

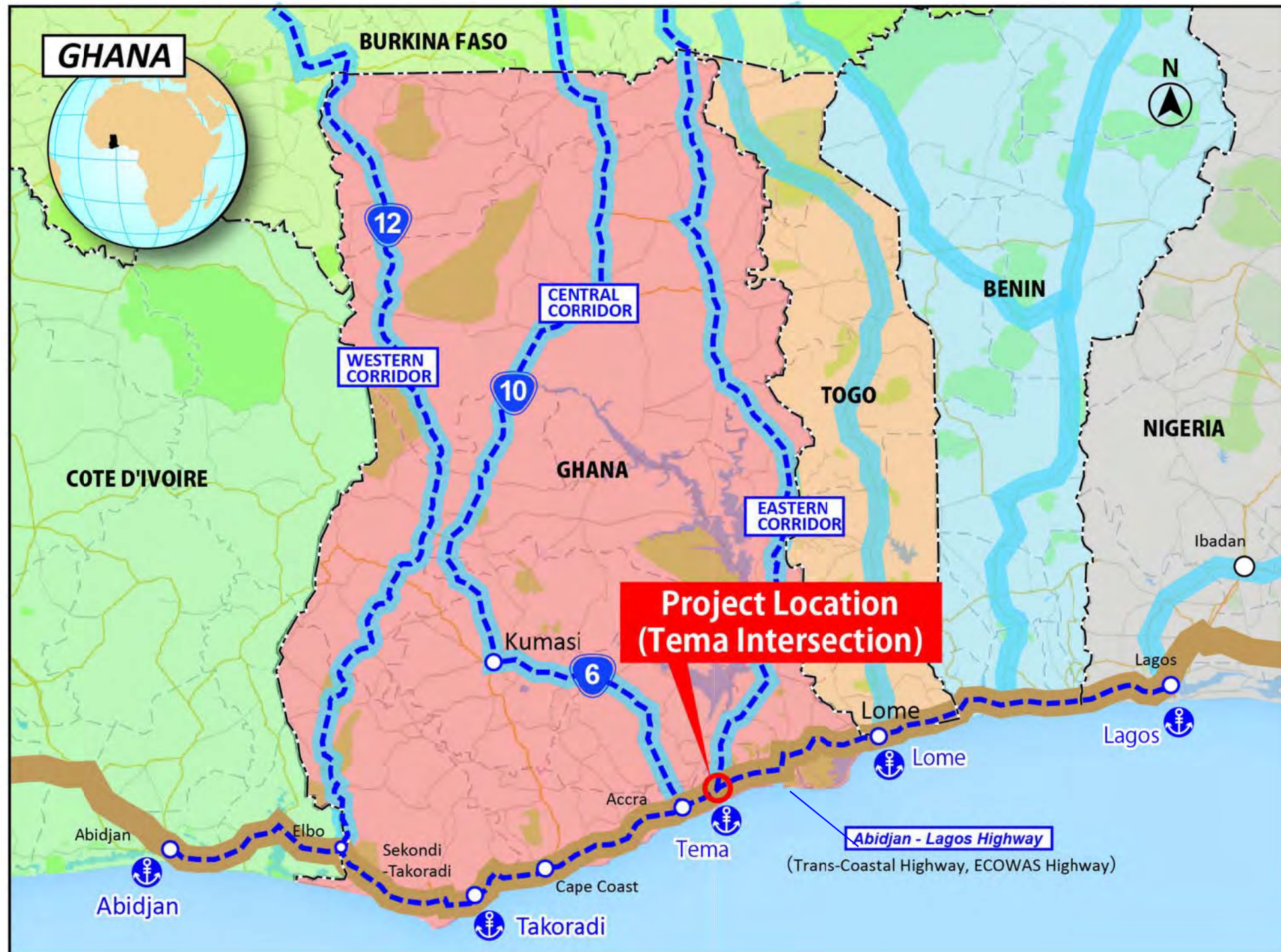
【添付資料－10】概略設計図面

PREPARATORY SURVEY ON THE PROJECT
FOR
THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT
IN
THE REPUBLIC OF GHANA

OUTLINE DESIGN DRAWINGS

FEBRUARY 2017

JAPAN INTERNATIONAL COOPERATION AGENCY
CTI ENGINEERING INTERNATIONAL CO.,LTD.



0 40 80 120 km

GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 PROJECT LOCATION MAP

SCALE:(A1size)	DRAWING NO.
S=1:400,000	GN-01



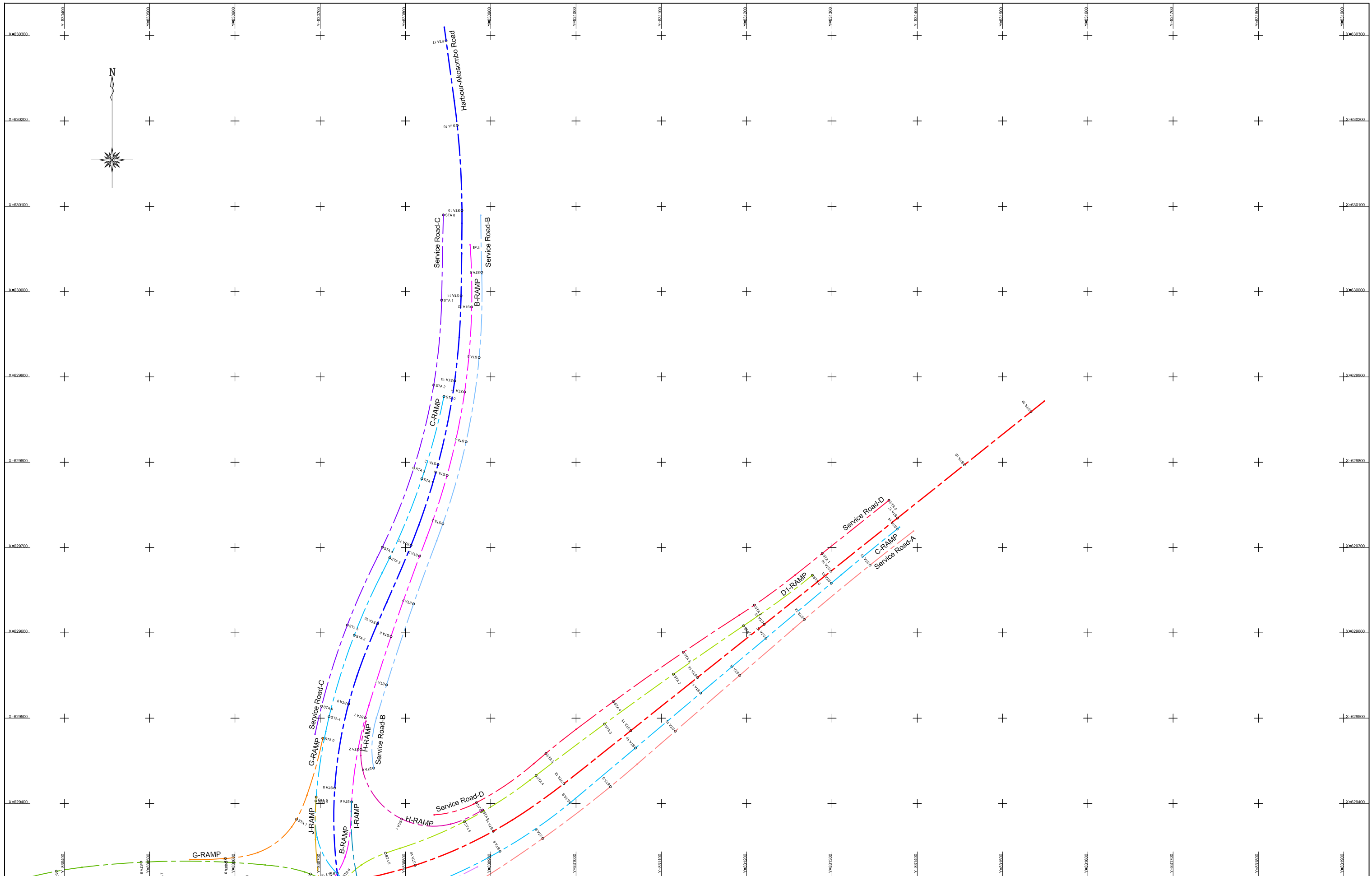
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 KEY PLAN (1)

SCALE (A1 size)	DRAWING NO.
S=1:2,500	GN-02



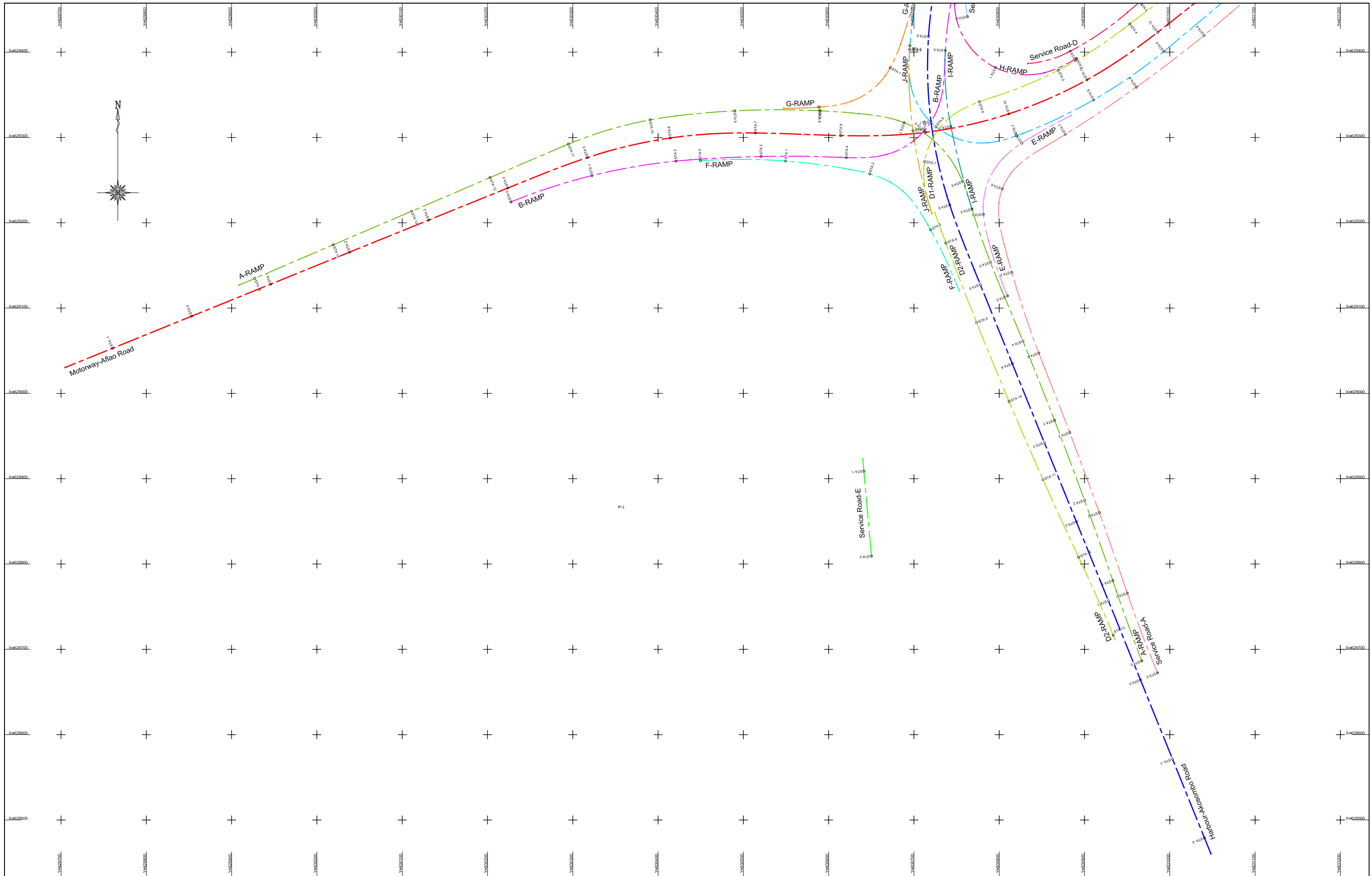
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 KEY PLAN (3)

SCALE:(A1size)	DRAWING NO.
1/2,000	GN-03



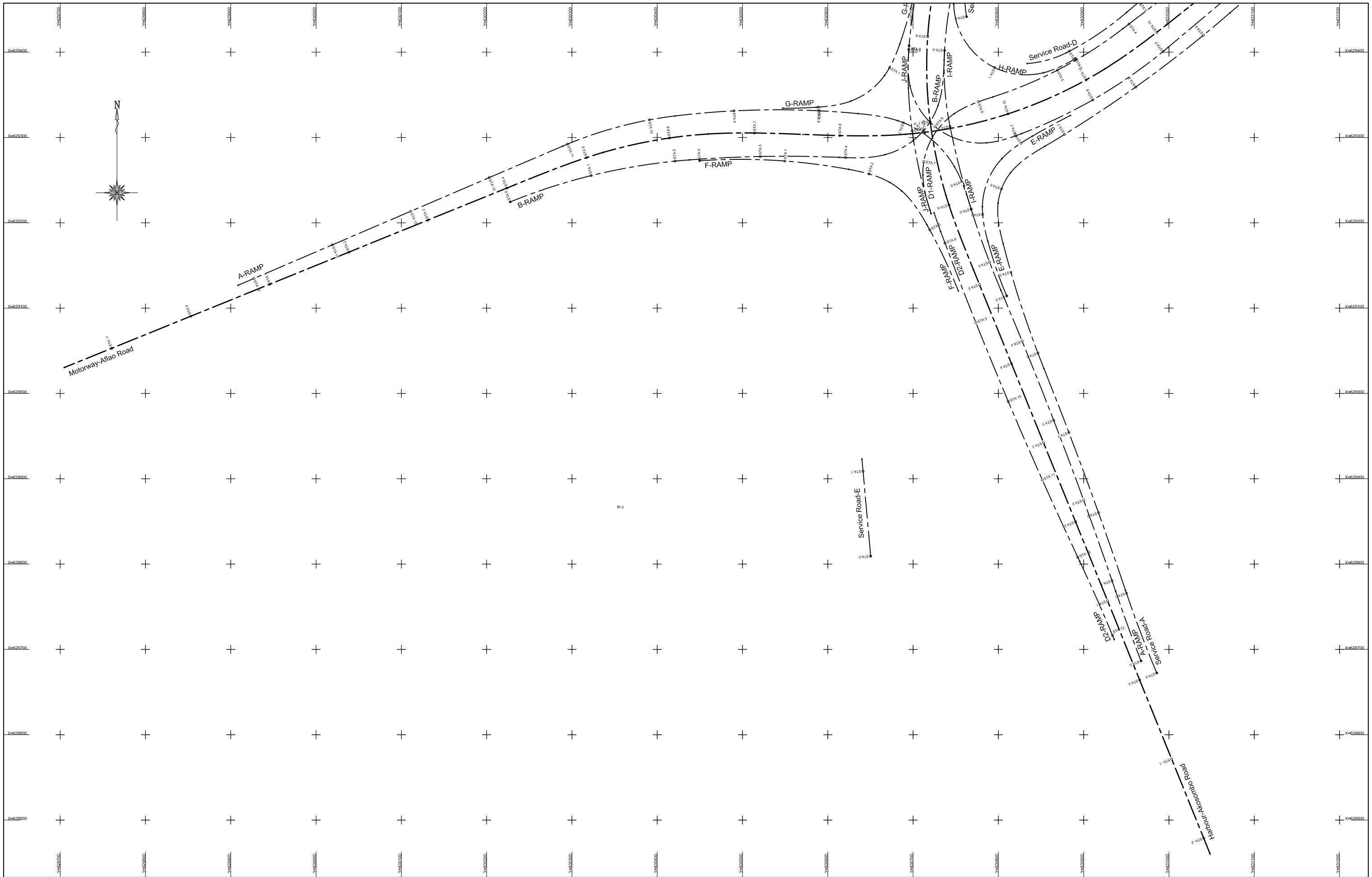
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 KEY PLAN (2)

SCALE:(A1size)	DRAWING NO.
1/2,000	GN-02



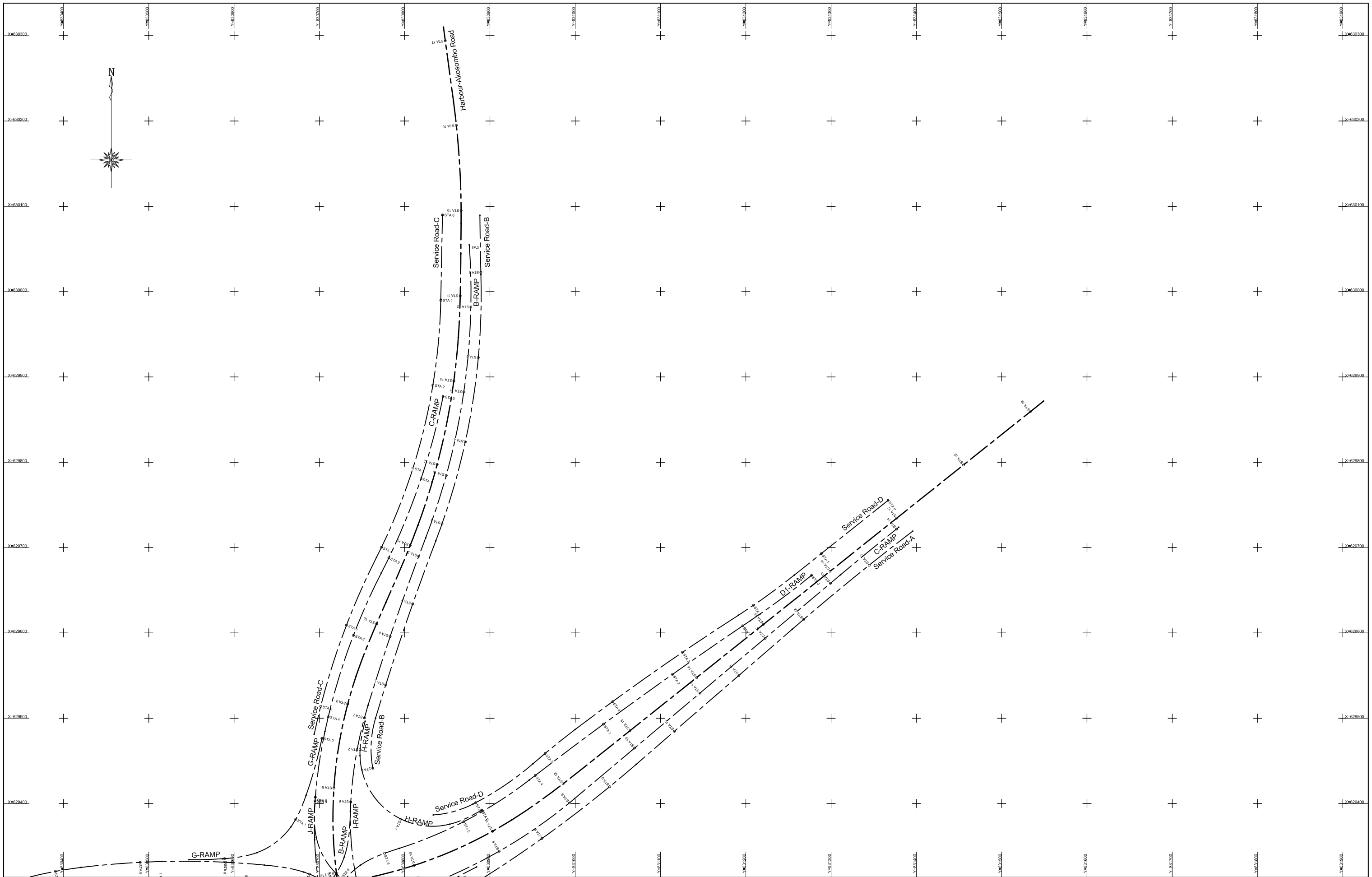
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 KEY PLAN(1)

SCALE:(A1size)	DRAWING NO.
1/2,000	GN-03



GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

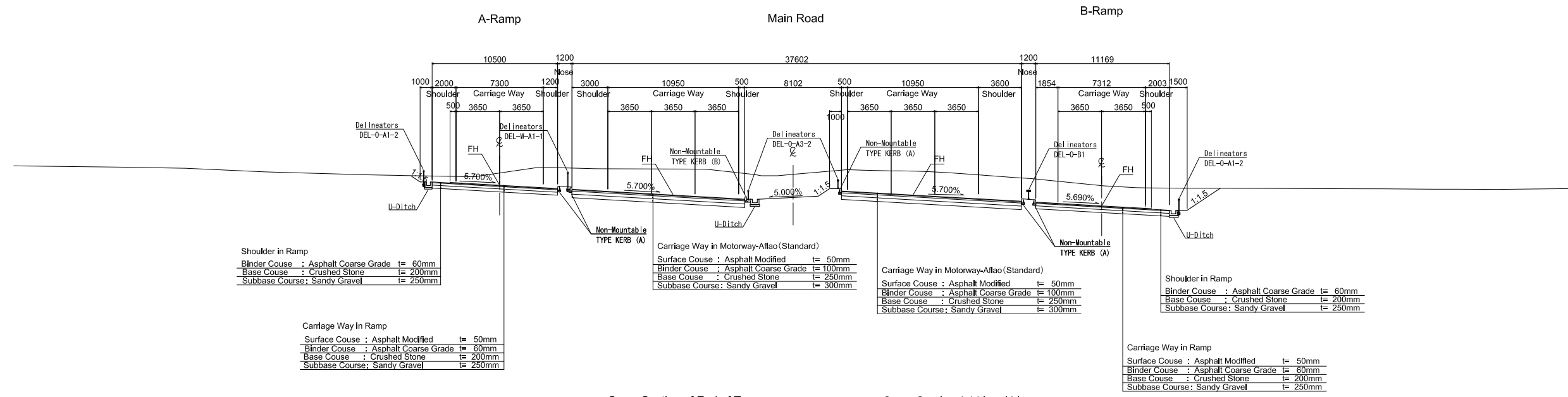
PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 KEY PLAN(2)

SCALE:(A1size)	DRAWING NO.
1/2,000	GN-04

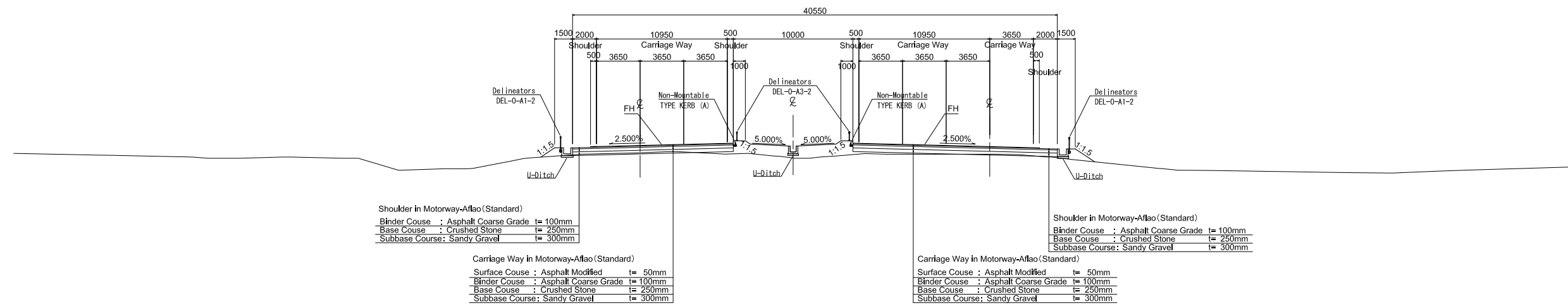
Motorway-Aflao Road

Cross Section of Nose

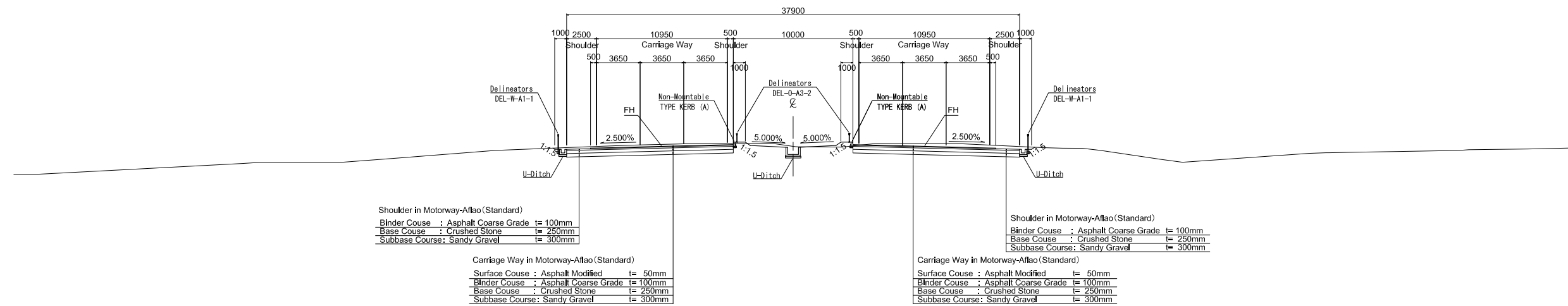


Cross Section of End of Taper

Cross Section Additional Line

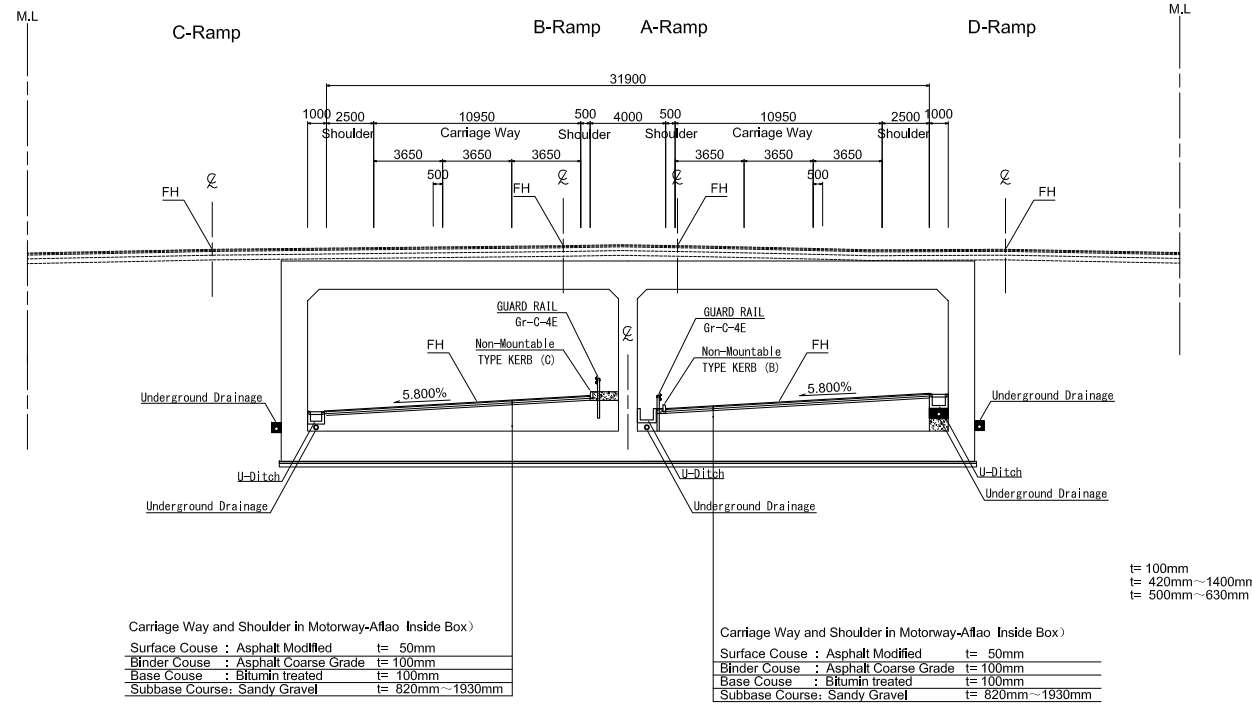


Motorway-Aflao Cross Section

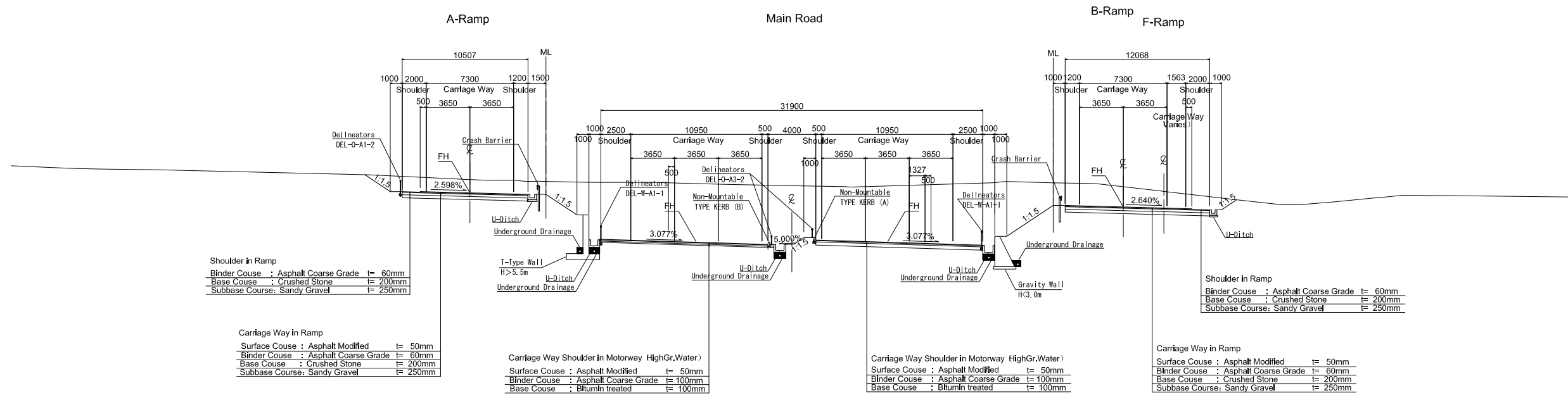


Motorway-Aflao

Cross Section at Underpass (Box Culvert)

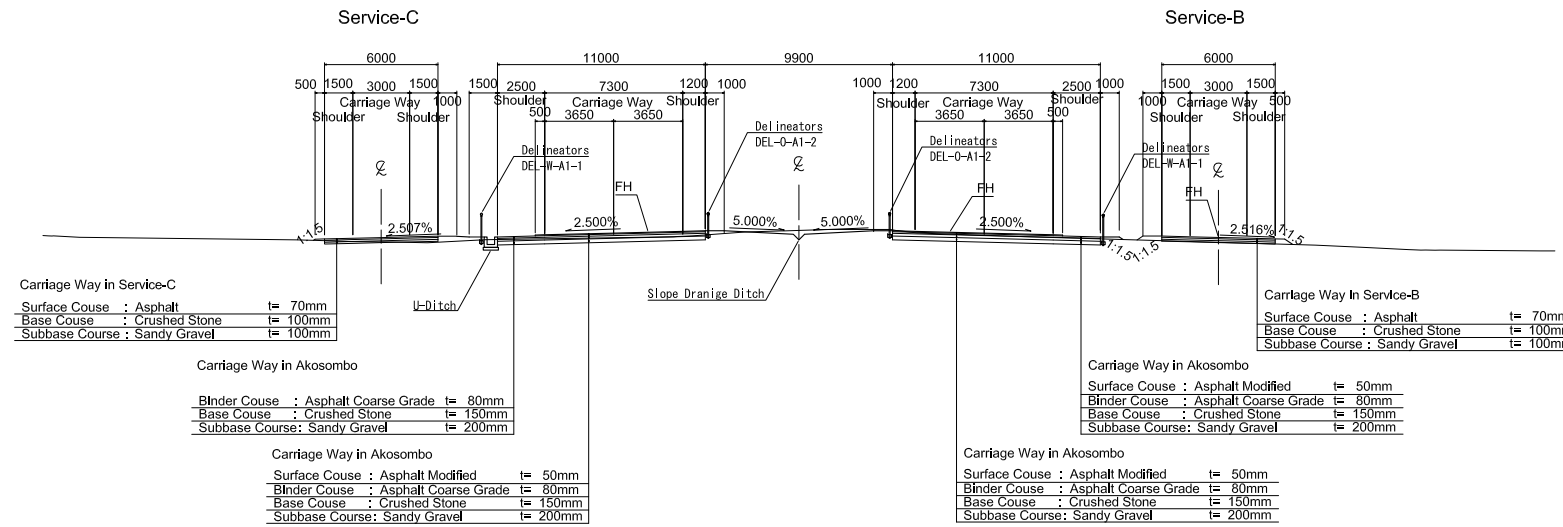


Cross Section at Depressed Section (Outside Box Culvert)

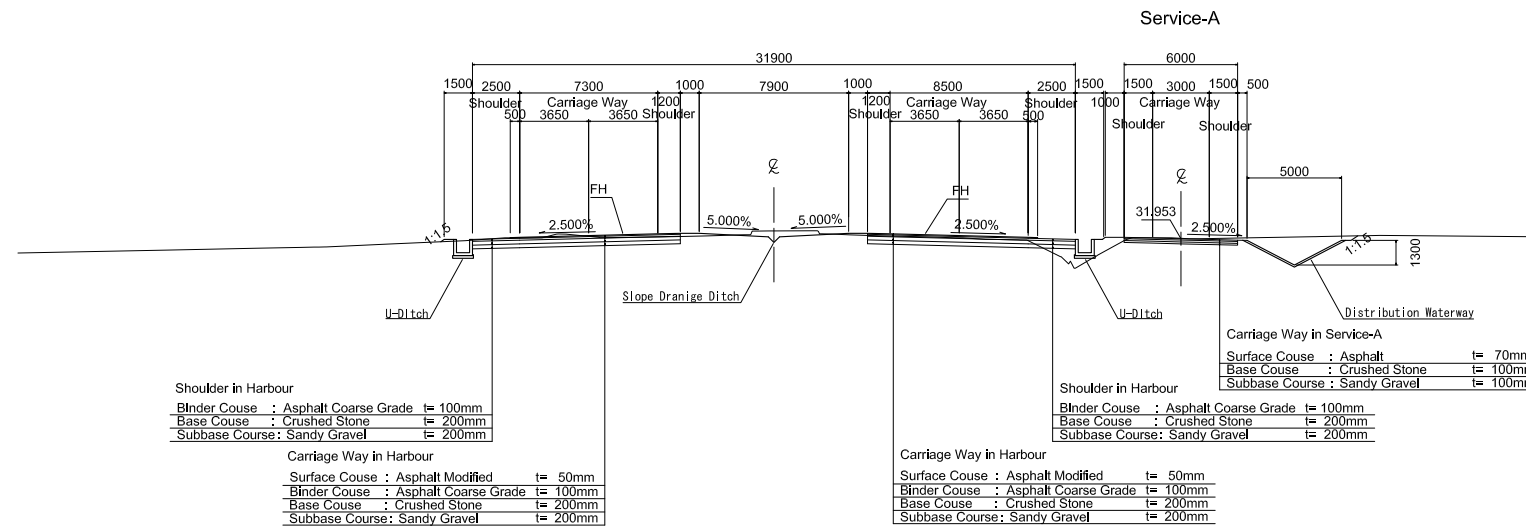


Harbour-Akosombo

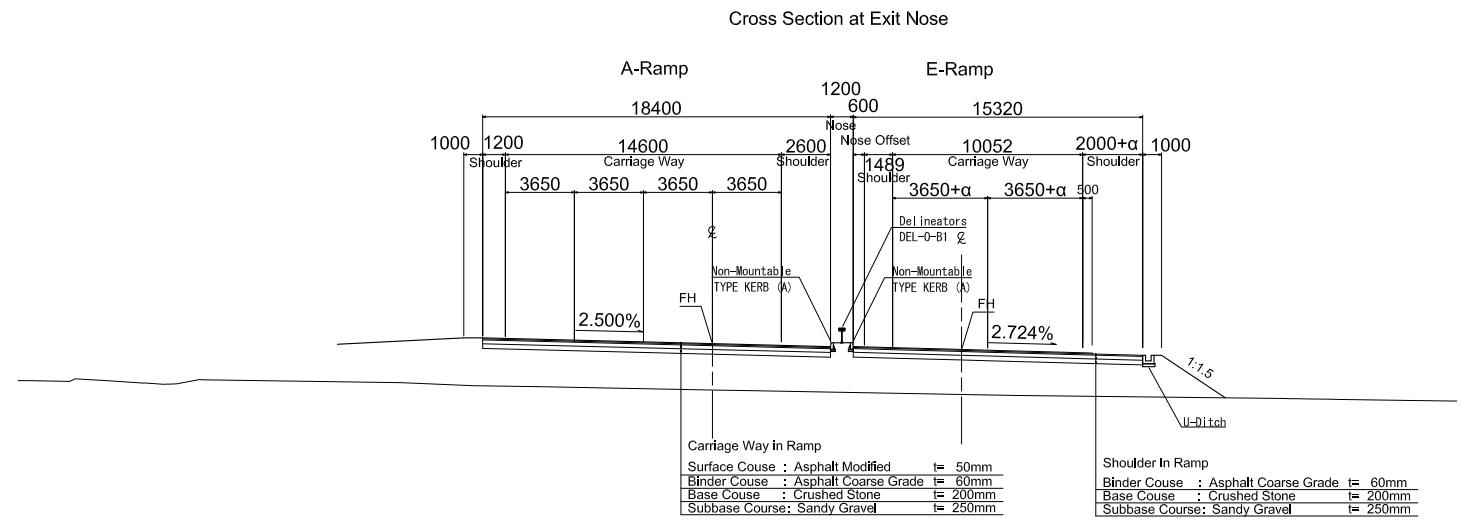
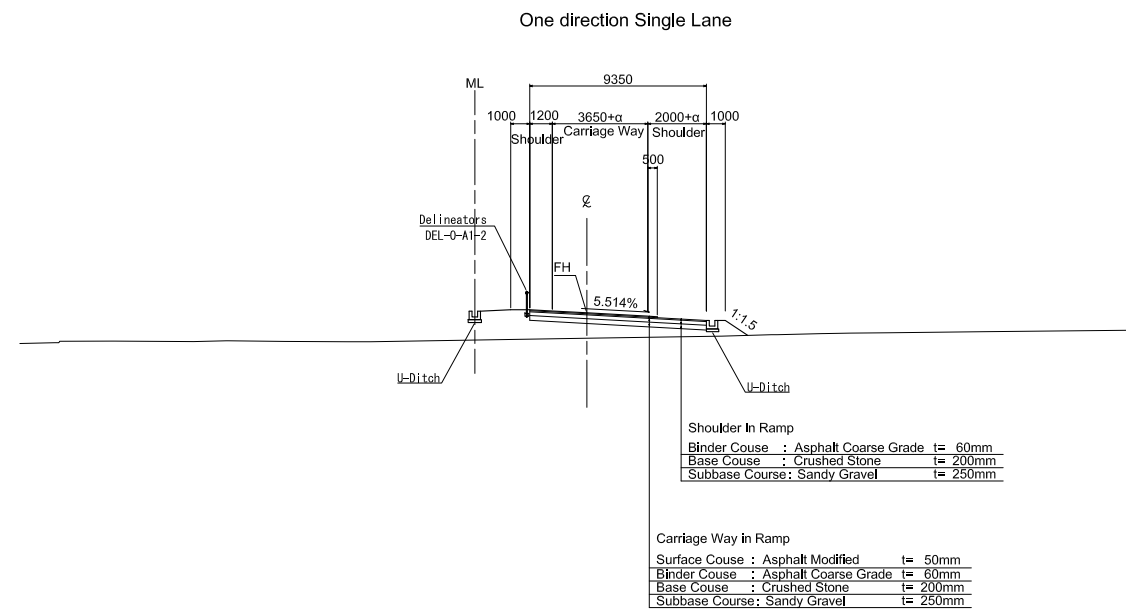
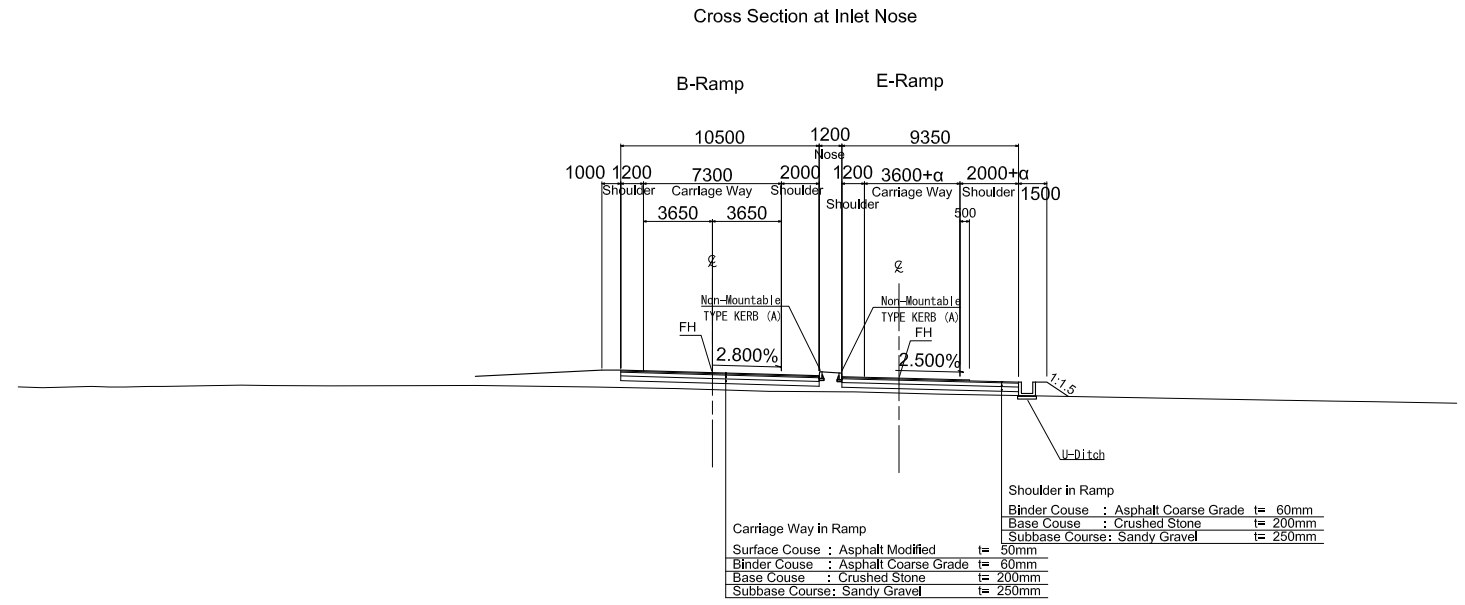
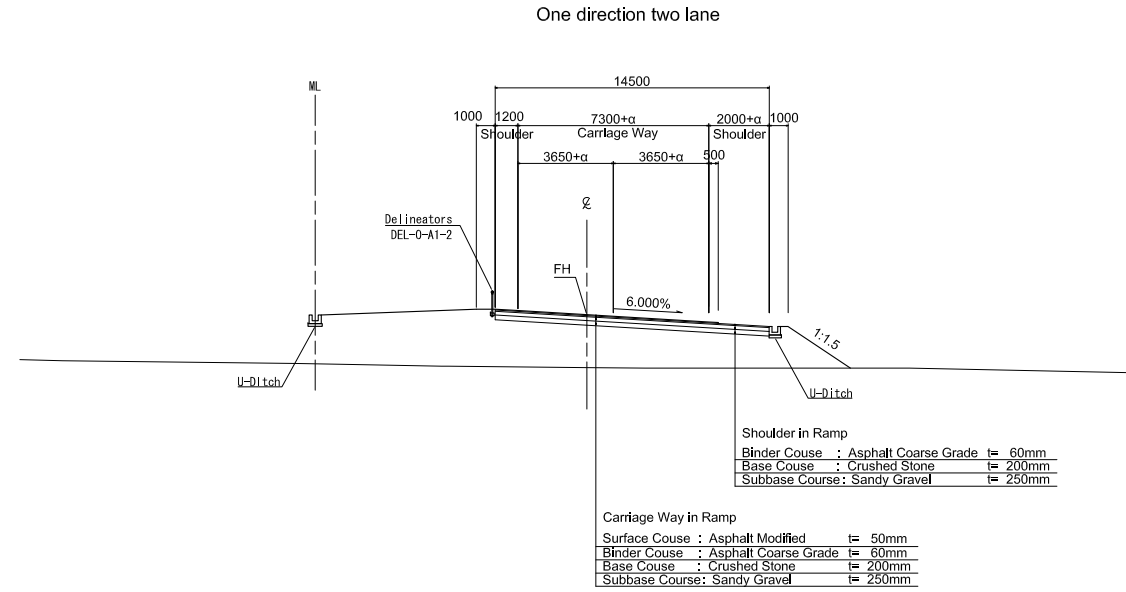
Akosombo Cross Section
Main Road



Harbour Cross Section
Main Road

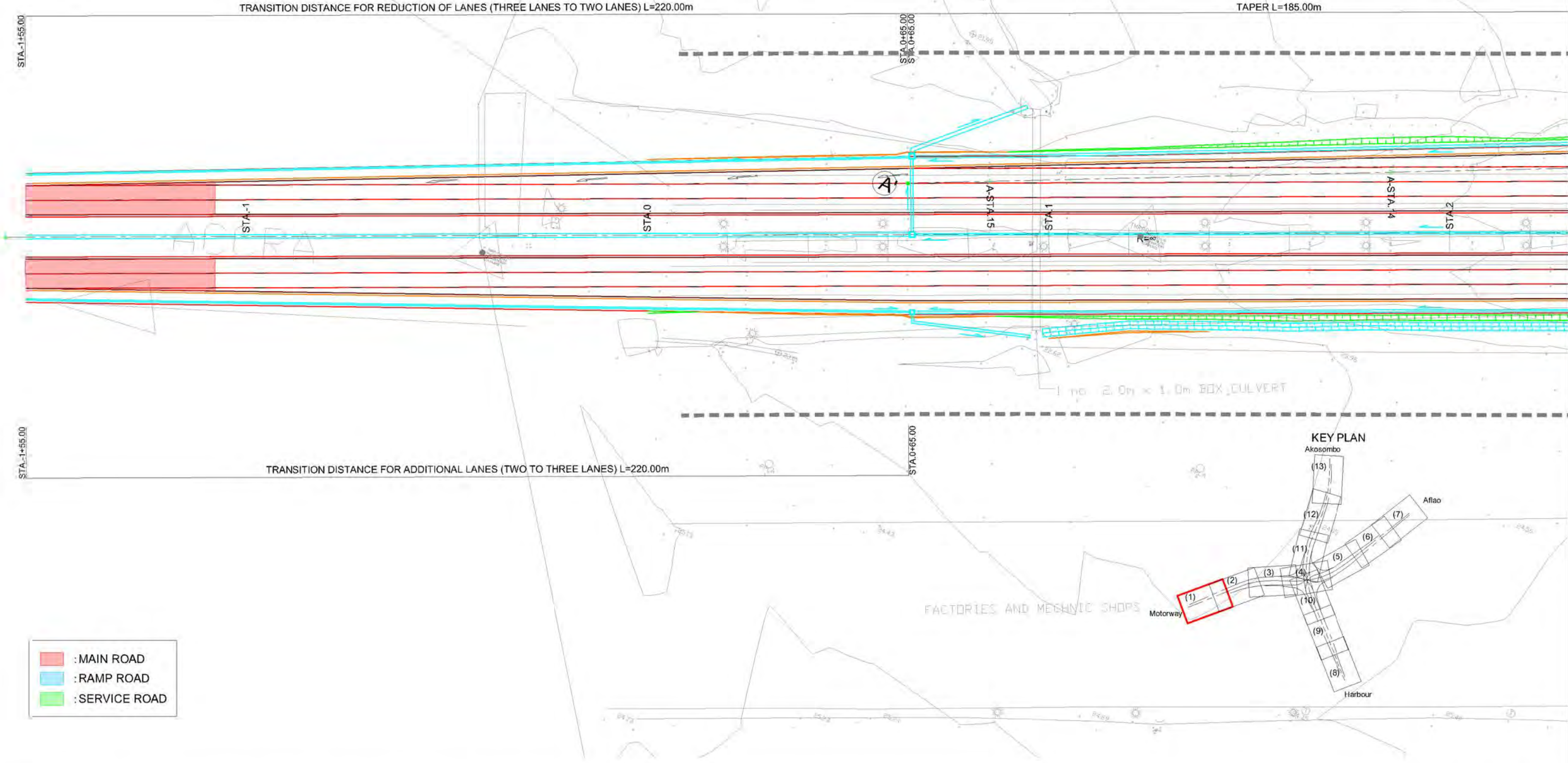


Ramp



NOTE:

“α” is the extra width required for widening and securing sight distance at curved sections

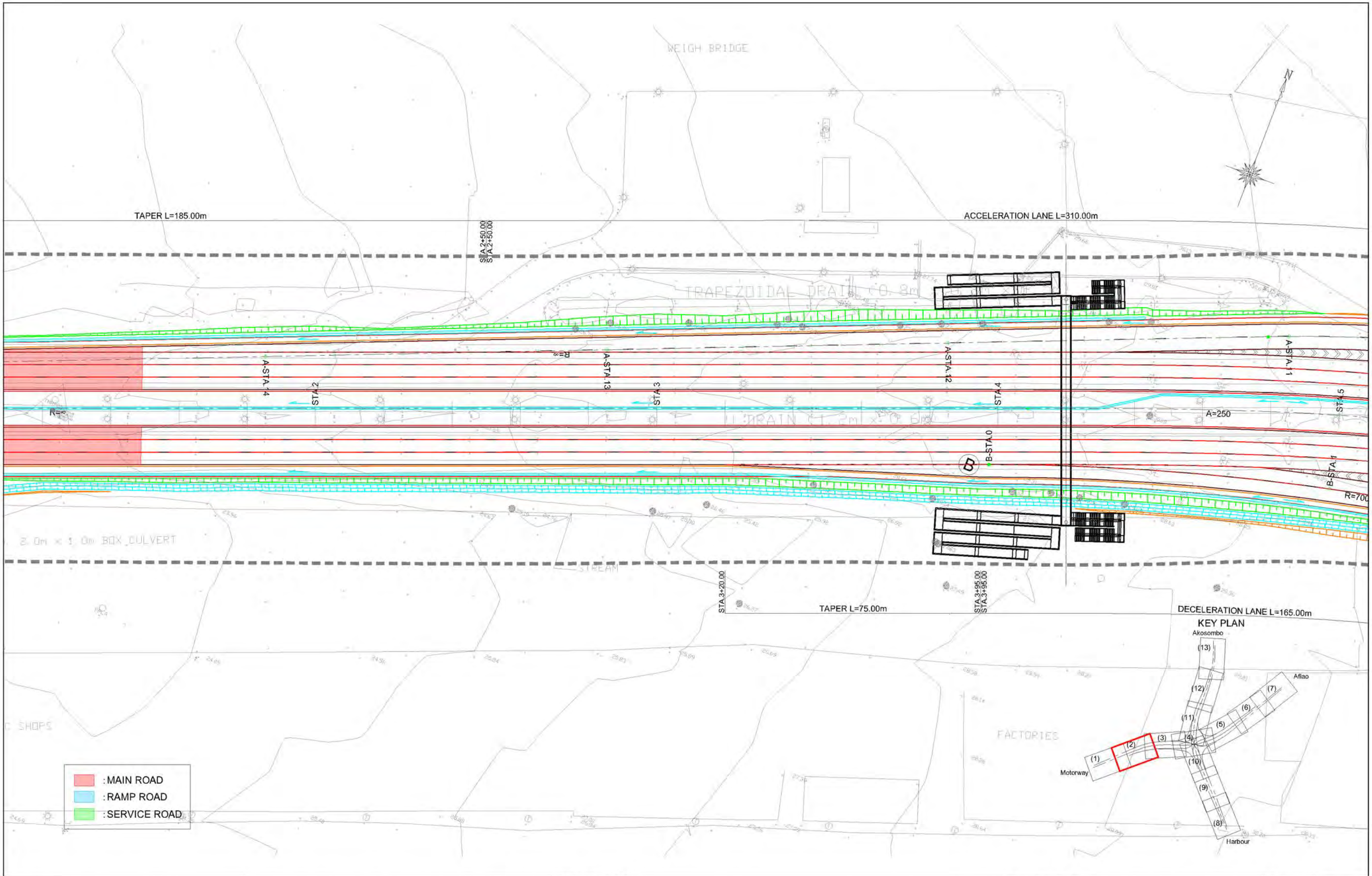


1 no. 2.0m x 1.0m BOX CULVERT

FACTORIES AND MECHANIC SHOPS

- : MAIN ROAD
- : RAMP ROAD
- : SERVICE ROAD

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: <h2 style="margin: 0;">PLAN(1)</h2>	SCALE:(A1size)	DRAWING NO.
				1:500	PL-01



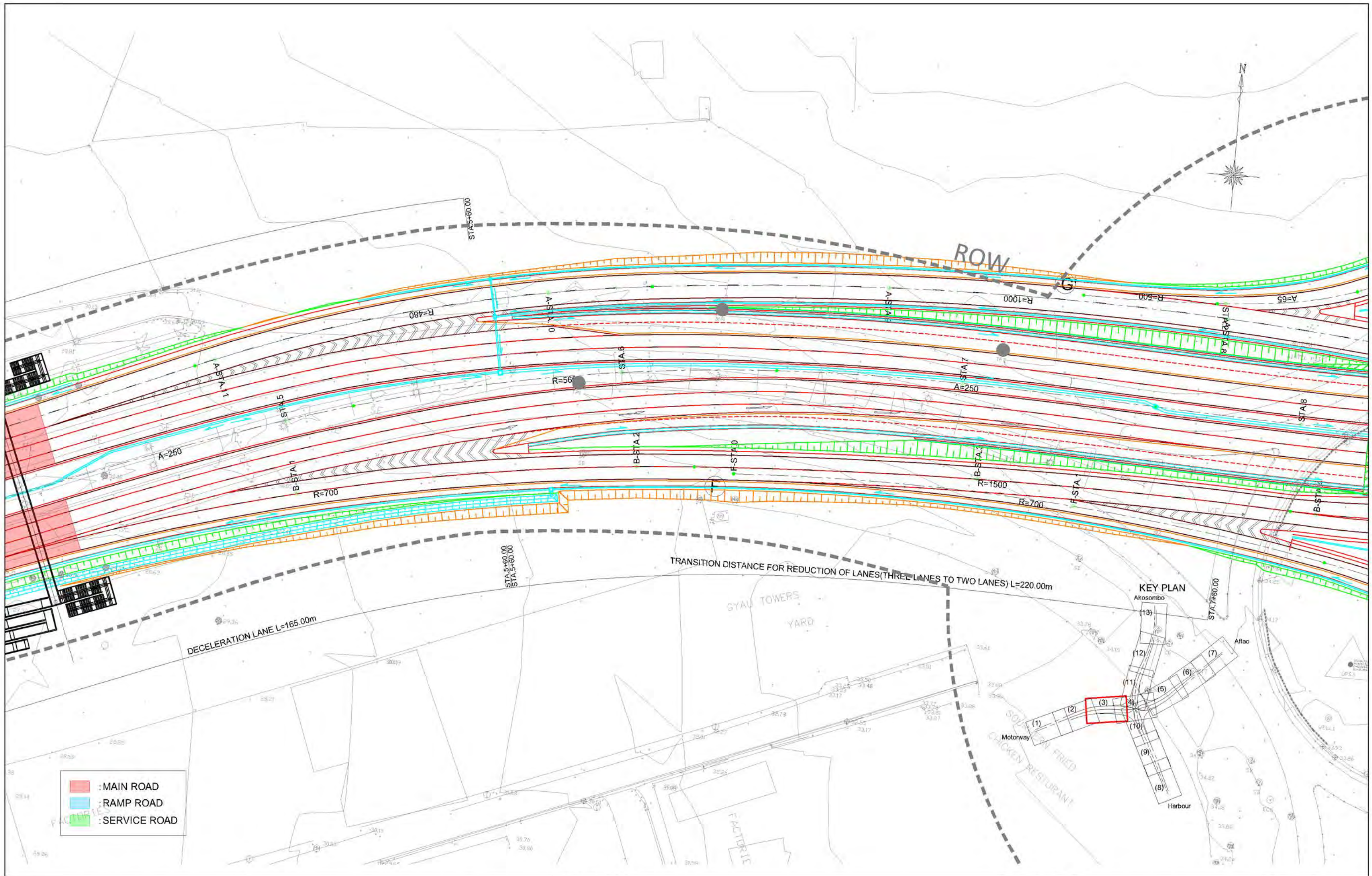
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(2)

SCALE (A1size)	DRAWING NO.
1:500	PL-02



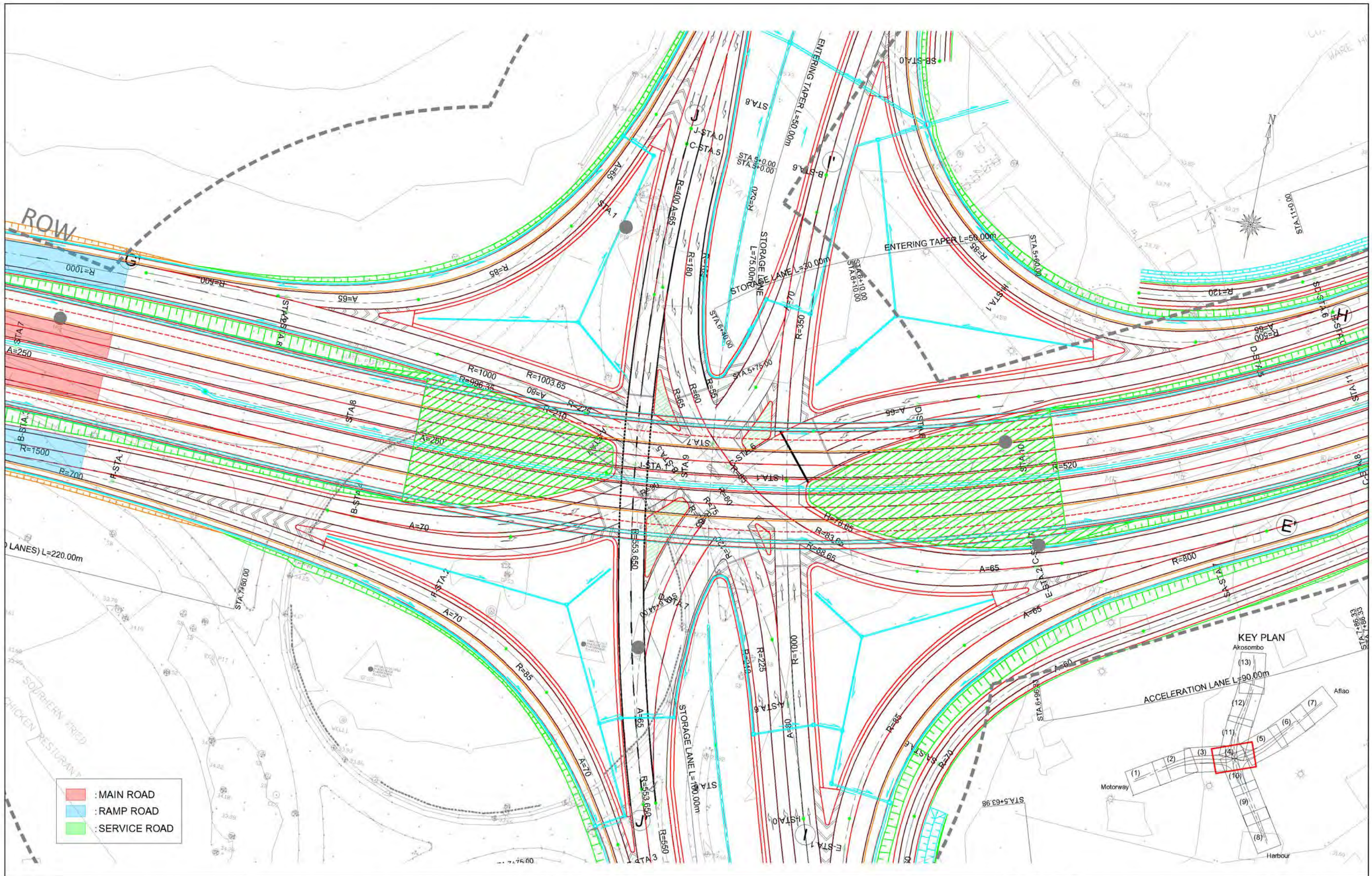
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(3)

SCALE:(A1size)	DRAWING NO.
1:500	PL-03



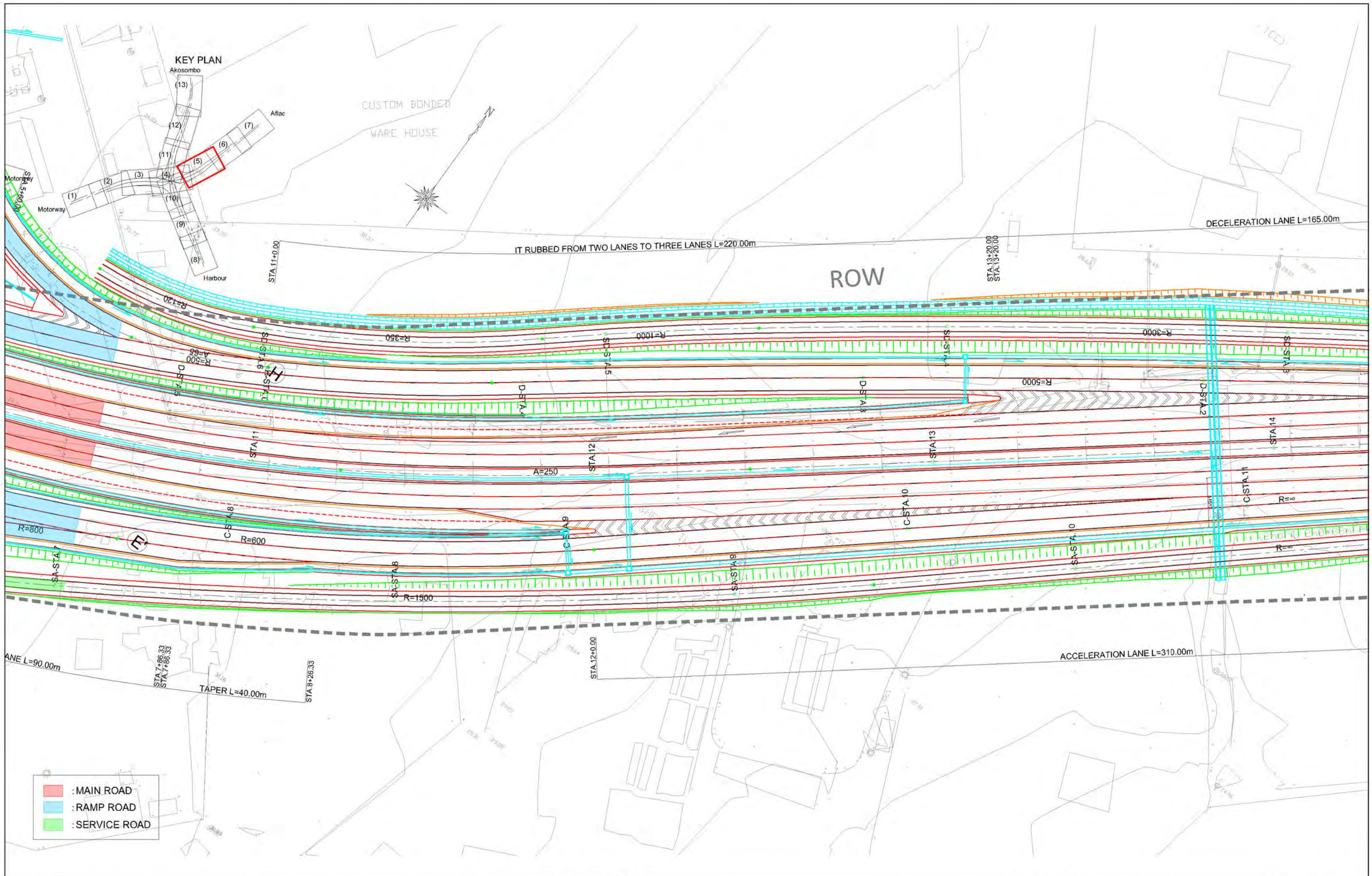
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

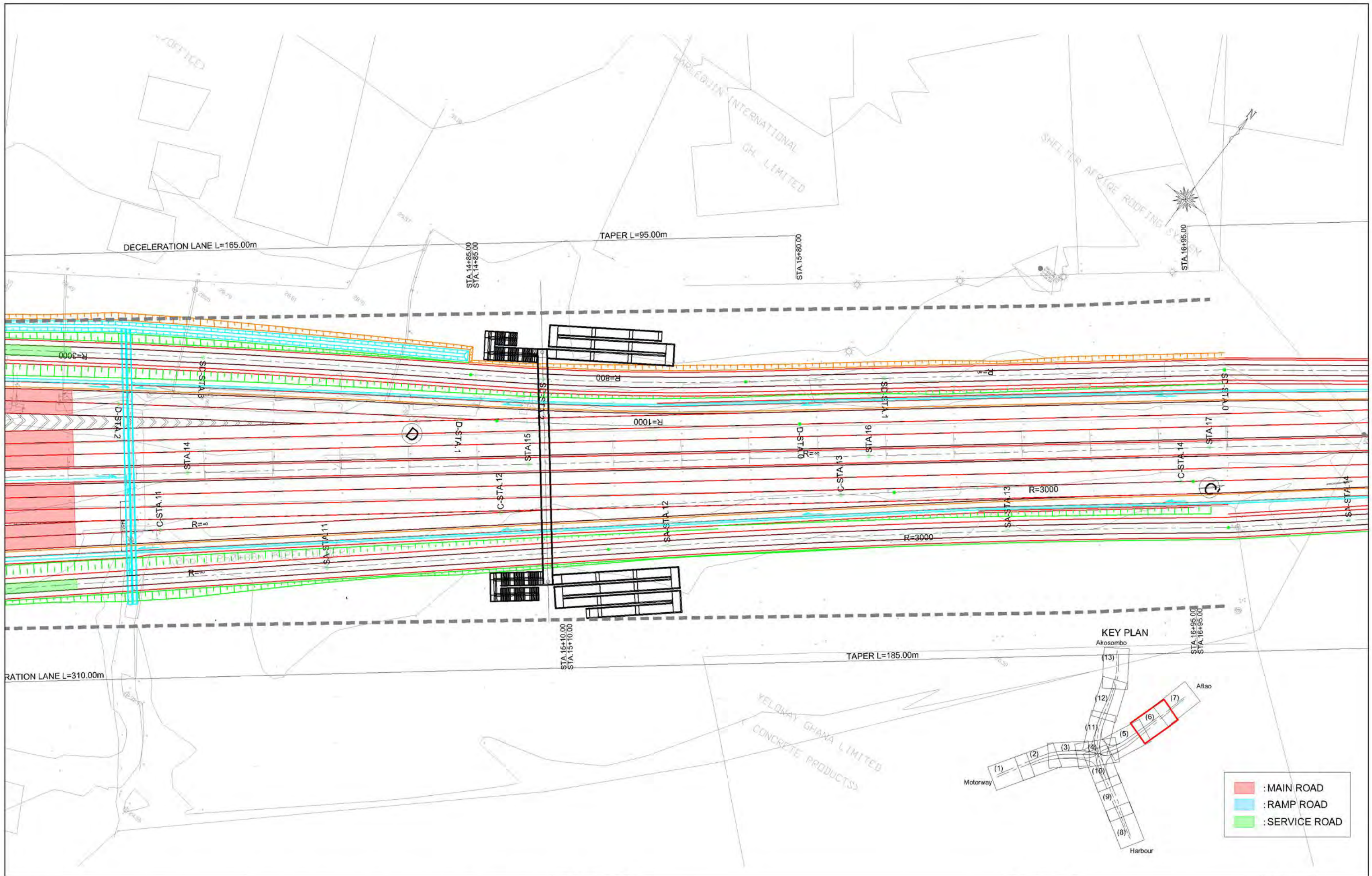
DRAWING TITLE:
PLAN(4)

SCALE:(A1size)	DRAWING NO.
1:500	PL-04



- : MAIN ROAD
- : RAMP ROAD
- : SERVICE ROAD

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: <h2 style="margin: 0;">PLAN(5)</h2>	SCALE: (A1size) 1:500	DRAWING NO. PL-05
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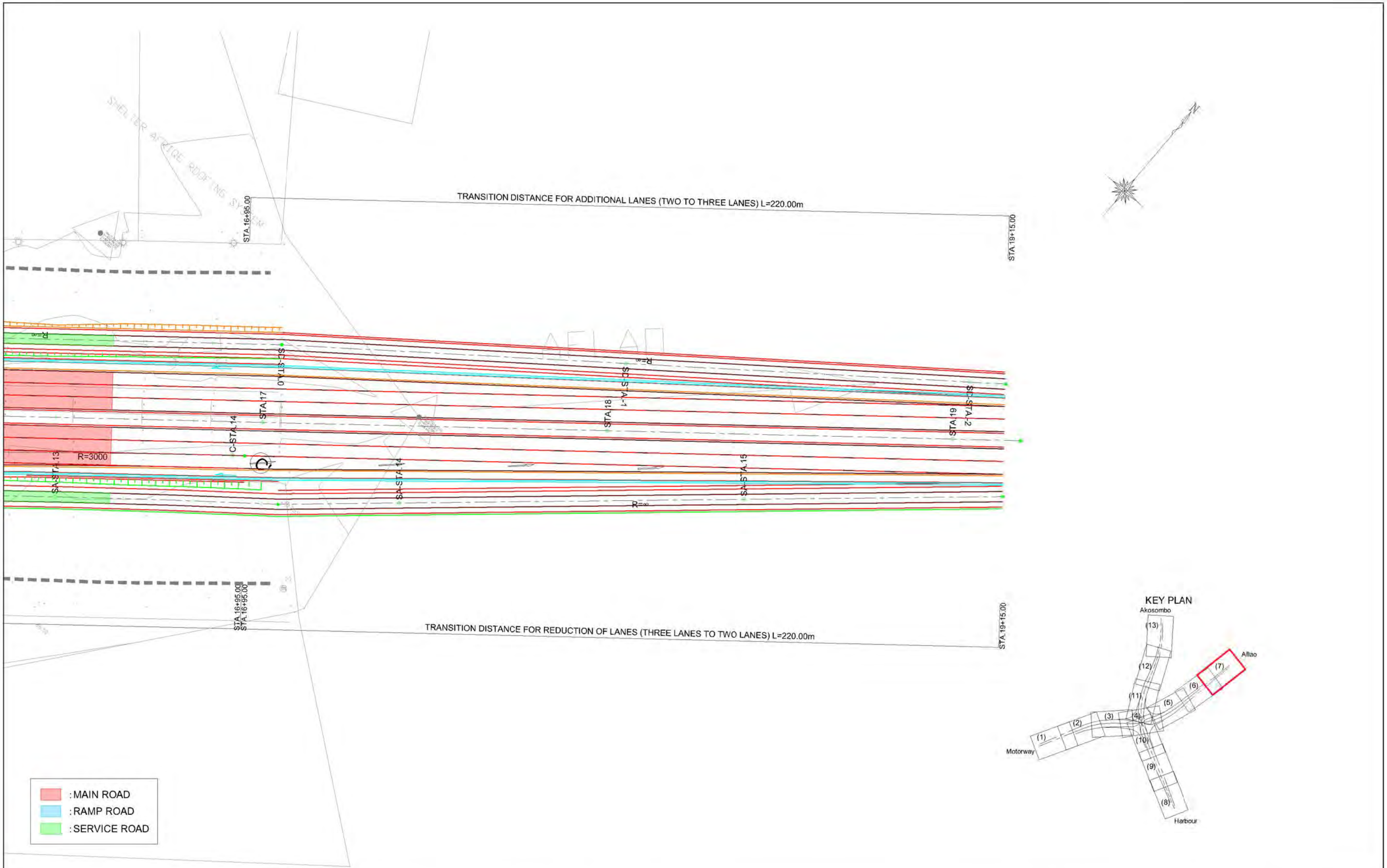
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(6)

SCALE:(A1size)	DRAWING NO.
1:500	PL-06



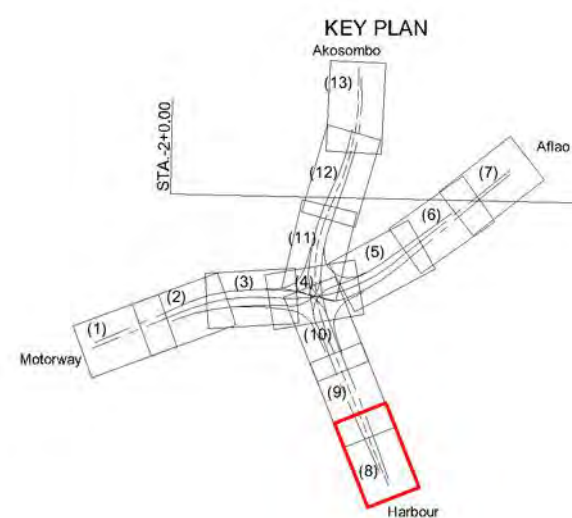
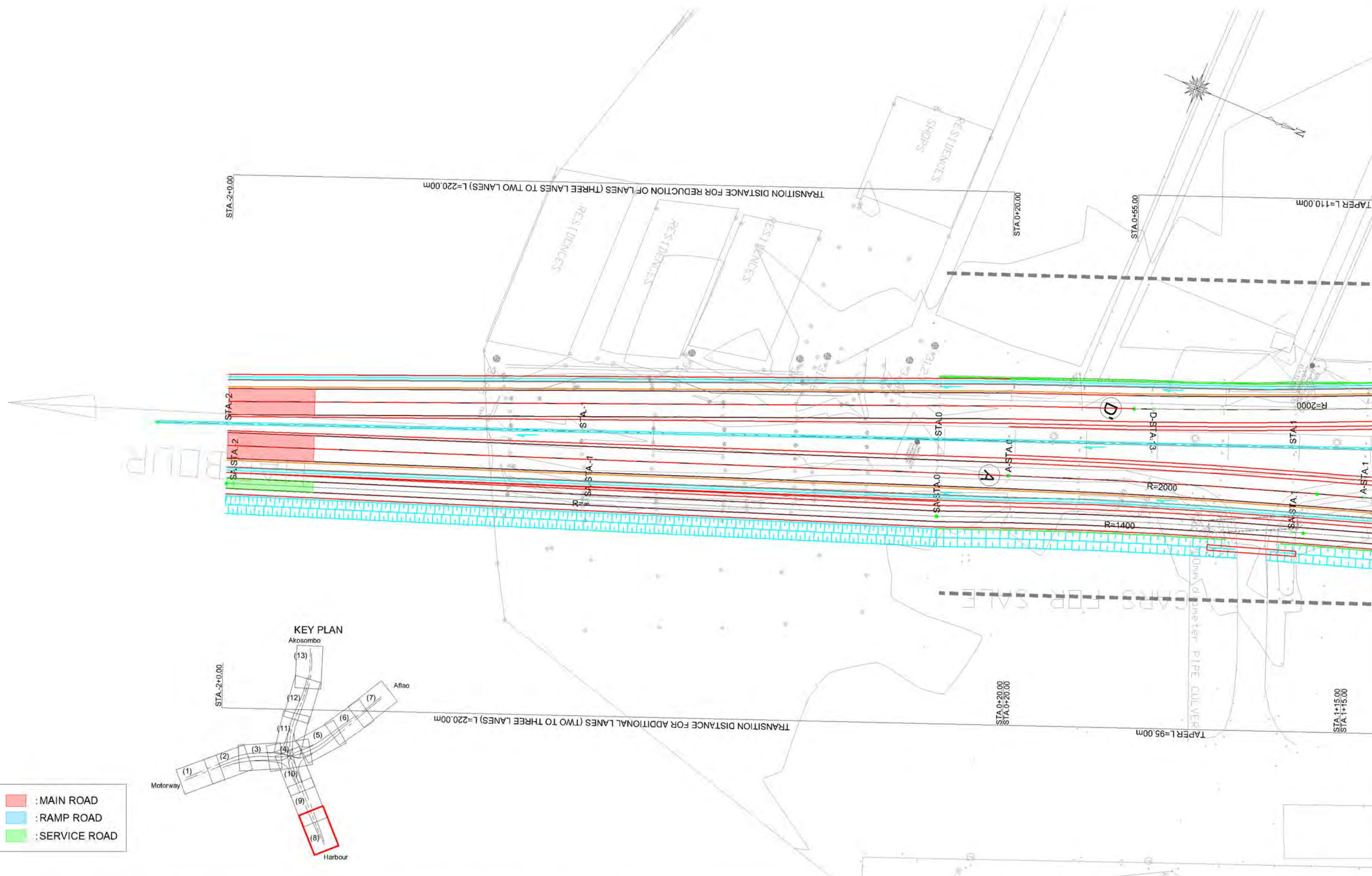
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(7)

SCALE(A1size)	DRAWING NO.
1:500	PL-07



- : MAIN ROAD
- : RAMP ROAD
- : SERVICE ROAD

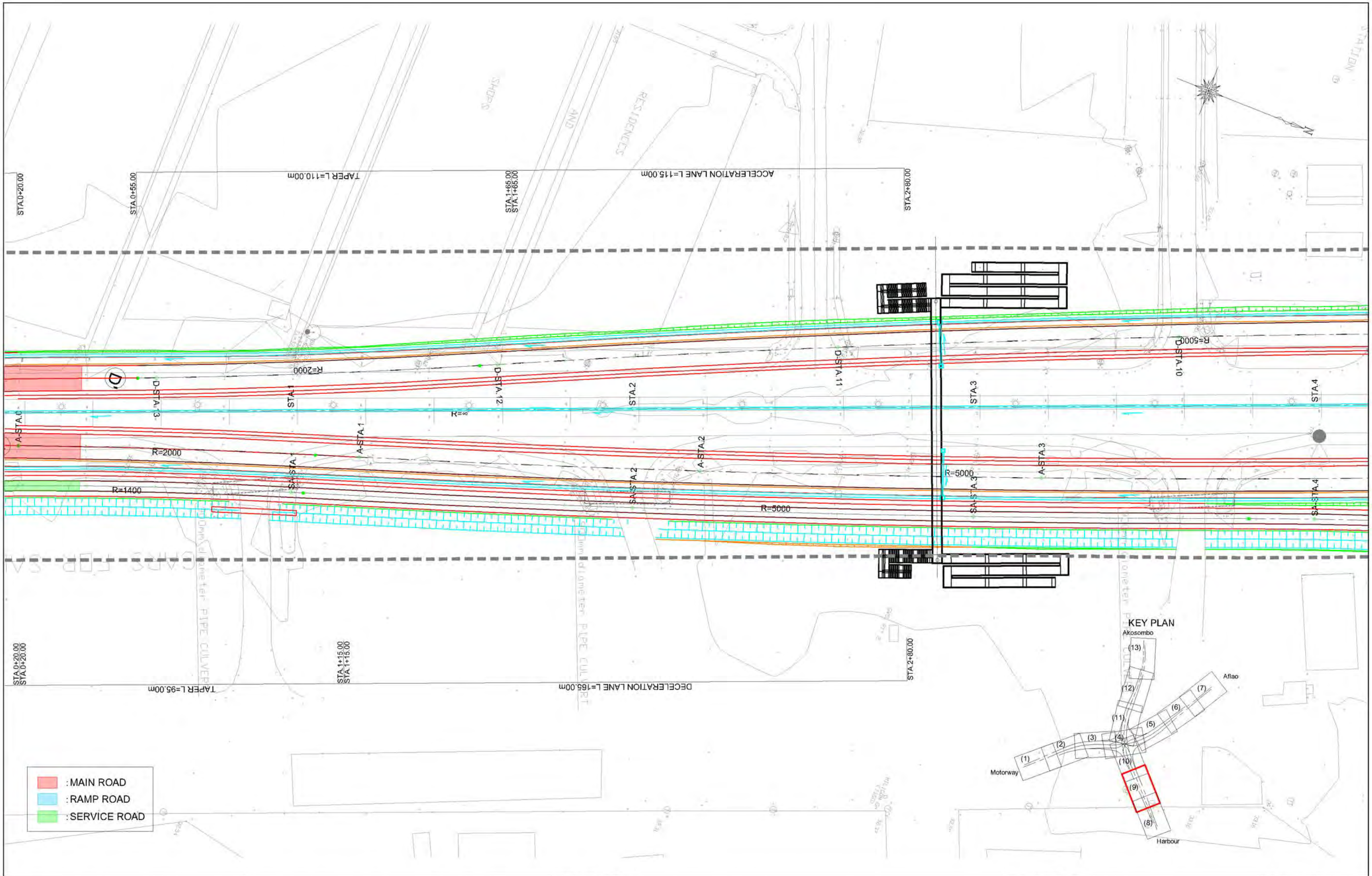
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(8)

