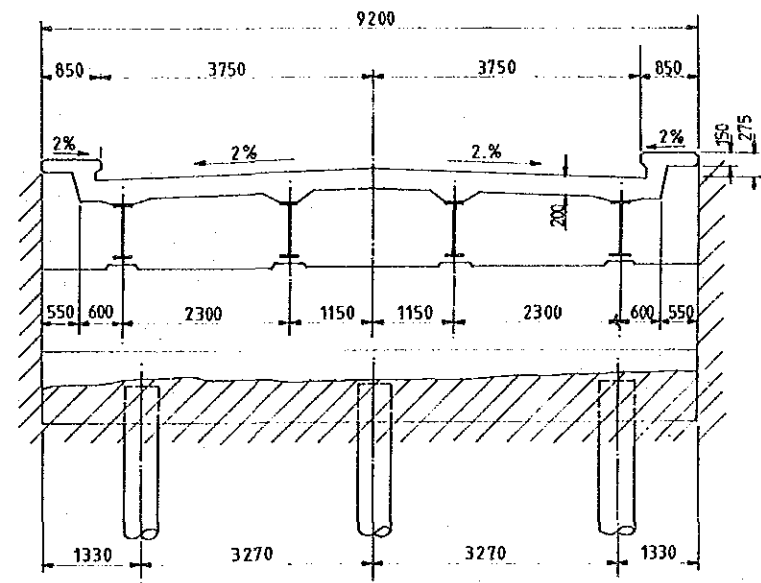
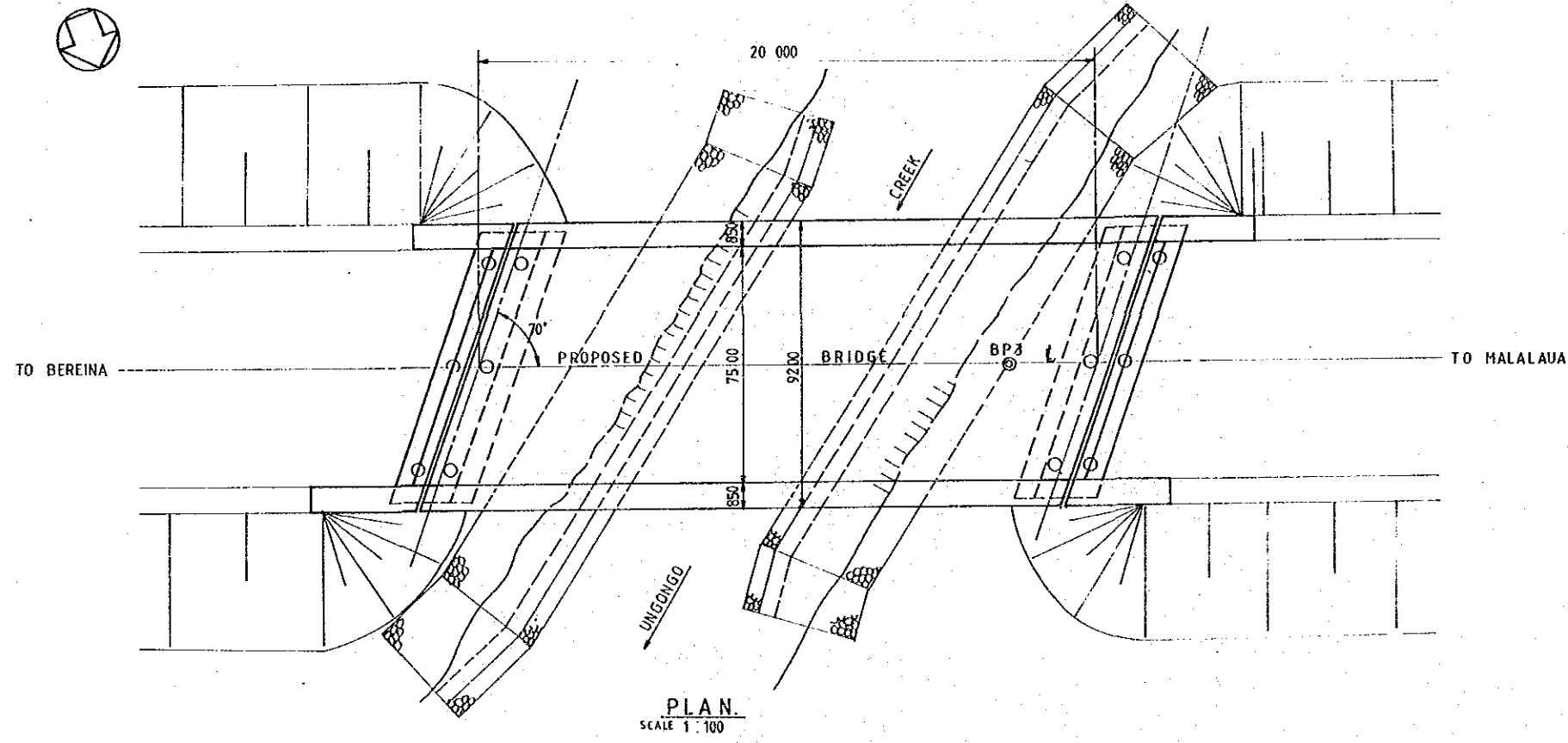


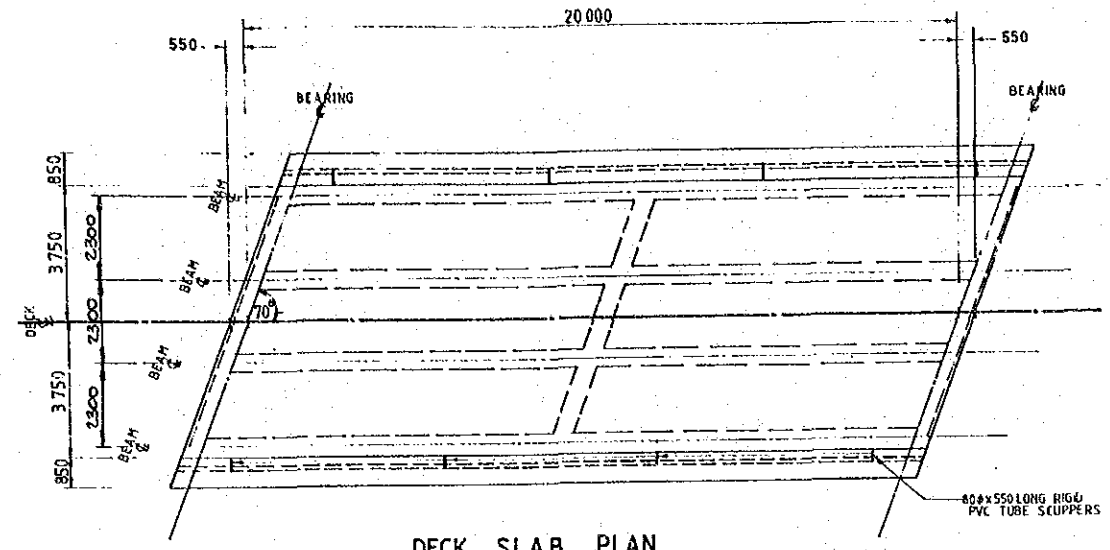
	25506	25509	15453	15402	15405
GRADE LEVELS					
SURFACE LEVELS					
CHAINAGE	CH. 16 +109.9	CH. 16 +112.5	CH. 16 +115.5	CH. 16 +127.5	CH. 16 +130.5



- NOTES:
1. ROAD ALIGNMENT DESIGN AND DETAILS BY OTHERS.
  2. GRADE LEVELS ARE AT BRIDGE CENTRELINE.

<b>JICA</b> SURVEY VERTICAL DATUM: MEAN SEA LEVEL HORIZONTAL DATUM: SURVEY BOOK No. 5		<b>JAPAN INTERNATIONAL CO-OPERATION AGENCY</b> DESIGN 25 Sep. 1989		DRAWN: J.M.S. CHECKED: Y. Doi DESIGNED: P. Kawasumi CHECKED: Y. Doi		RECOMMENDED: [Signature] PROJECT ENGINEER APPROVED: [Signature] PRINCIPAL ENGINEER		SCALES: [Scale bar]		CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU'A SECTION <b>BRIDGE No.3 - UNGONGO BRIDGE</b> GENERAL ARRANGEMENT	
REV.	AMENDMENTS	BY	A/P'D	DATE	PROJECT No. S.C. 120-33-814/A	SHEET 273 OF 281	PAPUA NEW GUINEA DEPARTMENT OF WORKS	DRAWING No. A1 88031			

