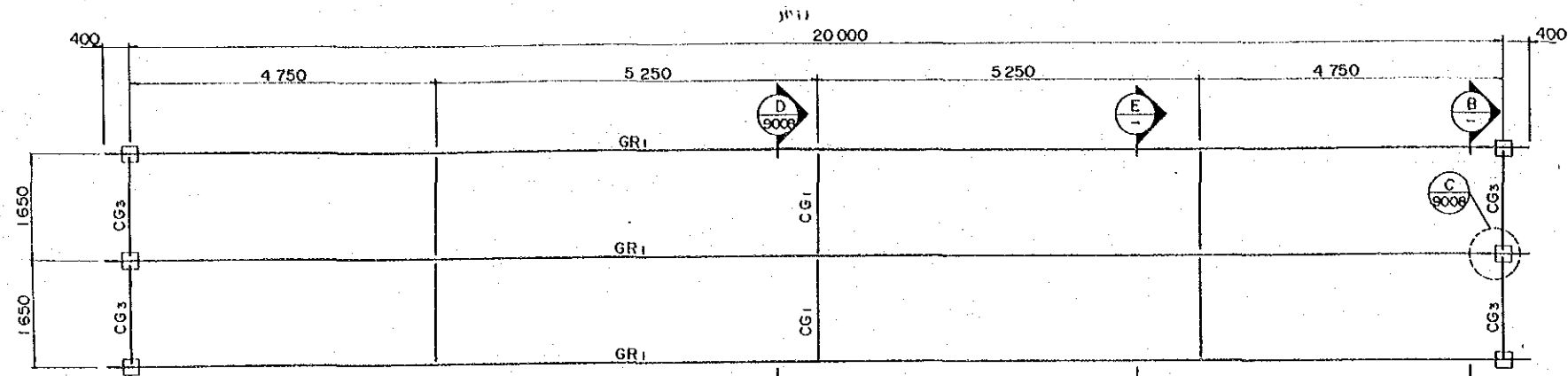
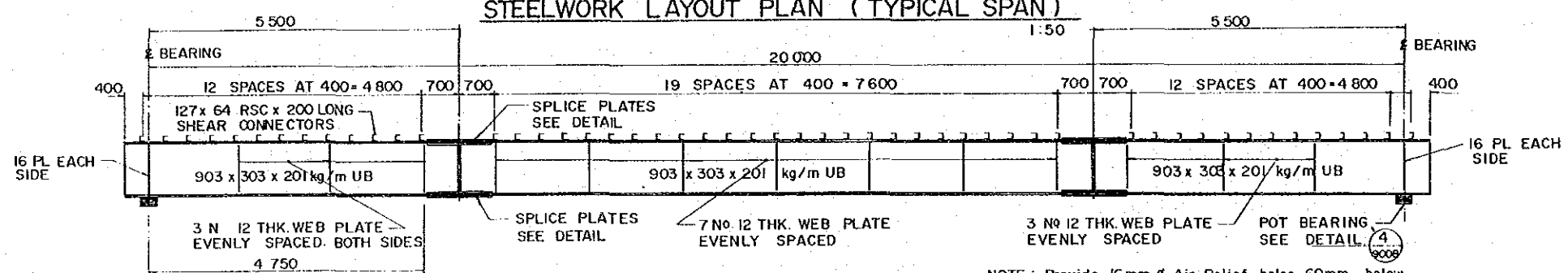
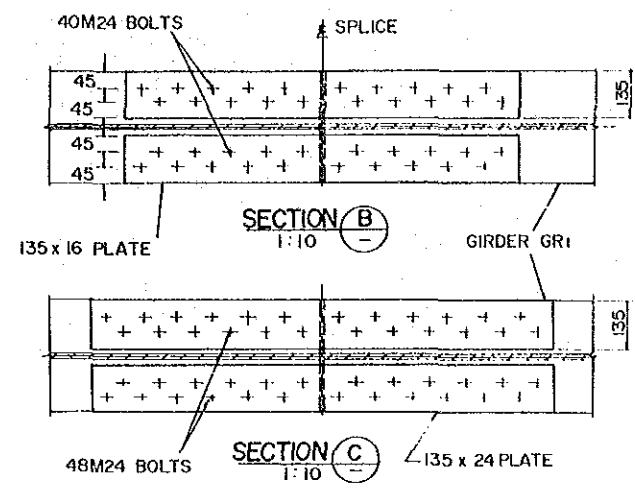


NOTE: DECK REINF. NOT SHOWN FOR CLARITY

REV.		AMENDMENTS		BY	APP'D	DATE	SURVEY		DESIGN		DRAWN		CHECKED		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES	
							JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		C S		of Dai		1/1/89		1:10		TRANS-ISLAND HIGHWAY BERRINA-MALALAU SECTION	
							VERTICAL DATUM MEAN SEA LEVEL		Principal		A. Shimizu		PROJECT ENGINEER		PRINCIPAL ENGINEER		PROJECT No. S.C.120-33-814/B		BRIDGE No.9- SAPPAHARO BRIDGE	
							HORIZONTAL DATUM		Date		of Dai		1/1/89		1:10		SHEET 295 OF 303		DECK SLAB DETAILS	
							SURVEY BOOK No.S		25 Sep. 1989		of Dai		EXECUTIVE ENGINEER		SECRETARY		DEPARTMENT OF WORKS		DRAWING No. A1/88329	

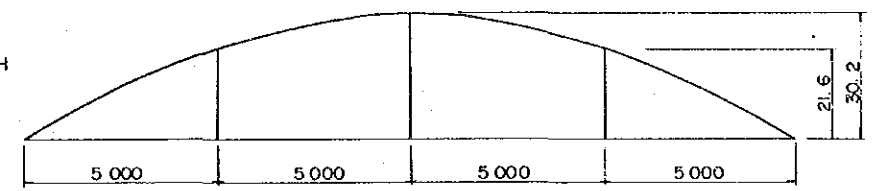


STEELWORK LAYOUT PLAN (TYPICAL SPAN)

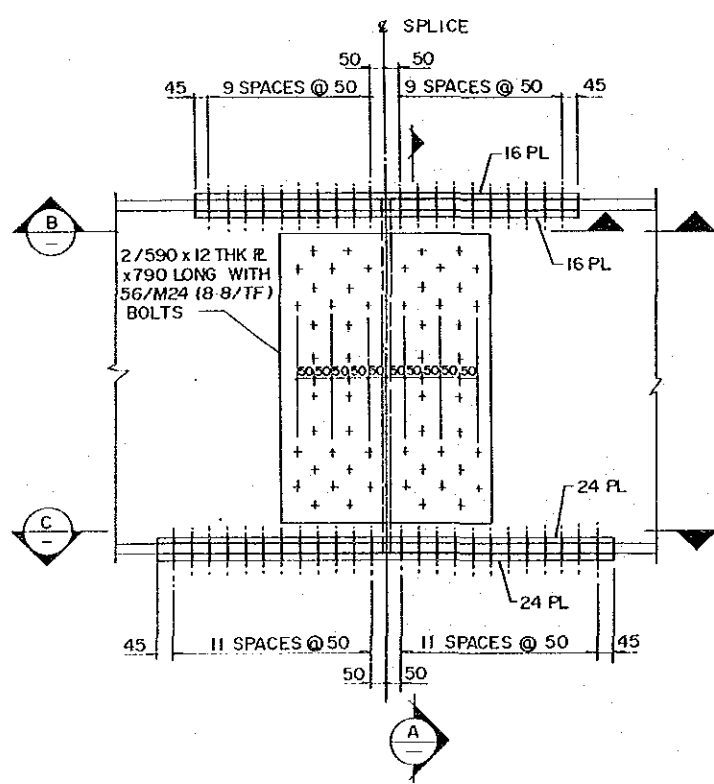


GIRDER 'GR1' ELEVATION
1:50

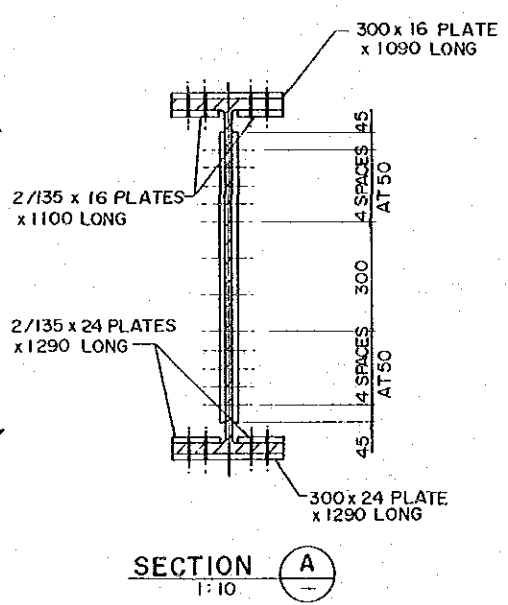
NOTE: Provide 16mm ϕ Air Relief holes 60mm below to Flange @ 500 ctrs.