SCALE:(A1size)	DRAWING NO.
1:500	PL-08



- : MAIN ROAD
- : RAMP ROAD
- : SERVICE ROAD

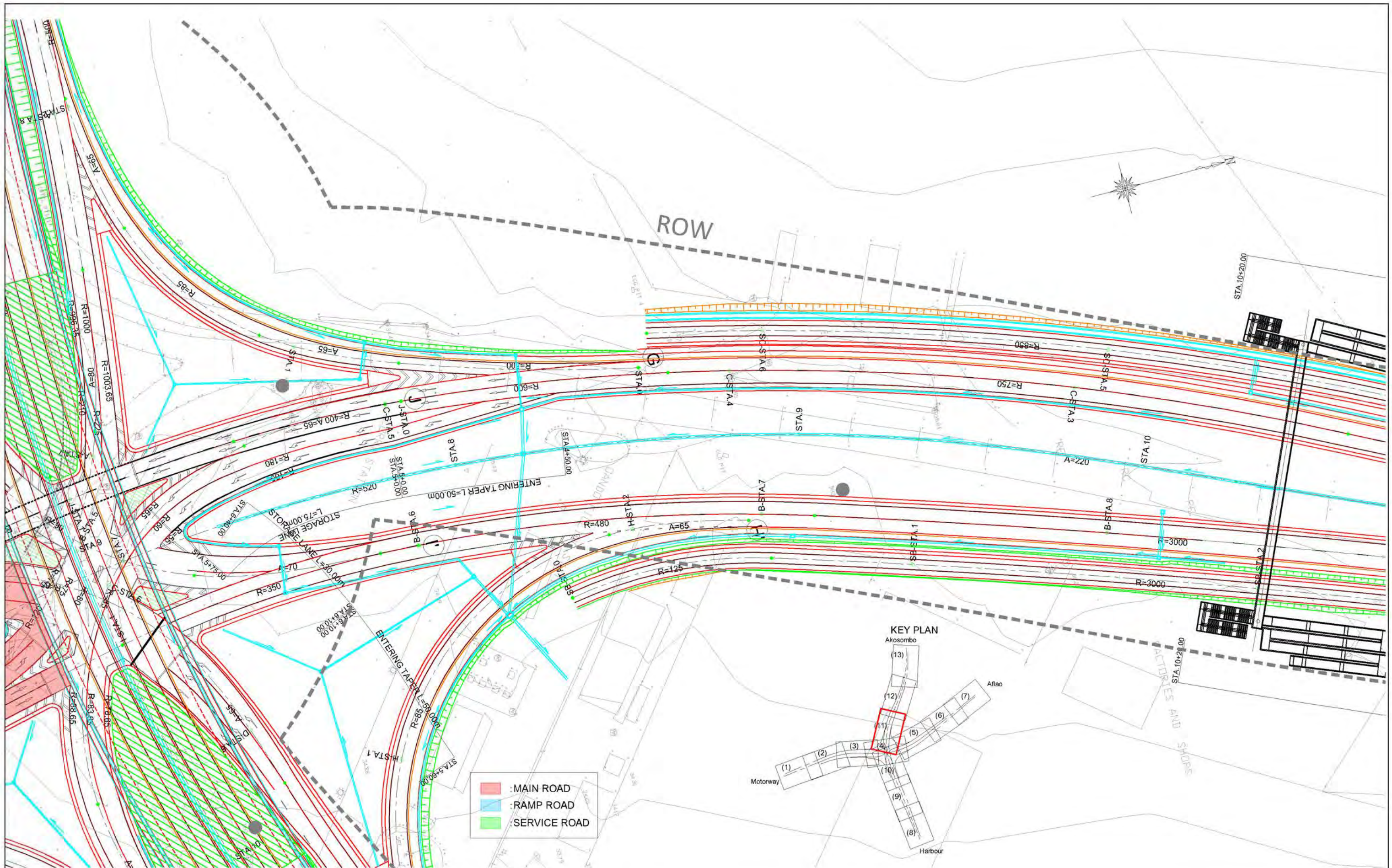
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

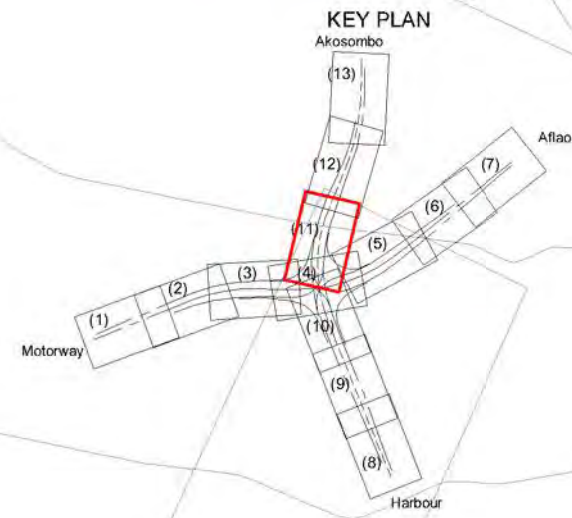
PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
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SCALE:(A1size)	DRAWING NO.
1:500	PL-09



- : MAIN ROAD
- : RAMP ROAD
- : SERVICE ROAD



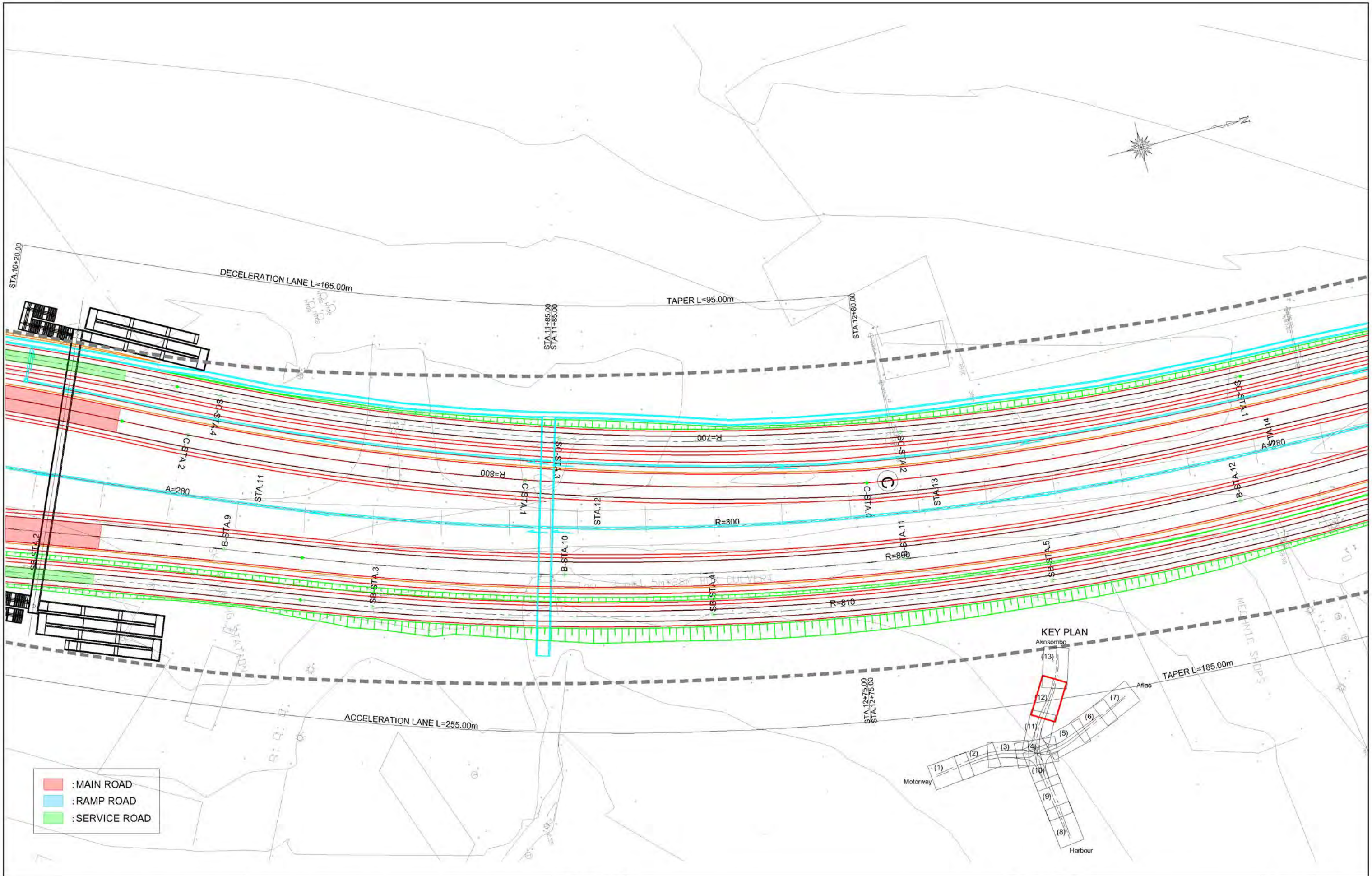
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(11)

SCALE:(A1size)	DRAWING NO.
1:500	PL-11



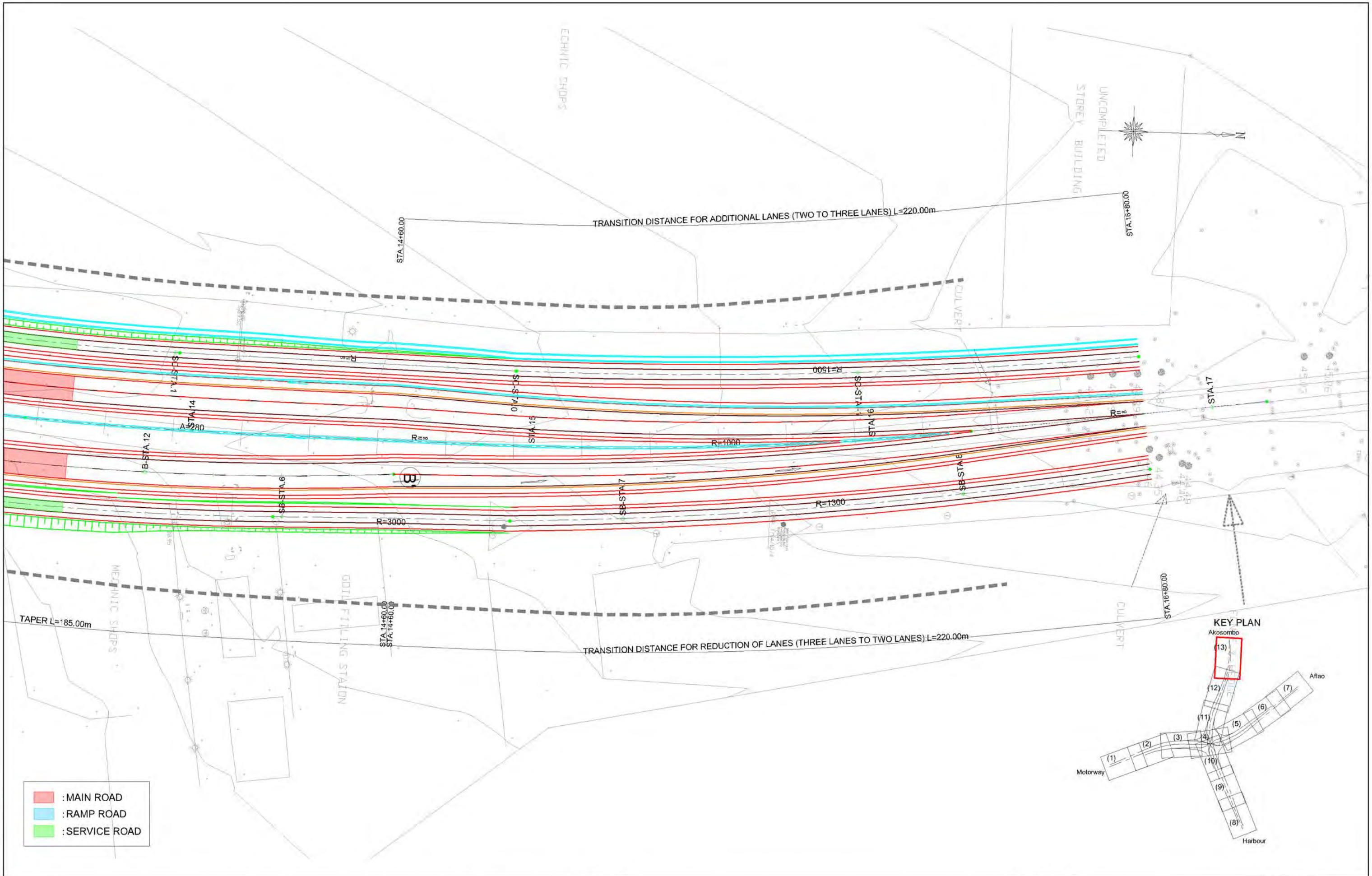
GHANA HIGHWAY AUTHORITY
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 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(12)

SCALE:(A1size)	DRAWING NO.
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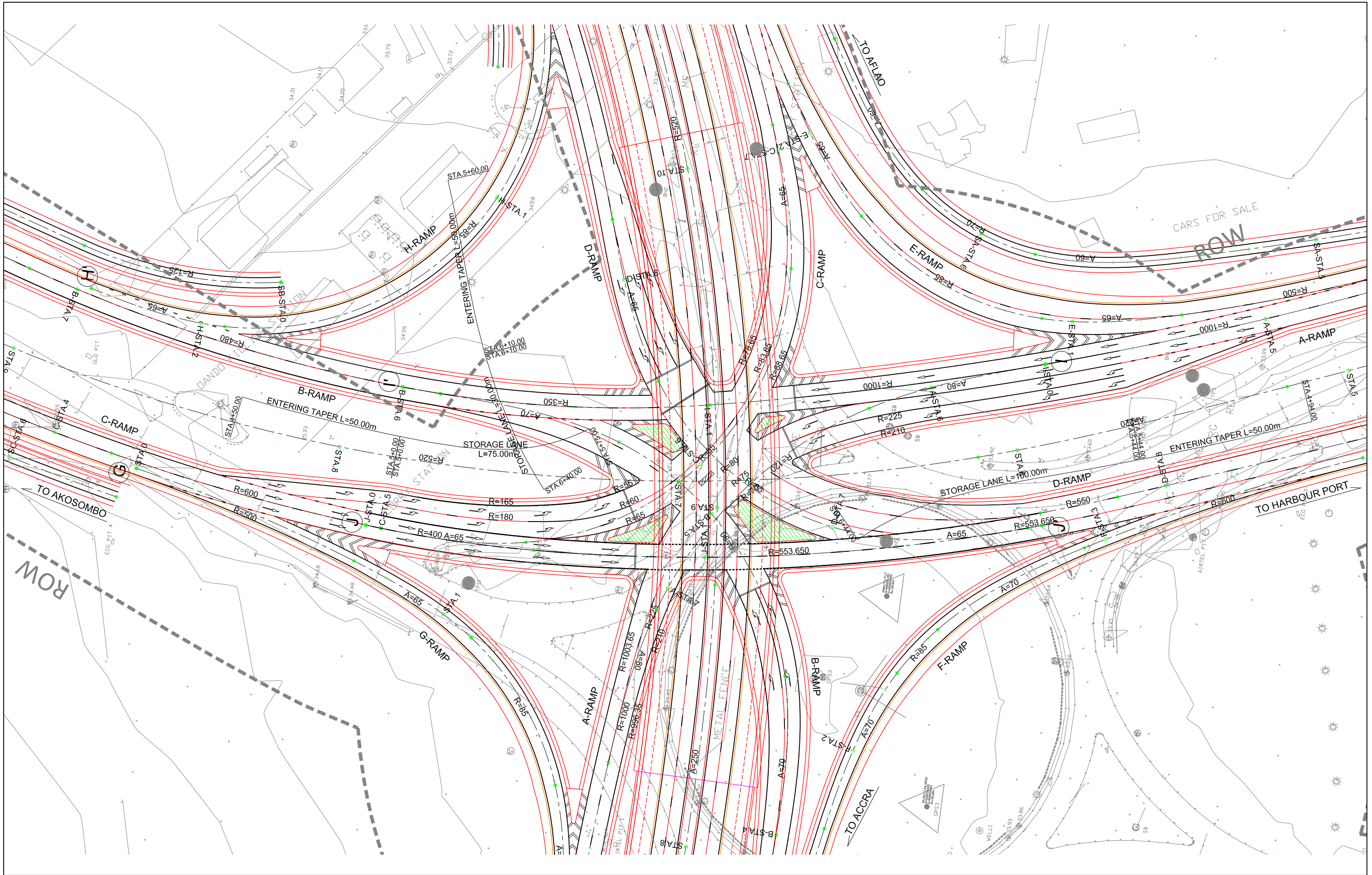
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PLAN(13)

SCALE:(A1size)	DRAWING NO.
1:500	PL-13



GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
INTERSECTION PLAN

SCALE:(A1size)	DRAWING NO.
1:500	IP-01

B-RAMP EXIT NOSE (B-STA. 1+58.782)
 A-RAMP INLET NOSE (A-STA. 10+21.394)
 STA. 5+60.000



VERTICAL ALIGNMENT	24.560		$i=0.379\%$ $L=95.000$		24.200		$i=2.000\%$ $L=335.000$		30.900																																							
FORMATION HEIGHT	24.560	24.484	24.408	24.341	24.363	24.453	24.497	24.743	25.100	25.500	25.900	26.300	26.700	27.100	27.500	27.900	28.300	28.700	29.100	29.493	29.833	30.113	30.217	30.333	30.420	30.493	30.593	30.633	30.613	30.540	30.538	30.460	30.380	30.300	30.220	30.140	30.060	30.038	29.980	29.900	29.820							
GROUND HEIGHT	24.48	24.30	24.00	24.34	24.00	23.94	24.44	24.34	24.76	25.00	25.39	25.48	26.10	26.17	26.91	27.00	27.45	27.95	28.05	28.19	29.09	29.03	29.06	29.72	29.82	30.10	30.35	30.97	31.10	31.44	31.42	31.69	32.12	32.80	33.00	33.29	33.63	33.50	34.00	34.26	34.55							
DISTANCE	0.000	20.000	20.000	20.000	20.000	15.000	5.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	8.868	11.132	10.000	10.000	20.000	20.000	20.000	0.475	19.525	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000						
STATION	BP	+20.000	+40.000	+60.000	+80.000	+95.000	STA. 1	+20.000	+40.000	+60.000	+80.000	STA. 2	+20.000	+40.000	+60.000	+80.000	STA. 3	+20.000	+40.000	+60.000	+80.000	STA. 4	KA 1-1	+20.000	+30.000	+40.000	+60.000	+80.000	STA. 5	+20.000	KE 1-1	+40.000	+60.000	+80.000	STA. 6	+20.000	+40.000	+60.000	+80.000	STA. 7								
HORIZONTAL CURVATURE	$R=\infty$ $L=408.868$												$L=111.607$ $A=250$												$L=124.923$ $R=560$												$L=111.607$ $A=250$											
SUPER ELEVATION	0.000												1/249												1/249												1/380											
WIDENING	Center line																																															

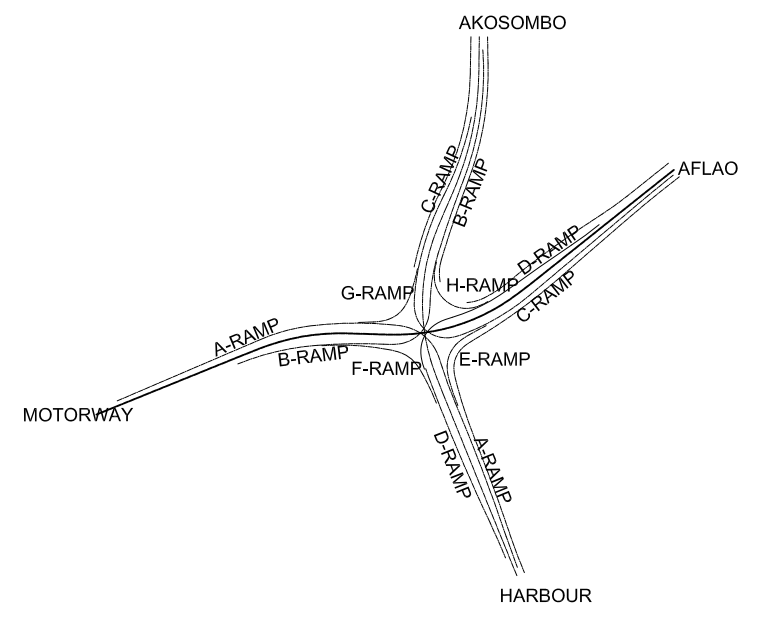
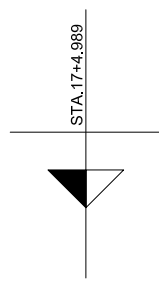
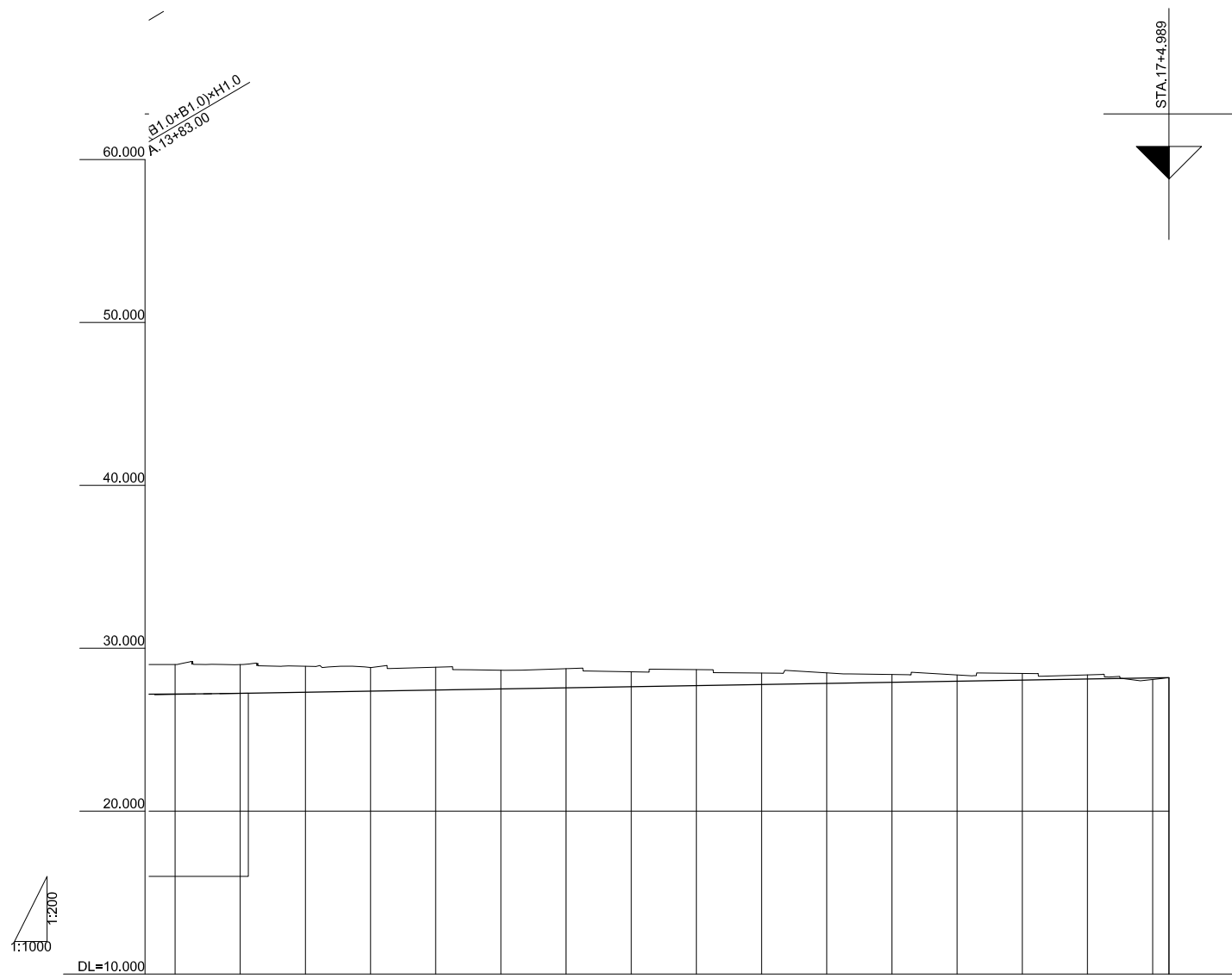
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 MOTORWAY-AFLAO ROAD PROFILE (1)

SCALE: (A1size)
 V=1/200
 H=1/1000
 DRAWING NO.
 PR-01



VERTICAL ALIGNMENT																	
FORMATION HEIGHT	27.190	27.236	27.303	27.371	27.438	27.506	27.574	27.642	27.709	27.777	27.845	27.912	27.980	28.048	28.115	28.183	28.200
GROUND HEIGHT	29.00	29.00	28.89	28.82	28.84	28.66	28.75	28.55	28.69	28.48	28.49	28.39	28.36	28.45	28.37	28.08	28.19
DISTANCE	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	4.989
STATION	STA.14	+20.000	+40.000	+60.000	+80.000	STA.15	+20.000	+40.000	+60.000	+80.000	STA.16	+20.000	+40.000	+60.000	+80.000	STA.17	EP
HORIZONTAL CURVATURE	$R = \infty$ $L = 458.603$																
SUPER ELEVATION																	
WIDENING																	

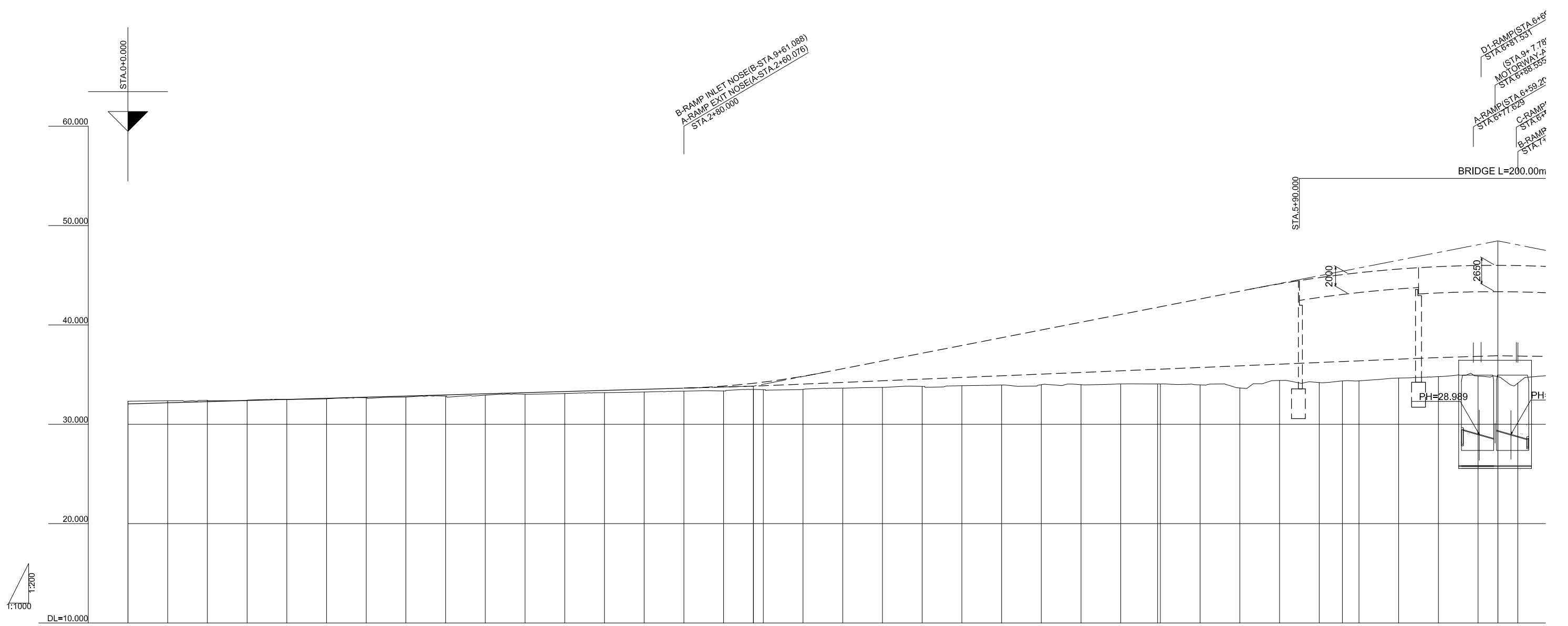
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
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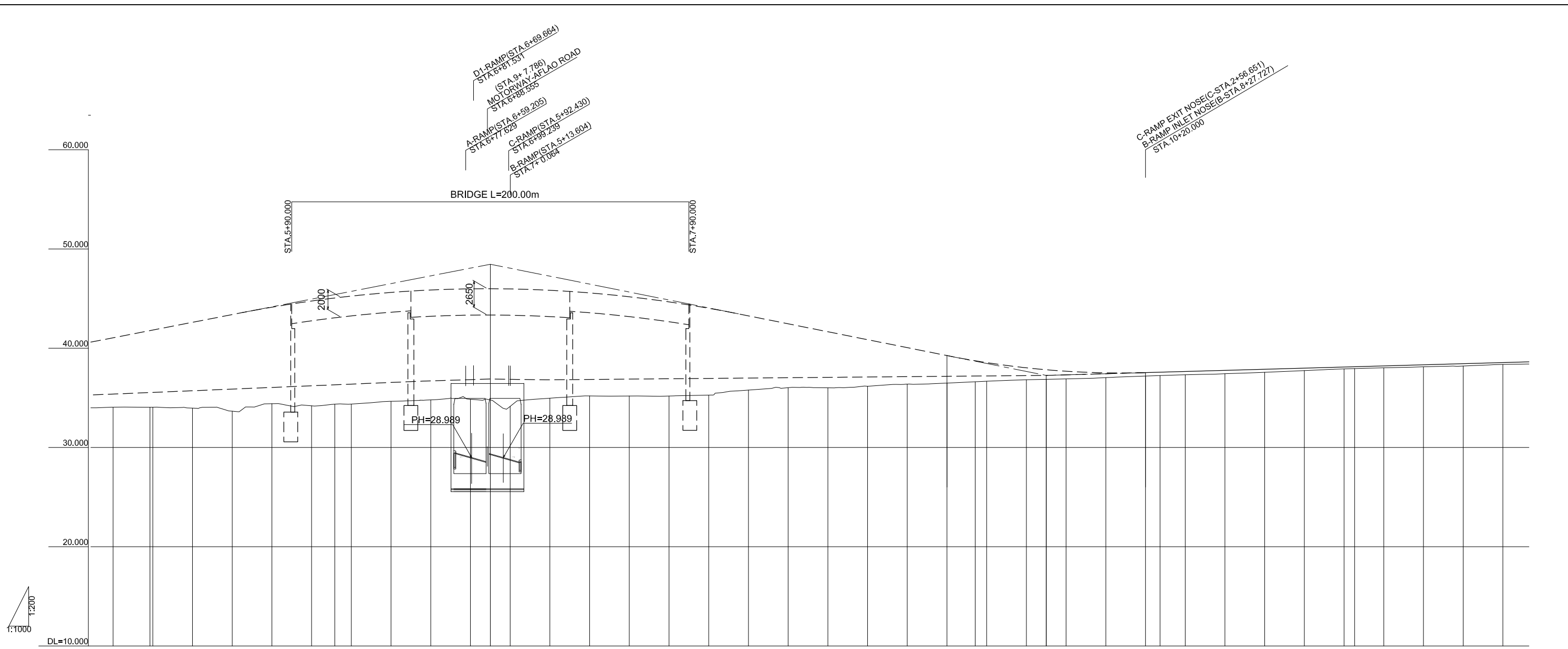
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
MOTORWAY-AFLAO ROAD PROFILE (3)

SCALE:(A1size)	DRAWING NO.
V=1/200 H=1/1000	PR-03

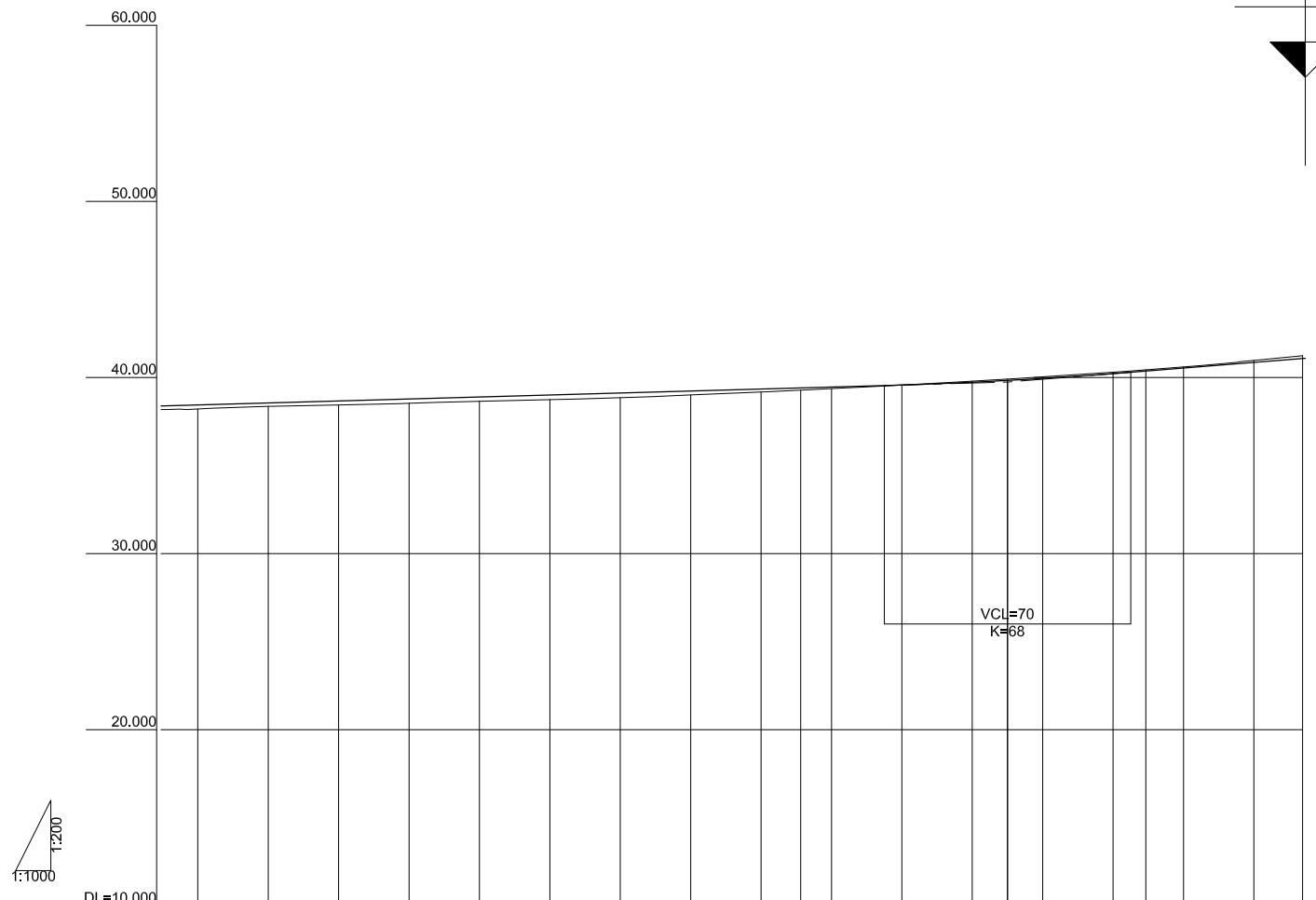
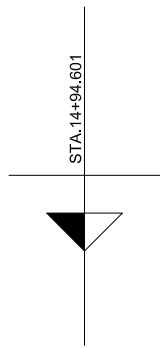
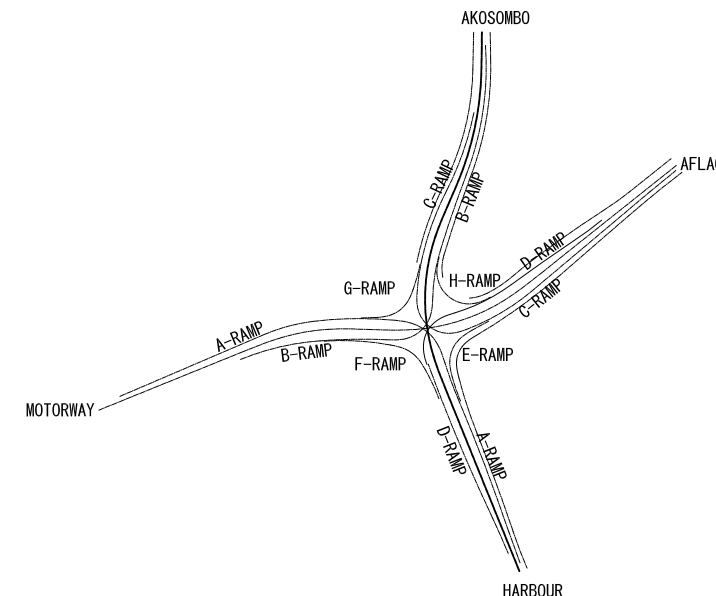


VERTICAL ALIGNMENT	FORMATION HEIGHT	GROUND HEIGHT	DISTANCE	STATION	HORIZONTAL CURVATURE	SUPER ELEVATION	WIDENING
32.050	32.050	32.32	0.000	BP			
	32.163	32.36	20.000	+20.000			
	32.277	32.42	20.000	+40.000			
	32.390	32.42	20.000	+60.000			
	32.503	32.49	20.000	+80.000			
	32.617	32.56	20.000	STA.1			
	32.730	32.67	20.000	+20.000			
	32.843	32.74	20.000	+40.000			
	32.957	32.83	20.000	+60.000			
	33.070	32.93	20.000	+80.000			
	33.183	33.02	20.000	STA.2			
	33.297	33.09	20.000	+20.000			
	33.410	33.18	20.000	+40.000			
	33.523	33.25	20.000	+60.000			
	33.637	33.33	20.000	+80.000			
	33.750	33.41	20.000	STA.3			
	33.863	33.49	15.000	+15.000			
	33.976	33.57	5.000	+20.000			
	34.089	33.65	20.000	+40.000			
	34.202	33.73	20.000	+60.000			
	34.315	33.81	20.000	+80.000			
	34.428	33.89	20.000	STA.4			
	34.541	33.97	20.000	+20.000			
	34.654	34.05	20.000	+40.000			
	34.767	34.13	20.000	+60.000			
	34.880	34.21	20.000	+80.000			
	34.993	34.29	20.000	STA.5			
	35.106	34.37	19.590	KA.1-1			
	35.219	34.45	1.410	+20.000			
	35.332	34.53	20.000	+40.000			
	35.445	34.61	20.000	+60.000			
	35.558	34.69	20.000	+80.000			
	35.671	34.77	20.000	STA.6			
	35.784	34.85	20.000	+20.000			
	35.897	34.93	11.667	KE 1-1			
	36.010	35.01	8.333	+20.000			
	36.123	35.09	20.000	+40.000			
	36.236	35.17	20.000	+60.000			
	36.349	35.25	20.000	+80.000			
	36.462	35.33	20.000	STA.7			
	36.575	35.41	10.000	+10.000			
	36.688	35.49	10.000	+20.000			

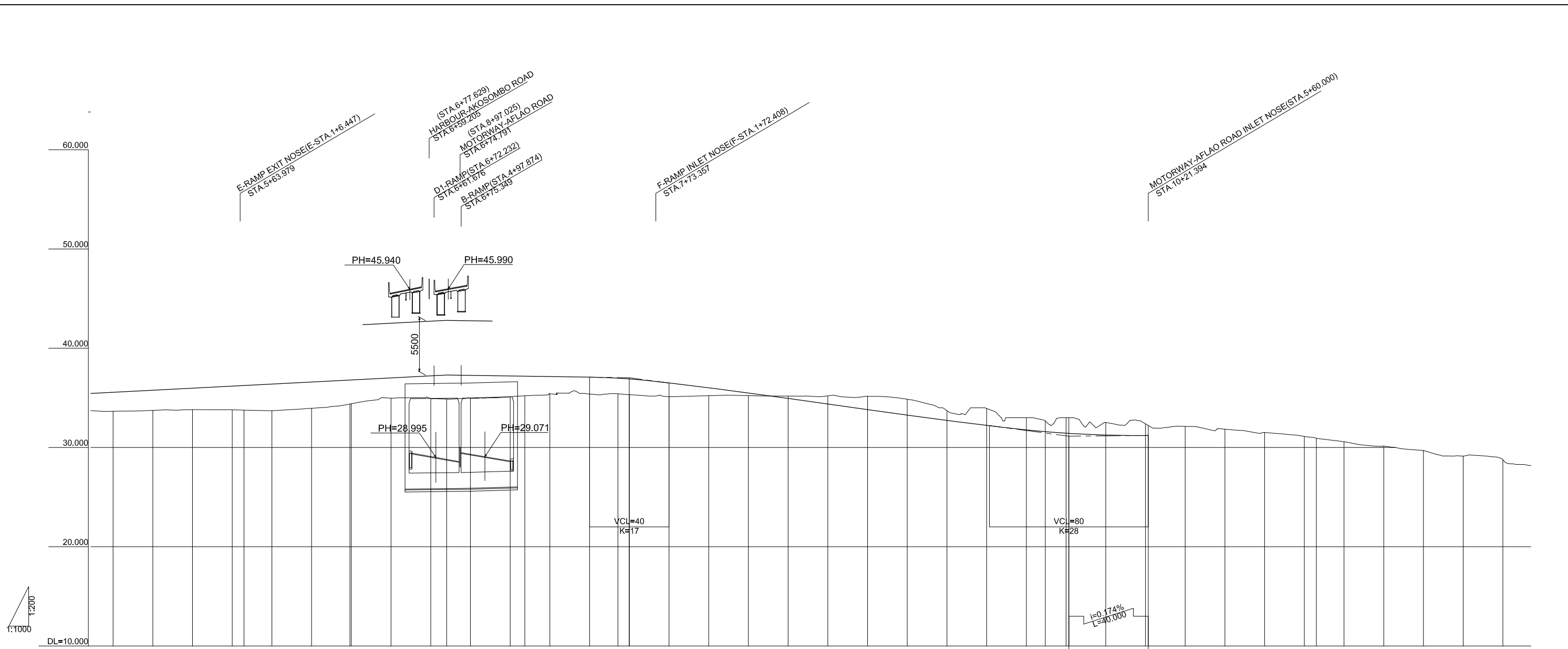


VERTICAL ALIGNMENT	i=3.900% L=375.000		48.460		i=4.000% L=280.000		37.260		i=0.564% L=440.000																																	
FORMATION HEIGHT	35.357	35.549 35.564	35.770	35.974	36.176	36.376	36.492	36.575	36.777	36.993	37.225	37.225	37.008	36.818	36.662	36.577	36.542	36.508	36.475	36.442	36.406	36.386	36.425	36.495	36.533	36.712	36.959	37.222	37.542	37.583	37.655	37.767	37.880	37.993	38.105	38.135	38.218	38.331	38.444	38.556		
GROUND HEIGHT	34.05	34.06 34.06	33.96	33.66	34.41	34.20	34.36	34.37	34.85	34.79	34.86	34.78	34.14	34.97	35.19	35.19	35.27	35.78	36.02	36.01	36.17	36.38	36.49	36.62	36.67	36.82	36.87	36.91	37.04	37.20	37.25	37.32	37.43	37.58	37.75	37.92	37.95	38.03	38.13	38.20	38.36	
DISTANCE	20.000	18.590 1.410	20.000	20.000	20.000	20.000	11.667	8.333	20.000	20.000	20.000	10.000	10.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	14.222	5.778	20.000	10.000	10.000	20.000	20.000	7.299	12.701	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
STATION	STA. 5	KA 1-1 +20.000	+40.000	+60.000	+80.000	STA. 6	KE 1-1 +20.000	+40.000	+60.000	+80.000	+90.000	STA. 7	+20.000	+40.000	+60.000	+80.000	STA. 8	+20.000	+40.000	+60.000	+80.000	STA. 9	+20.000	KE 1-2 +40.000	+60.000	+70.000	+80.000	STA. 10	+20.000	KA 2-1 +40.000	+60.000	+80.000	STA. 11	+20.000	KE 2-1 +40.000	+60.000	+80.000	STA. 12				
HORIZONTAL CURVATURE																																										
SUPER ELEVATION																																										
WIDENING	---																																									

KEY PLAN



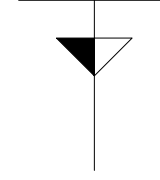
VERTICAL ALIGNMENT																				
FORMATION HEIGHT	38.444	38.556	38.669	38.782	38.895	39.007	39.120	39.233	39.345	39.409	39.458	39.573	39.730	39.830	39.946	40.221	40.367	40.538	40.857	41.090
GROUND HEIGHT	38.20	38.36	38.44	38.53	38.66	38.75	38.85	39.01	39.18	39.28	39.36	39.57	39.80	39.91	40.03	40.30	40.44	40.60	40.97	
DISTANCE	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	11.273	8.727	20.000	20.000	10.000	10.000	20.000	9.273	10.727	20.000	14.601
STATION	+80.000	STA.12	+20.000	+40.000	+60.000	+80.000	STA.13	+20.000	+40.000	KE 2-2	+60.000	+80.000	STA.14	+10.000	+20.000	+40.000	KA 2-2	+60.000	+80.000	EP
HORIZONTAL CURVATURE																				
SUPER ELEVATION																				
WIDENING	-																			



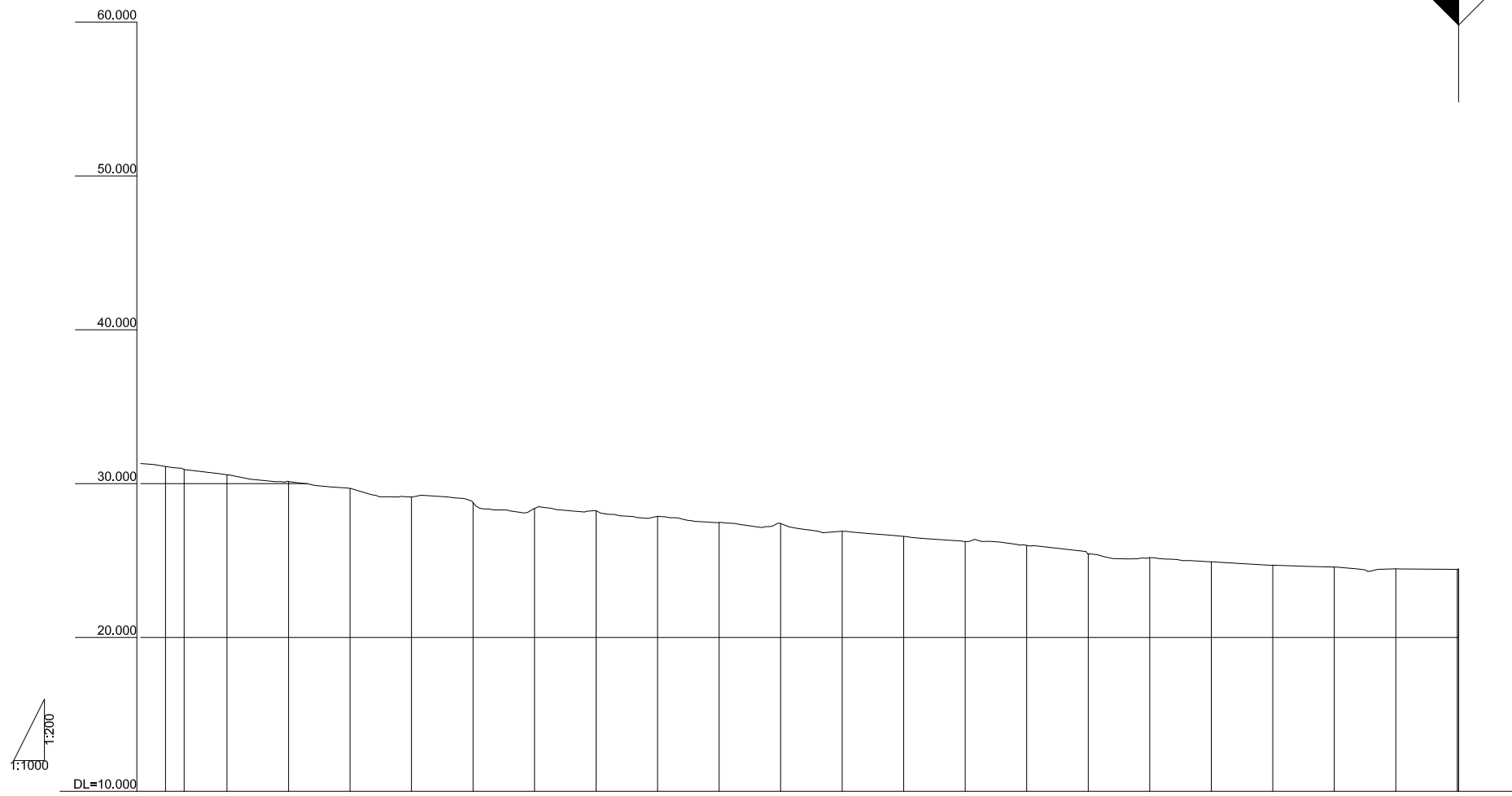
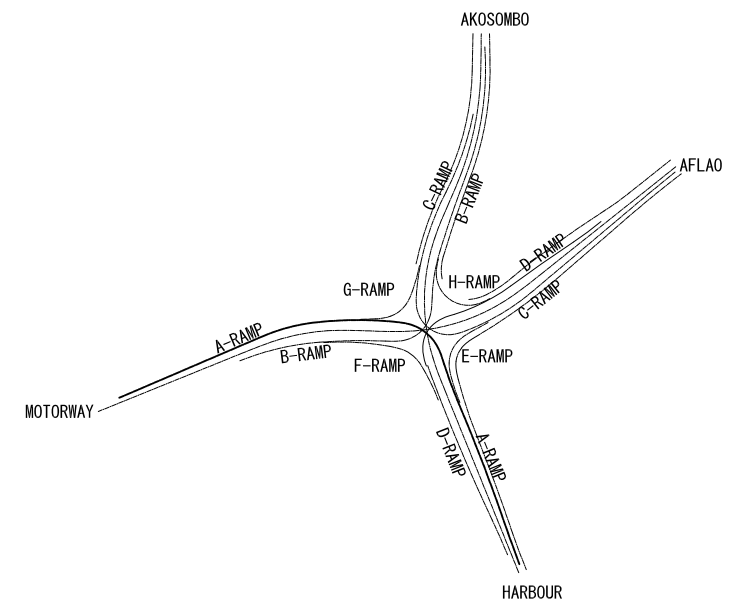
VERTICAL ALIGNMENT																																													
FORMATION HEIGHT	35.561	35.768	35.975	36.182	36.244	36.389	36.596	36.796	36.803	37.010	37.217	37.300	37.264	37.204	37.182	37.144	37.084	36.981	36.906	36.492	35.961	35.429	34.897	34.366	33.834	33.302	32.771	32.239	31.769	31.594	31.439	31.422	31.252	31.206	31.206										
GROUND HEIGHT	33.65	33.74	33.82	33.80	33.76	33.70	33.95	34.38	34.41	34.97	34.94	34.87	34.94	35.09	35.21	35.42	35.38	35.40	35.33	35.12	35.21	35.22	35.18	35.20	35.15	34.86	33.71	33.94	33.00	32.67	33.00	31.439	31.422	32.22	32.22	32.12	31.84	31.51	31.11	30.92	30.57	30.14	29.70	29.13	28.77
DISTANCE	20.000	20.000	20.000	20.000	5.967	14.033	20.000	19.300	0.700	20.000	20.000	8.000	12.000	20.000	7.366	12.634	20.000	14.300	5.700	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	9.550	10.450	1.394	18.606	20.000	1.394	18.606	20.000	20.000	20.000	6.067	13.933	20.000	20.000	20.000	20.000
STATION	STA.5	+20.000	+40.000	+60.000	KA 4-1	+80.000	STA.6	KE 4-1	+20.000	+40.000	+60.000	+80.000	+80.000	STA.7	KE 4-2	+20.000	+40.000	KA 4-2	+60.000	+80.000	STA.8	+20.000	+40.000	+60.000	+80.000	STA.9	+20.000	+40.000	+60.000	BC 5-0	+80.000	+81.394	STA.10	+20.000	+21.394	+40.000	+60.000	+80.000	STA.11	EC 5-0	+20.000	+40.000	+60.000	+80.000	STA.12
HORIZONTAL CURVATURE																																													
SUPER ELEVATION																																													
WIDENING																																													

STA. 5+60.000

A-STA. 15+20.390

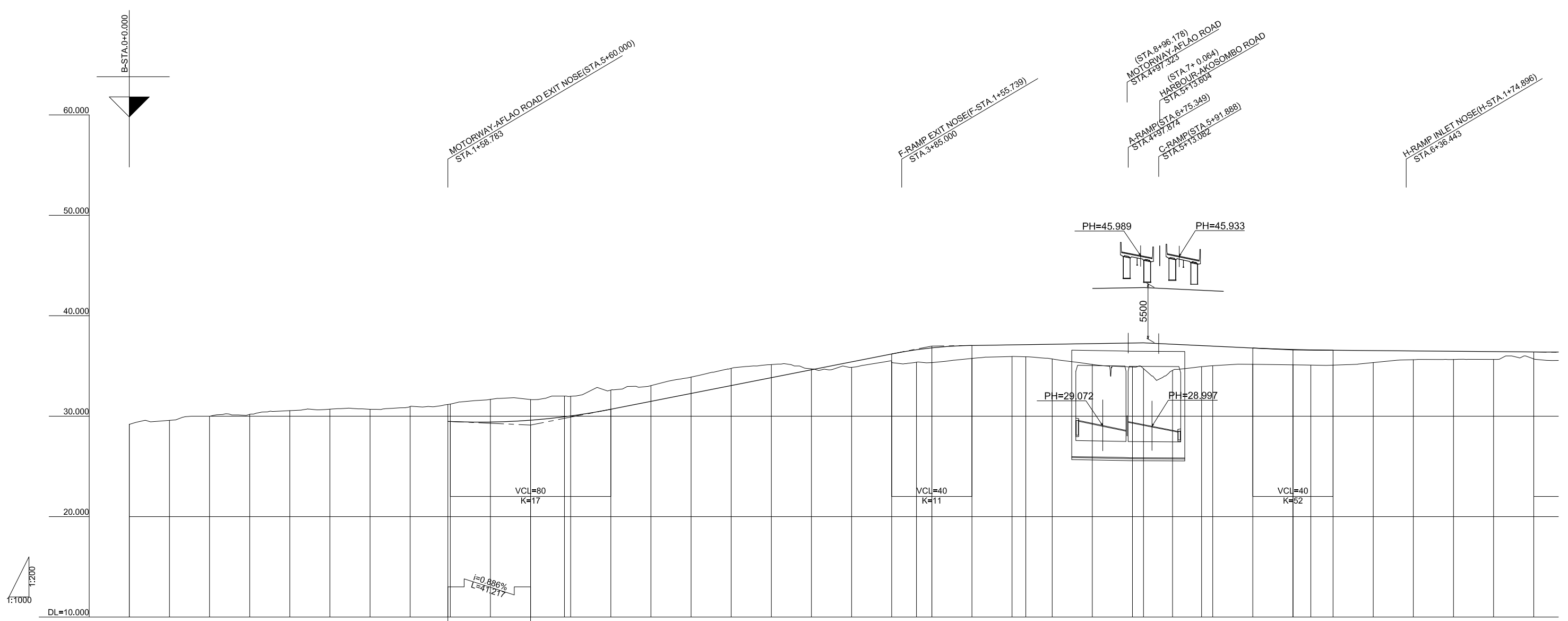


KEY PLAN



VERTICAL ALIGNMENT																							
FORMATION HEIGHT																							
GROUND HEIGHT	31.11	30.92	30.57	30.14	29.70	29.13	28.77	28.38	28.24	27.87	27.47	27.41	26.90	26.57	26.23	25.98	25.42	25.19	24.92	24.70	24.57	24.46	24.46
DISTANCE	20.000	6.067	13.933	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
STATION	STA.11 EC 5+0	+20.000	+40.000	+60.000	+80.000	STA.12	+20.000	+40.000	+60.000	+80.000	STA.13	+20.000	+40.000	+60.000	+80.000	STA.14	+20.000	+40.000	+60.000	+80.000	STA.15	EP20.000	
HORIZONTAL CURVATURE	R_{∞} $L=414.323$																						
SUPER ELEVATION																							
WIDENING	-----																						

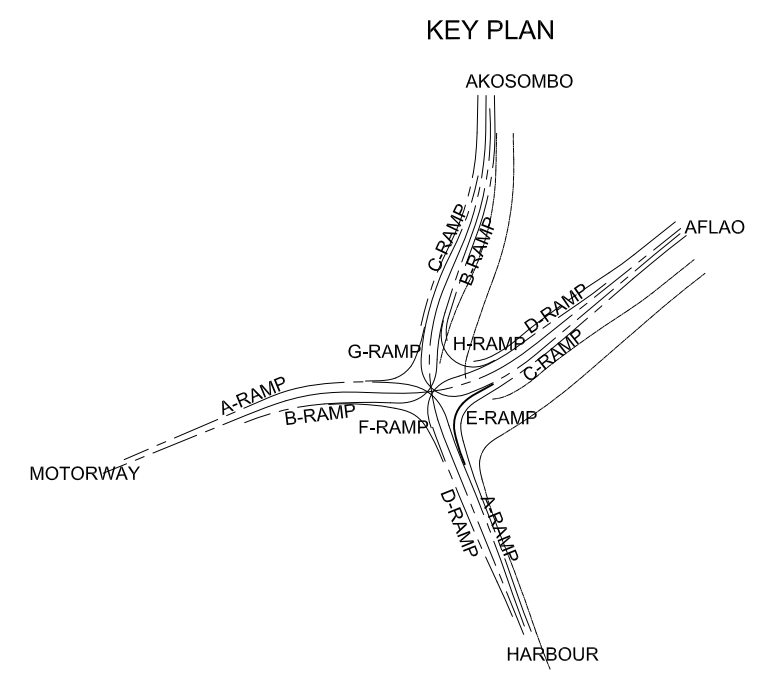
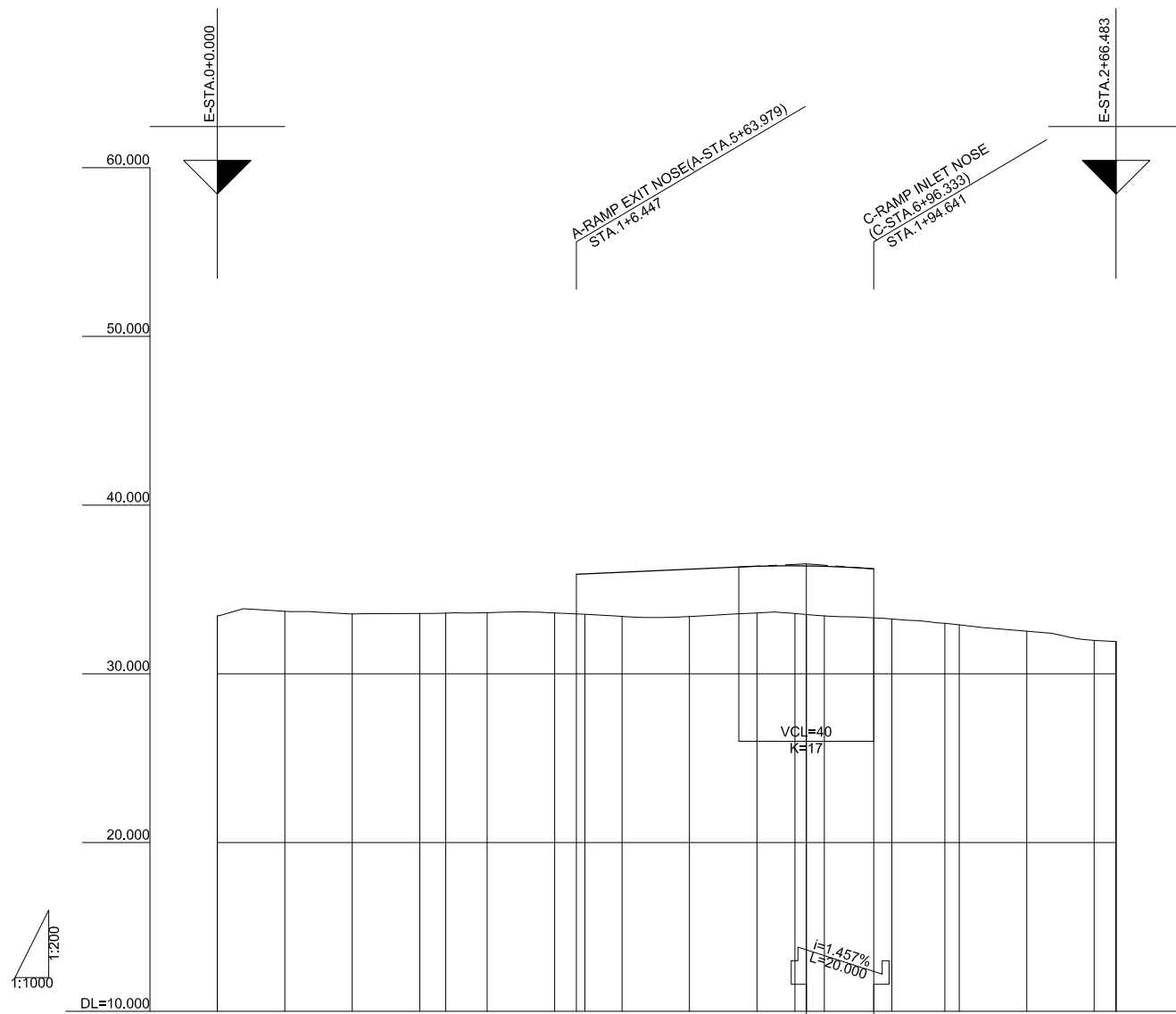
GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: A-RAMP PROFILE (3)	SCALE:(A1size)	DRAWING NO.
				V=1/200 H=1/1000	PR-09



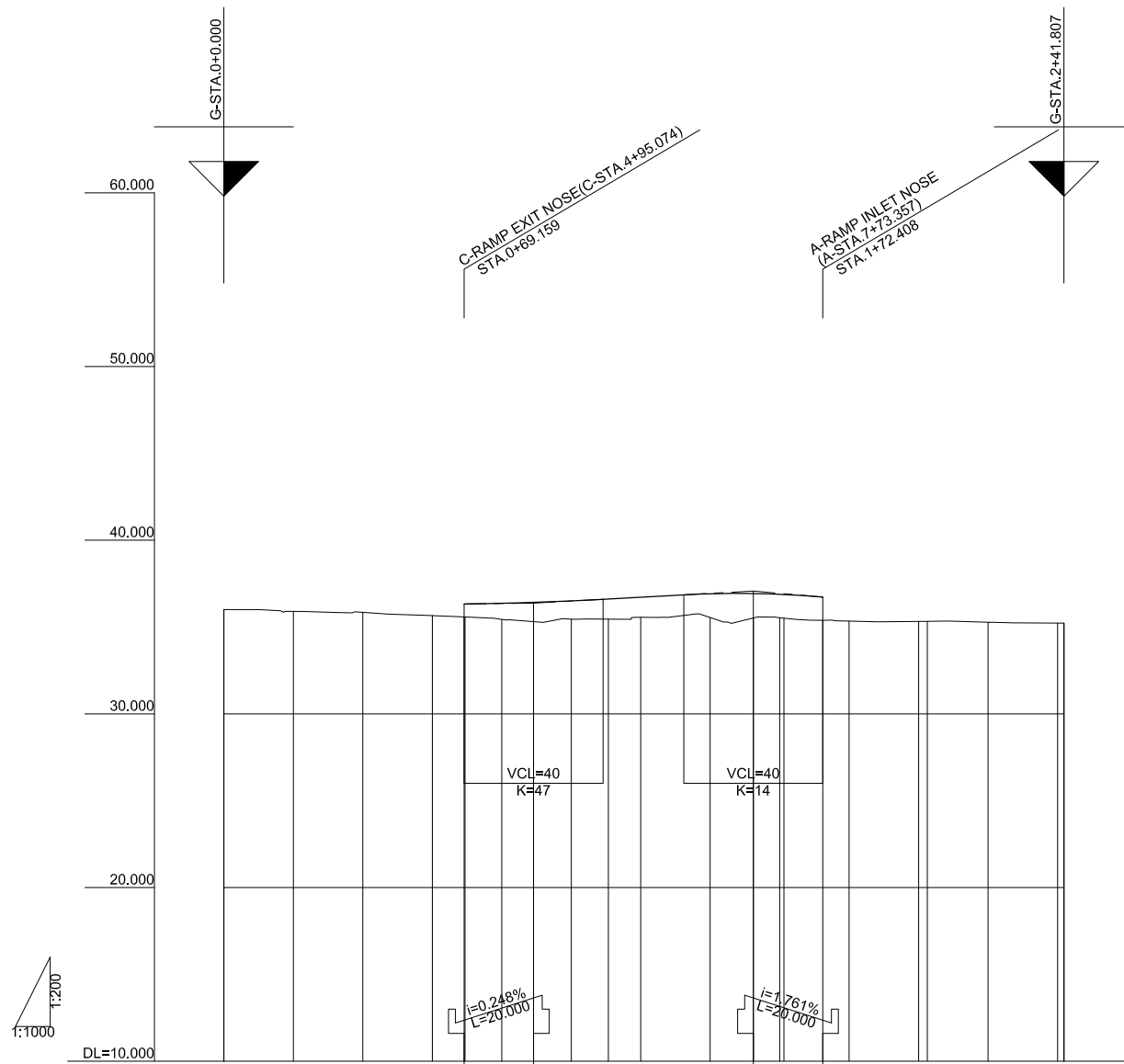
VERTICAL ALIGNMENT	FORMATION HEIGHT	GROUND HEIGHT	DISTANCE	STATION	HORIZONTAL CURVATURE	SUPER ELEVATION	WIDENING
		29.19	0.000	BC 1-0			
		29.58	20.000	+20.000			
		30.00	20.000	+40.000			
		30.18	20.000	+60.000			
		30.55	20.000	+80.000			
		30.69	20.000	STA.1			
		30.68	20.000	+20.000			
		30.96	20.000	+40.000			
		31.16	18.783	+58.783			
		31.20	1.217	+60.000			
		31.68	20.000	+80.000			
		31.65	20.000	STA.2			
		32.00	16.908	+20.000			
		31.98	3.092	+20.000			
		32.59	20.000	+40.000			
		33.03	20.000	+60.000			
		33.89	20.000	+80.000			
		34.76	20.000	STA.3			
		35.14	20.000	+20.000			
		34.71	20.000	+40.000			
		34.86	20.000	+60.000			
		35.36	20.000	+80.000			
		35.37	12.372	KA 2-1			
		35.34	7.628	STA.4			
		35.75	20.000	+20.000			
		35.94	20.000	+40.000			
		35.91	6.816	KE 2-1			
		35.70	13.184	+60.000			
		35.16	20.000	+80.000			
		34.90	20.000	STA.5			
		34.74	5.500	+5.500			
		34.56	14.500	+20.000			
		34.93	14.468	KE 2-2			
		35.03	5.532	+40.000			
		35.16	20.000	+60.000			
		35.12	20.000	+80.000			
		35.09	8.913	KA 3-1			
		35.08	11.087	STA.6			
		35.34	20.000	+20.000			
		35.62	20.000	+40.000			
		35.66	20.000	+60.000			
		35.65	20.000	+80.000			
		35.70	20.000	STA.7			



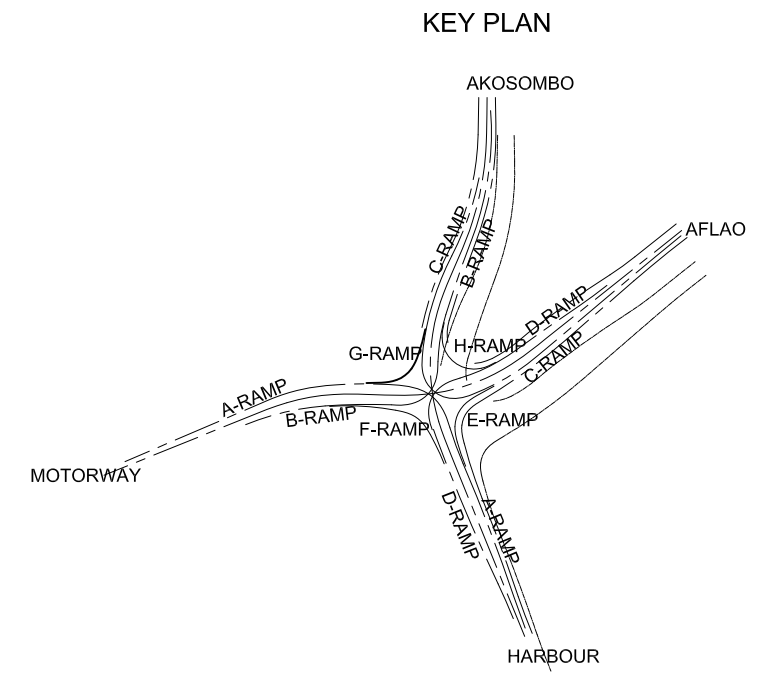
VERTICAL ALIGNMENT	37.300		36.328 36.237		33.598		33.331																																			
FORMATION HEIGHT	37.263	37.300	37.150	36.950	36.793	36.750	36.550	36.373	36.350	36.328	36.237	36.059	36.005	35.859	35.659	35.459	35.259	35.059	34.859	34.659	34.459	34.259	34.061	33.878	33.714	33.667	33.568	33.441	33.333	33.331												
GROUND HEIGHT	34.82	34.72	34.85	34.98	34.91	34.89	34.62	34.45	34.50	34.59	34.47	34.36	34.21	34.04	33.85	34.15	33.74	33.43	33.39	33.45	33.26	33.32	33.10	33.00	33.00	33.11	33.04	32.76	32.57	32.69	32.29	32.20	32.30	32.39	32.09	32.36	32.42	32.45	32.31	32.15	32.12	32.06
DISTANCE	20.000	5.000	15.000	20.000	15.669	4.331	20.000	17.744	2.266	2.197	17.803	5.368	14.632	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	6.083	13.917	20.000	0.476	19.524	20.000	20.000	20.000	20.000	5.240	14.760	20.000	20.000	20.000	20.000	5.487		
STATION	+60.000	+65.000	+80.000	STA.7	KE 4-2	+20.000	+40.000	KA 5-1	+60.000	+62.197	+80.000	EBC 1-1	STA.8	+20.000	+40.000	+60.000	+80.000	STA.9	+20.000	+40.000	+60.000	+80.000	STA.10	+20.000	+26.083	+40.000	+60.000	+80.000	+80.476	STA.11	+20.000	+40.000	+60.000	+80.000	STA.12	BC 2-0	+20.000	+40.000	+60.000	+80.000	STA.13	+5.487
HORIZONTAL CURVATURE	R=85 L=84.094		A=65 L=42.075		R=550 L=23.171		R=553.65 L=4.453		R=550 L=23.171		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		R=5000 L=419.871		L=100.247 R=20000		L=100.247 R=20000		L=100.247 R=20000		L=100.247 R=20000					
SUPER ELEVATION	1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149		1/231		1/149			
WIDENING	ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m		ROADWAY line Left 3.30m + Right 1.65=4.95m			



VERTICAL ALIGNMENT															
FORMATION HEIGHT															
GROUND HEIGHT	33.42	33.71	33.55	33.58	33.60	33.63	33.61	33.56	33.53	33.41	33.40	33.61	33.58	33.52	33.45
DISTANCE	0.000	20.000	20.000	20.000	7.727	12.273	20.000	6.447	2.536	11.017	20.000	20.000	11.271	3.370	5.359
STATION	BC 1-0	+20.000	+40.000	+60.000	KAE 1-1	+80.000	STA. 1	+6.447	KEE 1-1	+20.000	+40.000	+60.000	KEE 1-2	+74.641	+80.000
HORIZONTAL CURVATURE															
SUPER ELEVATION															
WIDENING															



VERTICAL ALIGNMENT																						
FORMATION HEIGHT				36.326	36.327	36.365	36.418	36.504	36.613	36.716	36.916	36.930	36.894	36.873	36.721							
GROUND HEIGHT	36.00	35.90	35.84	35.66	35.58	35.57	35.44	35.31	35.45	35.45	35.56	35.54	35.52	35.54	35.51	35.39	35.34	35.32	35.33	35.27	35.22	35.22
DISTANCE	0.000	20.000	20.000	20.000	9.159	0.269	10.572	9.159	10.841	10.683	9.317	20.000	12.408	7.992	1.235	11.173	7.592	20.000	2.491	17.509	20.000	1.807
STATION	BC 1-0	+20.000	+40.000	+60.000	+69.159	+80.000	+89.159	STA. 1	KEE 1-1	+20.000	+40.000	+52.408	+60.000	KEE 1-2	+72.408	+80.000	STA. 2	KEE 1-2	+20.000	+40.000	EP	
HORIZONTAL CURVATURE	L=69.428 R=500			L=41.256 A=65				L=50.552 R=85				L=41.256 A=65				L=39.316 R=500						
SUPER ELEVATION																						
WIDENING																						



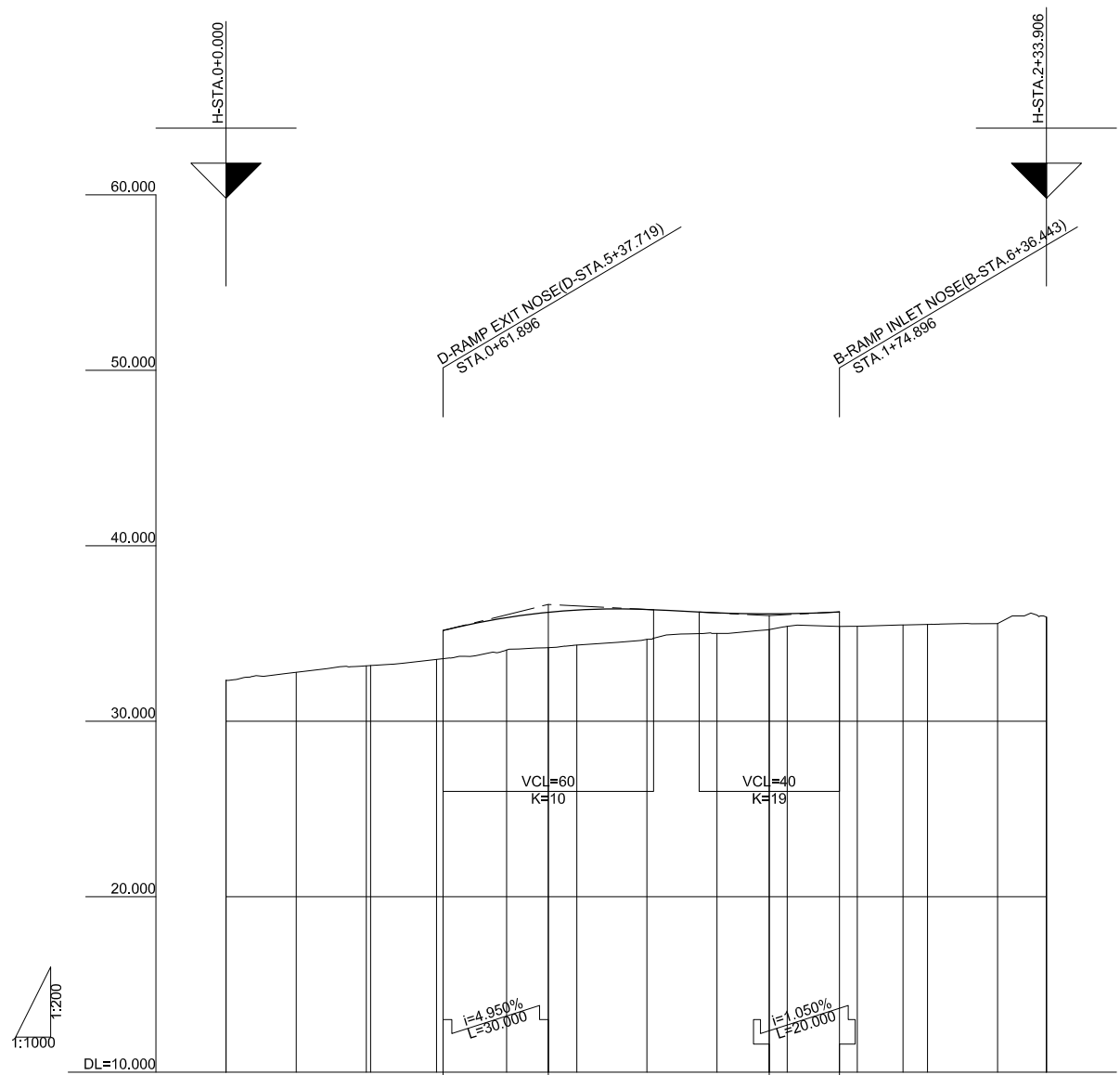
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

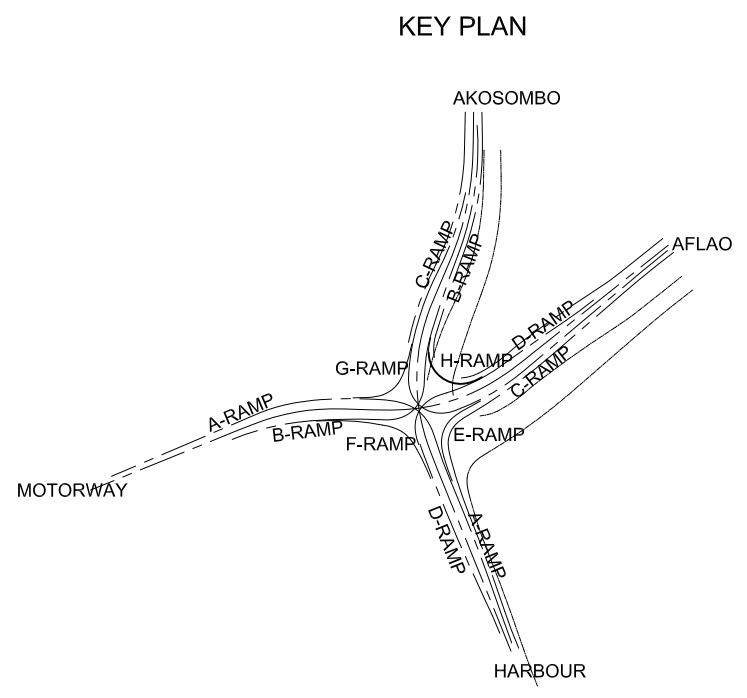
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
G-RAMP PROFILE

SCALE:(A1size)	DRAWING NO.
V=1/200 H=1/1000	PR-18



VERTICAL ALIGNMENT																	
FORMATION HEIGHT	32.106	33.096	34.086	35.076	35.903	36.208	36.335	36.369	36.175	36.121	36.129	36.228	36.282	36.418	36.492	36.702	36.848
GROUND HEIGHT	32.33	32.79	33.16	33.52	34.06	34.19	34.33	34.67	35.00	35.23	35.41	35.40	35.41	35.49	35.52	35.57	35.94
DISTANCE	0.000	20.000	20.000	18.775	18.104	11.896	8.104	20.000	20.000	14.896	5.104	14.896	5.104	13.036	6.964	20.000	13.906
STATION	KA 1-1	+20.000	+40.000	+60.000	+80.000	+91.896	STA. 1	+20.000	+40.000	+54.896	+60.000	+74.896	+80.000	KEE 1-2	STA. 2	+20.000	+33.906
HORIZONTAL CURVATURE	L=41.225 A=65			L=151.811 R=85										L=40.87 A=65			
SUPER ELEVATION																	
WIDENING																	



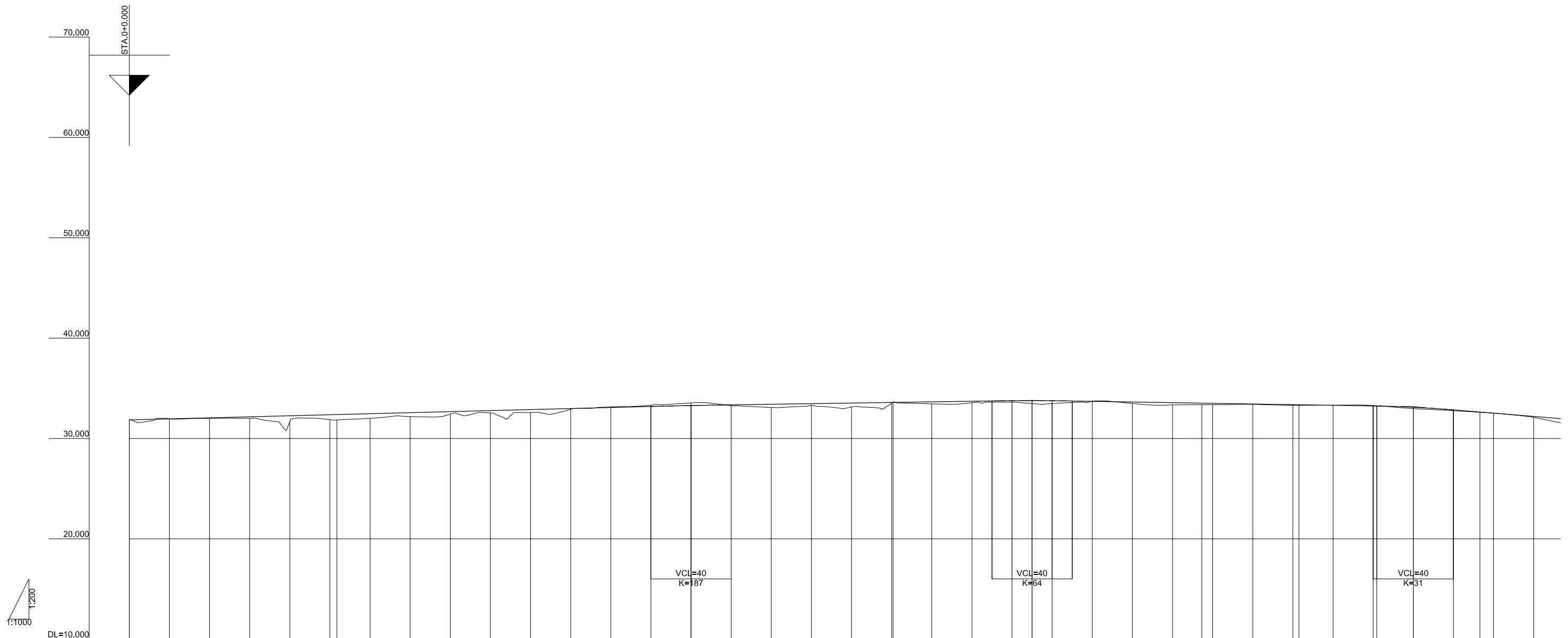
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
H-RAMP PROFILE

