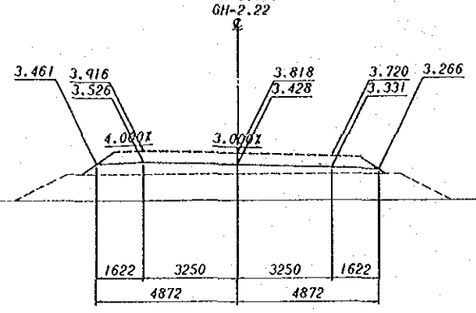
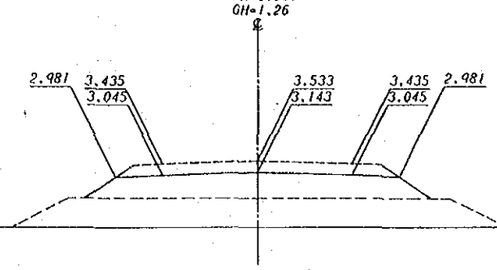
CH. 76+215.000
PH=3.818
GH=2.22



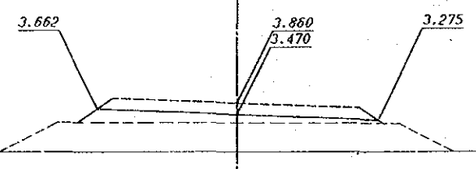
DL= 0.00

CH. 76+500.000
PH=3.533
GH=1.26



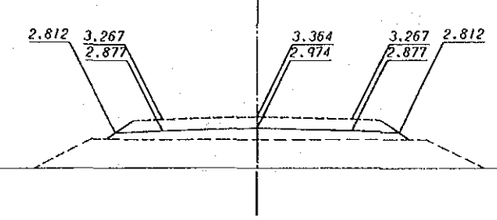
DL= 0.00

CH. 76+200.000
PH=3.860
GH=2.20



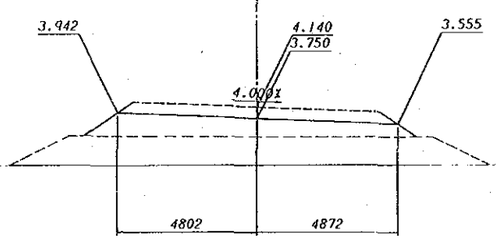
DL= 0.00

CH. 76+400.000
PH=3.364
GH=1.62



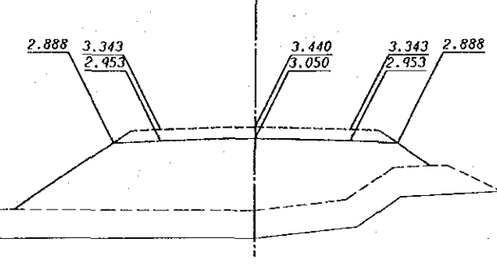
DL= 0.00

CH. 76+100.000
PH=4.140
GH=2.16



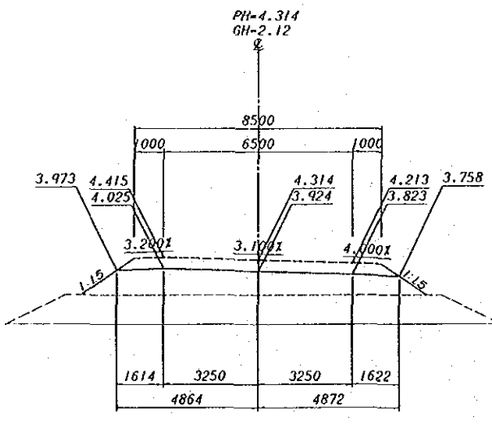
DL= 0.00

CH. 76+350.000
PH=3.440
GH=-0.37



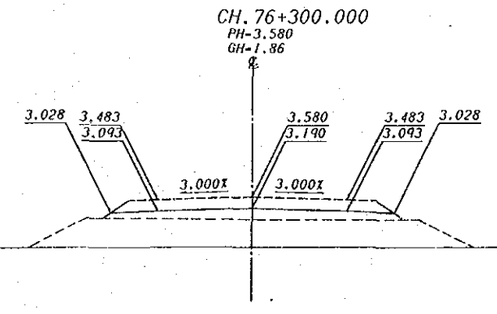
DL= -1.00

CH. 76+ 26.000
PH=4.314
GH=2.12



DL= 0.00

CH. 76+300.000
PH=3.580
GH=1.86



DL= 0.00

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
J. Hashimoto, Principal — 25 Sep. 1989 Date

DRAWN: K.E.
CHECKED:
DESIGNED: A. Magaro
CHECKED: T. Kaleni

PROJECT ENGINEER
EXECUTIVE ENGINEER

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED 25.10.89: FAS(TS) SECRETARY

SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

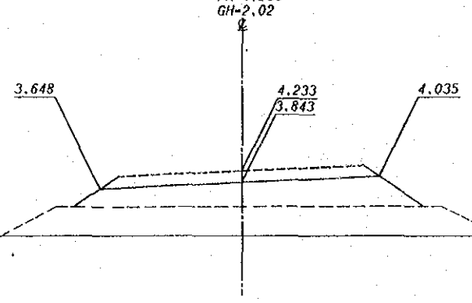
SHEET 203 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 76 + 26 — CH. 76 + 500

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

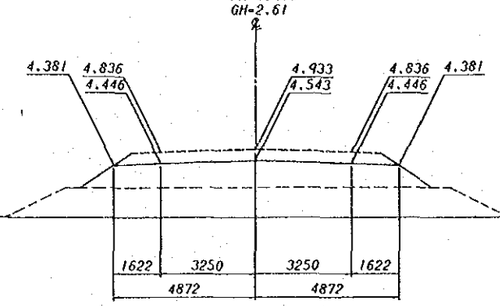
DRAWING No. A1/ 88237 REV

CH. 76+800.000
PH=4.233
GH=2.02



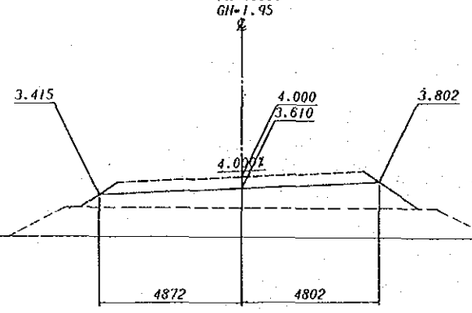
DL = 0.00

CH. 77+100.000
PH=4.933
GH=2.61



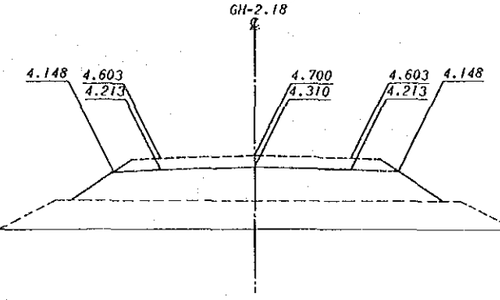
DL = 0.00

CH. 76+700.000
PH=4.000
GH=1.95



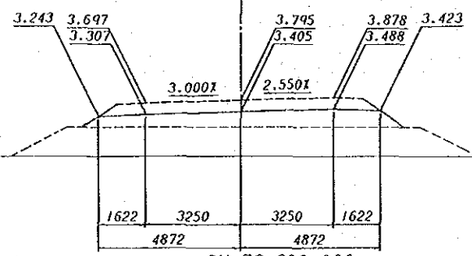
DL = 0.00

CH. 77+ 0.000
PH=4.700
GH=2.18



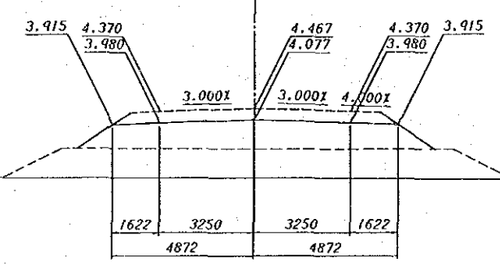
DL = 0.00

CH. 76+612.000
PH=3.795
GH=1.88



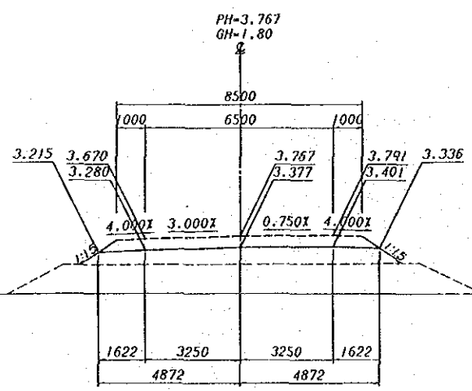
DL = 0.00

CH. 76+900.000
PH=4.467
GH=2.09



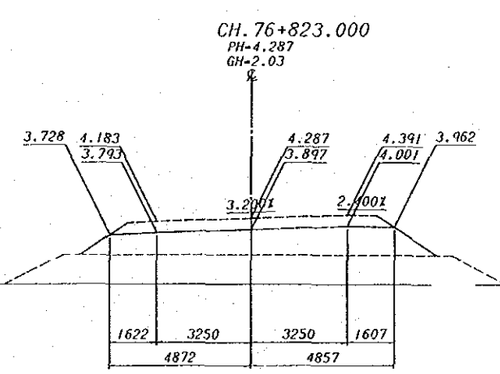
DL = 0.00

CH. 76+600.000
PH=3.767
GH=1.80



DL = 0.00

CH. 76+823.000
PH=4.287
GH=2.03



DL = 0.00

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NR.S:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Hatcho, Principal — 25 Sep. 1989, Date

DRAWN: K.E.
CHECKED:
DESIGNED: A. Magato
CHECKED: T. Kaolom

PROJECT ENGINEER
EXECUTIVE ENGINEER

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED: 25.10.89
FAS(N) SECRETARY

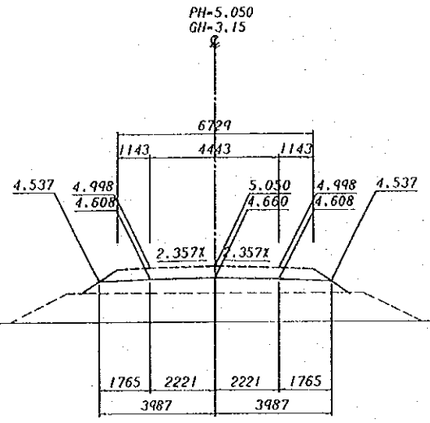
SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 204 OF 303
PROJECT No. S.C. 120-33-814/B

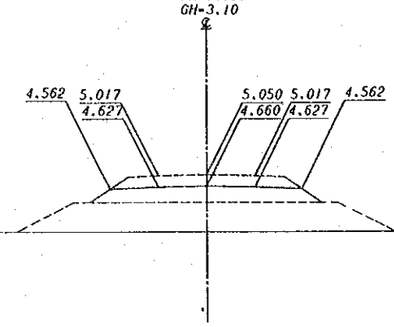
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 76 + 600 — CH. 77 + 100

PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88238
REV.

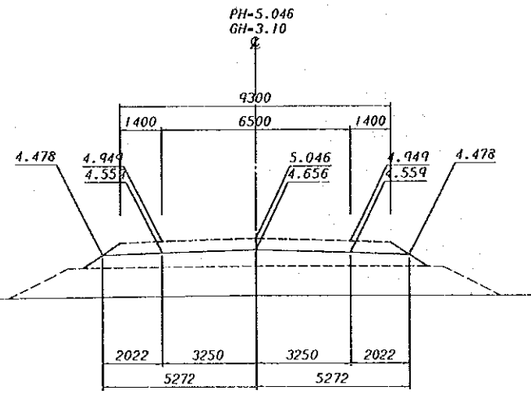
CH. 77+200.000



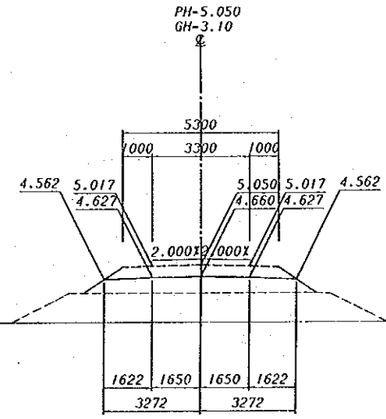
CH. 77+211.400



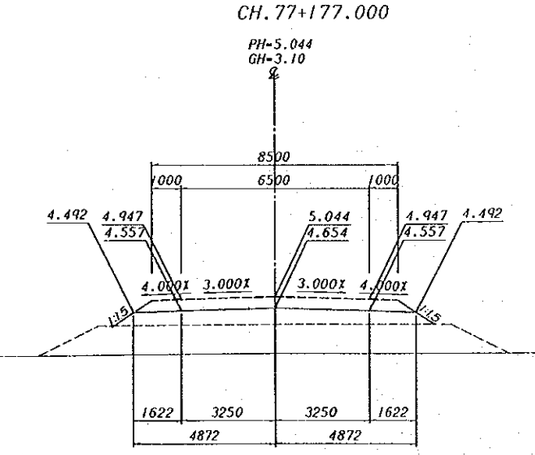
CH. 77+182.000



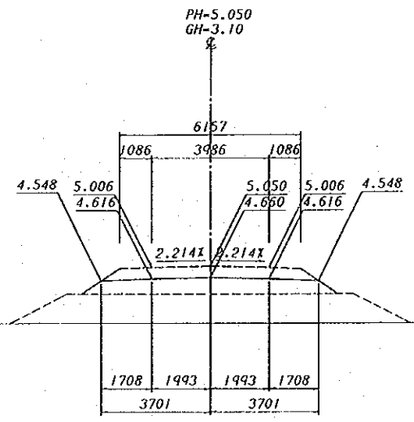
CH. 77+210.000



CH. 77+177.000



CH. 77+204.000



REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NT.S

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yokota — Principal — 25 Sep. 1989 — Date

DRAWN: K.E.
CHECKED: C. Pb'
DESIGNED: A. Magalo
CHECKED: T. Kaleo

PROJECT ENGINEER: W. Kuk
EXECUTIVE ENGINEER: Mta

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED: 25.10.89 — SECRETARY

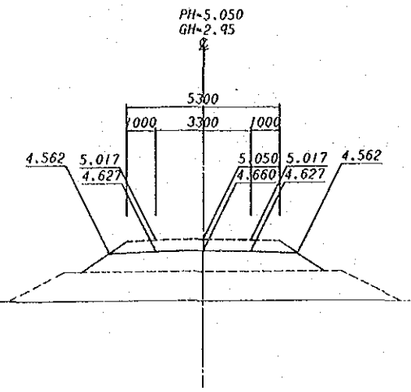
SCALES: 4 2 0 2 4 — HORIZONTAL & VERTICAL m. — 1 : 100

SHEET 205 OF 303
PROJECT No. S.C. 120-33-814/B

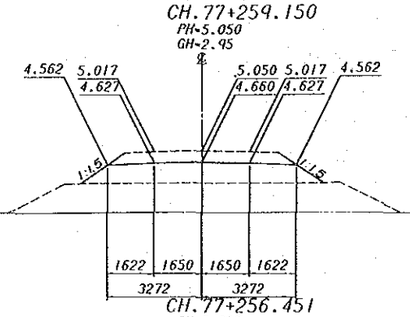
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 77 + 177 — CH. 77 + 211.400

PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88239
REV.

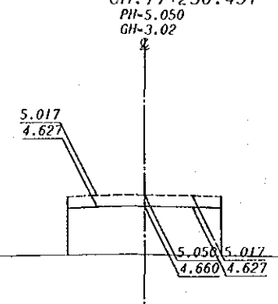
CH.77+261.000



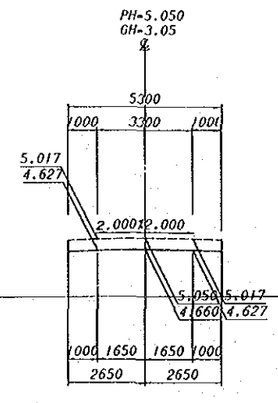
CH.77+259.150



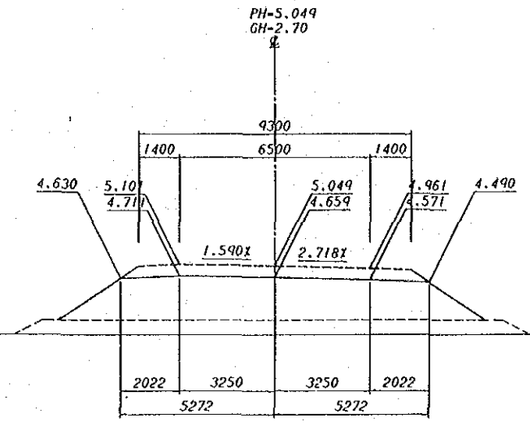
CH.77+256.451



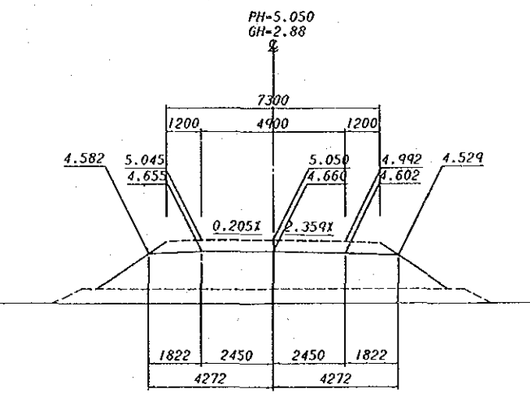
CH.77+214.099



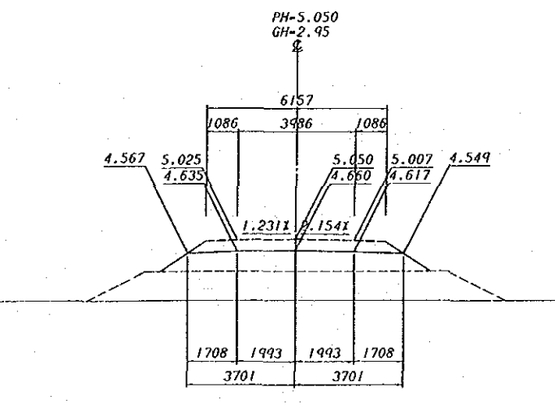
CH.77+289.000



CH.77+275.000



CH.77+267.000



REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NO.8

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yakuwa — Principal — 25 Sep. 1989 — Date

DRAWN: K.E.
CHECKED: C. Z.
DESIGNED: A. Magalio
CHECKED: T. Kakeu

PROJECT ENGINEER: L. Kirke
EXECUTIVE ENGINEER:

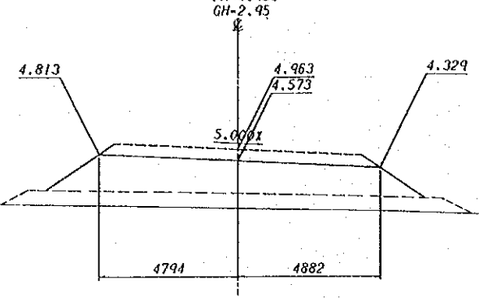
RECOMMENDED: A. Magalio — PRINCIPAL ENGINEER
APPROVED: 25.10.89 — T. Iwami — FOR (S) SECRETARY

SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 206 OF 303
PROJECT No. S.C. 120-33-814/B

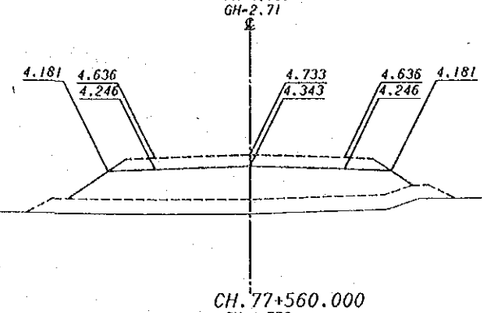
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 77 + 214.099 — CH. 77 + 289
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88240

CH.77+400.000
PH=4.963
GH=2.95



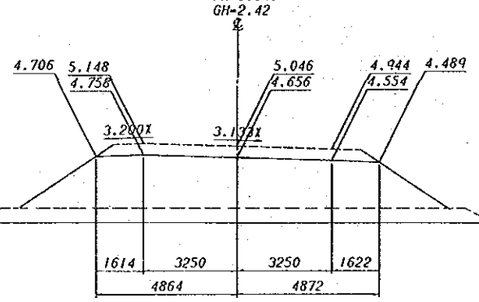
DL= 0.00

CH.77+600.000
PH=4.733
GH=2.71



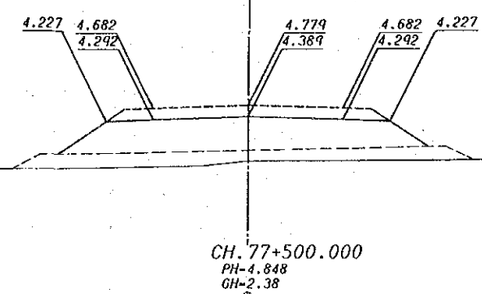
DL= 0.00

CH.77+301.000
PH=5.046
GH=2.42



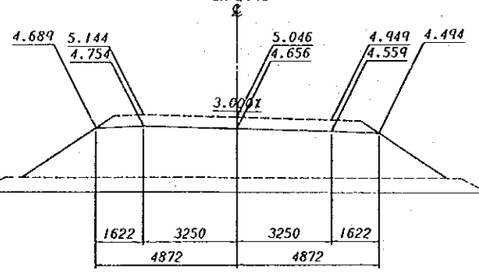
DL= 0.00

CH.77+560.000
PH=4.779
GH=2.88



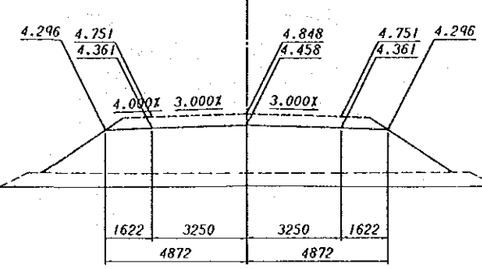
DL= 0.00

CH.77+300.000
PH=5.046
GH=2.48



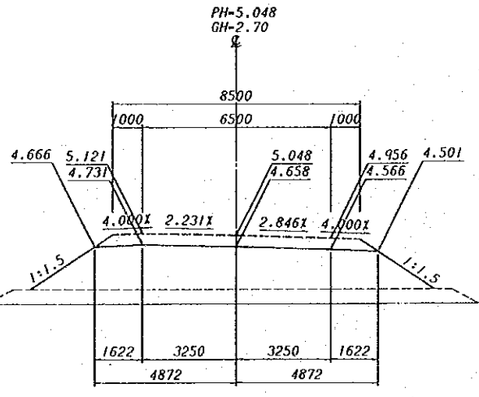
DL= 0.00

CH.77+500.000
PH=4.848
GH=2.38



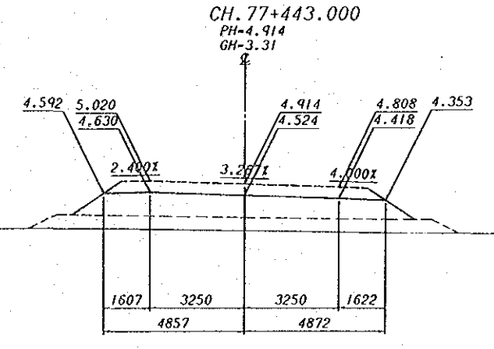
DL= 0.00

CH.77+294.000
PH=5.048
GH=2.70



DL= 0.00

CH.77+443.000
PH=4.914
GH=3.31



DL= 0.00

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM
SURVEY BOOK NO.9

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Hakuta — Principal — 25 Sep. 1989 — Date

DRAWN: K.E.
CHECKED: C. Z.
DESIGNED: A. Nagata
CHECKED: T. Kanbara

PROJECT ENGINEER
EXECUTIVE ENGINEER

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED 25.10.89 — SECRETARY

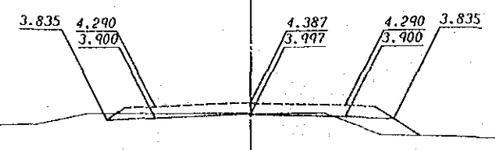
SCALES
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 207 OF 303
PROJECT No. S.C.120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 77 + 294 — CH. 77 + 600

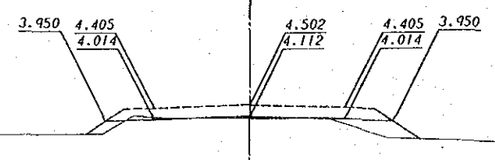
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88241
REV.

CH.77+900.000
PH=4.387
GH=4.02



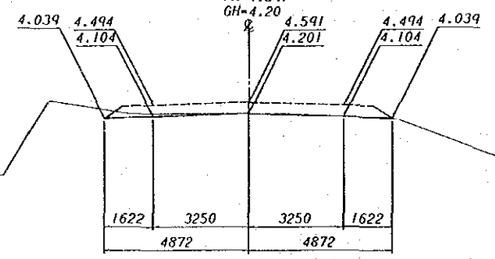
DL= 1.00

CH.77+800.000
PH=4.502
GH=4.05



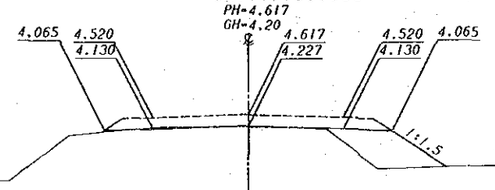
DL= 1.00

CH.77+723.000
PH=4.591
GH=4.20



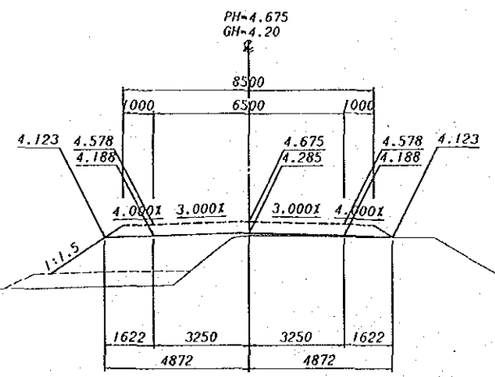
DL= 0.00

CH.77+700.000
PH=4.617
GH=4.20



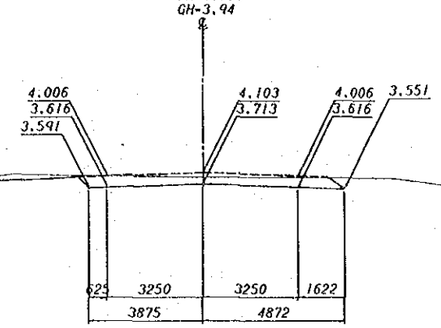
DL= 1.00

CH.77+650.000
PH=4.675
GH=4.20



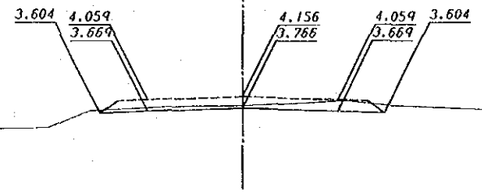
DL= 1.00

CH.78+146.000
PH=4.103
GH=3.94



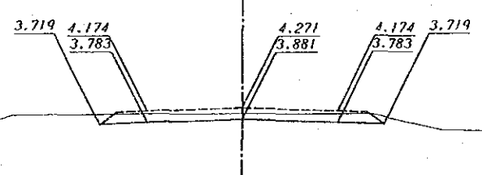
DL= 1.00

CH.78+100.000
PH=4.156
GH=3.85



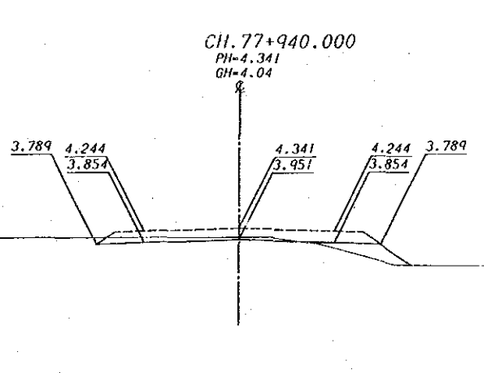
DL= 1.00

CH.78+ 0.000
PH=4.271
GH=4.07



DL= 1.00

CH.77+940.000
PH=4.341
GH=4.04



DL= 1.00

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NO.:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yakushi — Principal — 25 Sep. 1969 — Date

DRAWN: K.E.
CHECKED: C. Ito
DESIGNED: A. Magabe
CHECKED: T. Kanbara

PROJECT ENGINEER: K. Kuroda
EXECUTIVE ENGINEER:

RECOMMENDED: A. Mlanga — PRINCIPAL ENGINEER
APPROVED: 25.10.84 — J. Simo — DIRECTOR(S) SECRETARY

SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 208 OF 303
PROJECT No. S.C. 120-33-814/B

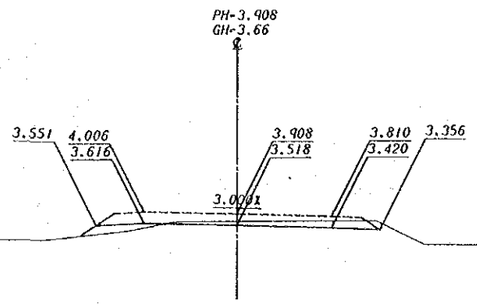
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 77 + 650 — CH. 78 + 146

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

DRAWING No. A1/ 88242

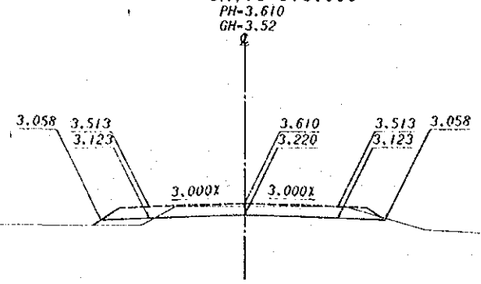
REV.

