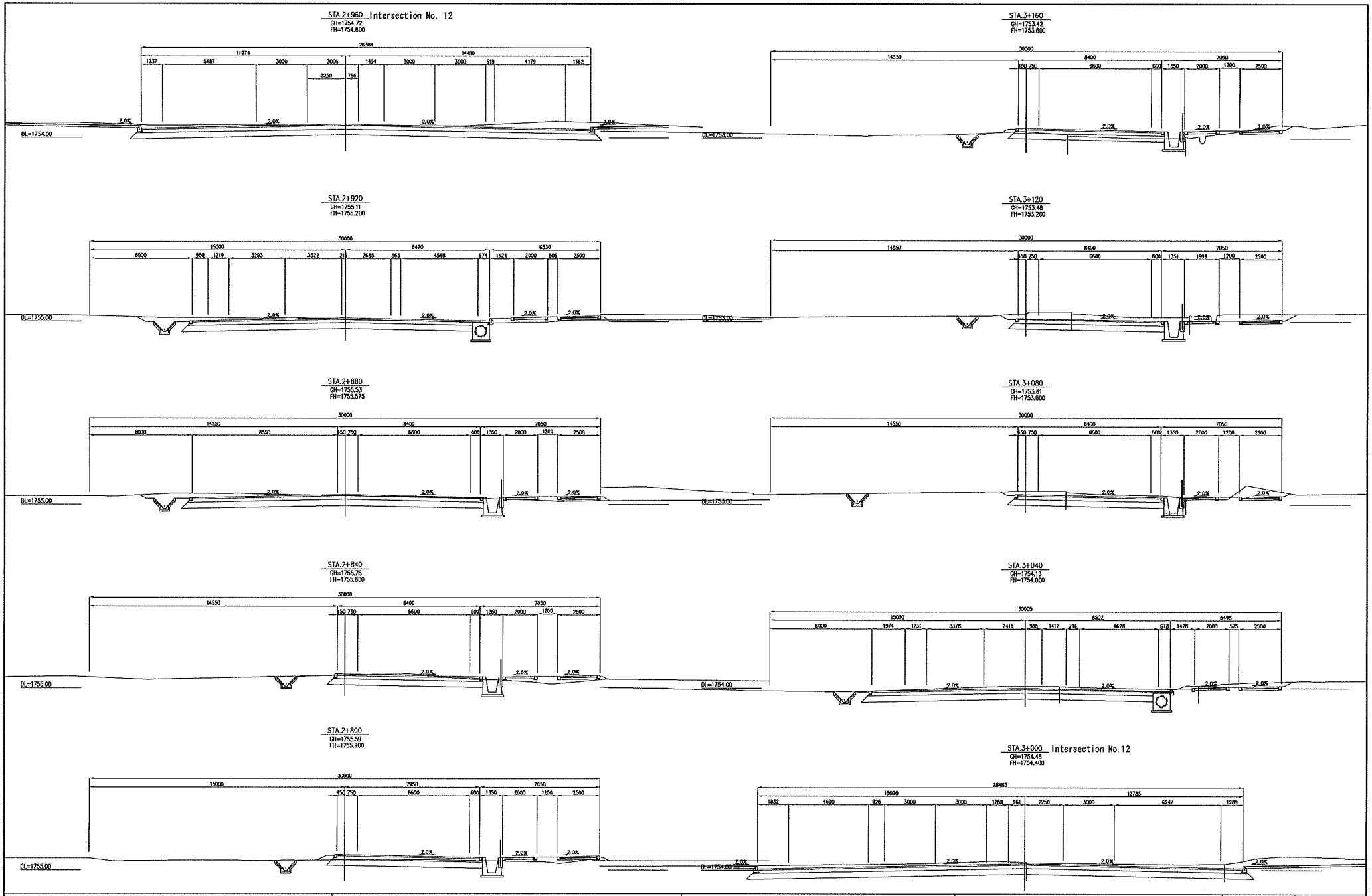
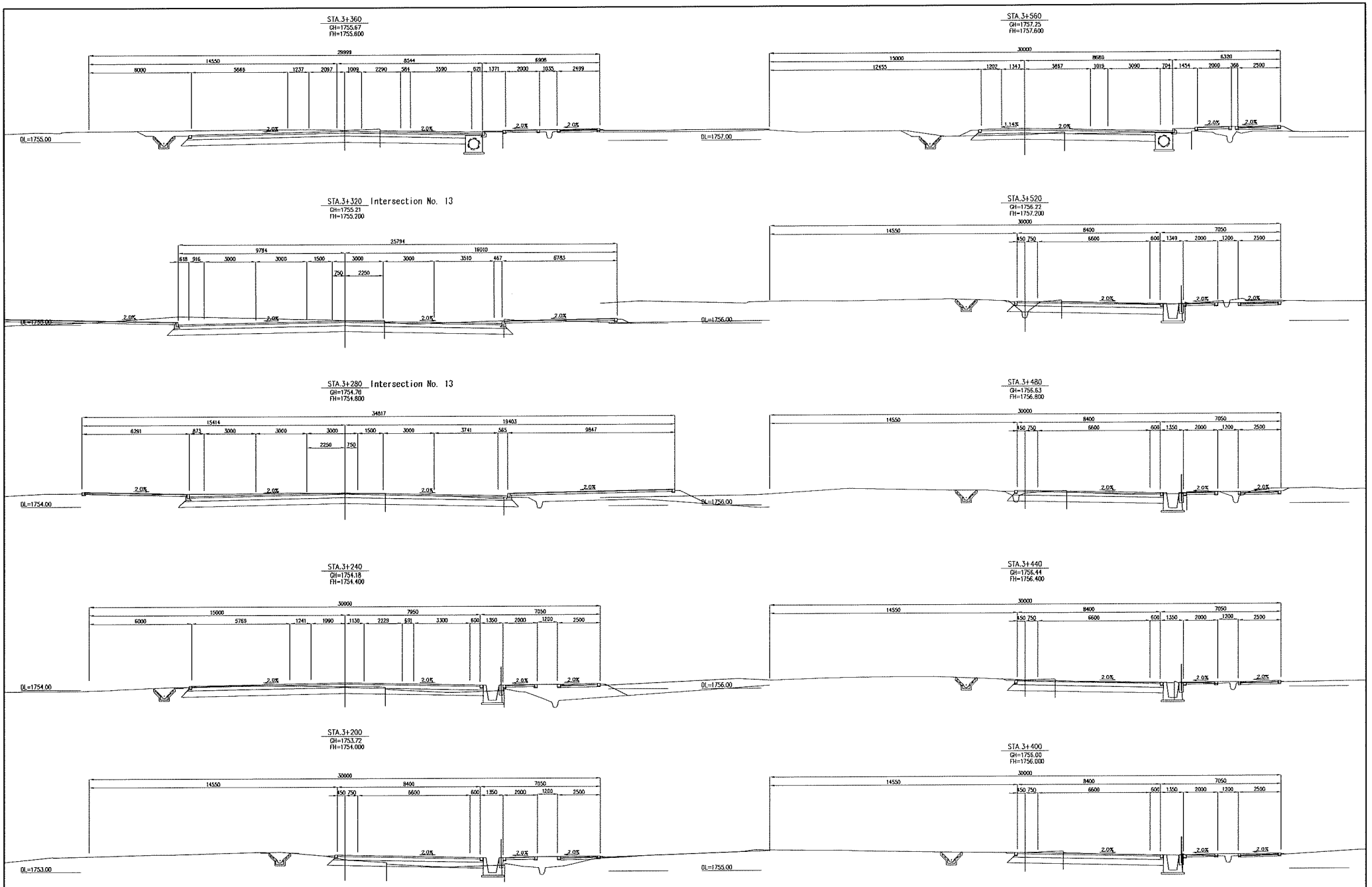
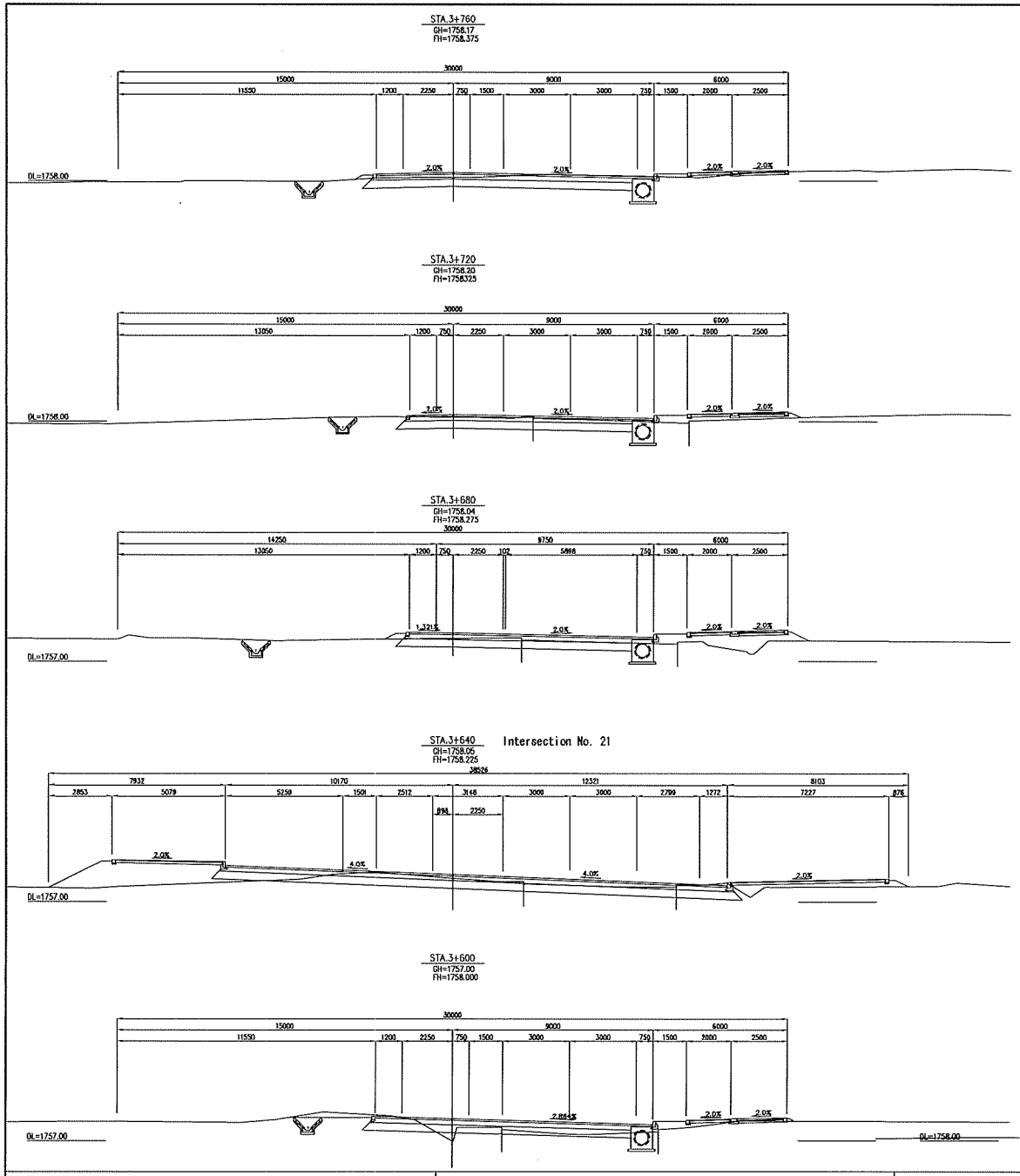


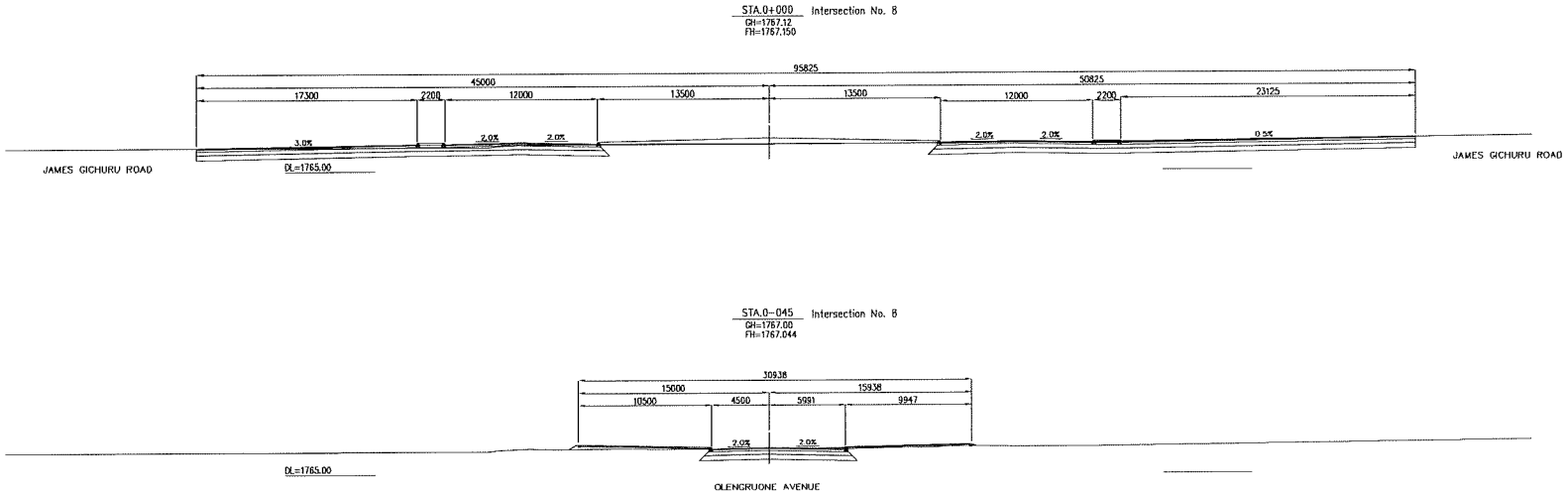
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROAD	JAPAN INTERNATIONAL COOPERATATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : CROSS SECTION (ML7) (STA.2+800-STA.3+160)	Drawing No.	CS-25
				SCALE	1/200
				DATE	AUG. 2009



KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROAD	JAPAN INTERNATIONAL COOPERATATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : CROSS SECTION (ML7) (STA.3+200-STA.3+560)	Drawing No.	CS-26
				SCALE	1/200
				DATE	AUG. 2009

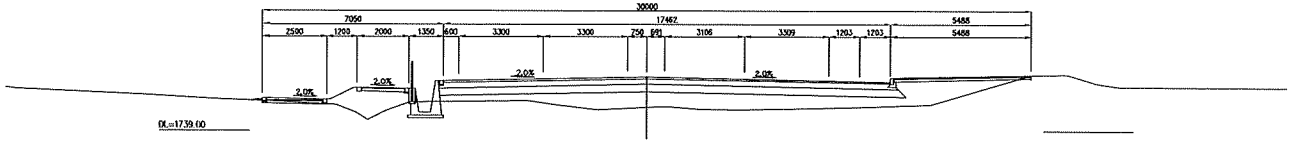


KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROAD	JAPAN INTERNATIONAL COOPERATATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: CROSS SECTION (ML7) (STA.3+600-STA.3+800)	Drawing No.	CS-27
				SCALE	1/200
				DATE	AUG. 2009

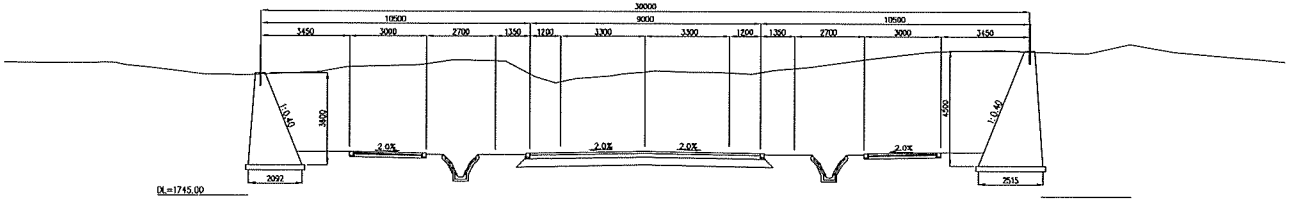


KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROAD	JAPAN INTERNATIONAL COOPERATATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: CROSS SECTION at Intersection No. 8 (ML7) (STA.0-045,STA.0+000)	Drawing No. SCALE DATE	CS-28 1/400 AUG. 2009

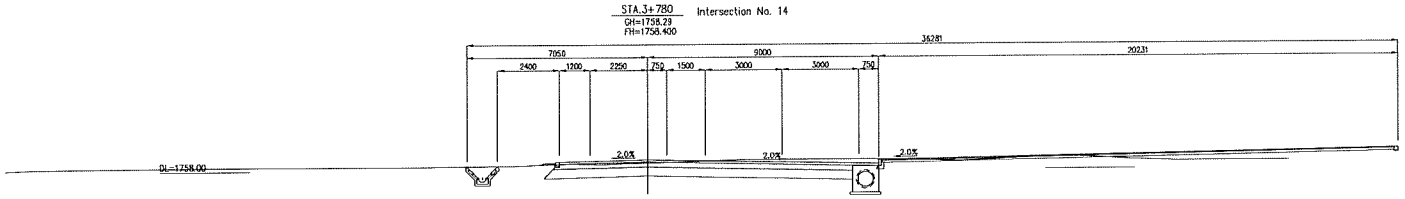
STA.1+866.254 Intersection No. 6
GH=1739.91
FH=1741.094



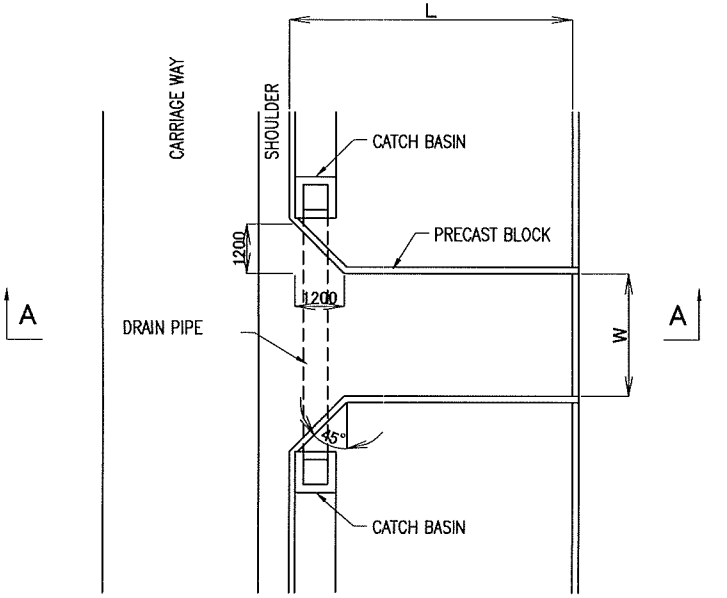
STA.1+750.751 Intersection No. 6
(GH=1749.85)
FH=1746.755



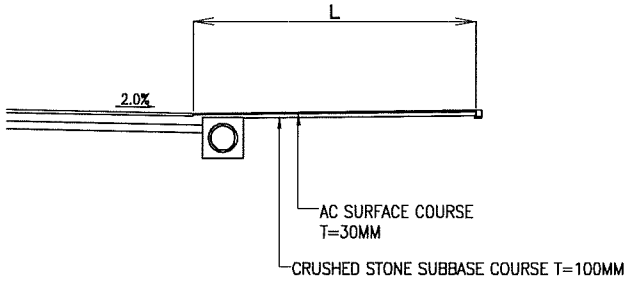
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROAD	JAPAN INTERNATIONAL COOPERATATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: CROSS SECTION at Intersection No. 6 (ML7) (STA.1+750.751,STA.1+866.254)	Drawing No. SCALE DATE	CS-29 1/200 AUG. 2009



KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROAD	JAPAN INTERNATIONAL COOPERATATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: CROSS SECTION at Intersection No. 14 (ML7) (STA.3+780)	Drawing No. SCALE DATE	CS-30 1/200 AUG. 2009



PLAN



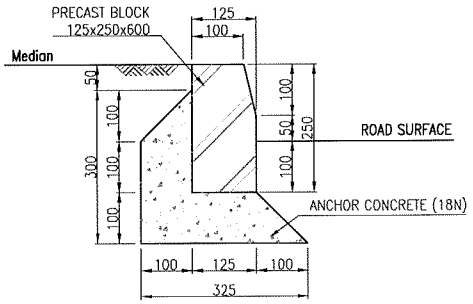
SCHEDULED LIST OF ACCESS WAY

ML3					
LEFT SIDE			RIGHT SIDE		
STATION	L	W	STATION	L	W
STA.0+300	6.9	3.8	STA.0+812	6.9	6.0
STA.0+393	6.9	4.5	STA.0+842	6.9	5.8
STA.0+478	6.9	5.0	STA.1+660	5.9	3.8
STA.0+555	5.9	5.6	STA.1+690	5.9	4.9
STA.0+637	6.9	4.1	STA.1+733	5.9	3.2
STA.0+972	5.9	5.1			
STA.1+037	6.9	4.6			
STA.1+104	6.9	4.4			
STA.1+123	6.9	3.7			
STA.1+152	6.9	3.8			
STA.1+169	6.9	3.8			
STA.1+361	0.9	9.6			
STA.1+401	6.9	15.4			
STA.1+426	6.9	4.6			
STA.1+510	6.9	3.5			
STA.1+701	5.9	4.6			
STA.1+713	5.9	3.0			

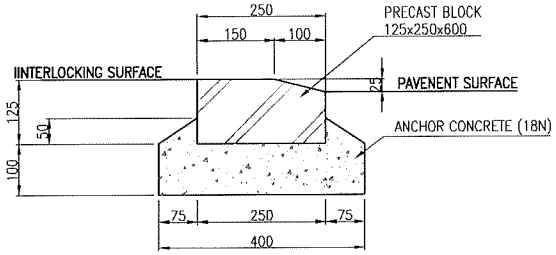
ML6					
LEFT SIDE			RIGHT SIDE		
STATION	L	W	STATION	L	W
STA.0+013	7.4	4.2	STA.0+038	7.4	5.0
STA.0+064	7.4	8.6	STA.0+052	7.4	6.0
STA.0+121	7.4	3.7	STA.0+072	7.4	4.3
STA.0+176	7.4	4.0	STA.0+124	7.4	5.6
STA.0+250	7.4	3.0	STA.0+186	7.4	5.5
STA.0+273	7.3	4.2	STA.0+259	7.4	4.5
STA.0+688	32.5	2.5	STA.0+323	10.0	9.6
STA.0+740	14.2	3.3	STA.0+460	7.4	4.8
			STA.0+634	7.4	5.6
			STA.0+715	7.4	4.4
			STA.0+772	7.4	2.8
			STA.0+880	7.4	3.8
			STA.0+891	7.4	3.6
			STA.1+005	7.4	4.5
			STA.1+104	5.9	9.0
			STA.1+127	6.1	6.3
			STA.1+139	6.9	3.6
			STA.1+148	7.4	3.2
			STA.1+162	7.4	3.2
			STA.1+173	7.4	3.8
			STA.1+232	7.4	5.2
			STA.1+344	7.6	12.6
			STA.1+420	7.4	15.0
			STA.1+562	6.9	4.3
			STA.1+587	6.9	4.4
			STA.1+603	6.9	4.4
			STA.1+722	6.9	11.0
			STA.1+848	6.9	6.0
			STA.1+864	6.9	5.1
			STA.2+116	6.9	4.5

ML7					
LEFT SIDE			RIGHT SIDE		
STATION	L	W	STATION	L	W
STA.0+053	6.5	4.4	STA.0+809	14.5	3.9
STA.0+100	9.4	3.4	STA.0+963	14.2	8.0
STA.0+148	6.5	11.4	STA.1+490	10.5	3.5
STA.0+245	6.5	3.2	STA.2+230	8.8	7.7
STA.0+354	6.5	9.8	STA.2+777	7.1	3.2
STA.0+448	6.5	4.6	STA.2+792	7.1	3.2
STA.0+460	6.5	4.6	STA.3+042	6.6	7.0
STA.0+548	6.5	9.5	STA.3+175	7.1	10.4
STA.0+630	6.5	8.3	STA.3+399	7.1	5.9
STA.0+654	6.4	14.0	STA.3+438	7.1	5.9
STA.0+954	7.9	14.0	STA.3+482	7.1	6.4
STA.0+963	10.5	4.1	STA.3+537	6.9	4.5
STA.1+022	10.5	5.1	STA.3+554	6.5	3.6
STA.1+089	10.5	4.5	STA.3+694	6.0	3.7
STA.1+226	8.8	4.5	STA.3+719	6.0	5.6
STA.1+237	8.6	4.5			
STA.1+383	10.5	4.0			
STA.1+893	7.1	6.0			

