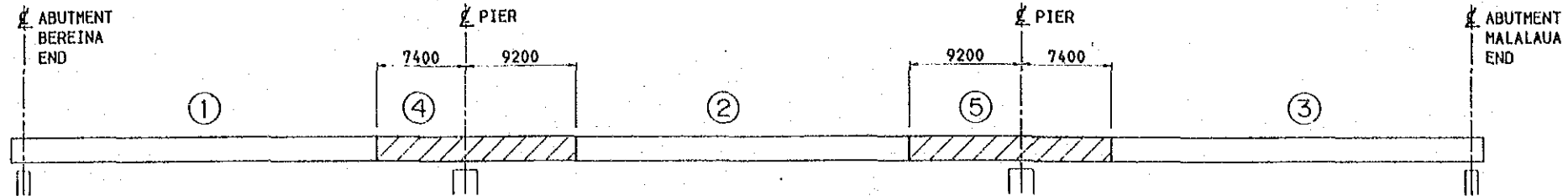


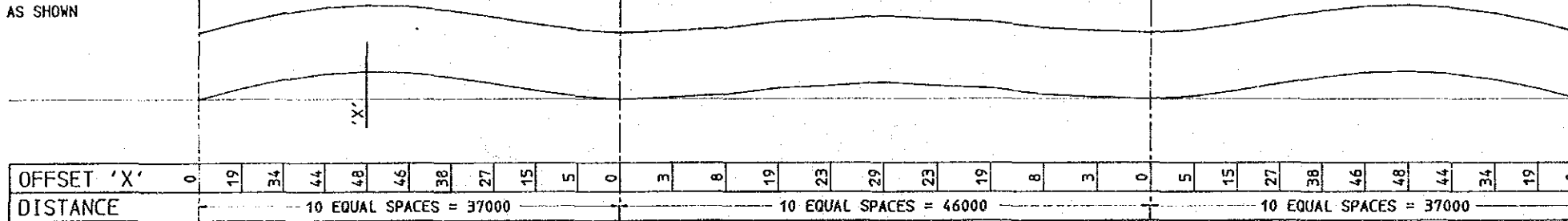
SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MKS, M.S. CHECKED 4/11/89		RECOMMENDED PROJECT ENGINEER APPROVED 1. 4. 89 EXECUTIVE ENGINEER		SCALES 1: 20		CENTRAL / GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		HORIZONTAL DATUM		DESIGNED "Rising" CHECKED 4/11/89		PRINCIPAL ENGINEER		PROJECT No. S.C. 120-33-814/B		TRANS-ISLAND HIGHWAY BEREINA-MALALAUCA SECTION	
SURVEY BOOK NOS		Date 25 Sep. 1989		Principal		SECRETARY		SHEET 250 OF 303		BRIDGE No.6 - LAKEKAMU BRIDGE	
AMENDMENTS		BY APP'D DATE		Principal		SECRETARY		DEPARTMENT OF WORKS		DRAWING No. A1 88284	



**SEQUENCE OF CONSTRUCTION  
OF CONCRETE DECK**

1: 250

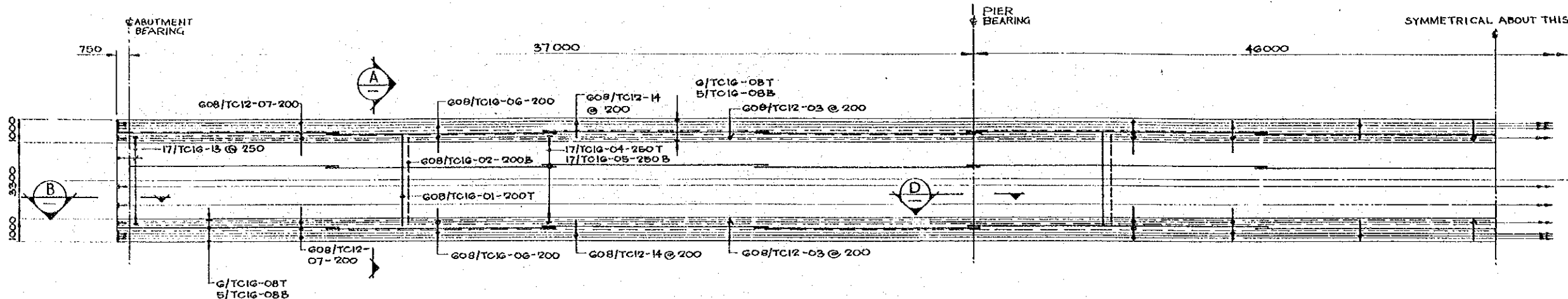
NOTE  
GIRDERS SHALL BE FABRICATED  
SO THAT WHEN TRIAL ASSEMBLED &  
FULLY SUPPORTED WILL INCORPORATE  
A CAMBER EQUAL TO THE CALCULATED  
DEAD LOAD DEFLECTION AS SHOWN



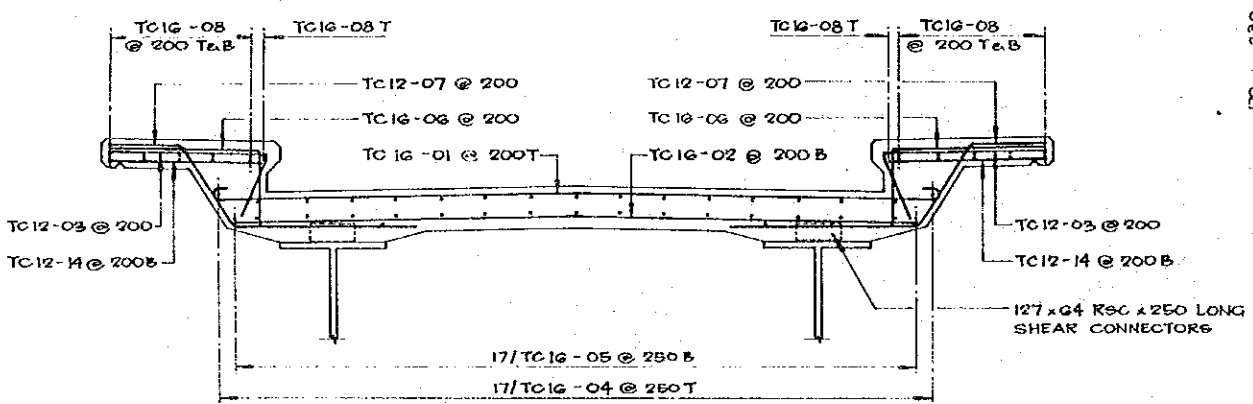
**CAMBER DIAGRAM**

HORIZ. 1: 250  
VERT. 1: 5

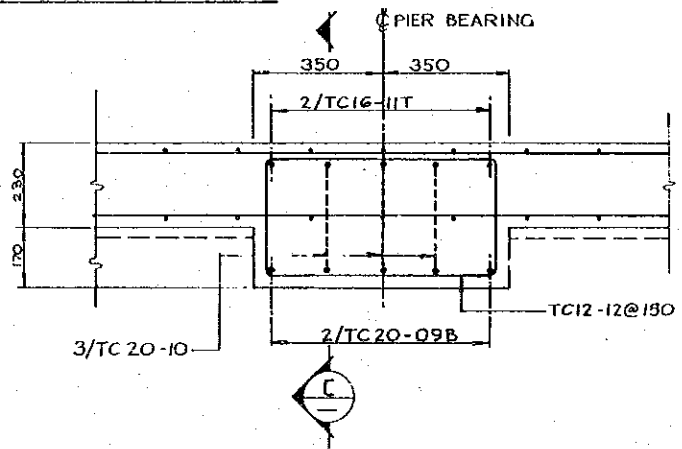
REV	AMENDMENTS	BY	APPD	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY - BEREINA - MALALAU SECTION
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	MKS, MS			
					VERTICAL DATUM MEAN SEA LEVEL		CHECKED	PROJECT ENGINEER		DECK CONSTRUCTION PROCEDURE
					HORIZONTAL DATUM		DESIGNED	APPROVED		PAPUA NEW GUINEA
					SURVEY BOOK NOS	Principal 25 Sep. 1989	CHECKED	SECRETARY		DEPARTMENT OF WORKS
									SHEET 251 OF 303	DRAWING No A1 88285
									PROJECT No S.C. 120-33-811/B	



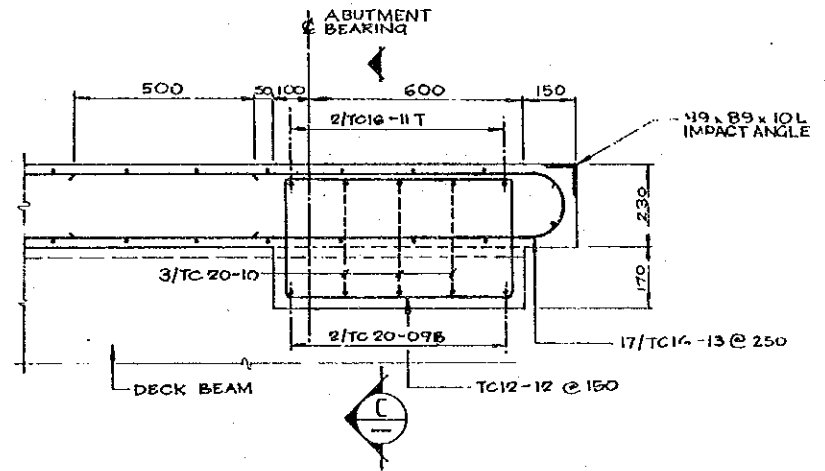
DECK SLAB TYPICAL SPAN 1:100



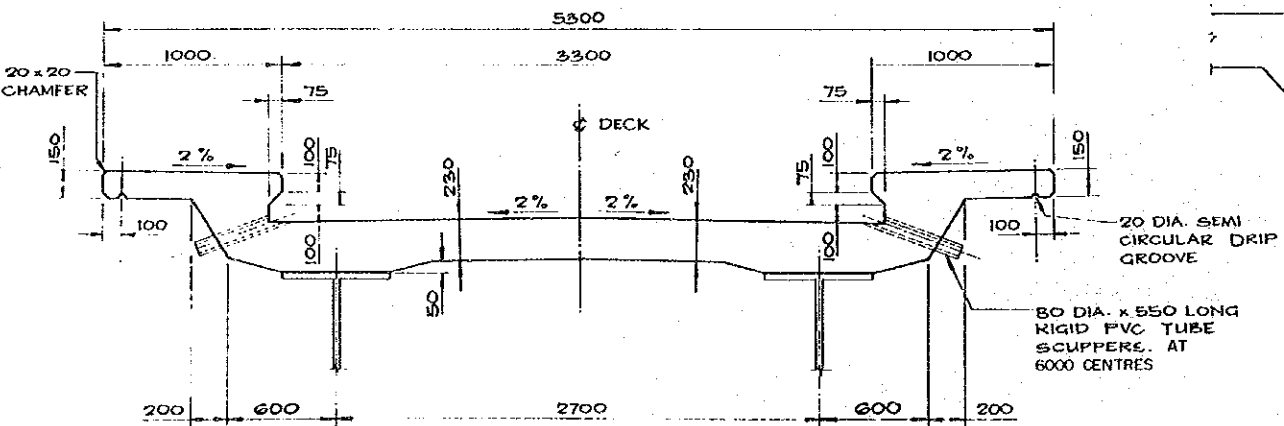
SECTION A REINF. 1:20



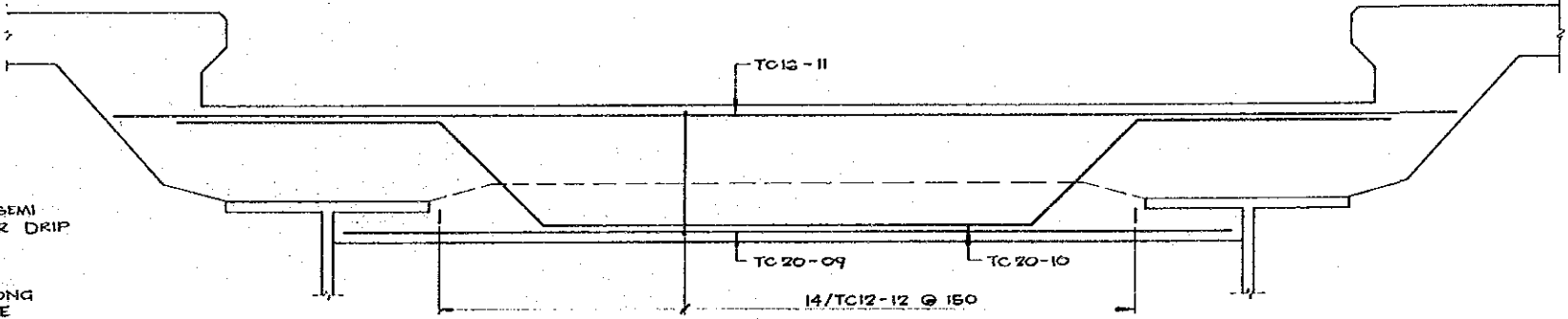
SECTION D 1:100



SECTION B 1:10



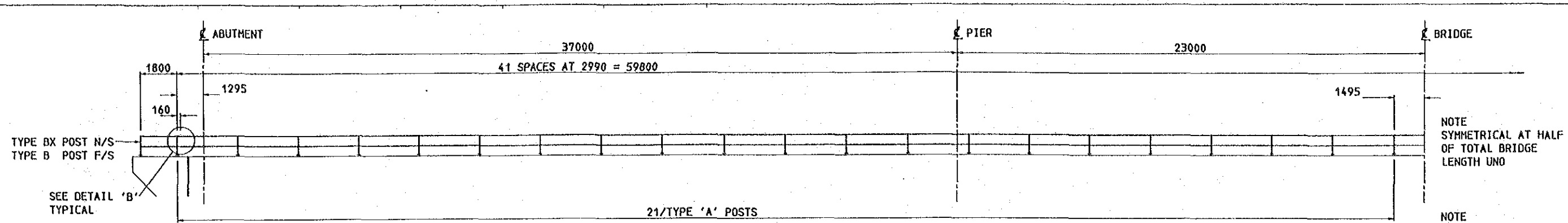
SECTION A TYPICAL 1:20



SECTION C 1:10

NOTE: DECK REINF. NOT SHOWN FOR CLARITY.

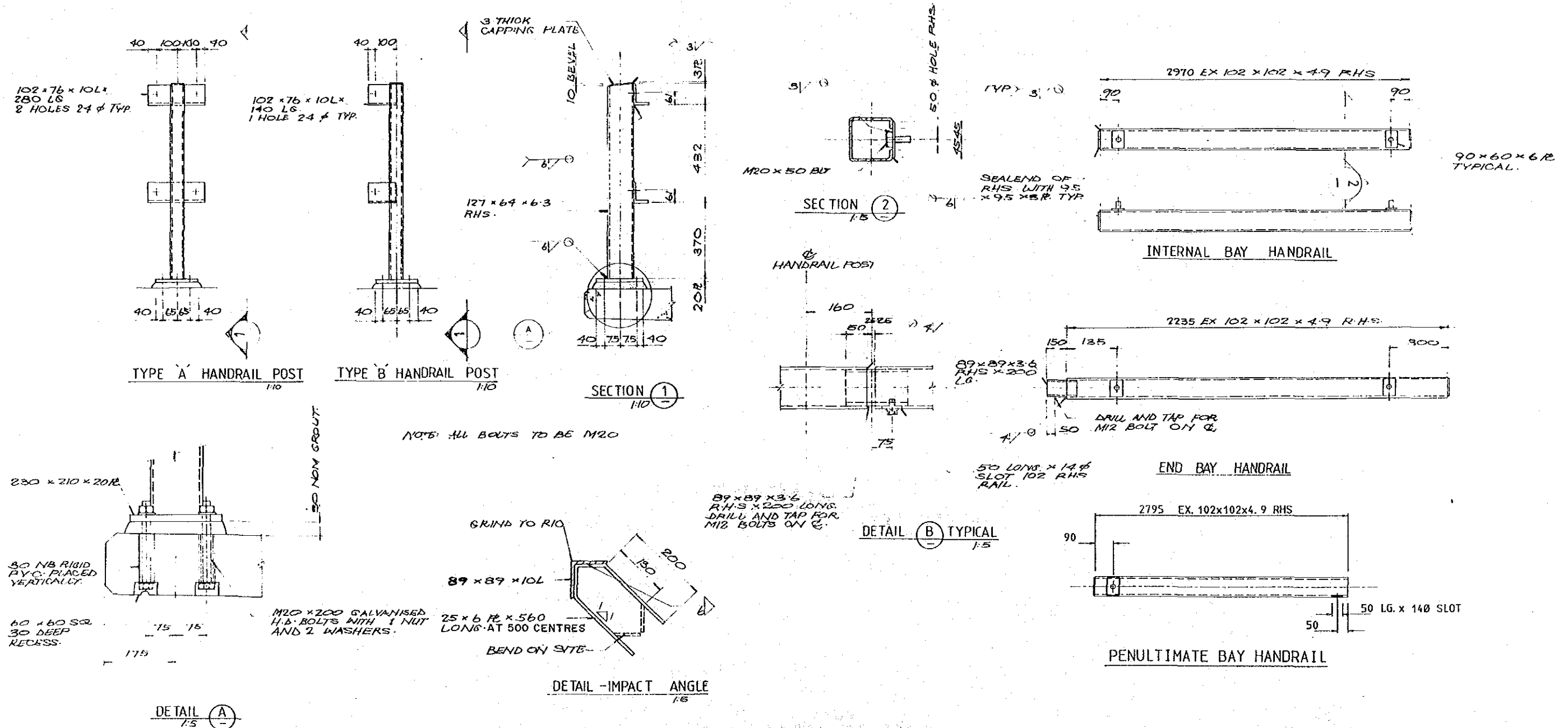
SURVEY <b>JICA</b> Date VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM SURVEY BOOK No. 5		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Date 25 Sep. 1989		DRAWN M.S. CHECKED DESIGNED CHECKED		RECOMMENDED PROJECT ENGINEER APPROVED I. II - 89 EXECUTIVE ENGINEER SECRETARY		SCALES CENTRAL / GULF PROVINCES TRANS-ISLAND HIGHWAY BERRINA-MALALAU SECTION BRIDGE No.6- LAKEKAMU BRIDGE DEPARTMENT OF WORKS		DRAWING No. A1 88286	
REV.	AMENDMENTS	BY	APP'D	DATE	SHEET 252 OF 303		PROJECT No. S.C.120-33-814/B		PAPUA NEW GUINEA		



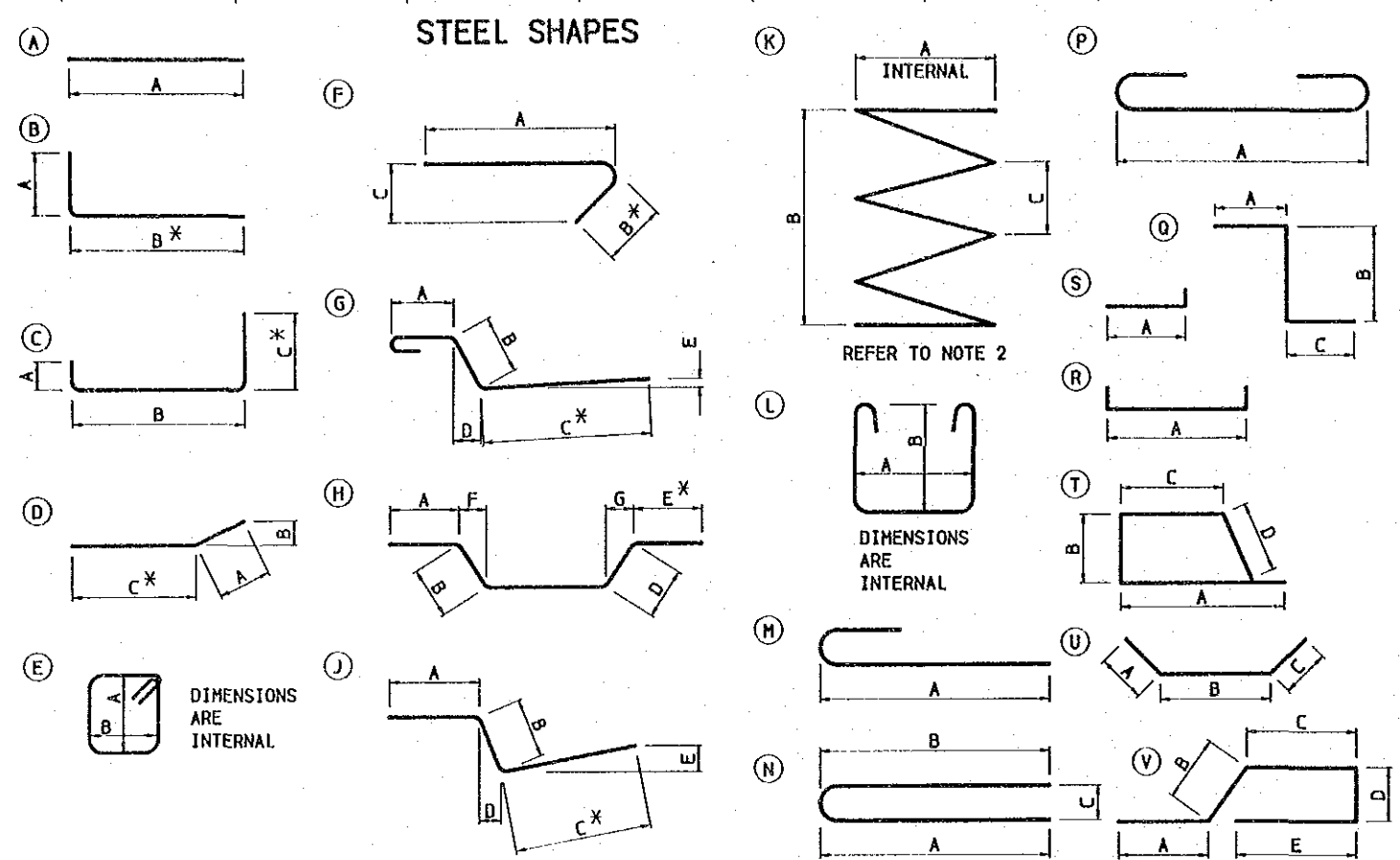
**TYPICAL ELEVATION ON HANDRAIL**

1:100

NOTE FOR THIS END OF BRIDGE TYPE B POST N/S TYPE BX POST F/S

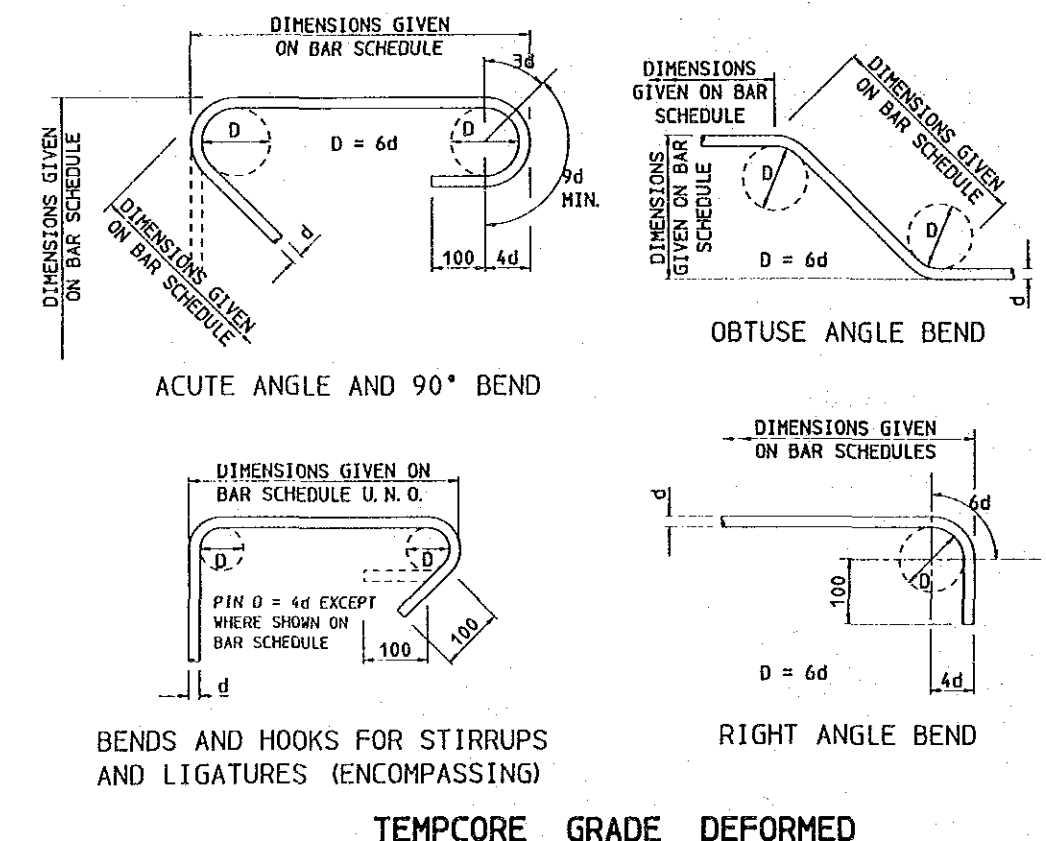


SURVEY <b>JICA</b> Date		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal		DRAWN M.S. CHECKED y. d. d.		RECOMMENDED PROJECT ENGINEER APPROVED 1. 11. 89 EXECUTIVE ENGINEER		SCALES PROJECT No. S.C. 120-33-814/B		CENTRAL / GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAYA SECTION BRIDGE No.6- LAKEKAMU BRIDGE HANDRAILING/IMPACT ANGLE DETAILS PAPUA NEW GUINEA DEPARTMENT OF WORKS	
VERTICAL DATUM MEAN SEA LEVEL		25 Sep. 1989 Date		DESIGNED A. S. S. S.		PRINCIPAL ENGINEER J. H. 89		SHEET 253 OF 303		DRAWING No. A1 88287	
HORIZONTAL DATUM		SURVEY BOOK No.5		CHECKED y. d. d.		SECRETARY				REV	



TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS	
TC16	01	608	4040							4040	3879	P		
TC16	02	608	3850							3850	3695	A		
TC16	03	1216	900	380	320					12080	23184	F		
TC16	04	17	119900							119900	3217	A	** SEE NOTE 5	
TC16	05	17	119900							119900	3217	A	** SEE NOTE 5	
TC16	06	1216	900	450	450					1800	3455	Q		
TC12	07	1216	440	500	*	250				1810	1954	J		
TC16	08	22	121400							121400	4216	A	** SEE NOTE 5	
TC20	09	8	2600							2600	51	A		
TC20	10	12	920	395	1500	395	920	280	280	4130	122	H		
TC16	11	8	4000							4000	51	A		
TC12	12	56	280	640						2060	102	E		
TC16	13	68	1380	1380	135					2810	302	N		
TC12	14	1216	900							900	972	A		
TOTAL TONNAGE = 48.417 TONNES IN DECK														
TC32	01	58	1000	5170	1000					7170	2625	C		
TC32	02	24	2200	5100	2200					9500	1439	C		
TC32	03	82	1000	3370	1000					5370	2780	C		
TC24	04	36	1800	1000	1800					4600	588	C		
TC32	05	132	1200	950	1200					3350	2792	C		
TC12	06	32	500	1000	500					2000	57	C		
TC12	07	16	500	800	500					1800	26	C		
TC24	08	96	1550	3200						4750	1619	B		
TC28	09	44	3200	3200						6400	1361	B		
TC28	10	50	3200	1920	3200					8320	2011	C		
TC24	11	100	2630							2630	934	P		
TC20	12	34	2900							2900	243	A		
TC20	13	34	2900							2900	243	A		
TC20	14	48	5240							5240	620	A		
TC20	15	6	3600							3600	53	A		
TC20	16	30	740	320	330	450				1808	134	T		
TC16	17	44	200	550	200					950	66	U		
TC16	18	64	300	310			(8SETS)		VARIES	610	135	B	INCREMENT=100	
				2410						2710				
TC16	19	128	300	800			(8SETS)		VARIES	1100	374	B	INCREMENT=300	
				2300						2600				
TC16	20	8	715	600	3100					3815	48	D		
TC16	21	72	200	500	200					900	102	U		
TC16	22	24	2640							2640	100	A		
TC16	23	72	900	90	900					1826	208	N		
TC16	24	48	2640							2640	200	A		
TC20	25	40	3300							3300	326	A		
TC24	26	72	13220							13220	3380	A		
R12	27	6	646	13220	150					186124	992	K		
TC24	28	144	300	1700						2000	1023	B		
R12	29	6	646	9220	150					131107	699	K		
TC24	30	72	9220							9220	2357	A		
TOTAL TONNAGE = 27.535 TONNES IN 2 ABUTMENTS														

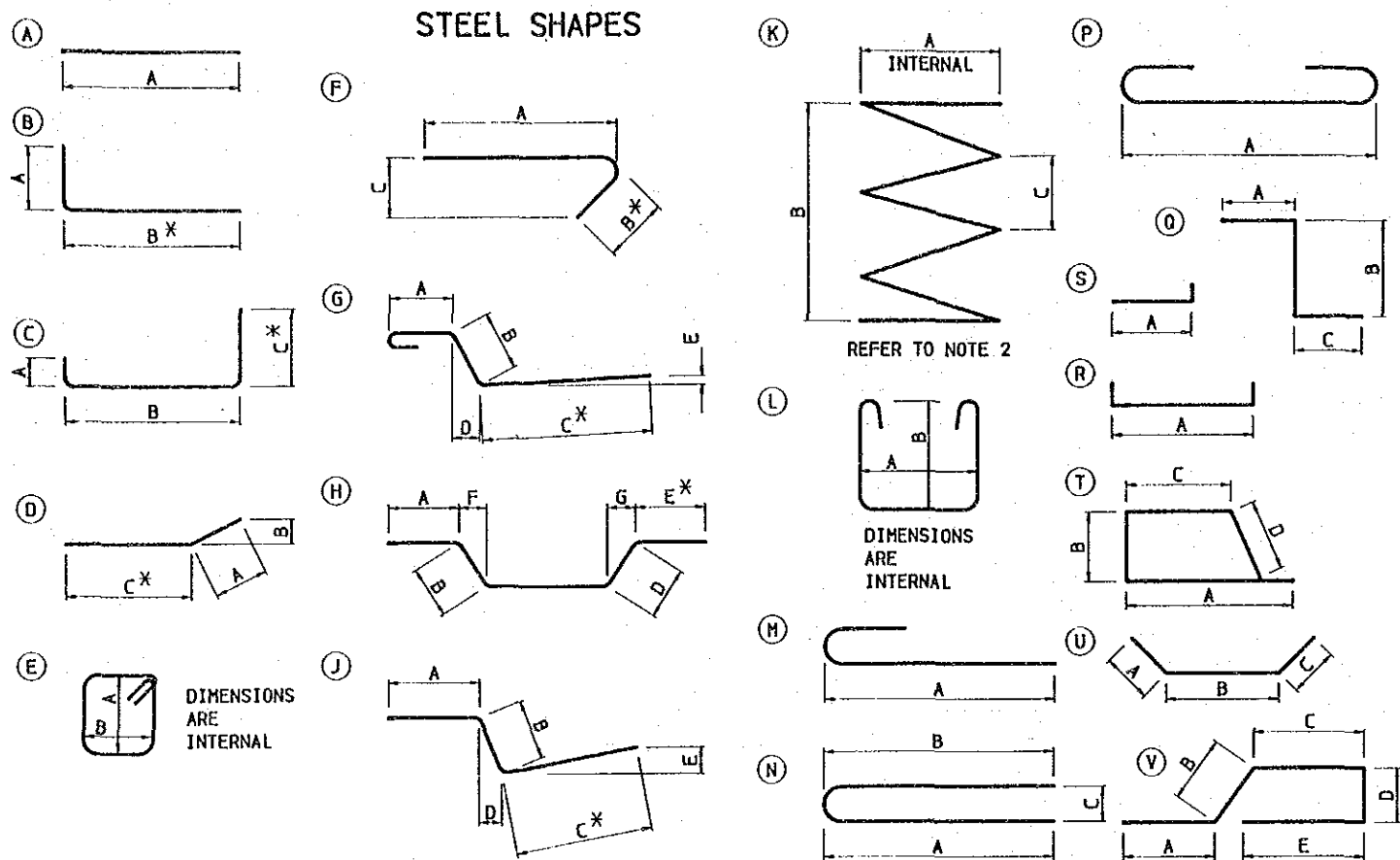
### STANDARD HOOKS AND BENDS



### NOTES

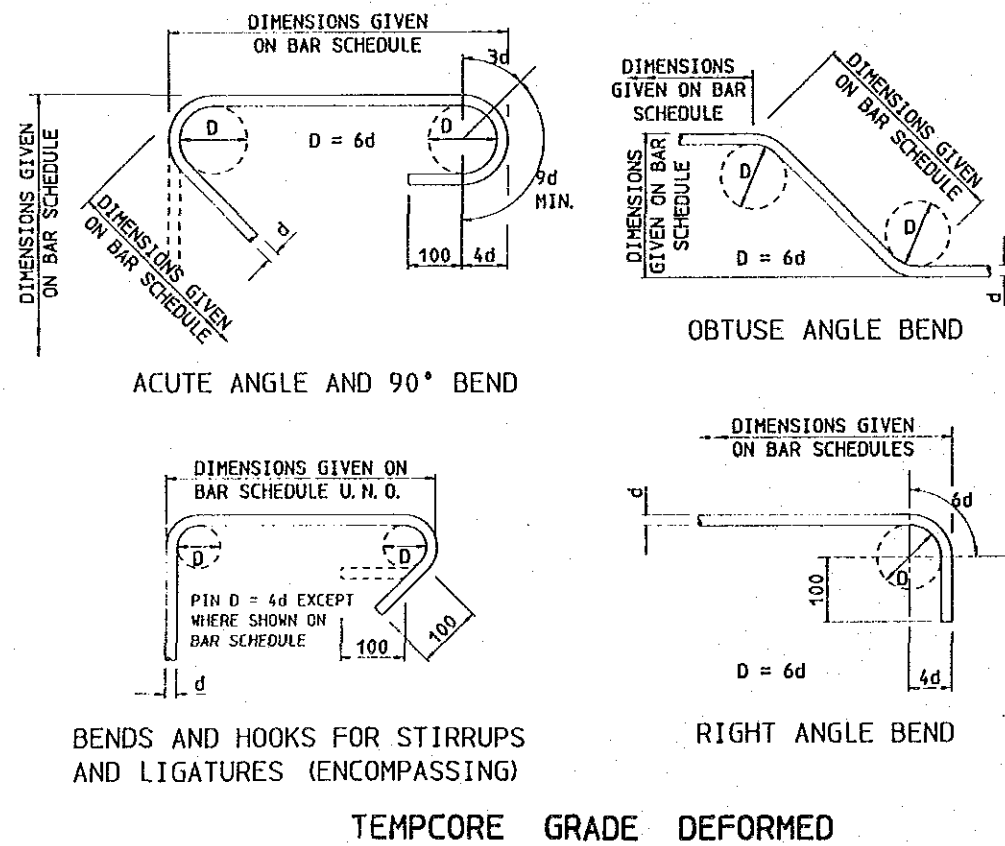
- EXPLANATION OF BAR MARKS  
e.g. 40 - TC32 - 07 - 250 - B  
No. OFF TYPE BAR DIAMETER LOCATION SPACING BAR MARK
- SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG. 86052
- DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
- \* DENOTES TOLERANCE TO BE TAKEN UP ON THIS 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

REV		AMENDMENTS		BY	APP'D	DATE	SURVEY		DESIGN		DRAWN		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES			
							JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		MKS, MS		PROJECT ENGINEER		PRINCIPAL ENGINEER		TRANS-ISLAND HIGHWAY BERKINA-MALALAU SECTION			
							VERTICAL DATUM MEAN SEA LEVEL		HORIZONTAL DATUM		DESIGNED		APPROVED		PROJECT No.		BRIDGE No. 6 - LAKEKAMU RIVER			
							SURVEY BOOK No. S		25 Sep. 1989		CHECKED		EXECUTIVE ENGINEER		S.C. 120-33-814/B		BAR BENDING SCHEDULE SHEET 1			
							PAPUA NEW GUINEA		DEPARTMENT OF WORKS		DRAWING No.		A1/88288							



TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC36	60	240	12000							12000	23014	A	
R12	61	8	846	21700	140					42350	3099	K	
TC36	62	240	400	2850						3250	6233	B	
TC32	63	40	1100	5220	1100					7420	1874	C	
TC32	64	44	1100	3920	1100					6120	1700	C	
TC32	65	42	1100	5220	1100					7420	1967	C	
TC32	66	54	1100	3920	1100					6120	2086	C	
TC24	67	24	2100	1100	2100					5300	452	C	
TC28	68	12	5200							5200	302	A	
TC28	69	12	800	3850	800					5450	316	C	
TC12	70	8	500	800	500					1800	14	C	
TC12	71	24	500	800	500					1800	39	C	
TC32	72	96	1100	1150	1100					3350	2030	C	
TC28	73	240	11250							11250	13052	A	
TOTAL TONNAGE = 56.088 TONNES IN 2 No. PIERS													

### STANDARD HOOKS AND BENDS

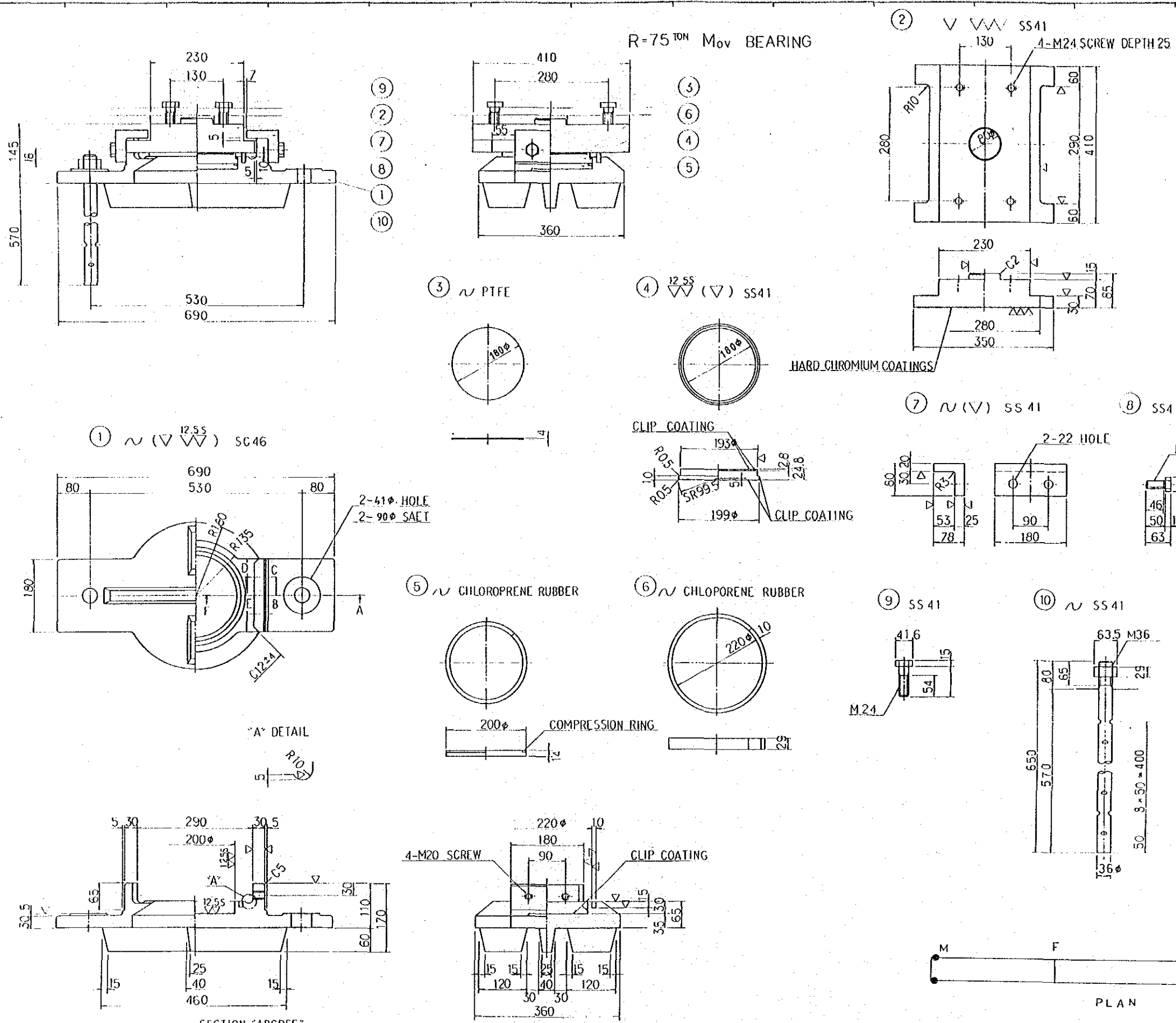


### NOTES

- 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. 86052
- 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
- XX 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

CENTRAL / GULF PROVINCES		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION		BRIDGE No.6 - LAKEKAMU BRIDGE		BAR BENDING SCHEDULE SHEET 2	
PAPUA NEW GUINEA		DEPARTMENT OF WORKS		DRAWING No. A1/88289		REV	
SURVEY <b>JICA</b> Date: _____ VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM SURVEY BOOK NOS		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Date: 25 Sep. 1989		DRAWN M.S. CHECKED DESIGNED CHECKED		RECOMMENDED APPROVED PROJECT ENGINEER PRINCIPAL ENGINEER EXECUTIVE ENGINEER SECRETARY	
AMENDMENTS BY    APP'D    DATE		SCALES PROJECT No. S.C. 120-33-814/B SHEET 255 OF 303		PROJECT No. S.C. 120-33-814/B SHEET 255 OF 303		PROJECT No. S.C. 120-33-814/B SHEET 255 OF 303	

### R=75<sup>TON</sup> M<sub>OV</sub> BEARING



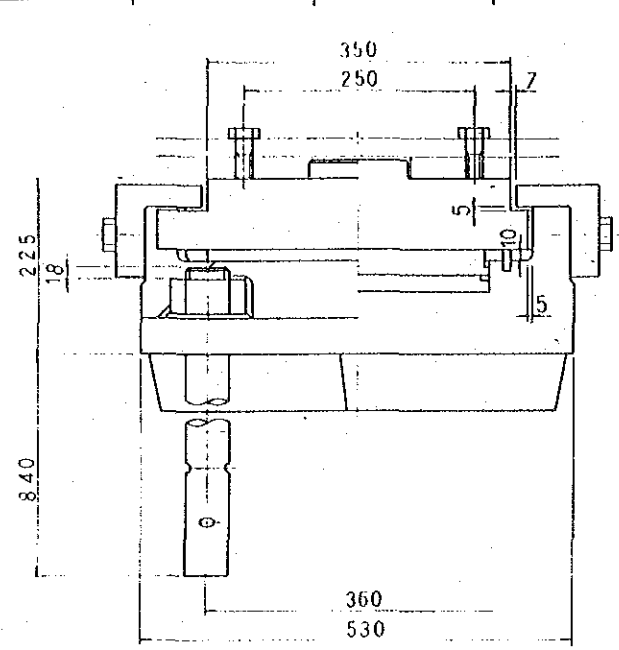
**DESIGN CONDITION**

TOTAL REACTION	R	71.2 ton
DEAD LOAD REACTION	Rd	34.7 ton
LIVE LOAD REACTION	R(l.v.)	36.5 ton
LONGITUDINAL FORCE (FRICTION)	RH1f	7.1 ton
LONGITUDINAL FORCE (EARTHQUAKE)	RH1e	14.6 ton
TRANSVERSE FORCE (EARTHQUAKE)	RH2e	14.6 ton
UPLIFT (EARTHQUAKE)	V	3.5 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	σba	80 kg/cm <sup>2</sup>