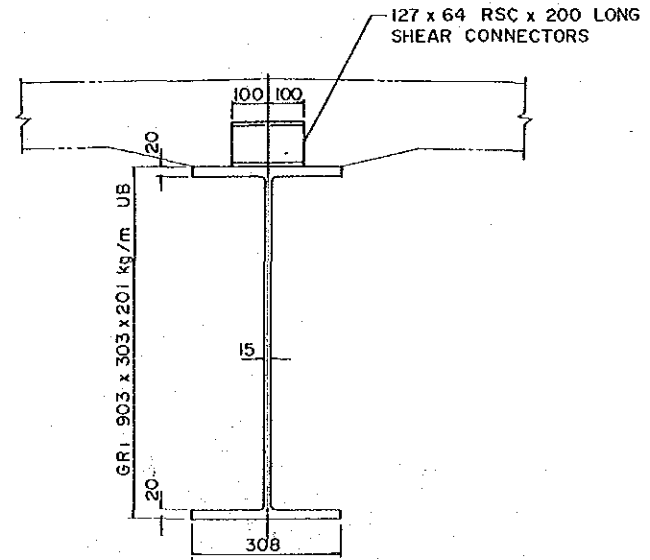
PRECAMBER DIAGRAM GR1



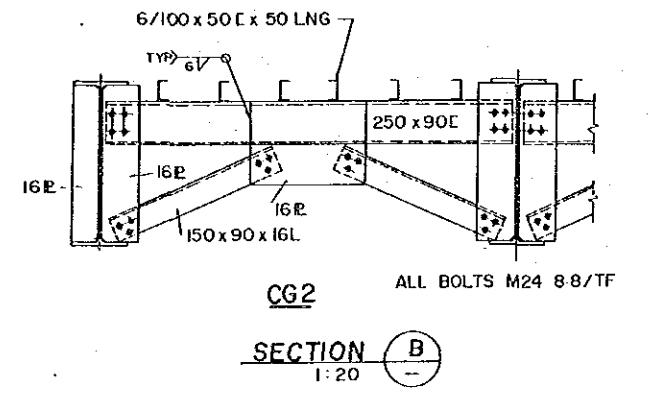
GIRDER GR1 SPLICE DETAIL
1:10



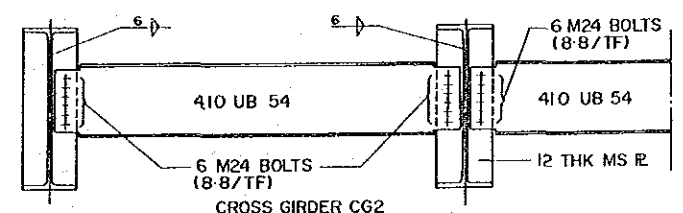
SECTION A
1:10



GIRDER 'GR1' SECTION
1:10

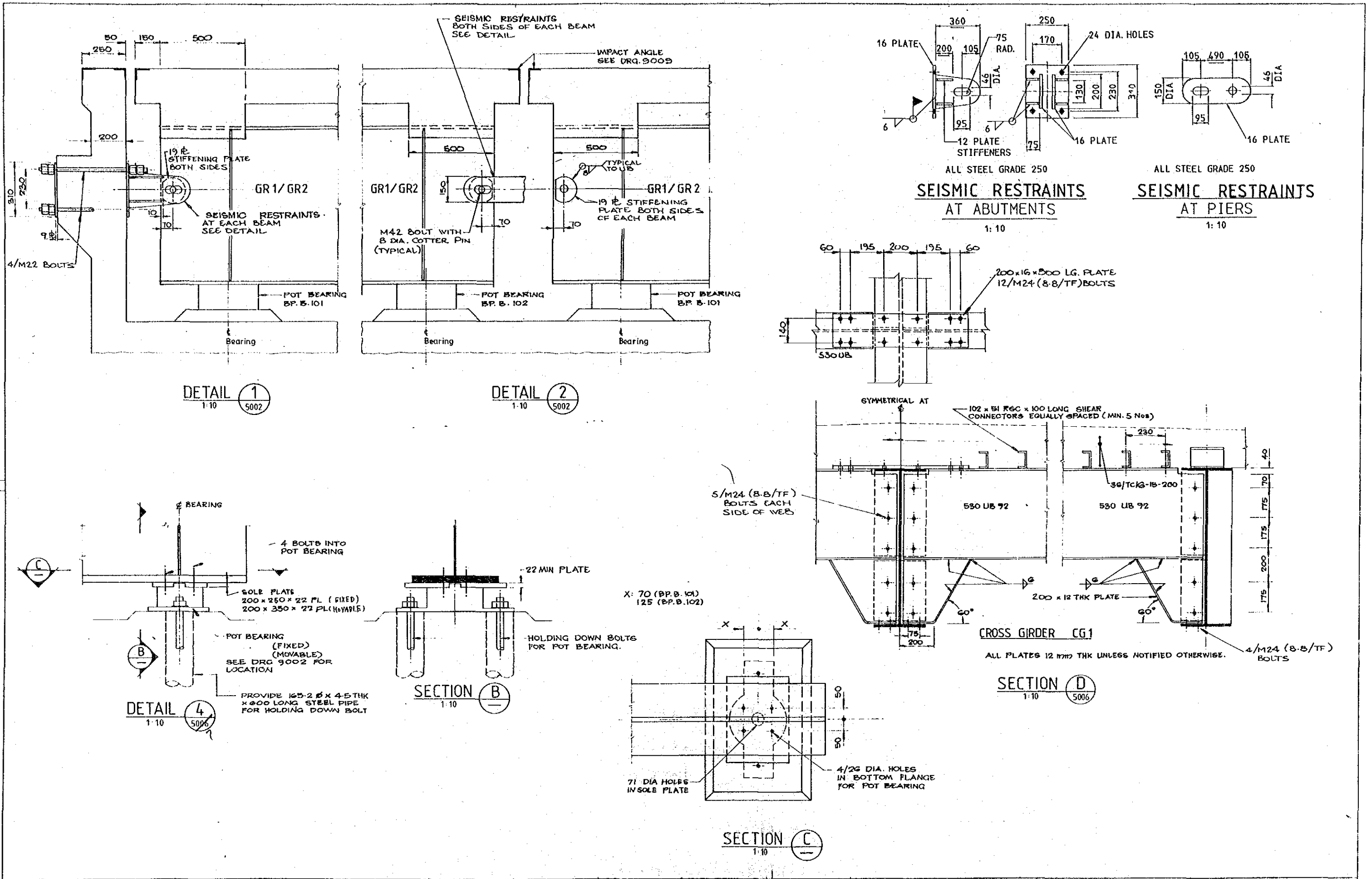


SECTION B
1:20

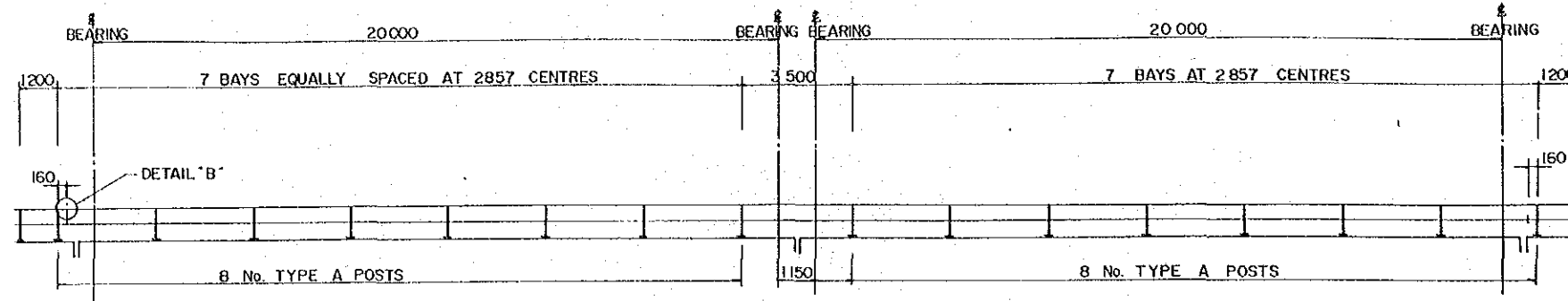


CROSS GIRDER CG2
SECTION C
1:20

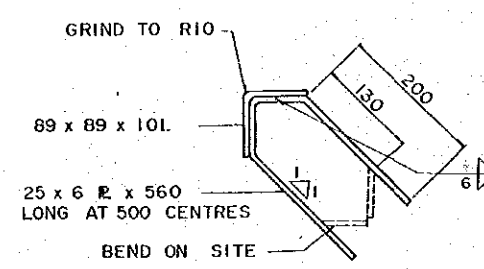
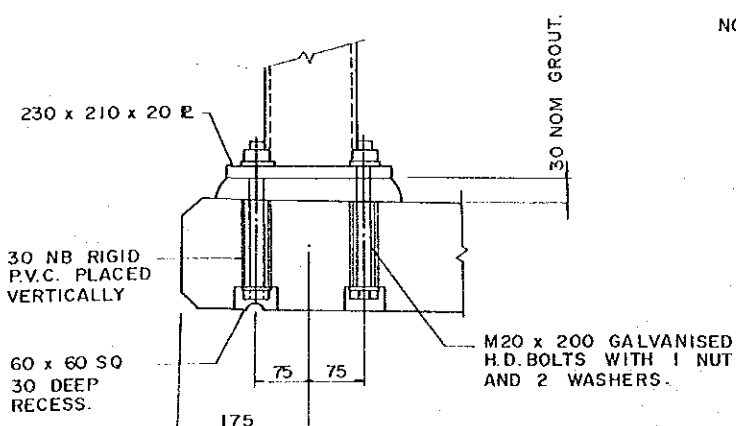
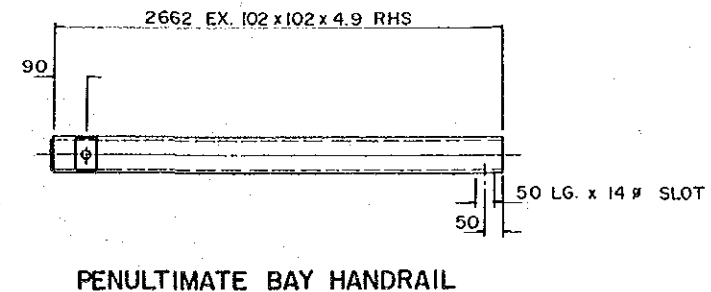
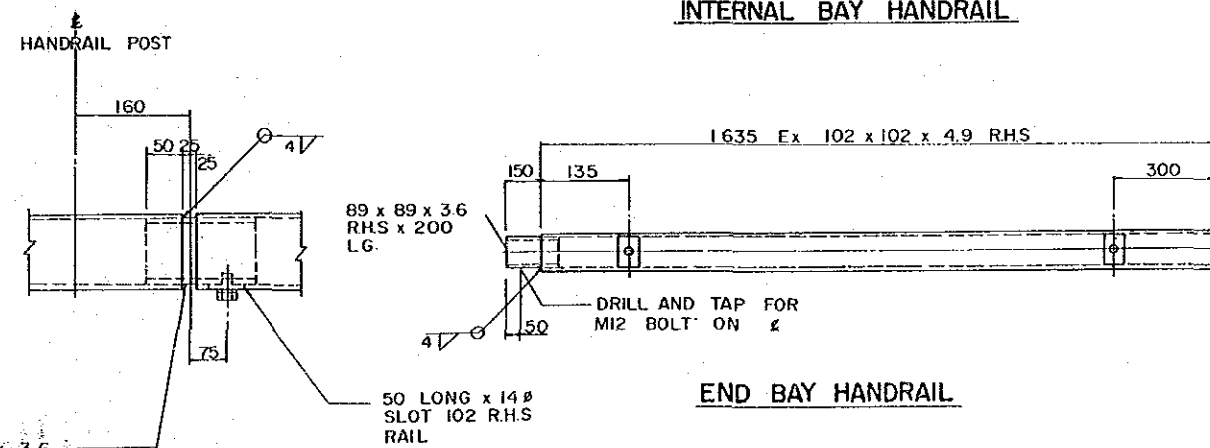
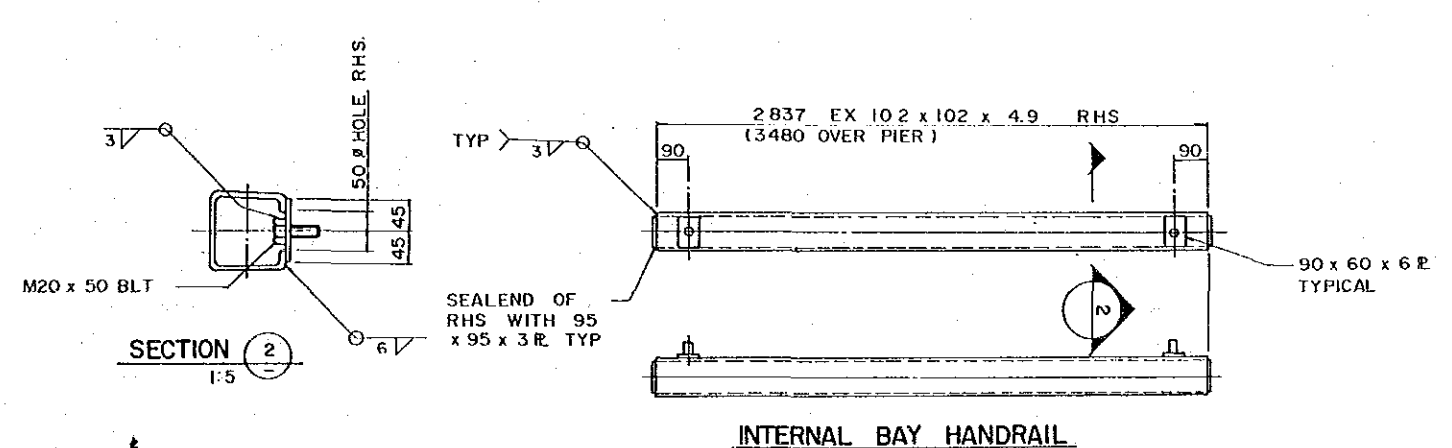
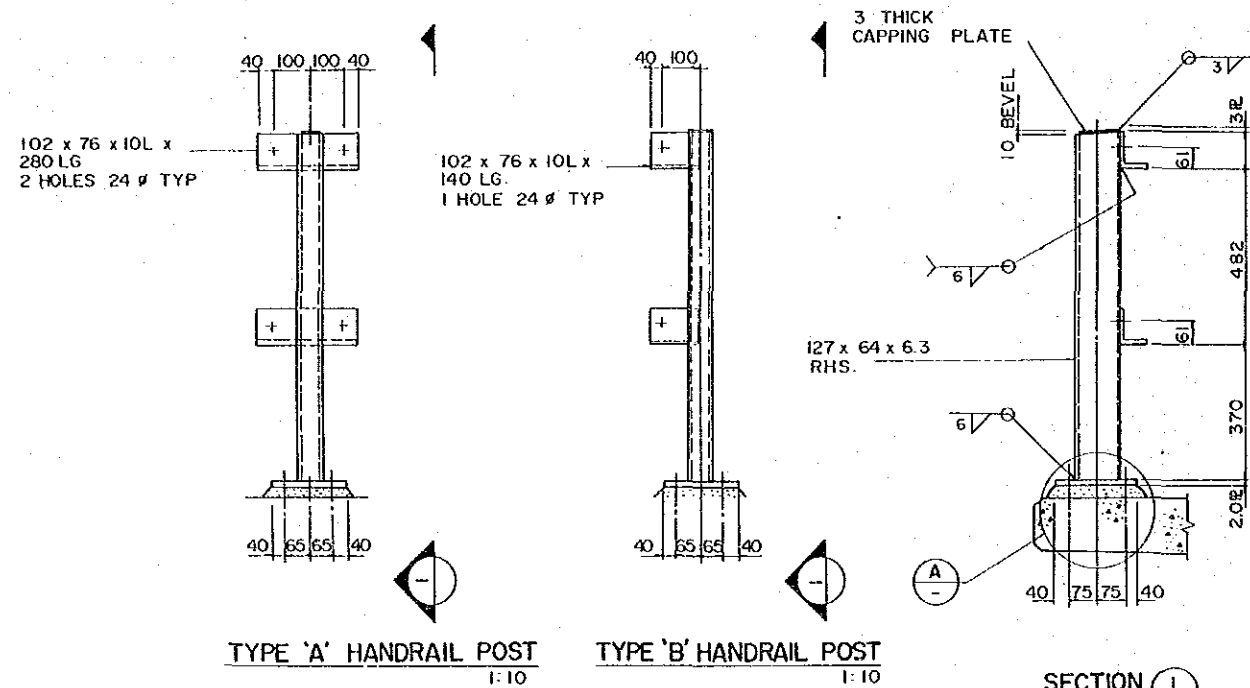
REV.		AMENDMENTS		BY	APP'D	DATE	SURVEY		DESIGN		DRAWN		RECOMMENDED		SCALES		CENTRAL GULF PROVINCES	
							JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		M-S		PROJECT ENGINEER		PROJECT No. S.C. 120-33-814/B		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
							VERTICAL DATUM MEAN SEA LEVEL		Principal		CHECKED		APPROVED		SHEET 296 OF 303		BRIDGE No.9- SAPPAHARO BRIDGE	
							HORIZONTAL DATUM		25 Sep. 1989		DESIGNED		PRINCIPAL ENGINEER		DRAWING No. A1 88330		STEELWORK DETAILS - SHEET 1	
							SURVEY BOOK No.S		Date		CHECKED		EXECUTIVE ENGINEER		DEPARTMENT OF WORKS		PAPUA NEW GUINEA	