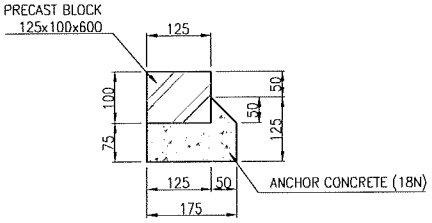
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : ACCESS WAY	Drawing No. AC-1 SCALE NONE SCALE DATE AUG. 2009



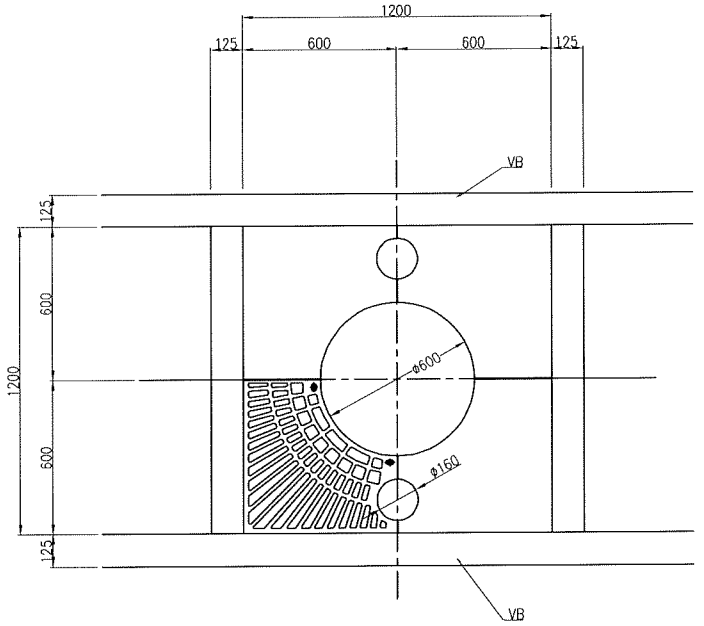
CURB STONE (CS–A)
S=1/100



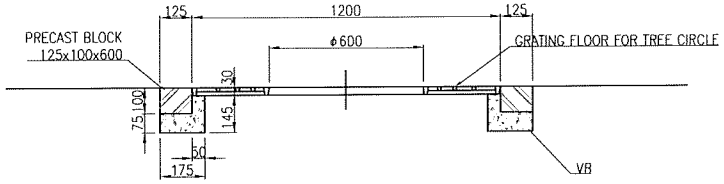
CURB STONE (CS–B)
S=1/100



VERGE BLOCK (VB)
S=1/100



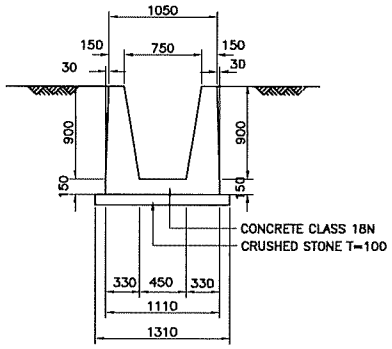
PLAN



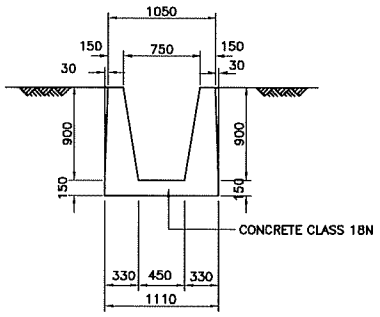
SECTION

TREE CIRCLE (TRC)
S=1/20

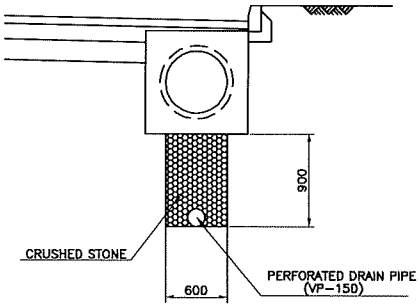
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : CURB AND TREE CIRCLE	Drawing No.	CT-1
				SCALE	AS SHOWN
				DATE	AUG. 2009



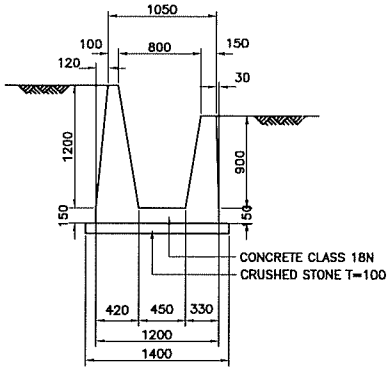
CONCRETE DITCH
(DC−450A1)



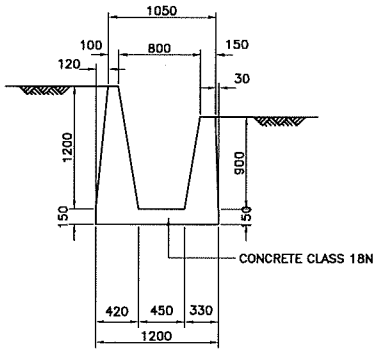
CONCRETE DITCH
(DC−450A2)



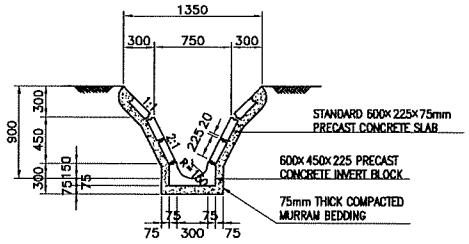
STONE FILLER DRAIN
(SFD)



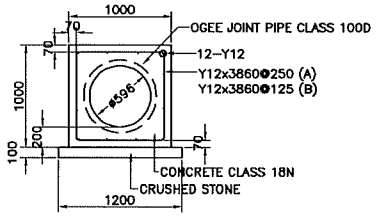
CONCRETE DITCH
(DC−450B1)



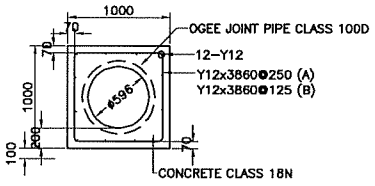
CONCRETE DITCH
(DC−450B2)



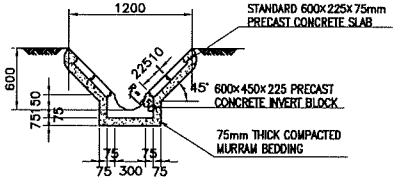
INVERT BLOCK DRAIN TYPE 'A'
(DV−A)



CONCRETE PIPE CULVERT
(DP−600A1 & B1)

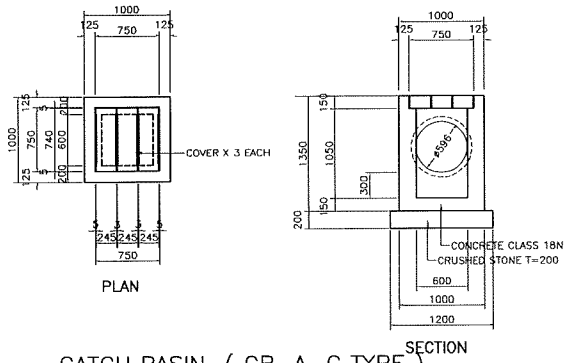


CONCRETE PIPE CULVERT
(DP−600A2 & B2)

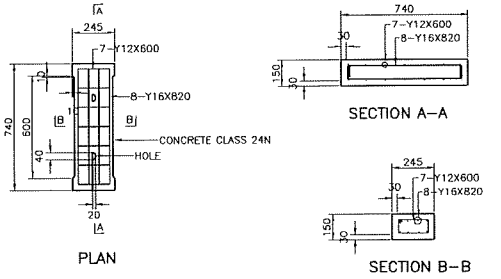


INVERT BLOCK DRAIN TYPE 'B'
(DV−B)

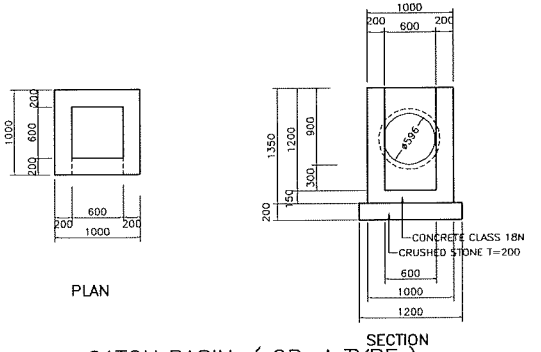
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: DRAINAGE STRUCTURE (1/2) SIDE DITCHES AND DRAIN PIPES	Drawing No.	DR-1
				SCALE	1/50
				DATE	AUG. 2009



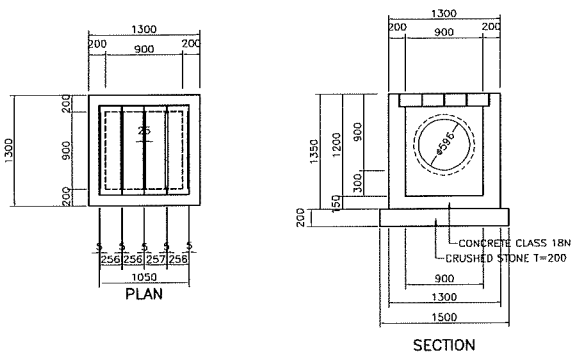
CATCH BASIN (CB-A-C TYPE)
S=1/60



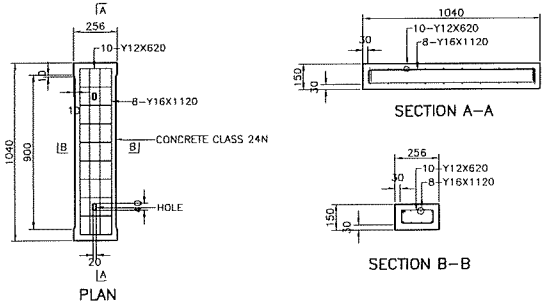
COVER FOR CB-A-C
S=1/30



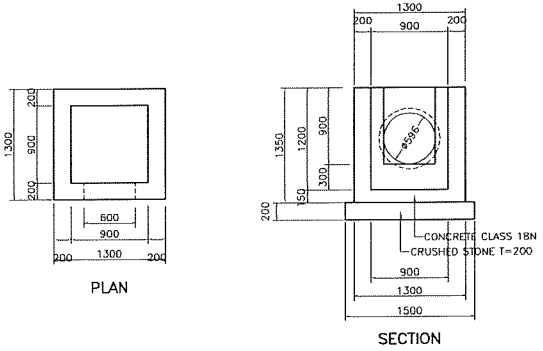
CATCH BASIN (CB-A TYPE)
S=1/60



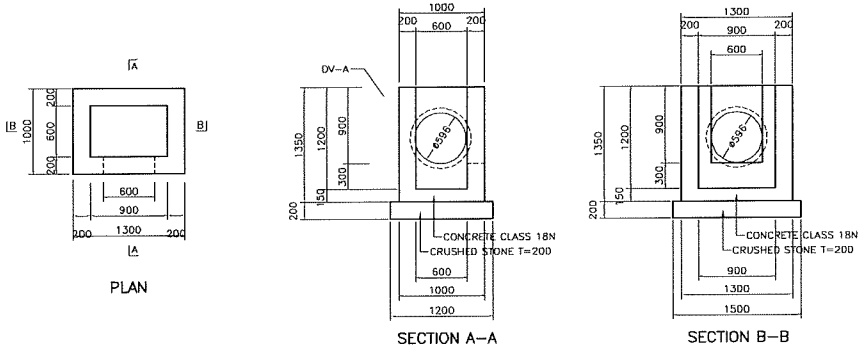
CATCH BASIN (CB-B-C TYPE)
S=1/60



COVER FOR CB-B-C
S=1/30



CATCH BASIN (CB-B TYPE)
S=1/60



CATCH BASIN (CB-C TYPE)
S=1/60

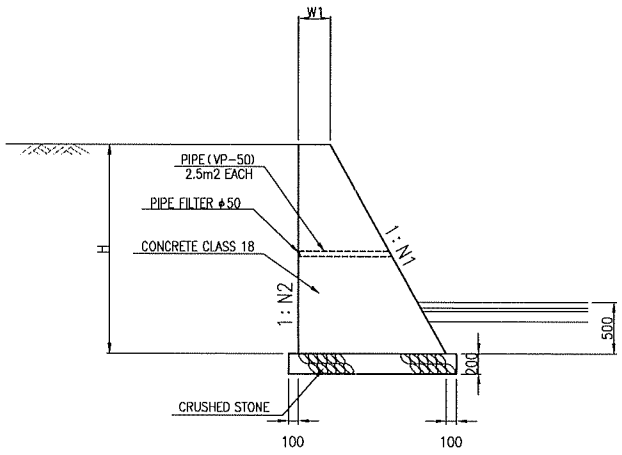
SCHEDULED LIST OF CATCH BASIN
(WITHOUT COVER)

TYPE	NOS. OF CONNECTING PIPE	SIZE
CB-A1	1	600*600*1200
CB-A2	2	
CB-A3	3	
CB-A4	4	
CB-B2	2	900*900*1200
CB-B3	3	
CB-B4	4	
CB-C1	1	600*900*1200
CB-C2	2	
CB-C3	3	

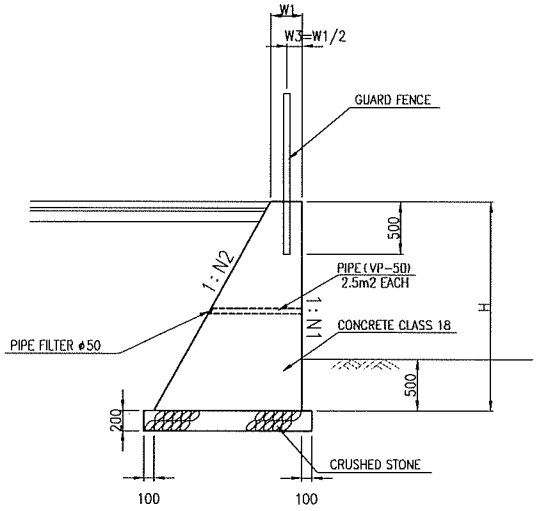
SCHEDULED LIST OF CATCH BASIN
(WITH COVER)

TYPE	NOS. OF CONNECTING PIPE	SIZE
CB-A1-C	1	600*600*1200
CB-A2-C	2	
CB-A3-C	3	
CB-B2-C	2	900*900*1200
CB-B3-C	3	
CB-B4-C	4	

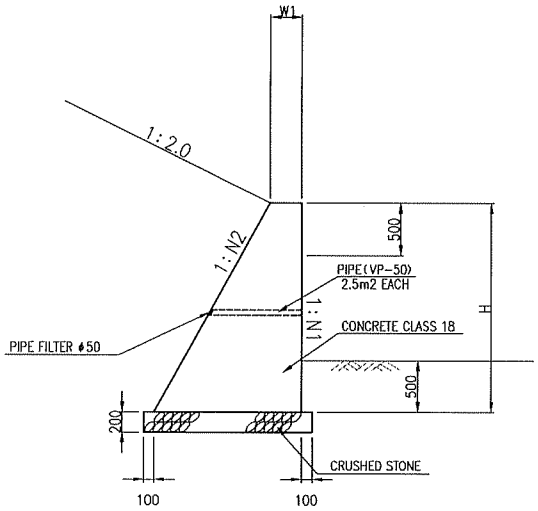
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : DRAINAGE STRUCTURE (2/2) CHTCH BASIN	Drawing No. DR-2 SCALE AS SHOWN DATE AUG. 2009



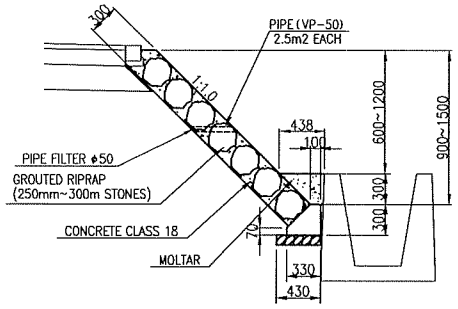
RETAINING WALL TYPE-A
(RW-A)



RETAINING WALL TYPE-B
(RW-B)



RETAINING WALL TYPE-C
(RW-C)

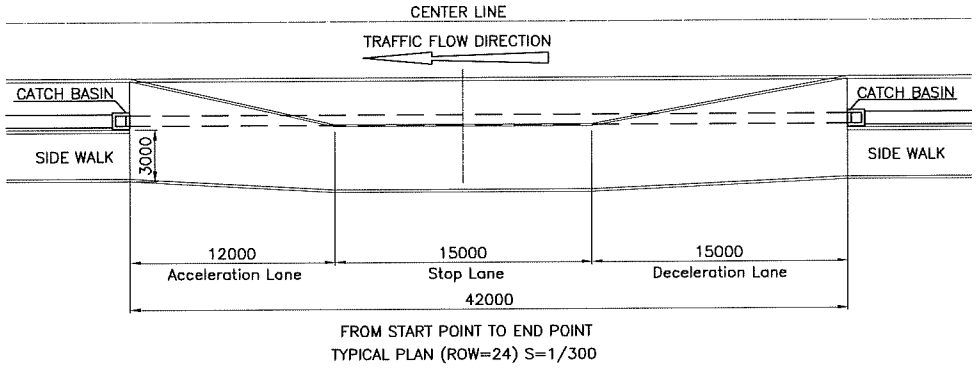


RIPRAP

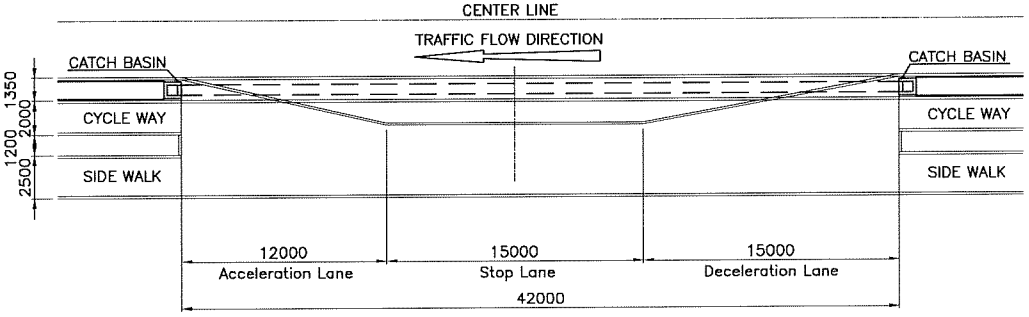
SCHEDULED LIST OF RETAING WALL

TYPE		H	N1	N2	W1
A	1	1001～1500	0.400	0.000	0.30
B			0.000	0.500	0.30
C			0.000	0.533	0.30
A	2	1501～2000	0.500	0.000	0.30
A`			0.400	0.000	0.30
B			0.000	0.550	0.30
C			0.000	0.600	0.30
B	3	2001～3000	0.000	0.600	0.40
C			0.000	0.600	0.40
B	4	3001～4000	0.200	0.263	0.40
A	5	4001～5000	0.400	0.070	0.40
B			0.200	0.270	0.40

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: RETAINING WALL AND RIPRAP	Drawing No.	RR-1
				SCALE	NONE SCALE
				DATE	AUG. 2009



FROM START POINT TO END POINT
TYPICAL PLAN (ROW=24) S=1/300



FROM START POINT TO END POINT
TYPICAL PLAN (ROW=30) S=1/300

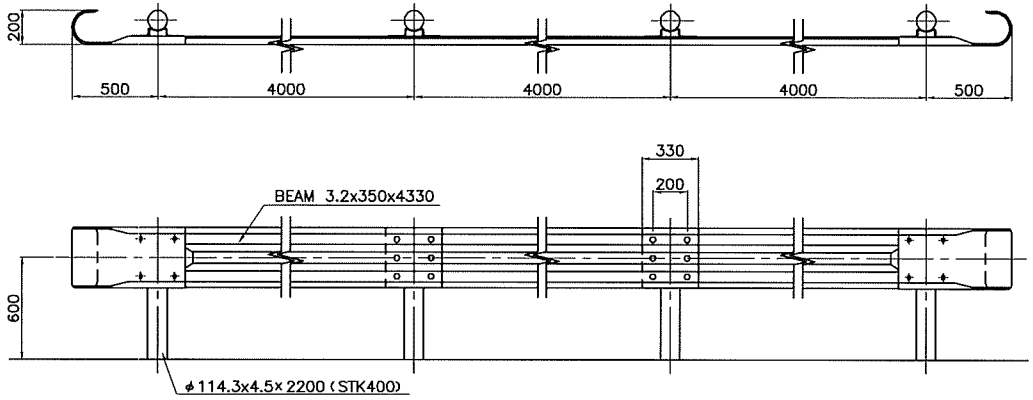
SCHEDULED LIST OF BUS BAY

ML3	
LEFT SIDE	RIGHT SIDE
STA.0+083	STA.0+512
STA.0+743	STA.0+880
STA.1+014	STA.1+496
STA.1+484	
SUB-TOTAL 4	SUB-TOTAL 3
TOTAL 7	

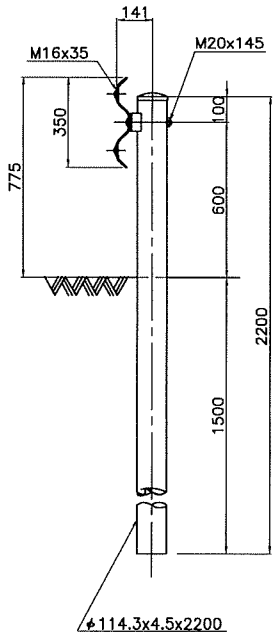
ML6	
LEFT SIDE	RIGHT SIDE
STA.0+098	STA.0+233
STA.0+600	STA.0+518
STA.1+154	STA.0+977
STA.1+669	STA.1+384
STA.2+312	STA.2+089
	STA.2+810
SUB-TOTAL 5	SUB-TOTAL 6
TOTAL 11	

ML7	
LEFT SIDE	RIGHT SIDE
STA.0+182	STA.0+180
STA.0+872	STA.0+688
STA.1+448	STA.1+168
STA.2+008	STA.1+580
STA.2+320	STA.2+018
STA.2+780	STA.2+528
STA.3+102	STA.2+848
STA.3+408	STA.3+140
STA.3+678	STA.3+743
SUB-TOTAL 9	SUB-TOTAL 9
TOTAL 18	

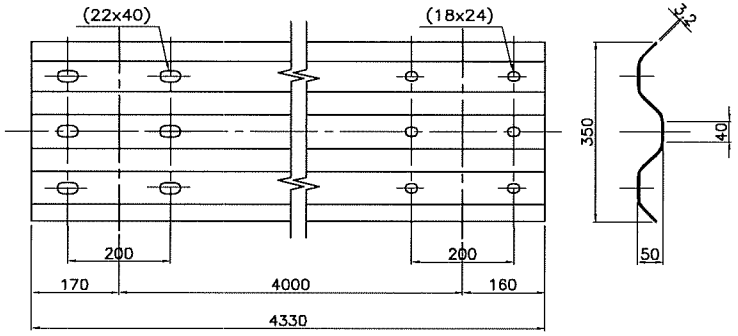
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : BUS SHELTER	Drawing No.	BS-1
				SCALE	1/300
				DATE	AUG. 2009



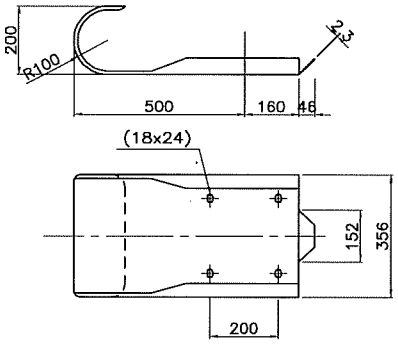
PLAN AND ELEVATION S=1/30



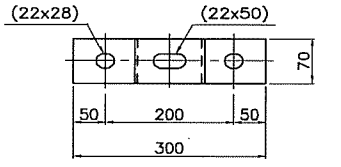
SECTION S=1/20

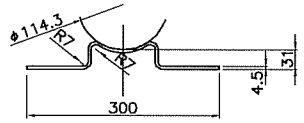


BEAM S=1/10

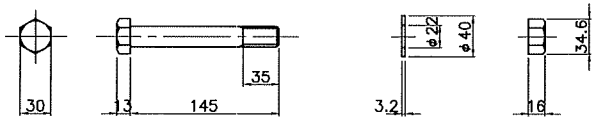


TERMINAL S=1/15

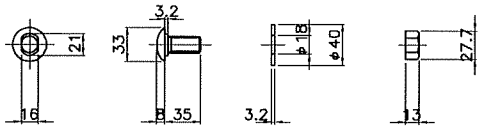




BRACKET S=1/8

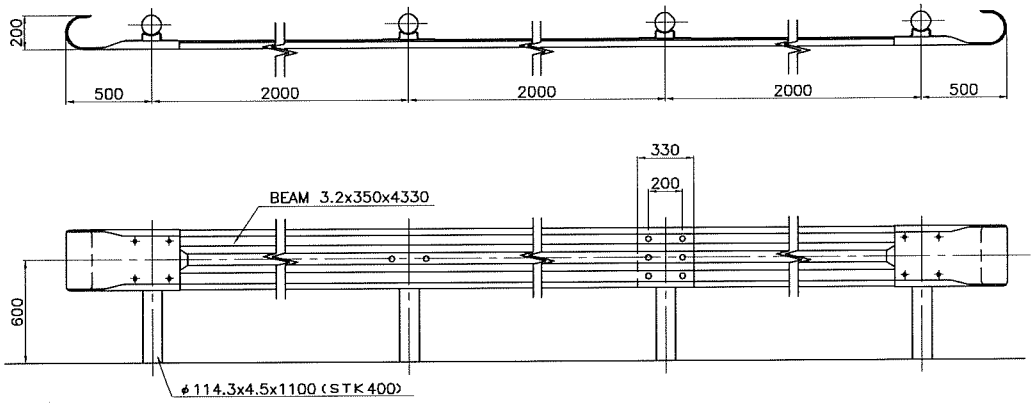


BOLT FOR BRACKET S=1/5
M20×145 (4・6)

