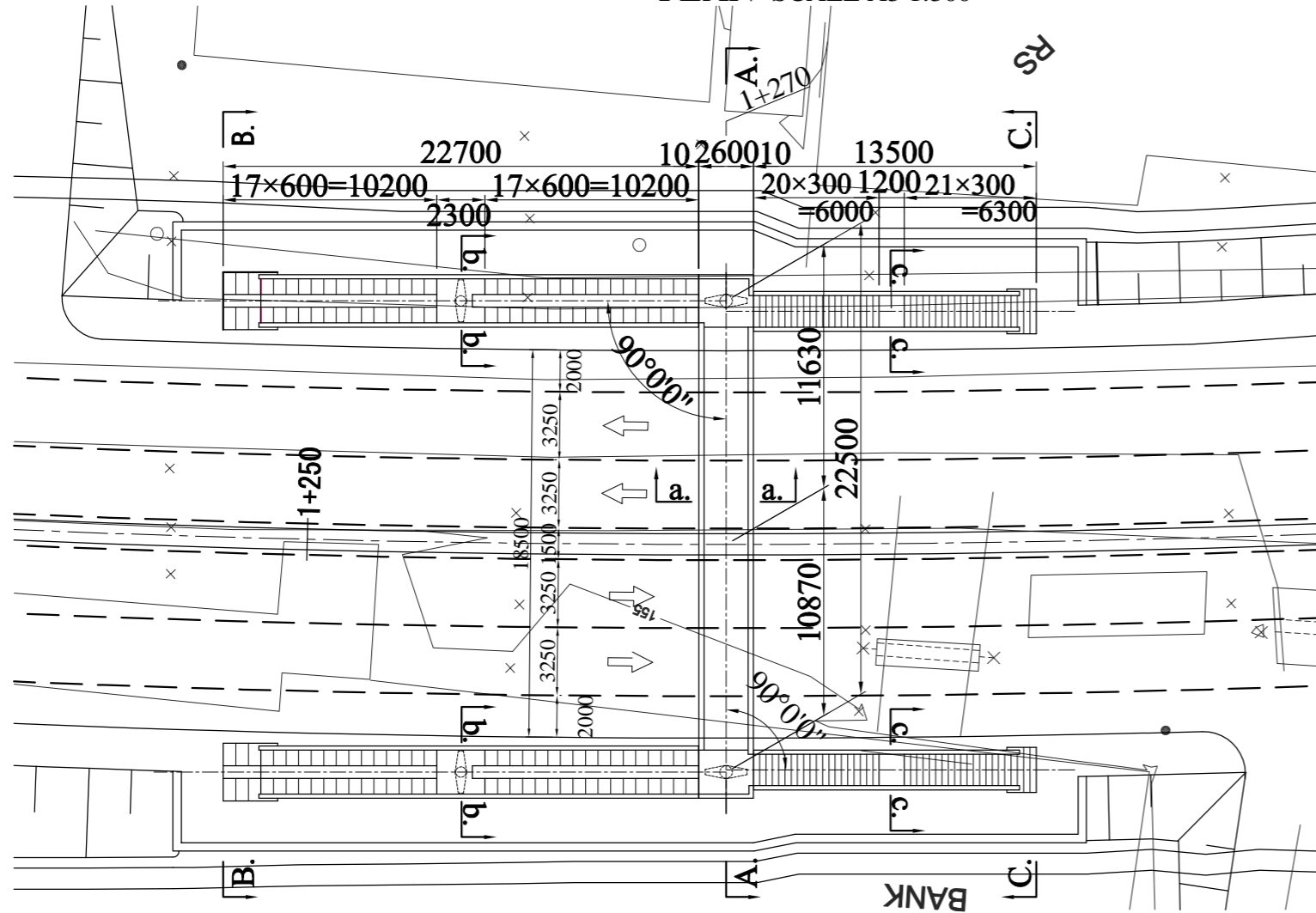
SIDE VIEW OF STAIRWAY
SCALE A3 1:300

PEDESTRIAN BRIDGE

<ASSIN FOSO NO.1+270>



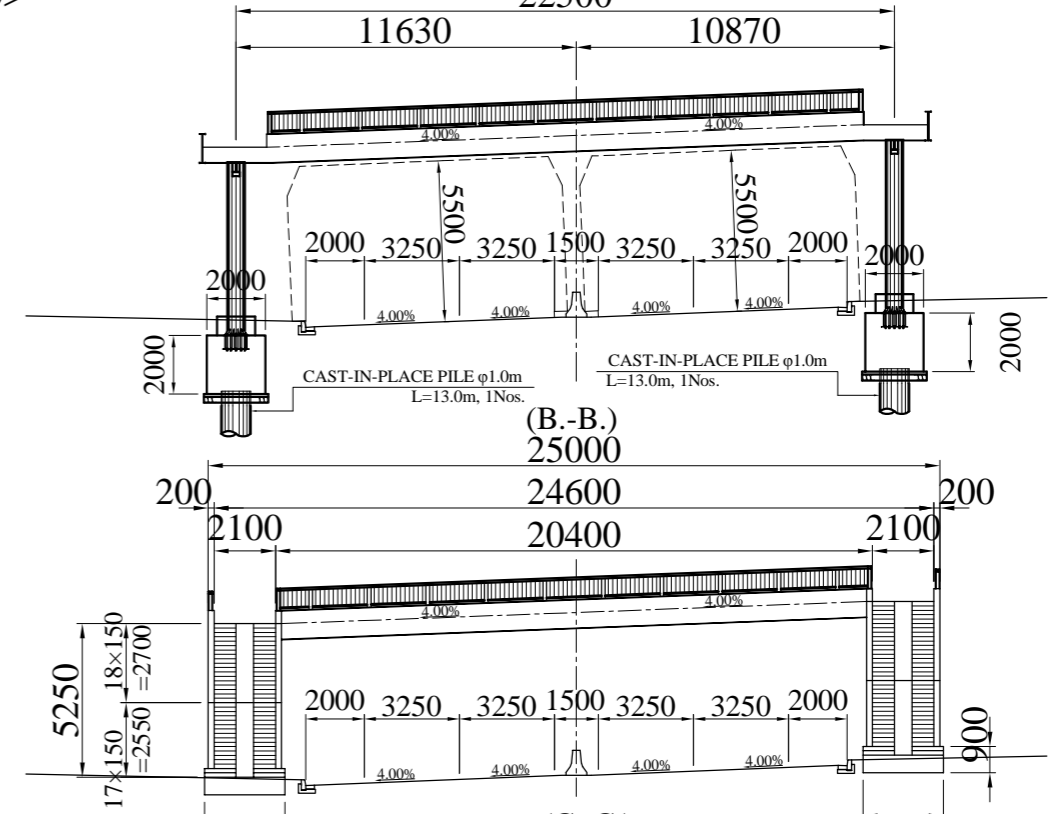
PLAN SCALE A3 1:300



SECTION SCALE A3 1:250

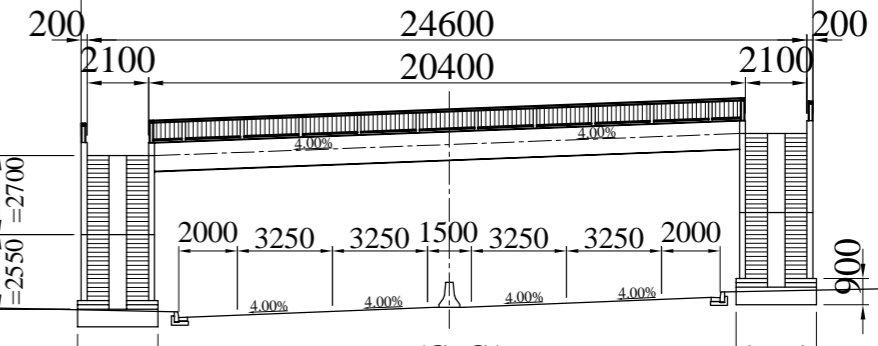
(A.-A.)

22500



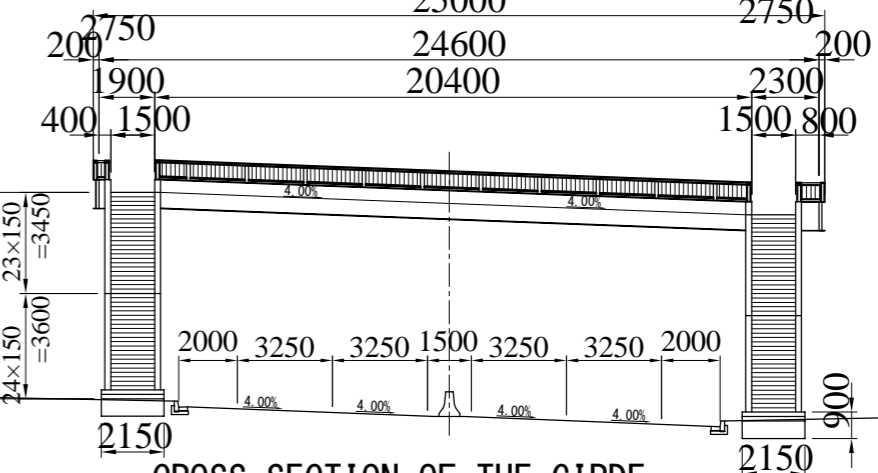
(B.-B.)

25000



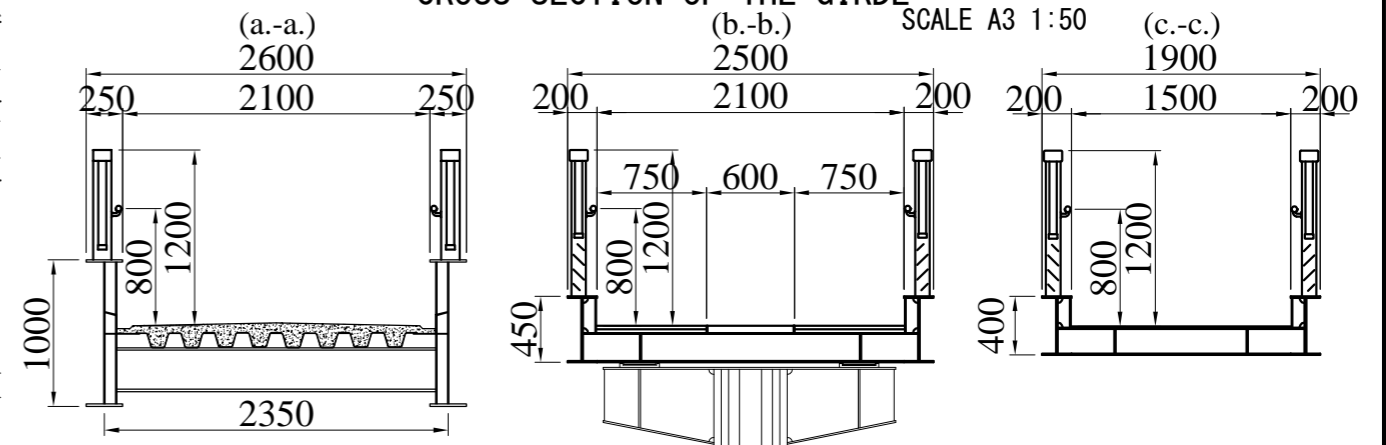
(C.-C.)