CH. 78+315.000



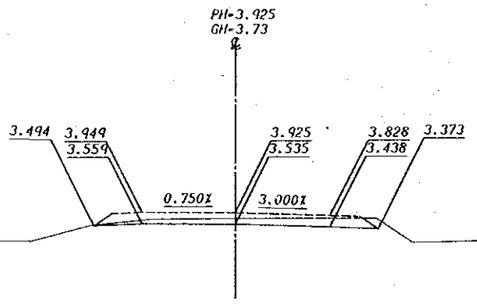
DL = 1.00

CH. 78+573.000



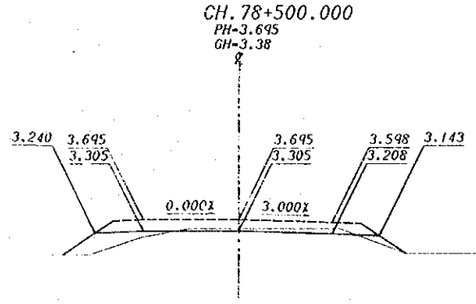
DL = 1.00

CH. 78+300.000



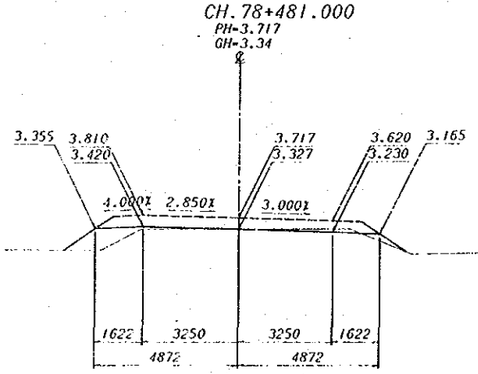
DL = 1.00

CH. 78+500.000



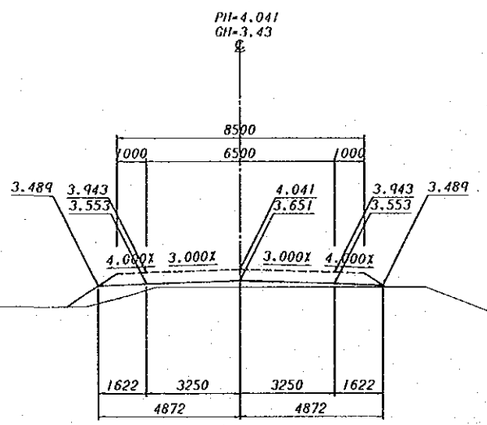
DL = 1.00

CH. 78+481.000



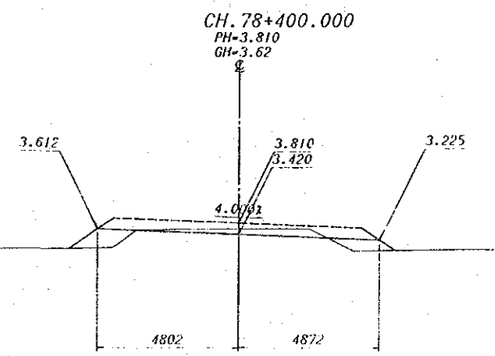
DL = 1.00

CH. 78+200.000



DL = 1.00

CH. 78+400.000



DL = 1.00

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
J. Matsuda — Principal — 25 Sep. 1989 — Date

DRAWN: K.E.
CHECKED: C. [illegible]
DESIGNED: A. Magabo
CHECKED: [illegible]

[illegible] — PROJECT ENGINEER
[illegible] — EXECUTIVE ENGINEER

RECOMMENDED: [illegible] — PRINCIPAL ENGINEER
APPROVED: 25.10.89
[illegible] — SECRETARY

SCALES
HORIZONTAL & VERTICAL m.
1 : 100

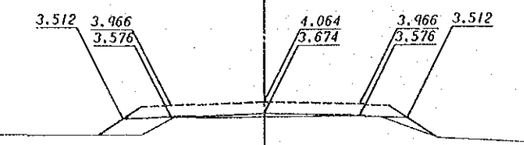
SHEET 209 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 78 + 200 — CH. 78 + 573

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

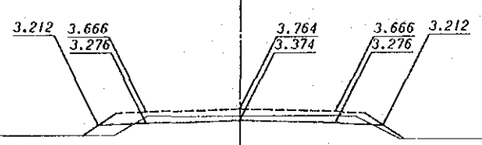
DRAWING No. A1/ 88243

CH.78+900.000
PH=4.064
GH=3.55



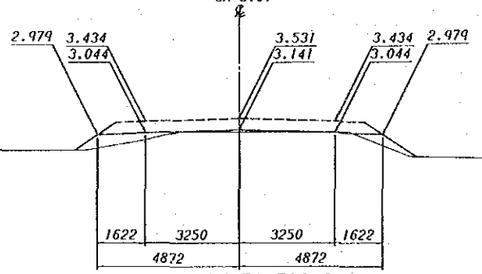
DL = 1.00

CH.78+800.000
PH=3.764
GH=3.52



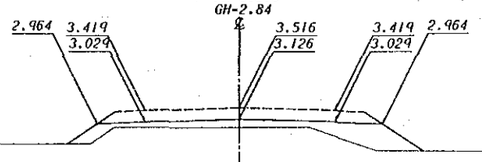
DL = 1.00

CH.78+713.000
PH=3.531
GH=3.07



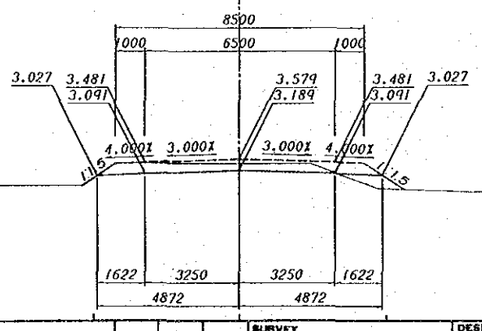
DL = 0.00

CH.78+700.000
PH=3.516
GH=2.84



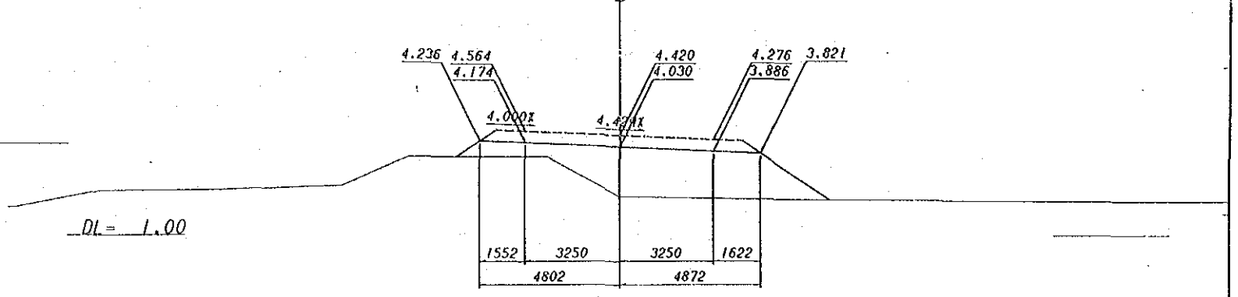
DL = 1.00

CH.78+600.000
PH=3.579
GH=3.42



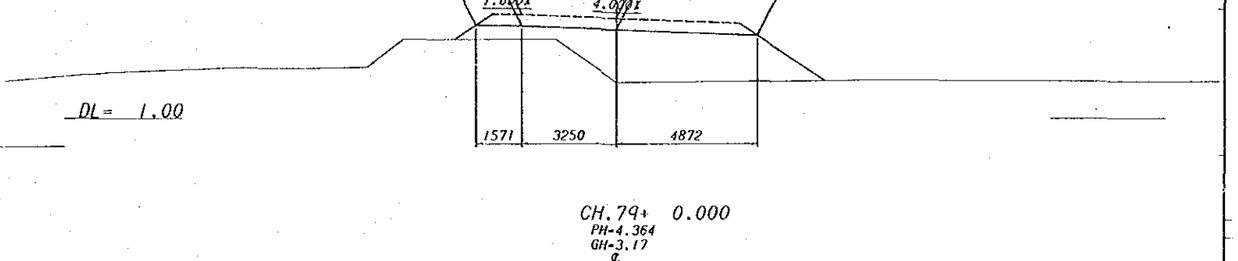
DL = 1.00

CH.79+ 25.000
PH=4.420
GH=2.33



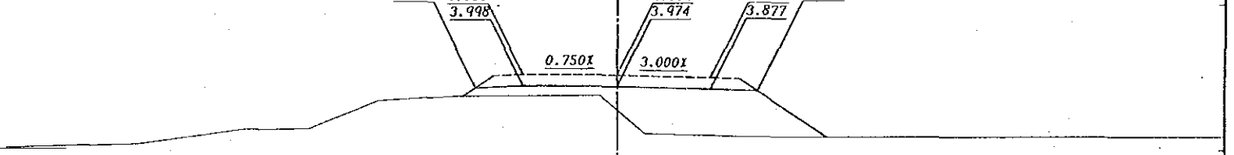
DL = 1.00

CH.79+ 22.000
PH=4.415
GH=2.23



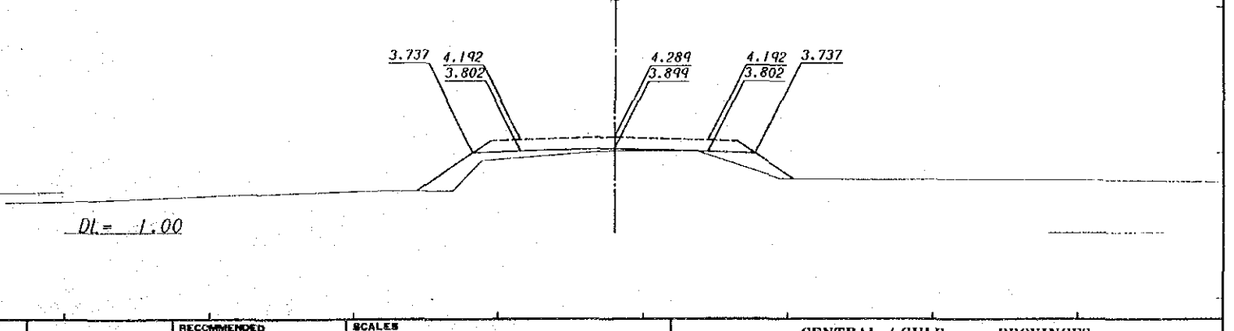
DL = 1.00

CH.79+ 0.000
PH=4.364
GH=3.17



DL = 1.00

CH.78+975.000
PH=4.289
GH=3.83



DL = 1.00

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK Nr.8

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Hakuta, Principal, 25 Sep. 1989, Date

DRAWN: K.E.
CHECKED:
DESIGNED:
CHECKED:

PROJECT ENGINEER
EXECUTIVE ENGINEER

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED: SECRETARY

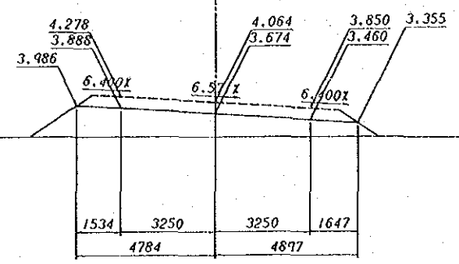
SCALES: HORIZONTAL & VERTICAL m. 1 : 100

SHEET 210 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 78 + 600 — CH. 79 + 25

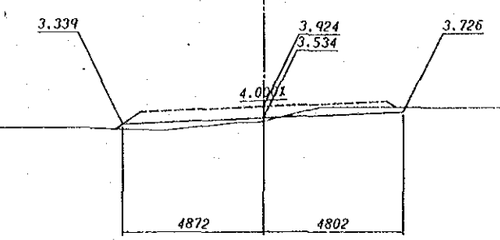
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88244
REV.

CH. 79+200.000
PH=4.064
GH=2.88



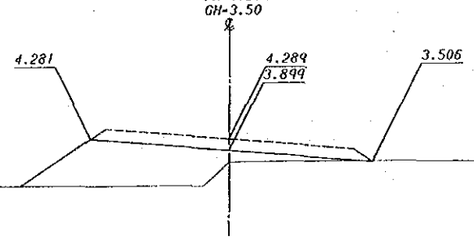
DL = 1.00

CH. 79+400.000
PH=3.924
GH=3.41



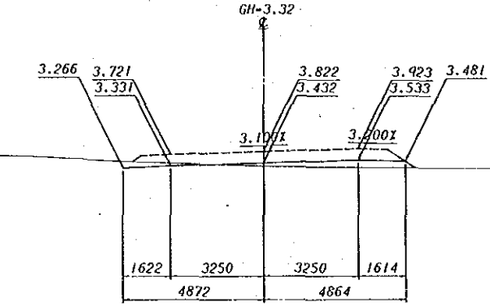
DL = 1.00

CH. 79+125.000
PH=4.289
GH=3.50



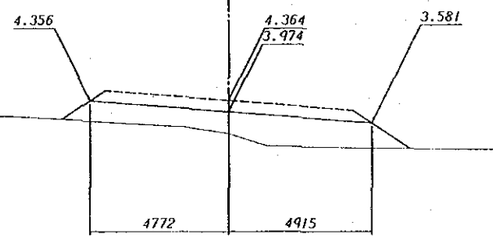
DL = 1.00

CH. 79+331.000
PH=3.822
GH=3.32



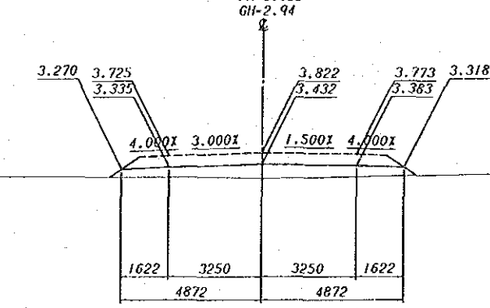
DL = 1.00

CH. 79+100.000
PH=4.364
GH=3.24



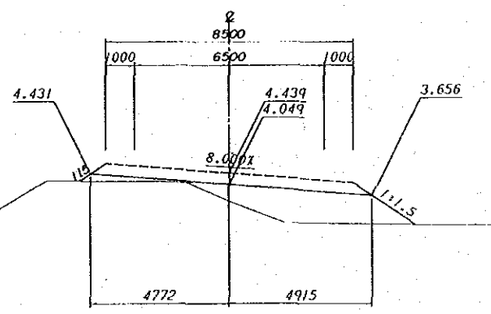
DL = 1.00

CH. 79+300.000
PH=3.822
GH=2.94



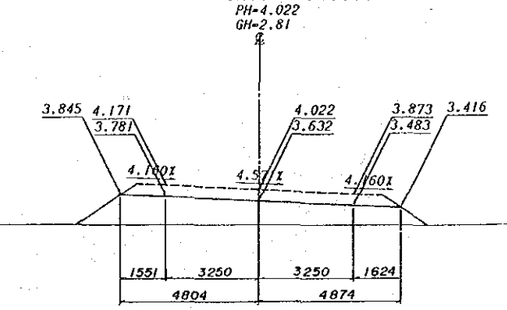
DL = 1.00

CH. 79+ 50.000
PH=4.439
GH=3.48



DL = 1.00

CH. 79+214.000
PH=4.022
GH=2.81



DL = 1.00

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NO.:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yahata, Principal, 25 Sep. 1989, Date

DRAWN: K.E.
CHECKED:
DESIGNED: A. Magaka
CHECKED:

PROJECT ENGINEER
EXECUTIVE ENGINEER

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED: 25.10.89, FAS(ES) SECRETARY

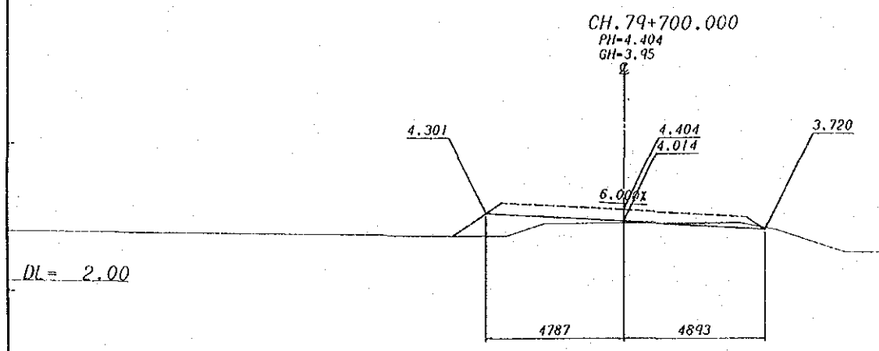
SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 211 OF 303
PROJECT No. S.C. 126-33-814/B

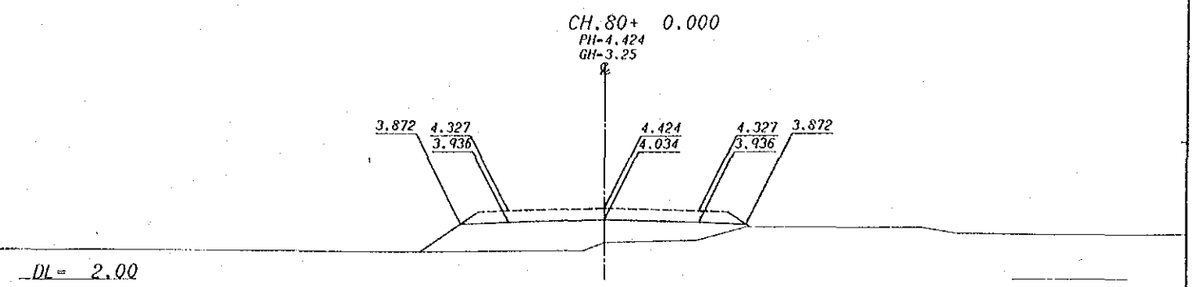
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 79 + 50 — CH. 79 + 400

PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88245

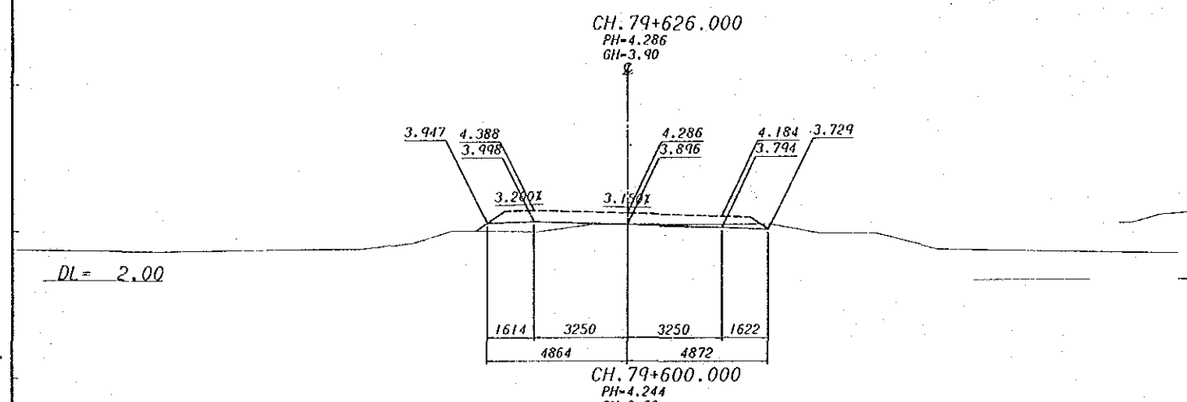
CH.79+700.000
PH=4.404
GH=3.95



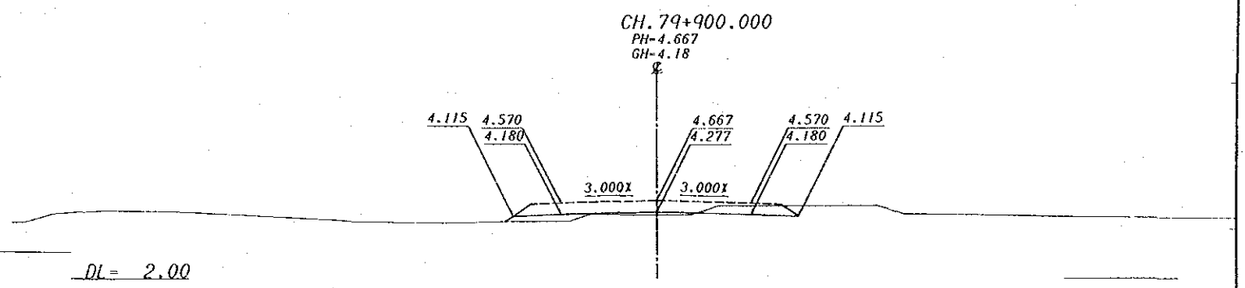
CH.80+ 0.000
PH=4.424
GH=3.25



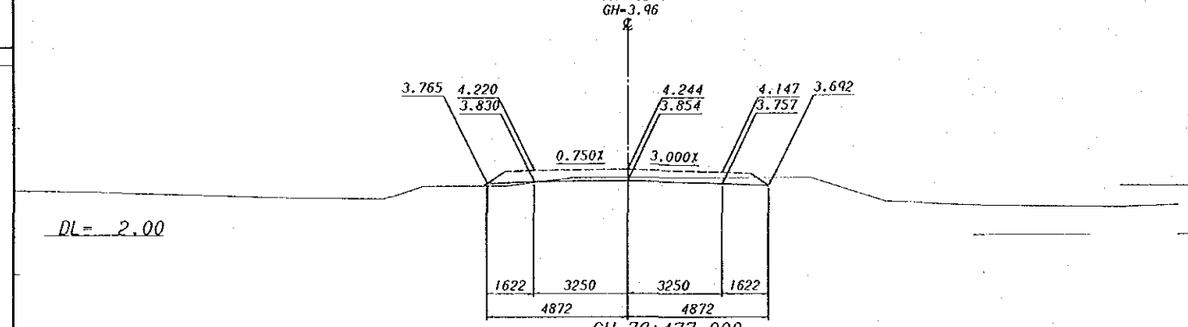
CH.79+626.000
PH=4.286
GH=3.90



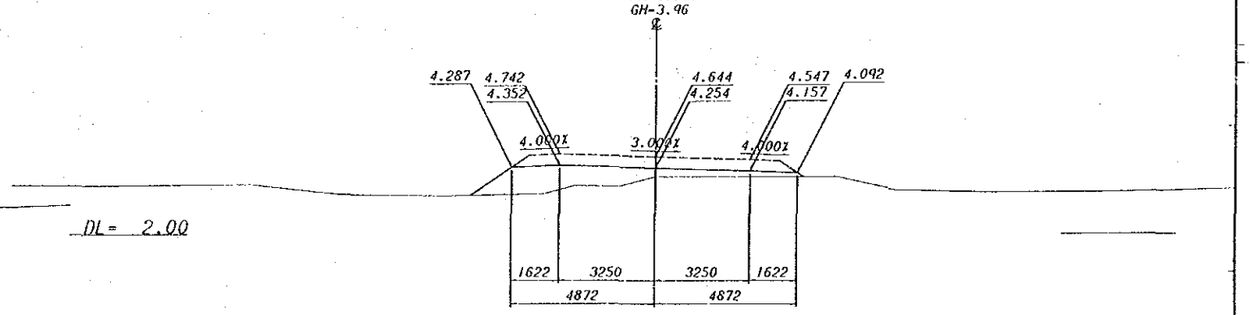
CH.79+900.000
PH=4.667
GH=4.18



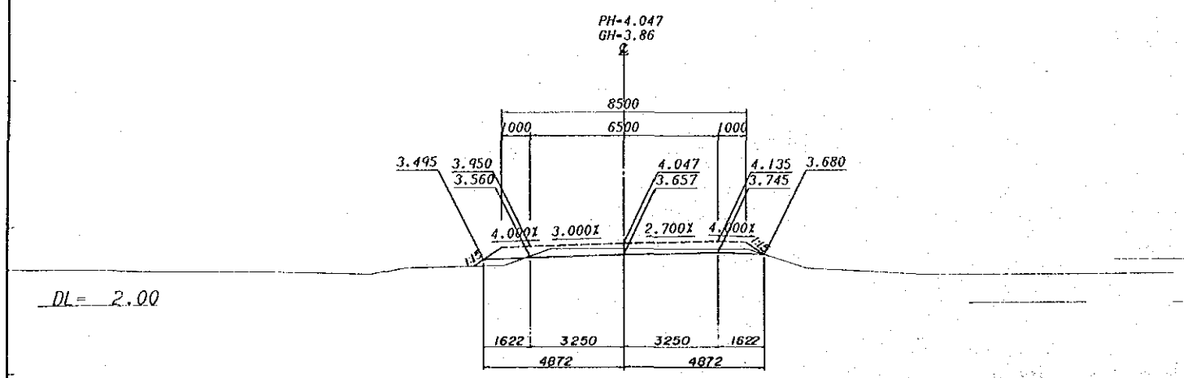
CH.79+600.000
PH=4.244
GH=3.96



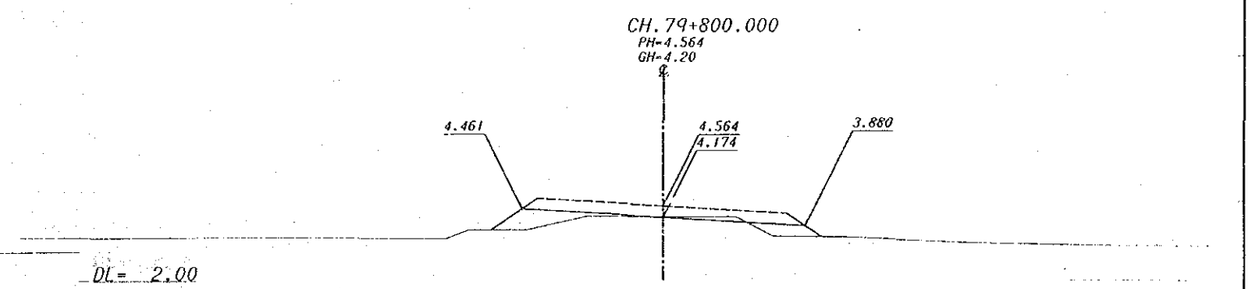
CH.79+850.000
PH=4.644
GH=3.96



CH.79+477.000
PH=4.047
GH=3.86



CH.79+800.000
PH=4.564
GH=4.20



REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.6

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yalida — Principal — 25 Sep. 1989 — Date

DRAWN: K.E.
CHECKED: C.B.L.
DESIGNED: A. Magabo
CHECKED: T. Kuboi

PROJECT ENGINEER: W. Kubokawa
EXECUTIVE ENGINEER: Ishii

RECOMMENDED: M. Magabo — PRINCIPAL ENGINEER
APPROVED: 30.10.89 — J. Leonardo — SECRETARY

SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 212 OF 303
PROJECT No. S.C. 120-33-814/B

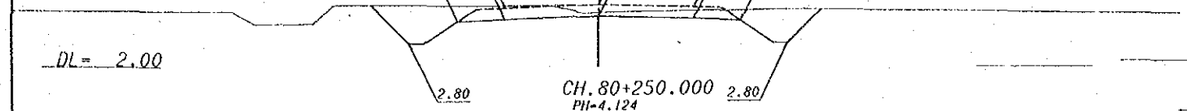
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 79 + 477 — CH. 80 + 0

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

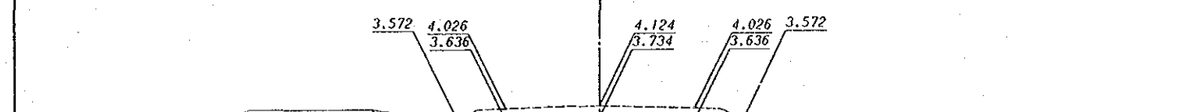
DRAWING No. A1/ 88246

REV.

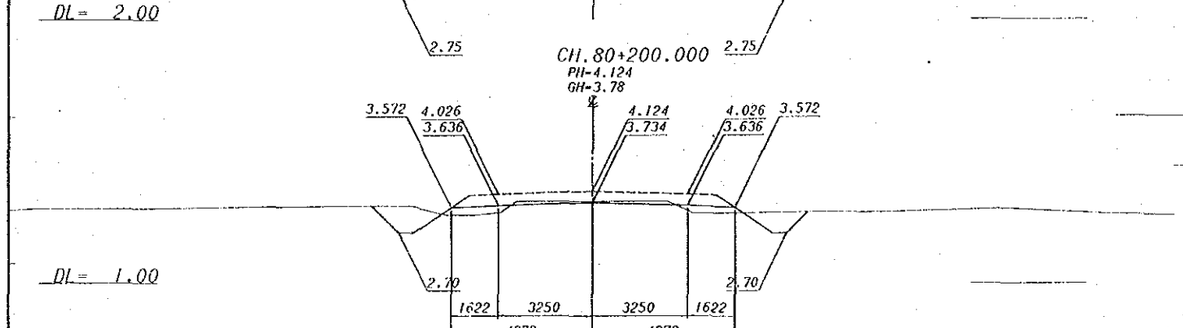
CH.80+300.000
PH=4.124
GH=3.86



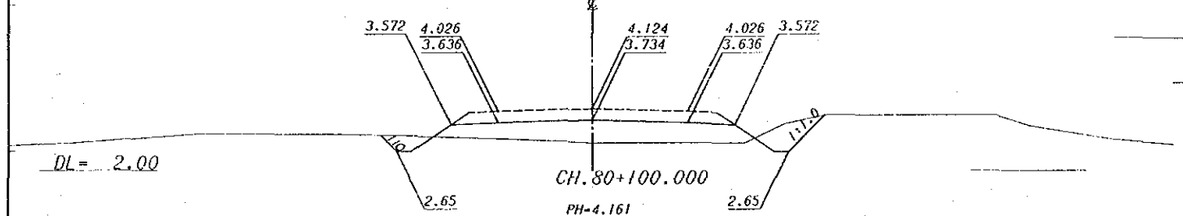
CH.80+250.000
PH=4.124
GH=3.66



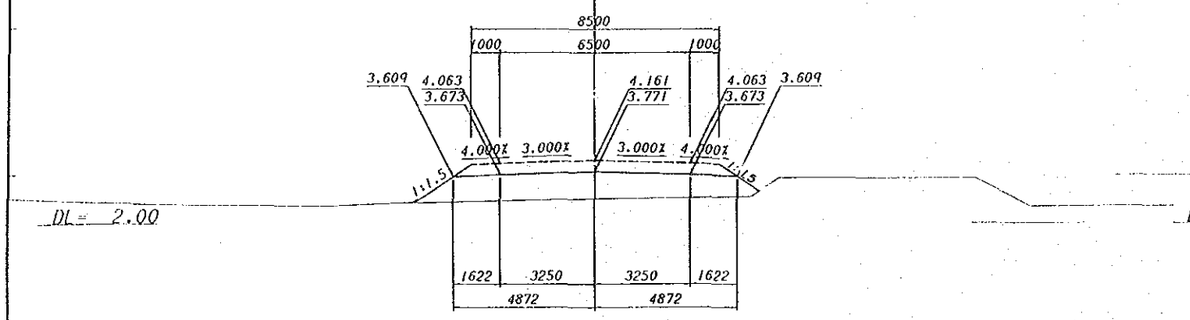
CH.80+200.000
PH=4.124
GH=3.78



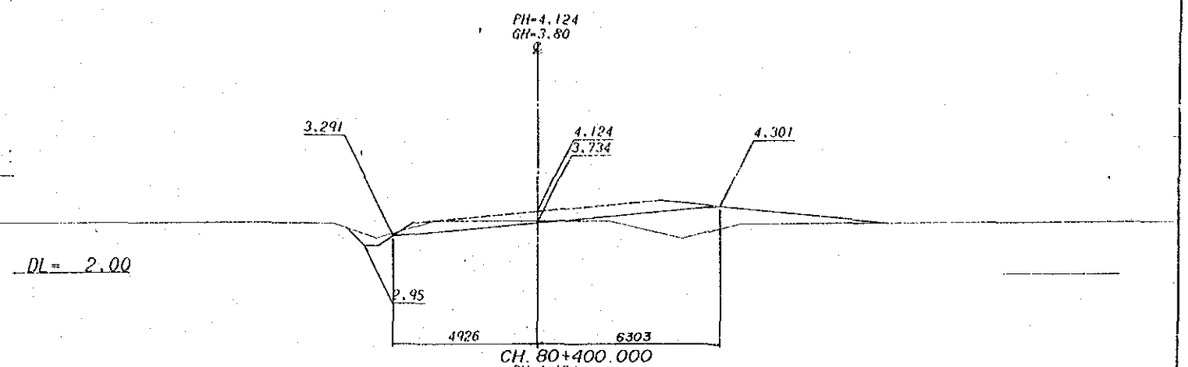
CH.80+150.000
PH=4.124
GH=2.95



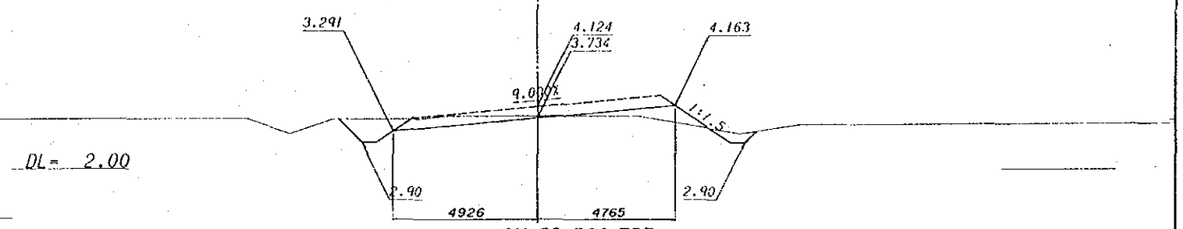
CH.80+100.000
PH=4.161
GH=2.85



CH.80+450.000
PH=4.124
GH=3.80

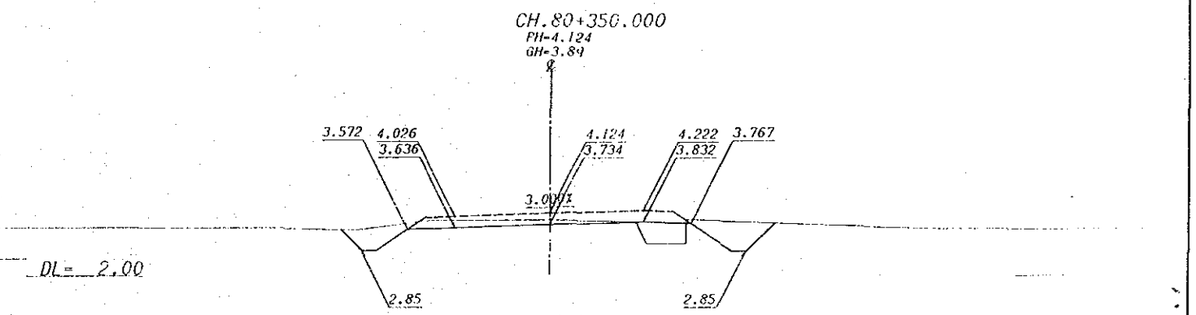


CH.80+400.000
PH=4.124
GH=3.80



CH.80+364.705
PH=4.124
GH=3.80

CH.80+350.000
PH=4.124
GH=3.84



REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA
Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NO.:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Jackson, Principal — 25 Sep. 1989, Date

DRAWN: K.E.
CHECKED: C. [illegible]
DESIGNED: A. Magalie
CHECKED: T. [illegible]

PROJECT ENGINEER: W. Kurlich
EXECUTIVE ENGINEER: [illegible]

RECOMMENDED: A. [illegible], PRINCIPAL ENGINEER
APPROVED: 25 JUL 89, J. [illegible], for(T) SECRETARY

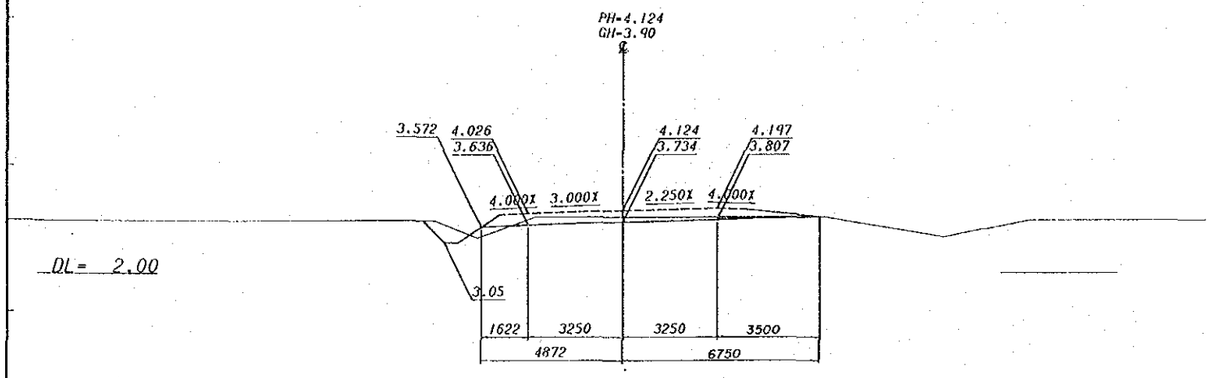
SCALES
1 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 213 OF 303
PROJECT No. S.C. 120-33-814/B

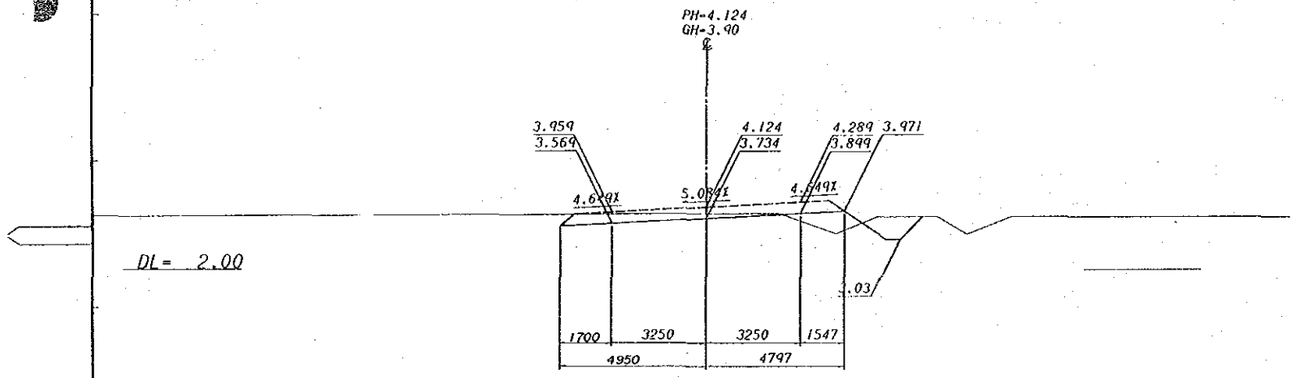
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 80 + 100 — CH. 80 + 450

PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/ 88247
REV.