REV	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BERENA-MALALUA SECTION BRIDGE No.9 - SAPPAHARO BRIDGE STEELWORK DETAILS - SHEET 2
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S.	<i>dy Kwan</i>	<i>1/1/89</i>	<i>B.1/1/85</i>	
					VERTICAL DATUM MEAN SEA LEVEL	HORIZONTAL DATUM	DESIGNED <i>P. N. N. N.</i>	CHECKED <i>dy Kwan</i>	APPROVED <i>J. J. J. J.</i>	1:10	PAPUA NEW GUINEA DEPARTMENT OF WORKS
					SURVEY BOOK NOS	Principal <i>J. J. J. J.</i> 25 Sep. 1989	Checked <i>dy Kwan</i>	Executive Engineer <i>U. U. U. U.</i> 1/1/89	Secretary <i>P. P. P. P.</i> 1/1/89	SHEET 297 OF 303	DRAWING No A1 88331

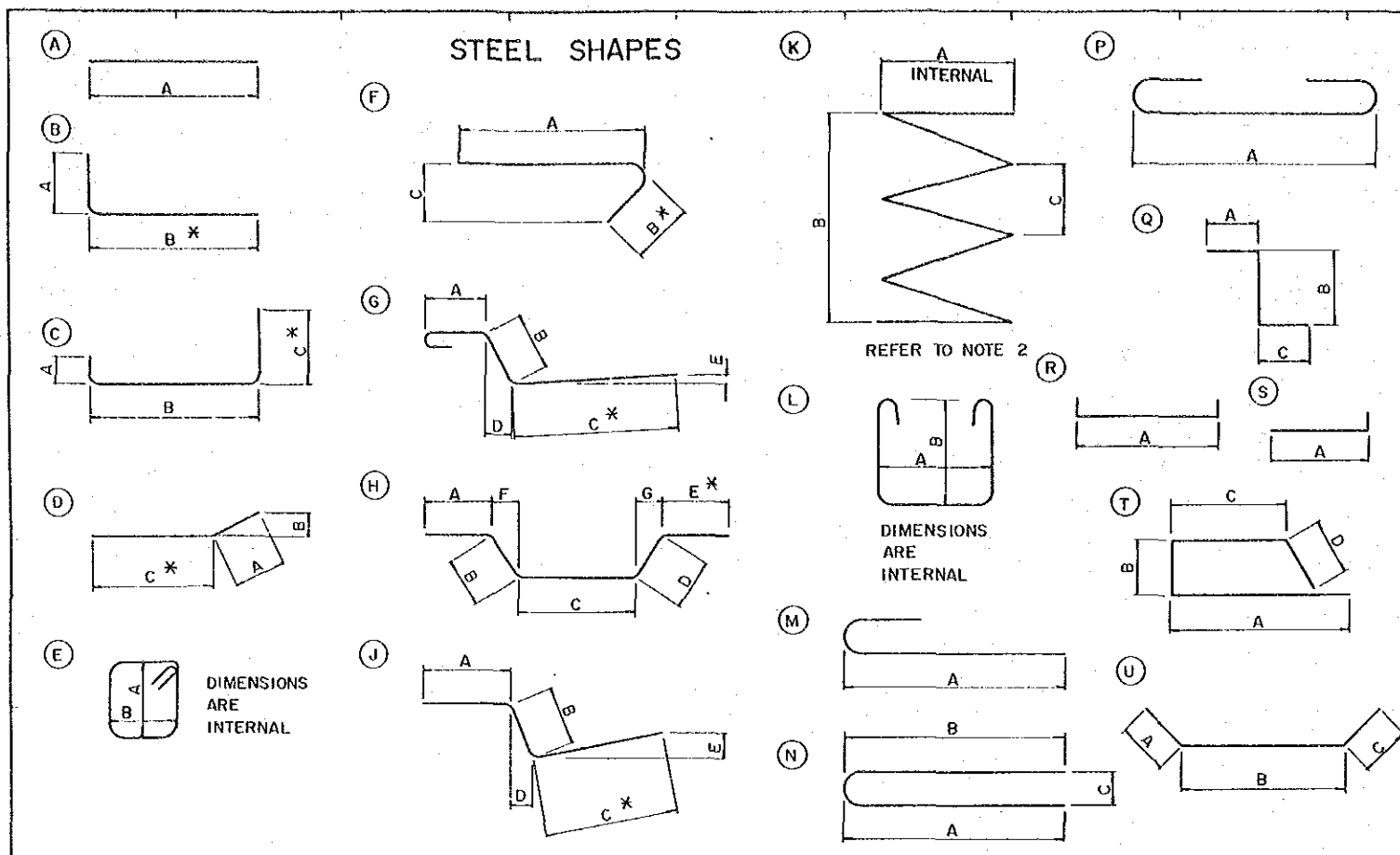


TYPICAL ELEVATION ON HANDRAIL
1:100

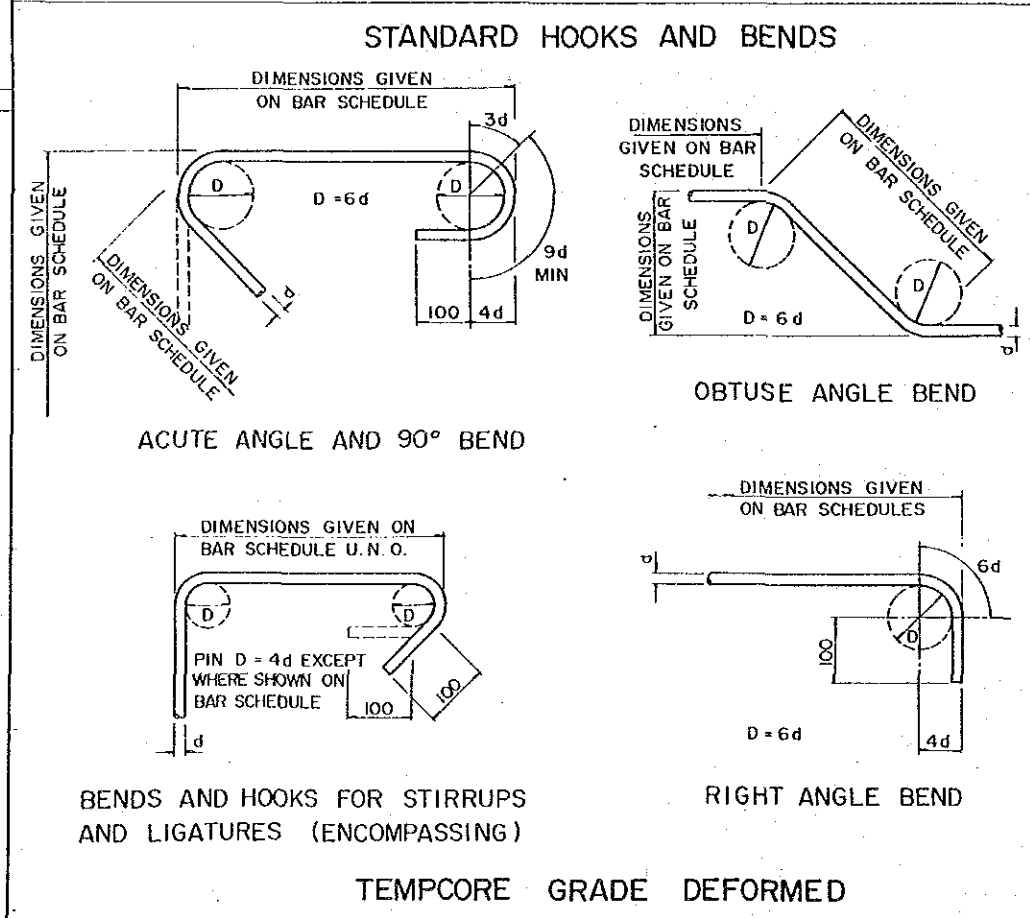


NOTE: ALL BOLTS TO BE M20

REV.		AMENDMENTS		BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	DESIGNED	CHECKED	RECOMMENDED	APPROVED	SCALES	CENTRAL GULF PROVINCES		
							JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M-S	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	1:50	TRANS-ISLAND HIGHWAY BEREINA-MALALAGA SECTION		
							VERTICAL DATUM MEAN SEA LEVEL	HORIZONTAL DATUM	25 Sep. 1989	PROJECT ENGINEER	PRINCIPAL ENGINEER	EXECUTIVE ENGINEER	SECRETARY		BRIDGE No. 9 - SAPPAHARO BRIDGE			
							SURVEY BOOK NO. 5									HANDRAILING/IMPACT ANGLE DETAILS		
															SHEET 298 OF 303	PROJECT No. S.C. 120-33-814/B	PAPUA NEW GUINEA DEPARTMENT OF WORKS	DRAWING No. A1 88332



TYPE & DIA	MARK	NO. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC16	01	212	4080							4440	1486.3	P	
TC16	02	212	3920							3920	1305.5	A	
TC12	03	424	900	380	320					1280	481.9	F	
TC16	04	34	19700							19700	1057.2	A	** SEE NOTE 5
TC16	05	36	19700							19700	1119.4	A	** SEE NOTE 5
TC16	06	424	900	450	450					1800	1205.1	Q	
TC12	07	424	450	500	*	200				1400	527.1	J	
TC16	08	44	21000							21000	1459	A	** SEE NOTE 5
TC20	09	16	1590							1590	62.8	A	
TC20	10	16	400	395	680	395	750	280	280	3180	125.5	H	
TC16	11	8	4120							4120	52.0	A	
TC12	12	72	295	440						1480	94.6	E	
TC16	13	68	1180	1180	85					2130	228.7	N	
TC12	14	424	900							900	338.9	A	
TC16	15	200	500	210	500	210	*	154	154	1925	607.7	H	
TC12	16	24	500	210	180	210	*	154	154	1615	34.5		
			TOTAL	TONNAGE	= 10.186	TONNES	2	No.	SPAN	DECK			
TC28	60	64	16045							16045	4963.6	A	** SEE NOTE 5
IR12	61	4	646	16045						236440	839.6	K	
TC28	62	64	400	2700						3100	959.0	B	
TC32	63	18	1000	5220	*					7220	820.5	C	
TC32	64	27	1000	3400	*					5360	913.6	C	
TC24	65	18	1000	5200	*					7200	460.2	C	
TC28	66	27	1000	3400	*					5360	699.5	C	
TC20	67	12	1700	1000	*					4400	130.2	C	
TC20	68	6	5200							5200	76.9	A	
TC20	69	6	800	3400	*					4980	73.7	C	
TC16	70	12	500	400	*					1400	26.5	C	
TC16	71	24	500	700	*					1700	64.4	C	
TC20	72	34	1000	1100	*					3100	260.0	C	
			TOTAL	TONNAGE	= 10.287	TONNES	1	No.	PIERS				