25000



CROSS SECTION OF THE GIRDE

SCALE A3 1:50



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
GENERAL VIEW
(Assin Foso Pedestrian bridge)

DATE:
PREPARED BY:
CHECKED BY:

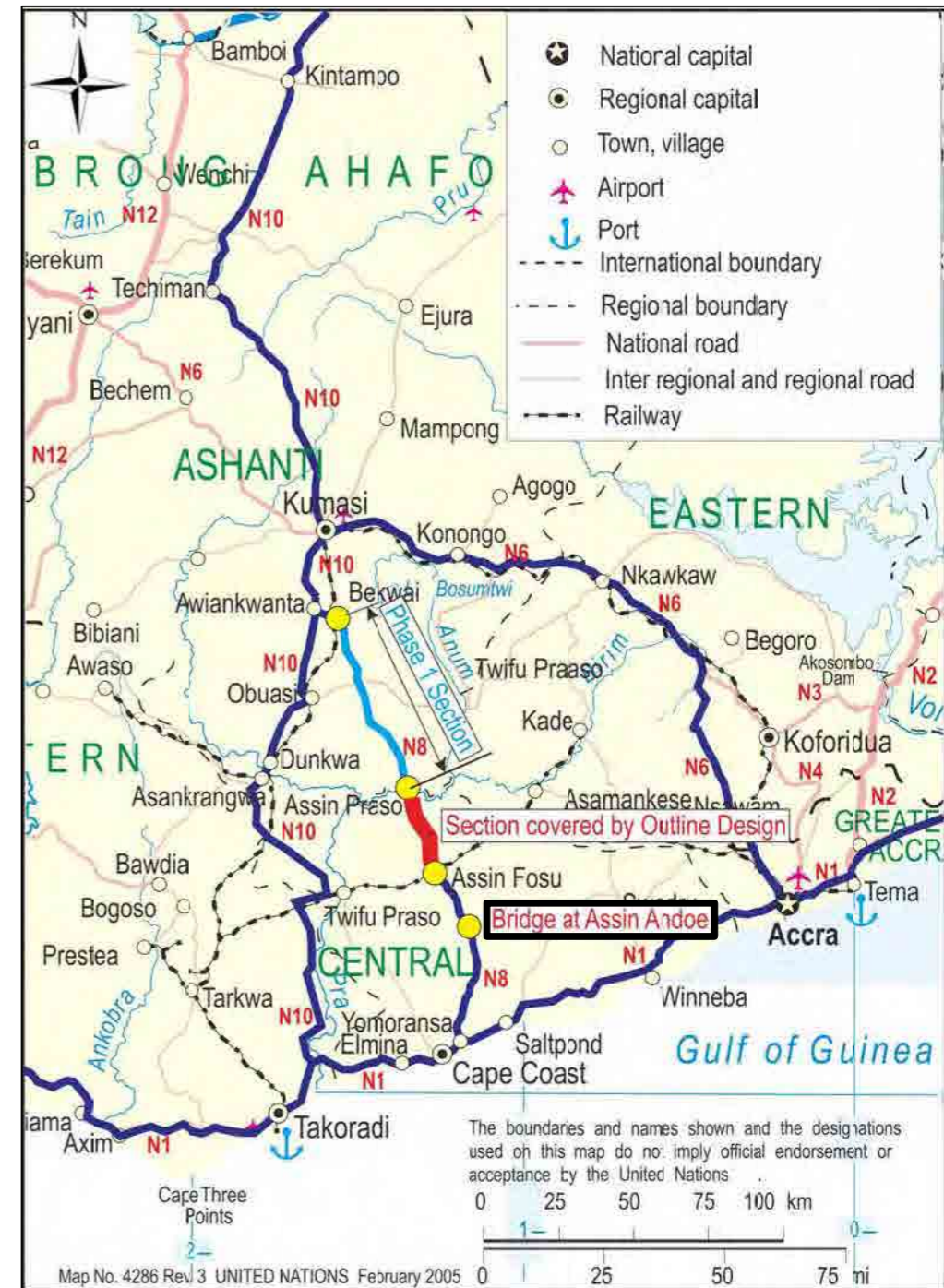
DRAWING No.:
59

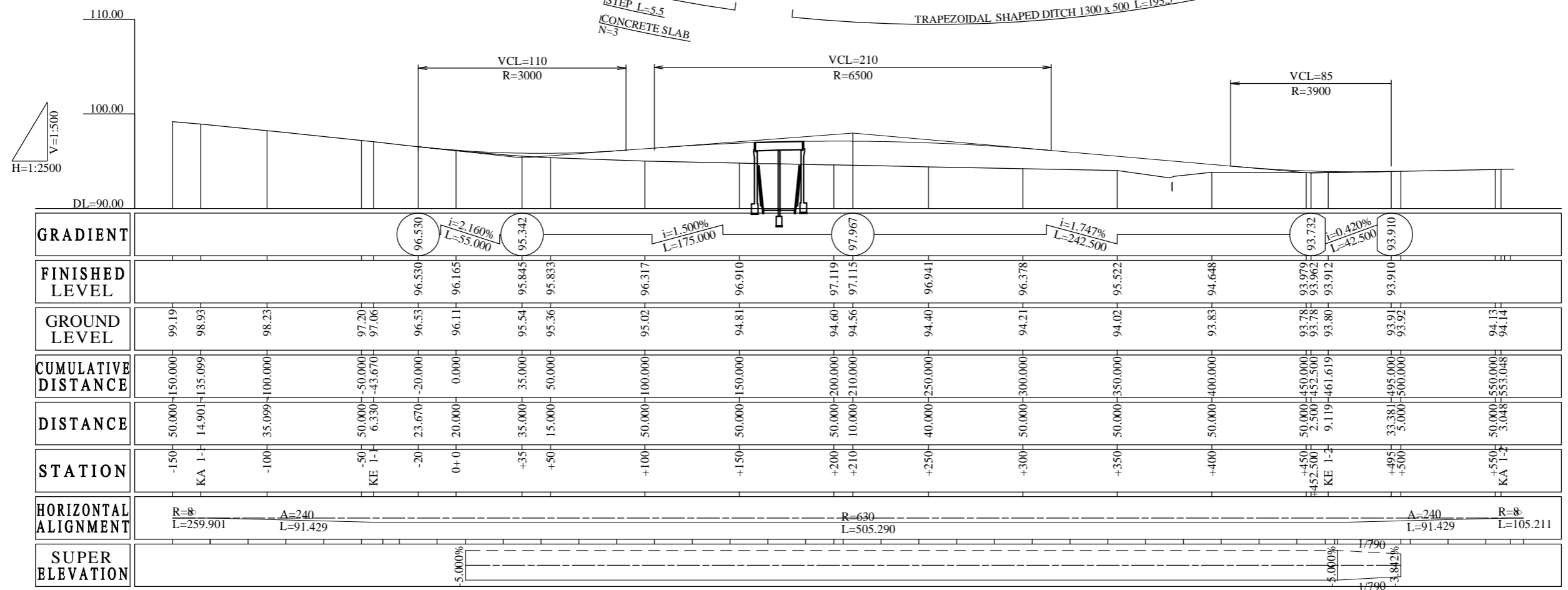
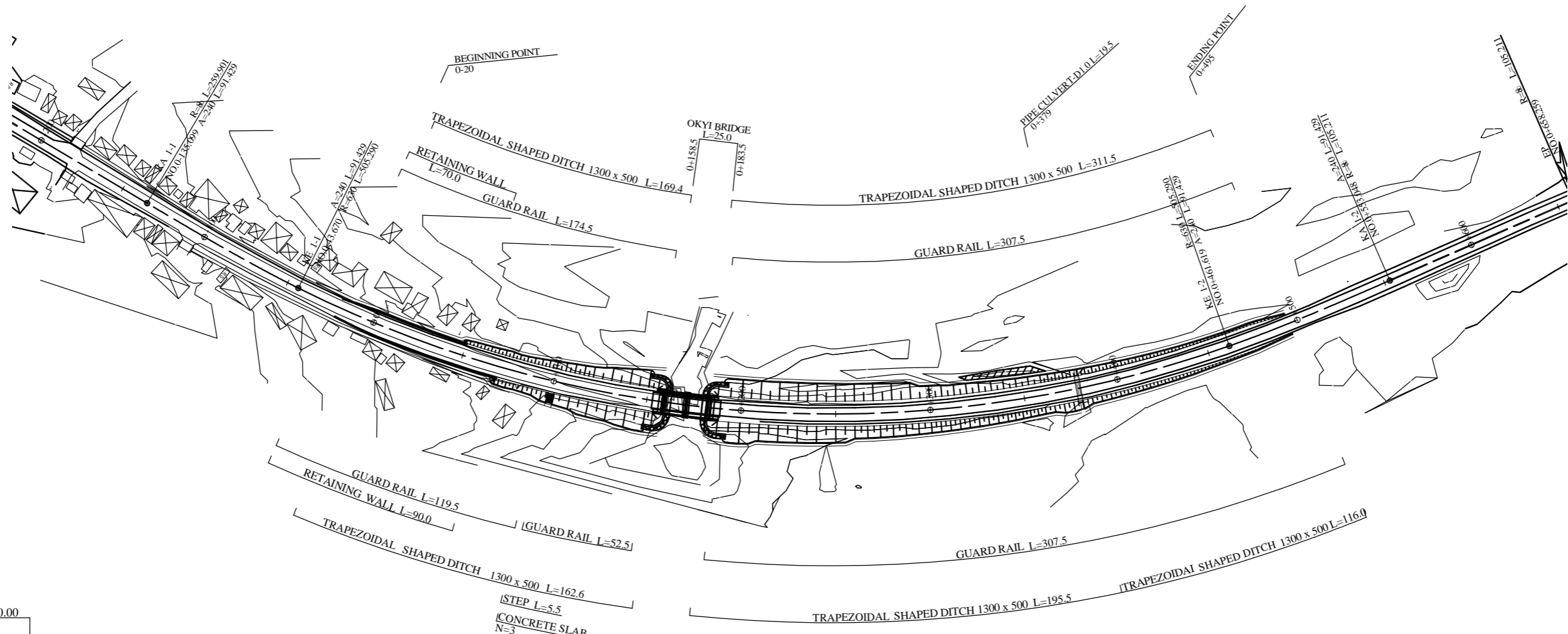
DRAWING TITLE

OKI RIVER BRIDGE REPLACEMENT AT ASSIN ANDOE

1. LOCATION MAP	.....	01
2. PLANS AND PROFILES	.....	02
3. TYPICAL CROSS SENTION	.....	03
4. GENERAL PLAN OF BRIDGE	.....	04
5. DRAINAGE STRUCTURE	.....	05 - 07
6. RETAINING WALL	.....	08
7. TRAFFIC SAFETY DEVICES	.....	09
8. STEP	.....	10
9. STREET LIGHTING	.....	11
10. DETOUR PLAN (REFERENCE)	.....	12 - 17

LOCATION MAP

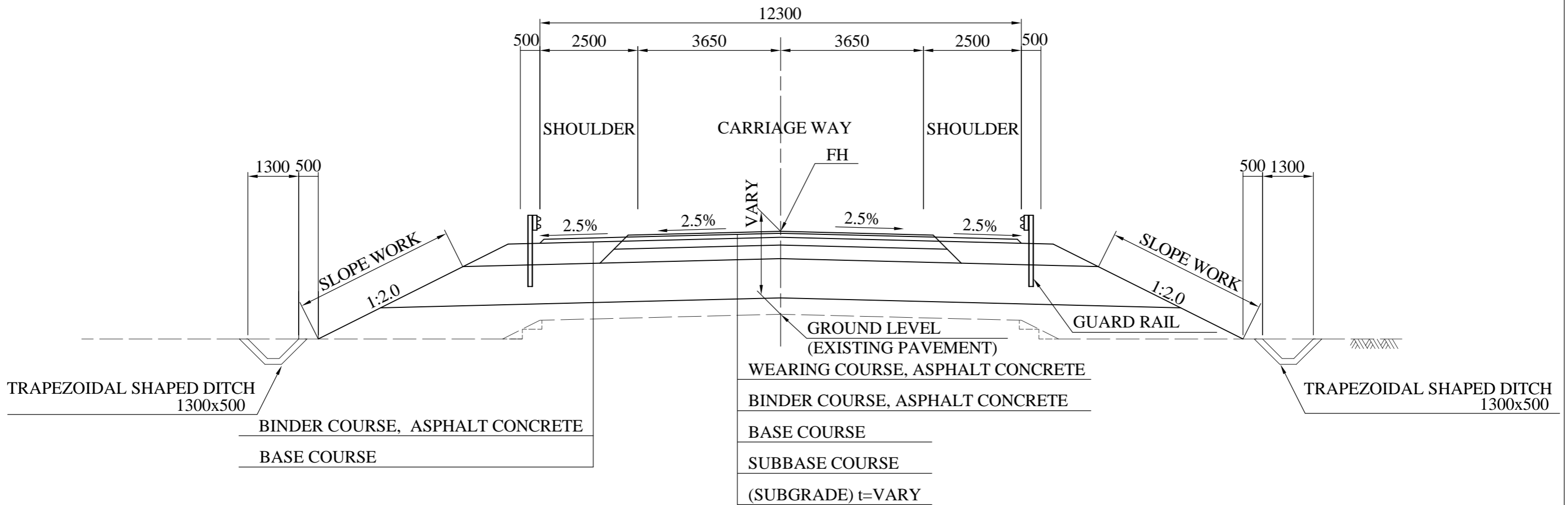




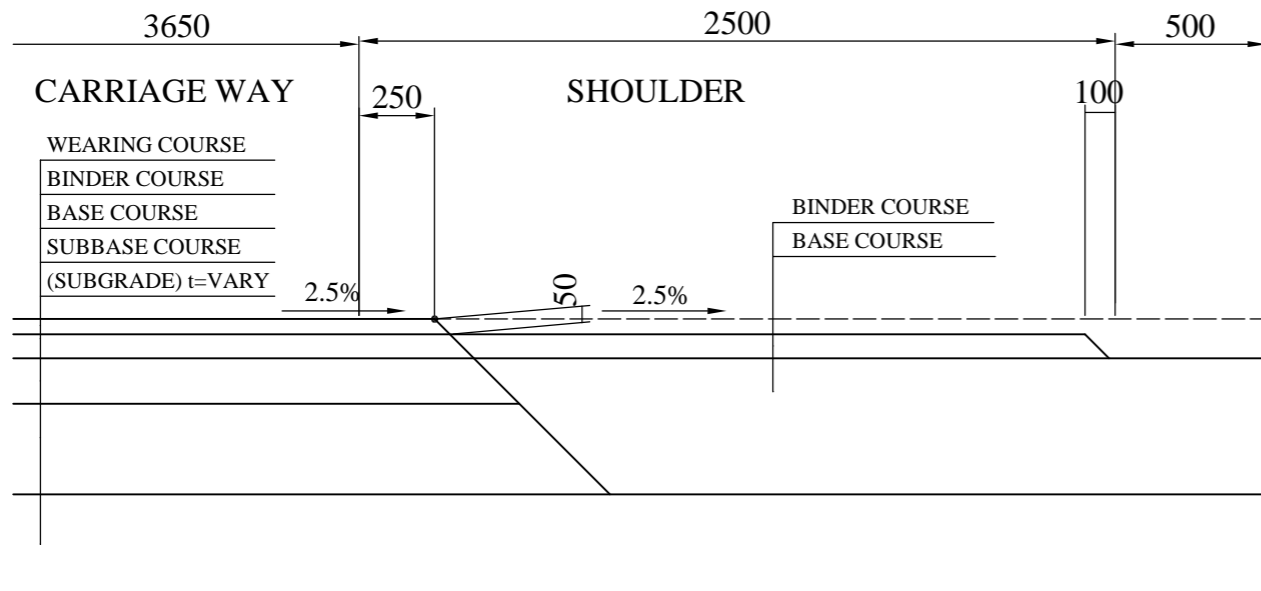
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 02
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	PLAN AND PROFILE (OKYI BRIDGE)	PREPARED BY:	
				CHECKED BY:	