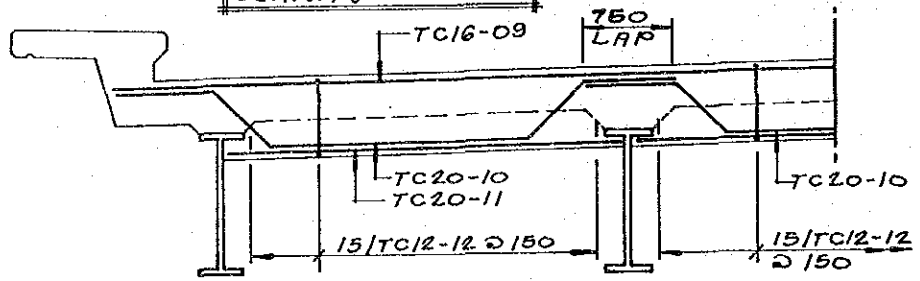




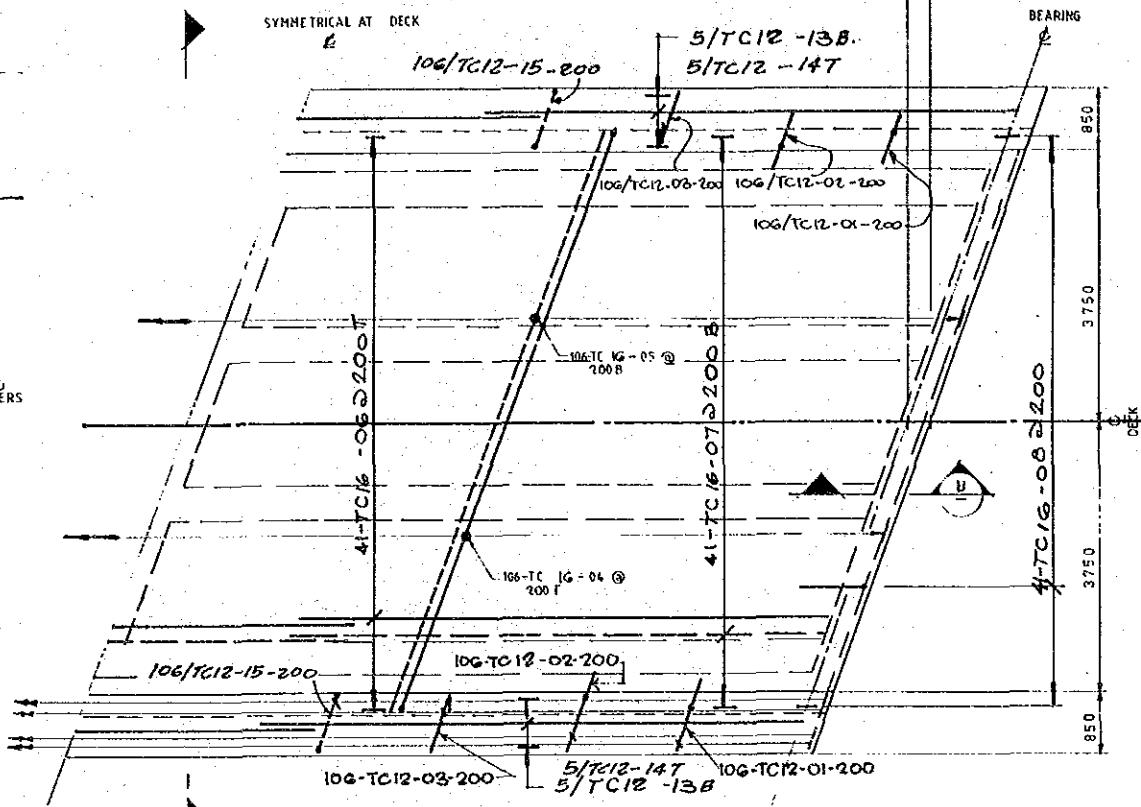
DECK SLAB PLAN  
1:100

NOTE: DECK REINF. NOT SHOWN FOR CLARITY

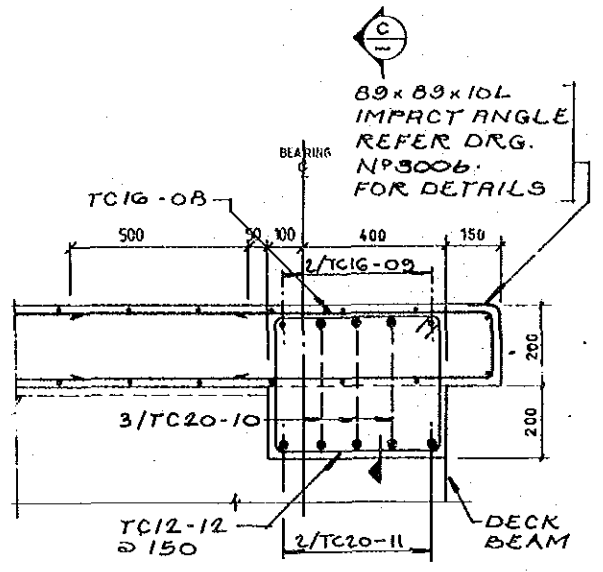
SYMMETRICAL ABOUT DECK



SECTION C  
1:20

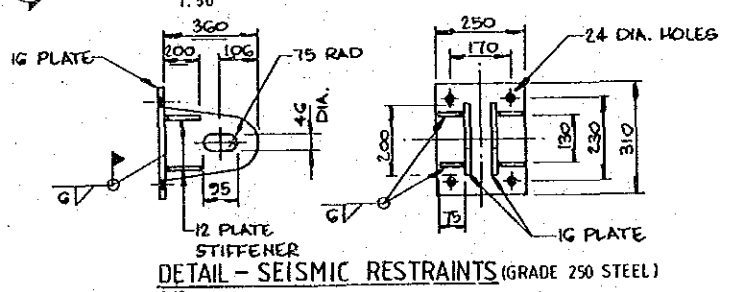


PART PLAN REINFORCEMENT  
1:50

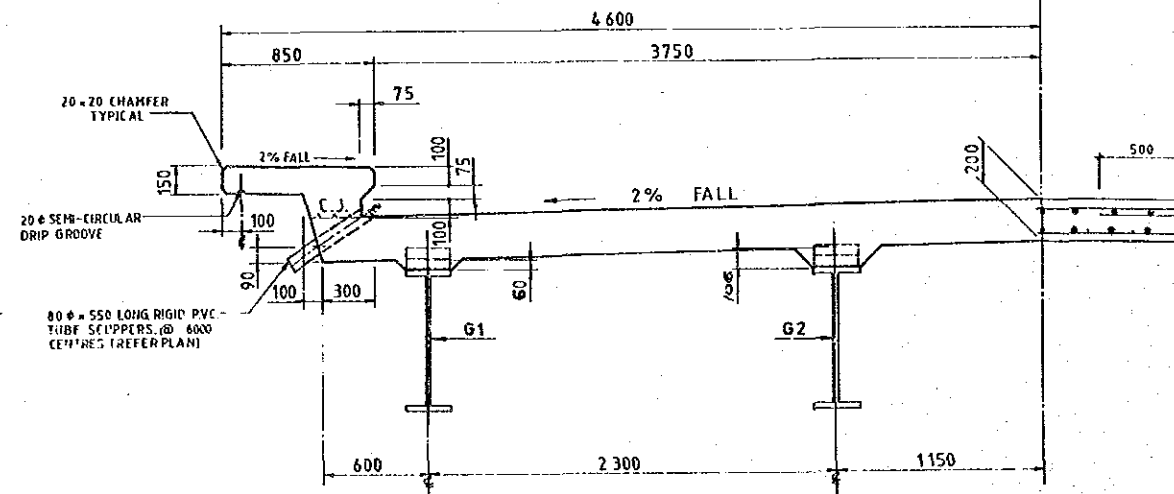


SECTION B  
1:10

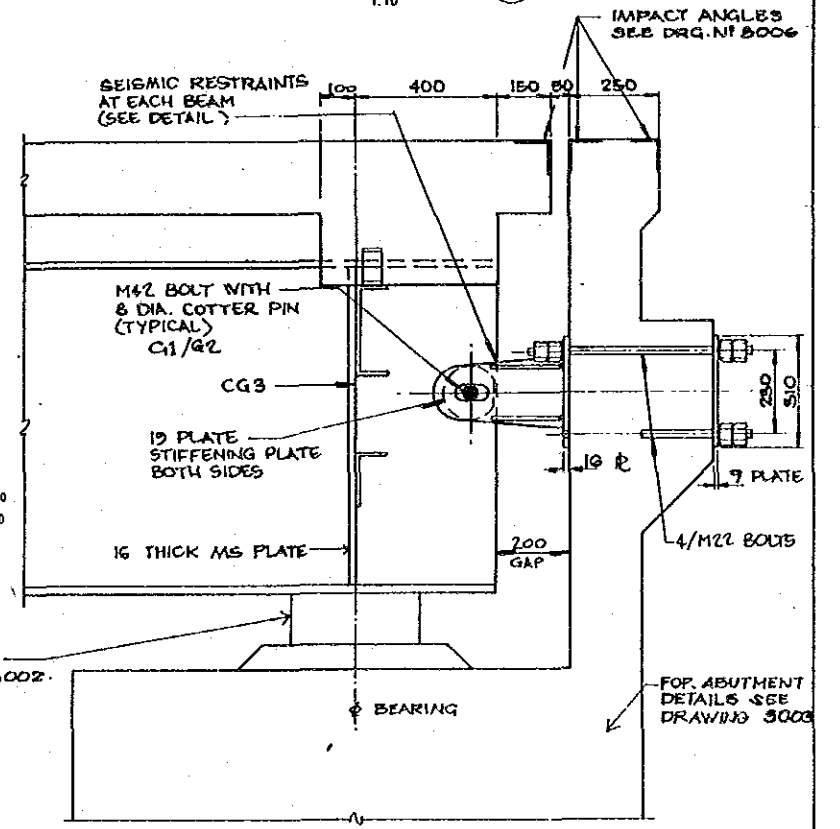
89x89x10L IMPACT ANGLE REFER DRG. NP3006 FOR DETAILS