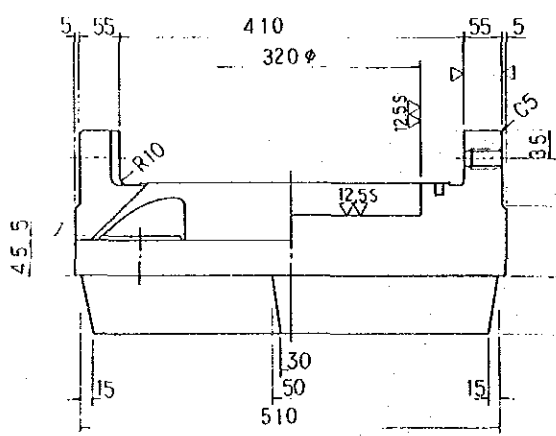
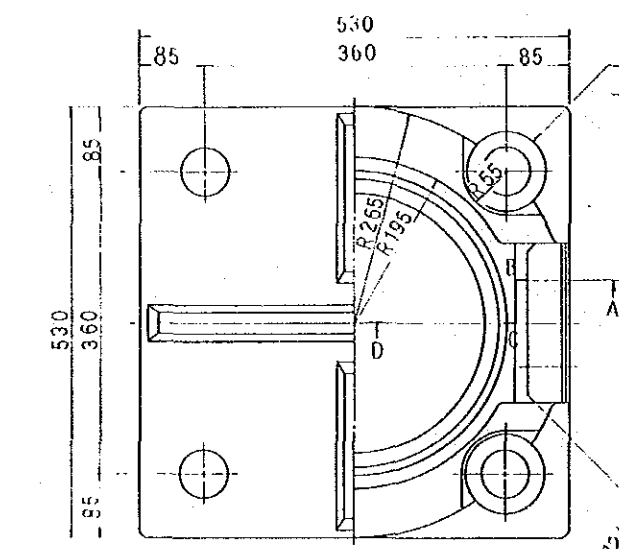
**MATERIAL LIST**

NO	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	68.3	
2	UPPER BEARING	SS41	1	59.2	
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		M24, 54
10	ANCHOR BOLT-NUT	SS41	2	11.2	
				TOTAL WEIGHT (kg)	154.2

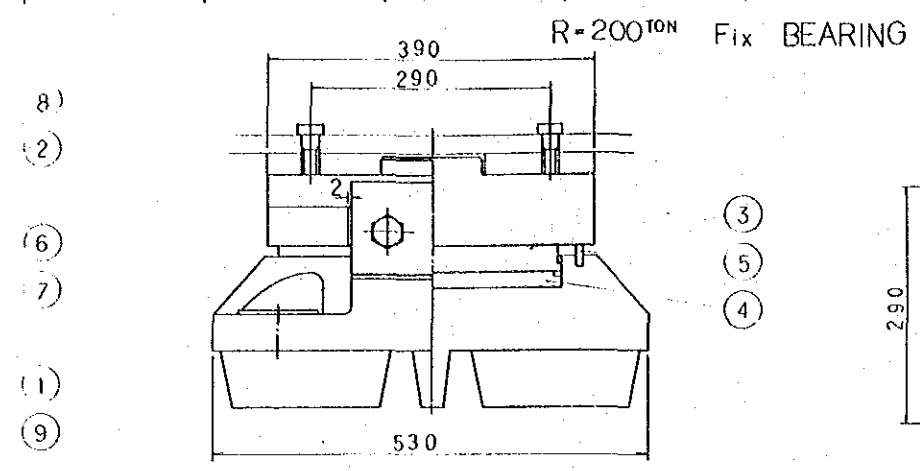
SURVEY <b>JICA</b> Date		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Date: 25 Sep. 1989		DRAWN M.S. CHECKED: Y. Oki DESIGNED: M. Shimizu CHECKED: Y. Oki		RECOMMENDED PROJECT ENGINEER: <i>[Signature]</i> PRINCIPAL ENGINEER: <i>[Signature]</i> APPROVED: L. H. 89 EXECUTIVE ENGINEER: <i>[Signature]</i> SECRETARY: <i>[Signature]</i>		SCALES 1:1		CENTRAL / GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		HORIZONTAL DATUM		SHEET 256 OF 303		PROJECT No. S.C. 120-33-814/13		BRIDGE No.6 - LAKEKAMU BRIDGE		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
SURVEY BOOK No.S		BY APP'D DATE		DEPARTMENT OF WORKS		DRAWING No. A1/86290		BEARING BP-B 104 (MOVABLE)		REC	



① ~ (▽▽) SC 46



SECTION "ABCD"

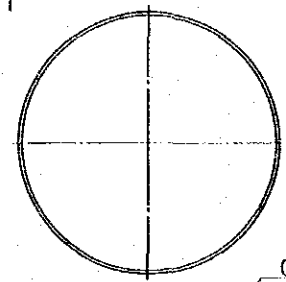


R=200TON Fix BEARING

- 8)
- ②
- ⑥
- ⑦
- ①
- ⑨

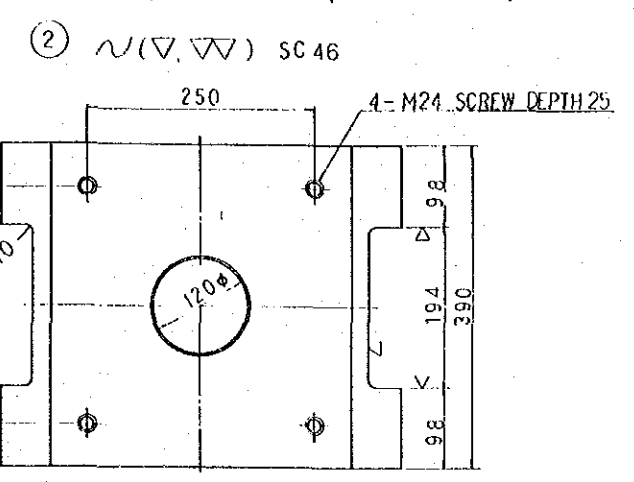
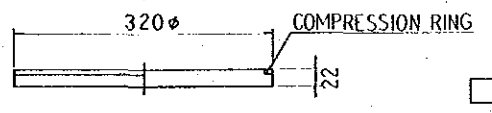
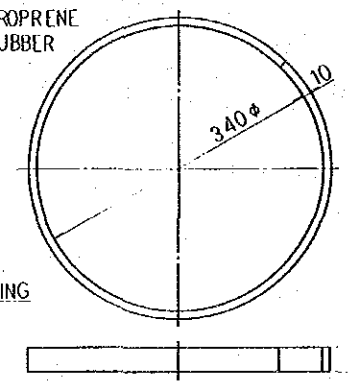
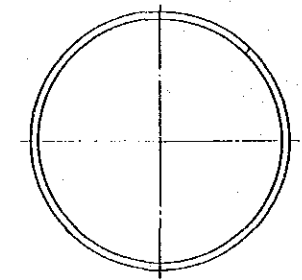
- ③
- ⑤
- ④

③ ~ (▽) SS 41



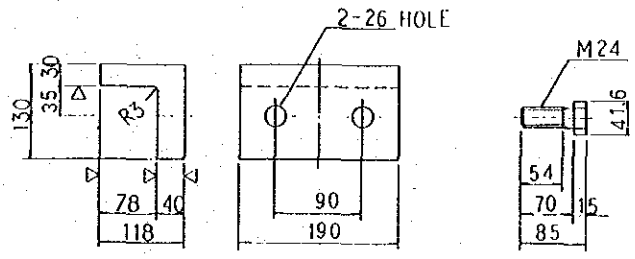
④ ~ CHLOROPRENE RUBBER

⑤ ~ CHLOROPRENE RUBBER



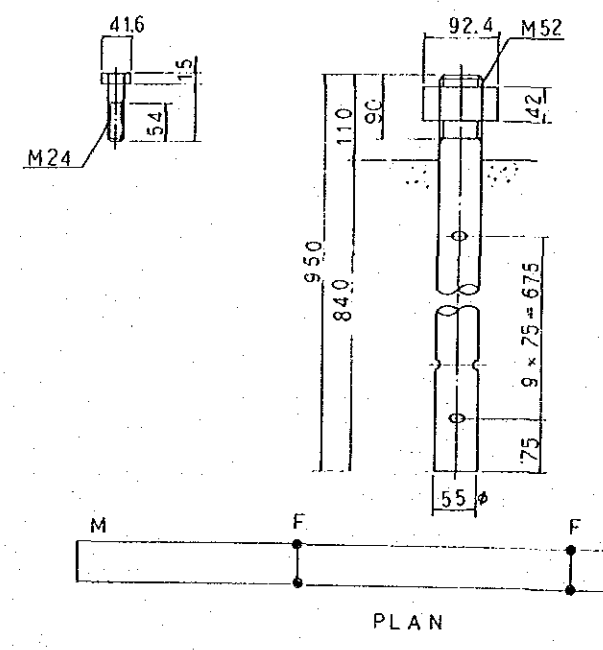
⑥ ~ (▽) SC 46

⑦ SS 41



⑧ SS 41

⑨ ~ SS 41



PLAN

DESIGN CONDITION

TOTAL REACTION	R	190.2 ton
DEAD LOAD REACTION	Rd	116.5 ton
LIVE LOAD REACTION	R(L+I)	73.7 ton
LONGITUDINAL FORCE (FRICTION)	R(L+I)	19.0 ton
LONGITUDINAL FORCE (EARTHQUAKE)	R(L+I)	63.5 ton
TRANSVERSE FORCE (EARTHQUAKE)	R(L+I)	48.9 ton
UPLIFT (EARTHQUAKE)	V	11.7 ton
SEISMIC COEFFICIENT	KH	0.42
FRICTION COEFFICIENT	f	0.1
BEARING STRESS OF CONCRETE	σ <sub>b</sub>	60 kg/cm <sup>2</sup>

MATERIAL LIST

MAKE	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC 46	1	205.0	
2	UPPER BEARING	SC 46	1	117.0	
3	MIDDLE PLATE	SS 41	1	17.1	
4	RUBBER PLATE	CHLOROPRENE RUBBER	1	2.3	
5	SEAL RING	CHLOROPRENE RUBBER	1	0.4	
6	SIDE BLOCK	SC 46	2	21.8	
7	BOLT	SS 41	4	1.4	M24 x 70
8	BOLT	SS 41	4	15.4	M24 x 54
9	ANCHOR BOLT NUT	SS 41	4	75.5	M24 x 54
			TOTAL WEIGHT (kg)	440.5	

SURVEY <b>JICA</b> Date		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal 25 Sep. 1989 Date		DRAWN M/S CHECKED of dai DESIGNED M. Hanyu CHECKED of dai		RECOMMENDED PROJECT ENGINEER APPROVED 1. 11. 89 PRINCIPAL ENGINEER SECRETARY		SCALES PROJECT No. S.C. 120-33-814/B		CENTRAL / GULF PROVINCES TRANS-ISLAND HIGHWAY BERFINA-MALALAUJA SECTION BRIDGE No. 6 - LAKEKAMU BRIDGE BEARING BP-B - 117 (FIXED) PAPUA NEW GUINEA DEPARTMENT OF WORKS		DRAWING No. A1/ 88291	
REV	AMENDMENTS	BY	APP'D	DATE									



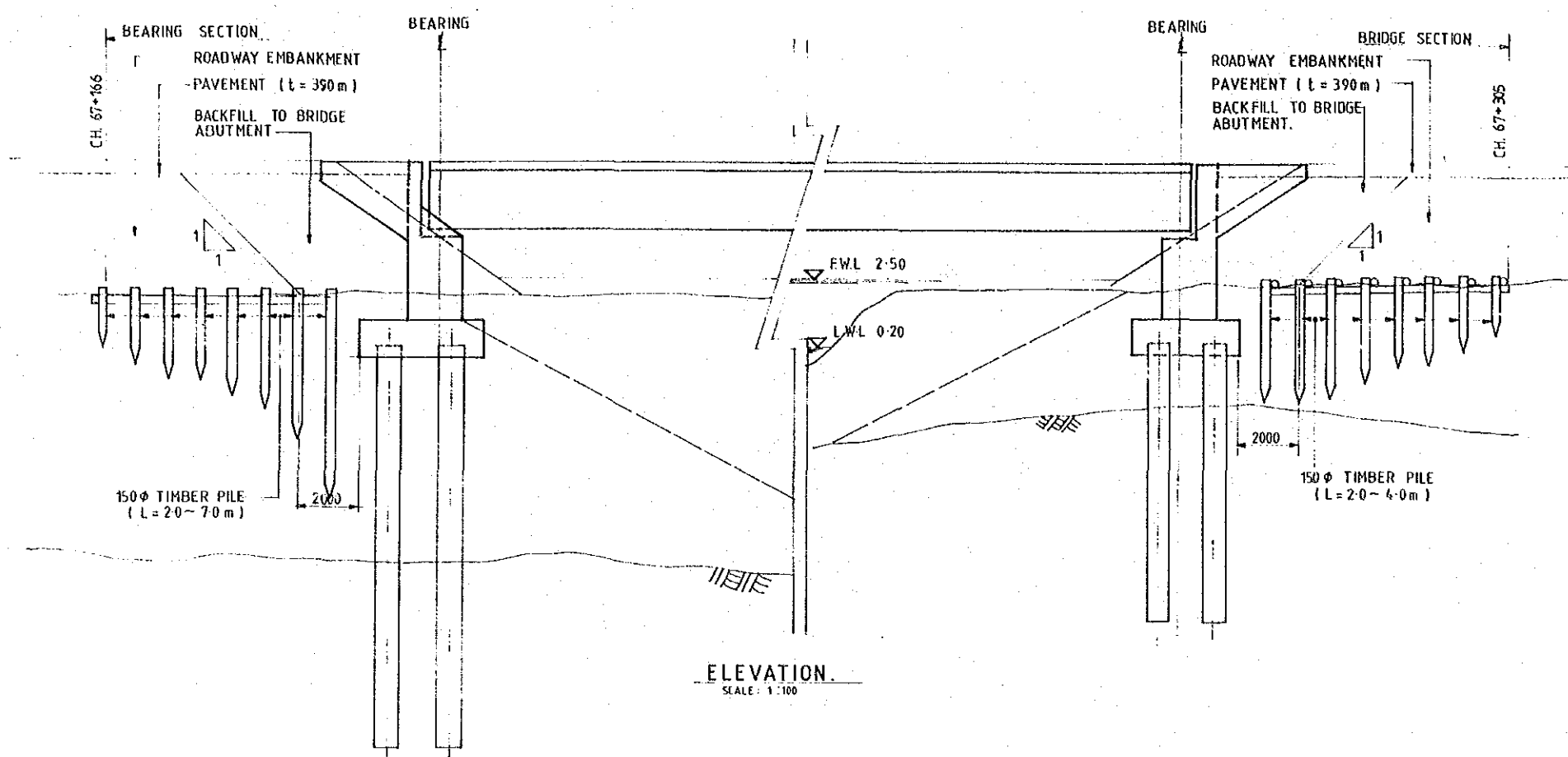
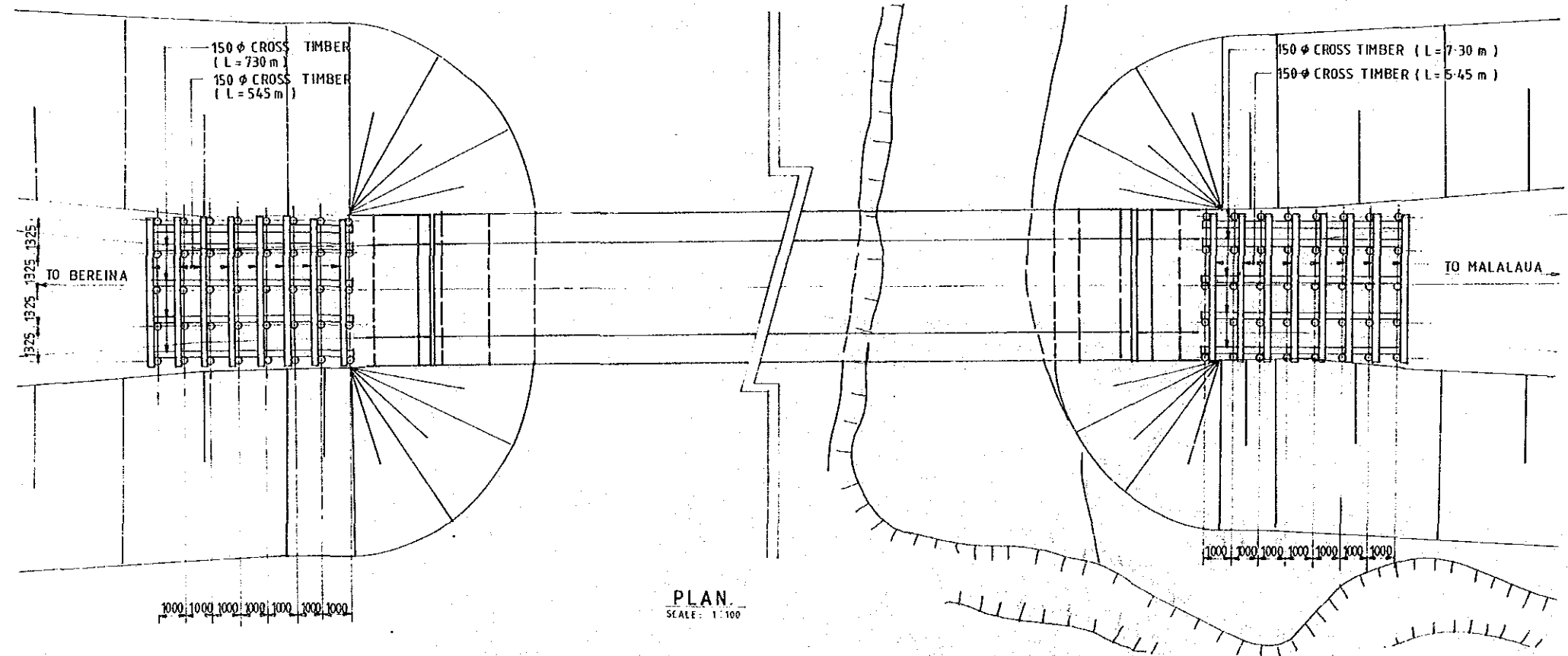


TABLE OF QUANTITIES				
DESCRIPTION	UNIT	QUANTITY	REMARKS	
CLEARING AND GRUBBING AT BRIDGE SITE	ha	0.1		
EXCAVATION FOR STRUCTURAL FOUNDATIONS	TYPE C	m <sup>3</sup>	0	
	TYPE D	m <sup>3</sup>	186	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS	m <sup>3</sup>	105.1		
BACKFILL TO BRIDGE ABUTMENT	m <sup>3</sup>	446		
ROADWAY EMBANKMENT	m <sup>3</sup>	883		
BEARING UNITS	TIMBER PILE	m	280	150 φ
	CROSS TIMBER	m	160.2	150 φ
SAND MAT	m <sup>3</sup>	0		

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



SURVEY <b>JICA</b> Date: _____ VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal: <i>J. Malino</i> 25 Sep. 1969 Date		DRAWN M.S. J. B. MGGIO CHECKED <i>dy Bai</i> DESIGNED <i>J. Kambou</i> CHECKED <i>dy Bai</i>		PROJECT ENGINEER <i>Albanta</i> 1/1/69 RECOMMENDED <i>P. J. S.</i> PRINCIPAL ENGINEER APPROVED I. A. B. <i>J. S.</i> 1/1/69 SECRETARY		SCALES 		CENTRAL GUINEA PROVINCES TRANS-ISLAND HIGHWAY - BEREINA-MALALAU SECTION <b>BRIDGE No. 6 - LAKEKAMU BRIDGE</b> BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT & OTHERS.	
REV AMENDMENTS	BY APP'D DATE	SURVEY BOOK NO. 5	PROJECT No. S.C. 120-33-814/B	SHEET 258 OF 303	DEPARTMENT WORKS	DRAWING No. A1 88292					

## GENERAL NOTES

### 1. ABBREVIATIONS

T	TOP	STRP	STIRRUP
B	BOTTOM	TRMR	TRIMMER
NF	NEAR FACE	MS	MILD STEEL
FF	FAR FACE	SYMM	SYMMETRICAL
EW	EACH WAY	NTS	NOT TO SCALE
EF	EACH FACE	TYP	TYPICAL
C	CENTRELINE	FLG	FLANGE
E	PLATE		

### 2. DESIGN LOADINGS

NORMAL	T44	STANDARD VEHICLE
ABNORMAL	60	TONNE VEHICLE
EARTHQUAKE	EEBPNG	1985 ZONE 4
DECK	A14	

### 3. PILING

ALL PILING SHALL BE THE SPECIFIED GRADE  
MAXIMUM TOLERANCE ON PILE POSITION AT PILE  
TOP FOR ANY PILE = ± 75mm

#### PILE CONTRACT LENGTHS SIZE

BEREINA ABUTMENT	9.4m x 6 nos	800φ x 12 THK
BEREINA PIER	21.8m x 4 nos	1000φ x 12 THK
MALALAU PIER	21.8m x 4 nos	1000φ x 12 THK
MALALAU ABUTMENT	10.9m x 6 nos	800φ x 12 THK

MAXIMUM PILE WORKING LOADS  
ABUTMENTS 1500 kN COMPRESSION 700kN TENSION  
PIERS 4500 kN COMPRESSION 3000kN TENSION

THE TIPS OF THE PILES SHALL BE REINFORCED AS SHOWN

MIN SOCKET LENGTH INTO ROCK 4000mm abutts, 9000mm piers

PREVENTION PILE 16.0m x 2 nos 800φ

### 4. CONCRETE

ALL CONCRETE SHALL BE GRADE 25. (c = 25 MPa)

### 5. REINFORCING STEEL

ALL REINFORCEMENT SHALL BE EITHER :-

- TEMPCORE (T.C.) BARS OF 410 MPa
- ROUND (R) BARS OF 230 MPa

### 6. LAP LENGTHS

UNLESS NOTED OTHERWISE LAP LENGTHS TO BE AS FOLLOWS :-

12	DIA	500mm
16	DIA	650mm
20	DIA	800mm
24	DIA	1000mm
28	DIA	1500mm
32	DIA	1650mm

### 7. COVER TO OUTSIDE FACE OF REINFORCEMENT

DECK		
a)	TOP OF ROADWAY	35mm
	BOT OF ROADWAY AND ELSEWHERE	30mm
PIER		
a)	CROSS BEAM	40mm
b)	COLUMNS	40mm
c)	PILE CAP	65mm
ABUTMENT		
a)	WINGWALL/BACKWALL	
	- OPEN FACES	30mm
	- FILL FACES	50mm
b)	PILE CAP	65mm

### 8. STRUCTURAL STEELWORK

ALL MAIN BEAMS, COVER PLATES AND SPLICE PLATES  
TO BE GRADE 350 STEEL. ALL OTHER STEELWORK  
TO BE GRADE 250 STEEL. ALL WELDS SHALL BE 6mm CONTINUOUS  
FILLET WELDS UNLESS NOTED OTHERWISE

### 9. BOLTING

ALL BOLTS ON MAIN STEELWORK (MAIN BEAMS, CROSS FRAMES AND  
BRACING) TO BE M24 8.8/TF.

ALL OTHER BOLTS TO BE GRADE 4.6/S

### 10. STEELWORK FINISHES

ALL SURFACES TO BE SUITABLY PROTECTED BY PAINT WORK  
- REFER TO SPECIFICATION.

### 11. BEARINGS

PIER LOADS -	DEAD LOAD = 1165kN
	LIVE LOAD = 737kN
	TOTAL = 1902kN

BEARING ASSUMED FOR DETAILING = POT BEARING BP. B-113  
(FIXED)

#### ABUTMENT LOADS -

DEAD LOAD = 347kN
LIVE LOAD = 365kN
TOTAL = 712kN

BEARING ASSUMED FOR DETAILING = POT BEARING BP. B-104  
MOVABLE

MEAN TEMPERATURE IS 26.1°C AT THE PROJECT SITE

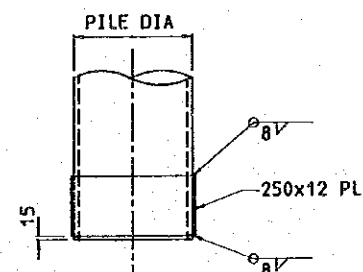
### 12. MAIN BEAM PRECAMBER

STEEL BEAMS TO BE PRECAMBERED TO THE UNSTRESSED PROFILE  
SHOWN ON THE DRAWINGS.

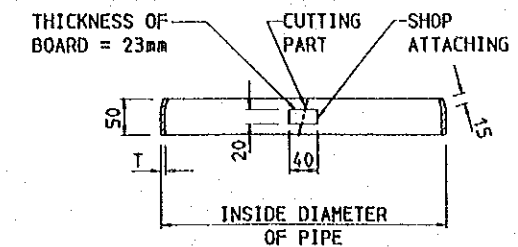
### 13. ERECTION

THE CONTRACTOR IS TO PROVIDE DETAILS OF THE  
ERECTION PROCEDURES TO THE ENGINEER PRIOR TO ERECTION  
OF THE GIRDERS. THIS IS TO ENSURE THAT THE ALLOWABLE  
STRESSES ON THE GIRDER SECTION ARE NOT EXCEEDED.

14. ABUTMENT A - BEREINA SIDE  
ABUTMENT B - MALALAU SIDE

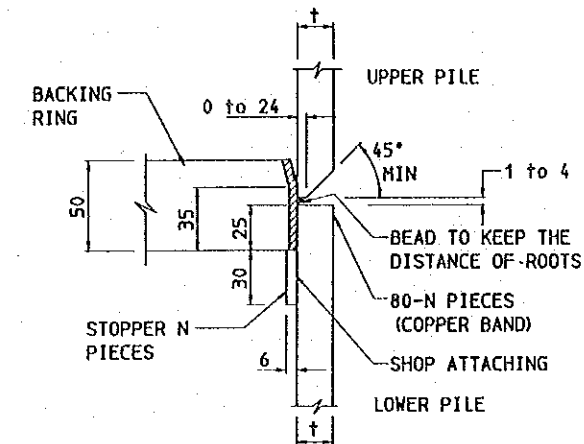


**PILE TOE REINFORCEMENT  
(OPEN END)**



BACKING RING - CROSS SECTION

THICKNESS OF BACKING RING	
OUTSIDE DIAMETER D	T (mm)
1016 AND UNDER	4.5
OVER 1016	6.0



BACKING RING AND STOPPER

NUMBER OF STOPPERS	
OUTSIDE DIAMETER D (mm)	N NUMBER OF PIECES
609.6 AND UNDER	4
OVER 609.6 to 1016 incl.	6
OVER 1016	8

#### NOTES

- MAXIMUM PILE SECTION LENGTH EQUALS 10m.
- WELDING TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

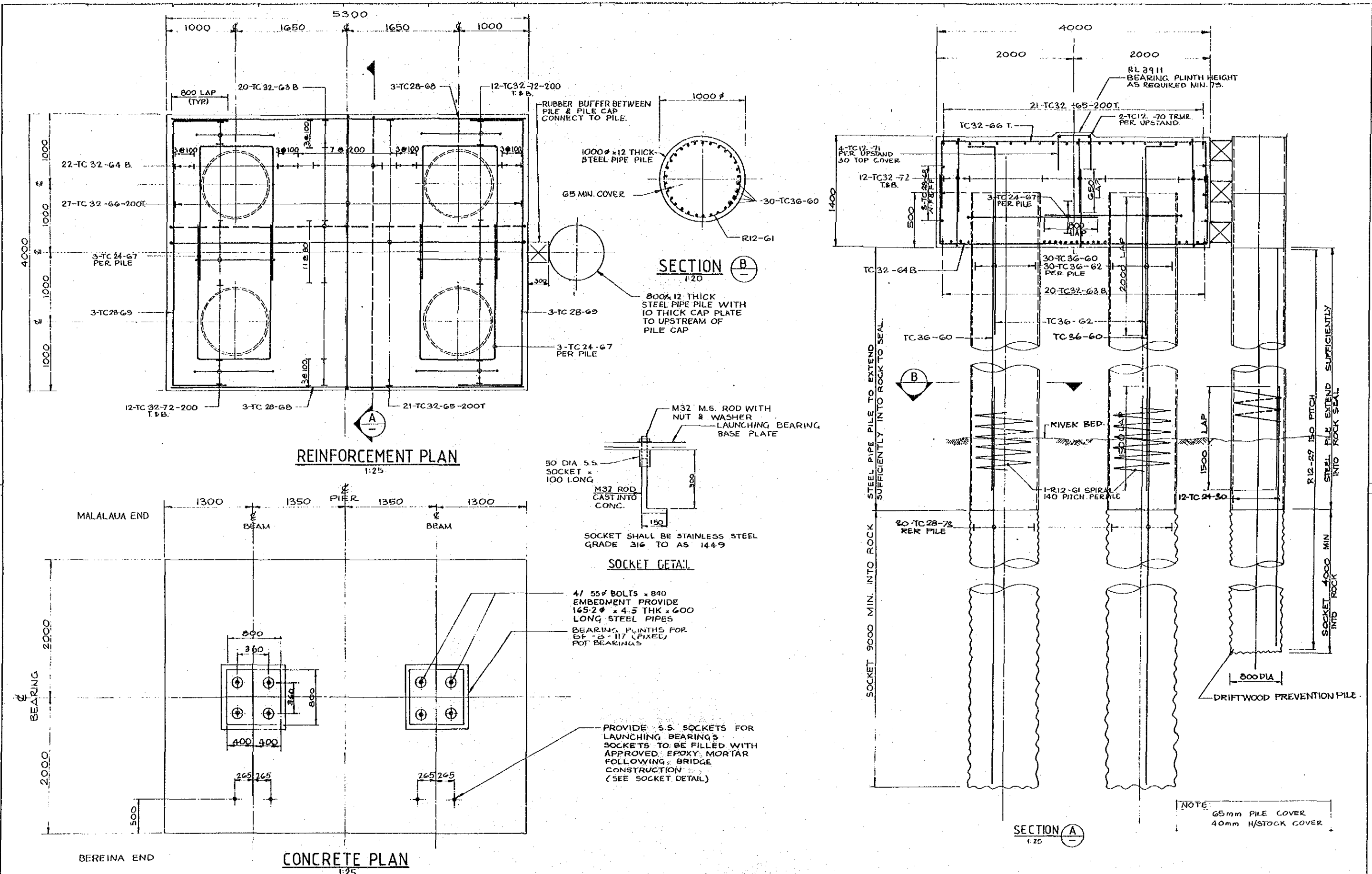
## SHAPES AND DIMENSIONS OF BACKING RING AND STOPPER

DRAWING LIST	
DRG No.	DRAWING TITLE
88293	GENERAL NOTES AND DRAWING LIST
88294	GENERAL ARRANGEMENT
88295	ABUTMENT PLAN REINFORCEMENT & CONCRETE DETAILS
88296	PIER DETAILS
88297	DECK STEELWORK GENERAL ARRANGEMENT
88298	GIRDER DETAILS SHEET 1
88299	GIRDER DETAILS SHEET 2
88300	GIRDER LAUNCHING DETAILS
88301	GIRDER ERECTION PROCEDURE
88302	DECK SECTIONS
88303	DECK CONSTRUCTION PROCEDURE
88304	DECK SLAB DETAILS
88305	HANDRAILING/IMPACT ANGLE DETAILS
88306	BAR BENDING SCHEDULE SHEET 1
88307	BAR BENDING SCHEDULE SHEET 2
88308	BEARING BP.B-104 (MOVABLE)
88309	BEARING BP.B-117 (FIXED)
88310	BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS

REV	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION BRIDGE No.7 - TAURI BRIDGE GENERAL NOTES AND DRAWING LIST PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88293
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S				
					VERTICAL DATUM MEAN SEA LEVEL						
					HORIZONTAL DATUM						
					SURVEY BOOK NO.5	Principal J. Hanaka	25 Sep. 1989	Checked y. lal	PROJECT ENGINEER 1/10/89	PRINCIPAL ENGINEER 1.11.89	SHEET 259 OF 303
									EXECUTIVE ENGINEER 1/10/89	SECRETARY 1/10/89	PROJECT No. S.C.120-33-814/B







**REINFORCEMENT PLAN**  
1:25

**CONCRETE PLAN**  
1:25

**SECTION B**  
1:20

**SECTION A**  
1:25

**SOCKET DETAIL**

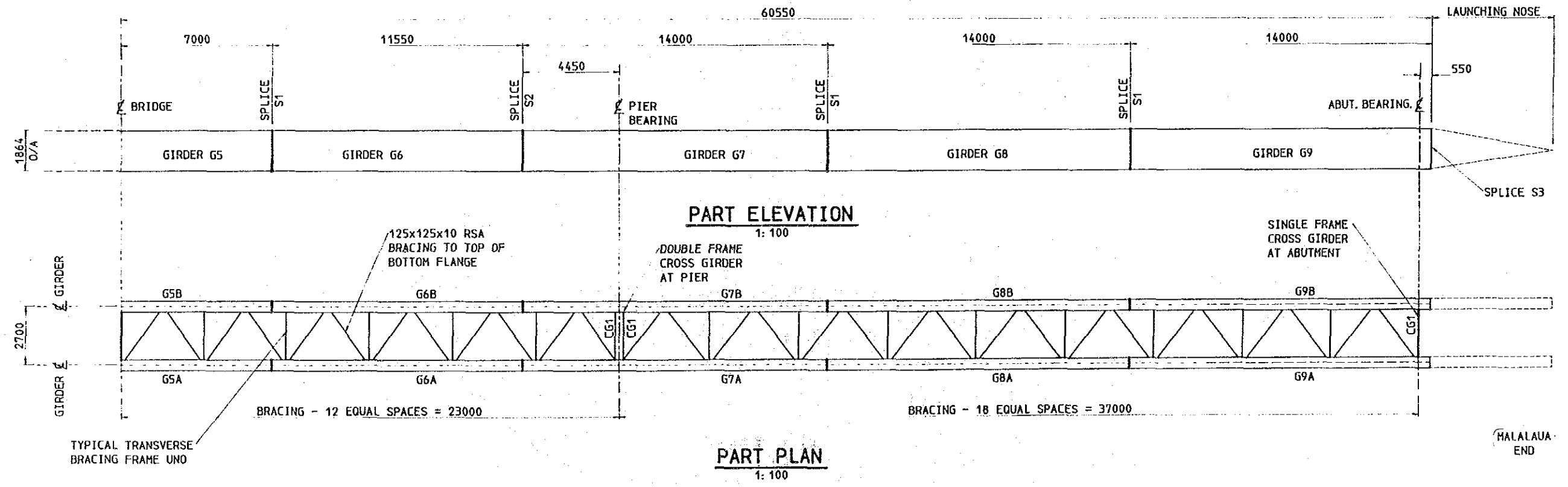
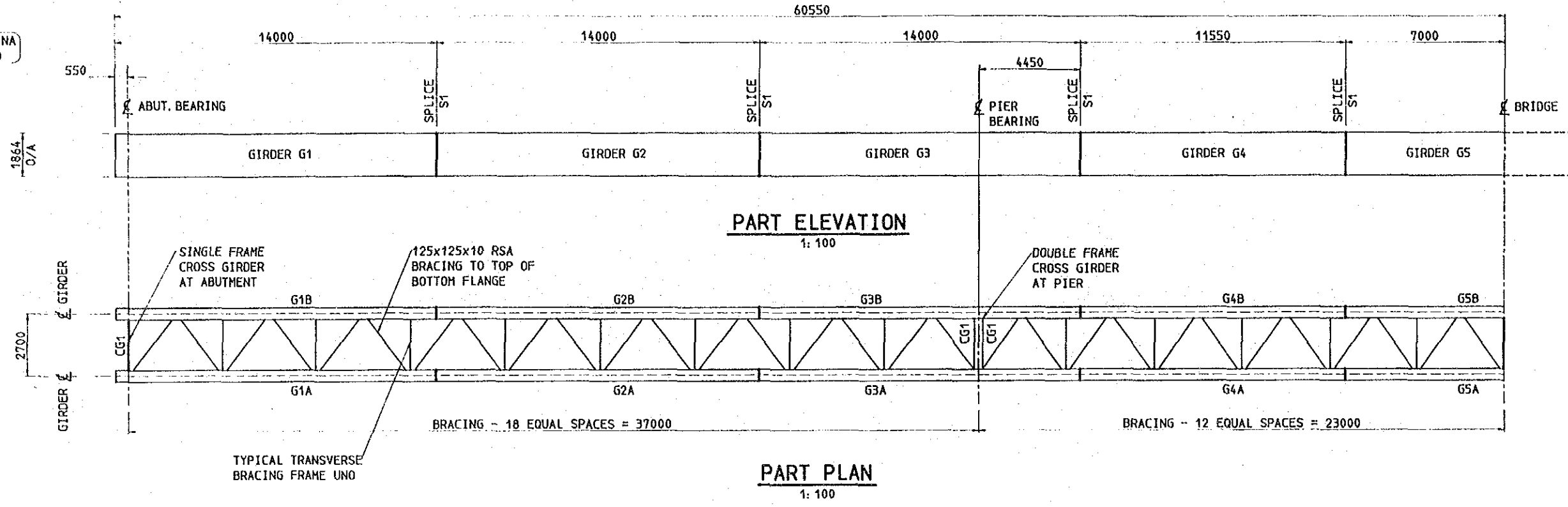
4/ 55# BOLTS x 840  
EMBEDMENT PROVIDE  
165-2# x 4.5 THK x 600  
LONG STEEL PIPES  
BEARING PLINTHS FOR  
SF-25-117 (FIXED)  
POT BEARINGS

PROVIDE S.S. SOCKETS FOR  
LAUNCHING BEARINGS  
SOCKETS TO BE FILLED WITH  
APPROVED EPOXY MORTAR  
FOLLOWING BRIDGE  
CONSTRUCTION  
(SEE SOCKET DETAIL)