TYPICAL CROSS SECTION

SCALE A3 1:100



EDGE OF PAVEMENT SCALE A3 1:25

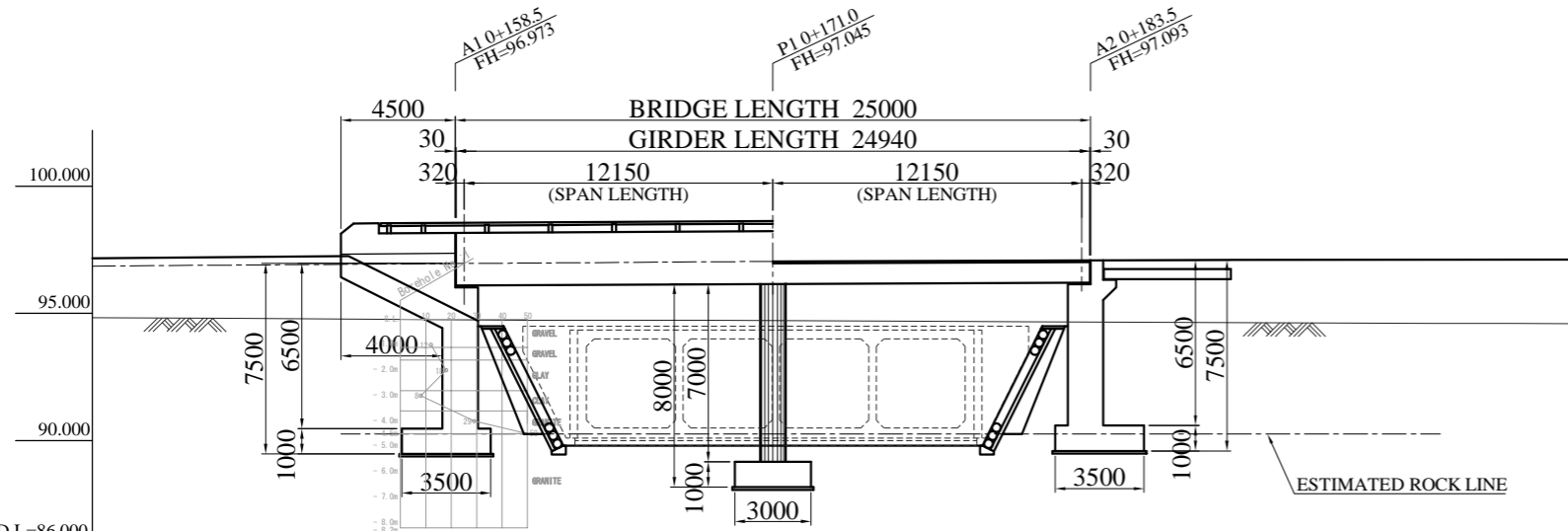


THICKNESS OF PAVEMENT LIST

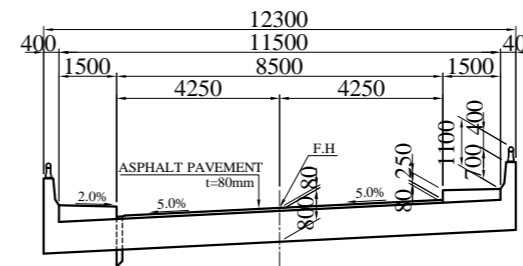
SECTION	STA.	CARRIAGE WAY				SHOULDER	
		WEARING (mm)	BINDER (mm)	BASE (mm)	SUBBASE (mm)	BINDER (mm)	BASE (mm)
RAISING (0-0.3m)	0-20 - 0+34 0+438 - 0+495	50	100	200	-	100	200
RAISING (0.3m-BRIDGE)	0+34 - 0+438	50	100	200	350	100	550

SIDE VIEW

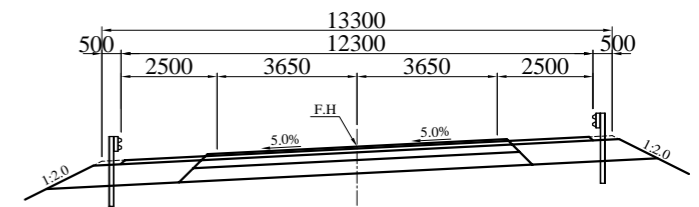
GENERAL PLAN OF BRIDGE (OKYI RIVER BRIDGE) SCALE A3 1:300



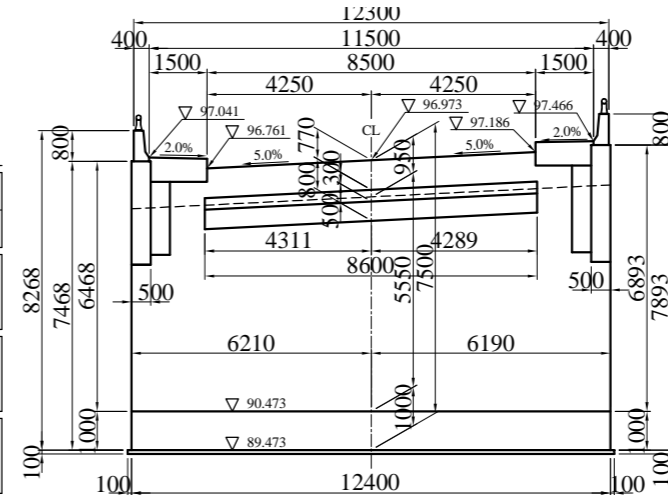
SECTION OF SUPERSTRUCTURE SCALE A3 1:200



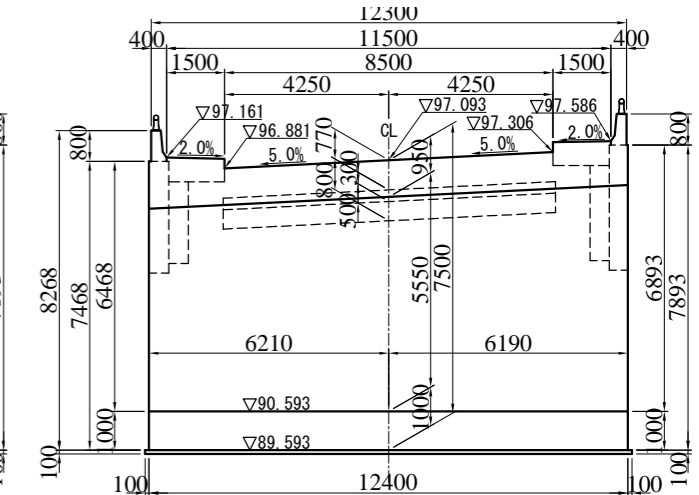
SECTION OF ROAD SCALE A3 1:200



SECTION OF A1 ABUTMENT SCALE A3 1:200

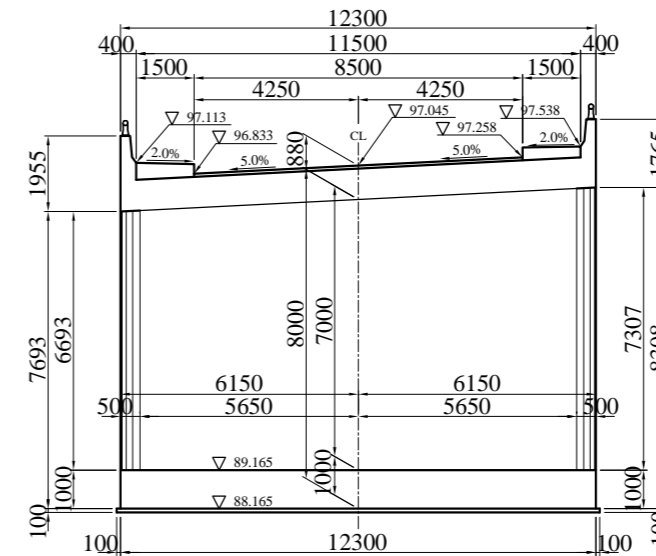


SECTION OF A2 ABUTMENT SCALE A3 1:200

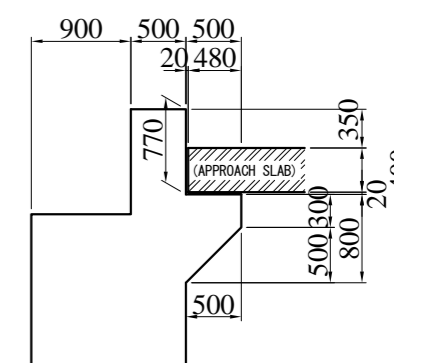


GRADIENT	95.342	$i=1.500\%$ $L=175.000$				(VCL=210.000) (R=6500)	97.967	$i=1.747\%$ $L=242.500$
DESIGN LEVEL		96.973	96.983	97.045	97.082	97.093		
GROUND HEIGHT		94.75	94.74	94.72	94.67	94.66		
DISTANCE		1.500	11.000	9.000	3.500			
STATION	0+35	A1 0+158.50	0+160	P1 0+171.0	0+180	A2 0+183.50	0+210	
ALIGNMENT		R=630.000m L=505.290m						

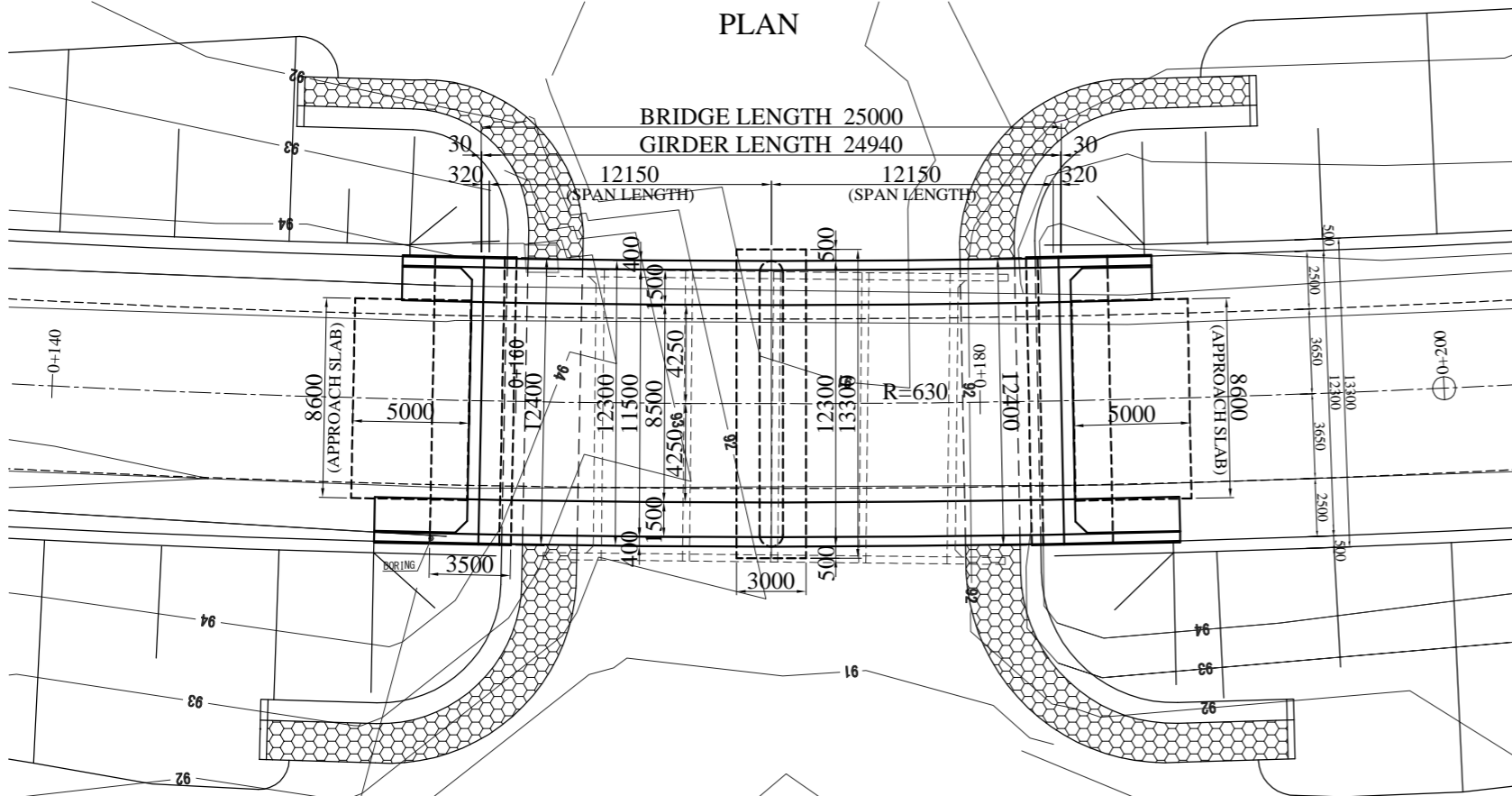
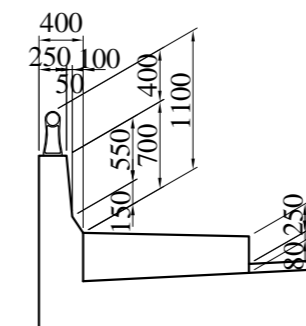
SECTION OF P1 PIER SCALE A3 1:200