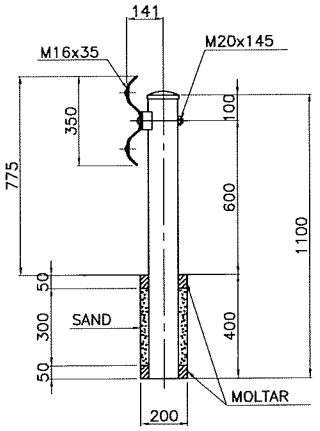


BOLT FOR BRACKET S=1/5
M16×35 (6・8)

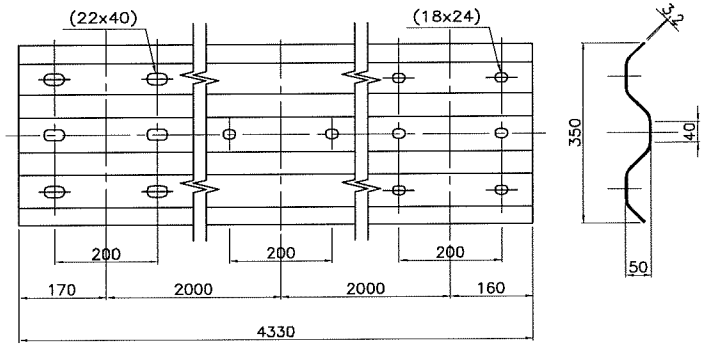
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: GUARDRAIL (Gr-E) (ON THE GROUND)	Drawing No.	GR-1
				SCALE	AS SHOWN
				DATE	AUG. 2009



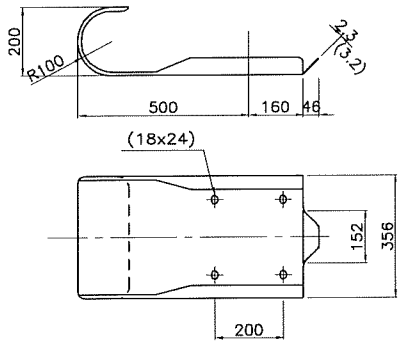
PLAN AND ELEVATION S=1/30



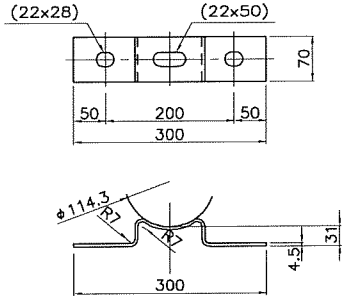
SECTION S=1/20



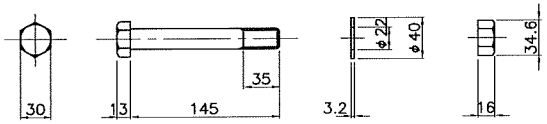
BEAM S=1/10



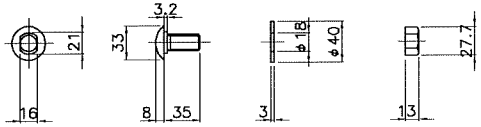
TERMINAL S=1/15



BRACKET S=1/8

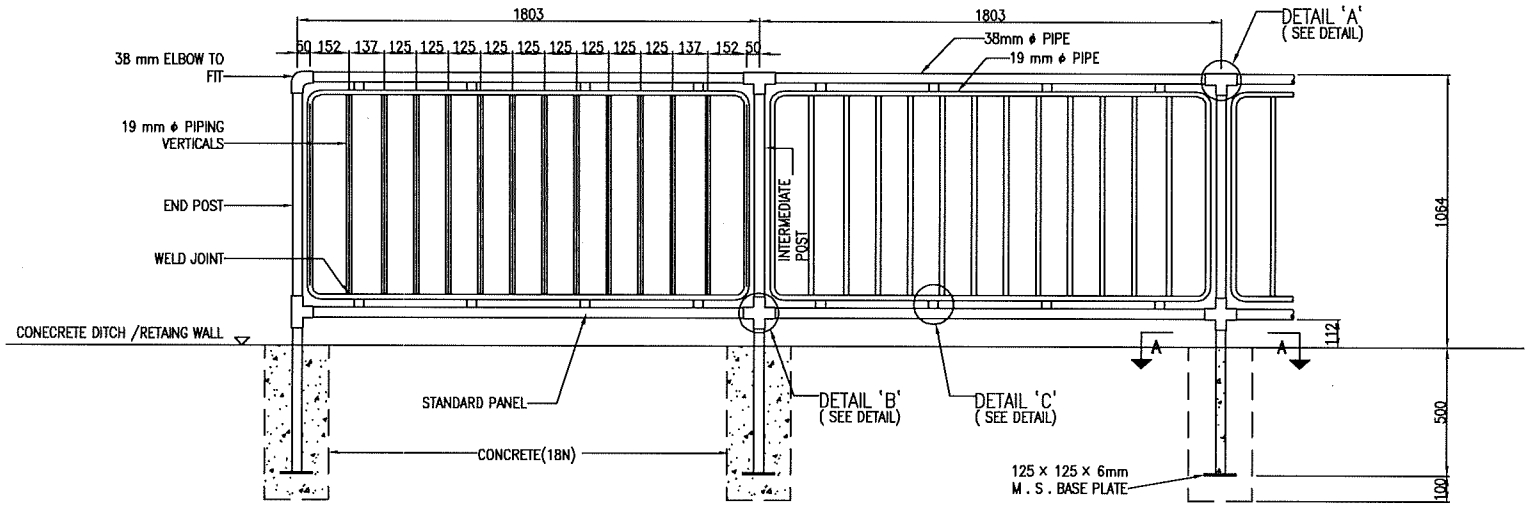


BOLT FOR BRACKET S=1/5
M20×145 (4・6)

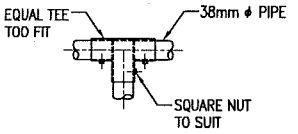


BOLT FOR BRACKET S=1/5
M16×35 (6・8)

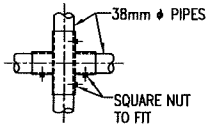
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : GUARDRAIL (Gr-B) (ON THE STRUCTURE)	Drawing No.	GR-2
				SCALE	AS SHOWN
				DATE	AUG. 2009



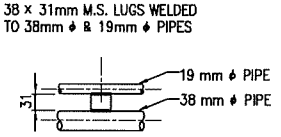
ELEVATION S=1/20



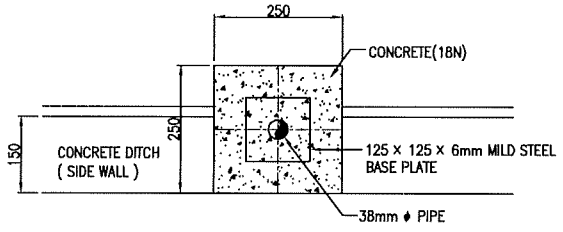
DETAIL 'A' S=1/10



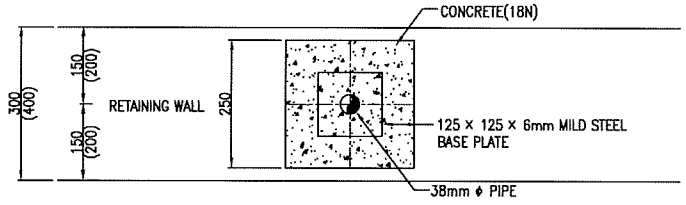
DETAIL 'B' S=1/10



DETAIL 'C' S=1/10



SECTION A–A S=1/10



SECTION A–A S=1/10

NOTE :

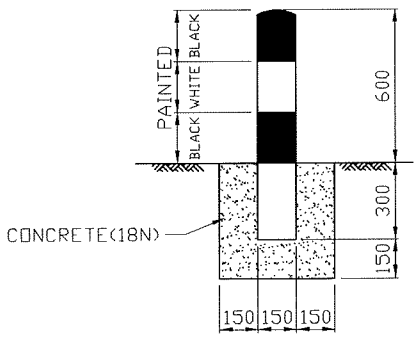
1 All materials and fabrication to latest edition of the appropriate British standard specifation

2 Alternative couplings on vertical posts to accommodate changes in direction of between 120° to 175°

3 Railings to be supplied with one coat of inhibive prime and one oil bound undercoat. Erection damage to be made good and one full gross oil bound finish coat applied after erection.

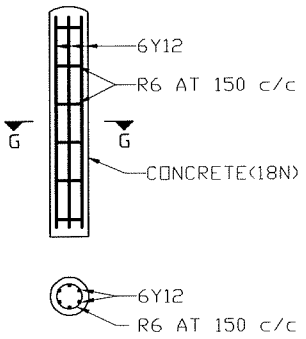
4 All welds to be done conviniently to suit the adjoining parts.

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : **GUARD FENCE (GF)**	Drawing No.	GF-1
				SCALE	AS SHOWN
				DATE	AUG. 2009



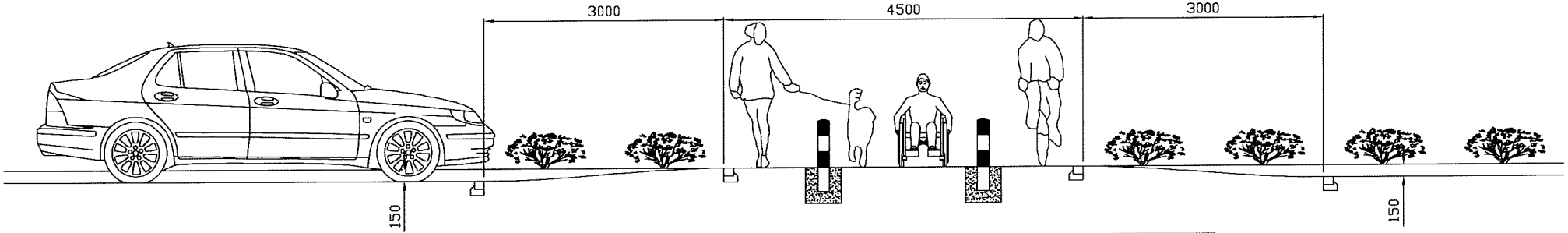
SECTION

GUARD POST DETAILS S=1/20



SECTION G–G

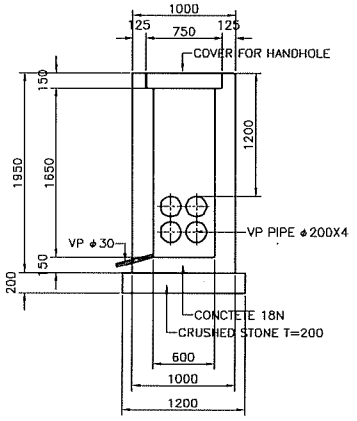
REINFORCEMENT DETAILS S=1/20

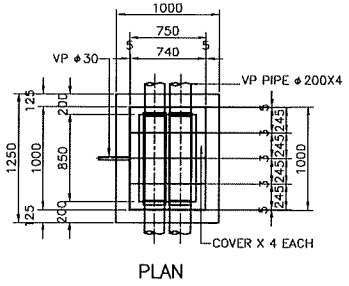


Distance (mm)	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000
Hight (mm)	0.0	1.5	4.5	9.0	15.0	22.5	31.5	42.0	52.5	63.0	75.0	87.0	97.5	108.0	118.5	127.5	135.0	141.0	145.5	148.5	150.0

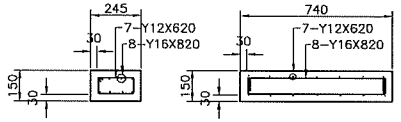
Raised Cross Walk with Sine Curve Hamp [L=10.5m/H=150mm] S=1/50

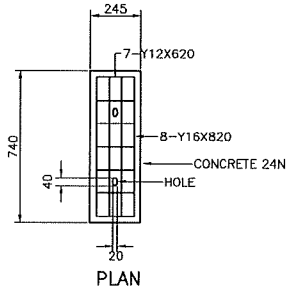
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : **GUARD POST (GP) AND HAMP**	Drawing No. GP-1 SCALE AS SHOWN DATE AUG. 2009





HAND HOLE (HH)
S=1/50

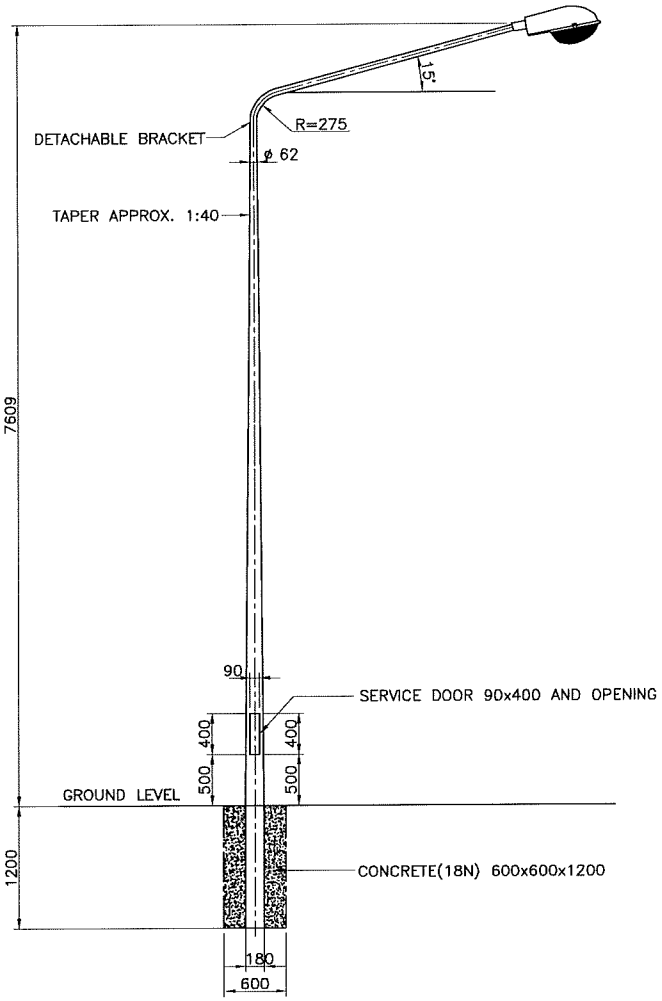




COVER FOR HAND HOLE
S=1/25

NOTE :
Hand hole and duct pipe shall be installed at every intersections.

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : HAND HOLE (HH)	Drawing No.	HH-1
				SCALE	AS SHOWN
				DATE	AUG. 2009



STREET LIGHTING

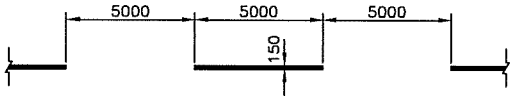
SCHEDULED LIST OF STREET LIGHTING

ML3			
No.	LEFT SIDE	No.	RIGHT SIDE
1	STA.0+040	1	STA.0+665
2	STA.0+103	2	STA.0+715
3	STA.0+140	3	STA.0+765
4	STA.0+190	4	STA.0+817
5	STA.0+240	5	STA.0+865
6	STA.0+290	6	STA.0+915
7	STA.0+340	7	STA.1+615
8	STA.0+390	8	STA.1+665
9	STA.0+440	9	STA.1+715
10	STA.0+490		
11	STA.0+540		
12	STA.0+590		
13	STA.0+640		
14	STA.0+690		
15	STA.0+739		
16	STA.0+790		
17	STA.0+840		
18	STA.0+890		
19	STA.0+928		
20	STA.0+990		
21	STA.1+040		
22	STA.1+090		
23	STA.1+140		
24	STA.1+190		
25	STA.1+240		
26	STA.1+290		
27	STA.1+340		
28	STA.1+380		
29	STA.1+440		
30	STA.1+491		
31	STA.1+540		
32	STA.1+590		
33	STA.1+640		
34	STA.1+690		
35	STA.1+740		

ML6					
No.	LEFT SIDE	No.	RIGHT SIDE	No.	RIGHT SIDE
1	STA.0+047	1	STA.0+022	41	STA.2+022
2	STA.0+092	2	STA.0+075	42	STA.2+072
3	STA.0+147	3	STA.0+120	43	STA.2+122
4	STA.0+197	4	STA.0+172	44	STA.2+172
5	STA.0+246	5	STA.0+222	45	STA.2+222
6	STA.0+297	6	STA.0+272	46	STA.2+272
7	STA.0+337	7	STA.0+320	47	STA.2+322
8	STA.0+397	8	STA.0+373	48	STA.2+372
9	STA.1+480	9	STA.0+422	49	STA.2+422
10	STA.1+547	10	STA.0+472	50	STA.2+472
11	STA.2+200	11	STA.0+522	51	STA.2+522
12	STA.2+843	12	STA.0+572	52	STA.2+572
		13	STA.0+622	53	STA.2+622
		14	STA.0+672	54	STA.2+672
		15	STA.0+722	55	STA.2+722
		16	STA.0+770	56	STA.2+772
		17	STA.0+822	57	STA.2+822
		18	STA.0+872		
		19	STA.0+922		
		20	STA.0+972		
		21	STA.1+022		
		22	STA.1+072		
		23	STA.1+122		
		24	STA.1+169		
		25	STA.1+222		
		26	STA.1+272		
		27	STA.1+322		
		28	STA.1+372		
		29	STA.1+429		
		30	STA.1+472		
		31	STA.1+522		
		32	STA.1+572		
		33	STA.1+622		
		34	STA.1+672		
		35	STA.1+729		
		36	STA.1+772		
		37	STA.1+822		
		38	STA.1+872		
		39	STA.1+922		
		40	STA.1+972		

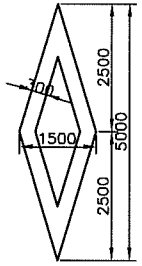
ML7					
No.	LEFT SIDE	No.	LEFT SIDE	No.	RIGHT SIDE	No.	RIGHT SIDE
1	STA.0+048	41	STA.2+098	1	STA.0+023	41	STA.3+166
2	STA.0+157	42	STA.2+148	2	STA.0+973	42	STA.3+223
3	STA.0+198	43	STA.2+198	3	STA.1+023	43	STA.3+273
4	STA.0+250	44	STA.2+248	4	STA.1+073	44	STA.3+323
5	STA.0+298	45	STA.2+298	5	STA.1+123	45	STA.3+373
6	STA.0+346	46	STA.2+598	6	STA.1+173	46	STA.3+423
7	STA.0+398	47	STA.2+635	7	STA.1+223	47	STA.3+473
8	STA.0+442	48	STA.2+948	8	STA.1+273	48	STA.3+523
9	STA.0+498	49	STA.3+002	9	STA.1+323	49	STA.3+573
10	STA.0+540	50	STA.3+291	10	STA.1+373	50	STA.3+613
11	STA.0+598	51	STA.3+611	11	STA.1+423	51	STA.3+673
12	STA.0+644			12	STA.1+473	52	STA.3+724
13	STA.0+698			13	STA.1+523	53	STA.3+773
14	STA.0+748			14	STA.1+558		
15	STA.0+798			15	STA.1+623		
16	STA.0+848			16	STA.1+673		
17	STA.0+898			17	STA.1+723		
18	STA.0+954			18	STA.1+784		
19	STA.0+998			19	STA.1+823		
20	STA.1+048			20	STA.2+024		
21	STA.1+098			21	STA.2+173		
22	STA.1+148			22	STA.2+224		
23	STA.1+198			23	STA.2+273		
24	STA.1+248			24	STA.2+323		
25	STA.1+298			25	STA.2+373		
26	STA.1+348			26	STA.2+423		
27	STA.1+398			27	STA.2+473		
28	STA.1+448			28	STA.2+522		
29	STA.1+498			29	STA.2+573		
30	STA.1+548			30	STA.2+623		
31	STA.1+598			31	STA.2+670		
32	STA.1+648			32	STA.2+723		
33	STA.1+698			33	STA.2+772		
34	STA.1+748			34	STA.2+823		
35	STA.1+798			35	STA.2+873		
36	STA.1+848			36	STA.2+923		
37	STA.1+899			37	STA.2+964		
38	STA.1+948			38	STA.3+023		
39	STA.1+998			39	STA.3+073		
40	STA.2+048			40	STA.3+123		

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : **STREET LIGHTING**	Drawing No. ST-1 SCALE 1/50 DATE AUG. 2009

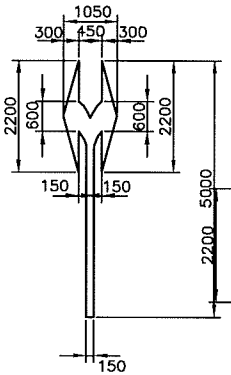


CENTRE LINE S=1/200

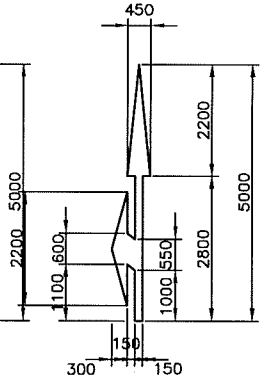
EDGE LINE S=1/200



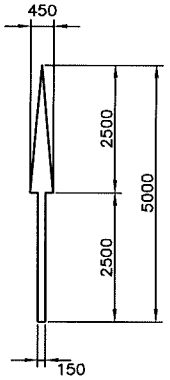
CROSS WALK



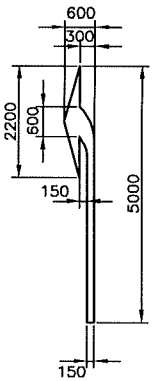
LEFT AND RIGHT



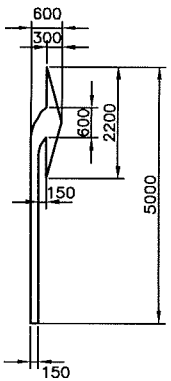
STRAIGHT AND LEFT



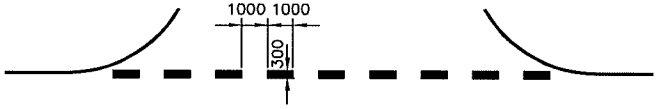
STRAIGHT



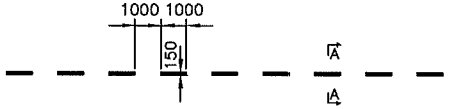
LEFT



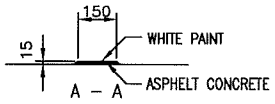
RIGHT

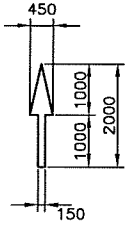


BROKEN LINE S=1/200

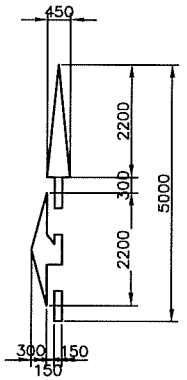


CHANNELIZING LINE
S=1/200

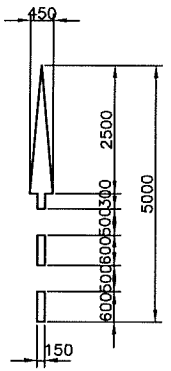




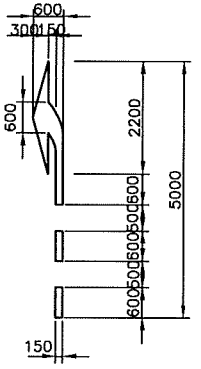
SPECIAL DIRECTION



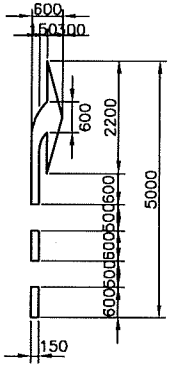
ADVANCE NOTICE
STRAIGHT AND LEFT



A.N.
STRAIGHT

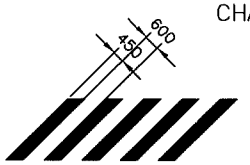


A.N.
LEFT

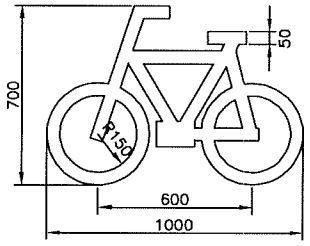


A.N.
RIGHT

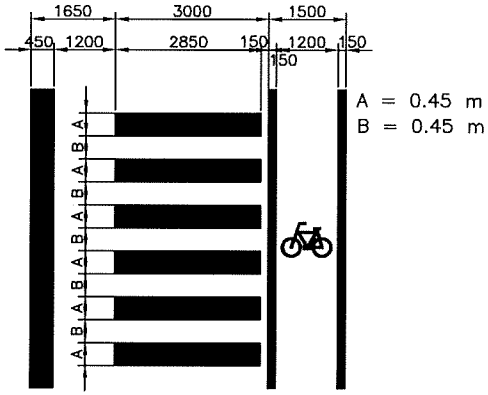
DIRECTIONAL ARROWS S=1/100



ZEBRA
S=1/200

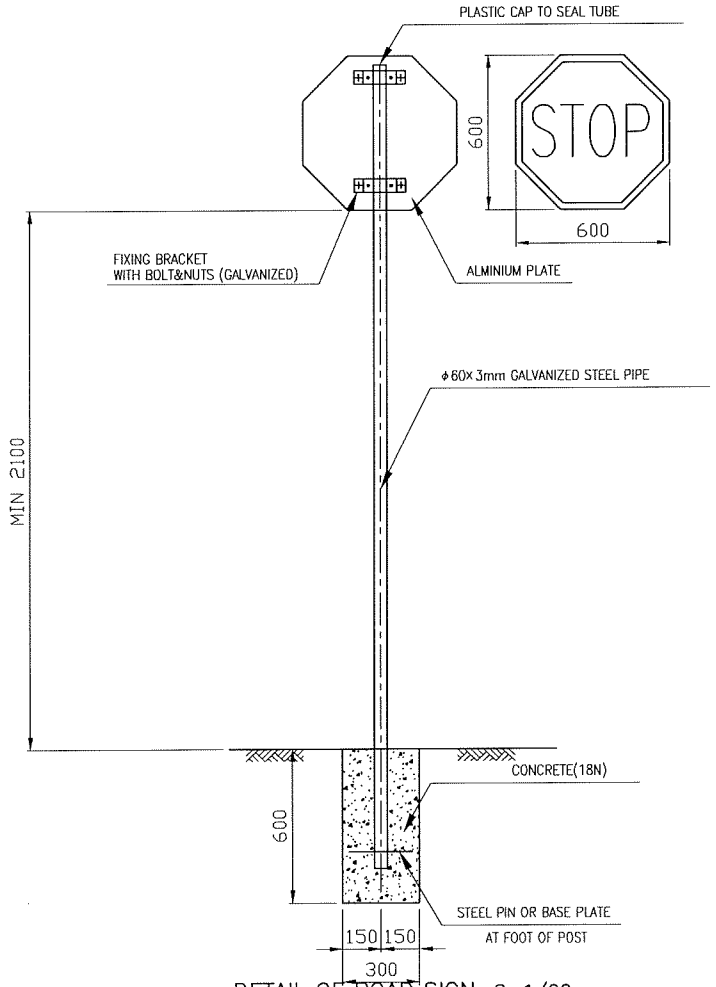


DETAIL OF BICYCLE LOGO
S=1/200



STOP LINE/CROSS WALK/BICYCLE LANE
S=1/200

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: ROAD MARKING	Drawing No.	RM-1
				SCALE	AS SHOWN
				DATE	AUG. 2009