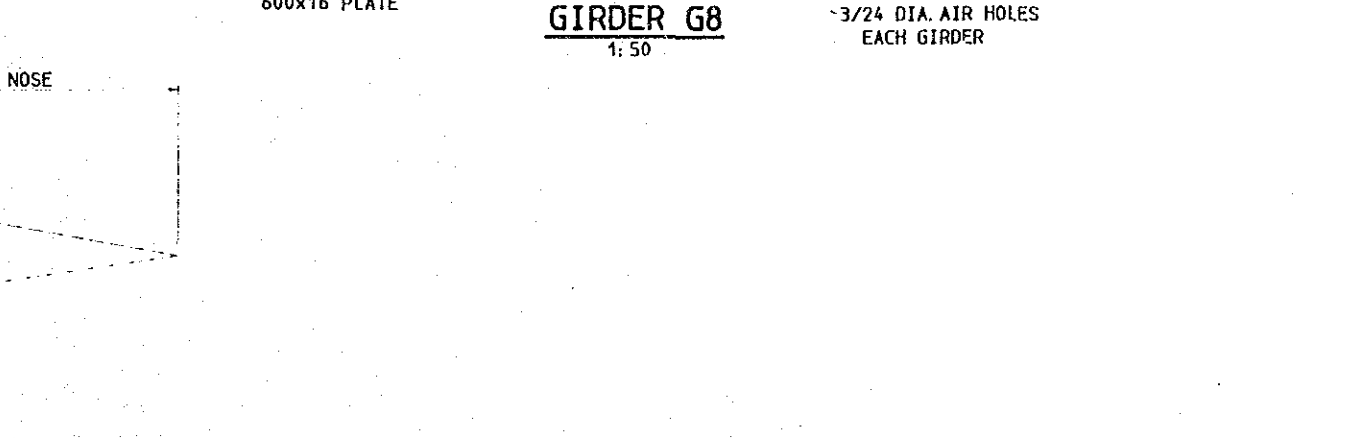
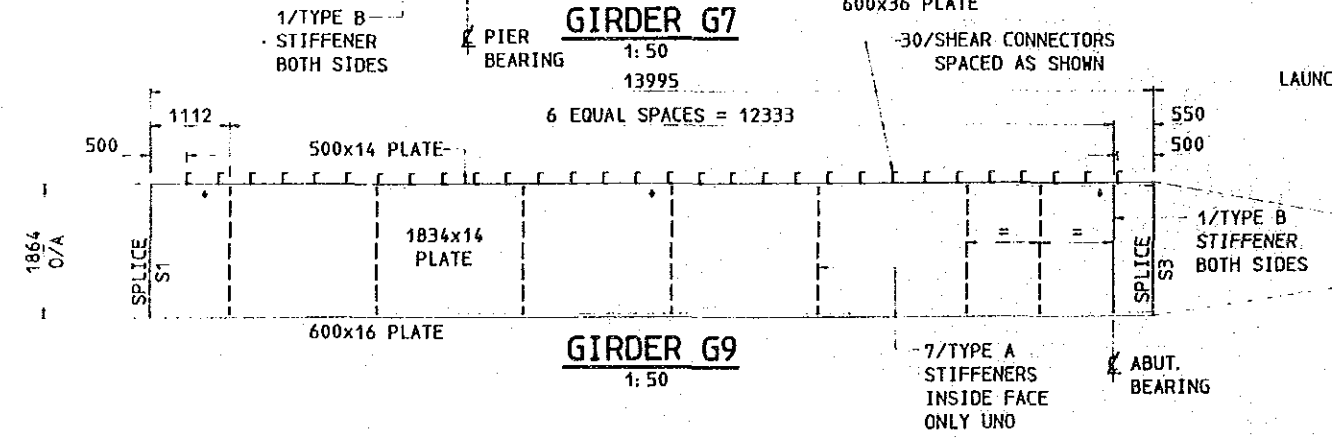
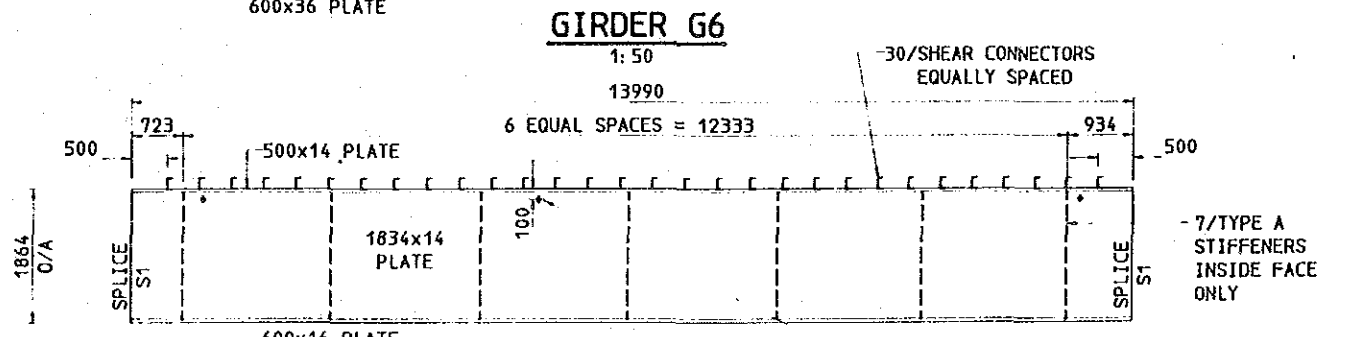
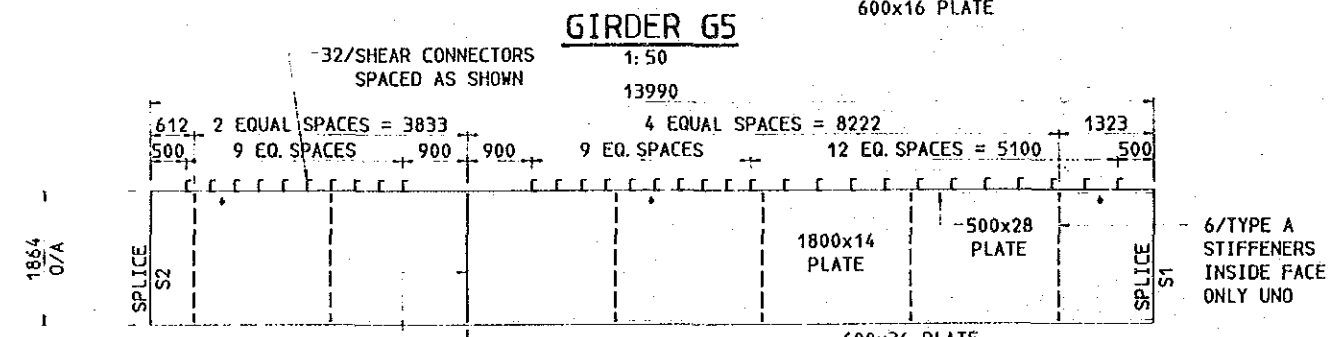
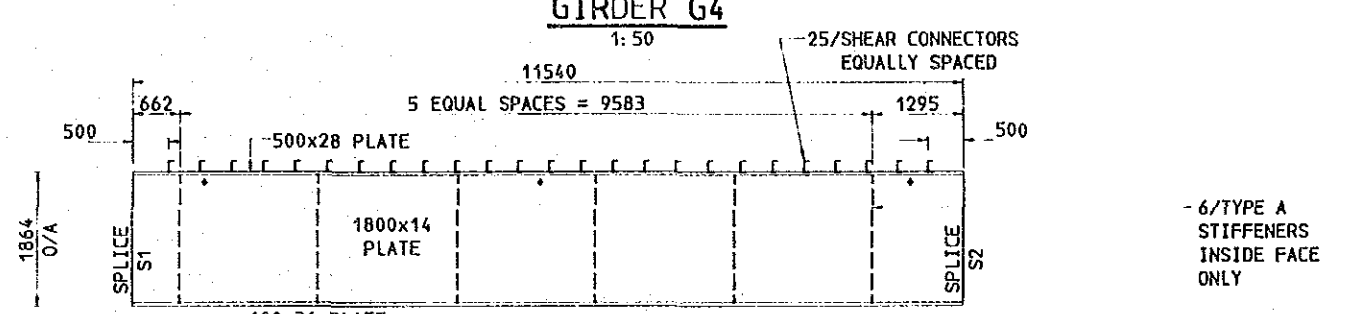
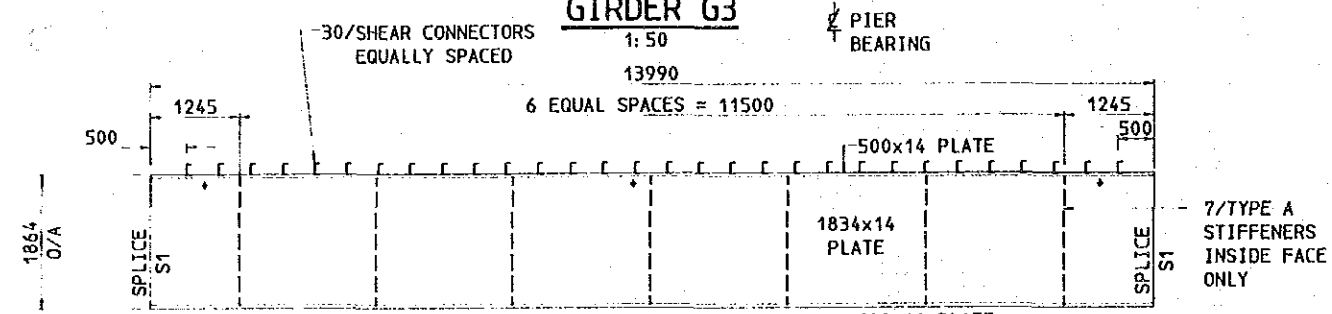
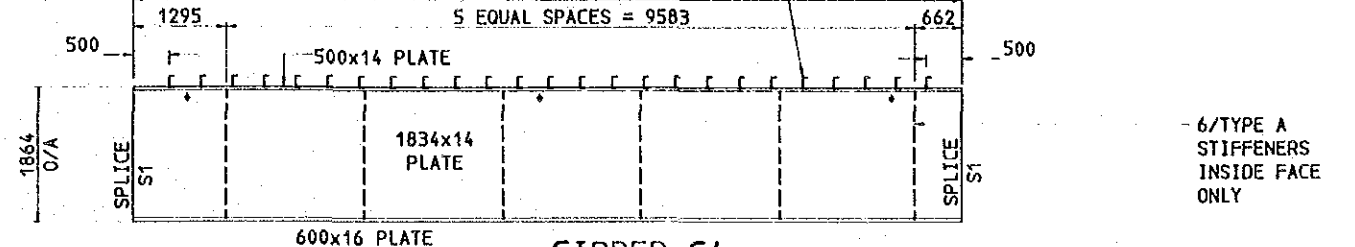
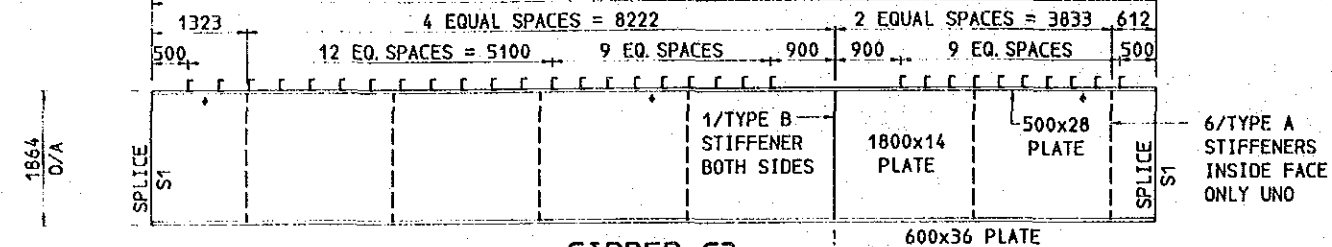
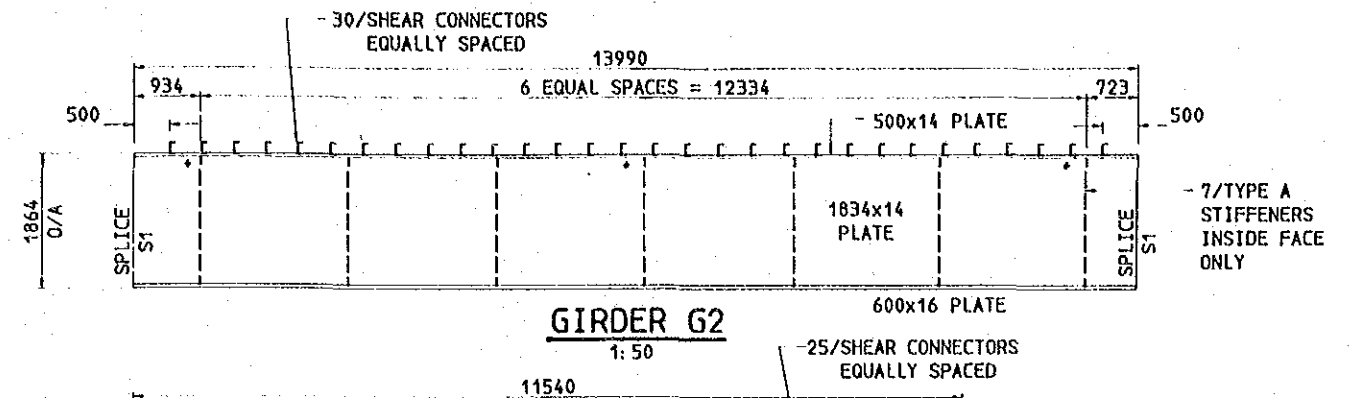
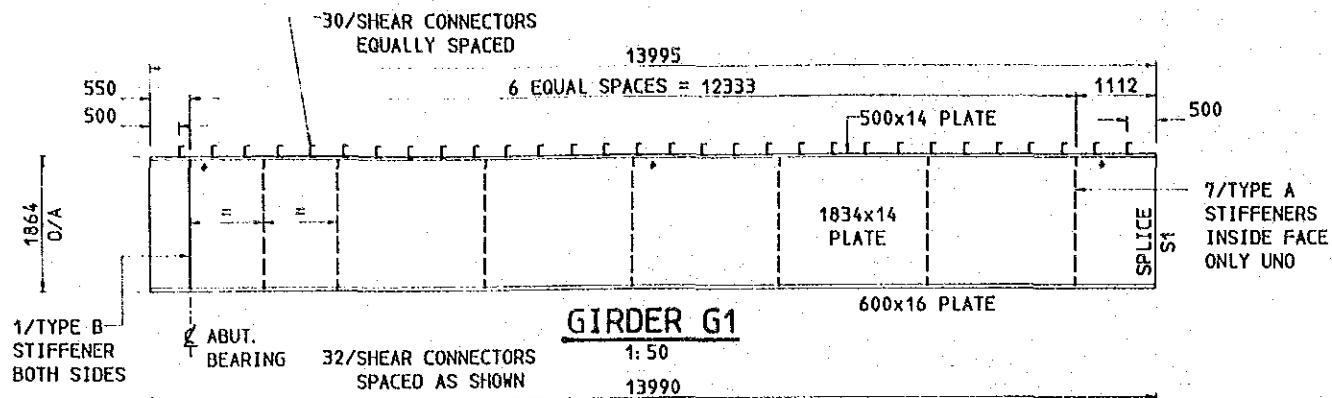
NOTE:  
65mm PILE COVER  
40mm H/STOCK COVER

REV.		AMENDMENTS		BY	APP'D	DATE	SURVEY		DESIGN		DRAWN		CHECKED		DESIGNED		CHECKED		RECOMMENDED		SCALES		CENTRAL GULF PROVINCES	
							JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		M.S.P.C. 20/11/89		1/1/89		1/1/89		1/1/89		1/1/89		PROJECT No. S.C. 120-33-814/B		TRANS-ISLAND HIGHWAY BERENA-MALALAU SECTION	
							Date		Date		Date		Date		Date		Date		Date		PROJECT No. S.C. 120-33-814/B		BRIDGE No. 7- TAURI BRIDGE	
							MEAN SEA LEVEL		JAPAN INTERNATIONAL CO-OPERATION AGENCY		PROJECT ENGINEER		PRINCIPAL ENGINEER		APPROVED		SECRETARY		SHEET 262 OF 303		DRAWING No. A1. 88 296		PIER DETAILS	
							HORIZONTAL DATUM		25 Sep. 1989		EXECUTIVE ENGINEER		SECRETARY						DEPARTMENT OF WORKS		PAPUA NEW GUINEA		P.L.S.	

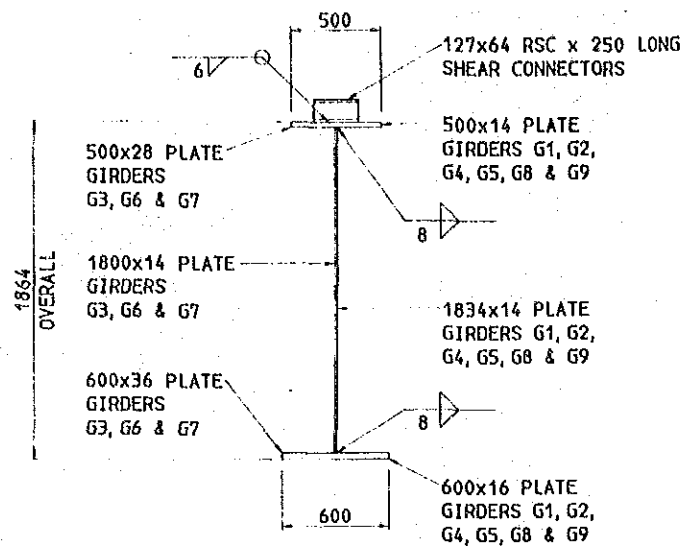
BEREINA  
END



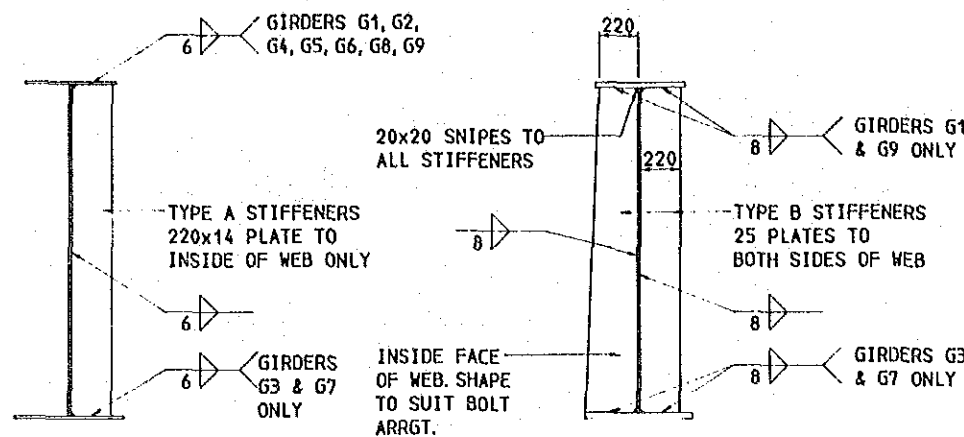
SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MKS, M.S.		RECOMMENDED		CENTRAL GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Principal <i>J. Y. ...</i> 25 Sep. 1989		CHECKED <i>M. ...</i>		PROJECT ENGINEER <i>Albertia</i> 1/11/89		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
HORIZONTAL DATUM		Date		CHECKED <i>M. ...</i>		APPROVED 1. 11. 89		BRIDGE No. 7 - TAURI BRIDGE	
SURVEY BOOK No. 5		Date		CHECKED <i>M. ...</i>		PRINCIPAL ENGINEER <i>J. ...</i>		DECK STEELWORK GENERAL ARRANGEMENT	
REV	AMENDMENTS	BY	APP'D	DATE	EXECUTIVE ENGINEER <i>M. ...</i> 1/11/89	SECRETARY <i>J. ...</i> 1/11/89	PROJECT No. S.C. 120-33-814/B	PAPUA NEW GUINEA DEPARTMENT OF WORKS	
							SHEET 263 OF 303	DRAWING No. A1 88297	



REV	AMENDMENTS		BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	RECOMMENDED	APPROVED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALUFA SECTION BRIDGE No.7- TAURI BRIDGE GIRDER DETAILS SHEET 1 PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88298
						JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	MKS, M-S				1:100	
						VERTICAL DATUM MEAN SEA LEVEL							
						HORIZONTAL DATUM							
						SURVEY BOOK No. S	Principal	25 Sep. 1989	Date	PROJECT ENGINEER	PRINCIPAL ENGINEER	PROJECT No. S.C. 120-33-811/B	

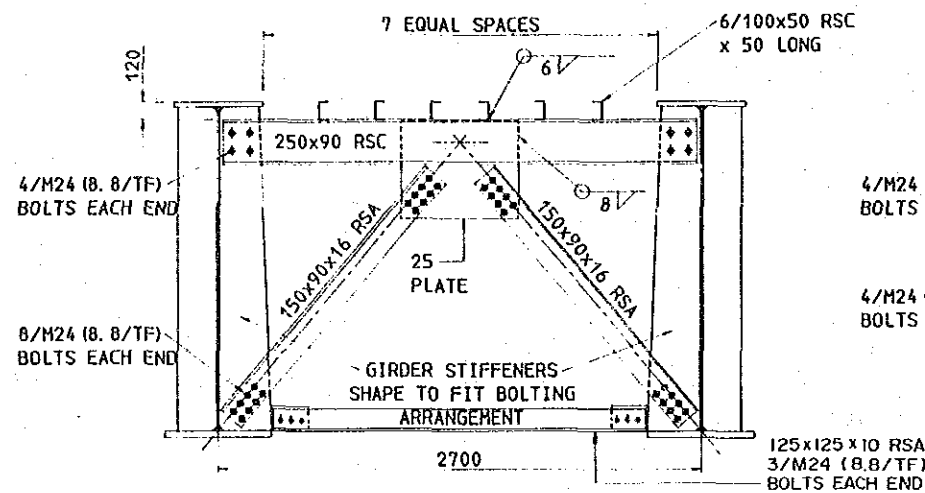


**TYPICAL SECTION**  
1: 20



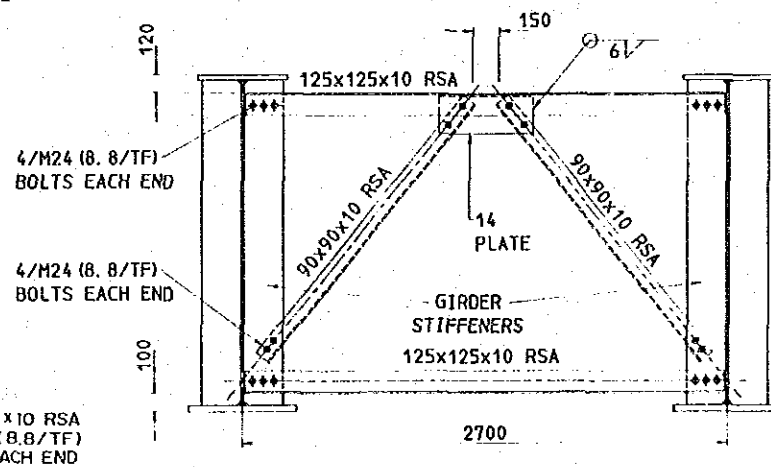
**SECTION TYPE A STIFFENER**  
1: 20

**SECTION TYPE B STIFFENER**  
1: 20

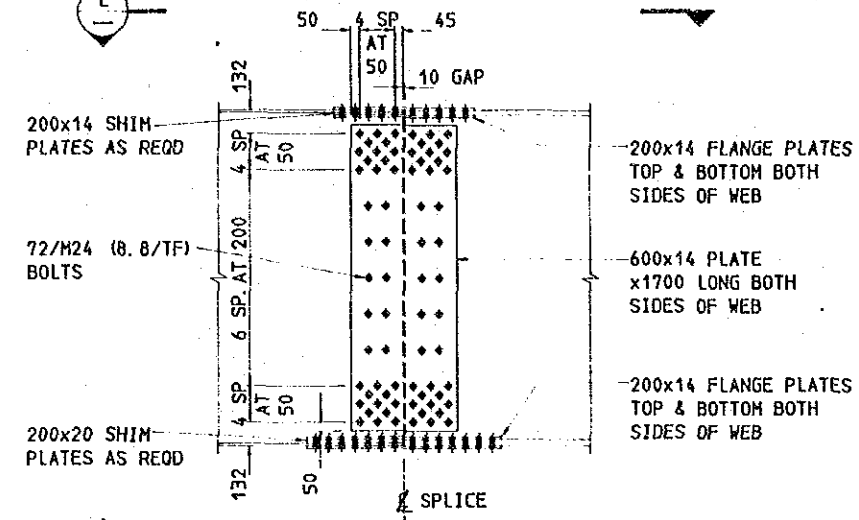
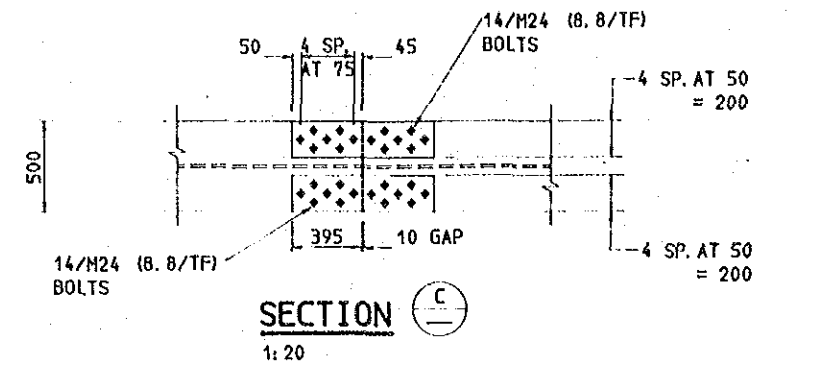


**SECTION CROSS GIRDER CG1**  
1: 20

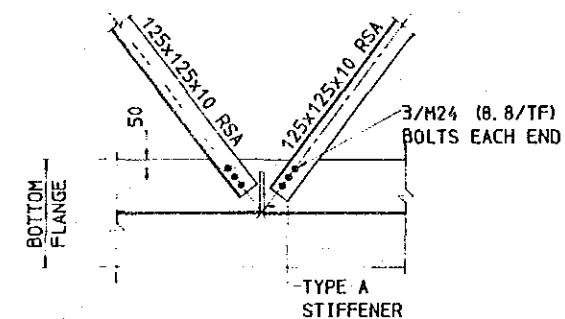
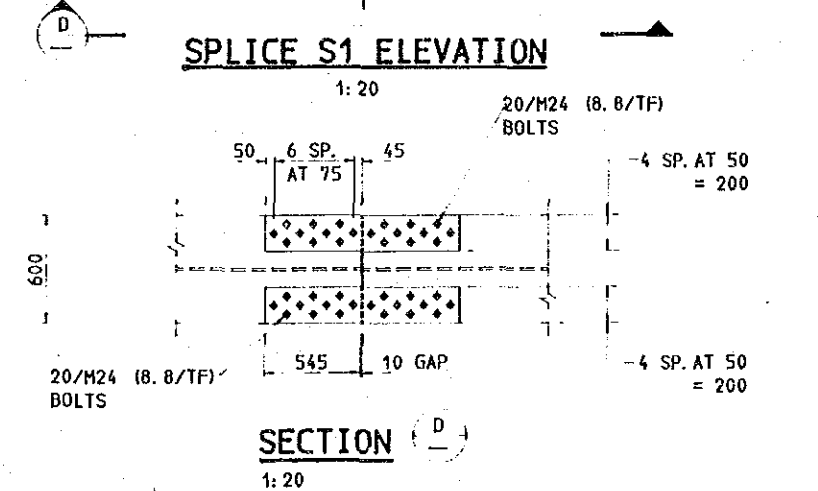
NOTE: SINGLE MEMBERS AT ABUTMENTS  
DOUBLE MEMBERS AT PIERS



**SECTION - TYPICAL TRANSVERSE BRACING FRAME**  
1: 20

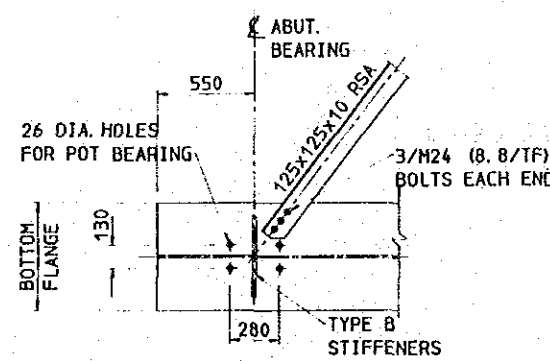


**SPLICE S1 ELEVATION**  
1: 20



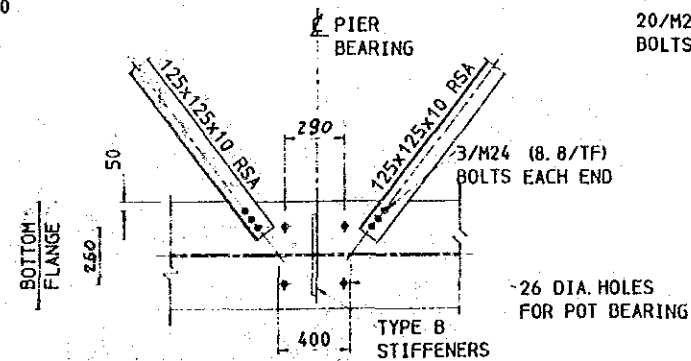
**TYPICAL BRACING DETAIL**  
1: 20

N. B. BRACING LOCATED TO TOP OF BOTTOM FLANGE



**TYPICAL BRACING DETAIL AT ABUTMENTS**  
1: 20

N. B. BRACING LOCATED TO TOP OF BOTTOM FLANGE

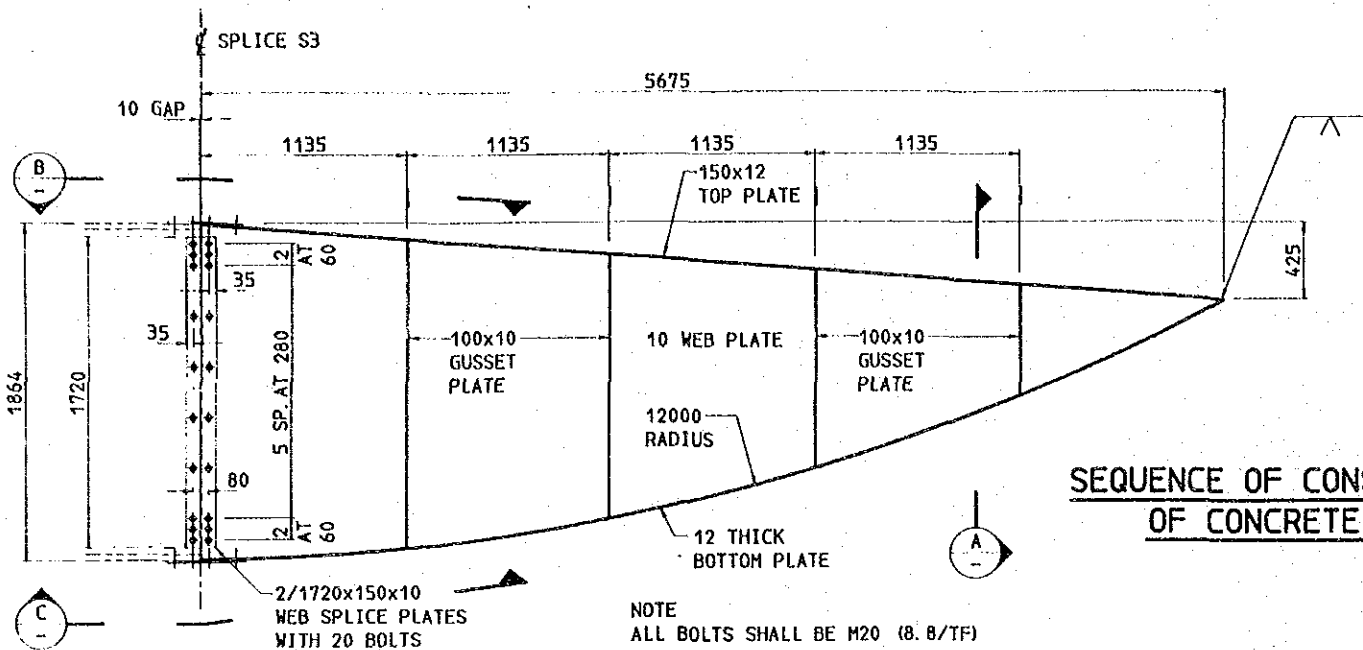


**TYPICAL BRACING DETAIL AT PIERS**  
1: 20

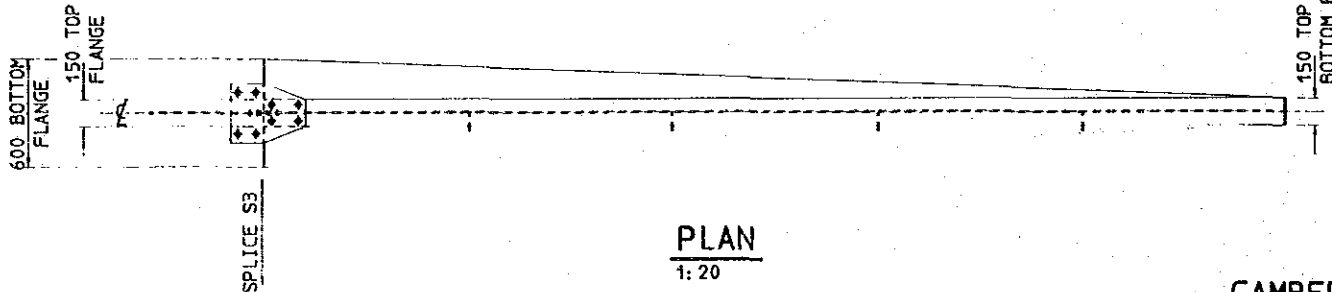
N. B. BRACING LOCATED TO TOP OF BOTTOM FLANGE

AMENDMENTS		BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	DESIGNED	CHECKED	RECOMMENDED	APPROVED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BERENI-MALALITA SECTION BRIDGE No.7 - TAURI BRIDGE GIRDER DETAILS SHEET 2	
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	MKS, M-S	d/Doc	M. Shingiz	d/Doc	11/1/89	11/1/89	1: 11. 89	SHEET 265 OF 303	PAPUA NEW GUINEA DEPARTMENT OF WORKS PROJECT No S.C. 120-33-814/15 DRAWING No A1 88299
					VERTICAL DATUM MEAN SEA LEVEL	Principal 25 Sep. 1989	PROJECT ENGINEER	PRINCIPAL ENGINEER	EXECUTIVE ENGINEER	SECRETARY					



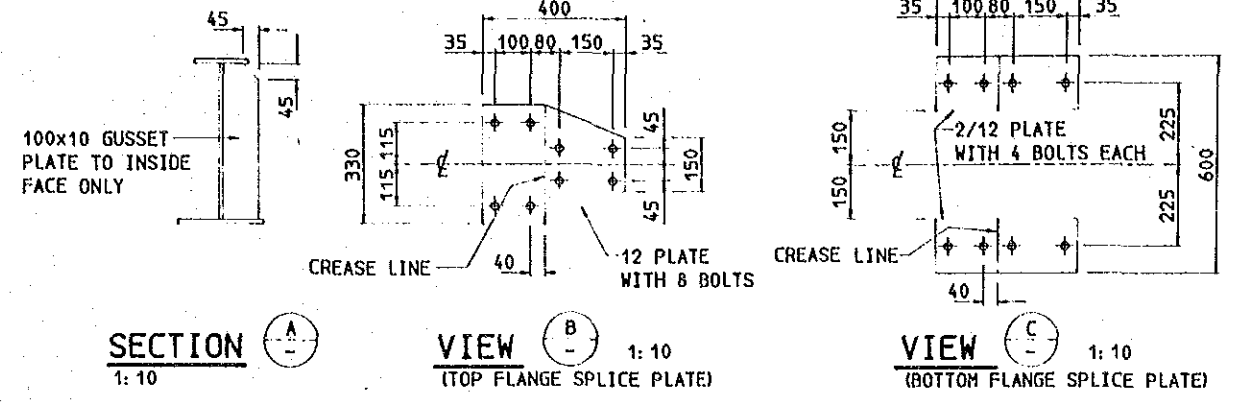


**ELEVATION LAUNCHING NOSE**  
1: 20

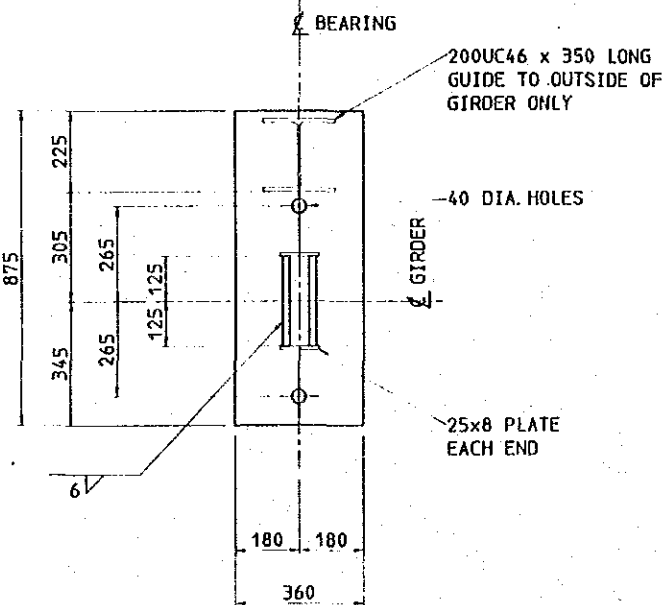


**PLAN**  
1: 20

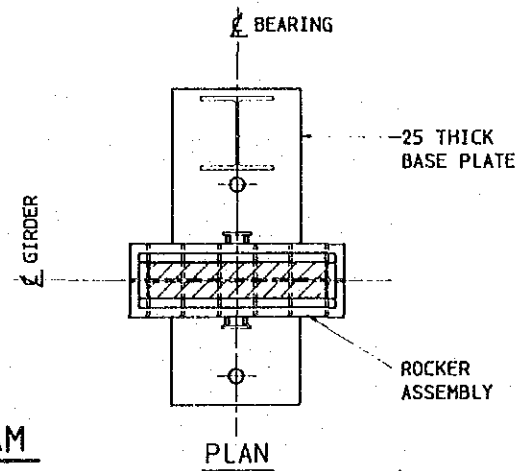
**SEQUENCE OF CONSTRUCTION OF CONCRETE DECK**



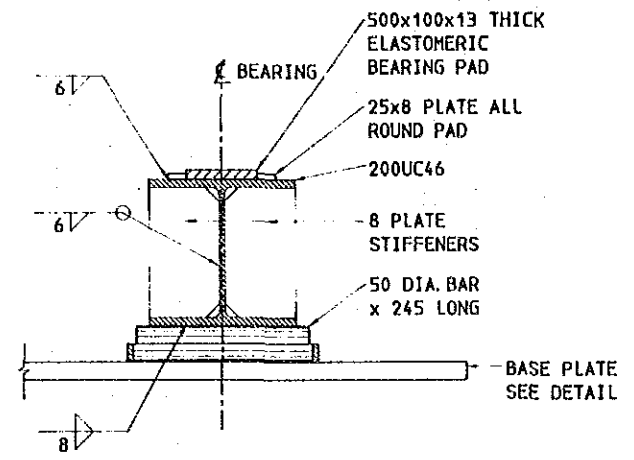
**CAMBER DIAGRAM**



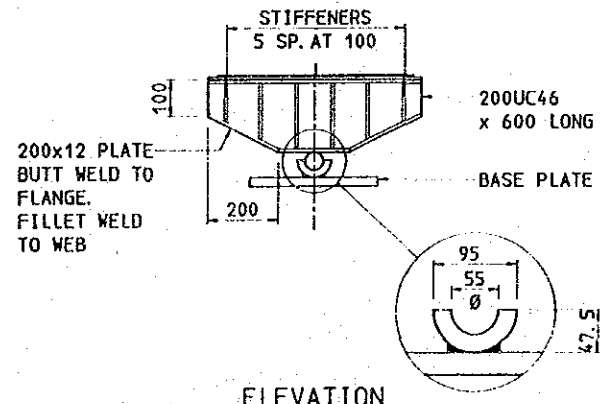
**LAUNCHING BEARING BASE PLATE**  
1: 10



**PLAN**



**SECTION THROUGH ROCKER ASSEMBLY**  
1: 5



**ELEVATION**

**LAUNCHING BEARING ASSEMBLY**  
1: 10

**NOTE**  
THE DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY THE CONTRACTOR SHALL DESIGN THE TEMPORARY WORKS FOR HIS LAUNCHING SYSTEM FOR THE CONSTRUCTION OF BRIDGE 7 TO SUIT HIS METHOD OF WORKING

**NOTES**

- ELASTOMERIC BEARING TO COMPLY WITH THE FOLLOWING
  - LAYERS OF BEARING FROM TOP DOWN SHALL BE
    - 1mm P. T. F. E. (UNFILLED)
    - 2mm ELASTOMER
    - 2mm STEEL PLATE
    - 4mm ELASTOMER
    - 2mm STEEL PLATE
    - 2mm ELASTOMER
  - THE RESIN USED IN THE P. T. F. E. LAYER SHALL BE 100 PERCENT VIRGIN MATERIAL WITH A RELATIVE DENSITY OF 2.13 TO 2.19 AND DUROMETER HARDNESS OF 50 TO 65.
  - STEEL AND RUBBER USED IN THE BEARINGS SHALL COMPLY WITH A. S. 1523.
- STEEL SHALL BE GRADE 250.
- STAINLESS STEEL STRIPS 150mm WIDE AND 1mm THICK WILL BE CONNECTED TO THE UNDERSIDE OF GIRDERS USING AN APPROVED DETAIL TO PROVIDE A SLIDING SURFACE DURING LAUNCHING. THE STAINLESS STEEL SURFACE SHALL CONFORM TO A. S. 1449 GRADE 316L, 2B FINISH.
- TEMPORARY SUPPORTS 25m FROM BEREINA ABUTMENT SHALL BE DESIGNED TO TAKE CONSTRUCTION HORIZONTAL LOADS AND A VERTICAL LOAD OF 450 kN/GIRDER DURING LAUNCHING.

REV	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY - BEREINA - MALALUA SECTION BRIDGE No. 7 - TAURI BRIDGE GIRDER LAUNCHING DETAILS
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	MKS, M-S	PROJECT ENGINEER		
					VERTICAL DATUM MEAN SEA LEVEL		4/1/89	4/1/89	PROJECT No. S.C. 120-33-814/B	DRAWING No. A1 88 300
					HORIZONTAL DATUM		1/1/89	1/1/89	SHEET 266 OF 303	
					SURVEY BOOK NO. 5	Principal 25 Sep. 1989	Checked 4/1/89	Checked 4/1/89		
							Executive Engineer	Secretary		

STAGES

1

2

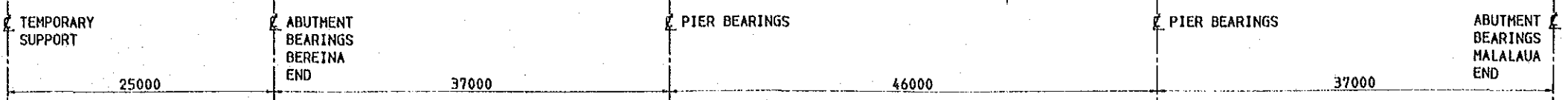
3

4

5

6

7



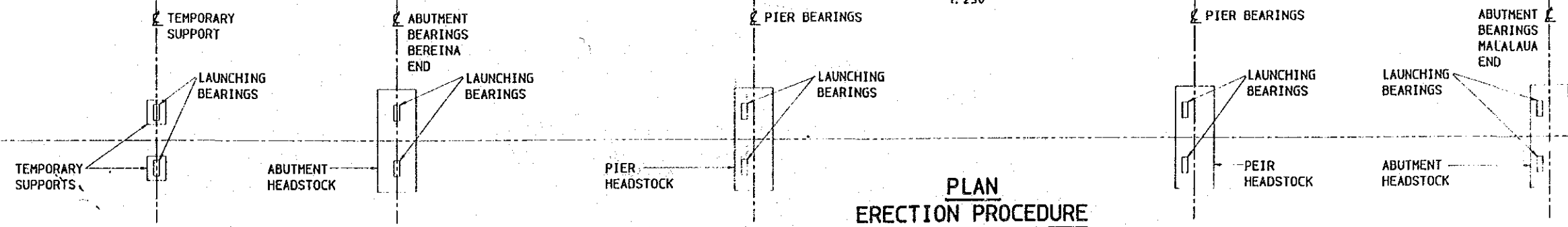
**NOTE**  
 THE DETAILS SHOWN ON THIS DRAWING ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL DESIGN THE TEMPORARY WORK FOR HIS LAUNCHING SYSTEM FOR THE CONSTRUCTION OF BRIDGE 7 TO SUIT HIS METHOD OF WORKING

REMOVE LAUNCHING BEARINGS & TEMPORARY SUPPORTS  
 RELOCATE BEARINGS TO MALALAU ABUTMENT

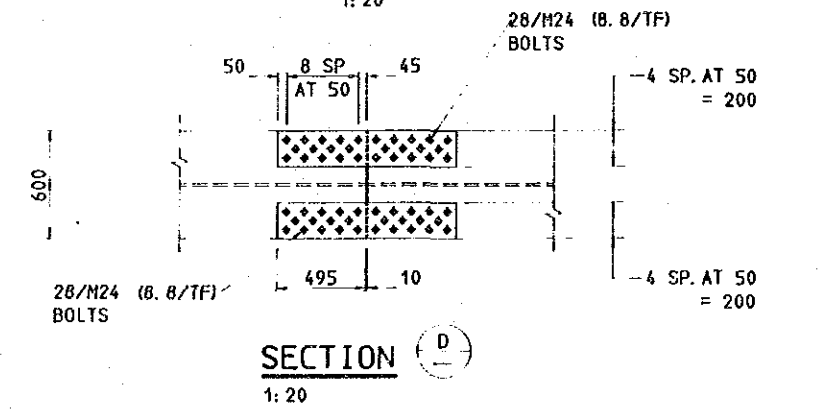
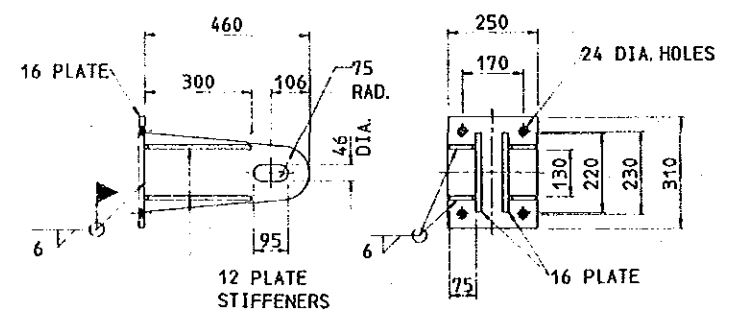
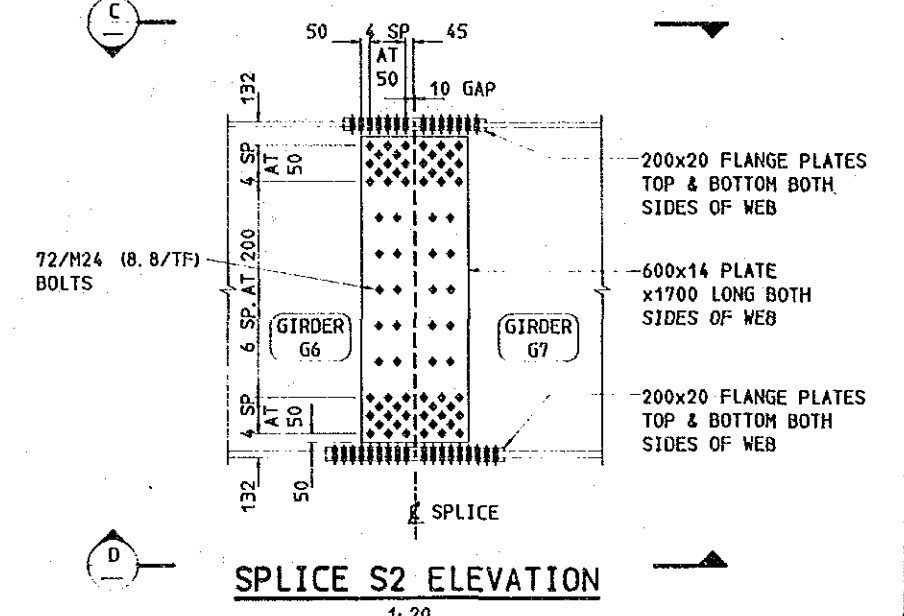
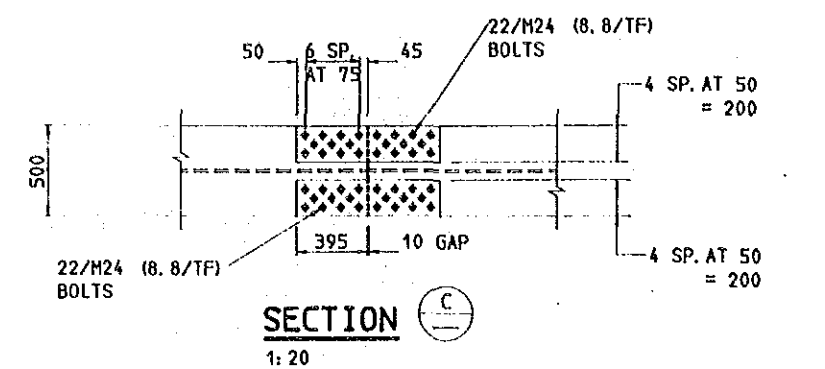
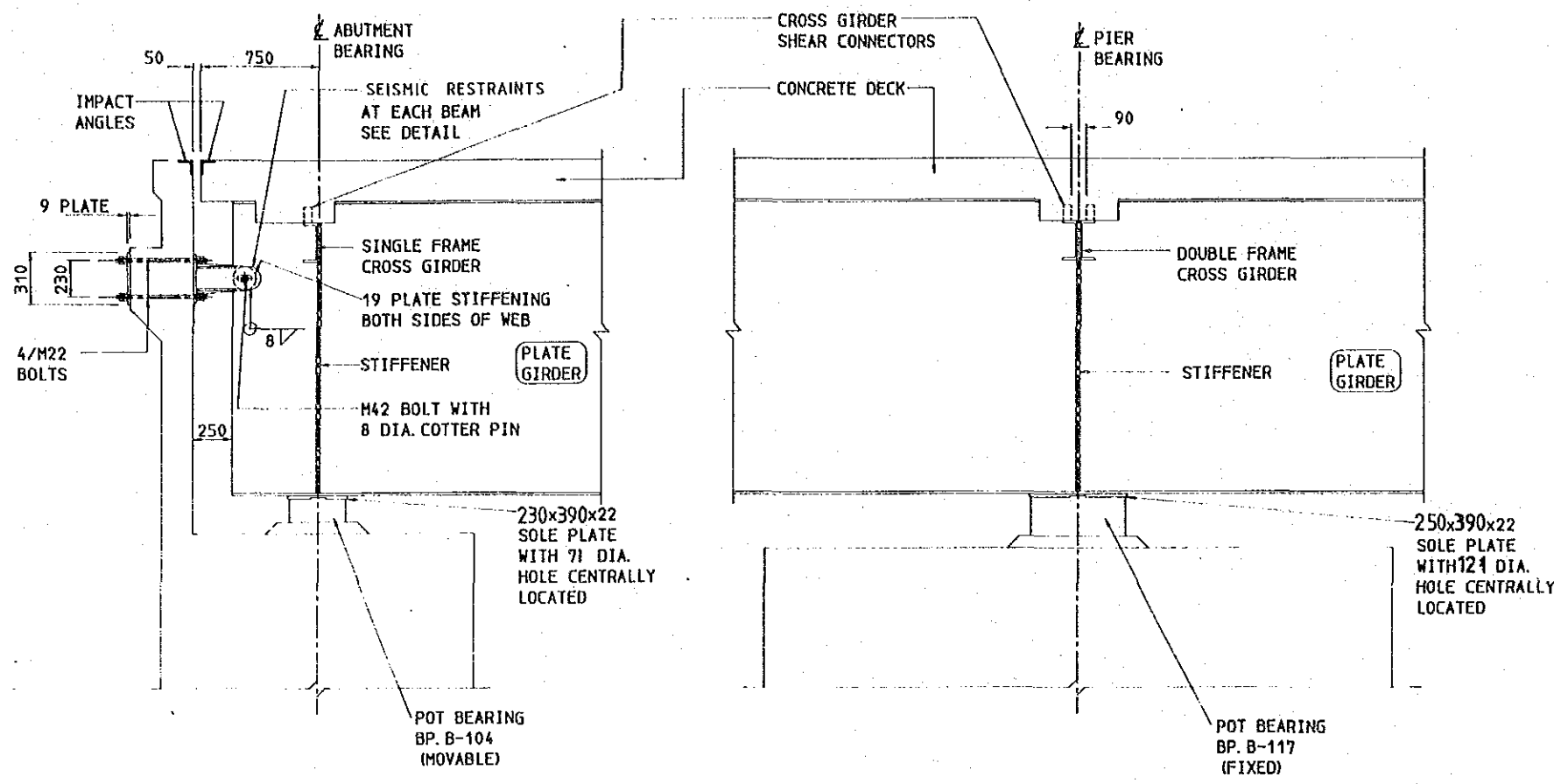
REMOVE NOSES