DETAIL OF SUPPORT FOR APPROACH SLAB SCALE A3 1:70



DETAIL OF CONCRETE BARRIER CURB SCALE A3 1:70



DESIGN CONDITION	
TYPE OF BRIDGE	RC 2SPANS T-RAHMEN BRIDGE
BRIDGE LENGTH	25.000 m
GIRDER LENGTH	24.940 m
SPAN LENGTH	2@12.150 m
WIDTH OF BRIDGE	12.300 m
SKEW ANGLE	90°00'00"
LIVE LOAD	LIVE LOAD B (JAPANESE STANDARDS)

GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

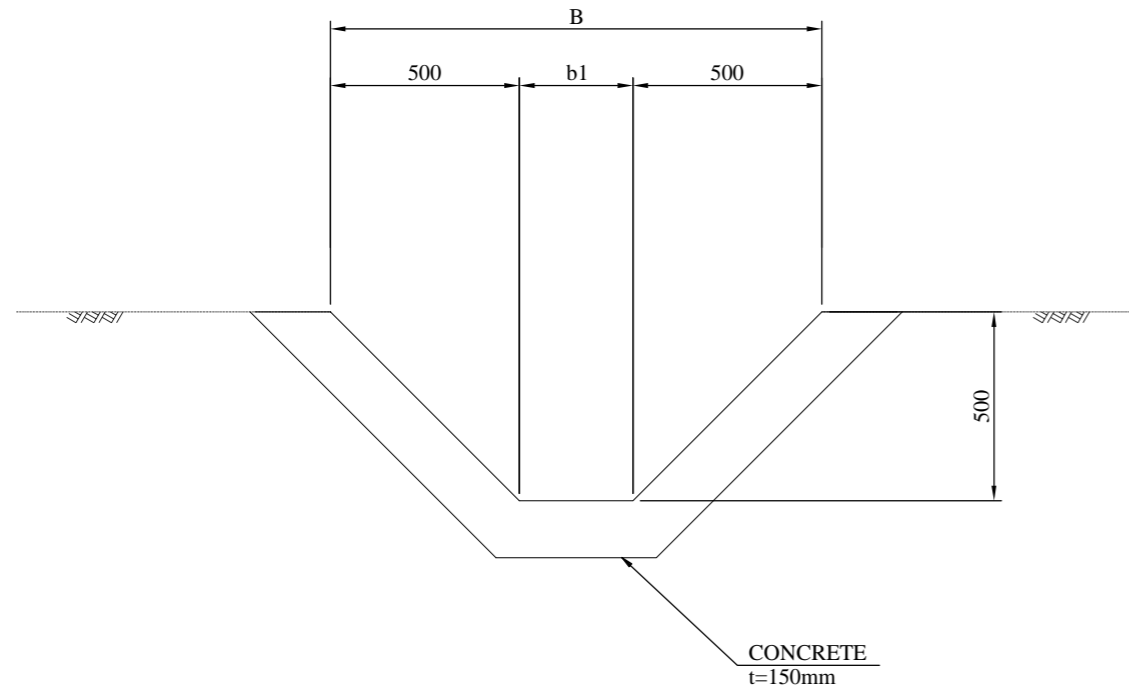
DRAWING TITLE:
GENERAL PLAN OF BRIDGE
(OKYI RIVER BRIDGE)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
04

DRAINAGE STRUCTURE (1) SCALE A3 1:20

TRAPEZOIDAL SHAPED DITCH 1300x500 1500x500



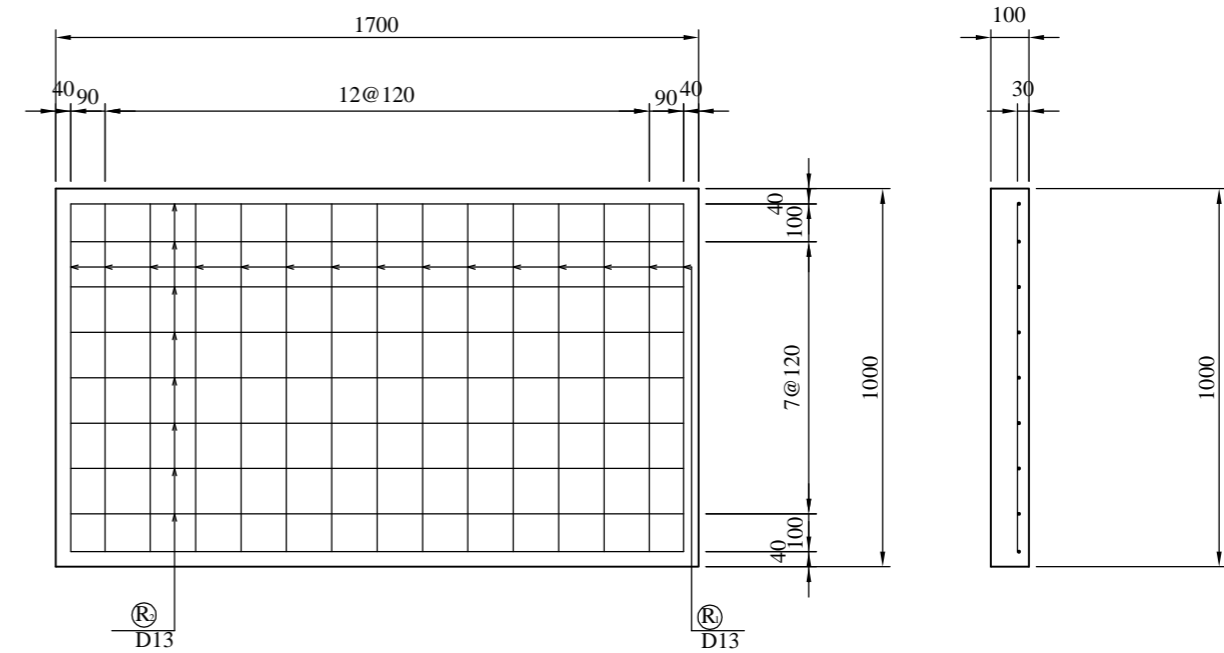
DIMENSION LIST

BxH	B	b1
1300x500	1300	300
2000x500	2000	1000

MATERIAL LIST

ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			1300 x 500	2000 x 500	
CONCRETE		cu.m	0.30	0.40	

CONCRETE SLAB

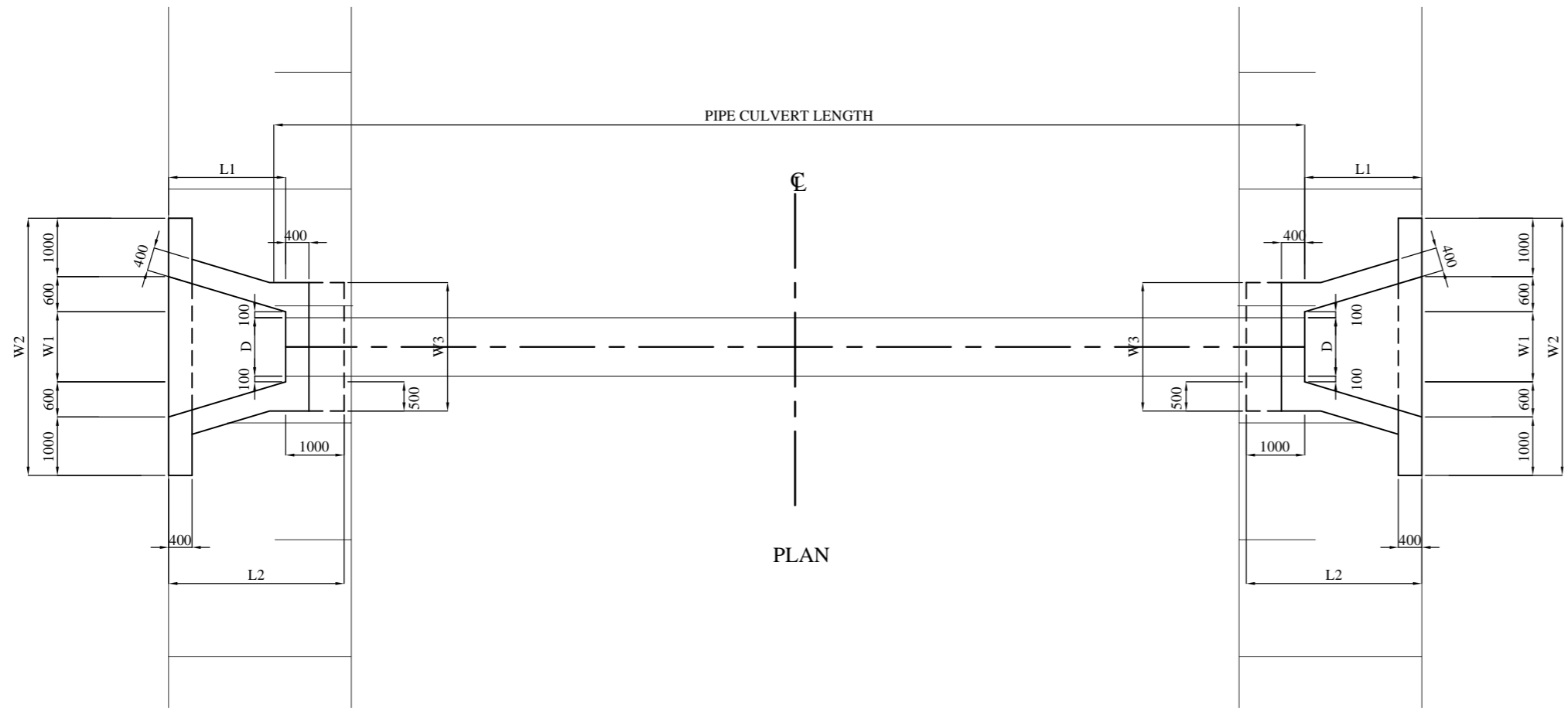


MATERIAL LIST

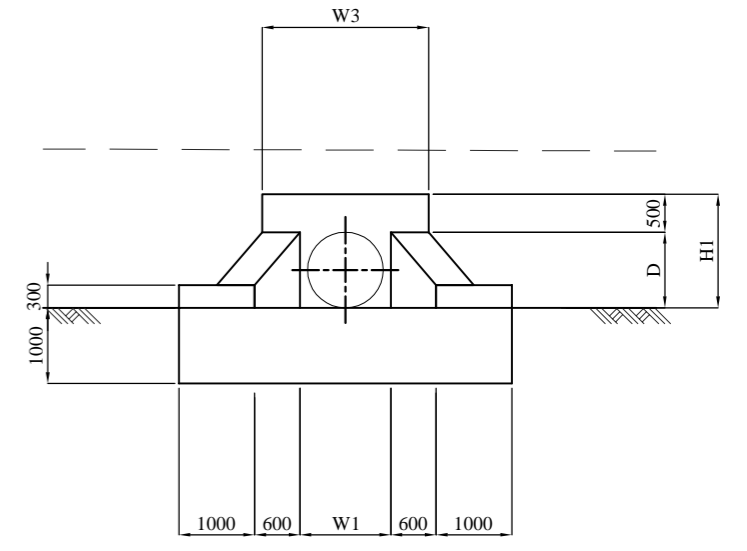
ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			PER nos		
CONCRETE		cu.m	0.17		
FORM		sq.m	0.54		
REINFORCING BAR	D13	kg	28.24		

DRAINAGE STRUCTURE (2) SCALE A3 1:100

INLET OUTLET (SINGLE CELL TYPE)