DETAIL - SEISMIC RESTRAINTS (GRADE 250 STEEL)  
1:10

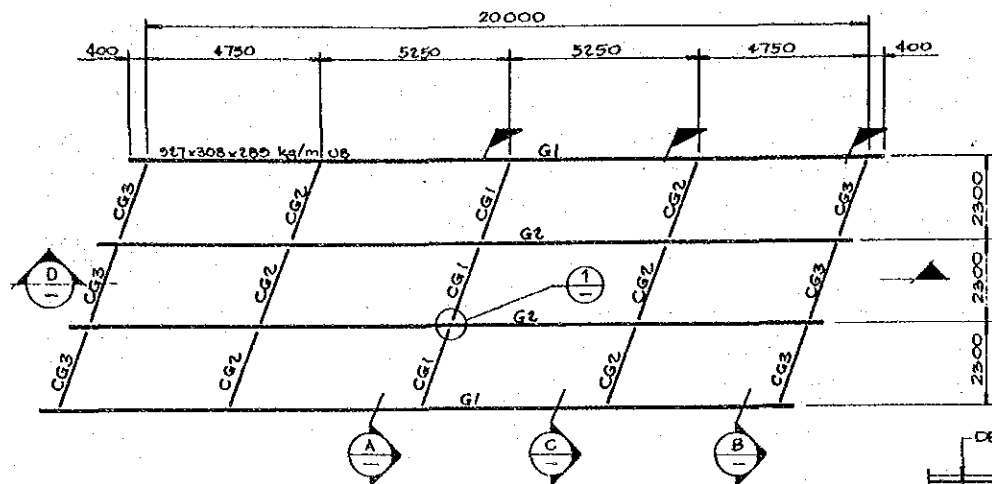


SECTION A  
1:20



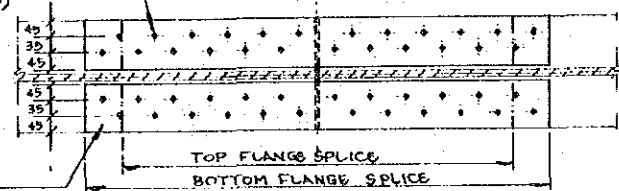
DETAIL 1  
1:10

SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MS		RECOMMENDED		CENTRAL / GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Principal J. Malin		CHECKED M. S. S. S.		PROJECT ENGINEER A. S. S. S.		TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION	
HORIZONTAL DATUM		Date 25 Sep. 1989		DESIGNED M. S. S. S.		APPROVED I. S. S. S.		BRIDGE No.3 - UNGONGO BRIDGE	
SURVEY BOOK NO.S		Principal		CHECKED M. S. S. S.		PRINCIPAL ENGINEER		CONCRETE DECK DETAILS	
REV.	AMENDMENTS	BY	APP'D	DATE	Principal	Executive Engineer	Secretary	SHEET 275 OF 281	PAPUA NEW GUINEA DEPARTMENT OF WORKS
								PROJECT No. S.C. 120-33-814/A	DRAWING No. A1/88033



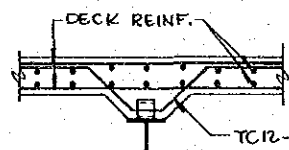
STEELWORK LAYOUT PLAN  
1:100

40/M24 (B-B/TF) BOLTS (TOP FLANGE)  
40/M24 (B-B/TF) BOLTS (BOTTOM FLANGE)

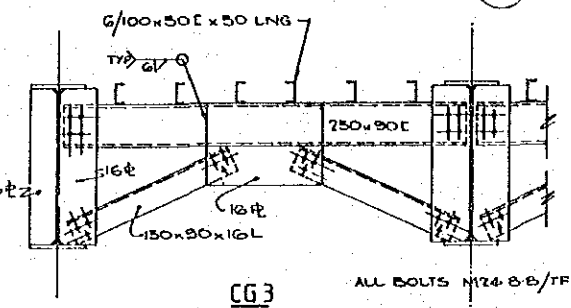


SECTION (Fb) (Fa) SIMILAR  
1:10

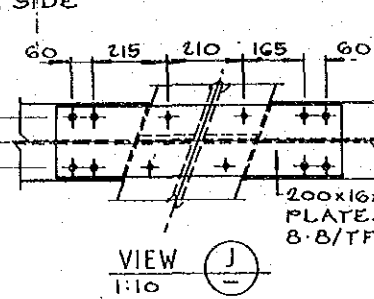
4/M24 B-B/TF BOLTS



SECTION (H)  
1:20

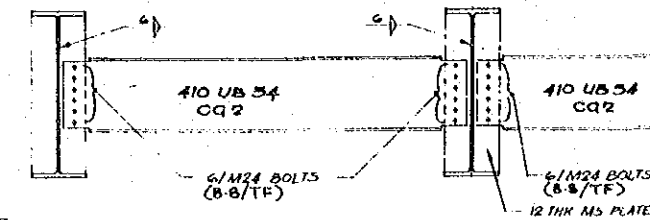


SECTION (B)  
1:20



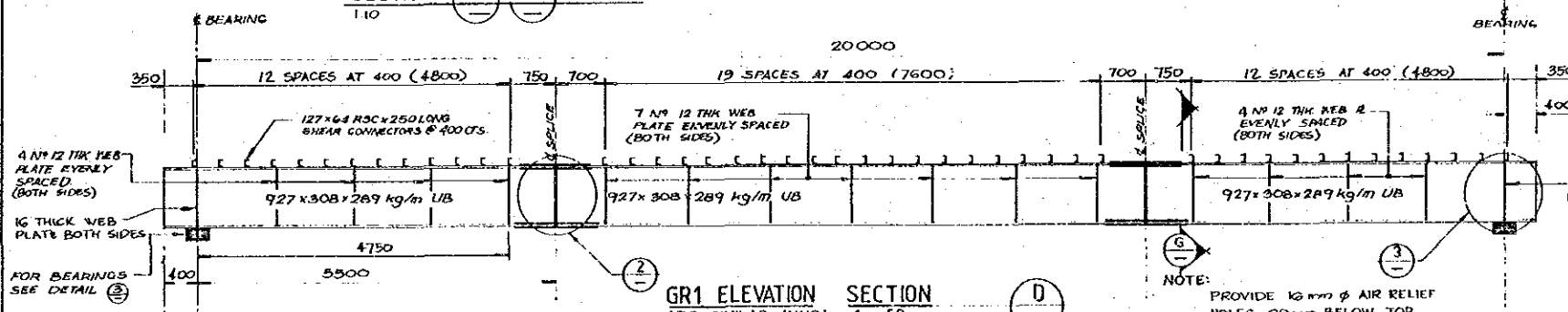
VIEW (J)  
1:10

SECTION (C)  
1:20



DETAIL (1)  
1:10

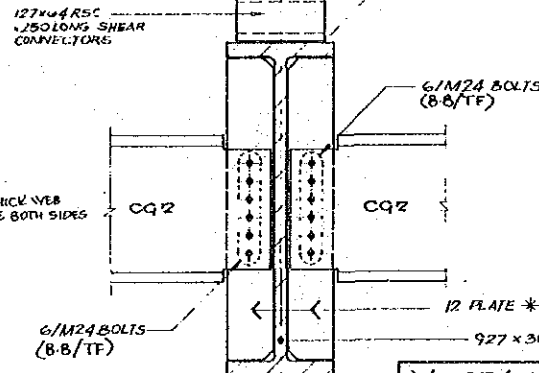
NOTE: - TOP FLANGES NOT SHOWN FOR CLARITY



GR1 ELEVATION SECTION  
GR2 SIMILAR (UNO)  
1:50

FOR BEARINGS SEE DETAIL (3)

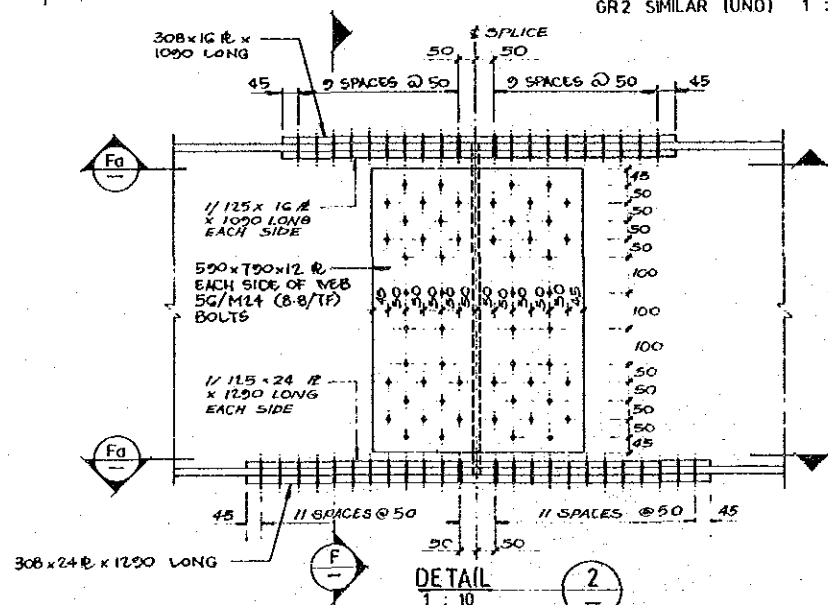
NOTE: PROVIDE 12mm Ø AIR RELIEF HOLES, 80mm BELOW TOP FLANGE AT 600mm CENTRES



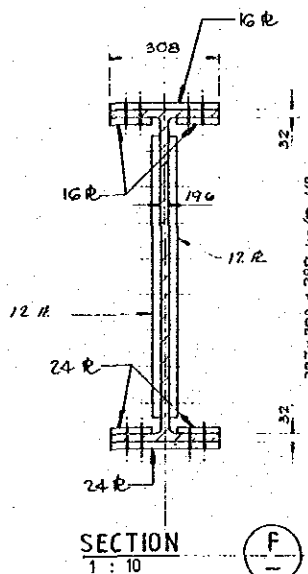
SECTION (G)  
1:10

\* THESE PLATES SHALL BE FILLETED 30x30 AS SHOWN. PLATES SHALL BE FITTED TO TOP AND BOTTOM FLANGES - NO WELDS.