SCALE:(A1size)	DRAWING NO.
V=1/200 H=1/1000	PR-19



1:1000
DL=10.000

VERTICAL ALIGNMENT																																											
FORMATION HEIGHT	31.850	31.953	32.056	32.159	32.261	32.364	32.382	32.467	32.570	32.673	32.776	32.879	32.981	33.084	33.187	33.279	33.350	33.410	33.470	33.530	33.590	33.692	33.650	33.710	33.762	33.769	33.759	33.701	33.636	33.570	33.522	33.504	33.438	33.372	33.362	33.307	33.241	33.234	33.110	32.850	32.635	32.525	32.200
GROUND HEIGHT	31.85	31.95	32.00	32.00	31.68	31.87	31.85	32.01	32.18	32.43	32.55	32.60	32.92	33.14	33.31	33.55	33.27	33.09	33.32	33.14	33.52	33.63	33.45	33.56	33.62	33.48	33.48	33.72	33.48	33.35	33.36	33.37	33.39	33.31	33.30	33.32	33.28	33.26	32.97	32.77	32.61	32.52	32.11
DISTANCE	0.000	20.000	20.000	20.000	20.000	20.000	16.500	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	0.713	19.287	20.000	20.000	10.000	10.000	20.000	20.000	20.000	20.000	20.000	3.004	16.996	20.000	1.707	18.203	20.000	20.000	13.226	6.774	20.000	
STATION	BC 1-0	+20.000	+40.000	+60.000	+80.000	STA.1 BC 2-0	+20.000	+40.000	+60.000	+80.000	STA.2	+20.000	+40.000	+60.000	+80.000	STA.3	+20.000	+40.000	+60.000	+80.000	BC 3-0	STA.4	+20.000	+40.000	+50.000	+60.000	+80.000	STA.5	+20.000	KAE 3-1	+40.000	+60.000	+80.000	KEE 3-1	STA.6	+20.000	KE 3-1	+40.000	+60.000	+80.000	KA 4-1	+80.000	STA.7
HORIZONTAL CURVATURE																																											
SUPER ELEVATION																																											

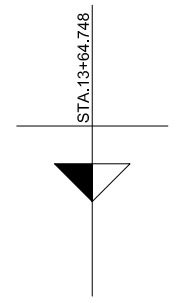
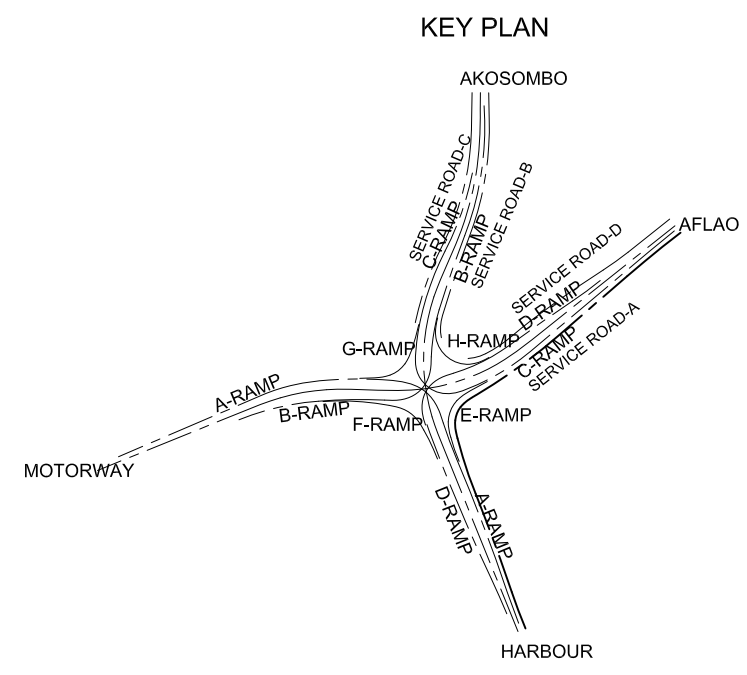
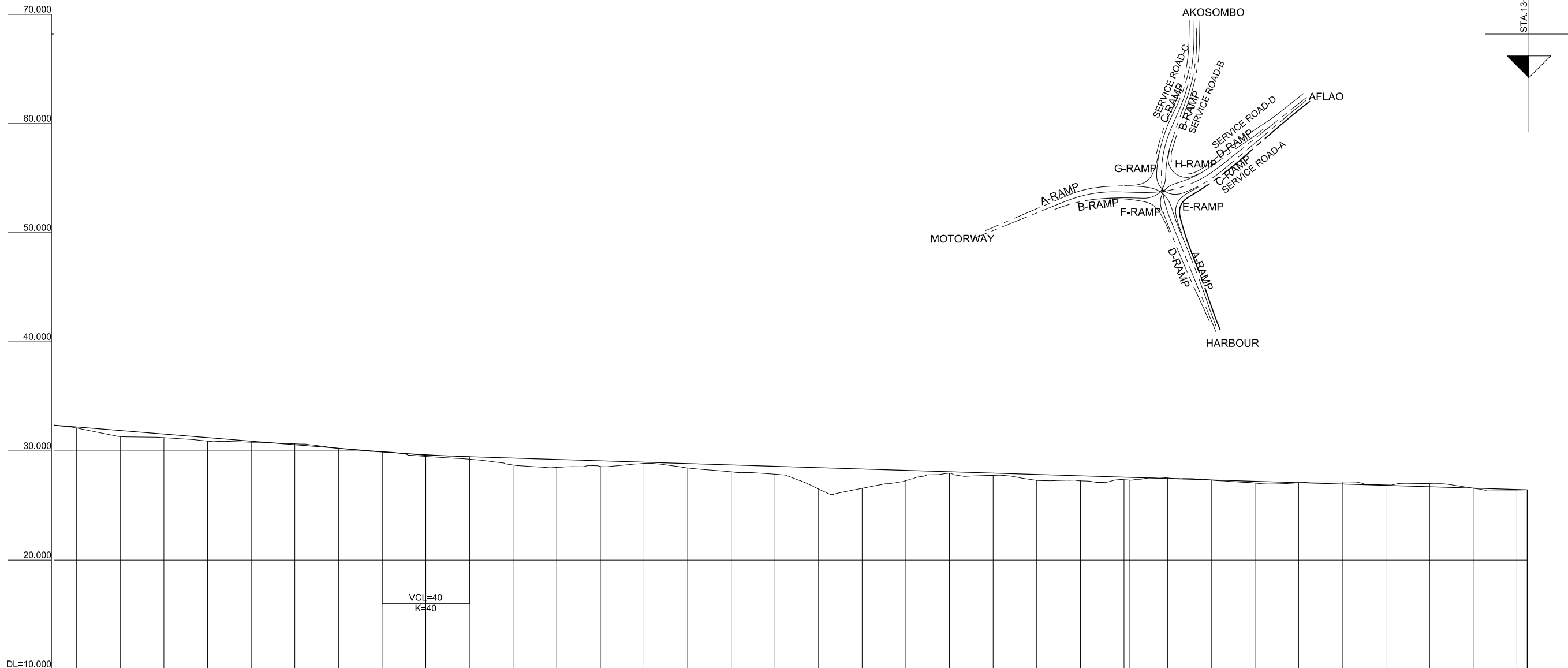
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

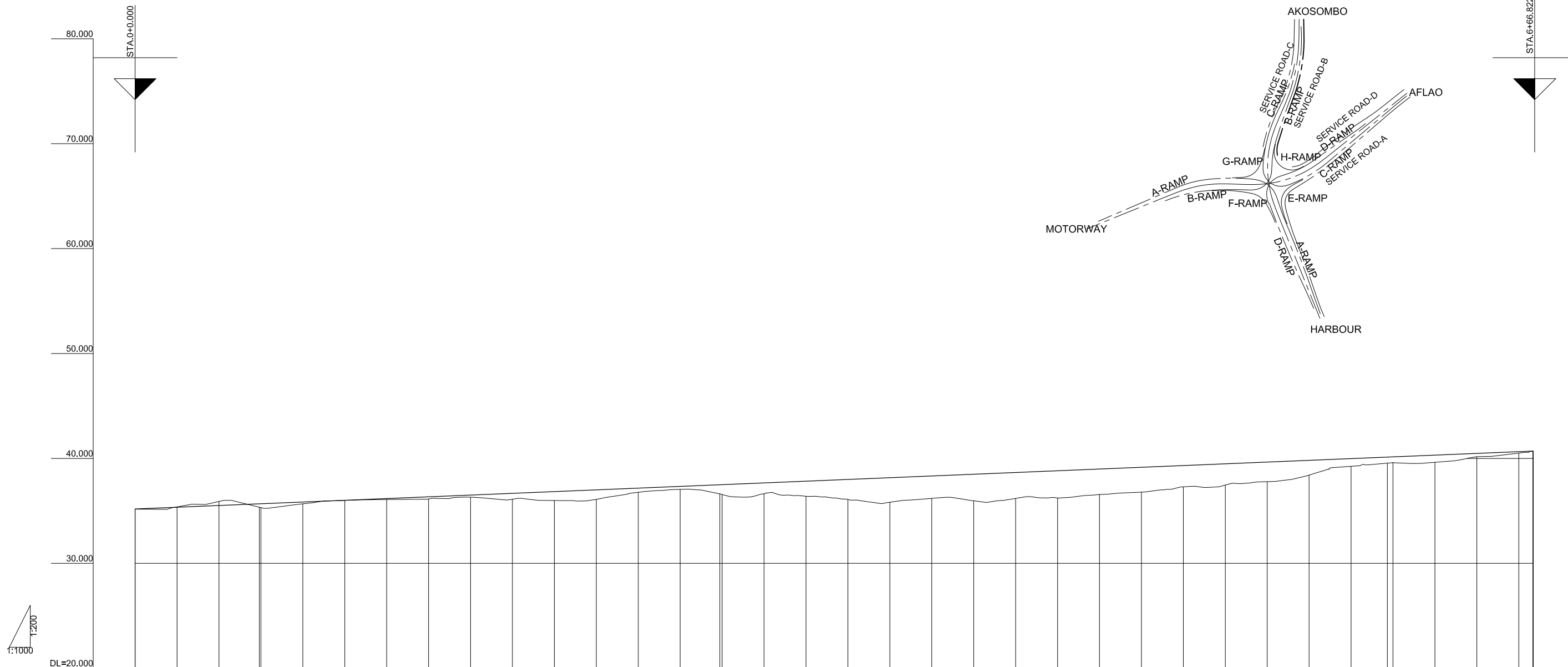
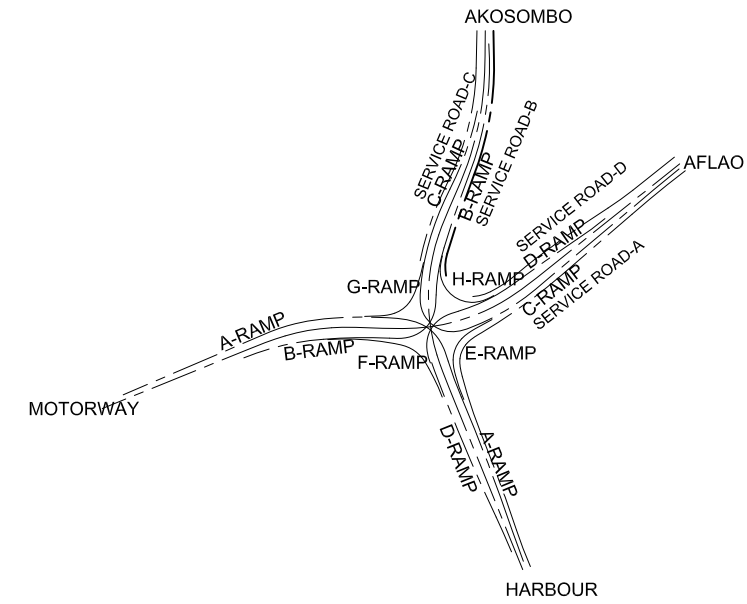
DRAWING TITLE:
SERVICE ROAD-A PROFILE (1)

SCALE:(A1size)
DRAWING NO.
V=1/200
H=1/1000
PR-20

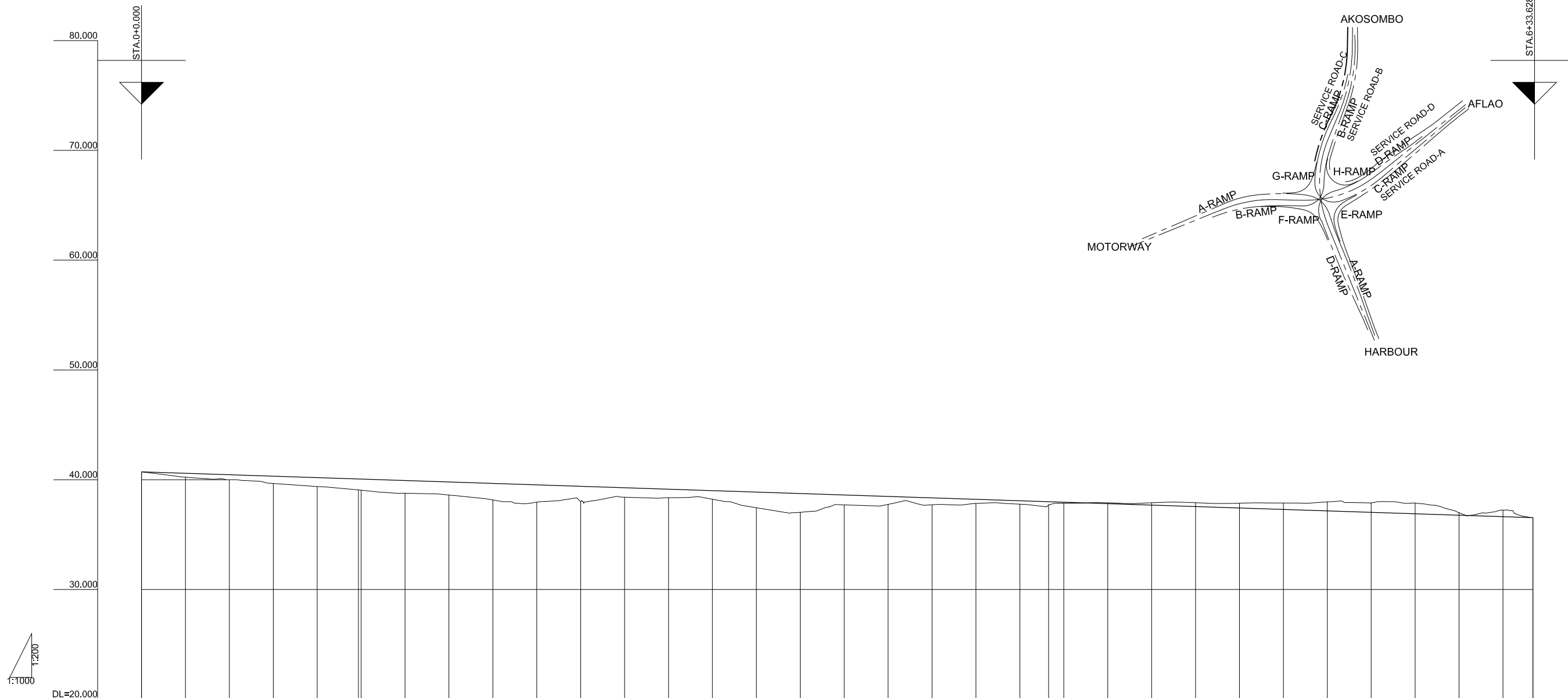


VERTICAL ALIGNMENT	$i=1.625\%$ $L=220.000$																												$i=0.626\%$ $L=504.748$																												$i=0.626\%$ $L=26.440$																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
FORMATION HEIGHT	32.200	31.875	31.550	31.225	30.900	30.575	30.250	29.925	29.600	29.275	28.950	28.625	28.300	27.975	27.650	27.325	27.000	26.675	26.350	26.025	25.700	25.375	25.050	24.725	24.400	24.075	23.750	23.425	23.100	22.775	22.450	22.125	21.800	21.475	21.150	20.825	20.500	20.175	19.850	19.525	19.200	18.875	18.550	18.225	17.900	17.575	17.250	16.925	16.600	16.275	15.950	15.625	15.300	14.975	14.650	14.325	14.000	13.675	13.350	13.025	12.700	12.375	12.050	11.725	11.400	11.075	10.750	10.425	10.100	9.775	9.450	9.125	8.800	8.475	8.150	7.825	7.500	7.175	6.850	6.525	6.200	5.875	5.550	5.225	4.900	4.575	4.250	3.925	3.600	3.275	2.950	2.625	2.300	1.975	1.650	1.325	1.000	0.675	0.350	0.025	-0.300	-0.625	-0.950	-1.275	-1.600	-1.925	-2.250	-2.575	-2.900	-3.225	-3.550	-3.875	-4.200	-4.525	-4.850	-5.175	-5.500	-5.825	-6.150	-6.475	-6.800	-7.125	-7.450	-7.775	-8.100	-8.425	-8.750	-9.075	-9.400	-9.725	-10.050	-10.375	-10.700	-11.025	-11.350	-11.675	-12.000	-12.325	-12.650	-12.975	-13.300	-13.625	-13.950	-14.275	-14.600	-14.925	-15.250	-15.575	-15.900	-16.225	-16.550	-16.875	-17.200	-17.525	-17.850	-18.175	-18.500	-18.825	-19.150	-19.475	-19.800	-20.125	-20.450	-20.775	-21.100	-21.425	-21.750	-22.075	-22.400	-22.725	-23.050	-23.375	-23.700	-24.025	-24.350	-24.675	-25.000	-25.325	-25.650	-25.975	-26.300	-26.625	-26.950	-27.275	-27.600	-27.925	-28.250	-28.575	-28.900	-29.225	-29.550	-29.875	-30.200	-30.525	-30.850	-31.175	-31.500	-31.825	-32.150	-32.475	-32.800	-33.125	-33.450	-33.775	-34.100	-34.425	-34.750	-35.075	-35.400	-35.725	-36.050	-36.375	-36.700	-37.025	-37.350	-37.675	-38.000	-38.325	-38.650	-38.975	-39.300	-39.625	-39.950	-40.275	-40.600	-40.925	-41.250	-41.575	-41.900	-42.225	-42.550	-42.875	-43.200	-43.525	-43.850	-44.175	-44.500	-44.825	-45.150	-45.475	-45.800	-46.125	-46.450	-46.775	-47.100	-47.425	-47.750	-48.075	-48.400	-48.725	-49.050	-49.375	-49.700	-50.025	-50.350	-50.675	-51.000	-51.325	-51.650	-51.975	-52.300	-52.625	-52.950	-53.275	-53.600	-53.925	-54.250	-54.575	-54.900	-55.225	-55.550	-55.875	-56.200	-56.525	-56.850	-57.175	-57.500	-57.825	-58.150	-58.475	-58.800	-59.125	-59.450	-59.775	-60.100	-60.425	-60.750	-61.075	-61.400	-61.725	-62.050	-62.375	-62.700	-63.025	-63.350	-63.675	-64.000	-64.325	-64.650	-64.975	-65.300	-65.625	-65.950	-66.275	-66.600	-66.925	-67.250	-67.575	-67.900	-68.225	-68.550	-68.875	-69.200	-69.525	-69.850	-70.175	-70.500	-70.825	-71.150	-71.475	-71.800	-72.125	-72.450	-72.775	-73.100	-73.425	-73.750	-74.075	-74.400	-74.725	-75.050	-75.375	-75.700	-76.025	-76.350	-76.675	-77.000	-77.325	-77.650	-77.975	-78.300	-78.625	-78.950	-79.275	-79.600	-79.925	-80.250	-80.575	-80.900	-81.225	-81.550	-81.875	-82.200	-82.525	-82.850	-83.175	-83.500	-83.825	-84.150	-84.475	-84.800	-85.125	-85.450	-85.775	-86.100	-86.425	-86.750	-87.075	-87.400	-87.725	-88.050	-88.375	-88.700	-89.025	-89.350	-89.675	-90.000	-90.325	-90.650	-90.975	-91.300	-91.625	-91.950	-92.275	-92.600	-92.925	-93.250	-93.575	-93.900	-94.225	-94.550	-94.875	-95.200	-95.525	-95.850	-96.175	-96.500	-96.825	-97.150	-97.475	-97.800	-98.125	-98.450	-98.775	-99.100	-99.425	-99.750	-100.075	-100.400	-100.725	-101.050	-101.375	-101.700	-102.025	-102.350	-102.675	-103.000	-103.325	-103.650	-103.975	-104.300	-104.625	-104.950	-105.275	-105.600	-105.925	-106.250	-106.575	-106.900	-107.225	-107.550	-107.875	-108.200	-108.525	-108.850	-109.175	-109.500	-109.825	-110.150	-110.475	-110.800	-111.125	-111.450	-111.775	-112.100	-112.425	-112.750	-113.075	-113.400	-113.725	-114.050	-114.375	-114.700	-115.025	-115.350	-115.675	-116.000	-116.325	-116.650	-116.975	-117.300	-117.625	-117.950	-118.275	-118.600	-118.925	-119.250	-119.575	-119.900	-120.225	-120.550	-120.875	-121.200	-121.525	-121.850	-122.175	-122.500	-122.825	-123.150	-123.475	-123.800	-124.125	-124.450	-124.775	-125.100	-125.425	-125.750	-126.075	-126.400	-126.725	-127.050	-127.375	-127.700	-128.025	-128.350	-128.675	-129.000	-129.325	-129.650	-129.975	-130.300	-130.625	-130.950	-131.275	-131.600	-131.925	-132.250	-132.575	-132.900	-133.225	-133.550	-133.875	-134.200	-134.525	-134.850	-135.175	-135.500	-135.825	-136.150	-136.475	-136.800	-137.125	-137.450	-137.775	-138.100	-138.425	-138.750	-139.075	-139.400	-139.725	-140.050	-140.375	-140.700	-141.025	-141.350	-141.675	-142.000	-142.325	-142.650	-142.975	-143.300	-143.625	-143.950	-144.275	-144.600	-144.925	-145.250	-145.575	-145.900	-146.225	-146.550	-146.875	-147.200	-147.525	-147.850	-148.175	-148.500	-148.825	-149.150	-149.475	-149.800	-150.125	-150.450	-150.775	-151.100	-151.425	-151.750	-152.075	-152.400	-152.725	-153.050	-153.375	-153.700	-154.025	-154.350	-154.675	-155.000	-155.325	-155.650	-155.975	-156.300	-156.625	-156.950	-157.275	-157.600	-157.925	-158.250	-158.575	-158.900	-159.225	-159.550	-159.875	-160.200	-160.525	-160.850	-161.175	-161.500	-161.825	-162.150	-162.475	-162.800	-163.125	-163.450	-163.775	-164.100	-164.425	-164.750	-165.075	-165.400	-165.725	-166.050	-166.375	-166.700	-167.025	-167.350	-167.675	-168.000	-168.325	-168.650	-168.975	-169.300	-169.625	-169.950	-170.275	-170.600	-170.925	-171.250	-171.575	-171.900	-172.225	-172.550	-172.875	-173.200	-173.525	-173.850	-174.175	-174.500	-174.825	-175.150	-175.475	-175.800	-176.125	-176.450	-176.775	-177.100	-177.425	-177.750	-178.075	-178.400	-178.725	-179.050	-179.375	-179.700	-180.025	-180.350	-180.675	-181.000	-181.325	-181.650	-181.975	-182.300	-182.625	-182.950	-183.275	-183.600	-183.925	-184.250	-184.575	-184.900	-185.225	-185.550	-185.875	-186.200	-186.525	-186.850	-187.175	-187.500	-187.825	-188.150	-188.475	-188.800	-189.125	-189.450	-189.775	-190.100	-190.425	-190.750	-191.075	-191.400	-191.725	-192.050	-192.375	-192.700	-193.025	-193.350	-193.675	-194.000	-194.325	-194.650	-194.975	-195.300	-195.625	-195.950	-196.275	-196.600	-196.925	-197.250	-197.575	-197.900	-198.225	-198.550	-198.875	-199.200	-199.525	-199.850	-200.175	-200.500	-200.825	-201.150	-201.475	-201.800	-202.125	-202.450	-202.775	-203.100	-203.425	-203.750	-204.075	-204.400	-204.725	-205.050	-205.375	-205.700	-206.025	-206.350	-206.675	-207.000	-207.325	-207.650	-207.975	-208.300	-208.625	-208.950	-209.275	-209.600	-209.925	-210.250	-210.575	-210.900	-211.225	-211.550	-211.875	-212.200	-212.525	-212.850	-213.175	-213.500	-213.825	-214.150	-214.475	-214.800	-215.125	-215.450	-215.775	-216.100	-216.425	-216.750	-217.075	-217.400	-217.725	-218.050	-218.375	-218.700	-219.025	-219.350	-219.675	-220.000	-220.325	-220.650	-220.975	-221.300	-221.625	-221.950	-222.275	-222.600	-222.925	-223.250	-223.575	-223.900	-224.225	-224.550	-224.875	-225.200	-225.525	-225.850	-226.175	-226.500	-226.825	-227.150	-227.475	-227.800	-228.125	-228.450	-228.775	-229.100	-229.425	-229.750	-230.075	-230.400	-230.725	-231.050	-231.375	-231.700	-232.025	-232.350	-232.675	-233.000	-233.325	-233.650	-233.975	-234.300	-234.625	-234.950	-235.275	-235.600	-235.925	-236.250	-236.575	-236.900	-237.225	-237.550	-237.875	-238.200	-238.525	-238.850	-239.175	-239.500	-239.825	-240.150	-240.475	-240.800	-241.125	-241.450	-241.775	-242.100	-242.425	-242.750	-243.075	-243.400	-243.725	-244.050	-244.375	-244.700	-245.025	-245.350	-245.675	-246.000	-246.325	-246.650	-246.975	-247.300	-247.625	-247.950	-248.275	-248.600	-248.925	-249.250	-249.575	-249.900	-250.225	-250.550	-250.875	-251.200	-251.525	-251.850	-252.175	-252.500	-252.825	-253.150	-253.475	-253.800	-254.125	-254.450	-254.775	-255.100	-255.425	-255.750	-256.075	-256.400	-256.725	-257.050	-257.375	-257.700	-258.025	-258.350	-258.675	-259.000	-259.325	-259.650	-259.975	-260.300	-260.625	-260.950	-261.275	-261.600	-261.925	-262.250	-262.575	-262.900	-263.225	-263.550	-263.875	-264.200	-264.525	-264.850	-265.175	-265.500	-265.825	-266.150	-266.475	-266.800	-267.125	-267.450	-267.775	-268.100	-268.425	-268.750	-269.075	-269.400	-269.725	-270.050	-270.375	-270.700	-271.025	-271.350	-271.675	-272.000	-272.325	-272.650	-272.975	-273.300	-273.625	-273.950	-274.275	-274.600	-274.925	-275.250	-275.575	-275.900	-276.225	-276.550	-276.875	-277.200	-277.525	-277.850	-278.175	-278.500	-278.825	-279.150	-279.475	-279.800	-280.125	-280.450	-280.775	-281.100	-281.425	-281.750	-282.075	-282.400	-282.725	-283.050	-283.375	-283.700	-284.025	-284.350	-284.675	-285.000	-285.325	-285.650	-285.975	-286.300	-286.625	-286.950	-287.275	-287.600	-287.925	-288.250	-288.575	-288.900	-289.225	-289.550	-289.875	-290.200	-290.525	-290.850	-291.175	-291.500	-291.825	-292.150	-292.475	-292.800	-293.125	-293.450	-293.775	-294.100	-294.425	-294.750	-295.075	-295.400	-295.725	-296.050	-296.375	-296.700	-297.025	-297.350	-297.675	-298.000	-298.325	-298.650	-298.975	-299.300	-299.625	-299.950	-300.275	-300.600	-300.925	-301.250	-301.575	-301.900	-302.225	-302.550	-302.875	-303.200	-303.

KEY PLAN



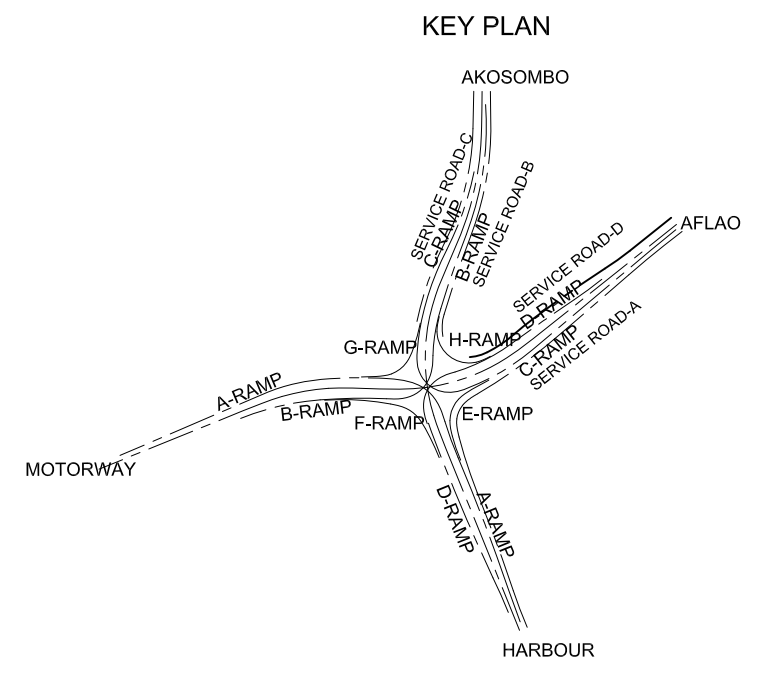
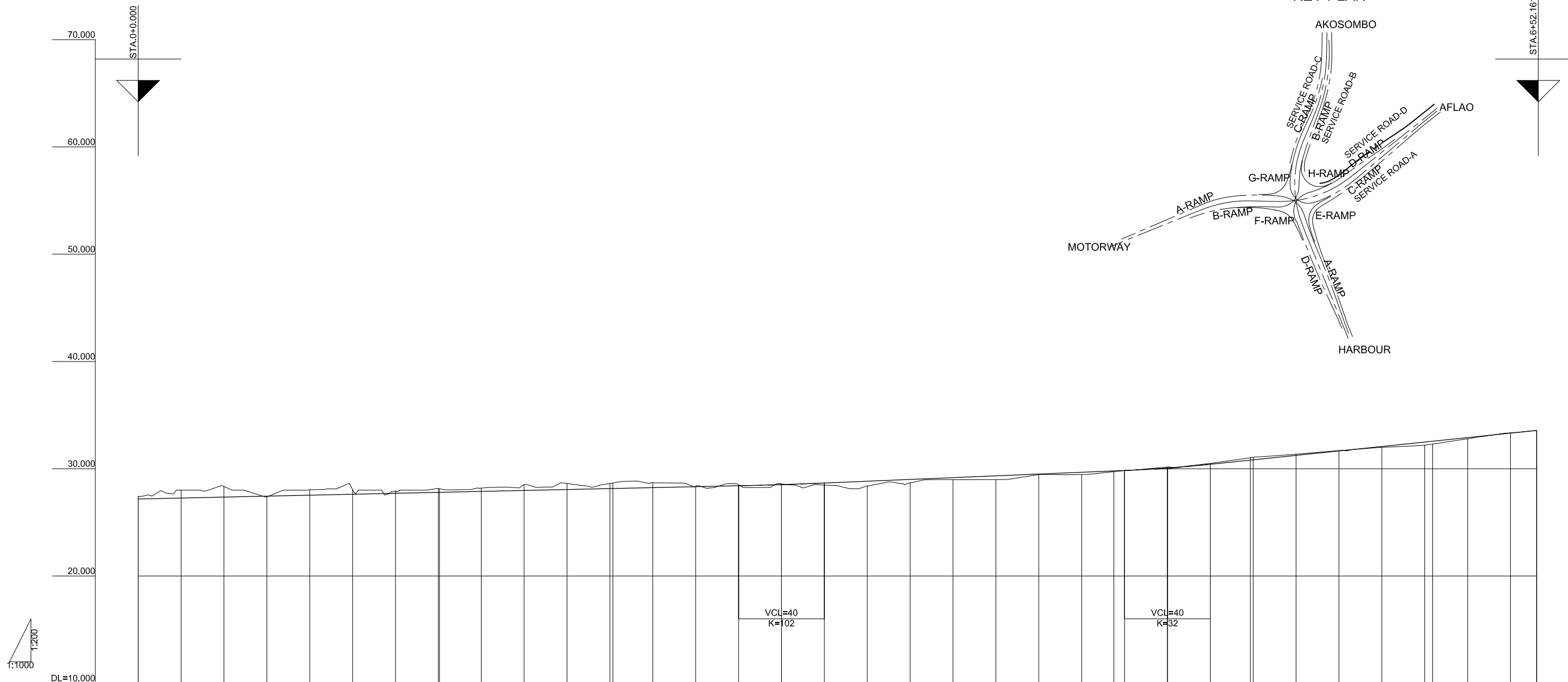
VERTICAL ALIGNMENT																																							
FORMATION HEIGHT	35.180	35.346	35.511	35.671	35.842	36.008	36.173	36.339	36.504	36.670	36.836	37.001	37.167	37.332	37.489	37.648	37.863	37.829	37.995	38.160	38.326	38.491	38.657	38.822	38.988	39.153	39.319	39.485	39.650	39.816	39.981	40.125	40.147	40.312	40.478	40.644	40.700		
GROUND HEIGHT	35.16	35.38	35.90	35.35	35.67	36.00	36.09	36.13	36.30	36.12	35.99	36.10	36.77	37.05	36.62	36.56	36.62	36.39	36.09	35.82	36.19	35.97	36.19	36.23	36.56	36.78	37.28	37.46	37.78	38.40	39.25	39.55	39.60	39.63	40.16	40.50	40.70		
DISTANCE	0.000	20.000	20.000	19.272	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	18.897	1.103	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	6.822
STATION	BC 1-0	+20.000	+40.000	EBC 1-1	+60.000	+80.000	STA.1	+20.000	+40.000	+60.000	+80.000	STA.2	+20.000	+40.000	+60.000	BC 2-0	+80.000	STA.3	+20.000	+40.000	+60.000	+80.000	STA.4	+20.000	+40.000	+60.000	+80.000	STA.5	+20.000	+40.000	+60.000	+80.000	BC 3-0	STA.6	+20.000	+40.000	+60.000	+66.822	
HORIZONTAL CURVATURE	L=59.272 R=125		L=219.624 R=3000												R=810 L=318.415												L=69.51 R=3000												
SUPER ELEVATION																																							



1:200
1:1000
DL=20.000

VERTICAL ALIGNMENT																																			
FORMATION HEIGHT	40.720	40.588	40.456	40.324	40.192	40.068	39.928	39.796	39.664	39.533	39.401	39.269	39.137	39.005	38.873	38.741	38.609	38.477	38.345	38.213	38.081	37.995	37.949	37.817	37.685	37.553	37.422	37.290	37.158	37.026	36.894	36.762	36.630	36.540	
GROUND HEIGHT	40.72	40.23	40.00	39.66	39.37	39.07	38.77	38.61	38.16	37.95	38.00	38.41	38.36	38.22	37.45	37.03	37.71	37.76	37.71	37.85	37.77	37.71	37.85	37.89	37.90	37.90	37.86	37.88	37.98	37.89	37.87	36.99	37.22	36.54	
DISTANCE	0.000	20.000	20.000	20.000	20.000	18.813	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	13.075	6.925	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	13.628		
STATION	BP	+20.000	+40.000	+60.000	+80.000	BC 1-0	STA.1	+20.000	+40.000	+60.000	+80.000	STA.2	+20.000	+40.000	+60.000	+80.000	STA.3	+20.000	+40.000	+60.000	+80.000	STA.4	BC 2-0	+20.000	+40.000	+60.000	+80.000	STA.5	+20.000	+40.000	+60.000	+80.000	STA.6	+20.000	+33.628
HORIZONTAL CURVATURE																																			
SUPER ELEVATION																																			

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: SERVICE ROAD-C PROFILE	SCALE:(A1size)	DRAWING NO.
				V=1/200 H=1/1000	PR-23



VERTICAL ALIGNMENT	27.180		i=0.440% L=300.000		28.500		i=0.833% L=180.000		30.000		i=2.074% L=172.161		33.570																												
FORMATION HEIGHT	27.180	27.268	27.356	27.444	27.532	27.620	27.708	27.796	27.798	27.884	27.972	28.060	28.148	28.154	28.236	28.324	28.412	28.520	28.667	28.833	29.000	29.167	29.333	29.500	29.667	29.792	29.833	30.062	30.415	30.802	30.829	31.244	31.659	32.074	32.488	32.565	32.903	33.318	33.570		
GROUND HEIGHT	27.44	28.00	28.35	27.37	28.03	28.05	27.93	28.16	28.13	28.19	28.51	28.62	28.62	28.67	28.70	28.36	28.49	28.58	28.47	28.39	28.68	28.98	28.99	29.46	29.46	29.72	29.83	30.15	30.50	31.02	31.06	31.37	31.69	32.00	32.19	32.30	32.78	33.35	33.57		
DISTANCE	0.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	0.513	19.487	20.000	20.000	20.000	1.364	18.636	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	15.003	4.997	20.000	20.000	18.955	1.355	20.000	20.000	20.000	20.000	20.000	3.691	16.309	20.000	12.161
STATION	BP	+20.000	+40.000	+60.000	+80.000	STA.1	+20.000	+40.000	BC 1-0	+60.000	+80.000	STA.2	+20.000	+40.000	BC 2-0	+60.000	+80.000	STA.3	+20.000	+40.000	+60.000	+80.000	STA.4	+20.000	+40.000	+60.000	+80.000	STA.5	BC 3-0	+20.000	+40.000	+60.000	+80.000	STA.6	BC 3-1	+20.000	+40.000	+52.161			
HORIZONTAL CURVATURE	R=∞ L=140.513				R=80.851 R=800				R=3000 L=233.639				R=1000 L=63.662				L=85.026 R=950				L=48.47 R=120																				
SUPER ELEVATION	2.500 (2.500 STA) (0.000)																																								

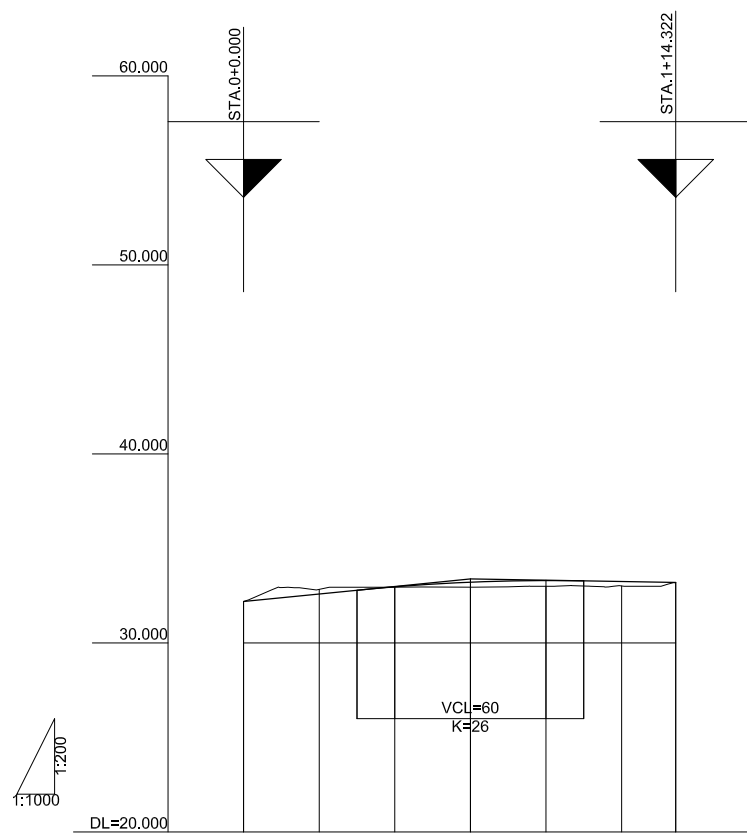
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

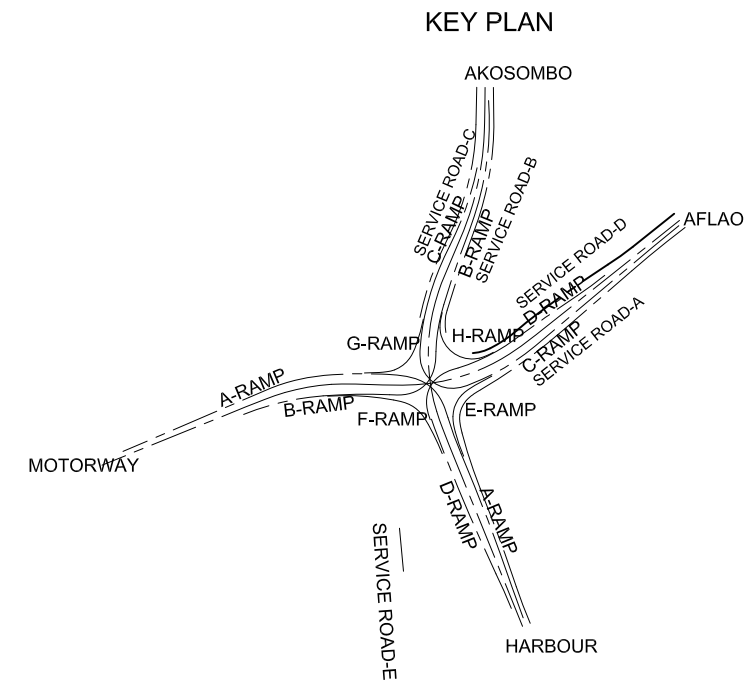
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
SERVICE ROAD-D PROFILE

SCALE:(A1size)
DRAWING NO.
V=1/200
H=1/1000
PR-24



VERTICAL ALIGNMENT							
FORMATION HEIGHT	32.190	32.590	32.970	33.214	33.300	33.250	33.200
GROUND HEIGHT	32.19	32.83	32.95	32.95	33.00	33.02	33.20
DISTANCE	0.000	20.000	20.000	20.000	20.000	20.000	14.322
STATION	BP	+20.000	+40.000	+60.000	+80.000	STA. 1	EP
HORIZONTAL CURVATURE	$R = \infty$ $L = 114.322$						
SUPER ELEVATION	2.500 STA.0+0.000 2.500 STA.1+14.322						



GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

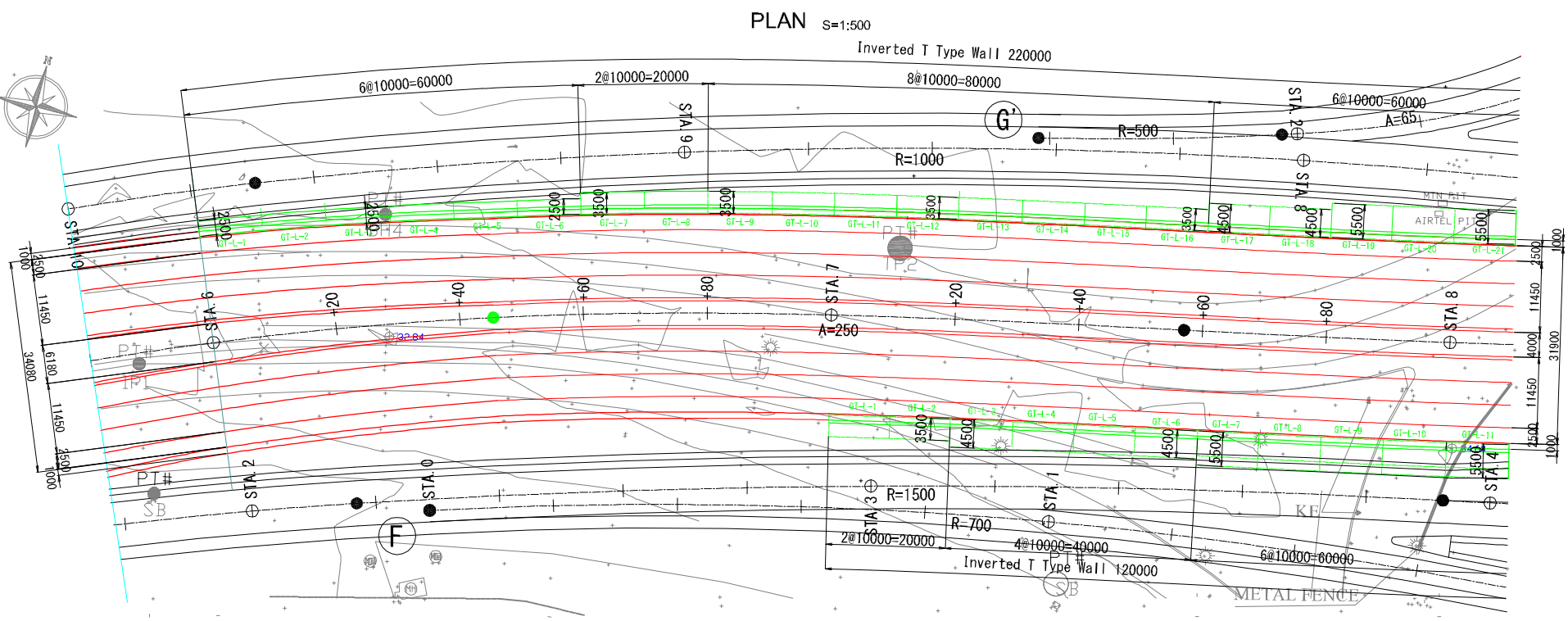
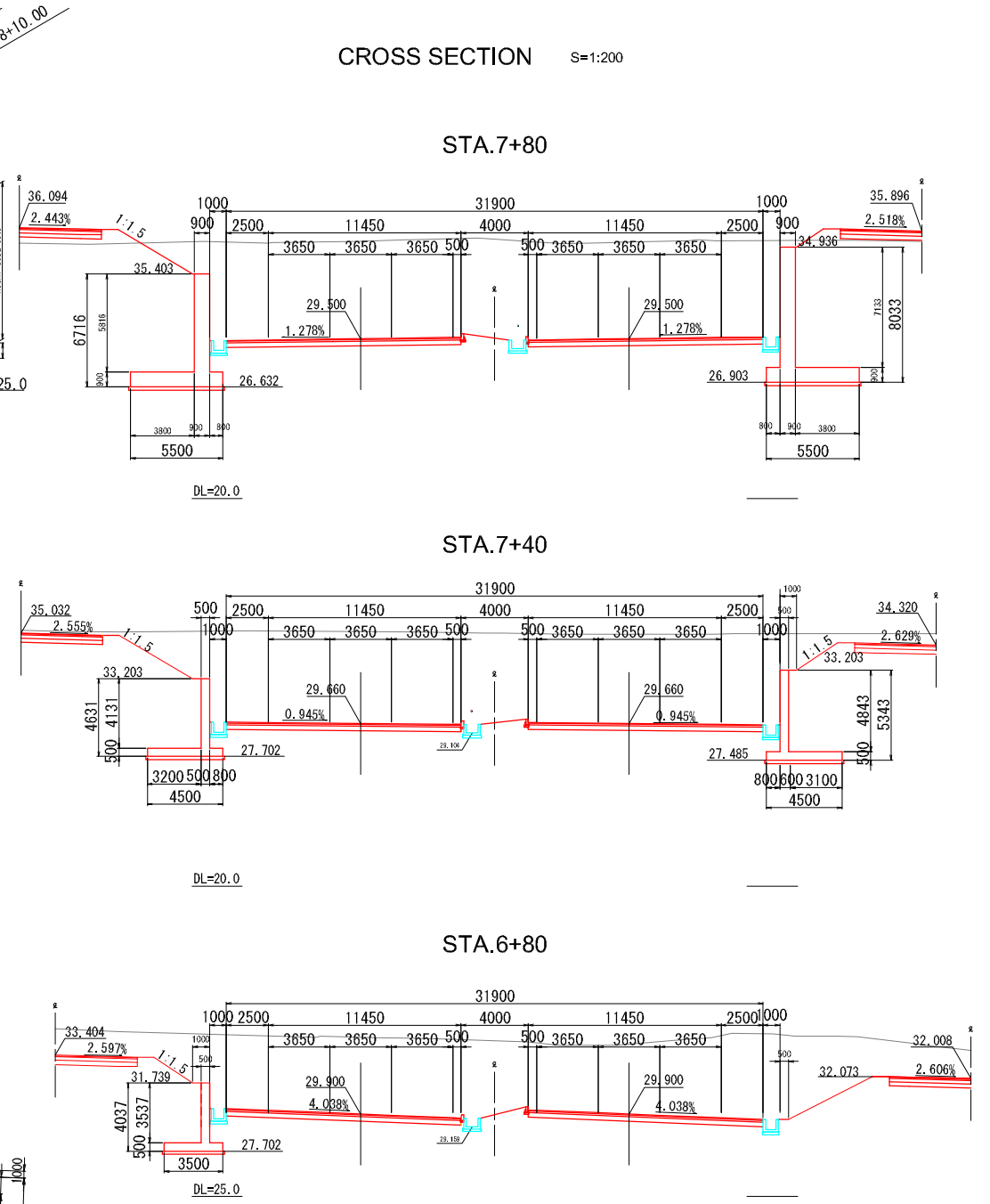
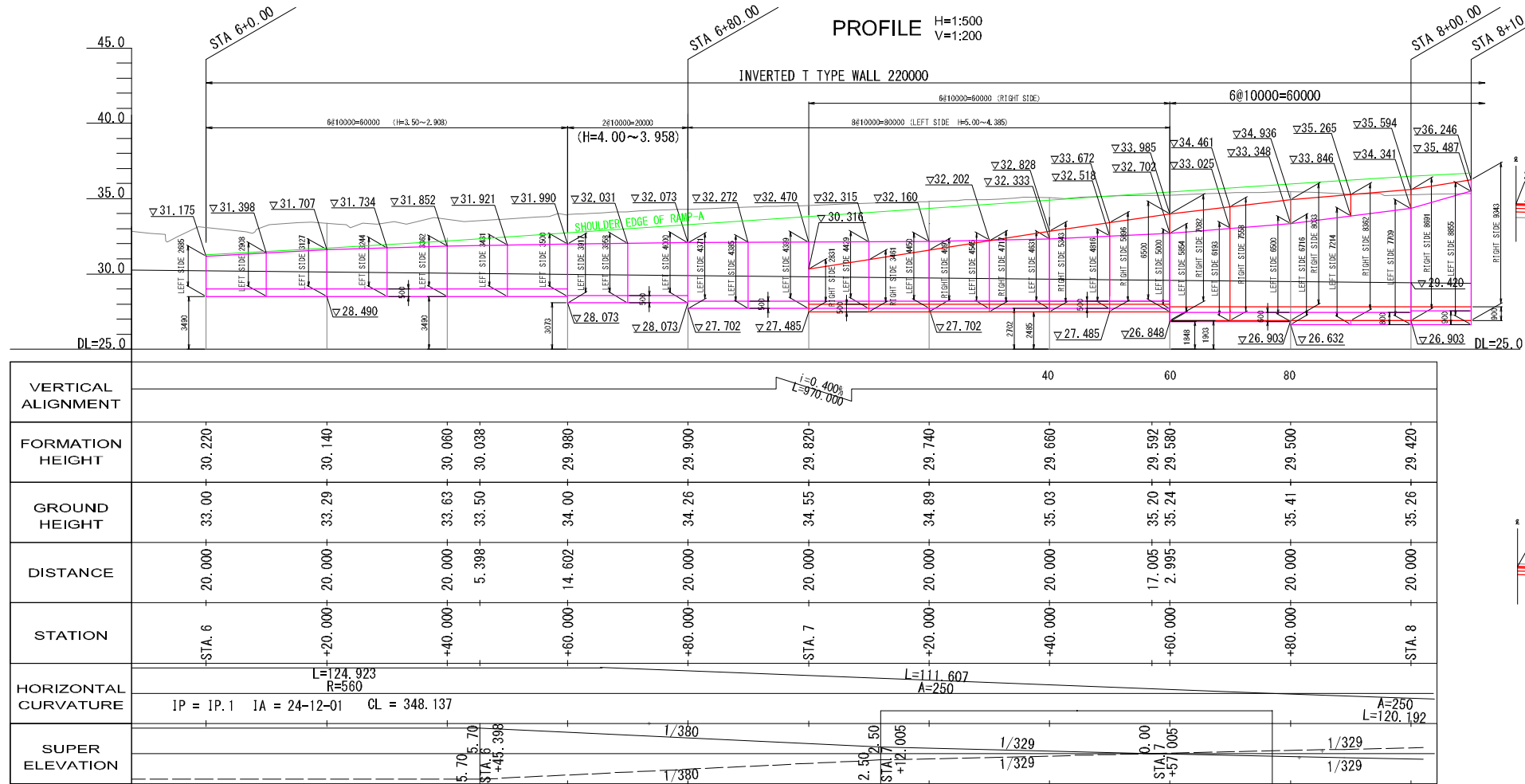
CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 SERVICE ROAD-E PROFILE

SCALE:(A1size)	DRAWING NO.
V=1/200 H=1/1000	PR-25

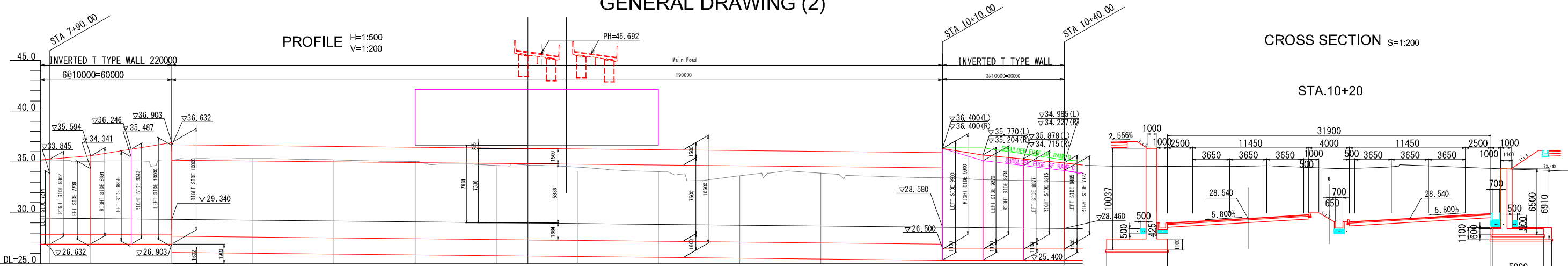
OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION) GENERAL DRAWING (1)



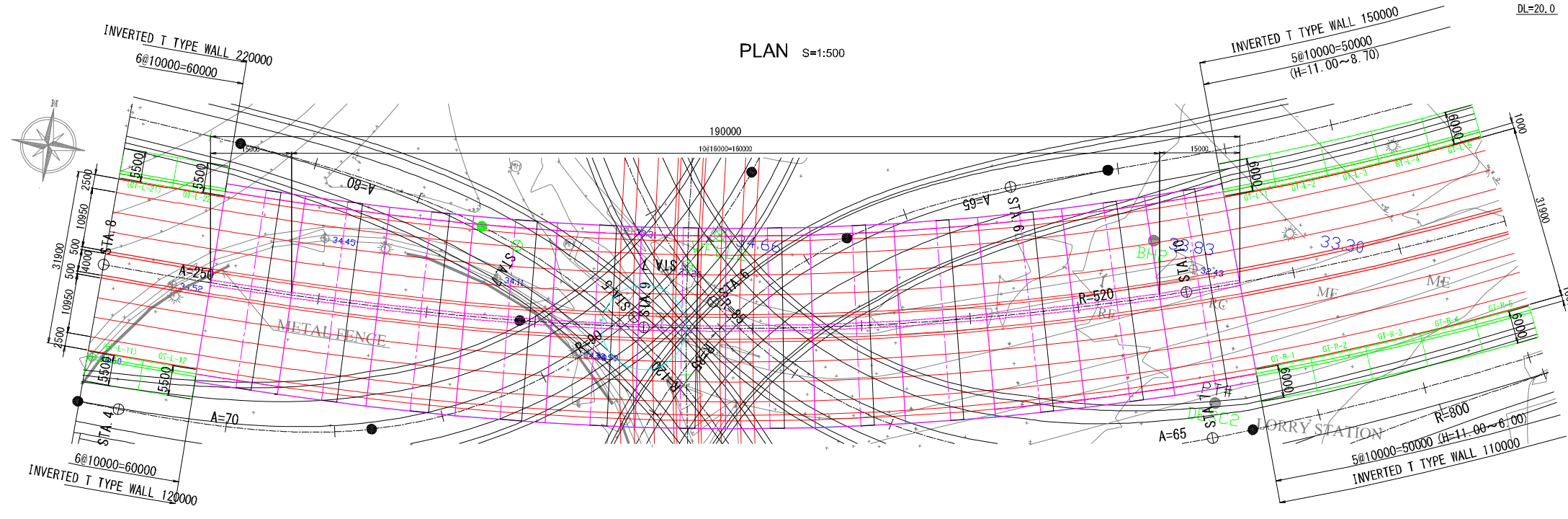
DESIGN CONDITION OF RETAINING WALLS

ITEMS	UNIT	QUANTITY	
	Reinforced Concrete	kN/m3	24.5
Plain Concrete	kN/m3	23.0	
Backfill	kN/m3	19.0	
Reinforced Conc.	Design Strength	N/mm2	24
	Bending Strength	N/mm2	8.0
	Shear Strength	N/mm2	0.39
	Re-bar Tensile Strength(SD345)	N/mm2	180
Plain Concrete	Design Strength	N/mm2	18
	Bending Strength	N/mm2	4.5
	Shear Strength	N/mm2	0.33
	Concrete Tensile Strength	N/mm2	0.23
Design Seismic Coefficient (H=8.00m以上)		0.16	
Fill Grade		1:1.5	

OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION) GENERAL DRAWING (2)



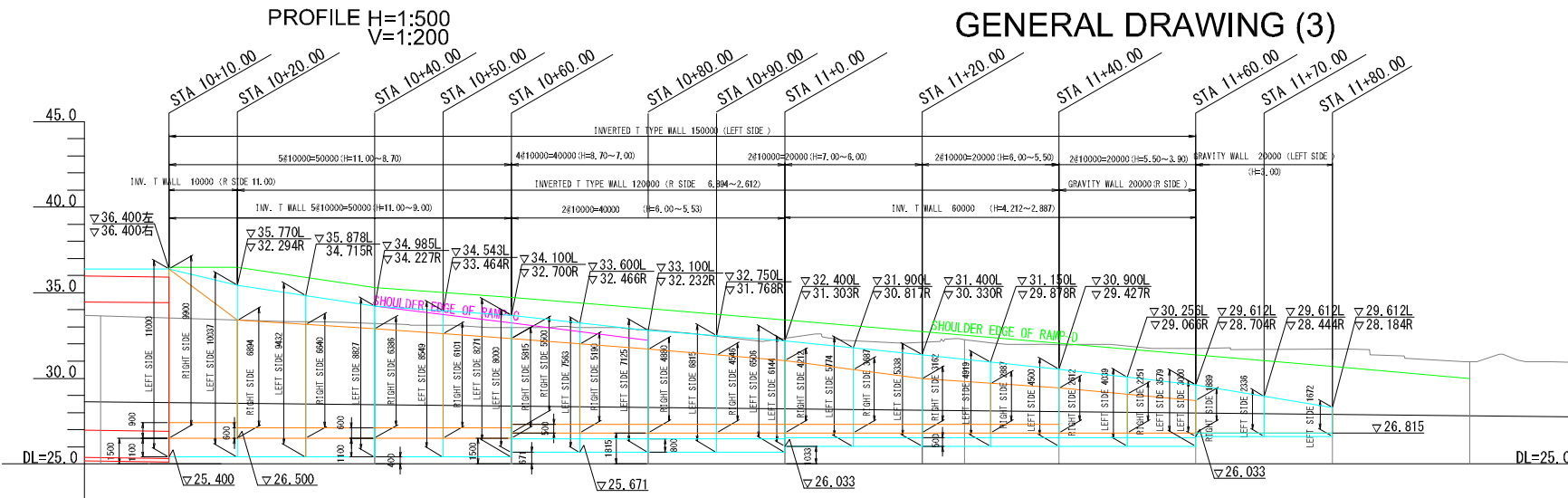
VERTICAL ALIGNMENT	L=0.400 L=970.000															
FORMATION HEIGHT	29.460	29.420	29.340	29.260	29.180	29.111	29.100	29.020	28.989	28.940	28.860	28.780	28.700	28.620	28.540	28.460
GROUND HEIGHT		35.26	35.32	35.54	35.39	35.24	35.23	34.87		34.69	34.22	34.00	34.00	33.31	33.43	33.25
DISTANCE	10.000	20.000	20.000	20.000	20.000	17.197	2.803	20.000	7.786	12.214	20.000	20.000	20.000	20.000	20.000	20.000
STATION	+90.000	STA. 8	+20.000	+40.000	+60.000	KE 2-1	+80.000	STA. 9	+7.786	+12.214	+40.000	+60.000	+80.000	STA. 10	+20.000	+40.000
HORIZONTAL CURVATURE	IP = IP.1 IA = 24-12-01 CL = 348.137															
SUPER ELEVATION	$\frac{2.50}{2.50}$ STA. 8 $\frac{2.006}{2.006}$ $\frac{3.29}{3.29}$ $\frac{1.7416}{1.7416}$ $\frac{5.80}{5.80}$ STA. 8 $\frac{7.197}{7.197}$ $\frac{3.29}{3.29}$ $\frac{1.7416}{1.7416}$															



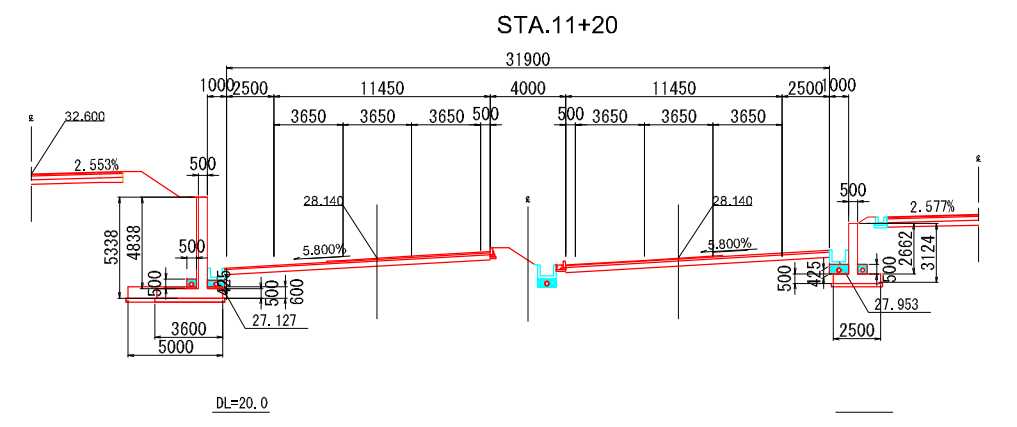
DESIGN CONDITION OF RETAINING WALLS			
	ITEMS	UNIT	QUANTITY
Unit Weight	Reinforced Concrete	kN/m ³	24.5
	Plain Concrete	kN/m ³	23.0
	Backfill	kN/m ³	19.0
Reinforced Conc.	Design Strength	N/mm ²	24
	Bending Strength	N/mm ²	8.0
	Shear Strength	N/mm ²	0.39
	Re-bar Tensile Strength(SD345)	N/mm ²	180
Plain Concrete	Design Strength	N/mm ²	18
	Bending Strength	N/mm ²	4.5
	Shear Strength	N/mm ²	0.33
	Concrete Tensile Strength	N/mm ²	0.23
Design Seismic Coefficient (H=8.00m以上)			0.16
Fill Grade			1:1.5

OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION)

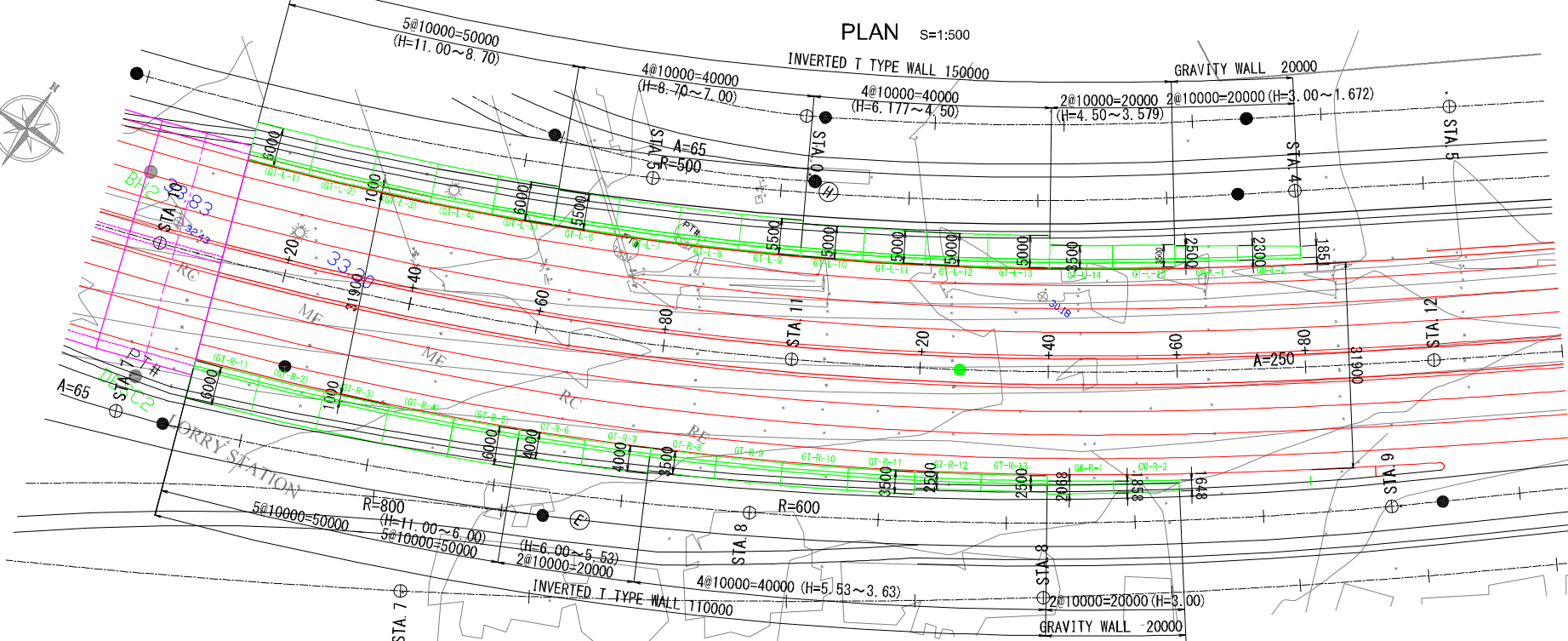
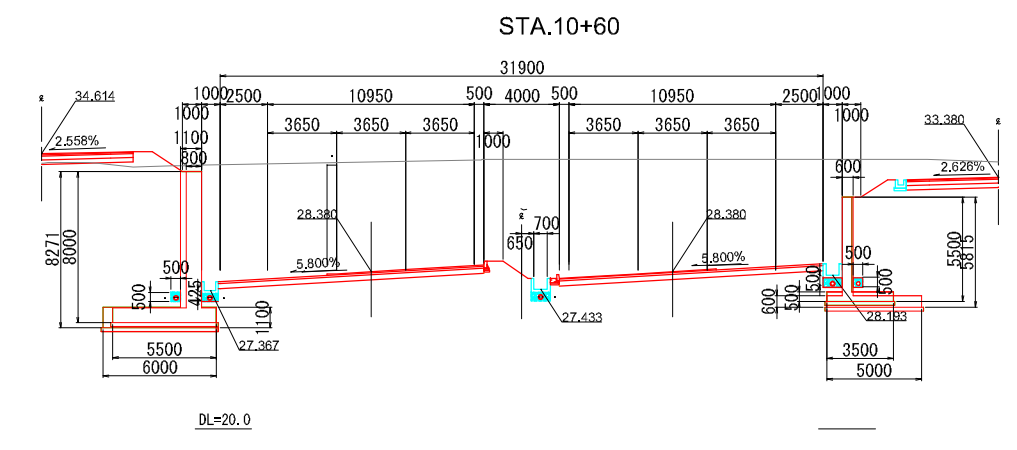
GENERAL DRAWING (3)



CROSS SECTION S=1:200



VERTICAL ALIGNMENT	L=0.400 L=370.000												
FORMATION HEIGHT	28.620	28.580	28.540	28.480	28.380	28.300	28.220	28.140	28.115	28.080	27.980	27.900	27.820
GROUND HEIGHT	33.43	33.43	33.43	33.25	33.00	32.89	32.38	32.14	32.30	31.99	31.79	31.75	31.00
DISTANCE	20.000	10.000	10.000	20.000	20.000	20.000	20.000	13.807	6.193	20.000	20.000	20.000	20.000
STATION	STA. 10	+10.000	+20.000	+40.000	+60.000	+80.000	STA. 11	+20.000	KE 2-2	+40.000	+60.000	+80.000	STA. 12
HORIZONTAL	IP = IP.2 IA = 40-40-43 CL = 489.381												
SUPER ELEVATION	R=520 L=248.996												
	A=250 L=120.192												
	1/264												
	2.50 STA. 11.50												
	2.50 STA. 12												
	2.50 STA. 12												



ITEMS	UNIT	QUANTITY	
	Reinforced Concrete	kN/m3	24.5
Plain Concrete	kN/m3	23.0	
Backfill	kN/m3	19.0	
Reinforced Conc.	Design Strength	N/mm2	24
	Bending Strength	N/mm2	8.0
	Shear Strength	N/mm2	0.39
	Re-bar Tensile Strength(SD345)	N/mm2	180
	Plain Concrete	Design Strength	N/mm2
Bending Strength		N/mm2	4.5
Shear Strength		N/mm2	0.33
Concrete Tensile Strength		N/mm2	0.23
Design Seismic Coefficient (H=8.00m以上)		0.16	
Fill Grade		1:1.5	

GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

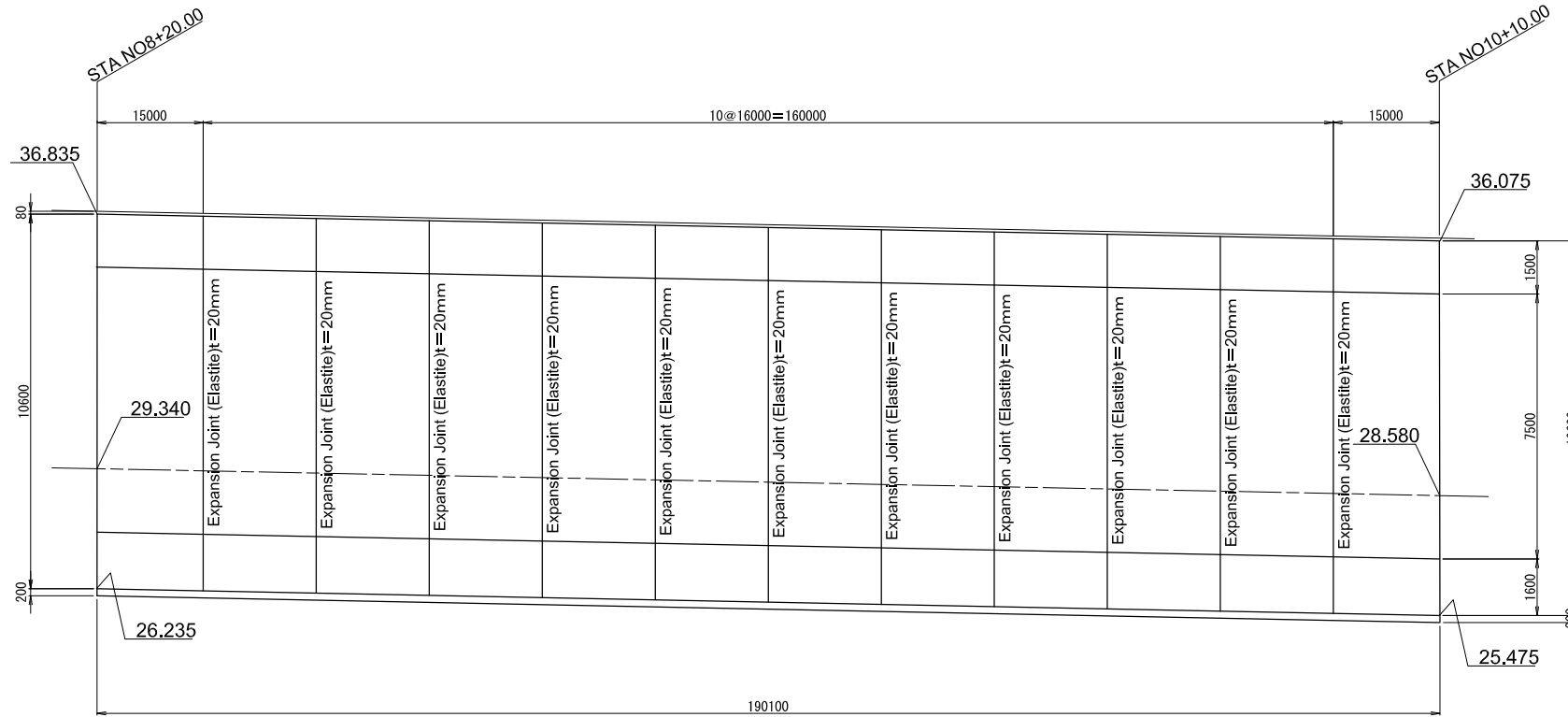
DRAWING TITLE:
RETAINING WALL
GENERAL DRAWING (3)

SCALE:(A1size)
As Shown
DRAWING NO.
US-03

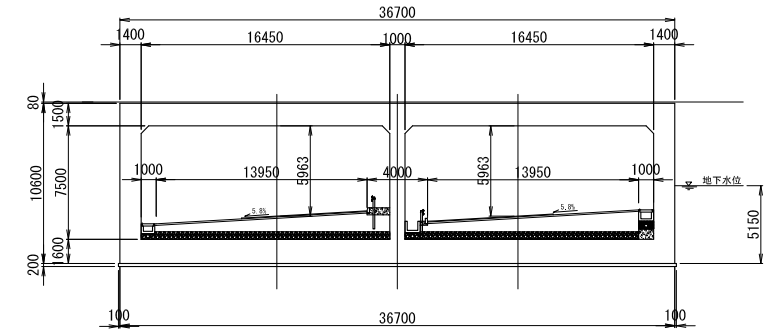
OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION)

STRUCTURE OF BOX CULVERT (1)