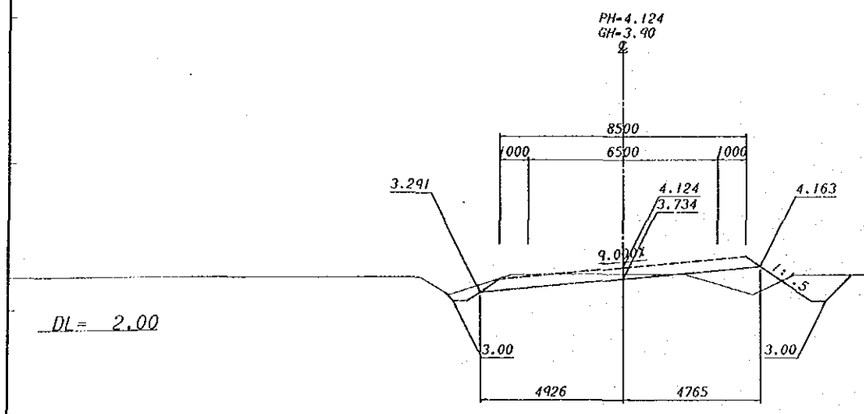
CH.80+550.000



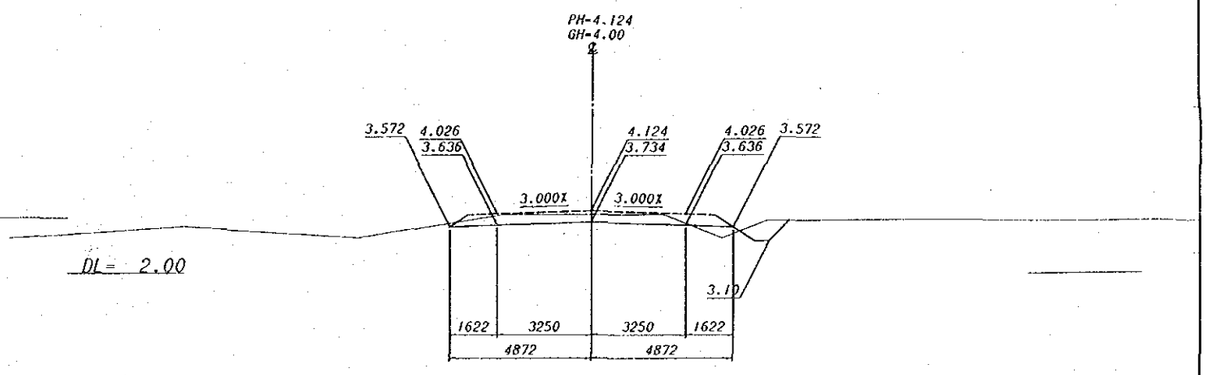
CH.80+531.105



CH.80+500.000



CH.80+596.107



REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.8

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. [signature] Principal 25 Sep. 1989 Date

DRAWN: K.E.
CHECKED: [signature]
DESIGNED: A. Magabe
CHECKED: T. Kakiuchi

[signature] PROJECT ENGINEER
[signature] EXECUTIVE ENGINEER

RECOMMENDED: [signature] PRINCIPAL ENGINEER
APPROVED: [signature] 25.10.89 SECRETARY

SCALES: 4 2 0 2 4
HORIZONTAL & VERTICAL m.
1 : 100

SHEET 214 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
CROSS SECTIONS
CH. 80 + 500 — CH. 80 + 596.107

PAPUA NEW GUINEA DEPARTMENT OF WORKS
DRAWING No. A1/ 88248
REV.

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
℄	CENTRELINE	FLG	FLANGE
℄	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 GRADE SPECIFIED
MAXIMUM TOLERANCE ON PLAN POSITION AT
PILE TOP FOR ANY PILE = ±75mm.

PILE CONTRACT LENGTHS — SIZE

BEREINA ABUTMENT	8·0m × 6 nos	600 ϕ × 14 THK	(OPEN ENDS)
BEREINA PIER	23·8m × 4 nos	800 ϕ × 12 THK	(CLOSED ENDS)
MALALAUA PIER	23·8m × 4 nos	800 ϕ × 12 THK	(CLOSED ENDS)
MALALAUA ABUTMENT	8·0m × 6 nos	600 ϕ × 14 THK	(OPEN ENDS)

MAX PILE WORKING COMPRESSION LOADS:
ABUTMENTS 900 kN
PIERS 1900 kN
THE TIP OF THE PILES SHALL BE REINFORCED AS SHOWN
TEST PILE 24m × 1no 800 ϕ × 12 THK
PREVENTION 16m × 2 nos 800 ϕ × 12 THK

4. CONCRETE

ALL CONCRETE SHALL BE GRADE 25. (f'_c = 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 50mm

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 =	181·97 kN
LIVE LOAD =	246·39 kN
TOTAL =	428·36 kN

BEARING ASSUMED FOR DETAILING = POT BEARING BP. B-103 (FIXED)
POT BEARING BP. B-104 (MOVEABLE)

ABUTMENT LOADS -

DEAD LOAD =	181·97 kN
LIVE LOAD =	246·39 kN
TOTAL =	428·36 kN

BEARING ASSUMED FOR DETAILING = POT BEARING BP. B-103 (FIXED)
POT BEARING BP. B-104 (MOVABLE)

MEAN TEMPERATURE IS 26·1 °C AT THE PROJECT SITE

12. MAIN BEAM PRECAMBER

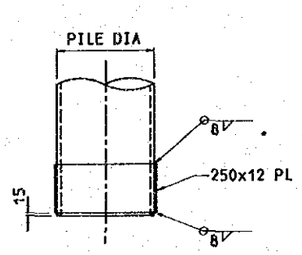
STEEL BEAMS TO BE PRECAMBERED TO THE UNSTRESSED PROFILE SHOWN ON THE DRAWINGS.

13. ERECTION

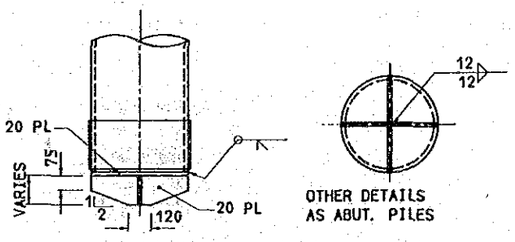
THE CONTRACTOR IS TO PROVIDE DETAILS OF ERECTION PROCEDURES TO THE ENGINEER PRIOR TO ERECTION OF THE GIRDERS, THIS IS TO ENSURE THAT THE ALLOWABLE STRESSES ON THE GIRDER SECTIONS ARE NOT EXCEEDED

14.

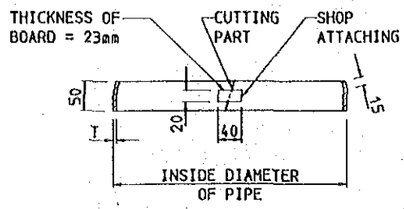
ABUTMENT A - BEREINA SIDE
ABUTMENT B - MALALAUA SIDE



PILE TOE REINFORCEMENT (OPEN END)



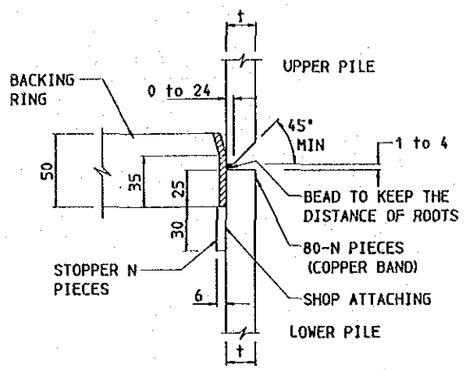
PILE TOE REINFORCEMENT (CLOSED END)



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
88249	GENERAL NOTES AND DRAWING LIST
88250	GENERAL ARRANGEMENT
88251	ABUTMENT PLANS, SECTIONS & DETAILS
88252	PIER DETAILS
88253	DECK SLAB DETAILS
88254	STEEL WORK DETAIL SHEET 1
88255	STEEL WORK DETAIL SHEET 2
88256	HANDRAILING / IMPACT ANGLE DETAILS
88257	BAR BENDING SCHEDULE SHEET 1
88258	BAR BENDING SCHEDULE SHEET 2
88259	BEARING BP.B-103 (FIXED)
88260	BEARING BP.B-104 (MOVABLE)
88261	RIVER BANK PROTECTION, BEARING UNITS, BACK FILL TO BRIDGE ABUTMENT AND OTHERS

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 — Principal — 25 Sep. 1989 Date

DRAWN: M.S
CHECKED
DESIGNED: M. Shimizu
CHECKED

PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED 1.11.89 — SECRETARY

SCALES

SHEET 215 OF 303

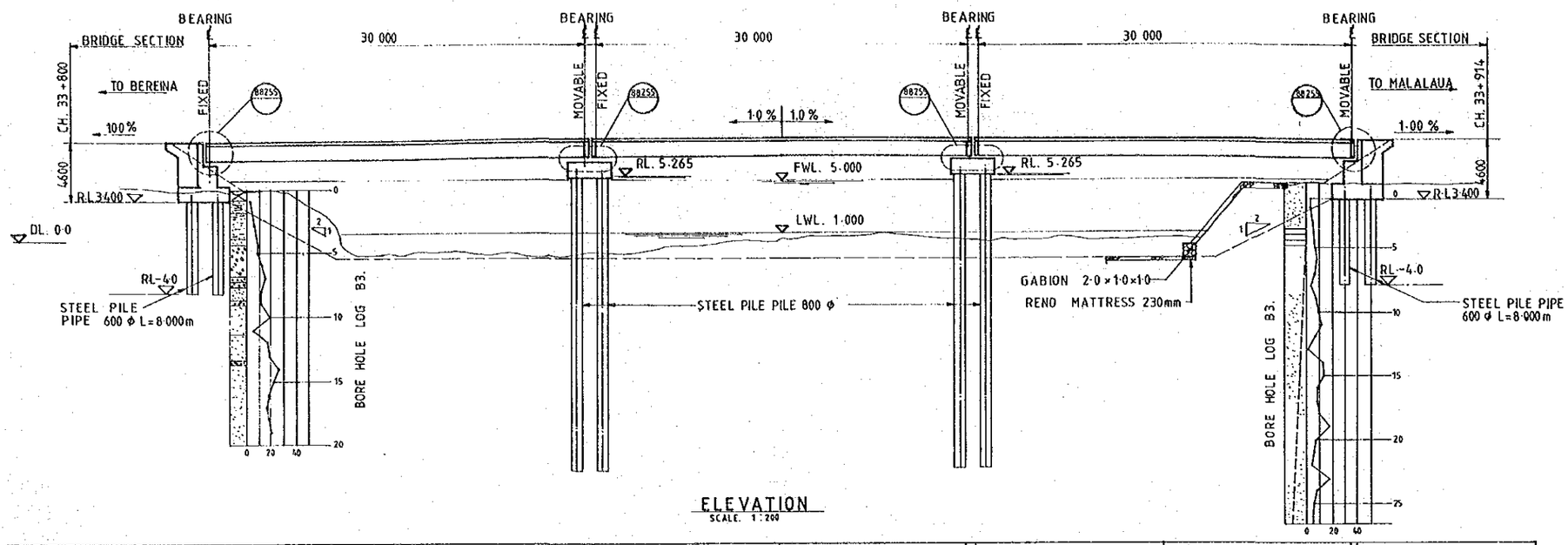
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
GENERAL NOTES AND DRAWING LIST

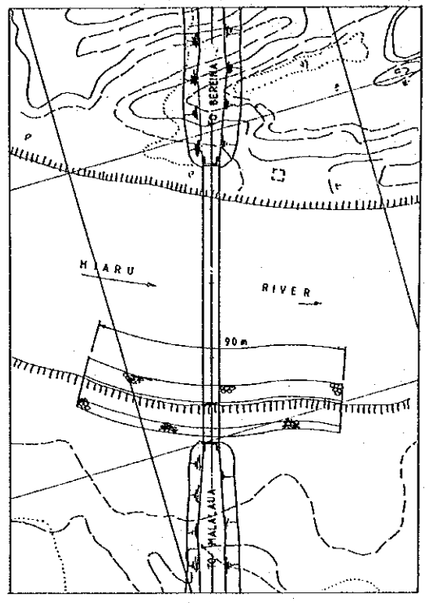
PAPUA NEW GUINEA DEPARTMENT OF WORKS

DRAWING No. A1 88249

REV.

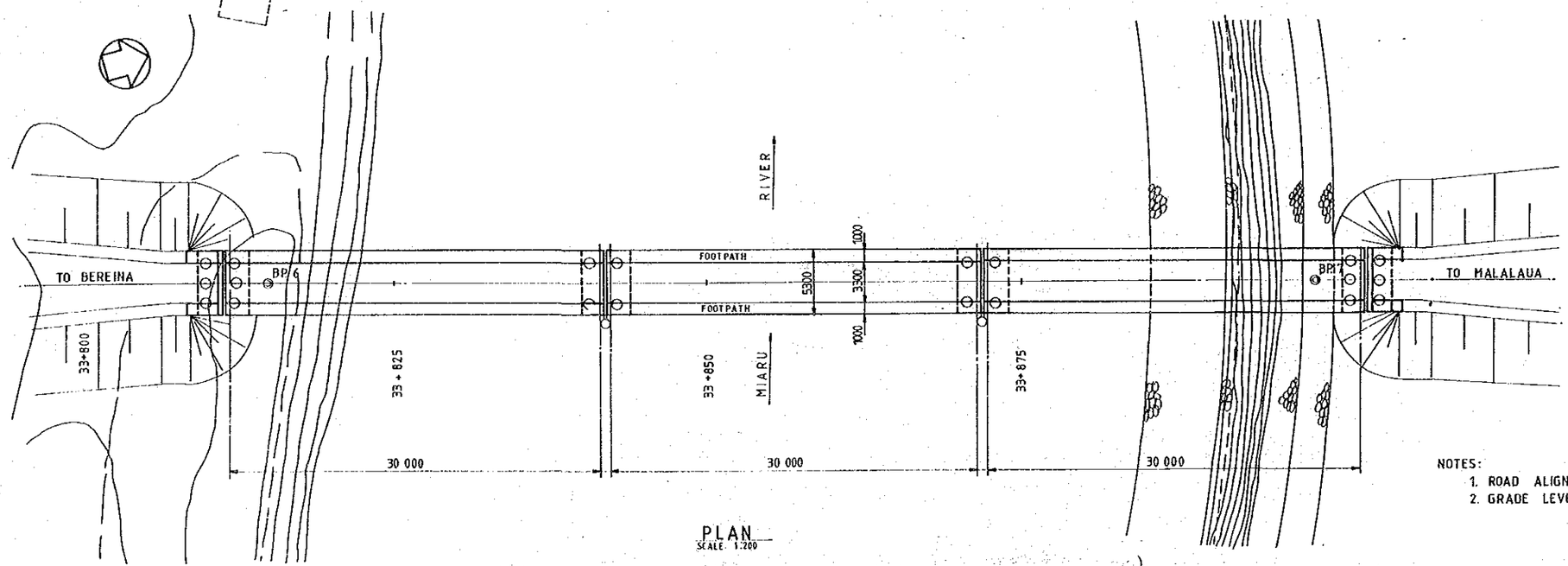


ELEVATION
SCALE. 1:200

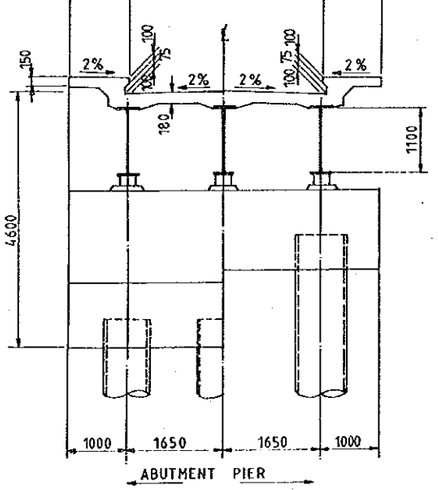


LOCALITY PLAN.
SCALE. 1:1000

GRADE LEVELS	7·986	7·992	8·108	8·179	8·183	8·205	8·183	8·179	8·108	7·992	7·986		
SURFACE LEVELS	4·36					0·66				4·75			
CHAINAGES	CH.33 +810·25	CH.33 +810·85	CH.33 +825·85	CH.33 +840·85	CH.33 +842·0	CH.33 +857·0	CH.33 +872·4	CH.33 +873·75	CH.33 +888·15	CH.33 +903·15	CH.33 +903·75		



PLAN
SCALE. 1:200



TYPICAL CROSS SECTION.
SCALE. 1:50

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

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.S

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yakuts, Principal, 25 Sep. 1989

DRAWN: M·S
CHECKED
DESIGNED
CHECKED

PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED 17/1/89 PRINCIPAL ENGINEER
APPROVED 1.11.89 SECRETARY

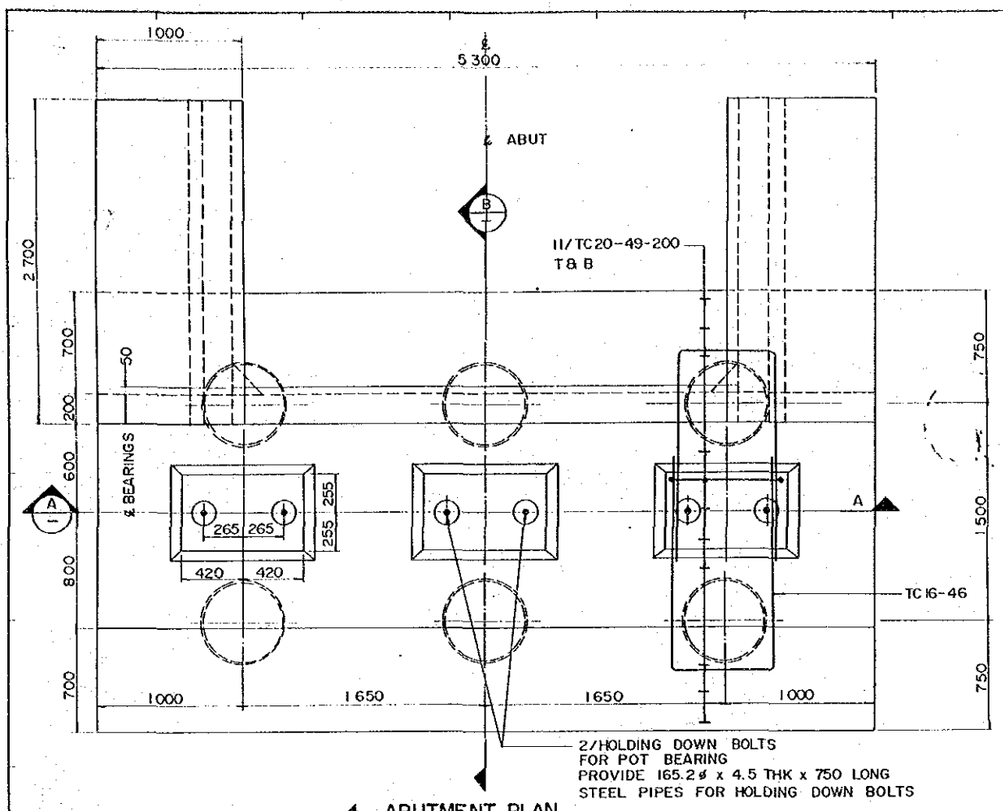
SCALES

SHEET 216 OF 303

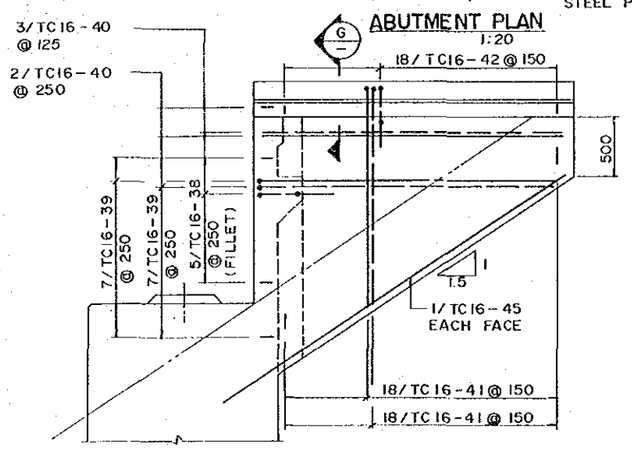
PROJECT No. S.C. 120-33-814/B

CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No. 4 - MIARU BRIDGE
GENERAL ARRANGEMENT.
PAPUA NEW GUINEA DEPARTMENT OF WORKS

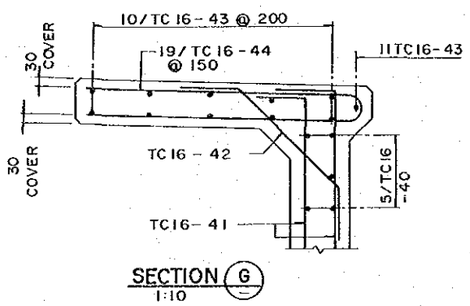
DRAWING No. A1 88250



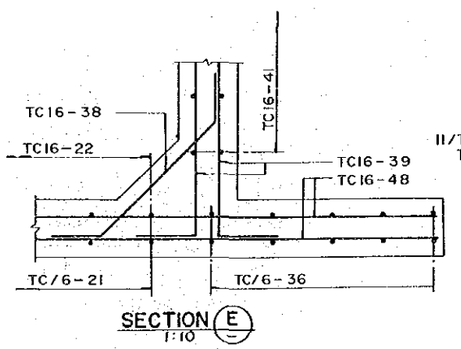
ABUTMENT PLAN
1:20



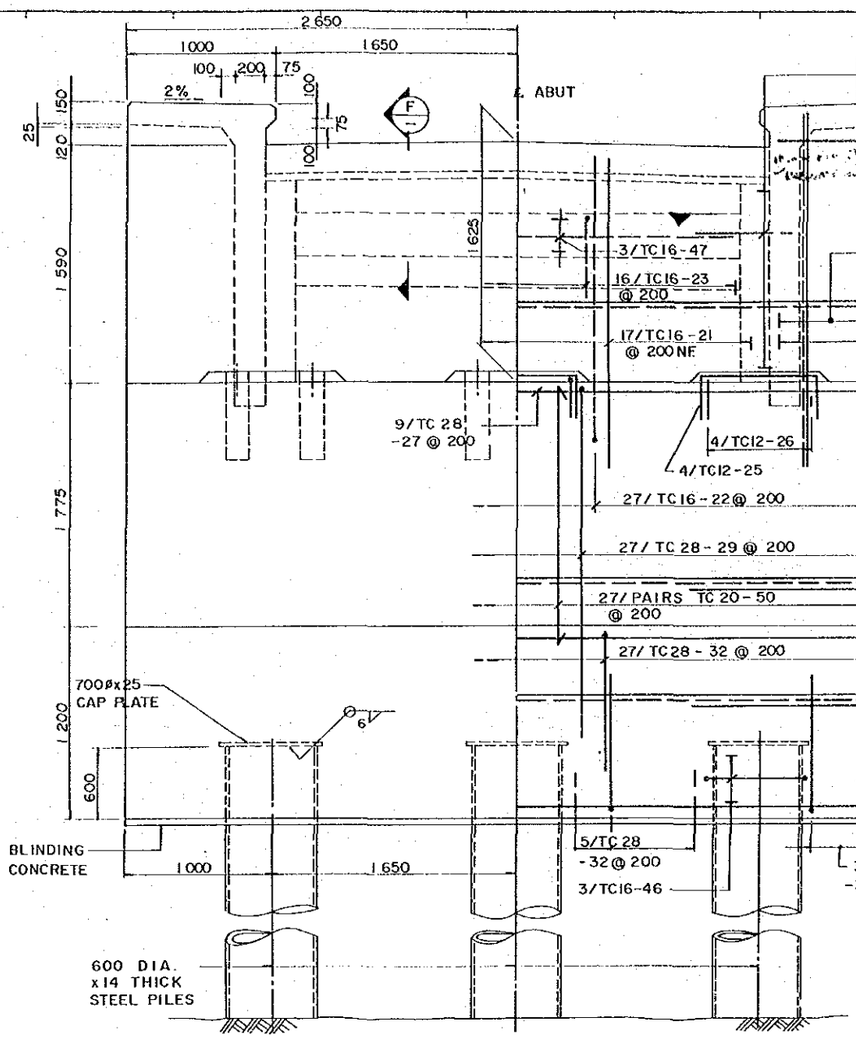
TYPICAL WINGWALL ELEVATION
1:25



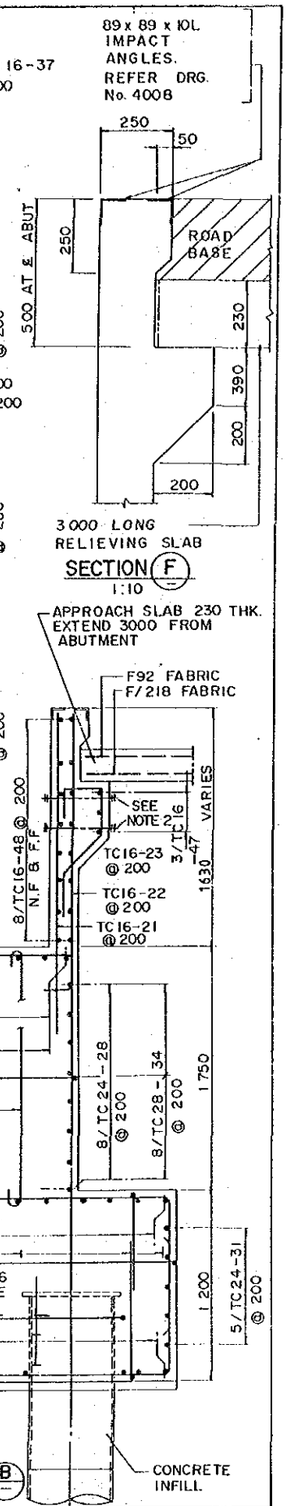
SECTION G
1:10



SECTION E
1:10



SECTION A
1:20



SECTION B
1:20

NOTE :
1. Backfill to Abutment wall.
   Provide min. 500 free draining fill material.
2. Anchor bolts and anchor plate (Drwg. 4007) shall be accurately fixed in position.

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
Principal — 25 Sep. 1989 — Date

DRAWN: M.S
CHECKED
DESIGNED
CHECKED

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER — 19/11/89
APPROVED — 1.11.89 — SECRETARY

SCALES

SHEET 217 OF 303

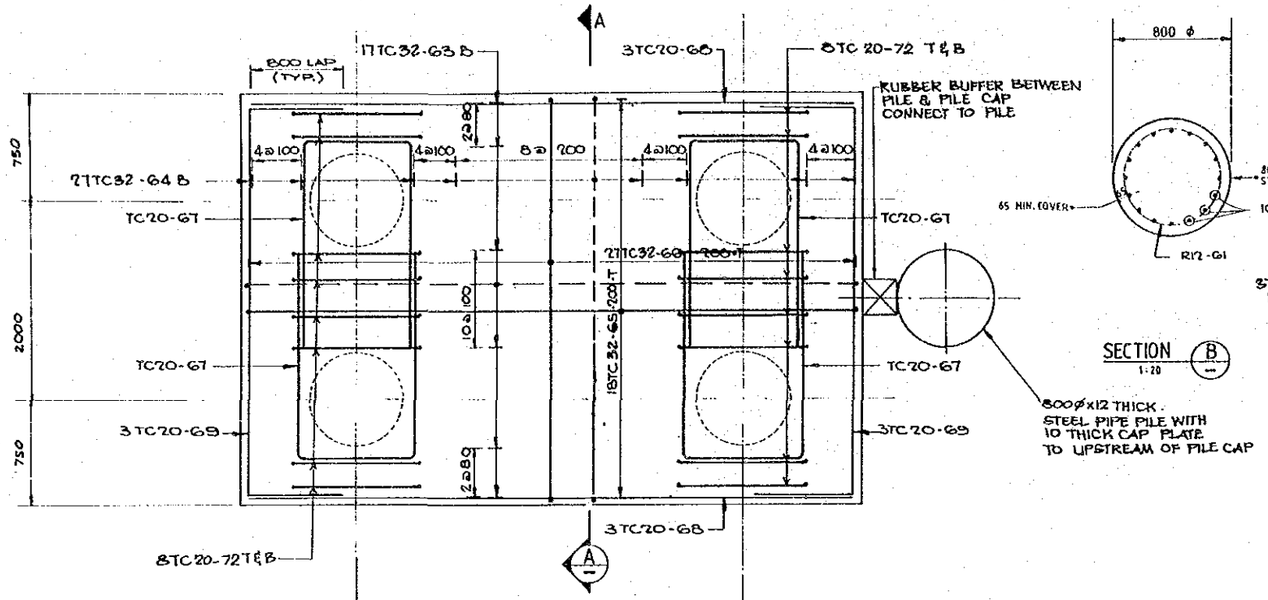
PROJECT No. S.C. 120-33-814/B

CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY HEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
ABUTMENT PLANS SECTIONS & DETAILS

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

DRAWING No. A1 88251

REV.

