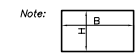
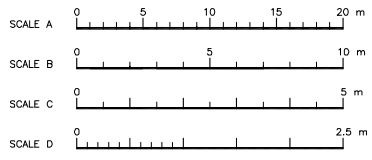


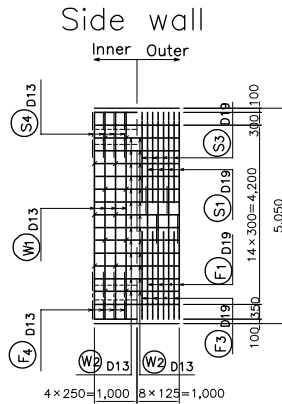
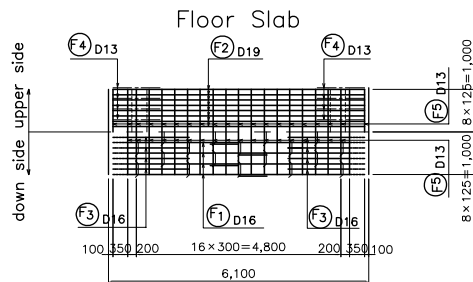
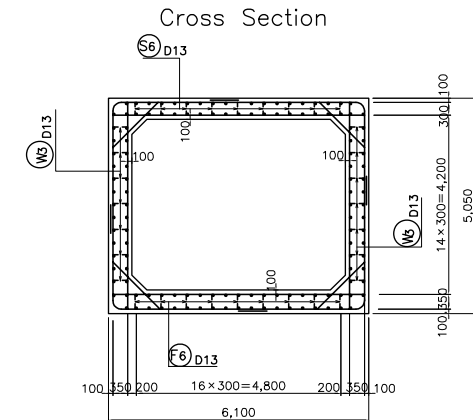
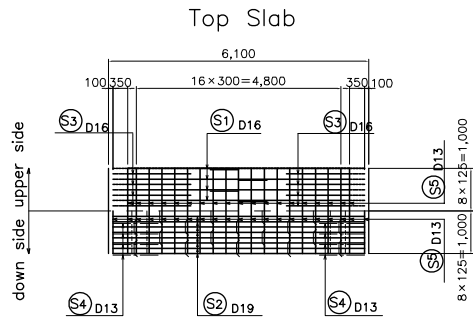
Note: Dimensions with () are for Box Culvert Type B4.



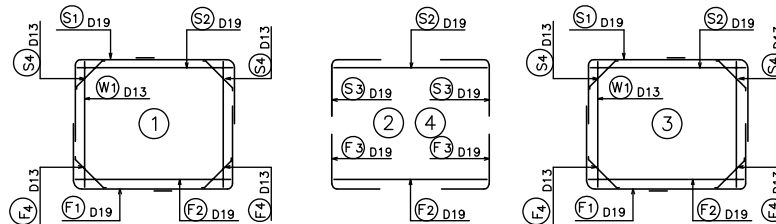
Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for Upgrading the Improvement of Masasi-Mangaka Road	LOCATION AND DIMENSION OF BOX CULVERT	Prepared by:	MR 03 F-1
				Checked by:	

BOX CULVERT 5.0x4.0

SCALE F

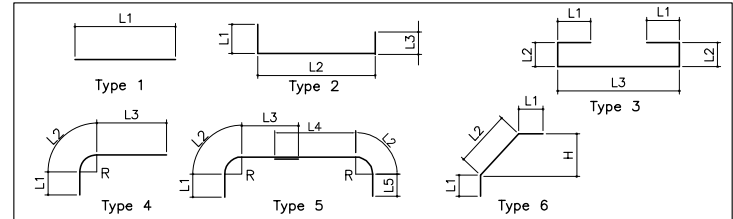


Main Bar Arrangement



SCALE F 0 5 6.25 m

Bar Arrangement List



Class	Type	D	Q'ty	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	R (mm)
S1	5	D19	4	11,860	2,865							200
S2	1	D19	8	5,900	5,900							
S3	4	D19	8	3,860	1,920	314	1,625					200
S4	6	D13	8	1,700	100	1,497	100				1,059	
S5	1	D13	42	1,000	1,000							
S6	3	D13	18	1,150	100	332	282					
W1	1	D13	8	4,850	4,850							
W2	1	D13	52	1,000	1,000							
W3	2	D13	28	580	100	379	100					
F1	5	D19	4	11,960	2,250	314	3,415	2,750	2,915			200
F2	1	D19	8	5,900	5,900							
F3	4	D19	8	3,760	1,849	314	1,590					200
F4	6	D13	8	1,770	100	1,568					1,109	
F5	1	D13	42	1,000	1,000							
F6	3	D13	18	1,250	100	382	282					

Reinforced Bar Weight List

Class	D	L (mm)	Q'ty	Unit Weight (kg/m)	Weight (kg/bar)	Total Weight (kg)	Remark
S1	D19	11,860	4	2.25	26.685	106.740	—
S2	D19	5,900	8	2.25	13.275	106.200	—
S3	D19	3,860	8	2.25	8.685	69.480	—
S4	D13	1,700	8	0.995	1.692	13.536	—
S5	D13	1,000	42	0.995	0.995	41.790	—
S6	D13	1,150	18	0.995	1.144	20.592	—
W1	D13	4,850	8	0.995	4.826	38.608	—
W2	D13	1,000	52	0.995	0.995	51.740	—
W3	D13	580	28	0.995	0.577	16.156	—
F1	D19	11,960	4	2.25	26.910	107.640	—
F2	D19	5,900	8	2.25	13.275	106.200	—
F3	D19	3,760	8	2.25	8.460	67.680	—
F4	D13	1,770	8	0.995	1.761	14.088	—
F5	D13	1,000	42	0.995	0.995	41.790	—
F6	D13	1,250	18	0.995	1.244	22.392	—

Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for Upgrading the Improvement of
Masasi-Mangaka Road

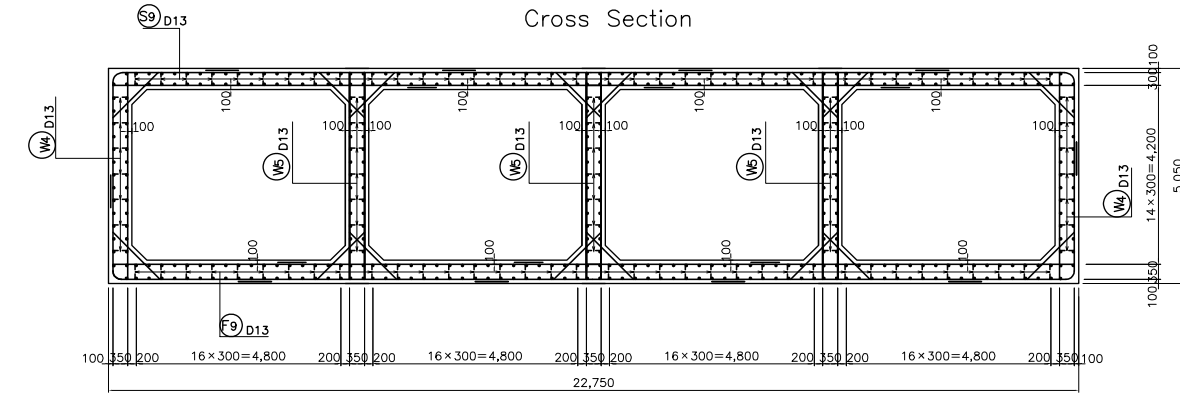
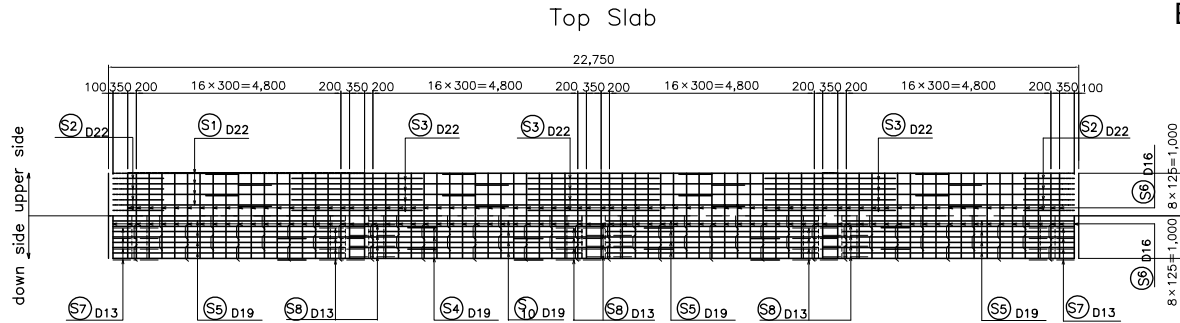
DRAWING TITLE:
BOX CULVERT 5.0x4.0x1
MAIN BODY BAR ARRANGEMENT

Date: Aug. 2009
Prepared by:
Checked by:

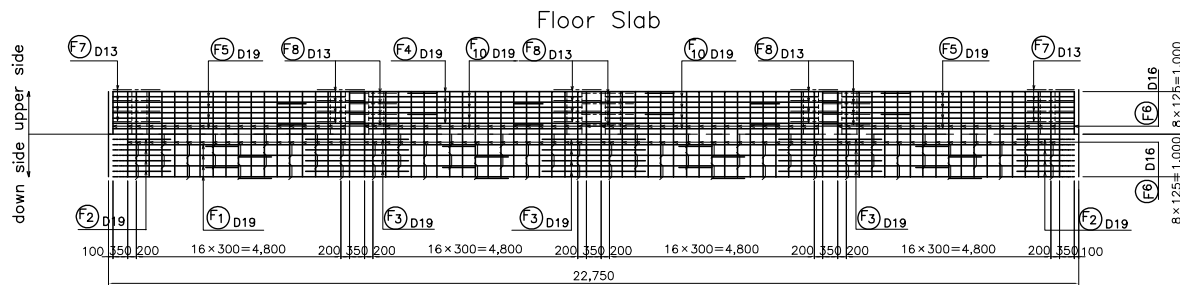
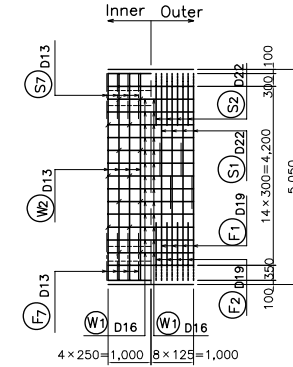
DRAWING No.:
MR 03 F-2

BOX CULVERT 5.0x4.0-4 (1/2)

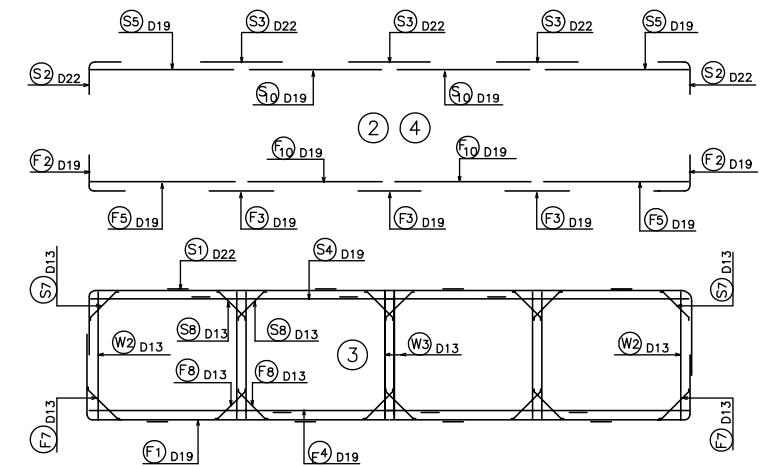
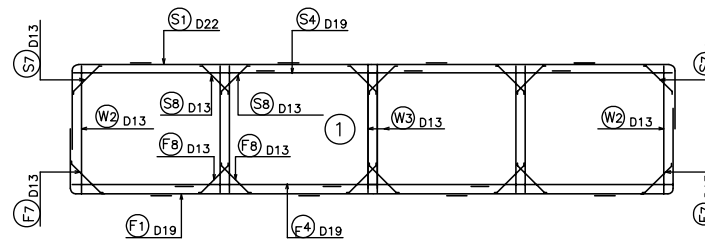
SCALE F



Side wall



Main Bar Arrangement



SCALE F 0 5 6.25 m

Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for Upgrading the Improvement of
Masasi-Mangaka Road

DRAWING TITLE:
BOX CULVERT 5.0x4.0x4
MAIN BODY BAR ARRANGEMENT(1/2)

Date: Aug. 2009
Prepared by:
Checked by:

DRAWING No.:
MR 03 F-3

BOX CULVERT 5.0x4.0-4 (2/2)

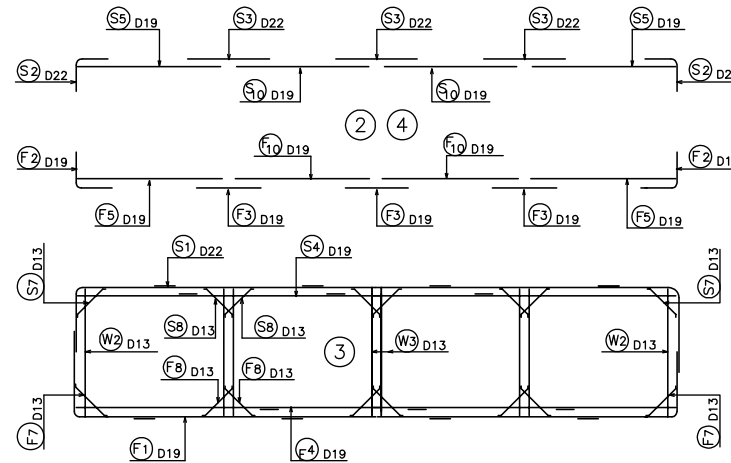
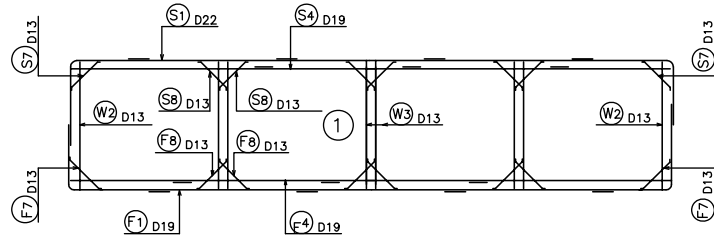
Reinforced Bar Weight List