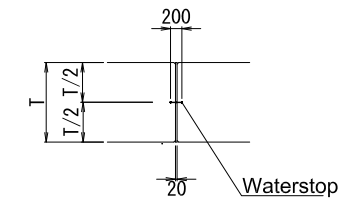
SIDE VIEW H=1:500
V=1:100



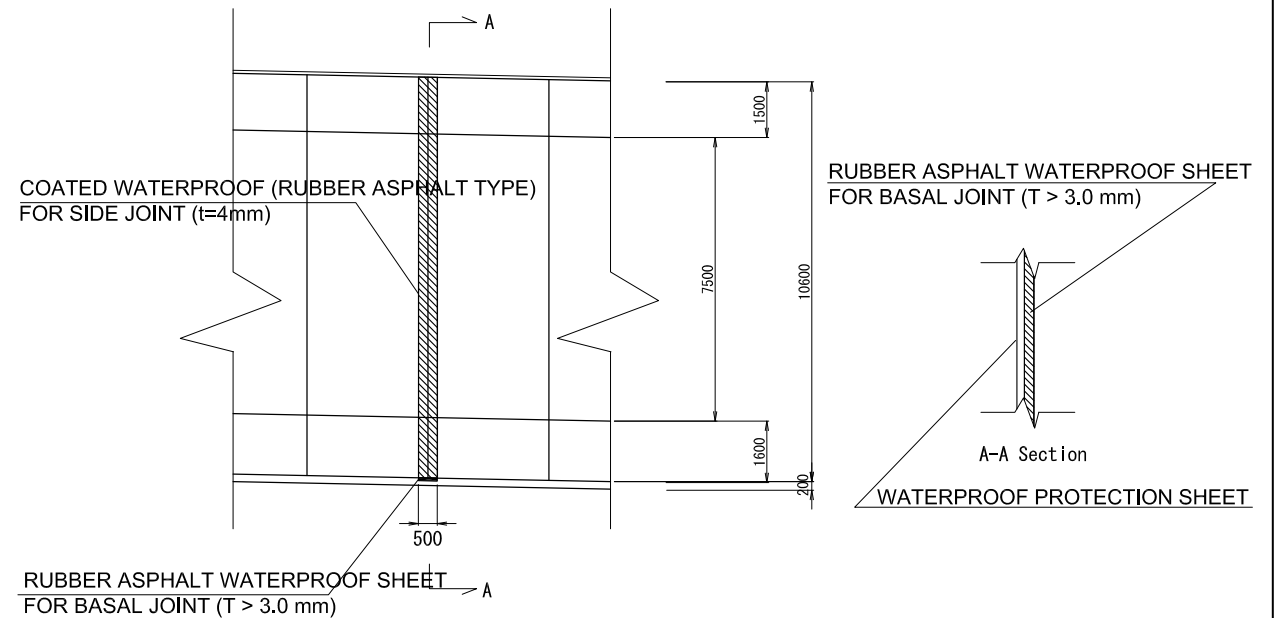
CROSS SECTION S=1:200



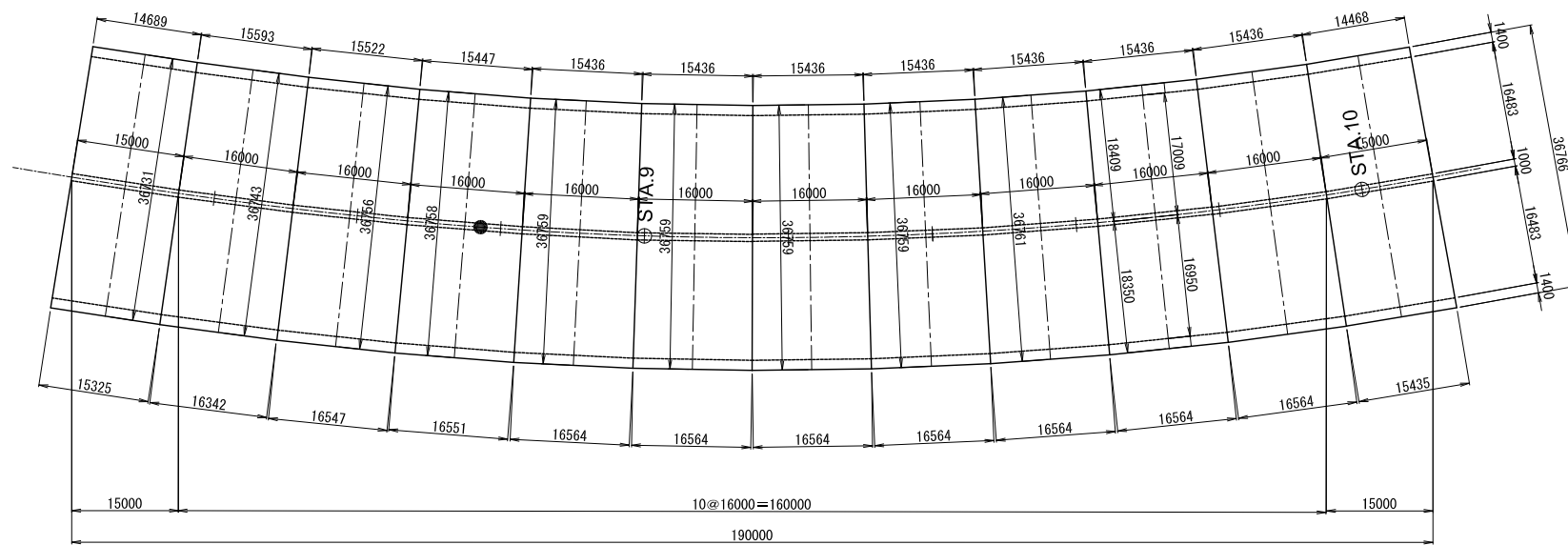
DETAIL OF EXPANSION JOINT



DETAIL OF WATER PROOFING



PLAN S=1:500



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

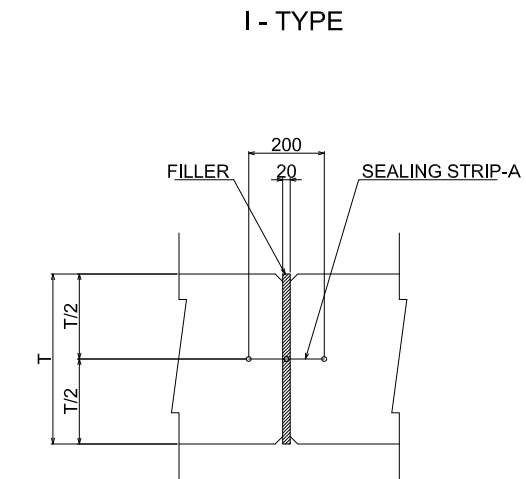
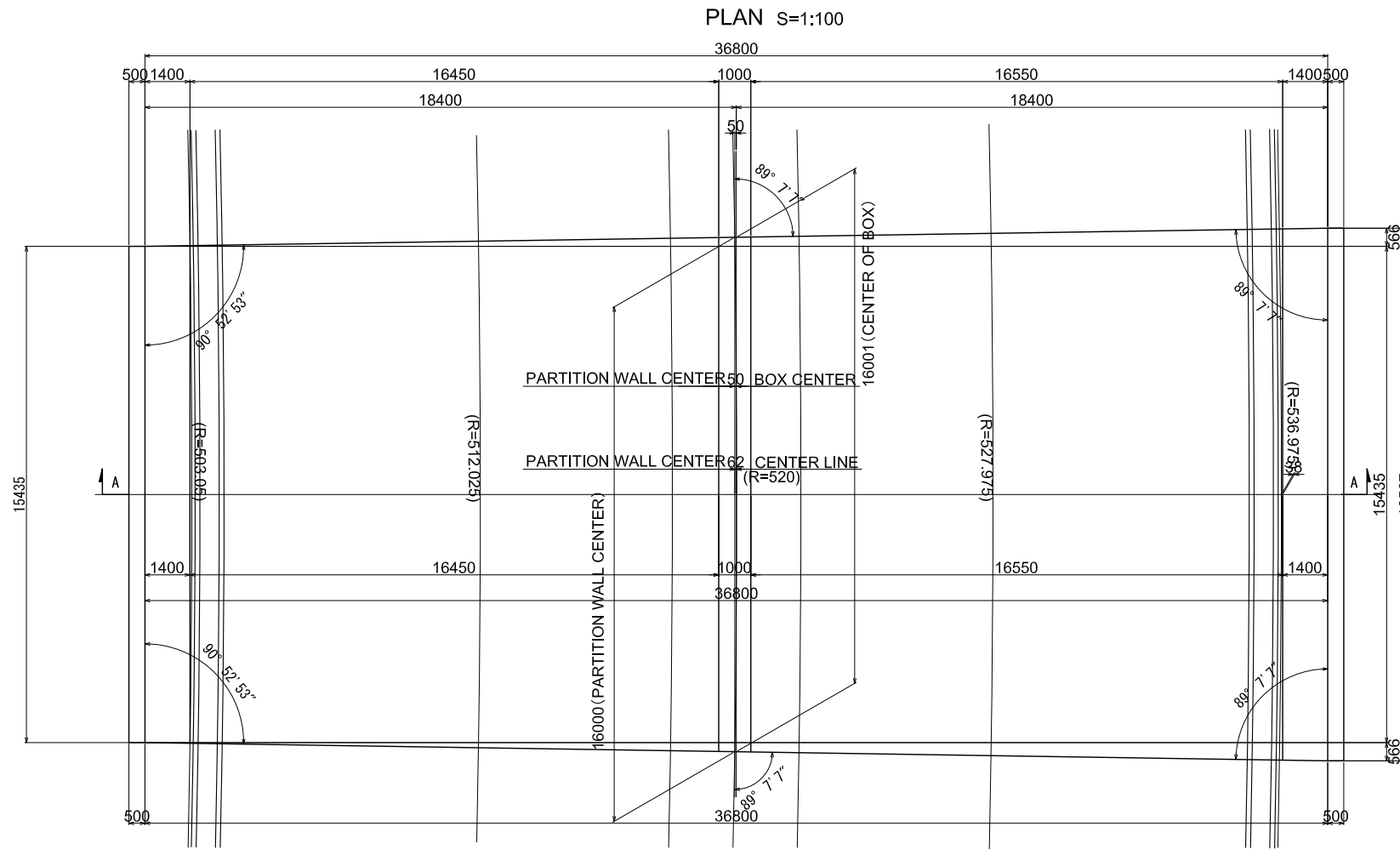
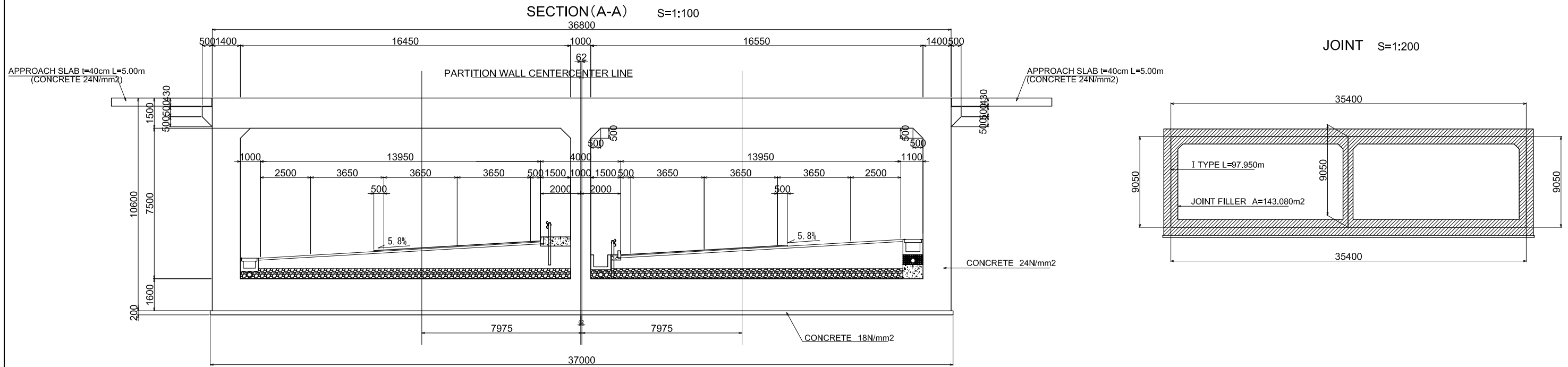
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
STRUCTURE OF BOX CULVERT (1)

SCALE:(A1size) DRAWING NO.
As Shown US-04

OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION)

STRUCTURE OF BOX CULVERT (2)



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

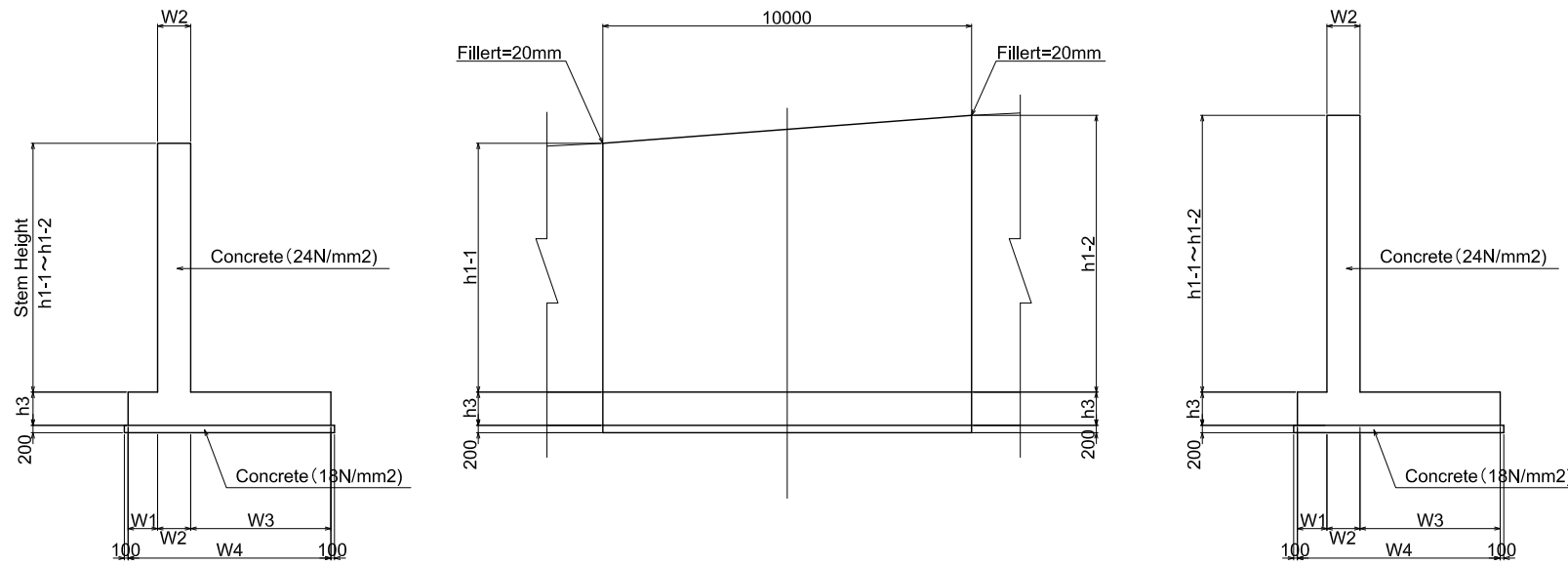
DRAWING TITLE:
STRUCTURE OF BOX CULVERT (2)

SCALE:(A1size)	DRAWING NO.
As Shown	US-05

OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION)

STRUCTURE OF RETAINING WALL (1)

CANTILEVERED (INVERTED T) TYPE RETAINING WALL S=1:100



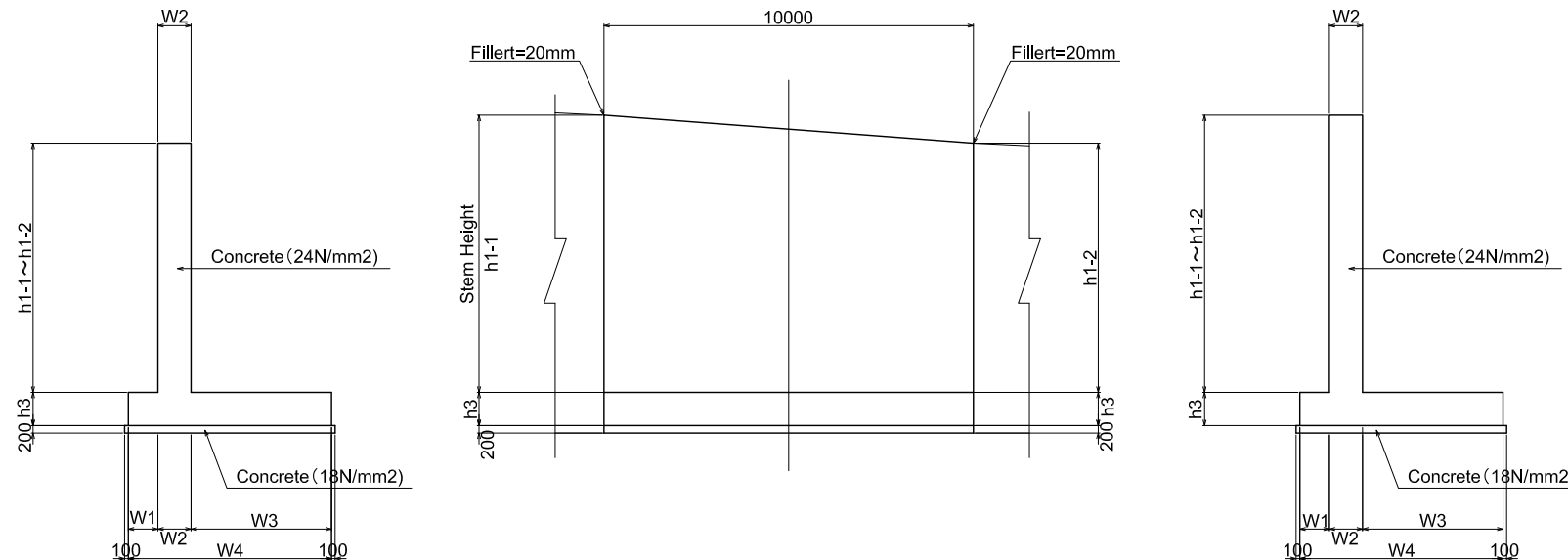
DIMENSION TABLE (West side of Box Culvert)

Code	Base Slab		Heel Width W1	Stem Width W2	Toe Width W3	Stem Height		Overall Height		Remarks
	Height h3	Width W4				h1-1	h1-2	H1	H2	
Retaining Walls on Left Hand Side										
GT-L-1	500	2500	800	500	1200	2185	~ 2408	2685	~ 2908	Invertd T type
GT-L-2	500	2500	800	500	1200	2408	~ 2627	2908	~ 3127	
GT-L-3	500	2500	800	500	1200	2627	~ 2744	3127	~ 3244	
GT-L-4	500	2500	800	500	1200	2744	~ 2862	3244	~ 3362	
GT-L-5	500	2500	800	500	1200	2862	~ 2931	3362	~ 3431	
GT-L-6	500	2500	800	500	1200	2931	~ 3000	3431	~ 3500	
GT-L-7	500	3500	800	500	2200	3417	~ 3458	3917	~ 3958	
GT-L-8	500	3500	800	500	2200	3458	~ 3500	3958	~ 4000	
GT-L-9	500	3500	800	500	2200	3871	~ 3885	4371	~ 4385	
GT-L-10	500	3500	800	500	2200	3885	~ 3899	4385	~ 4399	
GT-L-11	500	3500	800	500	2200	3899	~ 3929	4399	~ 4429	
GT-L-12	500	3500	800	500	2200	3929	~ 3950	4429	~ 4450	
GT-L-13	500	3500	800	500	2200	3950	~ 4045	4450	~ 4545	
GT-L-14	500	3500	800	500	2200	4045	~ 4131	4545	~ 4631	
GT-L-15	500	3500	800	500	2200	4131	~ 4316	4631	~ 4816	
GT-L-16	500	3500	800	500	2200	4316	~ 4500	4816	~ 5000	
GT-L-17	600	4500	800	600	3100	5254	~ 5593	5854	~ 6193	
GT-L-18	600	4500	800	600	3100	5593	~ 5900	6193	~ 6500	
GT-L-19	900	5500	800	900	3800	5816	~ 6314	6716	~ 7214	
GT-L-20	900	5500	800	900	3800	6314	~ 6809	7214	~ 7709	
GT-L-21	900	5500	800	900	3800	6809	~ 7955	7709	~ 8855	
GT-L-22	900	5500	800	900	3800	7955	~ 9100	8855	~ 10000	
Retaining Walls on Right Hand Side										
GT-R-1	500	3500	800	500	2200	2331	~ 2961	2831	~ 3461	Invertd T type
GT-R-2	500	3500	800	500	2200	2961	~ 3591	3461	~ 4091	
GT-R-3	500	4500	800	500	3200	3591	~ 4045	4091	~ 4545	
GT-R-4	500	4500	800	500	3200	4045	~ 4843	4545	~ 5343	
GT-R-5	500	4500	800	500	3200	4843	~ 5396	5343	~ 5896	
GT-R-6	500	4500	800	500	3200	5396	~ 6000	5896	~ 6500	
GT-R-7	900	5500	800	900	3800	6182	~ 6658	7082	~ 7558	
GT-R-8	900	5500	800	900	3800	6658	~ 7133	7558	~ 8033	
GT-R-9	900	5500	800	900	3800	7133	~ 7462	8033	~ 8362	
GT-R-10	900	5500	800	900	3800	7462	~ 7791	8362	~ 8691	
GT-R-11	900	5500	800	900	3800	7791	~ 8443	8691	~ 9343	
GT-R-12	900	5500	800	900	3800	8443	~ 9100	9343	~ 10000	

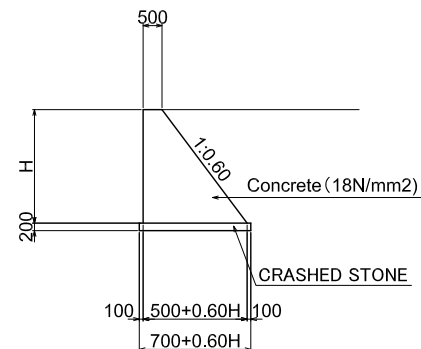
OUTLINE OF STRUCTURES ALONG MOTORWAY-AFLAO ROAD (DEPRESSED SECTION)

STRUCTURE OF RETAINING WALL (2)

CANTILEVERED (INVERTED T) TYPE RETAINING WALL S=1:100



GRAVITY-TYPE RETAINING WALL

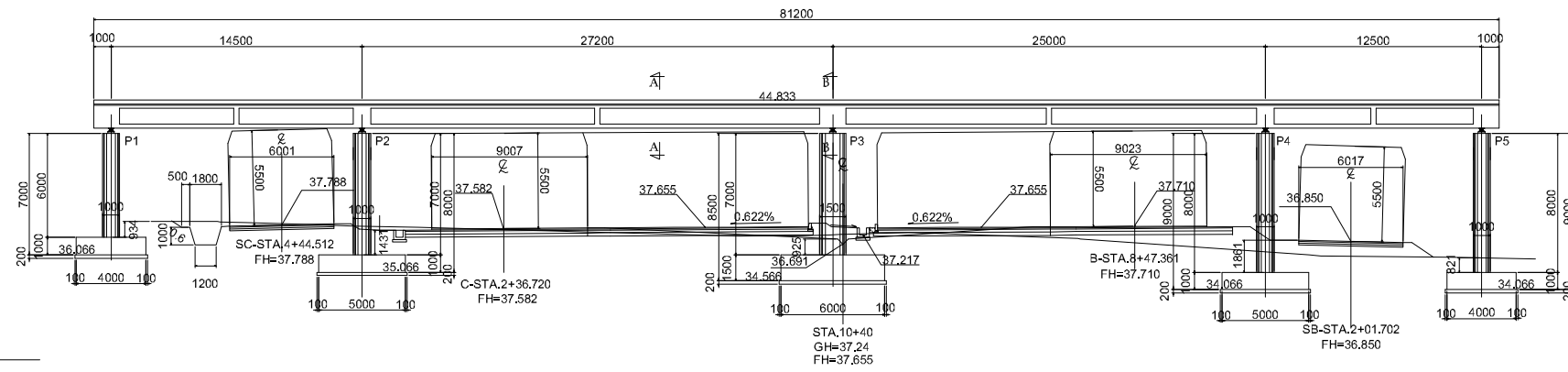


DIMENSION TABLE (East side of Box Culvert)

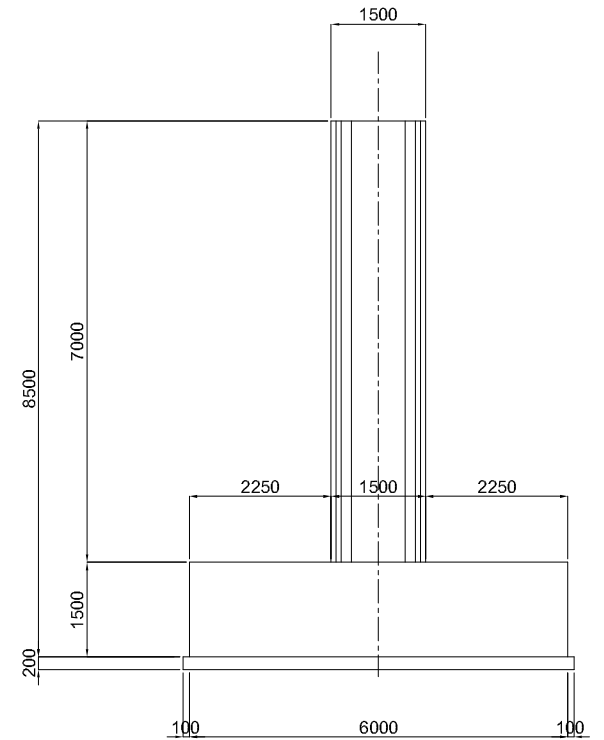
Code	Base Slab		Heel Width W1	Stem Width W2	Toe Width W3	Stem Height		Overall Height		Remarks
	Height h3	Width W4				h1-1	h1-2	H1	H2	
Retaining Walls on Left Hand Side										
GT-L-1	1100	6000	800	1100	4100	9900	~ 8937	11000	~ 10037	Invertd T type
GT-L-2	1100	6000	800	1100	4100	8937	~ 8332	10037	~ 9432	
GT-L-3	1100	6000	800	1100	4100	8332	~ 7727	9432	~ 8827	
GT-L-4	1100	6000	800	1100	4100	7727	~ 7449	8827	~ 8549	
GT-L-5	1100	6000	800	1100	4100	7449	~ 7171	8549	~ 8271	
GT-L-6	800	5500	800	800	3900	7200	~ 6763	8000	~ 7563	
GT-L-7	800	5500	800	800	3900	6763	~ 6325	7563	~ 7125	
GT-L-8	800	5500	800	800	3900	6325	~ 6015	7125	~ 6815	
GT-L-9	800	5500	800	800	3900	6015	~ 5706	6815	~ 6506	
GT-L-10	500	5000	800	500	3700	5644	~ 5274	6144	~ 5774	
GT-L-11	500	5000	800	500	3700	5274	~ 4838	5774	~ 5338	
GT-L-12	500	3500	800	500	2200	4838	~ 4419	5338	~ 4919	
GT-L-13	500	3500	800	500	2200	4419	~ 4000	4919	~ 4500	
GT-L-14	500	3500	800	500	2200	4000	~ 3539	4500	~ 4039	
GT-L-15	500	3500	800	500	2200	3539	~ 3079	4039	~ 3579	
GW-L-1								3000	~ 2336	Gravity Wall
GW-L-2								2336	~ 1672	
Retaining Walls on Right Hand Side										
GT-R-1	900	5500	800	900	3800	9000	~ 5994	9900	~ 6894	Invertd T type
GT-R-2	600	5000	800	600	3600	6294	~ 6040	6894	~ 6640	
GT-R-3	600	5000	800	600	3600	6040	~ 5786	6640	~ 6386	
GT-R-4	600	5000	800	600	3600	5786	~ 5501	6386	~ 6101	
GT-R-5	600	5000	800	600	3600	5501	~ 5215	6101	~ 5815	
GT-R-6	500	4000	800	500	2700	5000	~ 4690	5500	~ 5190	
GT-R-7	500	4000	800	500	2700	4690	~ 4380	5190	~ 4880	
GT-R-8	500	3500	800	500	2200	4380	~ 4046	4880	~ 4546	
GT-R-9	500	3500	800	500	2200	4046	~ 3712	4546	~ 4212	
GT-R-10	500	3500	800	500	2200	3712	~ 3187	4212	~ 3687	
GT-R-11	500	3500	800	500	2200	3187	~ 2662	3687	~ 3162	
GT-R-12	500	3500	800	500	2200	2662	~ 2387	3162	~ 2887	
GT-R-13	500	3500	800	500	2200	2387	~ 2112	2887	~ 2612	
GW-R-1								2612	~ 2251	Gravity Wall
GW-R-2								2251	~ 1889	

GENERAL DRAWING OF FOOTBRIDGE (1)

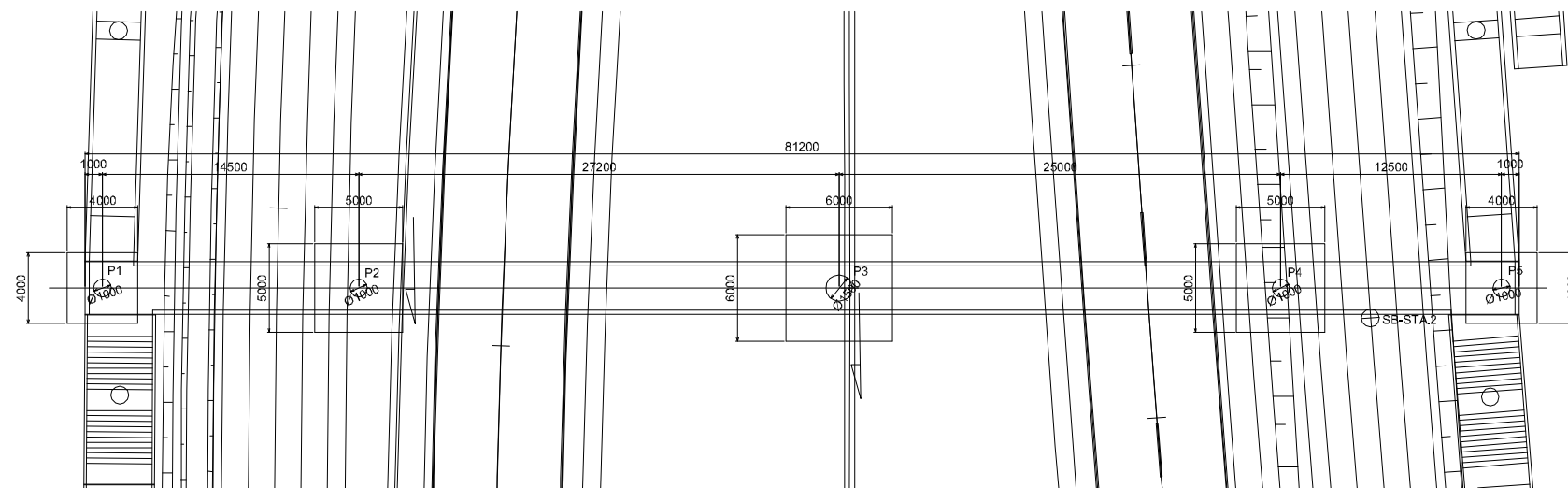
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Scale 1:500



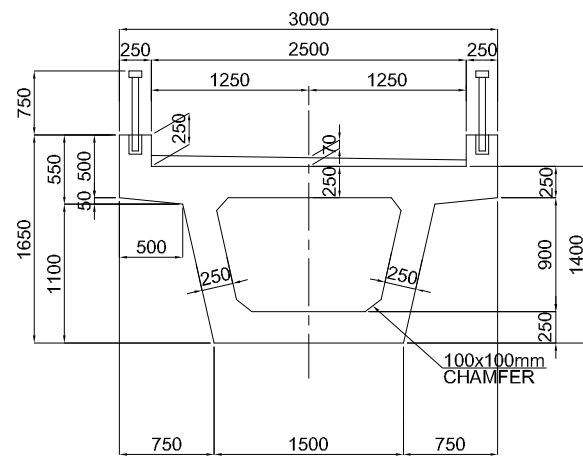
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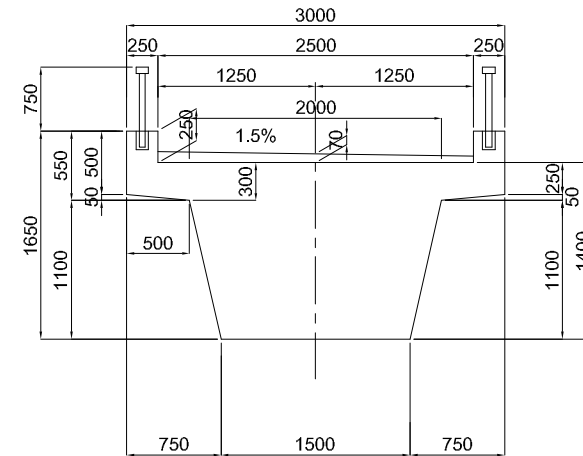
LAYOUT PLAN
Scale 1:500



SECTION A-A
Scale 1:30



SECTION B-B
Scale 1:30



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

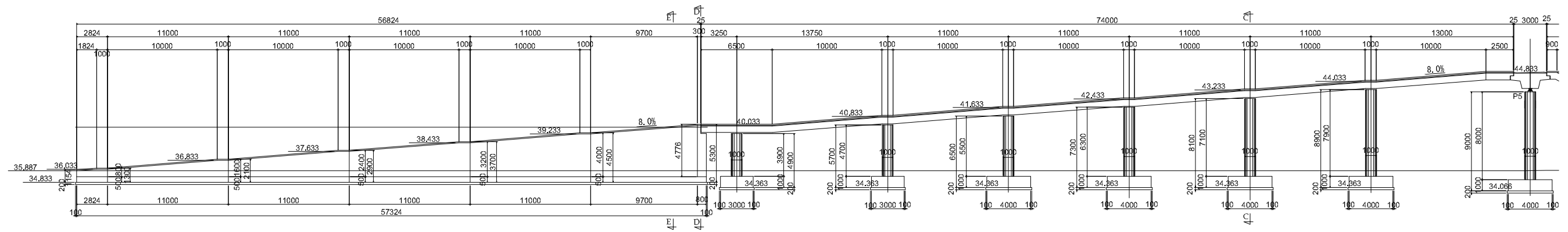
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
GENERAL DRAWING OF FOOTBRIDGE (1)

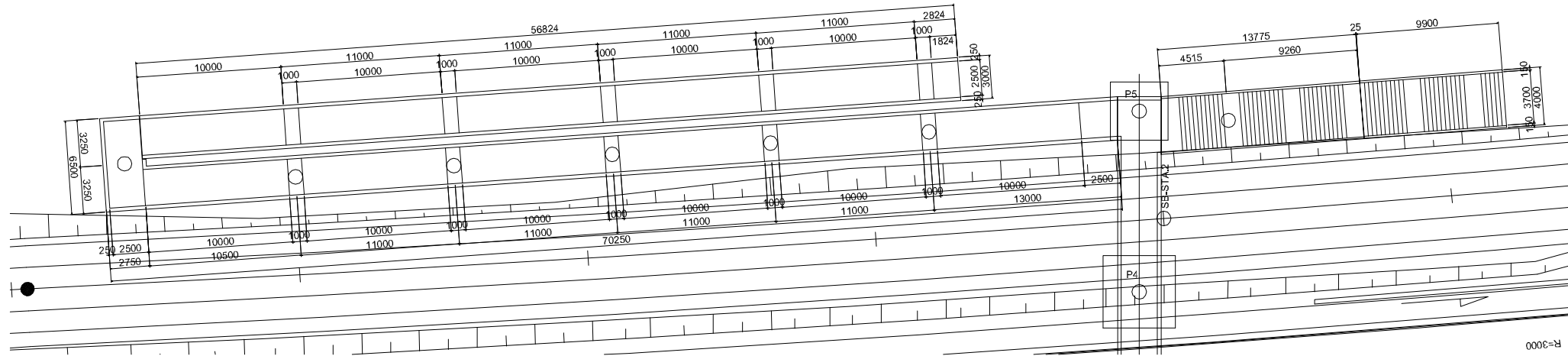
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As Shown	PB-01

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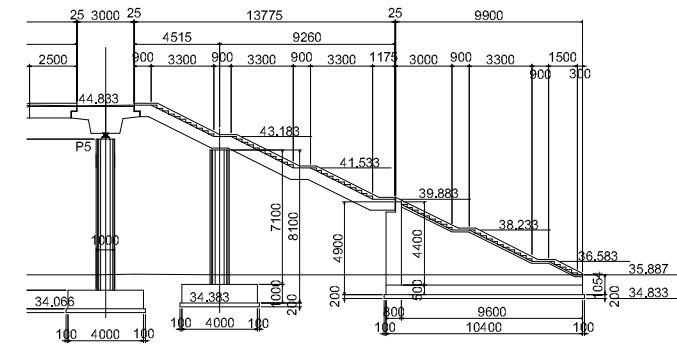
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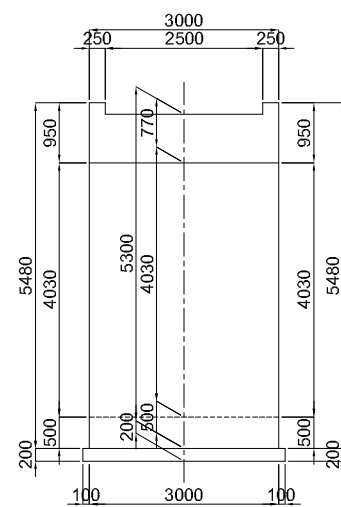
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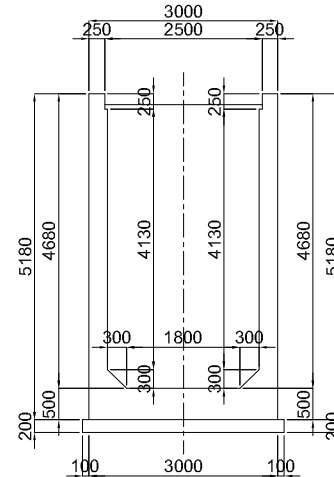
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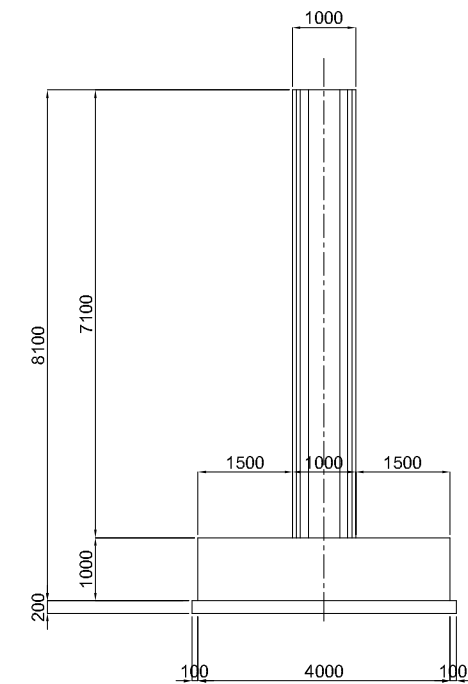
SECTION D-D
Scale 1:30



SECTION E-E
Scale 1:30



SECTION C-C
Scale 1:30



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

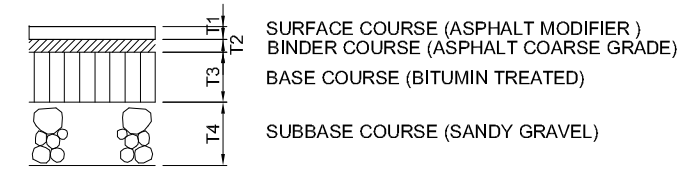
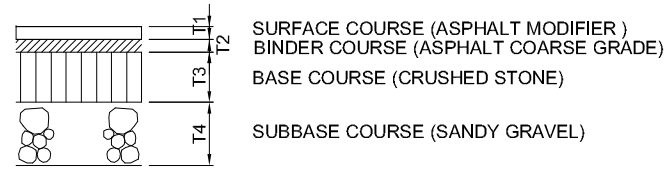
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
GENERAL DRAWING OF FOOTBRIDGE (3)

SCALE: (A1 size)
As Shown
DRAWING NO.
PB-03

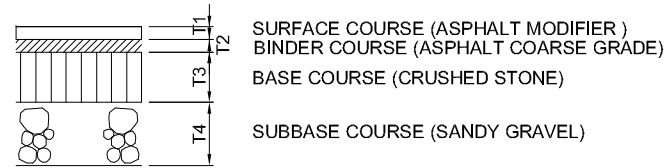
MAIN ROAD SURFACE COURSE(ASPHALT CONCRETE) S=1:10



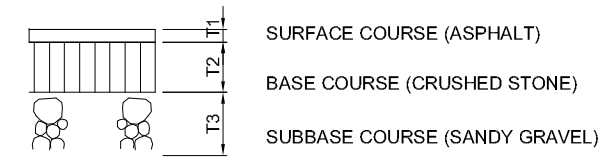
PAVEMENT COMPOSITION	SECTION		LENGTH (m)	T1 SURFASCE (mm)	T2 BINDER (mm)	T3 BASE (BASE COURSE) (mm)	T4 SUB BASE (SUBBASE COURSE) (mm)	DESIGN C.B.R.
	FROM	TO						
MOTORWAY (STANDARD SECTION)	-1 + 55	6 + 40	795m	50	100	250	300	
AFLAO (STANDARD SECTION)	12 + 0	19 + 15	715m	50	80	200	200	
HARBOUR ROAD	-2 + 0	2 + 80	480m	50	100	200	200	
AKOSOMBO ROAD	10 + 20	16 + 80	660m	50	80	150	200	

PAVEMENT COMPOSITION	SECTION		LENGTH (m)	T1 SURFASCE (mm)	T2 BINDER (mm)	T3 BASE (BASE COURSE) (mm)	T4 SUB BASE (SUBBASE COURSE) (mm)	DESIGN C.B.R.
	FROM	TO						
HIGHGR.WATER SECITION	6 + 40	12 + 0	370m	50	100	270	—	
INSIDE BOX	8 + 20	10 + 10	190m	50	100	420~1400	500~630	

RAMP ROAD SURFACE COURSE(ASPHALT CONCRETE) S=1:10



SERVICE ROAD SURFACE COURSE(ASPHALT CONCRETE) S=1:10



PAVEMENT COMPOSITION	SECTION		LENGTH (m)	T1 SURFASCE (mm)	T2 BINDER (mm)	T3 BASE (BASE COURSE) (mm)	T4 SUB BASE (SUBBASE COURSE) (mm)	DESIGN C.B.R.
	FROM	TO						
RAMP-A	2 + 60	10 + 21	761m	50	60	200	250	
RAMP-B	1 + 59	8 + 28	669m	50	60	200	250	
RAMP-C	2 + 57	9 + 8	651m	50	60	200	250	
RAMP-D	2 + 60	10 + 80	820m	50	60	200	250	
RAMP-E	1 + 6	1 + 95	89m	50	60	200	250	
RAMP-F	1 + 56	2 + 96	140m	50	60	200	250	
RAMP-G	0 + 69	1 + 72	103m	50	60	200	250	
RAMP-H	0 + 62	1 + 75	113m	50	60	200	250	

PAVEMENT COMPOSITION	SECTION		LENGTH (m)	T1 SURFASCE (mm)	T2 BASE (BASE COURSE) (mm)	T3 SUB BASE (SUBBASE COURSE) (mm)	DESIGN C.B.R.
	FROM	TO					
SERVICE-A	-2 + 2	15 + 75	1,777m	70	100	100	
SERVICE-B	0 + 0	8 + 55	855m	70	100	100	
SERVICE-C	-1 + 82	6 + 34	816m	70	100	100	
SERVICE-D	-2 + 10	6 + 52	862m	70	100	100	

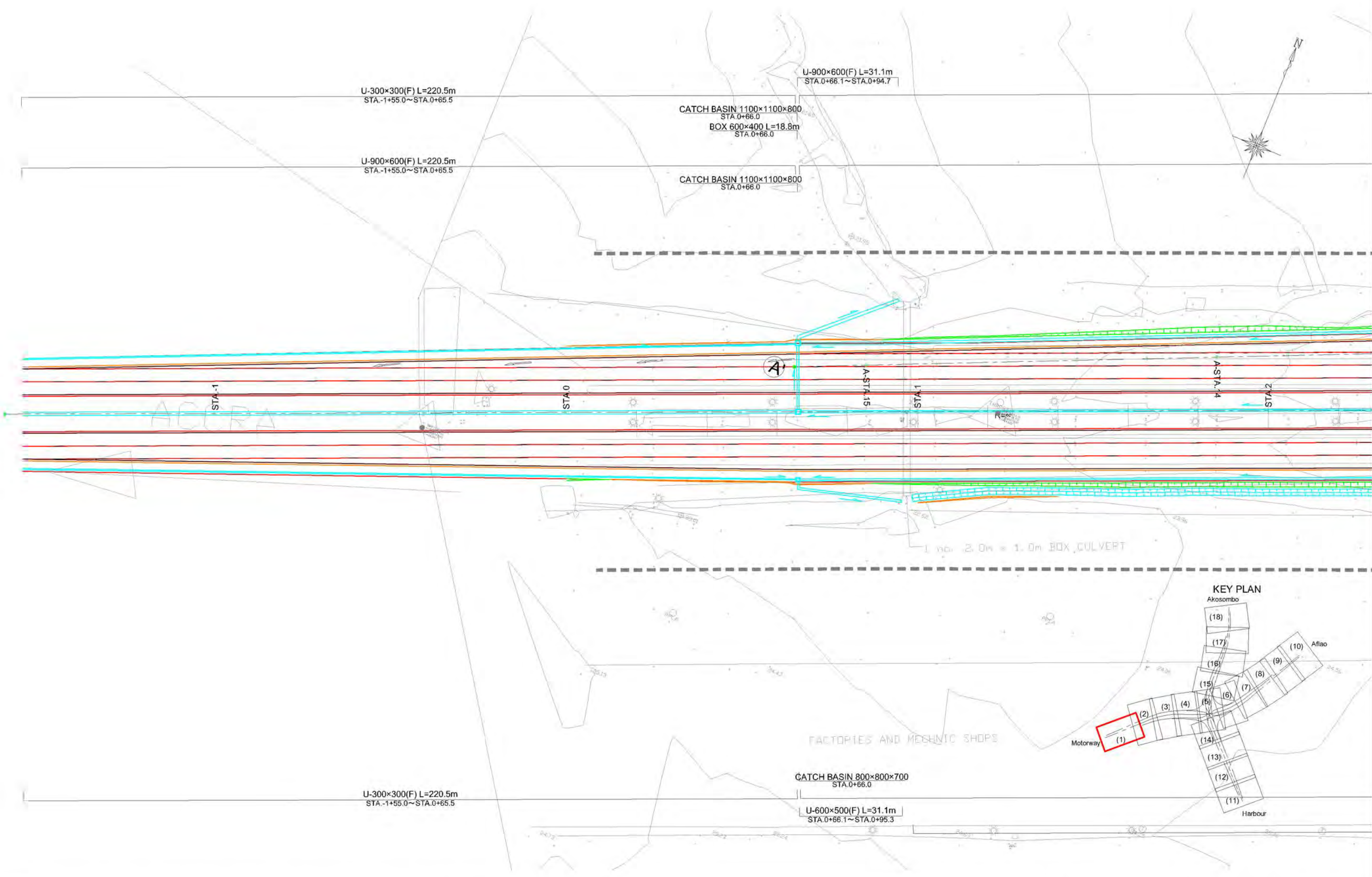
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
OUTLINE OF PAVEMENT STRUCTURE

SCALE	DRAWING NO.
As Shown	PS-01



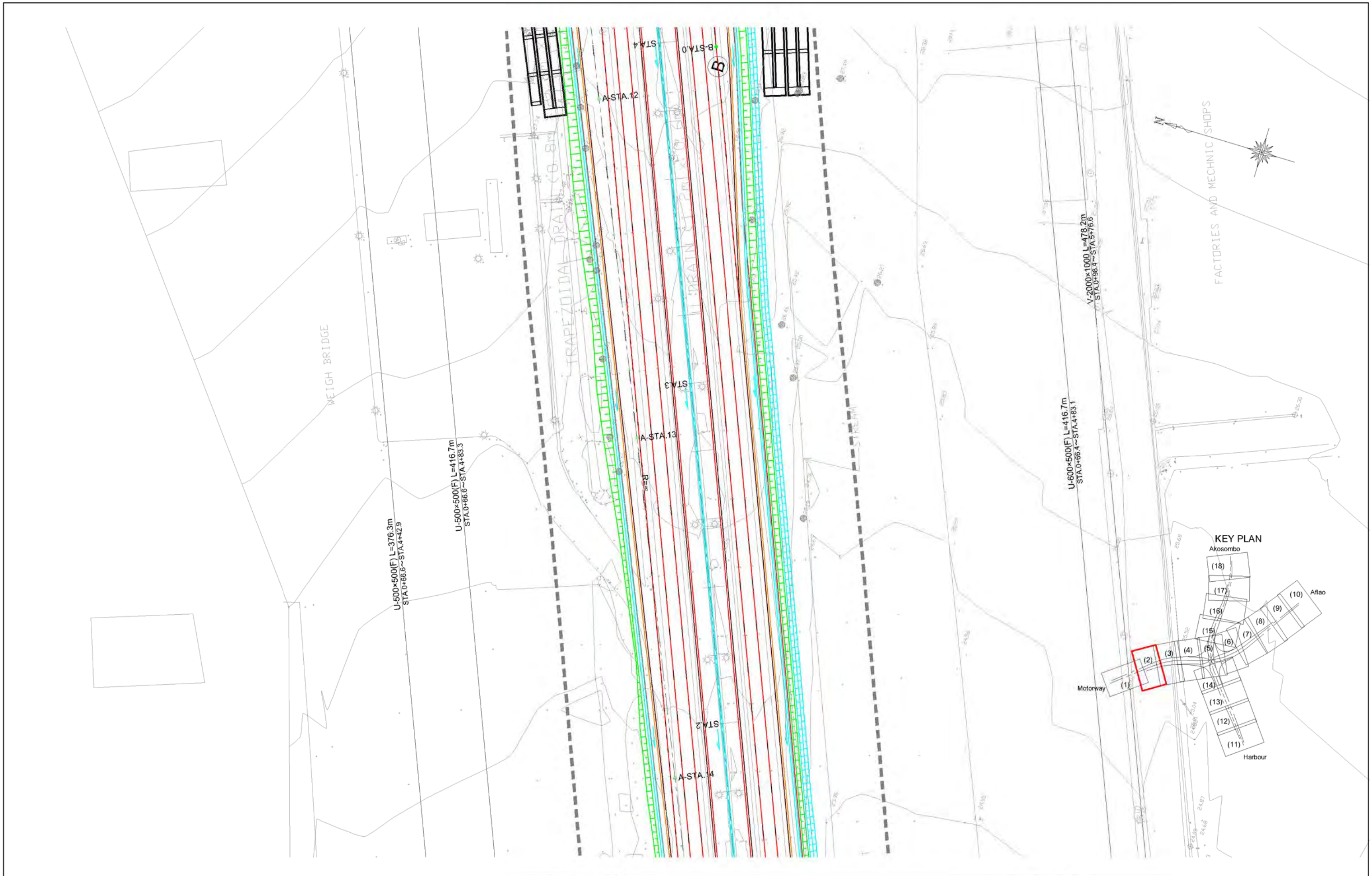
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (1)

SCALE (A1 size)	DRAWING NO.
1:500	DP-01



FACTORIES AND MECHANIC SHOPS



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

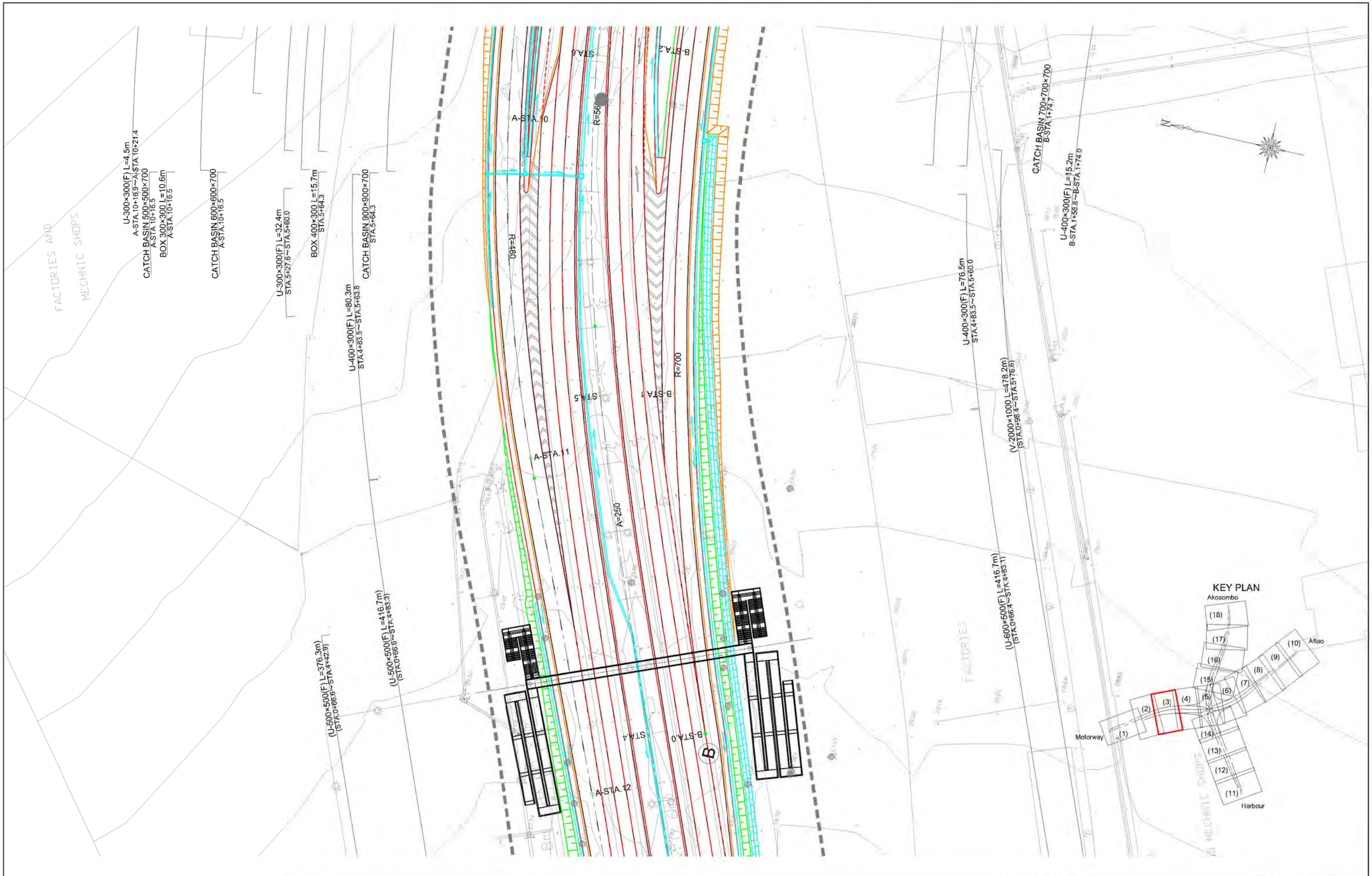
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (2)

SCALE:(A1size) DRAWING NO.

1:500 DP-02



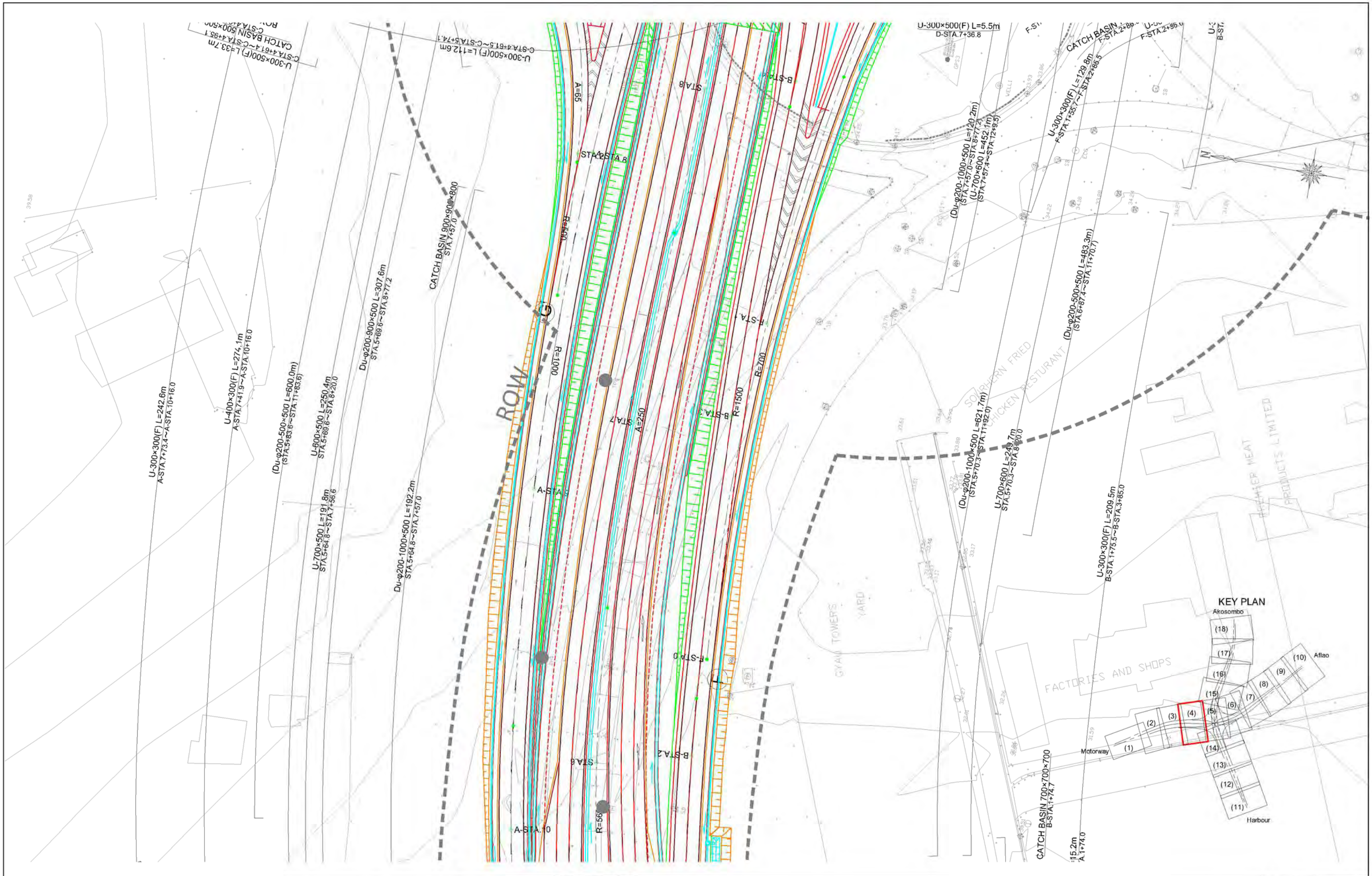
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (3)

SCALE (A1size)	DRAWING NO.
1:500	DP-03



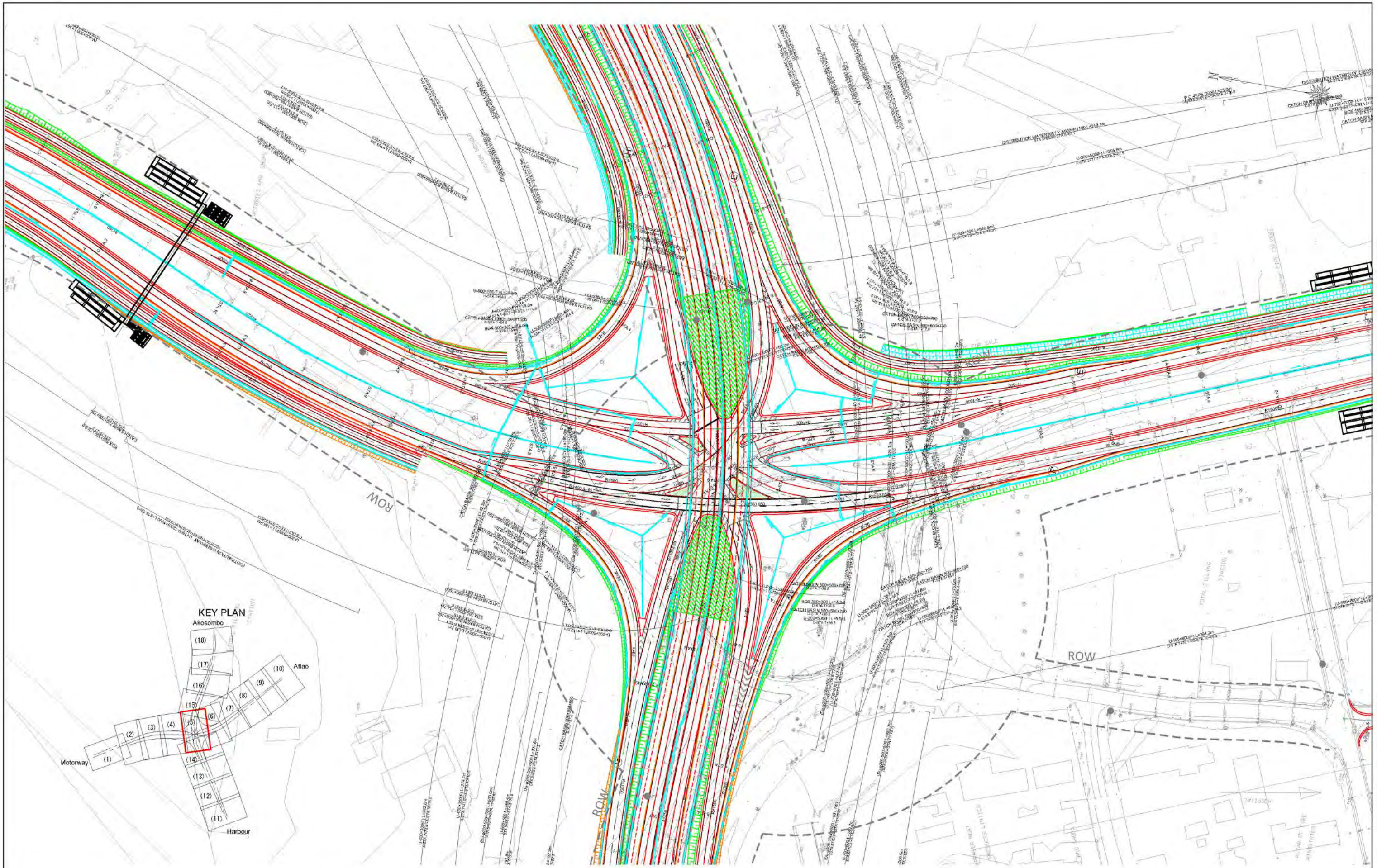
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (4)

SCALE (A1 size)	DRAWING NO.
1:500	DP-04



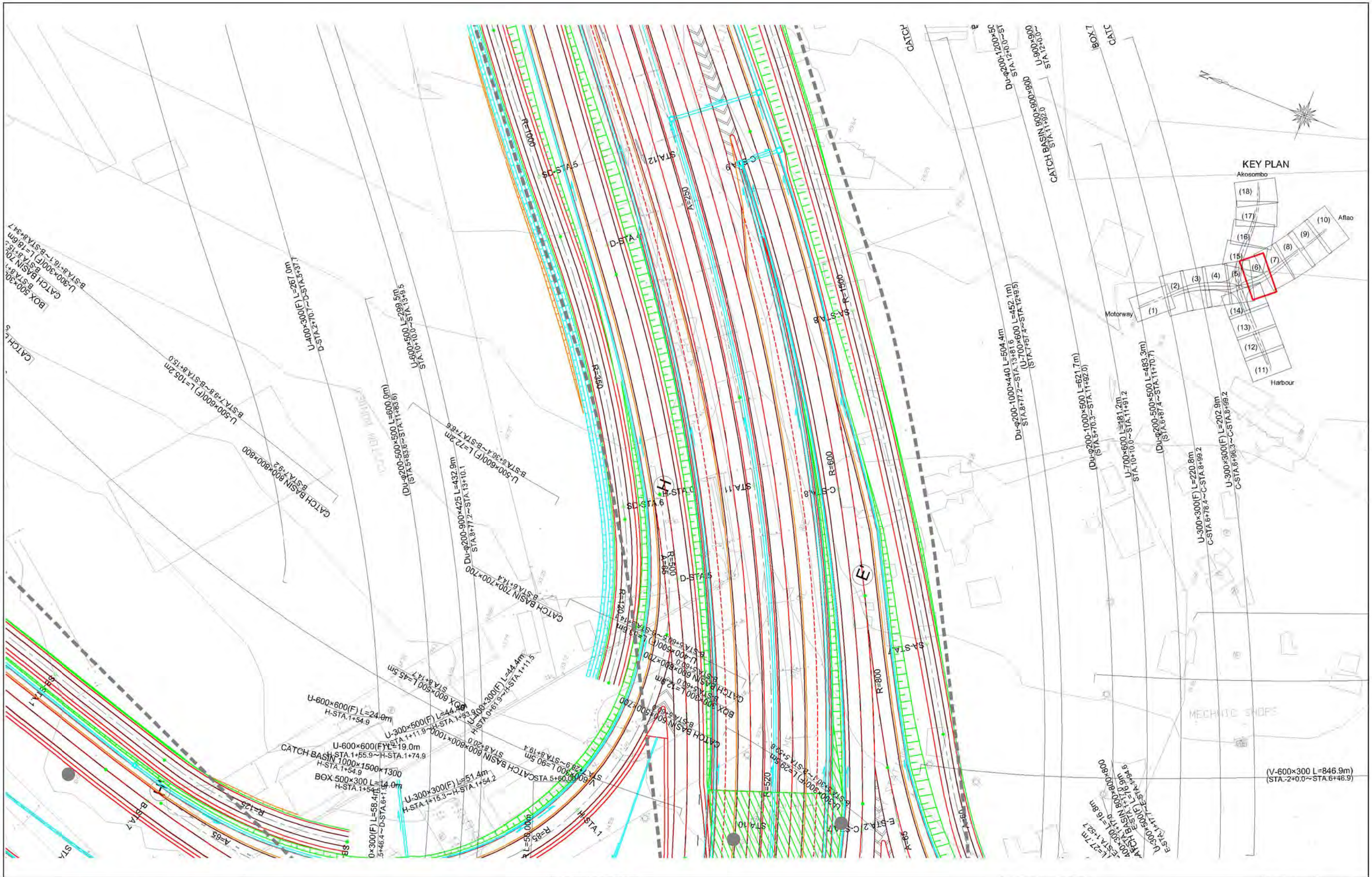
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (5)

SCALE (A1size)	DRAWING NO.
1:1000	DP-05



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 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
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DRAWING TITLE:
DRAINAGE PLAN (6)

SCALE: (A1size)	DRAWING NO.
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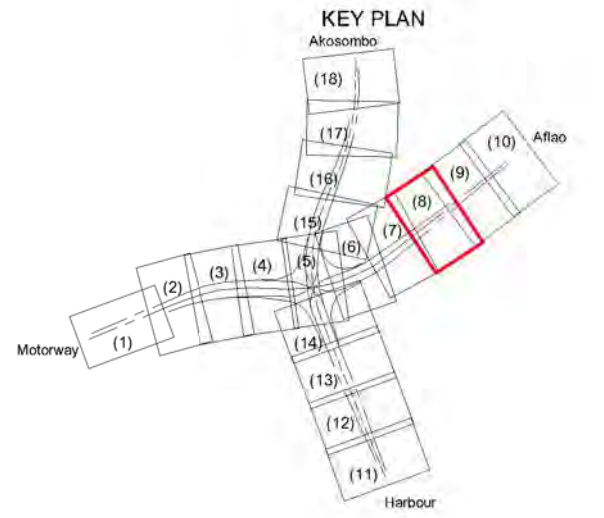
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (7)

SCALE (A1 size)	DRAWING NO.
1:500	DP-07



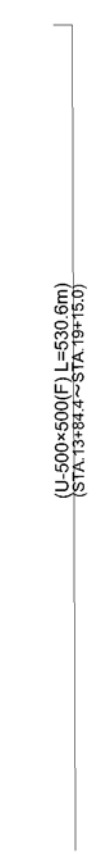
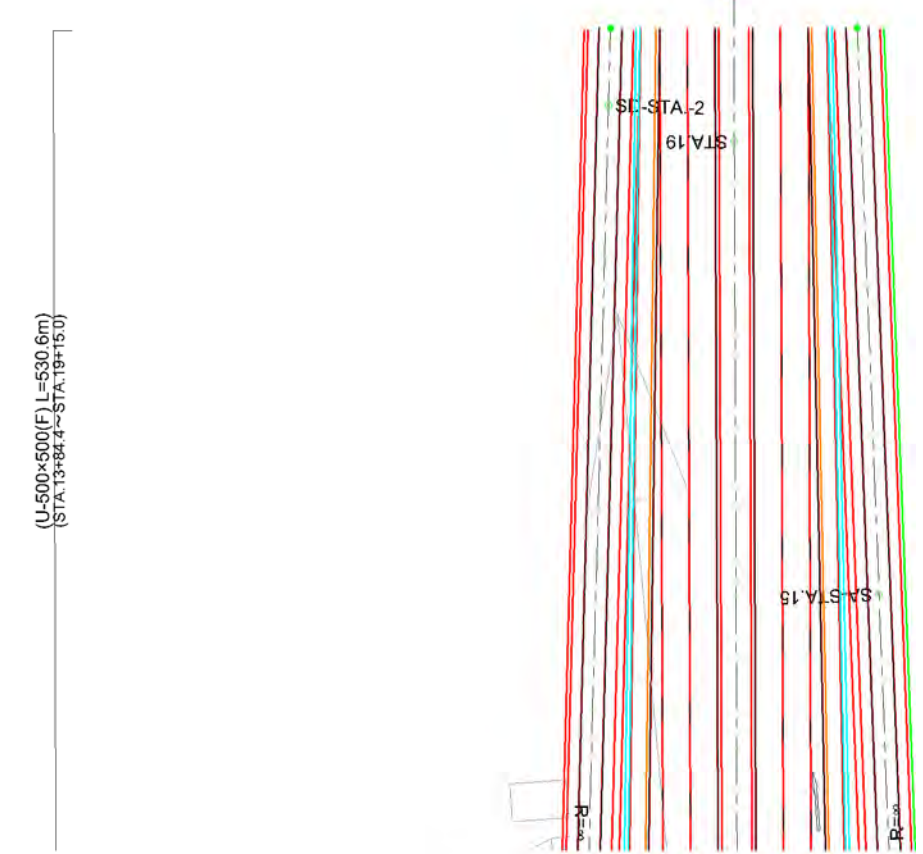
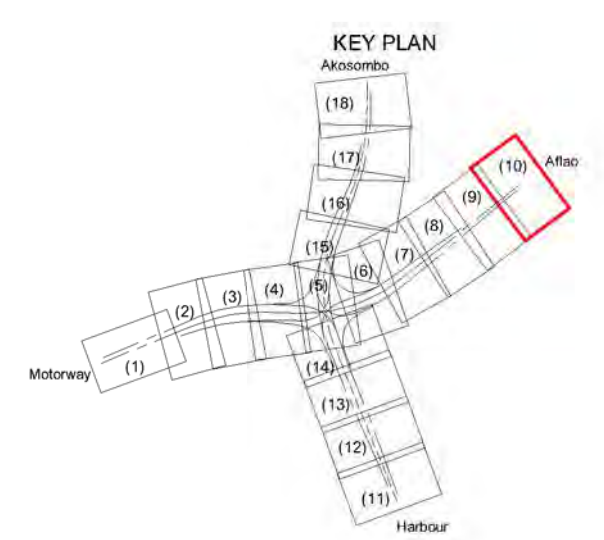
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (8)

SCALE (A1size)	DRAWING NO.
1:500	DP-08



GHANA HIGHWAY AUTHORITY
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (10)

SCALE (A1size)	DRAWING NO.
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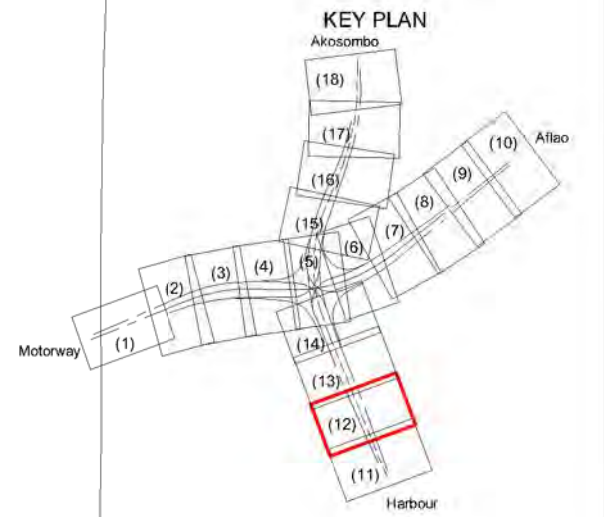
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (11)

SCALE (A1 size)	DRAWING NO.
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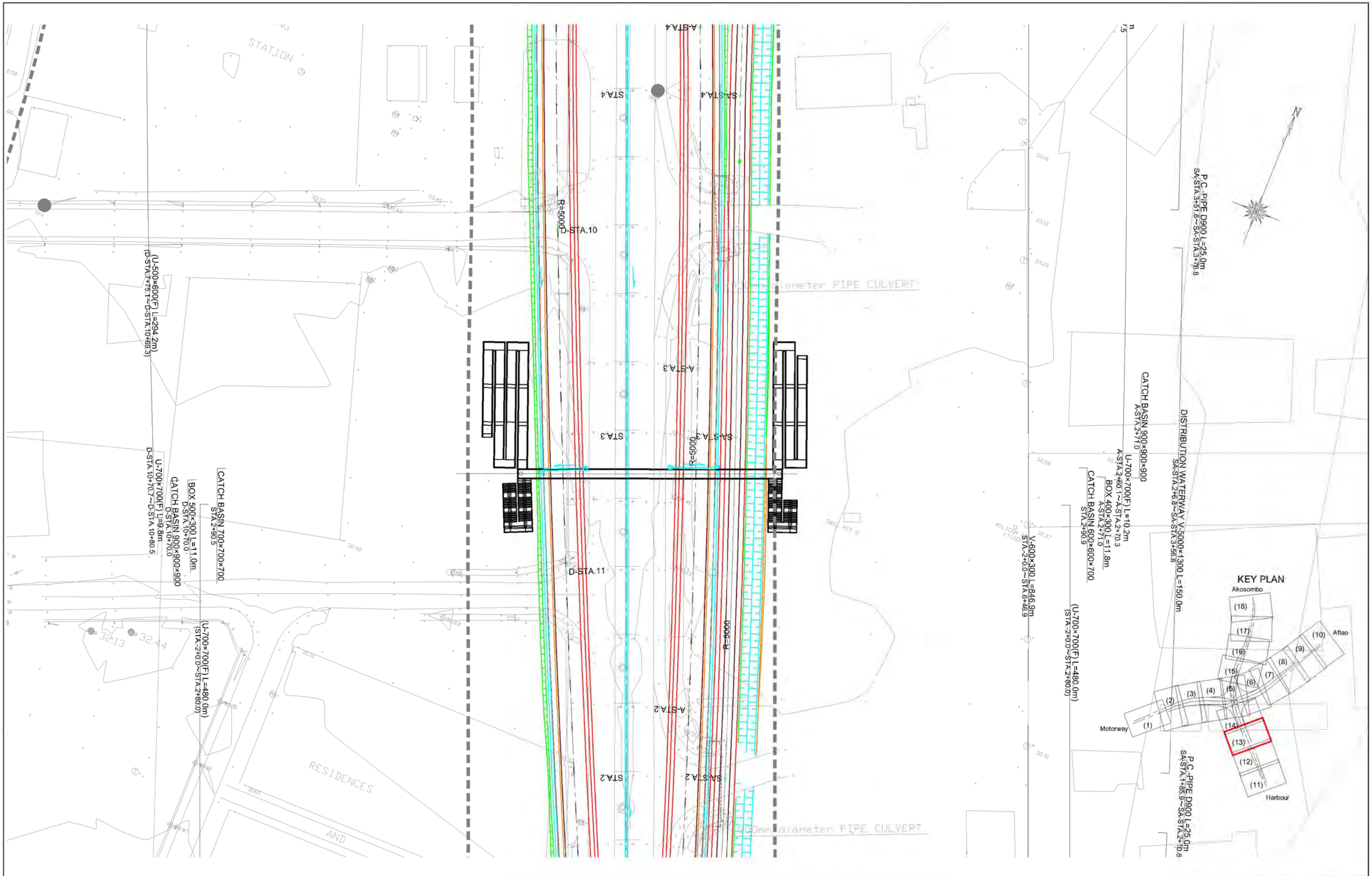
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
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SCALE (A1 size)	DRAWING NO.
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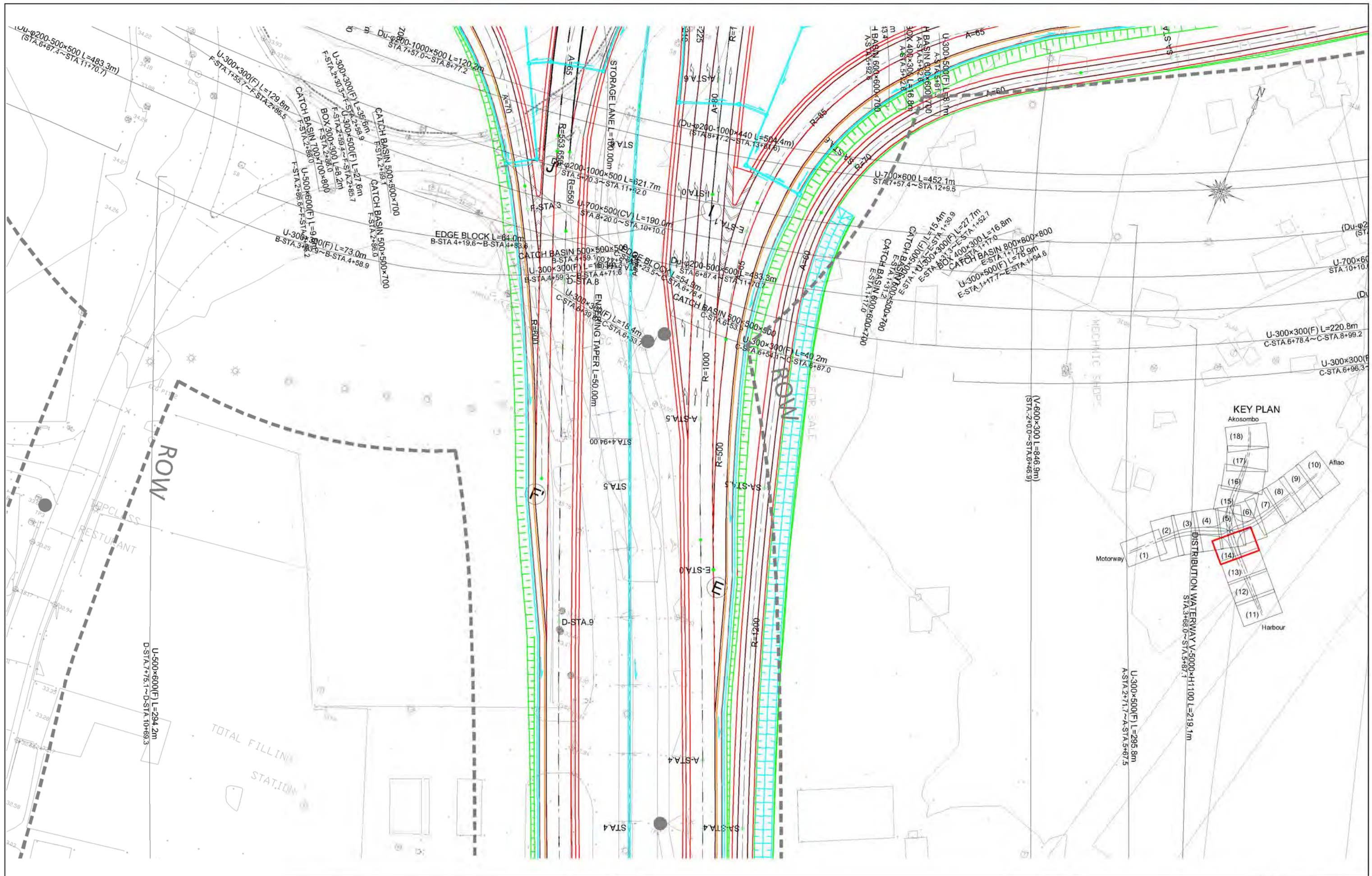
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
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SCALE (A1size)	DRAWING NO.
1:500	DP-13



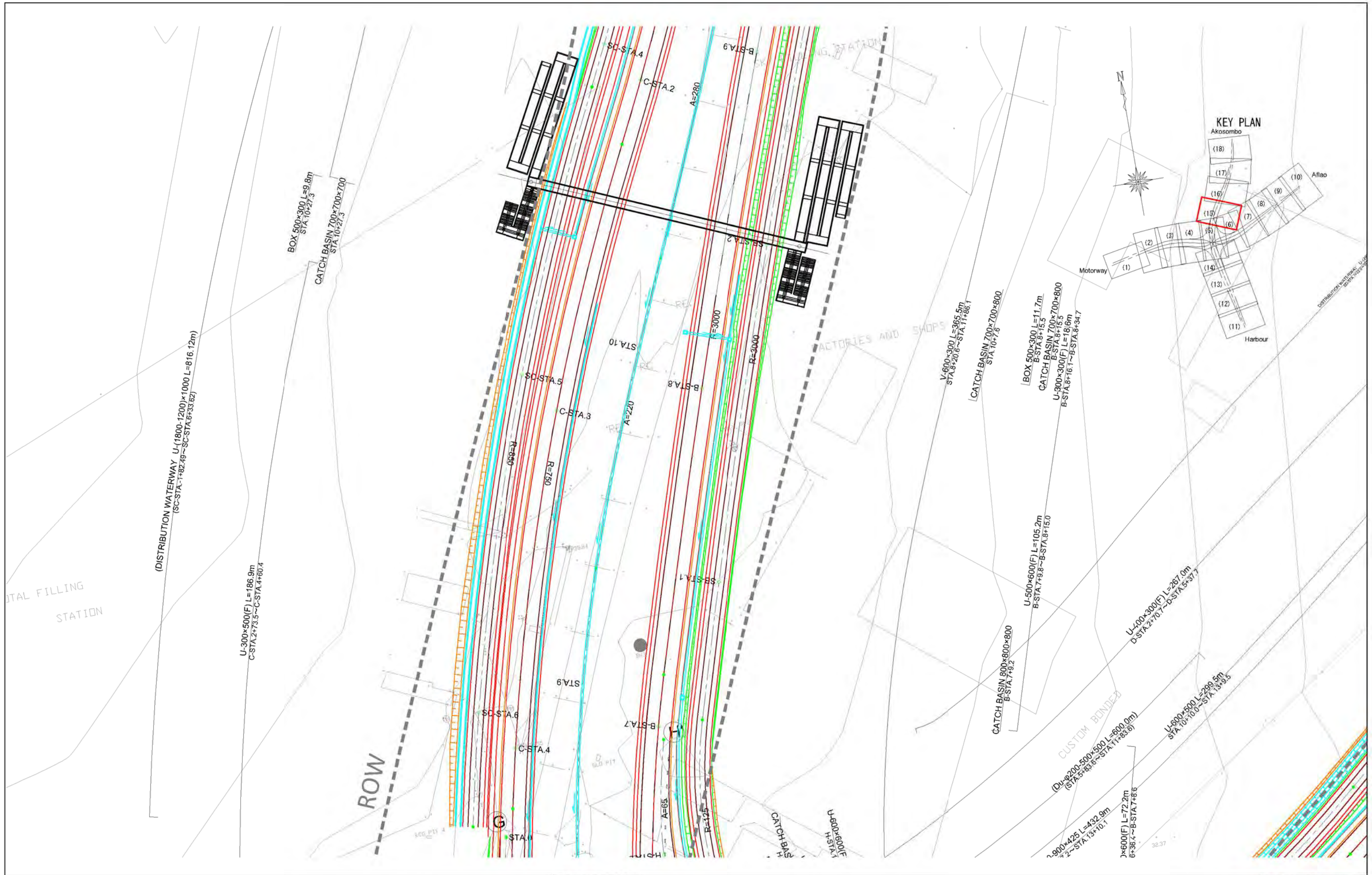
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
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SCALE (A1 size)	DRAWING NO.
1:500	DP-14



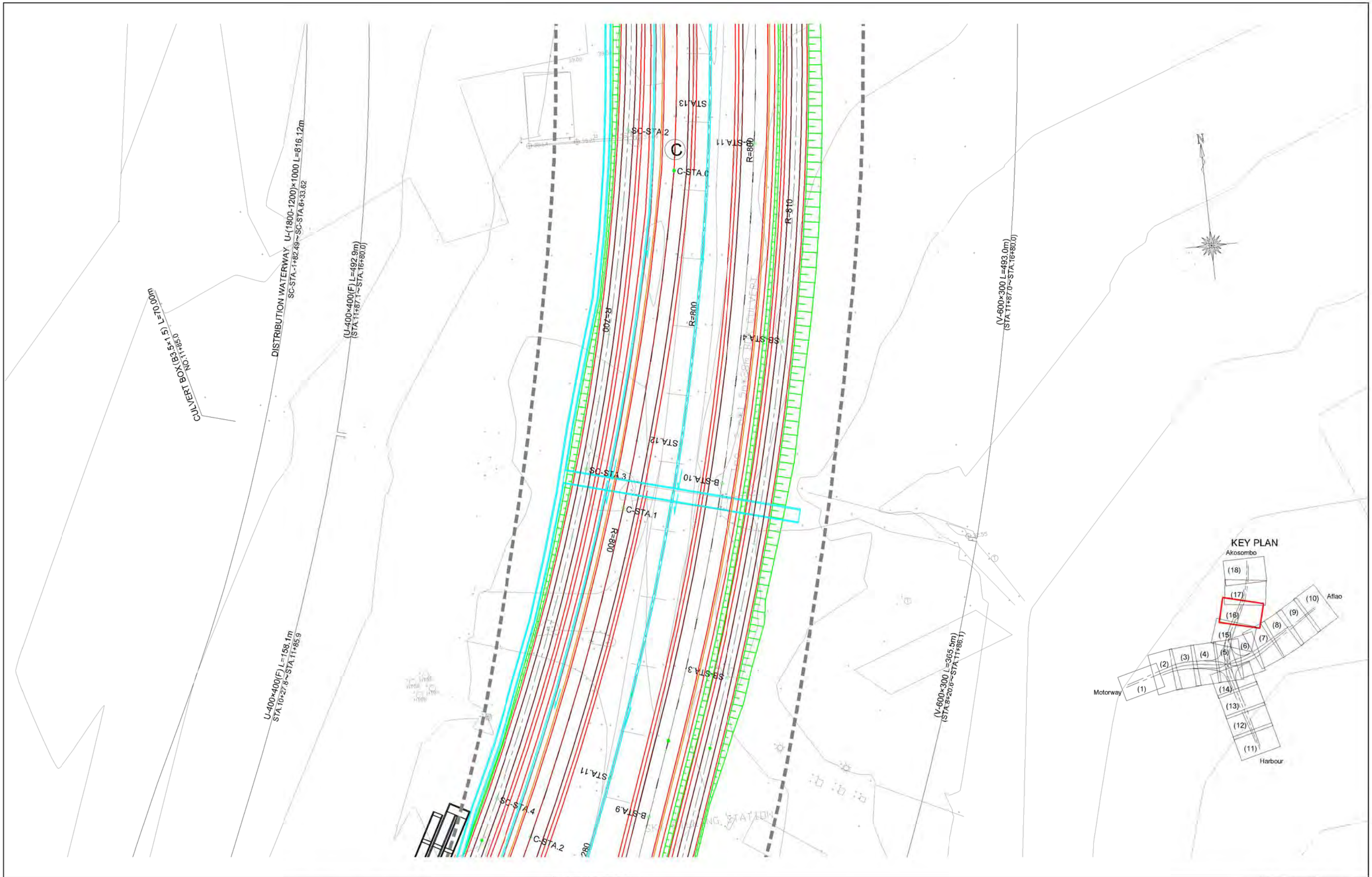
GHANA HIGHWAY AUTHORITY
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 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
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SCALE (A1 size)	DRAWING NO.
1:500	DP-15