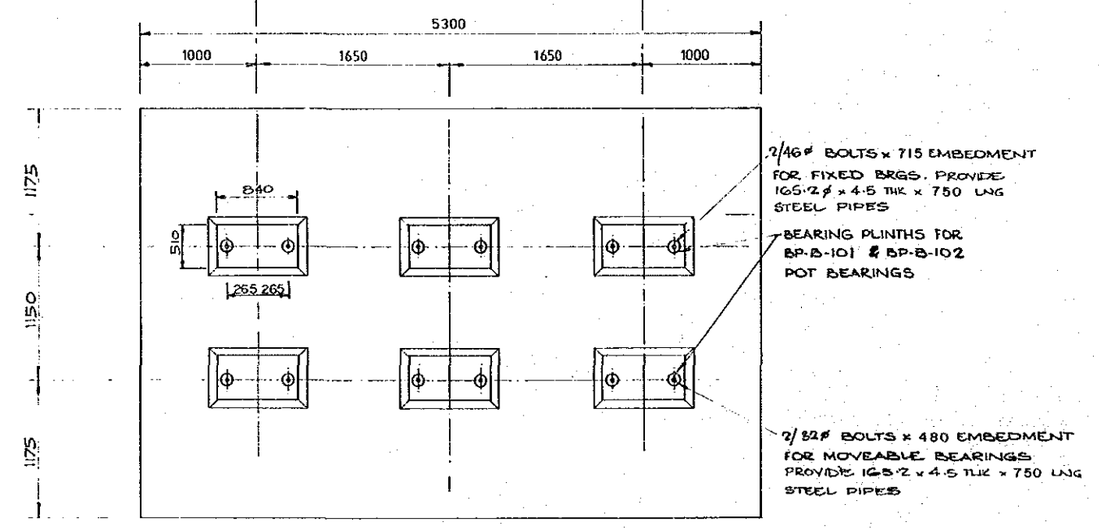


PIER REINFORCEMENT PLAN
1:25

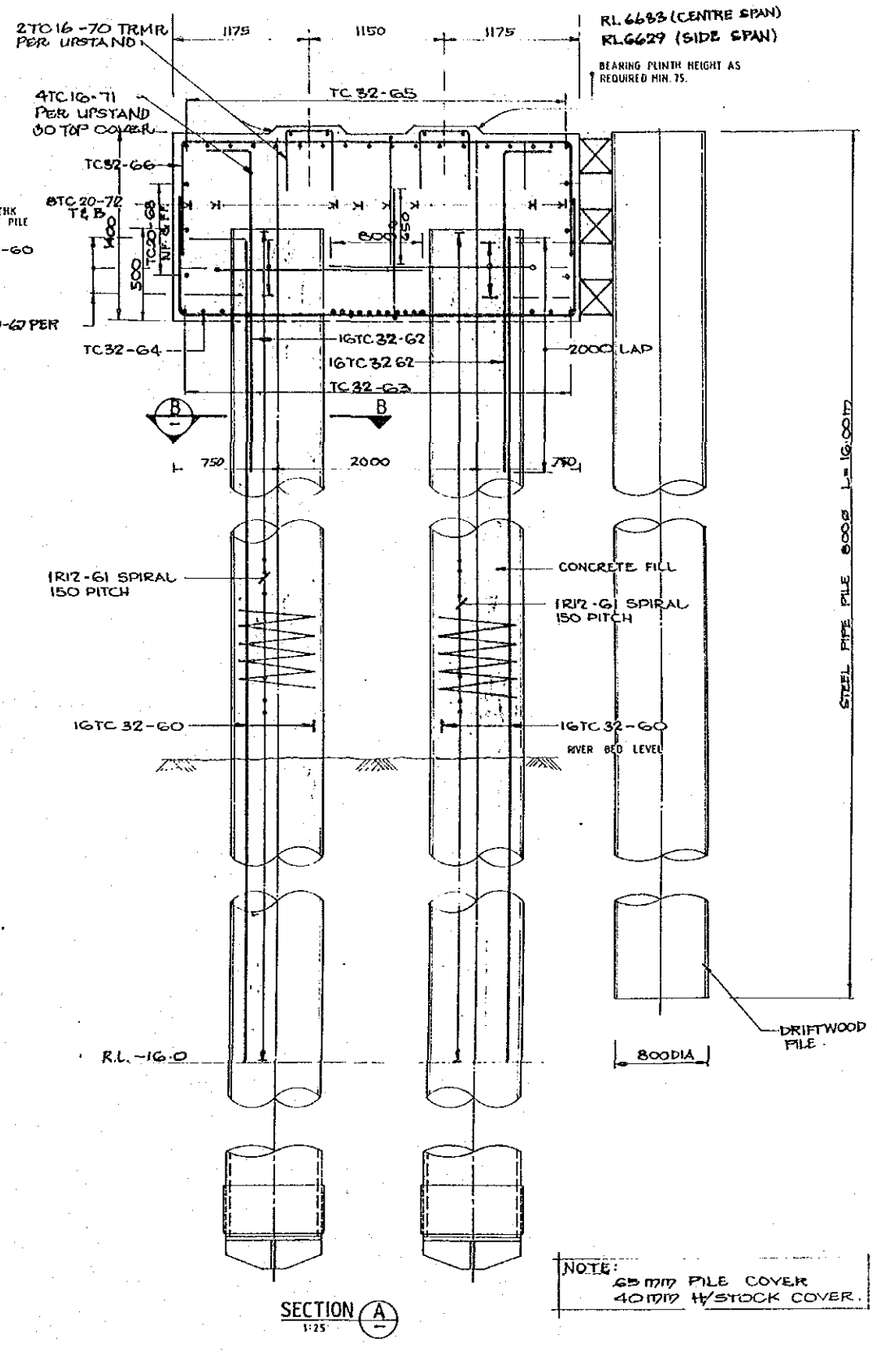
SECTION B
1:20

3TC 20-67 PER PILE

800ϕx12 THICK. STEEL PIPE PILE WITH 10 THICK CAP PLATE TO UPSTREAM OF PILE CAP



PLAN OF PIER
1:25



SECTION A
1:25

NOTE:
65 mm PILE COVER
40 mm W/STOCK COVER.

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
J. Yokura — Principal — 25 Sep. 1989 — Date

DRAWN: M·S
CHECKED: M Kini
DESIGNED: M Shinoya
CHECKED: M Kini

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED 1 U 89 — SECRETARY

SCALES

SHEET 218 OF 303

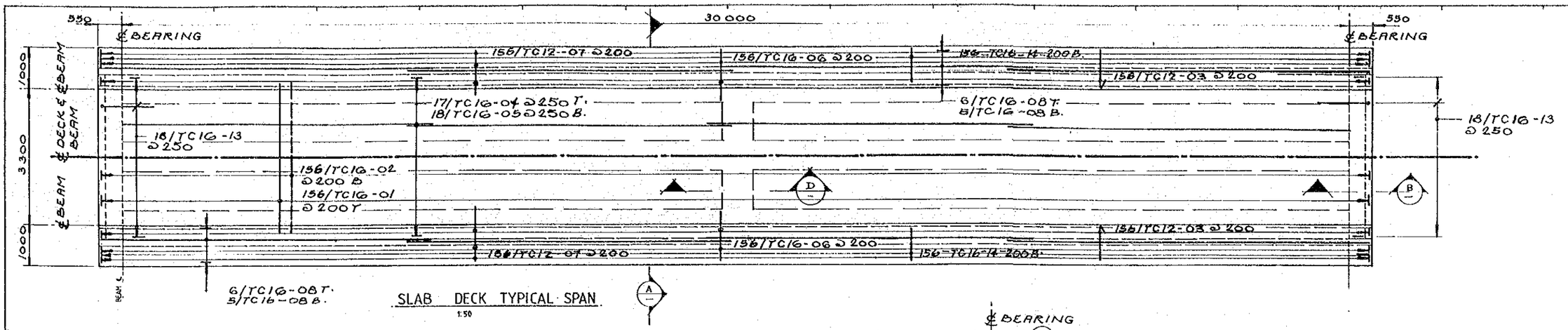
PROJECT No. S.C. 120-33-814/B

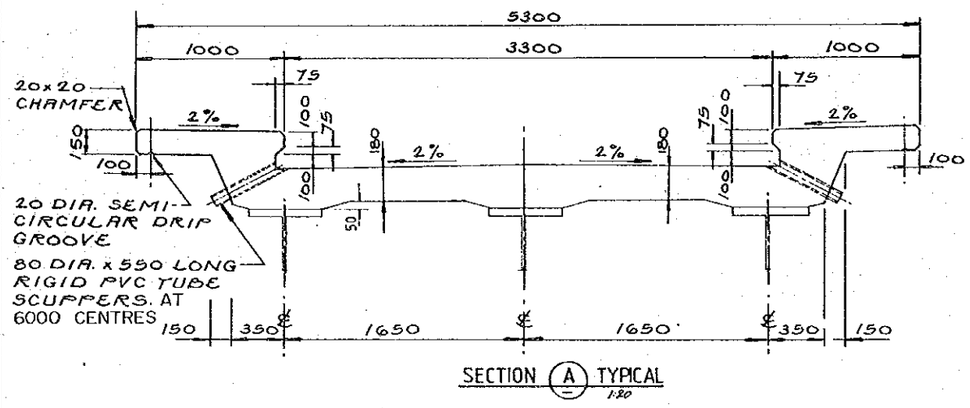
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
PIER DETAILS

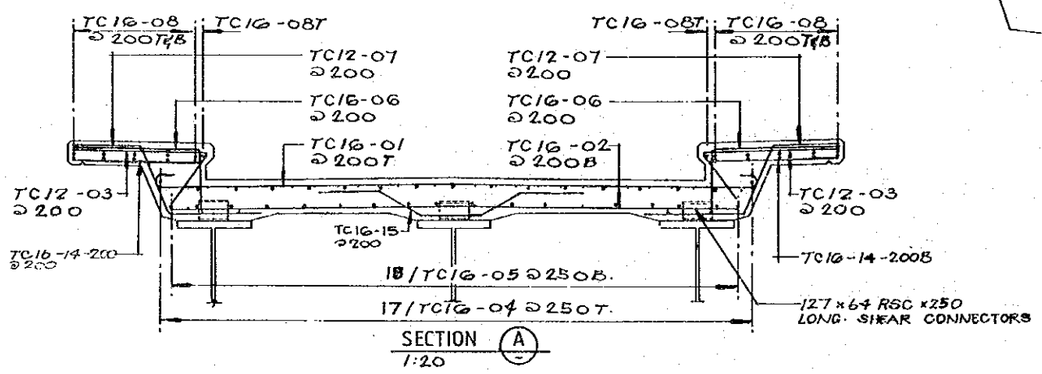
PAPUA NEW GUINEA
DEPARTMENT OF WORKS

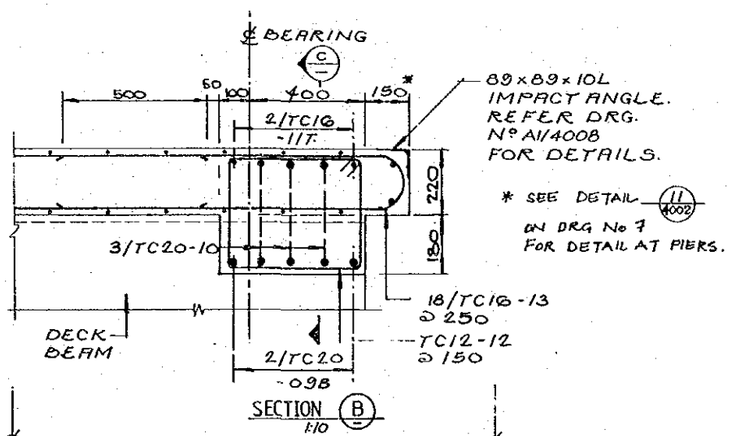
DRAWING No. A1/ 88252

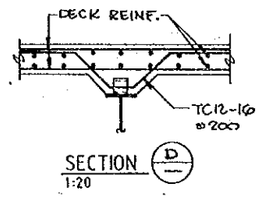
REV.

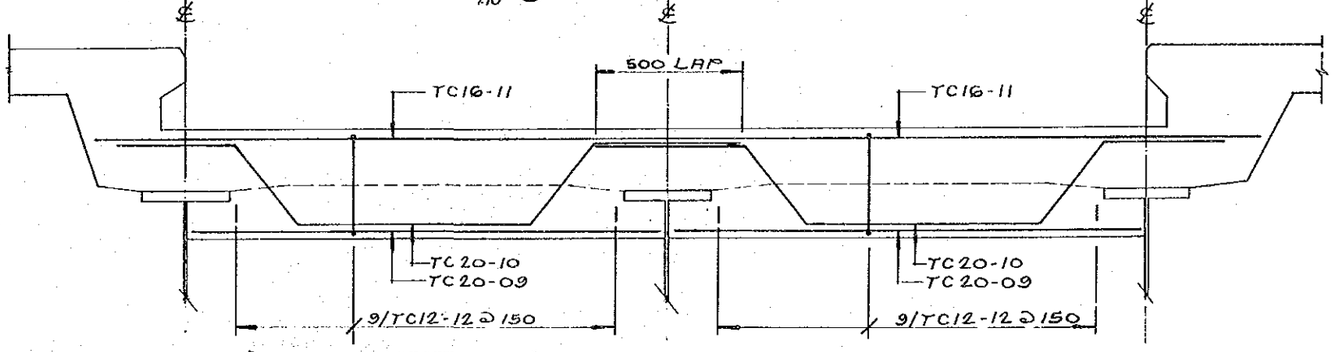












REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.S

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yukio 25 Sep. 1989
Principal Date

DRAWN: R-W, M-S
CHECKED:
DESIGNED: W. Shimizu
CHECKED:

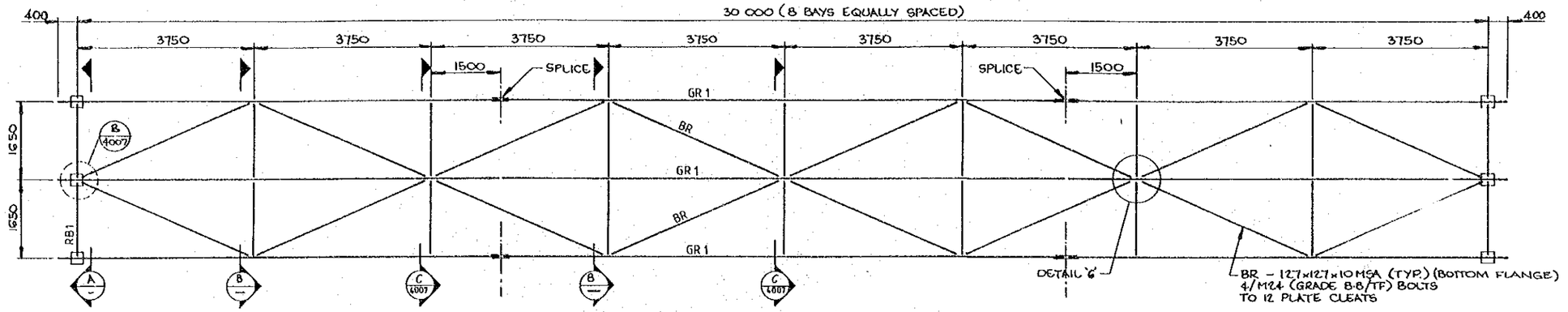
PROJECT ENGINEER 1/10/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED 1/10/89 PRINCIPAL ENGINEER
APPROVED 1.11.89 FMS(T) SECRETARY

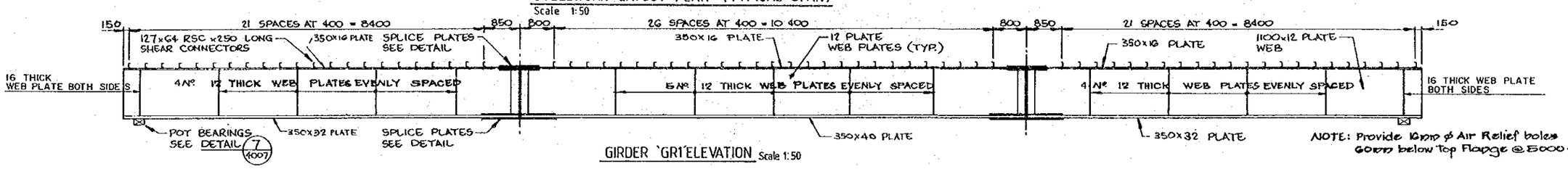
SCALES

SHEET 219 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
DECK SLAB. DETAILS
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/88253
REV.

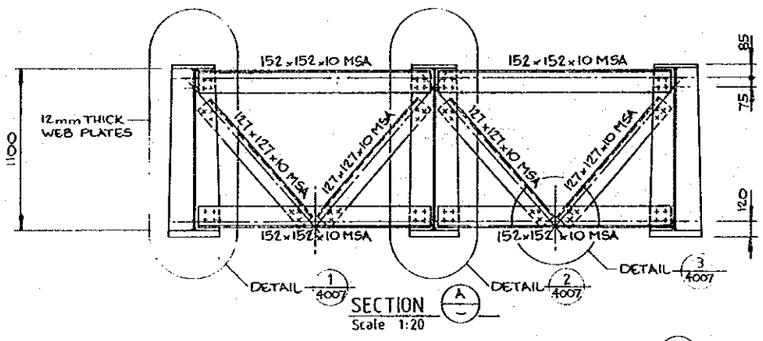


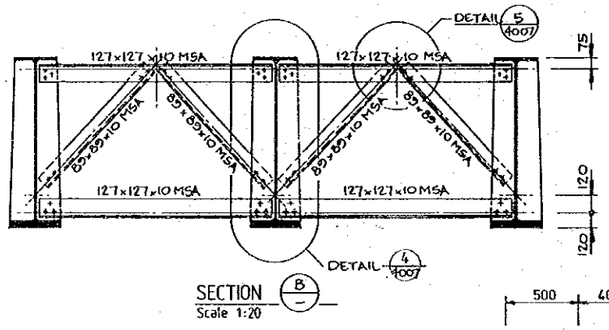
STEELWORK LAYOUT PLAN (TYPICAL SPAN)
Scale 1:50

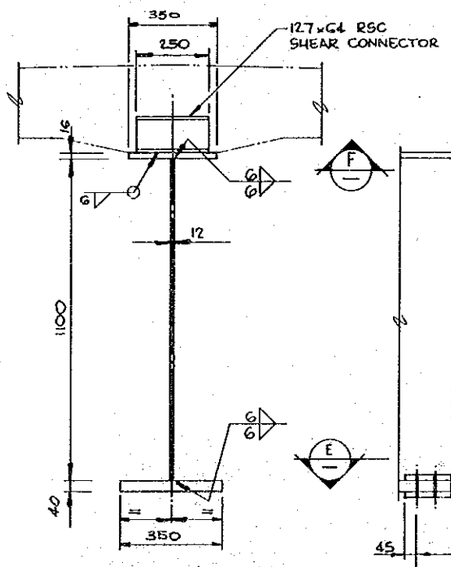


GIRDER 'GR1' ELEVATION Scale 1:50

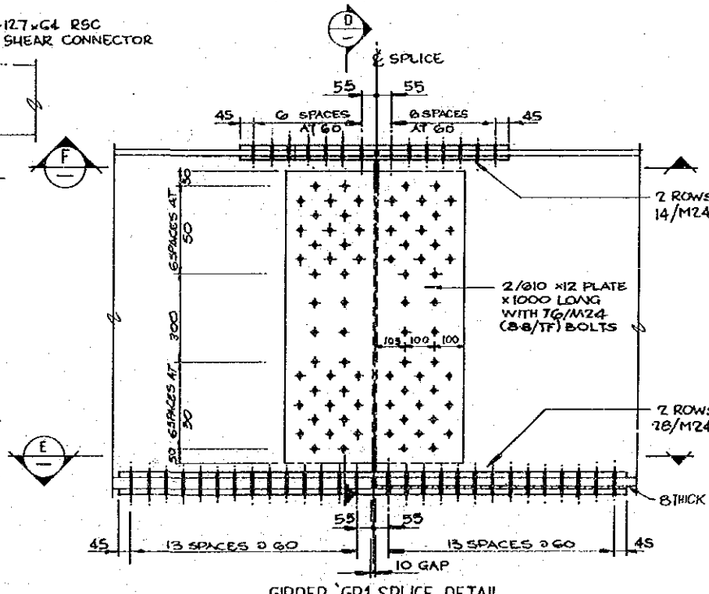
NOTE: Provide 10mm ø Air Relief holes 60mm below Top Flange @ 5000 c/rs.



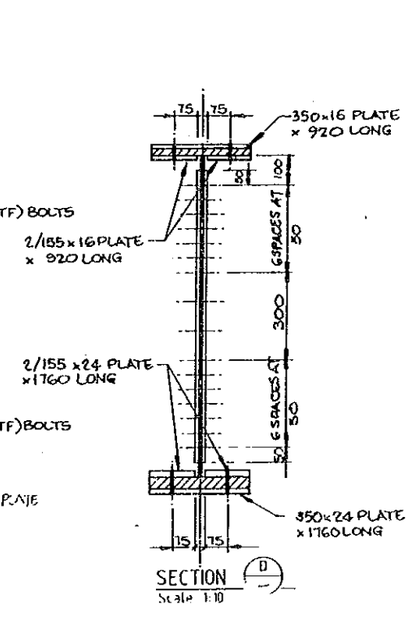




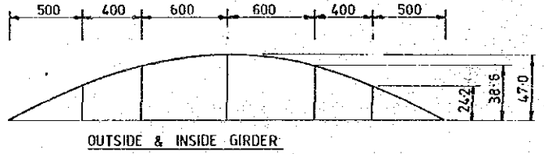
GIRDER 'GR1' SECTION
Scale 1:10



GIRDER 'GR1 SPLICE DETAIL
Scale 1:10

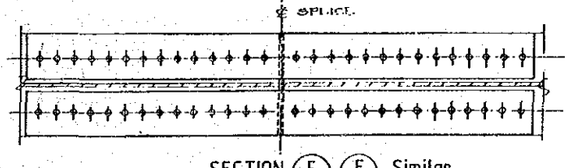


SECTION D
Scale 1:10



OUTSIDE & INSIDE GIRDER

PRECAMBER DIAGRAM



SECTION E F Similar
1:10

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NOS:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Iyekuni — Principal — 25 Sep. 1989 — Date

DRAWN: P·G, M·S
CHECKED:
DESIGNED: A. Shinjo
CHECKED:

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED 1.11.89 — SECRETARY

SCALES

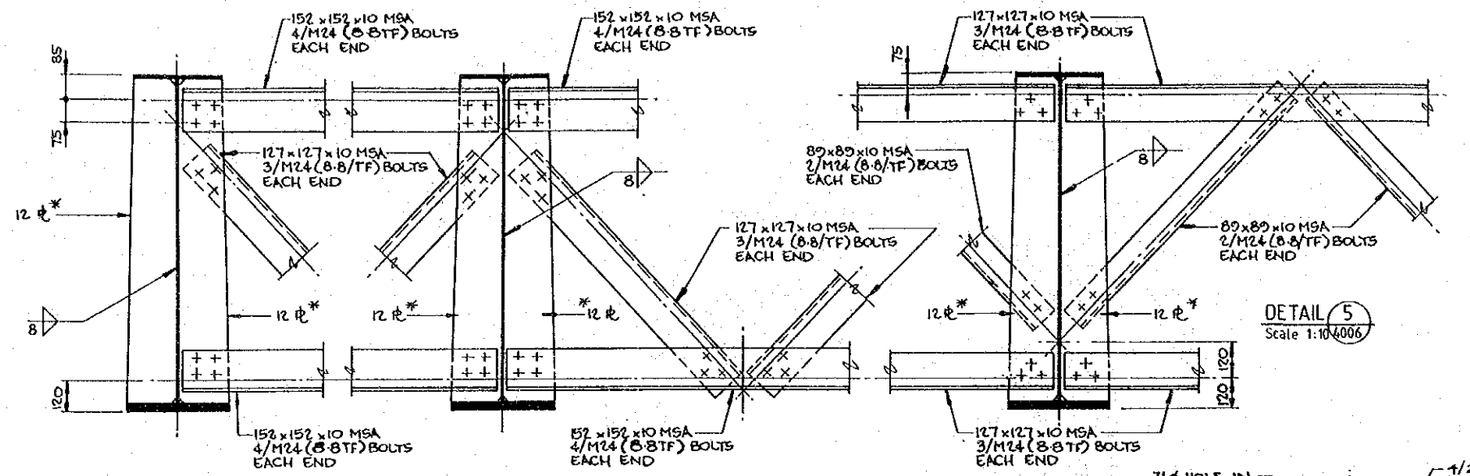
SHEET 220 OF 303

PROJECT No. S.C. 120-33-814/B

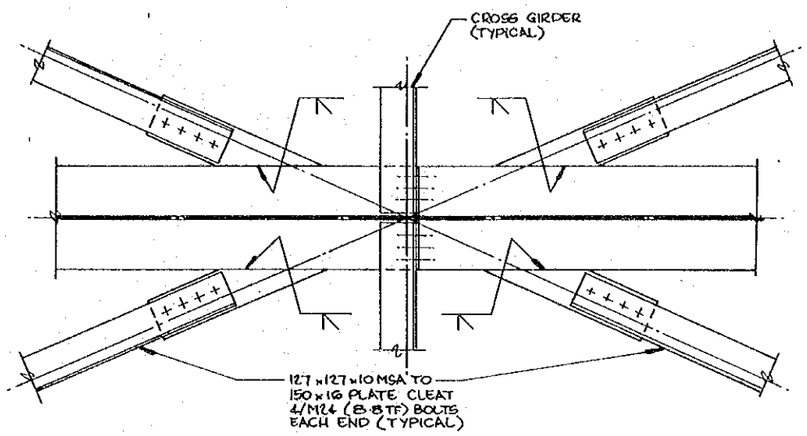
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
STEELWORK DETAILS - SHEET 1

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

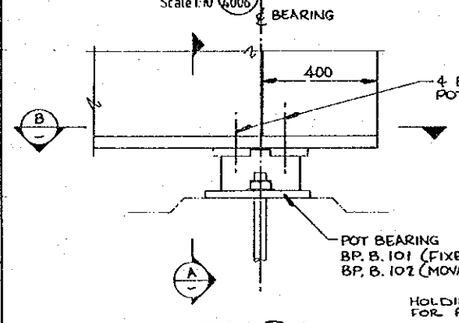
DRAWING No. A1/ 88254 REV.



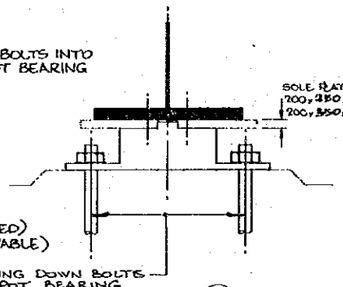
DETAIL 5
Scale 1:10 (4006)



DETAIL 1
Scale 1:10 (4006)



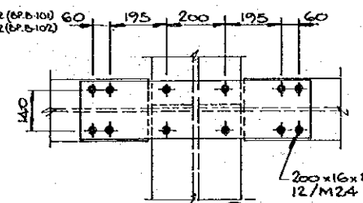
DETAIL 2
Scale 1:10 (4006)



SECTION A
Scale 1:10

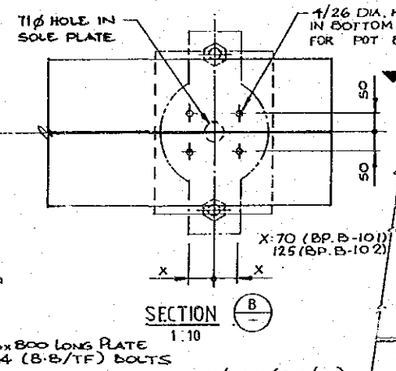
DETAIL 3
Scale 1:10 (4006)

* DENOTES THESE PLATES TO BE FILLETED 15 x 15 AS SHOWN AND TO BE FITTED TO TOP & BOTTOM FLANGES – NO WELDS



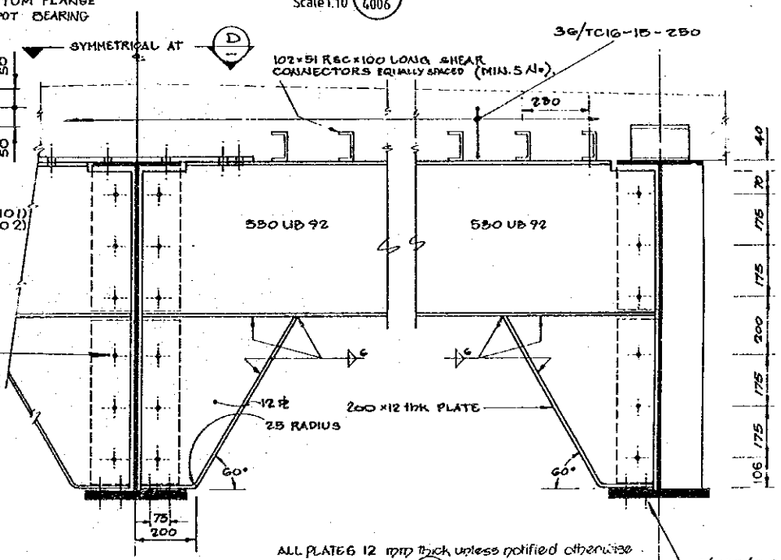
SECTION D
1:10

DETAIL 4
Scale 1:10 (4006)



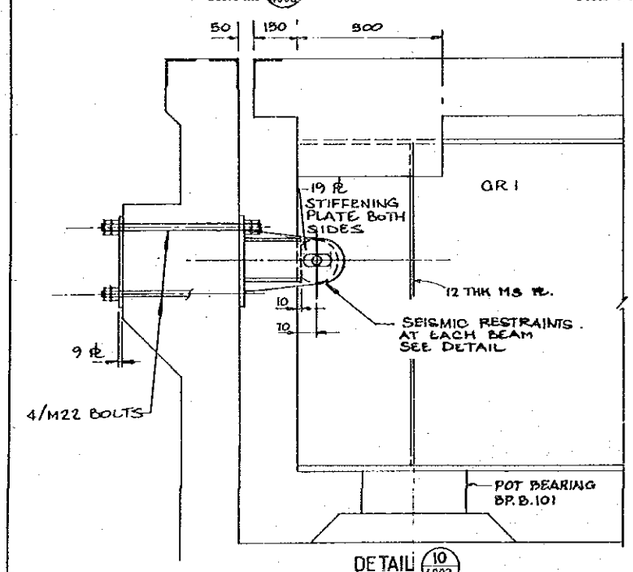
SECTION B
1:10

DETAIL 6
Scale 1:10 (4006)

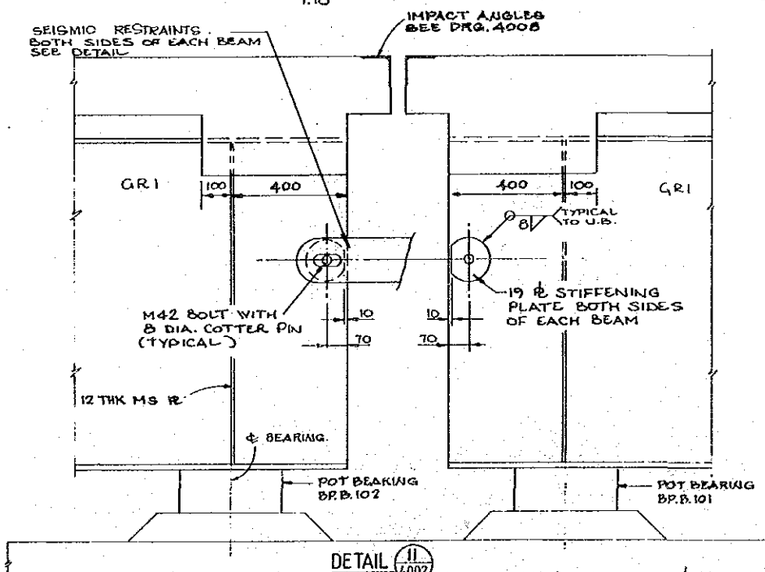


SECTION C
Scale 1:10 (4006)

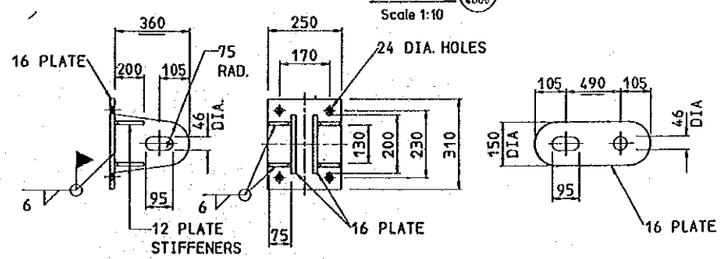
DETAIL 7
Scale 1:10 (4006)



DETAIL 10
1:10 (4002)



DETAIL 11
1:10 (4002)



ALL STEEL GRADE 250

SEISMIC RESTRAINTS AT ABUTMENTS

1: 10

ALL STEEL GRADE 250

SEISMIC RESTRAINTS AT PIERS

1: 10

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NOS

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yabuki — Principal — 25 Sep. 1989 — Date

DRAWN: P.G.M.S
CHECKED
DESIGNED
CHECKED

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED — SECRETARY

SCALES

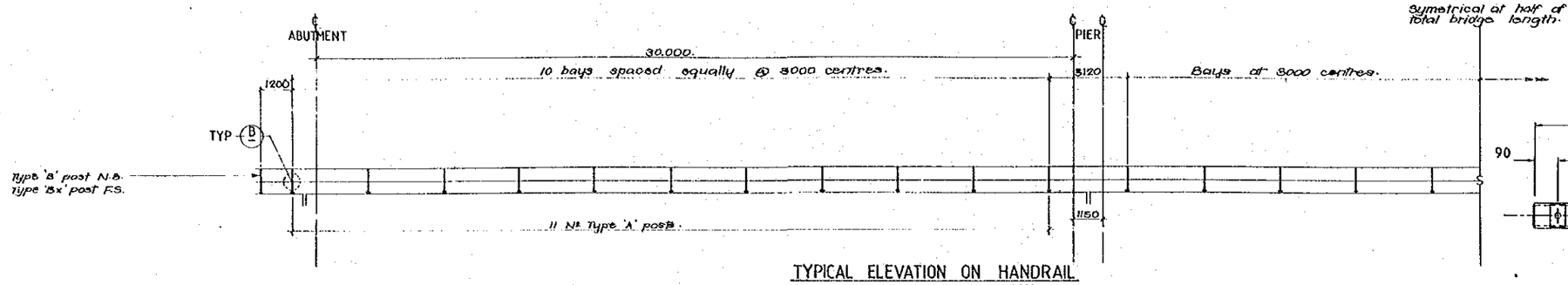
SHEET 221 OF 303

PROJECT No. S.C. 120-33-814/B

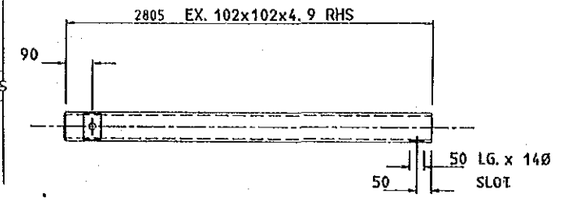
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
STEELWORK DETAILS - SHEET 2

PAPUA NEW GUINEA
DEPARTMENT OF WORKS

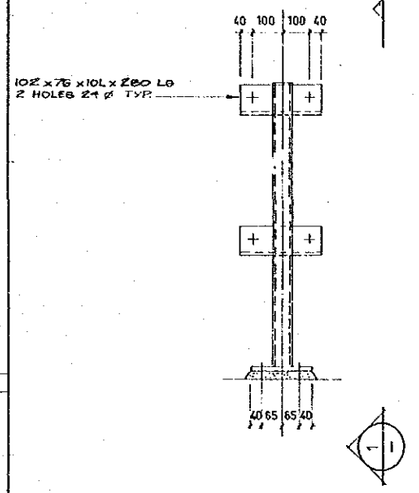
DRAWING No. A1/88255
REV.