DETAIL OF ROAD SIGN S=1/20

SCHEDULED LIST OF ROAD SIGN

No.	TYPE OF SIGN BOAD		LOCATION OF SIGN BOAD						TOTAL
			ML 3		ML 6		ML 7		
			LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE	
1	STOP		0+15, 0+610, 0+898, 0+955, 1+555, 1+590, 1+650	0+5, 0+50, 0+645, 0+670, 0+930, 0+995, 1+630, 1+690	0-53, 0+300, 0+370, 1+16, 1+442, 2+153, 2+180, 2+815, 2+840	0-10, 0+33, 0+393, 1+107, 1+565, 2+200, 2+235	0-65, 0+2 0+760, 1+240, 1+285, 1+750, 2+110, 2+175, 2+580, 2+660, 2+940, 2+995, 3+260, 3+310, 3+580, 3+625, 3+760	0-2, 0+55 0+790, 0+840, 1+278, 1+325, 1+870, 2+200, 2+260, 2+620, 2+710, 2+970, 3+25, 3+295 3+340, 3+620, 3+670	66
2	GIVE WAY		0+955	0+645, 0+930	0+373, 1+60, 2+180	2+200	1+285, 2+175, 2+660, 2+995, 3+310, 3+625	0+790, 1+278, 2+200, 2+620 2+970, 3+295, 3+620	20
3	SPEED LIMIT	30km	0+15, 1+520	0+5, 0+100, 1+690	0-53, 1+442, 2+800 2+840	0-5, 0+33, 1+600	0-05, 0-2, 1+730, 2+80 2+540	0-2, 0+140, 0+820, 1+910 2+280, 2+740	23
		40km	0+480, 0+860	0+720, 1+30	0+260, 0+980, 2+100	0+440, 1+150, 2+290	0+710 1+200, 2+880, 3+220, 3+530, 3+720	0+860, 1+330, 3+60, 3+370, 3+700	21
		50km	0+110, 0+760, 1+40	0+480, 0+860, 1+480	0+33, 0+400, 1+190 1+600, 2+280	0+300, 1+20, 1+430, 2+110, 2+720	0+80, 0+900 1+360, 1+910 2+280, 2+800, 3+80, 3+380	0+670, 1+200 1+730, 2+80 2+510, 2+880 3+220, 3+530	32
4	SLOPE	UP	0+640	0+680, 1+200		0+380, 1+480	1+80, 1+960	1+000, 1+980	9
		DOWN	0+40, 0+980	0+920	0+180, 1+320		0+840, 1+640	1+320, 2+160	9
5	T-JUNCTION		0+600, 1+555, 1+620	0+645, 0+690, 1+630 1+690	0+300 0+373, 1+20, 1+60	0+390, 1+120	0+780, 3+740 3+811	0+790, 0+840, 3+811	19
	X-JUNCTION		0+900, 0+955, 1+590	0+930, 1+000	2+100, 2+180	2+235, 2+280	1+240, 1+285, 2+80, 2+175 2+540 2+660, 2+880, 2+995, 3+220, 3+310, 3+570, 3+625	1+278, 1+360 2+200, 2+280 2+620, 2+740, 2+970, 3+50, 3+295, 3+370, 3+620, 3+690	33
	ROUNDABOUT		0+15	0+5, 0+100	0-53, 1+442, 2+800, 2+840	0-5, 0+33, 1+600	0-65, 0+2, 1+730	0-2, 0+55, 1+910	16
6	SCHOOL						3+480	3+680	2
7	CROSSWALK		0+15, 0+610, 0+898 0+955, 1+555, 1+590 1+650	0+5, 0+50, 0+645 0+670, 0+930, 0+995 1+630, 1+690	0-53, 0+300, 0+370, 1+16, 1+60 1+440, 2+153, 2+180, 2+815, 2+840	0-5, 0+33 0+393, 1+107, 1+565, 2+200, 2+235	0-65, 0+2 0+760, 1+240, 1+285, 1+750, 2+110, 2+175, 2+580, 2+660, 2+940, 2+995, 3+260, 3+310, 3+580, 3+625, 3+760	0-2, 0+55, 0+790, 1+278 1+325, 1+870, 2+200, 2+260 2+620, 2+710, 2+945, 2+970, 3+25, 3+295, 3+340, 3+620, 3+670	66
8	SIDEWALK		0+40, 0+630, 0+670 0+918, 0+975, 1+577 1+680, 1+740	0+670, 0+915, 1+670 1+740	0+16, 0+322, 1+60	0+20, 0+318, 0+373, 1+36, 1+87, 1+450, 1+565, 2+175, 2+233, 2+790	0+45, 0+780 0+820, 1+260, 1+305, 1+750, 1+852, 2+150, 2+950	0+940, 1+260, 1+305, 1+750 2+680, 3+13, 3+275, 3+325, 3+600, 3+650, 3+765	45
9	CYCLE TRACK		0+40, 0+630, 0+670 0+918, 0+975, 1+577 1+680, 1+740	0+30, 0+635, 0+670 0+915, 0+965, 1+575, 1+670, 1+740	0+16, 0+322, 0+373, 1+36 1+86 1+440, 1+555, 2+160, 2+212, 2+235 2+815	0+20, 0+318, 0+373, 1+36, 1+87, 1+450, 1+565, 2+175, 2+233, 2+790	0+45, 0+780, 0+820, 1+260 1+305, 1+750, 1+852, 2+150 2+600, 2+690, 2+950, 3+10, 3+275, 3+325, 3+600, 3+650, 3+780	0+45, 0+770 0+940, 1+260, 1+305, 1+750, 1+910, 2+130, 2+680, 2+945, 3+13, 3+275, 3+325, 3+600, 3+650, 3+765	70
10	SHEVRON		ROUNDABOUT NO.5(5)		ROUNDABOUT NO.7(3) ROUNDABOUT NO.6(4)		ROUNDABOUT NO.8(4)		11

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : ROAD SIGN (DETAIL AND SCHEDULED LIST)	Drawing No.	RS -1
				SCALE	1/20
				DATE	AUG. 2009

1. STOP

2. GIVE WAY

3.1 SPEED LIMIT
(30km)

3.2 SPEED LIMIT
(40km)

3.3 SPEED LIMIT
(50km)

4.1 SLOPE
(UP)

4.2 SLOPE
(DOWN)

5.1 T-JUNCTION

5.2 X-JUNCTION

5.3 ROUNDABOUT

6. SCHOOL

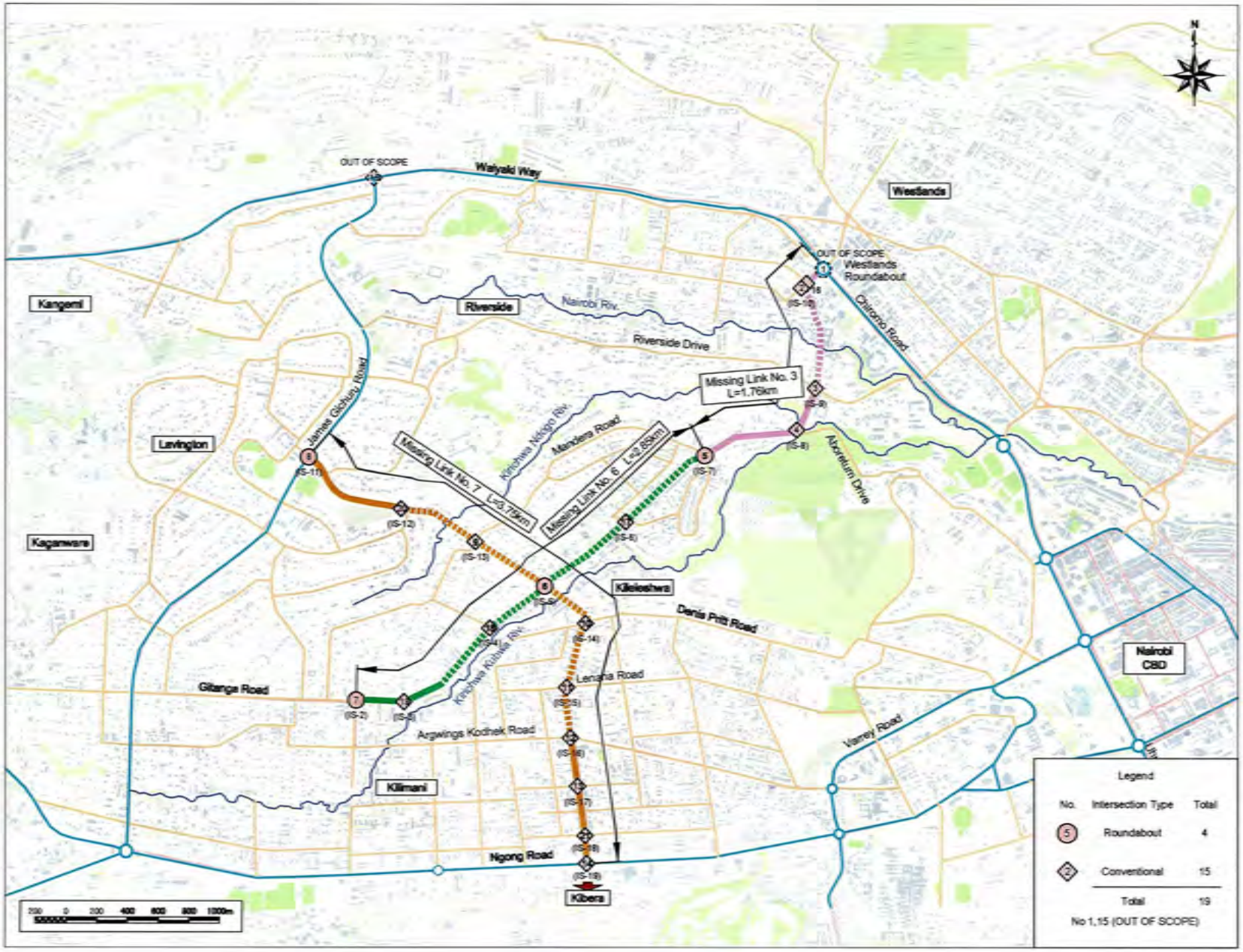
7. CROSSWALK

8. SIDEWALK

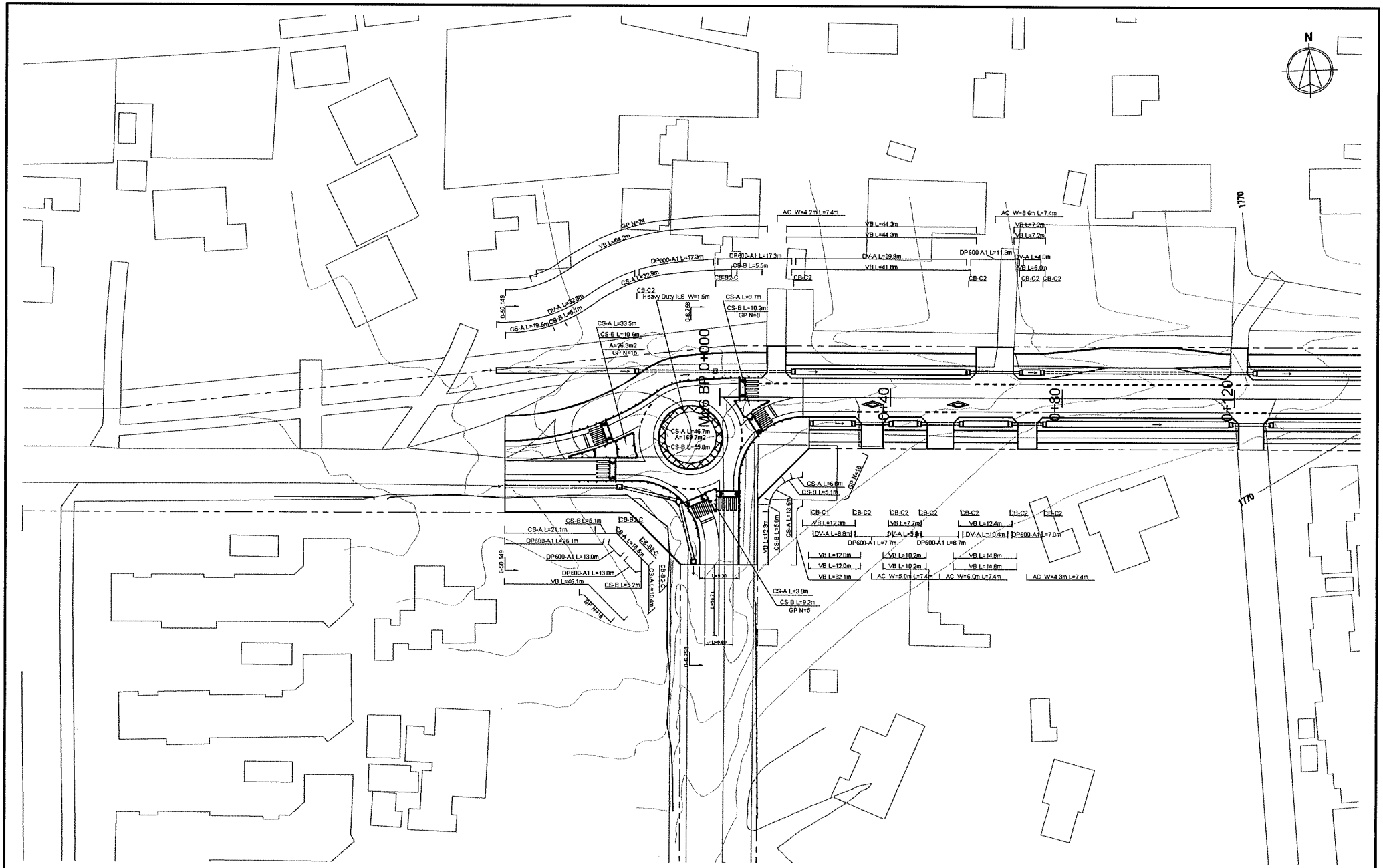
9. CYCLE TRACK

10. SHEVRON

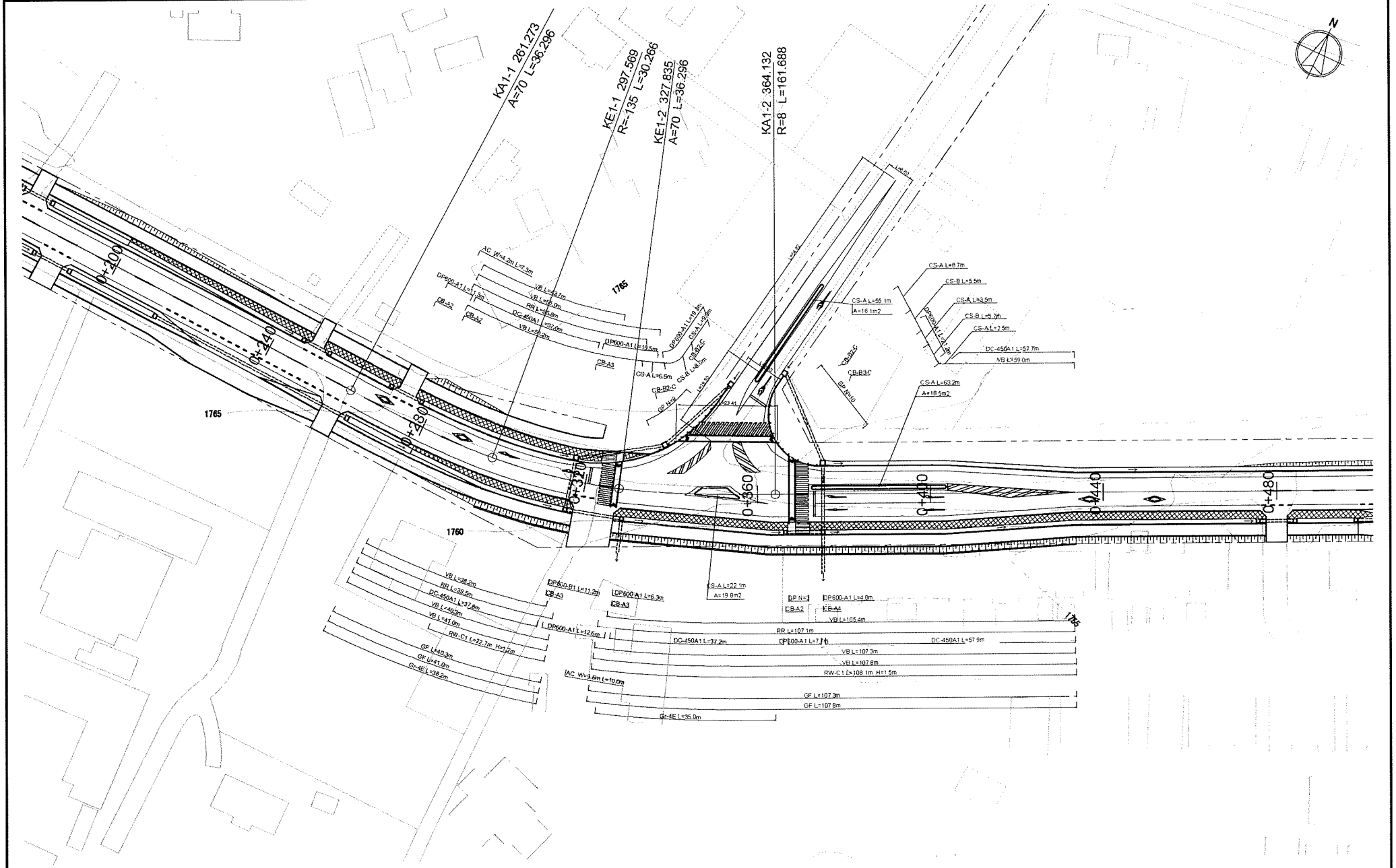
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: ROAD SIGN (TYPE)	Drawing No.	RS -2
				SCALE	NON SCALE
				DATE	AUG. 2009



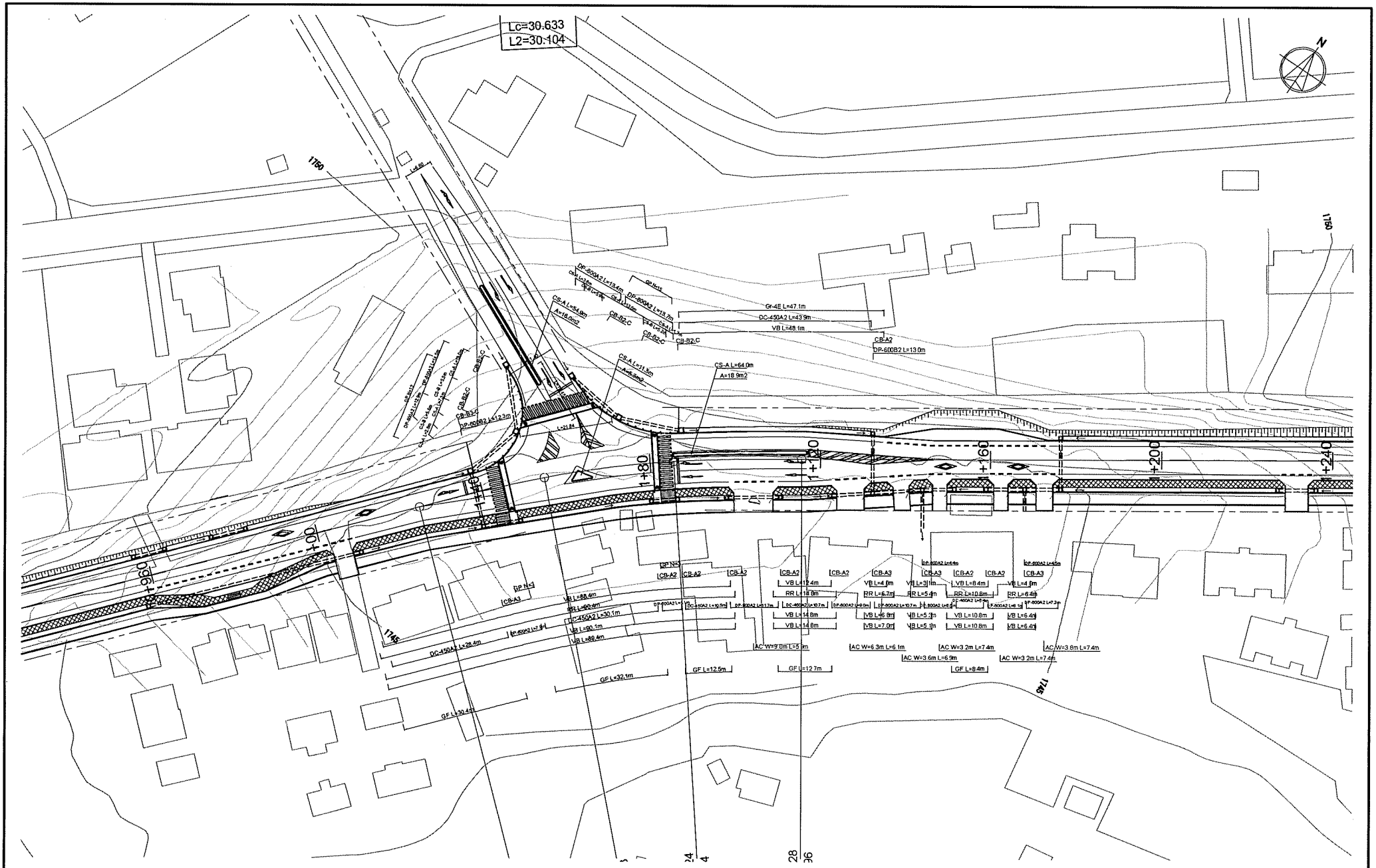
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: **INTERSECTION PLAN**	Drawing No.	IS-1
				SCALE	1/2500
				DATE	AUG. 2009