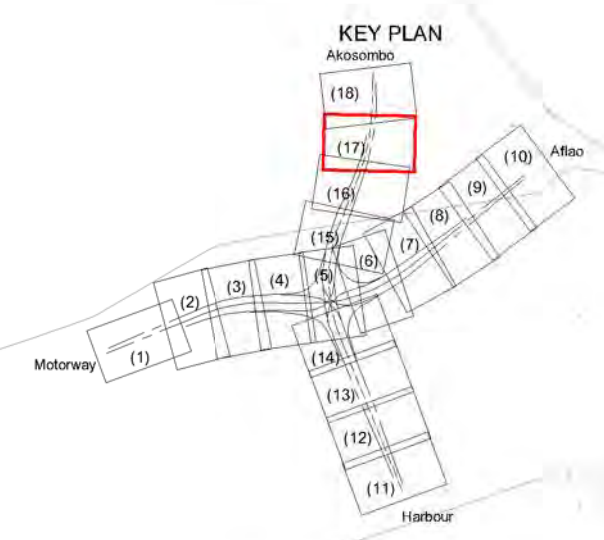
GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: DRAINAGE PLAN (16)	SCALE:(A1size)	DRAWING NO.
				1:500	DP-16

FACTORIES AND MECHNIC SHOPS

20-1200x1000 L=816.12m
TA.6+33.82

(DISTRIBUTION WATERWAY U (1800-1200)x1000 L=816.12m)
(SC-STA.1+82.49~SC-STA.6+33.82)

U-400x400(F) L=492.9m
STA.11+87.1~STA.16+80.0



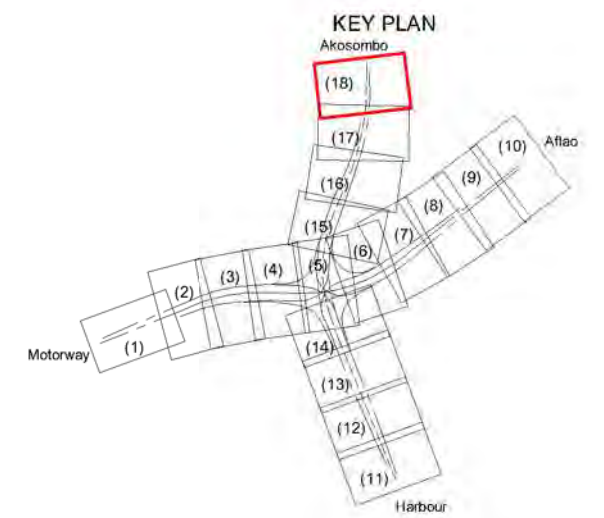
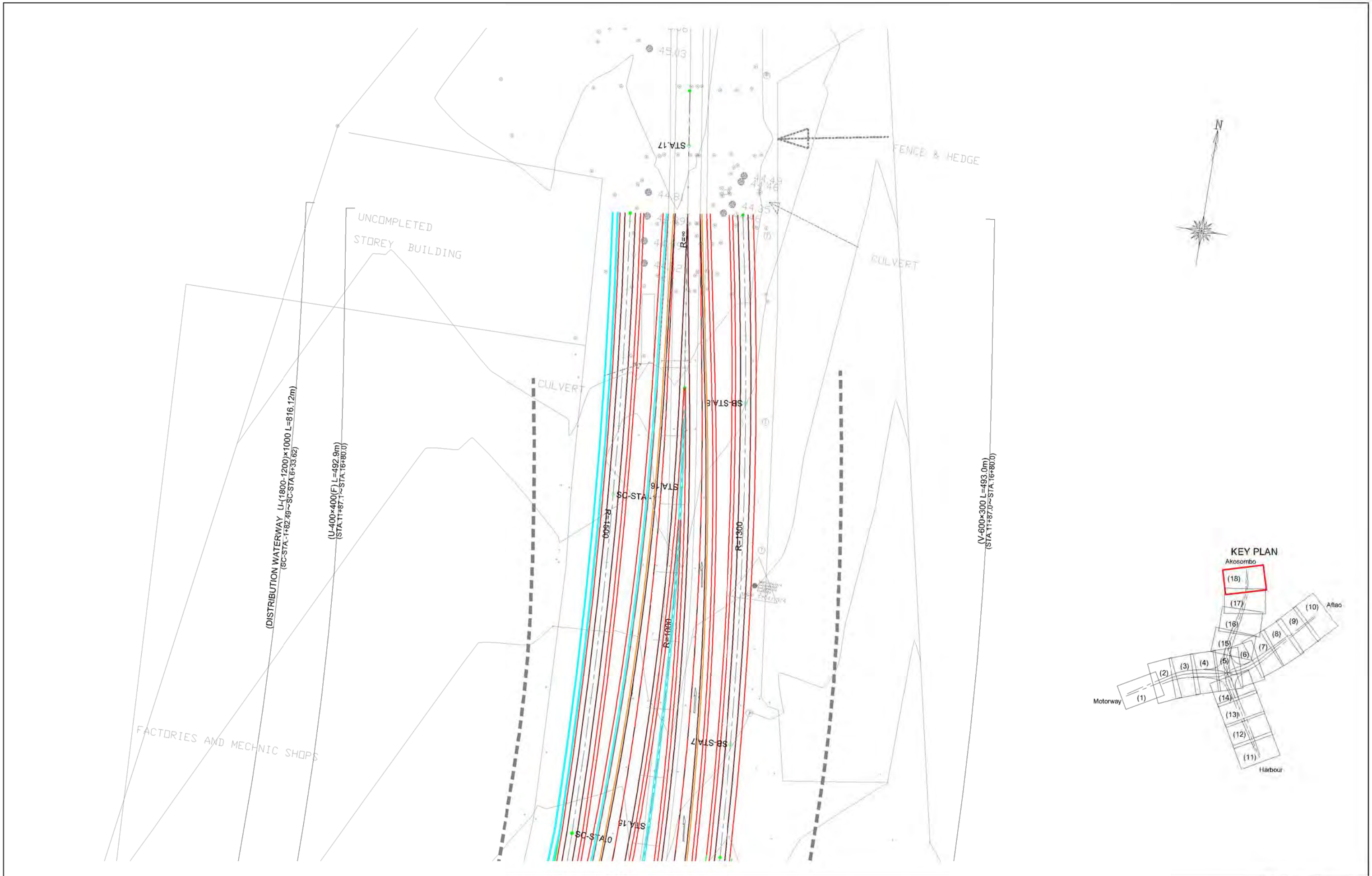
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
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CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (17)

SCALE (A1 size)	DRAWING NO.
1:500	DP-17



GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

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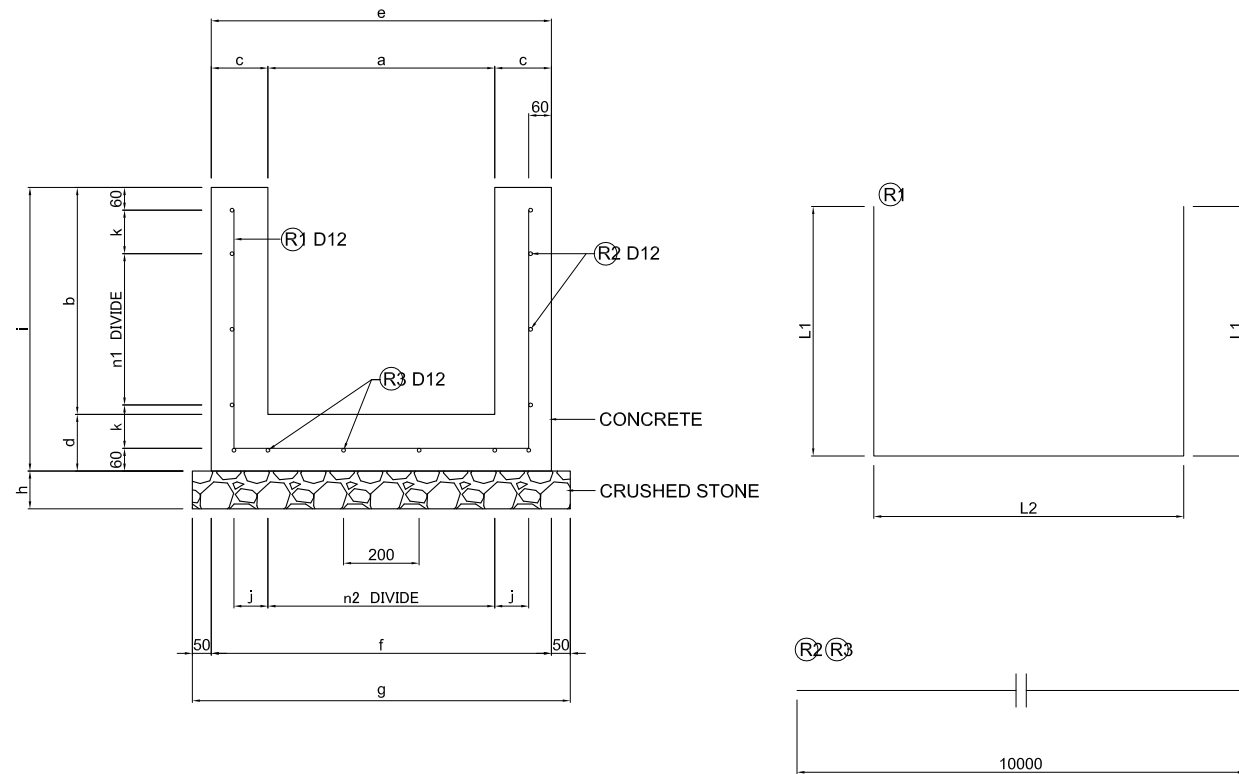
PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
DRAINAGE PLAN (18)

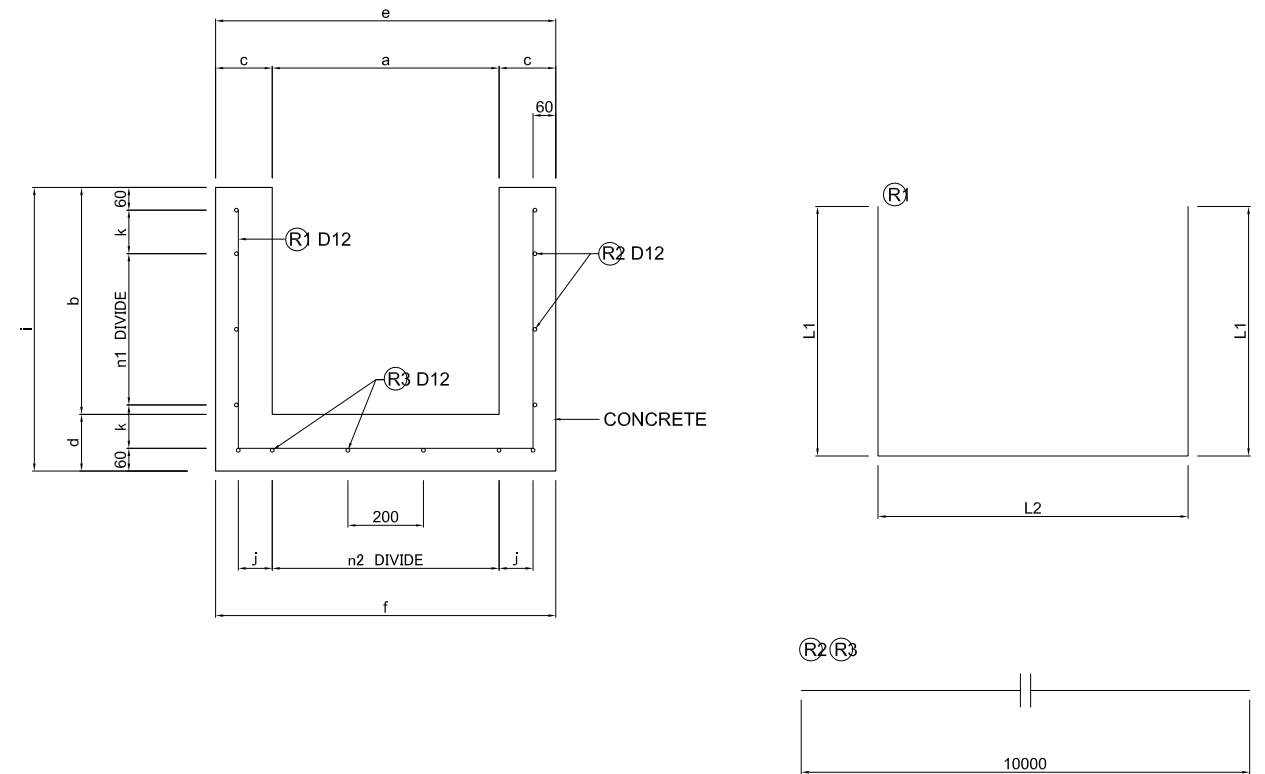
SCALE (A1 size)	DRAWING NO.
1:500	DP-18

SIDE DITCH(1)

U-DITCH U-B×H(F)



U-DITCH U-B×H



DIMENSION TABLE

Type	a	b	c	d	e	f	g	h	i	j	k	REMARKS
U-300×300(F)	300	300	150	150	600	600	700	100	450	110	65	
U-300×500(F)	300	500	150	150	600	600	700	100	650	110	65	
U-400×300(F)	400	300	150	150	700	700	800	100	450	160	65	
U-400×400(F)	400	400	150	150	700	700	800	100	550	160	115	
U-400×500(F)	400	500	150	150	700	700	800	100	650	160	65	
U-500×500(F)	500	500	150	150	800	800	900	100	650	140	65	
U-500×600(F)	500	600	150	150	800	800	900	100	750	140	115	
U-600×500(F)	600	500	150	150	900	900	1000	100	650	190	65	
U-600×600(F)	600	600	150	150	900	900	1000	100	750	190	115	
U-700×700(F)	700	700	150	150	1000	1000	1100	150	850	140	65	
U-800×600(F)	800	600	150	150	1100	1100	1200	150	750	190	115	
U-900×600(F)	900	600	150	150	1200	1200	1300	150	750	140	115	

LIST OF REINFORCEMENT

Type	a	b	n1	n2	L1	L2	R1	R2	R3	REMARKS
U-300×300(F)	300	300	1	1	330	480	50-D12×1140	4-D12×10000	4-D12×10000	ctc.200
U-300×500(F)	300	500	2	1	530	480	50-D12×1540	6-D12×10000	4-D12×10000	ctc.200
U-400×300(F)	400	300	1	1	330	580	50-D12×1240	4-D12×10000	4-D12×10000	ctc.200
U-400×400(F)	400	400	1	1	430	580	50-D12×1440	4-D12×10000	4-D12×10000	ctc.200
U-400×500(F)	400	500	2	1	530	580	50-D12×1640	6-D12×10000	4-D12×10000	ctc.200
U-500×500(F)	500	500	2	2	530	680	50-D12×1740	6-D12×10000	5-D12×10000	ctc.200
U-500×600(F)	500	600	2	2	630	680	50-D12×1940	6-D12×10000	5-D12×10000	ctc.200
U-600×500(F)	600	500	2	2	530	780	50-D12×1840	6-D12×10000	5-D12×10000	ctc.200
U-600×600(F)	600	600	2	2	630	780	50-D12×2040	6-D12×10000	5-D12×10000	ctc.200
U-700×700(F)	700	700	3	3	730	880	50-D12×2340	8-D12×10000	6-D12×10000	ctc.200
U-800×600(F)	800	600	2	3	630	980	50-D12×2240	6-D12×10000	6-D12×10000	ctc.200
U-900×600(F)	900	600	2	4	630	1080	50-D12×2340	6-D12×10000	7-D12×10000	ctc.200

DIMENSION TABLE

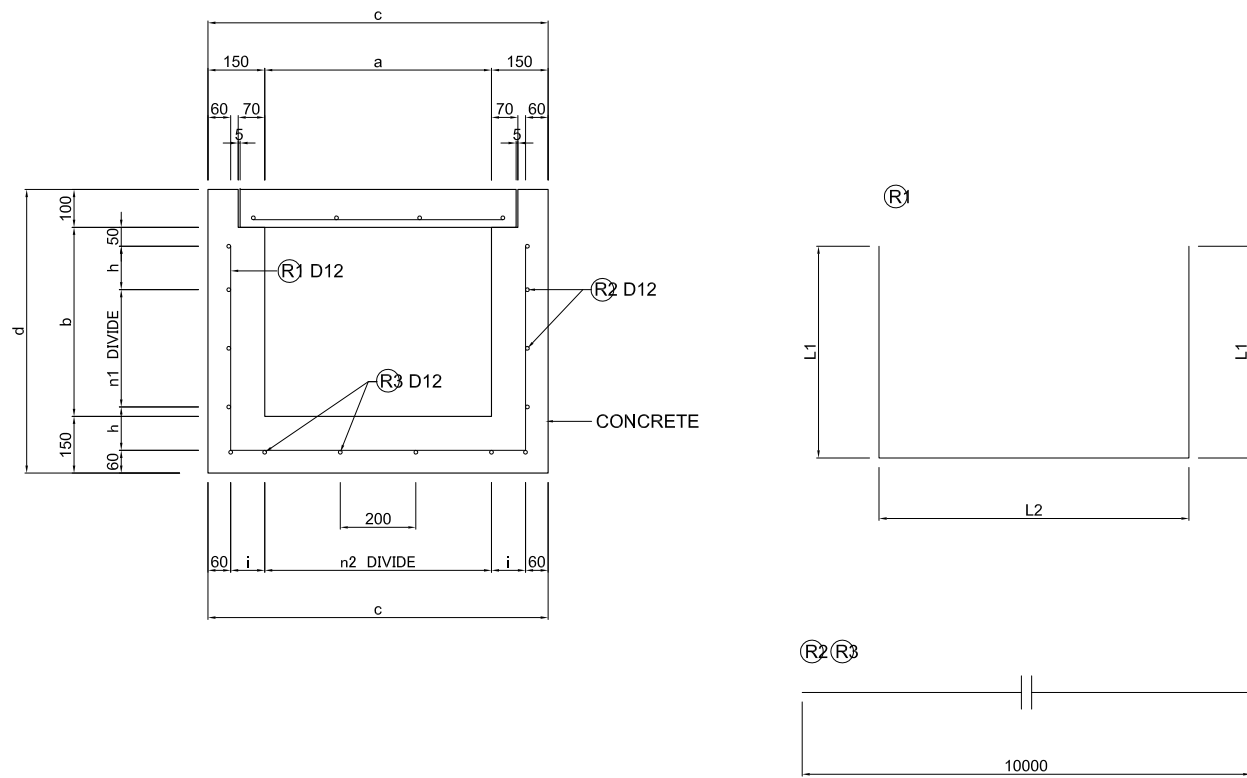
Type	a	b	c	d	e	f	i	j	k	REMARKS
U-600×500	600	500	150	150	900	900	650	190	65	
U-700×500	700	500	150	150	1000	1000	650	140	65	
U-700×600	700	600	150	150	1000	1000	750	140	115	
U-800×600	800	600	150	150	1100	1100	750	190	115	
U-900×900	900	900	150	150	1200	1200	1050	140	65	
U-1000×900	1000	900	150	150	1300	1300	1050	190	65	

LIST OF REINFORCEMENT

Type	a	b	n1	n2	L1	L2	R1	R2	R3	REMARKS
U-600×500	600	500	2	2	530	780	50-D12×1840	6-D12×10000	5-D12×10000	ctc.200
U-700×500	700	500	2	3	530	880	50-D12×1940	6-D12×10000	6-D12×10000	ctc.200
U-700×600	700	600	2	3	630	880	50-D12×2140	6-D12×10000	6-D12×10000	ctc.200
U-800×600	800	600	2	3	630	980	50-D12×2240	6-D12×10000	6-D12×10000	ctc.200
U-900×900	900	900	4	4	930	1080	50-D12×2940	10-D12×10000	7-D12×10000	ctc.200
U-1000×900	1000	900	4	4	930	1180	50-D12×3040	10-D12×10000	7-D12×10000	ctc.200

SIDE DITCH(2)

U-DITCH U-B×H(CV)



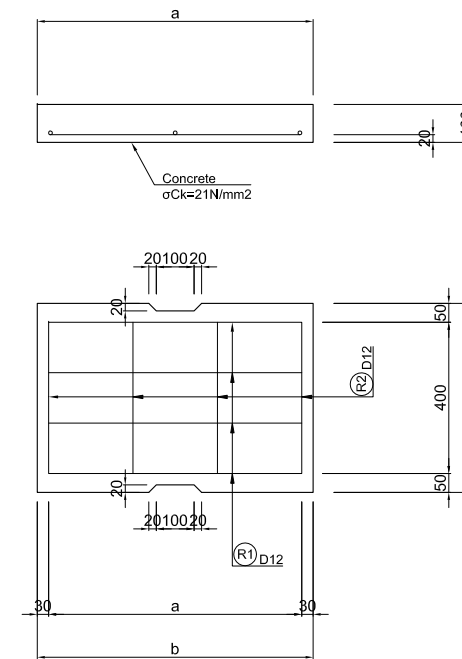
DIMENSION TABLE (mm)

Type	a	b	c	d	h	i	REMARKS
U-600×400(CV)	600	400	900	650	120	190	
U-700×500(CV)	700	500	1000	750	170	140	

LIST OF REINFORCEMENT (mm) (PER 10.0m)

Type	a	b	n1	n2	L1	L2	R1	R2	R3	REMARKS
U-600×400(CV)	600	400	1	2	440	780	50-D12×1660	3-D12×10000	5-D12×10000	R1 ctc.200
U-700×500(CV)	700	500	1	3	540	880	50-D12×1960	3-D12×10000	6-D12×10000	ctc.200

COVER



DIMENSION TABLE (mm)

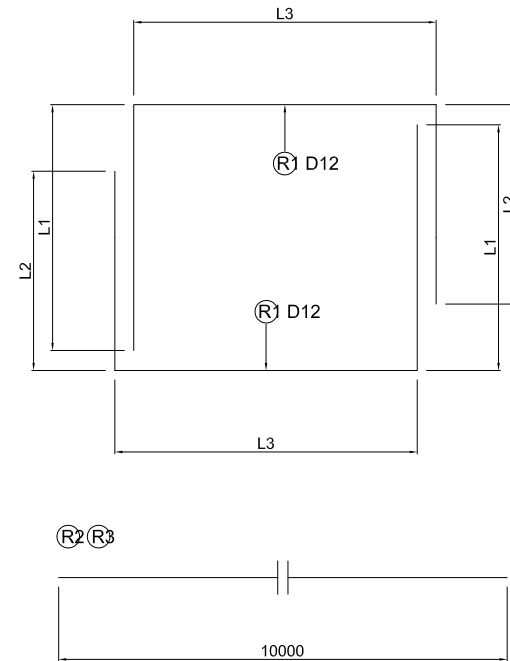
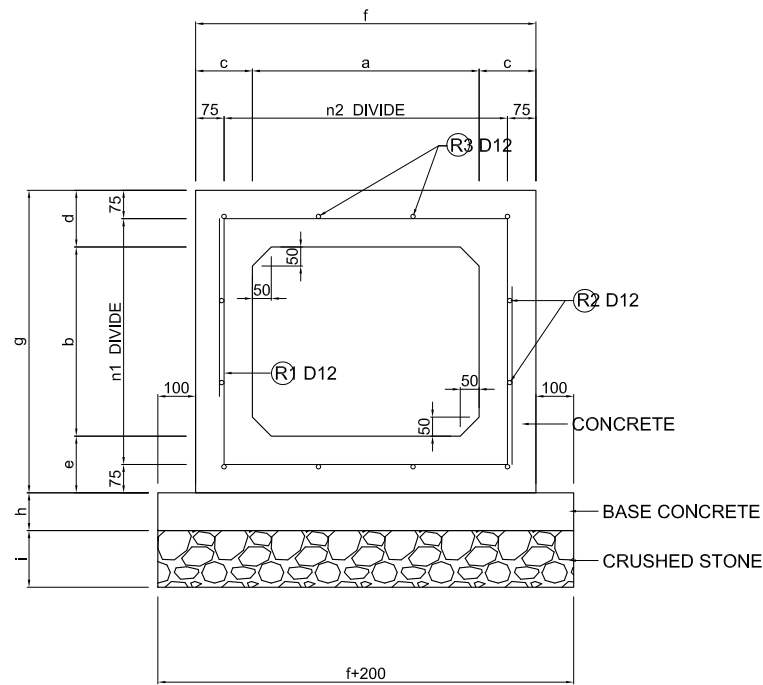
Type	a	b	REMARKS
U-600×400(CV)	670	730	
U-700×500(CV)	770	830	

LIST OF REINFORCEMENT (mm) (PER 10.0m)

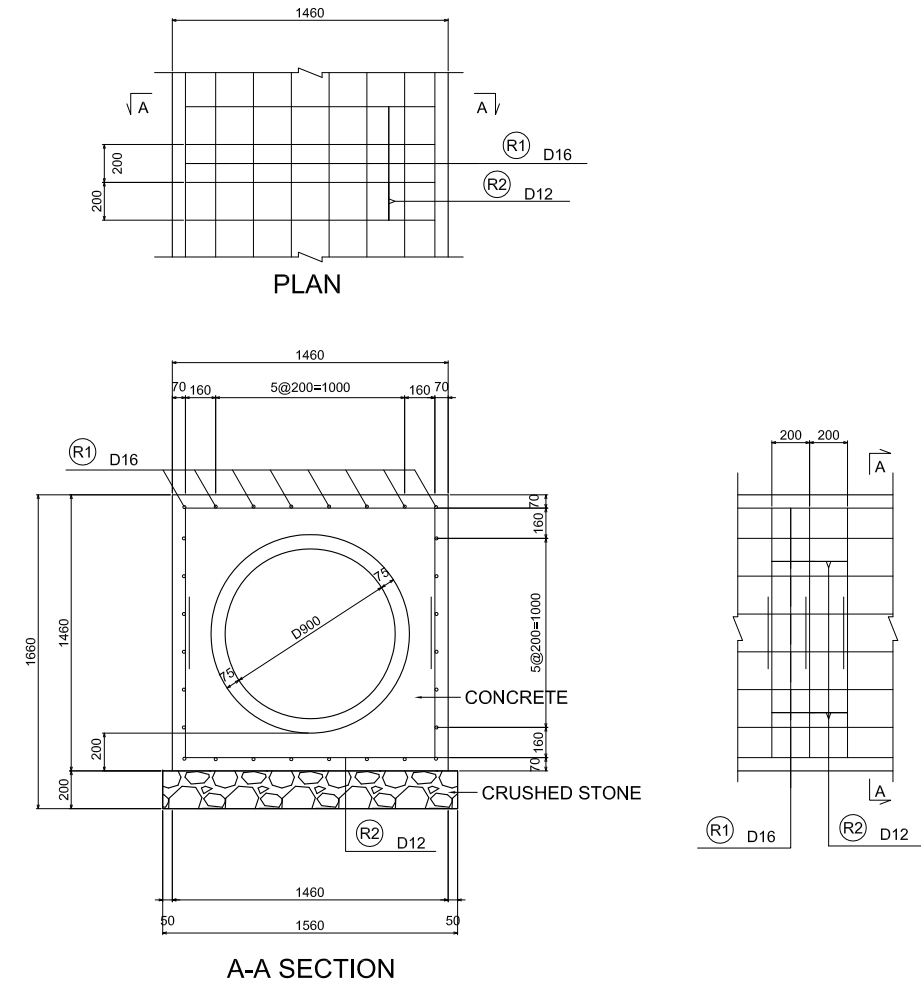
Type	R1	R2	REMARKS
U-600×400(CV)	80-D12×670	80-D12×400	ctc.200
U-700×500(CV)	80-D12×770	80-D12×400	ctc.200

CROSS DRAINAGE (1)

BOX-B×H S=1/10



R.C.-PIPE D900 S=1/20



LIST OF REINFORCEMENT

Type	R1 (PER 1.0m)				R2 (PER 1.0m)				TOTAL(kg)	
	SIZE	QTY.	UNIT WEIGHT(kg/m)	TOTAL WEIGHT(kg)	SIZE	QTY.	LENGTH(mm)	UNIT WEIGHT(kg/m)		TOTAL WEIGHT(kg)
R.C.-PIPE D900	D16	28	1.56	43.680	D12	10	3110	0.888	27.617	71.297

DIMENSION TABLE (mm)

Type	a	b	c	d	e	f	g	h	i	REMARKS
BOX 300×300	300	300	150	150	150	600	600	100	150	
BOX 400×300	400	300	150	150	150	700	600	100	150	
BOX 500×300	500	300	150	150	150	800	600	100	150	
BOX 600×400	600	400	150	150	150	900	700	100	150	
BOX 600×500	600	500	150	150	150	900	800	100	150	
BOX 700×500	700	500	150	150	150	1000	800	100	150	
BOX 800×600	800	600	150	150	150	1100	900	100	150	

LIST OF REINFORCEMENT (mm)

Type	a	b	n1	n2	L1	L2	L3	R1	R2	R3	REMARKS
BOX 300×300	300	300	1	1	450	450	450	50-D12×1350×2	4-D12×10000	8-D12×10000	R1 ctc.200
BOX 400×300	400	300	1	1	450	450	550	50-D12×1450×2	4-D12×10000	8-D12×10000	ctc.200
BOX 500×300	500	300	1	2	450	450	650	50-D12×1550×2	4-D12×10000	10-D12×10000	ctc.200
BOX 600×400	600	400	1	2	550	550	750	50-D12×1850×2	4-D12×10000	10-D12×10000	ctc.200
BOX 600×500	600	500	2	2	650	650	750	50-D12×2050×2	6-D12×10000	10-D12×10000	ctc.200
BOX 700×500	700	500	2	3	650	650	850	50-D12×2150×2	6-D12×10000	12-D12×10000	ctc.200
BOX 800×600	800	600	2	3	750	709	950	50-D12×2410×2	6-D12×10000	12-D12×10000	ctc.200

GHANA HIGHWAY AUTHORITY
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DRAWING TITLE:

CROSS DRAINAGE (1)

SCALE:(A1size)

1/10
1/20

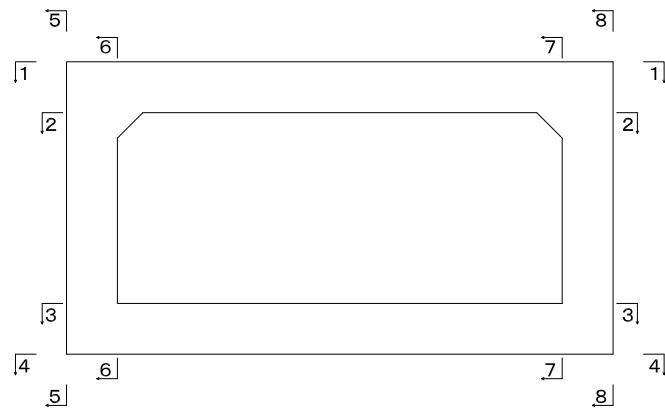
DRAWING NO.

DR-03

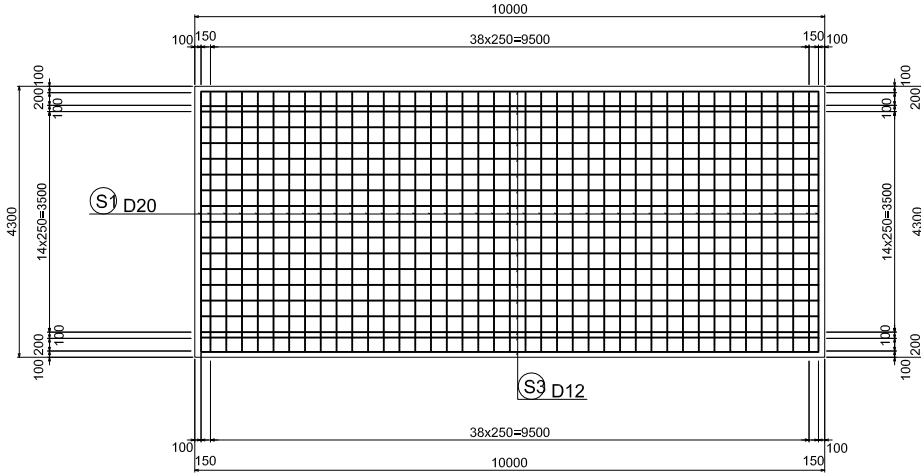
CROSS DRAINAGE (3) BOX 3500×1500

S=/60

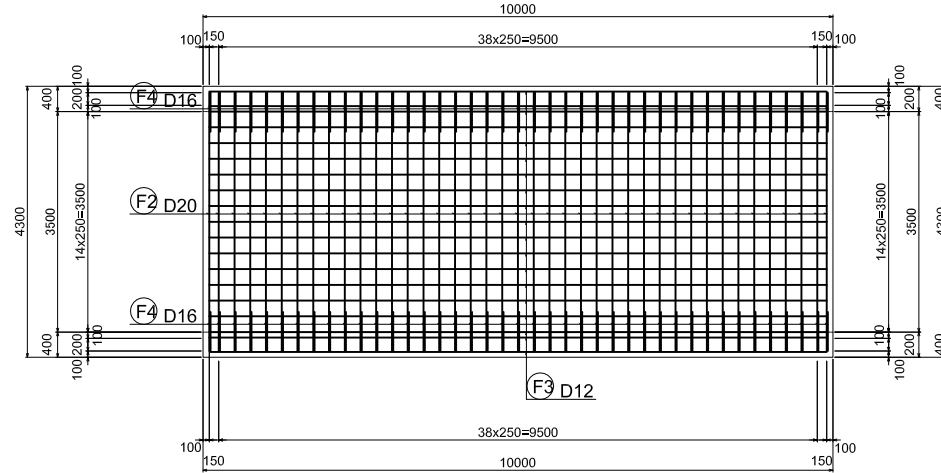
位置図



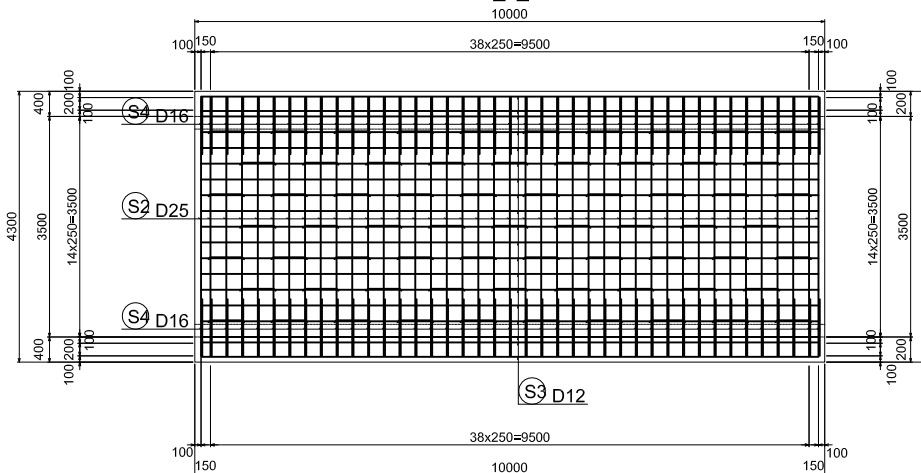
頂版上面図
1-1



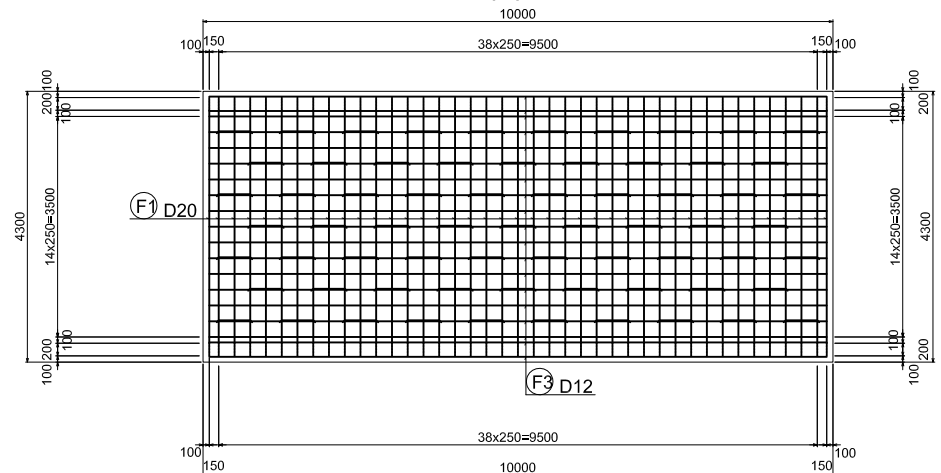
底板上面図
3-3



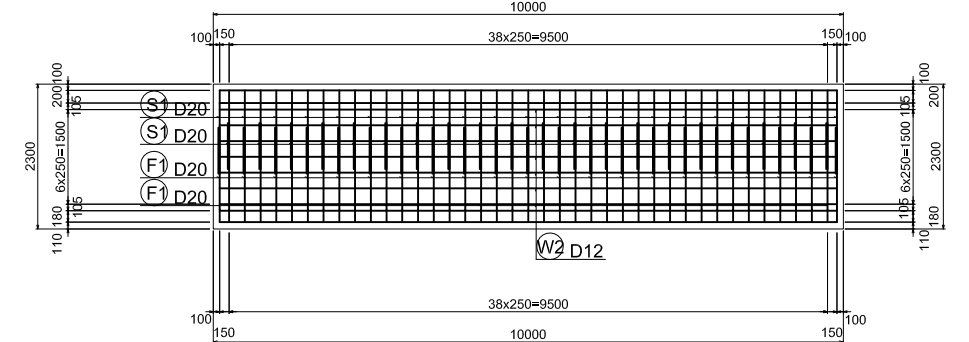
頂版下面図
2-2



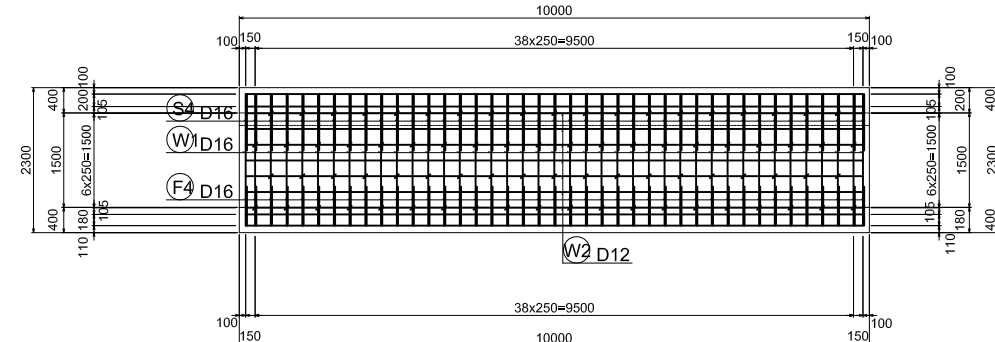
底板下面図
4-4



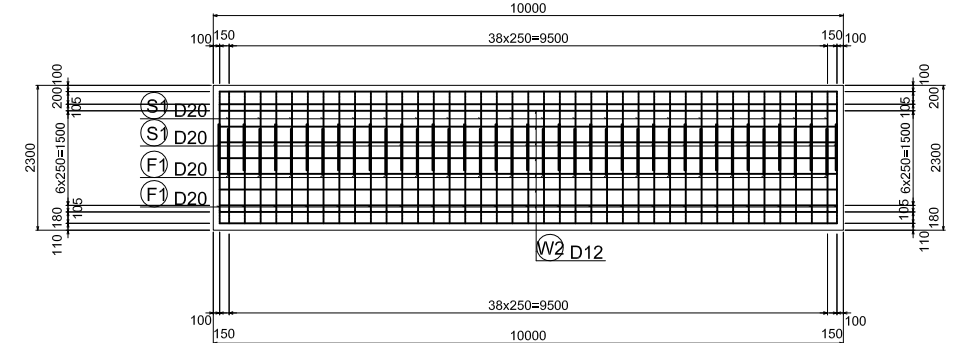
左側壁外面図
5-5



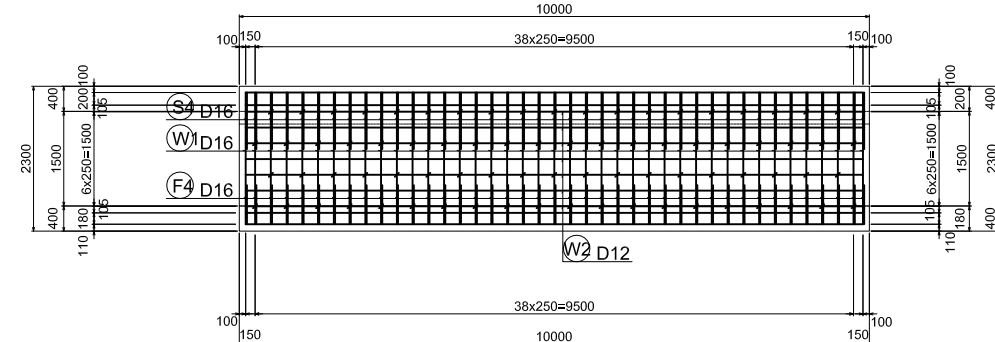
左側壁内面図
6-6



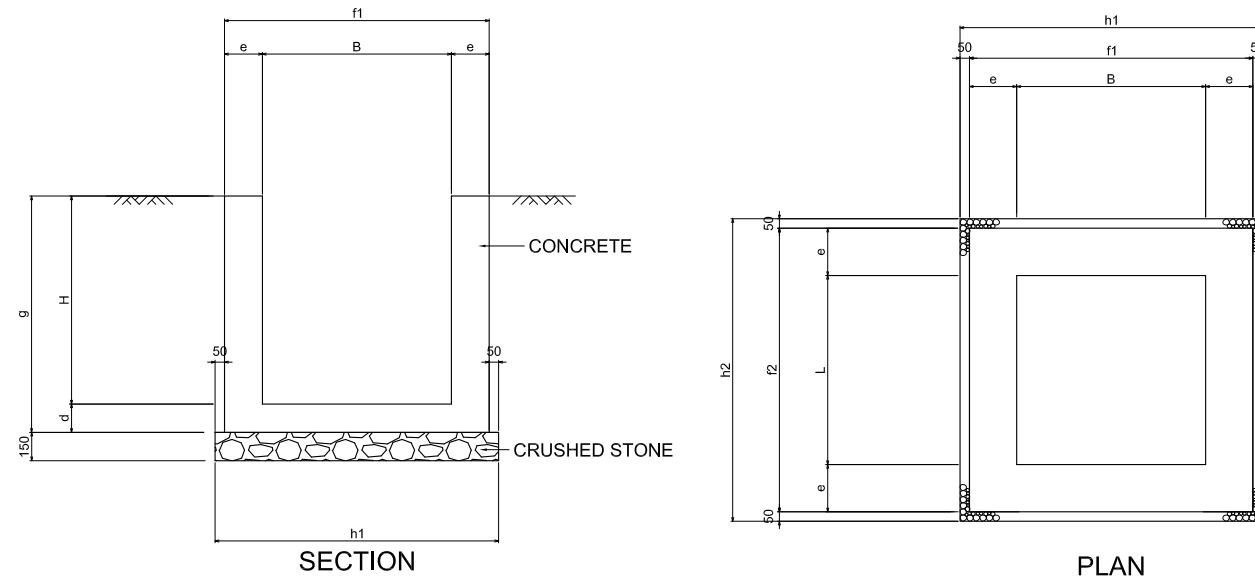
右側壁外面図
8-8



右側壁内面図
7-7



CATCH BASIN

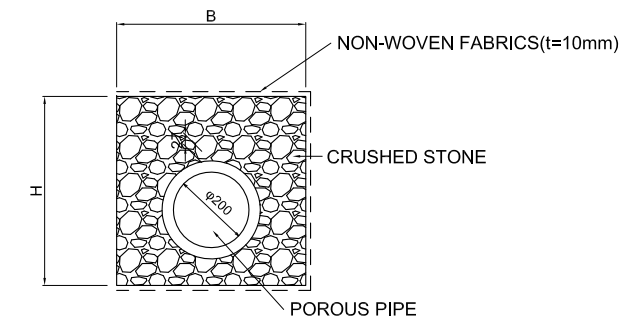


DIMENSION TABLE (mm)

Type	B	L	H	d	e	f1	f2	g	h1	h2	REMARKS
500×500×500	500	500	500	150	150	800	800	650	900	900	
500×500×700	500	500	700	150	150	800	800	850	900	900	
600×600×700	600	600	700	150	150	900	900	850	1000	1000	
700×700×700	700	700	700	150	150	1000	1000	850	1100	1100	
700×700×800	700	700	800	150	150	1000	1000	950	1100	1100	
800×800×700	800	800	700	150	150	1100	1100	850	1200	1200	
800×800×800	800	800	800	150	150	1100	1100	950	1200	1200	
800×800×1000	800	800	1000	150	150	1100	1100	1150	1200	1200	
900×900×700	900	900	700	150	150	1200	1200	850	1300	1300	
900×900×800	900	900	800	150	150	1200	1200	950	1300	1300	
900×900×900	900	900	900	150	150	1200	1200	1050	1300	1300	
1000×1000×800	1000	1000	800	150	150	1300	1300	950	1400	1400	
1000×1000×1000	1000	1000	1000	150	150	1300	1300	1150	1400	1400	
1000×1000×1100	1000	1000	1100	150	200	1300	1300	1250	1400	1400	
1000×1500×1300	1000	1500	1300	150	200	1300	1800	1450	1400	1900	
1100×1100×800	1100	1100	800	150	150	1400	1400	950	1500	1500	
1100×1100×1100	1100	1100	1100	150	200	1400	1400	1250	1500	1500	
1200×1200×1100	1200	1200	1100	150	200	1500	1500	1250	1600	1600	

UNDER GROUND DRAINAGE

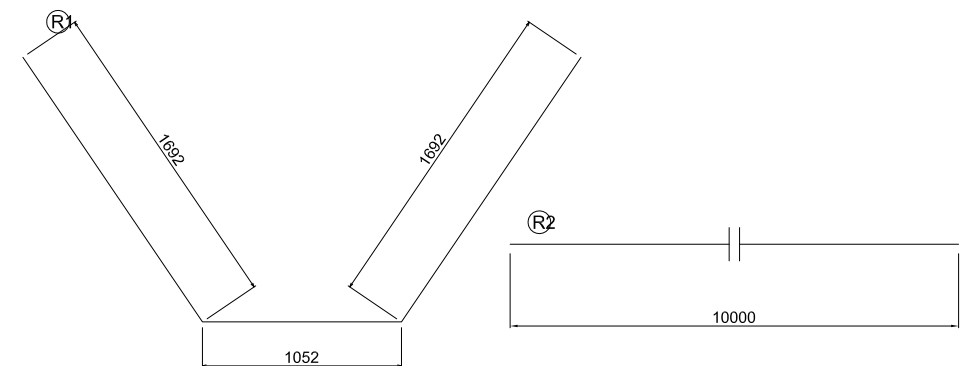
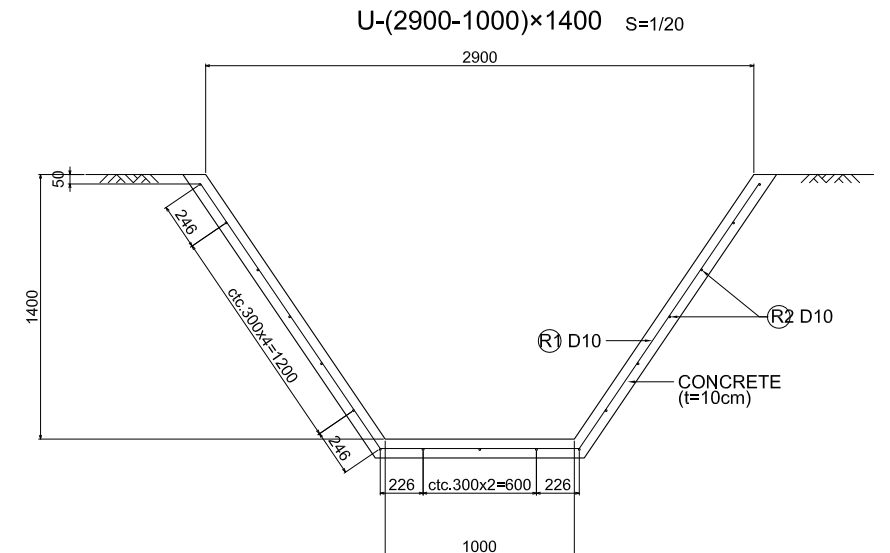
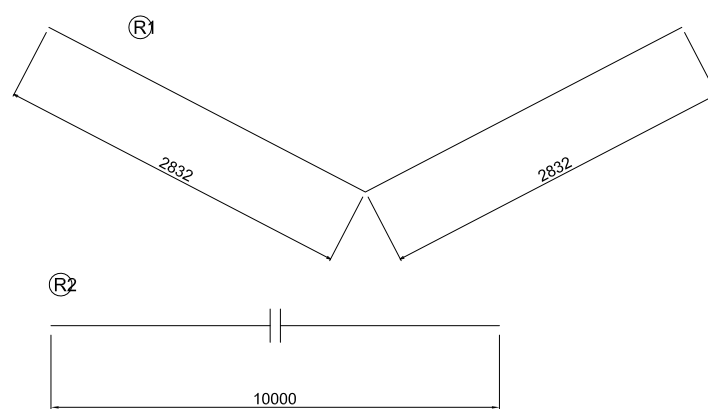
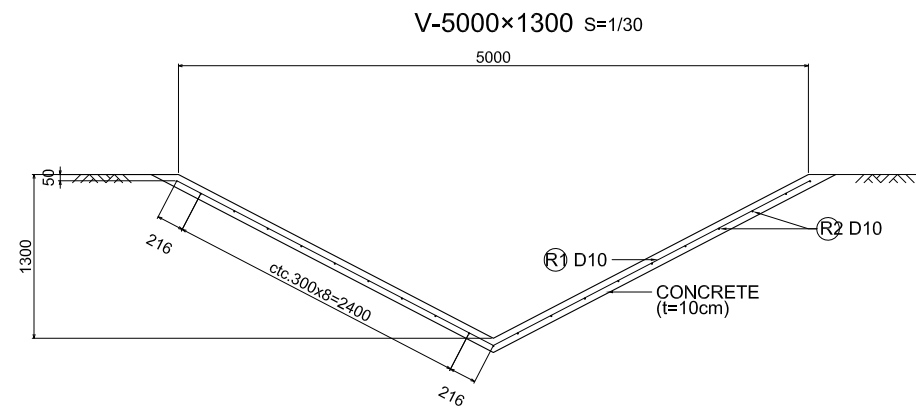
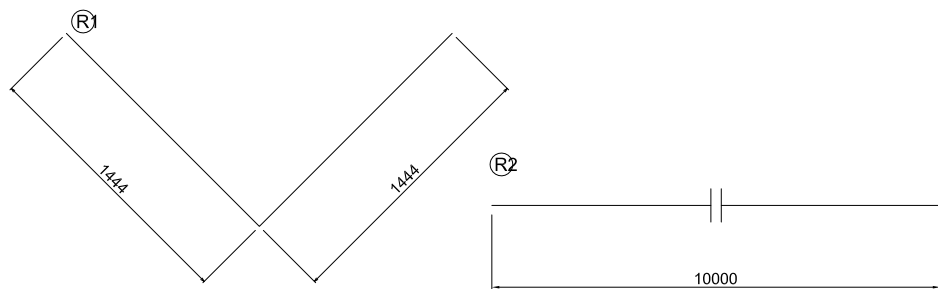
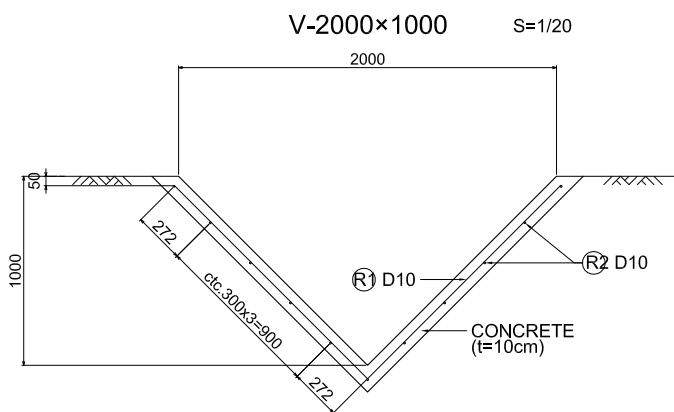
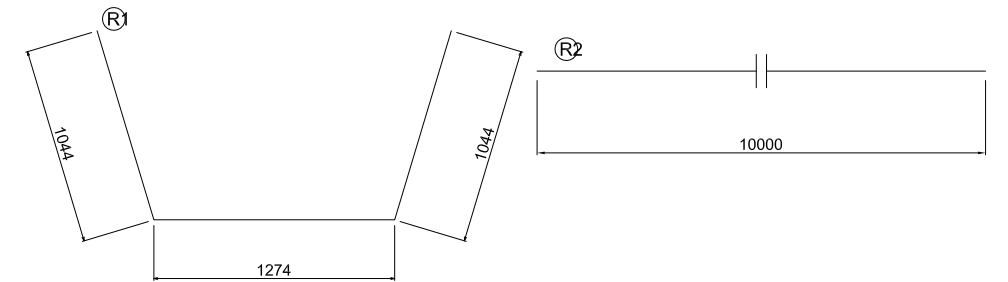
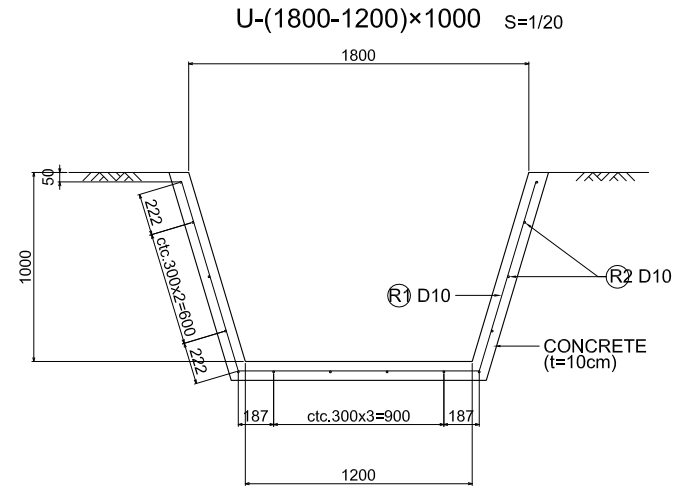
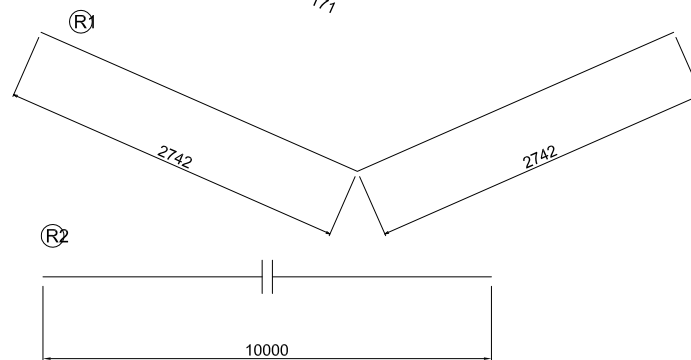
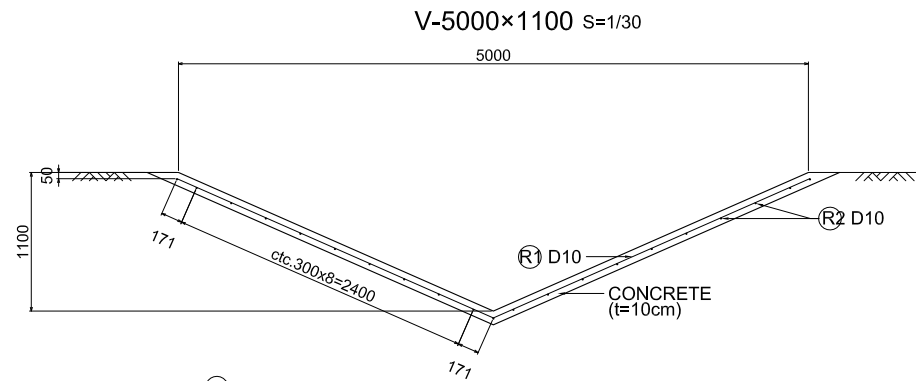
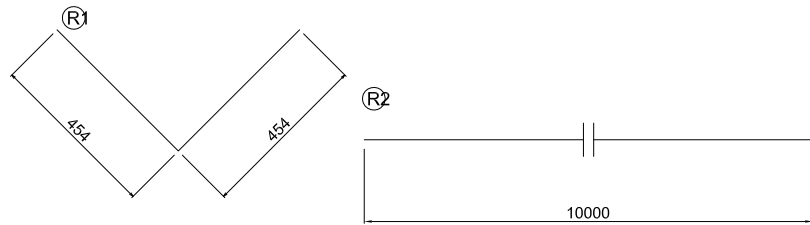
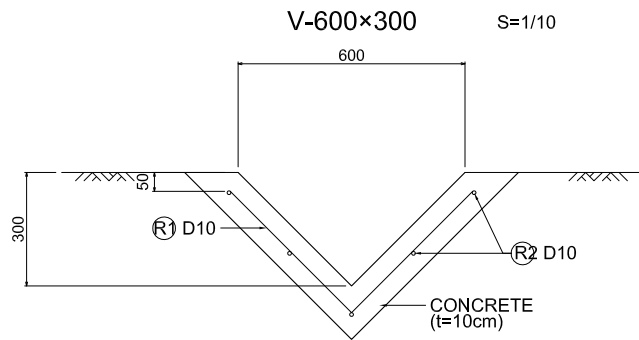
DU-φ200-B×H



DIMENSION TABLE (mm)

Type	B	H	REMARKS
DU-φ200-500×500	500	500	
DU-φ200-900×425	900	425	
DU-φ200-900×500	900	500	
DU-φ200-1000×440	1000	440	
DU-φ200-1000×500	1000	500	
DU-φ200-1100×425	1100	425	
DU-φ200-1200×500	1200	500	
DU-φ200-1300×500	1300	500	

DISTRIBUTION WATERWAY



LIST OF REINFORCEMENT (PER 10.0m)			
Type	R1	R2	REMARKS
V-600x300	33-D10x 910	5-D10x10000	R1 ctc.300
V-2000x1000	33-D10x2890	11-D10x10000	R1 ctc.300
V-5000x1100	33-D10x5490	21-D10x10000	R1 ctc.300
V-5000x1300	33-D10x5670	21-D10x10000	R1 ctc.300
U-(1800-1200)x1000	33-D10x3370	14-D10x10000	R1 ctc.300
U-(2900-1000)x1400	33-D10x4440	17-D10x10000	R1 ctc.300

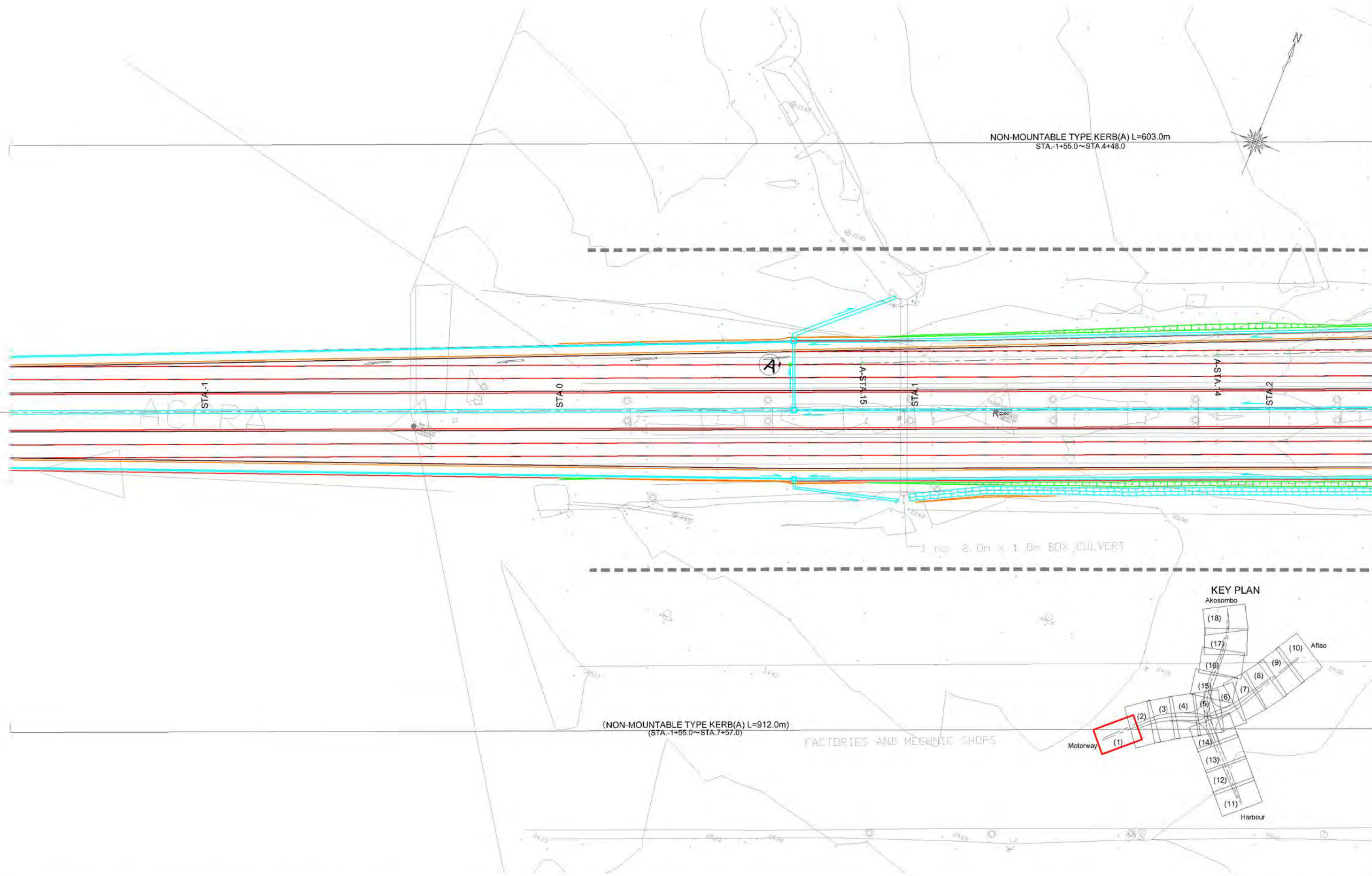
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
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DRAWING TITLE:
DISTRIBUTION WATERWAY

SCALE:(A1size)	DRAWING NO.
1/10 1/20 1/30	DR-07



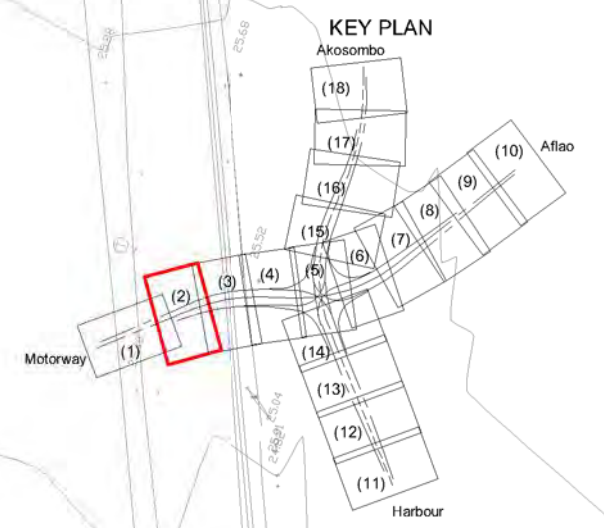
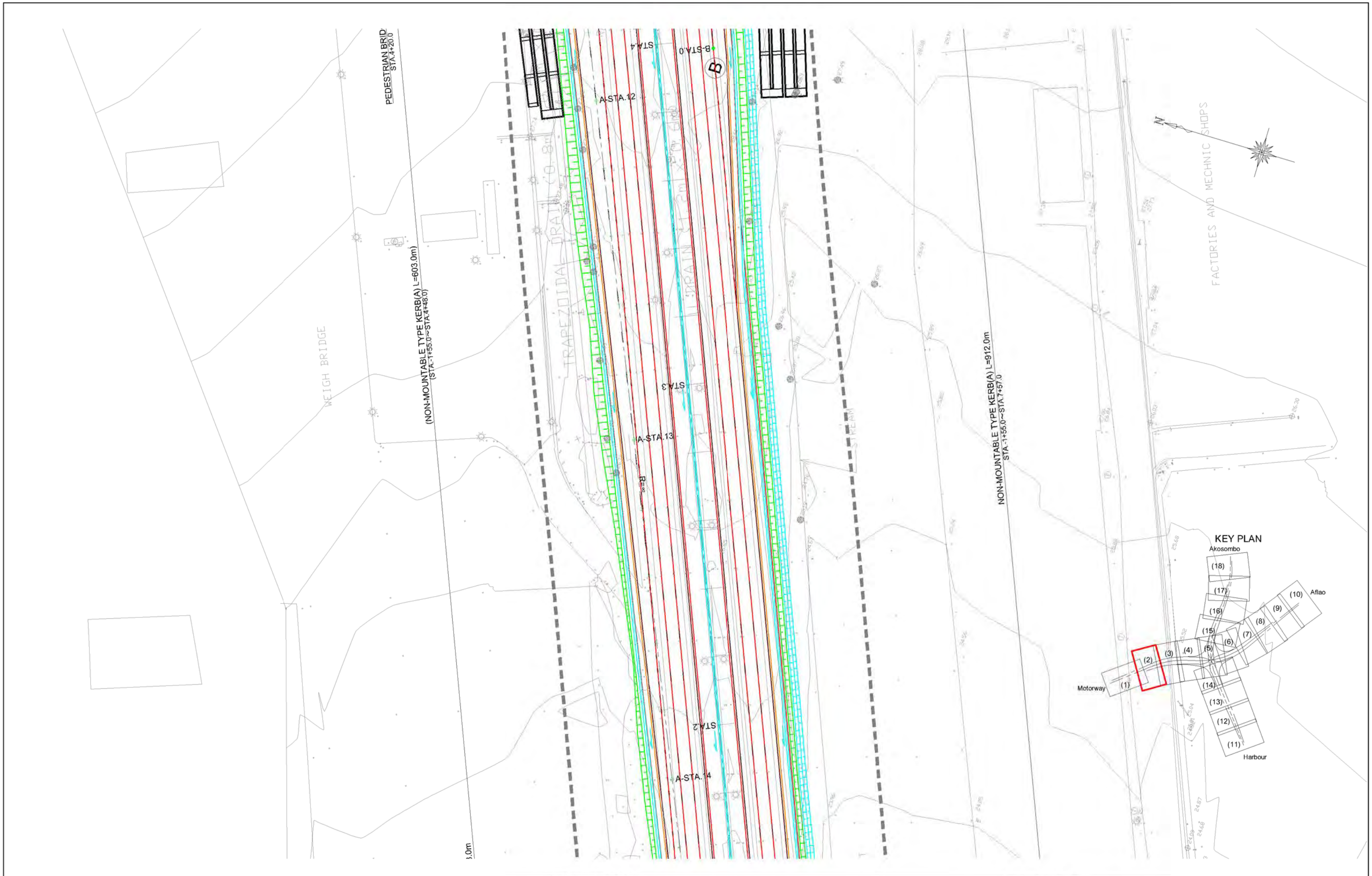
GHANA HIGHWAY AUTHORITY
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PROJECT TITLE:
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DRAWING TITLE:
ANCILLARY PLAN (1)

SCALE (A1size)	DRAWING NO.
1:500	RA-01



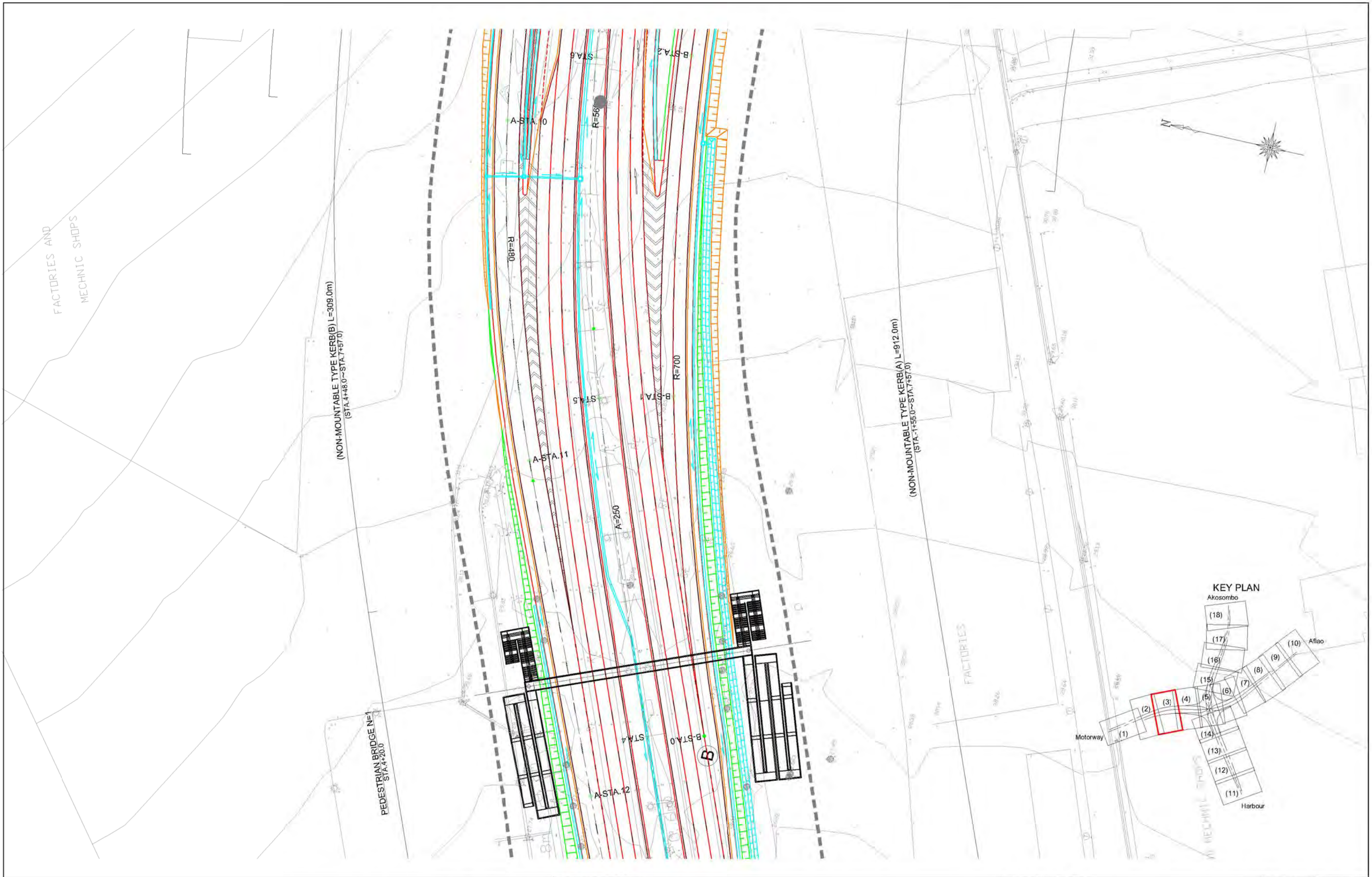
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DRAWING TITLE:
ANCILLARY PLAN (2)

SCALE:(A1size)	DRAWING NO.
1:500	RA-02



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DRAWING TITLE:
ANCILLARY PLAN (3)

SCALE (A1size)	DRAWING NO.
1:500	RA-03



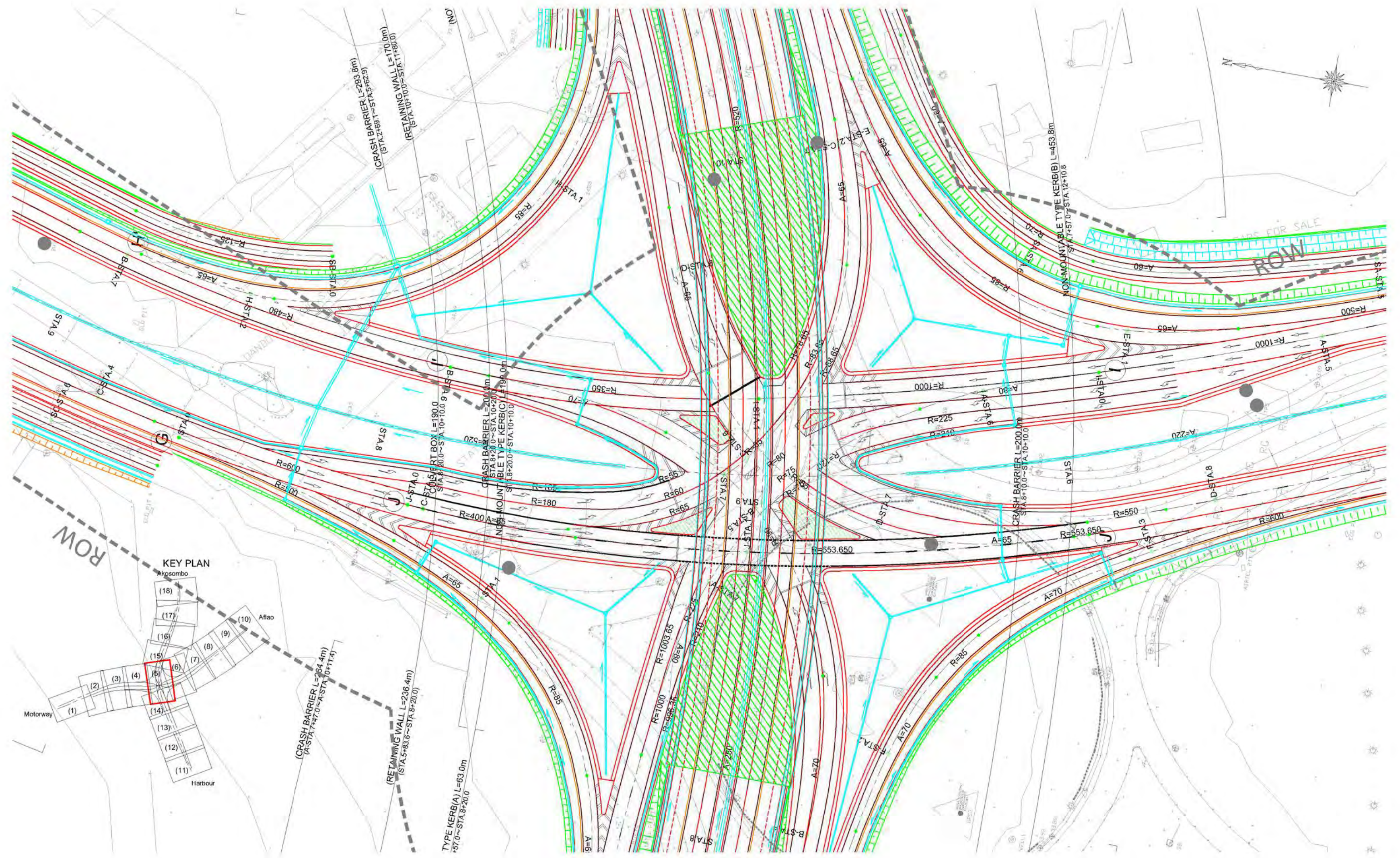
GHANA HIGHWAY AUTHORITY
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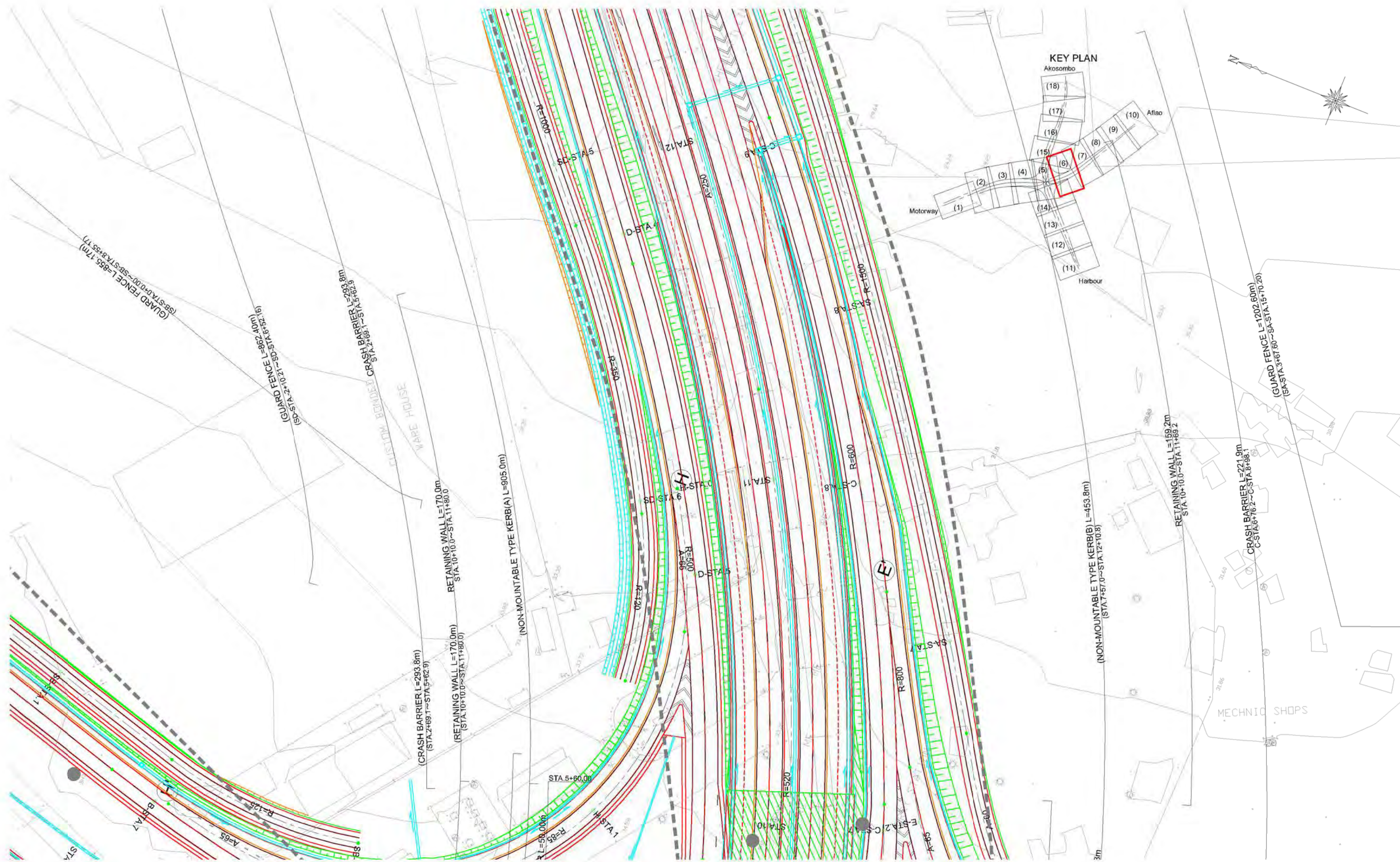
CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (4)

SCALE (A1 size)	DRAWING NO.
1:500	RA-04







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DRAWING TITLE:
ANCILLARY PLAN (7)