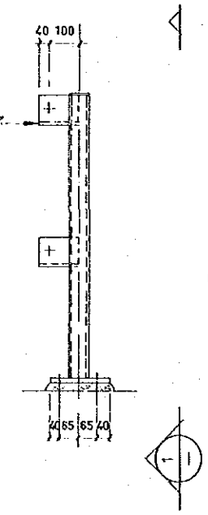
TYPICAL ELEVATION ON HANDRAIL
1:100



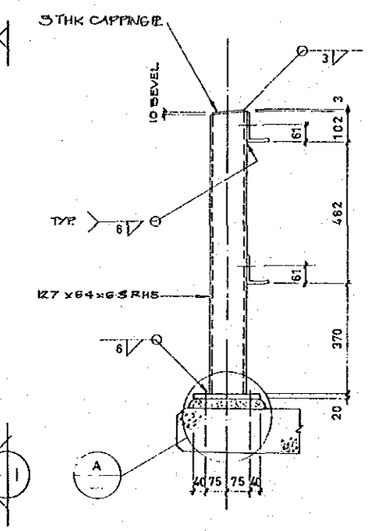
PENULTIMATE BAY HANDRAIL



TYPE 'A' HANDRAIL POST
1:10

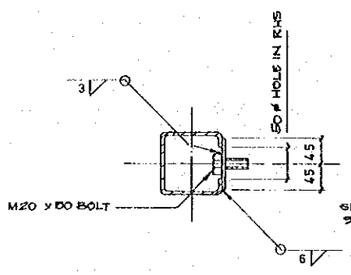


TYPE 'B' HANDRAIL POST
1:10

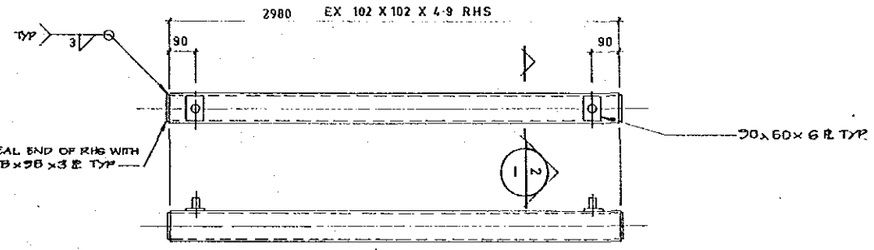


SECTION 1

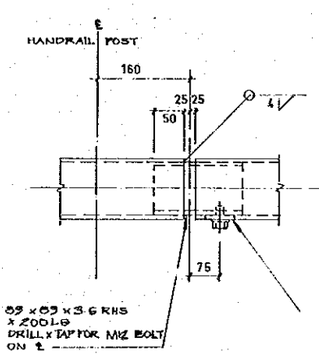
NOTE: ALL BOLTS TO BE M20



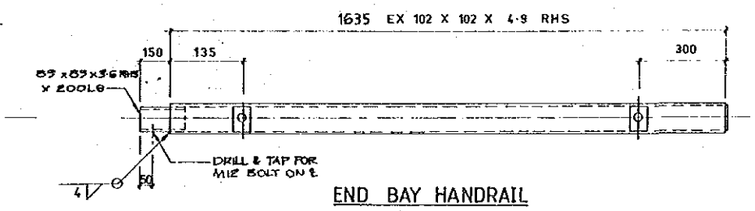
SECTION 2 TYP
1:5



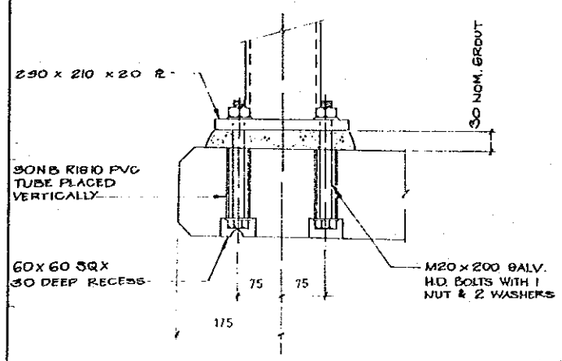
INTERNAL BAY HANDRAIL



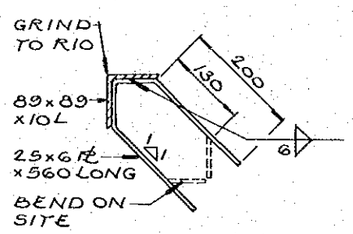
DETAIL 8 TYPICAL
1:5



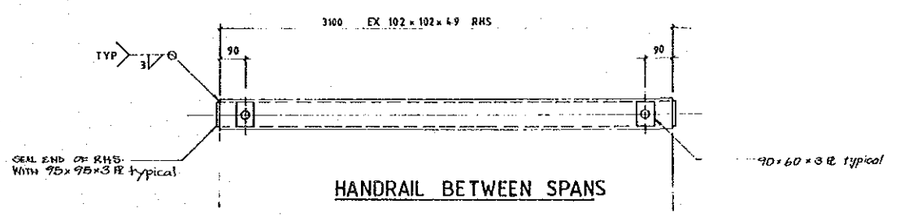
END BAY HANDRAIL



DETAIL A
1:5



DETAIL – IMPACT ANGLE
1:5



HANDRAIL BETWEEN SPANS

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
J. Watanabe, Principal — 25 Sep. 1989, Date

DRAWN: V.K.M.S
CHECKED:
DESIGNED: U. Shimizu
CHECKED:

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

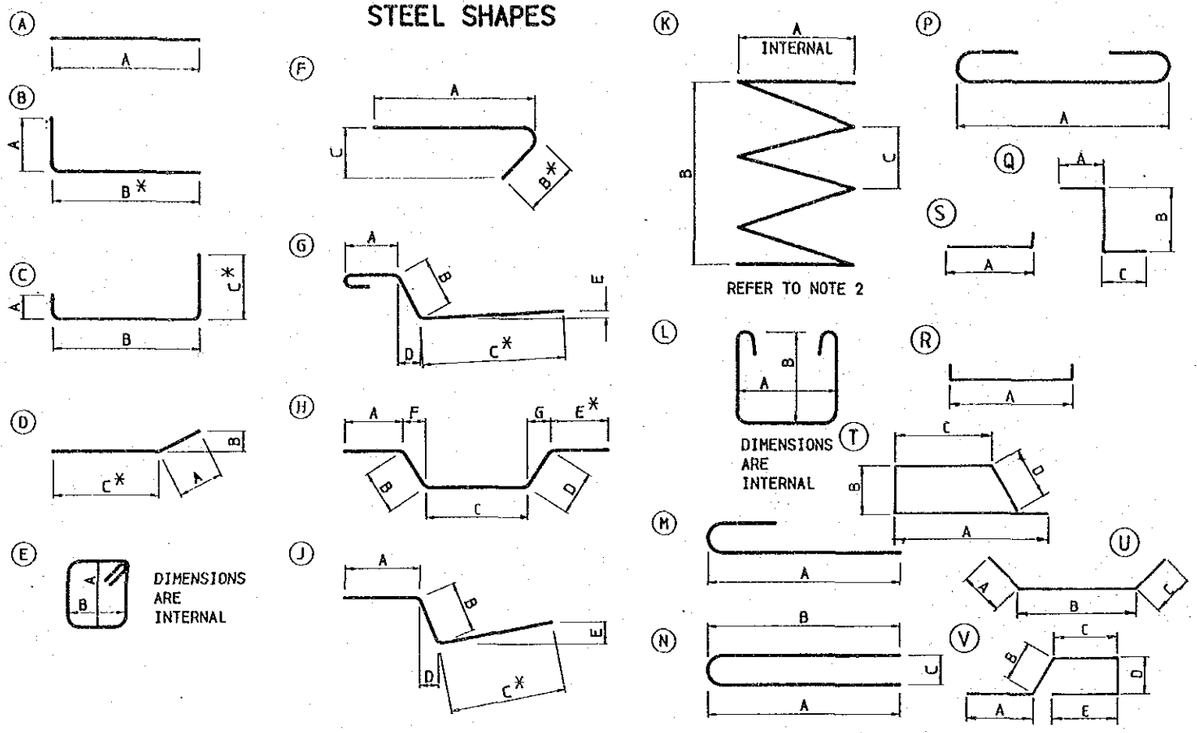
RECOMMENDED — 8/11/89 — PRINCIPAL ENGINEER
APPROVED — 1.11.89 — SECRETARY

SCALES

SHEET 222 OF 303
PROJECT No. S.C. 120-33-814/B

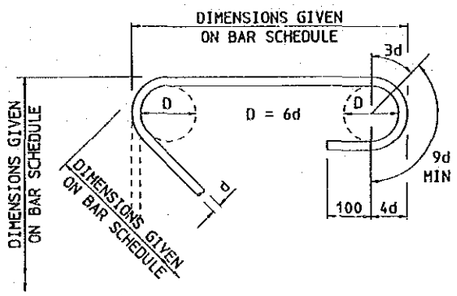
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE .. No. 4 - MIARU BRIDGE
HANDRAILING /IMPACT ANGLE DETAILS
PAPUA NEW GUINEA DEPARTMENT OF WORKS
DRAWING No. A1/88256
REV.

STEEL SHAPES

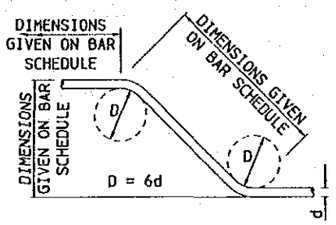


TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC16	01	468	4100							4590	339.8	P	
TC16	02	468	3900							3900	288.9	A	
TC12	03	936	930	*	225					1250	1058.9	F	
TC16	04	51	29900							29900	2407.8	A	*&** SEE NOTE 5
TC16	05	54	29900							29900	2549.4	A	** SEE NOTE 5
TC16	06	936	865	410	365					1540	2276.0	Q	
TC12	07	936	485	440	*	165				1500	1246.7	J	
TC16	08	66	31000							31000	3250.6	A	** SEE NOTE 5
TC20	09	24	1580							1580	98.5	A	
TC20	10	24	500	370	780	370	*	225	225	2520	149.1	H	
TC16	11	12	4000							4000	75.8	A	
TC12	12	108	395	315						1295	184.1	E	
TC16	13	108	1170	1170	125					2200	375.2	N	
TC16	14	936	865							865	1278.4	A	
TC16	15	450	500	320	400	320	*	250	250	2040	1448.9	H	
TC12	16	36	500	280	180	280	*	150	150	1740	55.6	H	
	TOTAL	TONNAGE =		22.673	TONNES	3 Nº	SPANS	DECK					
TC32	60	128	21800							21800	12619	A	** SEE NOTE 5
R12	61	8	646	21800						310300	2703.9	K	
TC36	62	128	400	2700						3100	3170.8	B	
TC32	63	54	1000	5220						6220	1548.9	C	
TC32	64	54	1000	3400						5240	1785.5	C	
TC32	65	36	1000	5200						7200	1635.5	C	
TC32	66	54	1000	3400						5400	1839.9	C	
TC20	67	24	1750	1000						4500	266.3	C	
TC20	68	12	5200							5200	153.9	A	
TC20	69	12	800	3400						5000	147.9	C	
TC16	70	24	500	400						1400	53.1	C	
TC16	71	48	500	700						1700	128.8	C	
TC20	72	64	975	1000	975					2950	465.6	C	
	TOTAL	TONNAGE =		25.319	TONNES	2 Nº	PIERS						
TC16	21	34	2000							2000	107.4	A	
TC16	22	54	1700	200						1900	162.0	B	
TC16	23	32	300	300	200	200	200	200		1200	60.6	V	
TC12	25	24	300	480	300					1080	28.0	C	
TC12	26	24	300	660	300					1260	26.8	C	
TC28	27	18	5200							5200	452.5	A	
TC24	28	32	5200							5200	590.9	A	
TC28	29	54	2545	1500	2545					6590	1720.1	C	
TC28	30	32	900	5200	900					7000	1759.6	C	
TC24	31	20	5200							5200	869.3	A	
TC28	32	86	900	2900	900					4700	1958.9	C	
TC24	33	20	1400	2900	1400					5700	404.8	C	
TC28	34	32	1400	1500	1400					4300	665.2	C	
TC16	35	36	2545							2545	144.6	A	
TC16	36	40	2500							2500	157.9	A	
TC16	37	24	850							850	31.45	A	
TC16	38	20	200	550	200					950	30.0	U	
TC16	39		450	*	(8 sets of 7)	TOTAL	LENGTH = 69m			650	41.1	B	
	TO		2600	*		TOTAL	WEIGHT = 103kg			2800	176.8	B	INCREMENTS = 537.5mm
TC16	40	20	2600							2600	82.1	A	

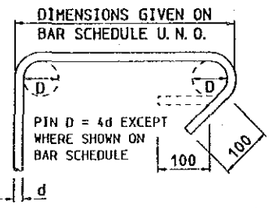
STANDARD HOOKS AND BENDS



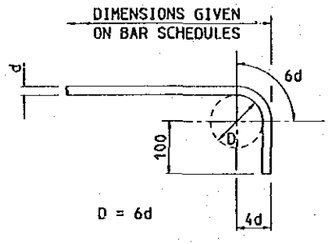
ACUTE ANGLE AND 90° BEND



OBTUSE ANGLE BEND



BENDS AND HOOKS FOR STIRRUPS AND LIGATURES (ENCOMPASSING)



RIGHT ANGLE BEND

TEMPCORE GRADE DEFORMED

NOTES

1. EXPLANATION OF BAR MARKS
   e.g. 40 - TC32 - 07 - 250 - B
   - 40: No. OFF
   - TC32: TYPE / BAR DIAMETER
   - 07: BAR MARK
   - 250: SPACING
   - B: LOCATION
2. SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG.
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 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.5

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY — J. Malcolm, Principal — 25 Sep. 1989 Date

DRAWN: M.S — CHECKED — DESIGNED: M. Shinjo — CHECKED

PROJECT ENGINEER 11/10/89 — EXECUTIVE ENGINEER 5/10/89

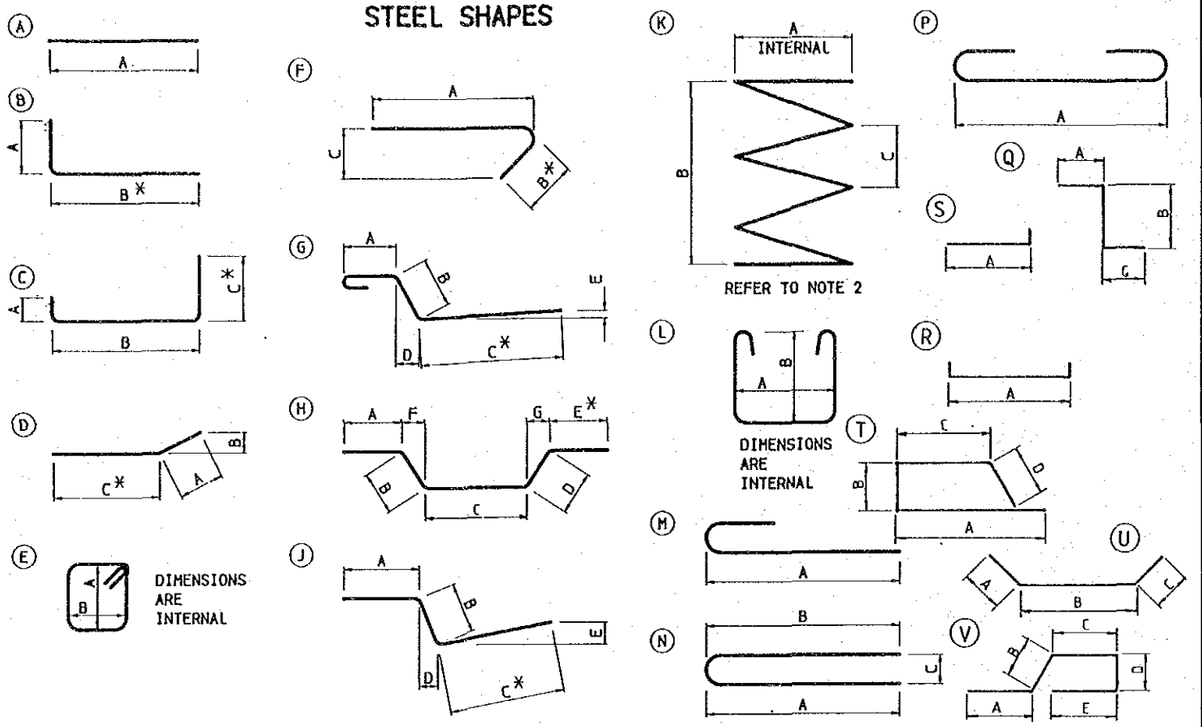
RECOMMENDED 11/10/89 PRINCIPAL ENGINEER — APPROVED 1.11.89 for SECRETARY

SCALES

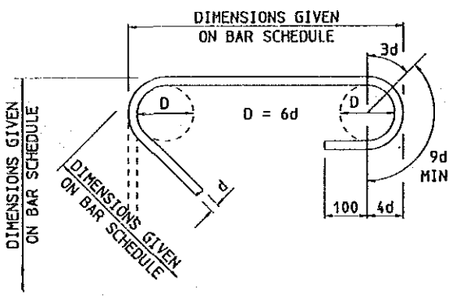
SHEET 223 OF 303 — PROJECT No. S.C. 120-33-814/B

CENTRAL : GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
BAR BENDING SCHEDULE SHEET 1
PAPUA NEW GUINEA DEPARTMENT OF WORKS — DRAWING No. A1 88257

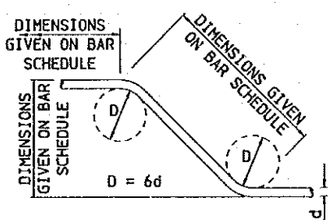
STEEL SHAPES



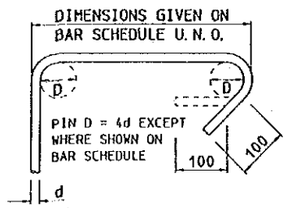
STANDARD HOOKS AND BENDS



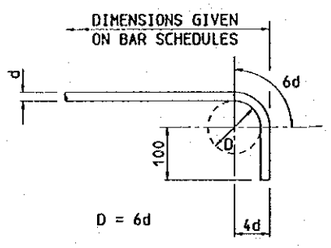
ACUTE ANGLE AND 90° BEND



OBTUSE ANGLE BEND



BENDS AND HOOKS FOR STIRRUPS AND LIGATURES (ENCOMPASSING)



RIGHT ANGLE BEND

TEMPCORE GRADE DEFORMED

NOTES

1. EXPLANATION OF BAR MARKS
   e.g. 40 - TC32 - 07 - 250 - B
   - 40 — No. OFF
   - TC32 — TYPE / BAR DIAMETER
   - 07 — SPACING
   - 250 — BAR MARK
   - B — LOCATION
2. SPIRAL LENGTH HAS BEEN CALCULATED ASSUMING WELDED LAP SHOWN ON DRG.
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 TEMPCORE (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	41	144	550	*	(8 sets of 18)	TOTAL LENGTH = 280.72 m				1050	238.7	B	
	TD	144	2350	*		TOTAL WEIGHT = 449.3 kg				2850	648	B	INCREMENTS = 230
TC16	42	64	200	500	200					900	90.9	U	
TC16	43	44	2600							2600	180.6	A	
TC16	44	76	900	900	90					1850	222	N	
TC16	45	8	3500							3 500	44.2	A	
TC16	46	36	1500	700	1500					3700	210.8	C	
TC16	47	6	2950							2950	27.9	A	
TC16	48	32	5200							5200	262.6	A	
TC20	49	182	900	750	900					2550	830.1	C	
TC20	50	108	1735							1850	492.7	P	
		TOTAL	TONNAGE	= 11.655	TONNES	2 Nº ABUTMENTS							

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 — J. Yabuta, Principal — 25 Sep. 1989 (Date)

DRAWN: M.S — CHECKED — DESIGNED: M. Shingu — CHECKED

PROJECT ENGINEER — 1/11/89

EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER

APPROVED 1.11.89 — SECRETARY

SCALES

SHEET 224 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES

TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION

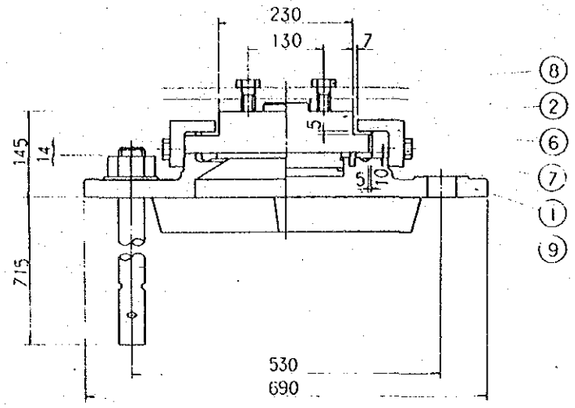
BRIDGE No.4 - MIARU BRIDGE

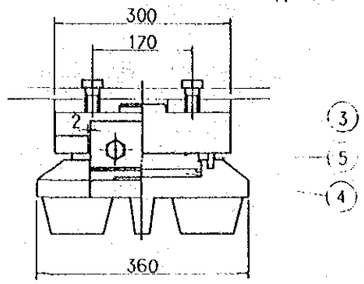
BAR BENDING SCHEDULE SHEET 2

PAPUA NEW GUINEA DEPARTMENT OF WORKS

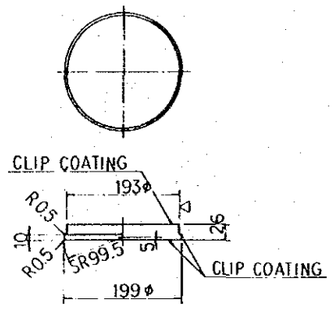
DRAWING No. A1/88258

R=75TON Fix BEARING

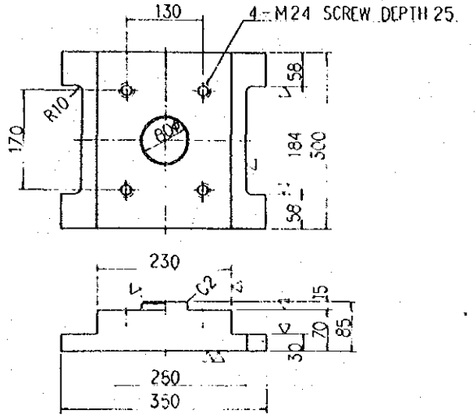




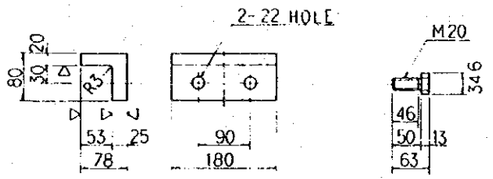
③ 12.5S (▽) SS41



② ∼ (▽ 7▽) SS41



⑥ ∼ (7) SS41 ⑦ SS41



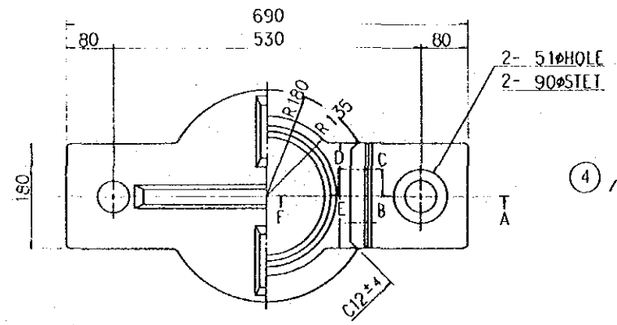
DESIGN CONDITION

TOTAL REACTION	R	54.0	ton
DEAD LOAD REACTION	Rd	14.7	ton
LIVE LOAD REACTION	RL(L1)	39.3	ton
LONGITUDINAL FORCE (FRICTION)	RH1f	5.4	ton
LONGITUDINAL FORCE (EARTHQUAKE)	RH1e	13.1	ton
TRANSVERSE FORCE (EARTHQUAKE)	RH2e	6.2	ton
UPLIFT (EARTHQUAKE)		1.5	ton
SEISMIC COEFFICIENT	Kh	0.42	
FRICATIVE COEFFICIENT	f	0.1	
BEARING STRESS OF CONCRETE	(S)	50	kg/cm²

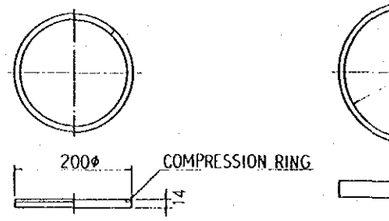
MATERIAL LIST

MARK	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	67.7	
2	UPPER BEARING	SS41	1	43.6	
3	MIDDLE PLATE	SS41	1	6.1	
4	RUBBER PLATE	CHLOROPRENE RUBBER	1	0.6	
5	SEAL RING	CHLOROPRENE RUBBER	1	0.3	
6	SIDE BLOCK	SS41	2	8.4	
7	BOLT	SS41	4	0.7	M20, 50 NEAR SS54
8	BOLT	SS41	4		M45 SS54
9	ANCHOR BOLT-NUT	SS41	2	22.4	
	TOTAL WEIGHT (kg)			149.8	

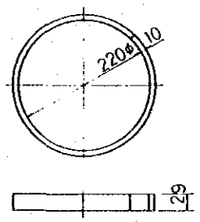
① ∼ (▽ 12.5S ▽▽) SC46



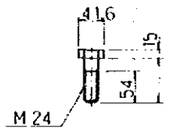
④ ∼ CHLOROPRENE RUBBER



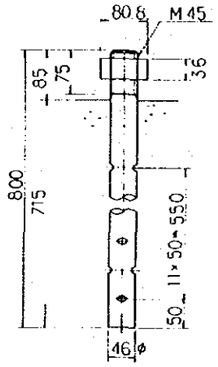
⑤ ∼ CHLOROPRENE RUBBER



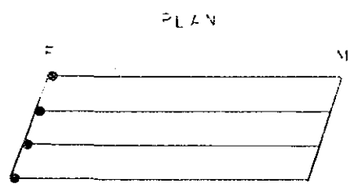
⑧ SS41



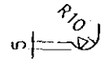
⑨ ∼ SS41

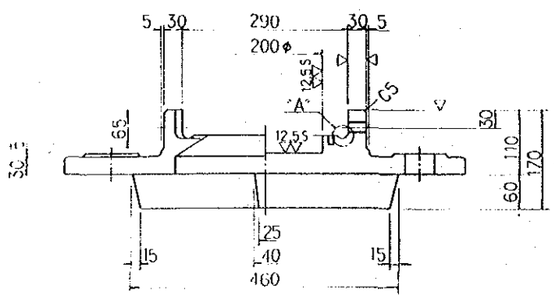


PLAN

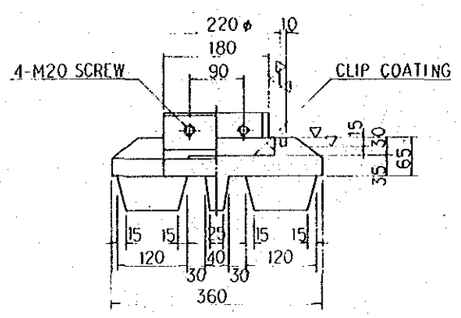


'A' DETAL





SECTION 'ABCDEF'



REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NO.6

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Valera — Principal — 25 Sep. 1989 — Date

DRAWN: M.S
CHECKED: Y. Dai
DESIGNED: M. Shinya
CHECKED: Y. Dai

PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED 1.11.89: Fas(ty) SECRETARY

SCALES

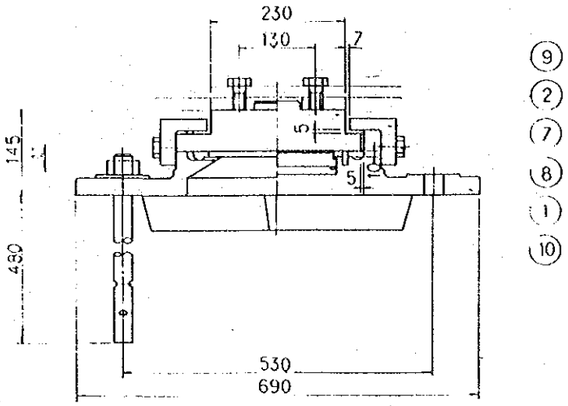
SHEET 225 OF 303

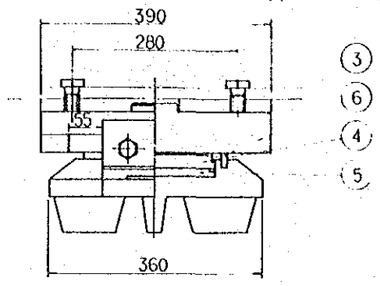
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4- MIARU BRIDGE
BEARING BP. B - 103 (FIXED)
PAPUA NEW GUINEA DEPARTMENT OF WORKS

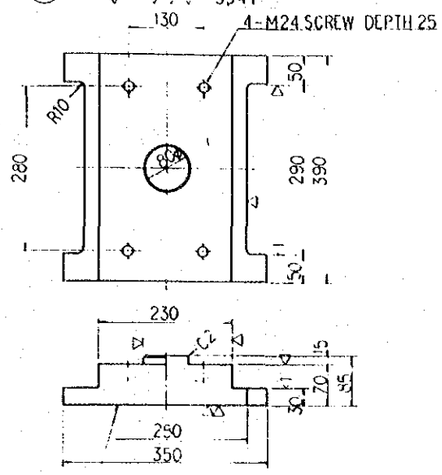
DRAWING No. A1/ 88259

R=75 TON M_{ov} BEARING

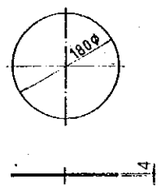




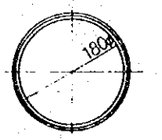
② ▽ SS41



③ ∼ PTFE

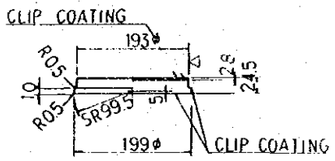


④ 12.5S ▽▽ (▽) SS41

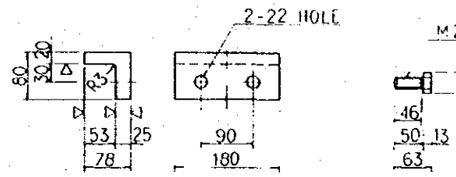


HARD CHROMIUM COATINGS

CLIP COATING

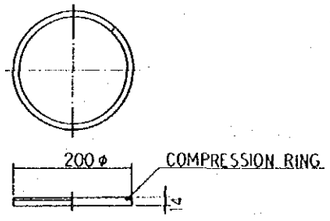


⑦ ∼ (▽) SS41 ⑤ SS41

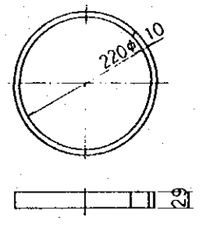


① ∼ (▽ 12.5S ▽▽) SC46

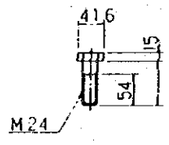
⑤ ∼ CHLOROPRENE RUBBER



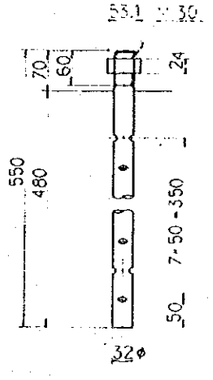
⑥ ∼ CHLOPORENE RUBBER



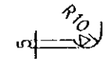
⑨ SS41

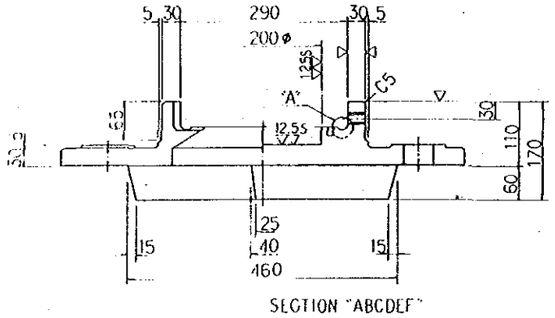


⑩ ∼ SS41

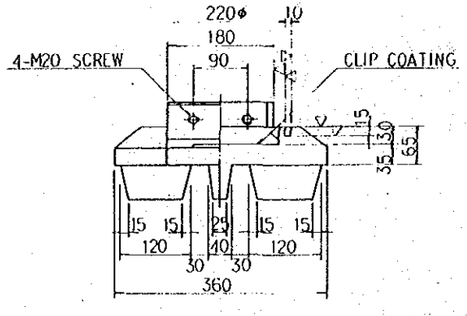


"A" DETAIL

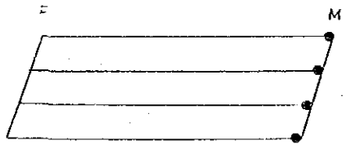




SECTION "ABCDEF"