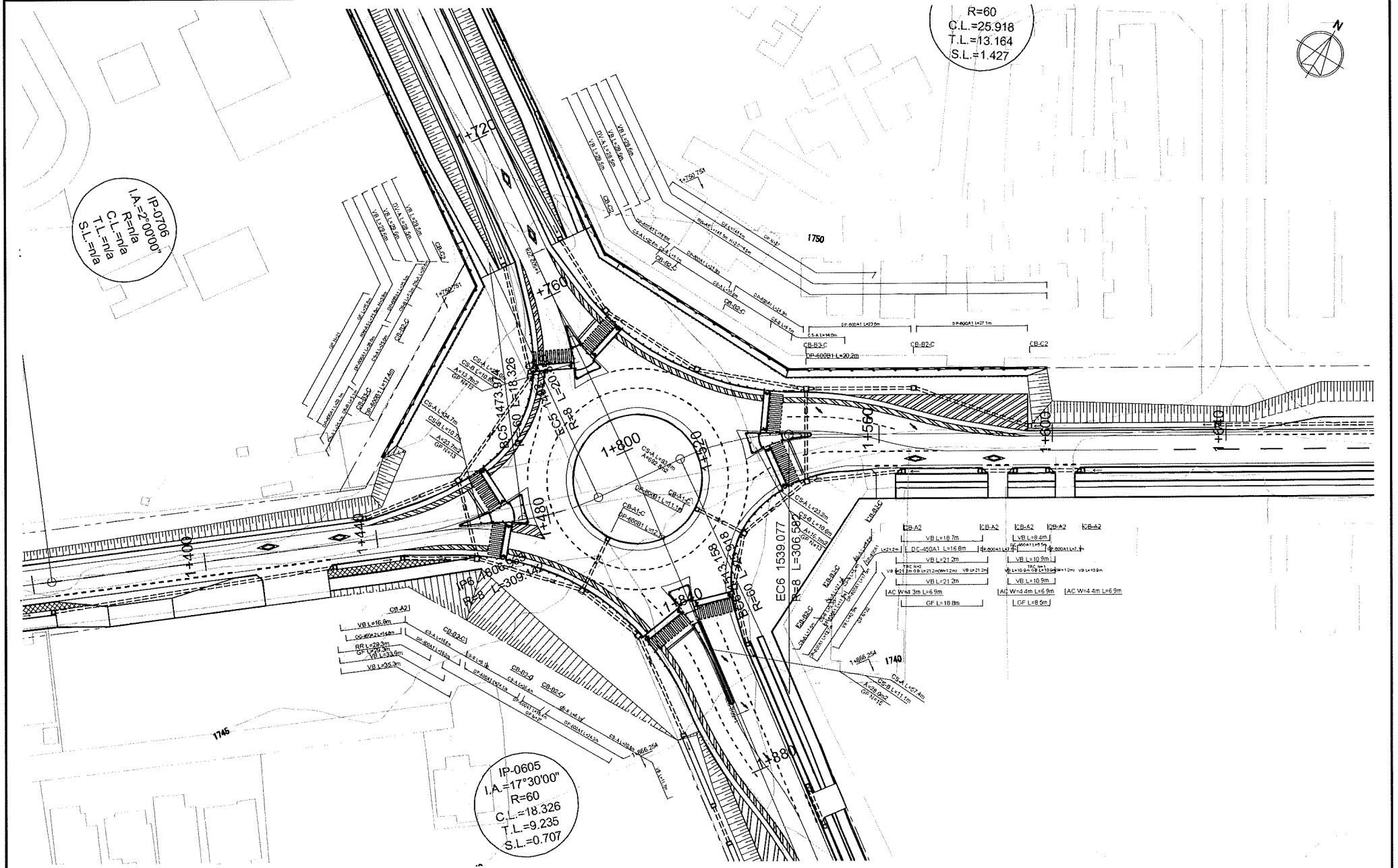
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML6 No.7 Gitanga)	Drawing No.	IS-2
				SCALE	1/800
				DATE	AUG. 2009



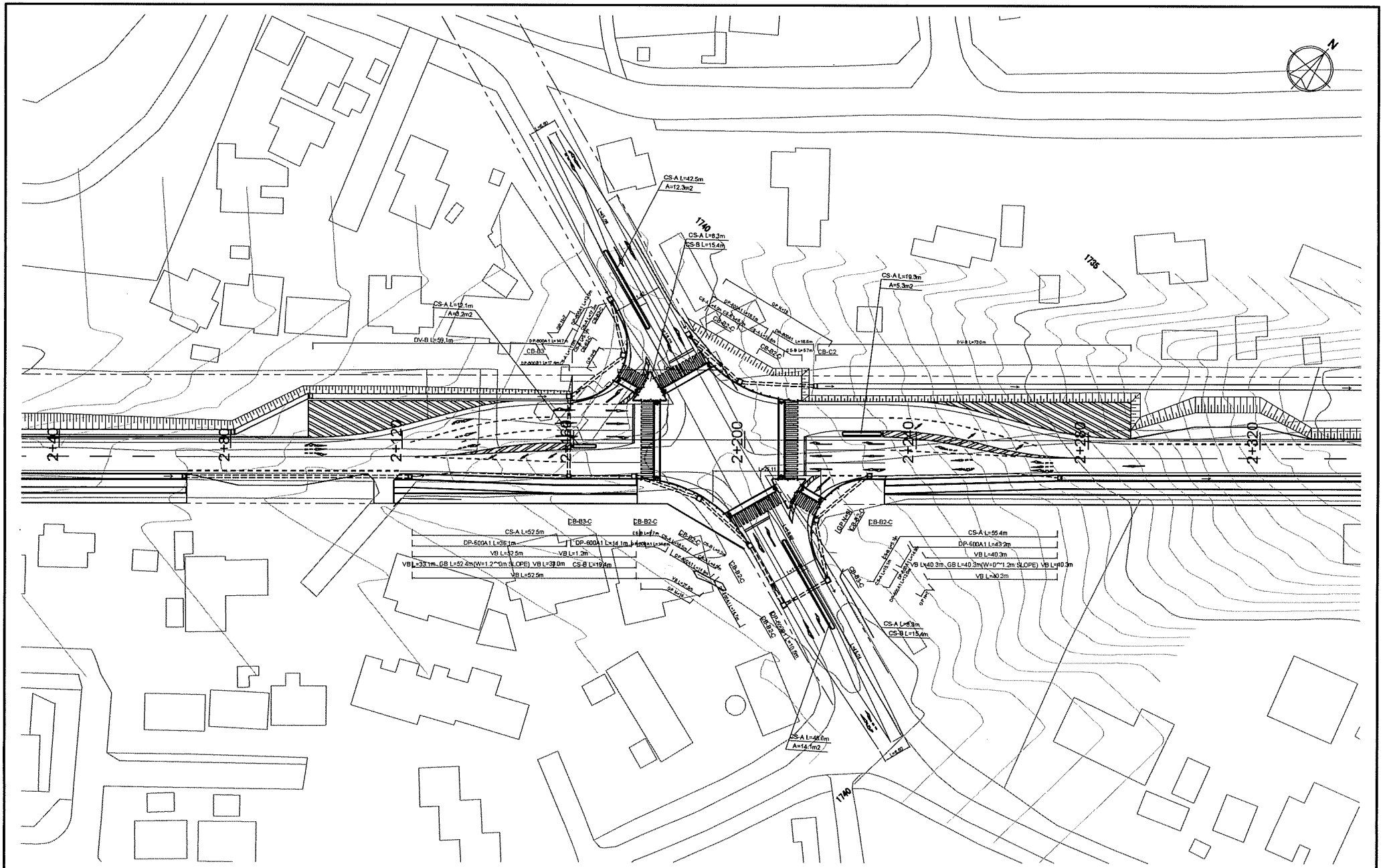
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML6 No.19)	Drawing No.	IS-3
				SCALE	1/800
				DATE	AUG. 2009



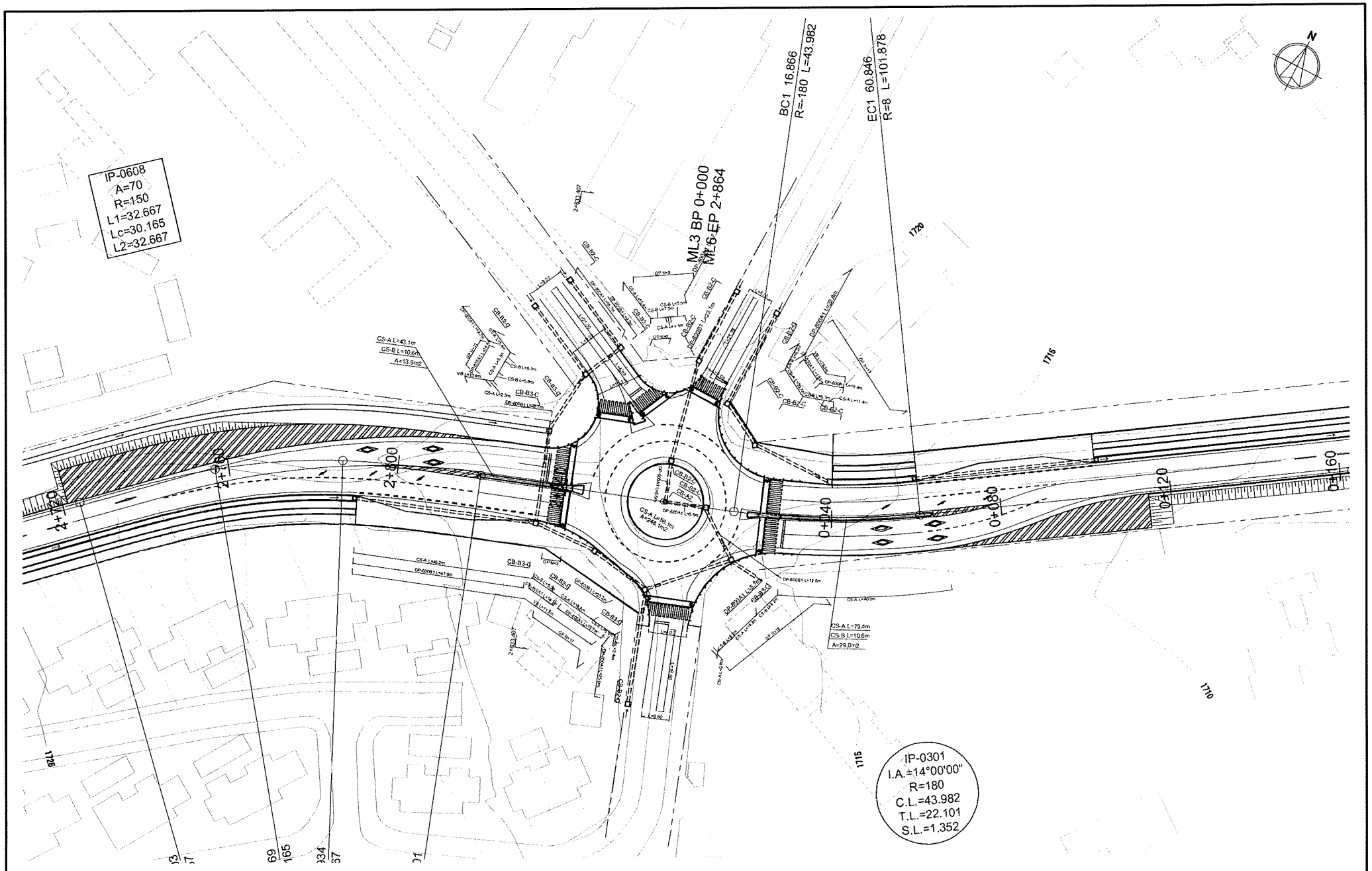
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML6 No.18)	Drawing No.	IS-4
				SCALE	1/800
				DATE	AUG. 2009



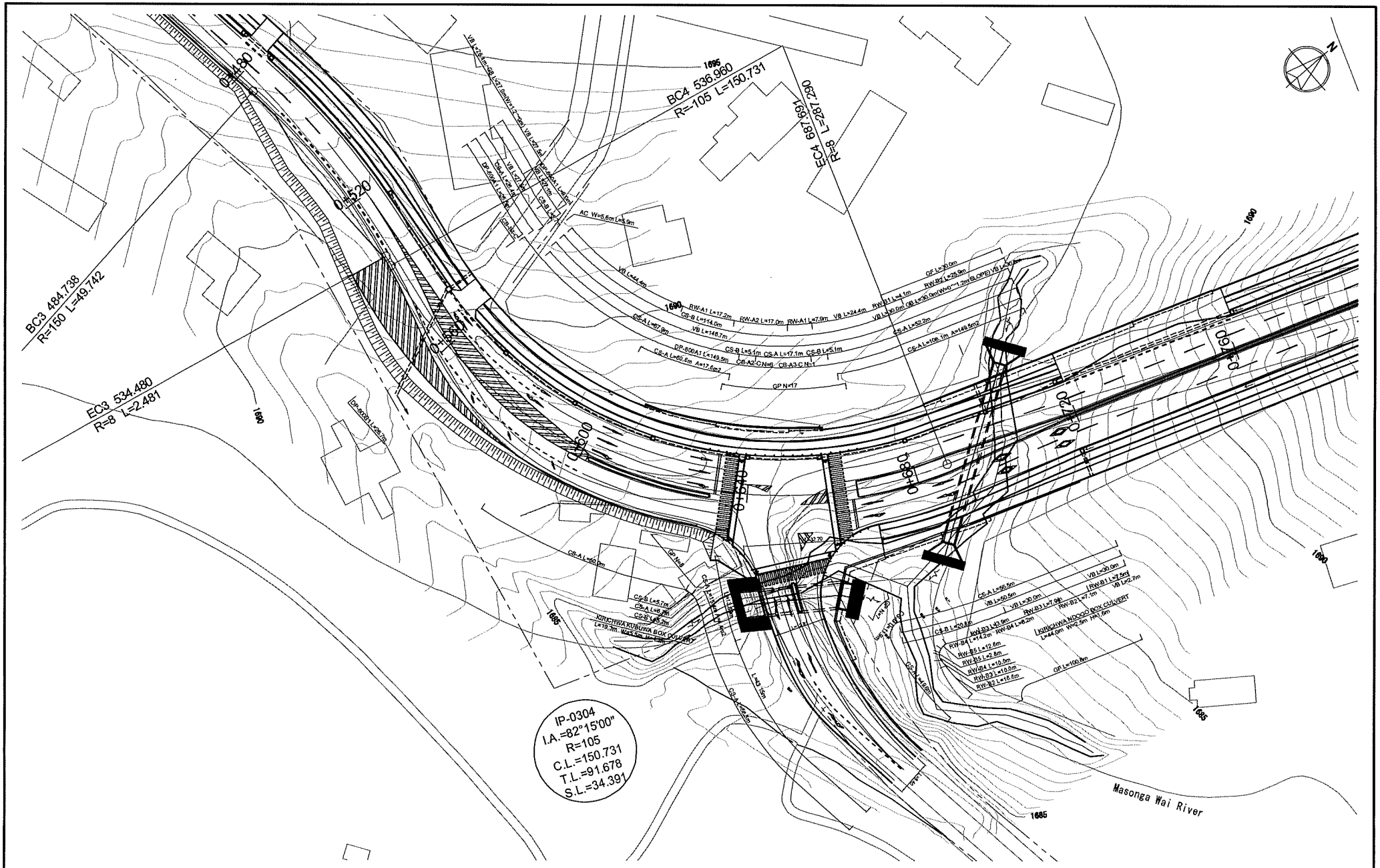
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML6 No.6 Kileleshwa)	Drawing No.	IS-5
				SCALE	1/800
				DATE	AUG. 2009



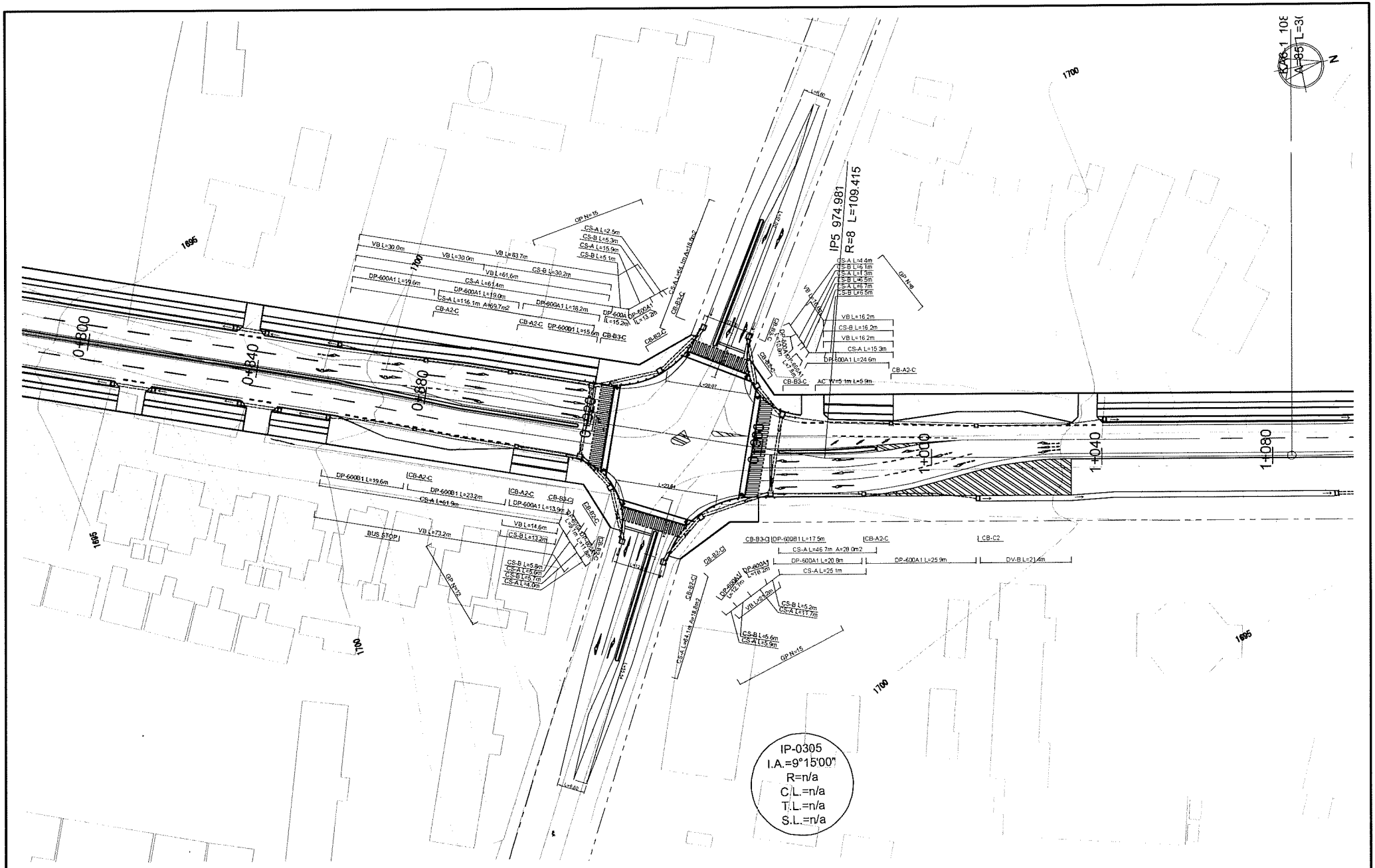
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML6 No.17)	Drawing No.	IS-6
				SCALE	1/800
				DATE	AUG. 2009



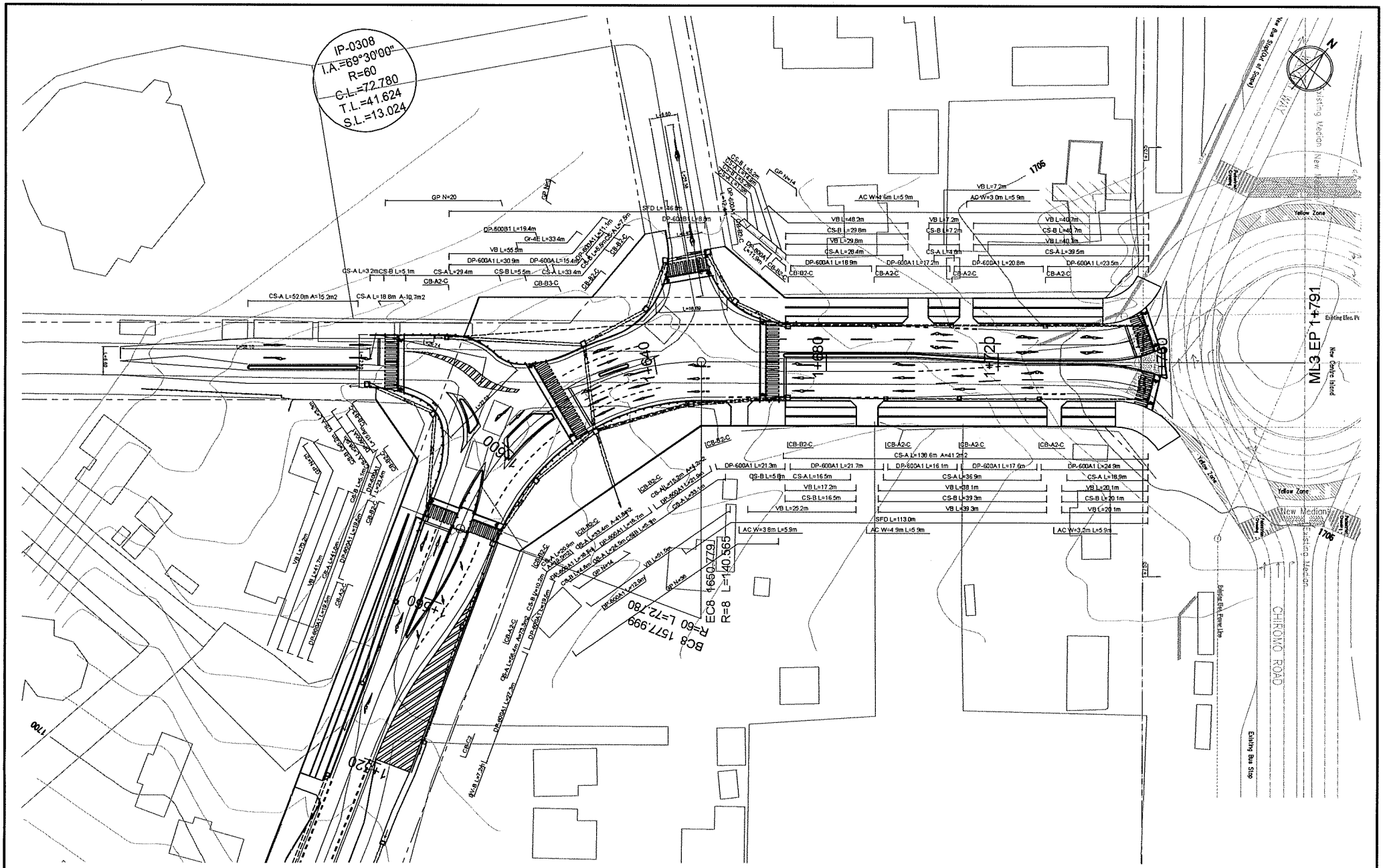
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML3 No.5 Kasuku Center)	Drawing No.	IS-7
				SCALE	1/600
				DATE	AUG. 2009