SCALE (A1 size)	DRAWING NO.
1:500	RA-07



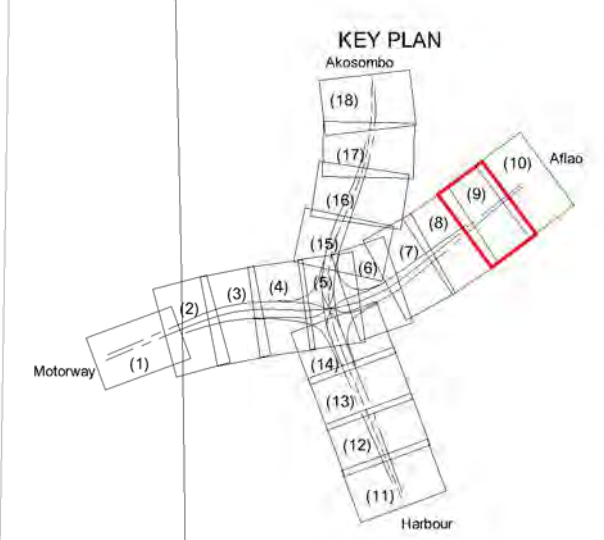
GHANA HIGHWAY AUTHORITY
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PROJECT TITLE:
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DRAWING TITLE:
ANCILLARY PLAN (8)

SCALE (A1 size)	DRAWING NO.
1:500	RA-08



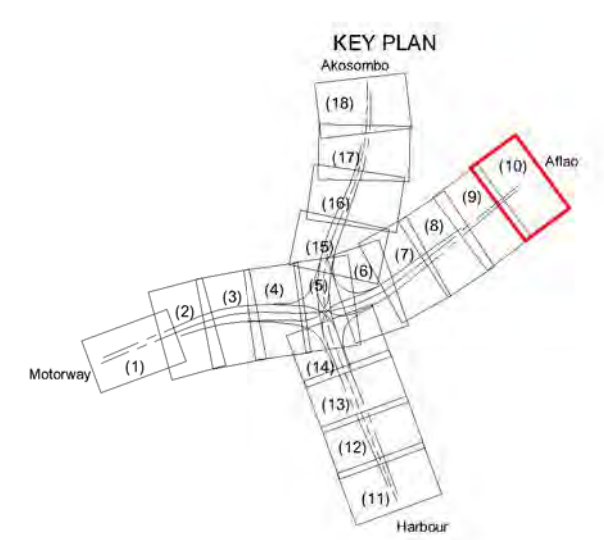
GHANA HIGHWAY AUTHORITY
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 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

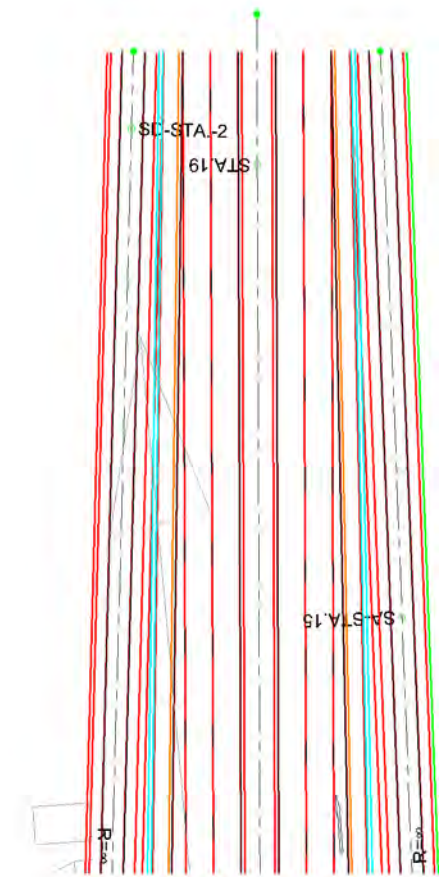
DRAWING TITLE:
ANCILLARY PLAN (9)

SCALE (A1size)	DRAWING NO.
1:500	RA-09



(GUARD FENCE L=862.40m)
(SD-STA: 2+10.21~SD-STA: 6+52.16)

(NON-MOUNTABLE TYPE KERB(A) L=905.0m)
(STA: 10+10.0~STA: 19+15.0)



(NON-MOUNTABLE TYPE KERB(A) L=704.2m)
(STA: 12+10.8~STA: 19+15.0)

(GUARD FENCE L=1202.60m)
(SA-STA: 3+67.60~SA-STA: 15+70.20)

GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (10)

SCALE (A1size)	DRAWING NO.
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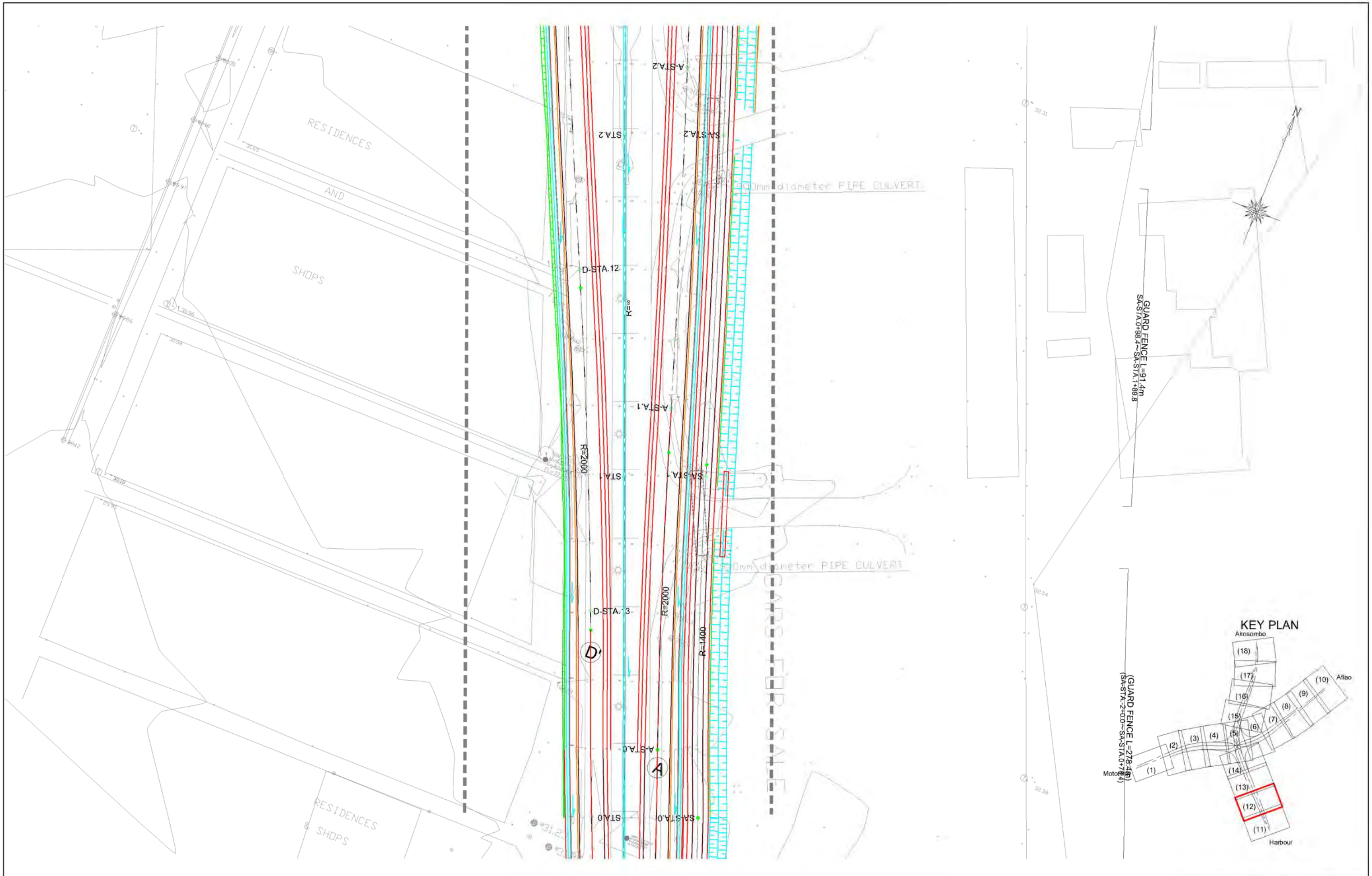
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (11)

SCALE(A1size)	DRAWING NO.
1:500	RA-11



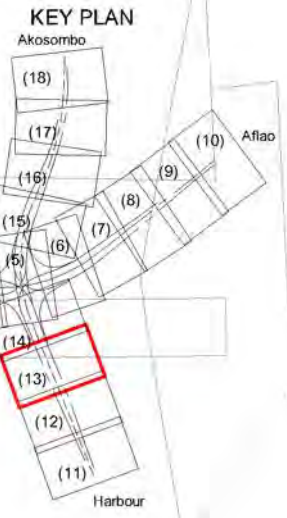
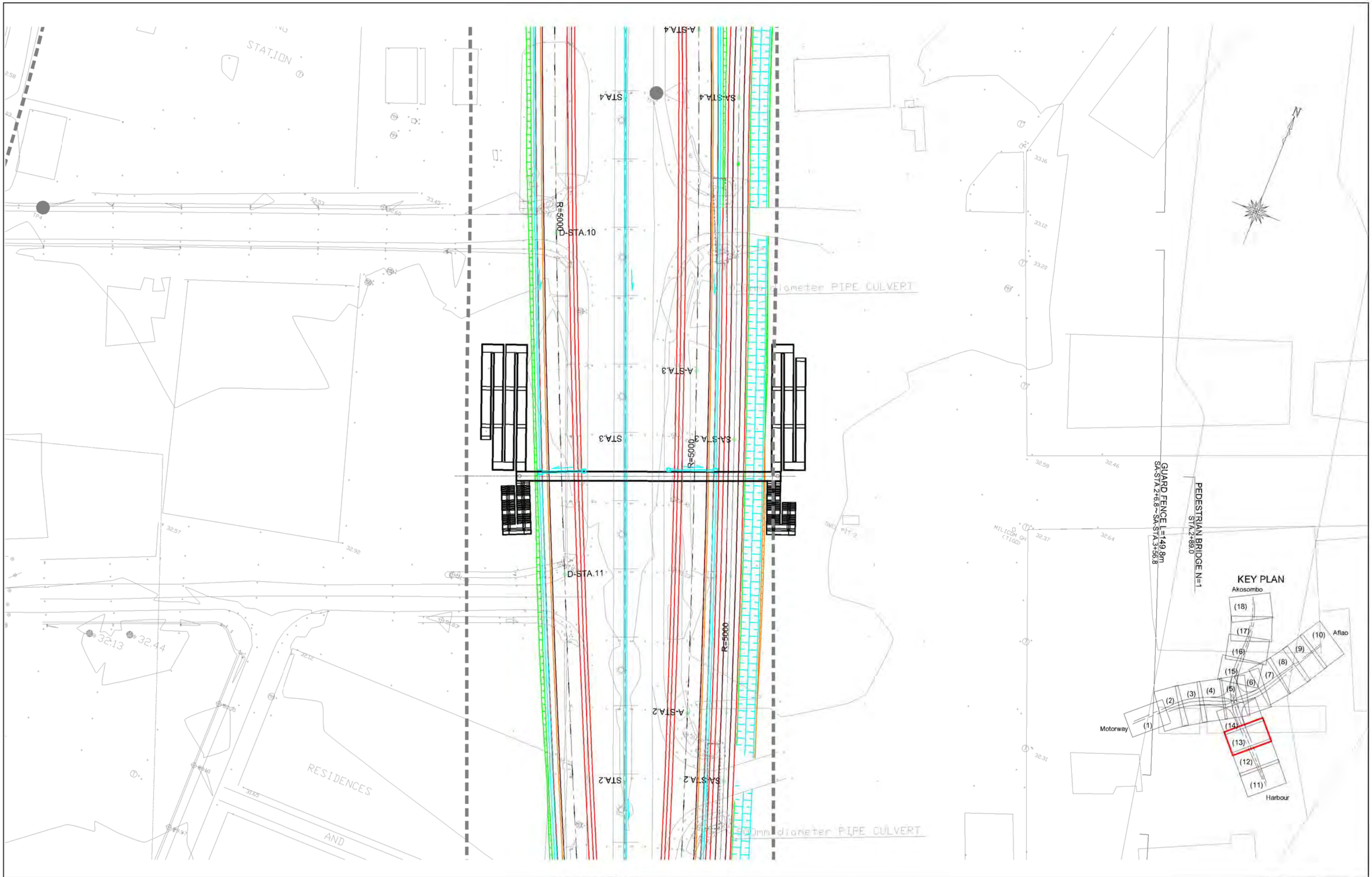
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
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DRAWING TITLE:
ANCILLARY PLAN (12)

SCALE (A1size)	DRAWING NO.
1:500	RA-12



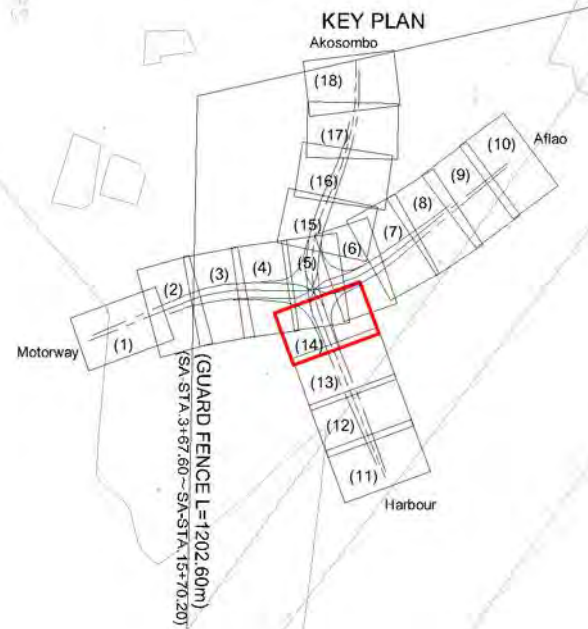
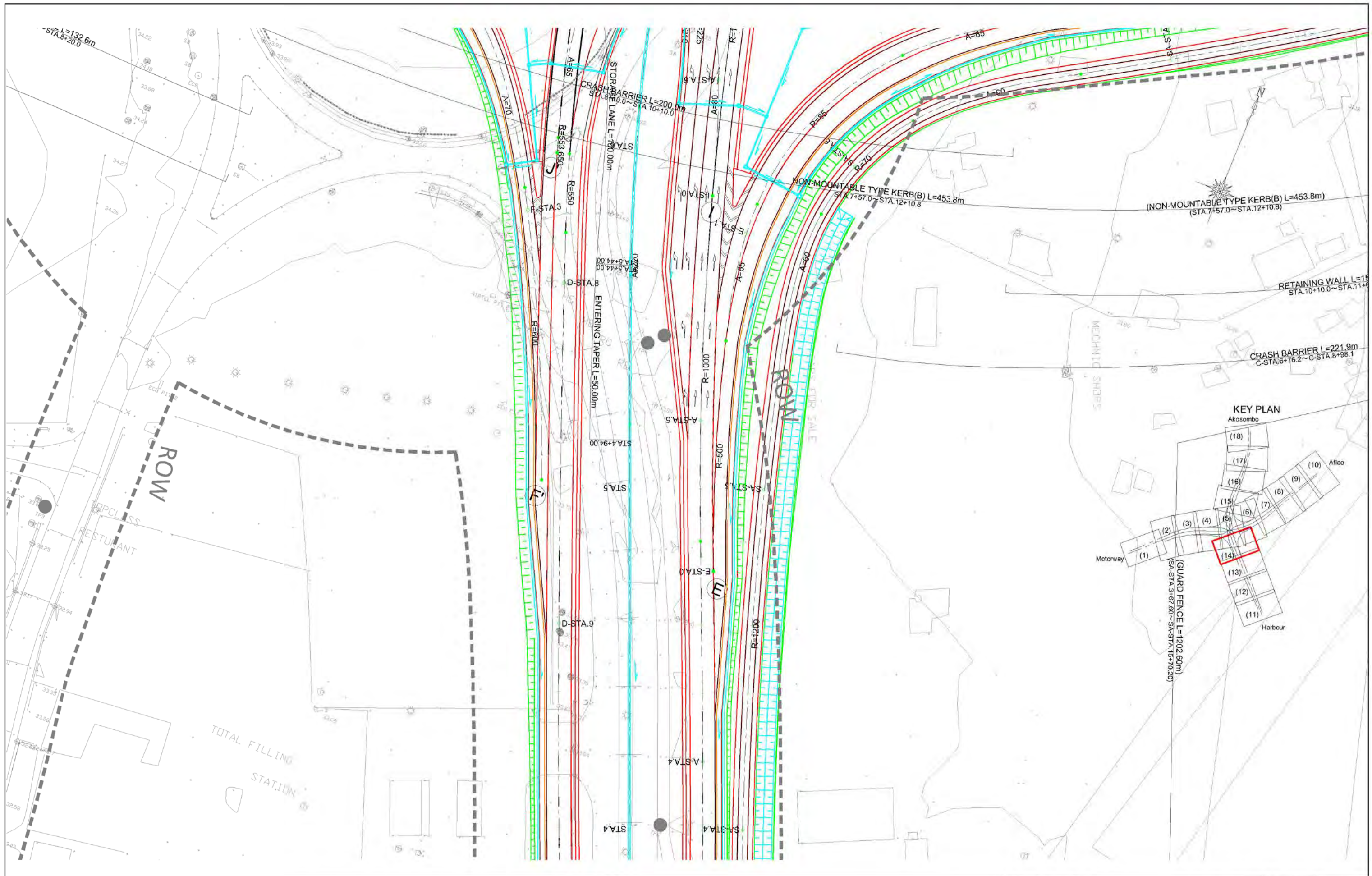
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (13)

SCALE (A1size)	DRAWING NO.
1:500	RA-13



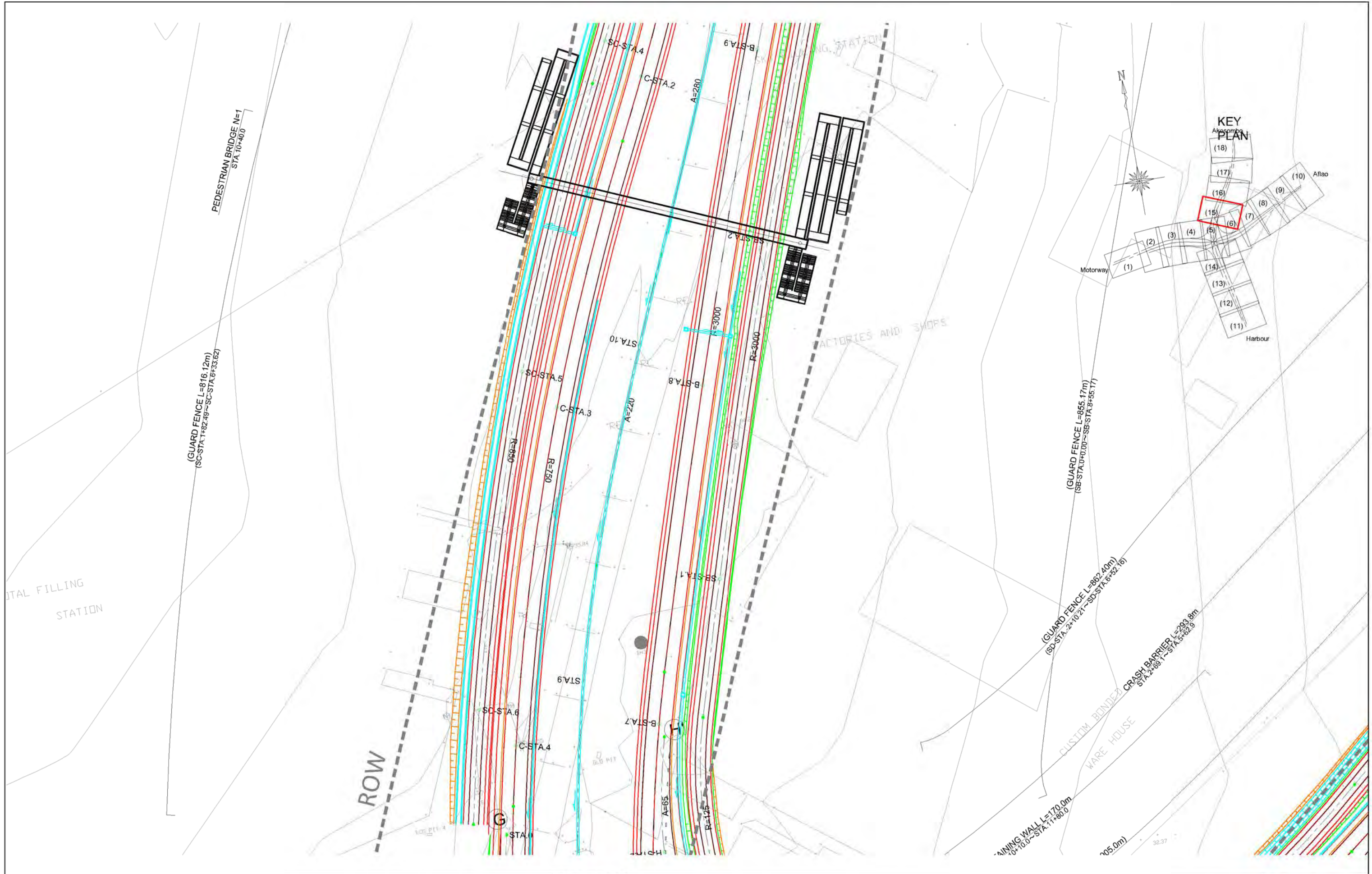
GHANA HIGHWAY AUTHORITY
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (14)

SCALE (A1size)	DRAWING NO.
1:500	RA-14



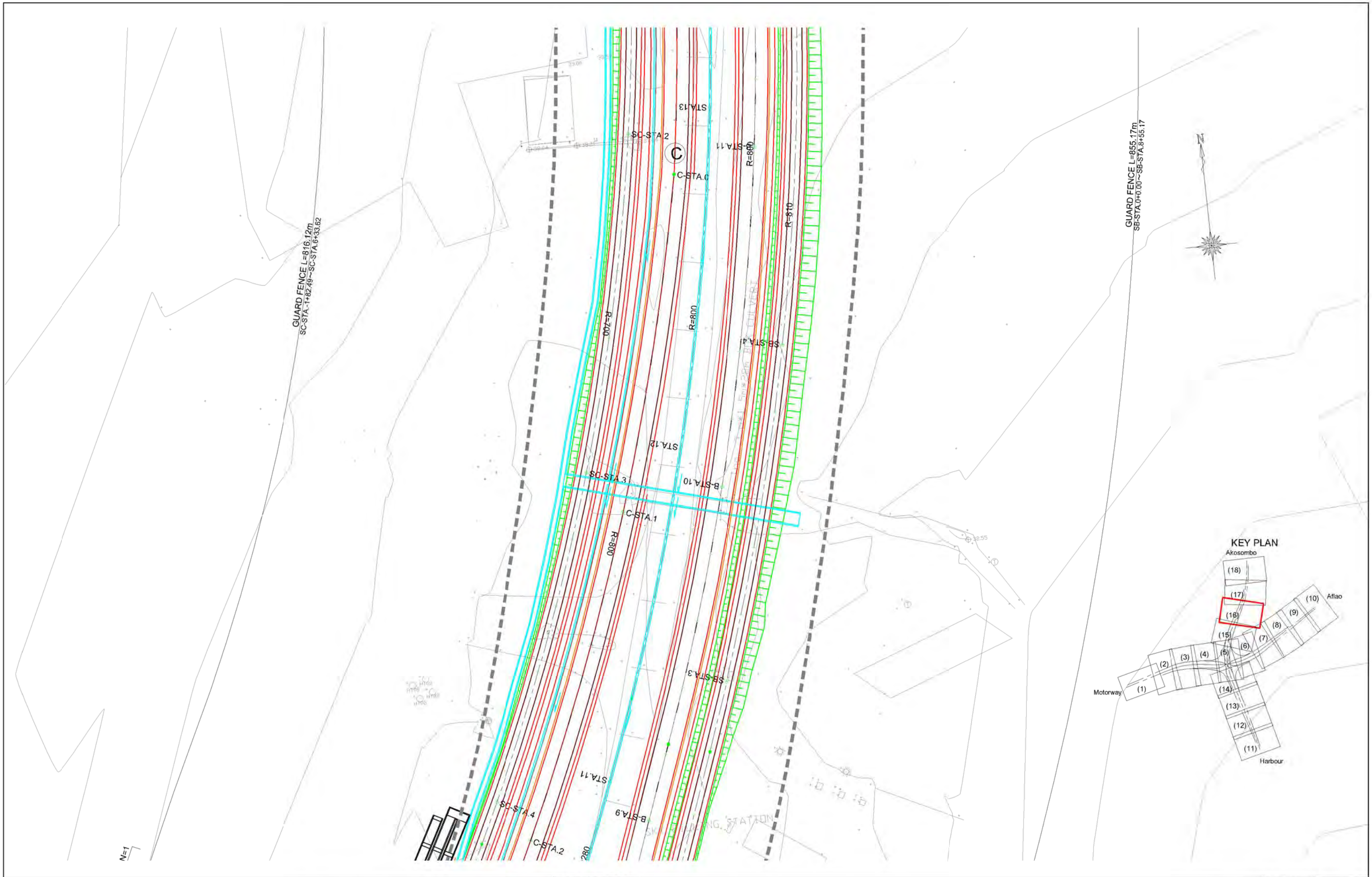
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
 REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (15)

SCALE (A1size)	DRAWING NO.
1:500	RA-15



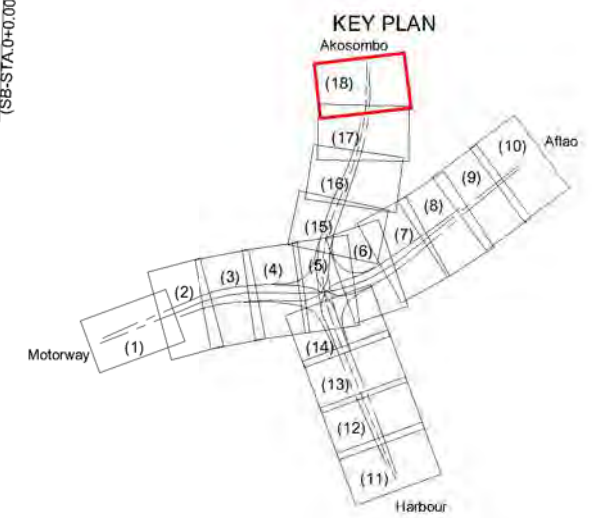
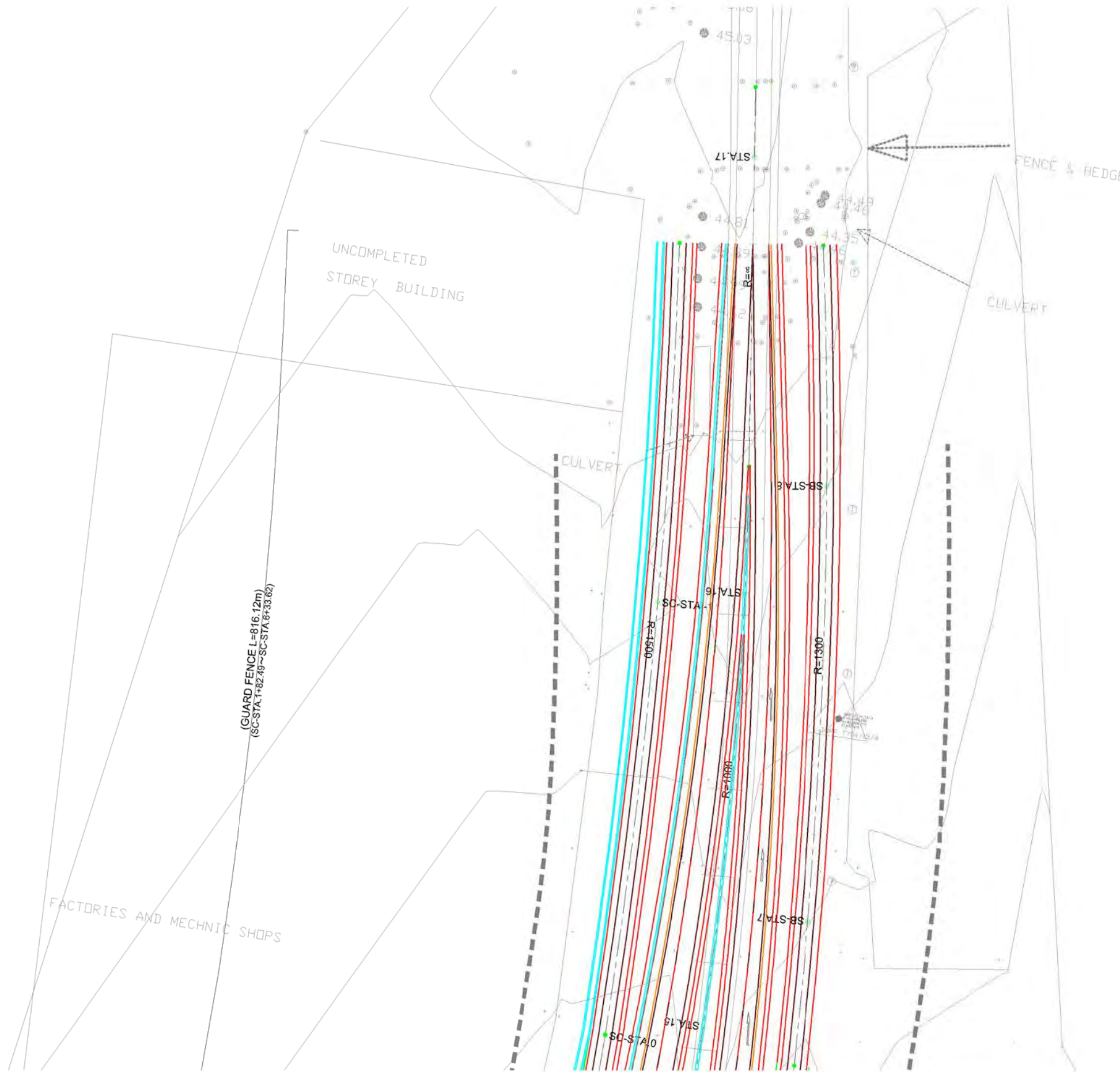
GHANA HIGHWAY AUTHORITY
 MINISTRY OF ROADS AND HIGHWAYS
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
ANCILLARY PLAN (16)

SCALE (A1size)	DRAWING NO.
1:500	RA-16



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

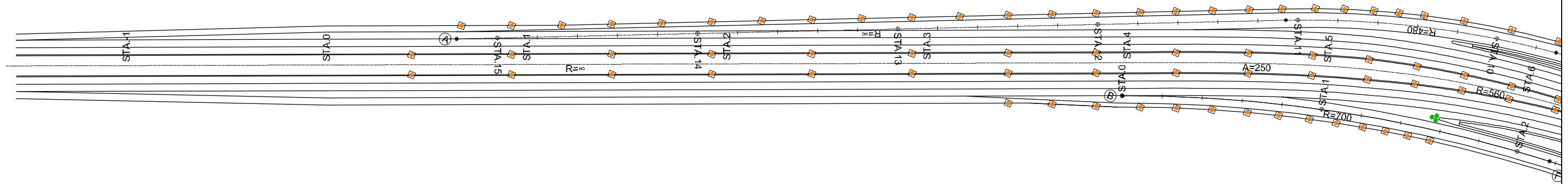
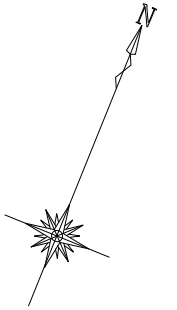
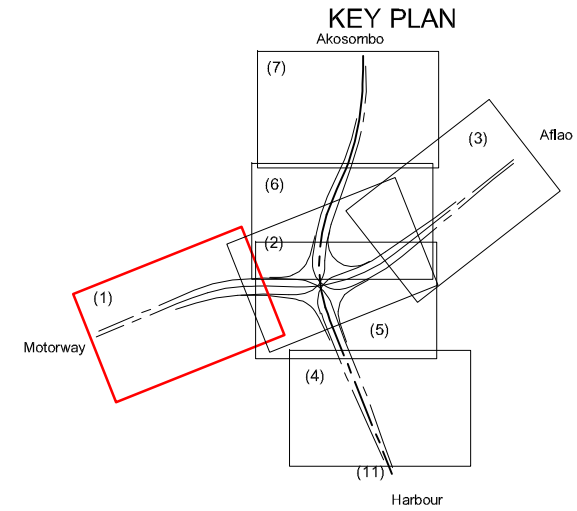
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA


DRAWING TITLE:
ANCILLARY PLAN (18)


SCALE (A1 size)	DRAWING NO.
1:500	RA-18

LAYOUT OF REFLECTORS (1) S=1:1000



LEGEND

 : DELINEATOR

 : CUSHION DRUM

GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

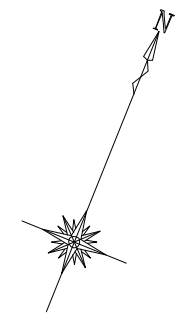
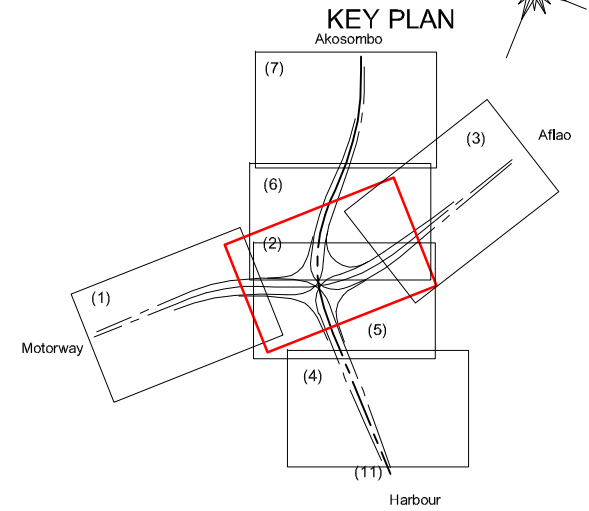
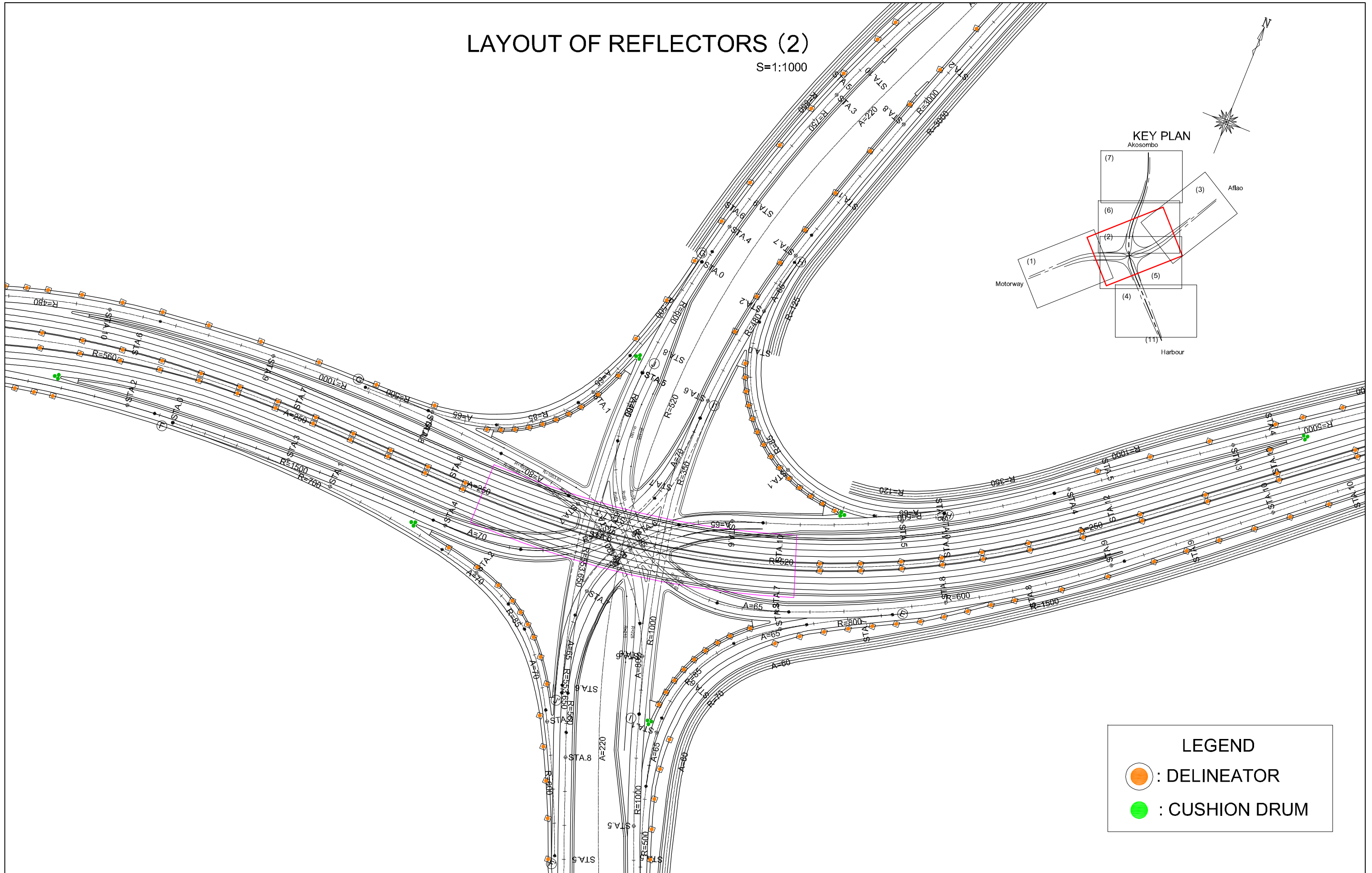
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
LAYOUT OF REFLECTORS (1)



SCALE:(A1size)	DRAWING NO.
1:1000	RA-19

LAYOUT OF REFLECTORS (2)

S=1:1000

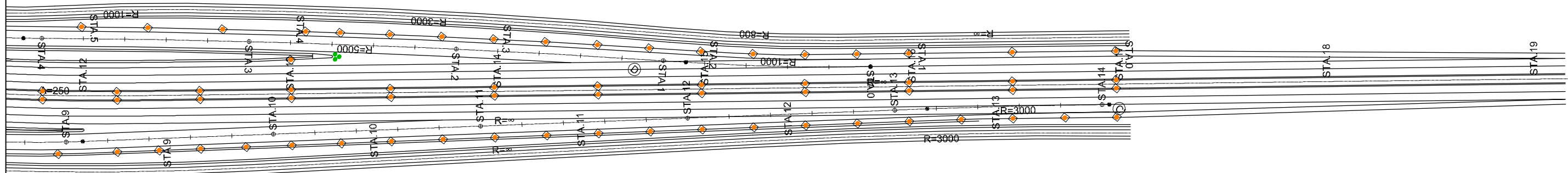
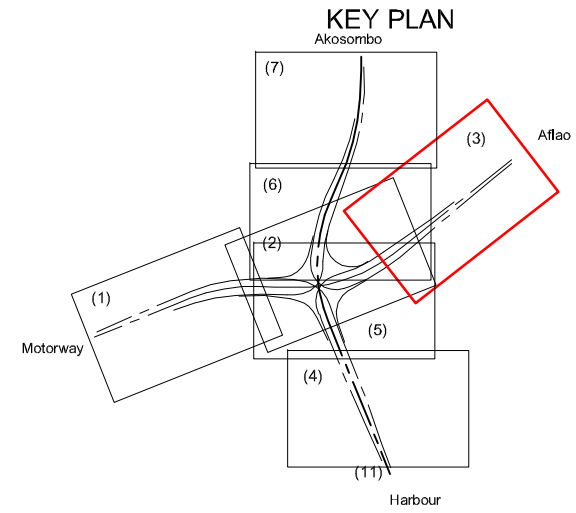


LEGEND

-  : DELINEATOR
-  : CUSHION DRUM

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE:	DRAWING TITLE:	SCALE:(A1size)	DRAWING NO.
		PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	LAYOUT OF REFLECTORS (2)	1:1000	RA-20

LAYOUT OF REFLECTORS (3) S=1:1000

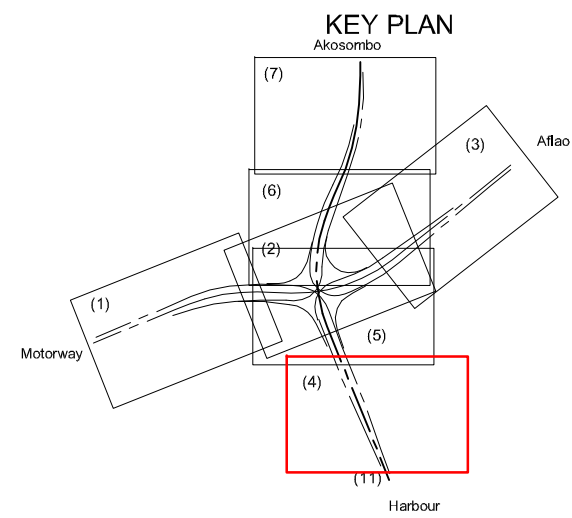
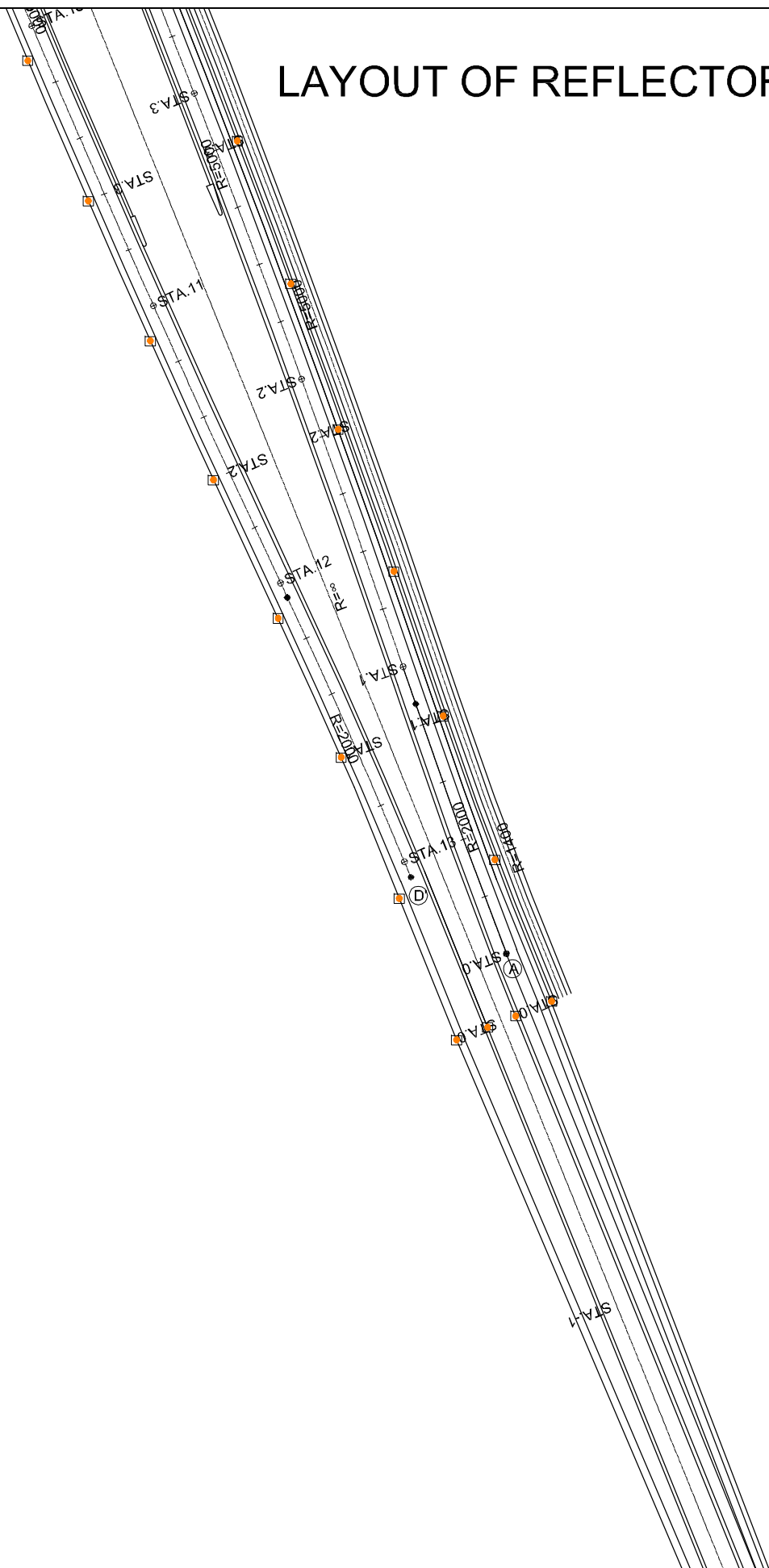


LEGEND



: DELINEATOR
 : CUSHION DRUM

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF REFLECTORS (3)	SCALE:(A1size)	DRAWING NO.
				1:1000	RA-21

LAYOUT OF REFLECTORS (4) S=1:1000



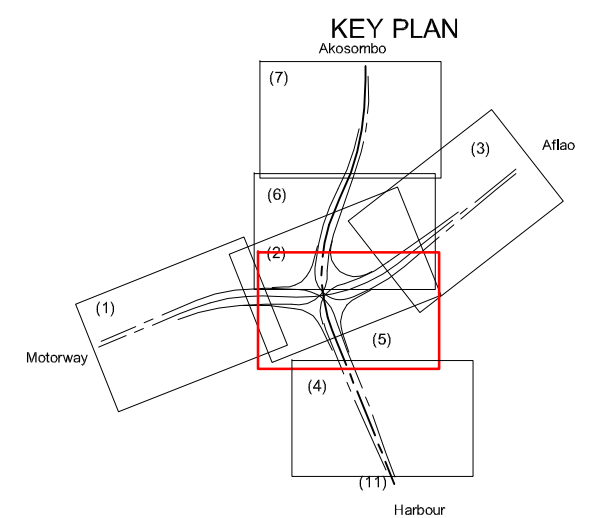
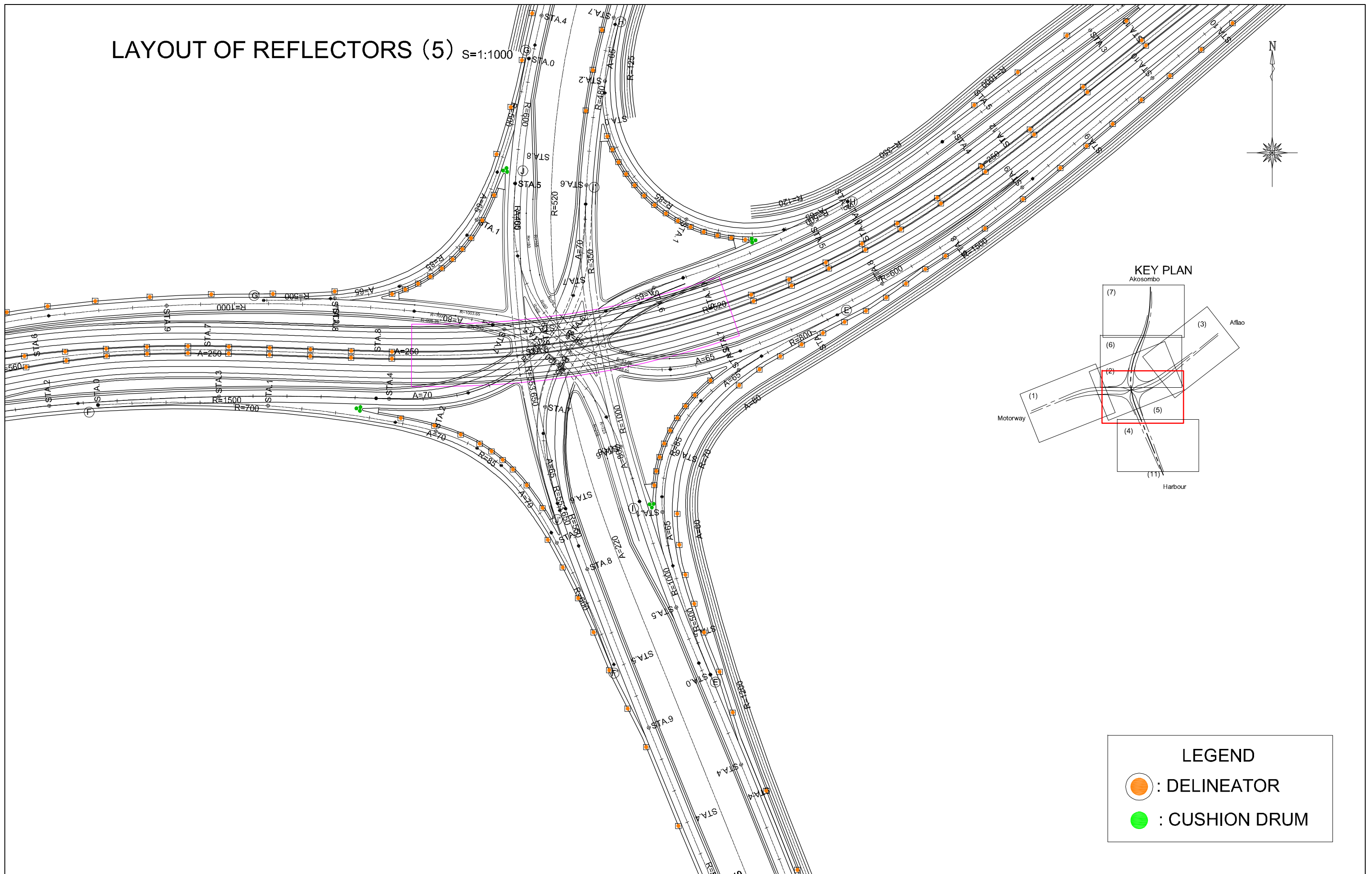
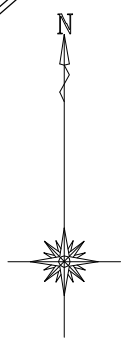
LEGEND

 : DELINEATOR
 : CUSHION DRUM

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF REFLECTORS (4)	SCALE:(A1size)	DRAWING NO.
				1:1000	RA-22

LAYOUT OF REFLECTORS (5)

S=1:1000

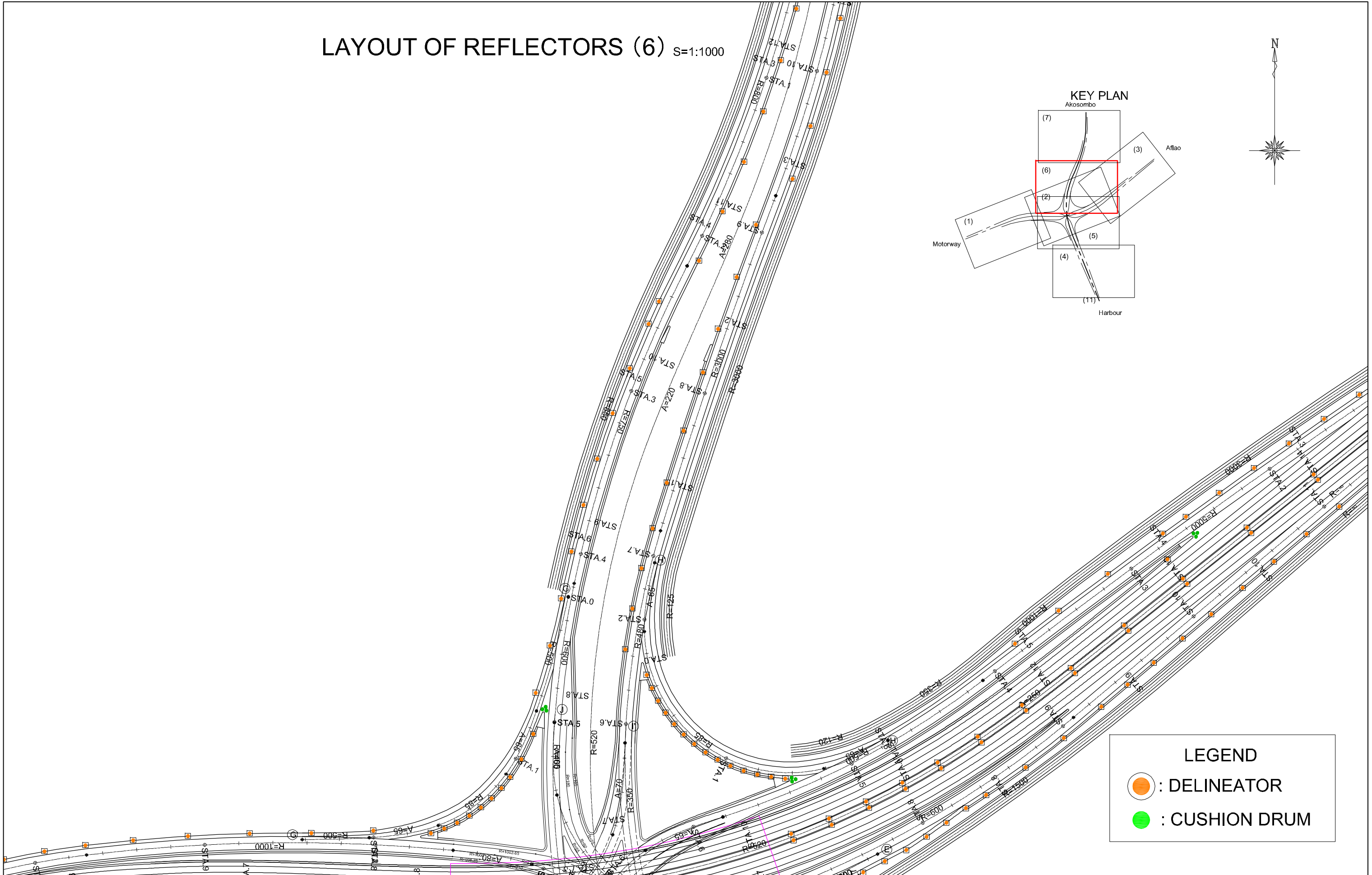


LEGEND

: DELINEATOR
 : CUSHION DRUM

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF REFLECTORS (5)	SCALE:(A1size)	DRAWING NO.
				1:1000	RA-23

LAYOUT OF REFLECTORS (6) S=1:1000

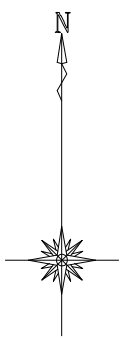
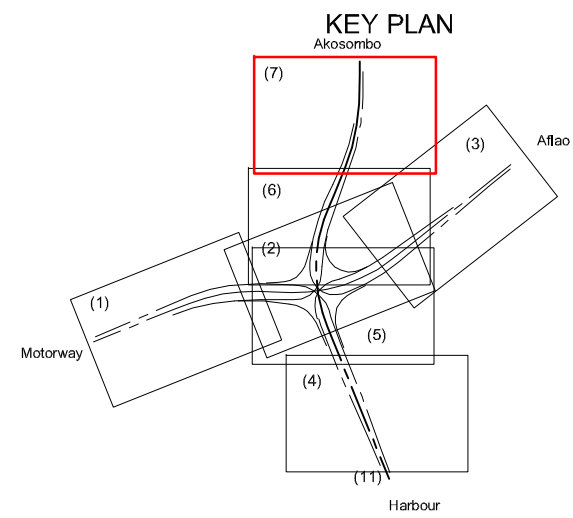
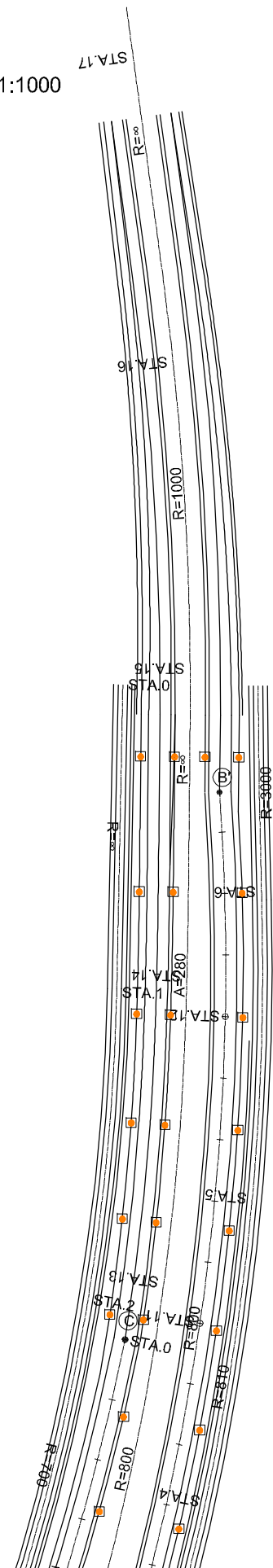


LEGEND

- : DELINEATOR
- : CUSHION DRUM

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF REFLECTORS (6)	SCALE:(A1size)	DRAWING NO.
				1:1000	RA-24

LAYOUT OF REFLECTORS (7) S=1:1000

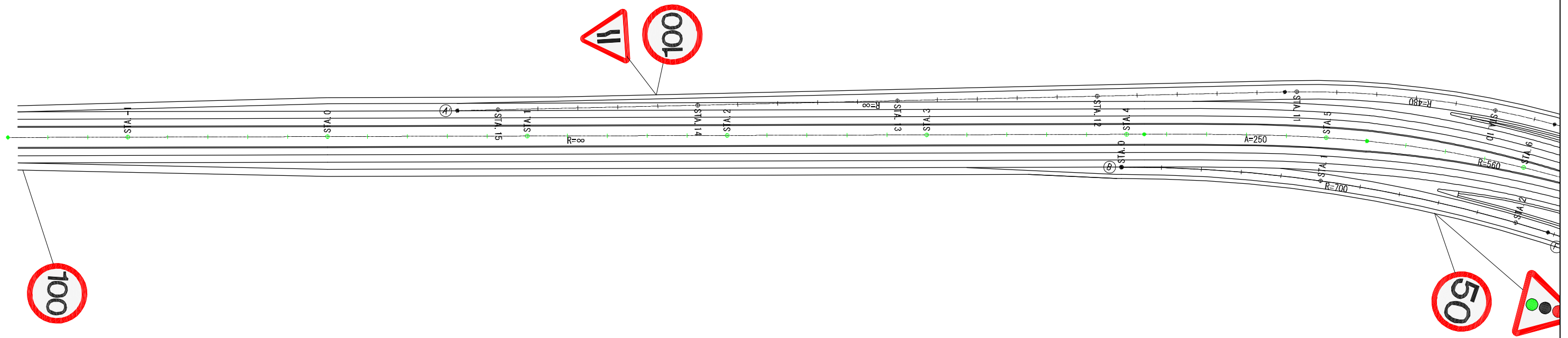
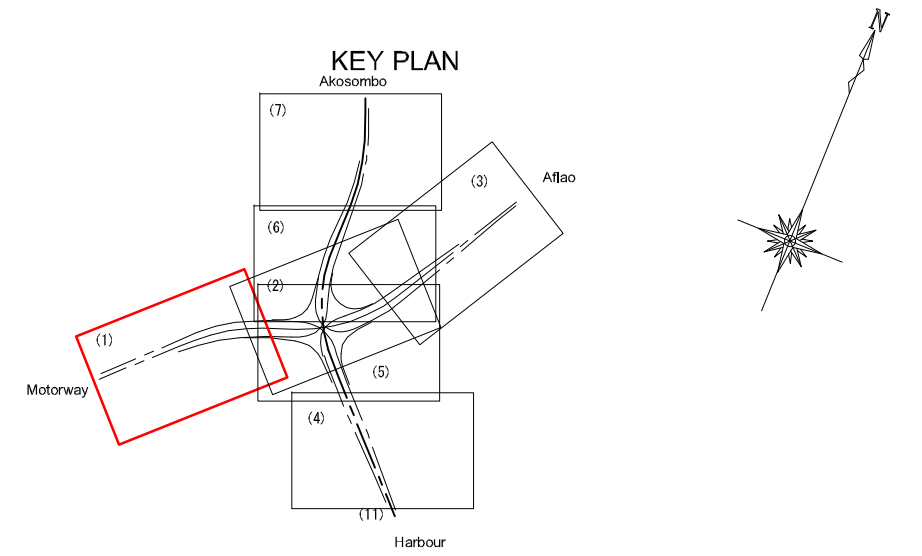


LEGEND

: DELINEATOR
 : CUSHION DRUM

GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF REFLECTORS (7)	SCALE:(A1size)	DRAWING NO.
				1:1000	RA-25

LAYOUT OF TRAFFIC SIGNS (1) S=1:1000



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

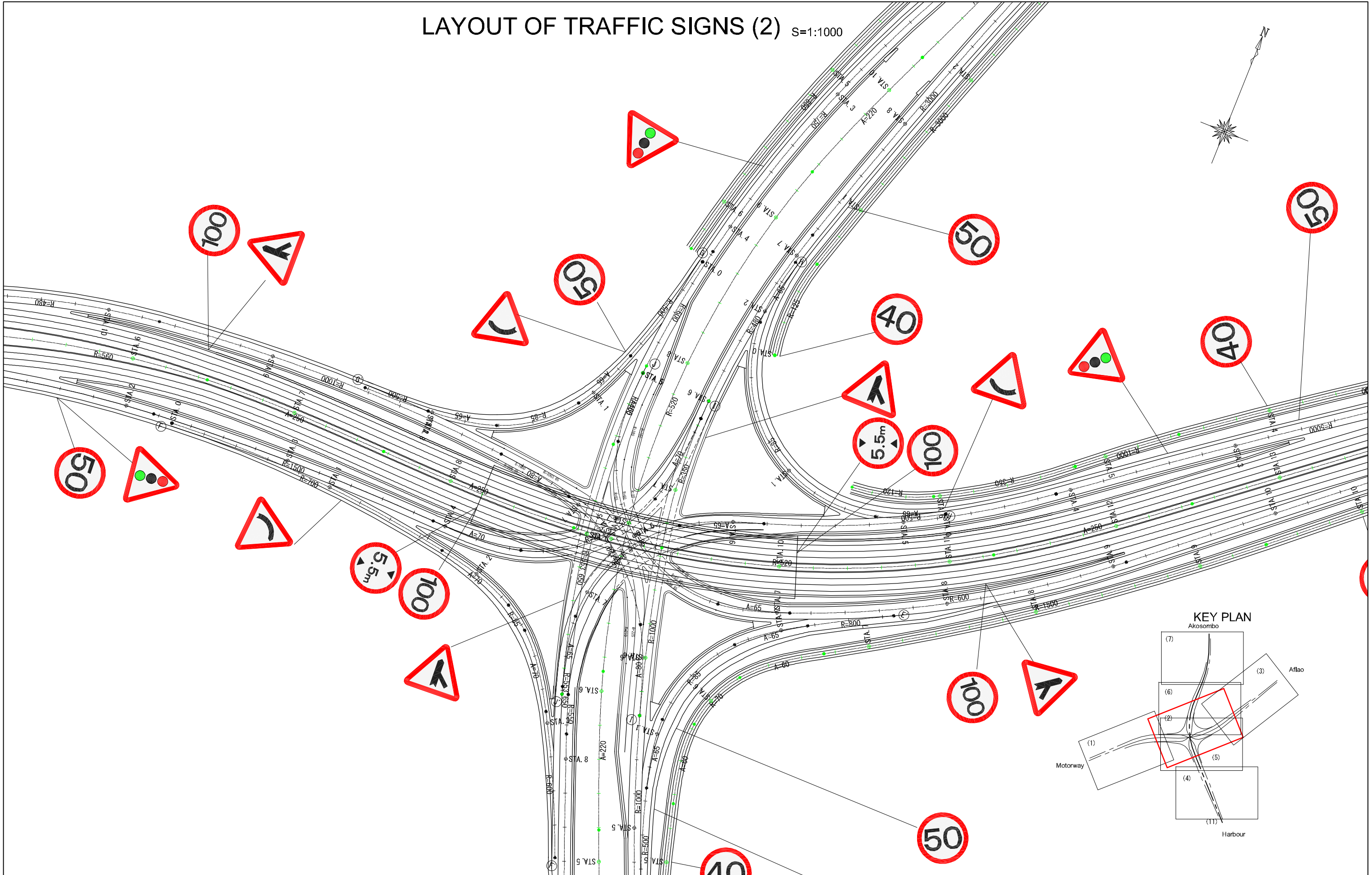
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
LAYOUT OF TRAFFIC SIGNS (1)

SCALE:(A1size)	DRAWING NO.
1:1000	RA-26

LAYOUT OF TRAFFIC SIGNS (2) S=1:1000



GHANA HIGHWAY AUTHORITY
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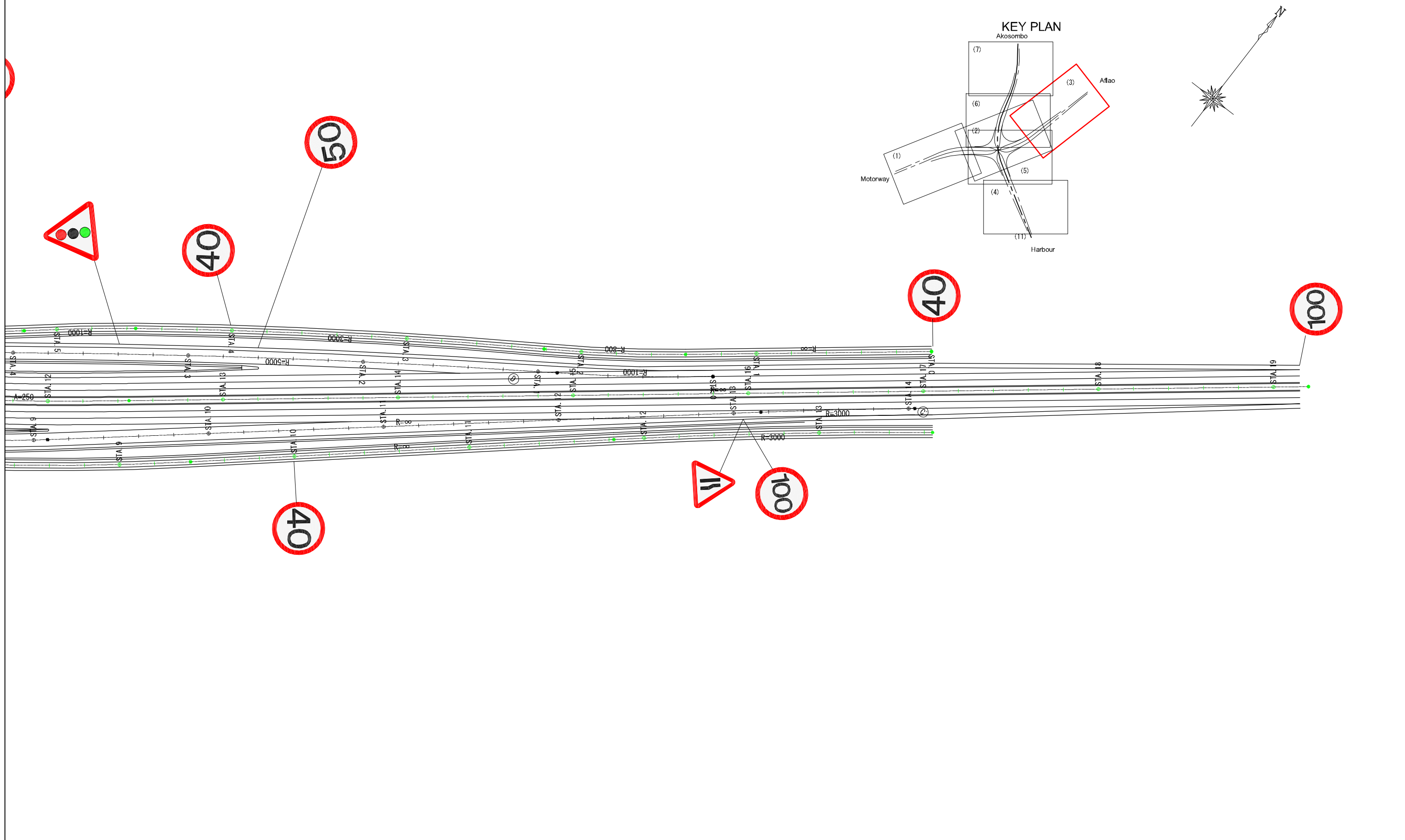
CTI ENGINEERING INTERNATIONAL CO., LTD.
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 LAYOUT OF TRAFFIC SIGNS (2)

SCALE:(A1size)	DRAWING NO.
1:1000	RA-27

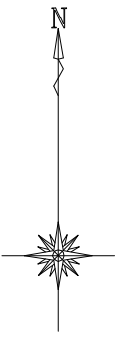
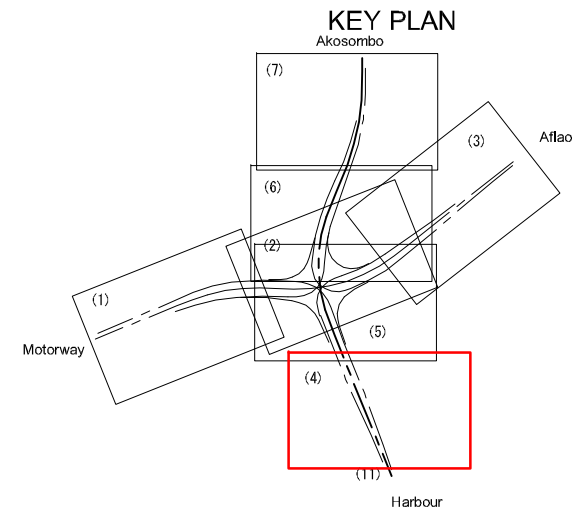
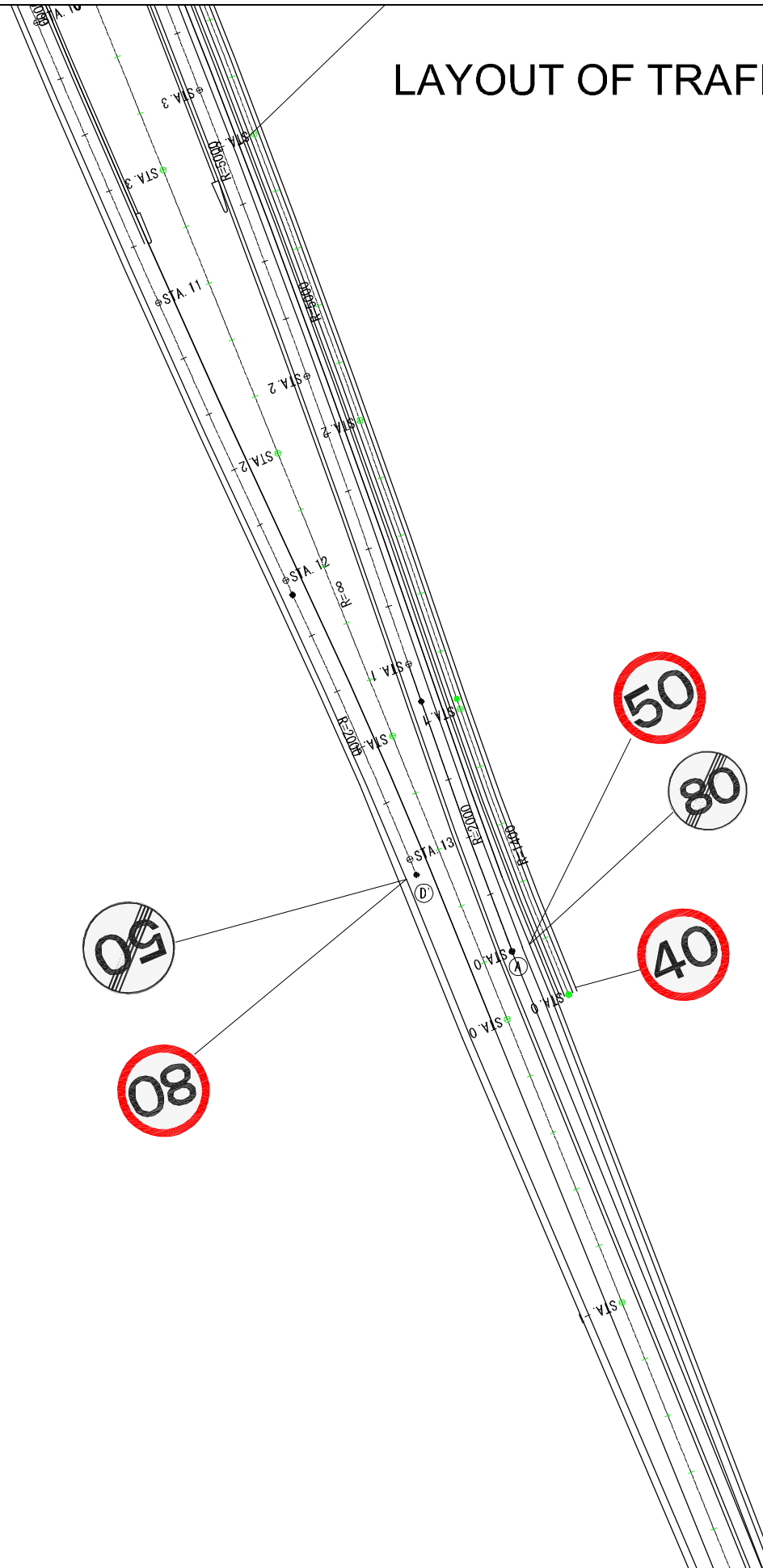
LAYOUT OF TRAFFIC SIGNS (3) S=1:1000



GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF TRAFFIC SIGNS (3)	SCALE:(A1size)	DRAWING NO.
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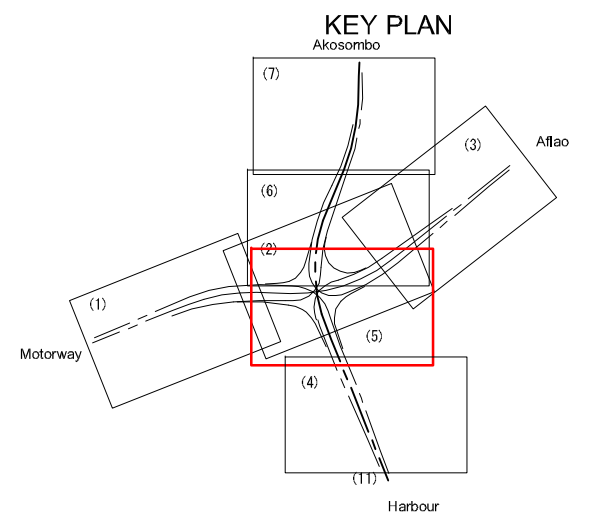
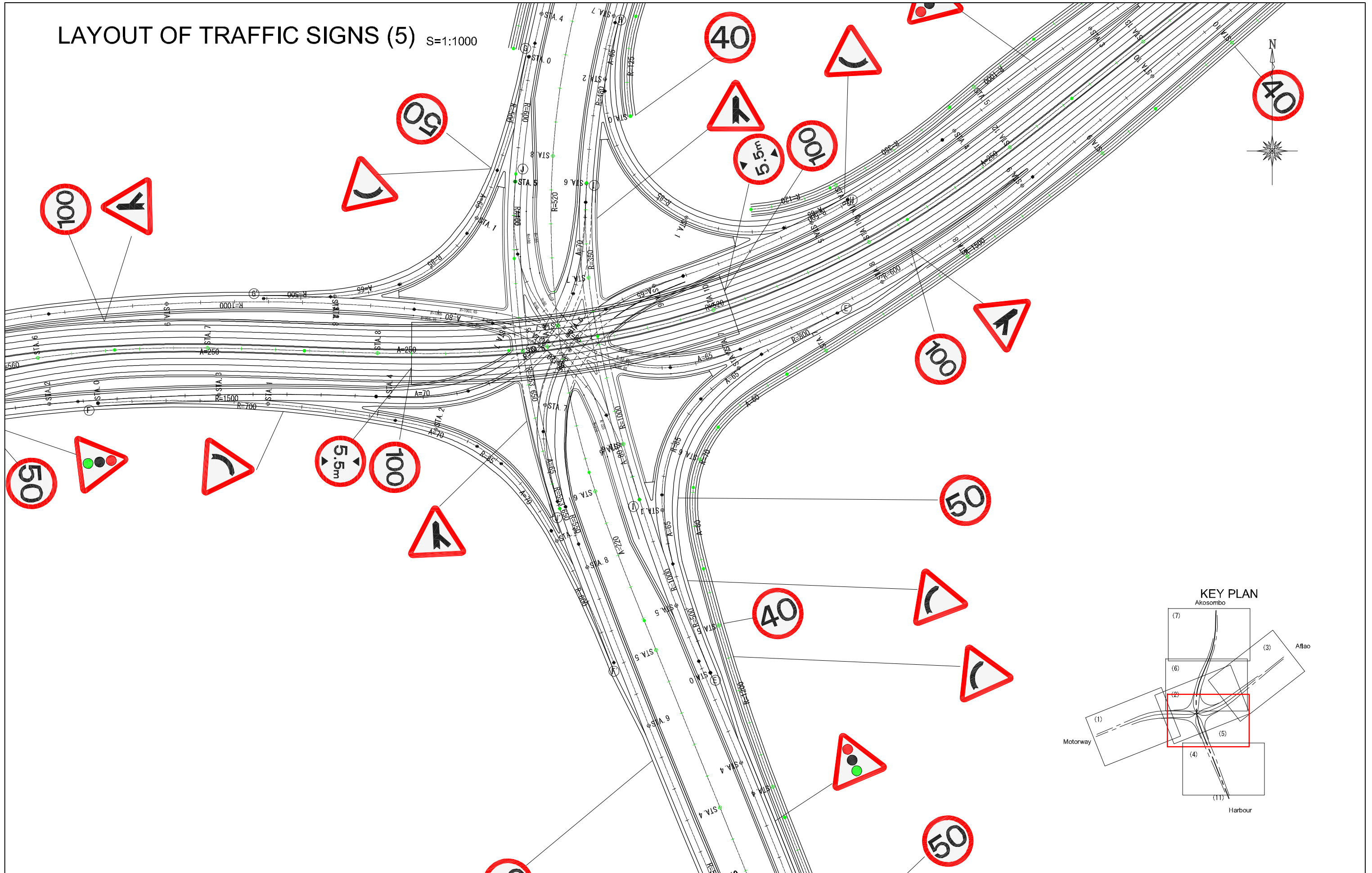


LAYOUT OF TRAFFIC SIGNS (4) S=1:1000



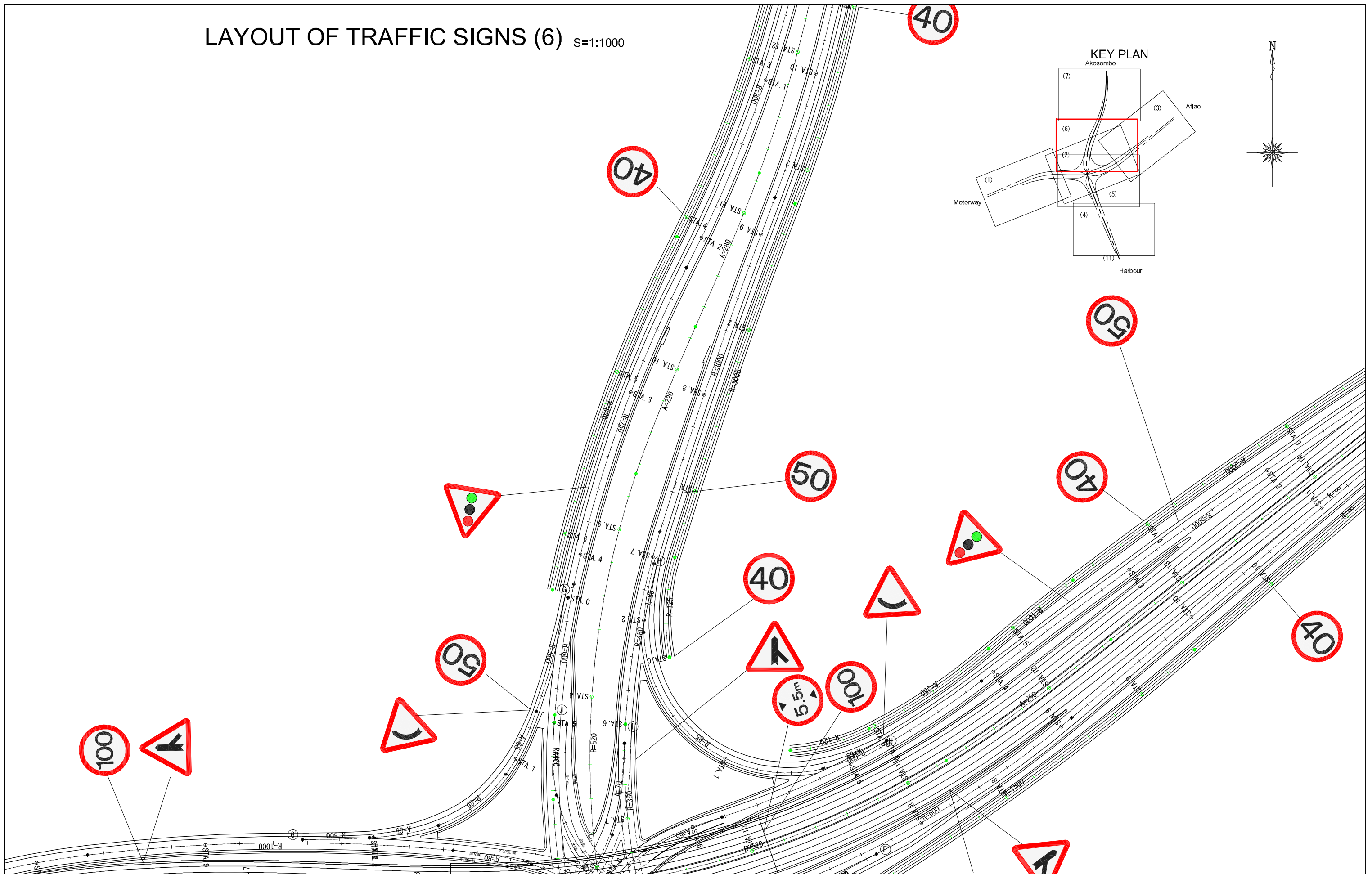
GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE:	DRAWING TITLE:	SCALE:(A1size)	DRAWING NO.
		PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	LAYOUT OF TRAFFIC SIGNS (4)	1:1000	RA-29