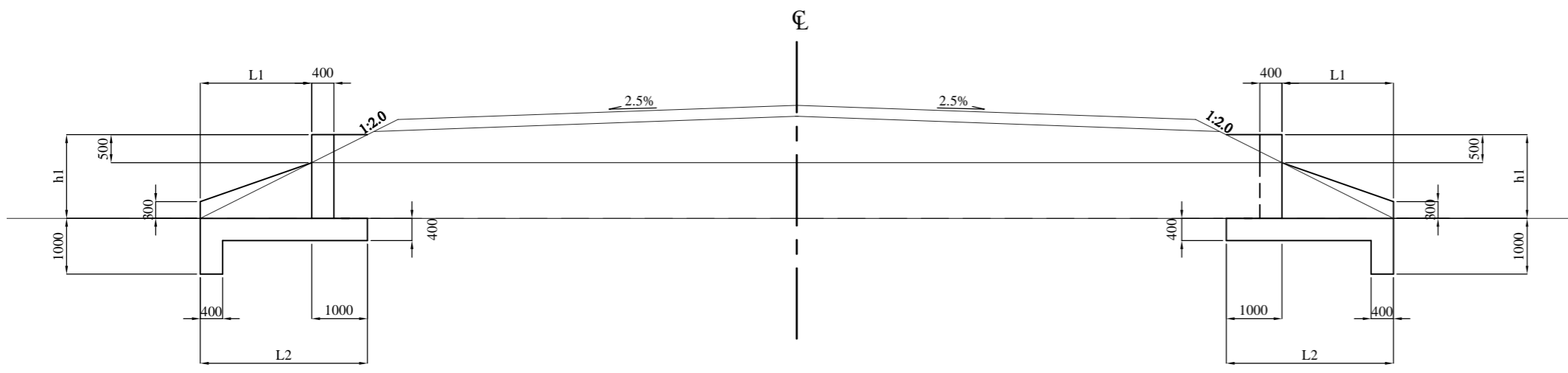
PLAN



ELEVATION

DIMENSION LIST

D	L1	L2	W1	W2	W3	H1
1000	2000	3000	1200	4400	2200	1500



SECTION

INLET

OUTLET

MATERIAL LIST (INLET OUTLET)

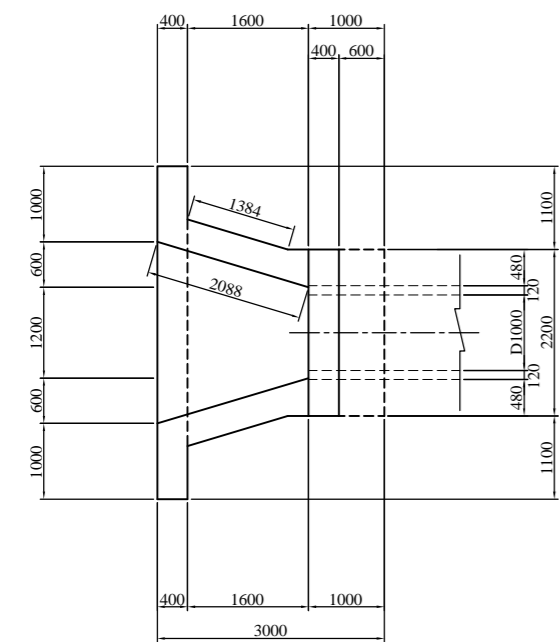
ITEM	STANDARD	UNIT	QUANTITY	REMARKS
			D1000	
CONCRETE		cu.m	6.33	
FORM		sq.m	19.88	
REINFORCING BAR	D13	kg	194.70	

PER each

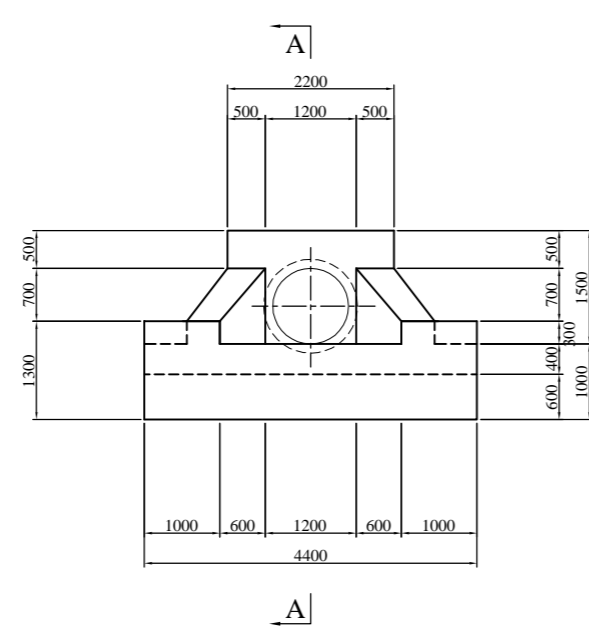
GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 06
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	DRAINAGE STRUCTURE (2) (OKYI BRIDGE)	PREPARED BY:	
				CHECKED BY:	

DRAINAGE STRUCTURE (3) SCALE A3 1:100

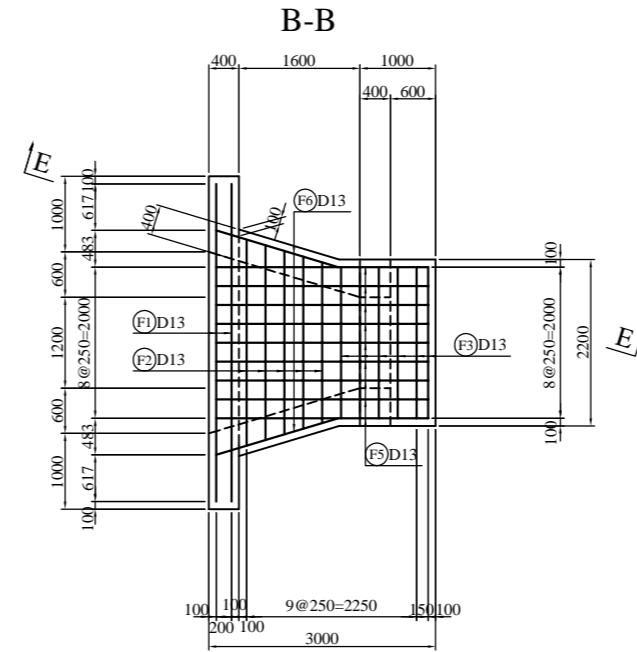
DETAIL OF INLET OUTLET (SINGLE CELL TYPE)



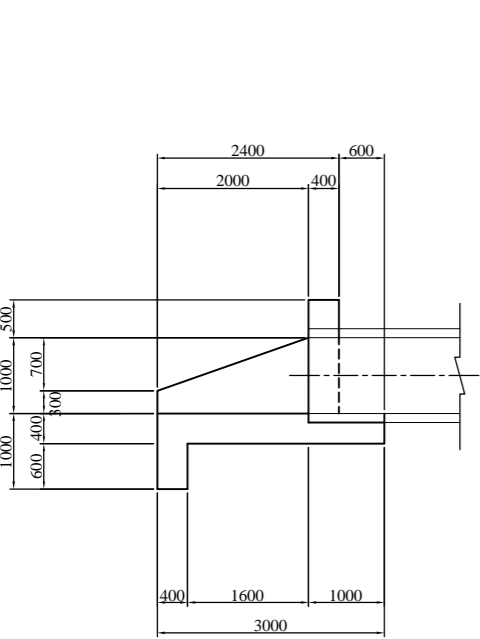
Plan



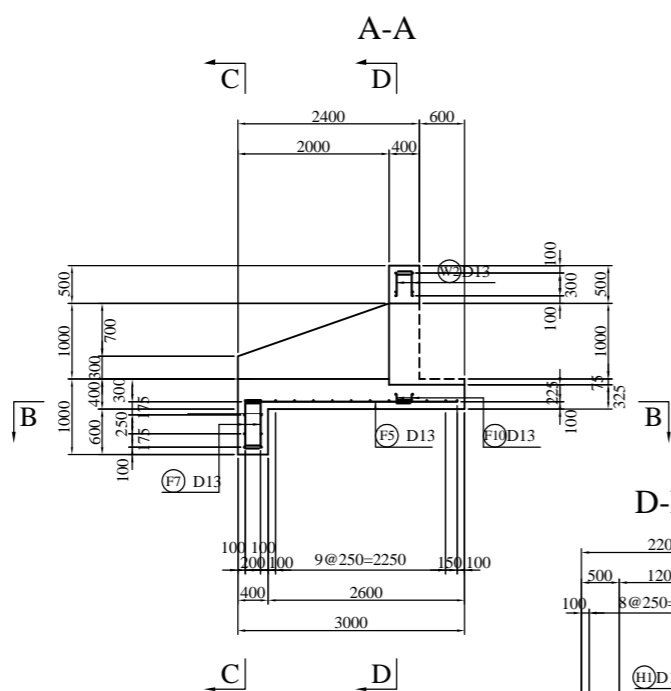
Elevation



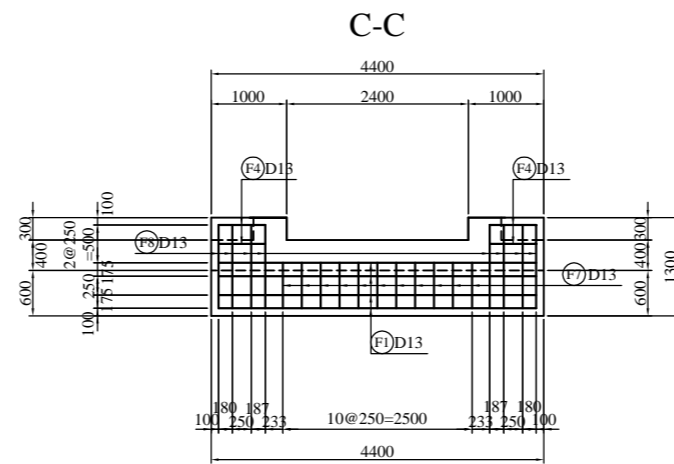
B-B



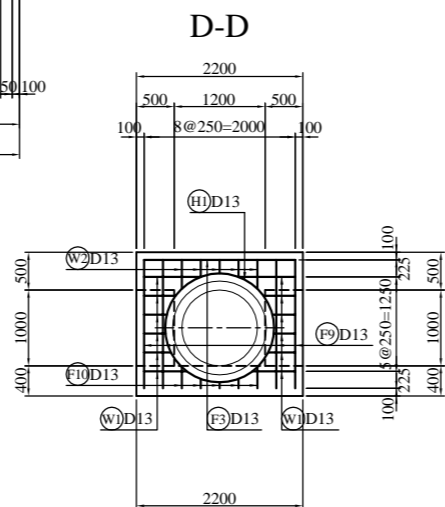
Profile



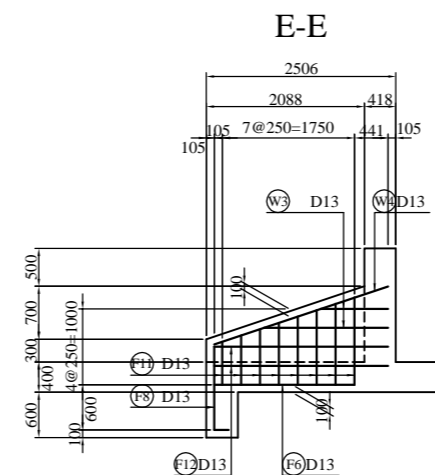
A-A



C-C



D-D

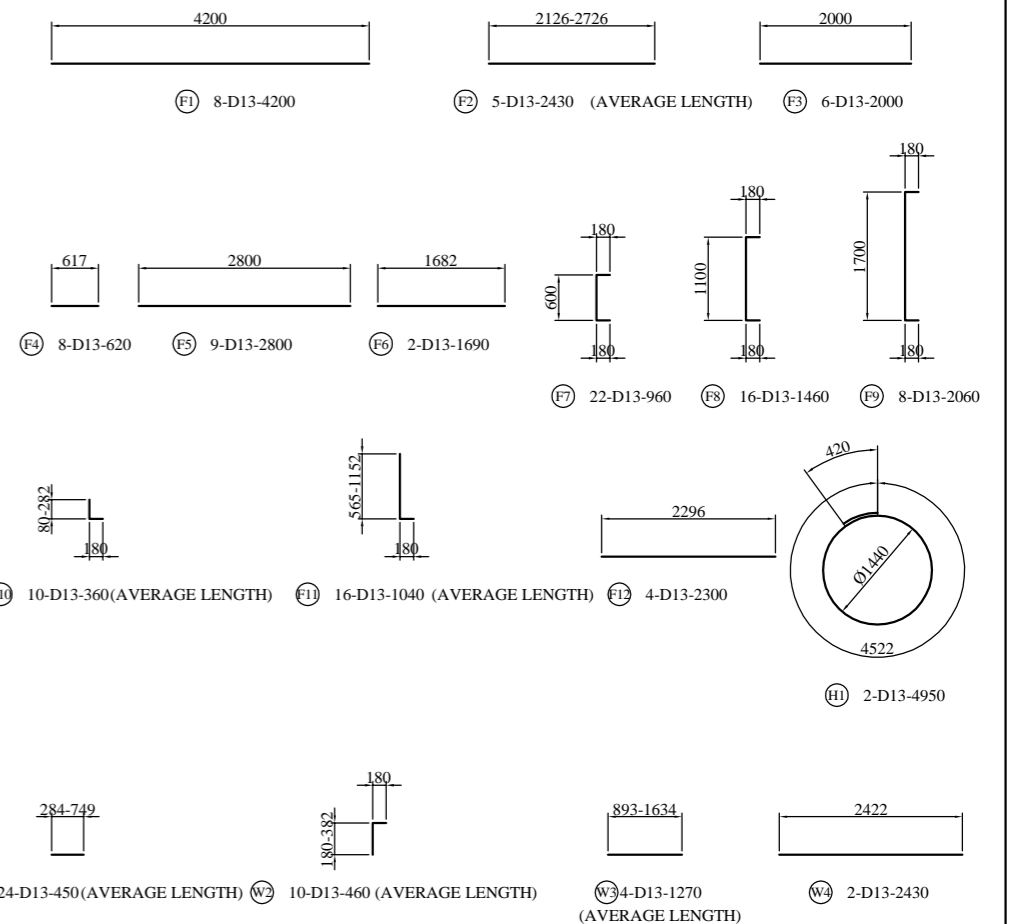


E-E

Bar arrangement (Inlet Outlet)