PLAN



DESIGN CONDITION

TOTAL REACTION	R	52.3	ton
DEAD LOAD REACTION	Rd	16.4	ton
LIVE LOAD REACTION	R(L)	36.5	ton
LONGITUDINAL FORCE (FRICTION)	RHf	5.3	ton
LONGITUDINAL FORCE (EARTHQUAKE)	RHe	6.9	ton
TRANSVERSE FORCE (EARTHQUAKE)	Rhe	6.9	ton
UPLIFT (EARTHQUAKE)	V	1.6	ton
MOVABLE LENGTH	e1	50	mm
DESIGNED LENGTH	e2	70	mm
TOTAL LENGTH	e	110	mm
SEISMIC COEFFICIENT	Kh	0.42	
FRICATIVE COEFFICIENT	f	0.1	
BEARING STRESS OF CONCRETE	σba	80	kg/cm²

MATERIAL LIST

MARK	NAME	MATERIAL	NO	WEIGHT	NOTE
1	LOWER BEARING	SC46	1	65.2	
2	UPPER BEARING	SS41	1	55.6	
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	6.4	
8	BOLT	SS41	4	0.7	M20 L=230 M24 L=100
9	BOLT	SS41	4		
10	ANCHORBOLT-NUT	SS41	2	7.4	
	TOTAL WEIGHT (kg)			140.0	

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM
SURVEY BOOK NO.6

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY — 25 Sep. 1989 — Date — Principal

DRAWN: M.S
CHECKED
DESIGNED: M. Shinjo
CHECKED

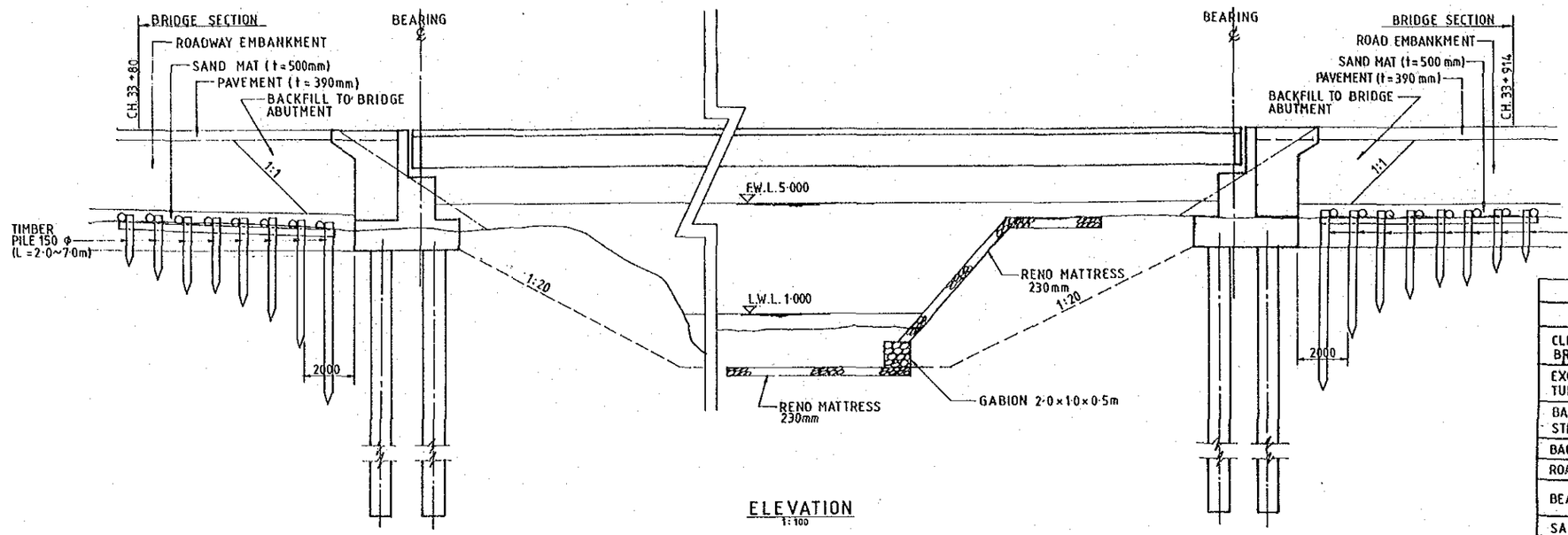
PROJECT ENGINEER — 1/9/89
EXECUTIVE ENGINEER — 1/9/89

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED — SECRETARY

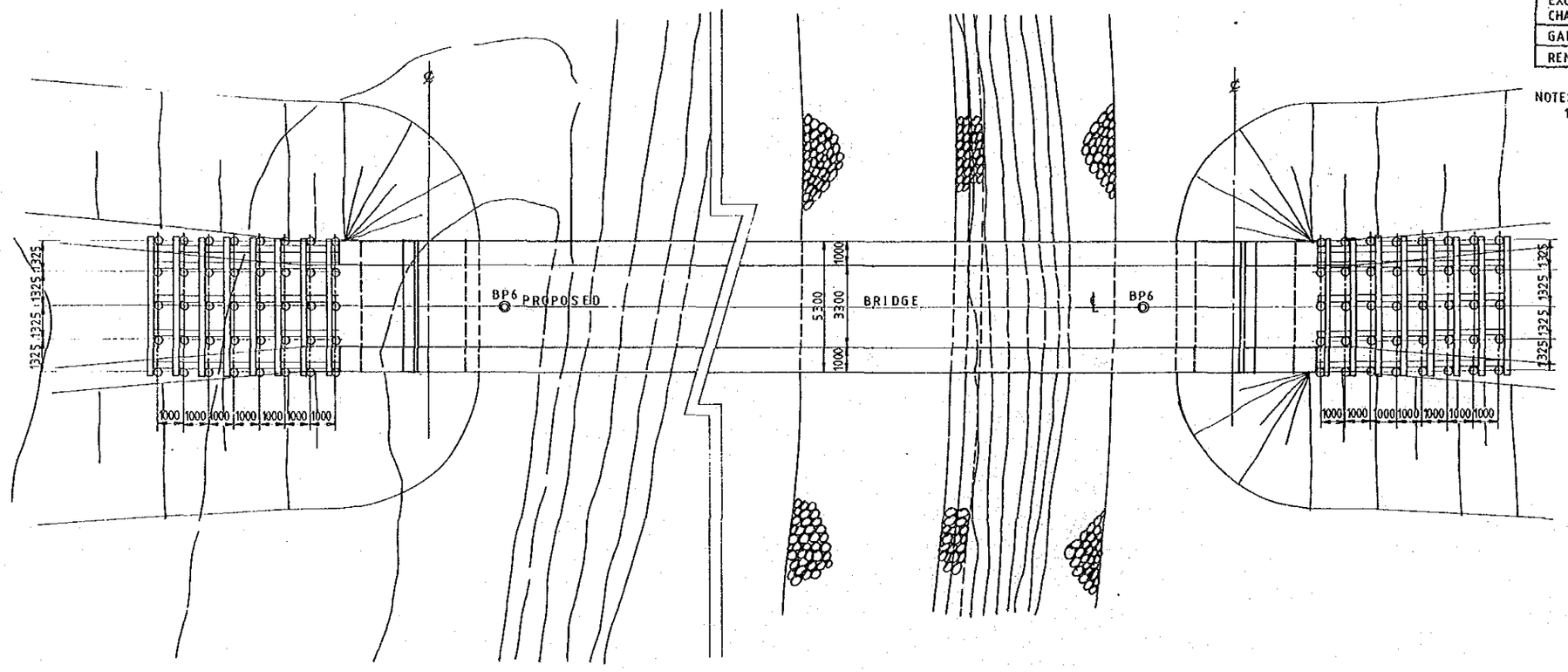
SCALES

SHEET 226 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.4 - MIARU BRIDGE
BEARING BP-B -104 (MOVABLE)
PAPUA NEW GUINEA DEPARTMENT OF WORKS
DRAWING No. A1 88260



ELEVATION
1:100



PLAN
1:100

TABLE OF QUANTITIES				
DESCRIPTION		UNIT	QUANTITY	REMARKS
CLEARING AND GRUBBING AT BRIDGE SITE		ha	0·1	
EXCAVATION FOR STRUCTURAL FOUNDATIONS	TYPE C	m³	0	
	TYPE D	m³	75	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS		m³	37·5	
BACKFILL TO BRIDGE ABUTMENT		m³	208	
ROADWAY EMBANKMENT		m³	495	
BEARING UNITS	TIMBER PILE	m	300	150 φ
	CROSS TIMBER	m	158·7	150 φ
SAND MAT		m³	143	
EXCAVATION FOR BANK PROTECTION WORKS (TYPE D)		m³	431·6	
EXCAVATION FOR RIVER CHANNEL ALIGNMENT (TYPE D)		m³	0	
GABIONS		m³	90	
RENO MATTRESSES (TYPE B)		m²	1485	t=230mm

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

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
J. Yabuta — Principal — 25 Sep. 1989 — Date

DRAWN: M·S
CHECKED: H. Doi
DESIGNED: T. Kawahara
CHECKED: H. Doi

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED: 6/10/89 — PRINCIPAL ENGINEER
APPROVED — F&S(S) — SECRETARY

SCALES

SHEET 227 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No 4. — MIARU BRIDGE
RIVER BANK PROTECTIONS, BEARING UNITS, BACKFILL TO BRIDGE ABUTMENTS AND OTHERS.
PAPUA NEW GUINEA
DEPARTMENT OF WORKS

DRAWING No. A1 88261

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
℄	CENTRELINE	FLG	FLANGE
℞	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	8.4 m × 6 no's	500 ϕ ×14 THK (OPEN END)
BEREINA	PIER	27.0m × 4 no's	800 ϕ ×12 THK (CLOSED END)
MALALAUA	PIER	27.0m × 4 no's	800 ϕ ×12 THK (CLOSED END)
MALALAUA	ABUTMENT.	8·4m × 6 no's	500 ϕ ×14 THK (OPEN END)

MAX PILE WORKING COMPRESSION LOADS:
ABUTMENTS 700 kN
PIERS 1400 kN
THE TIP OF THE PILES SHALL BE REINFORCED AS SHOWN
TEST PILE 27m × 1 no 800 ϕ THK

4. CONCRETE

ALL CONCRETE SHALL BE GRADE 25. (FĆ = 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 STEELWORK TO BE GRADE 250 STEEL. ALL WELDS SHALL BE 6mm CONTINUOUS FILLET WELDS UNLESS NOTES 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

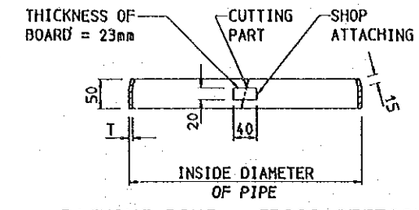
12. MAIN BEAM PRECAMBER

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.

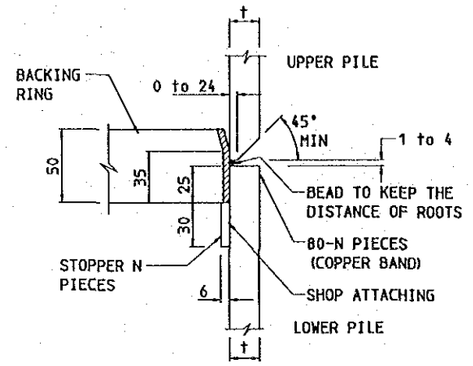
14 ABUTMENT A - BEREINA SIDE
ABUTMENT B - MALALAUA SIDE



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

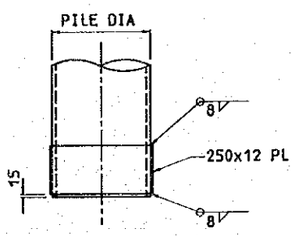
NUMBER OF STOPPERS

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

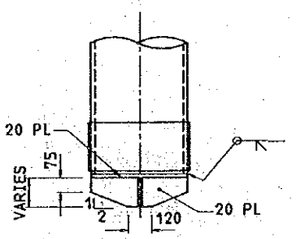
NOTES
1. MAXIMUM PILE SECTION LENGTH EQUALS 10m.
2. WELDING TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

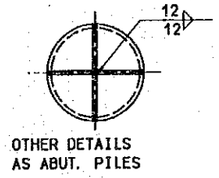
SHAPES AND DIMENSIONS OF BACKING RING AND STOPPER

DRAWING LIST	
DRG No.	DRAWING TITLE
88262	GENERAL NOTES AND DRAWING LIST
88263	GENERAL ARRANGEMENT
88264	ABUTMENT PLANS, SECTIONS & DETAILS
88265	PIER DETAILS
88266	DECK SLAB DETAILS
88267	STEEL WORK DETAILS SHEET 1
88268	STEEL WORK DETAILS SHEET 2
88269	HANDRAILING / IMPACT ANGLE DETAILS
88270	BAR BENDING SCHEDULE SHEET 1
88271	BAR BENDING SCHEDULE SHEET 2
88272	BEARING BP.B-101 (fixed)
88273	BEARING BP.B-102 (movable)
88274	BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS



PILE TOE REINFORCEMENT (OPEN END)





PILE TOE REINFORCEMENT (CLOSED END)

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM
SURVEY BOOK NO.8

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
Principal 25 Sep. 1989 Date

DRAWN: M·S
CHECKED
DESIGNED
CHECKED

PROJECT ENGINEER 11/10/89
EXECUTIVE ENGINEER 1/11/89

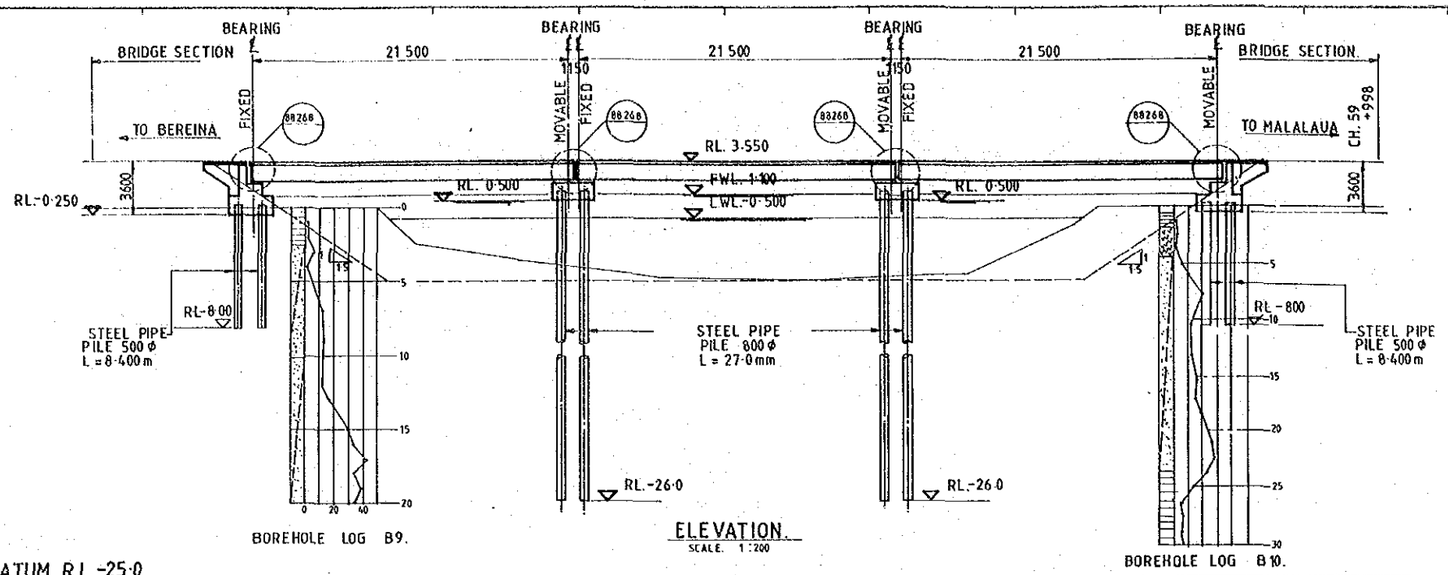
RECOMMENDED 1/11/89 PRINCIPAL ENGINEER
APPROVED 1.11.89 SECRETARY

SCALES

SHEET 228 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5 - KAPURI BRIDGE
GENERAL NOTES AND DRAWING LIST

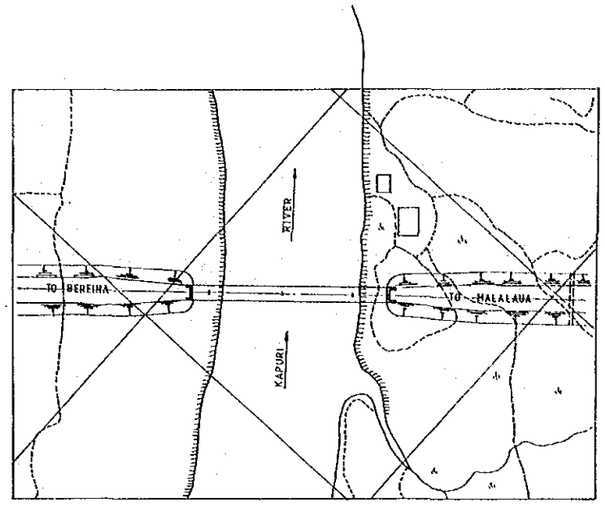
PAPUA NEW GUINEA DEPARTMENT OF WORKS
DRAWING No. A1/88262
REV.



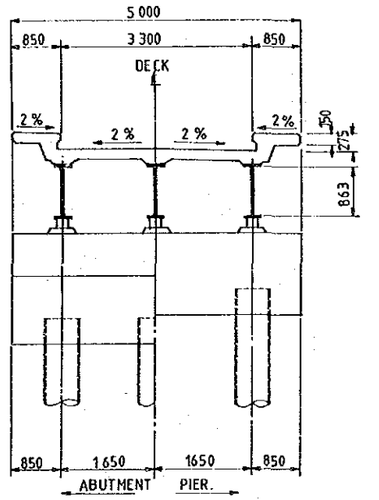
ELEVATION.
SCALE. 1:200

DATUM R.L.-25·0

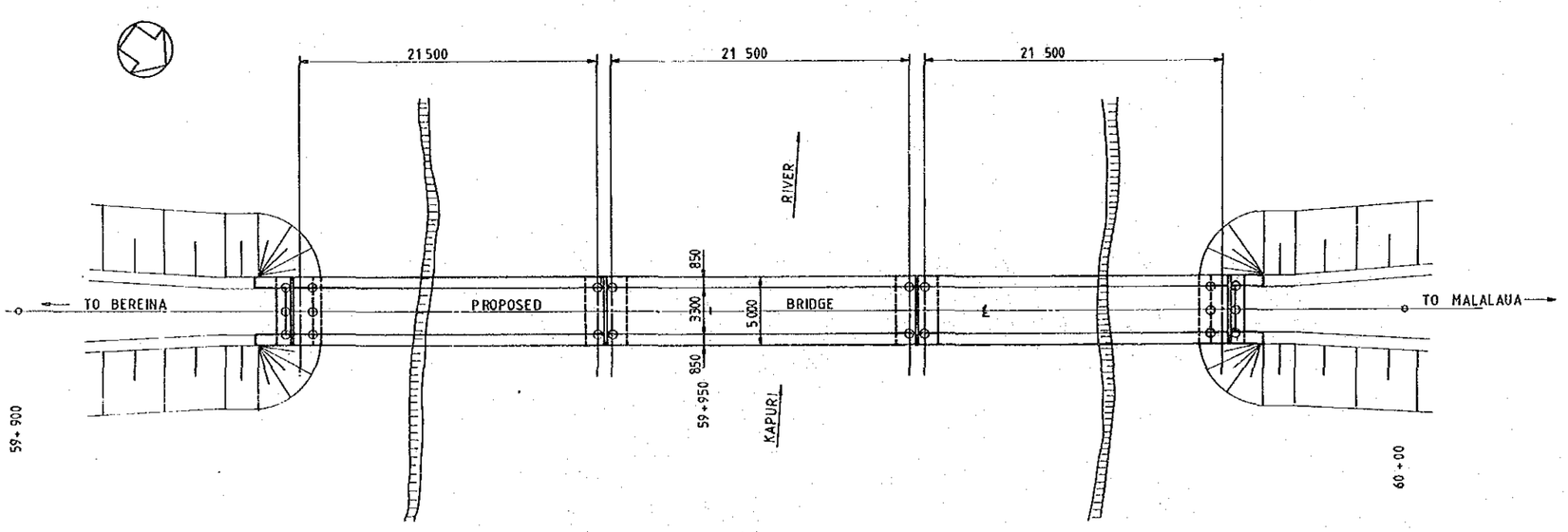
GRADE LEVELS	3·550 3·550	3·550	3·550	3·550 3·550	3·550	3·550 3·550
SURFACE LEVELS	0·49					0·47
CHAINAGE	CH. 59 +898 CH. 59 +926·0	CH. 59 +957·5	CH. 59 +941·5 CH. 59 +942·65	CH. 59 +953·4	CH. 59 +944·5 CH. 59 +966·3	CH. 59 +976·05	CH. 59 +983·4 CH. 59 +987·4



LOCALITY PLAN.
SCALE. 1:1000



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.

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 — J. Yakuwa (Principal) 25 Sep. 1989 (Date)

DRAWN: M·S — CHECKED: H. Dai — DESIGNED: T. Kawakami — CHECKED: H. Dai

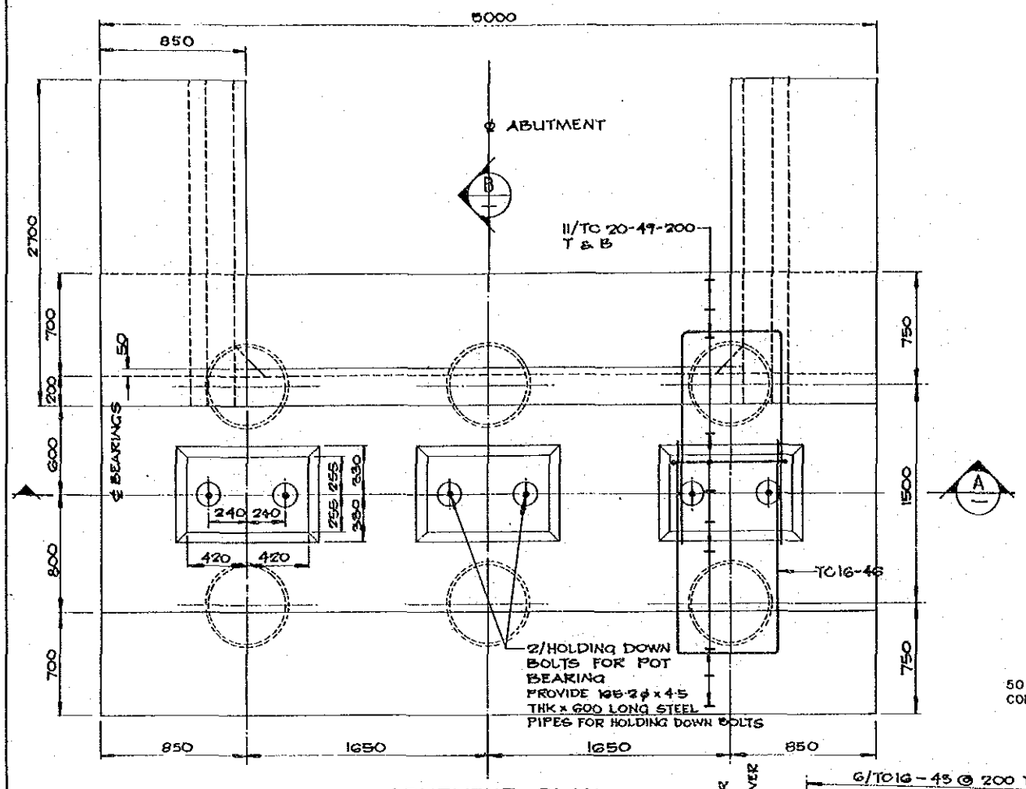
PROJECT ENGINEER: 1/11/89 — EXECUTIVE ENGINEER: 1/11/89

RECOMMENDED: PRINCIPAL ENGINEER — APPROVED: 1.11.89 FAS(19) SECRETARY

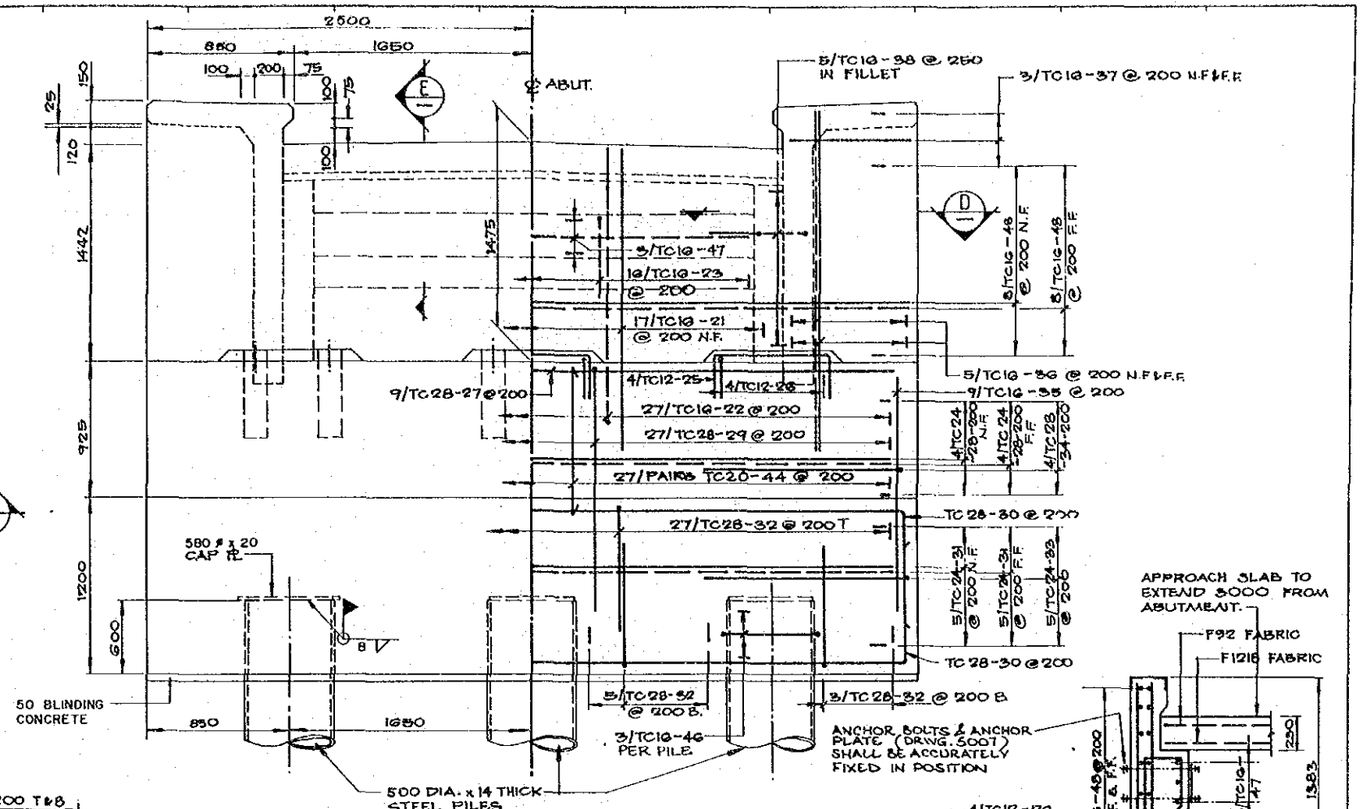
SCALES

SHEET 229 OF 303 — PROJECT No. S.C. 120-33-814/B

CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No. 5 – KAPURI BRIDGE
GENERAL ARRANGEMENT
PAPUA NEW GUINEA DEPARTMENT OF WORKS — DRAWING No. A1 88263

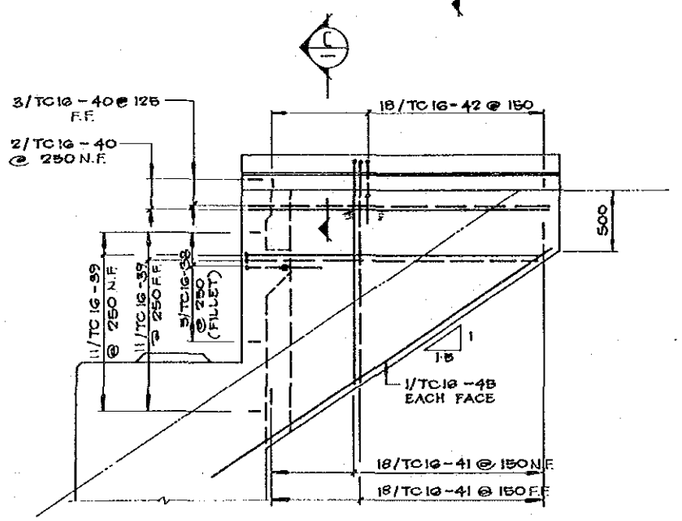


ABUTMENT PLAN 1:20



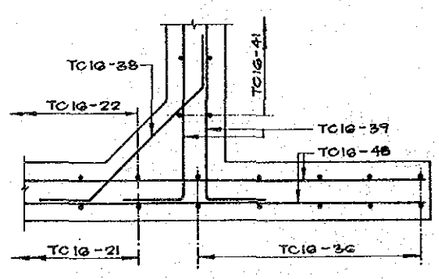
SECTION A 1:20

NOTE:
BACKFILL TO ABUTMENT WALL PROVIDE MIN. 600 FREE DRAINING FILL MATERIAL

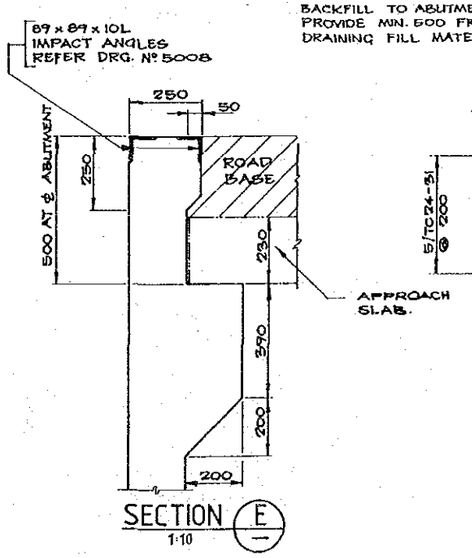


TYPICAL WINGWALL ELEVATION 1:25

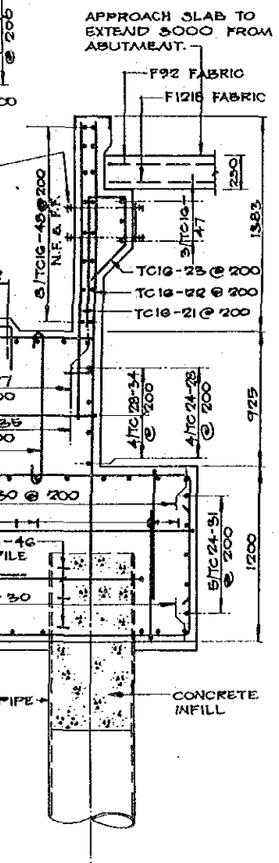
SECTION C 1:10



SECTION D 1:10



SECTION E 1:10



SECTION B 1:20

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
J. Yokota Principal 25 Sep. 1989 Date

DRAWN: M.S
CHECKED: Y. Kisi
DESIGNED: H. Shimizu
CHECKED: Y. Kisi

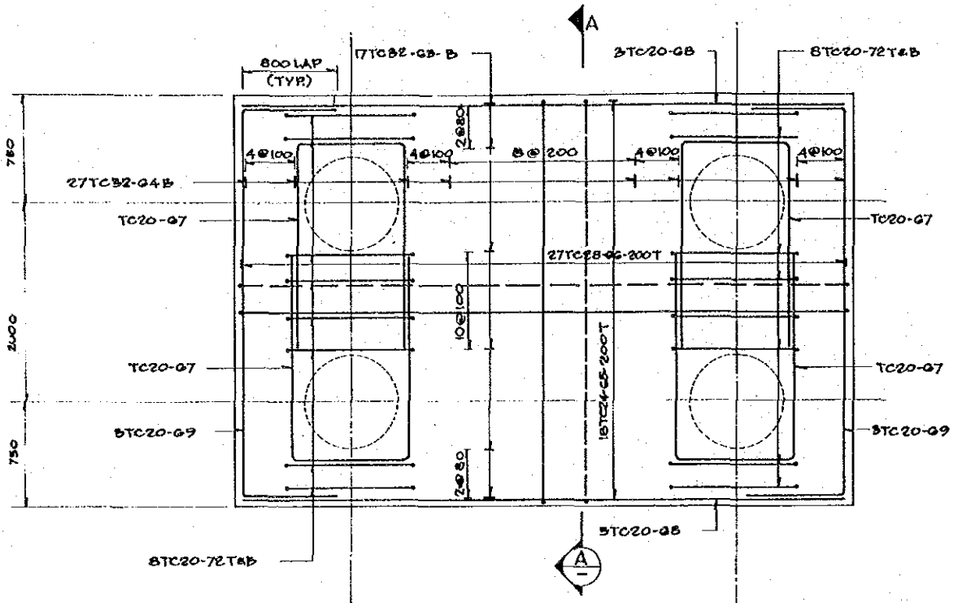
PROJECT ENGINEER 11/9/89
EXECUTIVE ENGINEER 14/9/89

RECOMMENDED 11/9/89 PRINCIPAL ENGINEER
APPROVED J.N.55 FAS(89) SECRETARY

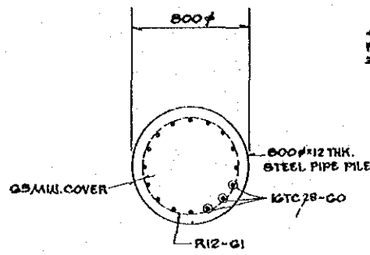
SCALES

SHEET 230 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5- KAPURI BRIDGE
ABUTMENT PLANS, SECTIONS & DETAILS
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1 / 88264