LAYOUT OF TRAFFIC SIGNS (5) S=1:1000



GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: LAYOUT OF TRAFFIC SIGNS (5)	SCALE:(A1size)	DRAWING NO.
				1:1000	RA-30

LAYOUT OF TRAFFIC SIGNS (6) S=1:1000



GHANA HIGHWAY AUTHORITY
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PROJECT TITLE:
 PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
 OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
 LAYOUT OF TRAFFIC SIGNS (6)

SCALE:(A1size)	DRAWING NO.
1:1000	RA-31

LAYOUT OF TRAFFIC SIGNS (7) S=1:1000

08

40

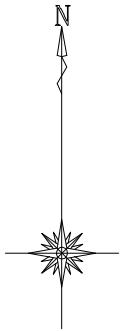
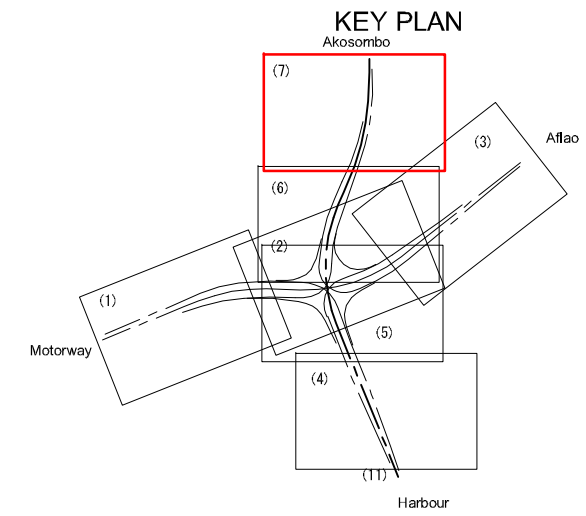
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50

80

50

40



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

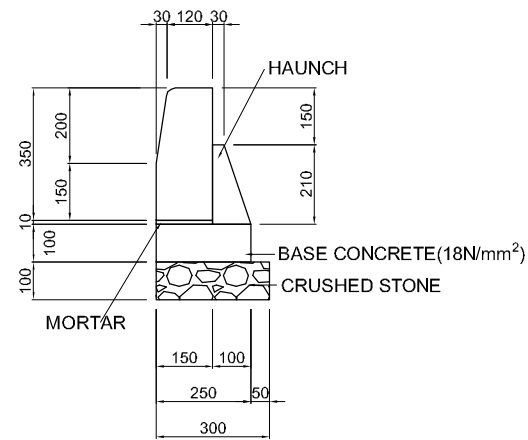
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
LAYOUT OF TRAFFIC SIGNS (7)

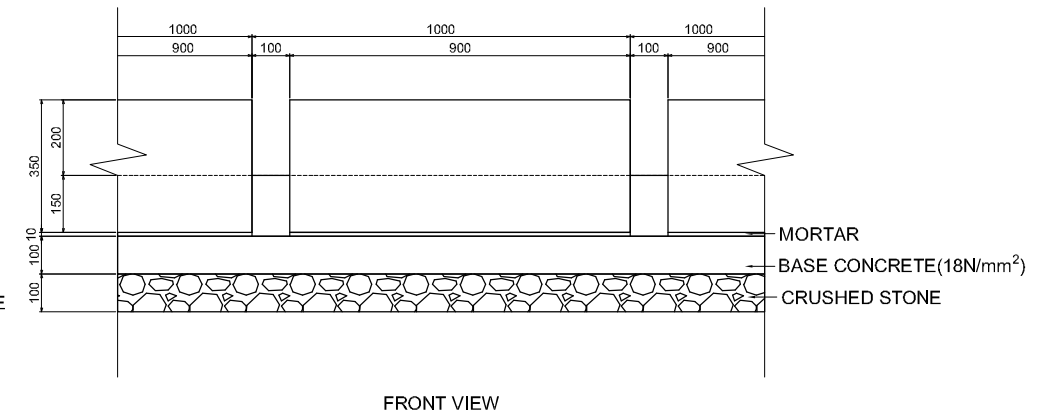
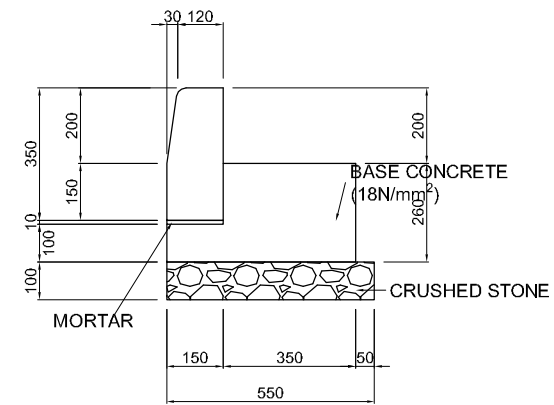
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1:1000	RA-32

MEDIAN BLOCK, KERB AND EDGE BLOCK (FLUSH KERB)

NON-MOUNTABLE TYPE KERB (A)

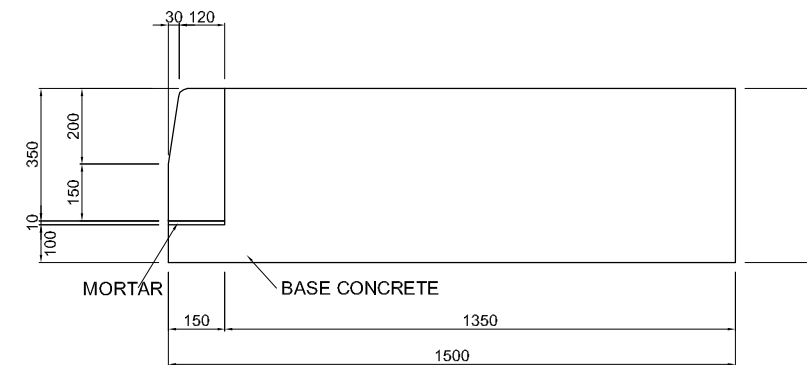
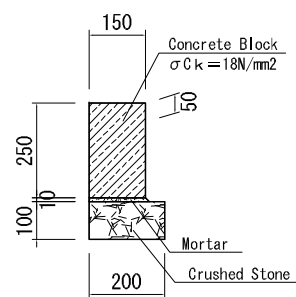


NON-MOUNTABLE TYPE KERB (B)



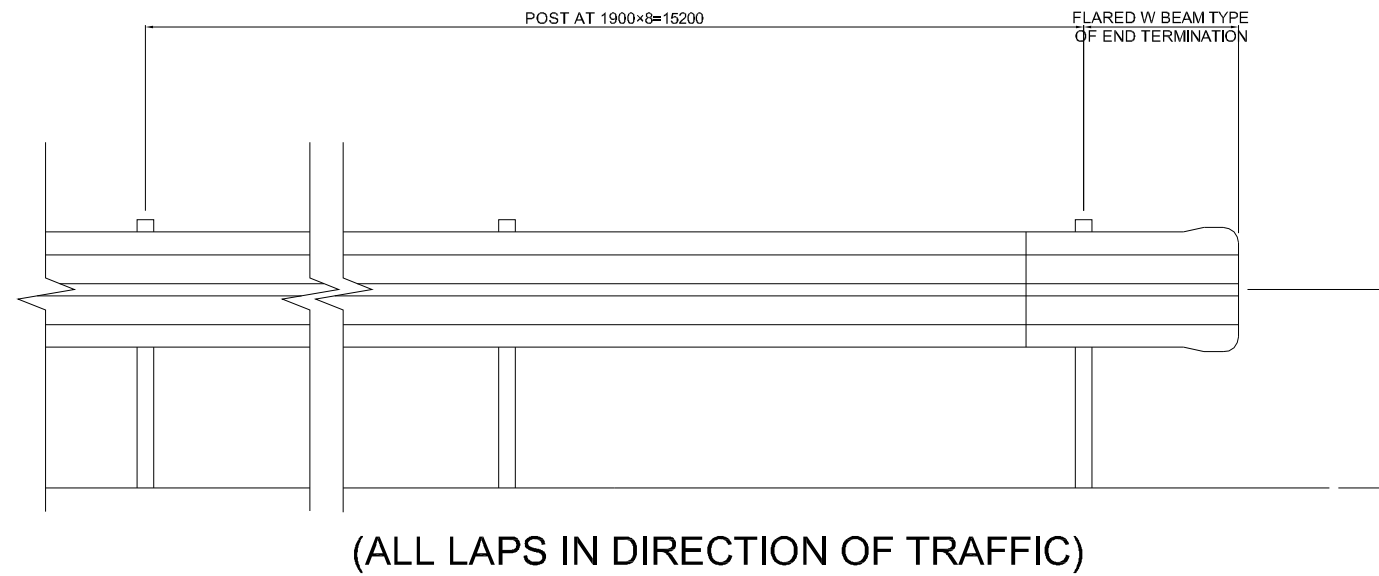
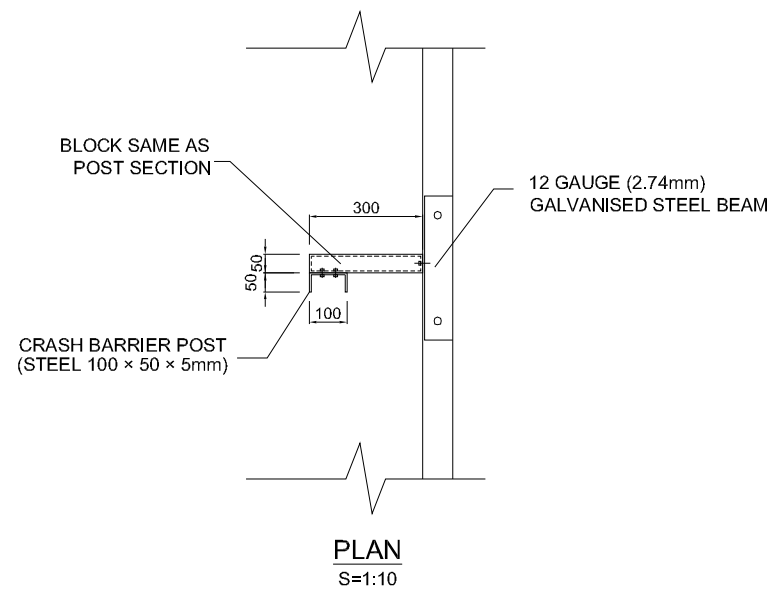
NON-MOUNTABLE TYPE KERB (C)

EDGE BLOCK

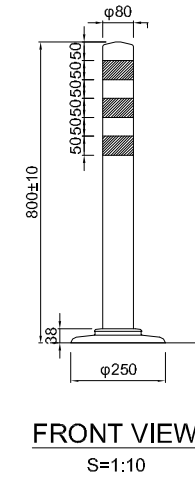


CRASH BARRIER AND REFLECTORS

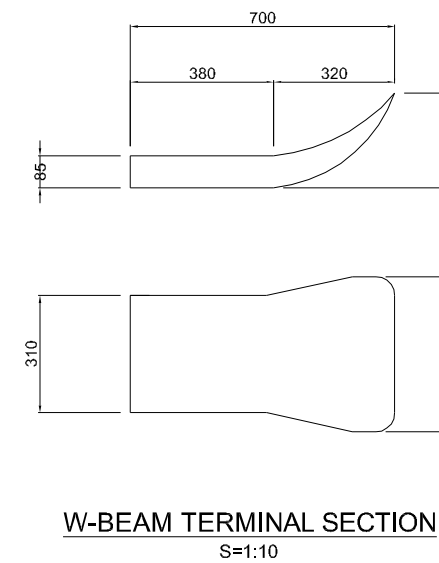
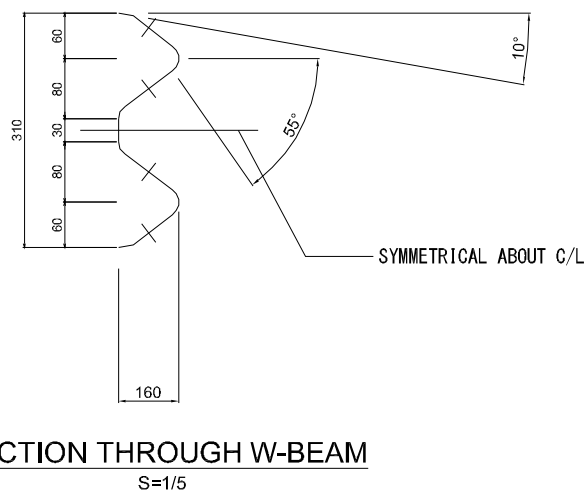
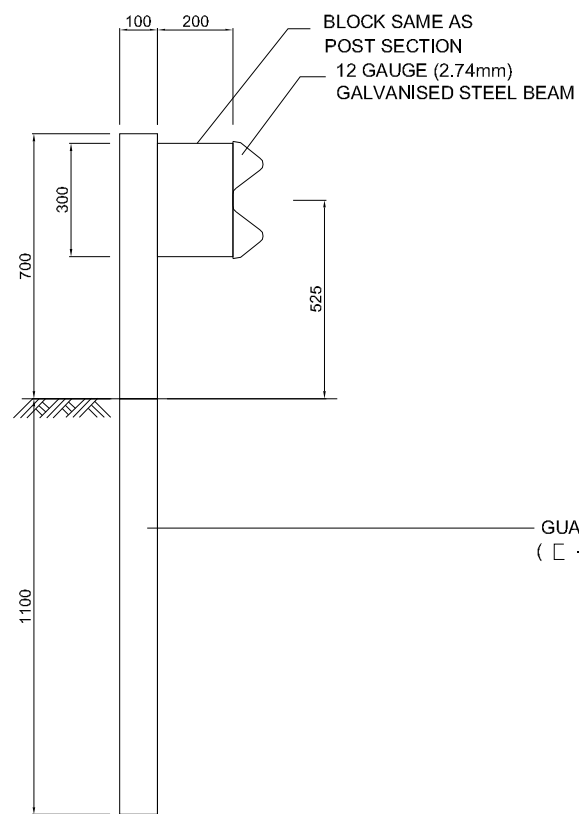
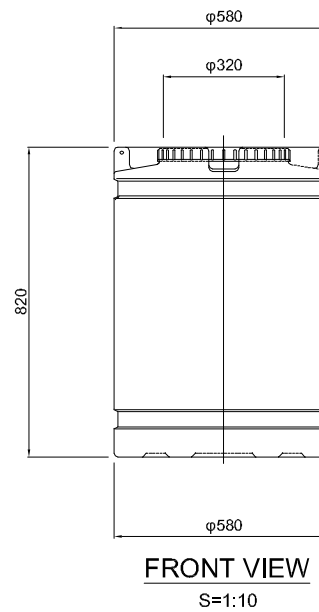
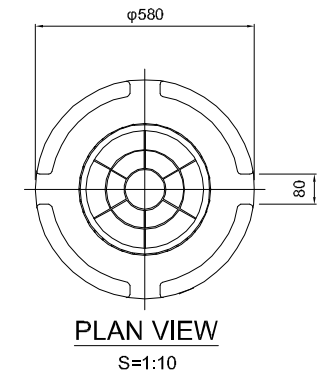
CRASH BARRIER



Rubber Pole

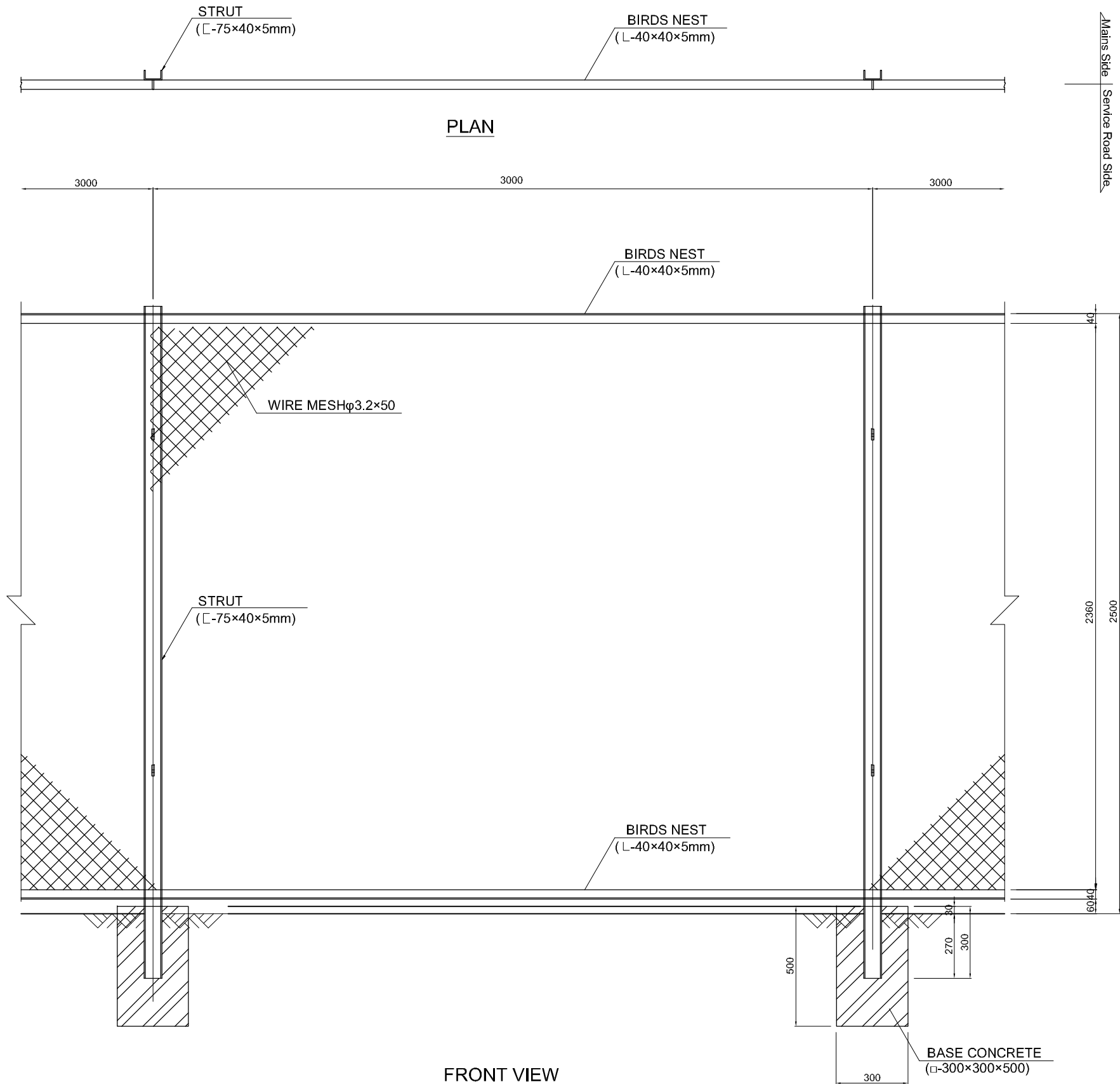


CUSHION DRUM



GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: CRASH BARRIER AND REFLECTORS	SCALE	DRAWING NO.
				As Shown	RA-34

GUARD FENCE



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MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
GUARD FENCE

SCALE	DRAWING NO.
1:10	RA-35

TYPICAL SIGNS

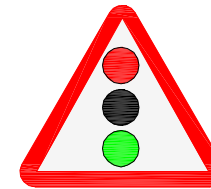
2 RIGHT BEND



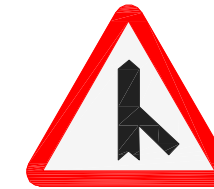
9 CARRIAGEWAY NARROWS



25 TRAFFIC SIGNALS



34 MINOR ROAD FROM RIGHT



72 NO ENTRY FOR VEHICLES WITH GROSS WEIGHT EXCEEDING SHOWN LIMIT



MAX SPEED LIMIT AS SHOWN

81-1



81-2



82

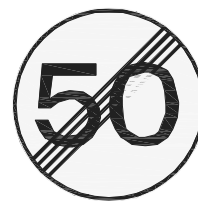


83

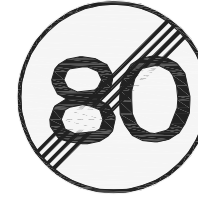


END OF RESTRICTION

86-1



86-2

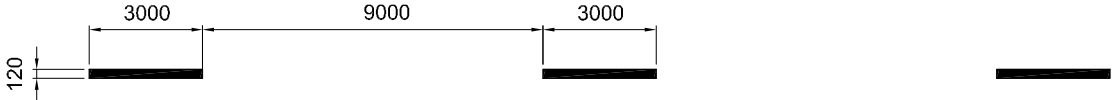


PAVEMENT MARKINGS (1)

CONTINUOUS LINE
BROKEN GUIDING LINE



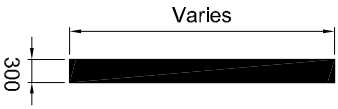
BROKEN GUIDING LINE



DASHED LINE



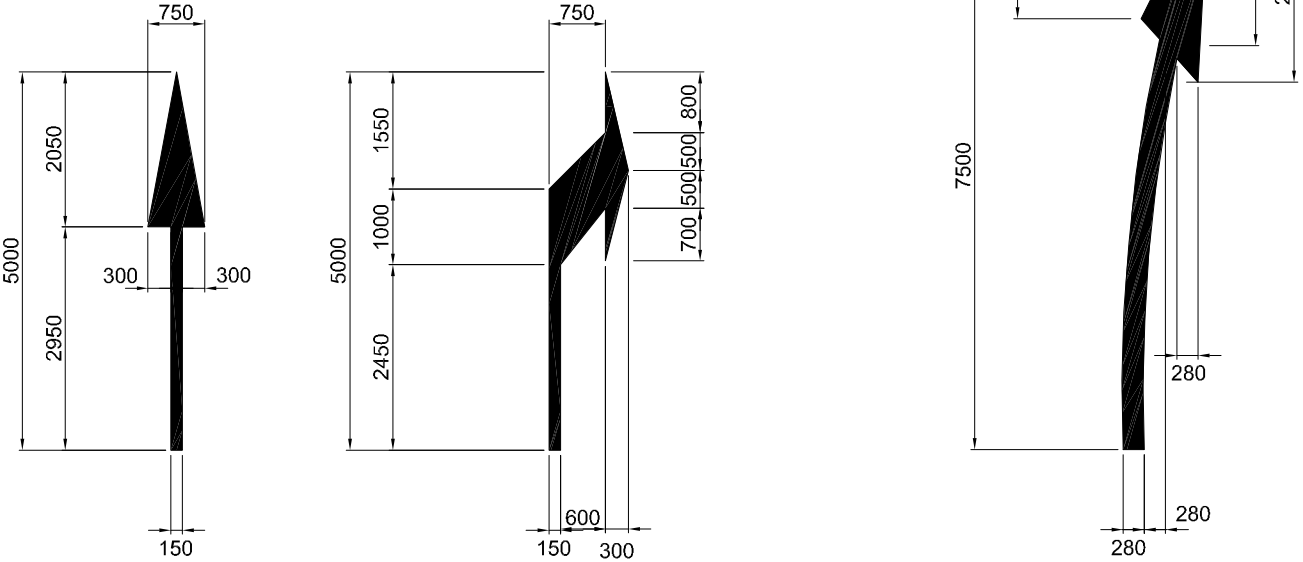
STOP LINE



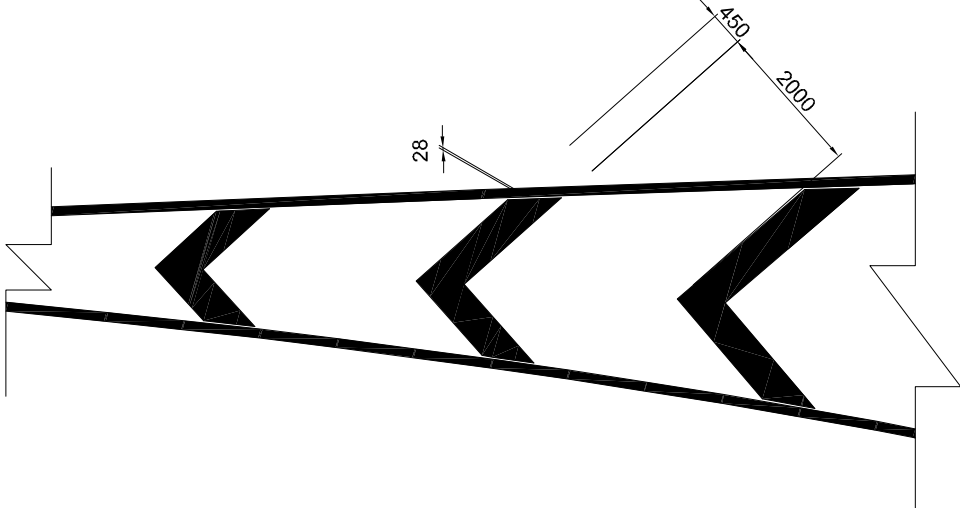
ARROW MARKINGS

FOR SPEED < 60km/h

FOR SPEED > 60km/h



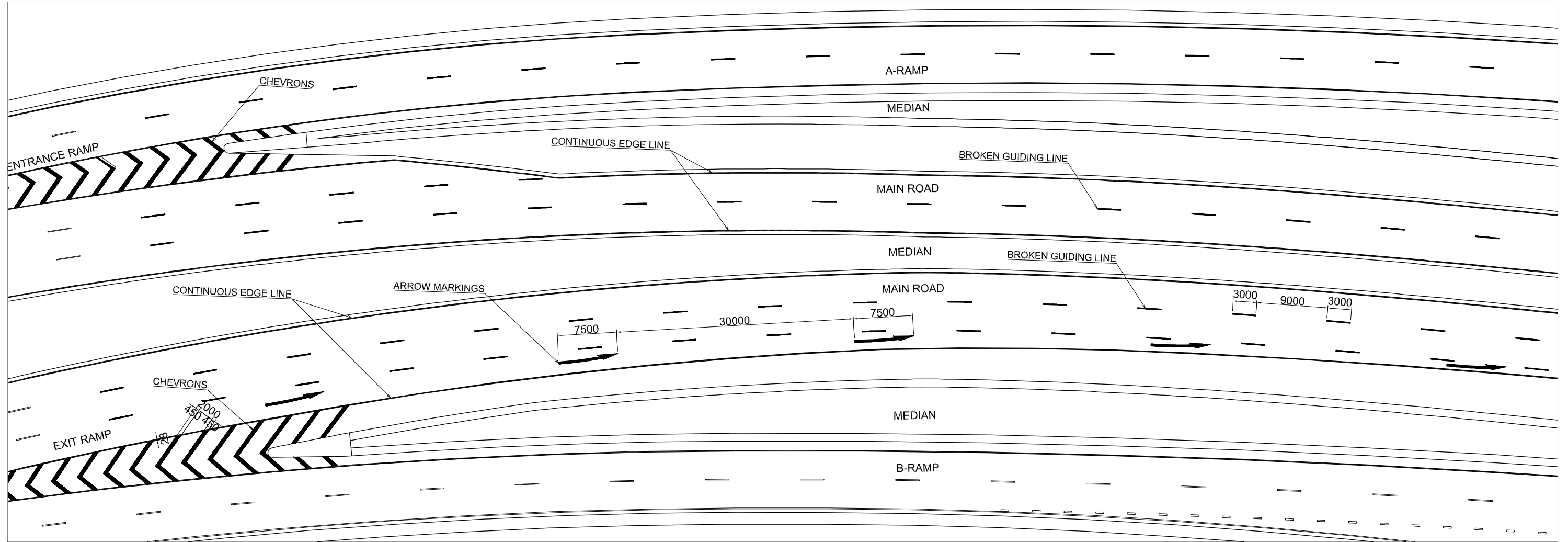
CHEVRONS



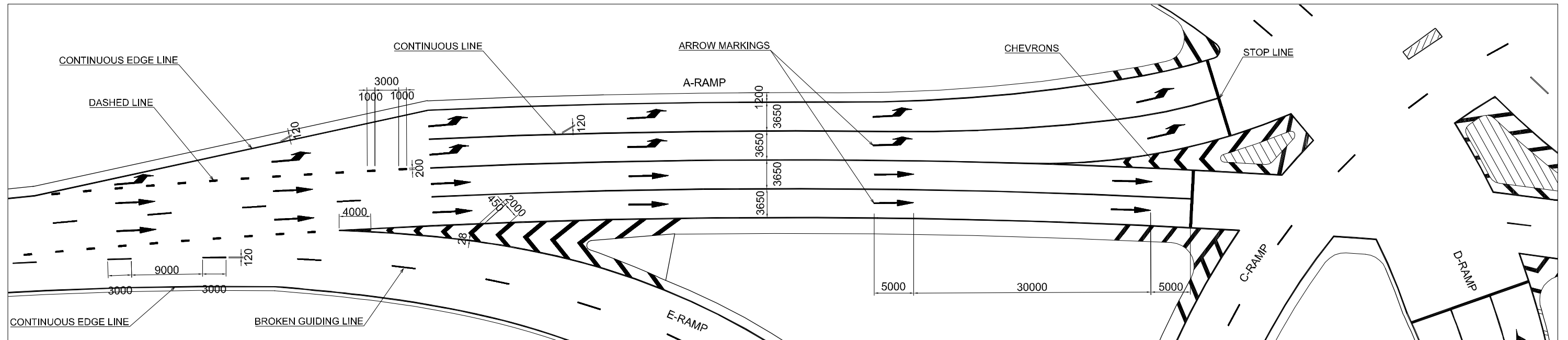
GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA	CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY	PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA	DRAWING TITLE: PAVEMENT MARKINGS (1)	SCALE:(A1size)	DRAWING NO.
				1/50	RA-37

PAVEMENT MARKINGS (2)

AT RAMP NOSE SECTION



AT INTERSECTIONS



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MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

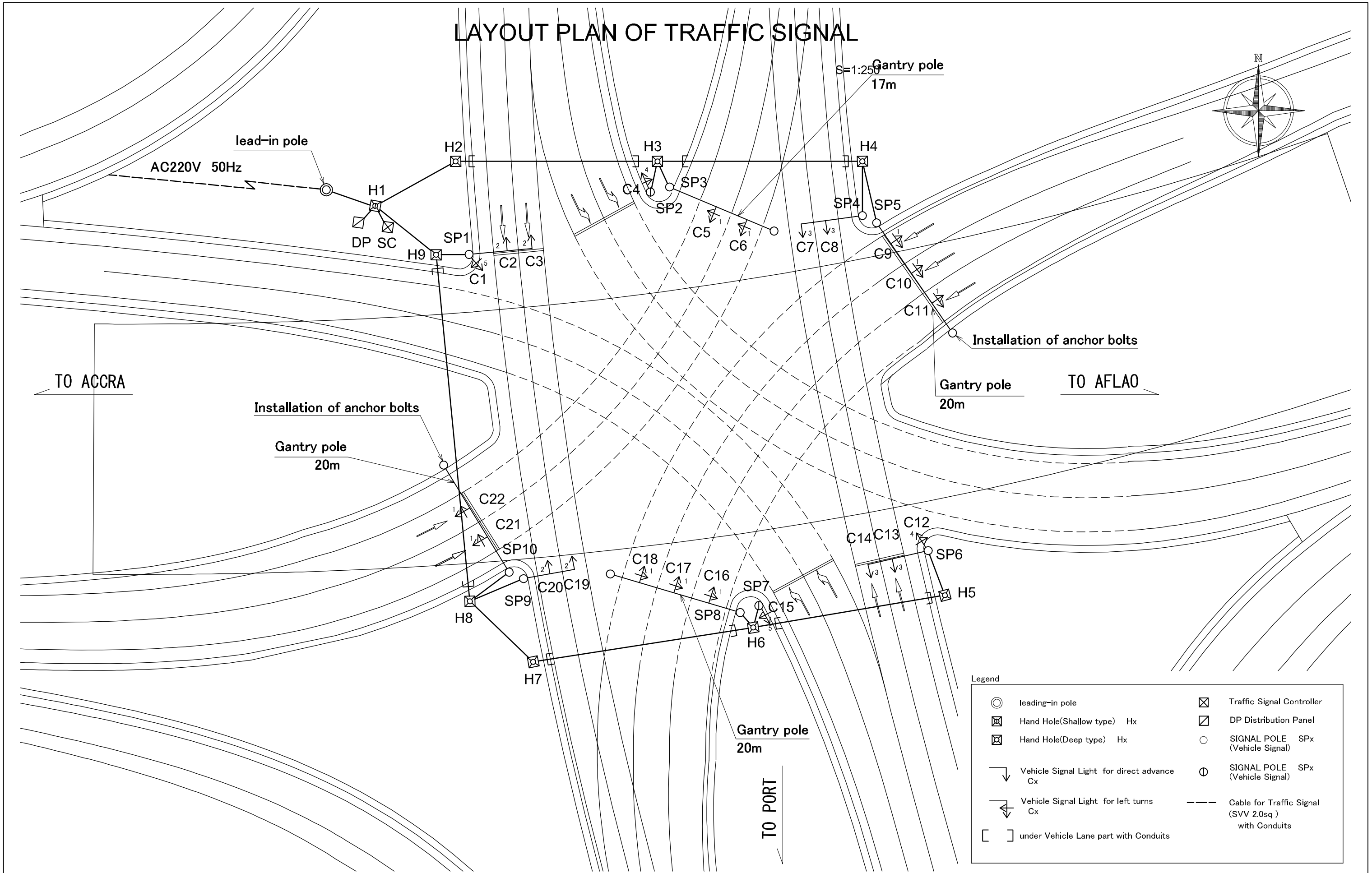
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
PAVEMENT MARKINGS (2)

SCALE:(A1size)	DRAWING NO.
1/250	RA-38

LAYOUT PLAN OF TRAFFIC SIGNAL



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MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

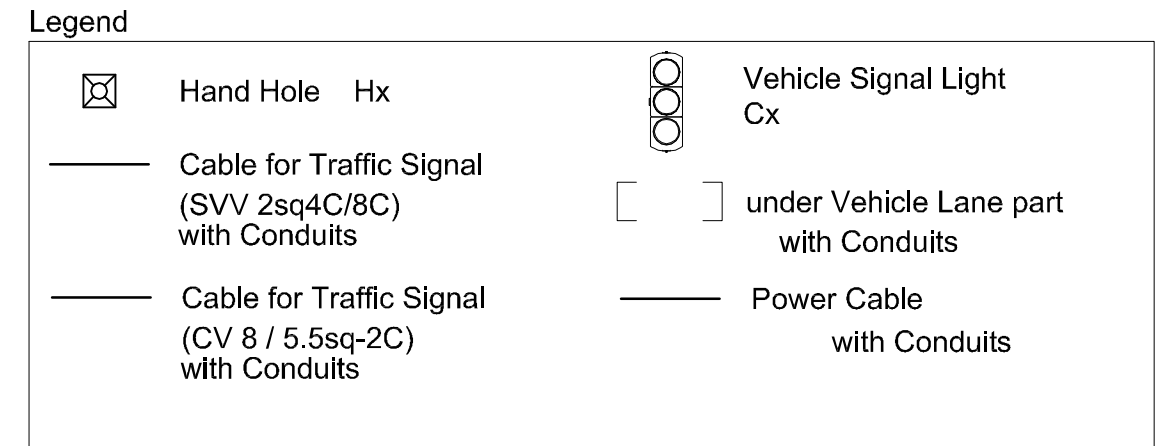
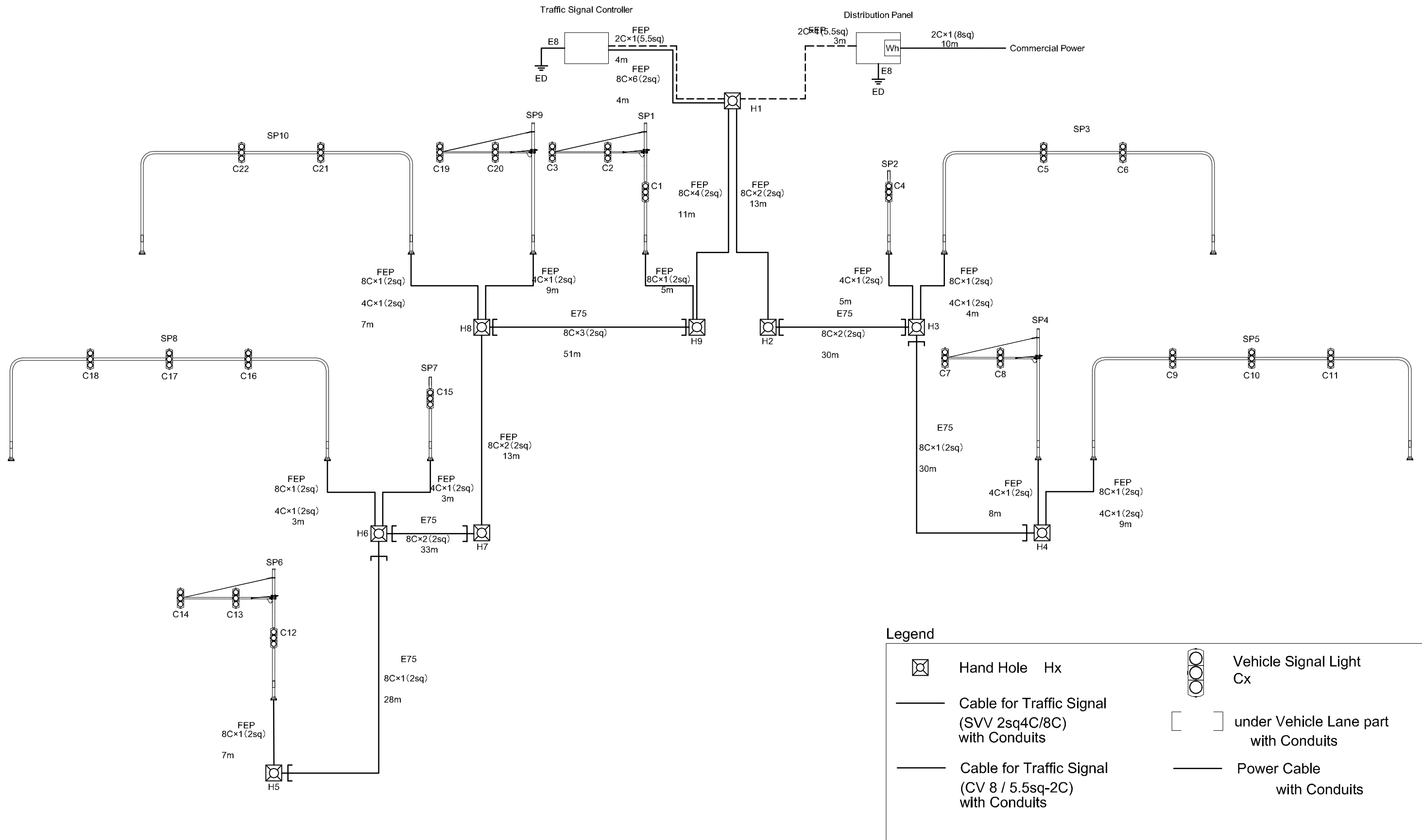
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

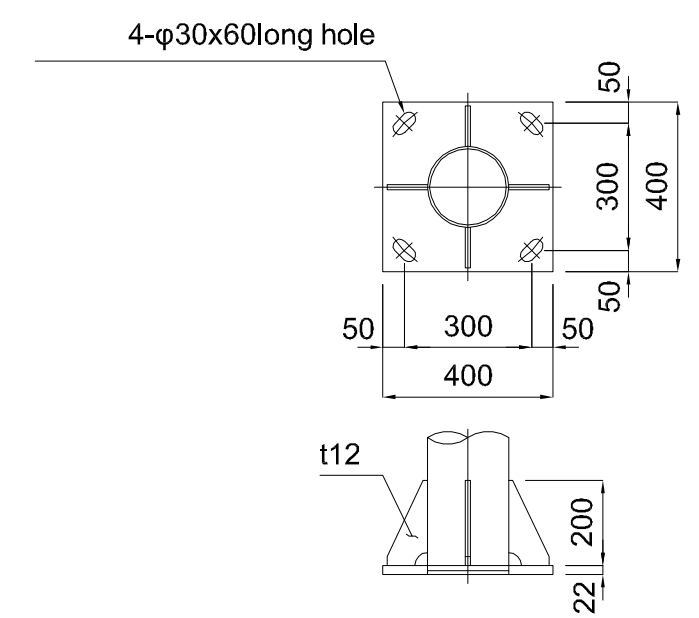
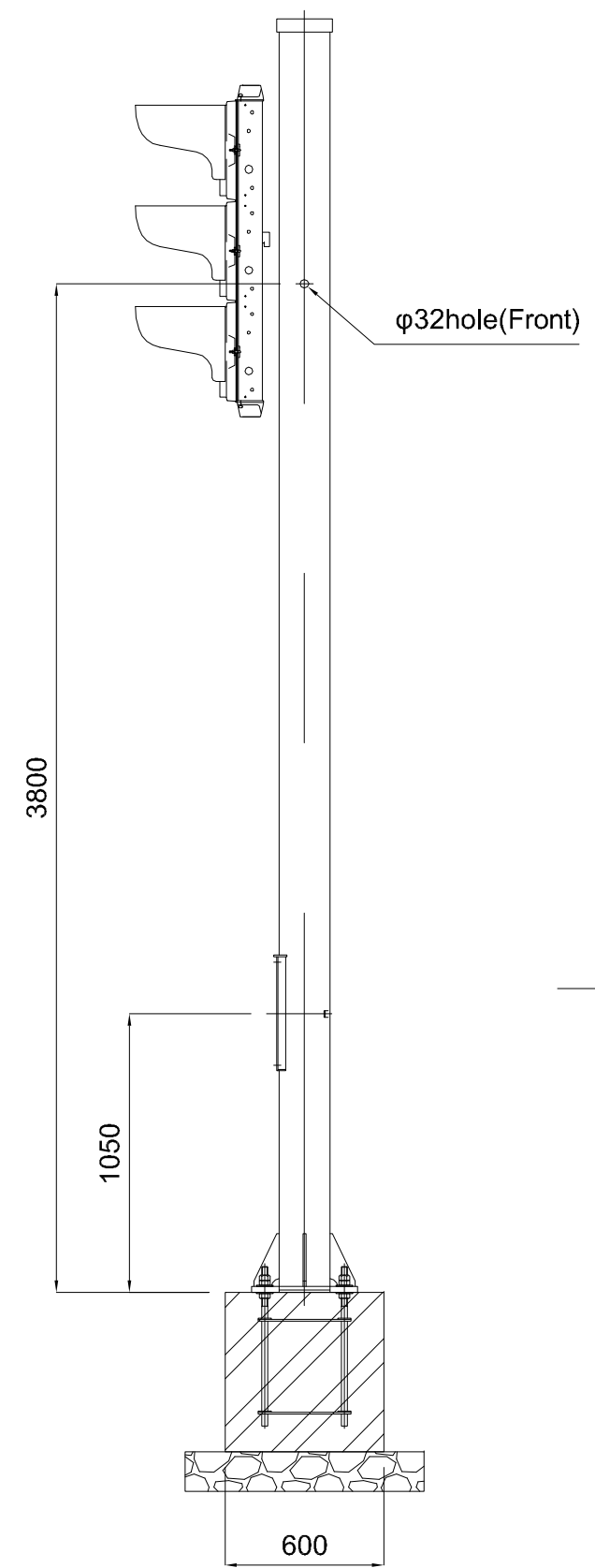
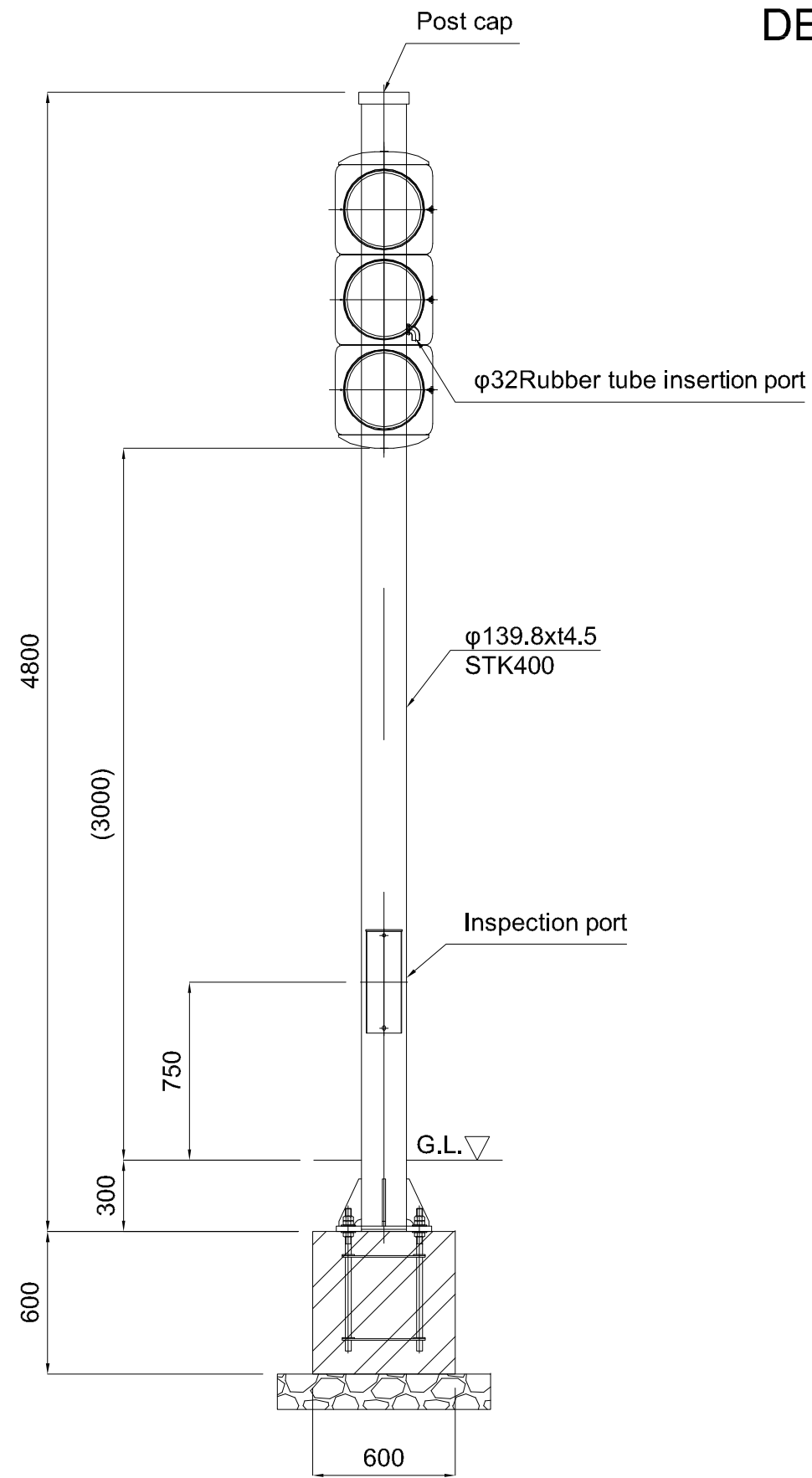
DRAWING TITLE:
LAYOUT PLAN OF
TRAFFIC SIGNAL LIGHT

SCALE:(A1size)	DRAWING NO.
S=1/250	TS-01

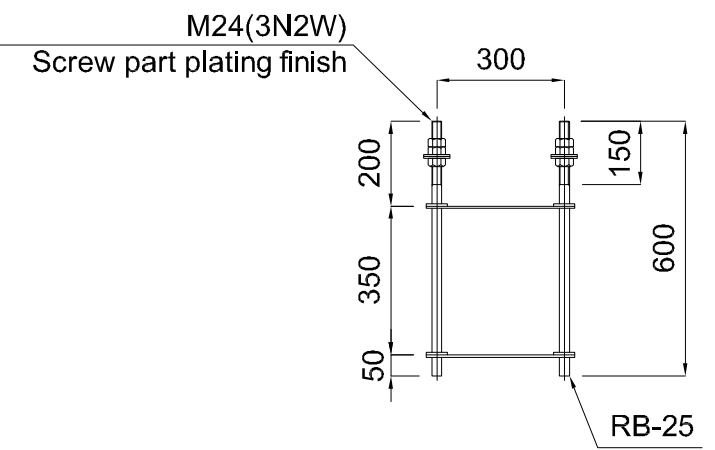
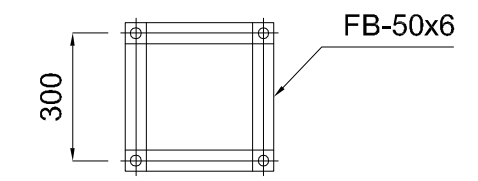
WIRING SYSTEM OF TRAFFIC SIGNAL



DETAIL OF TRAFFIC SIGNAL LIGHT (TYPE1)



Base part detailed view (S=1/20)

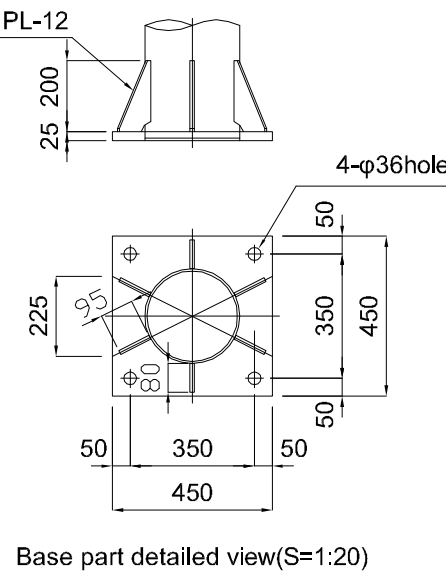
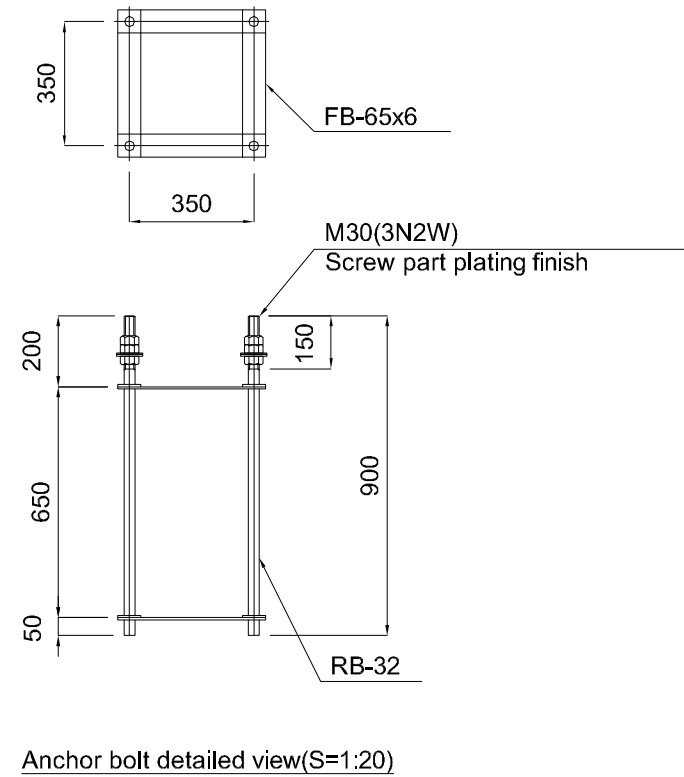
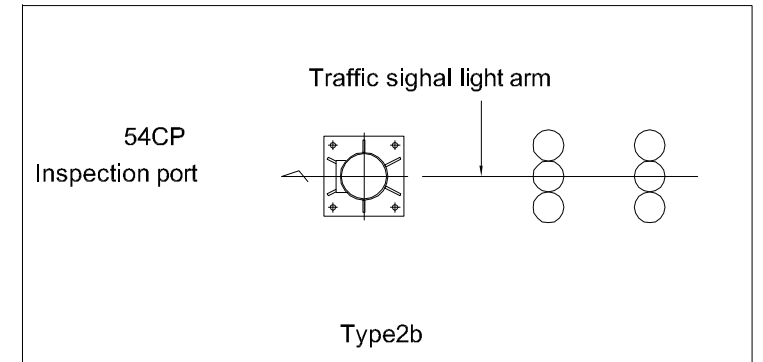
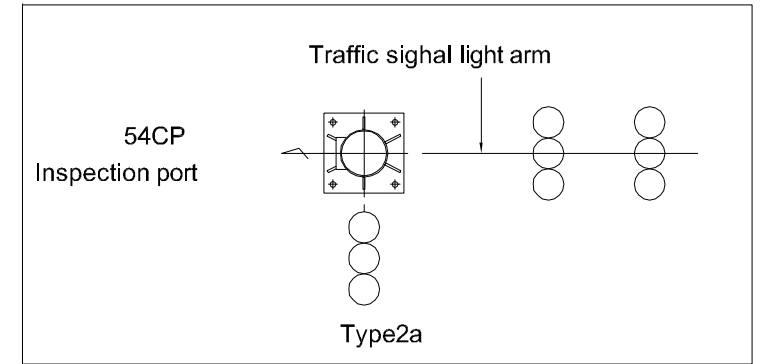
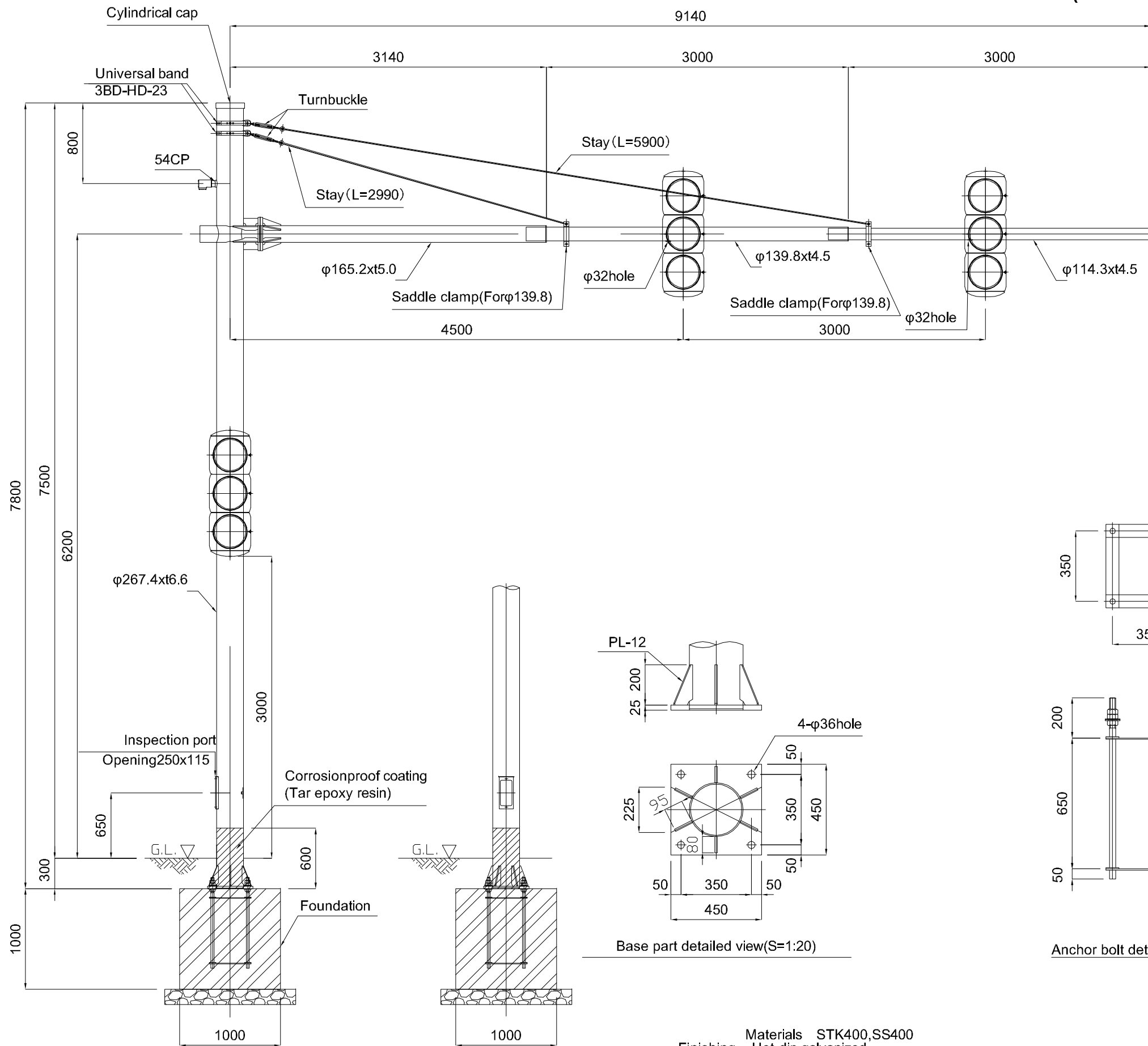


Anchor bolt detailed view (S=1/20)

Materials STK400, SS400
Finishing Hot-dip galvanized

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					TS-03

DETAIL OF TRAFFIC SIGNAL LIGHT (TYPE2)



Materials STK400,SS400
Finishing Hot-dip galvanized

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MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

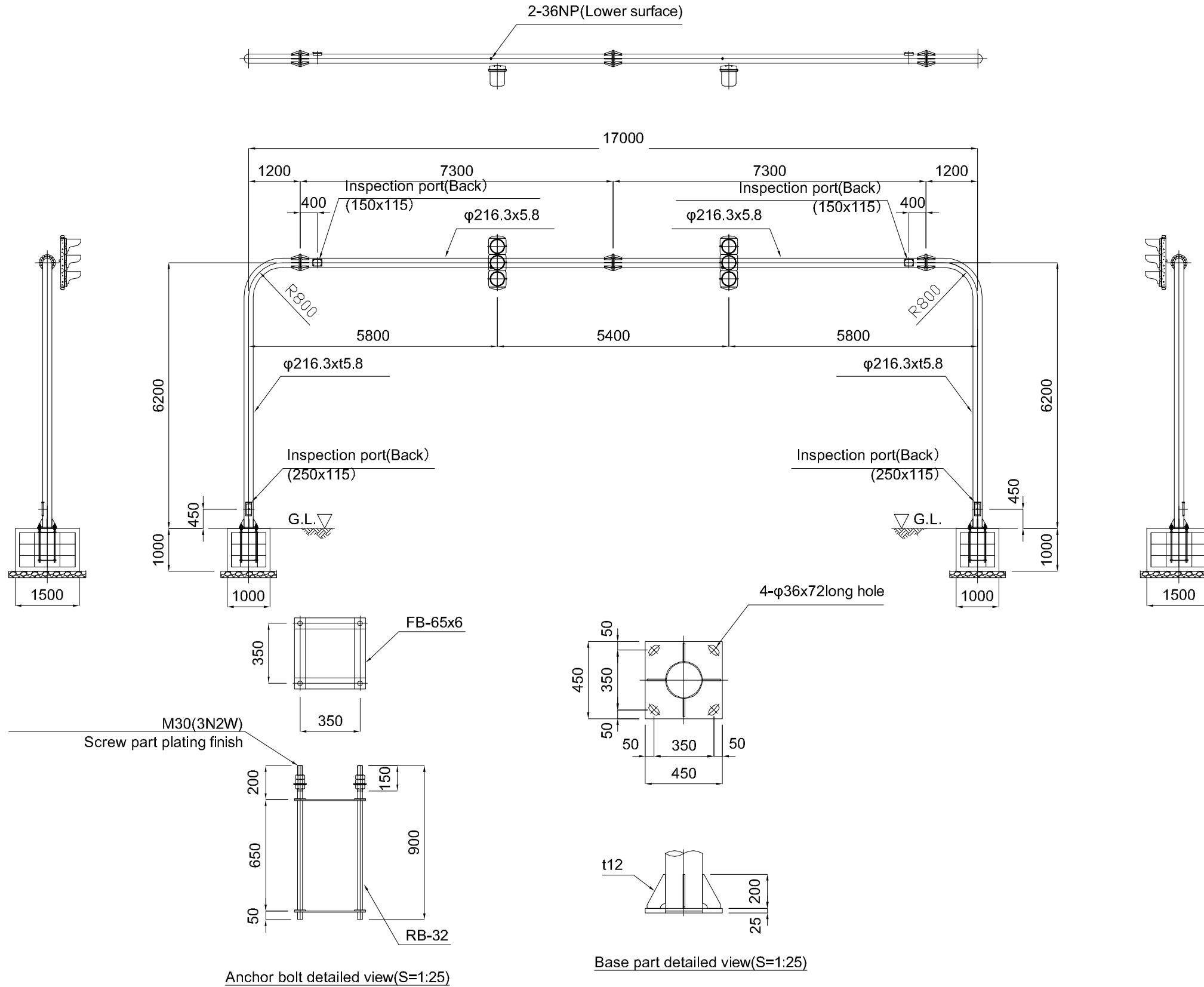
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
INSTALLATION
AND DETAIL DRAWING OF
TRAFFIC SIGNAL LIGHT (TYPE2)

SCALE:(A1size) DRAWING NO.

TS-04

DETAIL OF TRAFFIC SIGNAL LIGHT (TYPE3)



Materials STK400,SS400
Finishing Hot-dip galvanized

GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

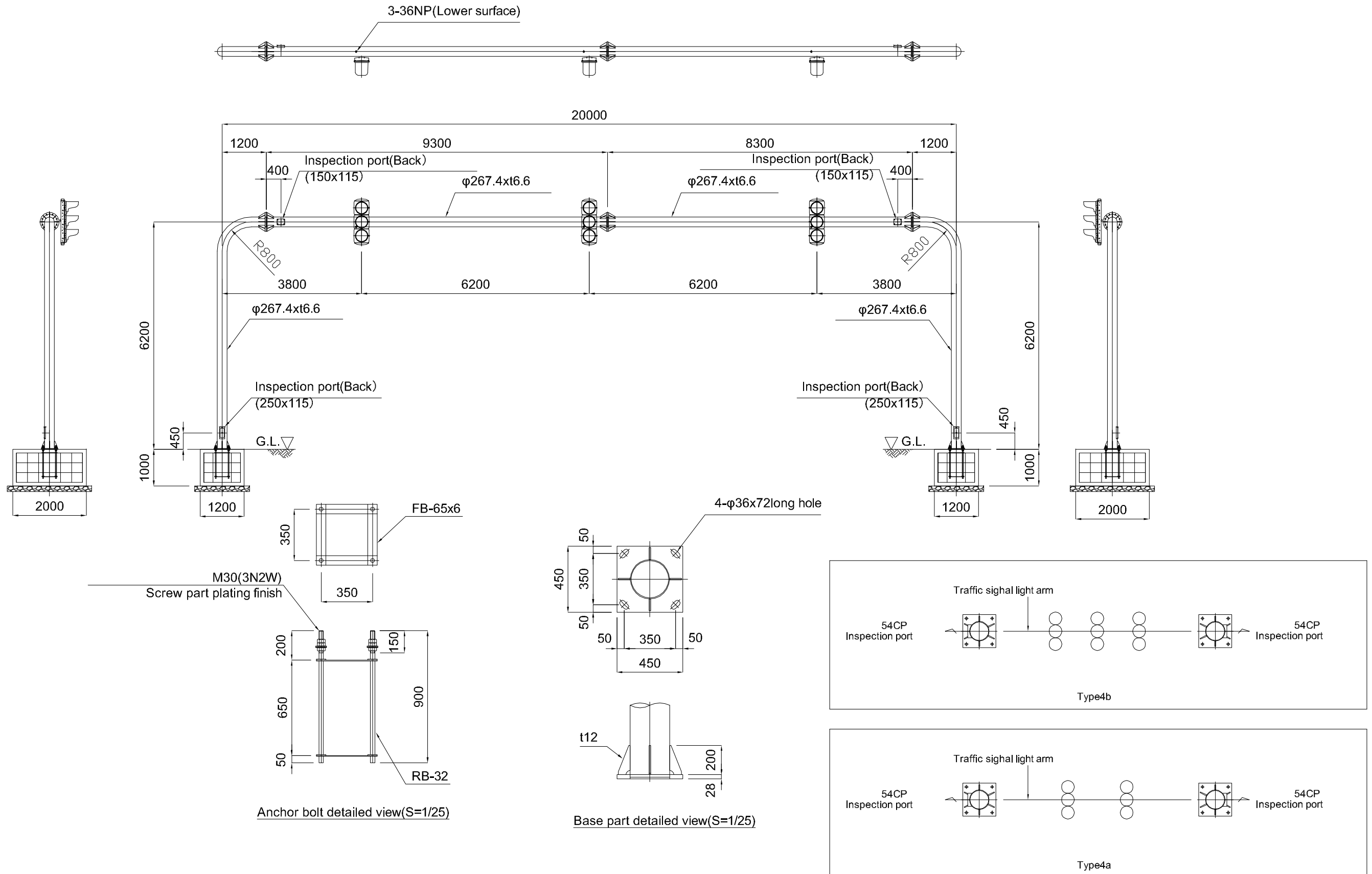
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
INSTALLATION
AND DETAIL DRAWING OF
TRAFFIC SIGNAL LIGHT (TYPE3)

SCALE:(A1size)	DRAWING NO.
AS SHOWN	TS-05

DETAIL OF TRAFFIC SIGNAL LIGHT (TYPE4)



Materials STK400,SS400
Finishing Hot-dip galvanized

GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

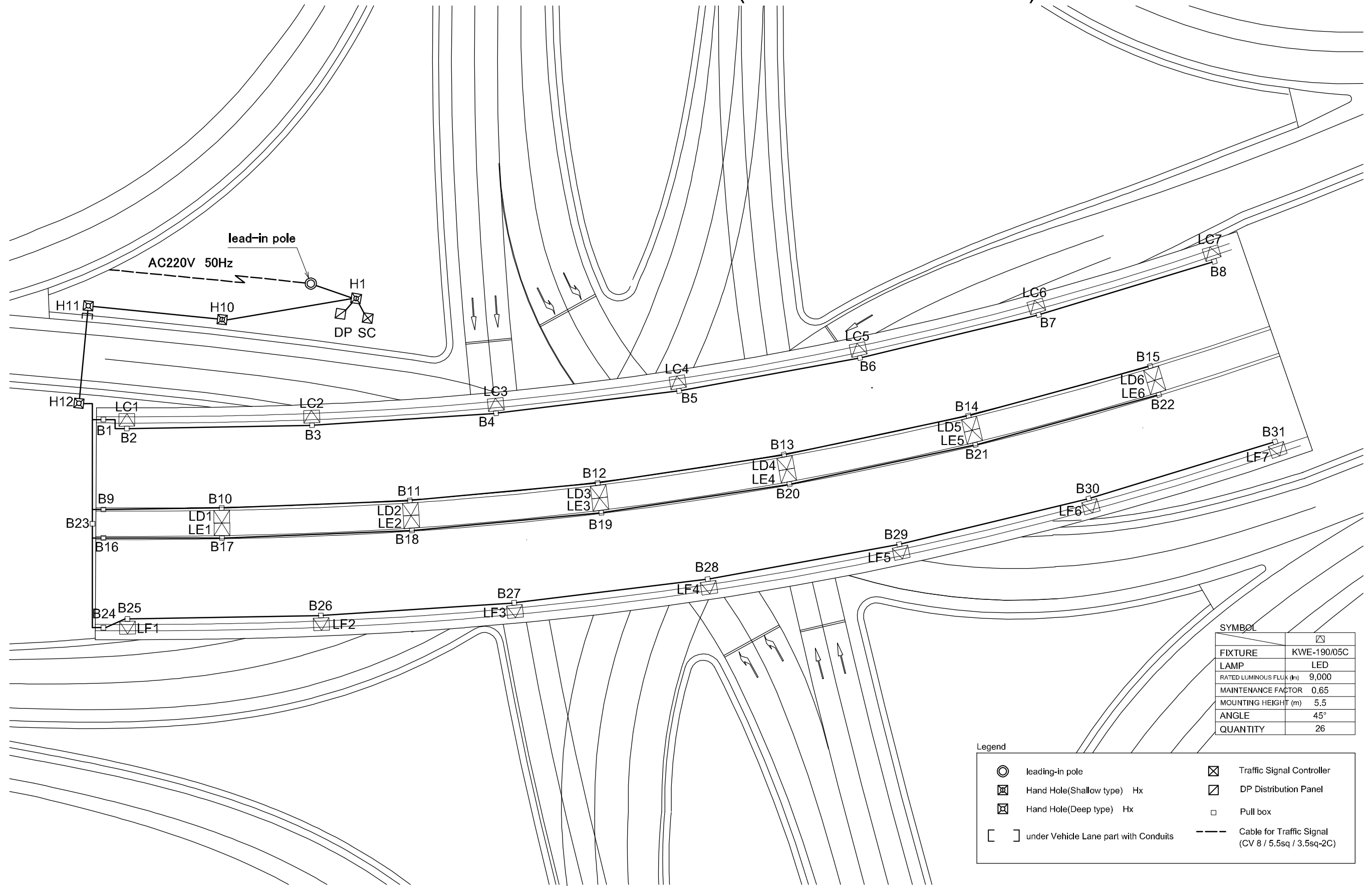
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

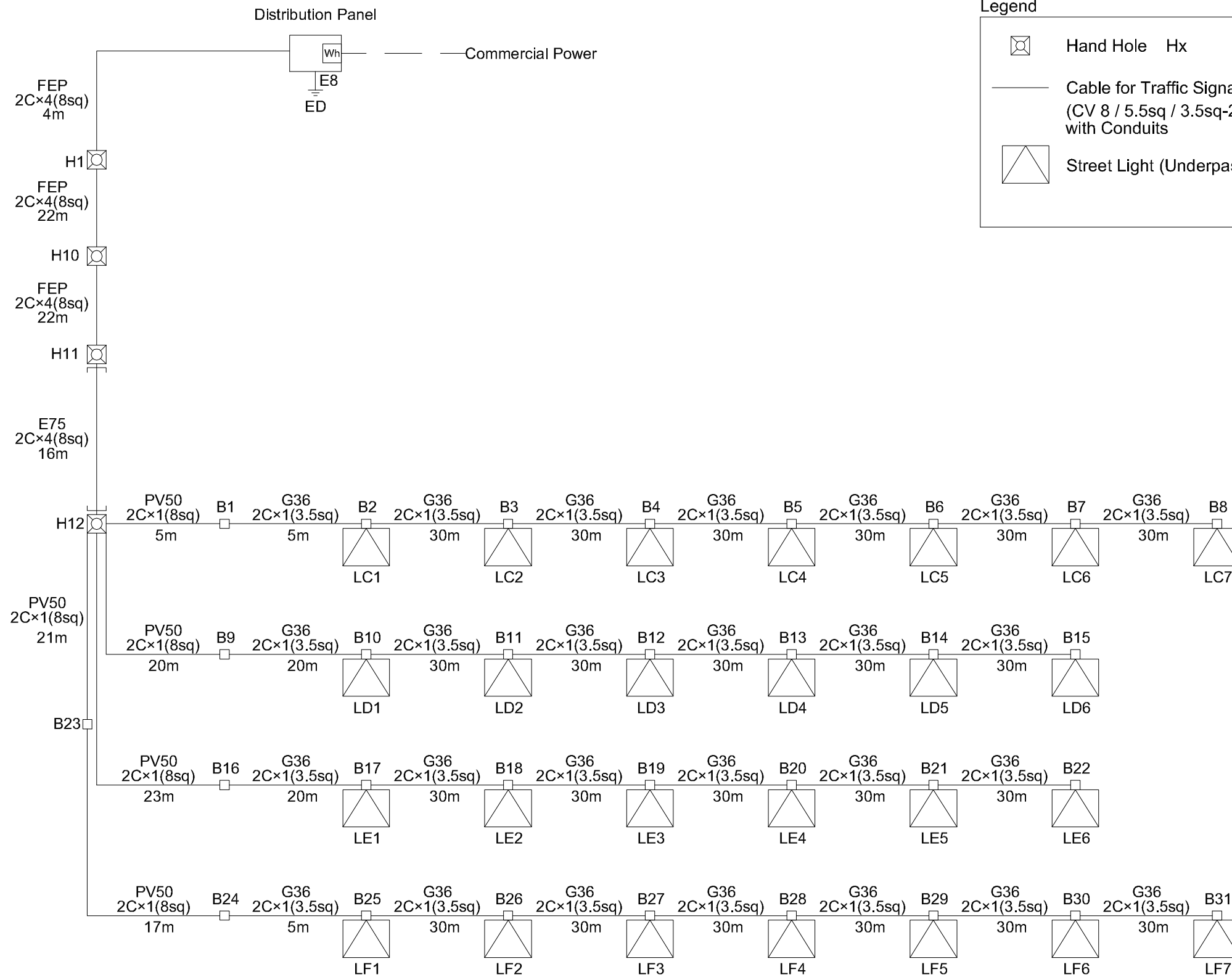
DRAWING TITLE:
INSTALLATION AND
DETAIL DRAWING OF
TRAFFIC SIGNAL LIGHT (TYPE4)

SCALE:(A1size) DRAWING NO.
TS-06

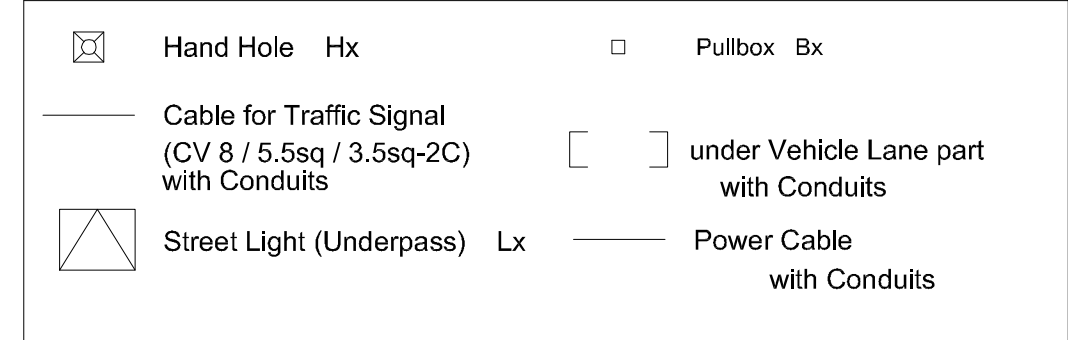
LAYOUT OF STREET LIGHT (INSIDE BOX CULVERT)



WIRING SYSTEM OF STREET LIGHT(UNDERPASS)



Legend



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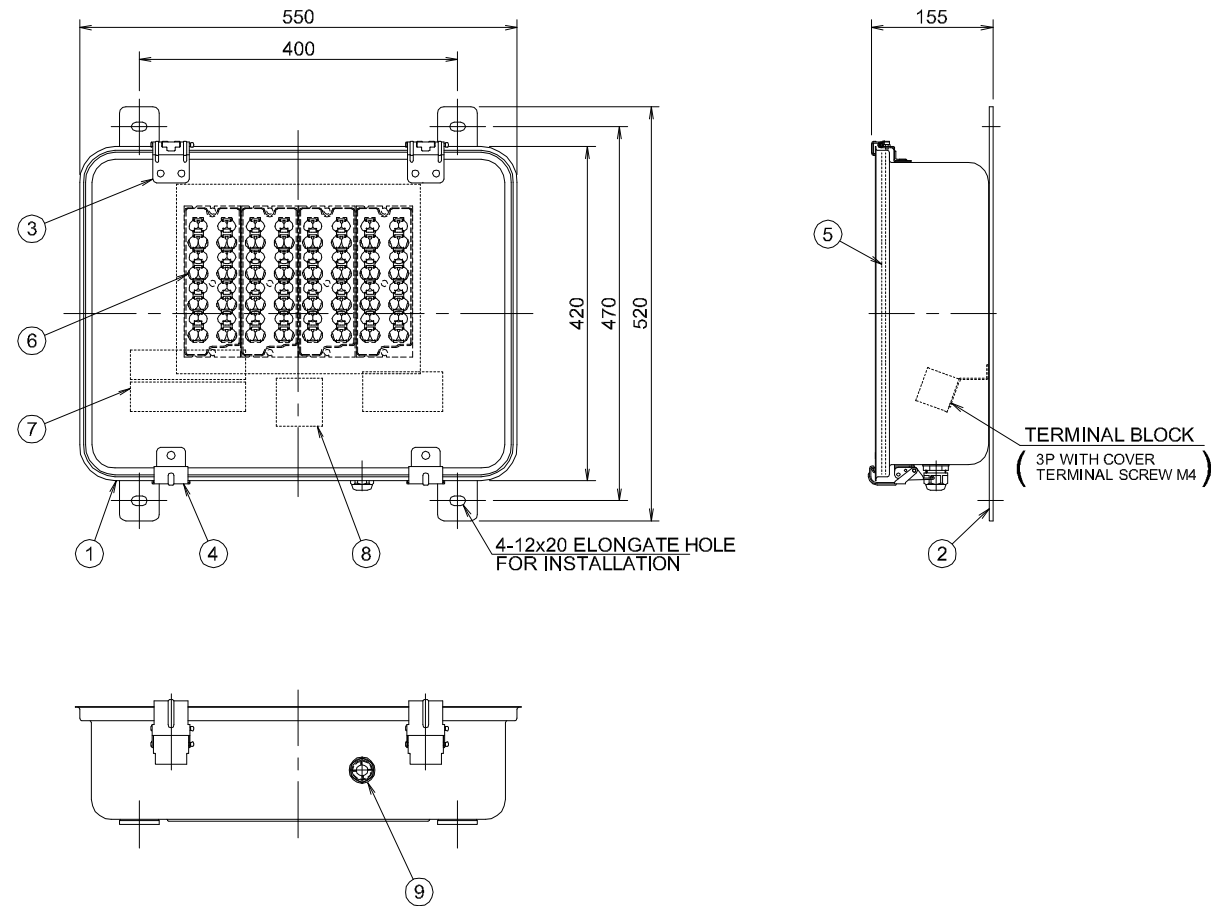
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
WIRING SYSTEM OF STREET LIGHT
(UNDERPASS)

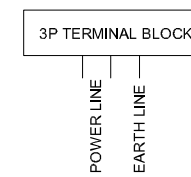
SCALE (As Size)	DRAWING NO.
	TS-08

DETAIL OF STREET LIGHT (UNDERPASS) S=1/5

LIGHTING FIXTURE FOR CULVERT (KWE-190/05C)