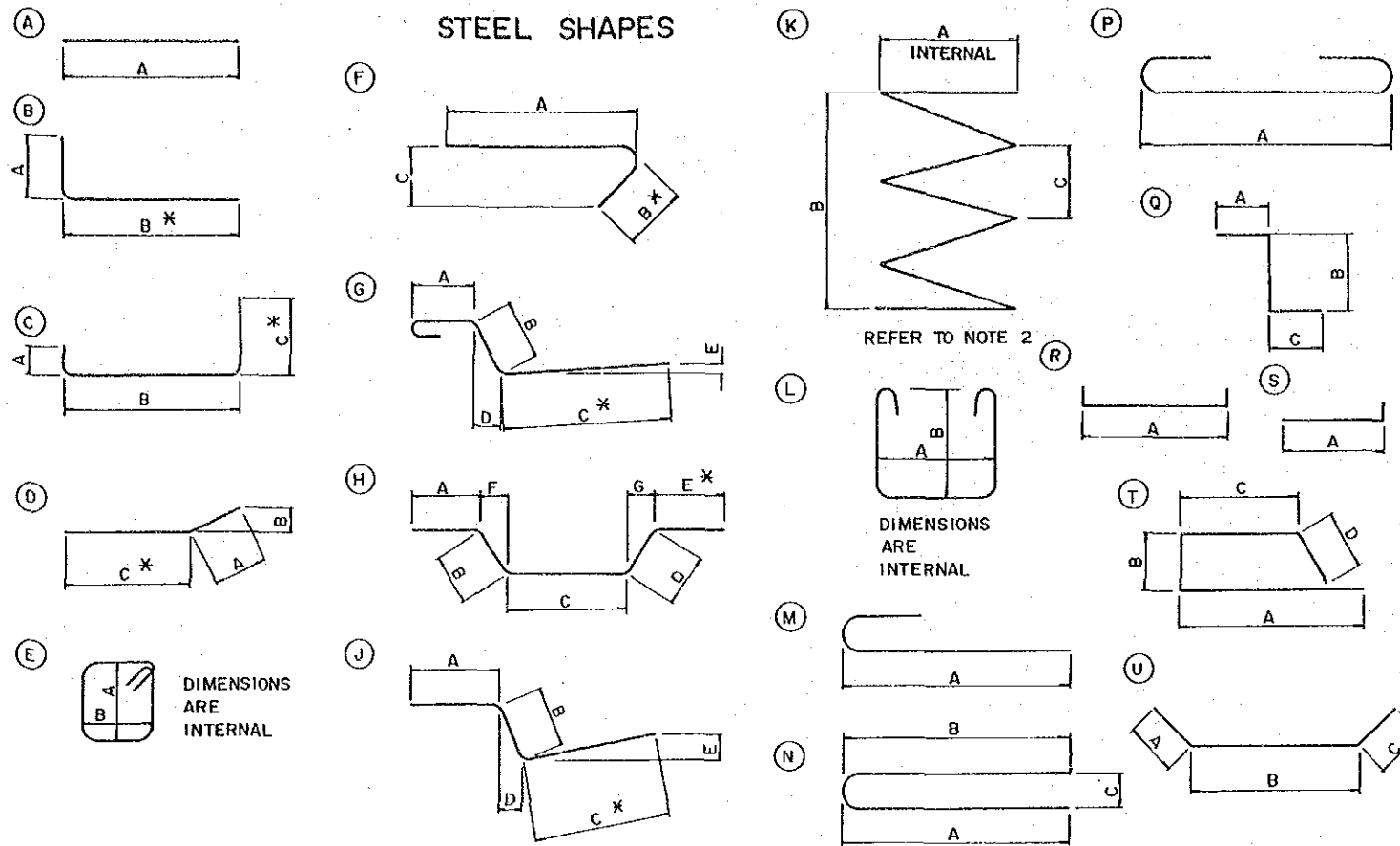


NOTES

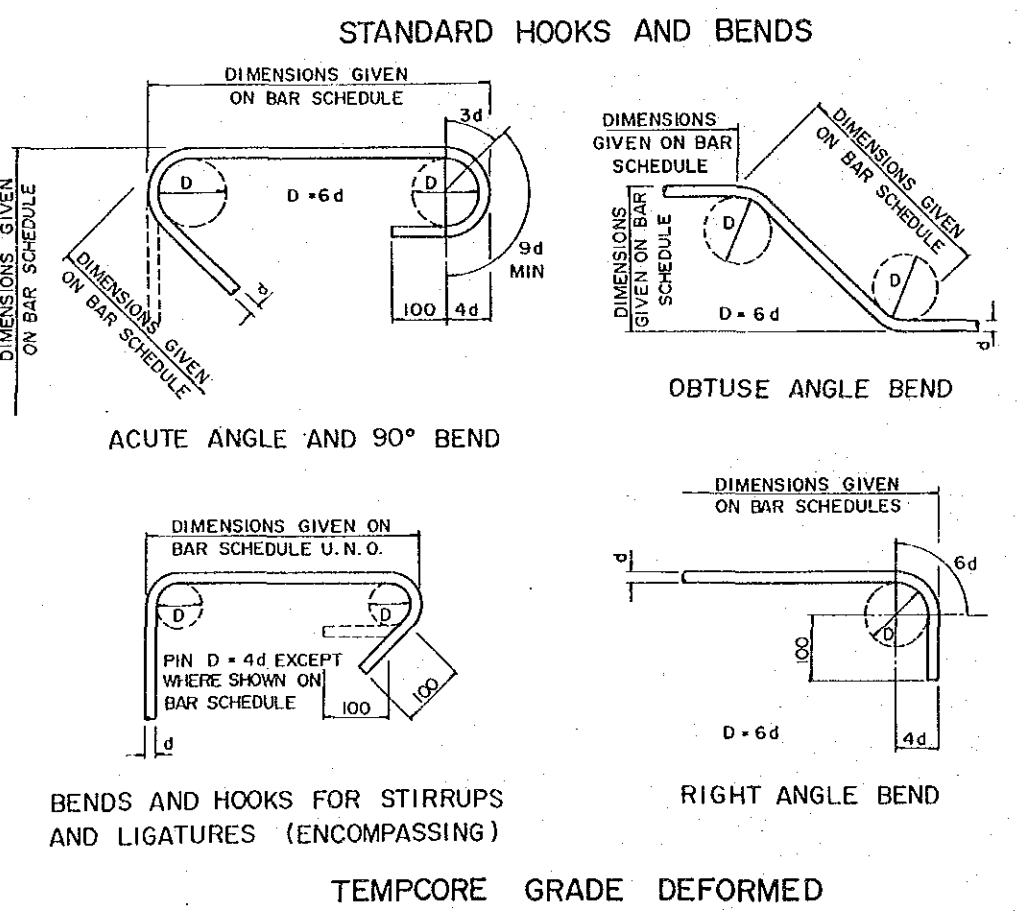
- EXPLANATION OF BAR MARKS
e.g. 40 - TC32 - 07 - 250 - B
No. OFF | TYPE | BAR DIAMETER | LOCATION SPACING BAR MARK
- SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG.
- DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
- X DENOTES TOLERANCE TO BE TAKEN UP ON THIS DIMENSION WHICH IS OMITTED FROM THE BAR BENDING SCHEDULE
- **X 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

TC16	21	17	2000							2000	53.7	A	
TC16	22	27	2000	200*						2000	93.8	B	
TC16	23	16	740	320	330	450				1808	45.7	T	
TC16	24	38	900	900	90					1826	109.5	N	
TC12	25	12	300	840	300*					1416	15.1	C	
TC12	26	12	300	510	300*					1086	11.6	C	
TC28	27	9	5200							5200	226.2	A	
TC24	28	10	5200							5200	184.7	A	
TC28	29	27	1930	1500	1930*					5360	699.5	C	
TC28	30	26	850	5200	850*					6844	860.2	C	
TC24	31	10	5200							5200	184.7	A	
TC28	32	43	850	2900	850*					4544	944.5	C	
TC24	33	10	1400	2900	1400*					5652	200.7	C	5 263.6
TC28	34	10	1400	1500	1400*					4244	205.1	C	
TC16	35	18	2075							2075	59.0	A	
TC16	36	20	2300							2300	72.6	A	
TC16	37	12	825							825	15.6	A	
TC16	38	10	200	550	200					950	15.0	U	
TC16	39	44	500	300*						800		B	INCREMENT = 225
TC16	TO	4 sets of 11	2600	300*						2900		B	
TC16	40	8	2600							2600	32.8	A	
TC16	41	72	810	300*						1100		B	INCREMENT = 100
TC16	TO	4 sets of 16	2380	300*						2680		B	
			TOTAL	LENGTH	= 81.4 m								
			TOTAL	WEIGHT	= 128.5 kg								
			TOTAL	LENGTH	= 136.1 m								
			TOTAL	WEIGHT	= 214.8 kg								

SURVEY JICA		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN M.S.		RECOMMENDED		CENTRAL GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Principal 25 Sep. 1989		CHECKED dj keel		PROJECT ENGINEER 1/1/89		TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION	
HORIZONTAL DATUM		Date		DESIGNED M. Shingir		PRINCIPAL ENGINEER 1/1/89		BRIDGE No. 9- SAPPAHARO BRIDGE	
SURVEY BOOK No. 5		Date		CHECKED dj keel		APPROVED 1/1/89		BAR BENDING SCHEDULE SHEET 1	