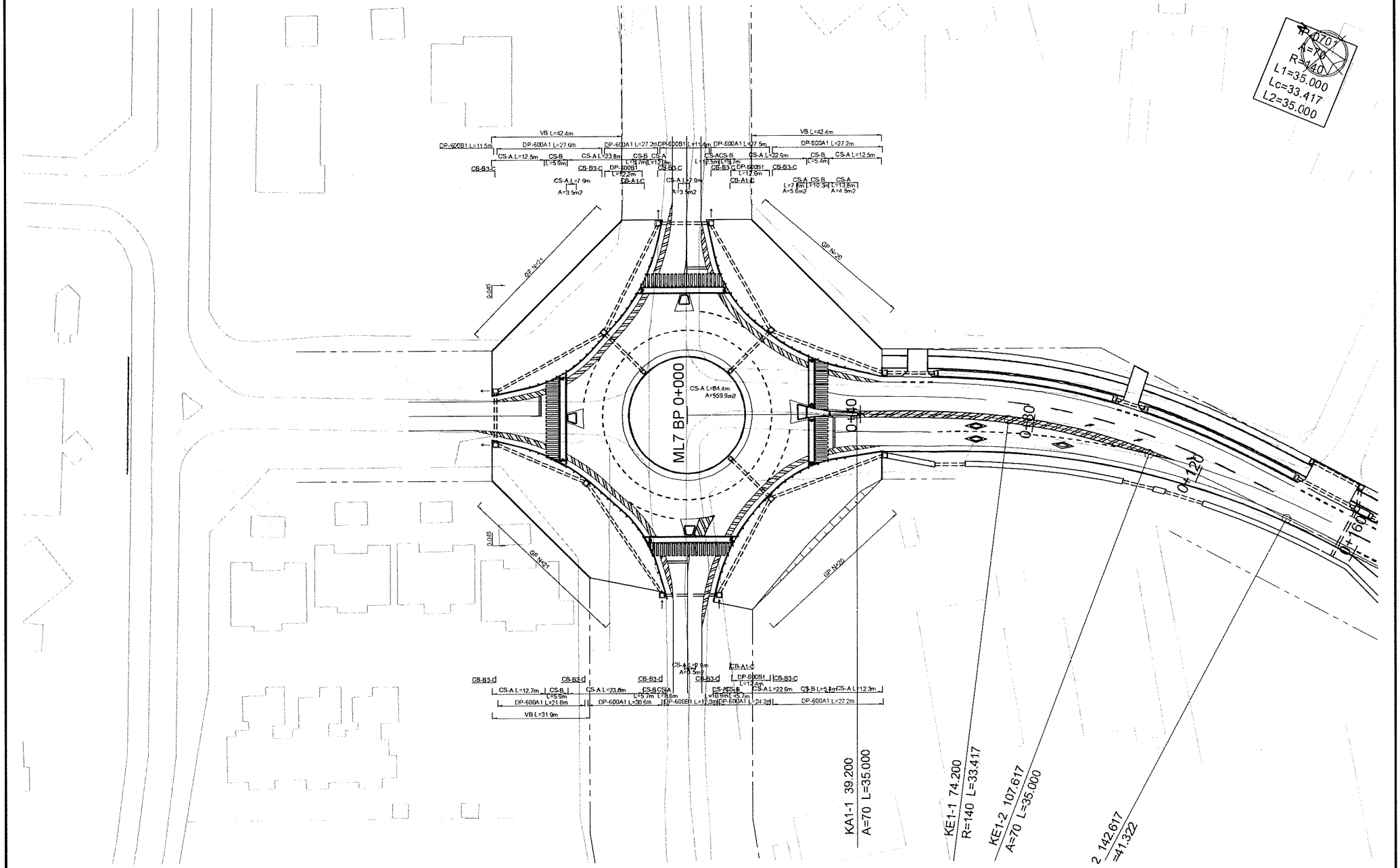
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML3 No.4 Aboretum)	Drawing No.	IS-8
				SCALE	1/800
				DATE	AUG. 2009



KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML3 No.3 Riverside)	Drawing No.	IS-9
				SCALE	1/800
				DATE	AUG. 2009



KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE: INTERSECTION PLAN (ML3 No.2,16 Westlands)	Drawing No. IS-10 SCALE 1/800 DATE AUG. 2009



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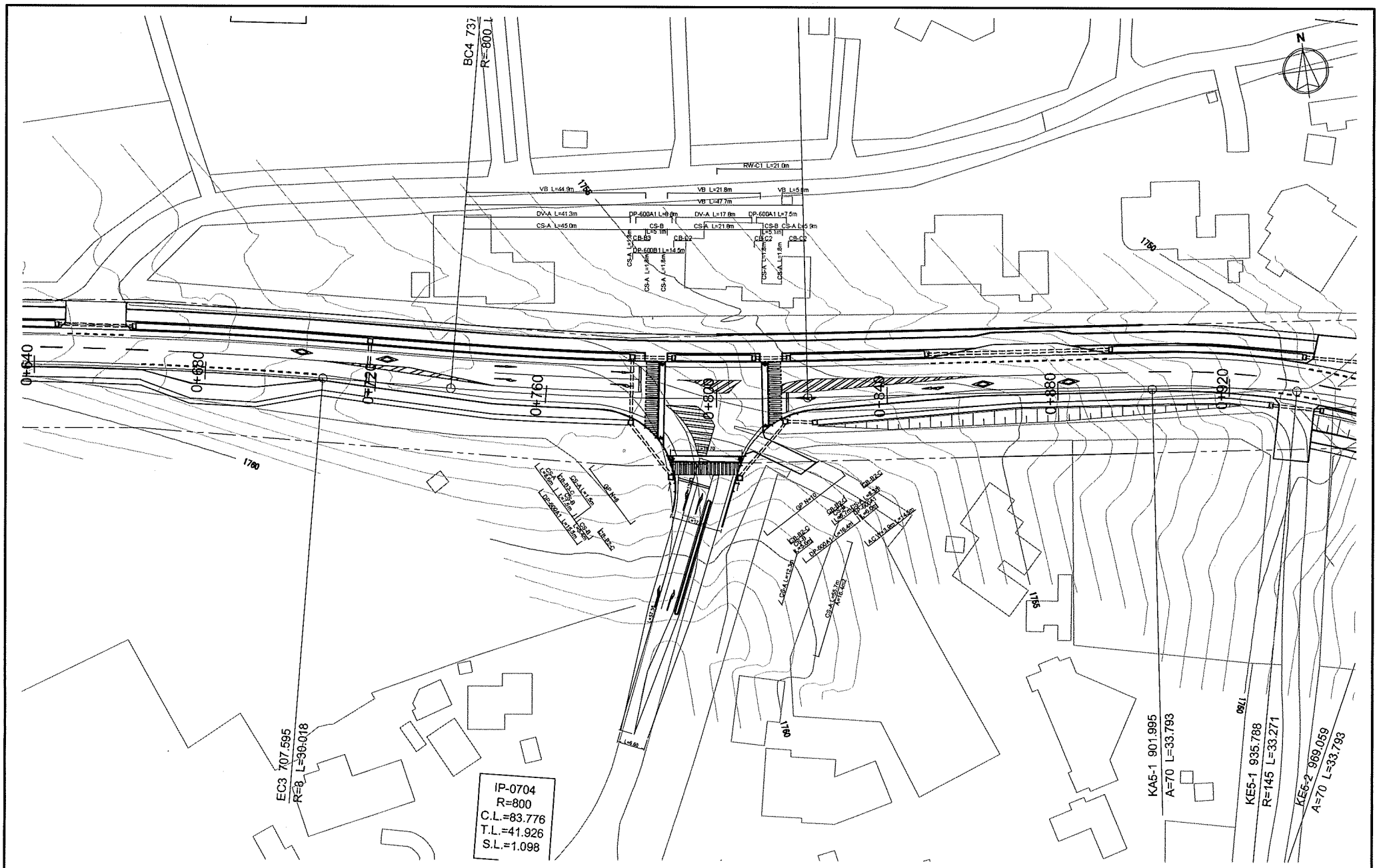
				DATE	AUG. 2009



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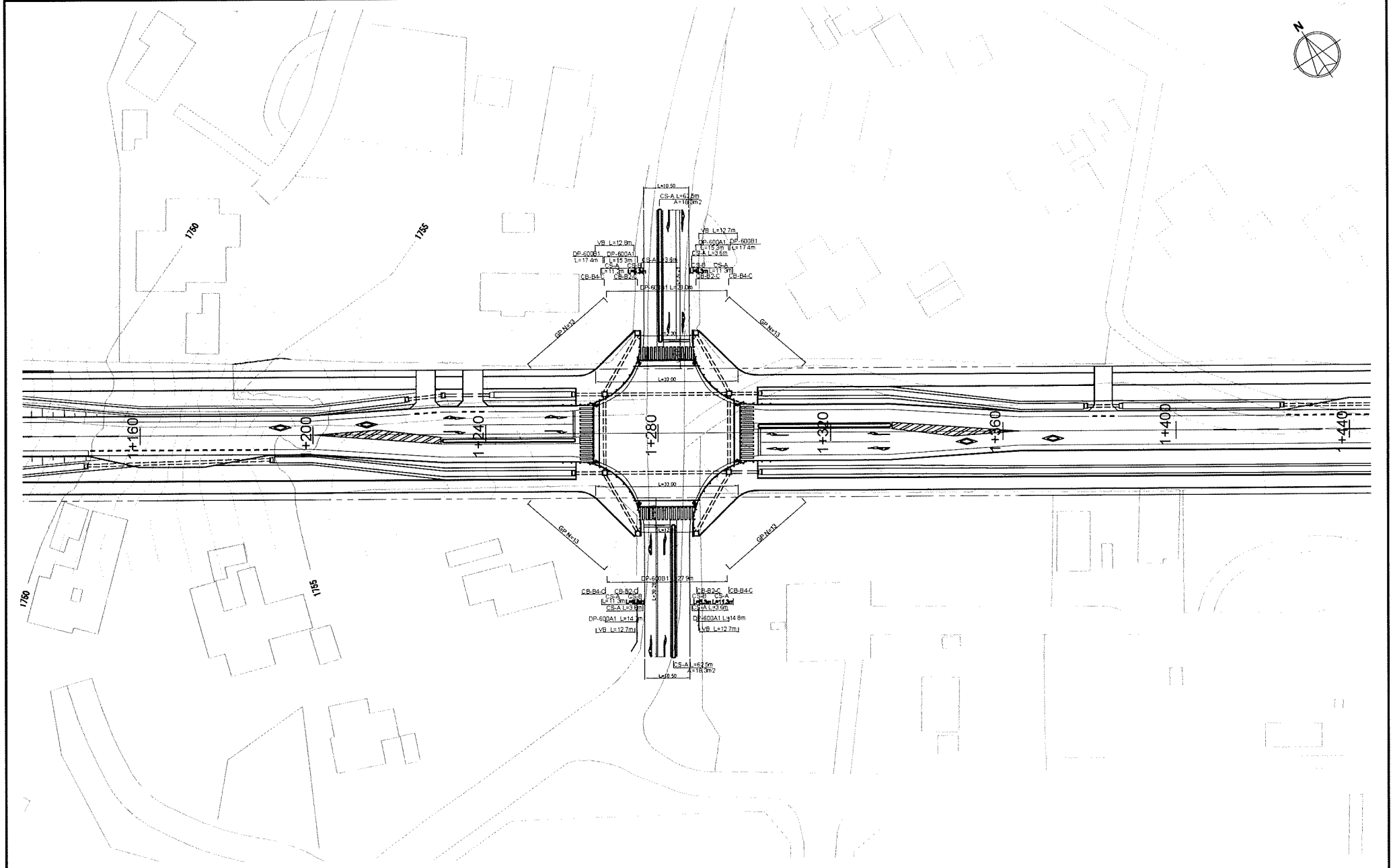

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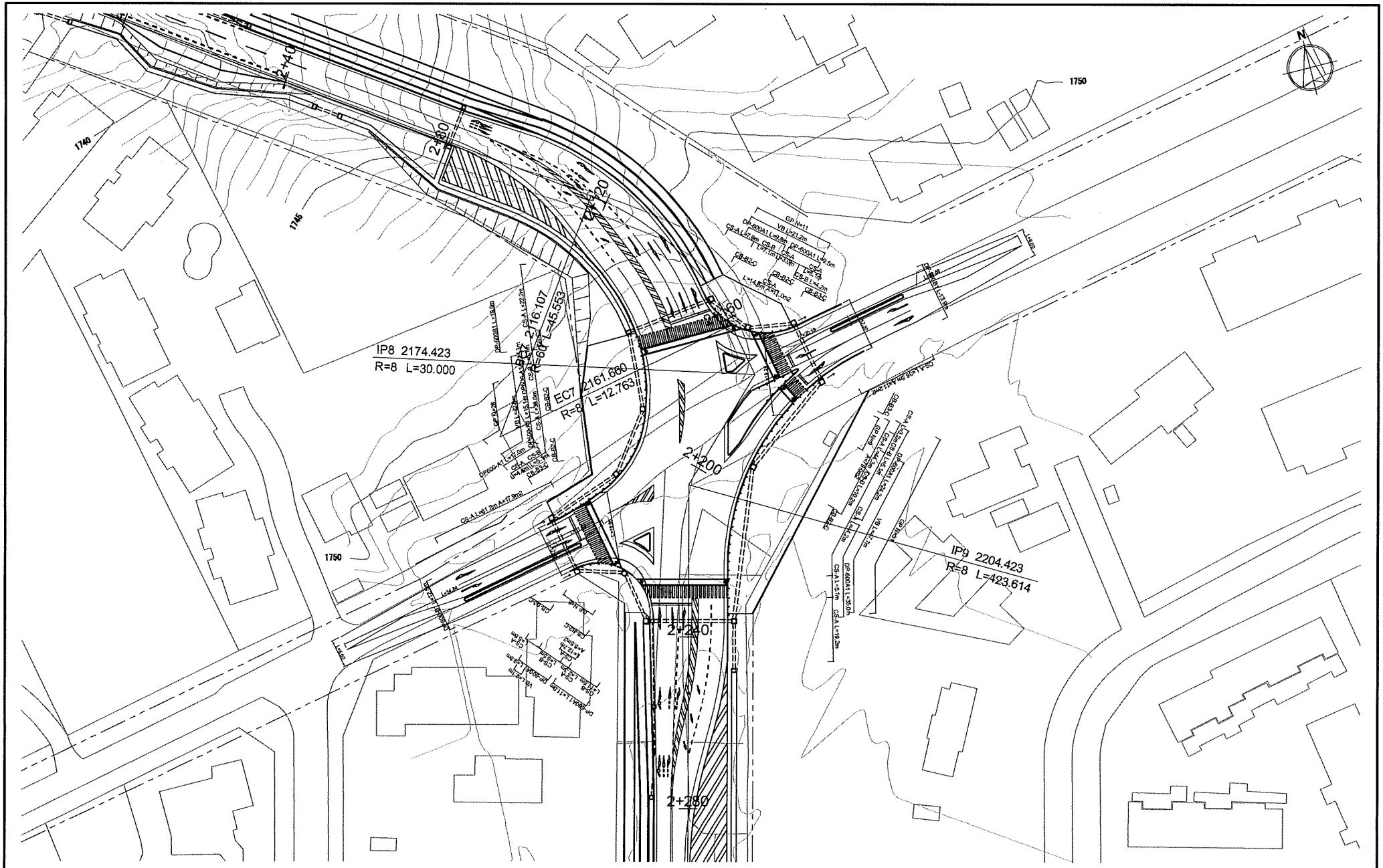

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				SCALE	1/800
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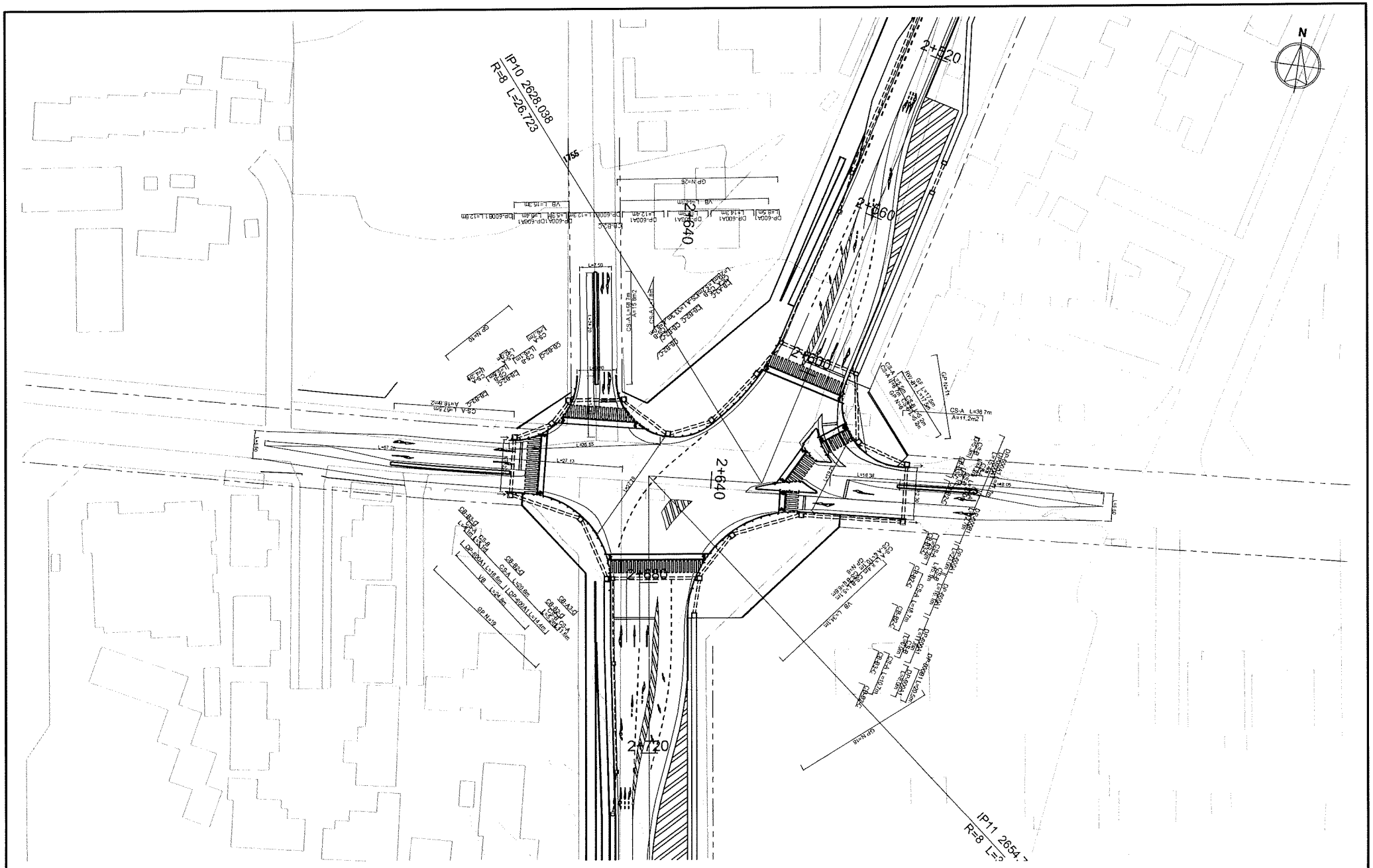

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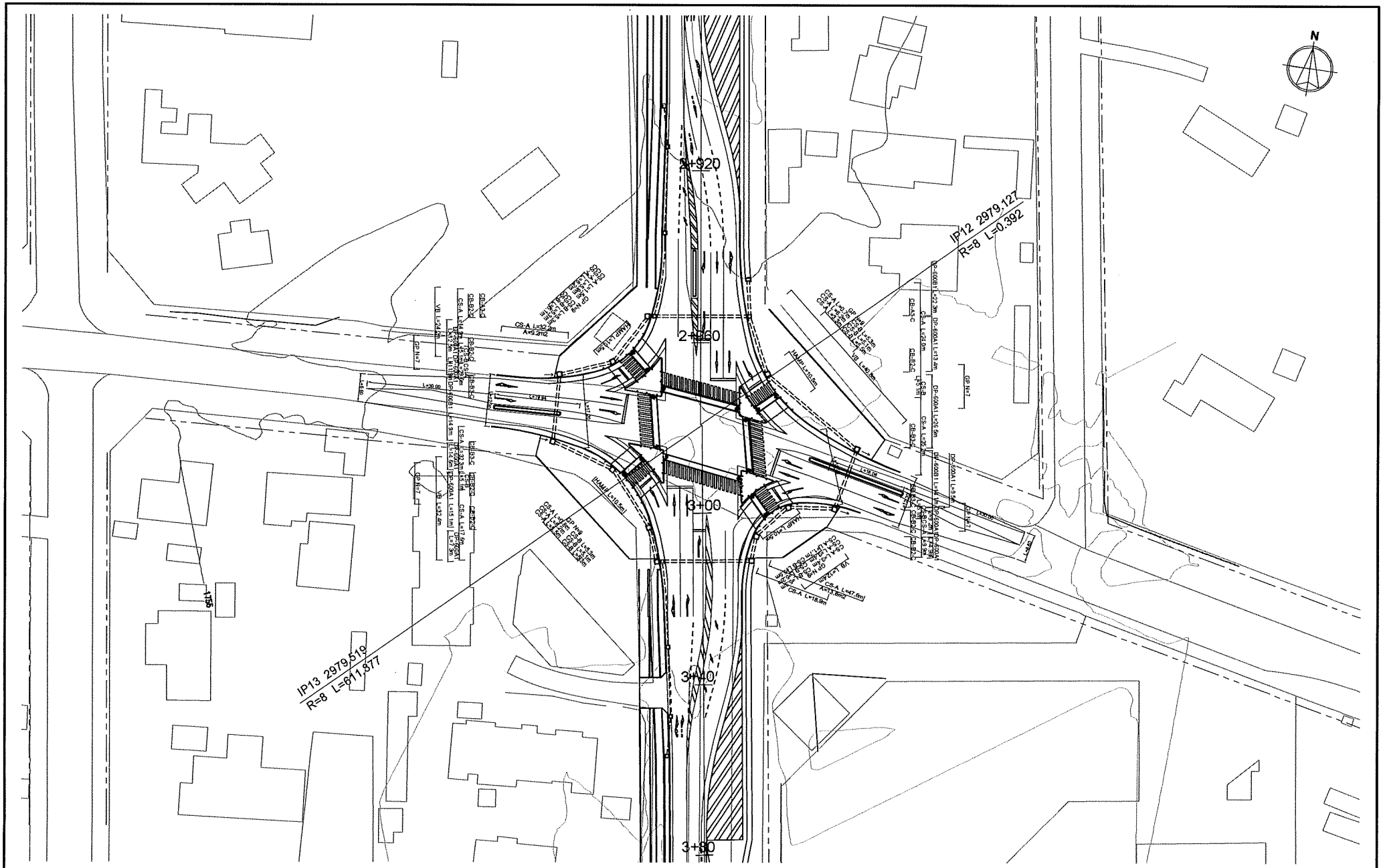

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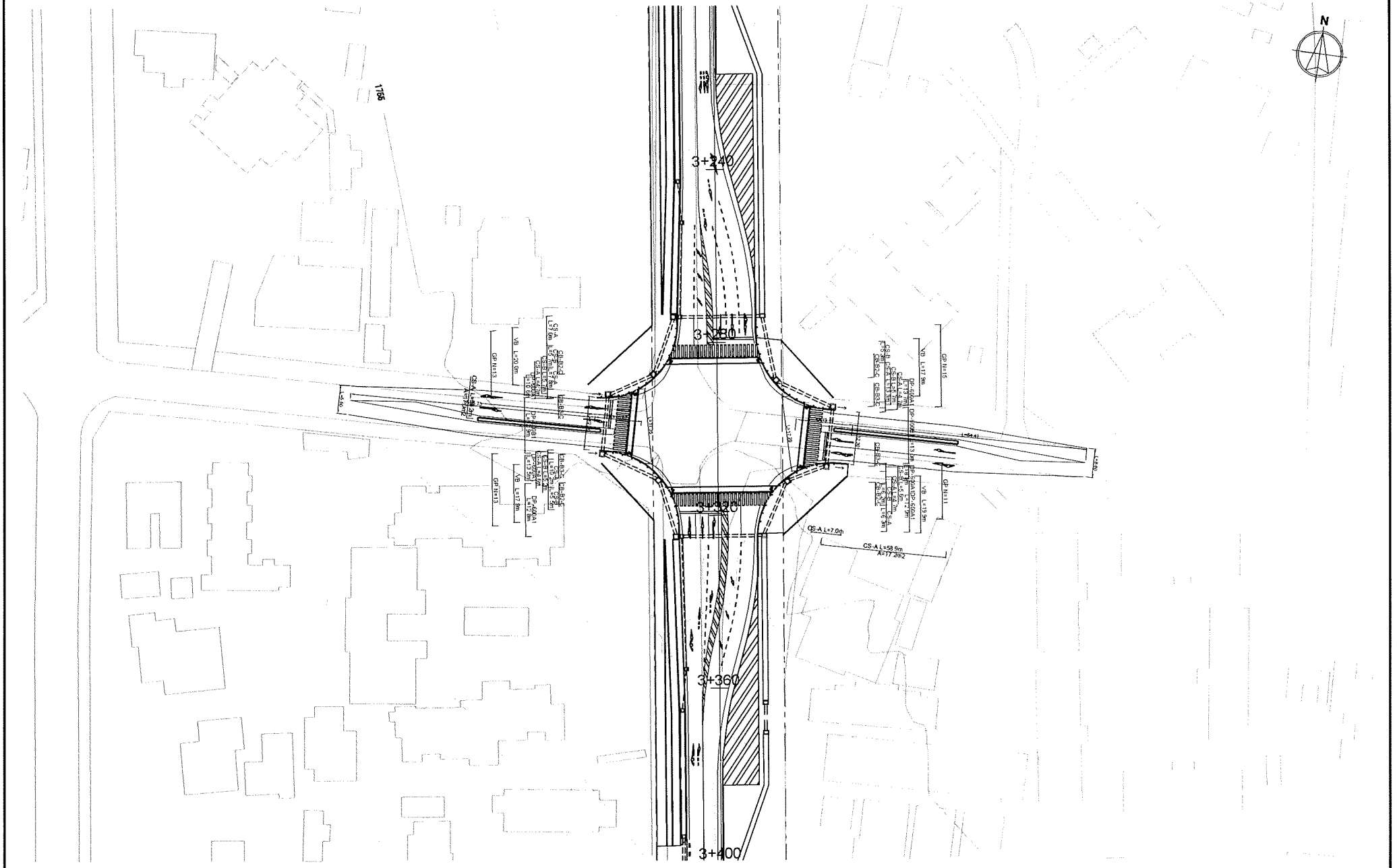