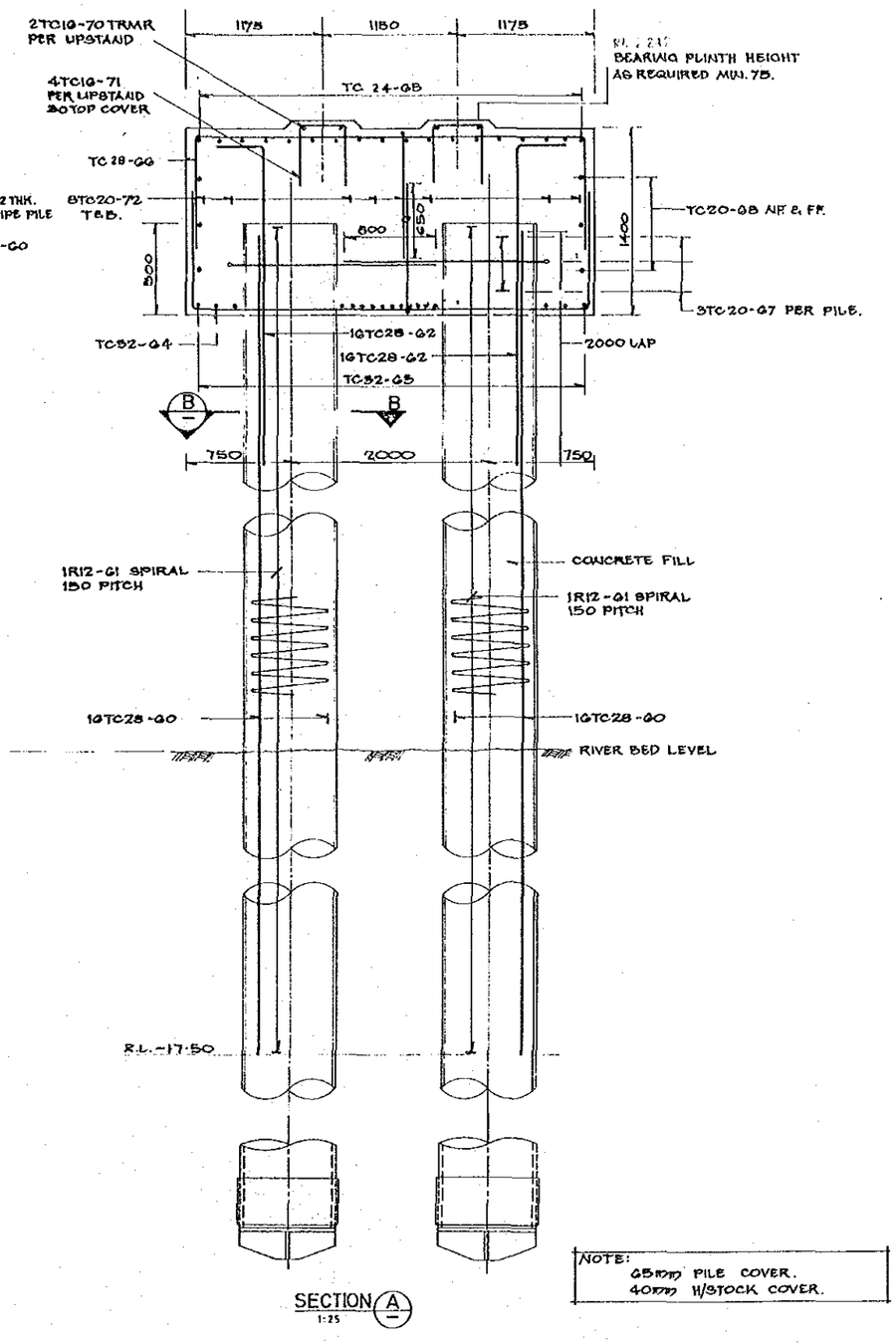


PIER REINFORCEMENT PLAN
1:25



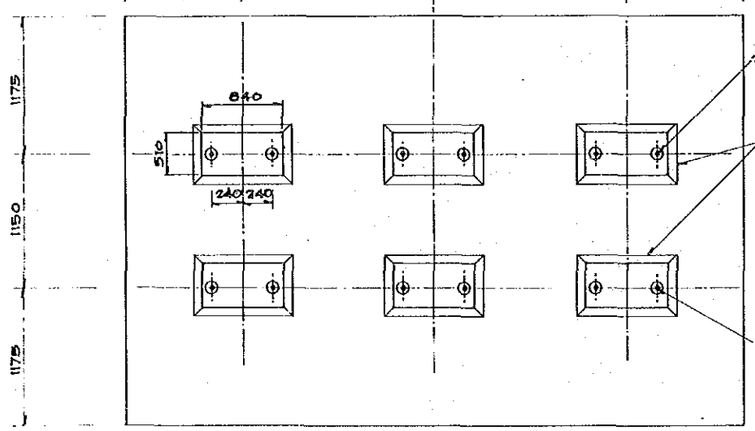
SECTION B
1:20

TO MALALUA



SECTION A
1:25

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



PLAN OF PIER
1:25

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date — VERTICAL DATUM: MEAN SEA LEVEL — HORIZONTAL DATUM — SURVEY BOOK NOS

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY — Principal — 25 Sep. 1989 — Date

DRAWN: M.S — CHECKED — DESIGNED — CHECKED

PROJECT ENGINEER — EXECUTIVE ENGINEER

RECOMMENDED — PRINCIPAL ENGINEER

APPROVED — SECRETARY

SCALES

SHEET 231 OF 303

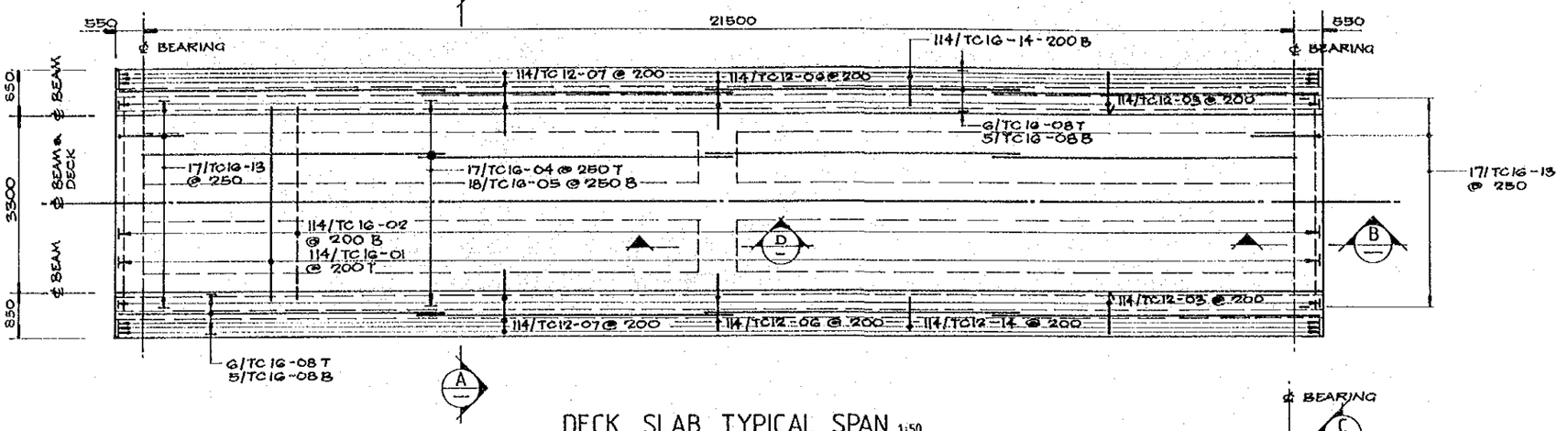
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5 - KAPURI BRIDGE
PIER DETAILS

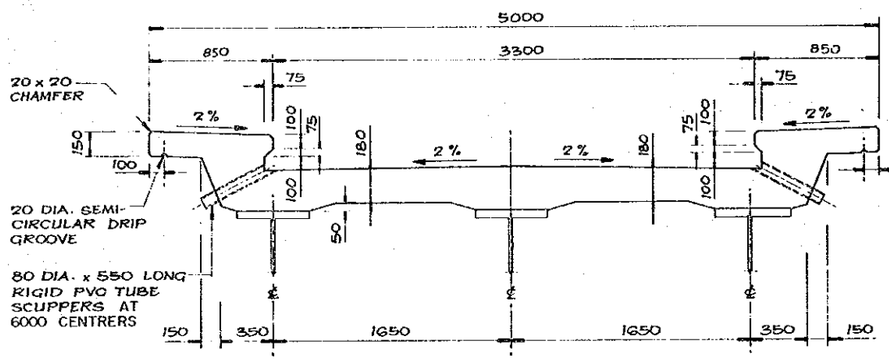
PAPUA NEW GUINEA DEPARTMENT OF WORKS

DRAWING No. A1 88265

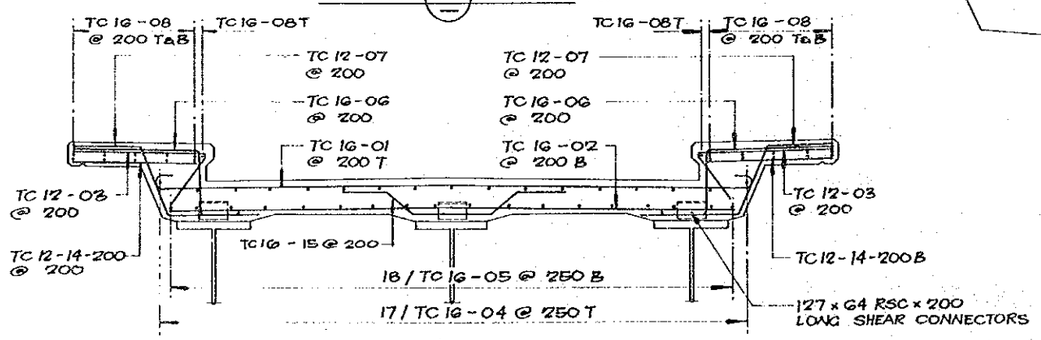
REV.



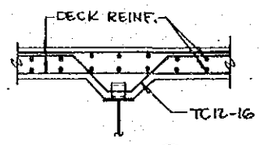
DECK SLAB TYPICAL SPAN 1:50



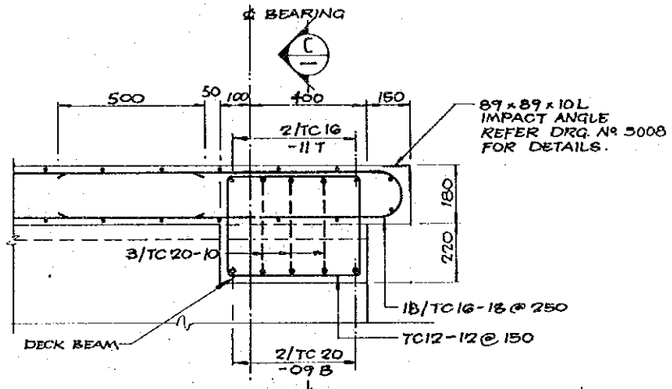
SECTION (A) TYPICAL 1:20



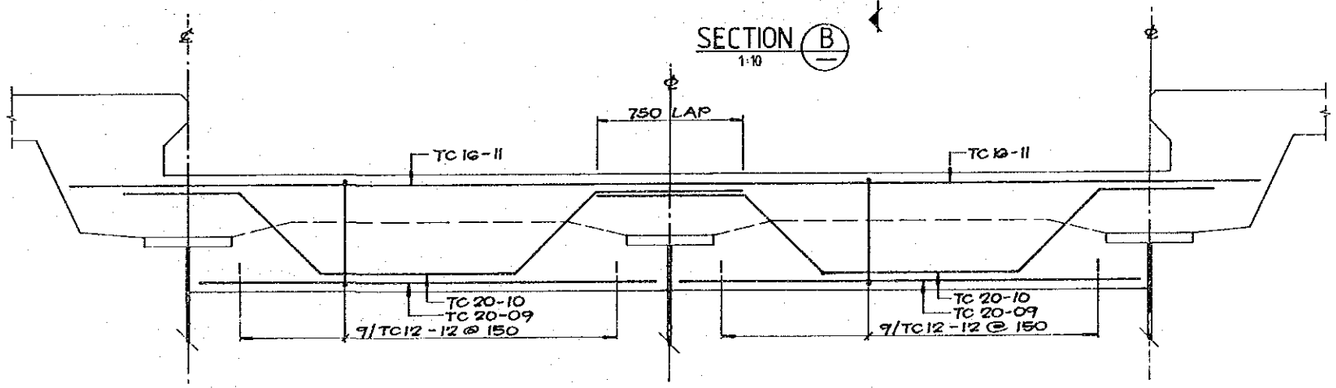
SECTION (A) REINF. 1:20



SECTION (D) 1:20



SECTION (B) 1:10



SECTION (C) 1:10

NOTE: DECK REINF. NOT SHOWN FOR CLARITY

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
J. Yakuta — Principal — 25 Sep. 1989 — Date

DRAWN: M.S
CHECKED:
DESIGNED:
CHECKED:

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER — 1/11/89
APPROVED — SECRETARY — 1.11.89 FAS(CS)

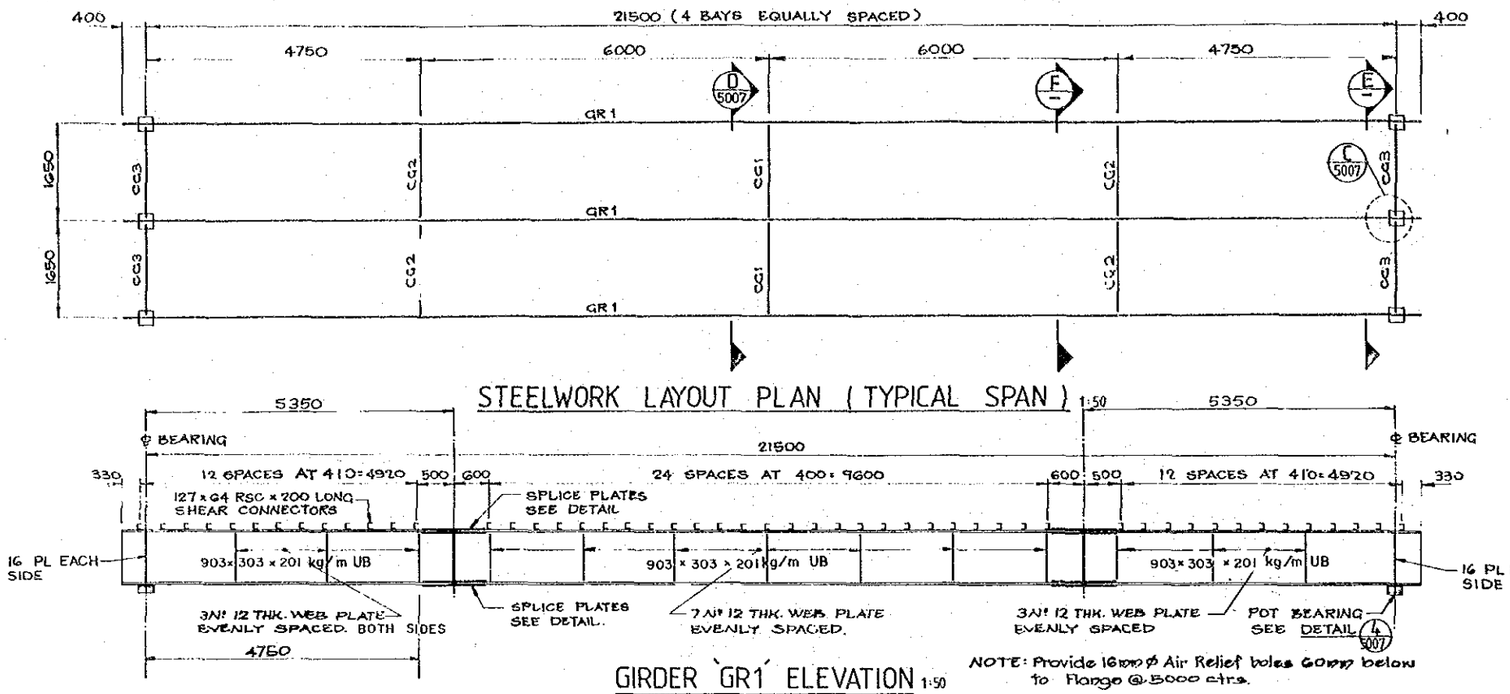
SCALES

SHEET 232 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5 - KAPURI BRIDGE
DECK SLAB DETAILS
PAPUA NEW GUINEA DEPARTMENT OF WORKS

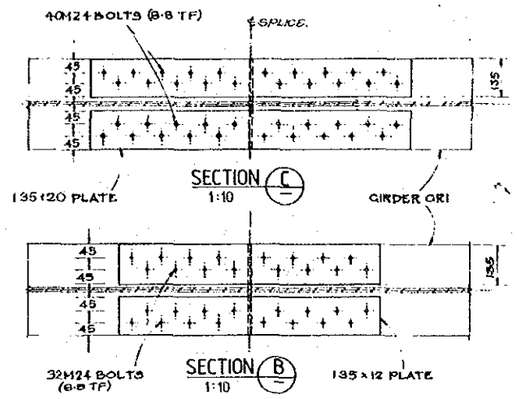
DRAWING No. A1/88266
REV.

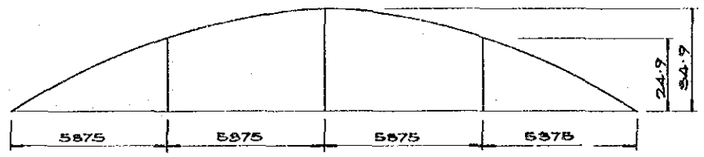


STEELWORK LAYOUT PLAN (TYPICAL SPAN) 1:50

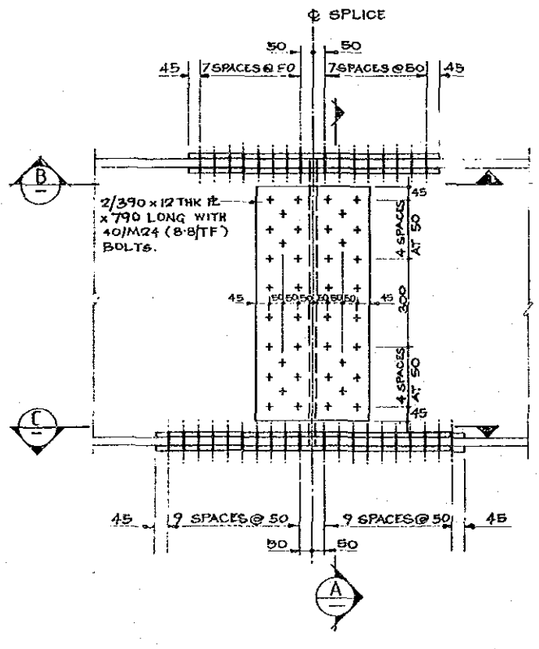
GIRDER 'GR1' ELEVATION 1:50

NOTE: Provide 16mm ℄ Air Relief holes 60mm below to Flange @ 5000 ctrs.

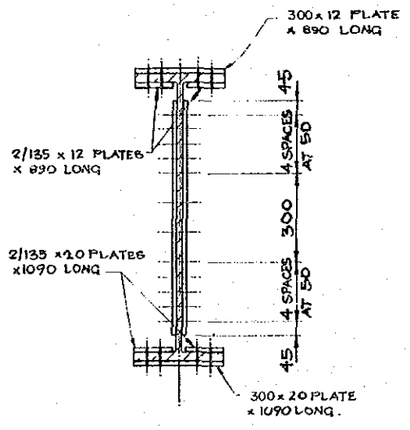




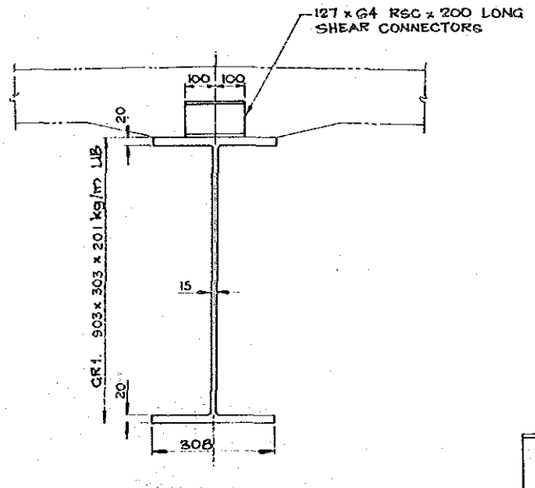
PRECAMBER DIAGRAM GR1



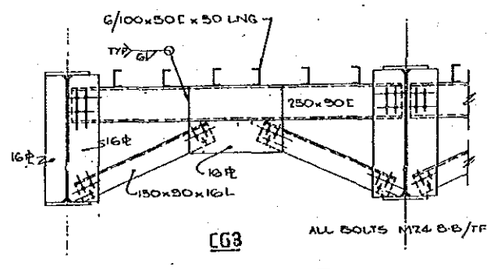
GIRDER GR1 SPLICE DETAIL 1:10



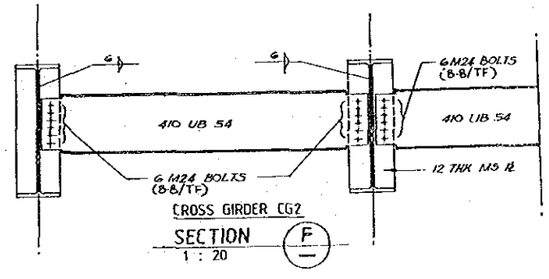
SECTION A 1:10



GIRDER 'GR1' SECTION 1:10

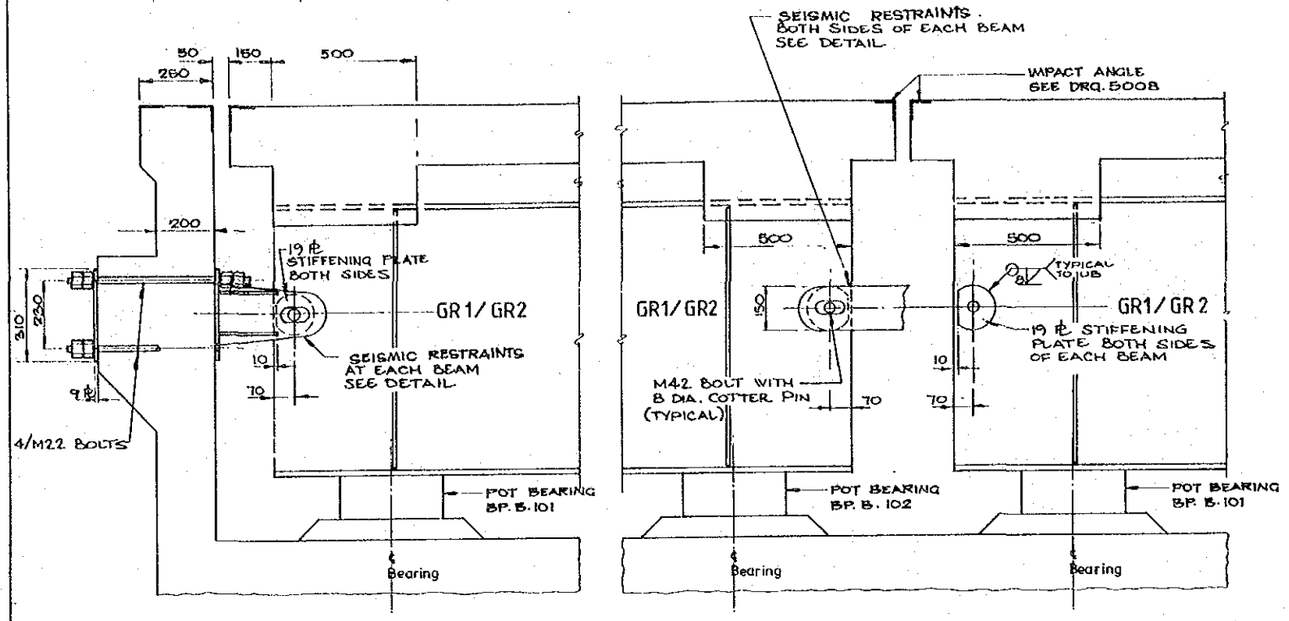


SECTION E 1:20



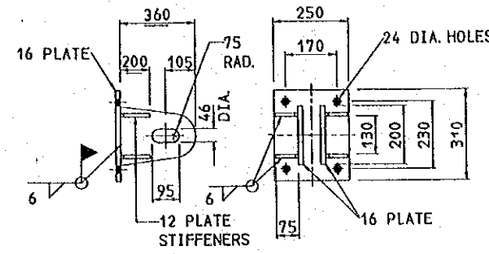
SECTION F 1:20

REV.	AMENDMENTS	BY	APP'D	DATE	SURVEY: JICA; VERTICAL DATUM: MEAN SEA LEVEL; HORIZONTAL DATUM; SURVEY BOOK No.S	DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY; 25 Sep. 1989	DRAWN: M·S; CHECKED; DESIGNED; CHECKED	PROJECT ENGINEER 1/11/89; EXECUTIVE ENGINEER 1/11/89	RECOMMENDED; PRINCIPAL ENGINEER; APPROVED 1.11.89; SECRETARY	SCALES	SHEET 233 OF 303; PROJECT No. S.C. 120-33-811/13	CENTRAL / GULF PROVINCES; TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION; BRIDGE No.5 - KAPURI BRIDGE; STEELWORK DETAILS - SHEET 1; PAPUA NEW GUINEA DEPARTMENT OF WORKS; DRAWING No. A1/88267



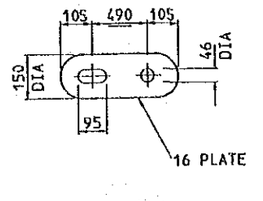
DETAIL 1 (5002)
1:10

DETAIL 2 (5002)
1:10



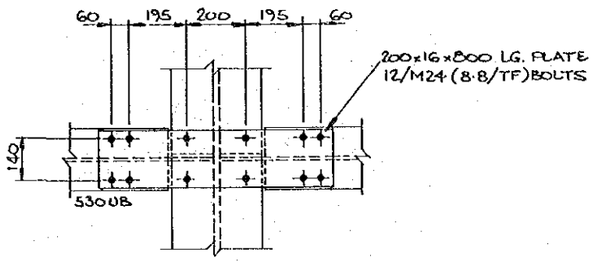
ALL STEEL GRADE 250

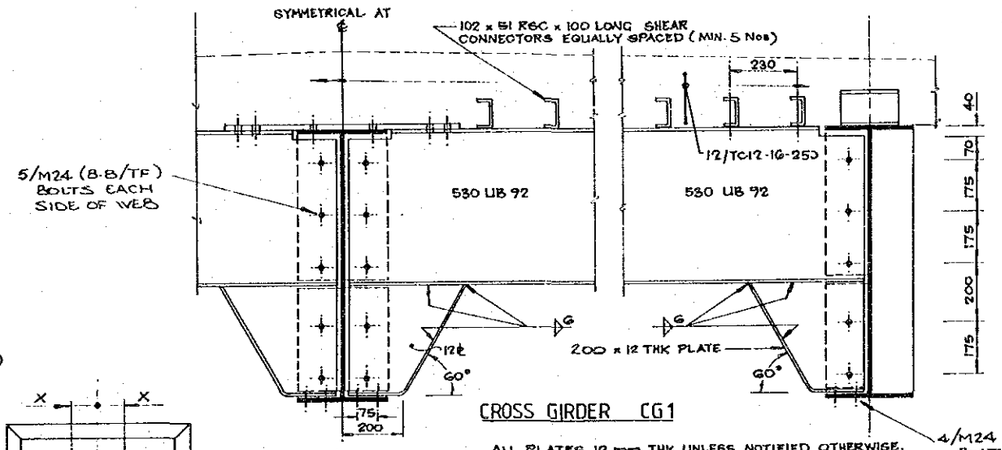
SEISMIC RESTRAINTS AT ABUTMENTS
1:10



ALL STEEL GRADE 250

SEISMIC RESTRAINTS AT PIERS
1:10

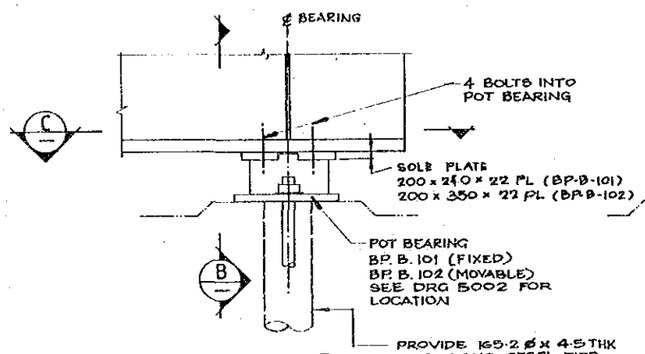




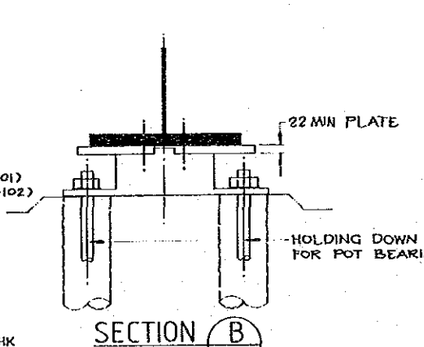
CROSS GIRDER CG1

ALL PLATES 12 mm THK UNLESS NOTIFIED OTHERWISE.

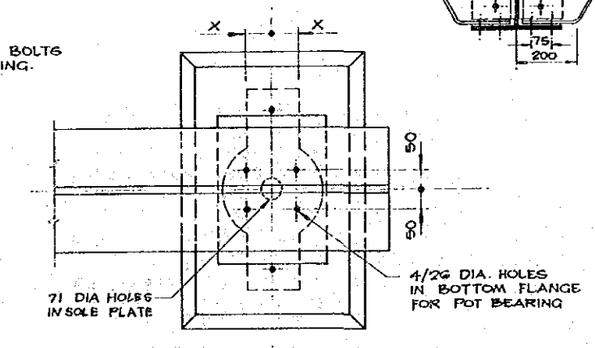
SECTION D (5006)
1:10



DETAIL 4 (5006)
1:10



SECTION B (—)
1:10



SECTION C (—)
1:10

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NOS:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Yahiro — Principal — 25 Sep. 1989 — Date

DRAWN: M.S
CHECKED:
DESIGNED:
CHECKED:

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER — 2.11.89
APPROVED — SECRETARY — 1.11.89

SCALES

SHEET 234 OF 303

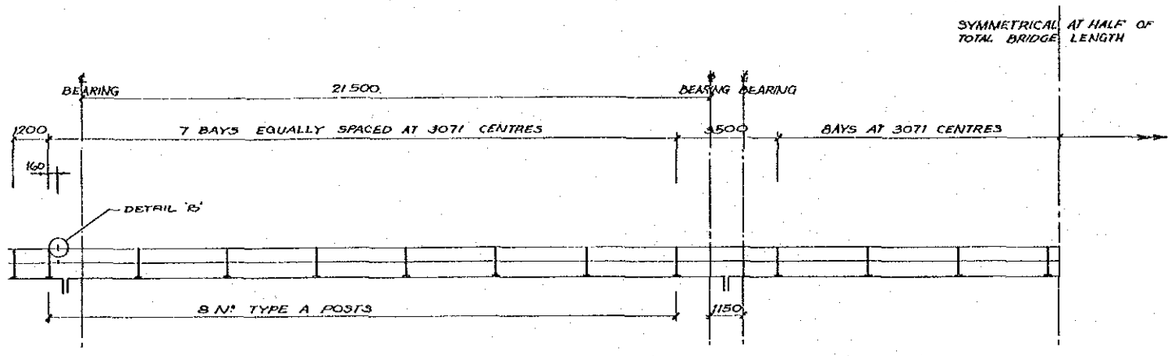
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No. 5 - KAPURI BRIDGE
STEELWORK DETAILS - SHEET 2

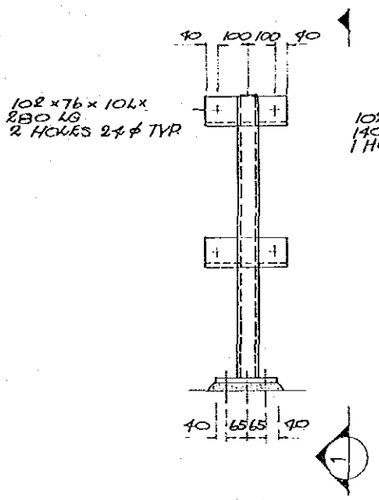
PAPUA NEW GUINEA
DEPARTMENT OF WORKS

DRAWING No. A1 · 88268

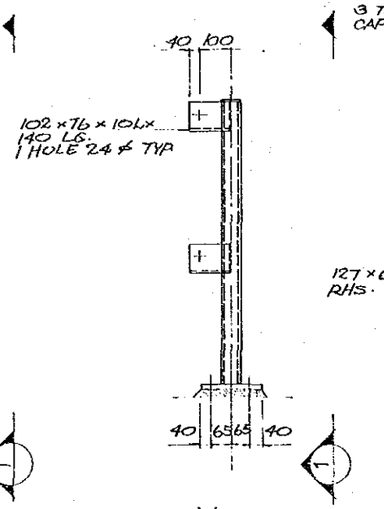
REV.