REV.	AMENDMENTS	BY	APP'D	DATE	EXECUTIVE ENGINEER 1/1/89	SECRETARY FAS (TS)	SCALES	PROJECT No. S.C. 120-33-814/B	PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88333



TYPE & DIA	MARK	NO. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC16	42	36	200	500	200					900	51.2	U	
TC16	43	22	2600							2600	90.3	A	
TC16	44	36	900	900	90					1820	103.5	N	
TC16	45	4	3500							3500	22.1	A	
TC16	46	18	1450	600	1450 *					3468	98.6	C	
TC16	47	3	2950							2950	14.0	A	
TC16	48	16	5200							5200	131.4	A	
TC20	49	66	850	630	850 *					2330	379.2	C	
TOTAL TONNAGE = 5264 TONNES													
MALALALA ABUTMENT													
TC28	01	27	760	5200	760 *					6720	877.1	C	
TC20	02	8	1750	5200	1750 *					8700	171.6	C	
TC28	03	41	760	2900	760 *					4420	876.0	C	
TC24	04	18	1350	600	1350 *					3300	210.9	C	
TC28	05	66	760	600	760 *					2120	676.4	C	
TC12	06	18	400	510	400 *					1310	20.9	C	
TC12	07	12	400	840	400 *					1640	17.5	C	
TC20	08	17	1825							1825	76.5	A	
TC20	09	17	1825	200 *						2025	84.9	B	
TC20	10	16	5200							5200	205.2	A	
TC20	11	3	2950							2950	21.8	A	
TC20	12	15	740	320	330	450				1800	66.6	T	
TC16	13	14	200	550	200					950	21.0	U	
TC20	14	20	2080							2080	102.6	A	
TC16	15		680	300						TOTAL LENGTH = 73.44 m		B	INCREMENT = 100
		T0	1780	300						TOTAL WEIGHT = 116.00 kg	116.0	B	
TC16	16		700	300						TOTAL LENGTH = 49.6 m		B	INCREMENT = 300
		T0	1900	300						TOTAL WEIGHT = 78.3 kg	78.3	B	
TC16	17	4	1300	580						1880	11.9	D	
TC16	18	24	1900							1900	72.0	A	
TC16	19	28	200	500	200 *					900	39.8	U	
TC16	20	28	900	90	900 *					1890	83.6	N	
TC16	21	8	1900	300						2200	27.8	B	
TOTAL TONNAGE = 3.86 TONNES													
BEREINA ABUTMENT													



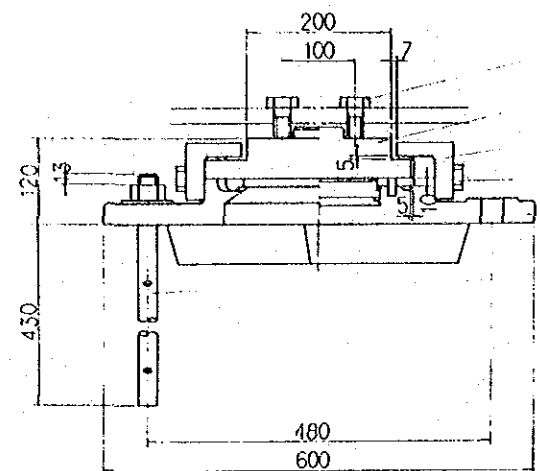
NOTES

- EXPLANATION OF BAR MARKS
e.g. 40 - TC32 - 07 - 250 - B
No. OFF | TYPE | SPACING | LOCATION | BAR DIAMETER | 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 TEMPCORE (T.C.) BARS GRADE 410
b) PLAIN ROUND (R) BARS GRADE 230