Class	D	L (mm)	Q'ty	Unit Weight (kg/m)	Weight (kg/bar)	Total Weight (kg)	Remark
S1	D22	30,990	4	3.04	94.210	376.840	
S2	D22	2,310	8	3.04	7.022	56.176	
S3	D22	3,060	12	3.04	9.302	111.624	
S4	D19	24,550	4	2.25	55.238	220.952	
S5	D19	5,430	8	2.25	12.218	97.744	
S6	D16	1,000	154	1.56	1.560	240.240	
S7	D13	1,700	8	0.995	1.692	13.536	
S8	D13	1,700	24	0.995	1.692	40.608	
S9	D13	1,160	72	0.995	1.154	83.088	
S10	D19	5,000	8	2.25	11.250	90.000	
W1	D16	1,000	130	1.56	1.560	202.800	
W2	D13	4,850	8	0.995	4.826	38.608	
W3	D13	4,850	24	0.995	4.826	115.824	
W4	D13	590	28	0.995	0.587	16.436	
W5	D13	580	42	0.995	0.577	24.234	
F1	D19	30,710	4	0.995	69.098	276.392	
F2	D19	2,620	8	2.25	5.895	47.160	
F3	D19	2,420	12	2.25	5.445	65.340	
F4	D19	24,550	4	2.25	55.238	220.952	
F5	D19	5,720	8	2.25	12.870	102.960	
F6	D16	1,000	154	1.56	1.560	240.240	
F7	D13	1,770	8	0.995	1.761	14.088	
F8	D13	1,770	24	0.995	1.761	42.264	
F9	D13	1,250	72	0.995	1.244	89.568	
F10	D19	5,000	8	2.25	11.250	90.000	

Bar Arrangement List

Class	Type	D	Q'ty	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	H (mm)	R (mm)
S1	5	D22	4	30,990	2,935	365	2,715							235
S2	4	D22	8	2,310	978	369	958							235
S3	1	D22	12	3,060										
S4	7	D19	4	24,550	7,583	6,215	6,215	4,533						
S5	1	D19	8	5,430	5,430									
S6	1	D16	154	1,000	1,000									
S7	6	D13	8	1,700	100	1,497	100						1,058	
S8	6	D13	24	1,700	100	1,497	100						1,058	
S9	3	D13	72	1,160	100	334	285							
S10	1	D19	8	5,000	5,000									
W1	1	D16	130	1,000	1,000									
W2	1	D13	8	4,850	4,850									
W3	1	D13	24	4,850	4,850									
W4	2	D13	28	590	100	381	100							
W5	2	D13	42	580	100	376	100							
F1	5	D19	4	30,710	2,250	314	3,415	6,215	6,215	6,215	2,750	3,020		200
F2	4	D19	8	2,620	1,152	314	1,153							200
F3	1	D19	12	2,420	2,414									
F4	7	D19	4	24,550	4,533	6,215	6,215	7,583						
F5	1	D19	8	5,720	5,715									
F6	1	D16	154	1,000	1,000									
F7	6	D13	8	1,770	100	1,568	100						1,109	
F8	6	D13	24	1,770	100	1,568	100						1,109	
F9	3	D13	72	1,250	100	382	282							
F10	1	D19	8	5,000	5,000									

Main Bar Arrangement



Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for Upgrading the Improvement of
Masasi-Mangaka Road

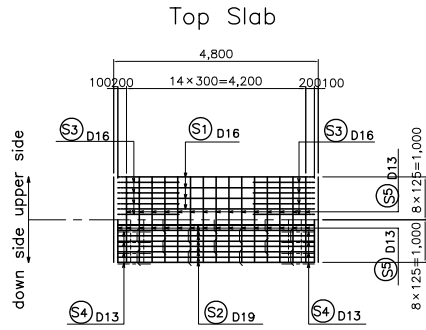
DRAWING TITLE:
BOX CULVERT 5.0x4.0x4
MAIN BODY BAR ARRANGEMENT(2/2)

Date: Aug. 2009
Prepared by:
Checked by:

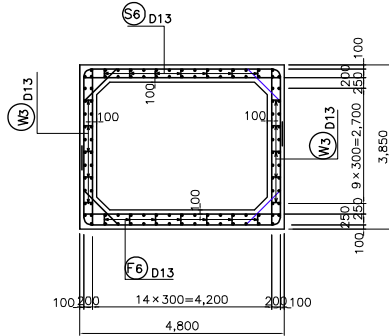
DRAWING No.:
MR 03 F-4

BOX_CULVERT 4.0×3.0

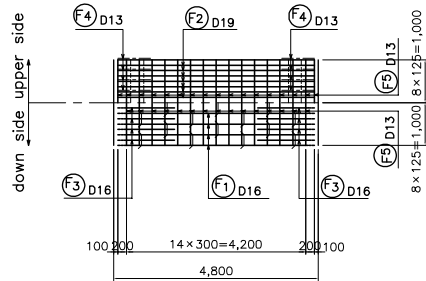
SCALE F



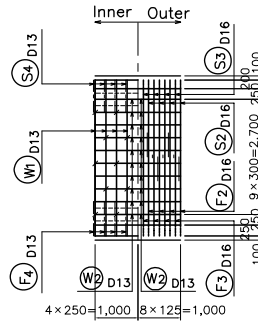
Cross Section



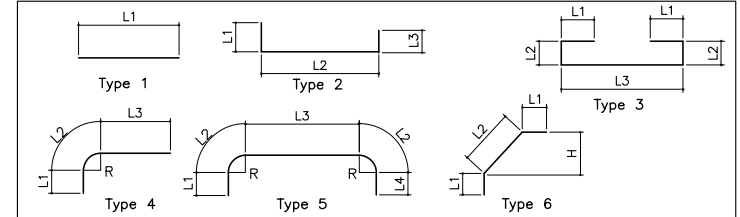
Floor Slab



Side wall



Bar Arrangement List

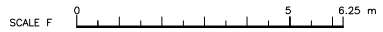
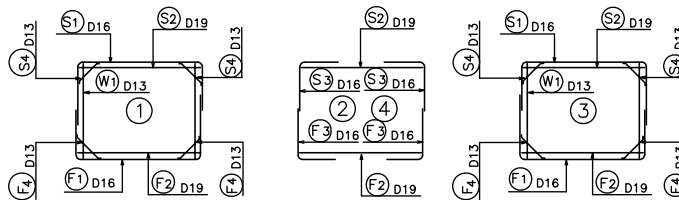


Class	Type	D	Q'ty	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	H (mm)	R (mm)
S1	5	D16	4	8,620	2,190	267	4,260	1,630				170
S2	1	D19	8	4,600	4,600							
S3	4	D16	8	3,190	1,653	267	1,264					170
S4	6	D13	8	1,280	100	1,073	100				759	
S5	1	D13	32	1,000	1,000							
S6	3	D13	14	950	100	231	282					
W1	1	D13	8	3,650	3,650							
W2	1	D13	40	1,000	1,000							
W3	2	D13	20	430	100	228	100					
F1	5	D16	4	8,720	1,680	267	4,260	2,240				170
F2	1	D19	8	4,600	4,600							
F3	4	D16	8	3,160	1,730	267	1,155					170
F4	6	D13	8	1,350	100	1,144					809	
F5	1	D13	32	1,000	1,000							
F6	3	D13	14	1,050	100	281	282					

Reinforced Bar Weight List

Class	D	L (mm)	Q'ty	Unit Weight (kg/m)	Weight (kg/bar)	Total Weight (kg)	Remark
S1	D16	8,620	4	1.56	13.447	53.788	—
S2	D19	4,600	8	2.25	10.350	82.800	—
S3	D16	3,190	8	1.56	4.976	39.808	—
S4	D13	1,280	8	1.56	1.274	10.192	—
S5	D13	1,000	32	0.995	0.995	31.840	—
S6	D13	950	14	0.995	0.945	13.230	—
W1	D13	3,650	8	0.995	3.632	29.056	—
W2	D13	1,000	40	0.995	0.995	39.800	—
W3	D13	430	20	0.995	0.428	8.560	—
F1	D16	8,720	4	1.56	13.603	54.412	—
F2	D19	4,600	8	2.25	10.350	82.800	—
F3	D16	3,160	8	1.56	4.930	39.440	—
F4	D13	1,350	8	0.995	1.343	10.744	—
F5	D13	1,000	32	0.995	0.995	31.840	—
F6	D13	1,050	14	0.995	1.045	14.630	—

Main Bar Arrangement



Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for Upgrading the Improvement of
Masasi-Mangaka Road

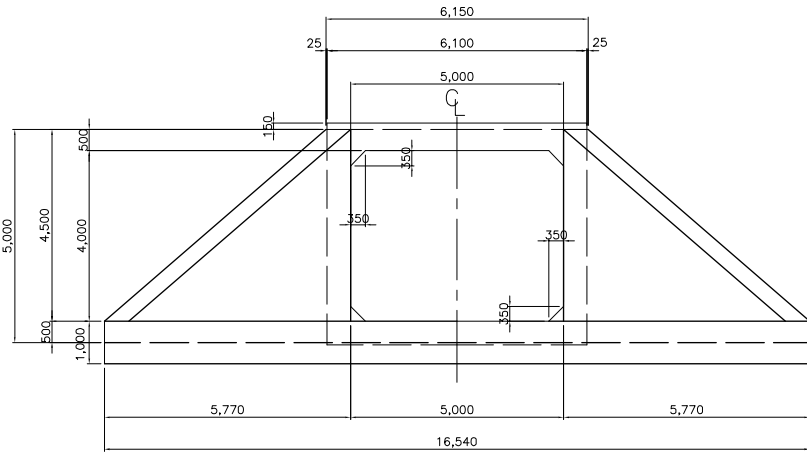
DRAWING TITLE:
BOX CULVERT 4.0×3.0×1
MAIN BODY BAR ARRANGEMENT

Date: Aug. 2009
Prepared by:
Checked by:

DRAWING No.:
MR 03 F-5

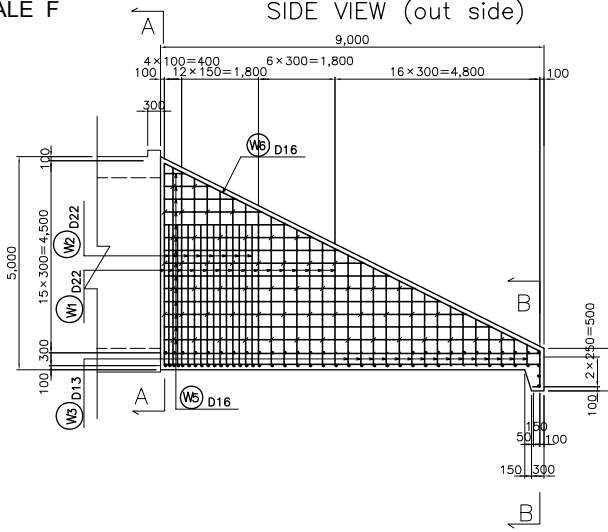
INLET/OUTLET (5.0×4.0×1)

FRONT VIEW

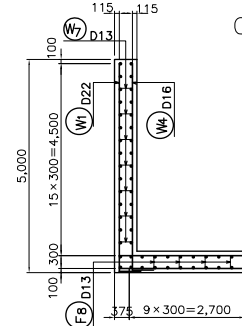


SCALE F

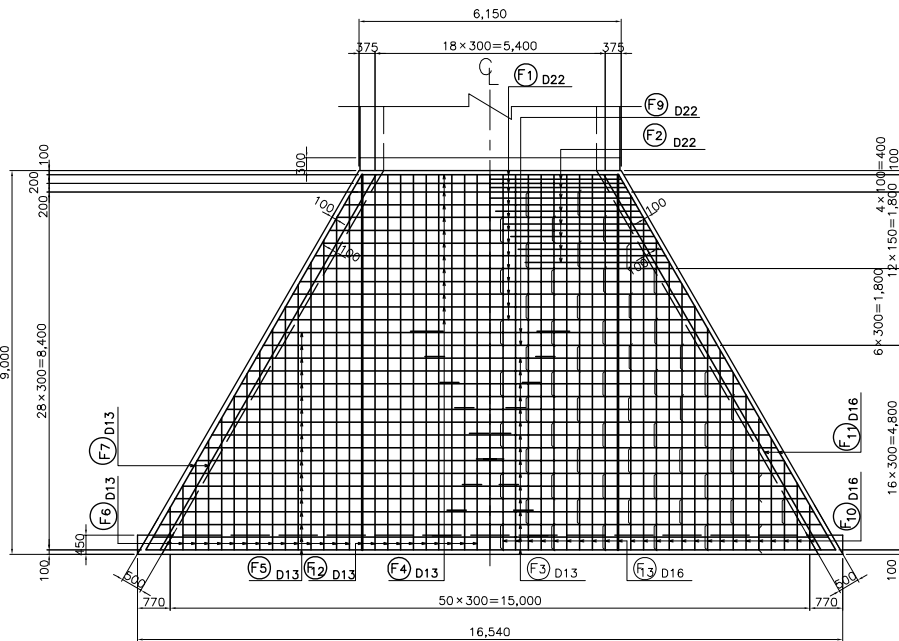
SIDE VIEW (out side)