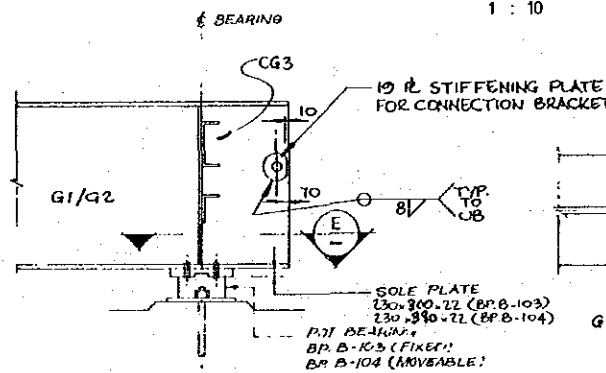
X' = 85 (BP. B-103)  
= 140 (BP. B-104)



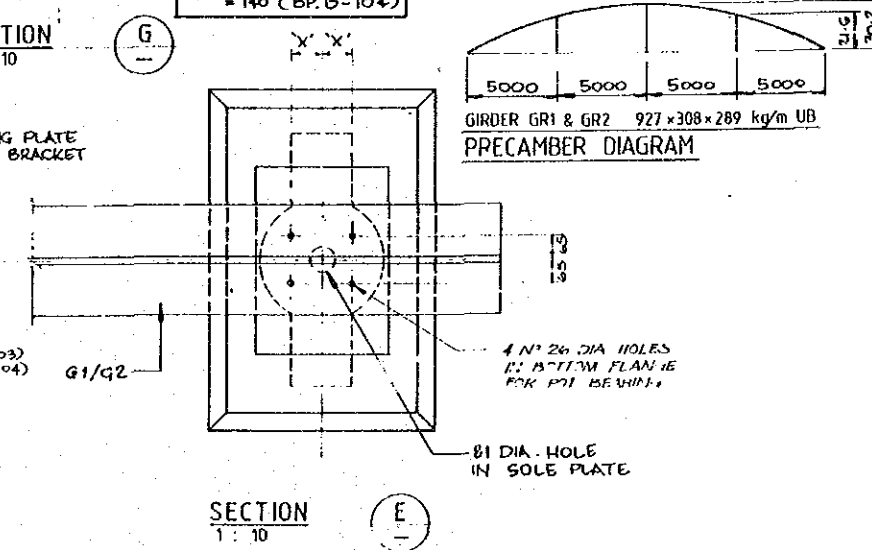
DETAIL (2)  
1:10



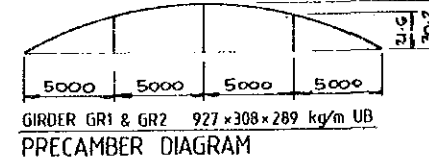
SECTION (F)  
1:10



DETAIL (3)  
1:20



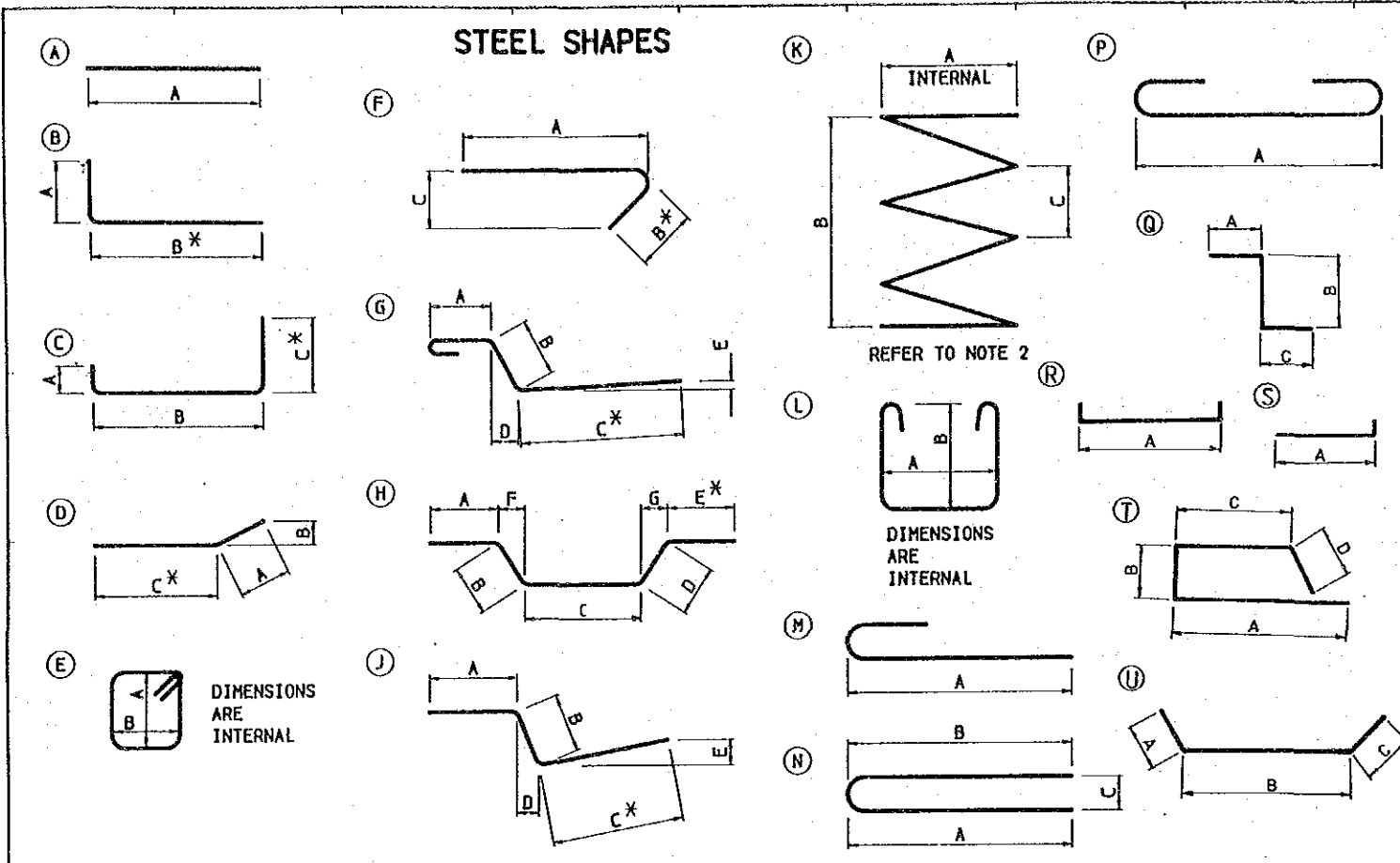
SECTION (E)  
1:10



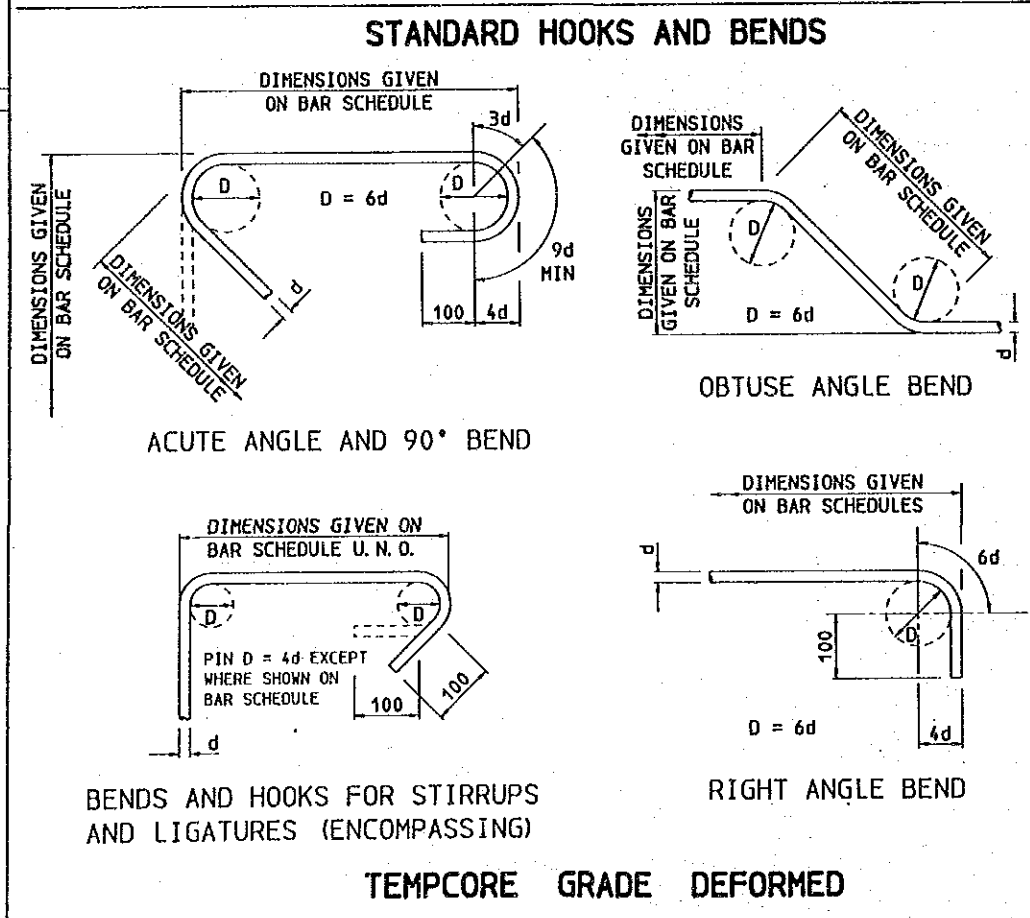
GIRDER GR1 & GR2 927x308x289 kg/m UB  
PRECAMBER DIAGRAM

SURVEY <b>JICA</b> Date: _____ VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM SURVEY BOOK NO. S		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY J. Yamamoto 25 Sep. 1989 Date		DRAWN P.G.M.S. CHECKED H. Shimizu DESIGNED H. Shimizu CHECKED H. Shimizu		RECOMMENDED PROJECT ENGINEER APPROVED I. R. B. SECRETARY		SCALES PROJECT No. S.C. 120-33-814/A SHEET 276 OF 281		CENTRAL PROVINCES TRANS-ISLAND HIGHWAY BERBINA-MALALUCA SECTION <b>BRIDGE No.3 - UNGONGO BRIDGE</b> <b>STEEL WORK DETAILS</b> PAPA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88034	
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TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (m)	MASS (kg)	SHAPE CODE	REMARKS
TC12	01	212	440	440	570*	165				1480	271.9	J	
TC12	02	212	720	410	305*					1465	275.8	Q	
TC12	03	212	340	800*						1115	200.9	F	
TC16	04	106	8620	*						9060	1516.4	P	
TC16	05	106	8515							8815	1424.8	A	
TC16	06	41	17700							17700	1288.3	A	** SEE NOTE E
TC16	07	41	17700							17700	1288.3	A	** SEE NOTE E
TC16	08	52	1240	1240	130					2520	301.5	N	
TC16	09	4	8620							8020	54.4	A	
TC20	10	18	800	400	1385	400	800*	269	269	3785	168.0	H	
TC20	11	12	2842							2842	69.3	A	
TC12	12	90	310	440						1655	132.2	E	
TC12	13	10	21000							21000	186.5	A	** SEE NOTE E
TC12	14	10	21000							21000	186.5	A	** SEE NOTE E
TC12	15	212	830							830	156.2	A	
TC16	16	212	500	280	200	280	500*	200	200	1760	589.1	H	
TC16	17	212	500	220	200	220	300*	150	150	1440	482.0	H	
TC17	18	35	500	220	180	220	500*	150	150	1620	47.4	H	
TOTAL TONNAGE = 8.650 tonnes DECK REINF. 1 <sup>st</sup> OFF													
TC28	01	96	850	*						6367	2954.7	B	
TC28	02	170	850	2554	*					4198	3449.8	C	
TC24	03	12	5615	1615	1515					7230	308.1	F	
TC24	04	12	1615	1515	5615					7230	308.1	D	
TC24	05	36	1276	600	*					3104	396.8	C	
TC28	06	36	1275	*						6792	1181.8	B	
TC28	07	94	1275	1596	*					4090	1858.4	C	
TC24	08	20	1021	*						6314	448.4	F	
TC24	09	20	1021	*						6314	448.4	D	
TC16	10	188	953							1313	389.7	P	
TC16	11	96	1775							1775	269.0	A	
TC16	12	96	1575	*						1859	281.8	B	