**ELEVATION  
 ERECTION PROCEDURE**  
 1: 250

**PLAN  
 ERECTION PROCEDURE**  
 1: 250

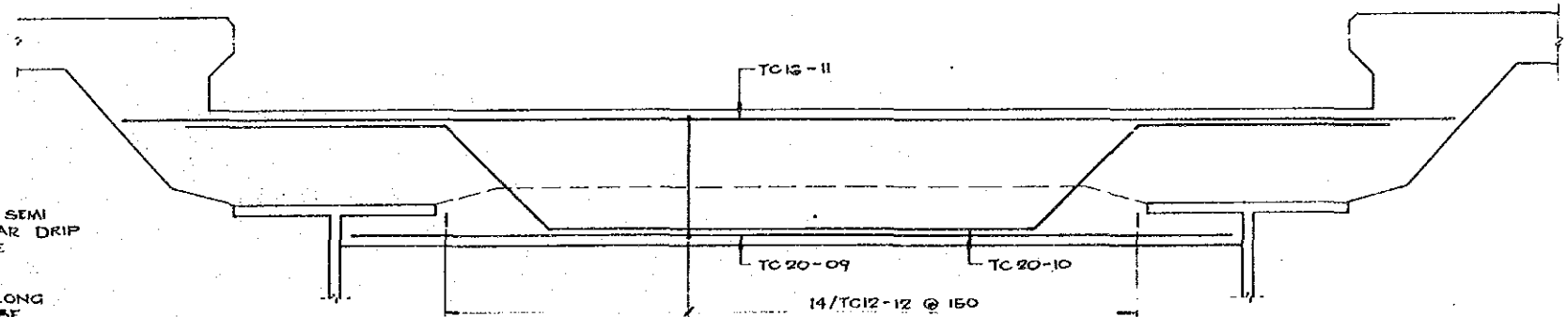
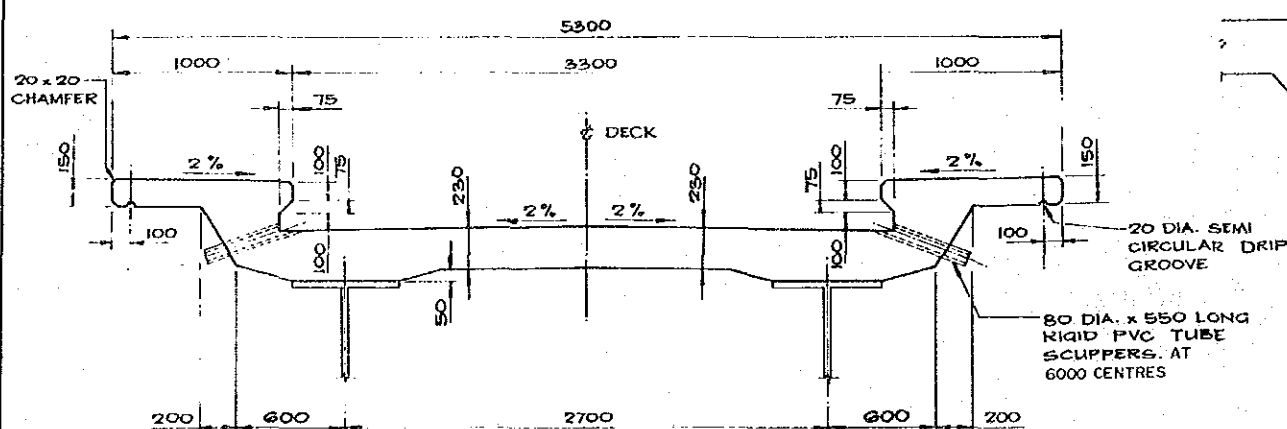
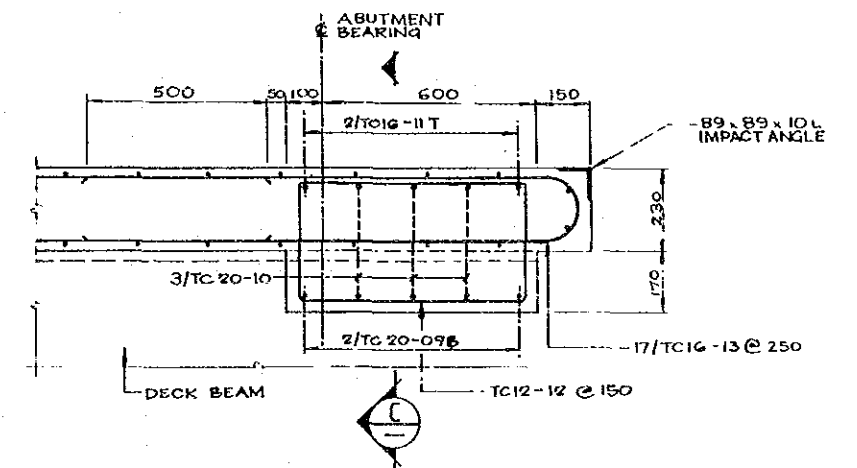
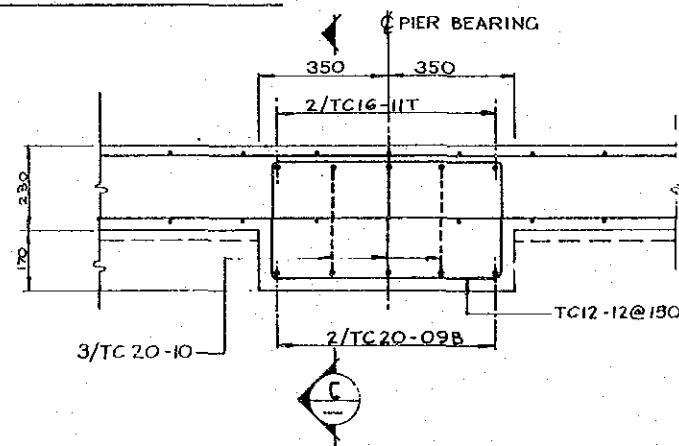
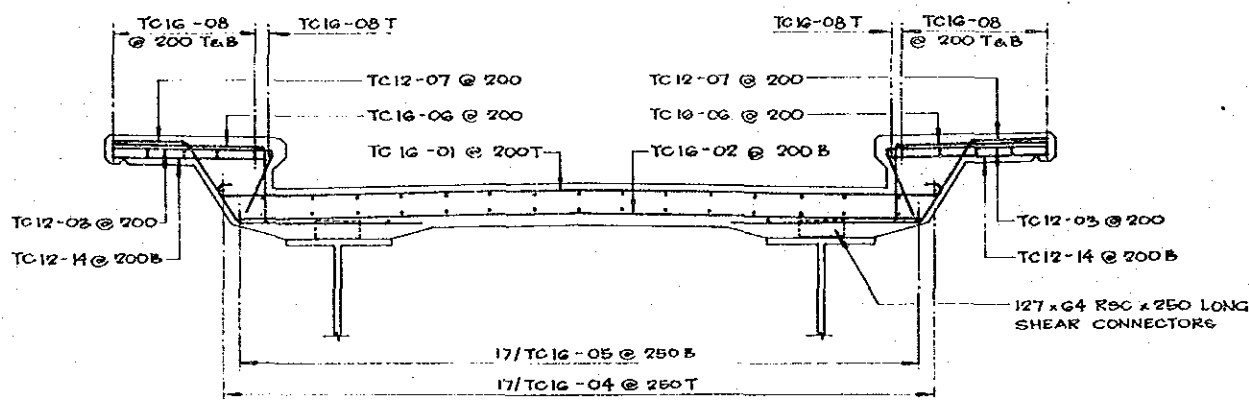
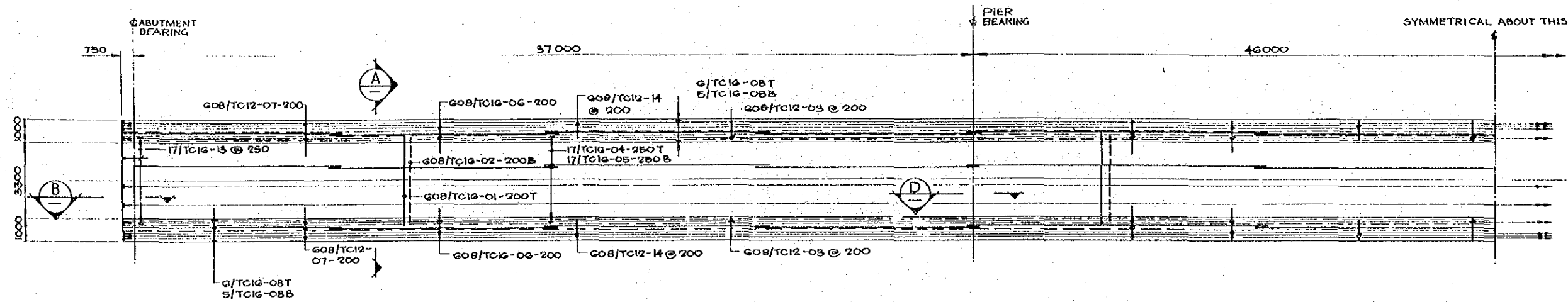


REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION BRIDGE No.7- TAURI BRIDGE GIRDER ERECTION PROCEDURE	PAPUA NEW GUINEA DEPARTMENT OF WORKS	DRAWING No A1 88301
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	MKS, M.S. CHECKED dy Bai	PROJECT ENGINEER 10/10/09				
					VERTICAL DATUM MEAN SEA LEVEL		DESIGNED M. Sking					
					HORIZONTAL DATUM		CHECKED dy Bai					
					SURVEY BOOK NO.5	Principal J. J. J. J.	EXECUTIVE ENGINEER 10/10/09			SHEET 267 OF 303		



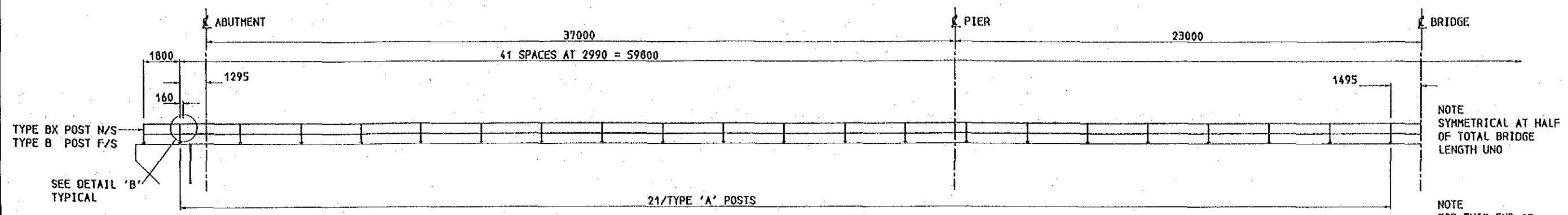
<b>SURVEY</b> JICA Date VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM		<b>DESIGN</b> JAPAN INTERNATIONAL CO-OPERATION AGENCY J. Yamazaki Principal 25 Sep. 1989 Date		<b>DRAWN</b> MKS, M'S CHECKED 4/20/89 PROJECT ENGINEER		<b>RECOMMENDED</b> 11/14/89 PRINCIPAL ENGINEER		<b>SCALES</b> - - - - -		CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY - BERENA-MALALUA SECTION <b>BRIDGE No. 7 - TAURI BRIDGE</b> DECK SECTIONS	
<b>DESIGNED</b> M. Shimizu CHECKED 4/20/89 EXECUTIVE ENGINEER		<b>APPROVED</b> 1. 11. 89 J. Yamazaki SECRETARY		<b>PROJECT No</b> S.C. 120-33-814/13		<b>SHEET</b> 268 OF 303		<b>PROJECT No</b> S.C. 120-33-814/13		<b>DRAWING No</b> A1 88302	
<b>REV</b> AMENDMENTS		<b>BY</b> APP'D DATE		<b>APPROVED</b> DATE		<b>PROJECT No</b> S.C. 120-33-814/13		<b>SHEET</b> 268 OF 303		<b>DRAWING No</b> A1 88302	





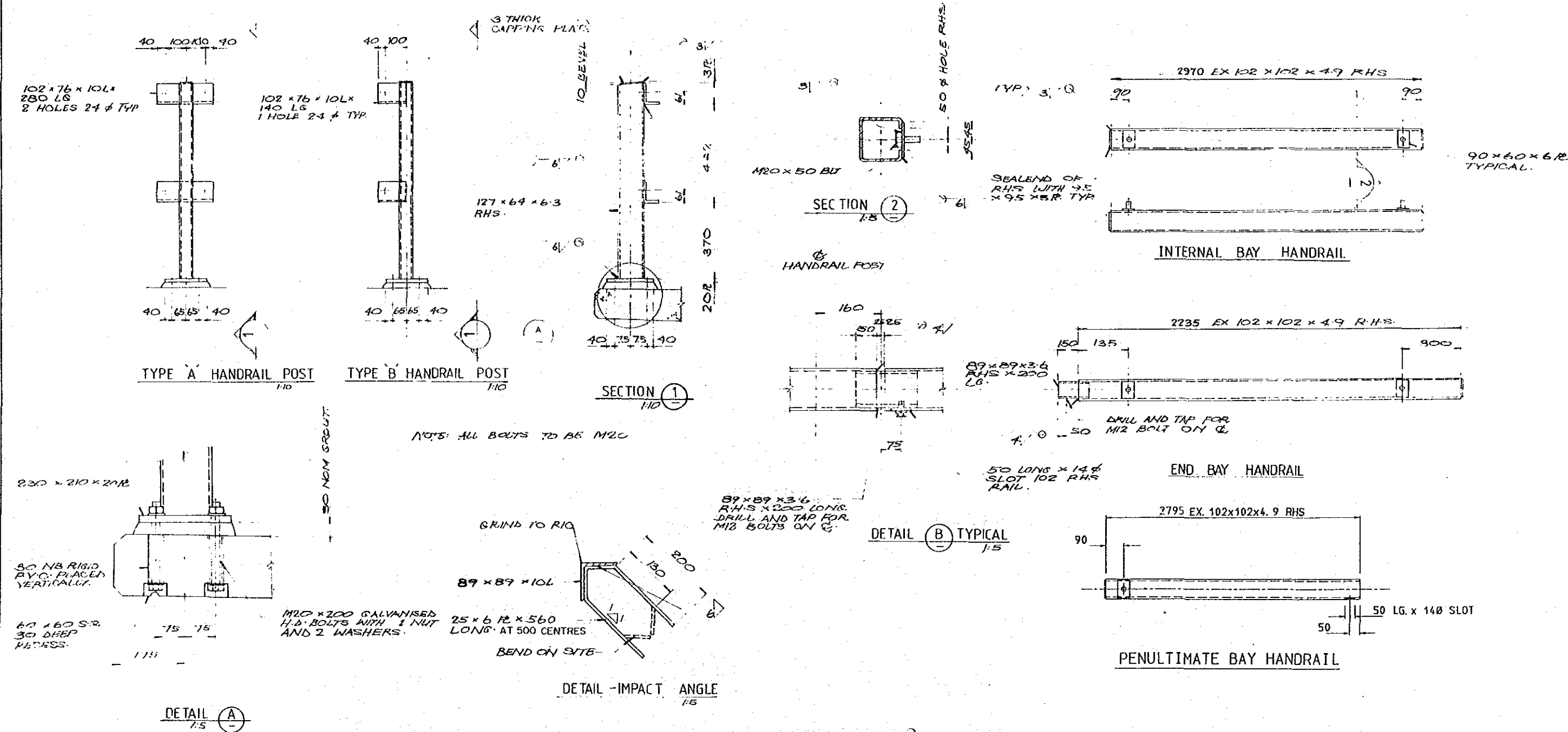
NOTE: DECK REINF. NOT SHOWN FOR CLARITY.

SURVEY		DESIGN		DRAWN		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES	
JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		MS		PROJECT ENGINEER		PROJECT No. S.C.120-33-814/B		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
Date		Principal		Checked		Principal ENGINEER		SHEET 270 OF 303		BRIDGE No.7- TAURI BRIDGE	
VERTICAL DATUM		J. J. J. J.		Designed		APPROVED		PROJECT No. S.C.120-33-814/B		DEPARTMENT OF WORKS	
MEAN SEA LEVEL		Principal		M. Shingir		1. 11. 89		DRAWING No. A1 88304		PAPUA NEW GUINEA	
HORIZONTAL DATUM		Principal		Checked		SECRETARY		REV.		DEPARTMENT OF WORKS	
SURVEY BOOK No.5		Principal		Checked		SECRETARY		REV.		DEPARTMENT OF WORKS	
BY		DATE		Checked		SECRETARY		REV.		DEPARTMENT OF WORKS	
AMENDMENTS		25 Sep. 1989		Checked		SECRETARY		REV.		DEPARTMENT OF WORKS	

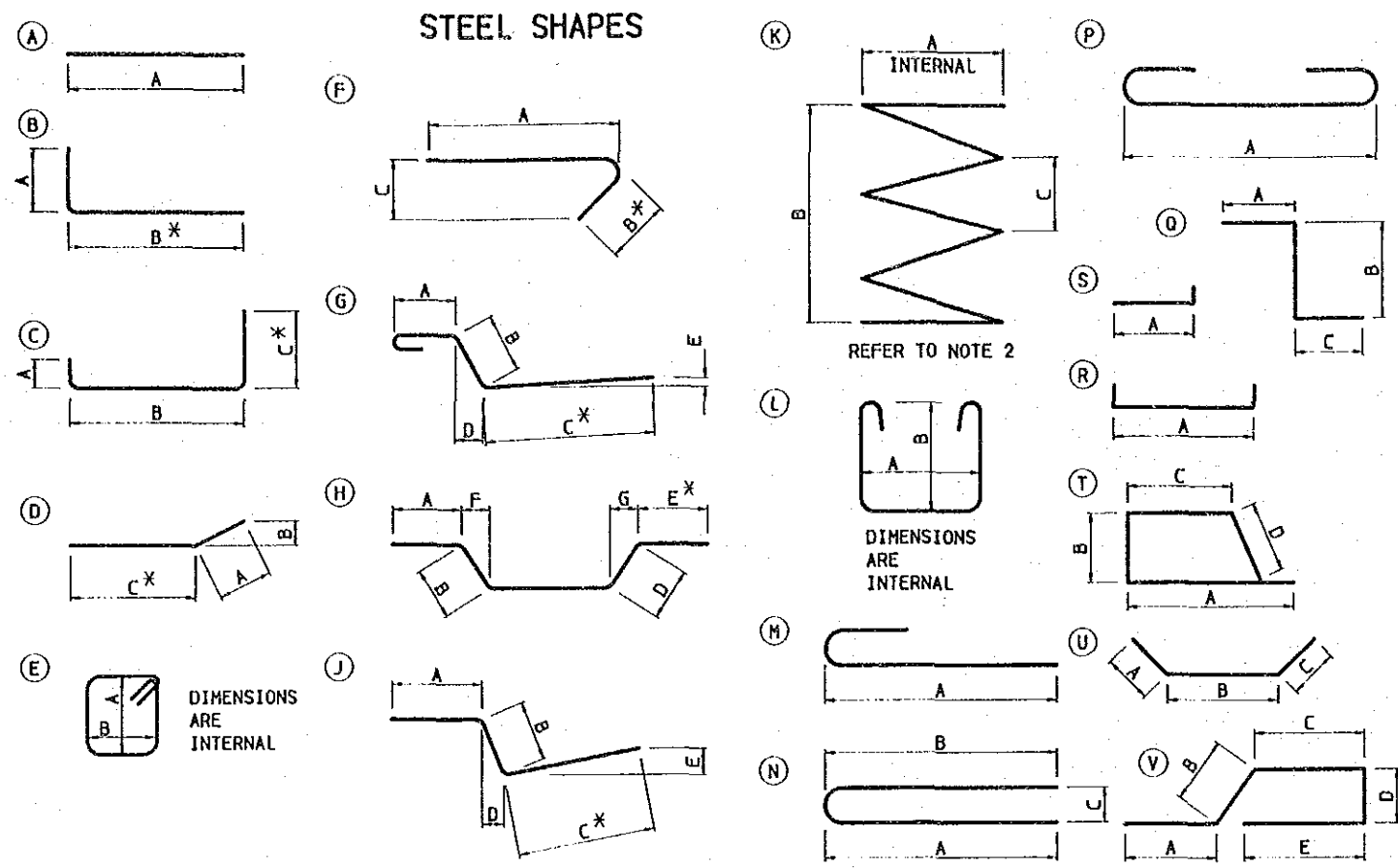


**TYPICAL ELEVATION ON HANDRAIL**

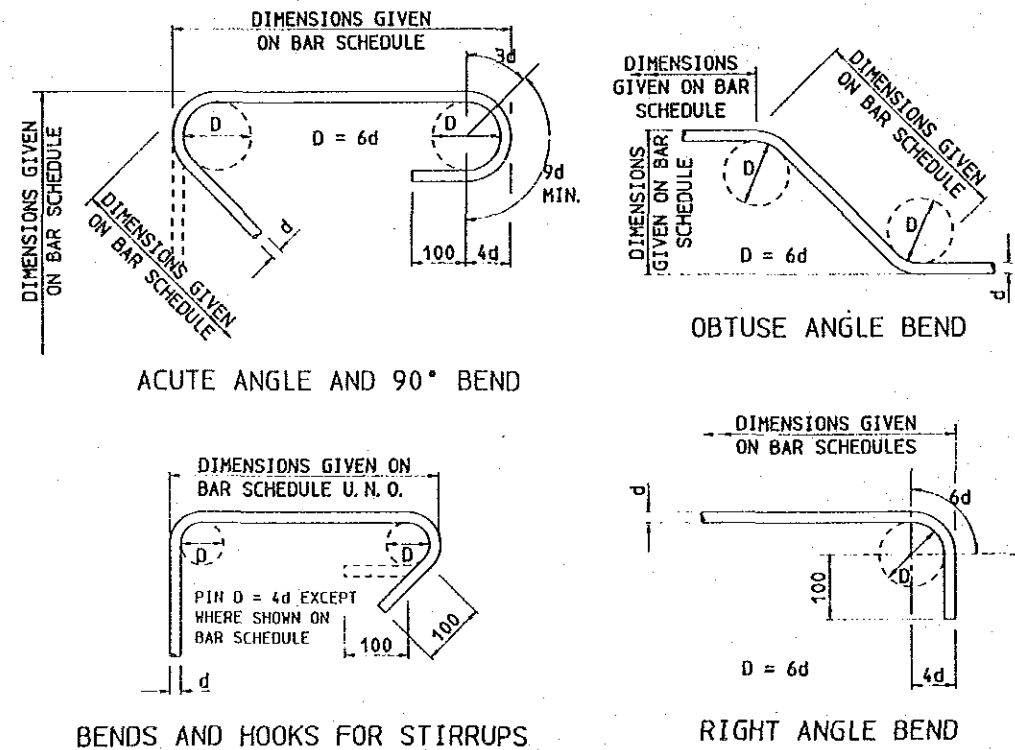
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REV	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BERENIA-MALALUA SECTION BRIDGE No 7 - TAURI BRIDGE HANDRAILING/IMPACT ANGLE DETAILS	PROJECT No S.C. 120-33-814/B	DRAWING No A1 88305
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S.					
					VERTICAL DATUM MEAN SEA LEVEL		Checked <i>[Signature]</i>	Checked <i>[Signature]</i>				
					HORIZONTAL DATUM		Designed <i>[Signature]</i>	Approved <i>[Signature]</i> 1.11.89				
					SURVEY BOOK No 5		Checked <i>[Signature]</i>	Checked <i>[Signature]</i>				
						Principal <i>[Signature]</i> 25 Sep. 1989	Executive Engineer <i>[Signature]</i>	Principal Engineer <i>[Signature]</i>				



### STANDARD HOOKS AND BENDS



BENDS AND HOOKS FOR STIRRUPS AND LIGATURES (ENCOMPASSING)

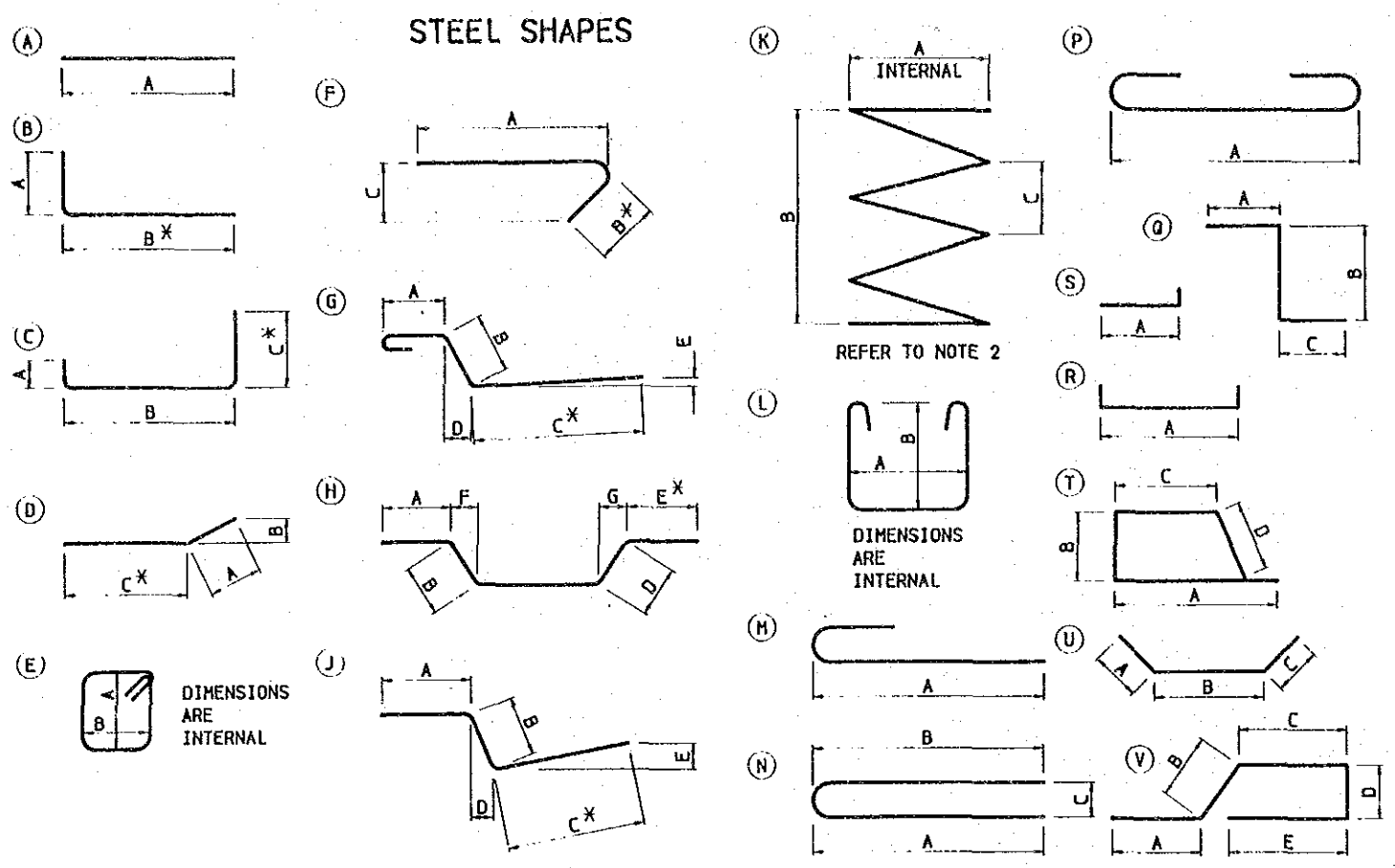
**TEMPCORE GRADE DEFORMED**

### NOTES

1. EXPLANATION OF BAR MARKS  
e.g. 40 - TC32 - 07 - 250 - B  
No. OFF      TYPE      LOCATION      SPACING      BAR MARK  
BAR DIAMETER      BAR MARK
2. SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG. 86052
3. DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
4. \* DENOTES TOLERANCE TO BE TAKEN UP ON THIS DIMENSION WHICH IS OMITTED FROM THE BAR BENDING SCHEDULE
5. \*\* DENOTES NO ALLOWANCE HAS BEEN MADE FOR LAPS
6. ALL HOOKS AND BENDS ARE TO BE IN ACCORDANCE WITH THE STANDARD DETAILS
7. OMISSION OF DIMENSION FOR PARTS OF STANDARD SHAPES IN THE SCHEDULE SHALL INDICATE DELETION OF THOSE PARTS
8. REINFORCING BARS TO BE EITHER  
a) DEFORMED TEMP CORE (T. C.) BARS GRADE 410  
b) PLAIN ROUND (R) BARS GRADE 230

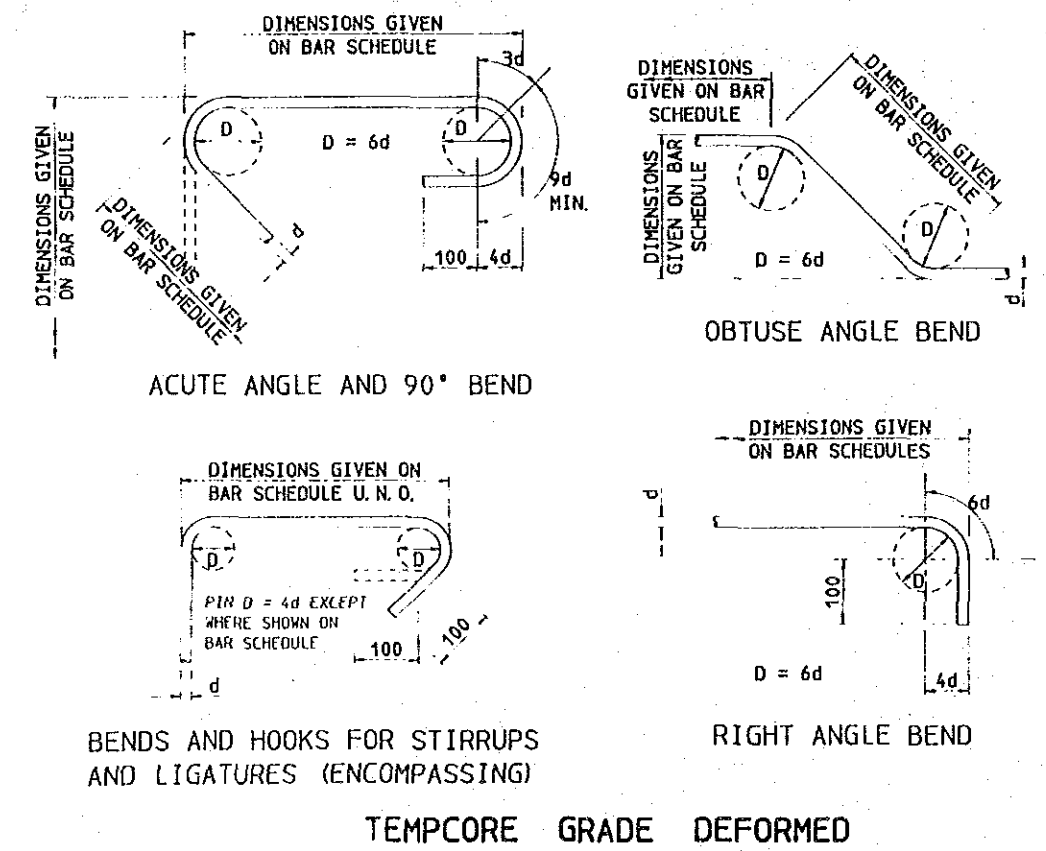
TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS	
TC16	01	608	4040							4040	3879	P		
TC16	02	608	3850							3850	3695	A		
TC16	03	1216	900	380	320					12080	23184	F		
TC16	04	17	119900							119900	3217	A	** SEE NOTE 5	
TC16	05	17	119900							119900	3217	A	** SEE NOTE 5	
TC16	06	1216	900	450	450					1800	3455	Q		
TC12	07	1216	440	500	*	250				1810	1954	J		
TC16	08	22	121400							121400	4216	A	** SEE NOTE 5	
TC20	09	8	2600							2600	51	A		
TC20	10	12	920	395	1500	395	920	280	280	4130	122	H		
TC16	11	8	4000							4000	51	A		
TC12	12	56	280	640						2060	102	E		
TC16	13	68	1380	1380	135					2810	302	N		
TC12	14	1216	900							900	972	A		
TOTAL TONNAGE = 48.417 TONNES IN DECK														
TC32	01	58	1000	5170	1000					7170	2625	C		
TC32	02	24	2200	5100	2200					9500	1439	C		
TC32	03	82	1000	3370	1000					5370	2780	C		
TC24	04	36	1800	1000	1800					4600	588	C		
TC32	05	132	1200	950	1200					3350	2792	C		
TC12	06	32	500	1000	500					2000	57	C		
TC12	07	16	500	800	500					1800	26	C		
TC24	08	96	1550	3200						4750	1619	B		
TC28	09	44	3200	3200						6400	1361	B		
TC28	10	50	3200	1920	3200					8320	2011	C		
TC24	11	100	2630							2630	934	P		
TC20	12	34	2900							2900	243	A		
TC20	13	34	2900							2900	243	A		
TC20	14	48	5240							5240	620	A		
TC20	15	6	3600							3600	53	A		
TC20	16	30	740	320	330	450				1808	134	T		
TC16	17	44	200	550	200					950	66	U		
TC16	18	64	300	310				(8SETS)		610	135	B	INCREMENT=100	
				2410						2710				
TC16	19	128	300	800				(8SETS)		1100	374	B	INCREMENT=300	
				2300						2600				
TC16	20	8	715	600	3100					3815	48	D		
TC16	21	72	200	500	200					900	102	U		
TC16	22	24	2640							2640	100	A		
TC16	23	72	900	90	900					1826	208	N		
TC16	24	48	2640							2640	200	A		
TC20	25	40	3300							3300	326	A		
TC24	26	72	9220							9220	2357	A		
R12	27	6	646	9220	150					131107	699	K		
TC24	28	144	300	1700						2000	1023	B		
R12	29	6	646	10720	150					151757	809	K		
TC24	30	72	10720							10720	2741	A		
TOTAL TONNAGE = 26.713 TONNES IN 2 ABUTMENTS														

		SURVEY <b>JICA</b> Date VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM SURVEY BOOK No.	DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal: <i>J. Habibe</i> Date: 25 Sep. 1989	DRAWN MKS, M'S CHECKED <i>d. dai</i> DESIGNED <i>M. Shimizu</i> CHECKED <i>d. dai</i>	RECOMMENDED <i>Abdullah</i> PROJECT ENGINEER APPROVED <i>J. Leonard</i> PRINCIPAL ENGINEER I. II. 89 EXECUTIVE ENGINEER SECRETARY	SCALES 	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALUCA SECTION BRIDGE No.7 - TAURI BRIDGE BAR BENDING SCHEDULE SHEET 1 PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88306
REV	AMENDMENTS	BY	APP'D	DATE	SHEET 272 OF 303	PROJECT No. S.C. 120-33-814/B	



TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC36	60	240	12000							12000	23014	A	
R12	61	8	846	21700	140					423550	3009	K	
TC36	62	240	400	2850						3250	6233	B	
TC32	63	40	1100	5220	1100					7420	1874	C	
TC32	64	44	1100	3920	1100					6120	1700	C	
TC32	65	42	1100	5220	1100					7420	1967	C	
TC32	66	54	1100	3920	1100					6120	2086	C	
TC24	67	24	2100	1100	2100					5300	452	C	
TC28	68	12	5200							5200	302	A	
TC28	69	12	800	3850	800					5450	316	C	
TC12	70	8	500	800	500					1800	14	C	
TC12	71	24	500	800	500					1800	39	C	
TC32	72	96	1100	1150	1100					3350	2030	C	
TC28	73	240	11250							11250	13052	A	
TOTAL TONNAGE = 56,088 TONNES IN 2 No. PIERS													

### STANDARD HOOKS AND BENDS

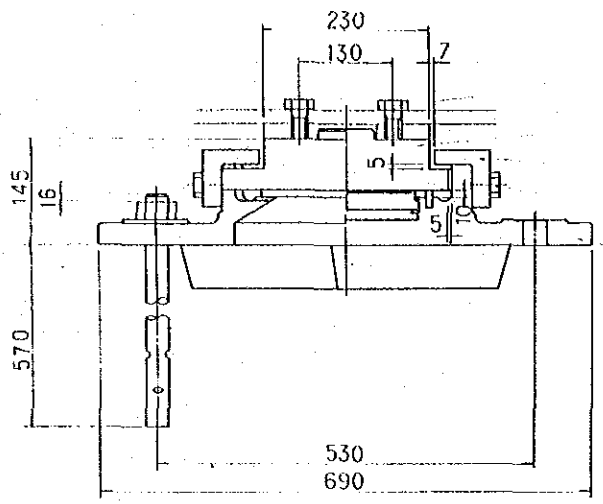


- #### NOTES
- EXPLANATION OF BAR MARKS  
e.g. 40 - TC32 - 07 - 250 - B  
No. OFF      TYPE      LOCATION      SPACING      BAR MARK  
BAR DIAMETER
  - SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG. 86052
  - DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
  - \* 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

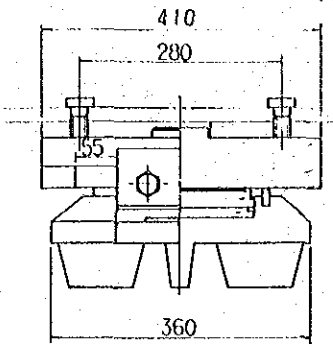
REV	AMENDMENTS	BY	APP'D	DATE	SURVEY JICA Date VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM SURVEY BOOK No. S	DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Date Principal	DRAWN M.S. CHECKED DESIGNED CHECKED	RECOMMENDED PROJECT ENGINEER APPROVED EXECUTIVE ENGINEER	SCALES PROJECT No. S.C.120-33-814/B	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALUCA SECTION BRIDGE No.7 - TAURI BRIDGE BAR BENDING SCHEDULE SHEET 2 PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88307
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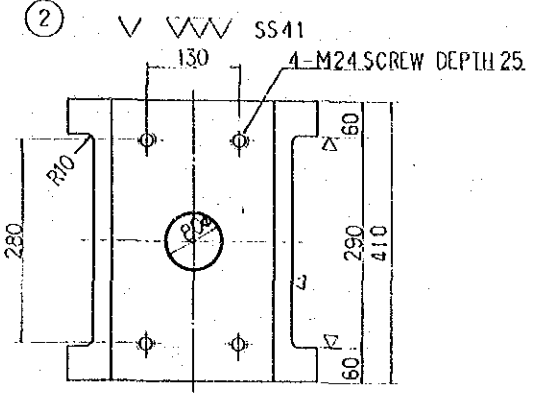
R-75<sup>TON</sup> Mov BEARING



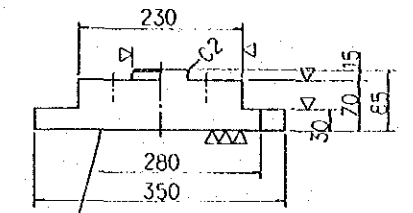
- ⑨
- ②
- ⑦
- ⑧
- ①
- ⑩



- ③
- ⑥
- ④
- ⑤



- ⑦ ~ (V) SS41
- ⑧ SS41



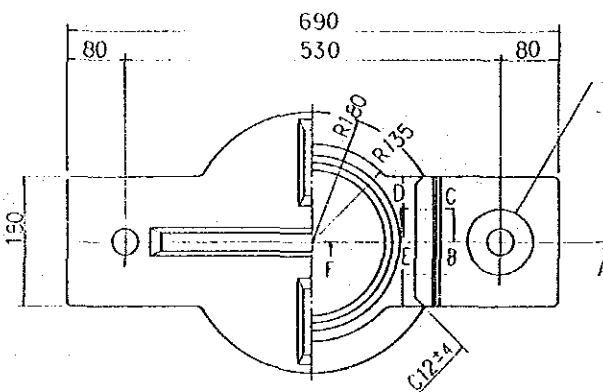
DESIGN CONDITION

TOTAL REACTION	R	71.2 ton
DEAD LOAD REACTION	Rd	34.7 ton
LIVE LOAD REACTION	R(l.i)	36.5 ton
LONGITUDINAL FORCE (FRICTION)	RH11	7.1 ton
LONGITUDINAL FORCE (EARTHQUAKE)	RH1e	14.6 ton
TRANSVERSE FORCE (EARTHQUAKE)	RH2e	14.6 ton
UPLIFT (EARTHQUAKE)	V	3.5 ton
MOVABLE LENGTH	e1	50 mm
DESIGNED LENGTH	e2	70 mm
TOTAL LENGTH	e	110 mm
SEISMIC COEFFICIENT	KII	0.42
FRICTION COEFFICIENT	f	0.1
BEARING STRESS OF CONCRETE	$\sigma_{ba}$	80 kg/cm <sup>2</sup>

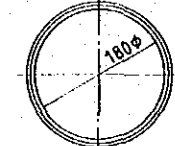
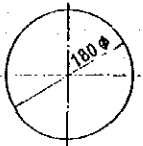
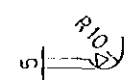
MATERIAL LIST

NO	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	68.3	
2	UPPER BEARING	SS41	1	59.2	
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	M20-60
9	BOLT	SS41	4	0.7	M24-54
10	ANCHOR BOLT-NUT	SS41	2	11.2	
TOTAL WEIGHT (kg)				154.2	