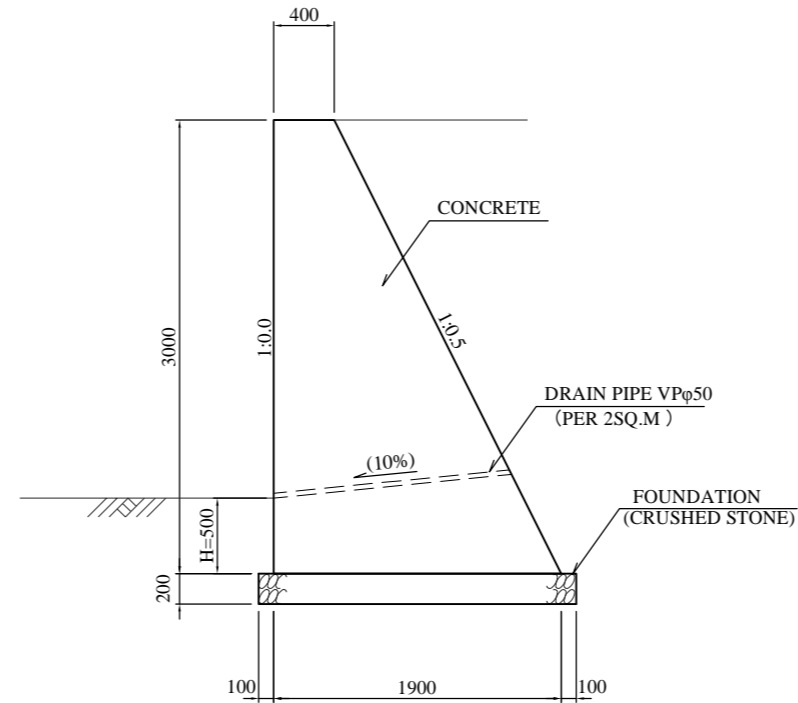
List of Bars

Items	Dia	Length (mm)	Unit	kg/m	Kg/Unit	Mass (kg)	Remarks
F1	D13	4200	8	0.995	4.179	12.2	—
F2	D13	2430	5	0.995	2.418	12.1	— (AVE.L)
F3	D13	2000	6	0.995	1.990	11.9	—
F4	D13	620	8	0.995	0.617	4.9	—
F5	D13	2800	9	0.995	2.786	25.1	—
F6	D13	1690	2	0.995	1.682	3.4	—
F7	D13	960	22	0.995	0.955	21.0	┌
F8	D13	1460	16	0.995	1.453	23.2	┌
F9	D13	2060	8	0.995	2.050	16.4	┌
F10	D13	360	10	0.995	0.358	3.6	┌ (AVE.L)
F11	D13	1040	16	0.995	1.035	16.6	┌ (AVE.L)
F12	D13	2300	4	0.995	2.289	9.2	—
W1	D13	450	24	0.995	0.448	10.7	— (AVE.L)
W2	D13	460	10	0.995	0.458	4.6	┌ (AVE.L)
W3	D13	1270	4	0.995	1.264	5.1	— (AVE.L)
W4	D13	2430	2	0.995	2.418	4.8	—
H1	D13	4950	2	0.995	4.925	9.9	○
						D13	194.7 kg
						Total	194.7 kg



RETAINING WALL SCALE AS SHOWN

GRAVITY TYPE RETAINING WALL SCALE A3 1:50



MATERIAL LIST (GRAVITY WALL)

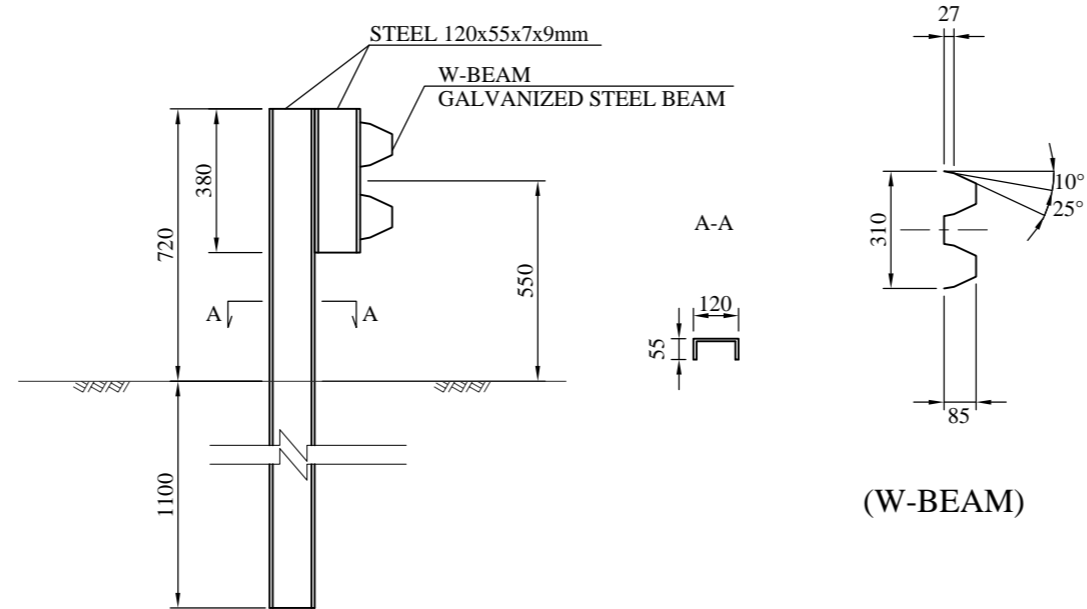
ITEM	STANDARD	UNIT	QUANTITY	REMARKS
CONCRETE		cu.m	3.45	
FORM		sq.m	6.35	
FOUNDATION	CRUSHED STONE	cu.m	0.42	
DRAIN PIPE	VP φ50	m	1.98	

PER m

TRAFFIC SAFETY STRUCTURE TRAFFIC FURNITURE

SCALE A3 1:20

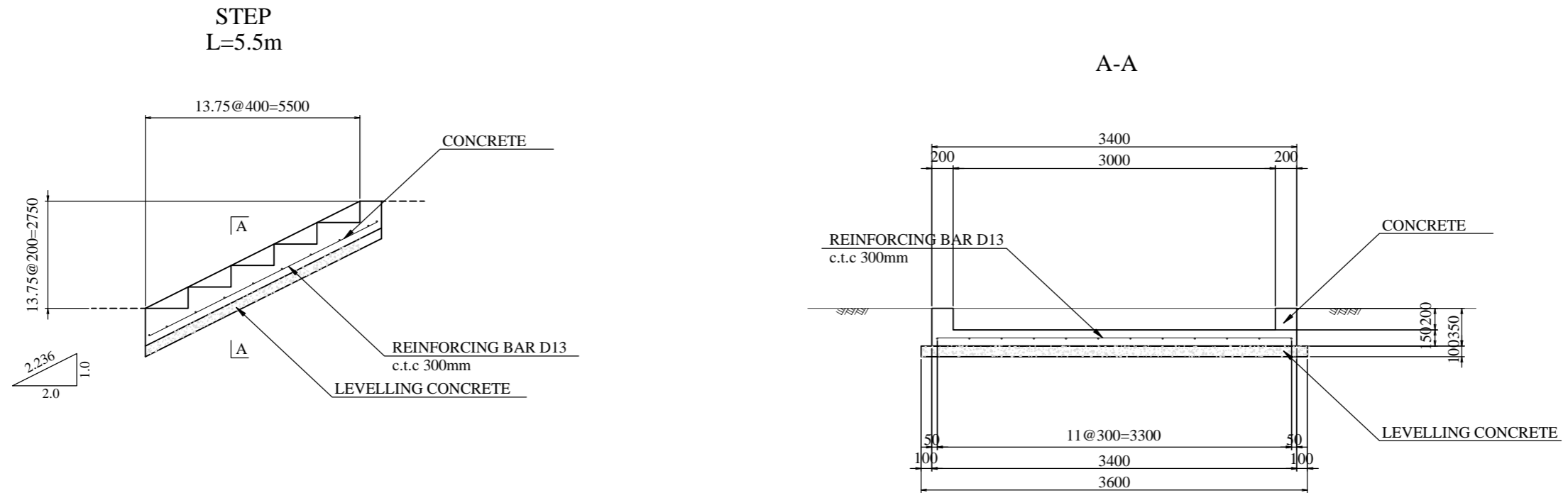
GUARD RAIL



MATERIAL LIST (GUARD RAIL)