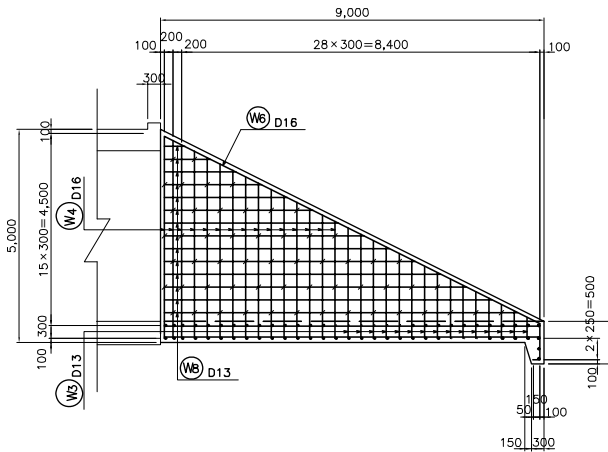
A-A SECTION



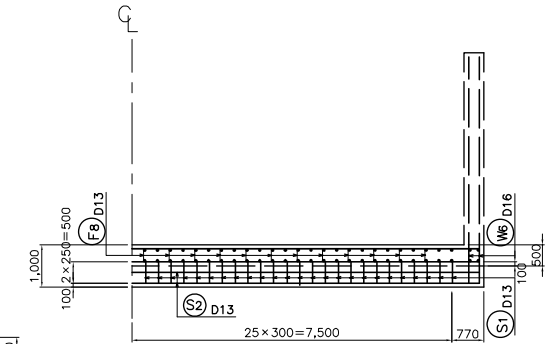
PLAN
upper side down side



SIDE VIEW (in side)



B-B SECTION



SCALE F 0 5 m 6.25m

Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

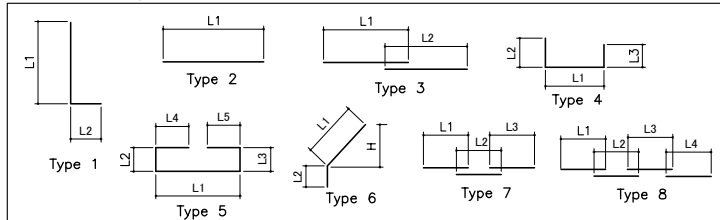
DRAWING TITLE:
BOX CULVERT 5.0×4.0×1
INLET/OUTLET BAR ARRANGMENT (1/2)

Date: Aug. 2009
Prepared by:
Checked by:

DRAWING No.:
MR 03 F-6

INLET/OUTLET (5.0×4.0×1)

Bar Arrangement List



Class	Type	D	Q'ty	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	H (mm)	(mm)
W1	1	D22	30	4,140	3,770	370					L1=2,740-4,800
W2	1	D22	16	3,670	3,300	370					
W3	1	D13	60	1,640	1,540	100					L1=490-2,590
W4	1	D16	30	3,870	3,770	100					L1=2,740-4,800
W5	2	D16	28	4,380	4,380						L1=480-8,280
W6	6	D16	4	10,680	9,840	840				4,400	
W7-1	4	D13	84	350	147	100	100				
W7-2	4	D13	28	350	143	100	100				
W8	2	D13	28	4,380	4,380						L1=480-8,280
F1	2	D22	13	7,980	7,980						L1=6,040-9,920
F2	2	D22	16	3,300	3,300						
F3	3	D13	16	14,050	10,000	4,045					L2=1,455-6,635
F4	2	D13	13	7,980	7,980						L1=6,040-9,920
F5	3	D13	18	13,690	10,000	3,685					L2=735-6,635
F6	2	D13	30	4,660	4,660						L1=1,010-8,310
F7	3	D13	4	10,620	10,000	620					
F8-1	5	D13	76	1,500	635	331	331	100	100		
F8-2	5	D13	84	1,480	626	326	326	100	100		
F9	3	D22	2	10,910	10,000	905					L2=735-1,075
F10	2	D16	30	4,660	4,660						L1=1,010-8,310
F11	3	D16	4	10,620	10,000	615					
F12	2	D13	21	8,800	8,800						
F13	2	D16	21	8,800	8,800						
S1	1	D13	51	650	500	150					
S2	3	D13	2	16,640	10,000	6,635					

Reinforced Bar Weight List

Class	D	L (mm)	Q'ty	Unit Weight (kg/m)	Weight (kg/bar)	Total Weight (kg)	Remark
W1	D22	4,140	30	3.04	12.586	377.580	L
W2	D22	3,670	16	3.04	11.157	178.512	L
W3	D13	1,640	60	0.995	1.632	97.920	L
W4	D16	3,870	30	1.56	6.037	181.110	L
W5	D16	4,380	28	1.56	6.833	191.324	—
W6	D16	10,680	4	1.56	16.661	66.644	—
W7-1	D13	350	84	0.995	0.348	29.232	L
W7-2	D13	350	28	0.995	0.348	9.744	L
W8	D13	4,380	28	0.995	4.358	122.024	—
F1	D22	7,980	13	3.04	24.259	315.367	—
F2	D22	3,300	16	3.04	10.032	160.512	—
F3	D13	14,050	16	0.995	13.980	223.680	—
F4	D13	7,980	13	0.995	7.940	103.220	—
F5	D13	13,690	18	0.995	13.622	245.196	—
F6	D13	4,660	30	0.995	4.637	139.110	—
F7	D13	10,620	4	0.995	10.567	42.268	—
F8-1	D13	1,500	76	0.995	1.493	113.468	L
F8-2	D13	1,480	84	0.995	1.473	123.732	L
F9	D22	10,910	2	3.04	33.166	66.332	—
F10	D16	4,660	30	1.56	7.270	218.100	—
F11	D16	10,620	4	1.56	16.567	66.268	—
F12	D13	8,800	21	0.995	8.756	183.876	—
F13	D16	8,800	21	1.56	13.728	288.288	—
S1	D13	650	51	0.995	0.647	32.997	L
S2	D13	16,640	2	0.995	16.557	33.114	—

Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

DRAWING TITLE:
BOX CULVERT 5.0×4.0×1
INLET/OUTLET BAR ARRANGMENT(2/2)

Date: Aug. 2009

Prepared by:

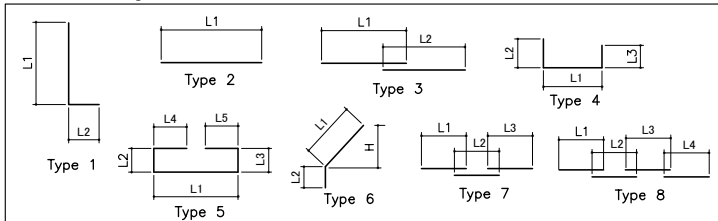
Checked by:

DRAWING No.:

MR 03 F-7

INLET/OUTLET (5.0×4.0×4)

Bar Arrangement List



Class	Type	D	Q'ty	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	H (mm)	(mm)
W1	1	D22	30	4,140	3,770	370					L1=2,740-4,800
W2	1	D22	16	3,670	3,300	370					
W3	1	D13	60	1,640	1,540	100					L1=490-2,590
W4	1	D16	30	3,870	3,770	100					L1=2,740-4,800
W5	2	D16	28	4,380	4,380						L1=480-8,280
W6	6	D16	4	10,680	9,840	840				4,400	
W7-1	4	D13	84	350	147	100	100				
W7-2	4	D13	28	350	143	100	100				
W8	2	D13	28	4,380	4,380						L1=480-8,280
F1	7	D22	15	26,530	10,000	10,000	6,530				L3=4,230-8,830
F2	2	D22	16	3,300	3,300						
F3	7	D13	5	29,250	10,000	10,000	9,250				L3=8,570-9,930
F4	2	D13	20	6,770	6,765						L1=3,600-9,930
F5	8	D13	11	32,490	10,000	10,000	2,485				L4=740-4,230
F6	2	D13	32	4,800	4,795						L1=900-8,690
F7	3	D13	4	10,620	10,000	620					
F8-1	5	D13	122	1,500	635	331	331	100	100		
F8-2	5	D13	196	1,480	626	326	326	100	100		
F9	8	D22	11	32,490	10,000	10,000	2,485				L4=740-4,230
F10	2	D16	32	4,800	4,795						L1=900-8,690
F11	3	D16	4	10,620	10,000	615					
F12	2	D13	75	8,800	8,800						
F13	2	D16	75	8,800	8,800						
S1	1	D13	107	650	500	150					
S2	8	D13	2	34,230	10,000	10,000	10,000	4,230			

Reinforced Bar Weight List

Class	D	L (mm)	Q'ty	Unit Weight (kg/m)	Weight (kg/bar)	Total Weight (kg)	Remark
W1	D22	4,140	30	3.04	12.586	377.580	L
W2	D22	3,670	16	3.04	11.157	178.512	L
W3	D13	1,640	60	0.995	1.632	97.920	L
W4	D16	3,870	30	1.56	6.037	181.110	L
W5	D16	4,380	28	1.56	6.833	191.324	—
W6	D16	10,680	4	1.56	16.661	66.644	—
W7-1	D13	350	84	0.995	0.348	29.232	—
W7-2	D13	350	28	0.995	0.348	9.744	—
W8	D13	4,380	28	0.995	4.358	122.024	—
F1	D22	26,530	15	3.04	80.651	1209.765	—
F2	D22	3,300	16	3.04	10.032	160.512	—
F3	D13	29,250	5	0.995	29.104	145.520	—
F4	D13	6,770	20	0.995	6.736	134.720	—
F5	D13	32,490	11	0.995	32.328	355.608	—
F6	D13	4,800	32	0.995	4.776	152.832	—
F7	D13	10,620	4	0.995	10.567	42.268	—
F8-1	D13	1,500	122	0.995	1.493	182.146	—
F8-2	D13	1,480	196	0.995	1.473	288.708	—
F9	D22	32,490	11	3.04	98.770	1086.470	—
F10	D16	4,800	32	1.56	7.488	239.616	—
F11	D16	10,620	4	1.56	16.567	66.268	—
F12	D13	8,800	75	0.995	8.756	656.700	—
F13	D16	8,800	75	1.56	13.728	1029.600	—
S1	D13	650	107	0.995	0.647	69.229	L
S2	D13	34,230	2	0.995	34.059	68.118	—

Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

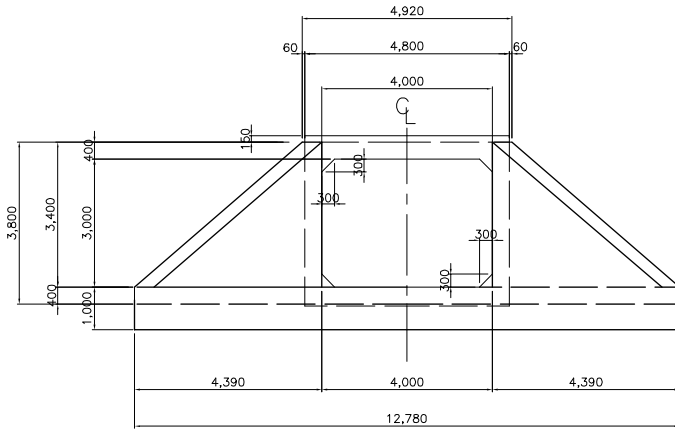
DRAWING TITLE:
BOX CULVERT 5.0×4.0×4
INLET/OUTLET BAR ARRANGEMENT (2/2)

Date: Aug. 2009
Prepared by:
Checked by:

DRAWING No.:
MR 03 F-9

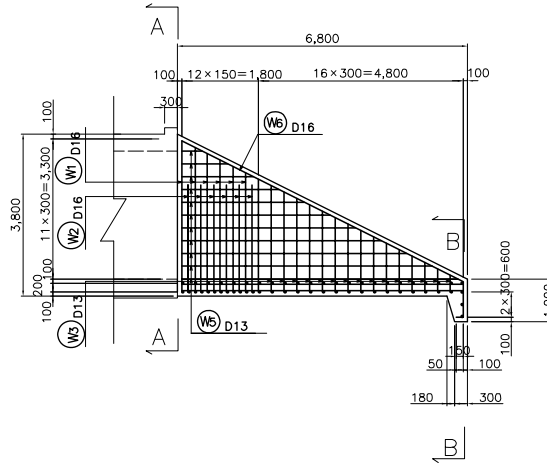
INLET/OUTLET (4.0×3.0)

FRONT VIEW

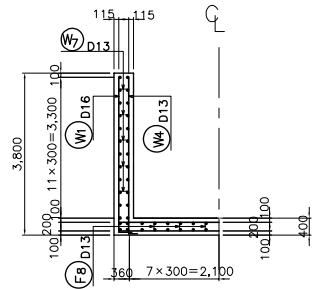


SCALE F

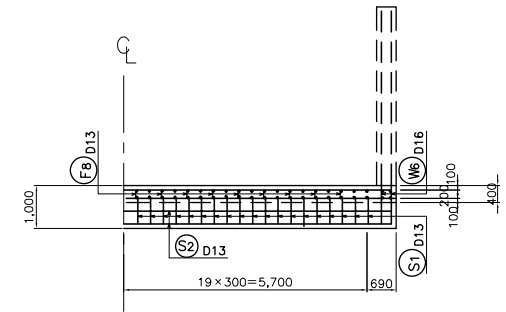
SIDE VIEW (out side)