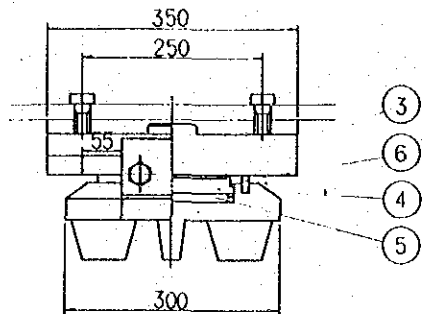
REV. AMENDMENTS		BY	APP'D	DATE	SURVEY BOOK No. 8	SURVEY JICA Date	DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY J. Jalil Date 25 Sep. 1989	DRAWN M-S CHECKED DESIGNED CHECKED	RECOMMENDED PROJECT ENGINEER APPROVED PRINCIPAL ENGINEER EXECUTIVE ENGINEER	SCALES PROJECT No. S.C. 120-33-814/B	CENTRAL / GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION BRIDGE No. 9 - SAPPAHARO BRIDGE BAR BENDING SCHEDULE SHEET 2		PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88334
-----------------	--	----	-------	------	-------------------	------------------------	--	--	---	--	---	--	--

R-50^{TON} Mov. BEARING

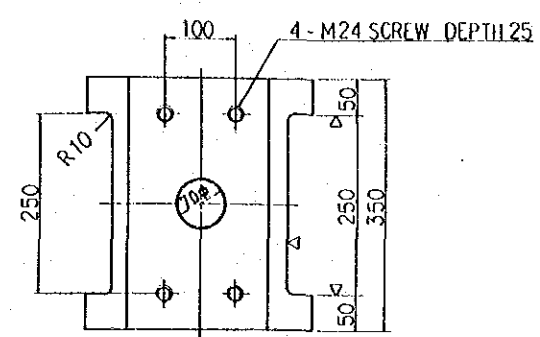
② ~ (▽▽▽) SS41



- ⑨
- ②
- ⑦
- ⑧
- ①
- ⑩



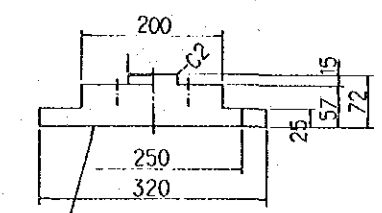
- ③
- ⑥
- ④
- ⑤



DESIGN CONDITION

TOTAL REACTION	R	33.6 ton
DEAD LOAD REACTION	Rd	12.6 ton
LIVE LOAD REACTION	R(l+i)	21.2 ton
LONGITUDINAL FORCE (FRICTION)	RH1f	3.4 ton
LONGITUDINAL FORCE (EARTHQUAKE)	RH1e	5.3 ton
TRANSVERSE FORCE (EARTHQUAKE)	RH2e	5.3 ton
UPLIFT (EARTHQUAKE)	V	1.3 ton
MOVABLE LENGTH	e1	50 mm
DESIGNED LENGTH	e2	70 mm
TOTAL LENGTH	e	110 mm
SEISMIC COEFFICIENT	KH	0.42
FRICATIVE COEFFICIENT	f	0.1
BEARING STRESS OF CONCRETE	σ _{ba}	80 kg/cm ²

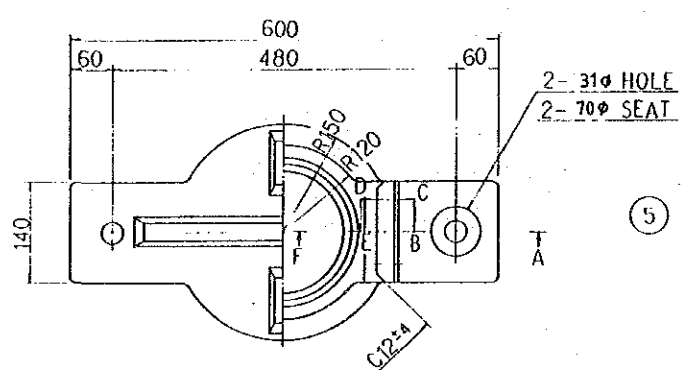
④ 12.5S (▽) SS41



MATERIAL LIST

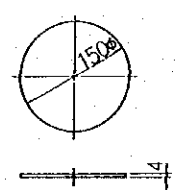
MAKE	NAME	MATERIAL	N.O.	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	43.2	
2	UPPER BEARING	SS41	1	36.2	
3	GLIDE PLATE	PTFE	1	0.2	
4	MIDDLE PLATE	SS41	1	3.8	
5	RUBBER PLATE	CHLOROPRENE RUBBER	1	0.4	
6	SEAL RING	CHLOROPRENE RUBBER	1	0.2	
7	SIDE BLOCK	SS41	2	6.4	
8	BOLT	SS41	4	0.7	M20:50 (5.46)
9	BOLT	SS41	4	0.7	M24:54 (5.54)
10	ANCHOR BOLT-NUT	SS41	2	5.2	
TOTAL WEIGHT (kg)				96.3	

① ~ (V V V) SC46

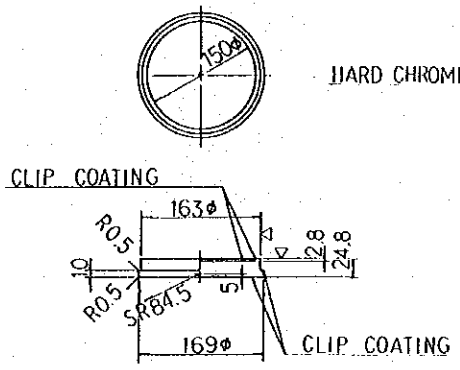


"A" DETAIL

③ ~ PTFE

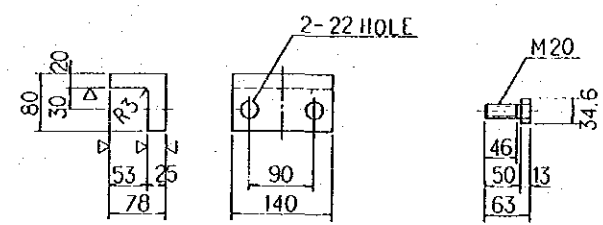


HAARD CHROMIUM COATINGS



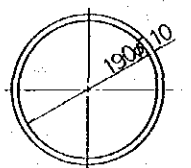
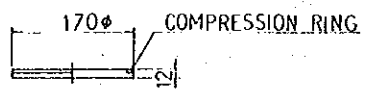
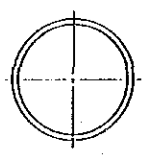
⑦ ~ (▽) SS41

⑧ SS41



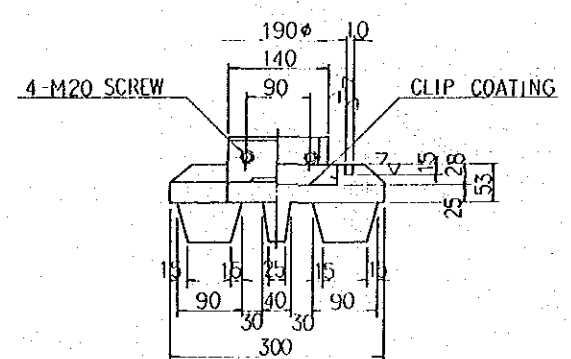
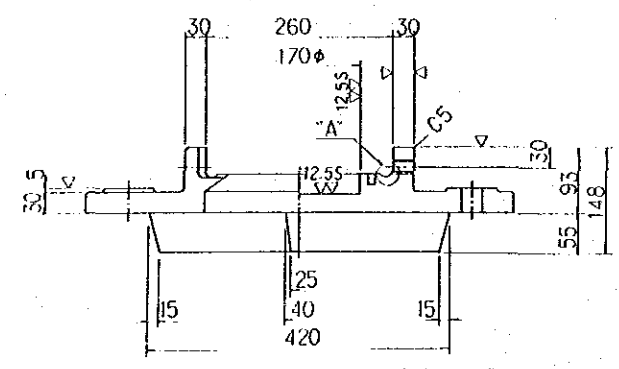
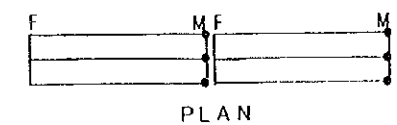
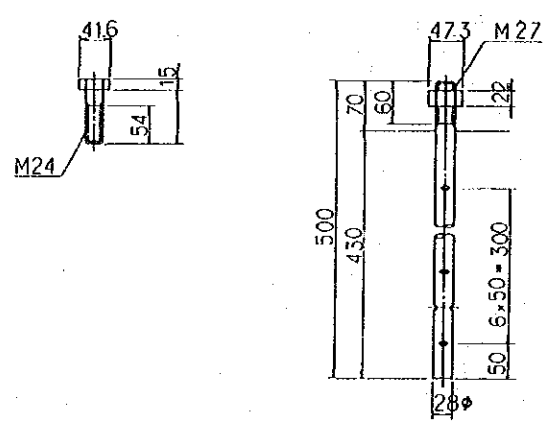
⑤ ~ CHLOROPRENE RUBBER

⑥ ~ CHLOROPRENE RUBBER



⑨ SS41

⑩ ~ SS41



SURVEY		DESIGN		DRAWN		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES	
JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		M.S.		PROJECT ENGINEER		PRINCIPAL ENGINEER		TRANS-ISLAND HIGHWAY BERBINA-MALALAU SECTION	
VERTICAL DATUM		HORIZONTAL DATUM		CHECKED		DESIGNED		APPROVED		BRIDGE No.9- SAPPARAO BRIDGE	
MEAN SEA LEVEL				Y. Saito		H. Shimizu		I. F. 89		BEARING BP-B-102 (MOVABLE)	
DATE		DATE		1/1/89		1/1/89		F&S(S)		PAPUA NEW GUINEA DEPARTMENT OF WORKS	
BY		APP'D		EXECUTIVE ENGINEER		SECRETARY		SHEET 302 OF 303		DRAWING No. A1/88336	
AMENDMENTS		SURVEY BOOK No.8		25 Sep. 1989				PROJECT No. S.C. 120-33-814/B		REV.	