TC16	13	28	9730							9730	430.0	A	
TC16	15	78	740	319	290	400				1717	211.4	T	
TC16	16	6	7882							7882	74.6	A	
TC12	17	48	450	790	*					1666	71.0	C	
TC12	18	32	450	460	*					1336	37.9	C	
TC16	19	136	533							533	6.7	A	
			TO							TOTAL LENGTH = 181.3 m			
			TO							TOTAL WEIGHT = 286.2 kg			INCREMENTS A = 100
TC16	20	32	300	280	1569					1953	12.5	D	
			TO							TOTAL LENGTH = 80.4 m			
			TO							TOTAL WEIGHT = 126.8 kg			INCREMENTS = 133
TC16	21	32	1569	300	280					3068	19.3	D	
			TO							TOTAL LENGTH = 80.4 m			
			TO							TOTAL WEIGHT = 126.8 kg			INCREMENTS = 133
TC16	22	8	400	300	4147					4597	58.1	D	
TC16	23	20	400	450	400					1250	39.5	U	
TC16	24	160	700	250						950	239.9	B	
TC16	25	80	250	500	250					1000	126.3	U	
TC16	26	80	790	790	80					1616	204.0	N	
TC16	27	48	2731							2731	206.9	A	
TC16	28	20	400	600	*					1400	44.2	U	
TC20	29	132	650	600	*					1860	605.4	C	
TC16	30	8	300	280	2685					3068	392.7	D	
TC16	31	8	2685	300	280					3068	392.7	F	
TOTAL TONNAGE = 16.066 tonnes ABUTMENT REINF. 2 <sup>nd</sup> OFF													



- ### NOTES
- EXPLANATION OF BAR MARKS  
e.g. 40 - TC32 - 07 - 250 - B  
No. OFF | TYPE | LOCATION | BAR DIAMETER | SPACING | BAR MARK
  - SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG.
  - DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
  - \* DENOTES TOLERANCE TO BE TAKEN UP ON THIS DIMENSION WHICH IS OMITTED FROM THE BAR BENDING SCHEDULE
  - \*\* DENOTES NO ALLOWANCE HAS BEEN MADE FOR LAPS
  - ALL HOOKS AND BENDS ARE TO BE IN ACCORDANCE WITH THE STANDARD DETAILS
  - OMISSION OF DIMENSION FOR PARTS OF STANDARD SHAPES IN THE SCHEDULE SHALL INDICATE DELETION OF THOSE PARTS
  - REINFORCING BARS TO BE EITHER  
a) DEFORMED TEMP CORE (T.C.) BARS GRADE 410  
b) PLAIN ROUND (R) BARS GRADE 230

SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN M-S		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES			
VERTICAL DATUM MEAN SEA LEVEL		DESIGNED <i>J. Halviti</i>		CHECKED <i>of Halviti</i>		PROJECT ENGINEER <i>1/1/89</i>		APPROVED <i>1/1/89</i>		TRANS-ISLAND HIGHWAY BERBINA-MALALAU SECTION			
HORIZONTAL DATUM		Principal		CHECKED <i>of Halviti</i>		EXECUTIVE ENGINEER <i>1/1/89</i>		SECRETARY <i>1/1/89</i>		BRIDGE No.3- UNGONGO BRIDGE			
SURVEY BOOK NO.		Date 25 Sep. 1989		CHECKED <i>of Halviti</i>		EXECUTIVE ENGINEER		SECRETARY		BAR BENDING SCHEDULE SHEET 1			
AMENDMENTS		BY APP'D DATE		Principal		EXECUTIVE ENGINEER		SECRETARY		PROJECT No. S.C.120-33-R14/A		DRAWING No. A1/88036	