- ① ~ (V) 12.5S SC46

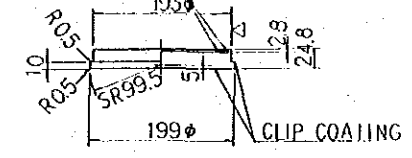


"A" DETAIL

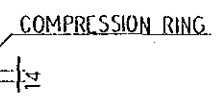
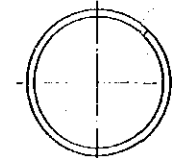


HARD CHROMIUM COATINGS

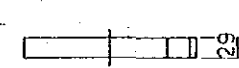
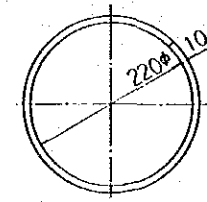
CLIP COATING



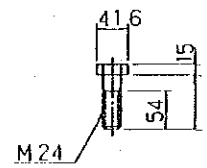
- ⑤ ~ CHLOROPRENE RUBBER



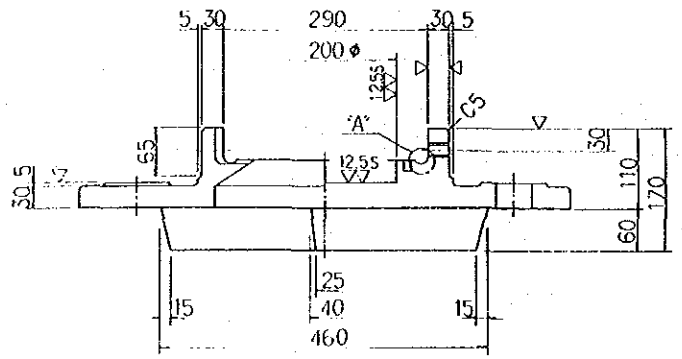
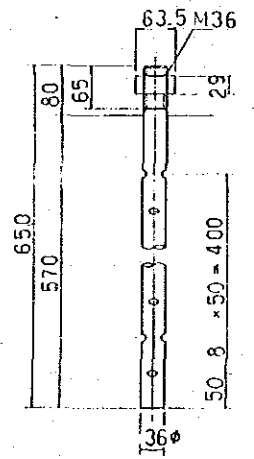
- ⑥ ~ CHLOROPRENE RUBBER



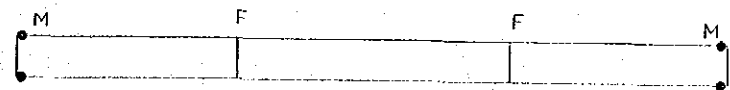
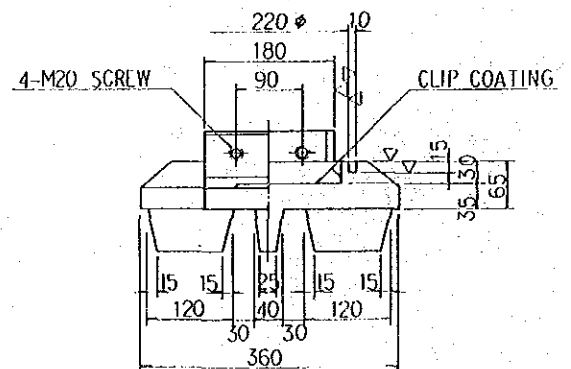
- ⑨ SS41



- ⑩ ~ SS41

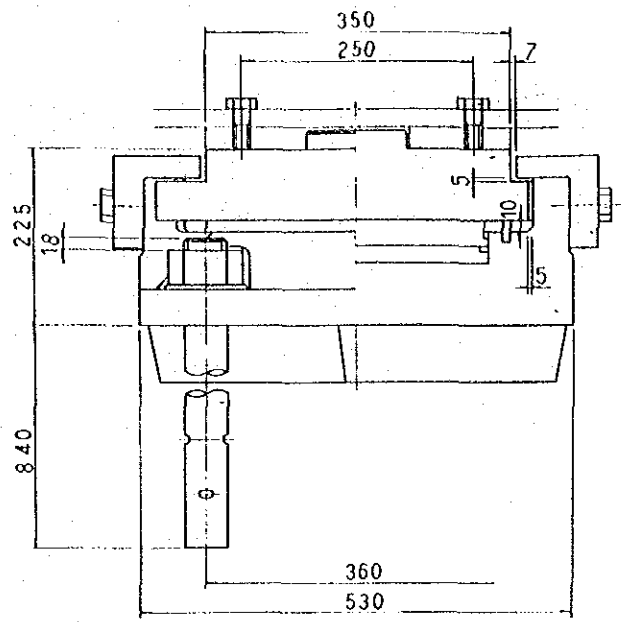


SECTION "ABCDE"

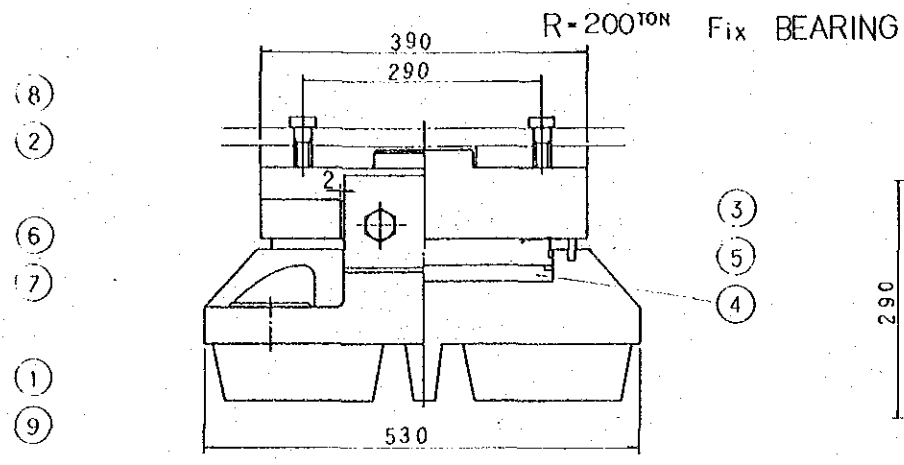


PLAN

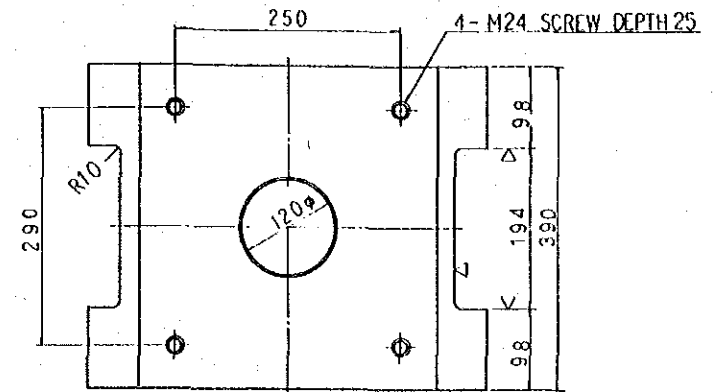
REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	RECOMMENDED	APPROVED	SCALES	CENTRAL / GULF PROVINCES TRANS-ISLAND HIGHWAY HERBINA-MALALUA SECTION BRIDGE No.7- TAURI BRIDGE BEARING BP-B # 104 MOVABLE PAPUA NEW GUINEA DEPARTMENT OF WORKS
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S	y Dai	1/10/79	1/10/79	1/10/79	
					VERTICAL DATUM MEAN SEA LEVEL							SHEET 274 OF 303
					HORIZONTAL DATUM							
					SURVEY BOOK NO.	Principal						
					25 Sep. 1989							



①  $\sim (\nabla \nabla) \text{SC 46}$



③  $\nabla (\nabla) \text{SS 41}$



⑥  $\sim (\nabla) \text{SC 46}$

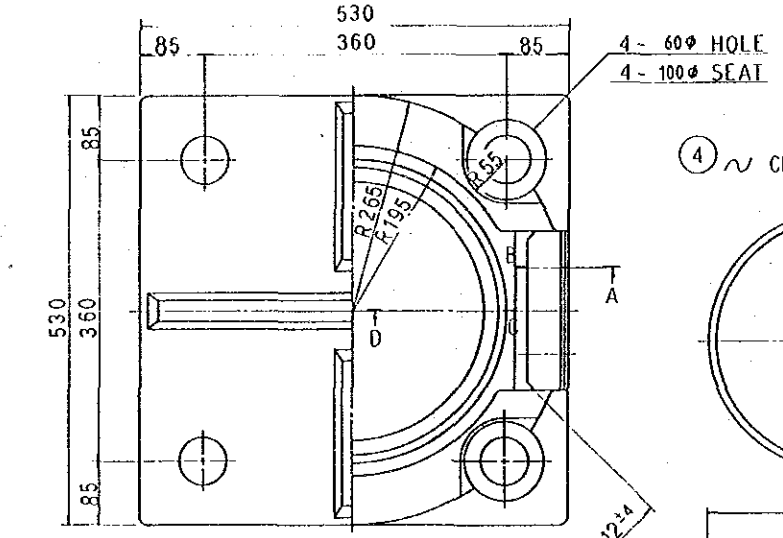
⑦  $\text{SS 41}$

DESIGN CONDITION

TOTAL REACTION	R	190.2	ton
DEAD LOAD REACTION	Rd	116.5	ton
LIVE LOAD REACTION	R(L)	73.7	ton
LONGITUDINAL FORCE (FRICTION)	R(L) f	19.0	ton
LONGITUDINAL FORCE (EARTHQUAKE)	R(L) e	63.5	ton
TRANSVERSE FORCE (EARTHQUAKE)	R(T) e	48.9	ton
UPLIFT (EARTHQUAKE)	V	11.7	ton
SEISMIC COEFFICIENT	KII	0.42	
FRICTIVE COEFFICIENT	f	0.1	
BEARING STRESS OF CONCRETE	$\sigma_{ba}$	80	$\text{kg/cm}^2$

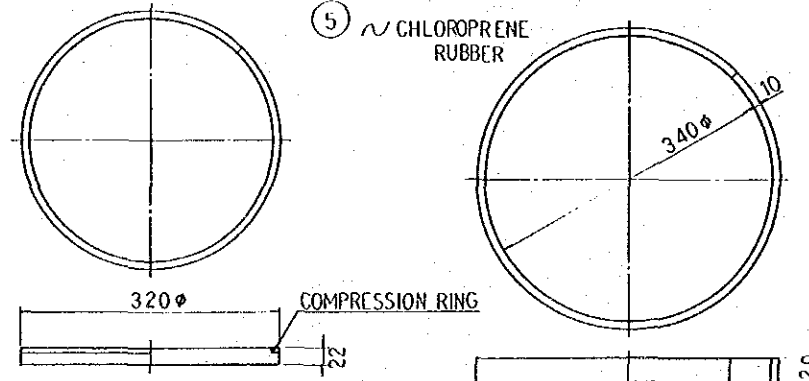
MATERIAL LIST

MAKE	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC 46	1	205.0	
2	UPPER BEARING	SC 46	1	117.0	
3	MIDDLE PLATE	SS 41	1	17.1	
4	RUBBER PLATE	CHLOROPRENE RUBBER	1	2.3	
5	SEAL RING	CHLOROPRENE RUBBER	1	0.4	
6	SIDE BLOCK	SC 46	2	21.8	
7	BOLT	SS 41	4	1.4	M24 x 70 (S=54)
8	BOLT	SS 41	4		M24 x 54 (S=54)
9	ANCHOR BOLT NUT	SS 41	4	75.5	
TOTAL WEIGHT (kg)				440.5	

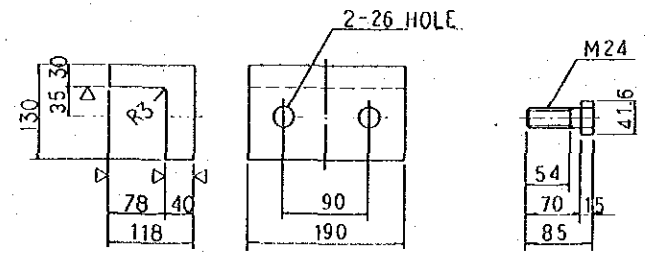
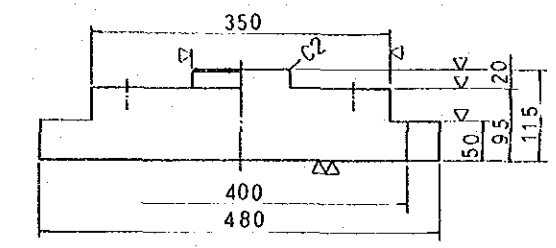


④  $\sim \text{CHLOROPRENE RUBBER}$

⑤  $\sim \text{CHLOROPRENE RUBBER}$

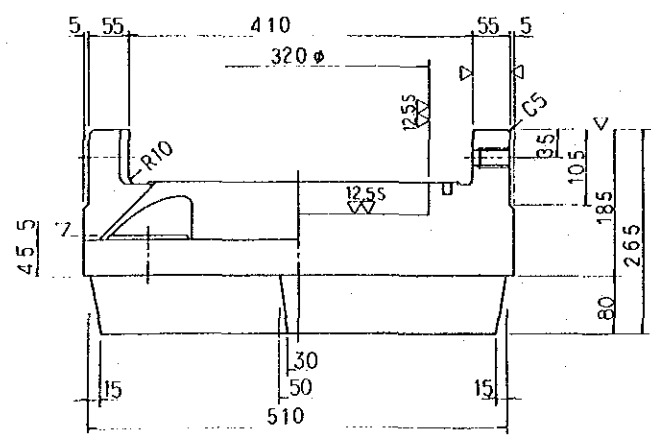
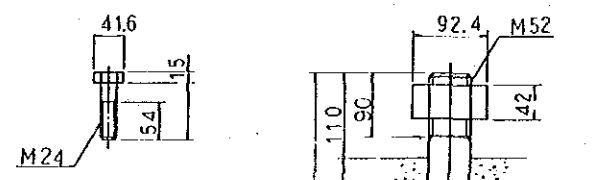


COMPRESSION RING

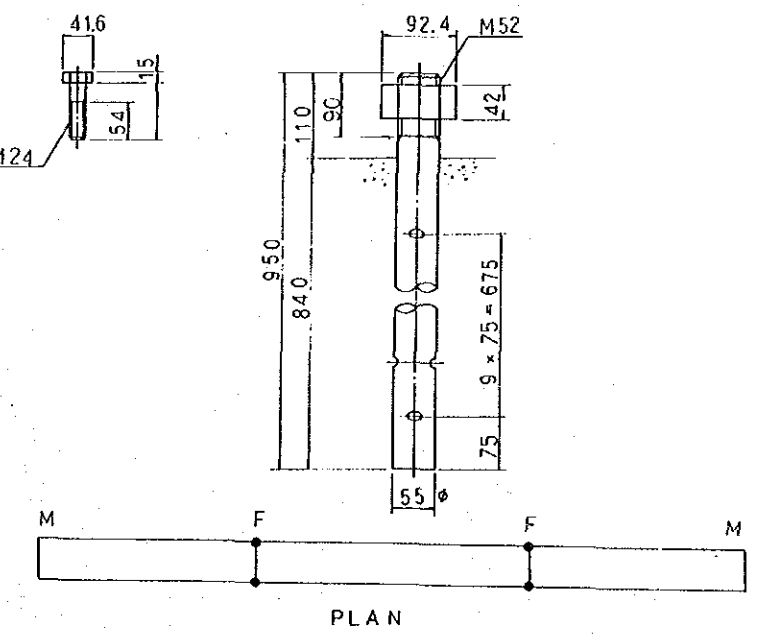
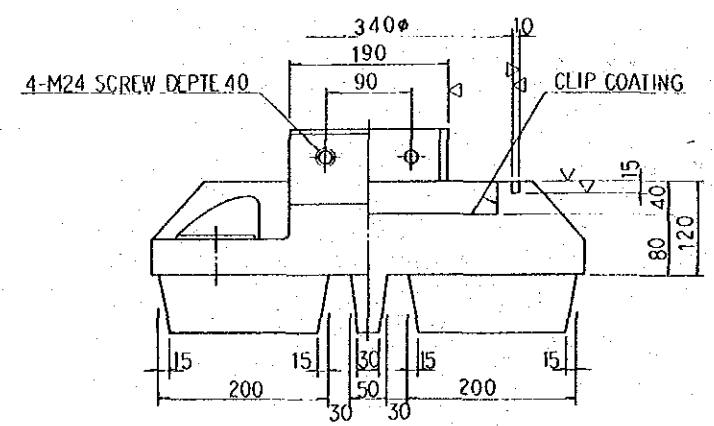


⑧  $\text{SS 41}$

⑨  $\sim \text{SS 41}$



SECTION "ABCD"



PLAN

REV	AMENDMENTS			BY	APP'D	DATE	SURVEY		DESIGN		DRAWN		RECOMMENDED		SCALES		CENTRAL / GULF PROVINCES			
							JICA		JAPAN INTERNATIONAL CO-OPERATION AGENCY		M-S		PROJECT ENGINEER		PRINCIPAL ENGINEER		1:1		TRANS-ISLAND HIGHWAY BERENIA-MALALAU SECTION	
							Date		Date		Checked		Date		Date		PROJECT No.		DRAWING No.	
							MEAN SEA LEVEL		Date		Checked		Date		Date		S.C.120-33-814/B		A1/88309	
							SURVEY BOOK NO.		Principal		Executive Engineer		Secretary		SHEET 275 OF 303		PAPUA NEW GUINEA DEPARTMENT OF WORKS			

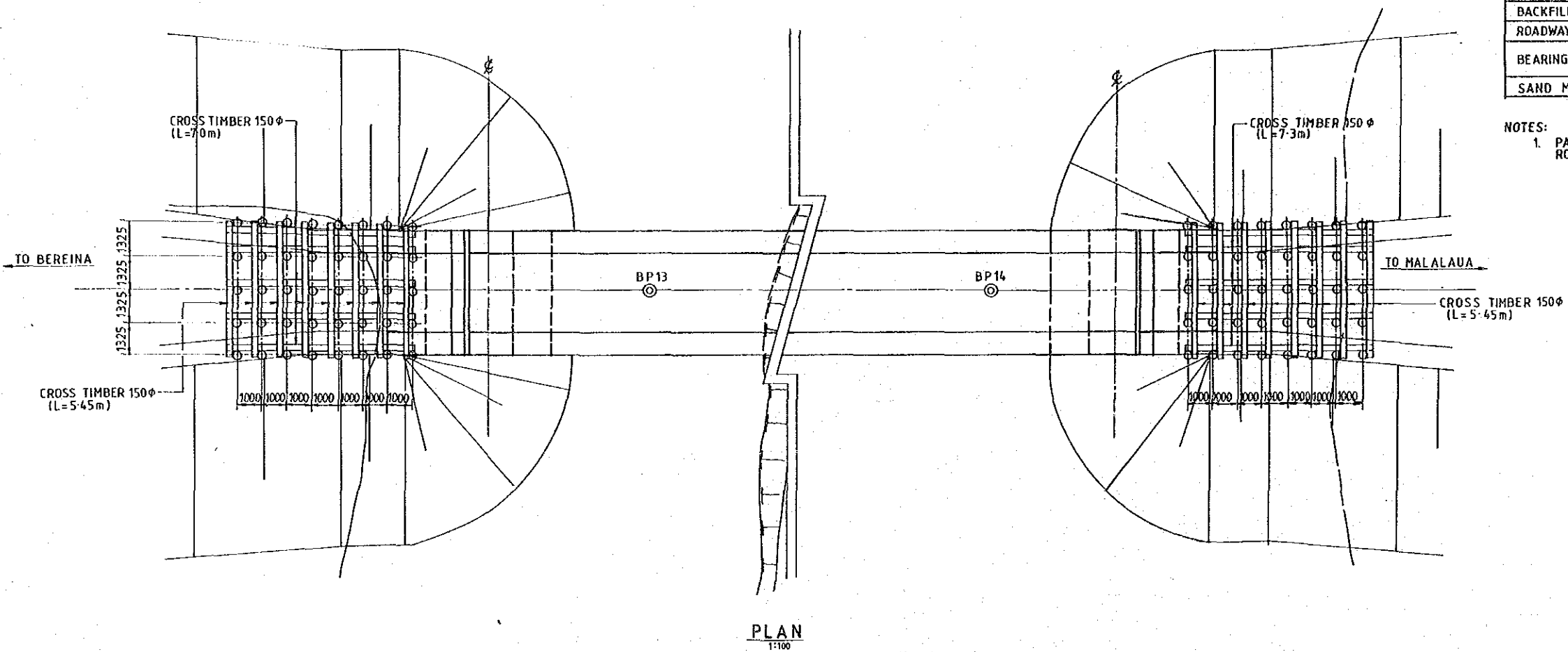
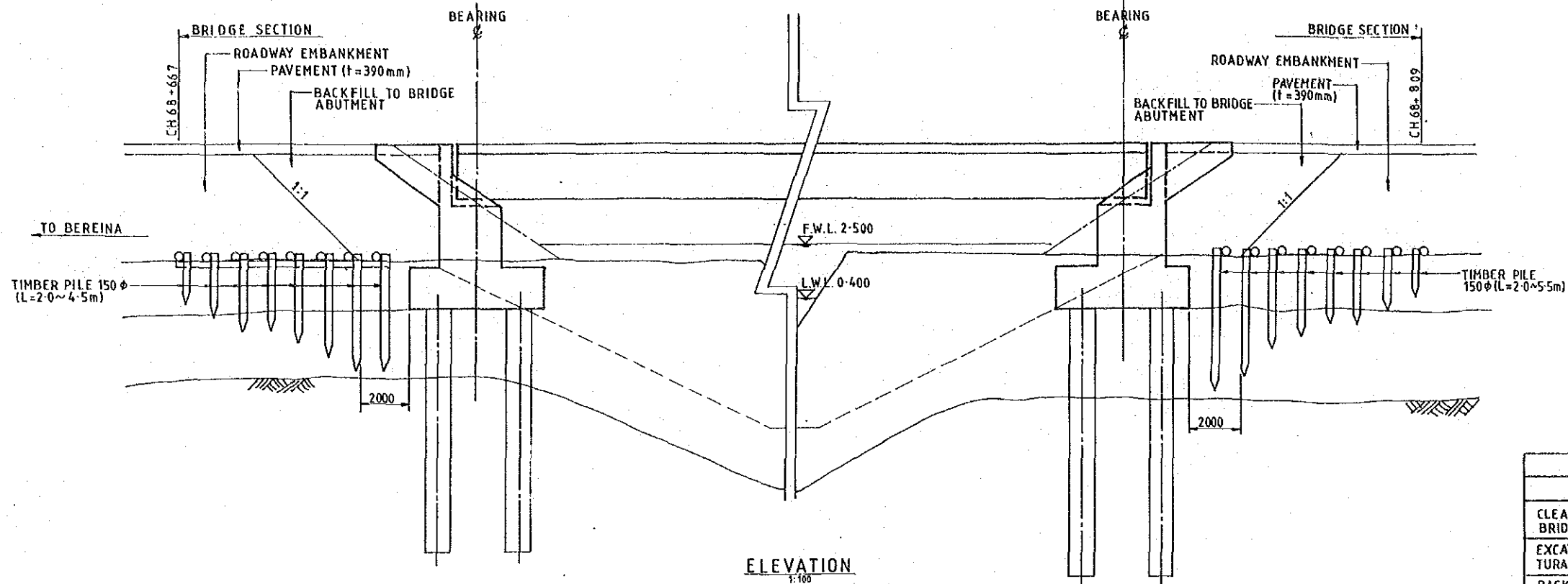


TABLE OF QUANTITIES			
DESCRIPTION	UNIT	QUANTITY	REMARKS
CLEARING AND GRUBBING AT BRIDGE SITE	ha	0.1	
EXCAVATION FOR STRUCTURAL FOUNDATIONS TYPE C	m <sup>3</sup>	0	
EXCAVATION FOR STRUCTURAL FOUNDATIONS TYPE D	m <sup>3</sup>	166	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS	m <sup>3</sup>	91.2	
BACKFILL TO BRIDGE ABUTMENT	m <sup>3</sup>	48.5	
ROADWAY EMBANKMENT	m <sup>3</sup>	968	
BEARING UNITS			
TIMBER PILE	m	277.5	150 φ
CROSS TIMBER	m	160.2	150 φ
SAND MAT	m <sup>3</sup>	0	

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

SURVEY <b>JICA</b> Data		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal: J. Mahito Date: 25 Sep. 1989		DRAWN P.G., M.S. Checked: <i>dy lei</i> Designed: <i>Z. Kauri</i> Checked: <i>dy lei</i>		RECOMMENDED Principal Engineer: <i>Albapaha</i> Approved: <i>J. Stewart</i> Date: 1. 11. 89 Secretary: <i>P.S. (S)</i>		SCALES 1:100		CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION <b>BRIDGE No. 7. — TAURI BRIDGE</b> BEARING UNITS, BACKFILL TO BRIDGE ABUTMENTS AND OTHERS.	
REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY BOOK No. 5	SHEET 276 OF 303	PROJECT No. S.C. 120-33-814/13	PAPUA NEW GUINEA DEPARTMENT OF WORKS		DRAWING No. A1 88310	

**GENERAL NOTES**

**1. ABBREVIATIONS**

T	TOP	STRP	STIRRUP
B	BOTTOM	TRMR	TRIMMER
NF	NEAR FACE	MS	MILD STEEL
FF	FAR FACE	SYMM	SYMMETRICAL
EW	EACH WAY	NTS	NOT TO SCALE
EF	EACH FACE	TYP	TYPICAL
CL	CENTRELINE	FLG	FLANGE
P	PLATE		

**2. DESIGN LOADINGS**

NORMAL	T44	STANDARD VEHICLE
ABNORMAL	60T	TONNE VEHICLE
EARTHQUAKE	EEBPNQ	1985 ZONE 4
DECK	A14	

**3. PILING**

ALL PILING SHALL BE THE SPECIFIED GRADE  
MAXIMUM TOLERANCE ON PLAN POSITION AT  
PILE TOP FOR ANY PILE = ± 75mm

PILE (CONTRACT)	LENGTHS	SIZE
BEREINA ABUTMENT	23.5m x 6 nos	500 φ x 14 THK (OPEN END)
PIER	27.0m x 4 nos	800 φ x 12 THK (CLOSED END)
MALALAU ABUTMENT	13.5m x 6 nos	500 φ x 14 THK (OPEN END)
TEST PILE	27.0m x 1 no	800 φ 12 THK

MAXIMUM PILE WORKING COMPRESSION LOADS:  
 ABUTMENTS 700 kN  
 PIERS 1400 kN

THE TIP OF THE PILES SHALL BE REINFORCED AS SHOWN

**4. CONCRETE**

ALL CONCRETE SHALL BE GRADE 25. (f<sub>c</sub> = 25 MPa)

**5. REINFORCING STEEL**

ALL REINFORCEMENT SHALL BE EITHER:

- a) TEMPCORE (T.C.) BARS OF 410 MPa
- b) ROUND (R) BARS OF 230 MPa

**6. LAP LENGTHS**

UNLESS NOTED OTHERWISE LAP LENGTHS TO BE AS FOLLOWS:

12 DIA	500mm
16 DIA	650mm
20 DIA	800mm
24 DIA	1000mm
28 DIA	1500mm
32 DIA	1650mm

**7. COVER TO OUTSIDE FACE OF REINFORCEMENT**

DECK	
a) TOP OF ROADWAY	35mm
b) BOT OF ROADWAY AND ELSEWHERE	30mm
PIER	
a) CROSS BEAM	40mm
b) COLUMNS	40mm
c) PILE CAP	65mm
ABUTMENT	
a) WINGWALL/BACKWALL	
- OPEN FACES	30mm
- FILL FACES	50mm
b) PILE CAP	65mm

**8. STRUCTURAL STEELWORK**

ALL MAIN BEAMS, COVER PLATES AND SPLICE PLATES  
TO BE GRADE 350 STEEL. ALL OTHER STEEL WORK  
TO BE GRADE 250 STEEL. ALL WELDS SHALL BE 6mm CONTINUOUS  
FILLET WELDS UNLESS NOTED OTHERWISE

**9. BOLTING**

ALL BOLTS ON MAIN STEELWORK (MAIN BEAMS, CROSS FRAMES AND  
BRACING) TO BE M24 8.8/TF.  
ALL OTHER BOLTS TO BE GRADE 4.6/S

**10. STEELWORK FINISHES**

ALL SURFACES TO BE SUITABLY PROTECTED BY PAINT WORK  
- REFER TO SPECIFICATION

**11. BEARINGS**

PIER LOADS & ABUTMENT LOADS	DEAD LOAD = 126.12 kN LIVE LOAD = 233.66 kN TOTAL = 359.78 kN
--------------------------------	---

BEARING ASSUMED FOR DETAILING = POT BEARING BP. B-101 (FIXED)  
POT BEARING BP. B-102 (MOVABLE)

MEAN TEMPERATURE IS 26.1°C AT THE PROJECT SITE

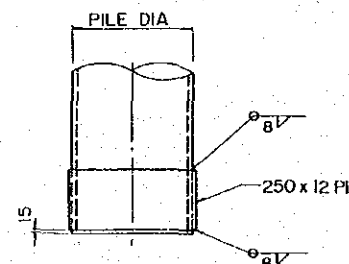
**12. MAIN BEAM PRECAMBER**

STEEL BEAMS TO BE PRECAMBERED TO THE UNSTRESSED PROFILE  
SHOWN ON THE DRAWING.

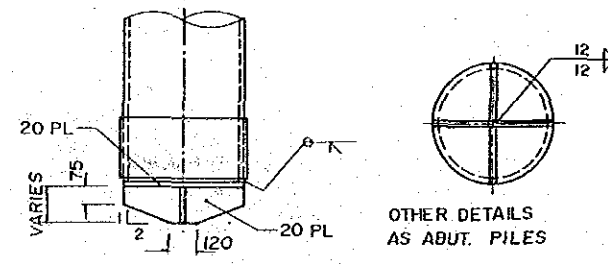
**13. ERECTION**

THE CONTRACTOR IS TO PROVIDE DETAILS OF ERECTION PROCEDURES  
TO THE ENGINEER PRIOR TO ERECTION OF THE GIRDERS THIS IS TO  
ENSURE THAT THE ALLOWABLE STRESSES ON THE GIRDER SECTIONS  
ARE NOT EXCEEDED

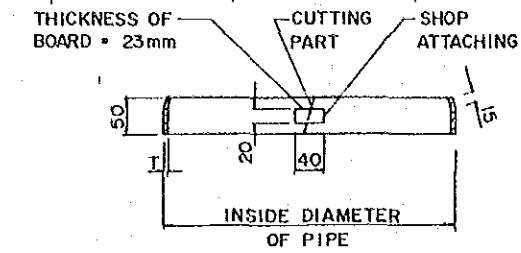
- 14. ABUTMENT A - BEREINA SIDE
- ABUTMENT B - MALALAU SIDE



**PILE TOE REINFORCEMENT (OPEN END)**

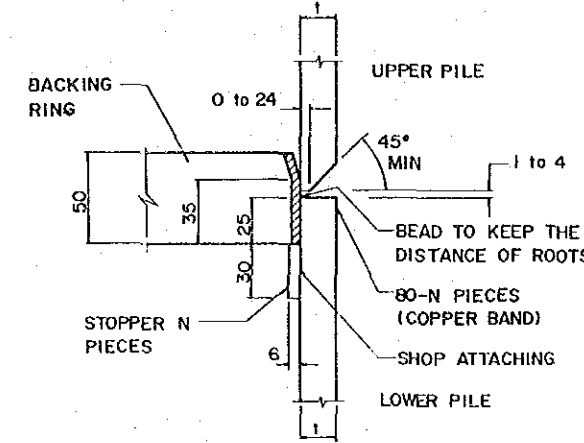


**PILE TIP REINFORCEMENT (CLOSED END)**



**BACKING RING - CROSS SECTION**

THICKNESS OF BACKING RING	
OUTSIDE DIAMETER D	T (mm)
1016 AND UNDER	4.5
OVER 1016	6.0



**BACKING RING AND STOPPER**

NUMBER OF STOPPERS	
OUTSIDE DIAMETER D (mm)	N NUMBER OF PIECES
609.6 AND UNDER	4
OVER 609.6 to 1016 Incl.	6
OVER 1016	8

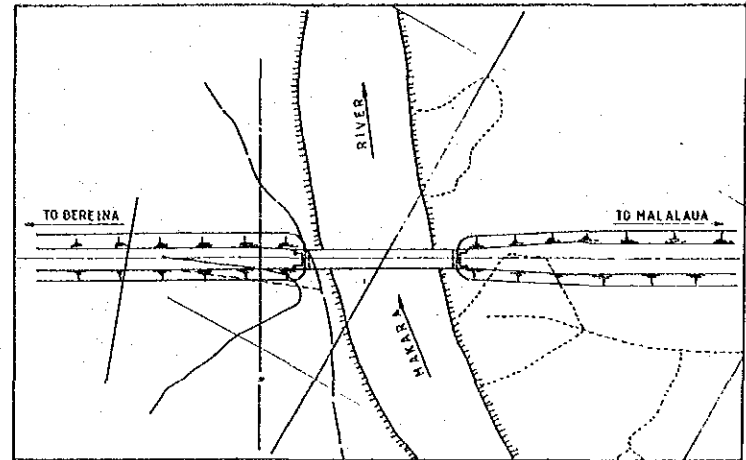
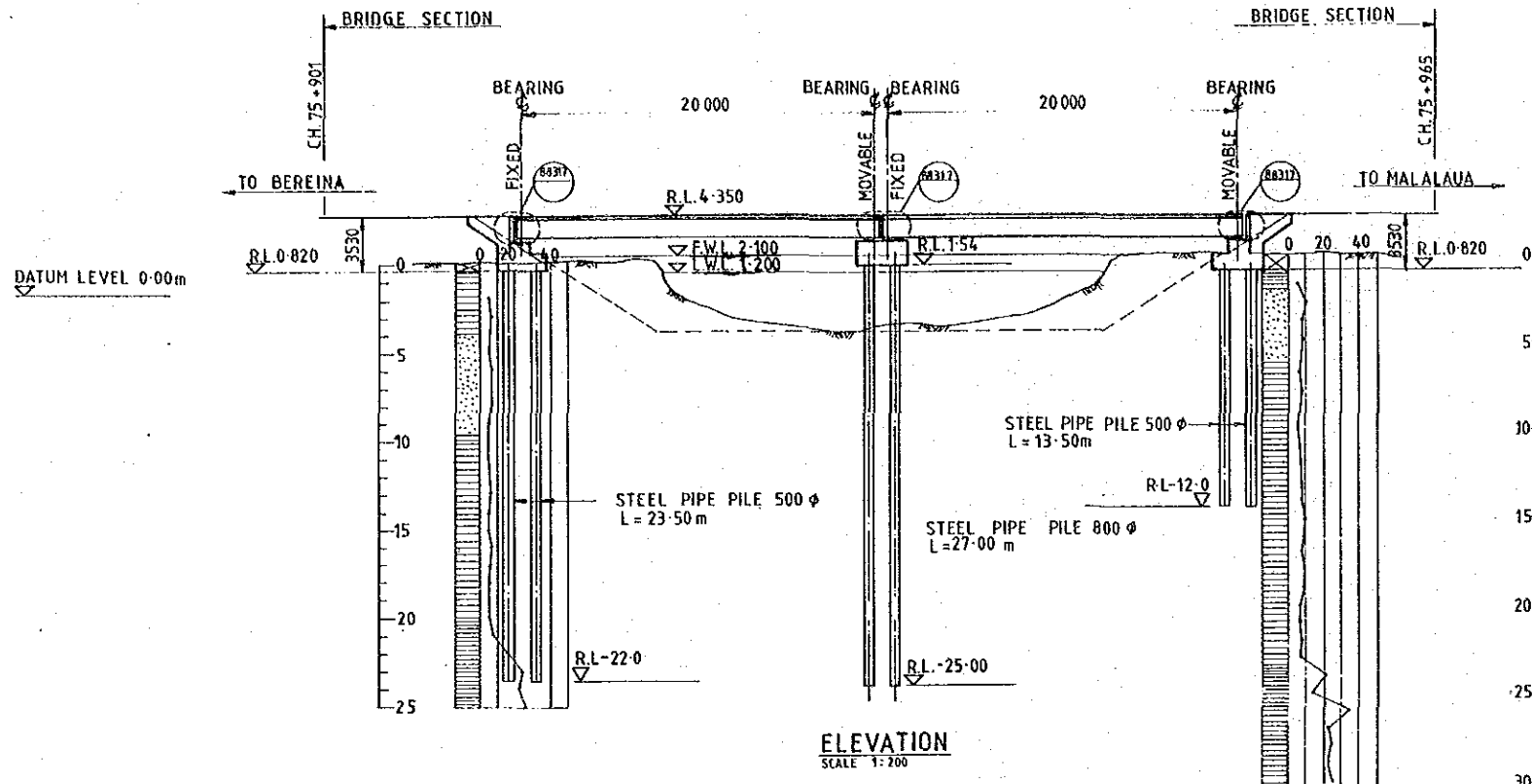
**NOTES**

- 1. MAXIMUM PILE SECTION LENGTH EQUALS 10m.
- 2. WELDING TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

**SHAPES AND DIMENSIONS OF BACKING RING AND STOPPER**

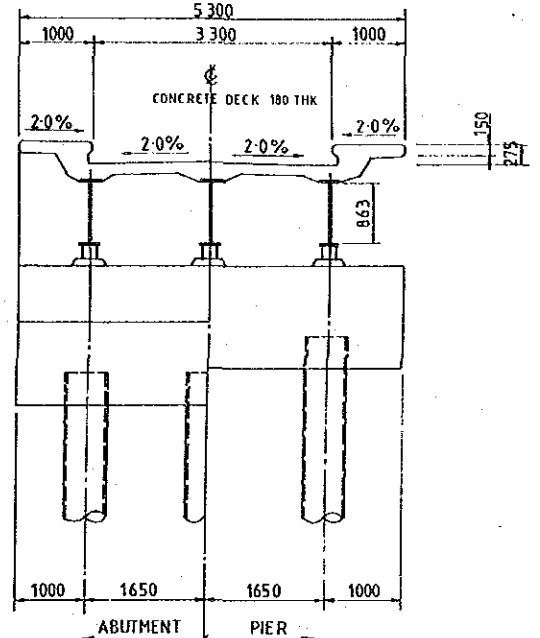
DRAWING LIST	
DRG. NO.	DRAWING TITLE
88311	GENERAL NOTES AND DRAWING LIST
88312	GENERAL ARRANGEMENT
88313	ABUTMENT PLANS, SECTIONS & DETAILS
88314	PIER DETAILS
88315	DECK SLAB DETAILS
88316	STEEL WORK DETAILS SHEET 1
88317	STEEL WORK DETAILS SHEET 2
88318	HANDRAILING / IMPACT ANGLE DETAILS
88319	BAR BENDING SCHEDULE SHEET 1
88320	BAR BENDING SCHEDULE SHEET 2
88321	BEARING BP. B-101 (FIXED)
88322	BEARING BP. B-102 (MOVABLE)
88323	BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS

REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	CHECKED	RECOMMENDED	SCALES	CENTRAL / GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION BRIDGE No.8 - MAKARA BRIDGE GENERAL NOTES AND DRAWING LIST
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S.	11/1/07	11/1/07	1:1	
					VERTICAL DATUM MEAN SEA LEVEL	25 Sep. 1989	PROJECT ENGINEER	PRINCIPAL ENGINEER	APPROVED	1:1	PROJECT No. S.C. 120-33-814/B
					HORIZONTAL DATUM		EXECUTIVE ENGINEER	SECRETARY			DRAWING No. A1 88311
					SURVEY BOOK No.8					SHEET 277 OF 303	

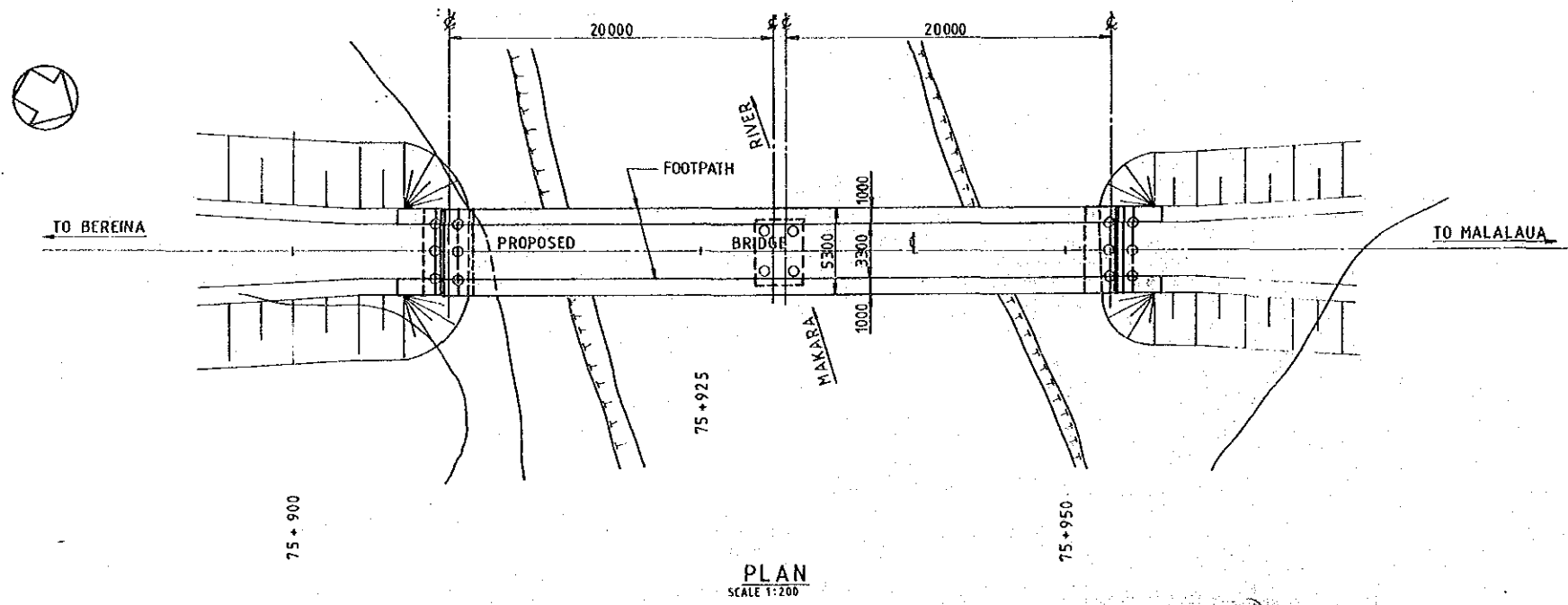


LOCALITY PLAN  
SCALE 1:1000

GRADE LEVELS	CH. 75 + 901	CH. 75 + 925	CH. 75 + 950	CH. 75 + 965
GRADE LEVELS	4.350	4.350	4.350	4.350
SURFACE LEVELS	1.61	2.10	2.10	2.10
CHAINAGE	CH. 75 + 901.000 CH. 75 + 912.400	CH. 75 + 922.400	CH. 75 + 932.400 CH. 75 + 933.550	CH. 75 + 942.550 CH. 75 + 952.550