A-A SECTION

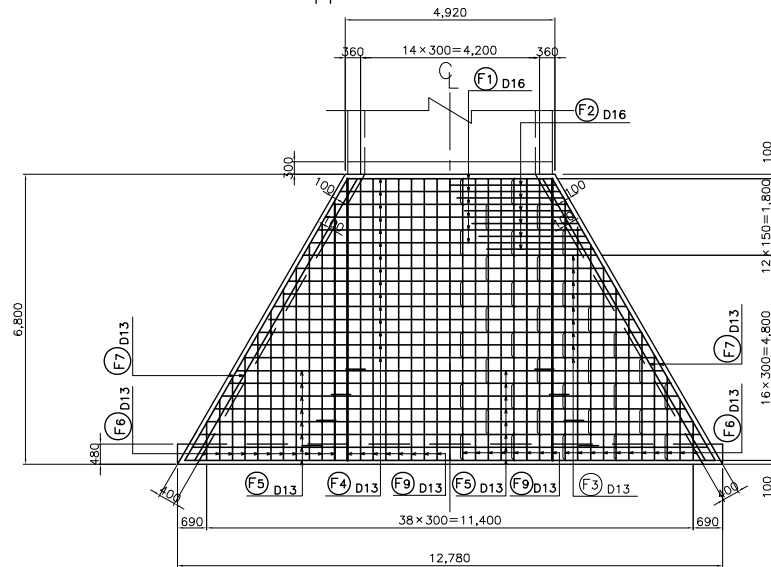


B-B SECTION

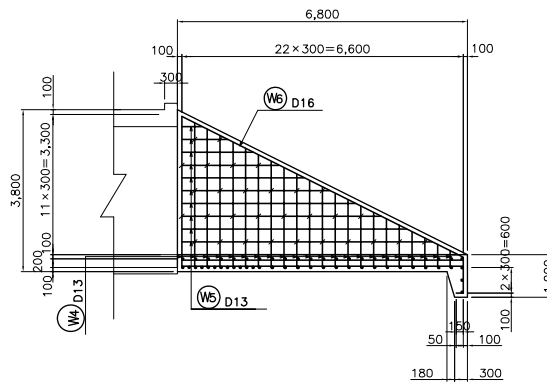


PLAN

upper side down side



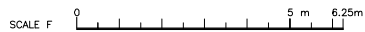
SIDE VIEW (in side)



MATERIAL LIST

(by 1 structure)

Type	Concrete (m ³)	Form (m ²)	Reinforcement bar (t)	Base (m ³)	Lean Concrete (m ³)	Lean Concrete Form (m ²)	Gabion (m ³)
4.0×3.0	37.74	59.68	1.54	12.17	5.48	1.46	4.43



Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

DRAWING TITLE:
BOX CULVERT 4.0×3.0×1
INLET/OUTLET BAR ARRANGMENT(1/2)

Date: Aug. 2009

Prepared by:

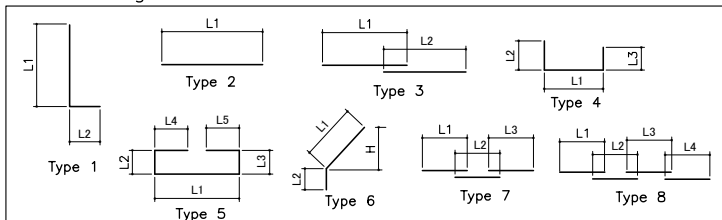
Checked by:

DRAWING No.:

MR 03 F-10

INLET/OUTLET (4.0×3.0×1)

Bar Arrangement List

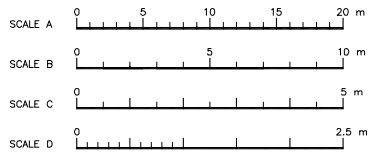
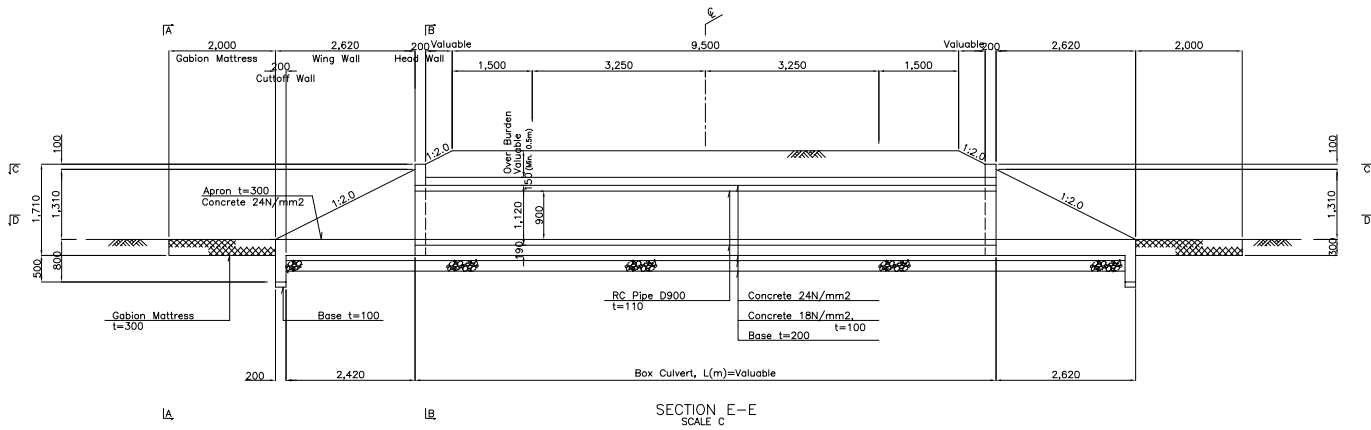
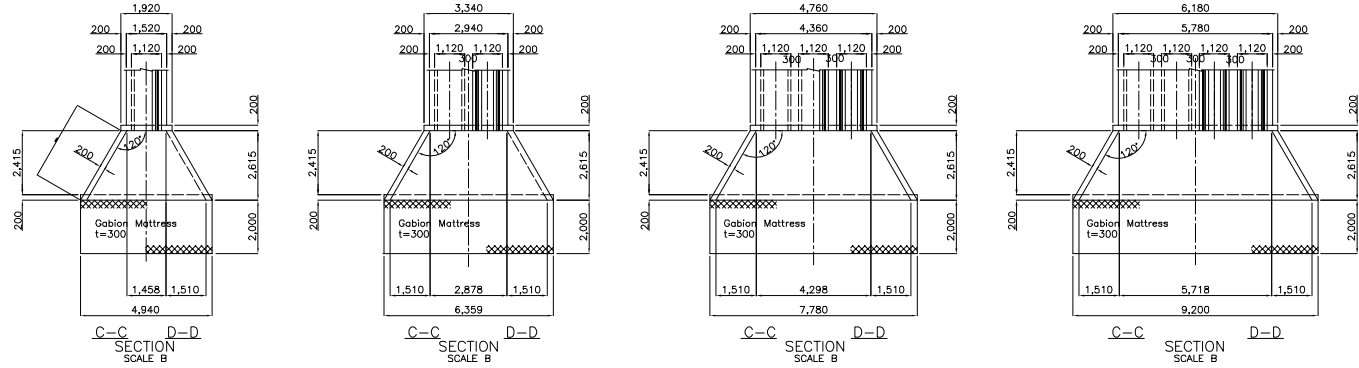
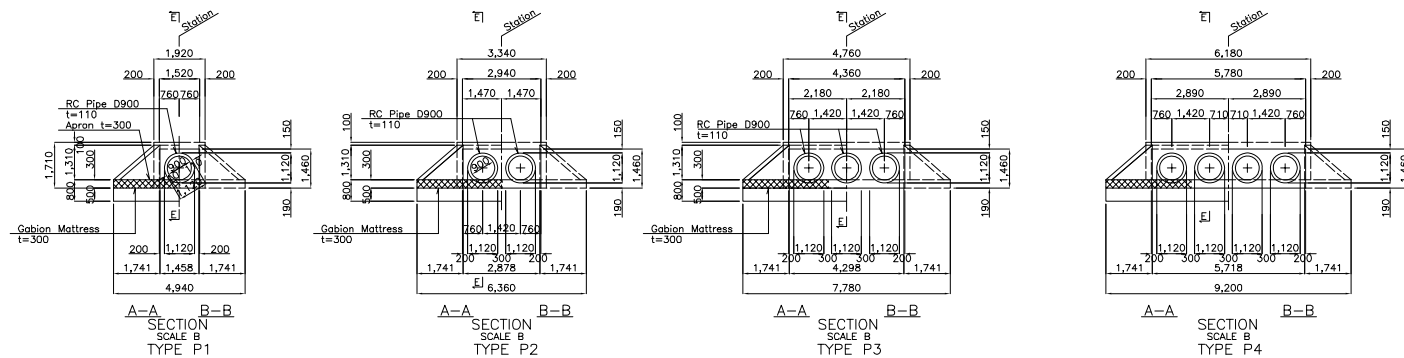


Class	Type	D	Q'ty	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	H (mm)	(mm)
W1	1	D16	12	3,460	3,195	260					L1=2,790-3,600
W2	1	D16	12	2,760	2,500	260					
W3	1	D13	32	1,670	1,515	155	1,625				L1=390-2,640
W4	1	D13	44	2,100	1,995	100	100				L1=390-3,600
W5	2	D13	44	3,480	3,480						L1=480-6,480
W6	6	D16	4	8,220	7,380	840				3,300	
W7-1	4	D13	28	350	143	100	100				
W7-2	4	D13	32	350	141	100	100				
F1	2	D16	6	5,690	5,685						L1=4,810-6,560
F2	2	D16	12	2,500	2,500						
F3	2	D13	9	8,280	8,280						L1=6,890-9,670
F4	2	D13	15	7,240	7,240						L1=4,810-9,670
F5	6	D13	16	11,680	10,000	1,678					L2=465-2,890
F6	2	D13	44	3,500	3,500						L1=900-6,100
F7	2	D13	8	7,630	7,630						
F8-1	5	D13	14	1,290	629	228	228	100	100		
F8-2	5	D13	60	1,280	626	226	226	100	100		
F9	2	D13	34	6,600	6,600						
S1	1	D13	39	750	600	150					
S2	3	D13	2	12,910	10,000	2,905					

Reinforced Bar Weight List

Class	D	L (mm)	Q'ty	Unit Weight (kg/m)	Weight (kg/bar)	Total Weight (kg)	Remark
W1	D16	3,460	12	1.56	5.398	64.776	L
W2	D16	2,760	12	1.56	4.306	51.672	L
W3	D13	1,670	32	0.995	1.662	53.184	L
W4	D13	2,100	44	0.995	2.090	91.960	L
W5	D13	3,480	44	0.995	3.463	152.372	—
W6	D16	8,220	4	1.56	12.823	51.292	—
W7-1	D13	350	28	0.995	0.348	9.744	L
W7-2	D13	350	32	0.995	0.348	11.136	L
F1	D16	5,690	6	1.56	8.876	53.256	—
F2	D16	2,500	12	1.56	3.900	46.800	—
F3	D13	8,280	9	0.995	8.239	74.151	—
F4	D13	7,240	15	0.995	7.204	108.060	—
F5	D13	11,680	16	0.995	11.622	185.952	—
F6	D13	3,500	44	0.995	3.483	153.252	—
F7	D13	7,630	8	0.995	7.592	60.736	—
F8-1	D13	1,290	14	0.995	1.284	17.976	L
F8-2	D13	1,280	60	0.995	1.274	76.440	L
F9	D13	6,600	34	0.995	6.567	223.278	—
S1	D13	750	39	0.995	0.746	29.094	L
S2	D13	12,910	2	0.995	12.845	25.690	—

Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for the improvement of Masasi-Mangaka Road	BOX CULVERT 4.0×3.0×1 INLET/OUTLET BAR ARRANGMENT	Prepared by:	MR 03 F-11
				Checked by:	



Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

DRAWING TITLE:
LOCATION AND DIMENSION
OF PIPE CULVERT

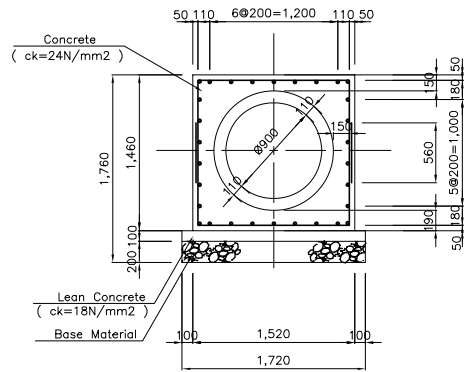
Date: Aug. 2009
Prepared by:
Checked by:

DRAWING No.:
MR 03 F-12

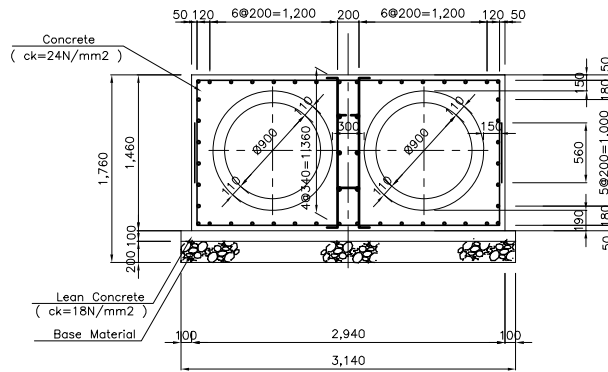
PIPE CULVERT 360°ENCASEMENT

SCALE D

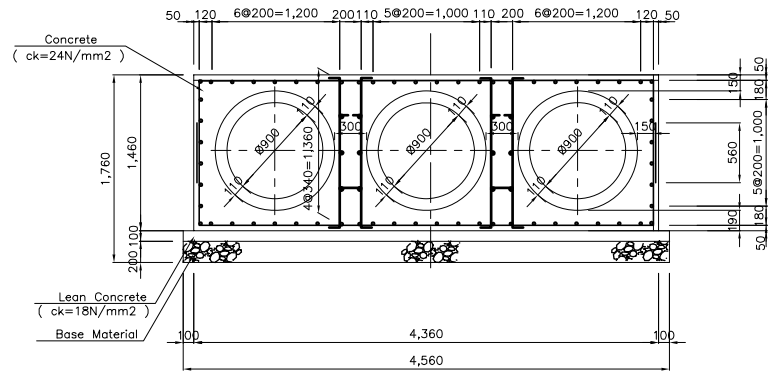
TYPE P1



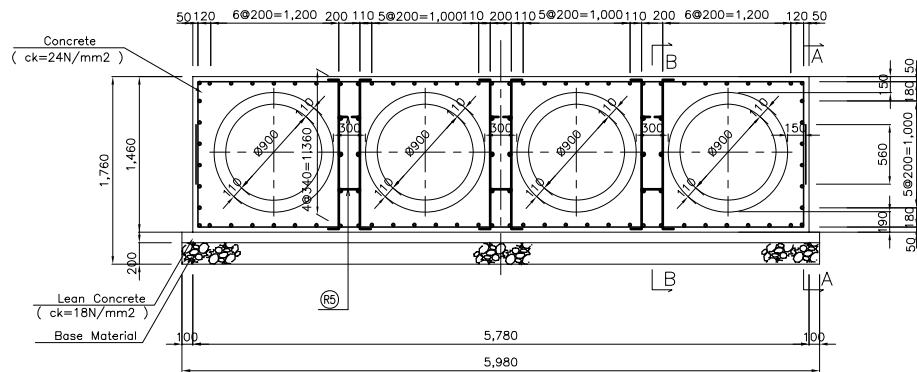
TYPE P2



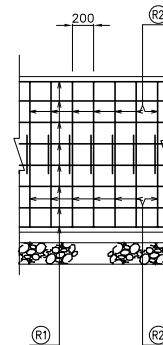
TYPE P3



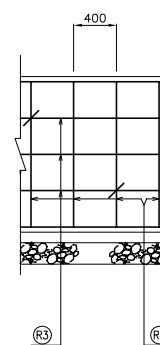
TYPE P4



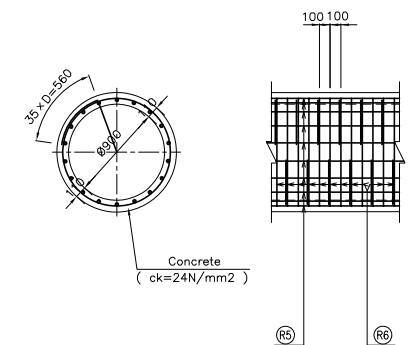
A - A



B - B



REINFORCED CONCREAT PIPE



Material List

(by 10m)

Type	Concrete (m3)	Form (m2)	Reinforcement bar (kg)	Base (m3)	Lean Concrete (m3)	Lean Concrete Form (m2)
P 1	12.340	29.200	989.04	3.440	1.720	2.000
P 2	23.220	29.200	1661.21	6.280	3.140	2.000
P 3	34.100	29.200	2364.57	9.120	4.560	2.000
P 4	44.980	29.200	3067.94	11.960	5.980	2.000

Reinforced Bar List

(by 1m)

Type	D	Q'ty	Unit Length (mm)	Unit Weight (kg/m)	Weight (kg)	Type
P1	(R1)	D16	30	1,000	1.56	46.800
	(R2)	D16	10	3,340	1.56	52.104
P2	(R1)	D16	44	1,000	1.56	68.640
	(R2)	D16	10	4,760	1.56	74.256
P3	(R1)	D16	60	1,000	1.56	93.600
	(R2)	D16	10	6,180	1.56	96.408
P4	(R1)	D16	76	1,000	1.56	118.560
	(R2)	D16	10	7,600	1.56	118.560

Reinforced Bar List

(by 1m)

Type	D	Q'ty	Unit Length (mm)	Unit Weight (kg/m)	Weight (kg)	Type
P2	(R3)	D16	6	1,000	1.56	9.360
	(R4)	D16	5	1,560	1.56	12.168
P3	(R3)	D16	12	1,000	1.56	18.720
	(R4)	D16	10	1,560	1.56	24.336
P4	(R3)	D16	18	1,000	1.56	28.080
	(R4)	D16	15	1,560	1.56	36.504
	(R5)	D16	7.5	435	1.56	5.090

RC Pipe Material List

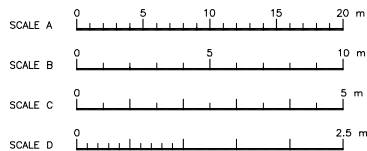
(by 10m)

Type	Concrete (m3)	Form (m2)	Reinforced Bar (kg)
D900	3.490	63.460	987.4

Reinforced Bar List

(by 1m)

Type	D	Q'ty	Unit Length (mm)	Unit Weight (kg/m)	Weight (kg)	Type
(R5)	D19	18	1,000	2.25	40.500	—
(R6)	D16	10	3,733	1.56	58.235	○



Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

DRAWING TITLE:
PIPE CULVERT 360°ENCASEMENT
(BAR ARRANGMENT)

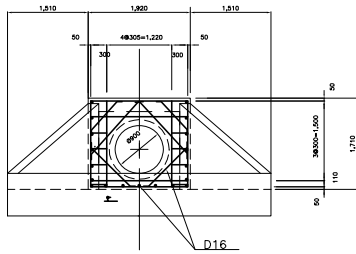
Date: Aug. 2009
Prepared by:
Checked by:

DRAWING No.:
MR 03 F-13

TRANSVERSE PIPE CULVERT INLET/OUTLET

TYPE P1
SCALE C

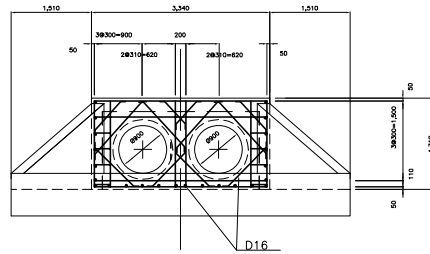
FRONT VIEW



PLAN

TYPE P2
SCALE C

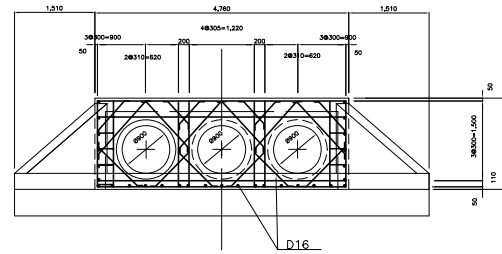
FRONT VIEW



PLAN

TYPE P3
SCALE C

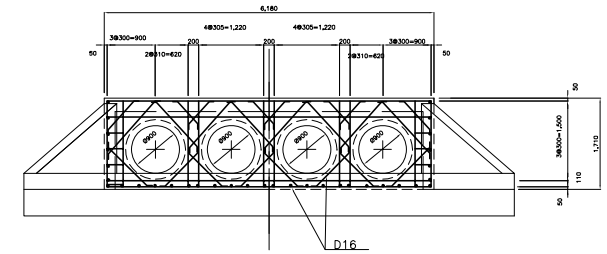
FRONT VIEW



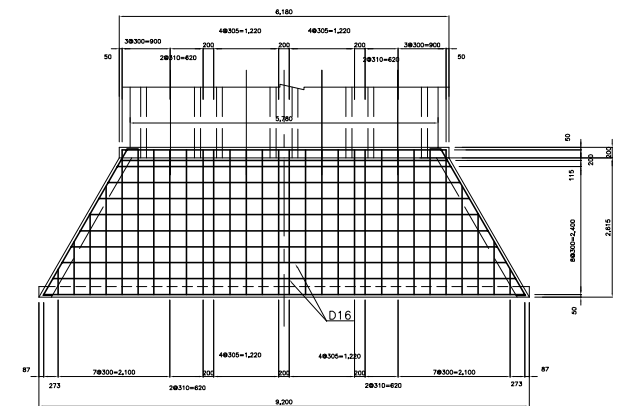
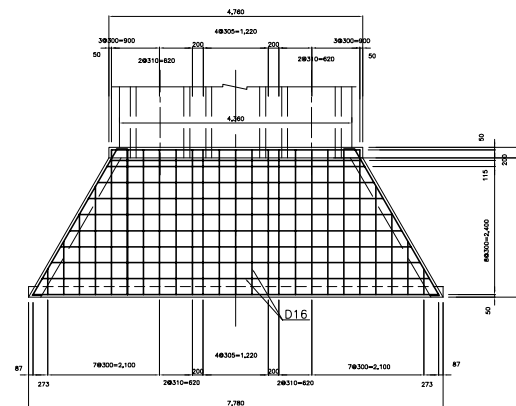
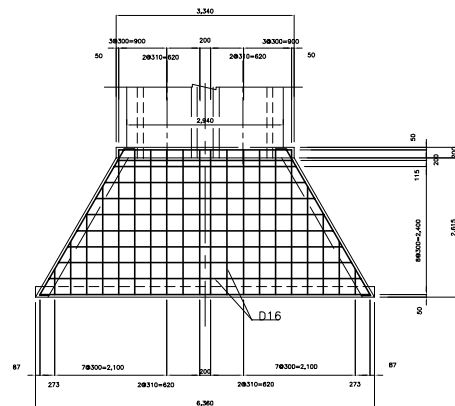
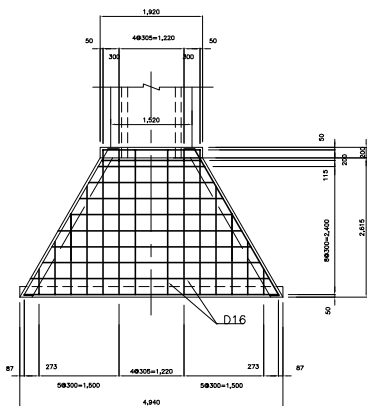
PLAN

TYPE P4
SCALE C

FRONT VIEW

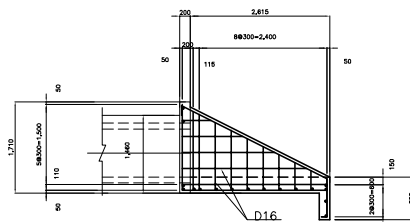


PLAN



PROFILE

SCALE C 5 m



SCALE C

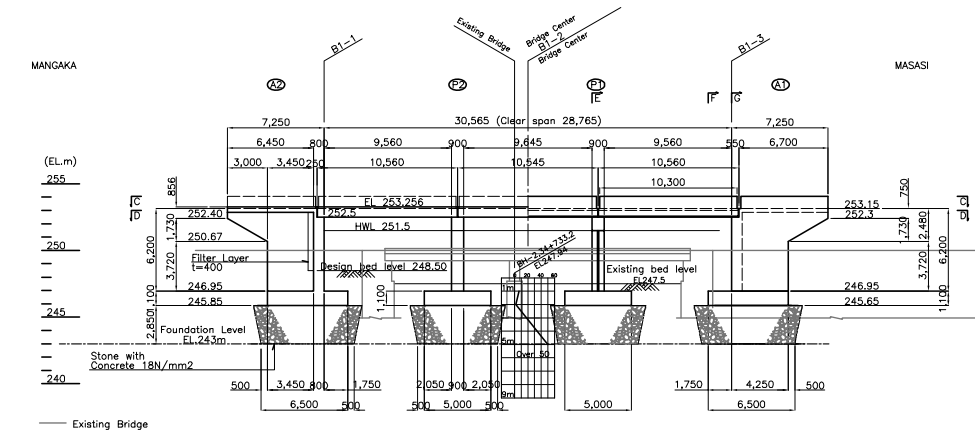
Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the improvement of
Masasi-Mangaka Road

DRAWING TITLE:
TRANSVERSE PIPE CULVERT INLET/OUTLET
(BAR ARRANGEMENT)

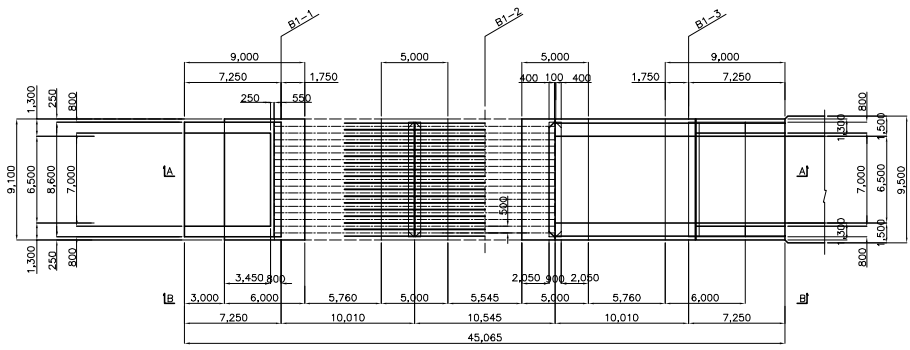
Date: Aug. 2009
Prepared by:
Checked by:
DRAWING No.:
MR 03 F-14