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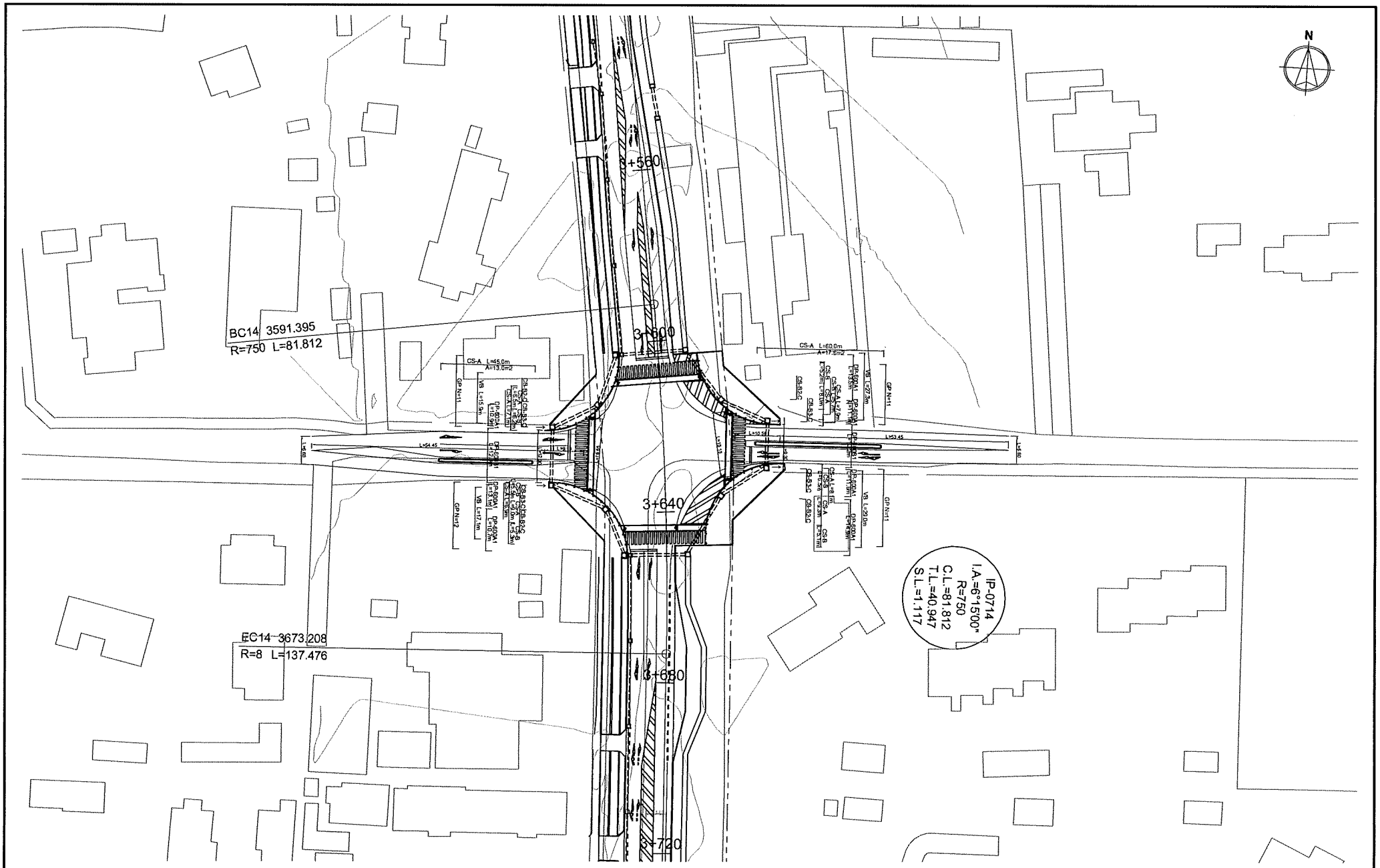

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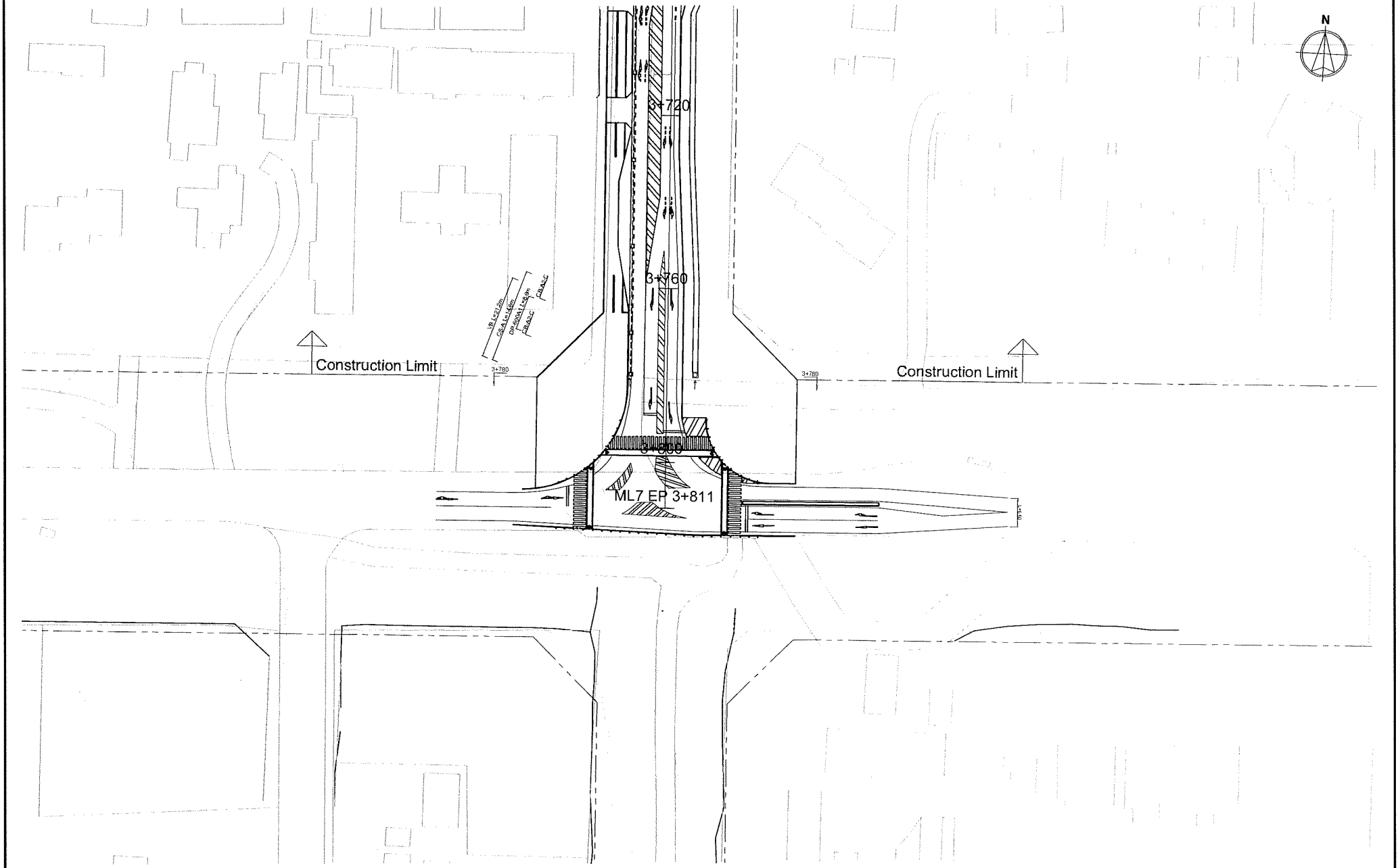
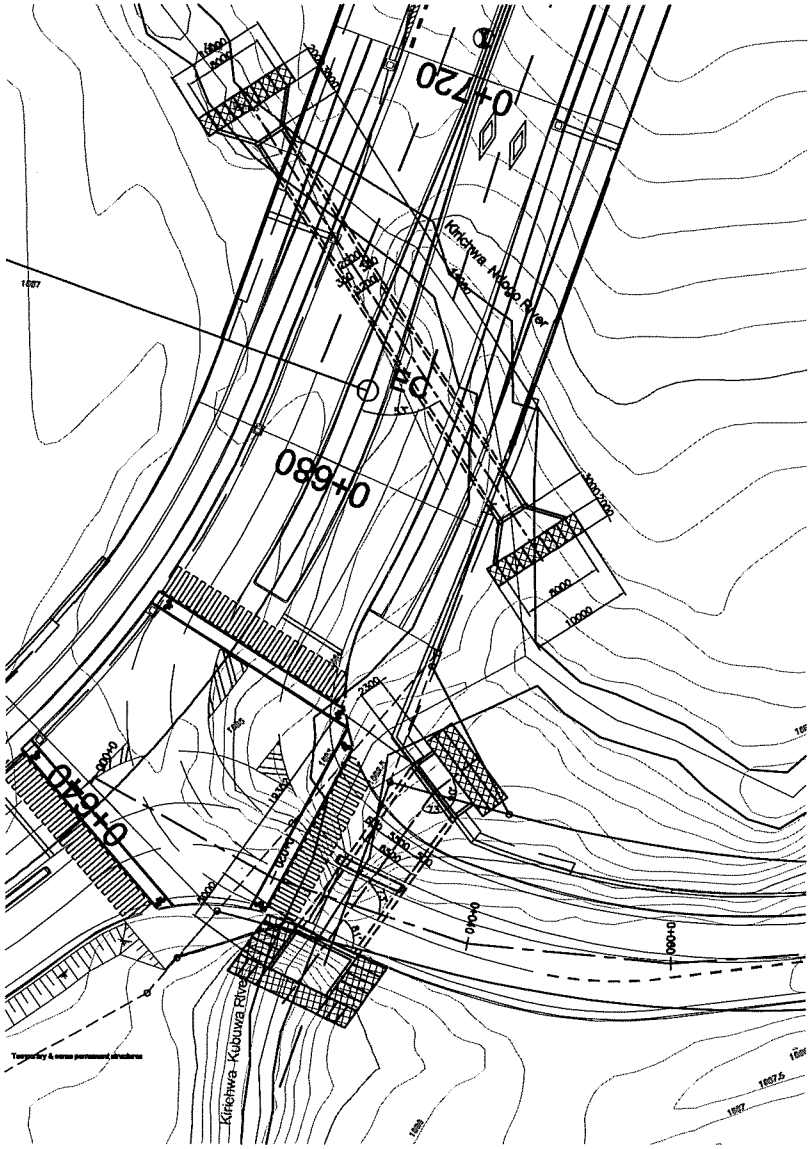


KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : INTERSECTION PLAN (ML7 No.14 Ngong)	Drawing No. SCALE DATE	IS-19 1/800 AUG. 2009



1 GENERAL PLAN
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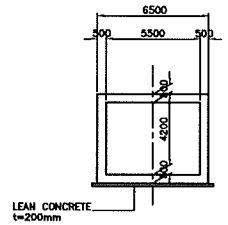
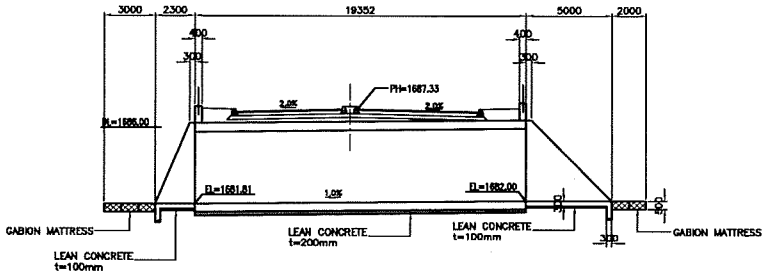
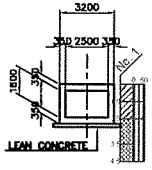


3a SECTION
SCALE 1:150



3b ELEVATION
SCALE 1:300

3 KIRICHWA KUBUWA BOX CULVERT
SCALE AS SHOWN



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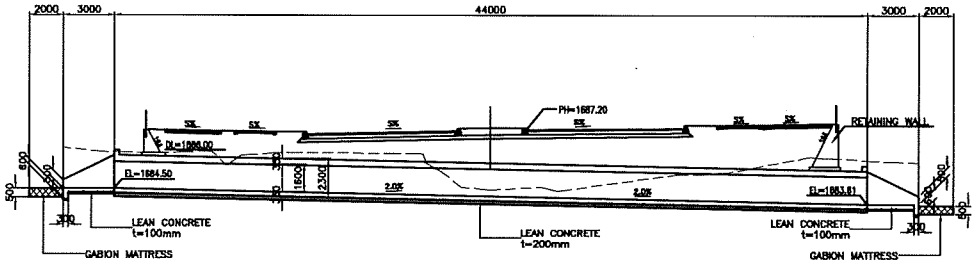
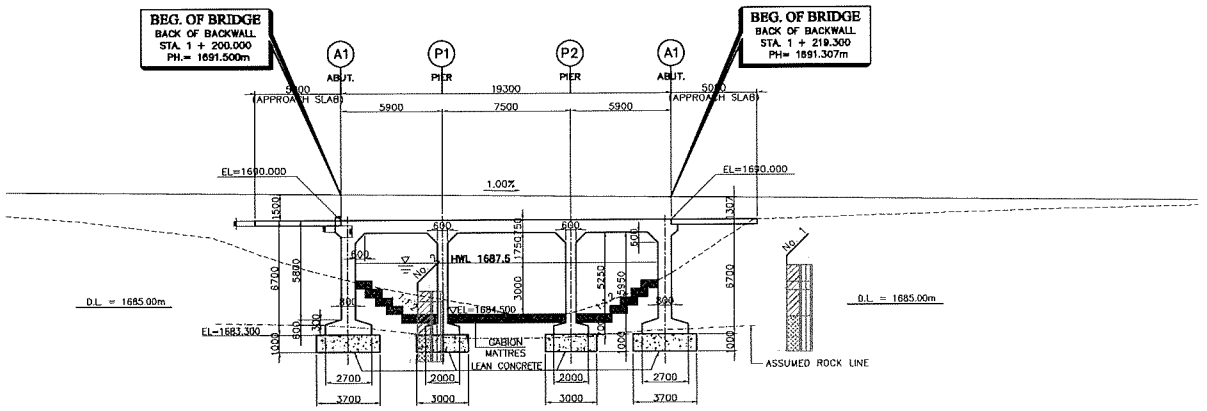


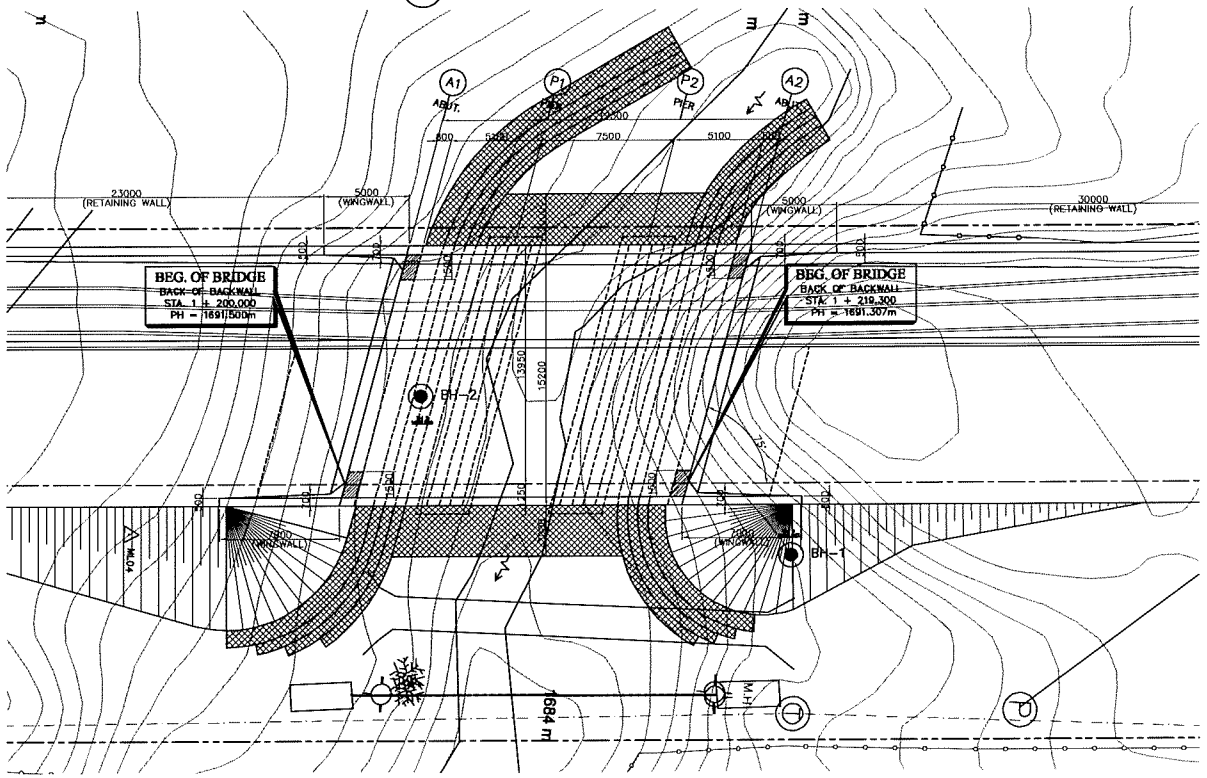
2b ELEVATION
SCALE 1:300

2 KIRICHWA NDOGO BOX CULVERT
SCALE AS SHOWN

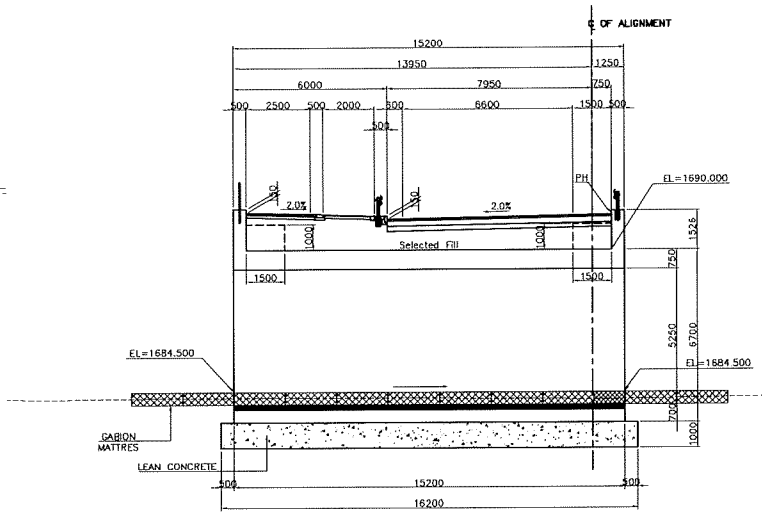
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : ML3 Abotetum Road Widening General Plan	Drawing No.	BR-1
				SCALE	AS SHOWN
				DATE	AUG. 2009



1 SECTION ALONG PH
SCALE 1 300

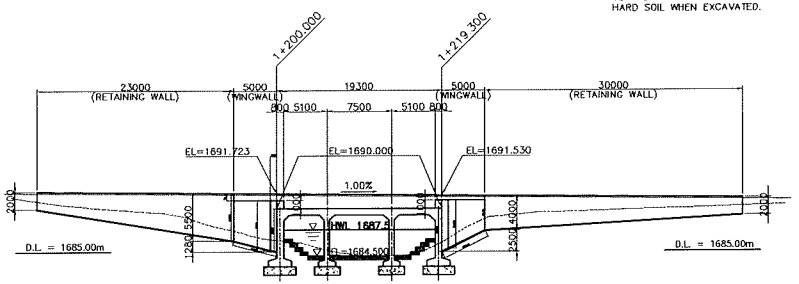


2 GENERAL PLAN
SCALE 1 300

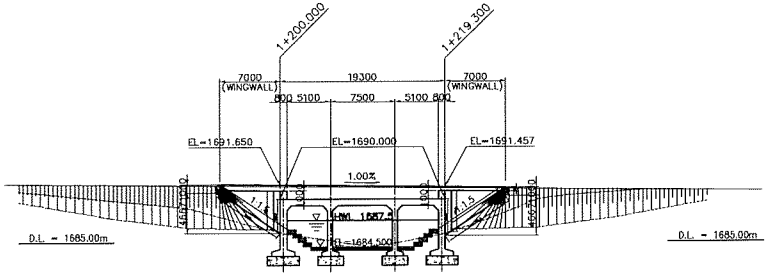


5 BRIDGE SECTION
SCALE 1 200

NOTE :
THICKNESS OF THE LEAN CONCRETE SHALL BE ADJUSTED TO THE ACTUAL DEPTH OF THE HARD SOIL WHEN EXCAVATED.