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
GUARD RAIL		m	1.00	

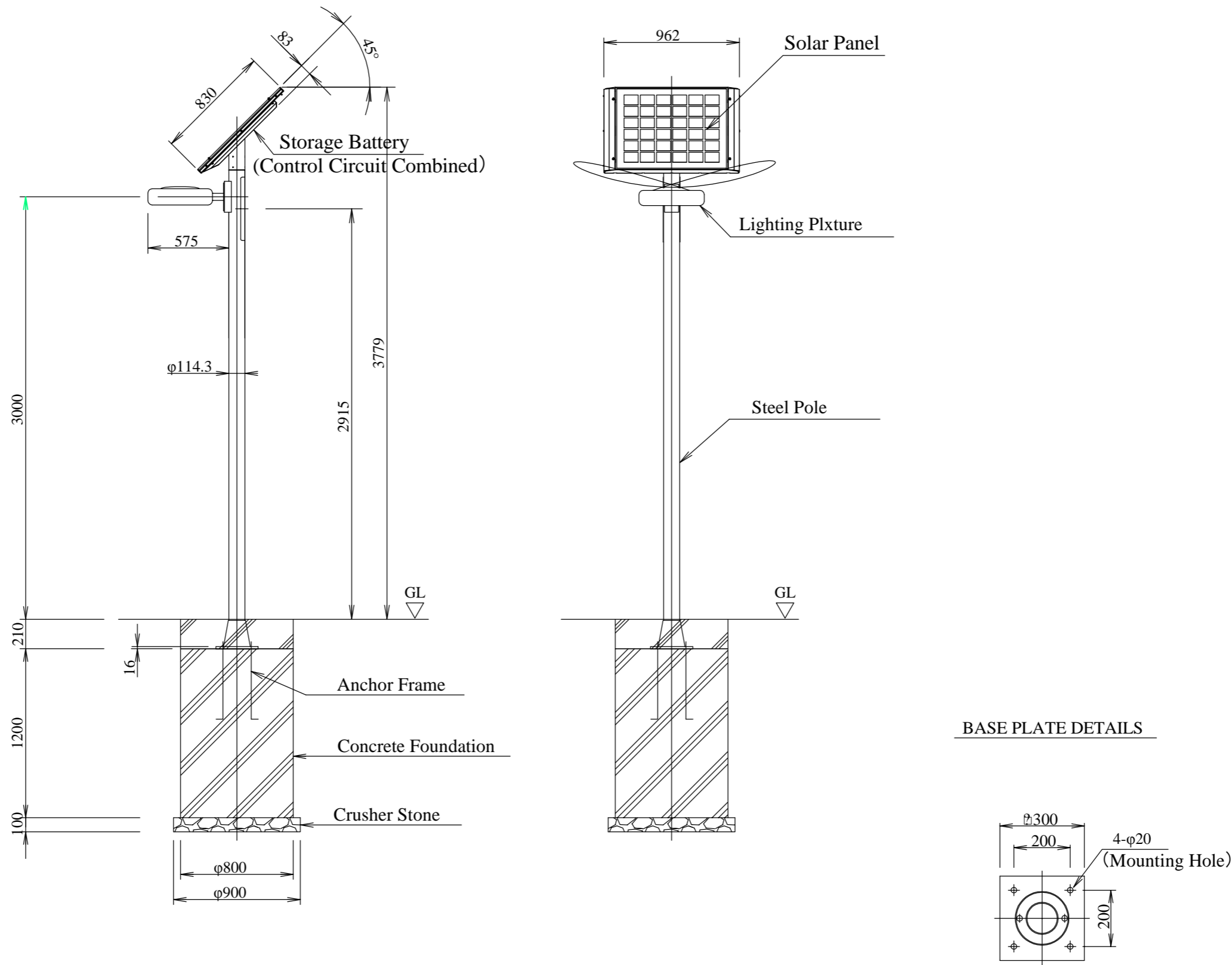
STEP SCALE A3 1:50



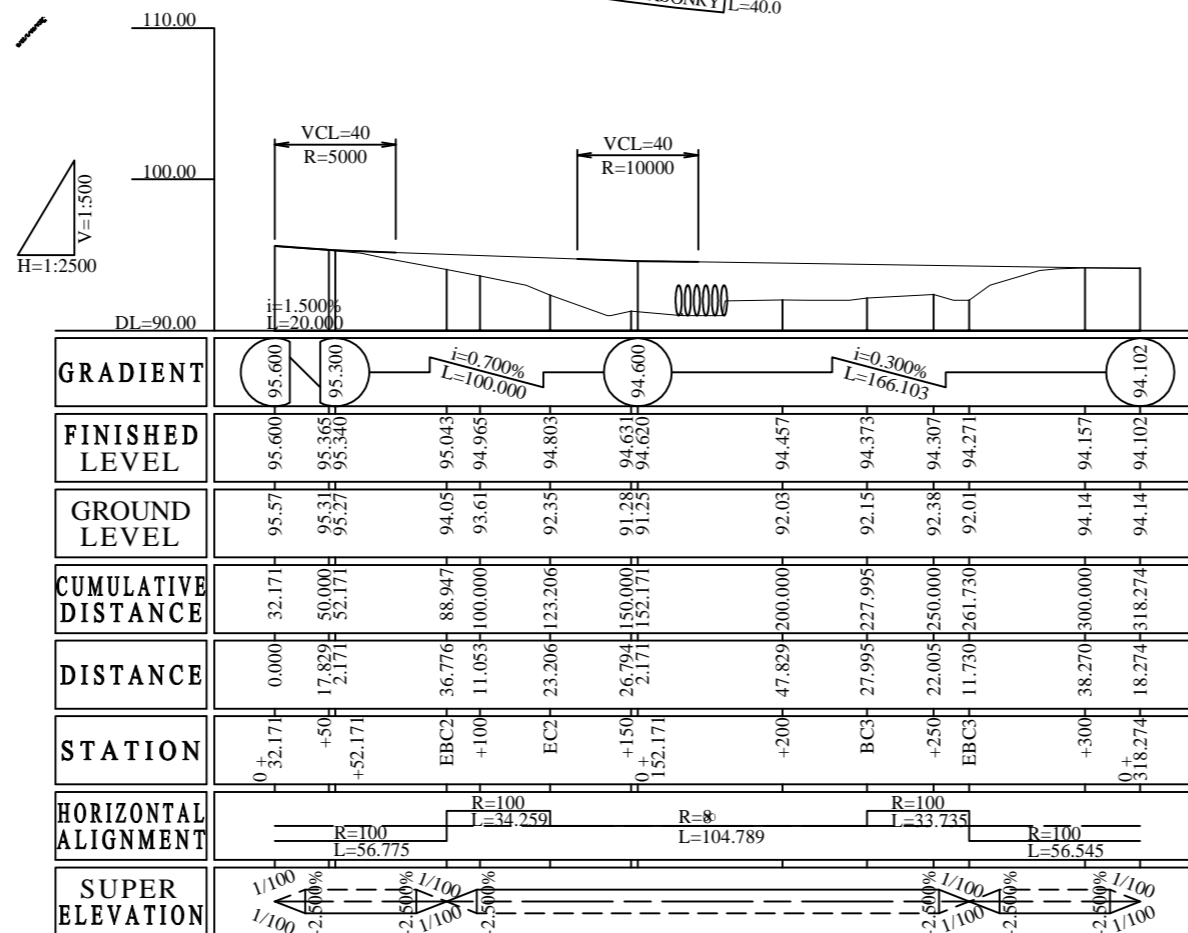
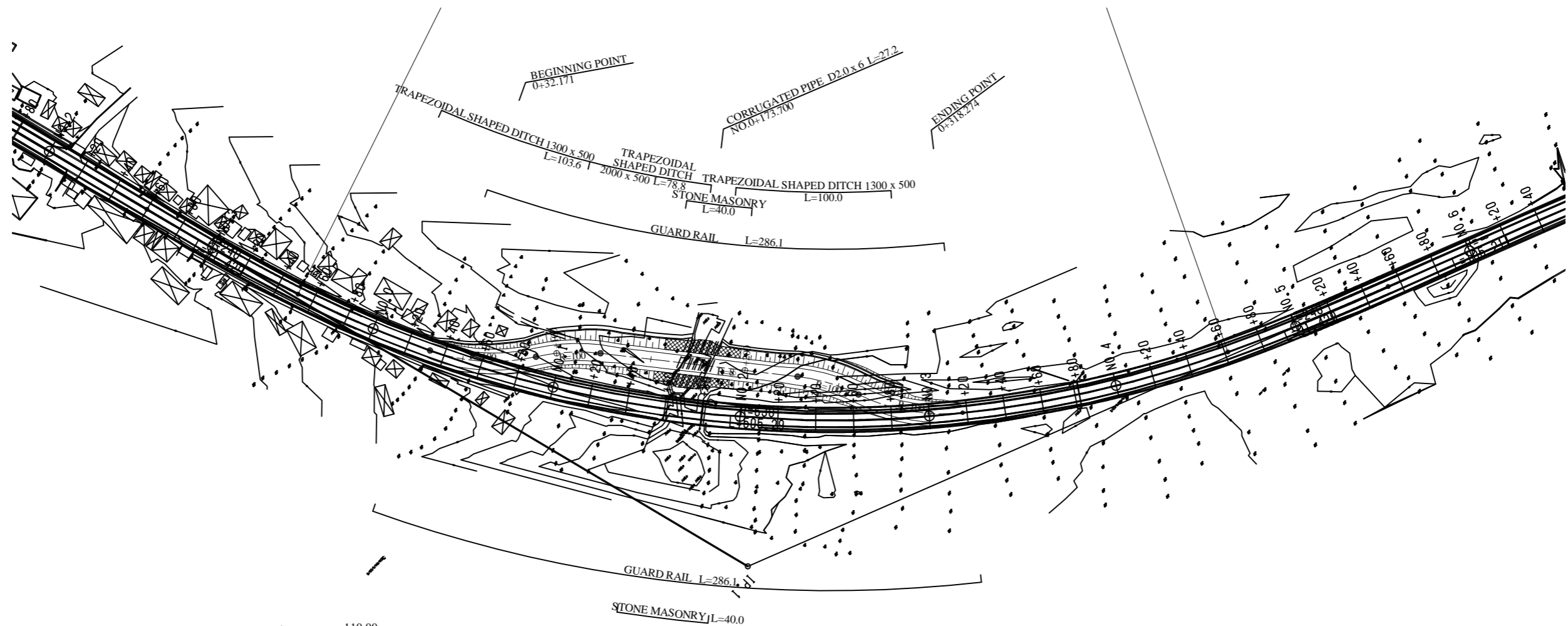
MATERIAL LIST (STEP) PER each

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
CONCRETE		cu.m	4.90	
FORM		sq.m	13.20	
REINFORCING BAR	D13	kg	142.37	
LEVELING Co		cu.m	1.98	
FORM	LEVELING Co	cu.m	1.82	

STREET LIGHTING



GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 11
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	(OKYI BRIDGE)	PREPARED BY:	
				CHECKED BY:	

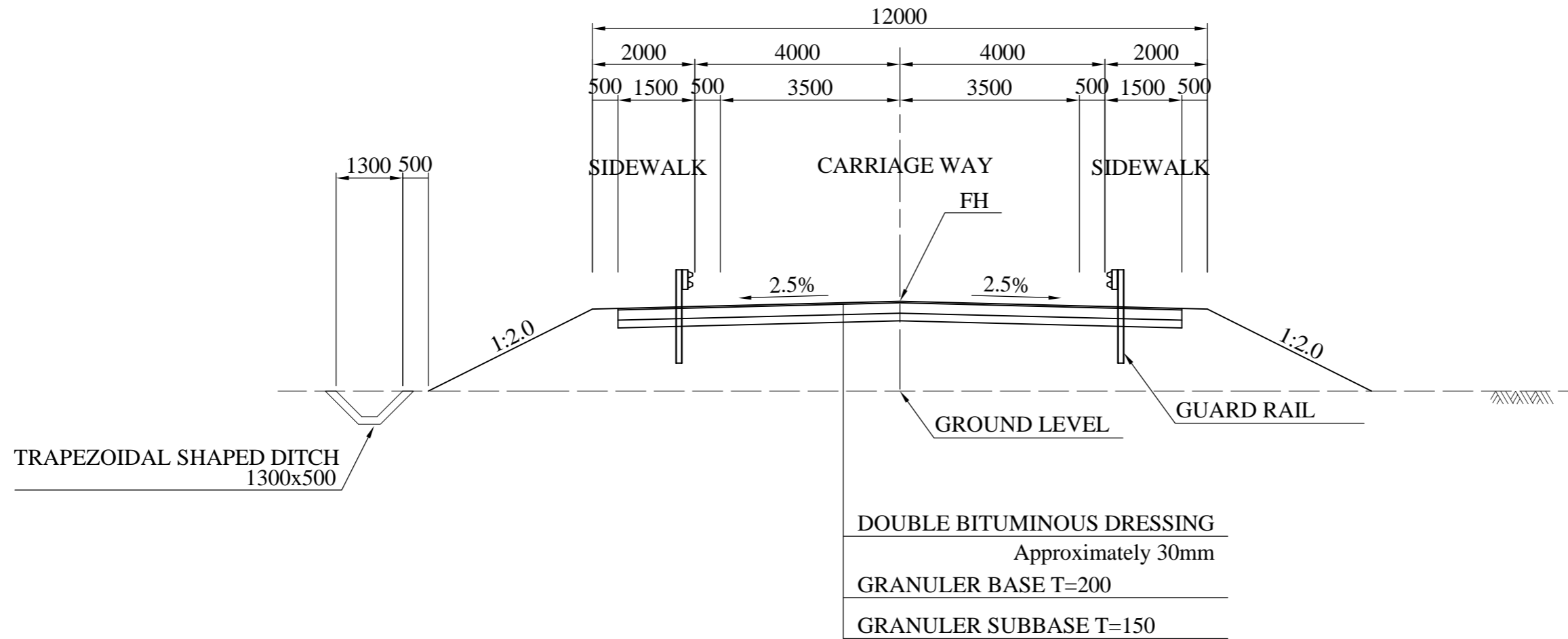


GHANA HIGHWAY AUTHORITY THE REPUBLIC OF GHANA	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	DATE:	DRAWING No. : 12
	CENTRAL CONSULTANT INC. EIGHT-JAPAN ENGINEERING CONSULTANTS INC.	PREPARATORY SURVEY ON REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)	PLAN AND PROFILE (DETOUR PLAN)	PREPARED BY: CHECKED BY:	

TYPICAL CROSS SECTION

SCALE A3 1:100

DETOUR



GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
TYPICAL CROSS SECTION
(DETOUR PLAN)

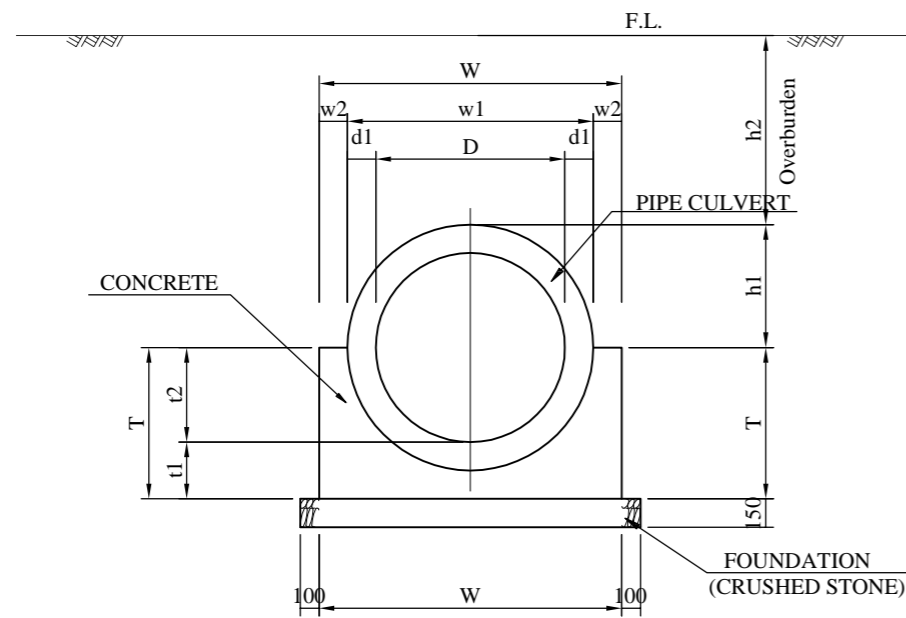
DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
13