R=75<sup>TON</sup> Fix BEARING

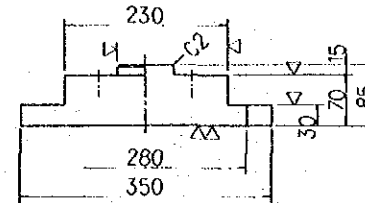
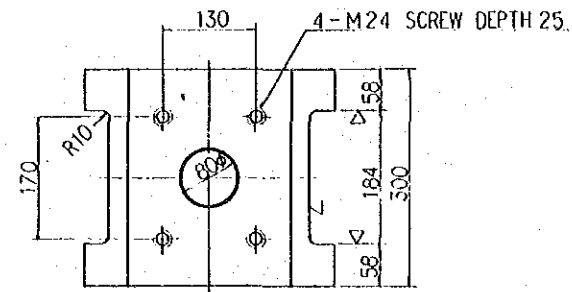
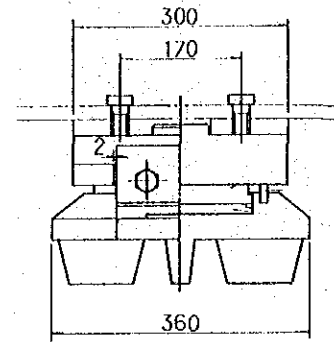
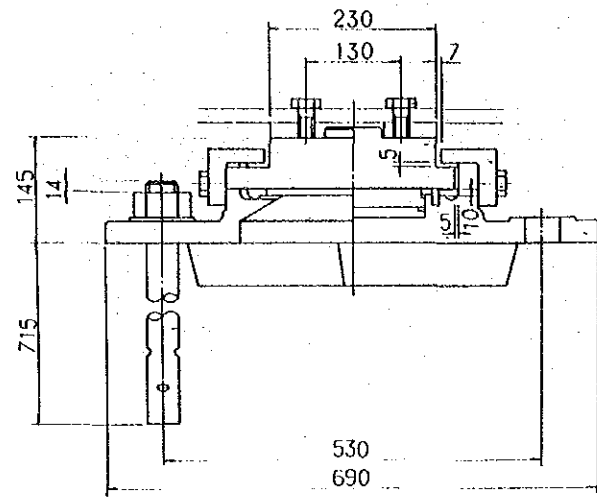
②  $\sim (\nabla \nabla)$  SS41

DESIGN CONDITION

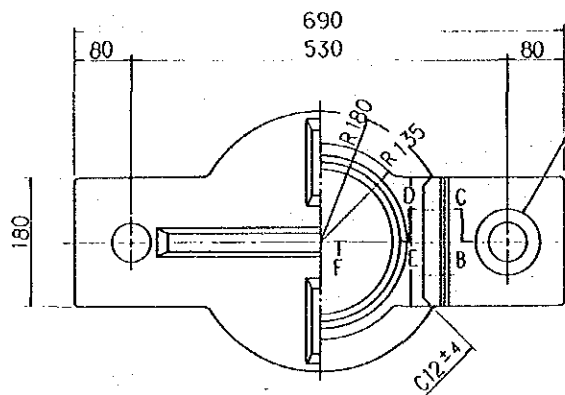
TOTAL REACTION	R	54.0 ton
DEAD LOAD REACTION	R <sub>d</sub>	14.7 ton
LIVE LOAD REACTION	R <sub>ll</sub>	39.3 ton
LONGITUDINAL FORCE (FRICTION)	R <sub>llf</sub>	5.4 ton
LONGITUDINAL FORCE (EARTHQUAKE)	R <sub>llte</sub>	13.1 ton
TRANSVERSE FORCE (EARTHQUAKE)	R <sub>llte</sub>	6.2 ton
UPLIFT (EARTHQUAKE)	V	1.5 ton
SEISMIC COEFFICIENT	K <sub>ll</sub>	0.42
FRICTIVE COEFFICIENT	f	0.1
BEARING STRESS OF CONCRETE	fb	80 kg/cm <sup>2</sup>

MATERIAL LIST

MAKE	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	67.7	
2	UPPER BEARING	SS41	1	43.6	
3	MIDDLE PLATE	SS41	1	6.1	
4	RUBBER PLATE	CHLOROPRENE RUBBER	1	0.6	
5	SEAL RING	CHLOROPRENE RUBBER	1	0.3	
6	SIDE BLOCK	SS41	2	8.4	
7	BOLT	SS41	4	0.7	M20, 50
8	BOLT	SS41	4	0.7	M24, 50
9	ANCHOR BOLT-NUT	SS41	2	22.4	M24, 50
				TOTAL WEIGHT (kg)	149.8



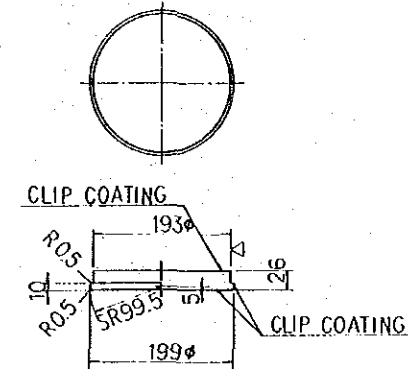
①  $\sim (\nabla \nabla)$  SC46



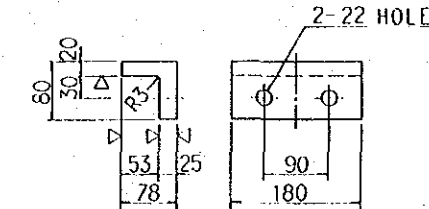
2-51φ HOLE  
2-90φ STEEL

A\* DETAIL

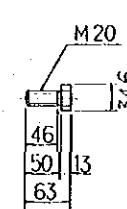
③ 1255  $\nabla \nabla$  (∇) SS41



⑥  $\sim (\nabla)$  SS41

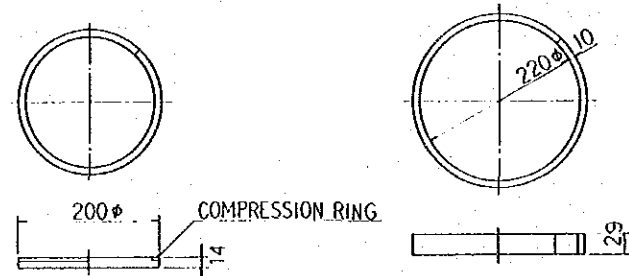


⑦ SS41

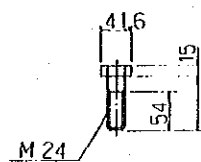


④  $\sim$  CHLOROPRENE RUBBER

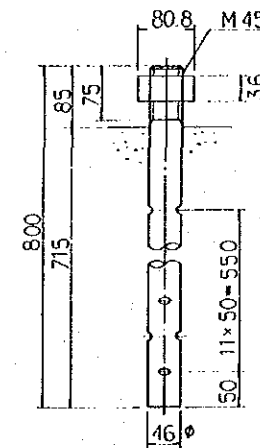
⑤  $\sim$  CHLOROPRENE RUBBER



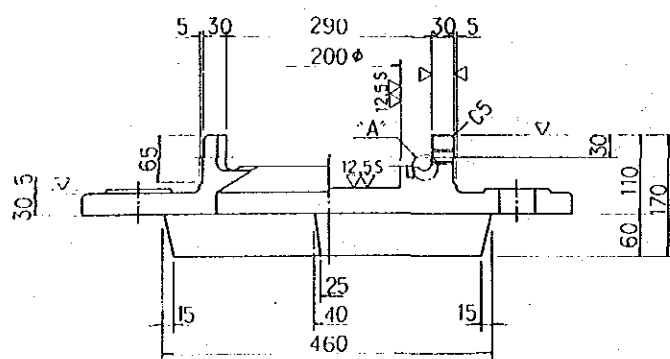
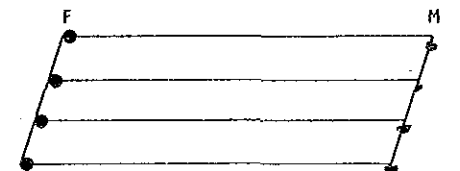
⑧ SS41



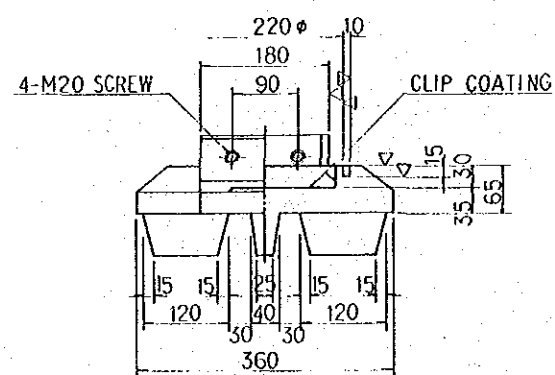
⑨  $\sim$  SS41



PLAN



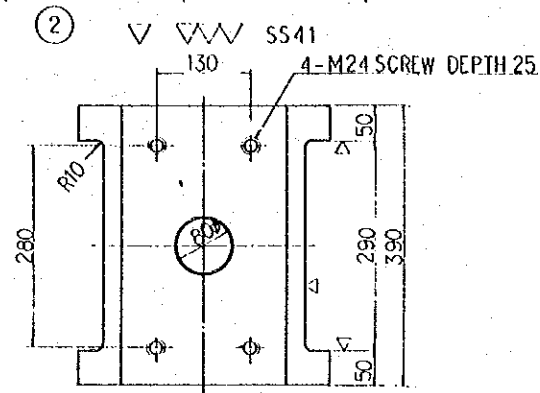
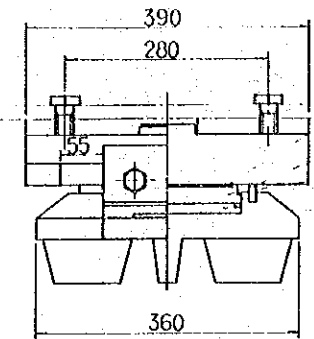
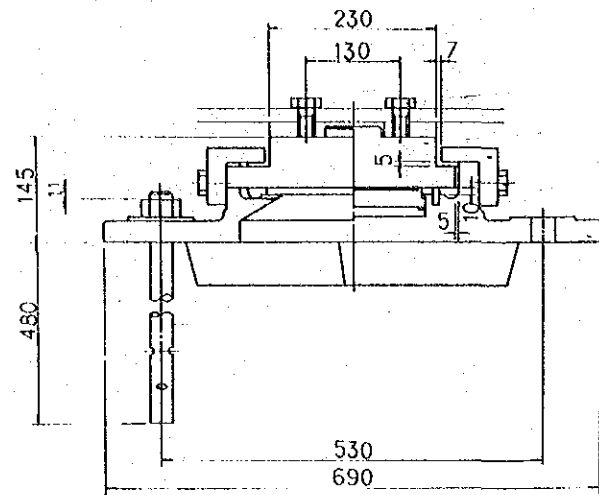
SECTION 'ABCDEF'