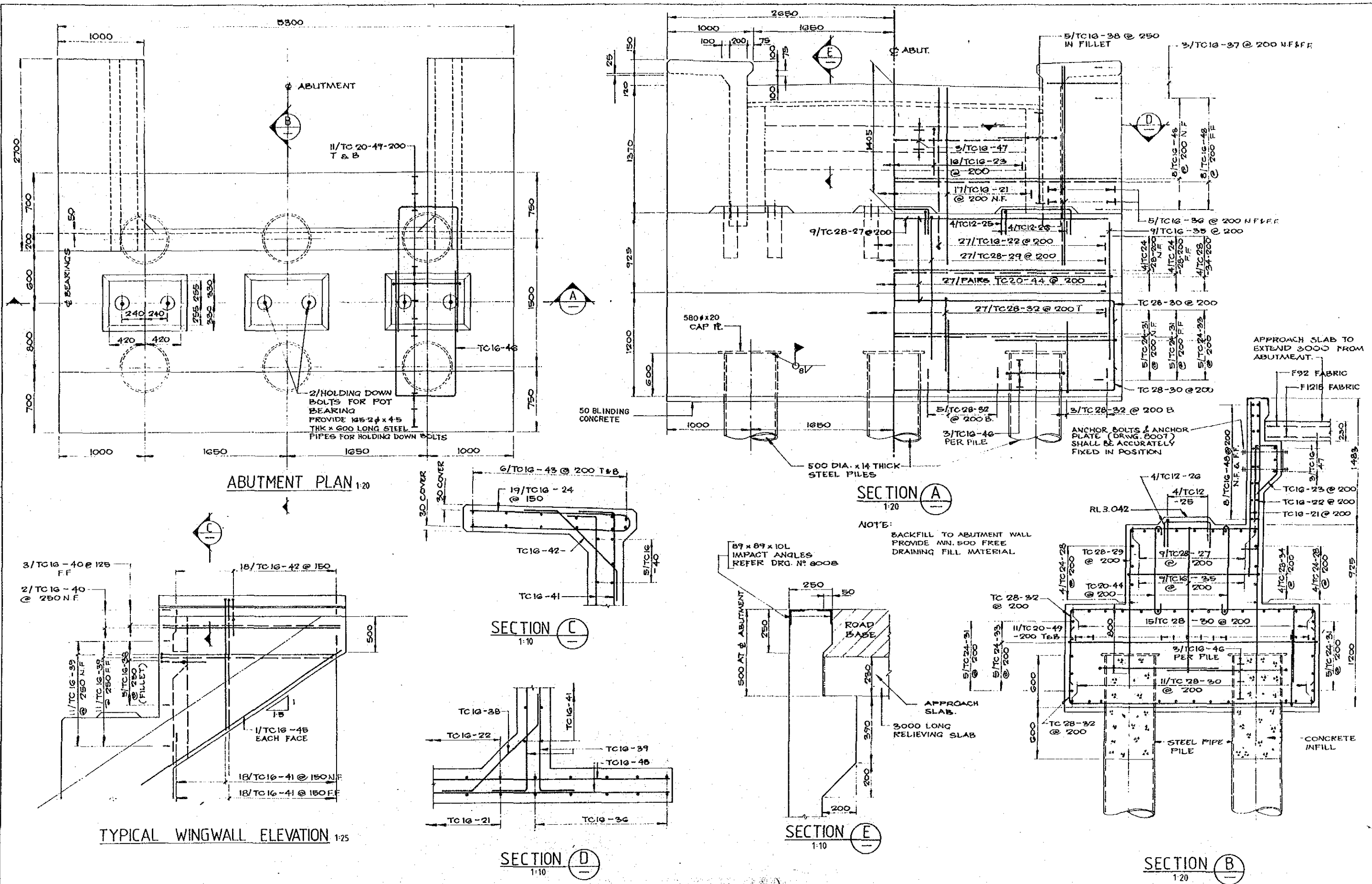
TYPICAL CROSS SECTION  
SCALE 1:50



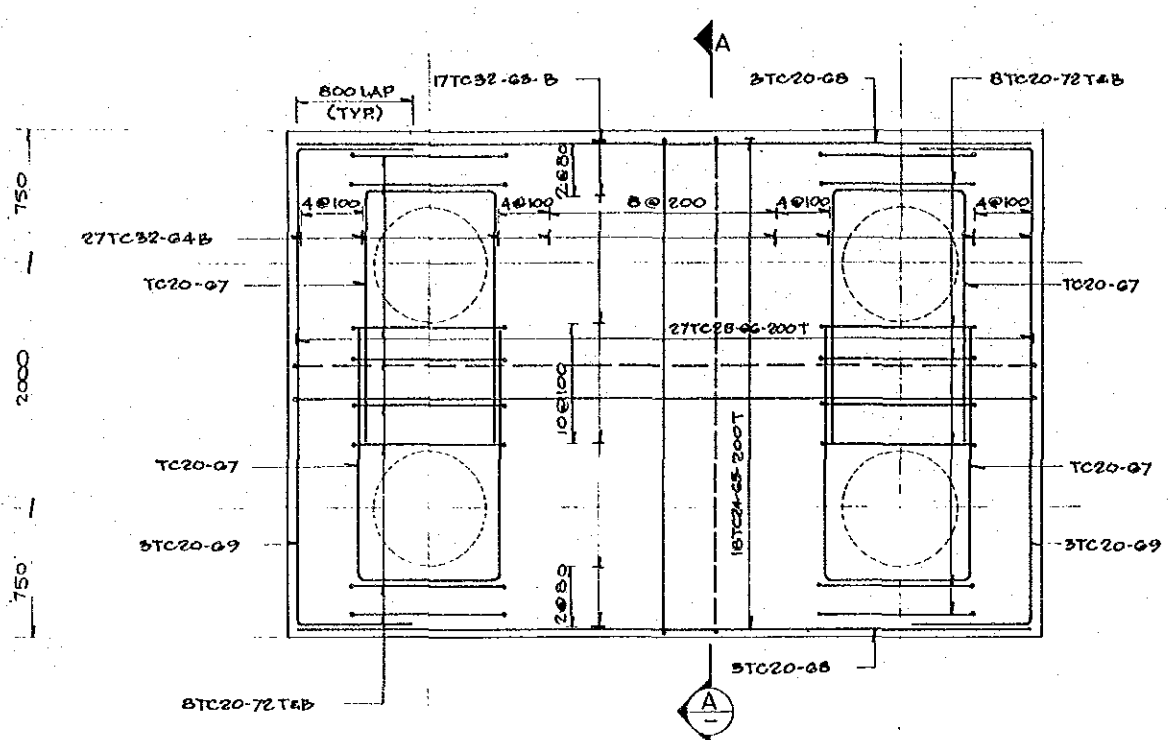
PLAN  
SCALE 1:200

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

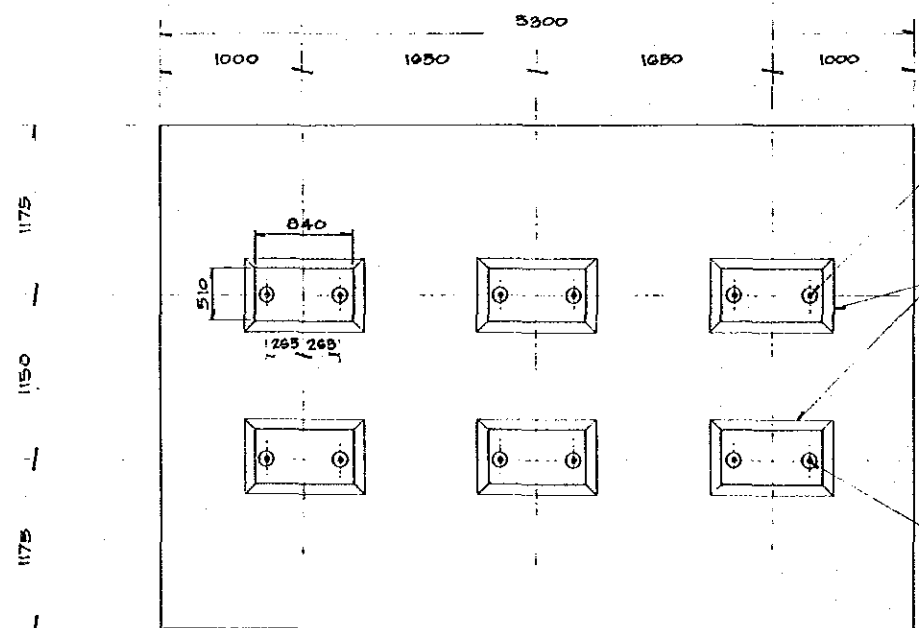
SURVEY <b>JICA</b> Date VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM				DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY J. Yabuta 25 Sep. 1989 Date				DRAWN MS CHECKED DESIGNED CHECKED				RECOMMENDED PROJECT ENGINEER APPROVED PRINCIPAL ENGINEER EXECUTIVE ENGINEER SECRETARY				SCALES 				CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION BRIDGE No. 8. — MAKARA BRIDGE GENERAL ARRANGEMENT			
AMENDMENTS BY APP'D DATE				SURVEY BOOK No. 5				SHEET 278 OF 303				PROJECT No. S.C. 120-33-814/B				PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88312							



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 BERENA-MALALUA SECTION	
VERTICAL DATUM MEAN SEA LEVEL		DESIGNED M. Shinjima		CHECKED M. Shinjima		APPROVED I. H. 89		SHEET 279 OF 303		BRIDGE No 8 - MAKARA BRIDGE	
HORIZONTAL DATUM		Principal J. J. J. J.		CHECKED M. Shinjima		EXECUTIVE ENGINEER		PROJECT No. S.C. 120-33-814/B		ABUTMENT PLANS, SECTIONS & DETAILS	
SURVEY BOOK No. 6		Date 25 Sep. 1989		CHECKED M. Shinjima		SECRETARY		DEPARTMENT OF WORKS		DRAWING No. AT 88313	
AMENDMENTS		BY APP'D DATE		REV							

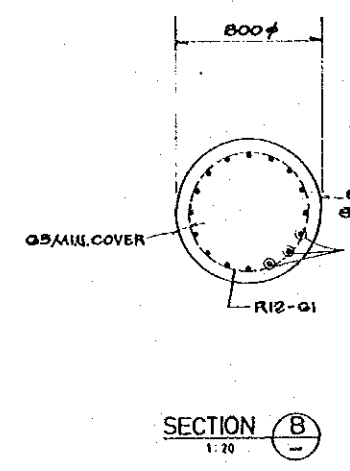


PIER REINFORCEMENT PLAN  
1:25

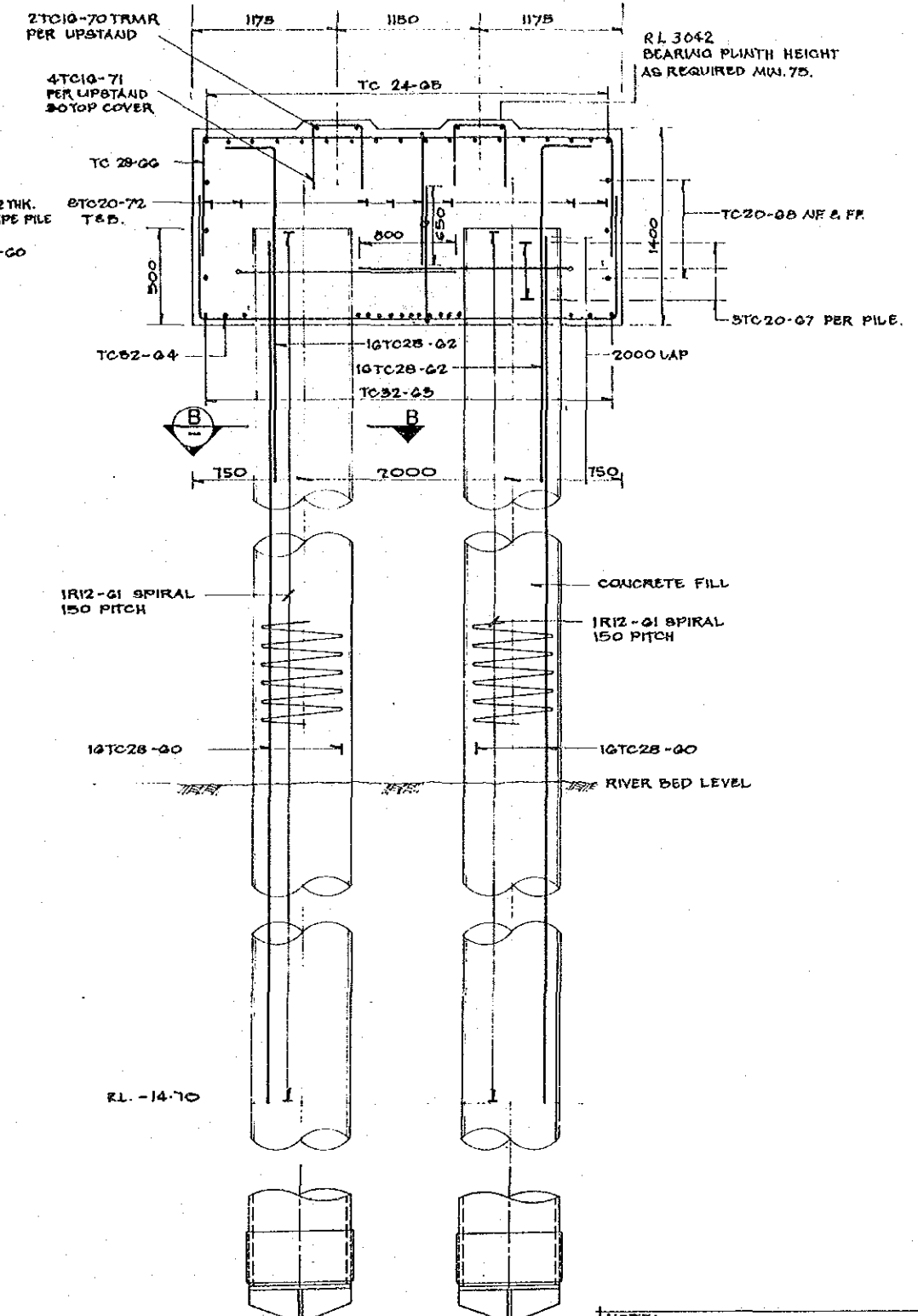


PLAN OF PIER  
1:25

TO MALALUA



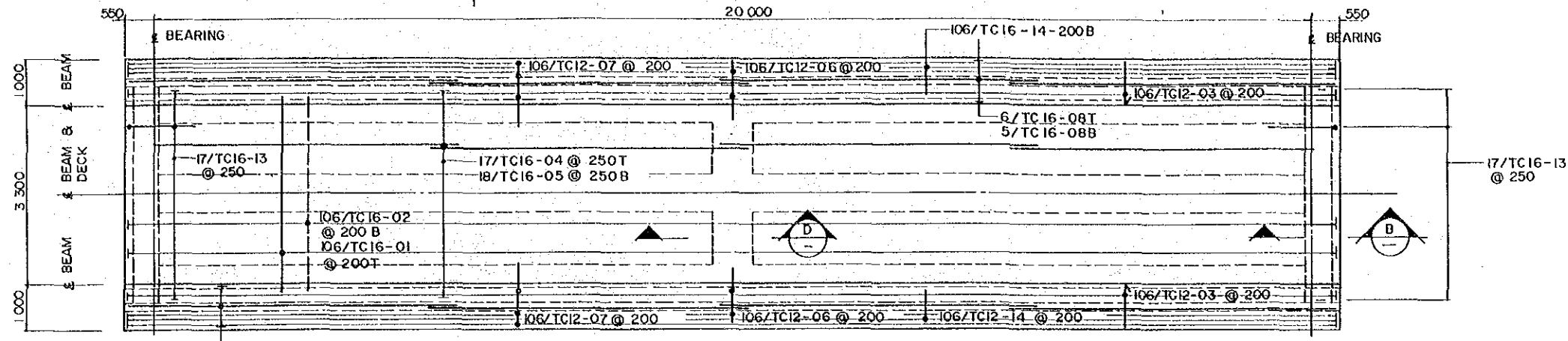
SECTION B  
1:20



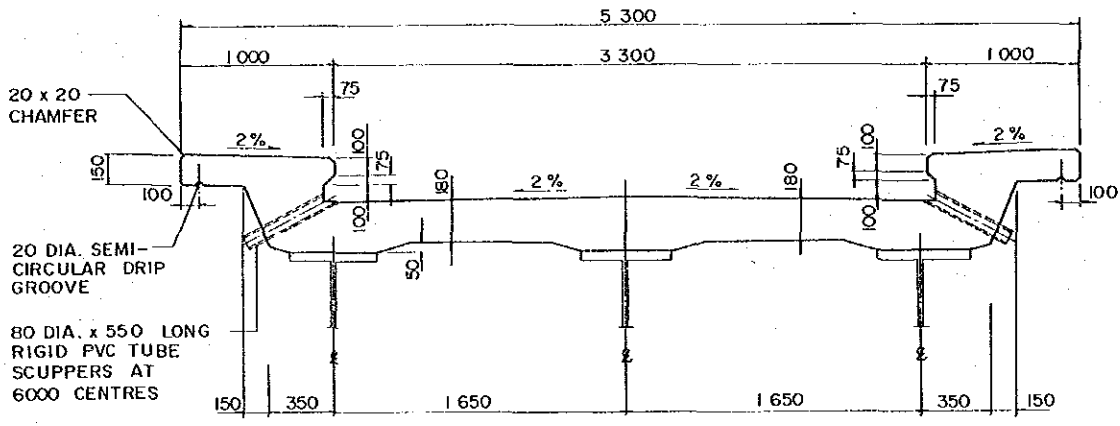
SECTION A  
1:25

NOTE:  
85MM PILE COVER.  
40MM W/STOCK COVER.

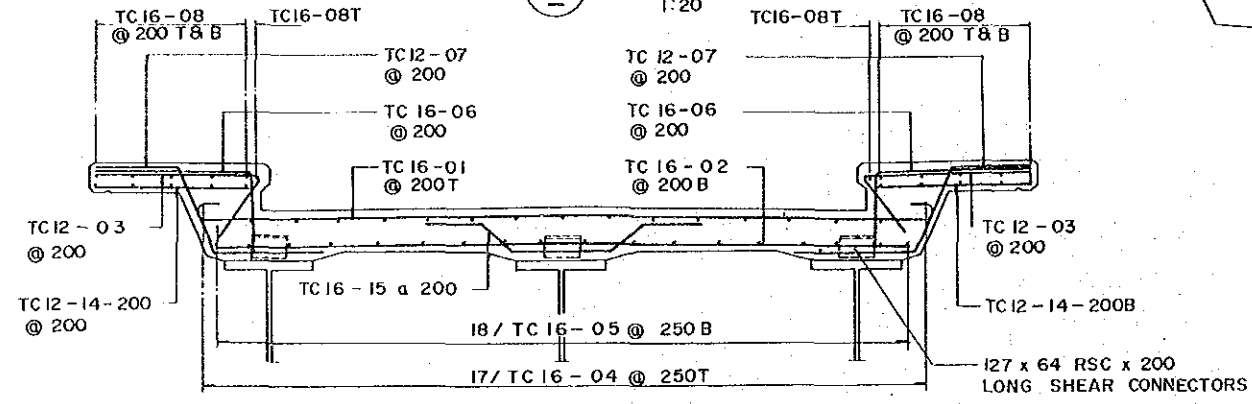
SURVEY JICA		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN M.S.		RECOMMENDED		CENTRAL GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		J. J. J. J.		CHECKED Y. Doi		PROJECT ENGINEER 1/11/89		TRANS-ISLAND HIGHWAY - BERRINA-MALALUA SECTION	
HORIZONTAL DATUM		Principal		DESIGNED H. Shingya		APPROVED I. H. B.		BRIDGE No.8 - MAKARA BRIDGE	
SURVEY BOOK NO'S		25 Sep. 1989		CHECKED Y. Doi		EXECUTIVE ENGINEER		PIER DETAILS	
AMENDMENTS		BY APP'D DATE		SHEET 280 OF 303		PROJECT No. S.C.120-33-814/B		PAPUA NEW GUINEA DEPARTMENT OF WORKS	
								DRAWING No. A1 88314	



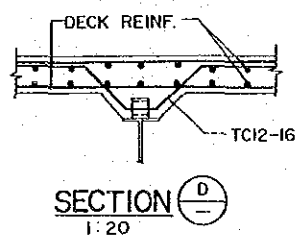
DECK SLAB TYPICAL SPAN  
1:50



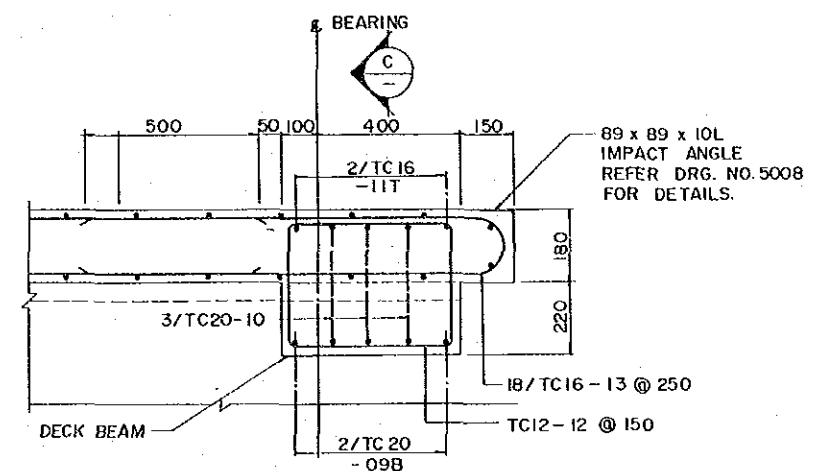
SECTION A TYPICAL  
1:20



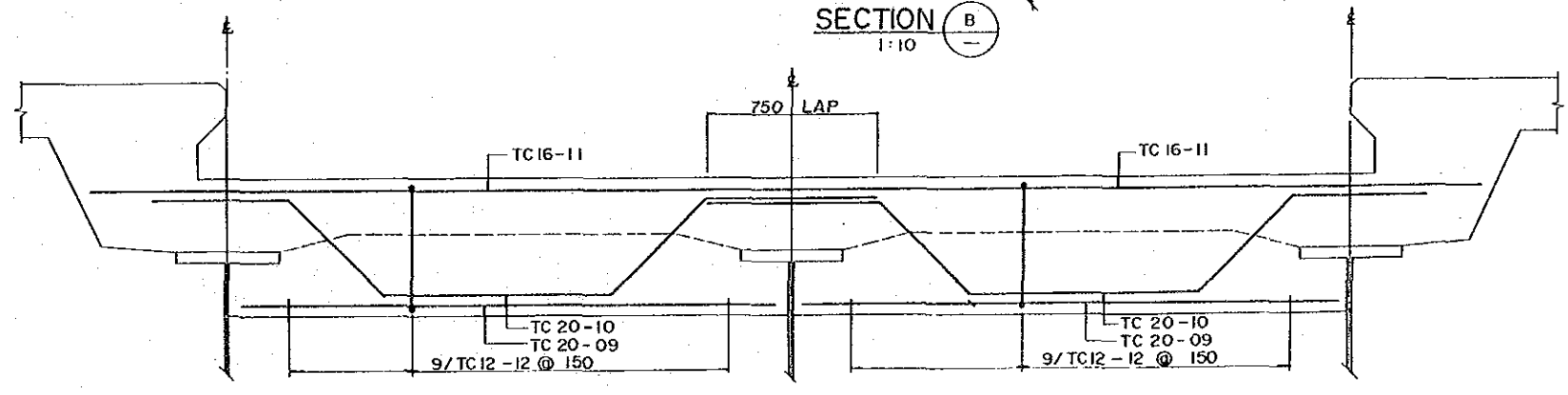
SECTION A REINF  
1:20



SECTION D  
1:20



SECTION B  
1:10

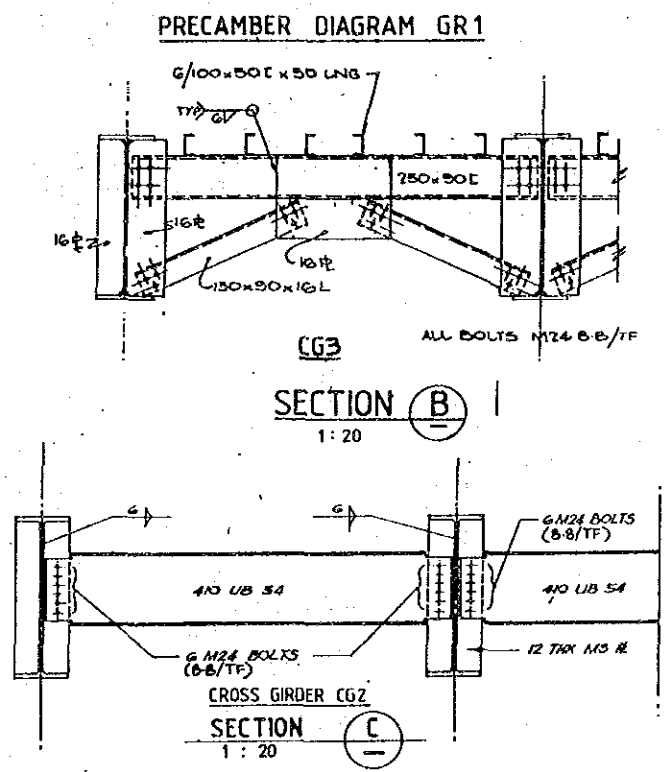
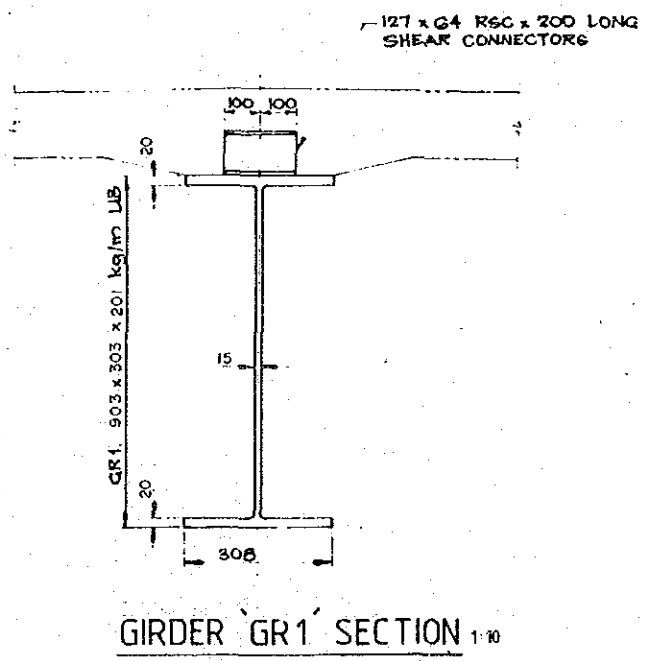
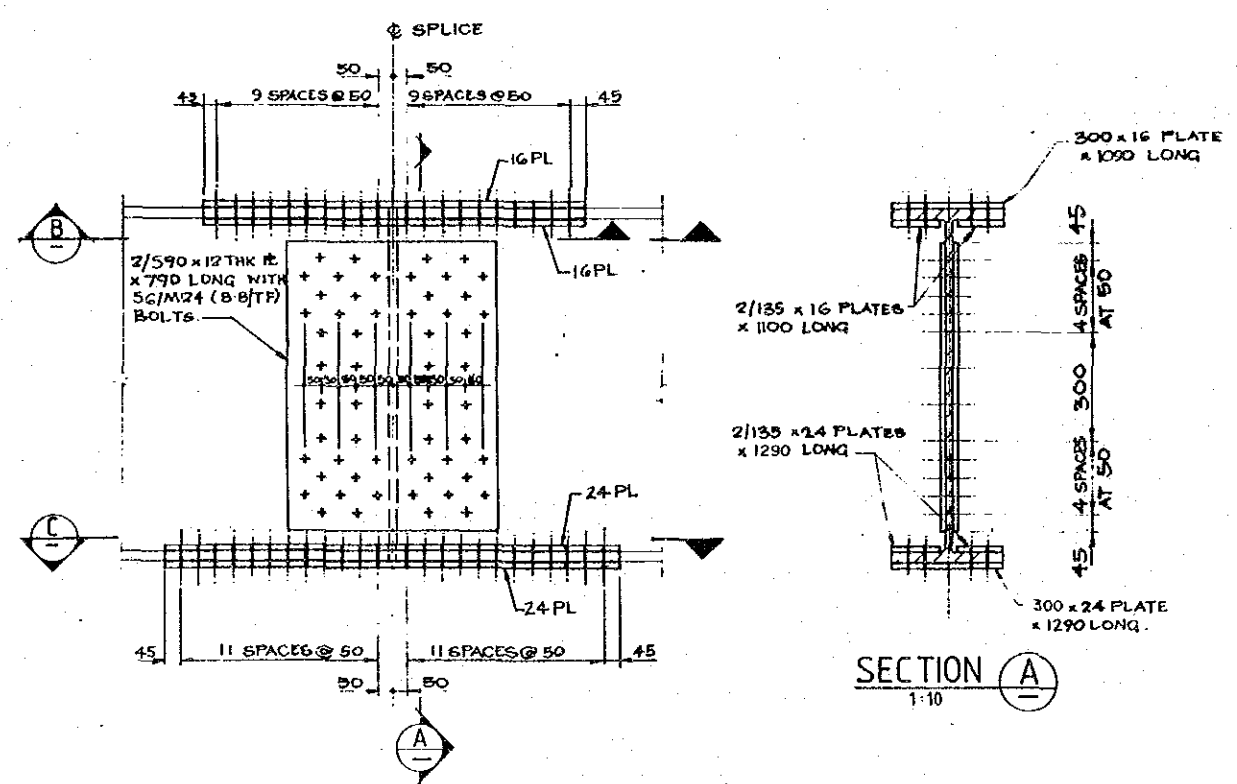
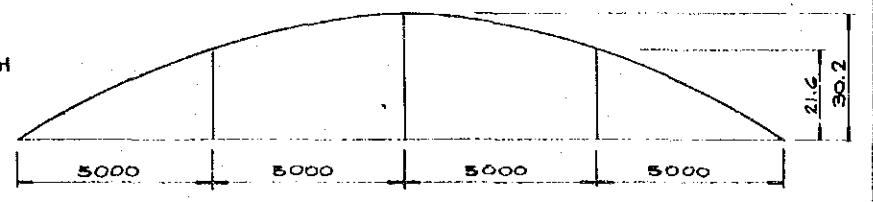
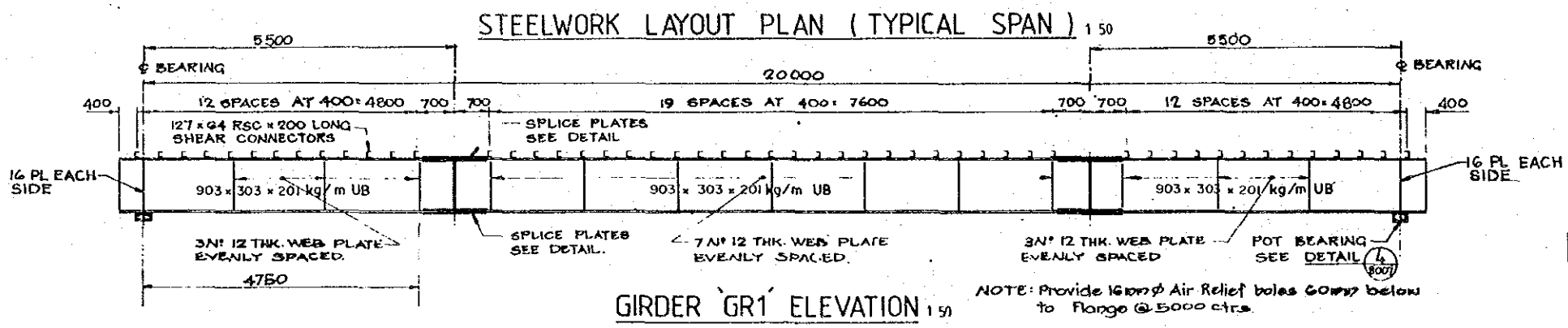
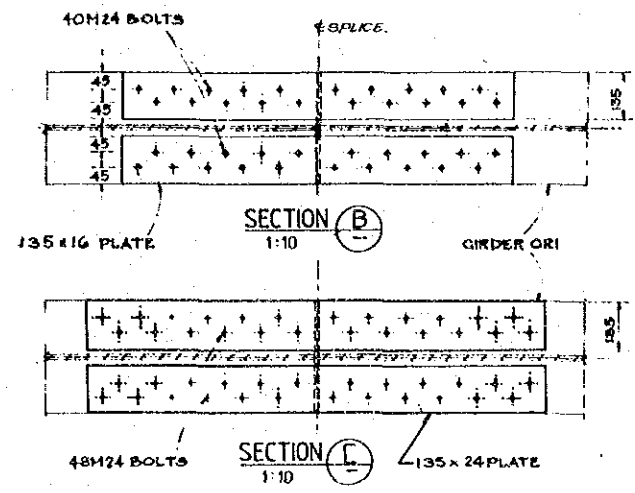
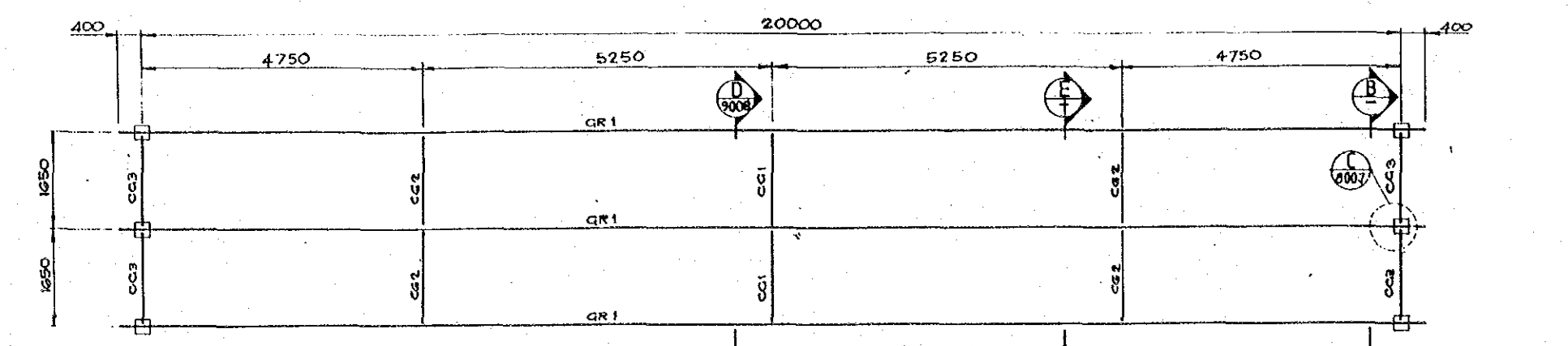


SECTION C  
1:10

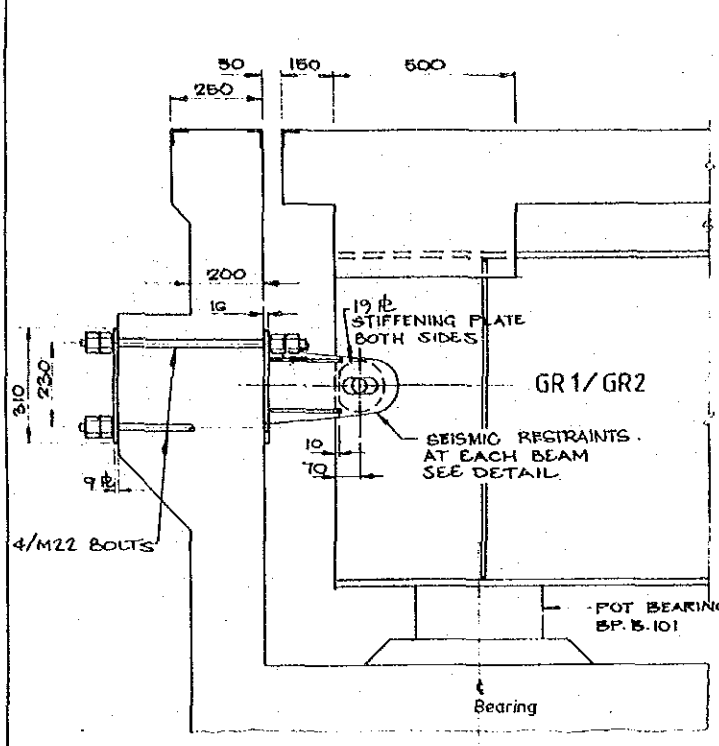
NOTE: DECK REINF. NOT SHOWN FOR CLARITY

SURVEY <b>JICA</b>		DESIGN <b>JAPAN INTERNATIONAL CO-OPERATION AGENCY</b>		DRAWN M.S.		RECOMMENDED		CENTRAL GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Principal <i>J. Malin</i> 25 Sep. 1983		Checked <i>of Wai</i>		Project Engineer <i>Albano</i>		TRANS-ISLAND HIGHWAY BERENA-MALALUA SECTION	
HORIZONTAL DATUM		Principal <i>J. Malin</i> 25 Sep. 1983		Designed <i>M. Shinguzi</i>		Principal Engineer <i>P. J. J.</i>		BRIDGE No.8 - MAKARA BRIDGE	
SURVEY BOOK No.5		Principal <i>J. Malin</i> 25 Sep. 1983		Checked <i>of Wai</i>		Approved <i>J. J. J.</i>		DECK SLAB DETAILS	
REV.	AMENDMENTS	BY	APP'D	DATE	Principal <i>J. Malin</i> 25 Sep. 1983	Executive Engineer <i>Albano</i>	Secretary <i>J. J. J.</i>	SHEET 281 OF 303	PAPUA NEW GUINEA DEPARTMENT OF WORKS
								PROJECT No. S.C. 120-33-814/B	DRAWING No. A1 88315

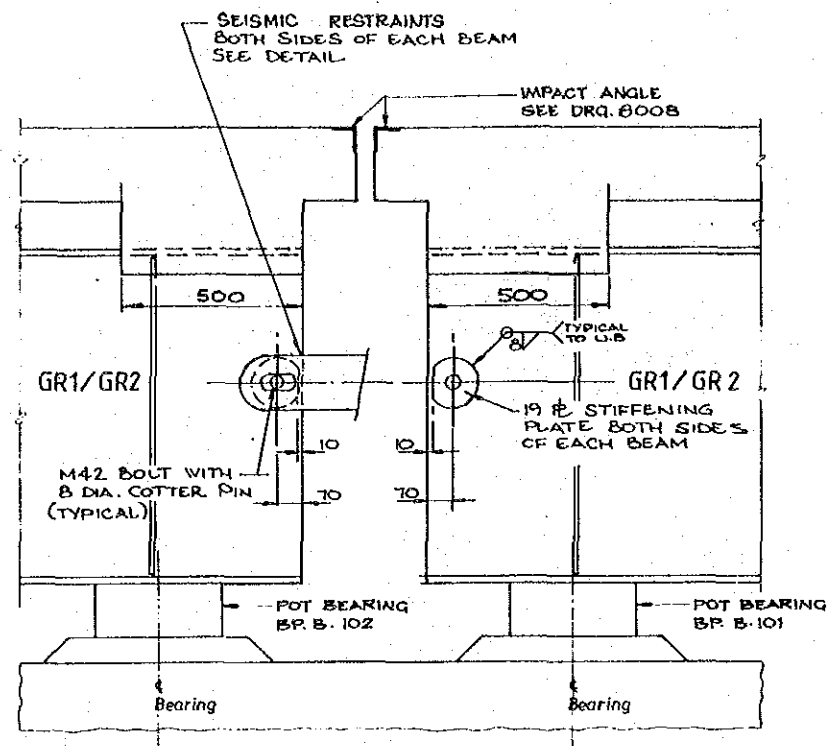




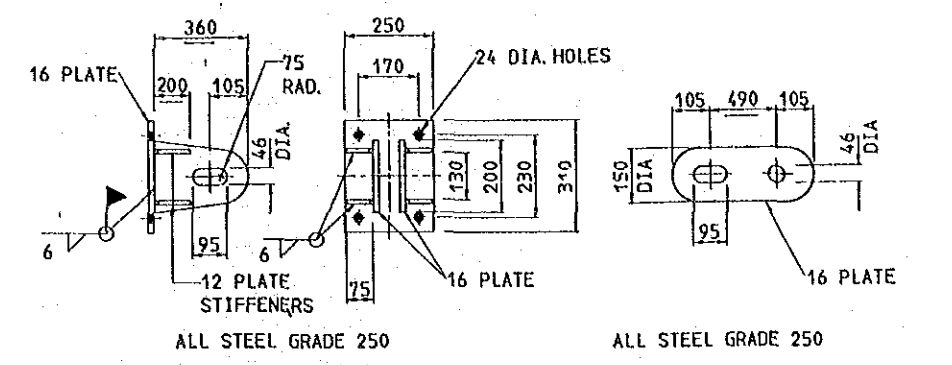
SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MS		RECOMMENDED		SCALES		CENTRAL GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL.		DESIGNED H. Shimizu		CHECKED Y. Doi		PROJECT ENGINEER 1/11/89		APPROVED 1.11.89		TRANS-ISLAND HIGHWAY BERENA-MALALUA SECTION	
SURVEY BOOK NO.5		Principal 25 Sep. 1989		CHECKED Y. Doi		EXECUTIVE ENGINEER 1/11/89		SHEET 282 OF 303		BRIDGE No. 8 - MAKARA BRIDGE	
AMENDMENTS		BY APP'D DATE		Principal		FAS(T) SECRETARY		PROJECT No. S.C.120-33-814/B		STEELWORK DETAILS - SHEET 1	
								SHEET 282 OF 303		PAPUA NEW GUINEA DEPARTMENT OF WORKS	
								PROJECT No. S.C.120-33-814/B		DRAWING No. A1 88316	



DETAIL 1  
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8002

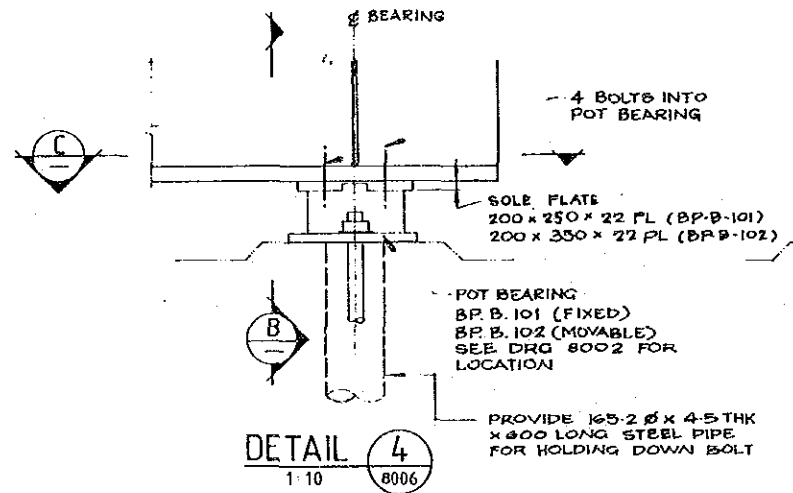
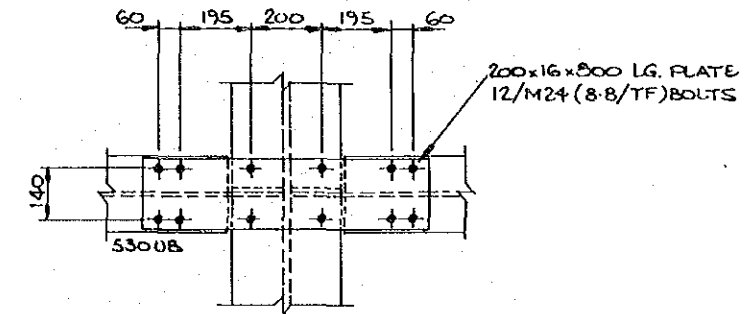


DETAIL 2  
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8002

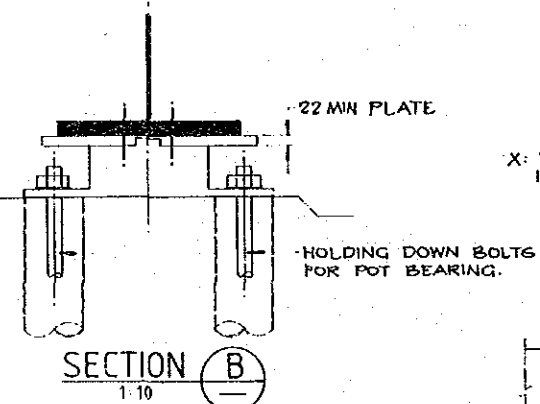


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1:10

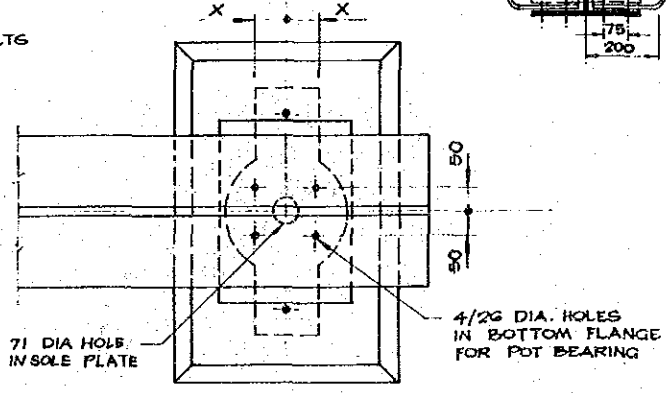
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1:10