Position	Station
B1	34+683.5

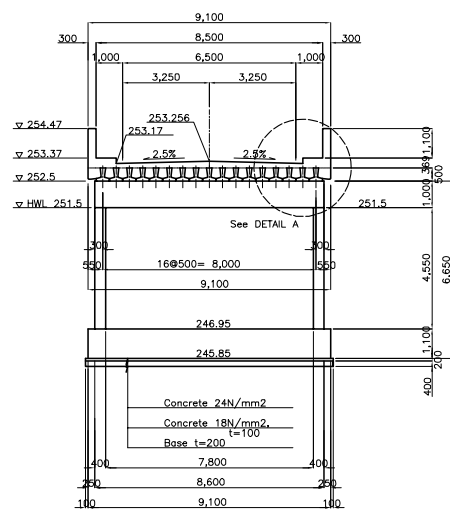
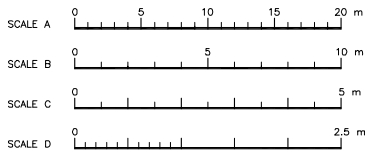
SECTION A-A
SCALE A

SECTION B-B
SCALE A

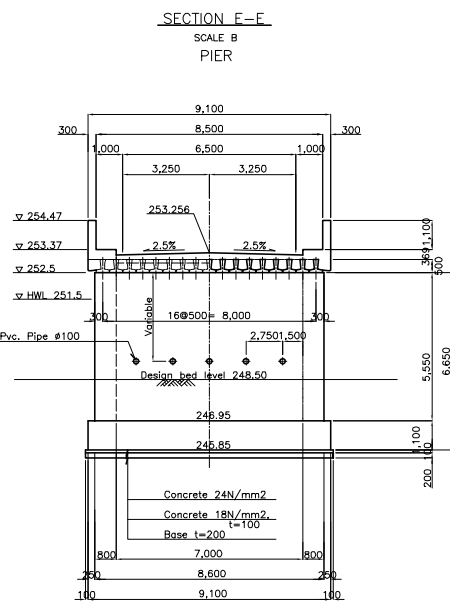


SECTION C-C
SCALE A

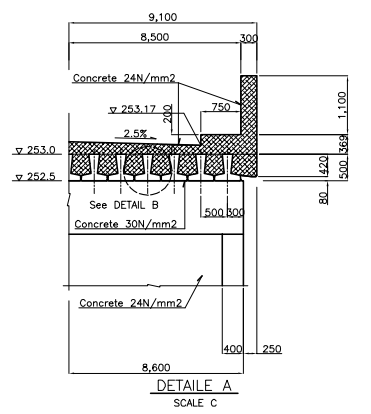
SECTION D-D
SCALE A



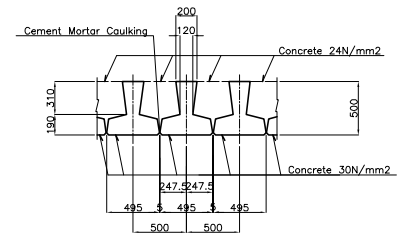
SECTION E-E
SCALE B



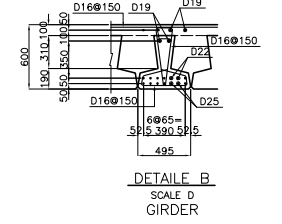
SECTION F-F
SCALE B



DETAIL A
SCALE C



DETAIL B
SCALE D



DETAIL C
SCALE D

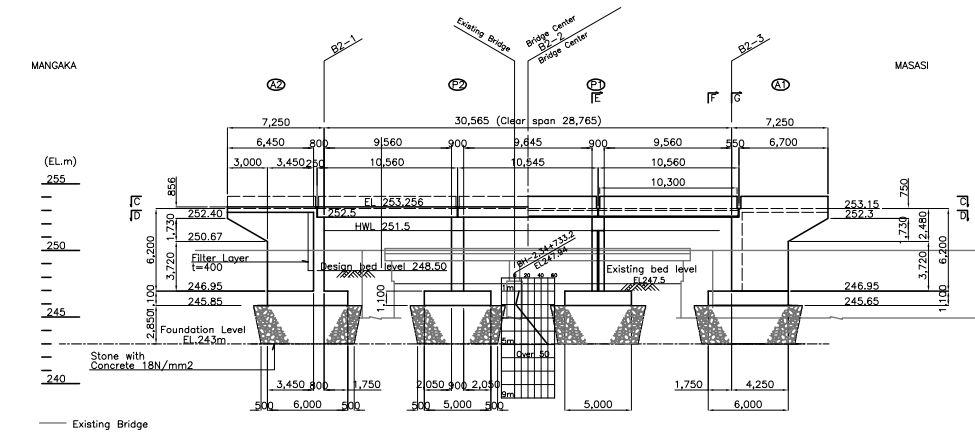
Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the Improvement of
Masasi-Mangaka Road

DRAWING TITLE:
BRIDGE No.1(KM.34+683.8)

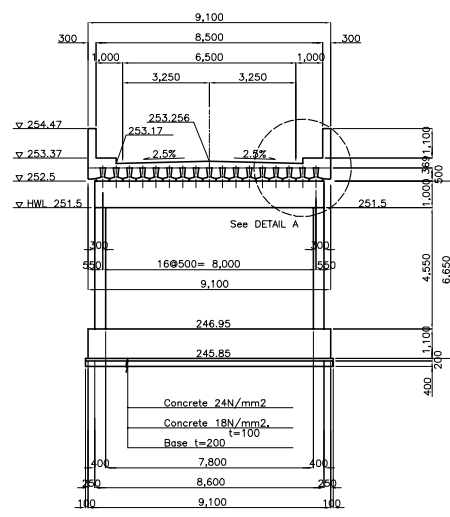
Date: Aug. 2009
Prepared by:
Checked by:
DRAWING No.:
MR 03 F-15



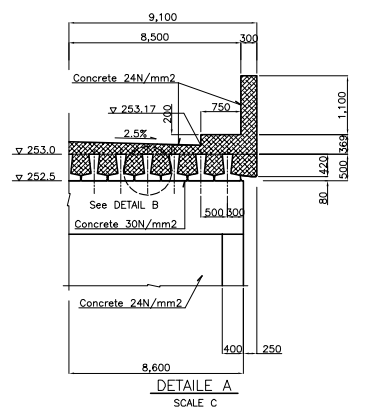
Bridge 2	
Position	Station
B2	34+869.2

SECTION A-A
SCALE A

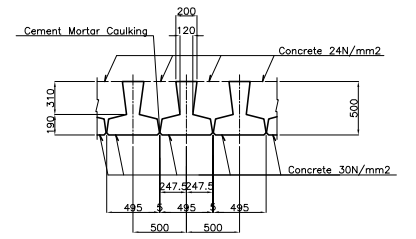
SECTION B-B
SCALE A



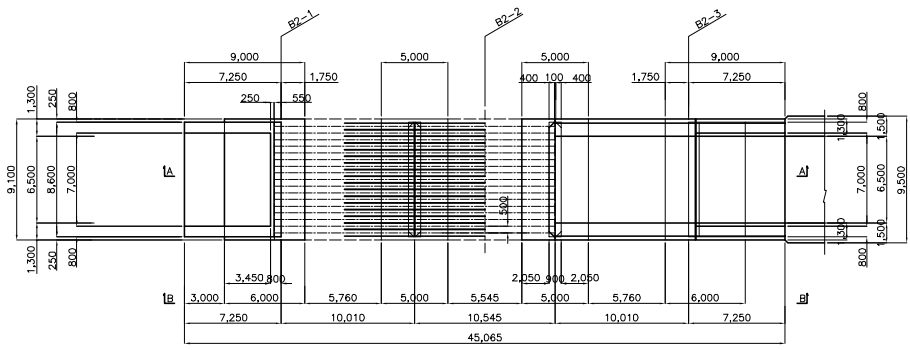
SECTION E-E
SCALE B



DETAIL A
SCALE C

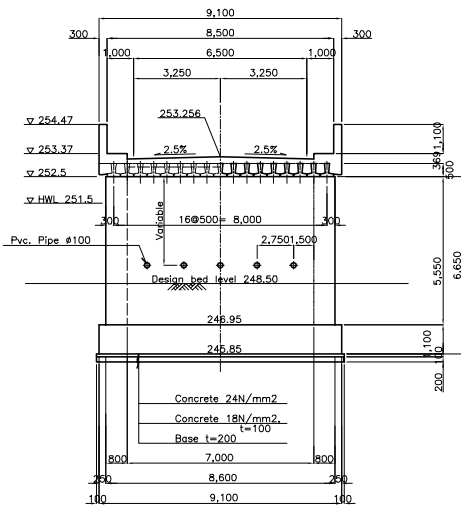


DETAIL B
SCALE D



SECTION C-C
SCALE A

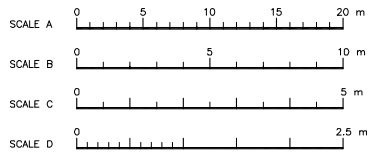
SECTION D-D
SCALE A



SECTION F-F
SCALE B

SECTION G-G
SCALE B

ABUTMENT



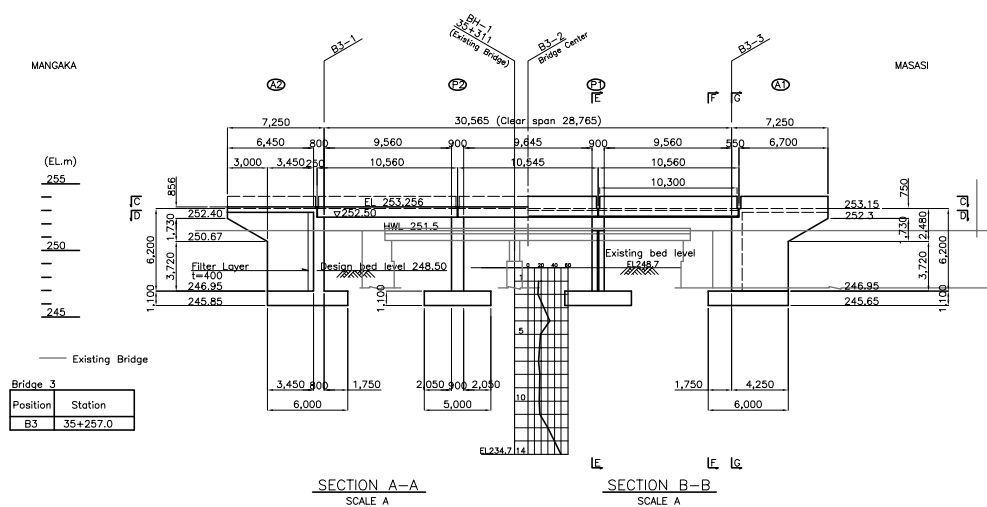
Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

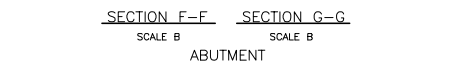
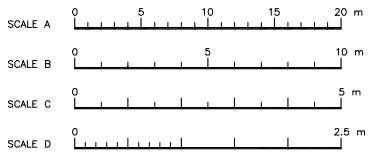
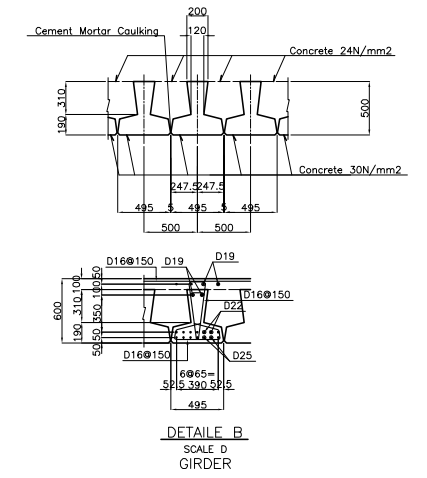
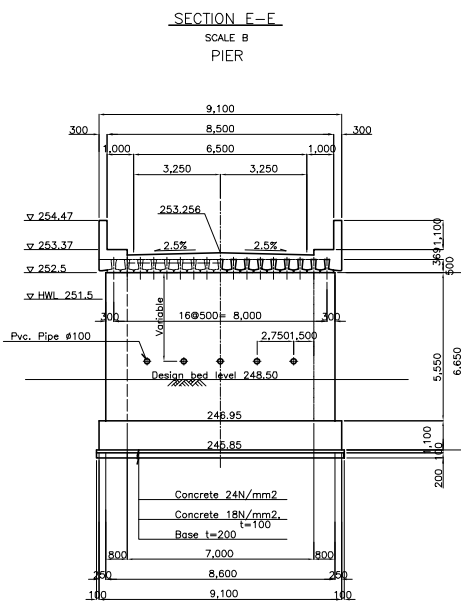
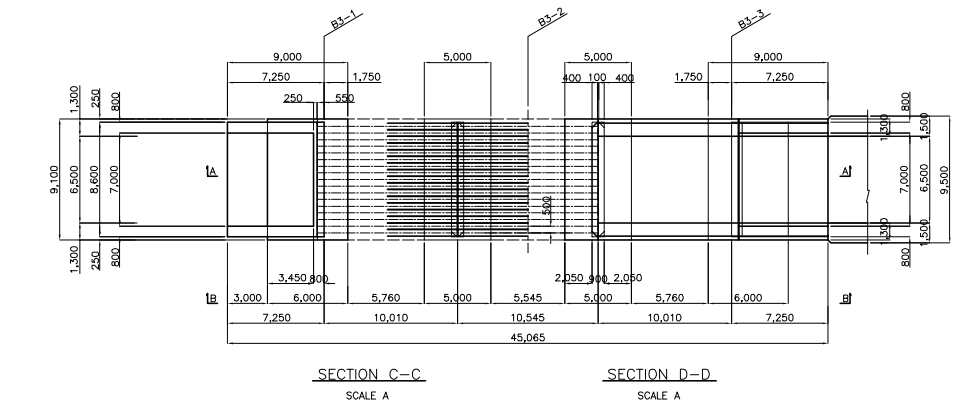
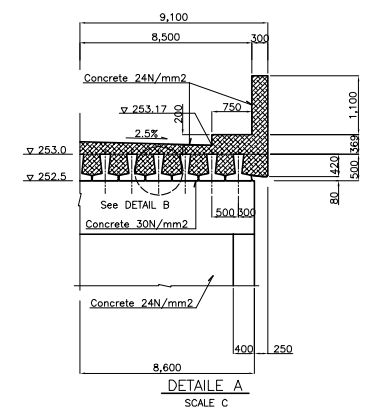
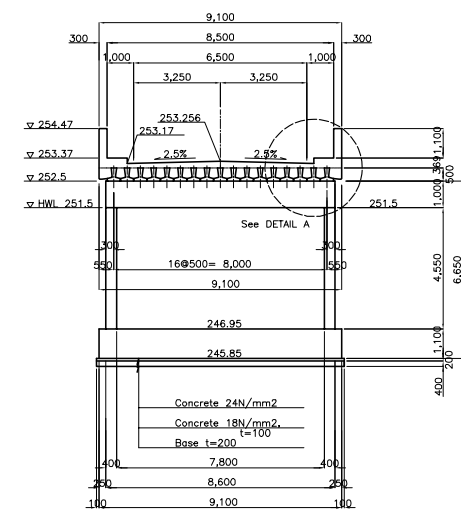
PROJECT NAME:
The Project for the Improvement of
Masasi-Mangaka Road