SURVEY		DESIGN		DRAWN		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES	
JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		M.S.		PROJECT ENGINEER		1:1		TRANS-ISLAND HIGHWAY BERENA-MALALABA SECTION	
VERTICAL DATUM Date MEAN SEA LEVEL.		HORIZONTAL DATUM		CHECKED 4/20/89		APPROVED 1/11/89		PROJECT No. S.C.120-33-811/A		BRIDGE No3 - UNGONGO BRIDGE	
SURVEY BOOK No.8		25 Sep. 1989		M. Shinjima		A. J. J. J.		SHEET 279 OF 281		BEARING BP-B - 103 (FIXED)	
AMENDMENTS		BY APP'D DATE		EXECUTIVE ENGINEER		SECRETARY		DEPARTMENT OF WORKS		DRAWING No. A1/88037	



R-75<sup>TON</sup> Mov BEARING

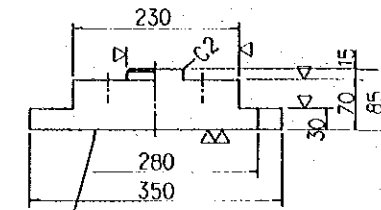


DESIGN CONDITION

TOTAL REACTION	R	53.3 ton
DEAD LOAD REACTION	Rd	16.4 ton
LIVE LOAD REACTION	R(l i)	36.9 ton
LONGITUDINAL FORCE (FRICTION)	Rf11	5.3 ton
LONGITUDINAL FORCE (EARTHQUAKE)	Rf1e	6.9 ton
TRANSVERSE FORCE (EARTHQUAKE)	Rf2e	6.9 ton
UPLIFT (EARTHQUAKE)	V	1.6 ton
MOVABLE LENGTH	e1	50 mm
DESIGNED LENGTH	e2	70 mm
TOTAL LENGTH	e	110 mm
SEISMIC COEFFICIENT	KH	0.42
FRICTIVE COEFFICIENT	f	0.1
BEARING STRESS OF CONCRETE	$\sigma_{ba}$	80 kg/cm <sup>2</sup>

③ ~ PTFE

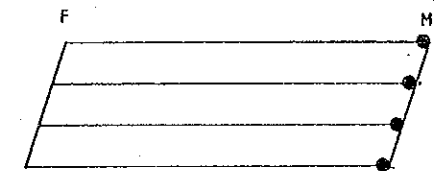
④ 12.55 (▽) SS41



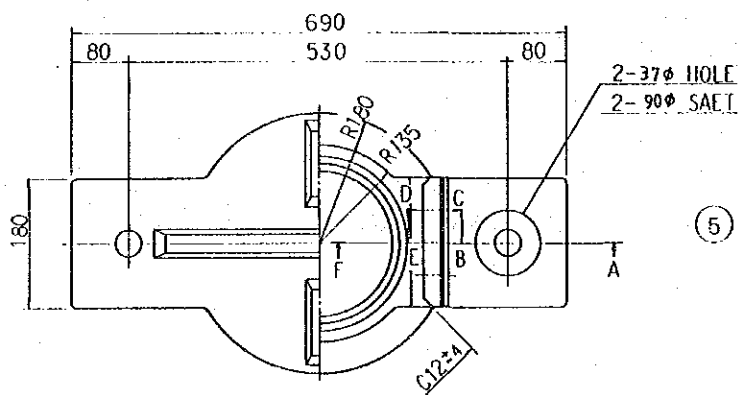
MATERIAL LIST

NO	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	68.2	
2	UPPER BEARING	SS41	1	55.8	
3	GLIDE PLATE	PTFE	1	0.2	
4	MIDDLE PLATE	SS41	1	5.3	
5	RUBBER PLATE	CHLOROPRENE RUBBER	1	0.6	
6	SEAL RING	CHLOROPRENE RUBBER	1	0.3	
7	SIDE BLOCK	SS41	2	8.4	
8	BOLT	SS41	4	0.7	M20-50
9	BOLT	SS41	4	0.7	M24-54
10	ANCHOR BOLT-NUT	SS41	2	7.4	
TOTAL WEIGHT (kg)				146.9	

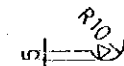
PLAN



① ~ (▽ 12.55) SC46

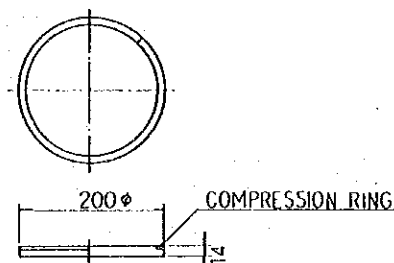


"A" DETAIL



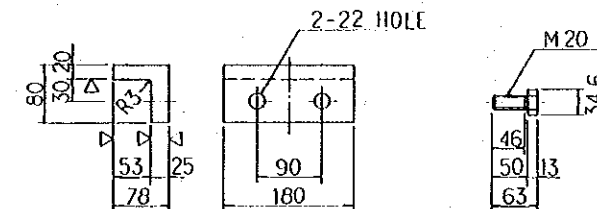
⑤ ~ CHLOROPRENE RUBBER

⑥ ~ CHLOROPRENE RUBBER



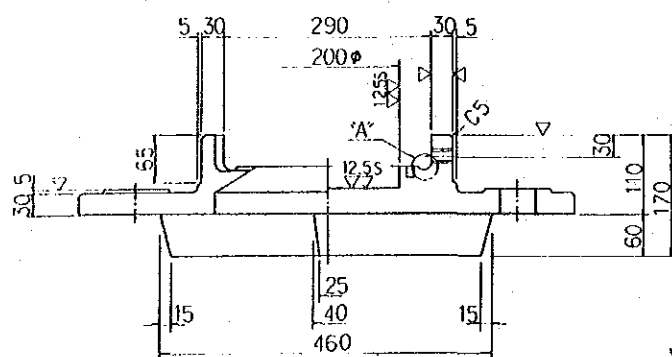
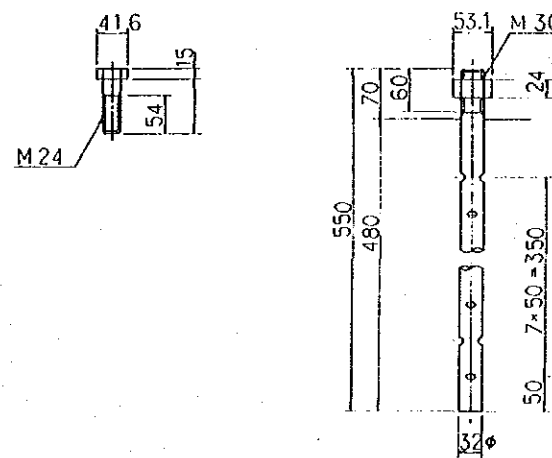
⑦ ~ (▽) SS41