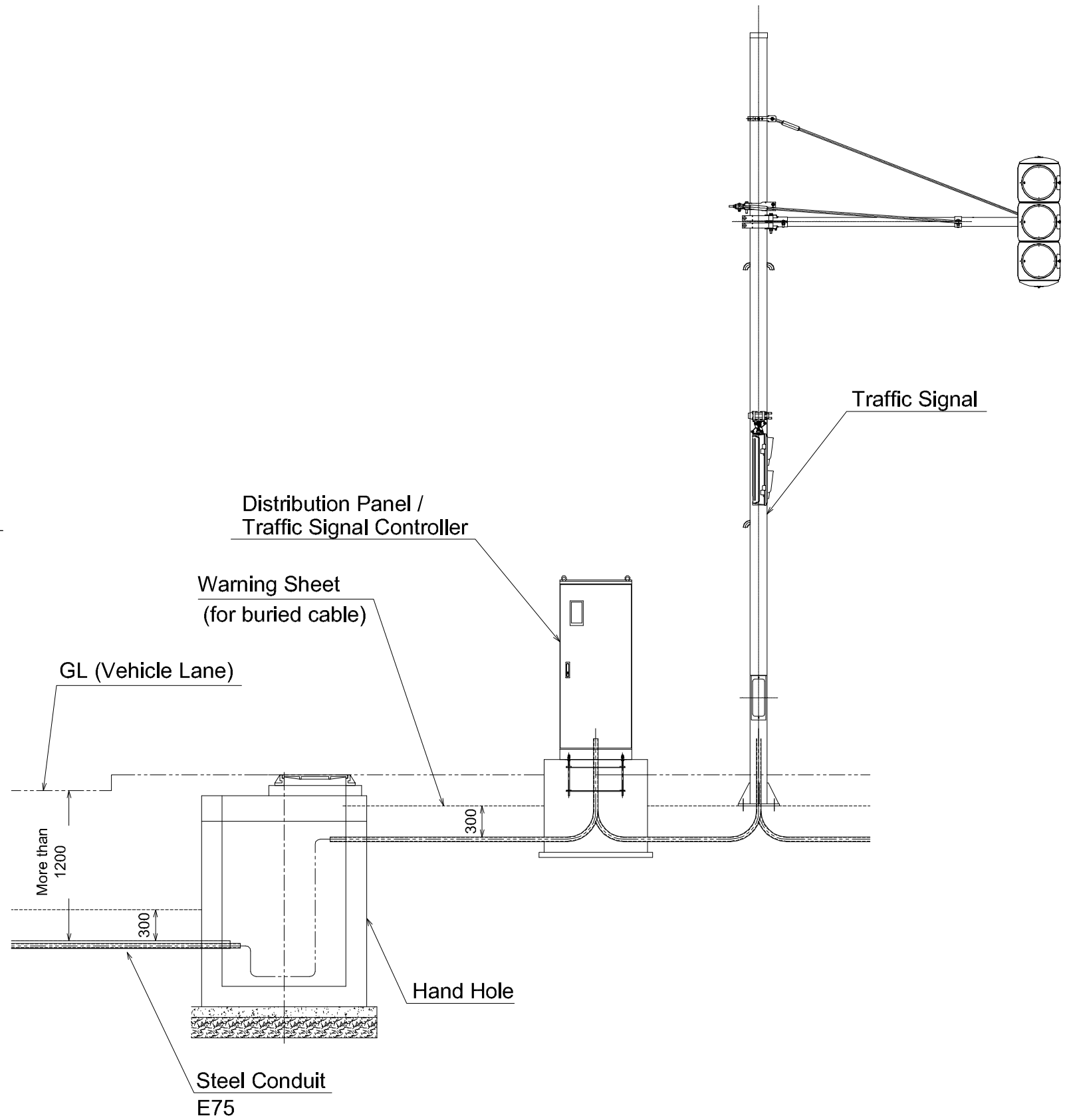
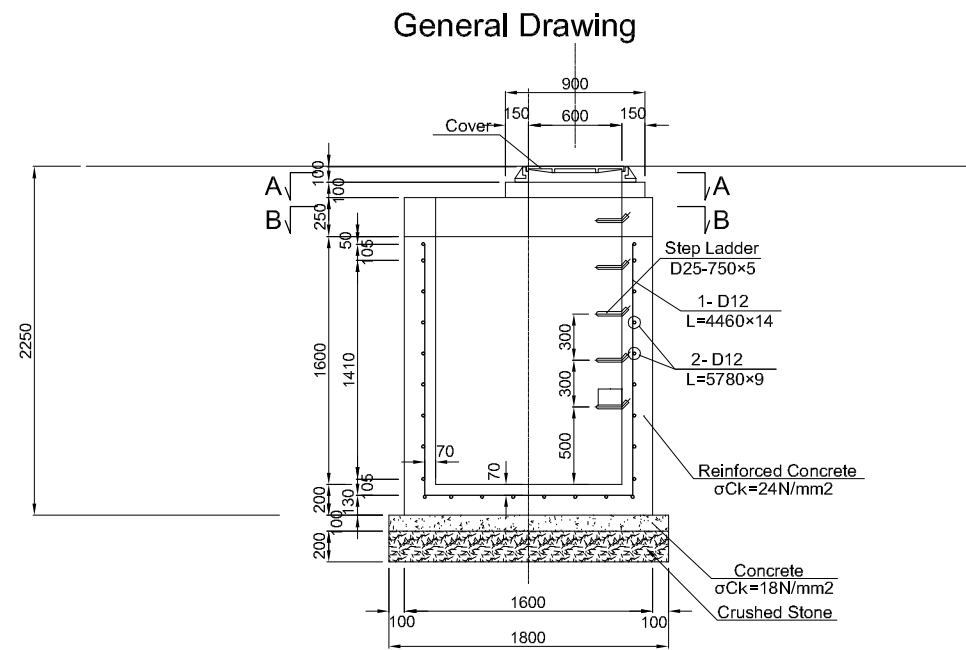
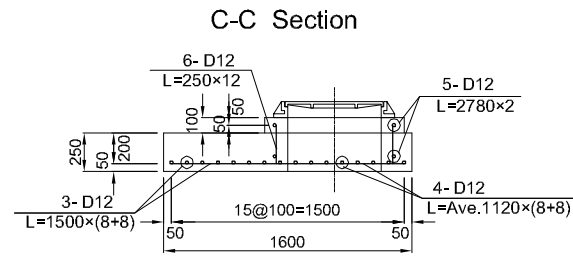
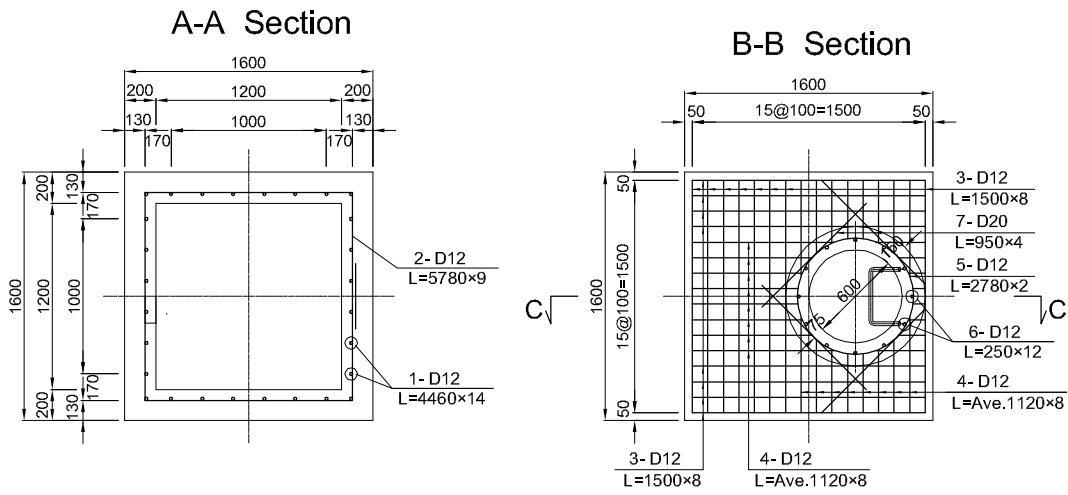
JOINT DIAGRAM



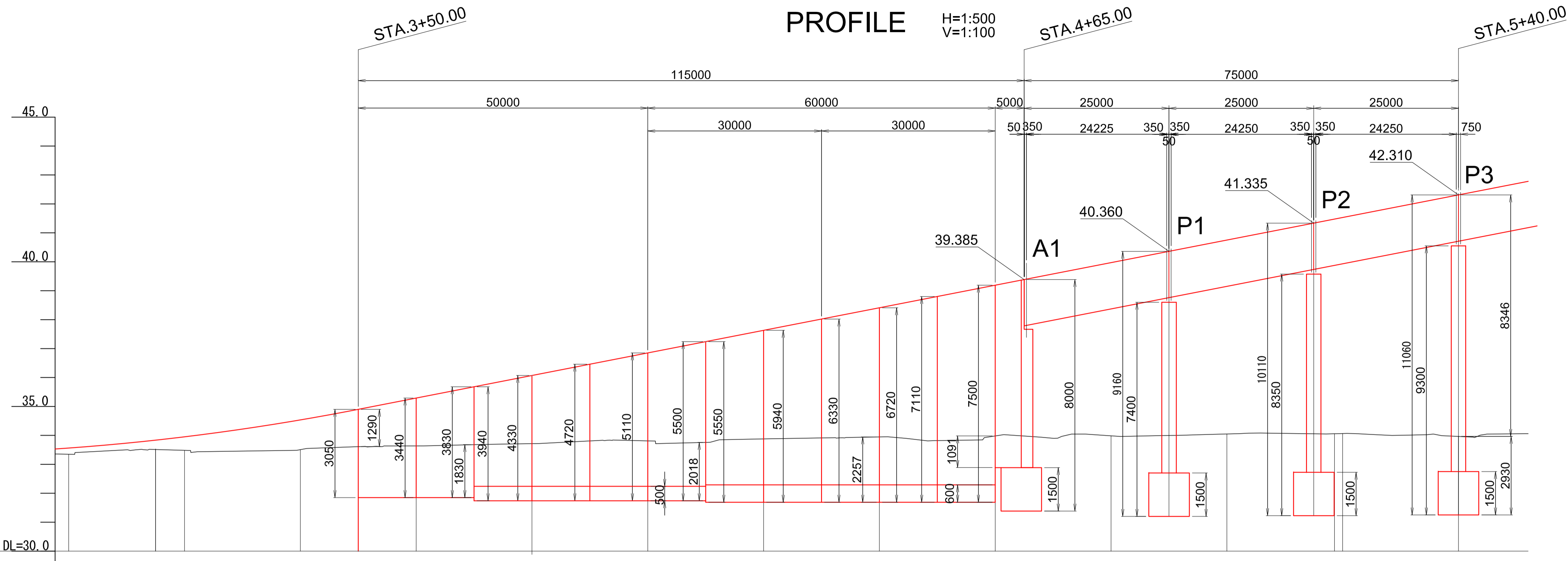
NO	PART NAME	MATERIAL/ THICKNESS	QTY	REMARKS
1	BODY	SUS304 t1.0	1	BAKED POLYSTER RESIN POWDER COATING
2	INSTALLATION ARM	STEEL SHEET t4.5	2	ZINC HOT DIP GALVANIZING
3	HINGE	SUS316 t1.5	2	
4	OPENING AND CLOSING FITTING	SUS316 t1.5	2	
5	FRONT GLASS	TEMPERED GLASS t5.0	1	CLEAR
6	LED UNIT	ASSEMBLY	1	
7	POWER SUPPLY UNIT	ASSEMBLY	2	
8	DISCONNECT TERMINAL BLOCK	ASSEMBLY	1	
9	WATERPROOF GLAND FOR POWER LINE	RESIN	1	

DETAIL OF CABLES AND HAND HOLE

Hand Hole S=1:20



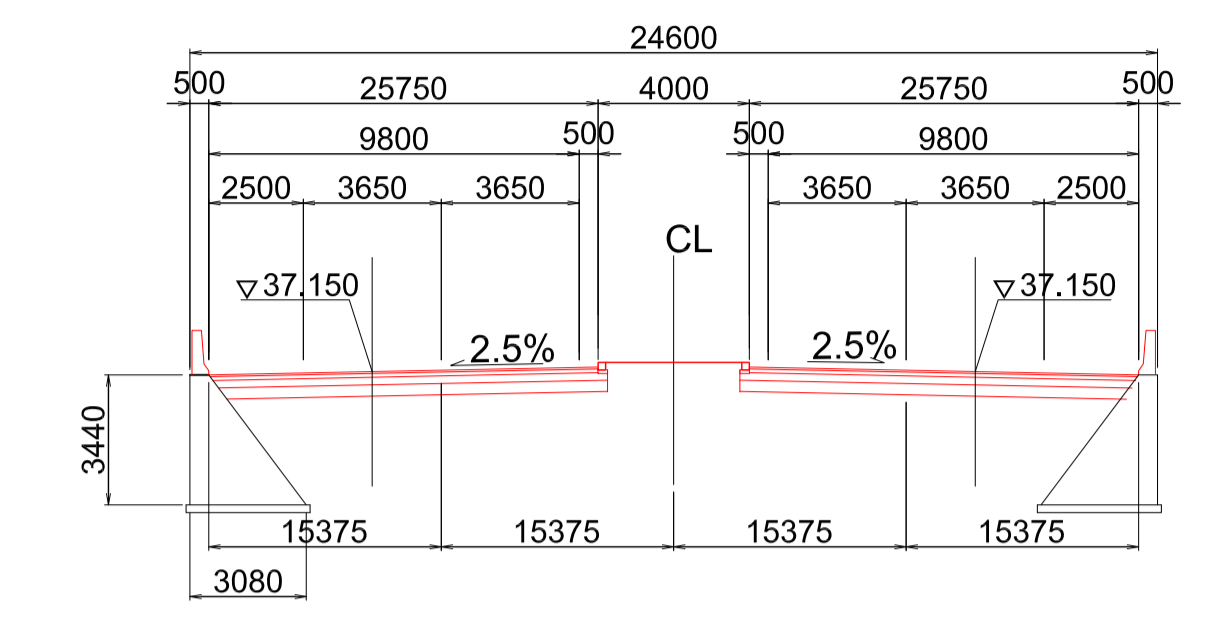
GENERAL DRAWING OF FLYOVER SECTION (1) (PHASE-2)



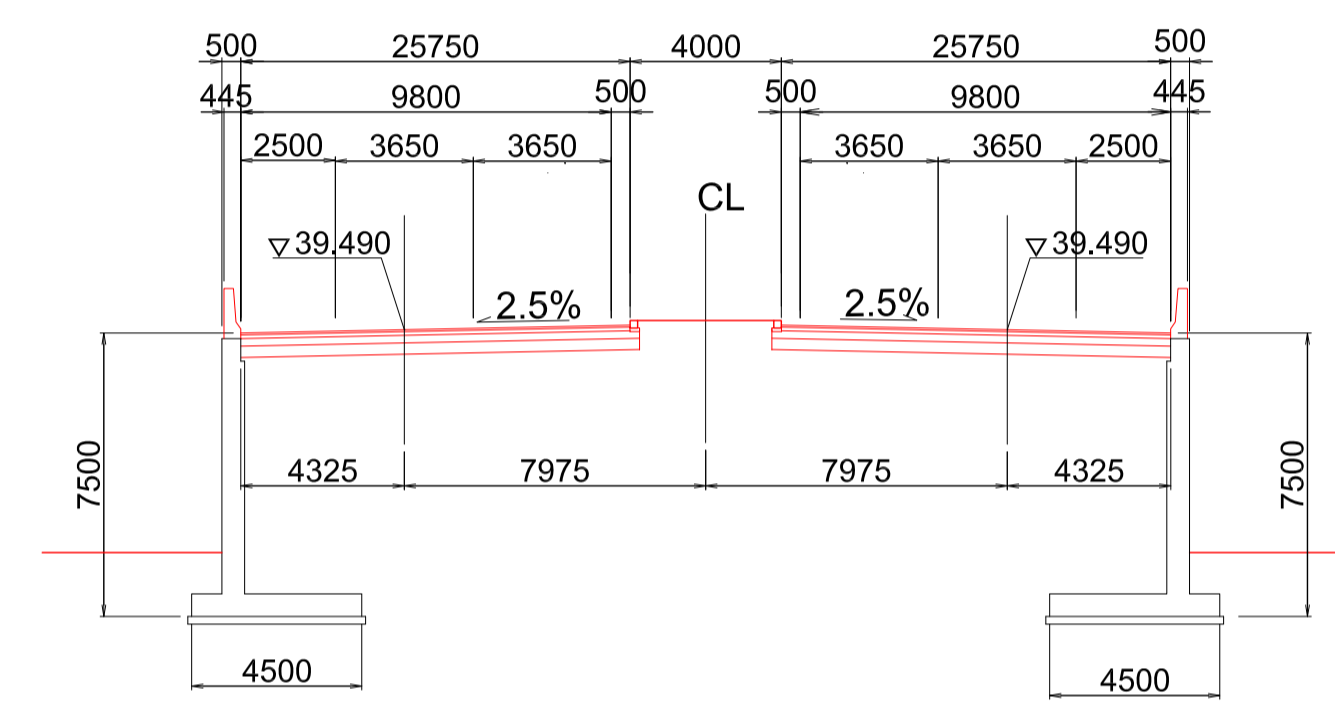
VERTICAL ALIGNMENT	$L=0.471\%$ $L=315.000$
FORMATION HEIGHT	33.562 33.835 33.950 34.534 34.912 35.290 36.070 36.850 37.630 38.410 39.190 39.970 40.750 41.475 41.530 42.310
GROUND HEIGHT	33.35 33.51 33.48 33.51 33.64 33.71 33.81 33.88 33.95 33.98 34.05 34.06 34.06 33.96
STATION	20.000 15.000 5.000 20.000 10.000 10.000 20.000 20.000 20.000 20.000 20.000 20.000 20.000 18.590 1.410 20.000
SUPER ELEVATION	STA..3 +15.000 +20.000 +40.000 +50.000 +60.000 +80.000 STA..4 +20.000 +40.000 +60.000 +80.000 STA..5 KA 1-1 +20.000 +40.000
HORIZONTAL CURVATURE	$R=$ $L=518.59$
WIDENING	$L=93.077$ $A=220$

FOR REFERENCE ONLY

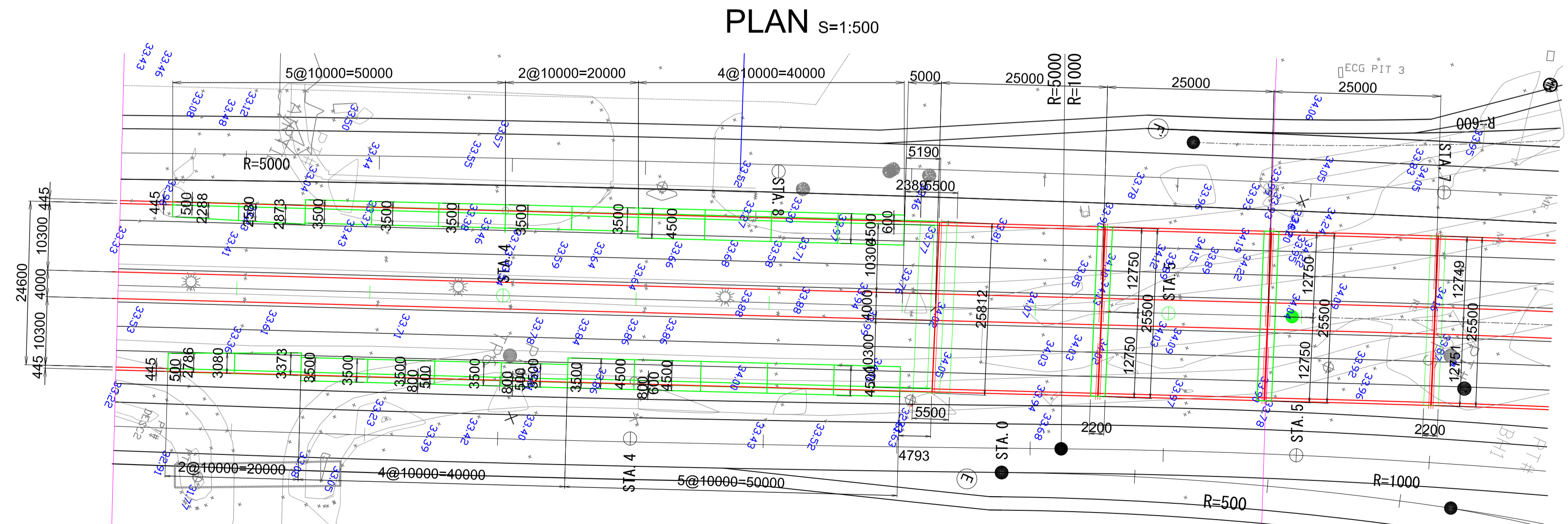
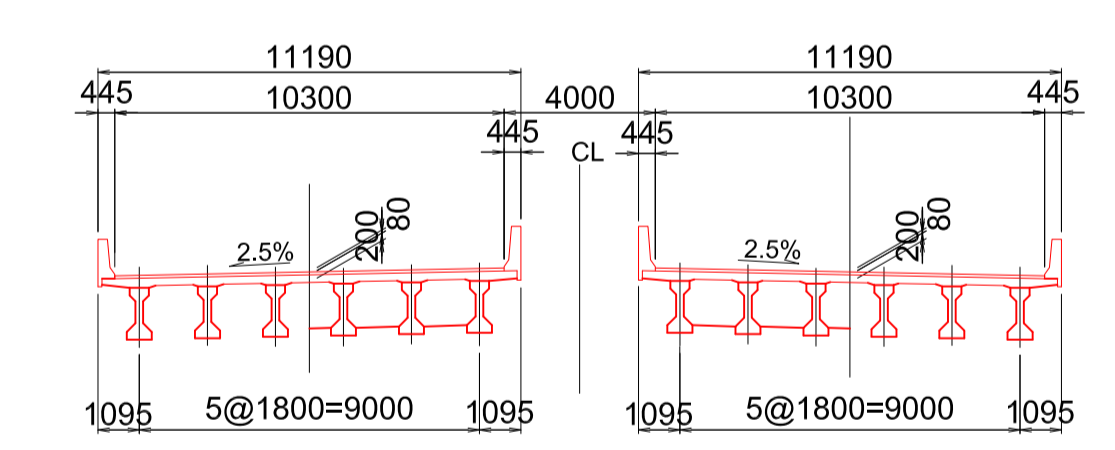
CROSS SECTION S=1:200
STA NO.4+00.00



STA NO.4+60.00



STA NO.4+60.00
SIMPLE PC GIRDER



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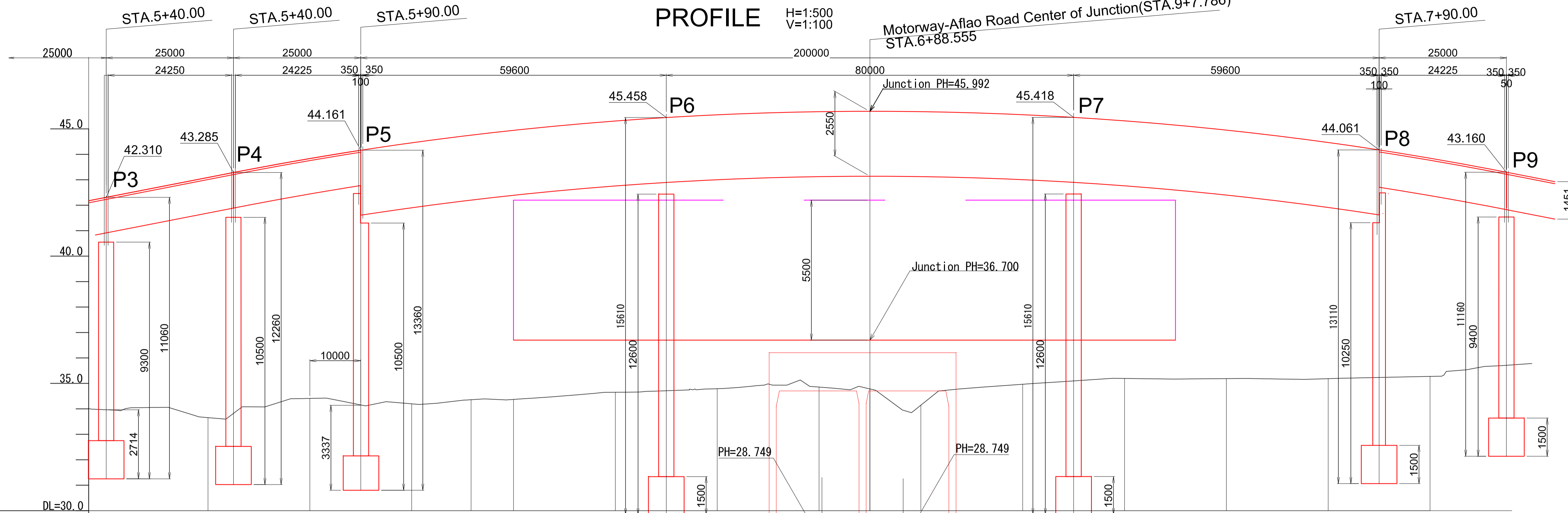
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
GENERAL DRAWING OF FLYOVER SECTION (1)
(PHASE-2)

SCALE	DRAWING NO.
As Shown	RF-01

GENERAL DRAWING OF FLYOVER SECTION (2) (PHASE-2)

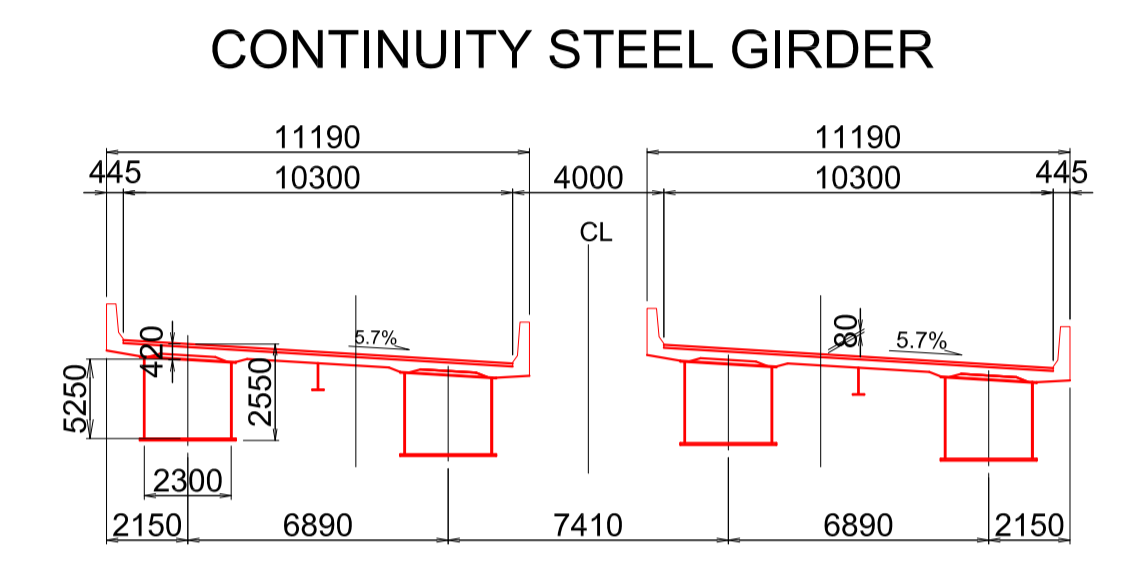
PROFILE H=1:500 V=1:100 Motorway-Aflao Road Center of Junction(STA.9+7.786) STA.6+88.555



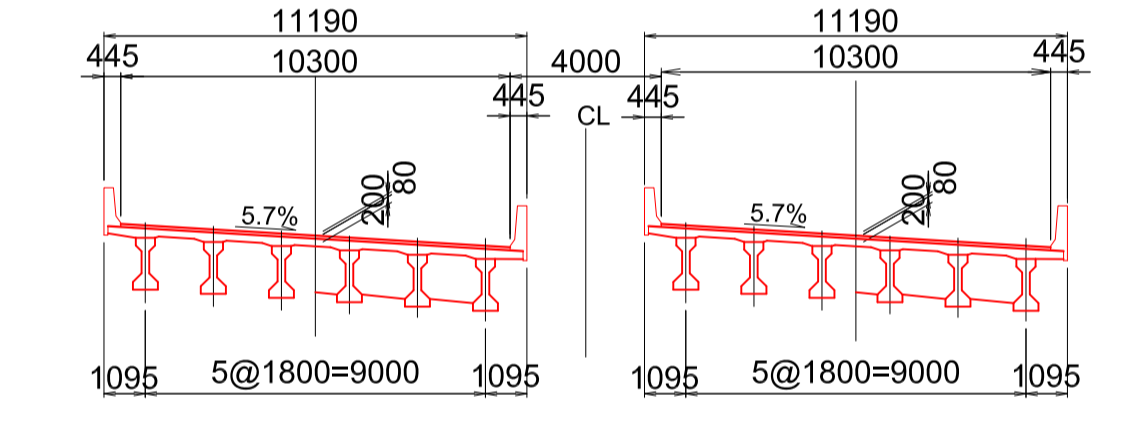
VERTICAL ALIGNMENT	$i=3.900\%$ $L=375.000$		$i=4.000\%$ $L=280.000$												
FORMATION HEIGHT	42.310	43.090	43.834	44.456	45.321	45.564	45.680	45.691	45.670	45.534	45.271	44.882	44.366	43.724	
GROUND HEIGHT	33.96	33.66	34.41	34.20	34.65	34.79	34.86	34.78	34.14	34.97	35.19	35.19	35.19	35.27	
STATION	-20.000	-20.000	-20.000	-20.000	-20.000	-20.000	-20.000	-10.000	-10.000	-20.000	-20.000	-20.000	-20.000	-20.000	
SUPER ELEVATION	+40.000	+60.000	+80.000	-STA.6	-KE 1-1	+20.000	+40.000	+60.000	+90.000	-STA.7	+20.000	+40.000	+60.000	+80.000	-STA.8
HORIZONTAL CURVATURE	$L=93.077$ $A=220$		$L=322.555$ $R=520$												
WIDENING	2.50 STA.5 +46.967	2.50 STA.5 +75.344	1/155	5.70 STA.6 +11.667	1/155										

FOR REFERENCE ONLY

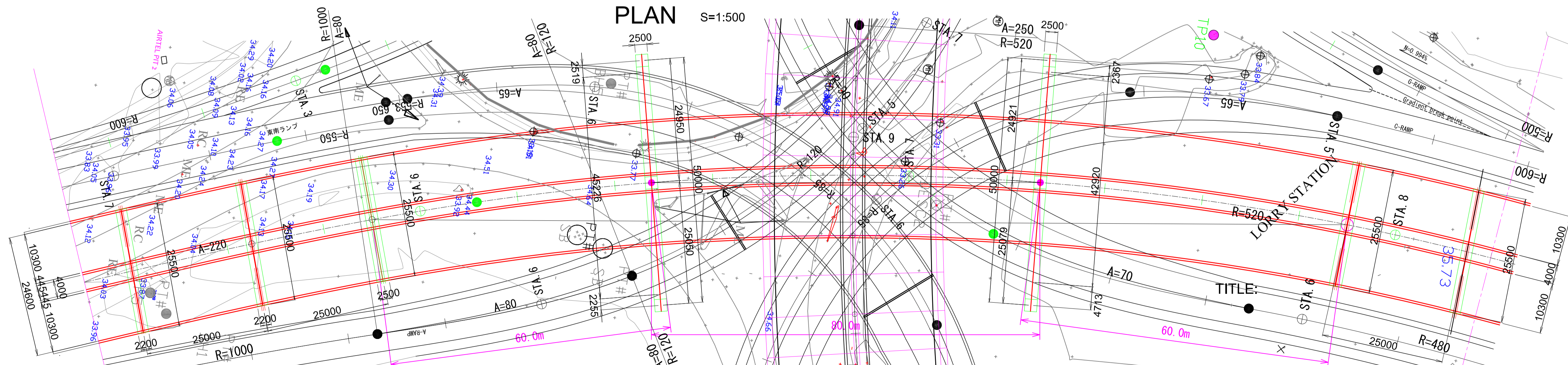
CROSS SECTION S=1:200



SIMPLE PC GIRDER



PLAN S=1:500



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REPUBLIC OF GHANA

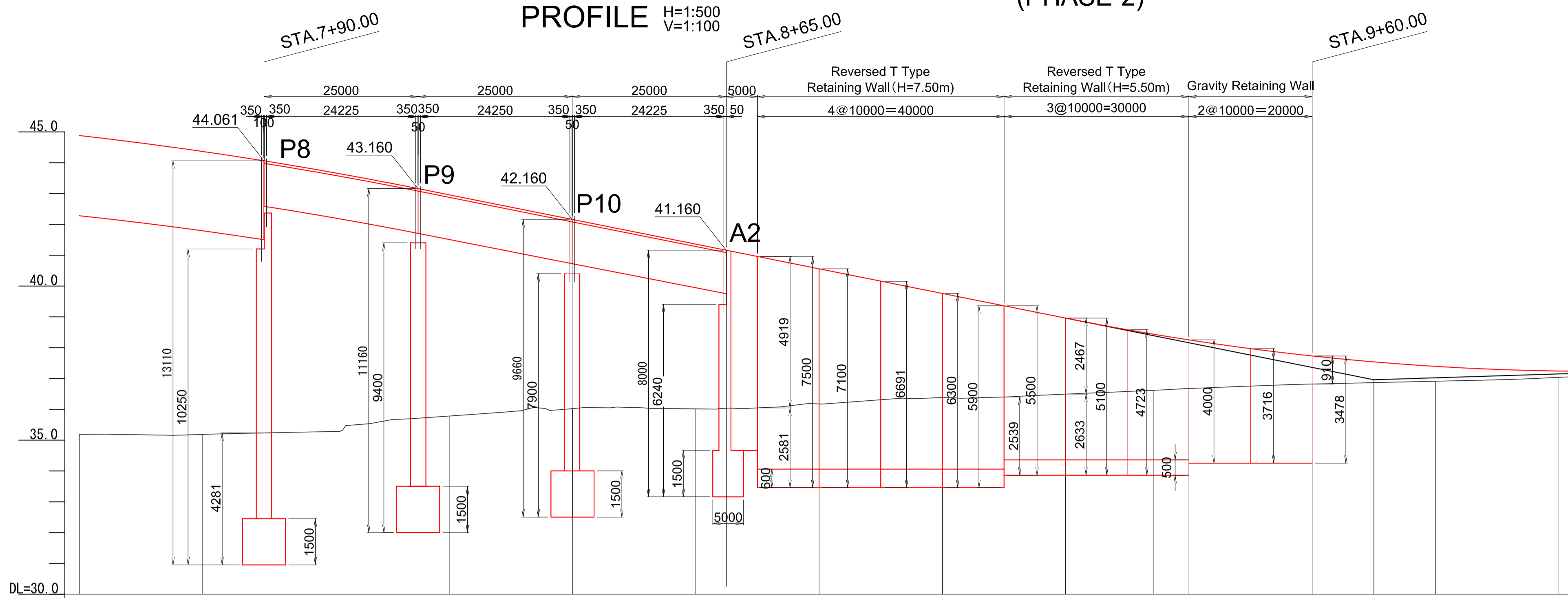
CTI ENGINEERING INTERNATIONAL CO., LTD.
JAPAN INTERNATIONAL COOPERATION AGENCY

PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
GENERAL DRAWING OF FLYOVER SECTION(2)
(PHASE-2)

SCALE	DRAWING NO.
As Shown	RF-02

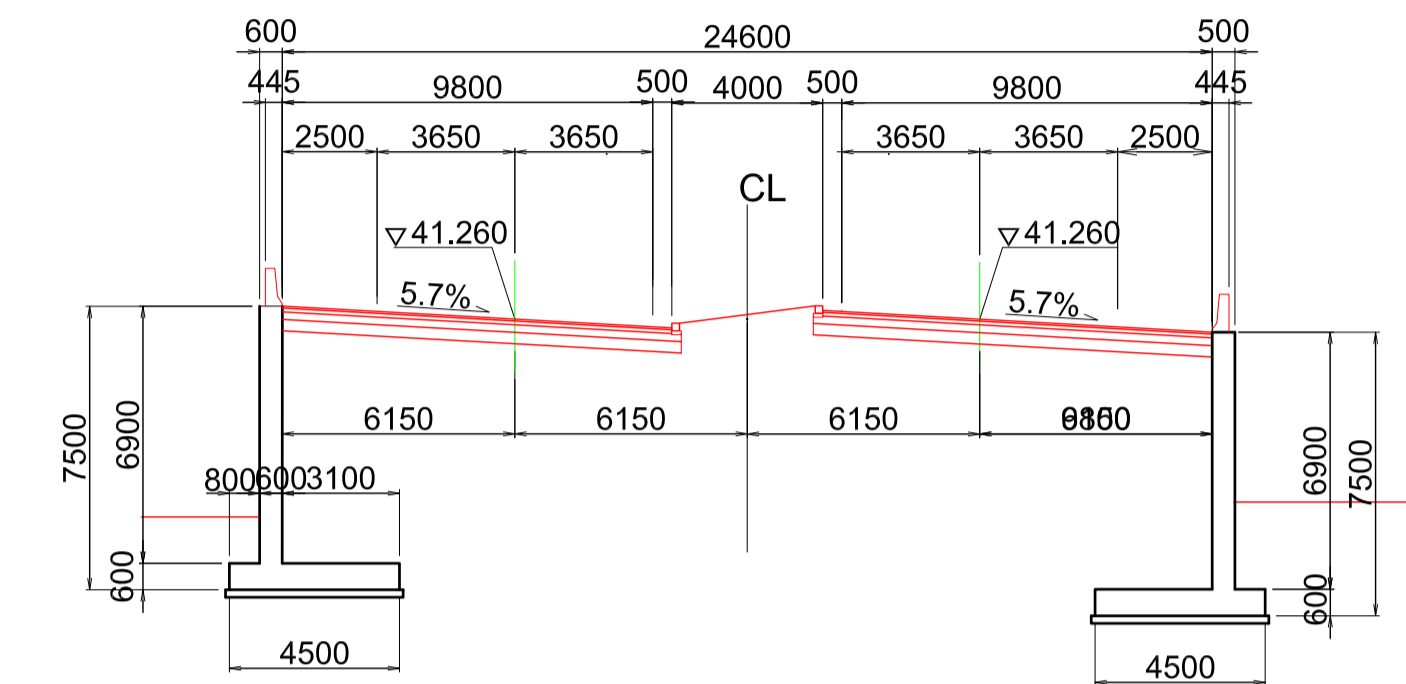
GENERAL DRAWING OF FLYOVER SECTION (3) (PHASE-2)



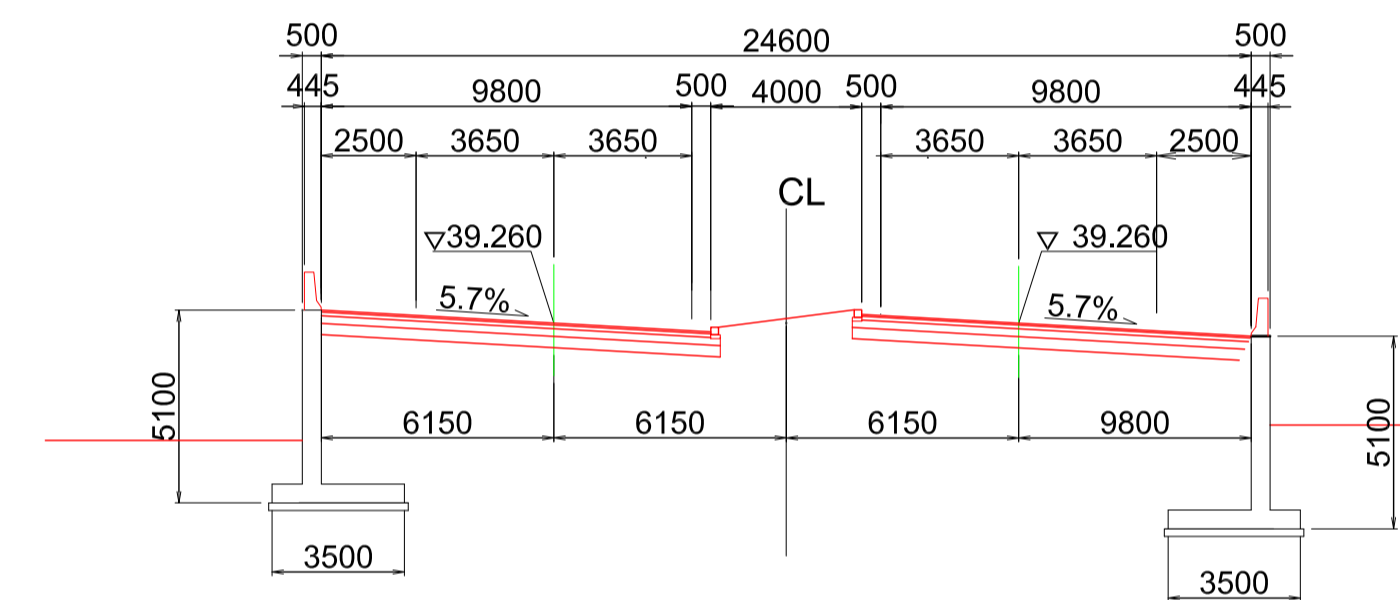
FOR REFERENCE ONLY

CROSS SECTION S=1:200

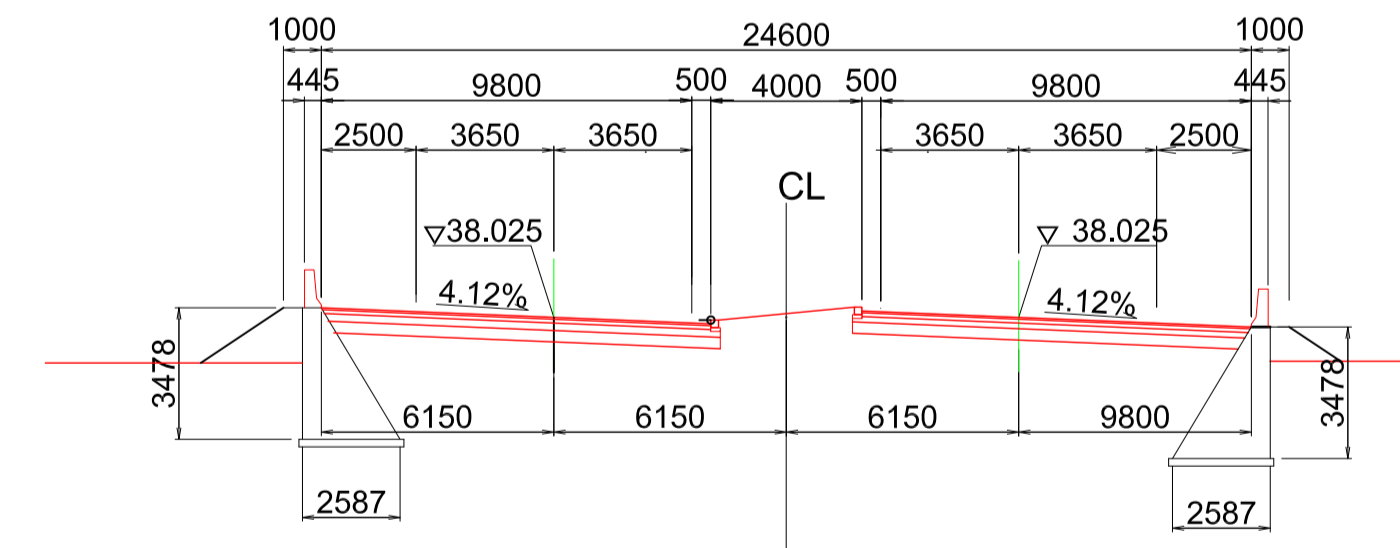
STA NO.8+70.00



STA NO.9+20.00

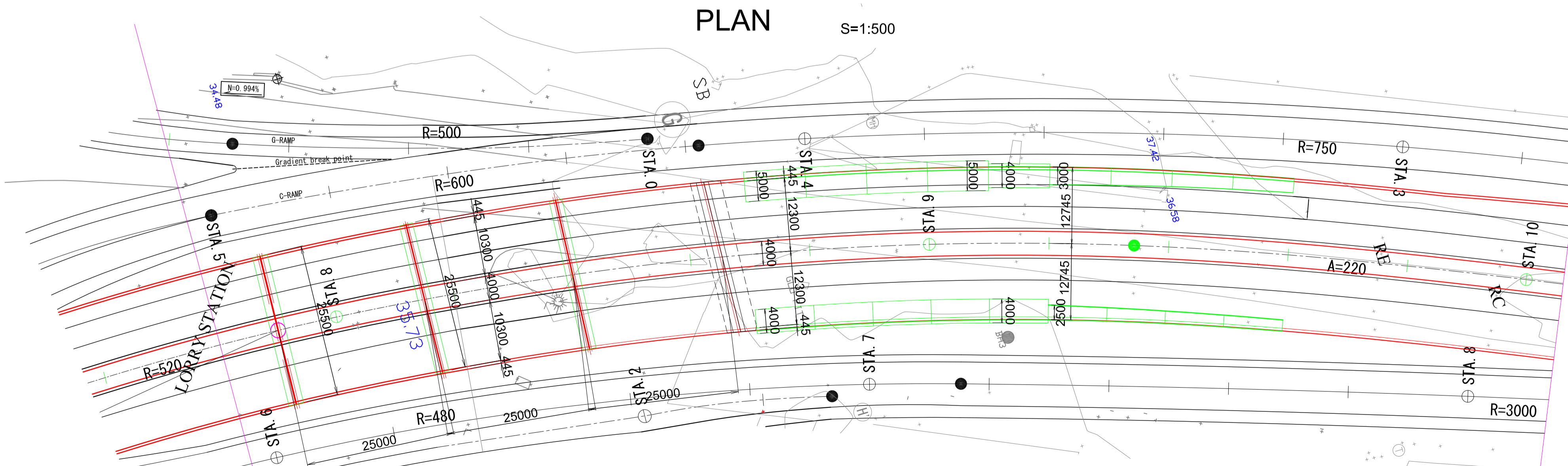


STA NO.9+60.00



VERTICAL ALIGNMENT	$i = -4.000\%$ $L = 280.000$										$i = +0.632\%$ $L = 440.000$			
FORMATION HEIGHT	44.882	44.366	43.724	42.960	42.160	41.360	40.560	39.760	38.960	38.438	37.731	37.539	37.394	37.242
GROUND HEIGHT	35.19	35.19	35.27	35.78	36.02	36.01	36.17	36.38	36.49	36.62	36.67	36.82	36.91	37.04
STATION	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	14.222	5.778	20.000	10.000	20.000
SUPER ELEVATION	+60.000	+80.000	STA. 8	+20.000	+40.000	+60.000	+80.000	STA. 9	+20.000	KE 1-2	+40.000	+60.000	+70.000	+80.000
HORIZONTAL CURVATURE	$L = 322.555$ $R = 520$										$L = 93.077$ $A = 220$			
WIDENING											5.700 STA. 9 +34.222	1/224		

PLAN S=1:500



GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
REPUBLIC OF GHANA

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JAPAN INTERNATIONAL COOPERATION AGENCY

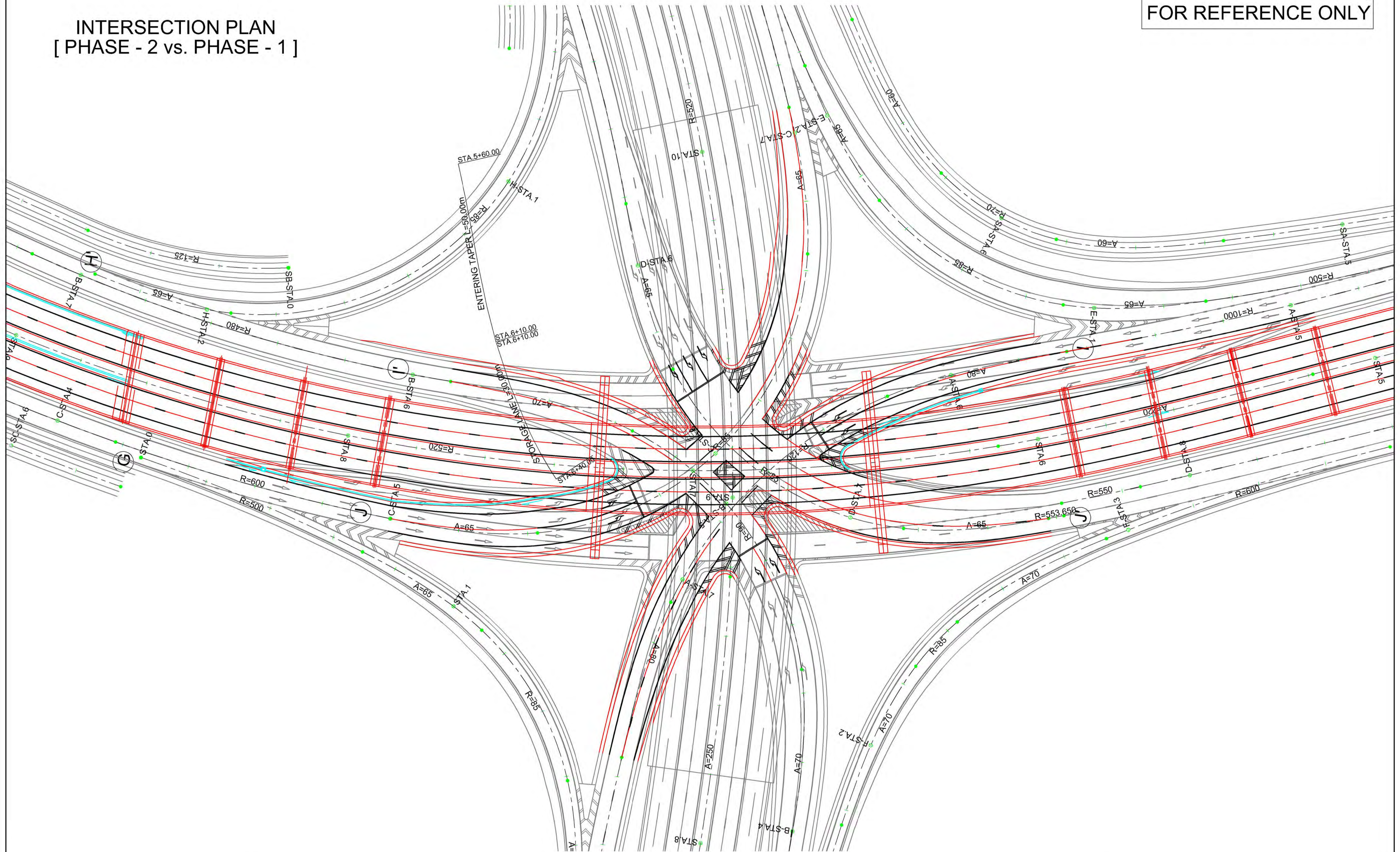
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
GENERAL DRAWING OF FLYOVER SECTION (3)
(PHASE-2)

SCALE	DRAWING NO.
As Shown	RF-03

INTERSECTION PLAN
[PHASE - 2 vs. PHASE - 1]

FOR REFERENCE ONLY



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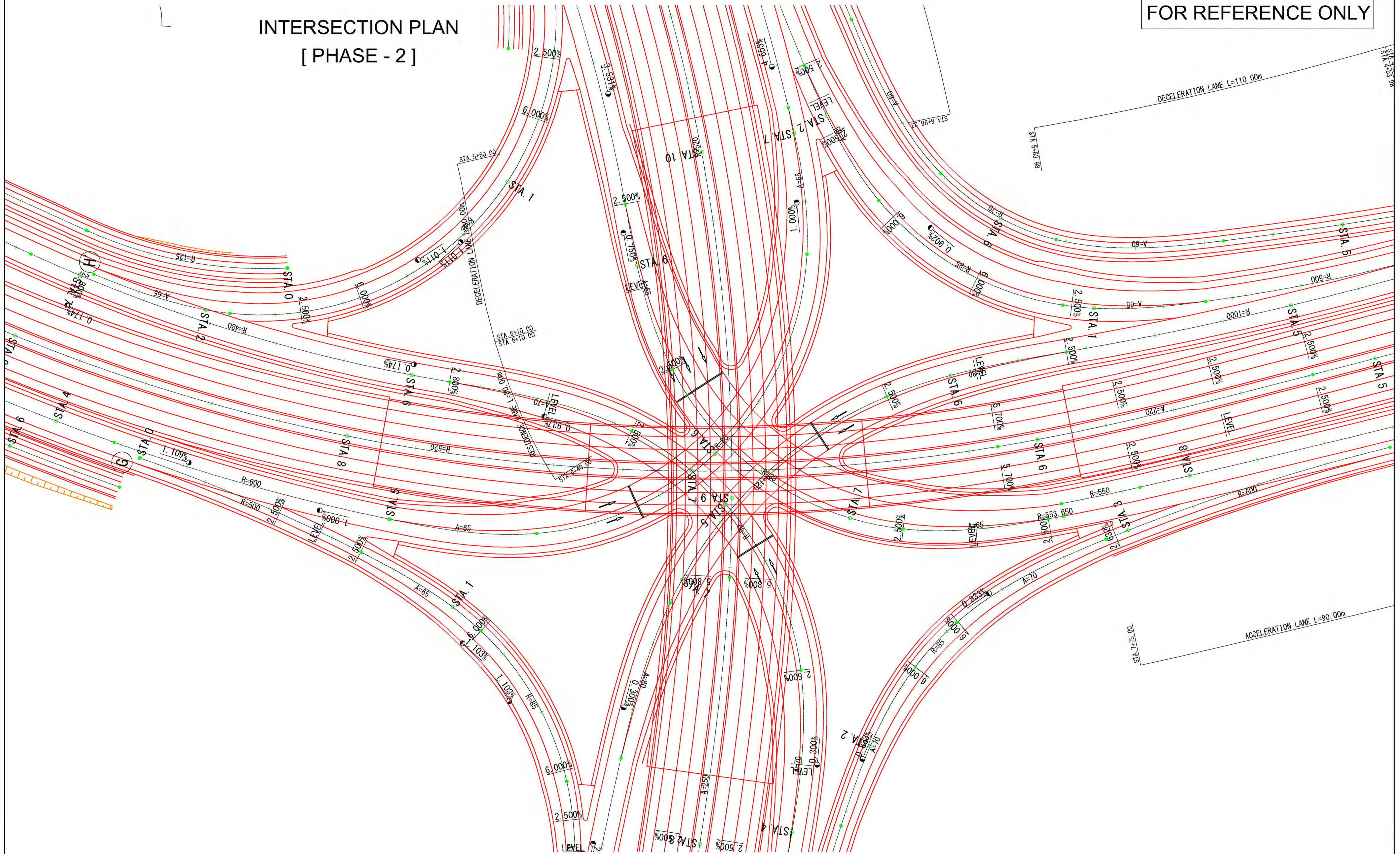
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
INTERSECTION PLAN (1)

SCALE	DRAWING NO.
S=1:500	RF-04

INTERSECTION PLAN [PHASE - 2]

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PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

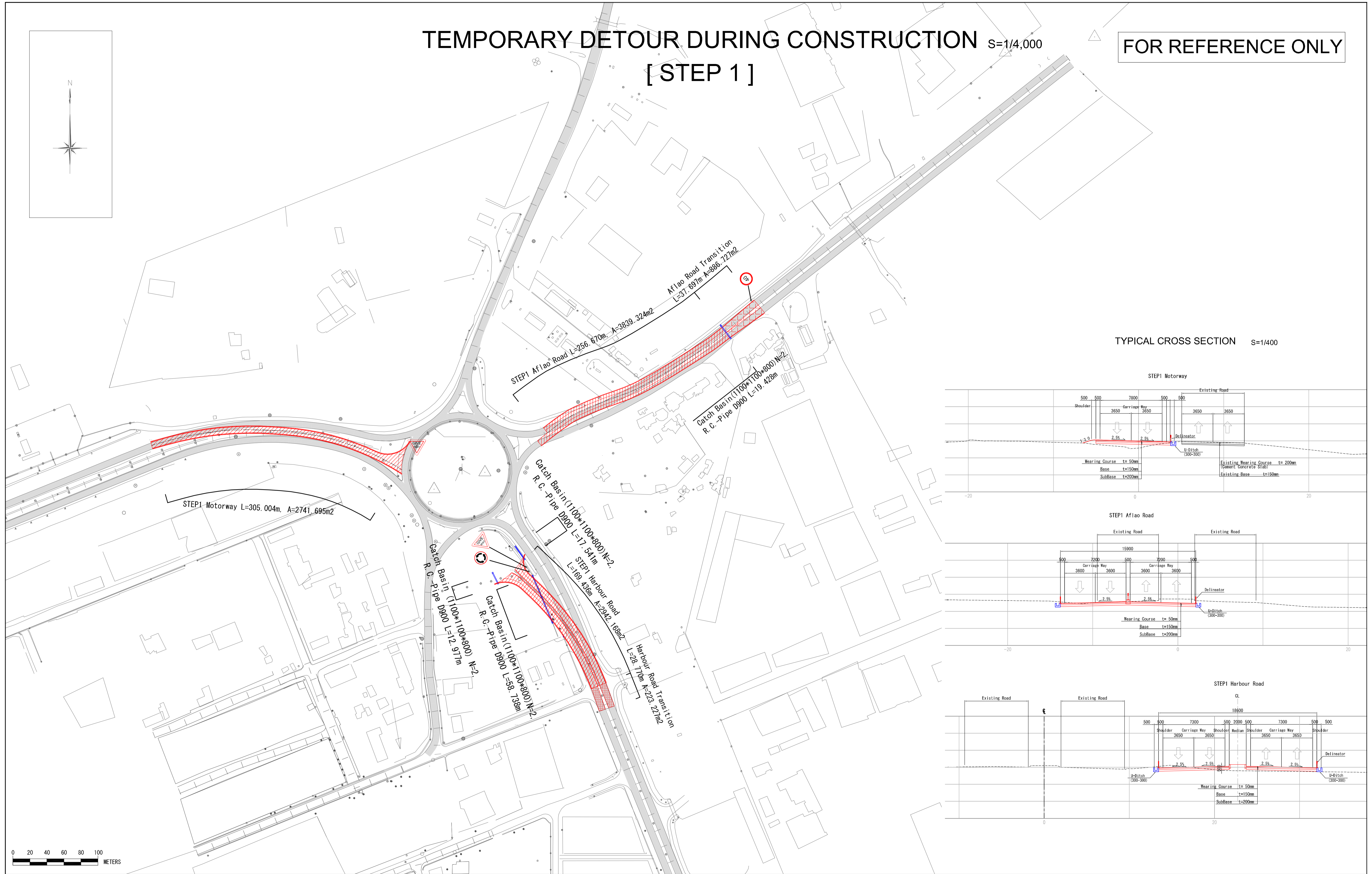
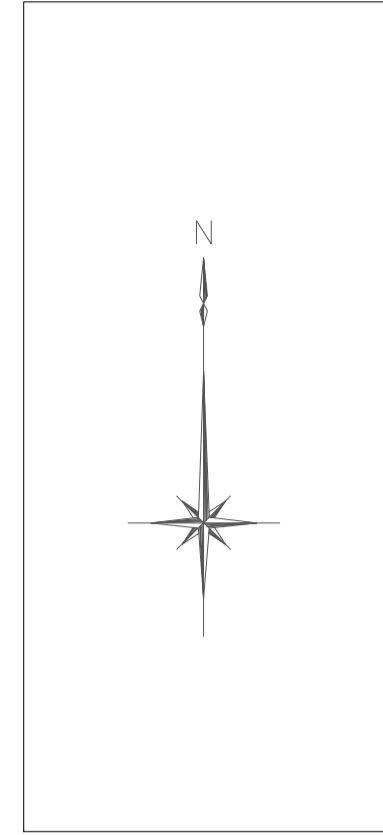
DRAWING TITLE:
**INTERSECTION PLAN
[PHASE - 2]**

SCALE	DRAWING NO.
S=1:500	RF-05

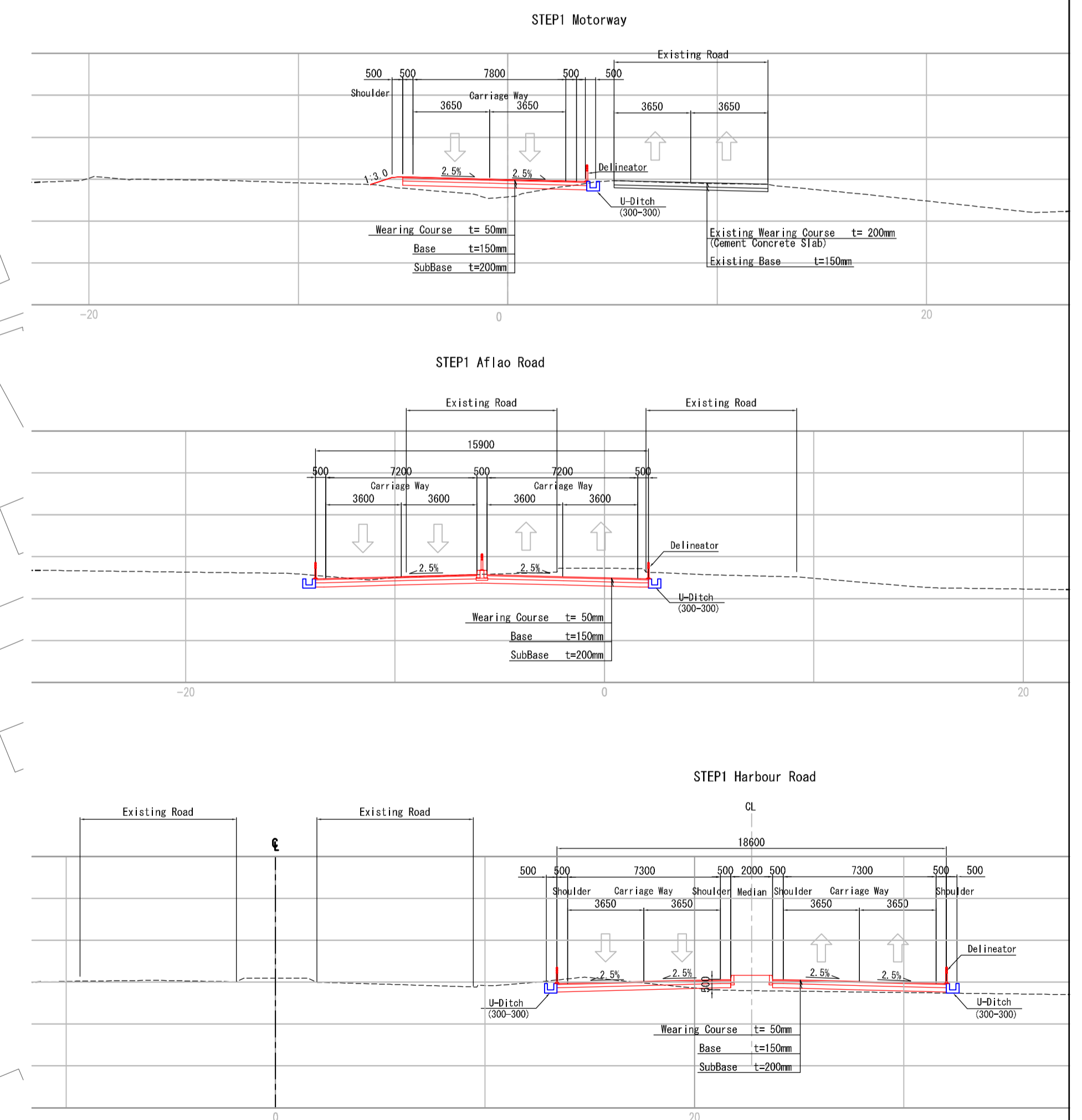
TEMPORARY DETOUR DURING CONSTRUCTION [STEP 1]

S=1/4,000

FOR REFERENCE ONLY



TYPICAL CROSS SECTION S=1/400



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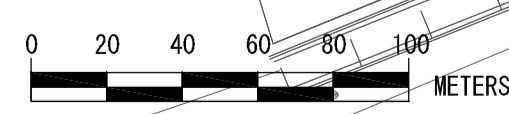
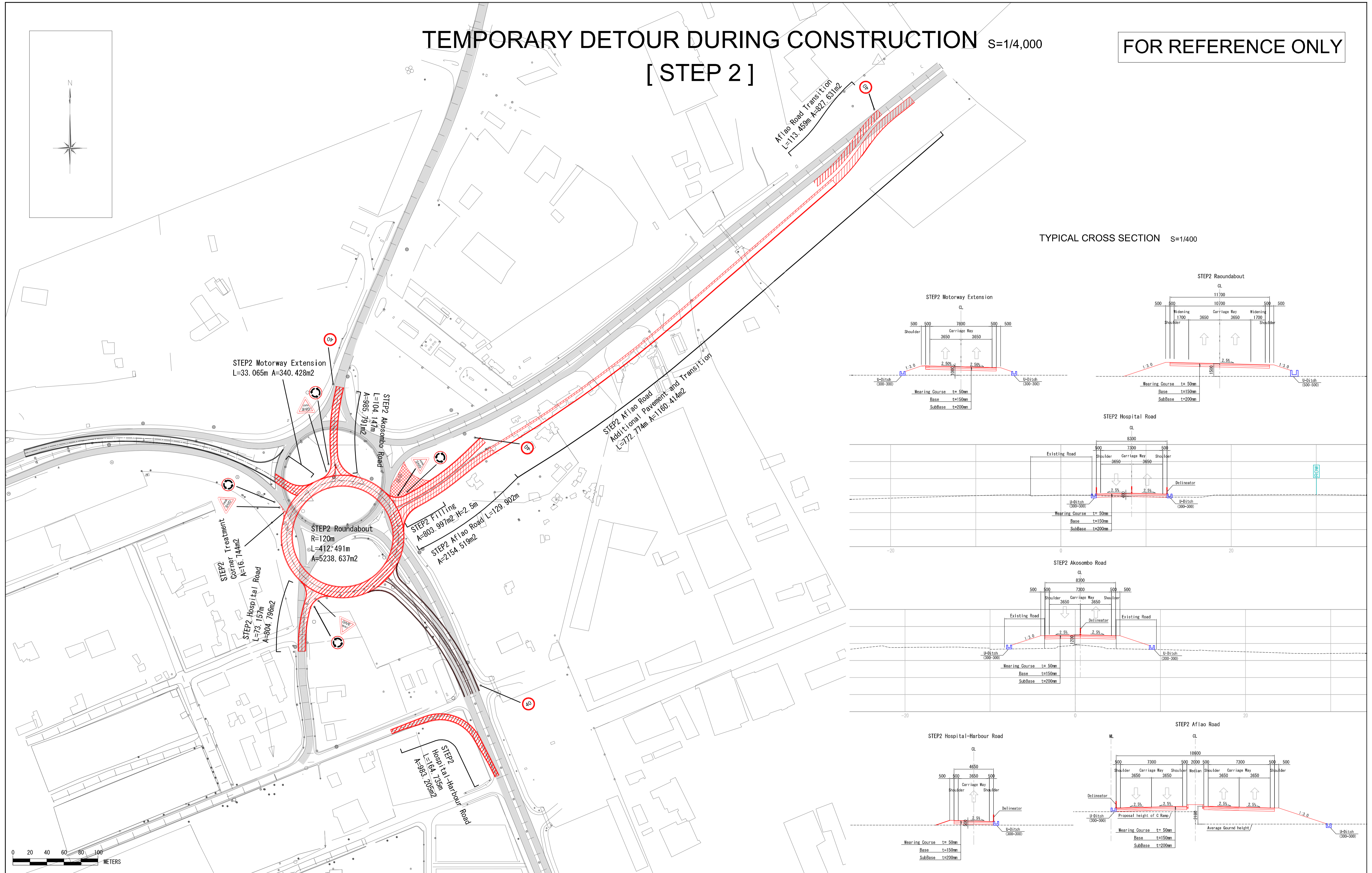
PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
TEMPORARY DETOUR DURING CONSTRUCTION
[STEP 1]

SCALE	DRAWING NO.
AS SHOWN	RF-06

TEMPORARY DETOUR DURING CONSTRUCTION [STEP 2] S=1/4,000

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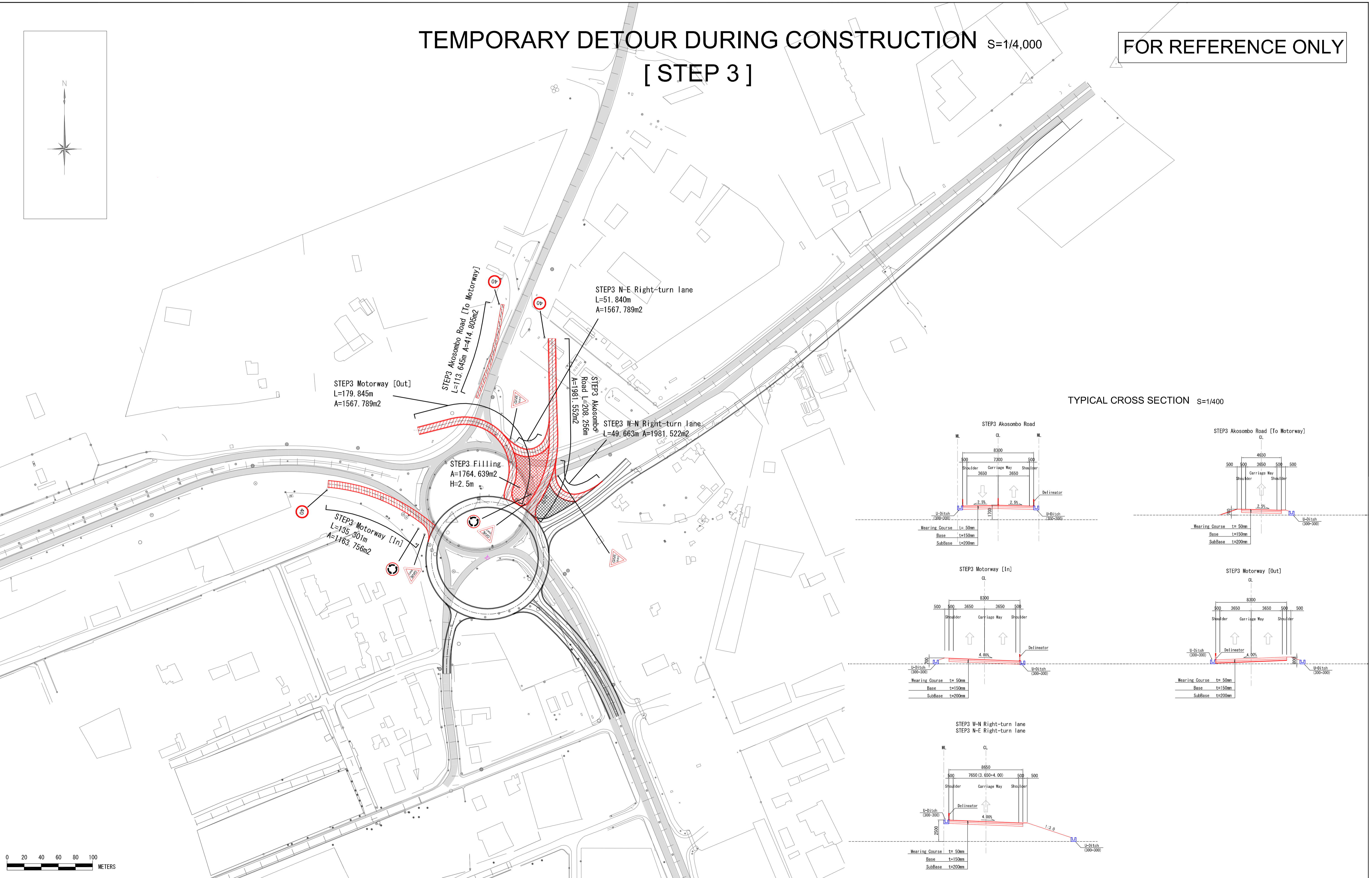
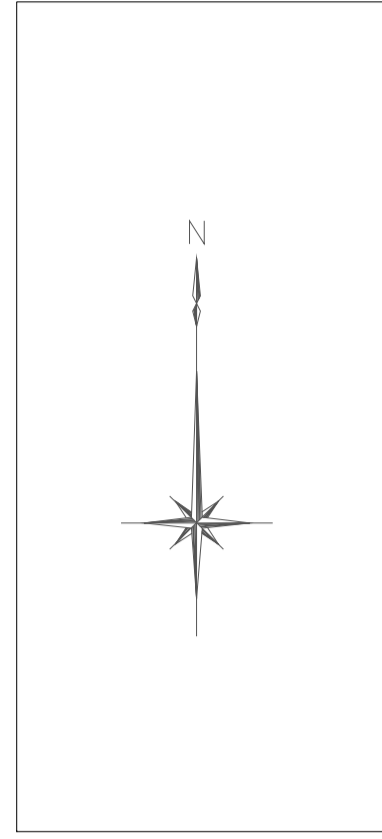


<p>GHANA HIGHWAY AUTHORITY MINISTRY OF ROADS AND HIGHWAYS REPUBLIC OF GHANA</p>	<p>CTI ENGINEERING INTERNATIONAL CO., LTD. JAPAN INTERNATIONAL COOPERATION AGENCY</p>	<p>PROJECT TITLE: PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA</p>	<p>DRAWING TITLE: TEMPORARY DETOUR DURING CONSTRUCTION [STEP 2]</p>	<table border="1"> <tr> <td>SCALE</td> <td>DRAWING NO.</td> </tr> <tr> <td>AS SHOWN</td> <td>RF-07</td> </tr> </table>	SCALE	DRAWING NO.	AS SHOWN	RF-07
SCALE	DRAWING NO.							
AS SHOWN	RF-07							

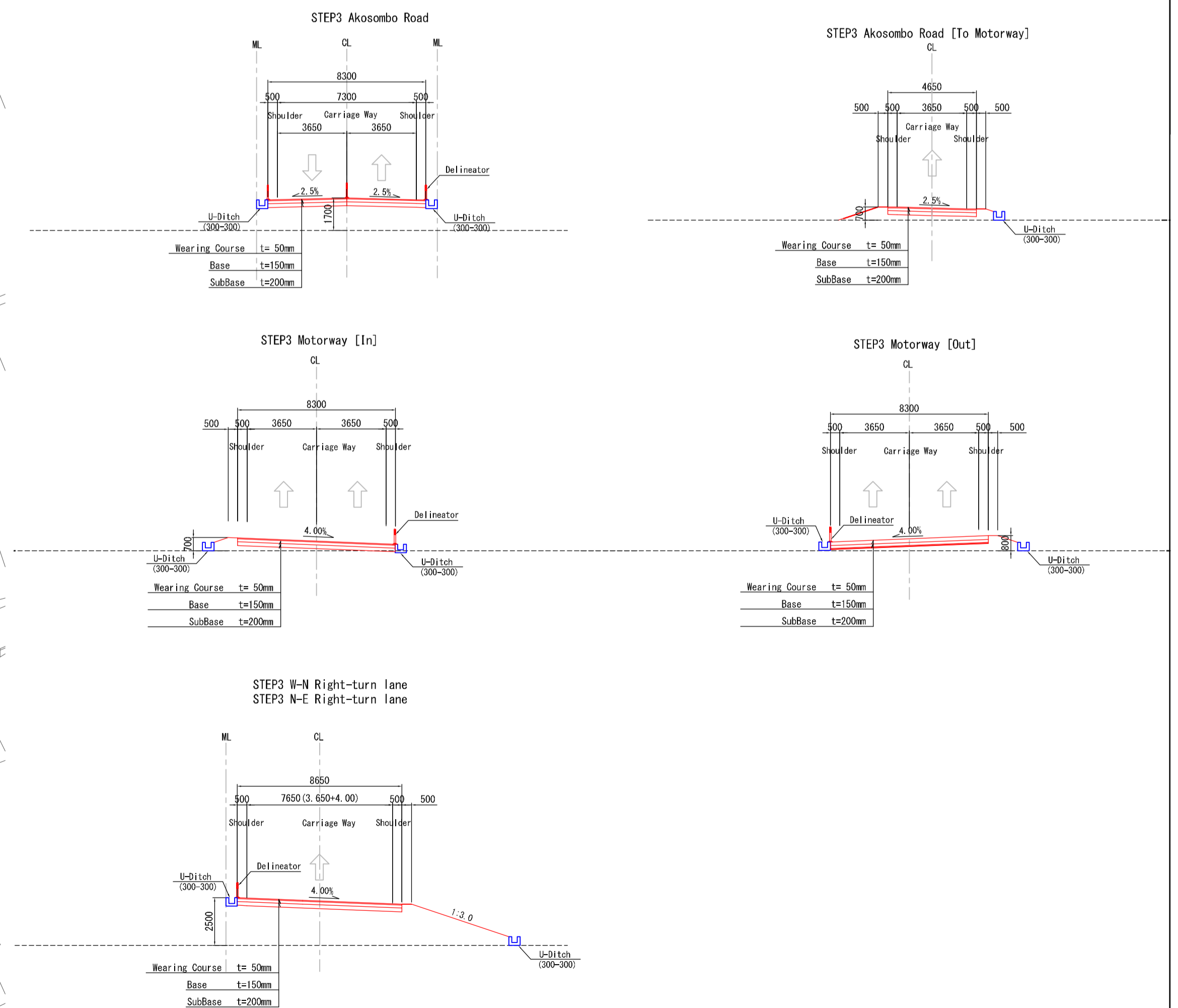
TEMPORARY DETOUR DURING CONSTRUCTION S=1/4,000

[STEP 3]

FOR REFERENCE ONLY



TYPICAL CROSS SECTION S=1/400



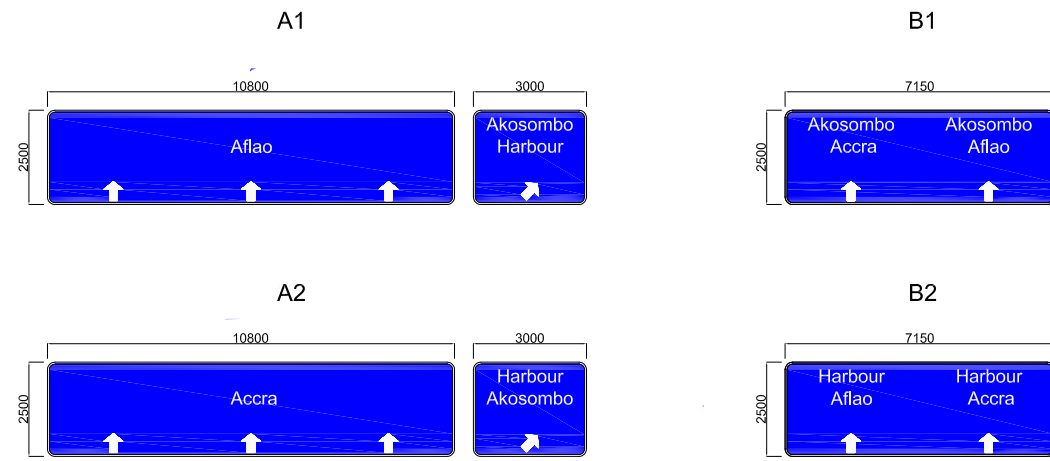
GHANA HIGHWAY AUTHORITY
MINISTRY OF ROADS AND HIGHWAYS
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CTI ENGINEERING INTERNATIONAL CO., LTD.
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PROJECT TITLE:
PREPARATORY SURVEY ON THE PROJECT FOR THE IMPROVEMENT
OF THE TEMA MOTORWAY ROUNDABOUT IN THE REPUBLIC OF GHANA

DRAWING TITLE:
TEMPORARY DETOUR DURING CONSTRUCTION
[STEP 3]

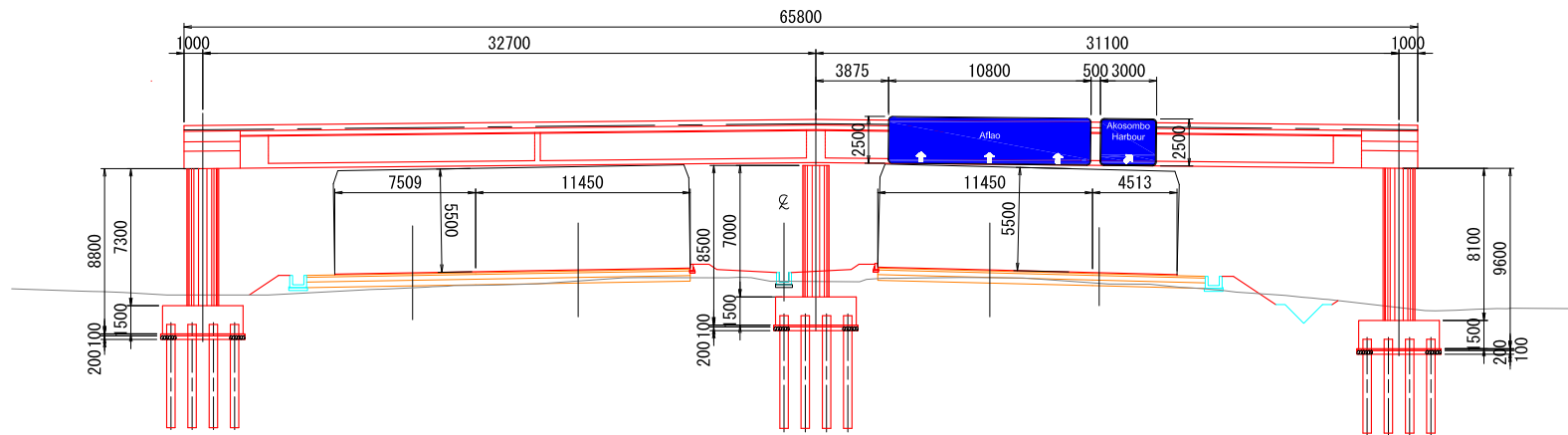
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AS SHOWN	RF-08



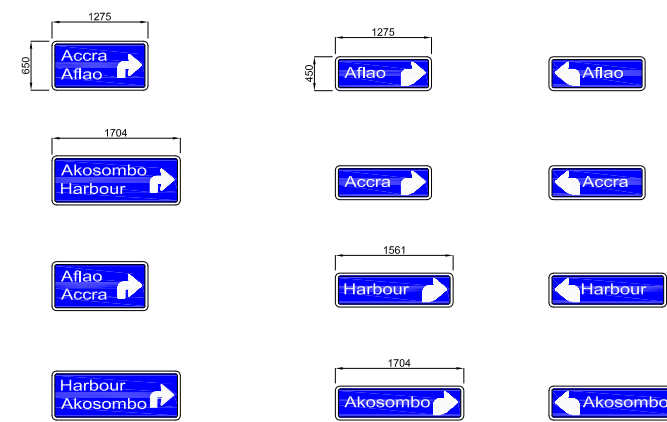
LANE DIRECTION SIGNS(GANTRY SIGNS) S=1:200



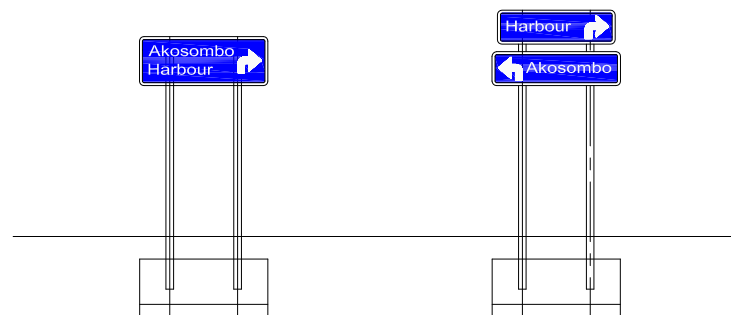
KEY PLAN



FOOTBRIDGE S=1:200



ADVANCE DIRECTION SIGNS(STACK TYPE) S=1:100



SIGN POST S=1:100