DRAWING TITLE:
BRIDGE No.2(KM.34+869.2)

Date: Aug. 2009
Prepared by:
Checked by:
DRAWING No.:
MR 03 F-16



Bridge 3	Station
B3	35+257.0



Tanzania National Roads Agency (TANROADS)
of The United Republic of Tanzania

CONSULTANTS:
INGEROSEC CORPORATION, JAPAN

PROJECT NAME:
The Project for the Improvement of
Masasi-Mangaka Road

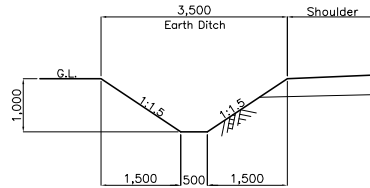
DRAWING TITLE:
BRIDGE NO.3 (KM.35+257.0)

Date: Aug. 2009
Prepared by:
Checked by:

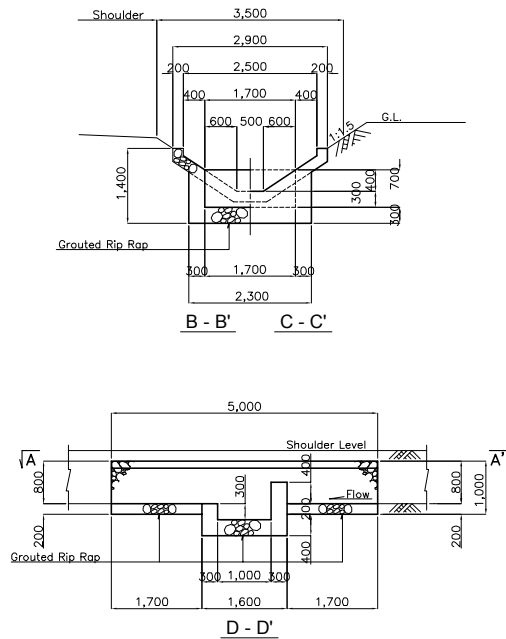
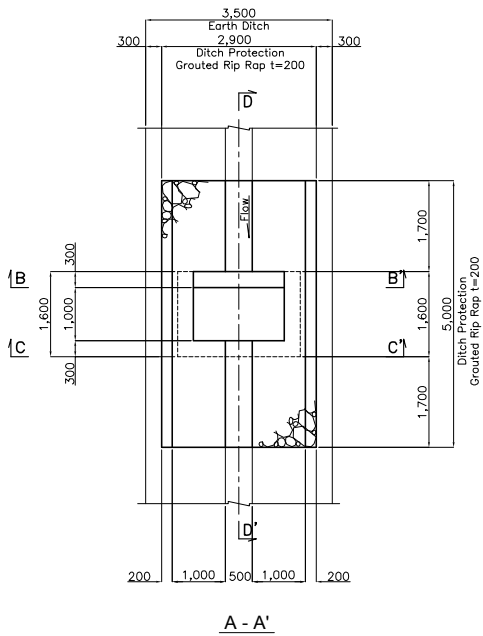
DRAWING No.:
MR 03 F-17

DITCH

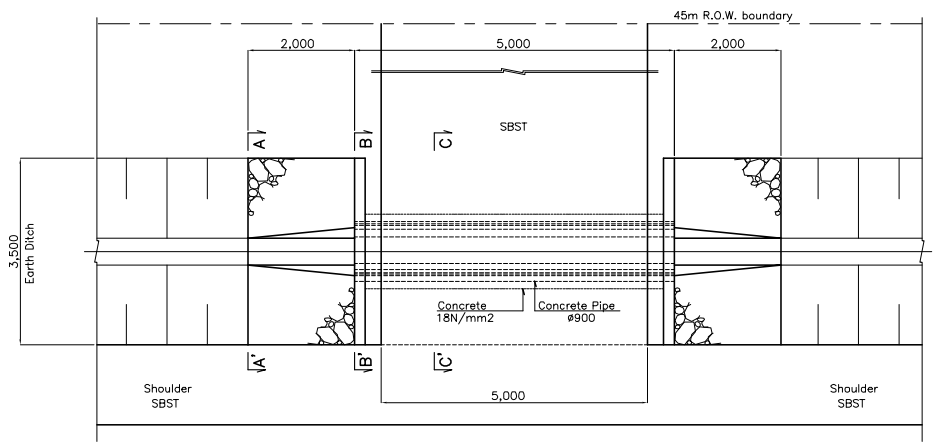
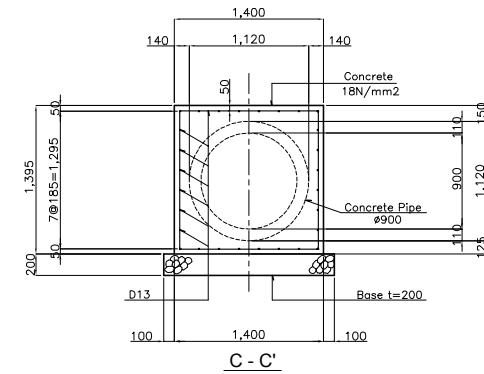
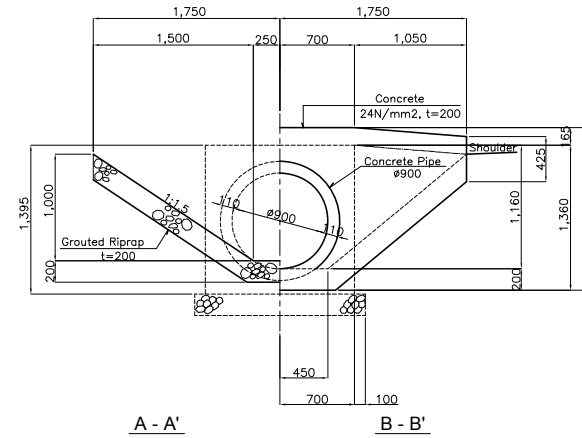
Ditch A (Earth Ditch)
Scale 1:100



Ditch Protection (Velocity Type)
Scale 1:100



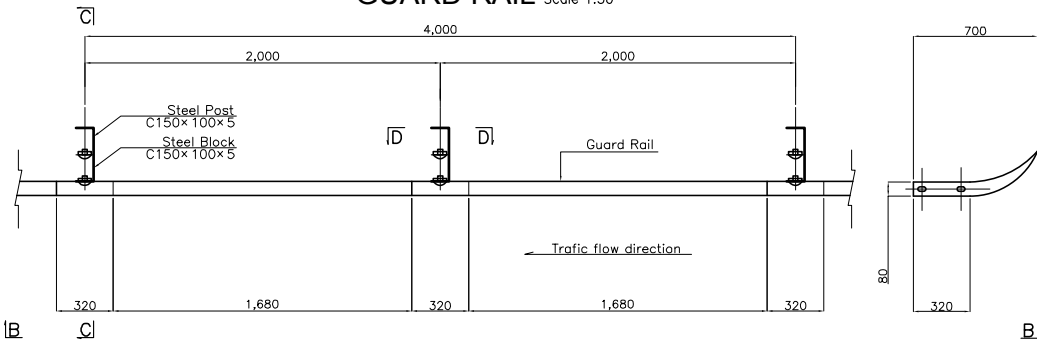
ENTRANCE CULVERT



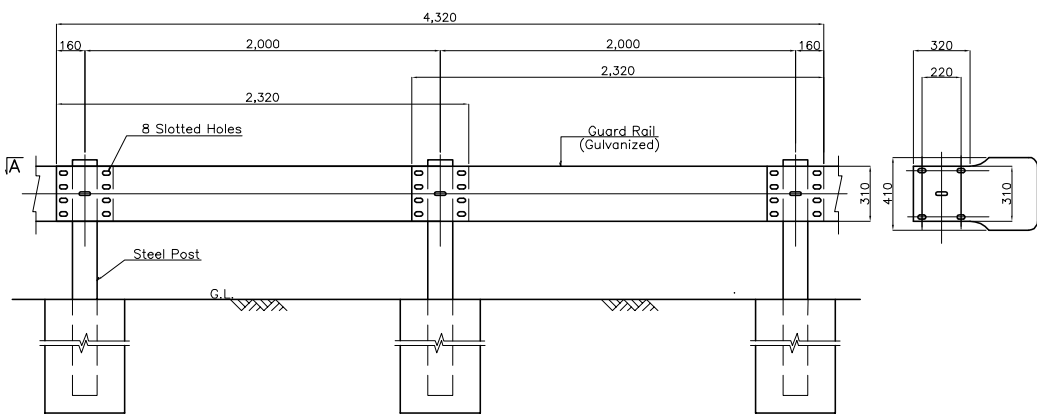
Note: All dimensions are in millimeters, unless otherwise noted.

Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for the Improvement of Masasi-Mangaka Road	INCIDENTAL WORKS-1 DITCH AND ENTRANCE CULVERT SCALE 1:50, 1:100, 1:200	Prepared by:	MR 03 G-1
				Checked by:	

GUARD RAIL Scale 1:30

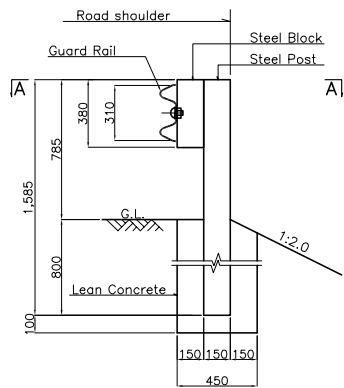


SECTION A - A

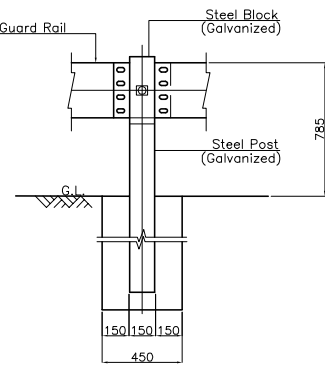


SECTION B - B

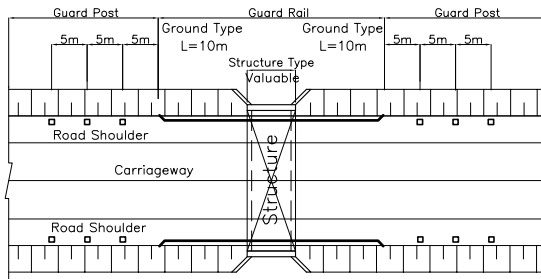
GUARD RAIL:GROUND TYPE



SECTION C - C



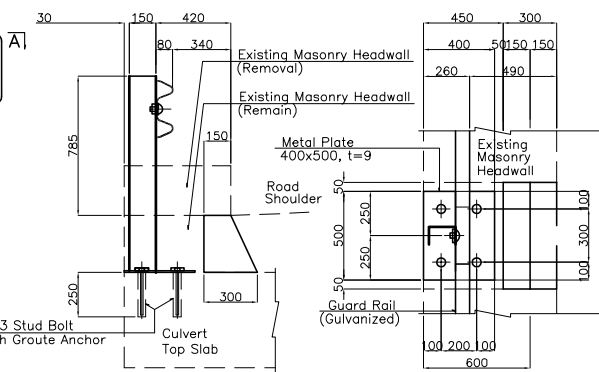
SECTION D - D



LAYOUT OF GUARD RAIL AND GUARD POST FOR STRUCTURE SECTION

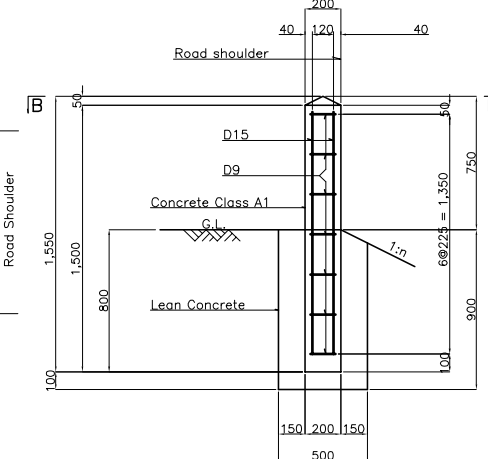
NON-SCALE

GUARD RAIL:STRUCTURE TYPE

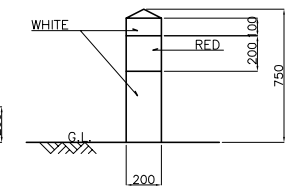


Note: This structure shall be applied for the existing headwall portions where the shoulder width is insufficient.