⑧ SS41

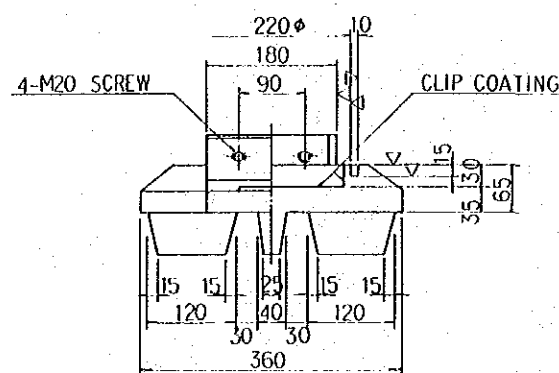


⑨ SS41

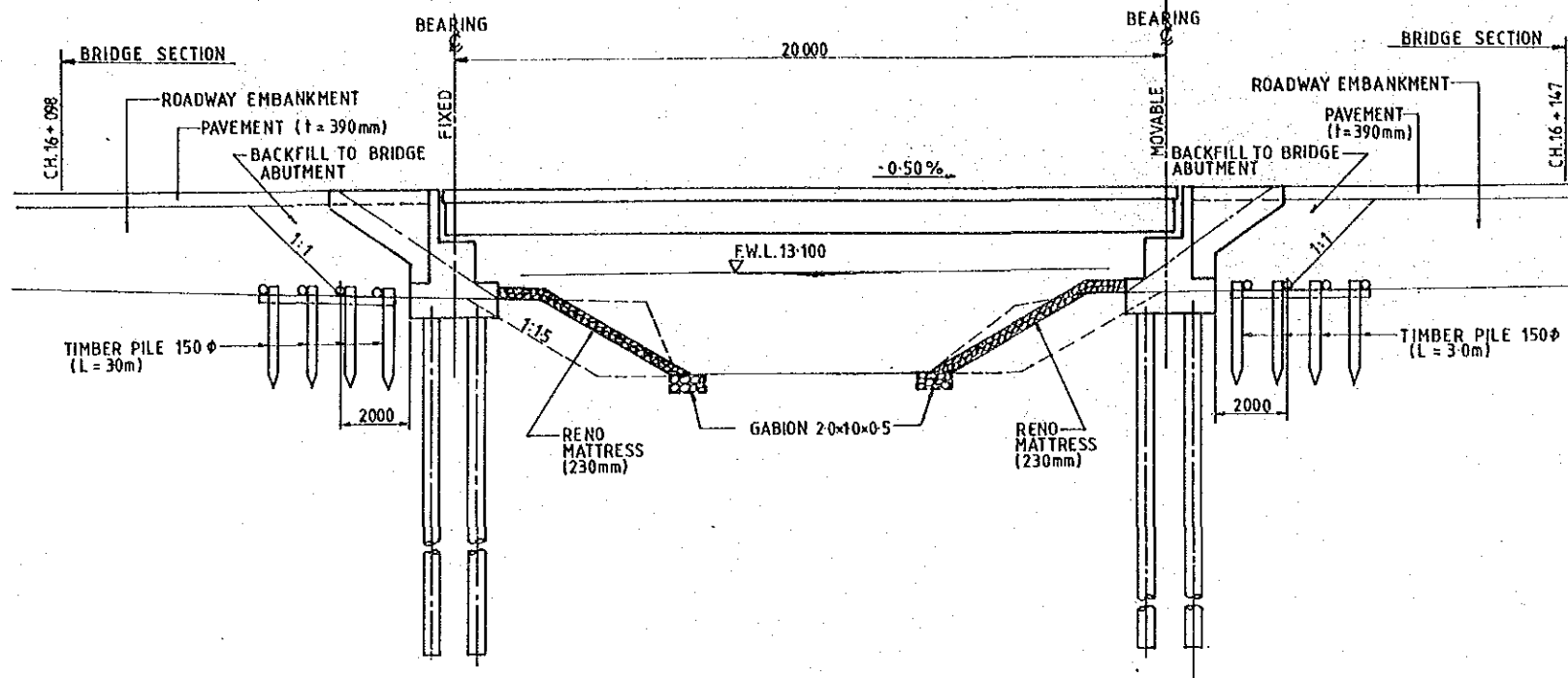
⑩ ~ SS41



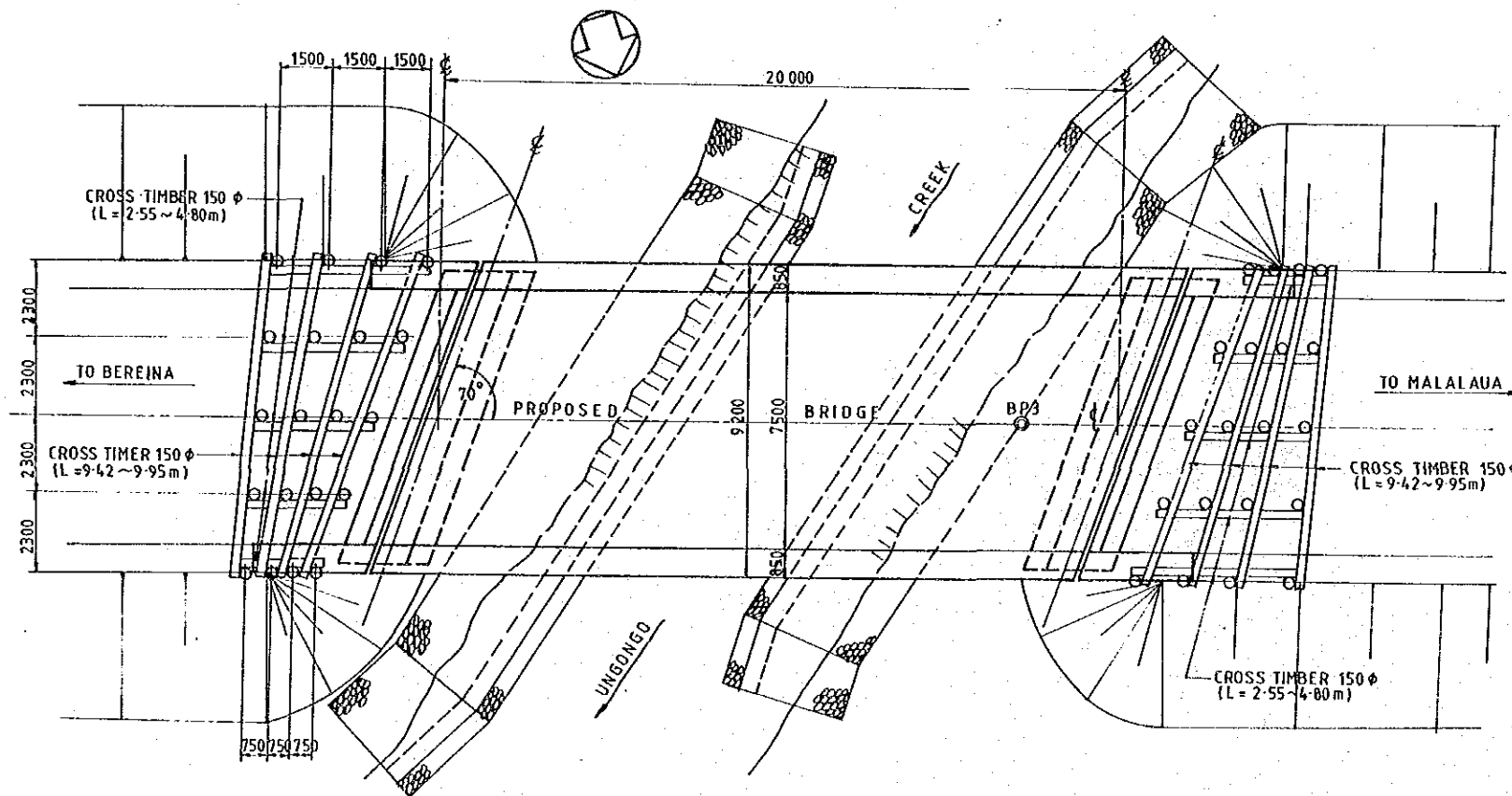
SECTION "ABCDEF"



SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MS		RECOMMENDED		CENTRAL / GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Date 25 Sep. 1989		CHECKED Y. Sei		PROJECT ENGINEER		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
HORIZONTAL DATUM		Principal J. Mahita		DESIGNED M. Shinji		APPROVED I. H. S.		BRIDGE No.3 - UNGONGO BRIDGE	
SURVEY BOOK NO.		Date		CHECKED Y. Sei		EXECUTIVE ENGINEER		BEARING BP-B-104 (MOVABLE)	
REV.	AMENDMENTS	BY	APP'D	DATE	SHEET 280 OF 281		PROJECT No. S.C.120-33-R14/A		DEPARTMENT OF WORKS
								DRAWING No. A1/88038	



ELEVATION  
1:100



PLAN  
1:100

TABLE OF QUANTITIES			
DESCRIPTION	UNIT	QUANTITY	REMARKS
CLEARING AND GRUBBING AT BRIDGE SITE	ha	0.1	
EXCAVATION FOR STRUCTURAL FOUNDATIONS	m <sup>3</sup>	0	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS	m <sup>3</sup>	4.3	
BACKFILL TO BRIDGE ABUTMENT	m <sup>3</sup>	350	
ROADWAY EMBANKMENT	m <sup>3</sup>	869	
BEARING UNITS			
TIMBER PILE	m	120.0	150 φ
CROSS TIMBER	m	114.0	150 φ
SAND MAT	m <sup>3</sup>	0	
EXCAVATION FOR BANK PROTECTION WORKS (TYPE D)	m <sup>3</sup>	83.7	
EXCAVATION FOR RIVER CHANNEL ALIGNMENT (TYPE D)	m <sup>3</sup>	123.1	
GABIONS	m <sup>3</sup>	22.3	
RENO MATTRESSES (TYPE B)	m <sup>2</sup>	267.0	t = 230mm

NOTES:  
1. PAVEMENT, ROAD SIGNS AND EXCAVATION FOR THE ROADWAY EMBANKMENT ARE INCLUDED IN ROAD WORKS.

SURVEY JICA Date		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY J. Malinda 25 Sep. 1989		DRAWN M-S CHECKED DESIGNED CHECKED		RECOMMENDED PROJECT ENGINEER APPROVED PRINCIPAL ENGINEER SECRETARY		SCALES 1:100		CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION BRIDGE No. 3. — UNGONGO BRIDGE RIVER BANK PROTECTIONS, BEARING UNITS, BACKFILL TO BRIDGE ABUTMENTS AND OTHERS.	
VERTICAL DATUM MEAN SEA LEVEL		SURVEY BOOK No. S		EXECUTIVE ENGINEER		SECRETARY		SHEET 281 OF 281		PROJECT No. S.C. 120-33-814/A	
HORIZONTAL DATUM		Date		Principal		Date		DEPARTMENT OF WORKS		DRAWING No. A1 88039	



JICA