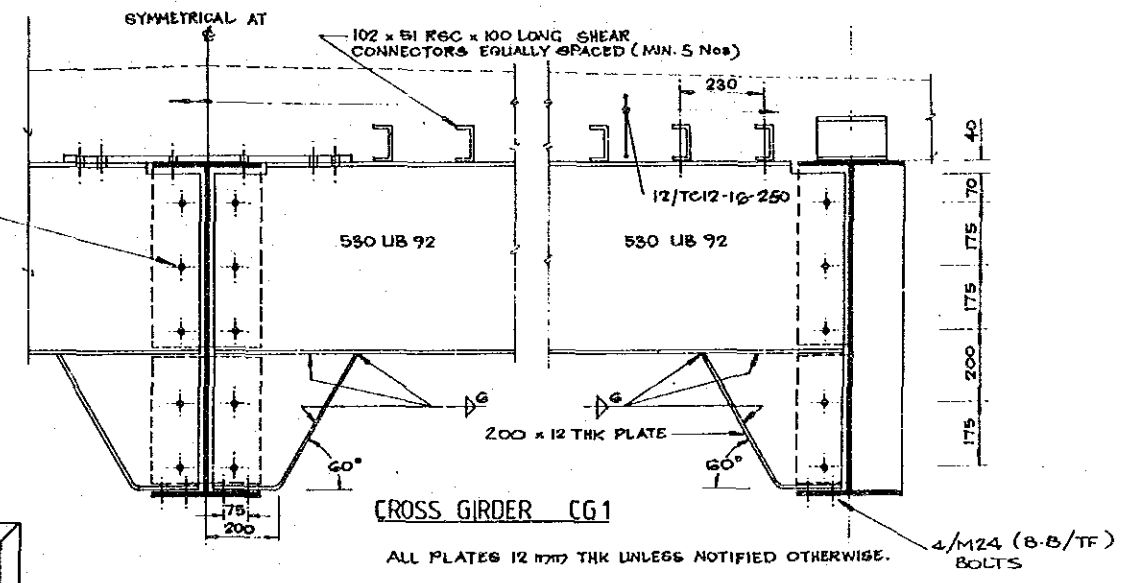
DETAIL 4  
1:10  
8006



SECTION B  
1:10

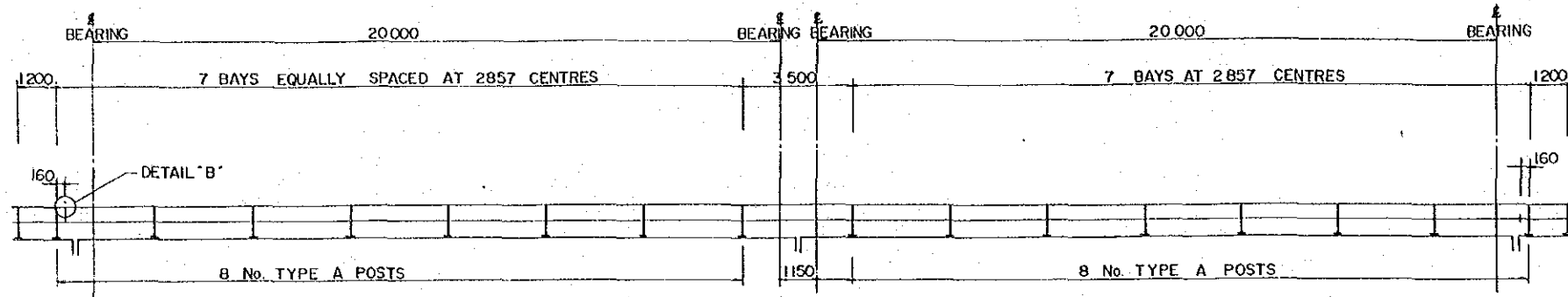


SECTION C  
1:10

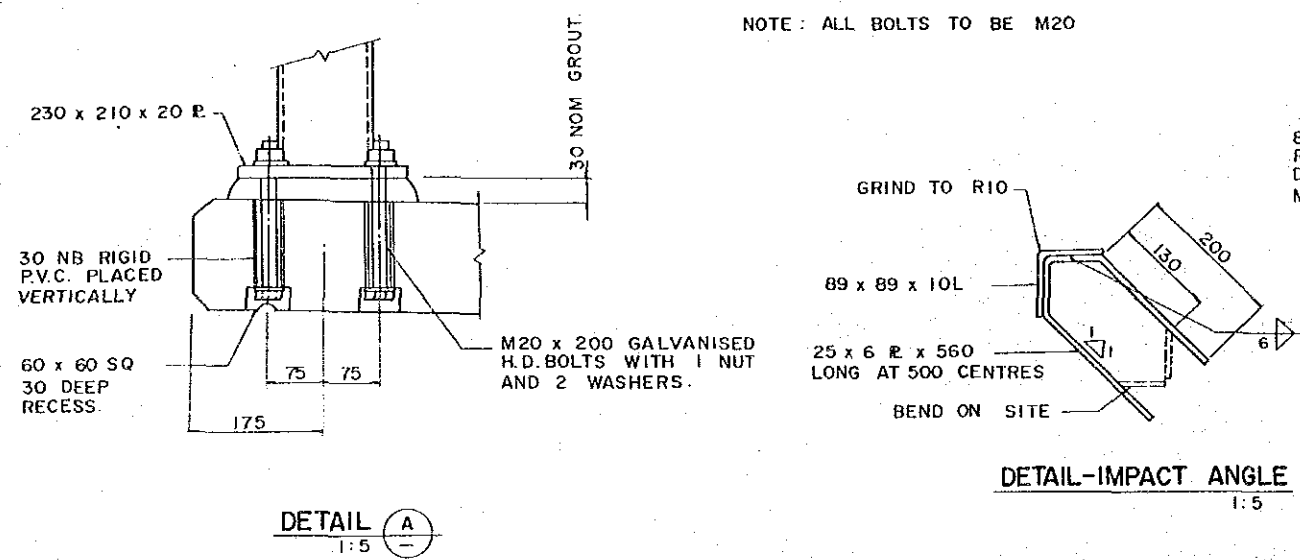
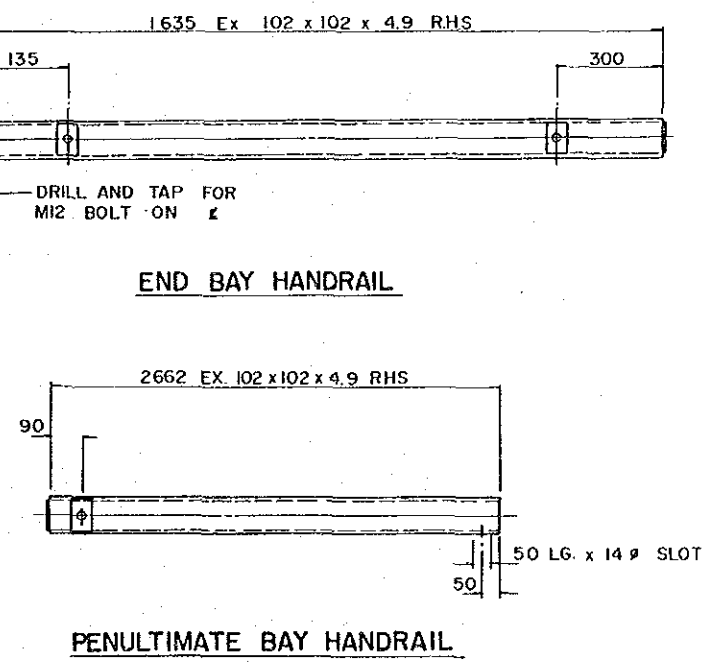
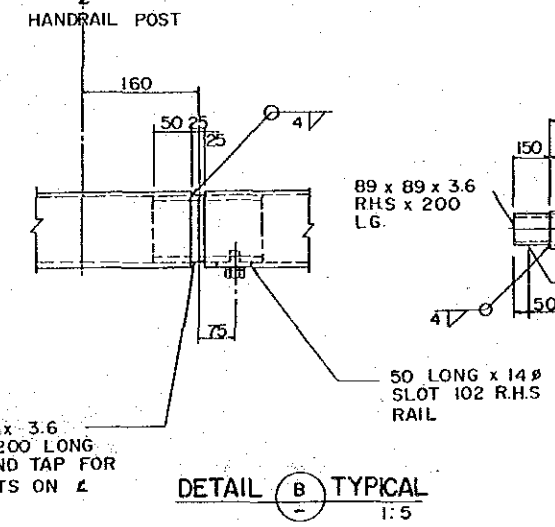
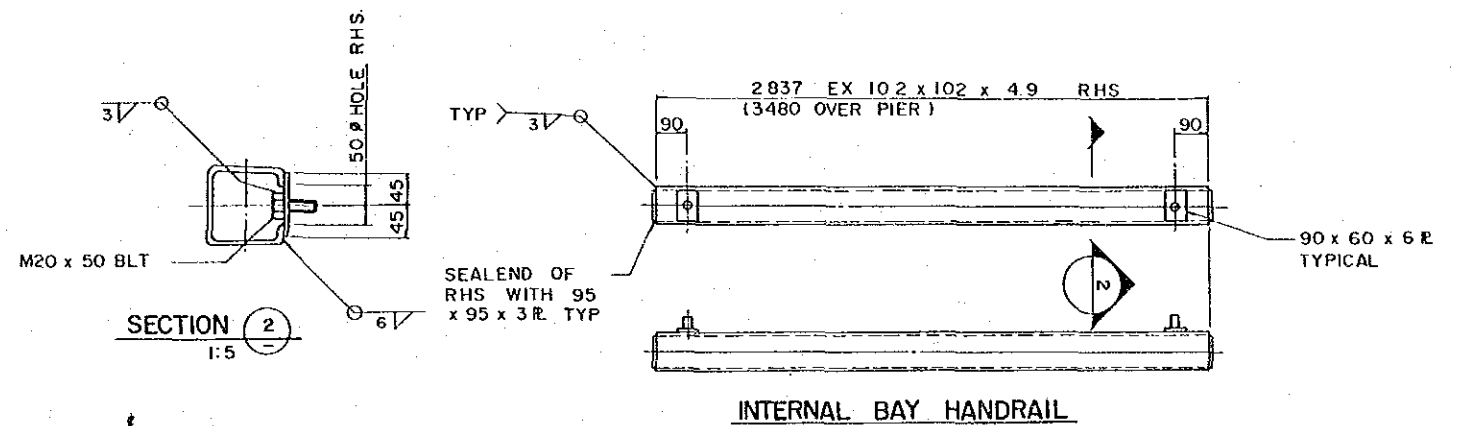
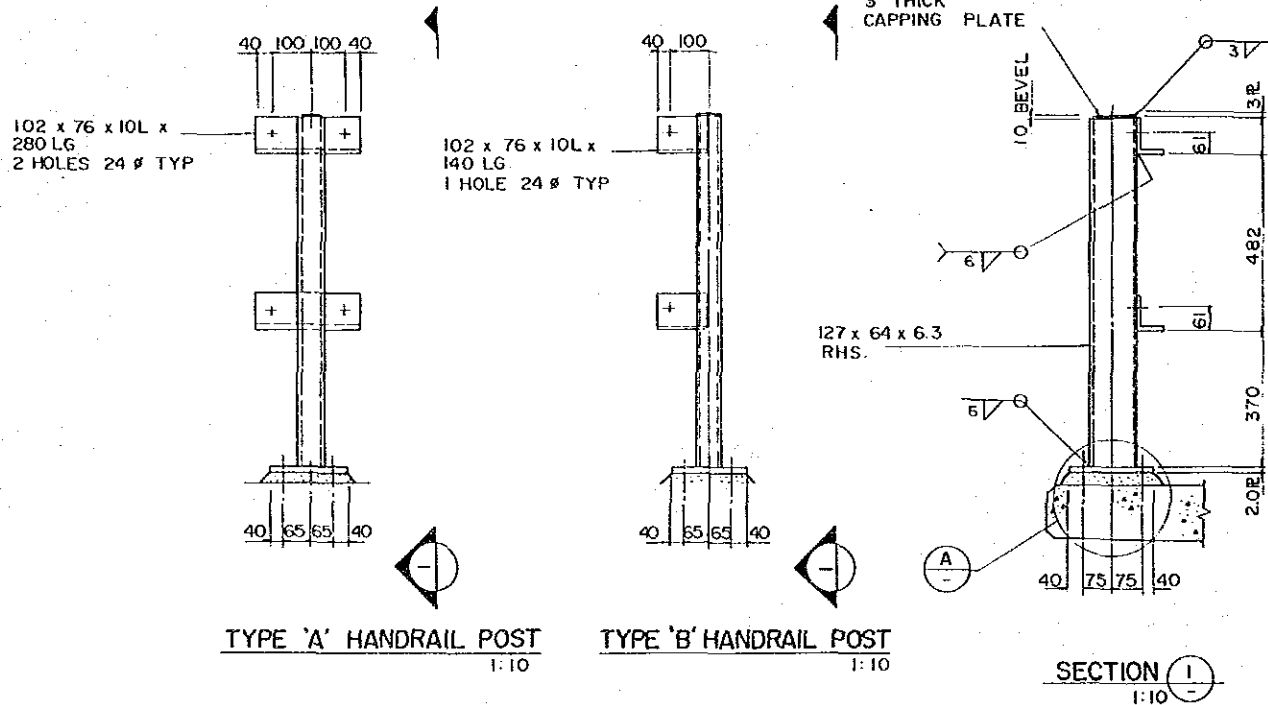


SECTION D  
1:10  
8006

SURVEY <b>JICA</b> Date:			DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal: <i>J. Marita</i> Date: 25 Sep. 1989			DRAWN M.S. CHECKED: <i>J. Doi</i> DESIGNED: <i>M. Shimizu</i> CHECKED: <i>J. Doi</i>			RECOMMENDED PROJECT ENGINEER: <i>Y. Imai</i> 1/11/89 PRINCIPAL ENGINEER: <i>E. Imai</i> 1/11/89 APPROVED: <i>I. Imai</i> 1. 11. 89 EXECUTIVE ENGINEER: <i>Y. Imai</i> 1/11/89 SECRETARY: <i>J. Imai</i> 1/11/89			SCALES 			CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY HERENA-MALALUA SECTION <b>BRIDGE No. 8 - MAKARA BRIDGE</b> <b>STEELWORK DETAILS - SHEET 2</b>		
AMENDMENTS REV BY APP'D DATE	SURVEY BOOK NOS		PROJECT No S.C.120-33-814/B			SHEET 283 OF 303			PAPUA NEW GUINEA DEPARTMENT OF WORKS DRAWING No A1 88317								

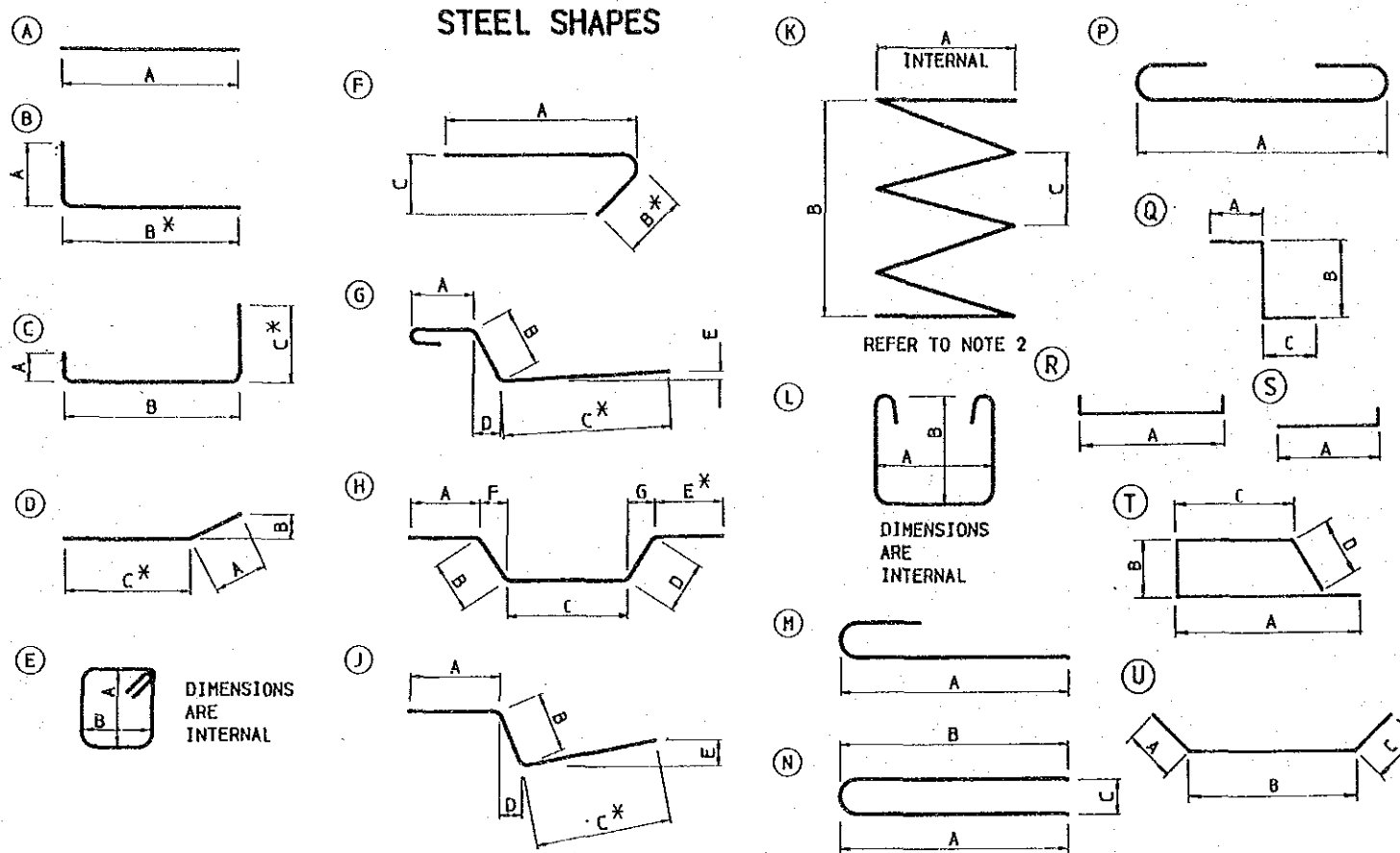


TYPICAL ELEVATION ON HANDRAIL  
1:100



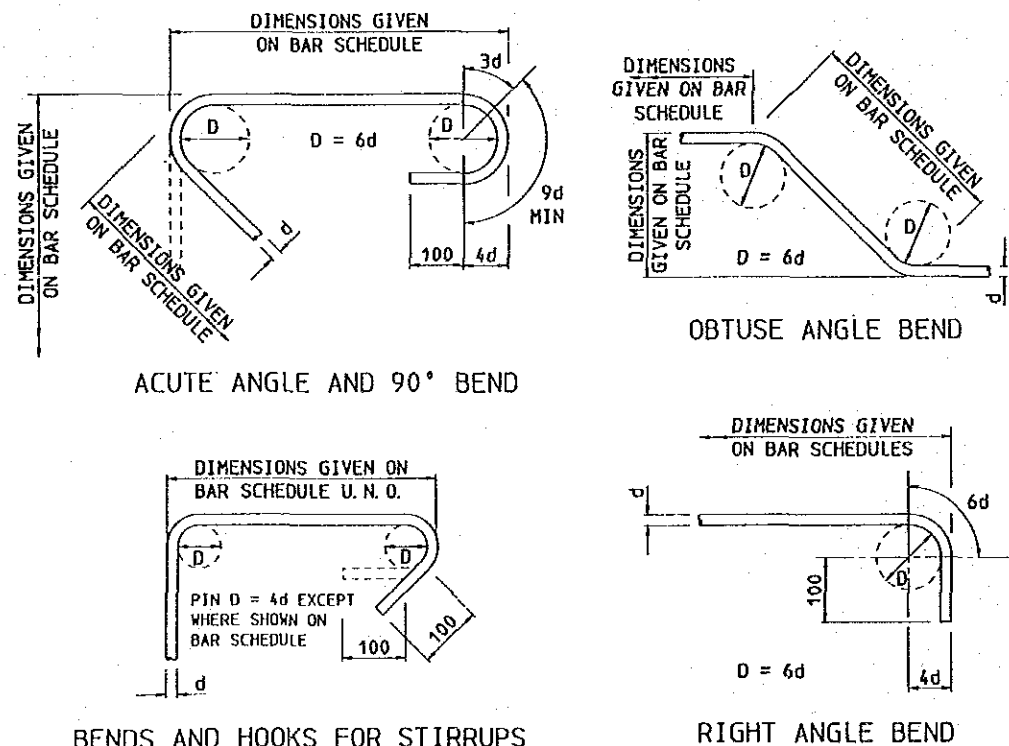
NOTE: ALL BOLTS TO BE M20

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	y Sei	M. Shoji	y Sei	1/11/89	1/11/89	1:1	TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION			
							VERTICAL DATUM MEAN SEA LEVEL	JAPAN INTERNATIONAL CO-OPERATION AGENCY								BRIDGE No.8 - MAKARA BRIDGE			
							HORIZONTAL DATUM									HANDRAILING/IMPACT ANGLE DETAILS			
							SURVEY BOOK No.S	25 Sep. 1989								SHEET 284 OF 303	PROJECT No. S.C.120-33-814/13	PAPUA NEW GUINEA DEPARTMENT OF WORKS	DRAWING No. A1 88318



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	521.1	J	
TC18	08	44	21000							21000	1459.0	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	52.1	A	
TC12	12	72	295	440						1480	94.6	E	
TC16	13	68	1180	1180	85					2130	228.6	N	
TC12	14	424	900							900	358.8	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 2.1 <sup>m</sup> SPAN DECK										
TC28	60	64	17000							17000	5259.1	A	** SEE NOTE 5
IR12	61	4	646	17000						247130	811.6	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 = 10.621 TONNES 1.1 <sup>m</sup> PIERS										
TC16	21	34	2000							2000	107.8	A	
TC16	22	54	2000	200*						7200	187.5	B	
TC16	23	32	740	320	330	450				1808	91.4	T	
TC16	24	76	900	900	90					1826	219.1	N	
TC12	25	24	300	840	300*					1416	30.2	C	
TC12	26	24	300	510	300*					1086	23.1	C	
TC28	27	18	5200							5200	452.5	A	
TC24	28	16	5200							5200	295.4	A	
TC28	29	54	1695	1500	1695*					4824	1259.2	C	
TC28	30	52	850	5200	850*					6844	1720.4	C	
TC24	31	20	5200							5200	363.3	A	
TC28	32	86	850	2900	850*					4544	1889.1	C	
TC24	33	20	1400	2900	1400*					5652	401.4	C	
TC28	34	16	1400	1500	1400*					4244	328.2	C	
TC16	35	36	1695							1695	96.3	A	
TC16	36	40	2300							2300	145.3	A	
TC16	37	24	825							825	31.3	A	
TC16	38	20	200	550	200					950	30.0	U	
TC16	39	28	500	300*								B	INCREMENT = 225
		TO (8 SETS OF 1)	2600	300*						TOTAL LENGTH = 172.8 m	859	B	
TC16	40	20	2600							2600	82.1	A	
TC16	41	144	810	300*						TOTAL LENGTH = 205.8 m	1096	B	INCREMENT = 100
TC16	TO (8 SETS OF 18)	2380	300*							TOTAL WEIGHT = 419.5 kg	2666	B	

### STANDARD HOOKS AND BENDS

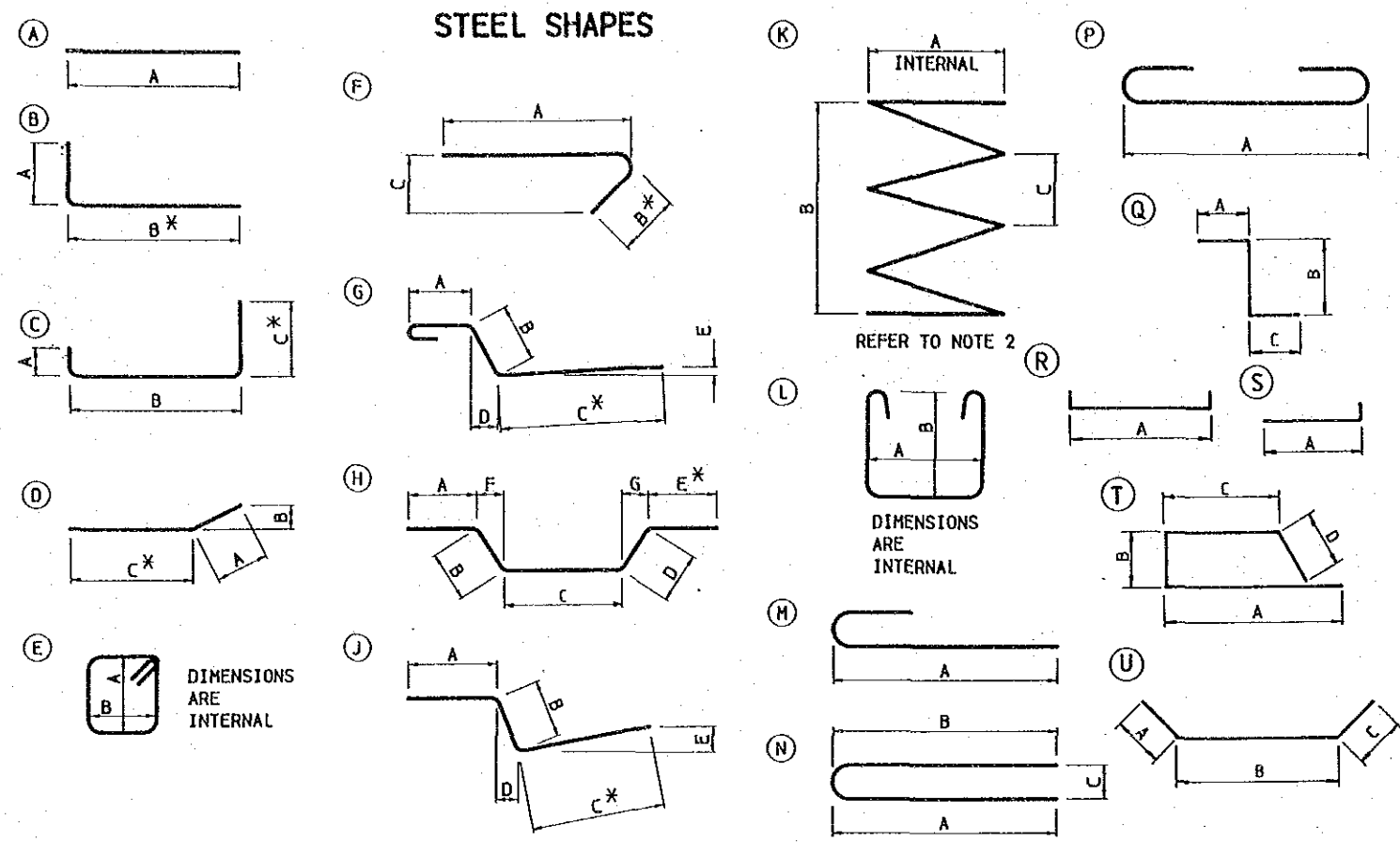


### NOTES

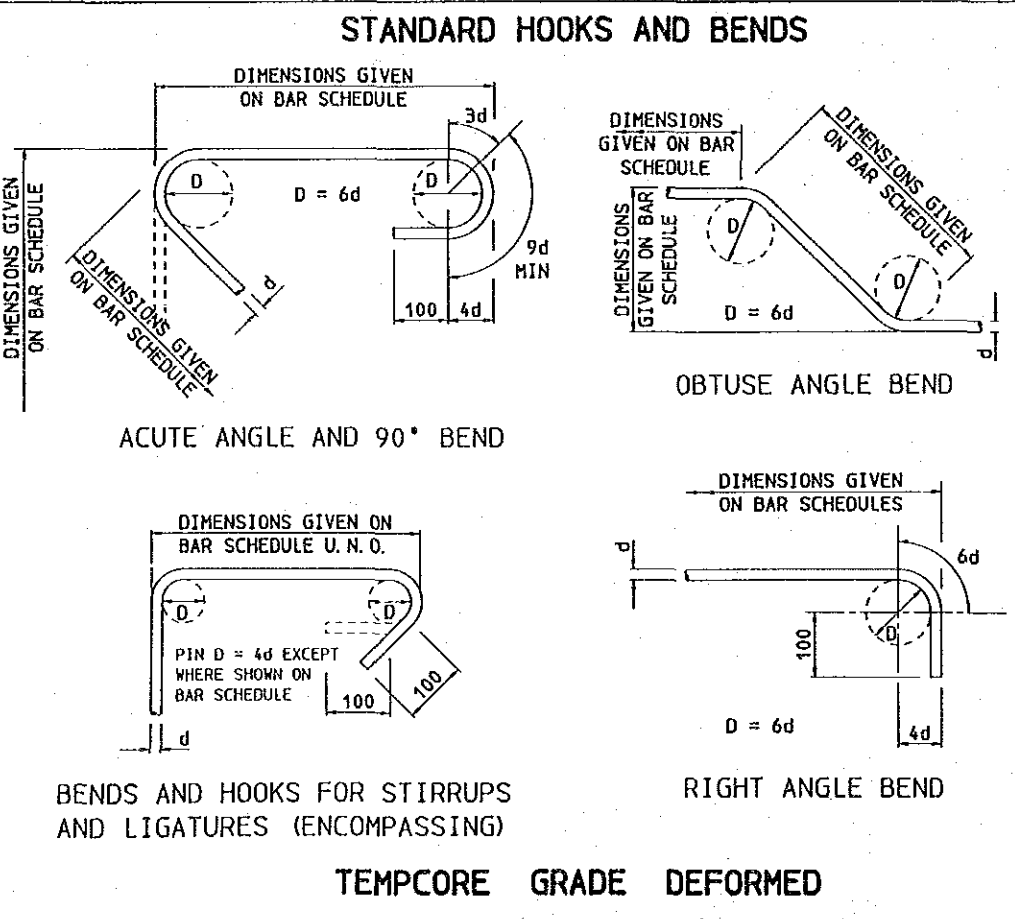
- EXPLANATION OF BAR MARKS  
e.g. 40 - TC32 - 07 - 250 - B  
No. OFF      TYPE      LOCATION      SPACING      BAR MARK  
BAR DIAMETER      BAR MARK
- SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG. 86052
- DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
- \* DENOTES 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

### TEPCORE GRADE DEFORMED

SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN M-S		RECOMMENDED		CENTRAL / GULP PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		DATE 25 Sep. 1989		CHECKED M. S. Kinge		PROJECT ENGINEER		TRANS-ISLAND HIGHWAY BEREINA-MALALATA SECTION	
HORIZONTAL DATUM		DATE		DESIGNED M. S. Kinge		APPROVED I. H. B.		BRIDGE No. 8 - MAKARA BRIDGE	
SURVEY BOOK No. 5		DATE		CHECKED M. S. Kinge		EXECUTIVE ENGINEER		BAR BENDING SCHEDULE SHEET 1	
AMENDMENTS		BY APP'D DATE		PROJECT No. S.C. 120-33-814/B		SHEET 285 OF 303		PAPUA NEW GUINEA DEPARTMENT OF WORKS	
				DRAWING No. A1 88319					

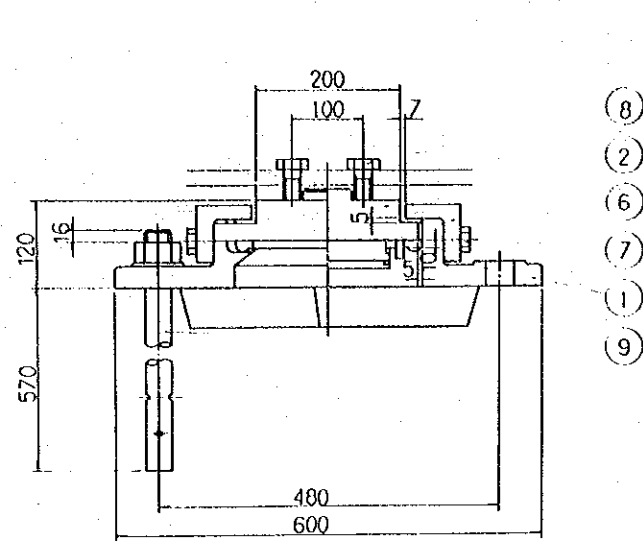


TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC16	42	72	200	500	200					900	102.3	U	
TC16	43	48	2600							2600	197.1	A	
TC20	44	108	1005							1443	384.4	F	
TC16	45	8	3500							3500	44.2	A	
TC16	46	36	1450	700	1450*					3568	202.0	C	
TC16	47	6	2950							2950	27.9	A	
TC16	48	32	5200							5200	262.7	A	
TC20	49	132	850	730	850*					2390	778.0	C	
TOTAL TONNAGE = 10.196 TONNES													2 N° ABUTMENTS

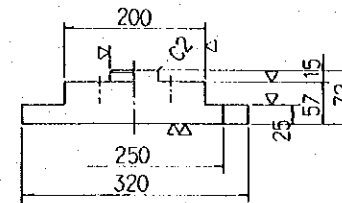
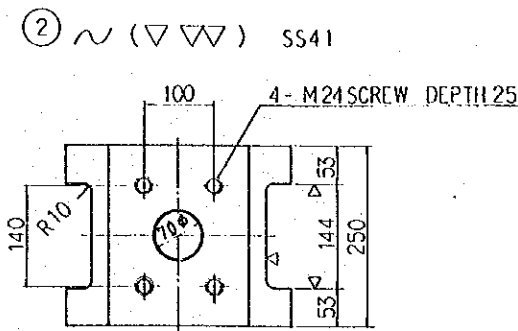
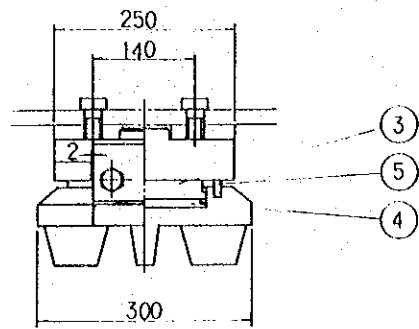


- ### NOTES
- EXPLANATION OF BAR MARKS  
e.g. 40 - TC32 - 07 - 250 - B  
No. OFF: 40, TYPE: TC, BAR DIAMETER: 32, LOCATION: 07, SPACING: 250, BAR MARK: B
  - SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG. 86052
  - DIMENSIONS ARE OUTSIDE TO OUTSIDE OF BARS UNLESS NOTED OTHERWISE
  - \* 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

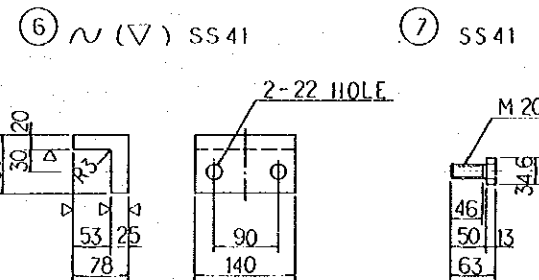
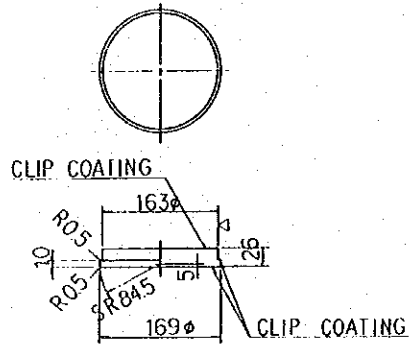
SURVEY <b>JICA</b> Date: _____ VERTICAL DATUM MEAN SEA LEVEL HORIZONTAL DATUM SURVEY BOOK No. S _____		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal: _____ Date: 25 Sep. 1989		DRAWN M.S. CHECKED _____ DESIGNED _____ CHECKED _____		RECOMMENDED PROJECT ENGINEER: _____ PRINCIPAL ENGINEER: _____ APPROVED EXECUTIVE ENGINEER: _____ SECRETARY: _____		SCALES _____ SHEET 286 OF 303		PROJECT No. S.C. 120-33-814/B		CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY - BEREINA-MALALAYA SECTION <b>BRIDGE No. 8 - MAKARA BRIDGE</b> <b>BAR BENDING SCHEDULE SHEET 2</b> PAPER NEW GUINEA DEPARTMENT OF WORKS DRAWING No. A1 88320	
REV	AMENDMENTS	BY	APP'D	DATE									



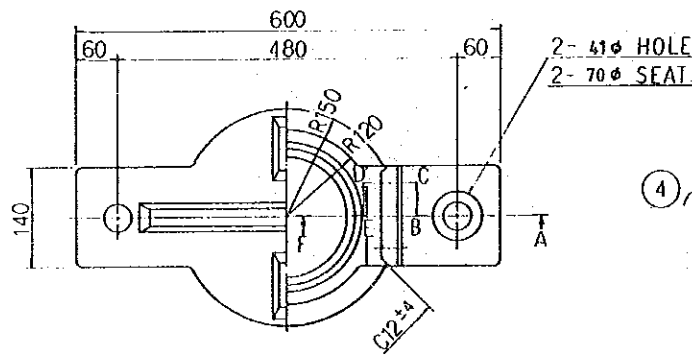
R - 50<sup>TON</sup> FIX BEARING



③ 12.55 (▽) SS41

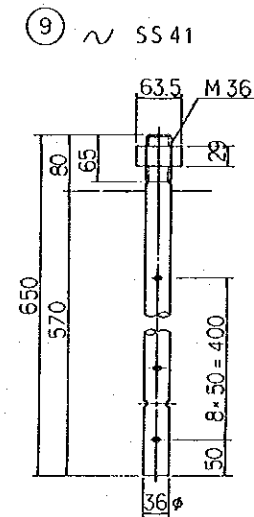
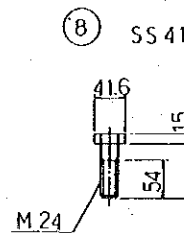
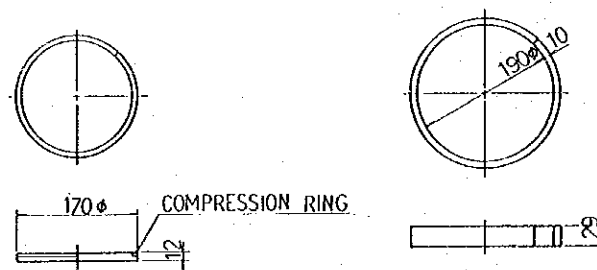


① 12.55 (▽) SC46

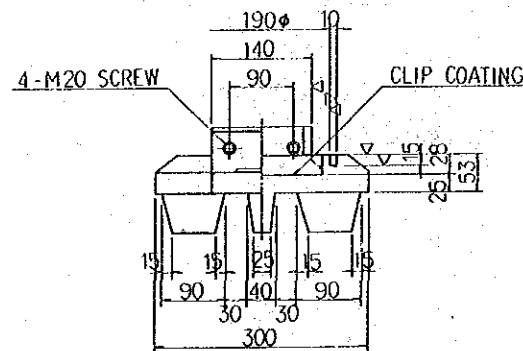
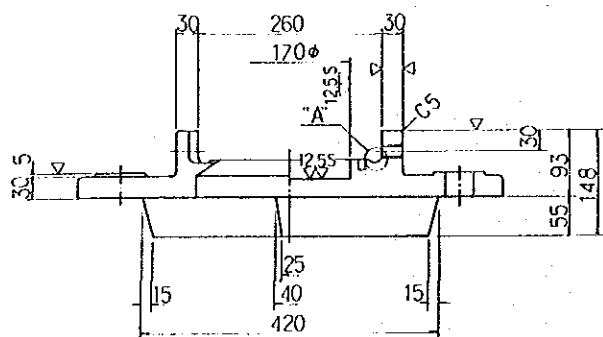


④ ~ CHLOROPRENE RUBBER

⑤ ~ CHLOROPRENE RUBBER



"A" DETAIL  
R10  
5

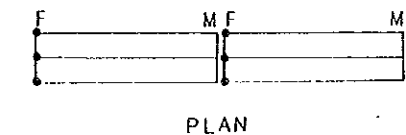


DESIGN CONDITION

TOTAL REACTION	R	36.0	ton
DEAD LOAD REACTION	R <sub>d</sub>	12.6	ton
LIVE LOAD REACTION	R <sub>(L)</sub>	23.4	ton
LONGITUDINAL FORCE (FRICTION)	R <sub>H1</sub>	3.6	ton
LONGITUDINAL FORCE (EARTHQUAKE)	R <sub>H1e</sub>	10.6	ton
TRANSVERSE FORCE (EARTHQUAKE)	R <sub>H2e</sub>	5.3	ton
UPLIFT (EARTHQUAKE)	V	1.3	ton
SEISMIC COEFFICIENT	K <sub>H</sub>	0.42	
FRICTATIVE COEFFICIENT	f	0.1	
BEARING STRESS OF CONCRETE	σ <sub>Ba</sub>	80	kg/cm <sup>2</sup>

MATERIAL LIST

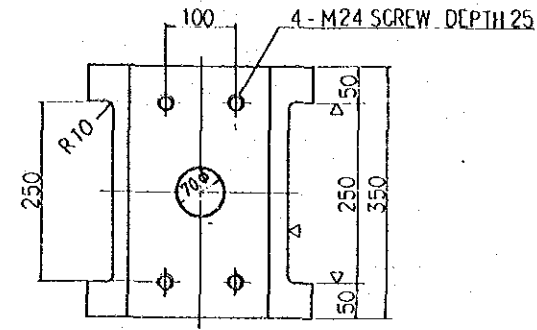
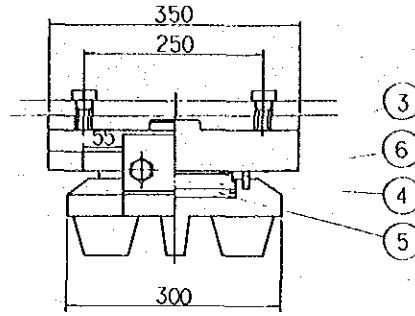
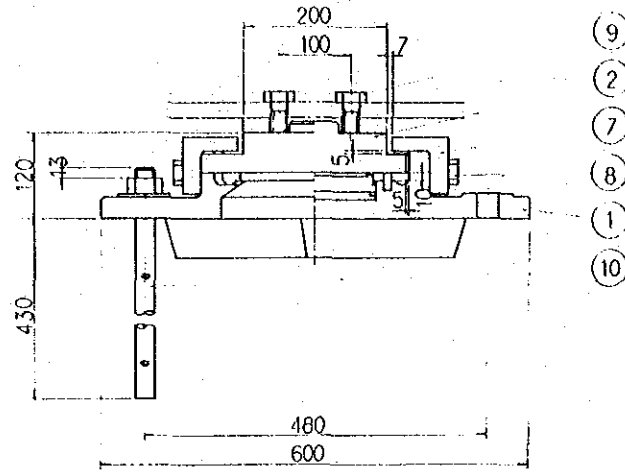
MAKE	NAME	MATERIAL	N O	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	42.8	
2	UPPER BEARING	SS41	1	26.4	
3	MIDDLE PLATE	SS41	1	4.4	
4	RUBBER PLATE	CHLOROPRENE RUBBER	1	0.4	
5	SEAL RING	CHLOROPRENE RUBBER	1	0.2	
6	SIDE BLOCK	SS41	2	6.4	
7	BOLT	SS41	4	0.7	M20 = 50 (S-46)
8	BOLT	SS41	4		M24 = 54
9	ANCHOR BOLT-NUT	SS41	2	11.2	
				TOTAL WEIGHT (kg)	92.5



SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MS		RECOMMENDED		CENTRAL / GULF PROVINCES	
Date		Date		Checked		Checked		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
VERTICAL DATUM MEAN SEA LEVEL		Date		Designed		Approved		BRIDGE No. 8 -- MAKARA BRIDGE	
HORIZONTAL DATUM		Date		Checked		Checked		BEARING BP-B-101 (FIXED)	
SURVEY BOOK No.		Date		Principal		Executive Engineer		PAPUA NEW GUINEA DEPARTMENT OF WORKS	
AMENDMENTS		BY APP'D DATE		Principal		Executive Engineer		DRAWING No.	
				25 Sep. 1989				A1/88321	
				Date		Date		SHEET 287 OF 303	
								PROJECT No. S.C.120-33-814/B	

R-50 TON Mov BEARING

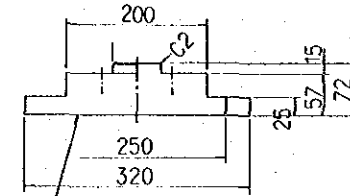
② ~ (▽▽▽) SS41



DESIGN CONDITION

TOTAL REACTION	R	33.8 ton
DEAD LOAD REACTION	Rd	12.6 ton
LIVE LOAD REACTION	R(l-v)	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 <sub>ba</sub>	80 kg/cm <sup>2</sup>

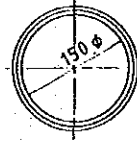
④ 12.5S (▽) SS41



MATERIAL LIST

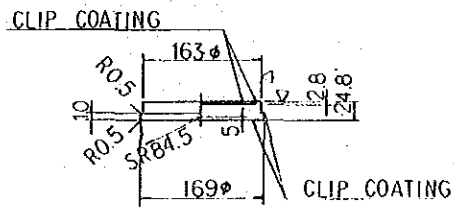
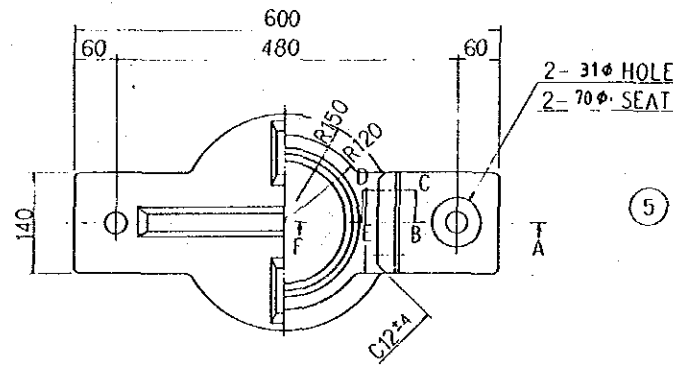
NO.	NAME	MATERIAL	QTY.	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	43.2	
2	UPPER BEARING	SS41	1	36.2	
3	GLIDE PLATE	PTFE	1	0.2	
4	MIDDLE PLATE	SS41	1	3.8	
5	RUBBER PLATE	CHLOROPRENE RUBBER	1	0.4	
6	SEAL RING	CHLOROPRENE RUBBER	1	0.2	
7	SIDE BLOCK	SS41	2	6.4	
8	BOLT	SS41	4	0.7	M20-50
9	BOLT	SS41	4	1.2	M24-46
10	ANCHOR BOLT-NUT	SS41	2	5.2	M24-54
TOTAL WEIGHT (kg)				96.3	

③ ~ PTFE



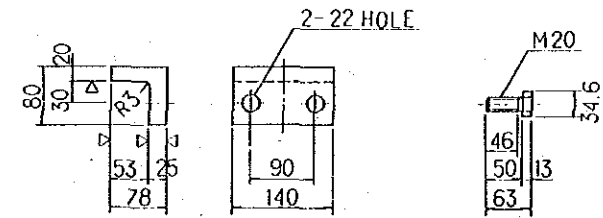
HARD CHROMIUM COATINGS

① ~ (▽▽) 12.5S SC46



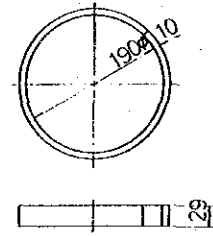
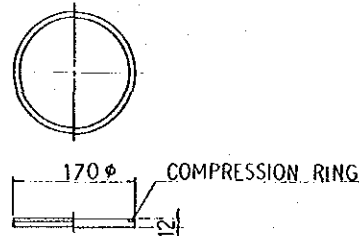
⑦ ~ (▽) SS41

⑧ SS41



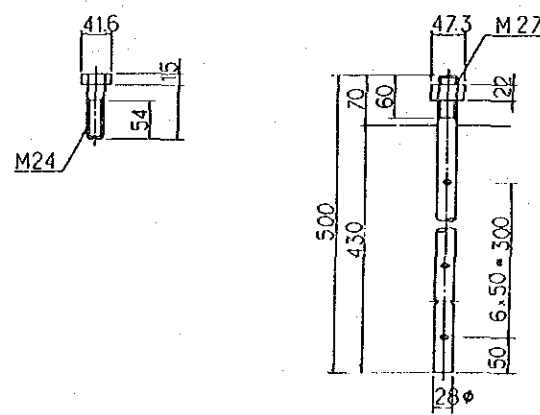
⑤ ~ CHLOROPRENE RUBBER

⑥ ~ CHLOROPRENE RUBBER

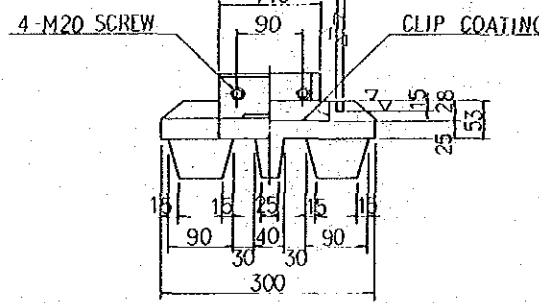
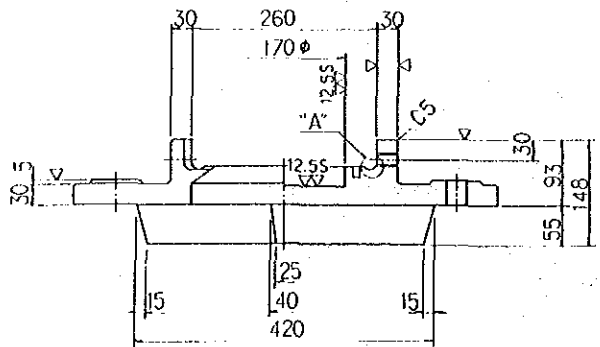


⑨ SS41

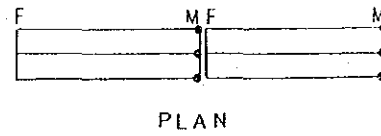
⑩ ~ SS41



"A" DETAIL



SECTION "ABCDEF"



PLAN

SURVEY JICA		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN MS		RECOMMENDED		CENTRAL / GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Principal 25 Sep. 1989		CHECKED of dai		PROJECT ENGINEER 1/11/89		TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION	
HORIZONTAL DATUM		Principal 25 Sep. 1989		DESIGNED H. Shingo		PRINCIPAL ENGINEER 1.11.89		BRIDGE No.8 - MAKARA BRIDGE	
SURVEY BOOK NOS		Principal 25 Sep. 1989		CHECKED of dai		EXECUTIVE ENGINEER 1/11/89		BEARING BP-B - 102 (MOVABLE)	
REV.	AMENDMENTS	BY	APP'D	DATE	Principal 25 Sep. 1989	SECRETARY FAS(15)		PAPUA NEW GUINEA DEPARTMENT OF WORKS	
				SHEET 288 OF 303		PROJECT No. S.C. 120-33-814/B		DRAWING No. A1/88322	

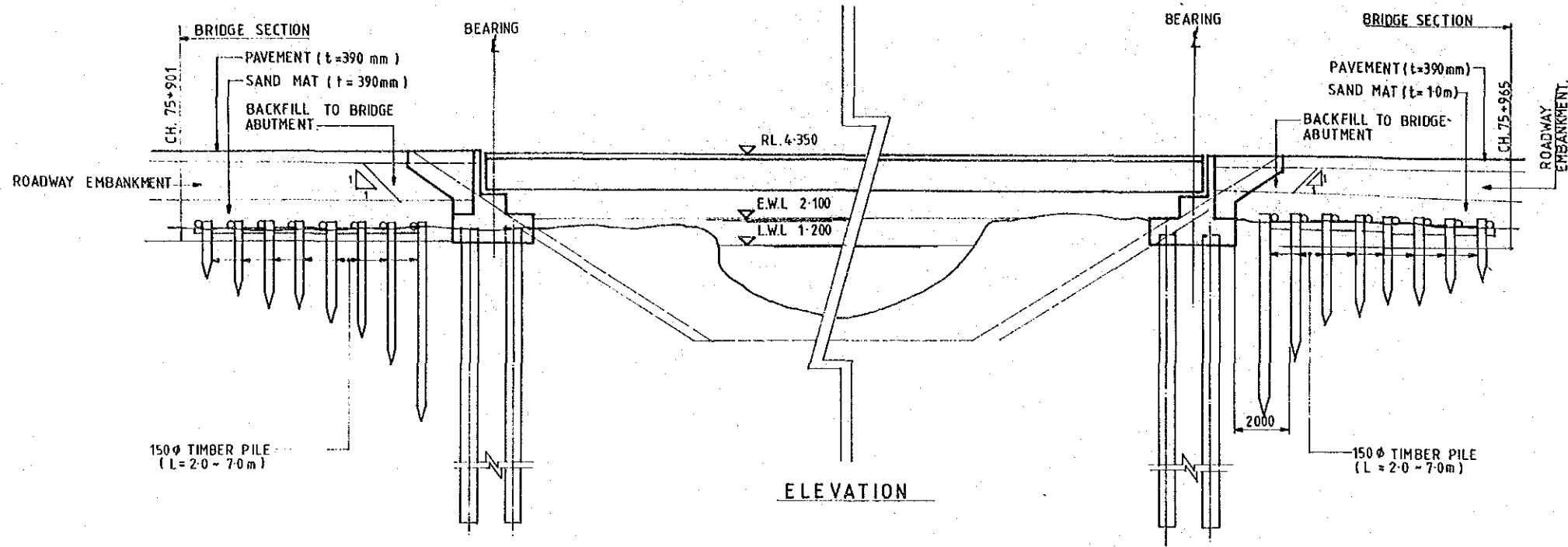
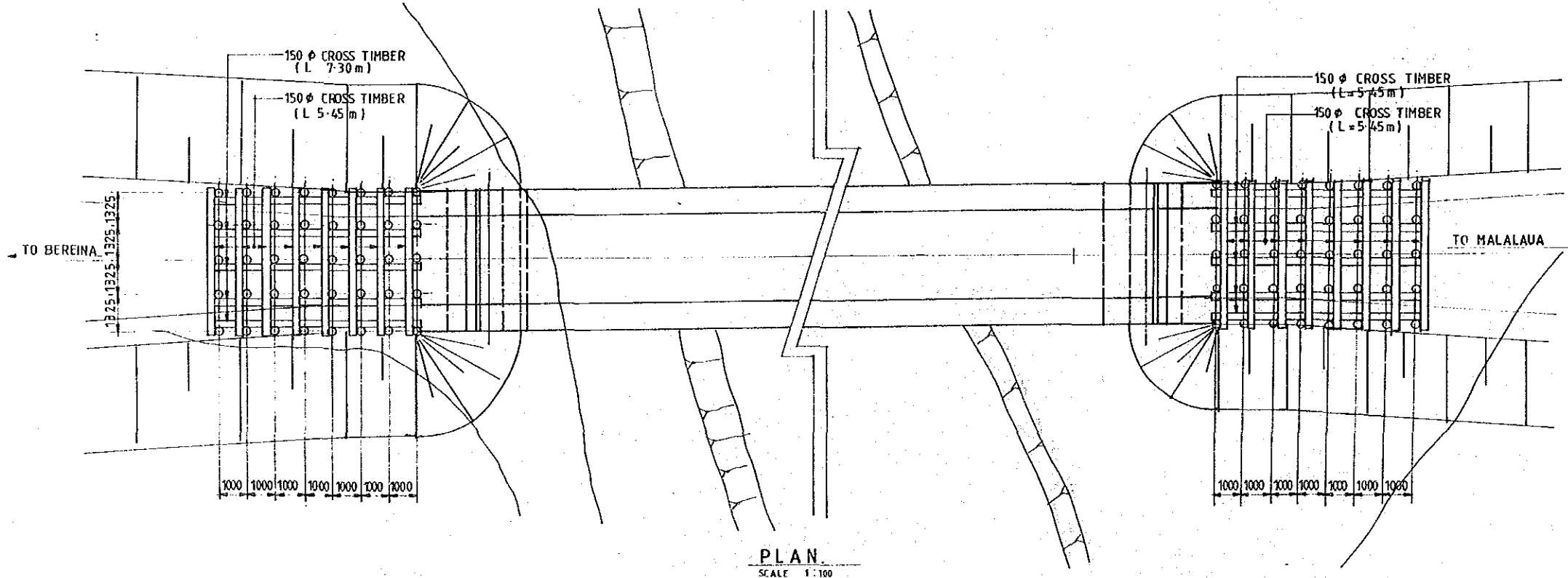


TABLE OF QUANTITIES				
DESCRIPTION	UNIT	QUANTITY	REMARKS	
CLEARING AND GRUBBING AT BRIDGE SITE	ha	0.1		
EXCAVATION FOR STRUCTURAL FOUNDATIONS	TYPE C	m <sup>3</sup>	0	
	TYPE D	m <sup>3</sup>	65	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS	m <sup>3</sup>	32.2		
BACKFILL TO BRIDGE ABUTMENT	m <sup>3</sup>	60		
ROADWAY EMBANKMENT	m <sup>3</sup>	130		
BEARING UNITS	TIMBER PILE	m	300	150 φ
	CROSS TIMBER	m	160.2	150 φ
SAND MAT	m <sup>3</sup>	238		

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



SURVEY <b>JICA</b>		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY		DRAWN M.S.		RECOMMENDED		CENTRAL GULF PROVINCES	
VERTICAL DATUM MEAN SEA LEVEL		Principal 25 Sep. 1989		CHECKED 4/19/89		PROJECT ENGINEER 11/11/89		TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION	
HORIZONTAL DATUM		Principal		DESIGNED 7/1/89		APPROVED 1.11.89		BRIDGE No. 8 - MAKARA BRIDGE.	
SURVEY BOOK NO. 8		Principal		CHECKED 4/19/89		EXECUTIVE ENGINEER		BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT & OTHERS.	
REV.	AMENDMENTS	BY	APP'D	DATE	SHEET 289 OF 303		PROJECT No. S.C. 120-33-814/B		PAPUA NEW GUINEA DEPARTMENT OF WORKS
							DRAWING No. A1 88323		



**GENERAL NOTES**

**1. ABBREVIATIONS**

T	TOP	STRP	STIRRUP
B	BOTTOM	TRMR	TRIMMER
NF	NEAR FACE	MS	MILD STEEL
FF	FAR FACE	SYMM	SYMMETRICAL
EW	EACH WAY	NTS	NOT TO SCALE
EF	EACH FACE	TYP	TYPICAL
C	CENTRELINE	FLG	FLANGE
R	PLATE		

**2. DESIGN LOADINGS**

NORMAL	T44	STANDARD VEHICLE
ABNORMAL	60T	TONNE VEHICLE
EARTHQUAKE	EEBPNG	1985 ZONE 4
DECK	A14	

**3. PILING**

ALL PILING SHALL BE THE SPECIFIED GRADE  
MAXIMUM TOLERANCE ON PLAN POSITION AT  
PILE TOP FOR ANY PILE = ± 75mm

PILE (CONTRACT)	LENGTHS	SIZE
BEREINA ABUTMENT	22.2m x 6 nos	500φ x 14 THK (OPEN END)
PIER	31.8m x 4 nos	800φ x 12 THK (CLOSED END)
MALALAU ABUTMENT	21.9m x 6 nos	500φ x 14 THK (OPEN END)
TEST PILE	31m x 1 no	800φ x 12 THK

MAXIMUM PILE WORKING COMPRESSION LOADS:  
ABUTMENTS 700 kN  
PIERS 1400 kN  
THE TIP OF THE PILES SHALL BE REINFORCED AS SHOWN

**4. CONCRETE**

ALL CONCRETE SHALL BE GRADE 25 (F<sub>c</sub> = 25 MPa)

**5. REINFORCING STEEL**

ALL REINFORCEMENT SHALL BE EITHER:

- a) TEMPCORE (T.C.) BARS OF 410 MPa
- b) ROUND (R) BARS OF 230 MPa

**6. LAP LENGTHS**

UNLESS NOTED OTHERWISE LAP LENGTHS TO BE AS FOLLOWS:

12 DIA	500mm
16 DIA	650mm
20 DIA	800mm
24 DIA	1000mm
28 DIA	1500mm
32 DIA	1650mm

**7. COVER TO OUTSIDE FACE OF REINFORCEMENT**

DECK	
a) TOP OF ROADWAY	35mm
BOT OF ROADWAY AND ELSEWHERE	30mm
PIER	
a) CROSS BEAM	40mm
b) COLUMNS	40mm
c) PILE CAP	65mm
ABUTMENT	
a) WINGWALL/BACKWALL	
- OPEN FACES	30mm
- FILL FACES	50mm
b) PILE CAP	65mm

**8. STRUCTURAL STEELWORK**

ALL MAIN BEAMS, COVER PLATES AND SPLICE PLATES  
TO BE GRADE 350 STEEL. ALL OTHER STEEL WORK  
TO BE GRADE 250 STEEL. ALL WELDS SHALL BE 6mm CONTINUOUS  
FILLET WELDS UNLESS NOTED OTHERWISE

**9. BOLTING**

ALL BOLTS ON MAIN STEELWORK (MAIN BEAMS, CROSS FRAMES AND  
BRACING) TO BE M24 8.8/TF.  
ALL OTHER BOLTS TO BE GRADE 4.6/S

**10. STEELWORK FINISHES**

ALL SURFACES TO BE SUITABLY PROTECTED BY PAINT WORK  
- REFER TO SPECIFICATION

**11. BEARINGS**

PIER LOADS & ABUTMENT LOADS	DEAD LOAD = 126.12 kN LIVE LOAD = 233.66 kN TOTAL = 359.78 kN
BEARING ASSUMED FOR DETAILING = POT BEARING BP. B-101 (FIXED) POT BEARING BP. B-102 (MOVABLE)	

MEAN TEMPERATURE IS 25.1 °C AT THE PROJECT SITE

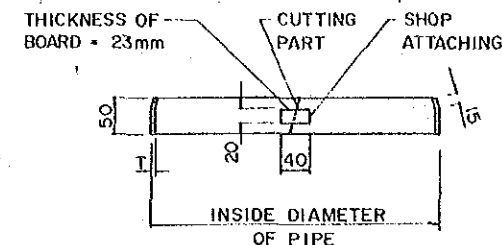
**12. MAIN BEAM PRECAMBER**

STEEL BEAMS TO BE PRECAMBERED TO THE UNSTRESSED PROFILE  
SHOWN ON THE DRAWING.

**13. ERECTION**

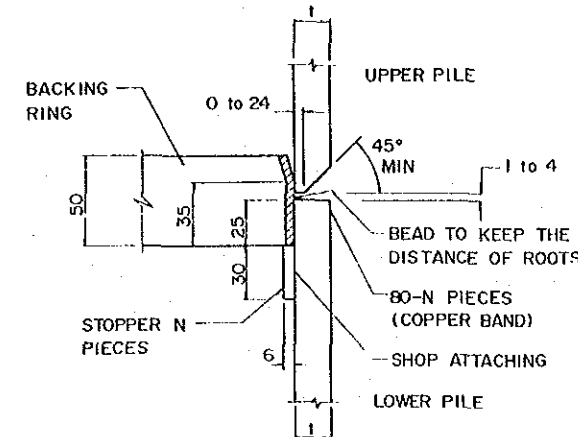
THE CONTRACTOR IS TO PROVIDE DETAILS OF ERECTION PROCEDURES  
TO THE ENGINEER PRIOR TO ERECTION OF THE GIRDERS THIS IS TO  
ENSURE THAT THE ALLOWABLE STRESSES ON THE GIRDER SECTIONS  
ARE NOT EXCEEDED

- 14. ABUTMENT A - BEREINA SIDE
- ABUTMENT B - MALALAU SIDE



BACKING RING - CROSS SECTION

THICKNESS OF BACKING RING	
OUTSIDE DIAMETER D	T (mm)
1016 AND UNDER	4.5
OVER 1016	6.0



BACKING RING AND STOPPER

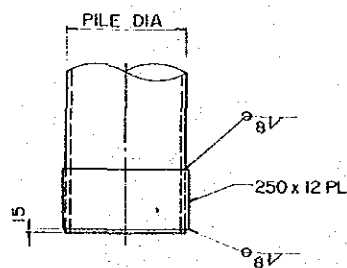
NUMBER OF STOPPERS	
OUTSIDE DIAMETER D (mm)	N NUMBER OF PIECES
609.6 AND UNDER	4
OVER 609.6 to 1016 incl.	6
OVER 1016	8

**NOTES**

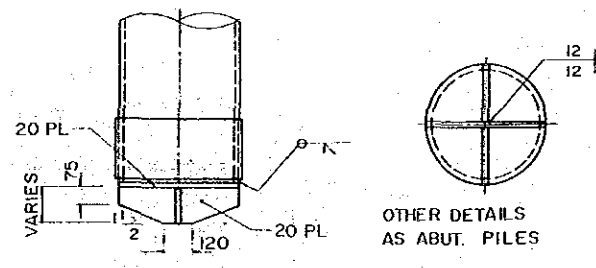
- 1. MAXIMUM PILE SECTION LENGTH EQUALS 10m.
- 2. WELDING TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

**SHAPES AND DIMENSIONS OF BACKING RING AND STOPPER**

DRAWING LIST	
DRG. NO.	DRAWING TITLE
88324	GENERAL NOTES AND DRAWING LIST
88325	GENERAL ARRANGEMENT
88326	ABUTMENT PLAN & DETAILS (MALALAU ABUTMENT)
88327	ABUTMENT PLAN & DETAILS (BEREINA ABUTMENT)
88328	PIER DETAILS
88329	DECK SLAB DETAILS
88330	STEELWORK DETAILS SHEET 1
88331	STEELWORK DETAILS SHEET 2
88332	HANDRAILING / IMPACT ANGLE DETAILS
88333	BAR BENDING SCHEDULE SHEET 1
88334	BAR BENDING SCHEDULE SHEET 2
88335	BEARING BP. B-101 (FIXED)
88336	BEARING BP. B-102 (MOVABLE)
88337	BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS

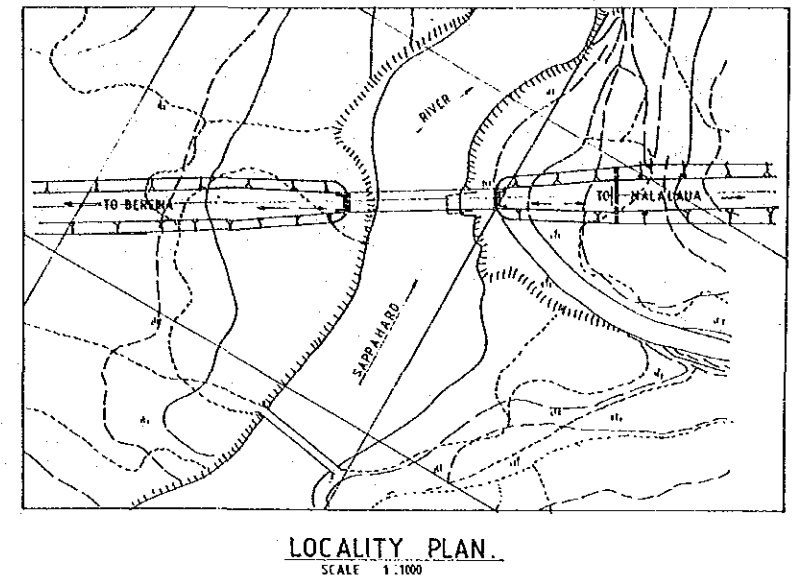
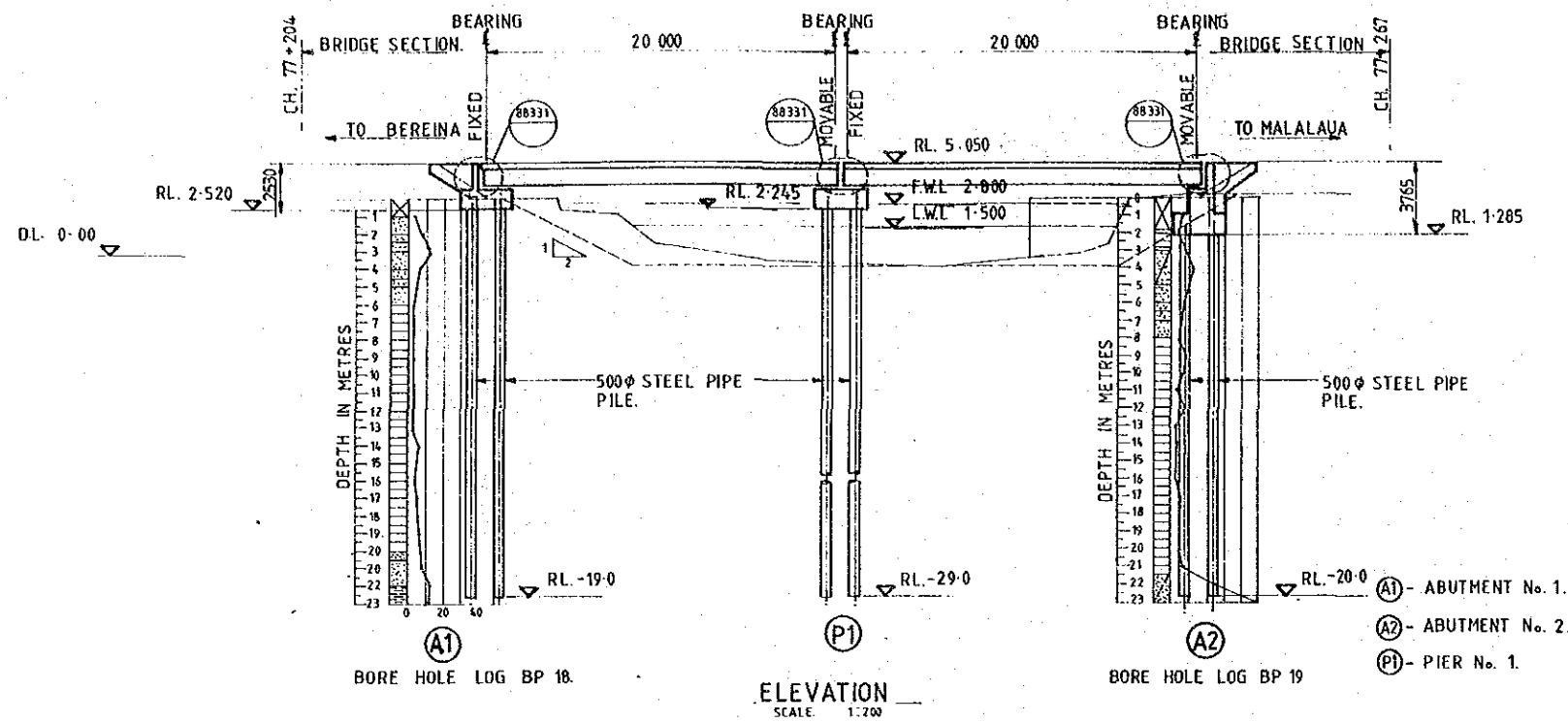


PILE TOE REINFORCEMENT (OPEN END)

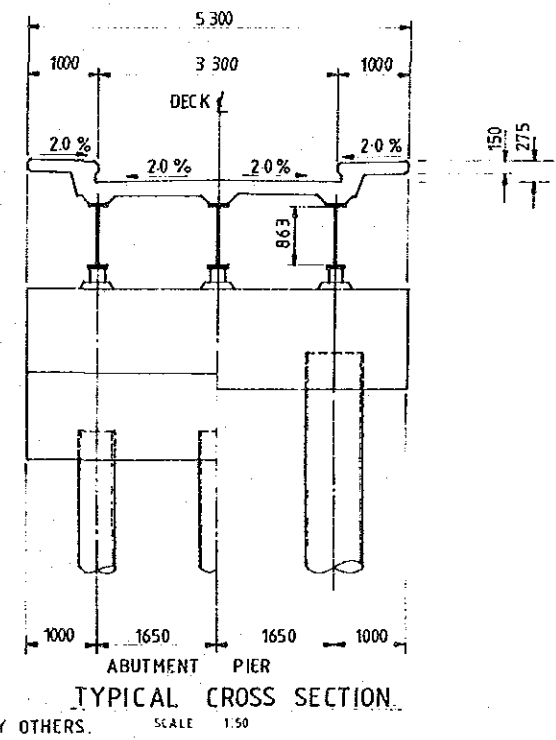
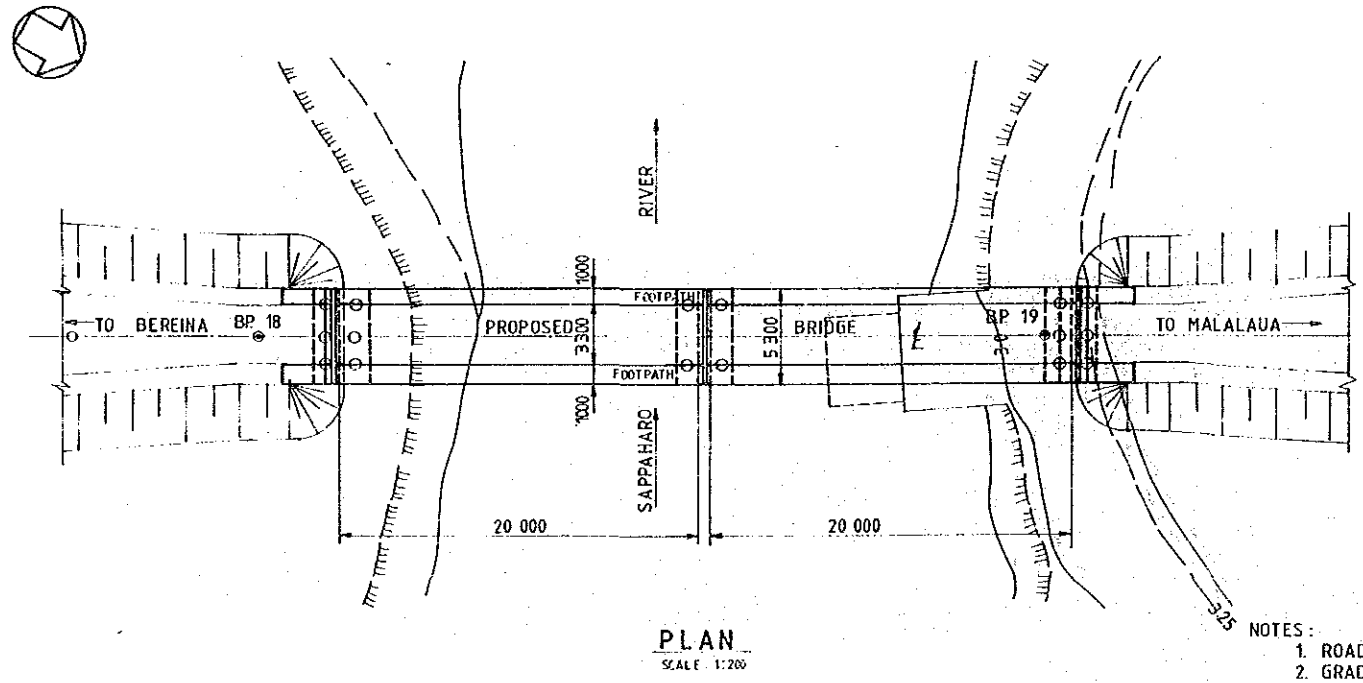


PILE TIP REINFORCEMENT (CLOSED END)

REV	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION BRIDGE No.9 - SAPPAHARO BRIDGE GENERAL NOTES AND DRAWING LIST PAPUA NEW GUINEA DEPARTMENT OF WORKS	DRAWING No. A1 88324	
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	M.S					
					VERTICAL DATUM MEAN SEA LEVEL		CHECKED	PROJECT ENGINEER	APPROVED			PRINCIPAL ENGINEER
					HORIZONTAL DATUM		DESIGNED		1.11.89			
					SURVEY BOOK NOS	25 Sep. 1989	CHECKED	EXECUTIVE ENGINEER	PROJECT No. S.C. 120-33-814/B	SHEET 290 OF 303		



GRADE LEVELS	5.05	5.05	5.05	5.05	5.05
SURFACE LEVELS	3.05				3.02
CHAINAGE	CH. 77 + 234.70 CH. 77 + 241.70	CH. 77 + 247.70	CH. 77 + 254.70 CH. 77 + 261.70	CH. 77 + 268.05	CH. 77 + 275.45 CH. 77 + 282.45

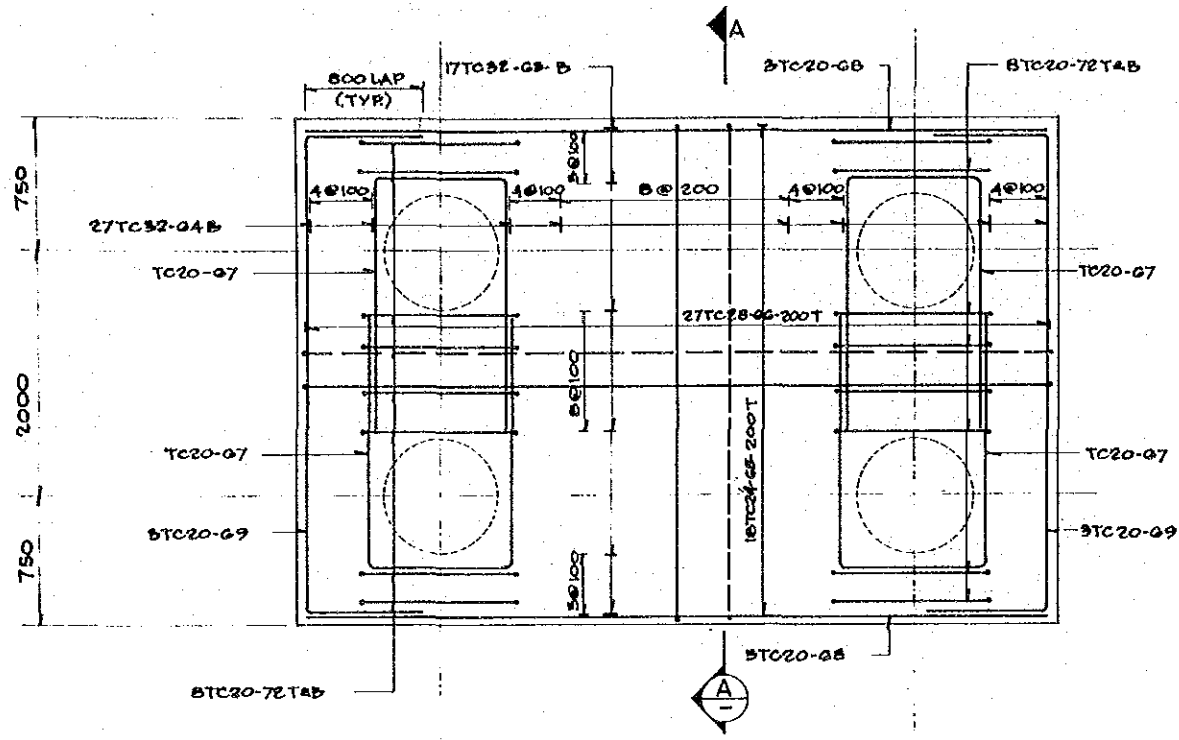


NOTES:  
1. ROAD ALIGNMENT DESIGN AND DETAILS BY OTHERS.  
2. GRADE LEVELS ARE AT BRIDGE CENTRE LINE.

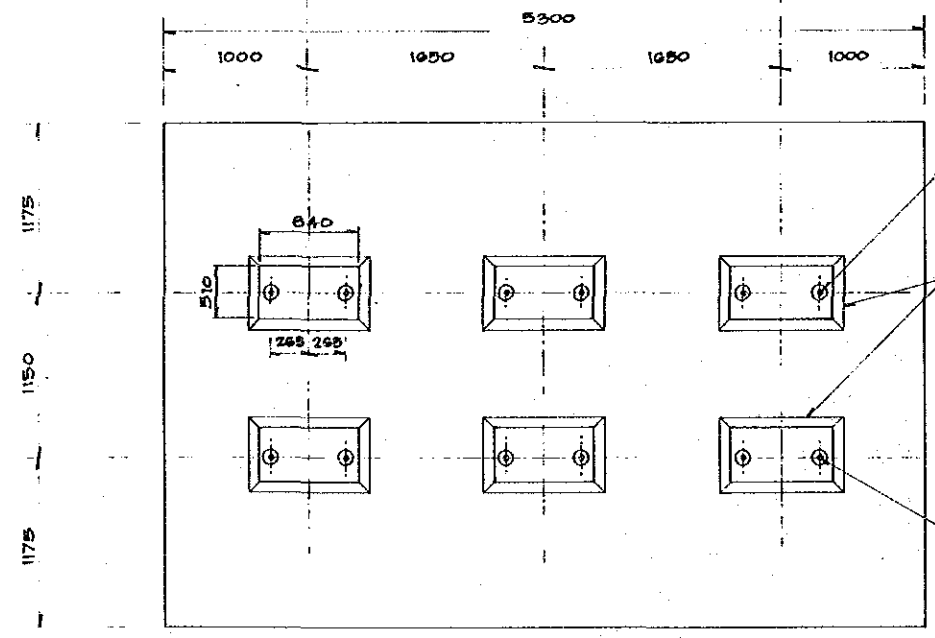
REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY	DESIGN	DRAWN	RECOMMENDED	SCALES	CENTRAL GULF PROVINCES	
					JICA	JAPAN INTERNATIONAL CO-OPERATION AGENCY	J. B. MAGGIO	W. J. JONES		TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION	
					VERTICAL DATUM MEAN SEA LEVEL		CHECKED D. Dai	PROJECT ENGINEER		BRIDGE No. 9 - SAPPAHARO BRIDGE	
					HORIZONTAL DATUM		DESIGNED	APPROVED		GENERAL ARRANGEMENT	
					SURVEY BOOK No. 8		CHECKED D. Dai	EXECUTIVE ENGINEER		PAPUA NEW GUINEA	DRAWING No.
					25 Sep. 1989			SECRETARY	SHEET 291 OF 303	DEPARTMENT OF WORKS	A1 88325
									PROJECT No. S.C. 120-33-814/B		







PIER REINFORCEMENT PLAN  
1:25

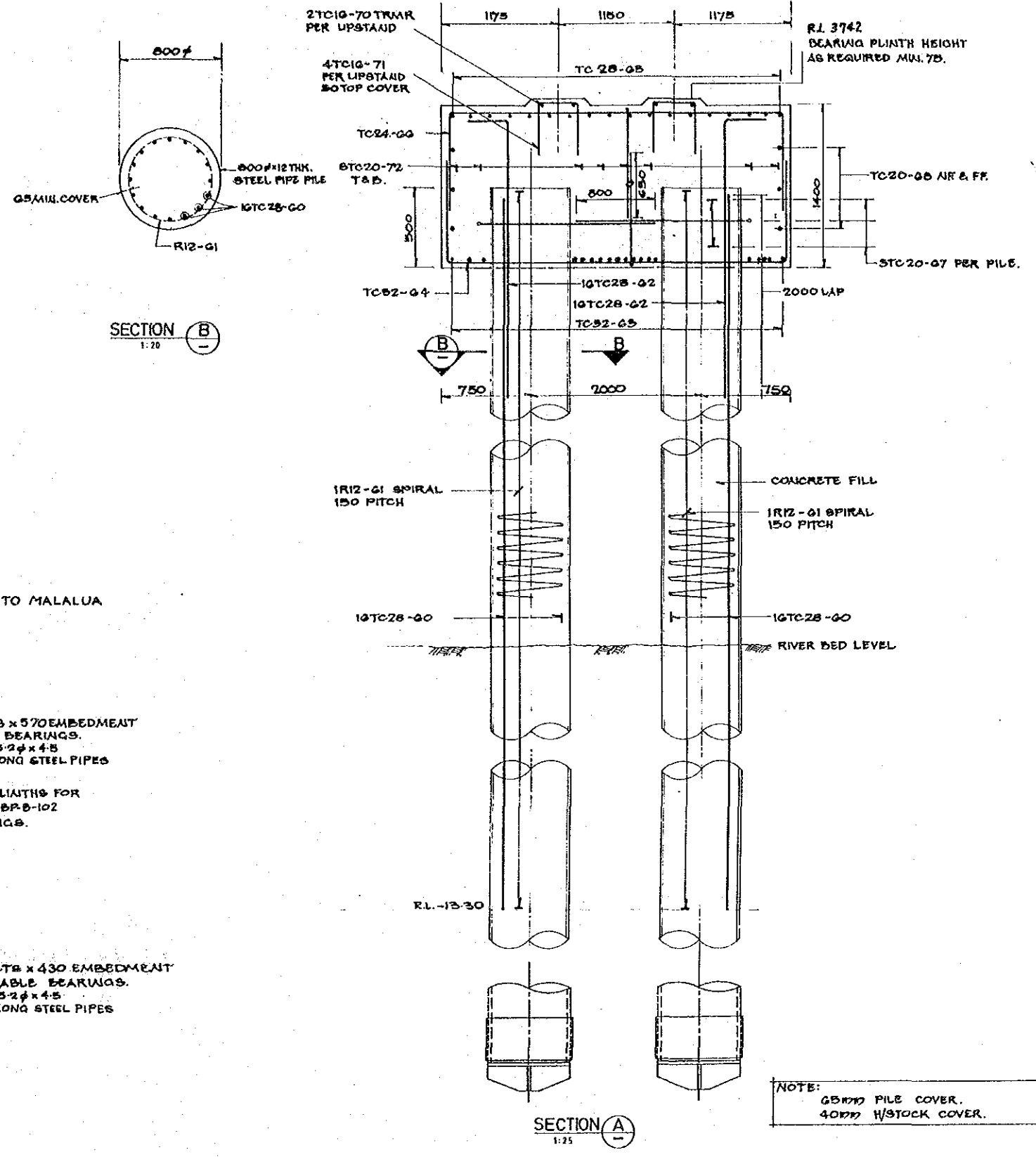


PLAN OF PIER  
1:25

2/50# BOLTS x 570 EMBEDMENT FOR FIXED BEARINGS. PROVIDE 105-24 x 45 THK x 600 LONG STEEL PIPES

BEARING PLINTHS FOR BP-B-101 & BP-B-102 POT BEARINGS.

2/28# BOLTS x 430 EMBEDMENT FOR MOVEABLE BEARINGS. PROVIDE 105-24 x 45 THK x 600 LONG STEEL PIPES



SECTION A  
1:25

NOTE:  
65#1770 PILE COVER.  
40#1770 W/STOCK COVER.

SURVEY <b>JICA</b> Date		DESIGN JAPAN INTERNATIONAL CO-OPERATION AGENCY Principal: <i>J. Yamashita</i> 25 Sep. 1989 Date		DRAWN R-W CHECKED <i>A. Doi</i> DESIGNED <i>M. Shimizu</i> CHECKED <i>A. Doi</i>		RECOMMENDED <i>Alkatira</i> 1/11/89 PROJECT ENGINEER <i>P. J. ...</i> 1/11/89 PRINCIPAL ENGINEER APPROVED <i>J. ...</i> 1.11.89 SECRETARY		SCALES [Scale bar]		CENTRAL GULF PROVINCES TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION BRIDGE No.9 - SAPP HARO BRIDGE PIER DETAILS	
REV	AMENDMENTS	BY	APP'D	DATE	SURVEY BOOK No.5	SHEET 294 OF 303	PROJECT No. S.C.120-33-814/II	PAPUA NEW GUINEA DEPARTMENT OF WORKS	DRAWING No. A1 88328	REV	