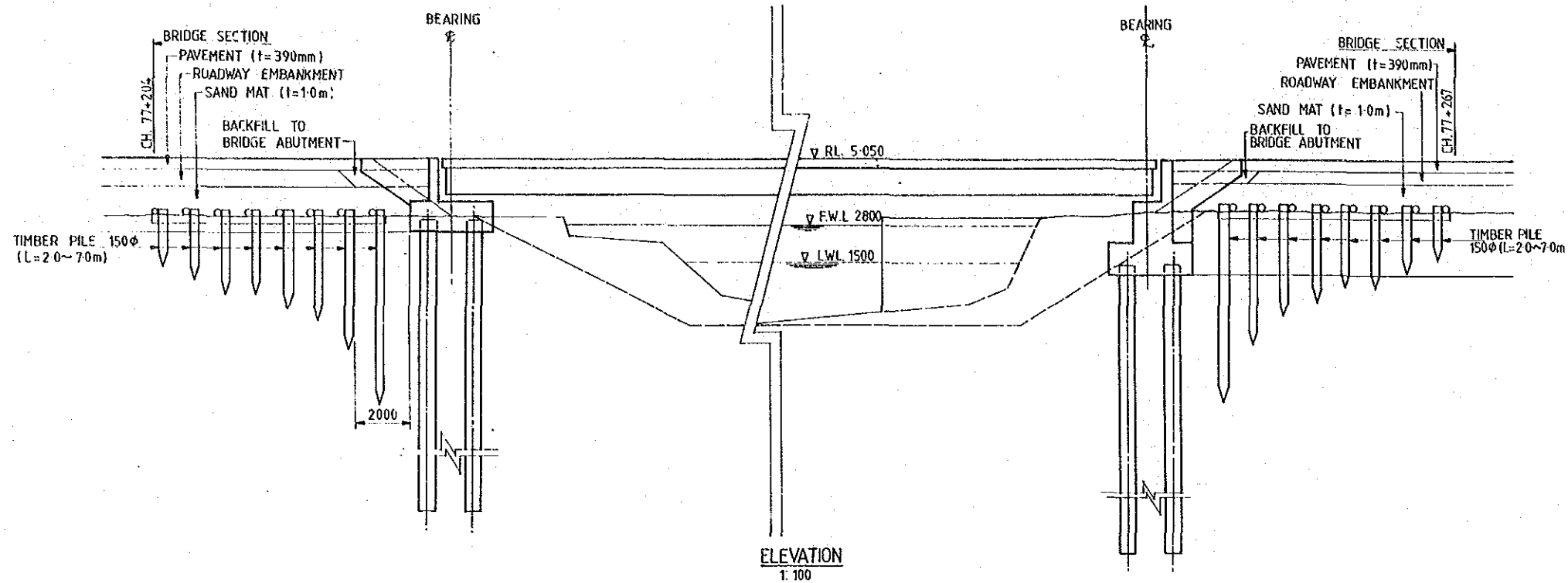
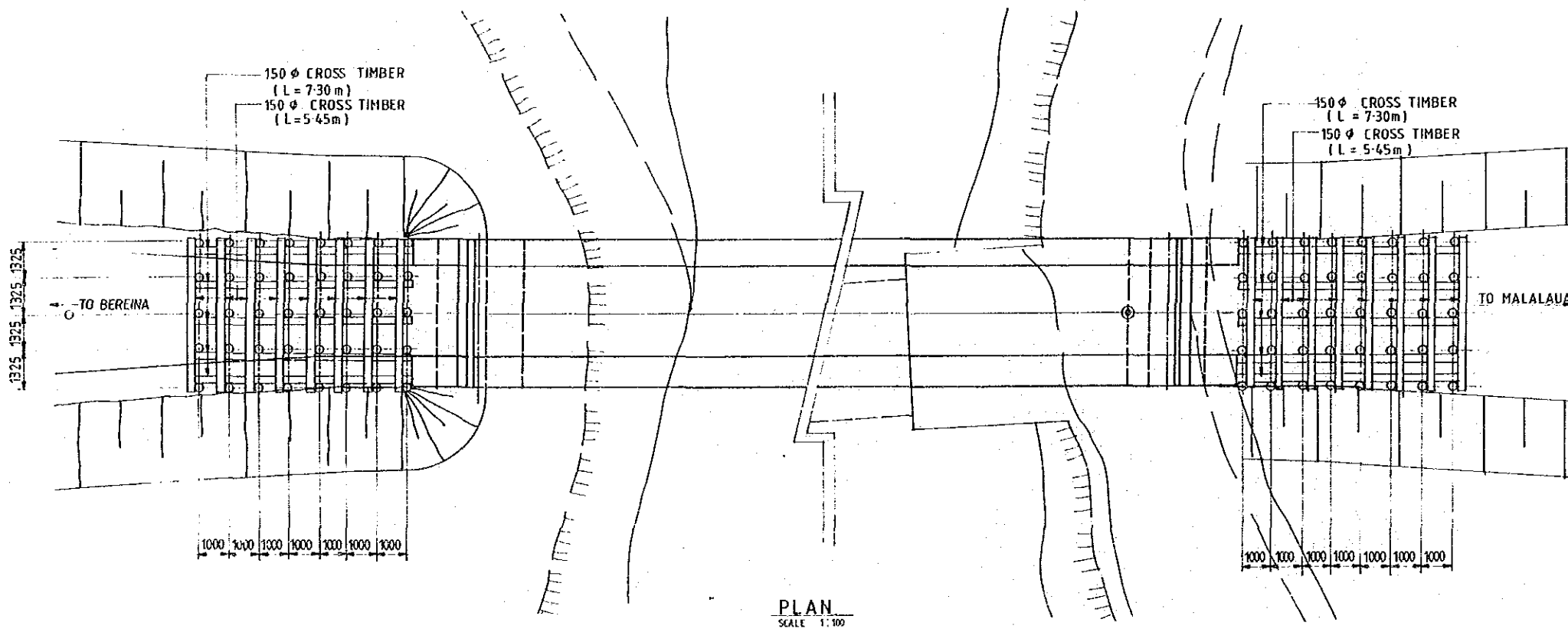


TABLE OF QUANTITIES			
DESCRIPTION	UNIT	QUANTITY	REMARKS
CLEARING AND GRUBBING AT BRIDGE SITE	ha	0.1	
EXCAVATION FOR STRUCTURAL FOUNDATIONS	TYPE C	5	
	TYPE D	76	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS	m ³	40.7	
BACKFILL TO BRIDGE ABUTMENT	m ³	28	
ROADWAY EMBANKMENT	m ³	100	
BEARING UNITS	TIMBER PILE	500.0	150 φ
	CROSS TIMBER	160.2	150 φ
SAND MAT	m ³	305	

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



PLAN
SCALE 1:100

REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES	TRANS-ISLAND HIGHWAY BEREINA-MALALAU'A SECTION	BRIDGE No. 9 - SAPPAHARO BRIDGE.	BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS	PAPUA NEW GUINEA DEPARTMENT OF WORKS	PROJECT No. S.C. 120-33-814/B	DRAWING No. A1 88337	
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S.	1/1/89									1/1/89
					VERTICAL DATUM MEAN SEA LEVEL		Checked of Dai	Checked of Dai									
					HORIZONTAL DATUM		DESIGNED of Dai	APPROVED of Dai									
					SURVEY BOOK NOS	Principal 25 Sep. 1989	Checked of Dai	Executive Engineer 1/1/89	Principal Engineer 1/1/89								

JICA