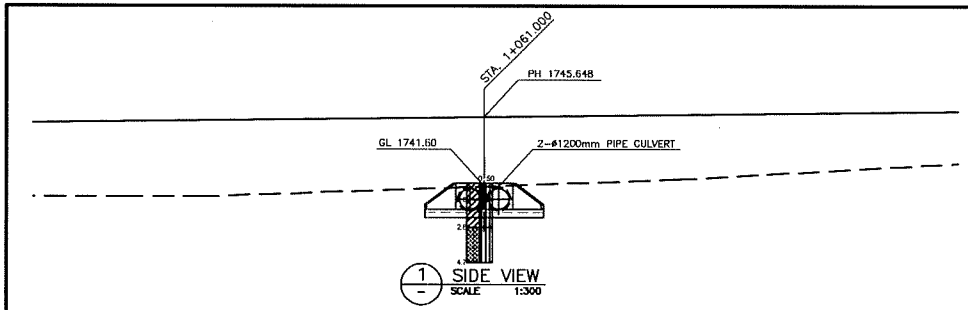


4 ELEVATION (UP STREAM SIDE)
SCALE 1 600

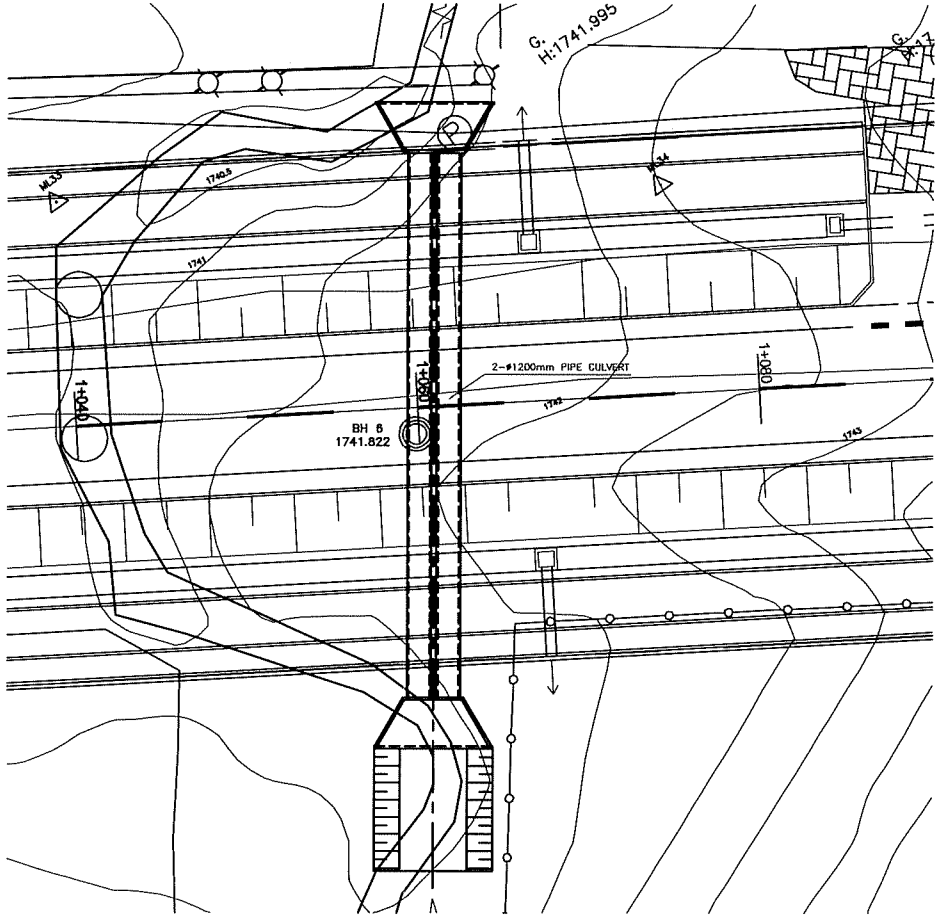


3 ELEVATION (DOWN STREAM SIDE)
SCALE 1 600

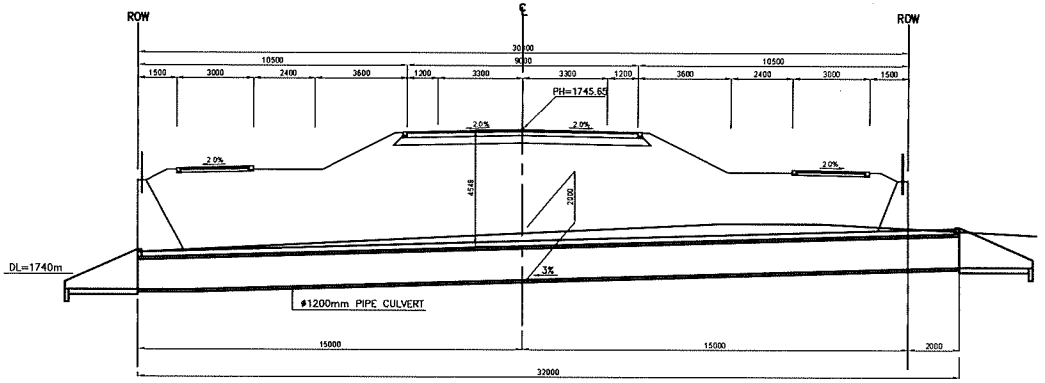
KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : ML3 Nairobi River Bridge General Plan	Drawing No.	BR-2
				SCALE	AS SHOWN
				DATE	AUG. 2009



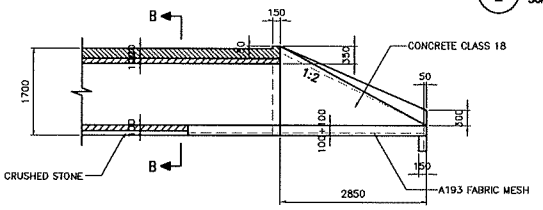
1 SIDE VIEW
SCALE 1:300



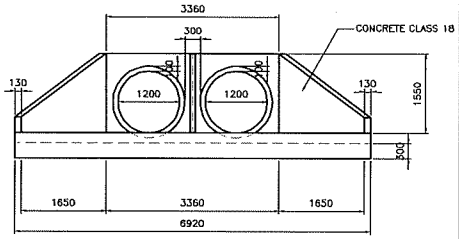
2 PLAN
SCALE 1:300



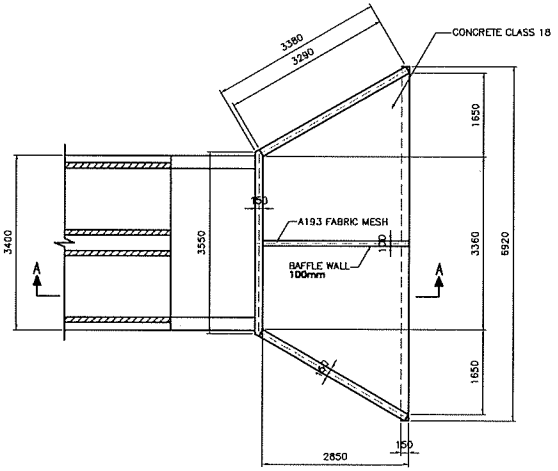
3 SECTION
SCALE 1:200



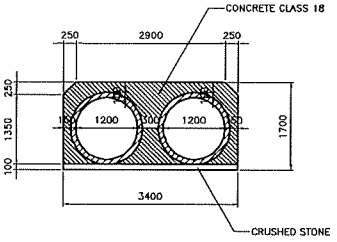
SECTION A–A



FRONT ELEVATION

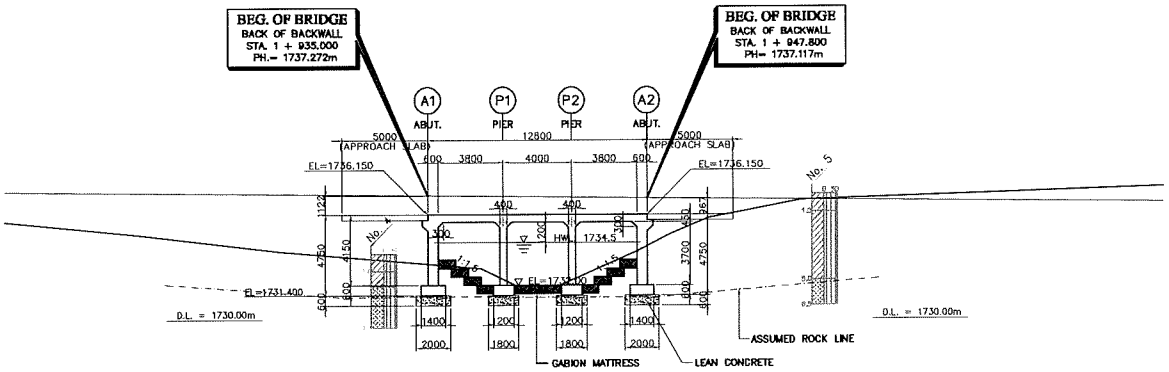


4 DETAILS
SCALE 1:100

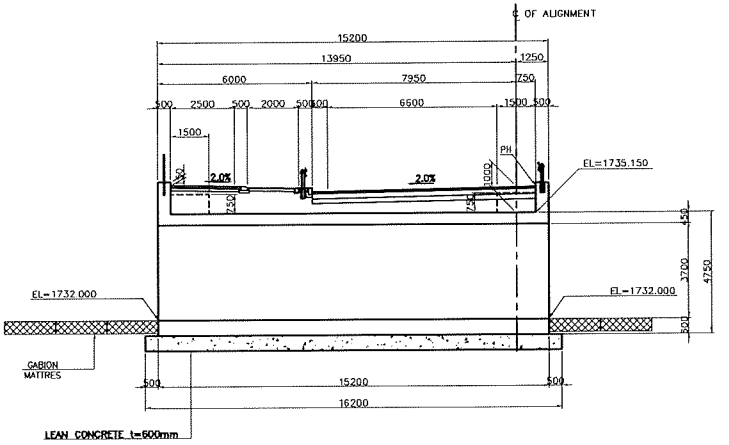


SECTION B–B

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : ML7 Kirichwa Ndogo RCPC General Plan	Drawing No.	BR-3
				SCALE	AS SHOWN
				DATE	AUG. 2009

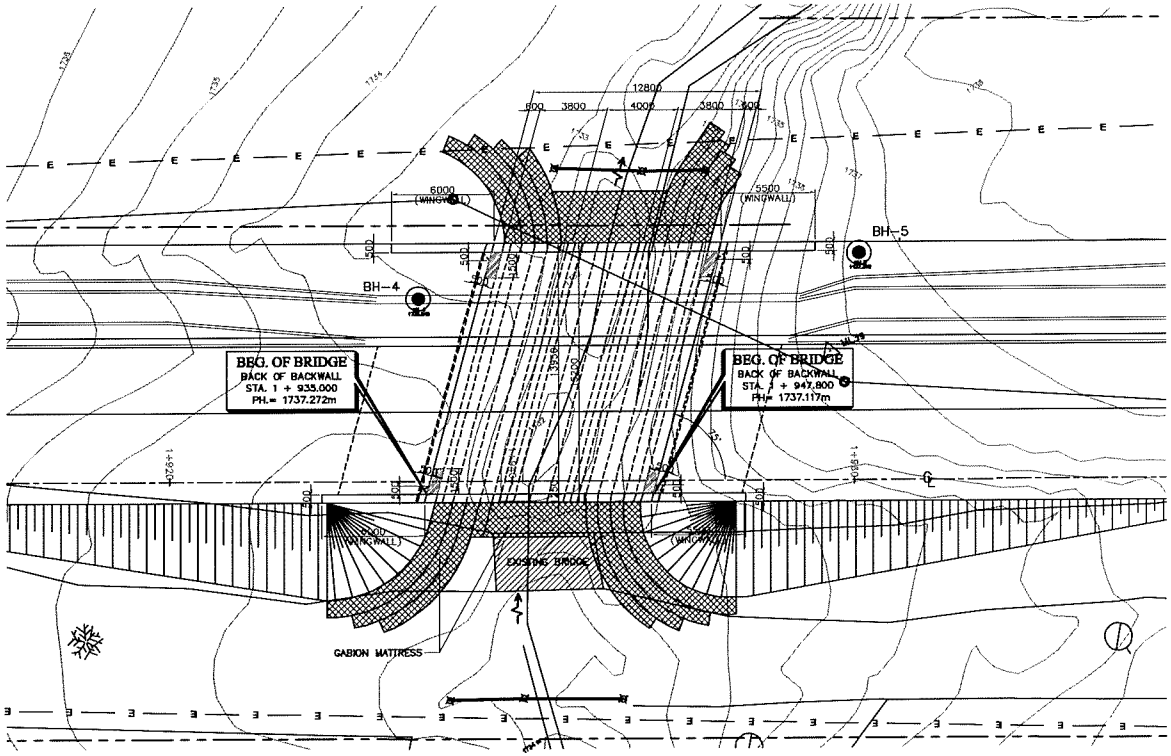


2 SECTION ALONG PH
SCALE 1:300

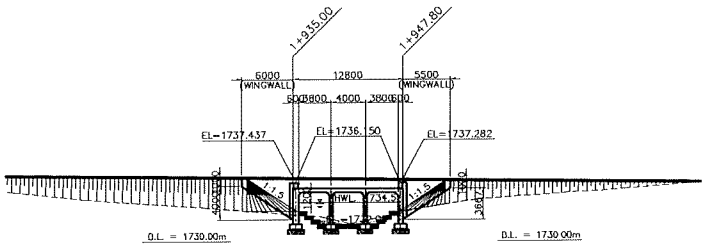


2 BRIDGE SECTION
SCALE 1:200

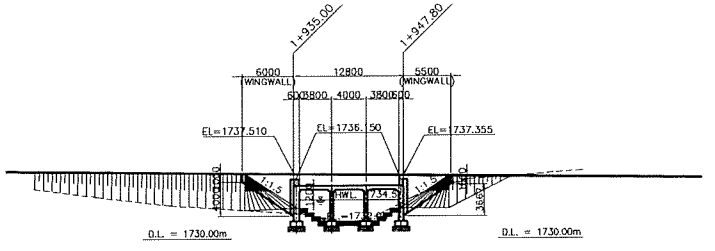
NOTE :
THICKNESS OF THE LEAN CONCRETE SHALL BE ADJUSTED TO THE ACTUAL DEPTH OF THE HARD SOIL WHEN EXCAVATED.



2 GENERAL PLAN
SCALE 1:300



2 ELEVATION (UP STREAM SIDE)
SCALE 1:600



2 ELEVATION (DOWN STREAM SIDE)
SCALE 1:600

KENYA URBAN ROAD AUTHORITY CITY COUNCIL OF NAIROBI MINISTRY OF LOCAL GOVERNMENT MINISTRY OF ROADS	JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR THE CONSTRUCTION OF NAIROBI WESTERN RING ROADS	TITLE : ML7 Kirichwa Kubwa Bridge General Plan	Drawing No.	BR-4
				SCALE	AS SHOWN
				DATE	AUG. 2009

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The basic concepts for implementation of the Project are as follows;

- ✓ On reaching an agreement and signing the exchange of note by both Governments of Japan and Kenya, the Project will be implemented in accordance with the guideline of Japan's Grant Aid.
- ✓ The Ministry of Roads (MoR) and Kenya Urban Road Authority (KURA) of Government of Kenya (GoK) are responsible for the Project implementation.
- ✓ Assistance in tendering and construction supervision will be undertaken by a Japanese consulting firm in accordance with a contract between the MoR and the consultant.
- ✓ A Japanese pre-qualified tenderer who has been awarded the contract by the MoR will undertake the implementation of the Project.

Main concepts for the implementation are as follows;

- ✓ Materials and labor for the project are procured in Kenya as many as possible. If required qualities and capacities are not enough, materials and labor can be procured effectively from third countries and/or Japan.
- ✓ Implementation method and schedule for the Project shall be planned on the basis of local meteorological, topographic and geological conditions as well as any natural conditions affected by the construction works.
- ✓ General and easy method without specific equipment and technology shall be planned.
- ✓ Appropriate standards and specifications for construction shall be proposed, and site organizations of both the contractor and consultant shall be arranged to comply abovementioned standards and specifications.
- ✓ Facilities to strictly secure safety for construction staff and third parties shall be installed. Especially, educative training on environment and anti-AID/HIV shall be carried out.
- ✓ Protection against water pollution and flooding by the implementation and installation and operation of asphalt plants, quarry sites and borrow pits shall be done in order to preserve environment. Construction waste shall be treated and/or dumped in a proper site specified by the Government of Kenya.

2-2-4-2 Implementation Conditions

Construction plan and method shall be prepared in order to secure the safety of the construction staff and the third parties first of all, and they shall be selected to consider preservation of environment for the road users and the road side residents.

Present Road Conditions

About two fifths of the proposed roads are already paved with DBST that have been deteriorated due to recent increase of traffic volume in line with economic growth.

Local streets in the area were initially designed to access to the residential plots and some of them are intentionally designed with dead ends for not allowing through traffic.

As a result, all traffic from/to those area and outside is concentrated into a few collector/distributor roads in the area, and caused sever traffic jams especially during the peak hours in the morning and evening, and commuters to office, school, and/or clinic are suffering from such conditions every day.

Therefore, safety and traffic management for road users and mitigation measures of environment for road side residents shall be considered in line with the construction planning.

Present Road Side Facility Conditions

The project is intending to construct urban collector road, which is going to connect both local streets and arterials that are important for citizens in the City of Nairobi. Right of way of the proposed roads is secured since long time ago to minimize adverse impacts, such as massive land acquisitions, in the established residential and commercial areas.

Therefore, complete road blocks shall be avoided during the construction stage by providing necessary accessibilities to all road users and residents as a first priority.

For road side residents, environmental consideration is must during the construction stage, and basically major works shall be carried out only during the daytime, and if it is absolutely necessary, night works may be done with extreme care.

Climate and Natural Conditions

City of Nairobi is located at elevation of around 1,700 m above sea level, and there are two seasons; relatively cool dry season (December to February and June to October) and relatively warm rainy season (March to May and October).

Terrain is composed from the plateau made by basalt rock as base rock and some weathered rocks as well as soft soils, such as laterite and black cotton soil.

Implementation shall be concentrated during the total 8 months long dry seasons. Especially pavement works shall be implemented with enough spans, because the works will be troubled by the rain.

Safety Management for Road Side Residents, Road Users, and Construction Personnel

During the construction stage, one lane may be occupied by construction equipments and works themselves, and remaining one lane space will be secured to deal alternating traffic with intense care for traffic safety.

And if it is absolutely necessarily, temporary carriageway and sidewalk will be provided within the right-of-way to secure smooth traffic flows on the roads under construction at particular important segments.

i. Safety for Road Side Residents;

- ✓ Construction yards will be clearly separated and off-limited from general public by using security facilities such as fences, barricades, safety cones, lighting signs, construction signboard, traffic control signboards, detour routes indication boards, and so on as well as traffic controllers
- ✓ Prevention measures to the heavy machine drivers and operators shall be carried out through periodical traffic and construction safety educations

ii. Safety Management to Construction Personnel;

- ✓ Guard persons will be provided to avoid collision between heavy machines and ordinary vehicles, pedestrians, and bicycles

iii. Consideration for Environment

- ✓ Debris and waste from removal of the existing pavement and bridges shall be done in proper manner to mitigate the environmental adverse impacts
- ✓ Selection of borrow pits will be made with consultation of the relevant authorities, and at the location with the least negative impacts to the environment
- ✓ Construction methods causing vibration and noise shall be avoided during early morning and night time
- ✓ Dust control measures shall be carried by spraying water promptly
- ✓ Provision of information and educative training on labour safety, public health (malaria, sex related disease, AIDS/HIV, etc), natural environment preservation measures shall be conducted for the construction work forces

2-2-4-3 Scope of Works

Undertakings of both Governments of Japan and Kenya are listed in Table 2-2-7.

Table 2-2-7 Undertakings of the Both Governments

Items	Contents	Undertaken by		Remarks
		Japan	Kenya	
Procurement of Materials & Equipments	Procurement & Transportation	√		
	In-land Transportation Clearance		√	
Preparation Works	Lands & Right of Way Acquisitions		√	Including Spaces for Site Office, Stock Yard, Work Shop, etc.
	Relocation of Encroached Kiosks and Other Facilities		√	
	Provision of Borrow Pits and Quarry Sites		√	
	Provision of Waste Disposal Areas		√	
	Other Works	√		
Relocation & Removal of Various Obstacles	Relocation of Underground & Aerial Obstacles		√	Including Electric Poles & Wires, Telephone Poles & Cables, Water Pipes, Sewer Pipes, Optical Fibre Cables, Billboards & Signboards, etc.
	Removal of Existing Bridges		√	ML3 and ML7
	Removal of Existing Trees		√	
	Removal of Existing Box & Pipe Culverts	√		ML3, Arboretum Dr., and ML7
Main Works	Road & Intersection Improvement Works	√		
Supplemental Works	Traffic Signal Installation Works		√	
	Underground Utility Ducts Installation Works		√	Except Ducts & Hand Holes for Traffic Signals around Intersections
	Traffic Safety Facilities Installation	√		Except Cushion Drums
	Other Works	√		

2-2-4-4 Consultant Supervision

A Japanese consultant will carry out detailed design, assistance in tendering and construction supervision in accordance with the consultant contract agreed by both Government of Kenya and the Consultant.

(1) Detailed Design Services

The following services shall be carried out as the Detailed Design Services by the Consultant;

- ✓ To confirm the contents of the Project with the Implementing Agencies in Kenya through discussions, detailed designs, and field investigations
- ✓ To review the detailed design and drawings, wherever necessary
- ✓ To review the procurement plan and project cost estimate, wherever necessary

Period for the Detailed Design Service will be as follows;

- ✓ 3.0 months from verification of agreement of detailed design

(2) Tender Related Services

The following services shall be carried out as the Tender Related Services in the period from tender notice to construction contract by the Consultant;

- ✓ Preparation of Tender Documents (shall be done in line with above-mentioned Detailed Design Services)
- ✓ Tender Notice
- ✓ Pre-Qualification
- ✓ Tendering
- ✓ Tender Evaluation
- ✓ Contract Facilitation

Period for the Tender Related Services will be as follows;

- ✓ 4.0 months from verification of agreement of construction supervision

(3) Construction Supervision Services

The following services shall be carried out as the Construction Supervision Services of the construction to be executed by the Contractor according to the contract and implementation plan by the Consultant. Major items are as follows;

- ✓ Inspections and Approvals of the Site Surveys
- ✓ Inspections and Approvals of the Construction Plans
- ✓ Quality Control
- ✓ Progress Control
- ✓ Measurement of the Works
- ✓ Inspection of the Safety Aspects
- ✓ Final Inspection and Delivery

The Consultant will provide a Permanent Supervising Engineer and an Assistant Engineer. And the construction will be planned to be carried out simultaneously for ML3, ML6 and ML7.

During the construction, the Consultant will coordinate with officer-in-charge for work safety management of the Contractor to prevent any accidents at the site in advance.

2-2-4-5 Quality Control Plan

Quality control plans for concrete works and earth & pavement works are shown in Table 2-2-8 and Table 2-2-9, respectively;

Table 2-2-8 Quality Control Plan for Concrete Works

Item	Test Item	Test Method (Specification)	Frequency of Tests
Cement	Physical Property Test	AASHTO M85	Once before trail mix; thence once in every 500m^3 of concrete or when material is changed
Fine Aggregate	Physical Property Test	AASHTO M6	Once before trail mix; thence once in every 500m^3 or when material source is changed*
	Sieve Analysis	AASHTO T27	Once a month
Course Aggregate	Physical Property Test	AASHTO M80	Once before trail mix; thence once in every 500m^3 or when material source is changed*
	Sieve Analysis	AASHTO T27	Once a month
Water	Quality Test	AASHTO T26	Once before trail mix
Concrete	Slump Test	AASHTO T119	Twice a day
	Air Content Test	AASHTO T121	Twice a day
	Compressive Strength Test	AASHTO T22	6 specimens in each concreting. In case of large amount in each concreting, 6 specimens in every 75 m^3 (3 for 7-day strength and 3 for 28-day strength)
	Temperature Test	—	Twice a day
	Salinity Test	—	Twice a day

*Note; Data from the supplier shall be confirmed

Table 2-2-9 Quality Control Plan for Earth & Pavement Works

Item	Test Item	Test Method (Specification)	Frequency of Tests
Embankment	Field Density Test	AASHTO T191	Once every 500 m^3
Subgrade & Base Course	Filed Compaction Test	AASHTO T180	Before trial execution, and when material is changed
	Modified CBR	AASHTO T193	Once before trial execution, and when material is changed
	Field Density Test	AASHTO T191	Twice every 1,000 m^2
Asphalt Concrete (Surface & Binder Course)	Sieve Analysis of Aggregate	AASHTO T27	Once before trial execution, and when material is changed
	Abrasion Test of Aggregate	AASHTO T96	Once before trial execution, and when material is changed
	Density Test of Asphalt Mixture	AASHTO T166	Once every 1,000 m^2
	Temperature of Asphalt Mixture	Temperatures while Carrying, Coating and Rolling	Once every 1 Truck

2-2-4-6 Procurement Plan

(1) Construction Materials Procurement Plan

All construction materials necessary for the Project such as asphalt mixtures, sands, aggregates, crushed stones, ready-mixed concretes (including site production) and lumbers are usually available in Kenyan markets either locally or through imports.

The procurement policies for major materials are as follows;

- ✓ Procurement in Kenya when materials are available in domestic markets,
- ✓ Procurement by importing from Japan and/or third countries when materials are not available in Kenya. The exporting countries will be decided by taking quality, price, availability and supply period into consideration.

Procurement plan for major materials is shown in Table 2-2-10.

Table 2-2-10 Procurement Plan for Major Materials

Item	Procured from			Remarks
	Kenya	Japan	Third Country	
Materials for Structures				
Crushed Stone (including for Footing)	√			
Cement	√			
Sand (for Concrete)	√			
Subgrade Material	√			
Ready Mixed Concrete	√			
Crushed Stone (for Asphalt Mixture)	√			
Asphalt Mixture	√			
Re-bar ; D9 ~ D32 mm	√			
Admixture (for Concrete)	√			
Shaped Steel	√			
Rubble (for Wet Masonry)	√			
PVC Pipe ; D = 50 ~ 200 mm	√			
RC Pipe ; D = 600 ~ 1200 mm	√			
Traffic Signs	√			
Plywood (for Form / Waterproof)	√			
Plywood (for Form / without Waterproof)	√			
Timber (for Support) & Log (for Scaffold)	√			
Electric Welding Rod	√			
Fuel & Lubrication	√			
Oxygen & Acetylene	√			
Gas Cutter	√			
Street Lights	√		√	South Africa

(2) Equipment

Procurement policies for equipments are as follows;

- ✓ Equipment required for the Project will be available in Kenya
- ✓ Equipment owned by local contractors will be hired or leased.

Procurement plan for major equipments is shown in Table 2-2-11.

Table 2-2-11 Procurement Plan for Major Equipment

Equipment	Size	Lease / Procurement	Procured from			Reason of Procurement	Transport Route
			Kenya	Japan	Third Country		
Backhoe	0.2m^3	Lease	√				
Backhoe	0.35m^3	Lease	√				
Backhoe	0.6m^3	Lease	√				
Bulldozer	15t	Lease	√				
Bulldozer	21t	Lease	√				
Motor Grader	3.7m	Lease	√				
Road Roller	10-12t	Lease	√				
Tire Roller	8-20t	Lease	√				
Vibration Roller	3-5t	Lease	√				
Vibration Roller	7t	Lease	√				
Wheel Loader	1.0m^3	Lease	√				
Wheel Loader	2.0m^3	Lease	√				
Asphalt Finisher	2.4-2.5m	Lease	√				
Sprinkler Truck	6.0kl	Lease	√				
Dump Truck	10t	Lease	√				
Truck Crane	20t	Lease	√				
Trailer Truck	20t	Lease	√				
Trailer Truck	30t	Lease	√				
Generator	35kVA	Lease	√				
Generator	60kVA	Lease	√				
Generator	100kVA	Lease	√				
Generator	250kVA	Lease	√				
Submersible Pump	150mm	Lease	√				
Submersible Pump	100mm	Lease	√				
Compressor	5m^3/min	Lease	√				
Compressor	10m^3/min	Lease	√				
Concrete Mixer	0.4-0.6m^3	Lease	√				

2-2-4-7 Implementation Schedule

Implementation schedule for detailed design, tender arrangement, and execution of the Project is shown in Table 2-2-12.

Table 2-2-12 Implementation Schedule