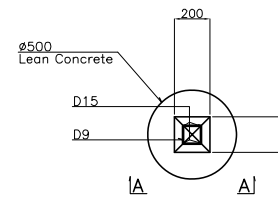
GUARD POST Scale 1:30



SECTION A-A



Installation:
- Culvert/Bridge Approach Section



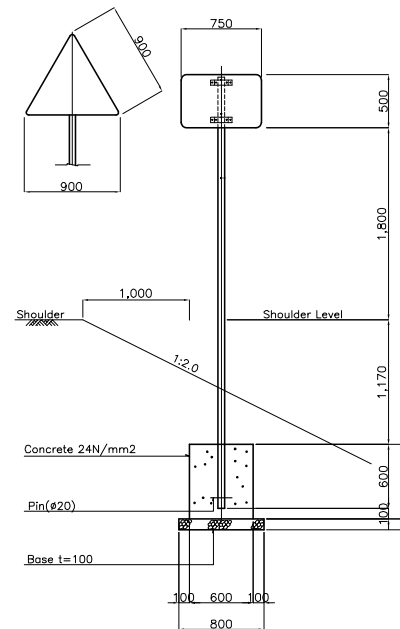
SECTION B-B

Note: All dimensions are in millimeters, unless otherwise noted.

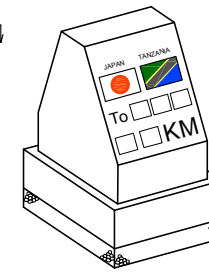
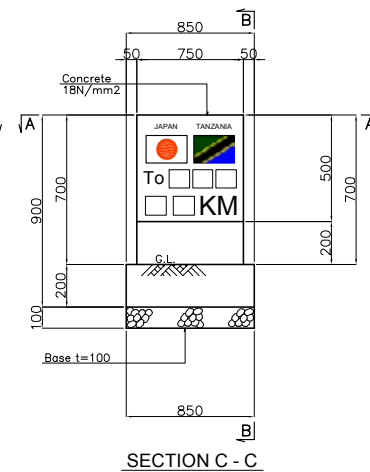
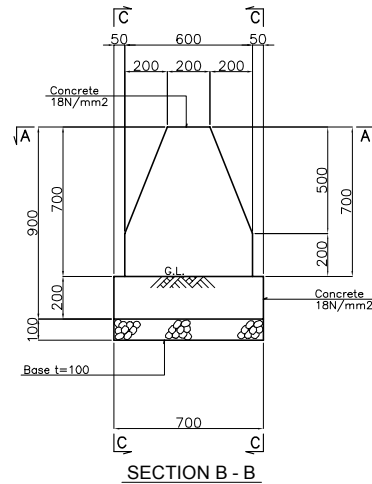
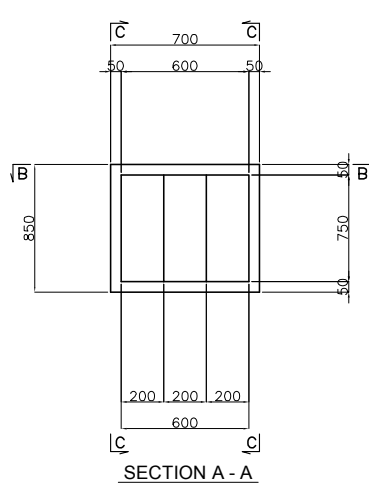
Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for the Improvement of Masasi-Mangaka Road	INCIDENTAL WORKS-2 GUARD RAIL AND GUARD POST SCALE 1:30	Prepared by:	MR 03 G-2
				Checked by:	

TRAFFIC SIGNS

SIGN POST
Scale 1:50



KILOMETER POST Scale 1:25



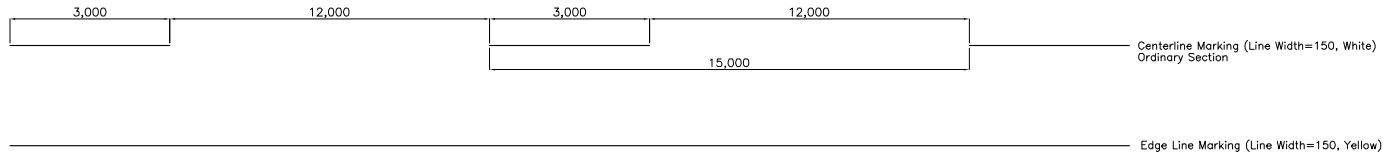
Note: Installation of kilopost shall be set alternately in each 1km

Note: All dimensions are in millimeters, unless otherwise noted.

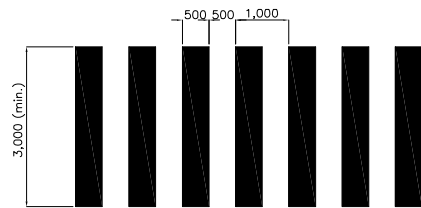
Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for the Improvement of Masasi-Mangaka Road	INCIDENTAL WORKS-3 TRAFFIC SIGNS AND KILOMETER POST SCALE 1:25, 1:50	Prepared by:	MR 03 G-3
				Checked by:	

PAVEMENT MARKINGS

LINE MARKINGS



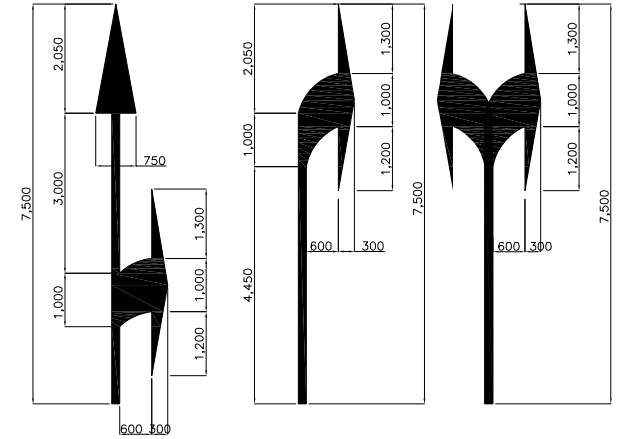
PEDESTRIAN CROSSING



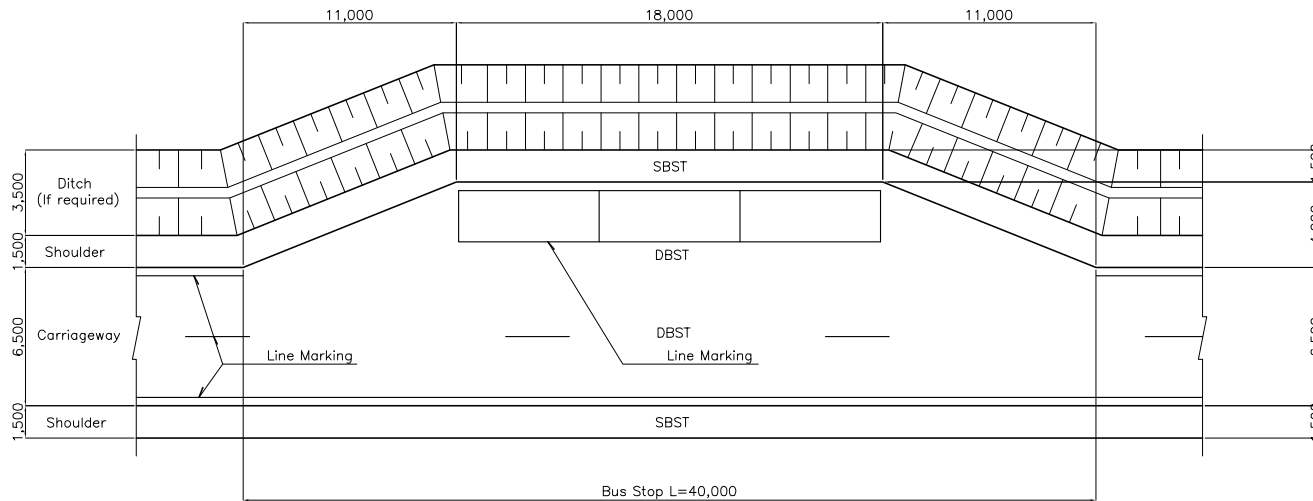
PEDESTRIAN CROSSING INSTALLATION

NO.	Location
1	17+975.0
2	21+850.0
3	24+430.0
4	26+012.0
5	30+318.0
6	32+395.0

ARROWS

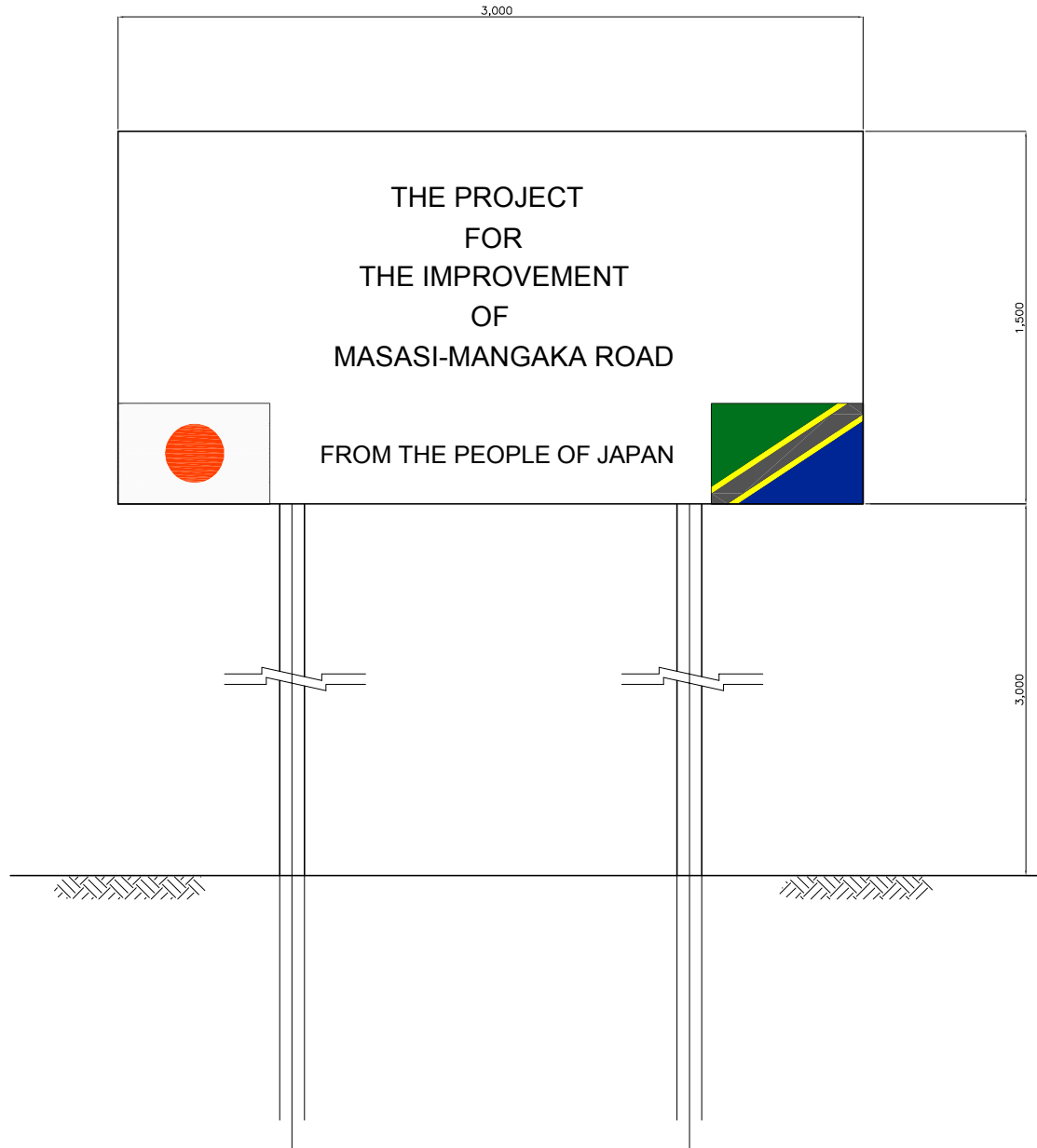


BUS STOP



PLAN

Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for the Improvement of Masasi-Mangaka Road	INCIDENTAL WORKS-4 PAVEMENT MARKINGS AND BUS STOP NON-SCALE	Prepared by:	MR 03 G-4
				Checked by:	



Tanzania National Roads Agency (TANROADS) of The United Republic of Tanzania	CONSULTANTS:	PROJECT NAME:	DRAWING TITLE:	Date: Aug. 2009	DRAWING No.:
	INGEROSEC CORPORATION, JAPAN	The Project for the Improvement of Masasi-Mangaka Road	INCIDENTAL WORKS-5 PROJECT INFORMATION BOARD SCALE 1:50	Prepared by:	MR 03 G-5
				Checked by:	