DRAINAGE STRUCTURE (1) SCALE AS SHOWN

PIPE CULVERT SCALE A3 1:40

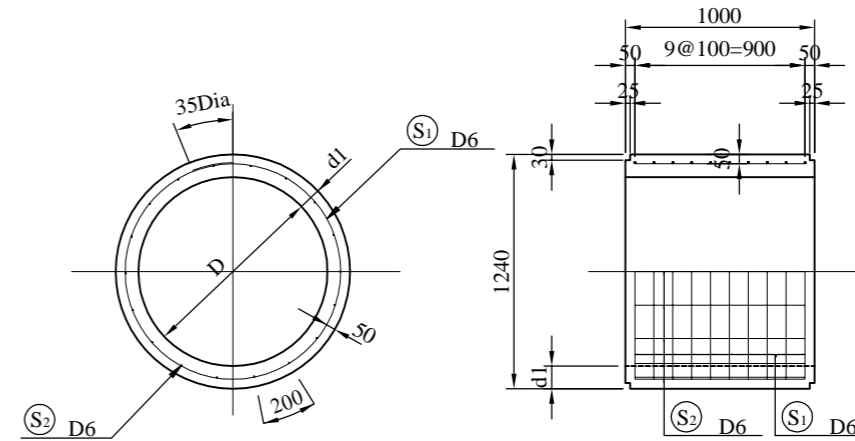
SINGLE CELL TYPE



DIMENSION LIST

D	d1	W	w1	w2	T	t1	t2	h1
1000	120	1540	1240	150	770	270	500	620

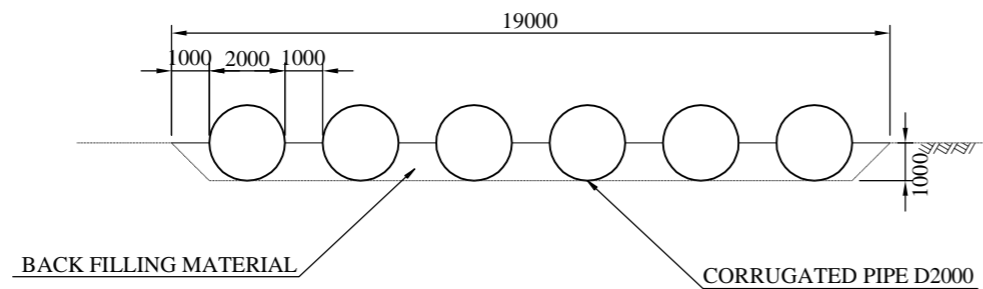
REINFORCED CONCRETE PIPE



MATERIAL LIST (SINGLE CELL TYPE)

ITEM	STANDARD	UNIT	PER m	
			QUANTITY	REMARKS
CONCRETE		cu.m	0.58	
FORM		sq.m	1.54	
FOUNDATION	CRUSHED STONE	cu.m	0.26	
PIPE CULVERT	φ1000	nos.	1.00	

CORRUGATED PIPE D2000x6 SCALE A3 1:200



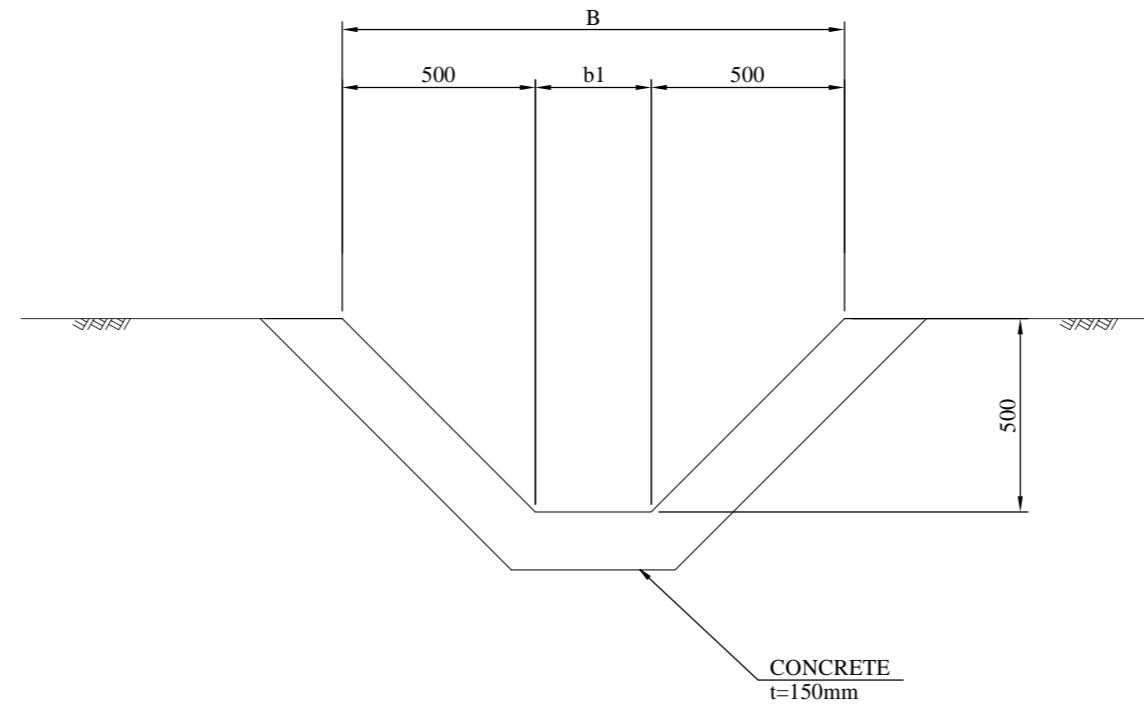
MATERIAL LIST

ITEM	STANDARD	UNIT	PER m	
			QUANTITY	REMARKS
BACK FILLING MATERIAL		cu.m	8.57	
CORRUGATED PIPE	D2000	m	6.00	

DRAINAGE STRUCTURE (2) SCALE A3 1:20

TRAPEZOIDAL SHAPED DITCH

1300x500
1500x500



DIMENSION LIST

BxH	B	b1
1300x500	1300	300
2000x500	2000	1000

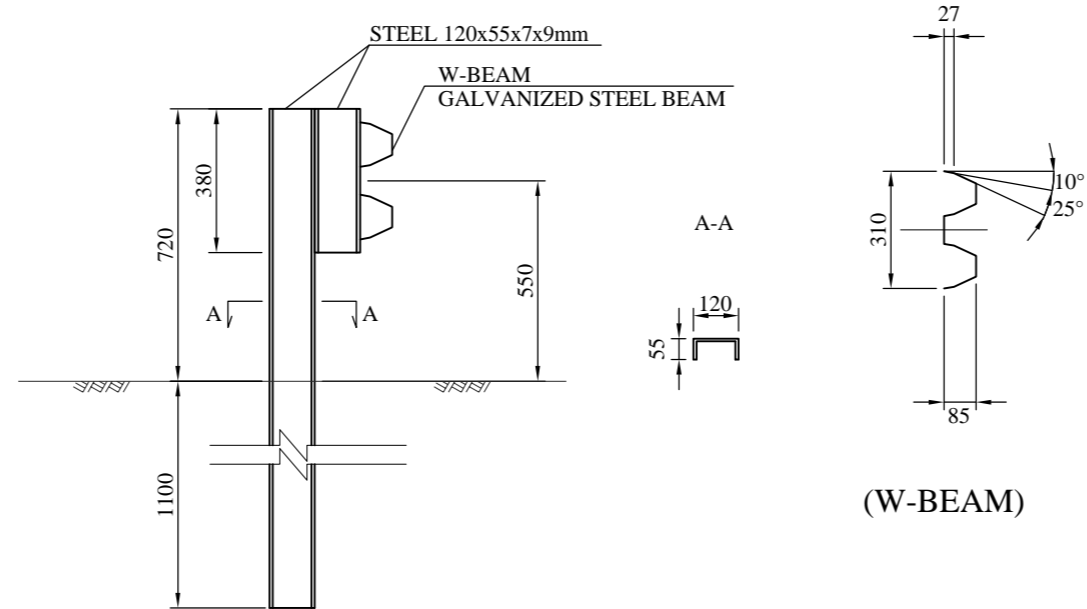
MATERIAL LIST

ITEM	STANDARD	UNIT	QUANTITY		REMARKS
			1300 x 500	2000 x 500	
CONCRETE		cu.m	0.30	0.40	

TRAFFIC SAFETY STRUCTURE TRAFFIC FURNITURE

SCALE A3 1:20

GUARD RAIL

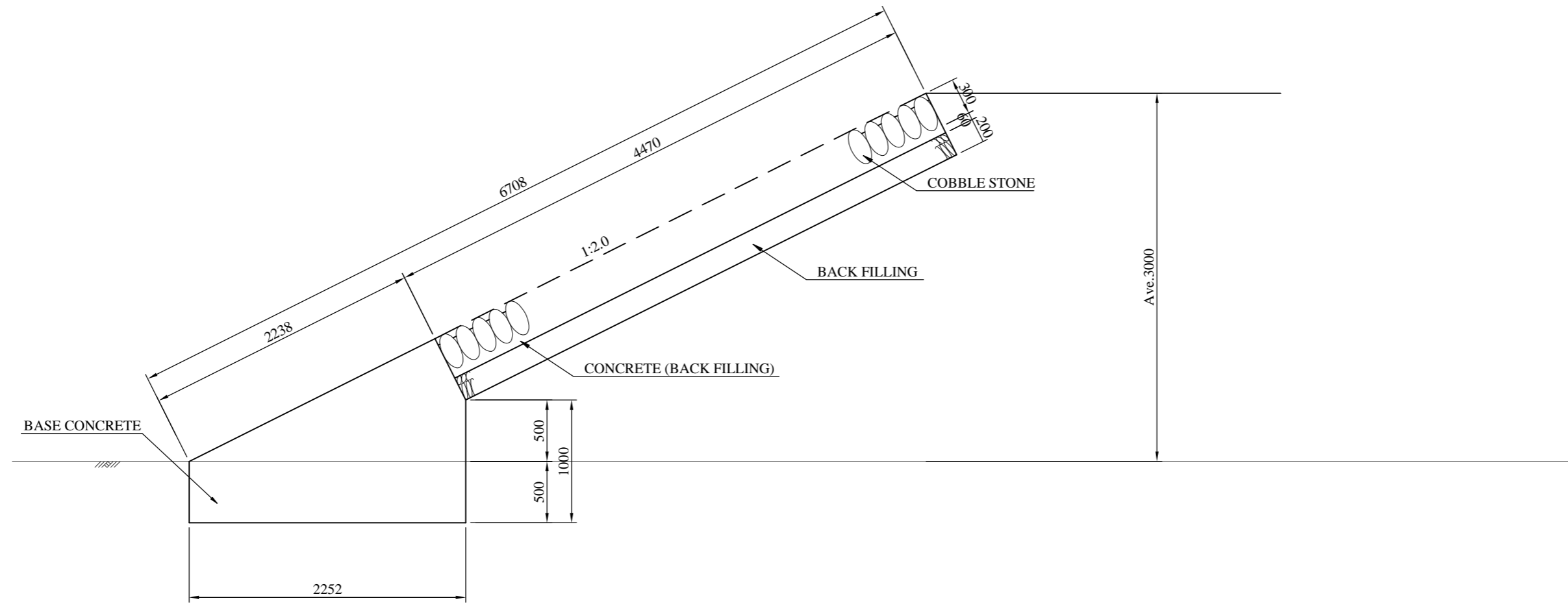


MATERIAL LIST (GUARD RAIL)

ITEM	STANDARD	UNIT	QUANTITY	REMARKS
GUARD RAIL		m	1.00	

STONE MASONRY

SCALE A3 1:40



MATERIAL LIST

ITEM	STANDARD	UNIT	QUANTITY	PER m	REMARKS
COBBLE STONE		sq.m	4.47		
CONCRETE		cu.m	0.45		
CONCRETE (BACK FILLING)		cu.m	0.27		
FORM(BACK FILLING)		sq.m	4.50		
BASE CONCRETE		cu.m	2.32		
FORM(BASE CONCRETE)		sq.m	1.50		
BACK FILLING		cu.m	0.89		

GHANA HIGHWAY AUTHORITY
THE REPUBLIC OF GHANA

CONSULTANTS:
CENTRAL CONSULTANT INC.
EIGHT-JAPAN ENGINEERING CONSULTANTS INC.

PROJECT NAME:
PREPARATORY SURVEY ON
REHABILITATION OF NATIONAL TRUNK ROAD NO.8 (PHASE 2)

DRAWING TITLE:
STONE MASONRY
(DETOUR PLAN)

DATE:
PREPARED BY:
CHECKED BY:

DRAWING No. :
17