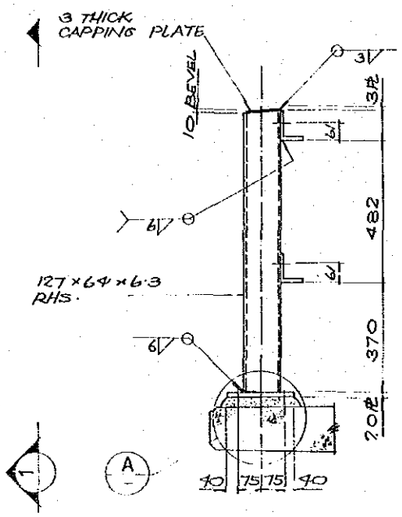
TYPICAL ELEVATION ON HANDRAIL
1 : 100



TYPE 'A' HANDRAIL POST
1:10



TYPE 'B' HANDRAIL POST
1:10

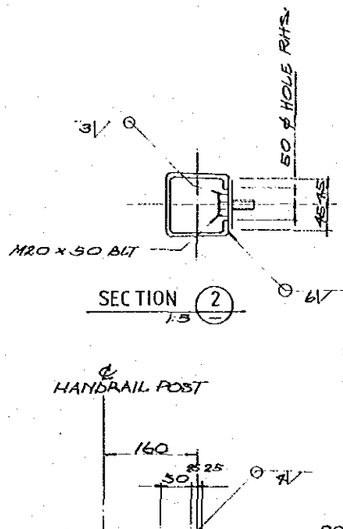


SECTION (1)
1:10

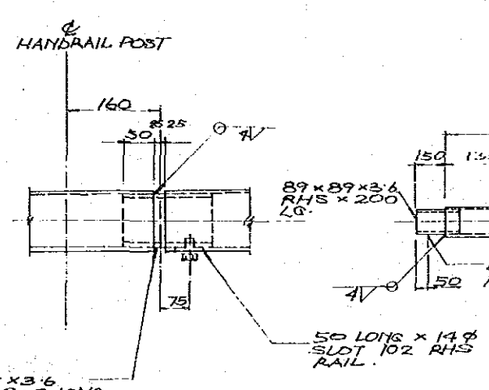
NOTE: ALL BOLTS TO BE M20

DETAIL (A)
1:5

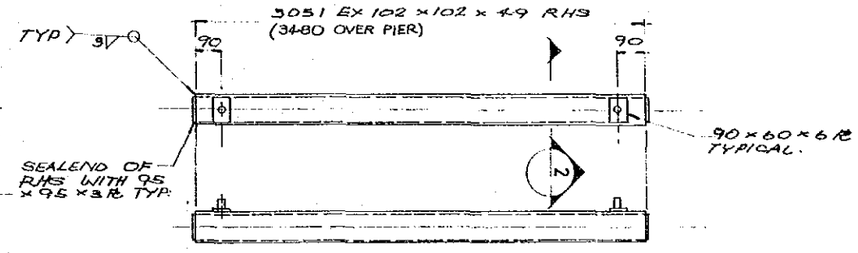
DETAIL - IMPACT ANGLE
1:5



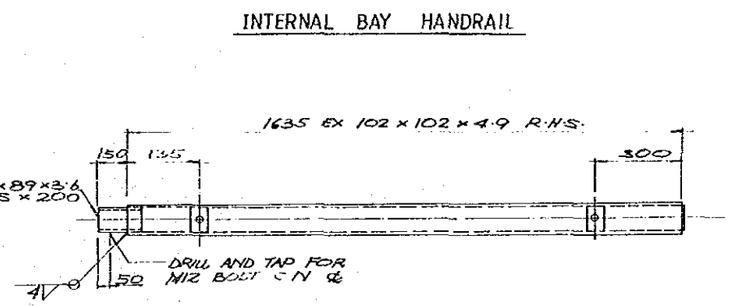
SECTION (2)
1:5



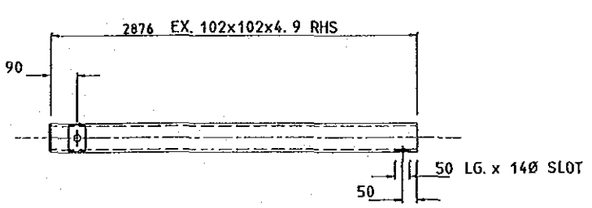
DETAIL (B) TYPICAL
1:5



INTERNAL BAY HANDRAIL



END BAY HANDRAIL



PENULTIMATE BAY HANDRAIL

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
Principal — 25 Sep. 1989 Date

DRAWN: M.S
CHECKED:
DESIGNED:
CHECKED:

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER — 1/11/89
APPROVED — I. N. 89 — SECRETARY

SCALES

SHEET 235 OF 303

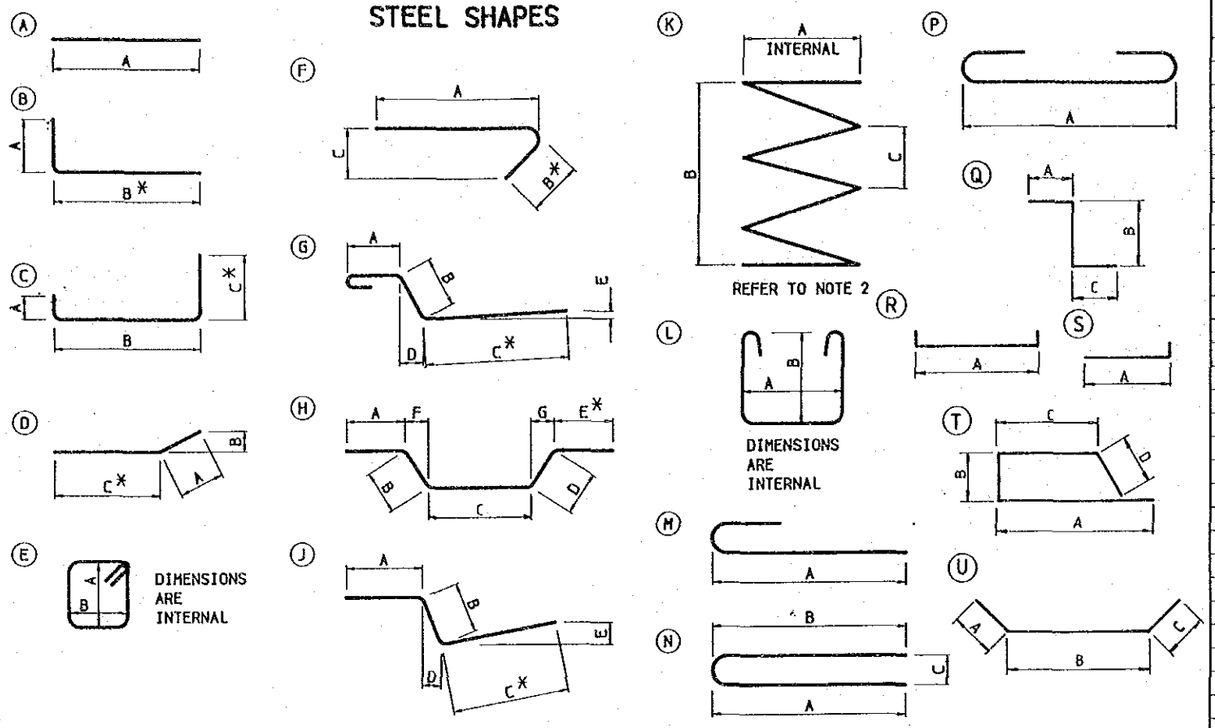
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5 - KAPURI BRIDGE
HANDRAILING / IMPACT ANGLE DETAILS
PAPUA NEW GUINEA
DEPARTMENT OF WORKS

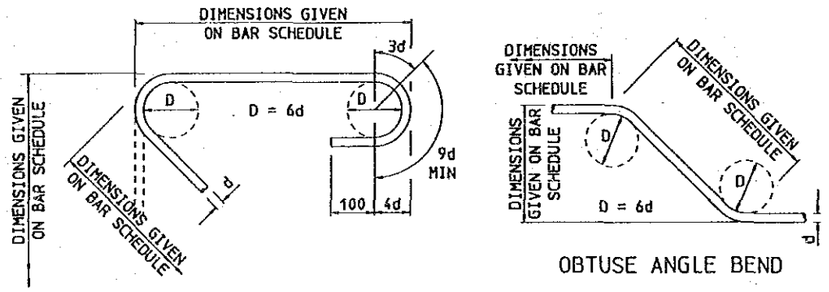
DRAWING No. A1. 88269

REV

STEEL SHAPES

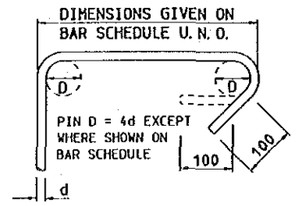


STANDARD HOOKS AND BENDS

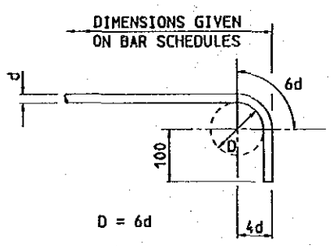


ACUTE ANGLE AND 90° BEND

OBTUSE ANGLE BEND



BENDS AND HOOKS FOR STIRRUPS AND LIGATURES (ENCOMPASSING)



RIGHT ANGLE BEND

NOTES

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

TEMPCORE GRADE DEFORMED

TYPE & DIA	MARK	No. OFF	A	B	C	D	E	F	G	CUTTING LENGTH (mm)	MASS (kg)	SHAPE CODE	REMARKS
TC16	01	342	4490							4490	2424.7	P	
TC16	02	342	3920							3920	2116.9	A	
TC12	03	684	750	580	320					1130	680.4	F	
TC16	04	51	21400							21400	1723.8	A	**SEE NOTE 5
TC16	05	54	21400							21400	1824.7	A	**SEE NOTE 5
TC16	06	684	750	450	450					1650	1791.3	Q	
TC12	07	684	300	500	*	200				1680	1020.4	J	
TC16	08	46	21400							21400	2250.2	A	**SEE NOTE 5
TC20	09	24	1550							1590	34.1	A	
TC20	10	36	400	395	680	395	750	280	280	3180	282.4	H	
TC16	11	12	4120							4120	78.1	A	
TC12	12	108	345	440						1580	151.6	E	
TC16	13	102	1180	1180	145					2510	404.0	N	
TC12	14	684	750							750	810.0	A	
TC16	16	306	500	210	500	210	*	154	154	1925	929.7	H	
TC17	16	36	500	210	180	210	*	154	154	1615	51.6	H	
		TOTAL	TONNAGE = 16.609 TONNES 3/1° SPAN DECK.										
TC28	60	128	18500							18500	11446.2	A	**SEE NOTE 5
TR12	61	8	646	18500						268400	1906.3	K	
TC28	62	128	400	2700						3100	1918.0	B	
TC32	63	36	1000	5220						6220	1554.4	C	
TC32	64	54	1000	3400	*					5936	1818.2	C	
TC24	65	36	1000	5200	*					7200	920.5	C	
TC28	66	54	1000	3400	*					5336	1392.8	C	
TC20	67	24	1700	1000	*					4336	256.6	C	
TC20	68	12	5200							5200	158.9	A	
TC20	69	12	800	3400	*					4956	146.1	C	
TC16	70	24	500	400	*					1400	53.1	C	
TC16	71	48	500	700	*					1700	128.8	C	
TC20	72	68	1000	1100	*					3100	489.3	C	
		TOTAL	TONNAGE = 21.964 TONNES 2 A1° PIERS.										
TC16	21	34	2000							1875	100.7	A	
TC16	22	54	2000	200*						2075	176.9	B	
TC16	23	32	740	320	330	450				1808	91.4	T	
TC16	24	76	750	750	90					1590	190.8	N	
TC12	25	24	300	840	300*					1416	30.2	C	
TC12	26	24	300	510	300*					1086	23.1	C	
TC28	27	18	4900							4900	426.4	A	
TC24	28	16	4900							4900	278.4	A	
TC28	29	54	1600	1500	1600*					4644	1212.3	C	
TC28	30	52	850	4900	850*					6544	1645.0	C	
TC24	31	20	4900 splice							4900	348.0	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	1600							1600	91.0	A	
TC16	36	40	2300							2300	145.3	A	
TC16	37	24	675							675	25.6	A	
TC16	38	20	200	550	200					950	30.0	U	
TC16	39	88	575	300* (8 sets of 11)		TOTAL	LENGTH = 172.8 m			859		B	INCREMENT = 225
	TO	88	2600	300*		TOTAL	WEIGHT = 272.8 kg			2884		B	
TC16	40	20	2600							2600	82.1	A	
TC16	41	144	812	300* (8 sets of 18)		TOTAL	LENGTH = 265.8 m			1096		B	INCREMENT = 100
TC16	TO	144	2312	300* (8 sets of 18)		TOTAL	WEIGHT = 419.5 kg			2596		B	

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.8

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
Principal — 25 Sep. 1989 Date

DRAWN: M.S P.G 9/11/89
CHECKED
DESIGNED: M. Shimizu
CHECKED

PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED 8/1/89 PRINCIPAL ENGINEER
APPROVED 1.11.89 FOR/TO SECRETARY

SCALES

SHEET 236 OF 303

PROJECT No. S.C. 120-33-814/B

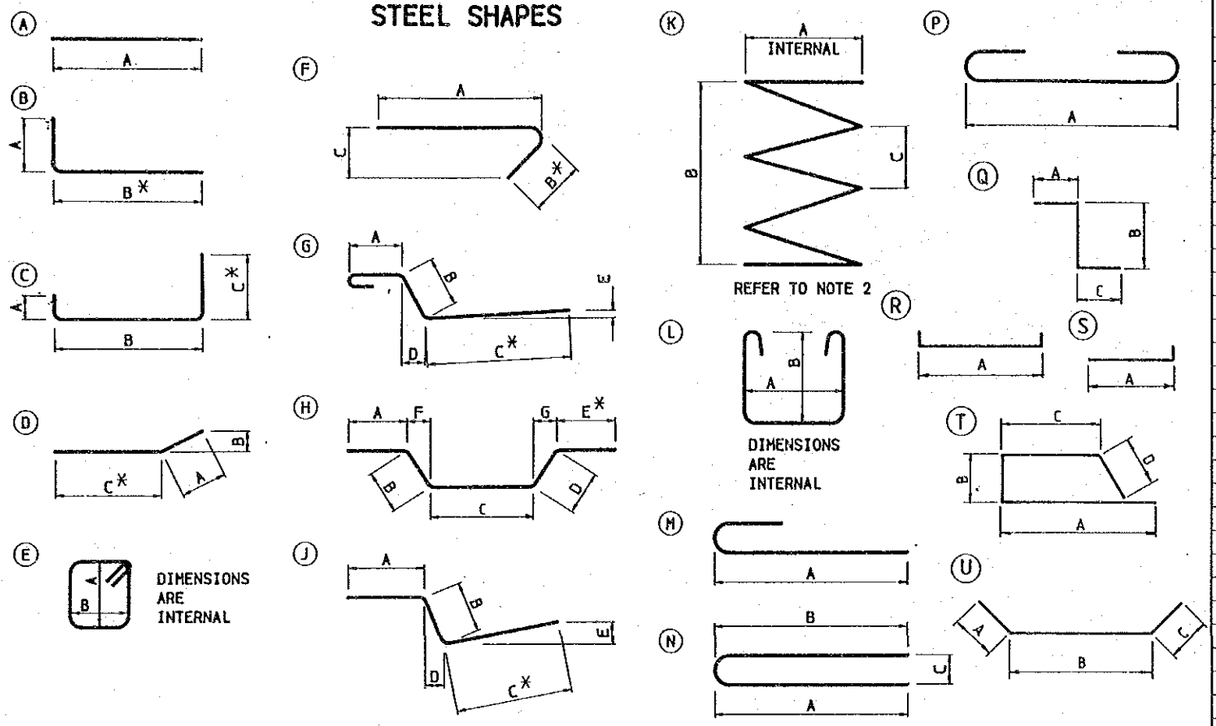
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5- KAPURI BRIDGE
BAR BENDING SCHEDULE SHEET 1

PAPUA NEW GUINEA DEPARTMENT OF WORKS

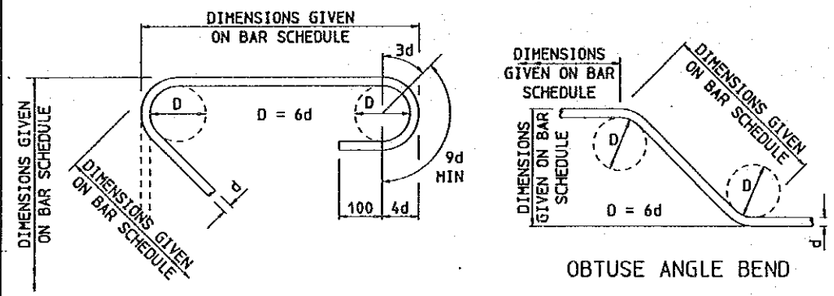
DRAWING No. A1/ 88270

REV.

STEEL SHAPES

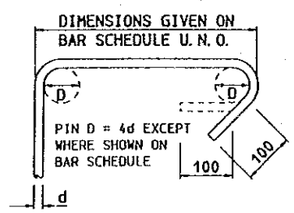


STANDARD HOOKS AND BENDS

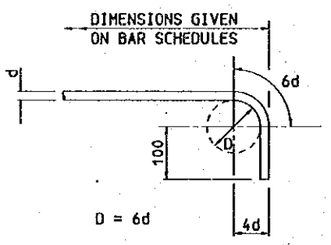


ACUTE ANGLE AND 90° BEND

OBTUSE ANGLE BEND



BENDS AND HOOKS FOR STIRRUPS AND LIGATURES (ENCOMPASSING)



RIGHT ANGLE BEND

TEMPCORE GRADE DEFORMED

NOTES

1. EXPLANATION OF BAR MARKS
   e.g. 40 - TC32 - 07 - 250 - B
   40 = No. OFF
   TC32 = TYPE / BAR DIAMETER
   07 = SPACING
   250 = LOCATION / 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 TEMPCORE (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	42	72	200	500	200					900	102·3	U	
TC16	43	48	2600							2600	197·1	A	
TC20	44	108	953							1393	371·0	P	
TC16	45	8	3500							3500	44·2	A	
TC16	46	36	1450	700	1450*					3568	202·8	C	
TC16	47	6	2950							2950	27·8	A	
TC16	48	32	4900							4900	247·5	A	
TC20	49	132	850	730	850*					2390	778·0	C	
		TOTAL TONNAGE = 10·179 TONNES						2 Nº ABUTMENTS					

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
J. Hirschuter — Principal — 25 Sep. 1989 — Date

DRAWN: M.S P.G 1/11/89
CHECKED: [signature]
DESIGNED: M. Shimizu
CHECKED: [signature]

PROJECT ENGINEER: [signature] 1/11/89
EXECUTIVE ENGINEER: [signature] 1/11/89

RECOMMENDED: [signature] 1/11/89 — PRINCIPAL ENGINEER
APPROVED: I. H. [signature] — SECRETARY

SCALES

SHEET 237 OF 303

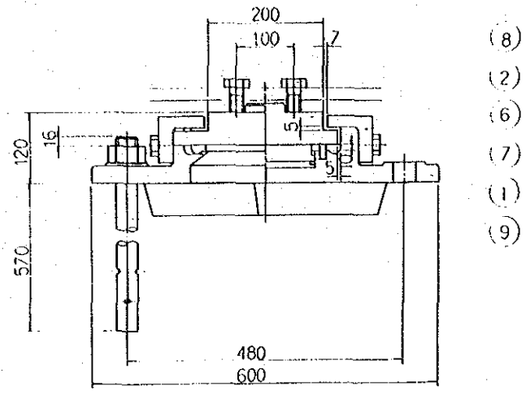
PROJECT No. S.C. 120-33-814/B

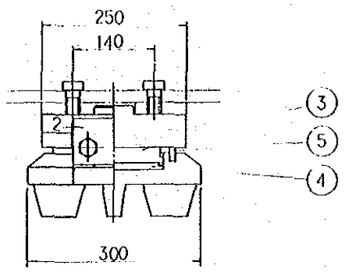
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.5- KAPURI BRIDGE
BAR BENDING SCHEDULE SHEET 2
PAPUA NEW GUINEA DEPARTMENT OF WORKS

DRAWING No. A1 88271

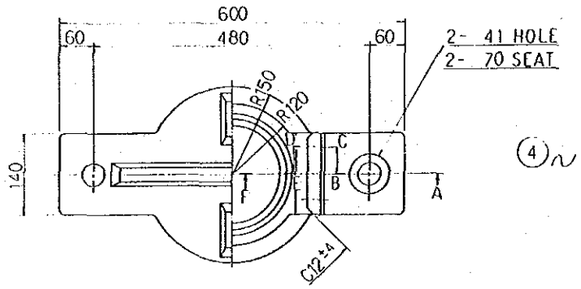
REV.

R-50TON Fix BEARING

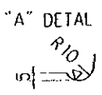


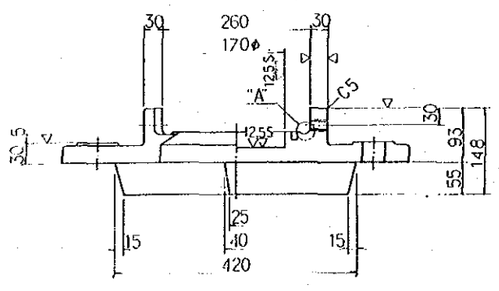


① ∧∨ (▽ 12.5S) SC46



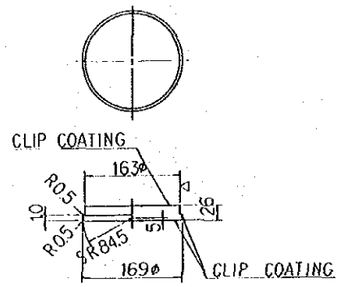
"A" DETAL



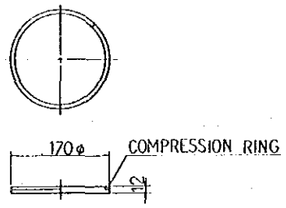


SECTION "ABCDEF"

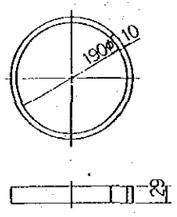
③ 12.5S (▽) SS41

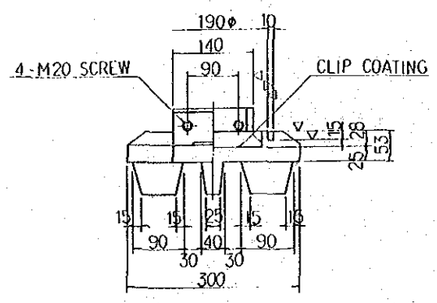


④ ∼ CHLOROPRENE RUBBER

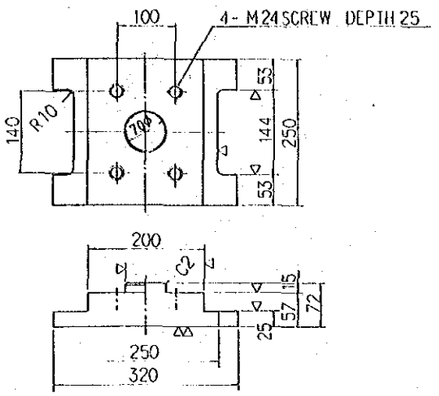


⑤ ∼ CHLOROPRENE RUBBER

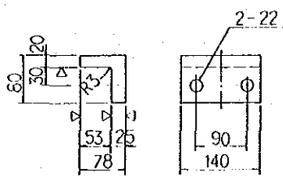




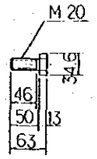
② ∼ (▽▽) SS41



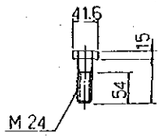
⑥ ∼ (▽) SS41



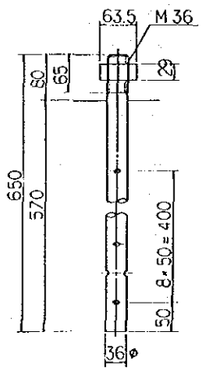
⑦ SS41

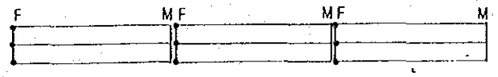


⑧ SS41



⑨ ∼ SS41





PLAN

DESIGN CONDITION

TOTAL REACTION	R	36.0	ton
DEAD LOAD REACTION	R_d	12.6	ton
LIVE LOAD REACTION	$R_{(l+i)}$	23.4	ton
LONGITUDINAL FORCE (FRICTION)	R_{H1f}	3.6	ton
LONGITUDINAL FORCE (EARTHQUAKE)	R_{H1e}	10.6	ton
TRANSVERSE FORCE (EARTHQUAKE)	R_{H2e}	5.3	ton
UPLIFT (EARTHQUAKE)	V	1.3	ton
SEISMIC COEFFICIENT	K_H	0.42	
FRICATIVE COEFFICIENT	f	0.1	
BEARING STRESS OF CONCRETE	σ_{ba}	80	kg/cm²

MATERIAL LIST

MARK	NAME	MATERIAL	NO.	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) (S-54)
8	BOLT	SS41	4		
9	ANCHOR BOLT-NUT	SS41	2	11.2	
	TOTAL WEIGHT (kg)			92.5	

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date — VERTICAL DATUM: MEAN SEA LEVEL — HORIZONTAL DATUM — SURVEY BOOK NO.8

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY — J. Valente, Principal — 25 Sep. 1989, Date

DRAWN: M.S — CHECKED: Y. Kai — DESIGNED: M. Shinjo — CHECKED: Y. Kai

PROJECT ENGINEER — 1/4/89

EXECUTIVE ENGINEER — 4/4/89

RECOMMENDED — PRINCIPAL ENGINEER

APPROVED — J. Leonard, FAS(S), SECRETARY

SCALES

SHEET 238 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES

TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION

BRIDGE No.5- KAPURI BRIDGE

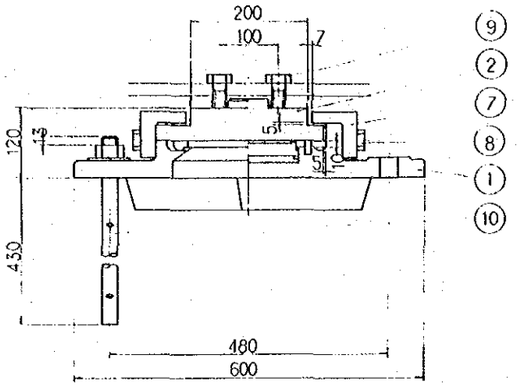
BEARING BP-B-101 (FIXED)

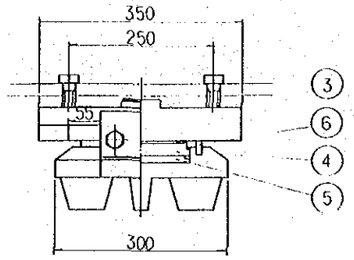
PAPUA NEW GUINEA — DEPARTMENT OF WORKS

DRAWING No. A1/88272

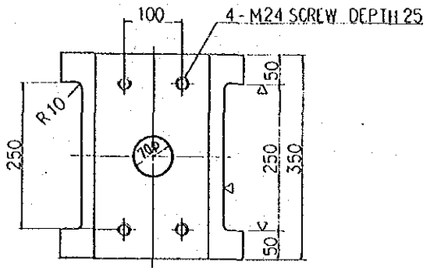
REV.

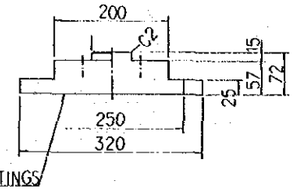
R-50 TON Mov BEARING





② ∼ (▽ ▽▽) SS41





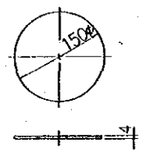
DESIGN CONDITION

TOTAL REACTION	R	33.8	ton
DEAD LOAD REACTION	Rd	12.6	ton
LIVE LOAD REACTION	R(l+i)	21.2	ton
LONGITUDINAL FORCE (FRICTION)	RH1f	3.4	ton
LONGITUDINAL FORCE (EARTHQUAKE)	RH1e	5.3	ton
TRANSVERSE FORCE (EARTHQUAKE)	RH2e	5.3	ton
UPLIFT (EARTHQUAKE)	V	1.3	ton
MOVABLE LENGTH	e1	50	mm
DESIGNED LENGTH	e2	70	mm
TOTAL LENGTH	e	110	mm
SEISMIC COEFFICIENT	KH	0.42	
FRICATIVE COEFFICIENT	f	0.1	
BEARING STRESS OF CONCRETE	σba	80	kg/cm²

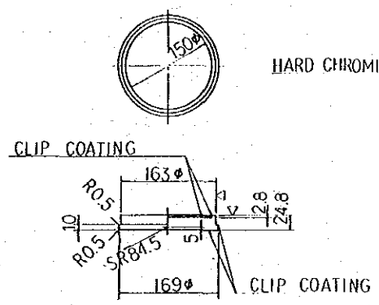
MATERIAL LIST

MARK	NAME	MATERIAL	NO.	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 (S-46)
9	BOLT	SS41	4		M24-(S-54)
10	ANCHOR BOLT-NUT	SS41	2	5.2	
	TOTAL WEIGHT (kg)			96.3	

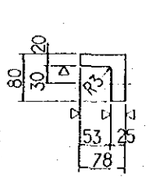
③ ∼ PTFE

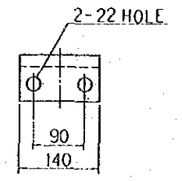


④ 12.5S ▽▽ (▽) SS41

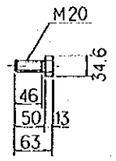


⑦ ∼ (▽) SS41

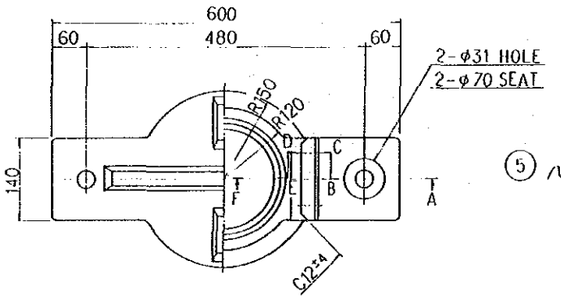




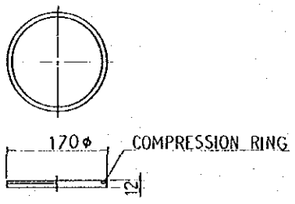
⑧ SS41



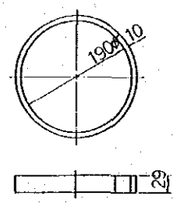
① ∼ (▽ 12.5S ▽▽) SC46



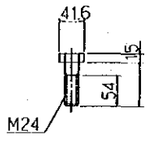
⑤ ∼ CHLOROPRENE RUBBER



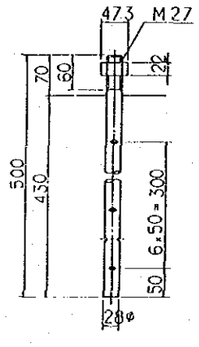
⑥ ∼ CHLOROPRENE RUBBER



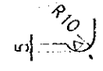
⑨ SS41

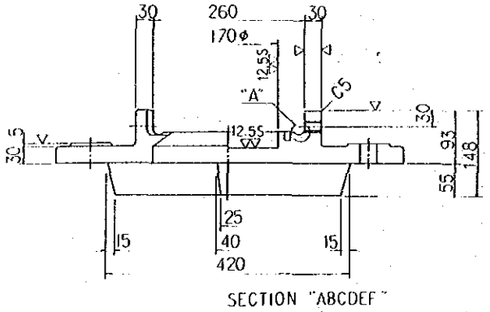


⑩ ∼ SS41

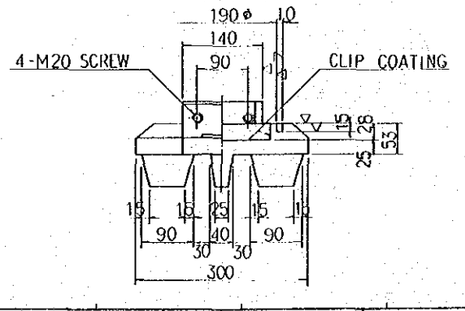


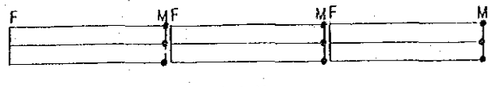
"A" DETAIL





SECTION "ABCDEF"





PLAN

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 — J. Hakuta, Principal — 25 Sep. 1989, Date

DRAWN: M.S — CHECKED — DESIGNED: M. Shinjo — CHECKED

PROJECT ENGINEER — 1/8/89 — EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER — 1.11.89

APPROVED — FAS(89) SECRETARY

SCALES

SHEET 239 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES

TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION

BRIDGE No.5 - KAPURI BRIDGE

BEARING BP-B-102 (MOVABLE)

PAPUA NEW GUINEA DEPARTMENT OF WORKS

DRAWING No. A1/88273

REV.

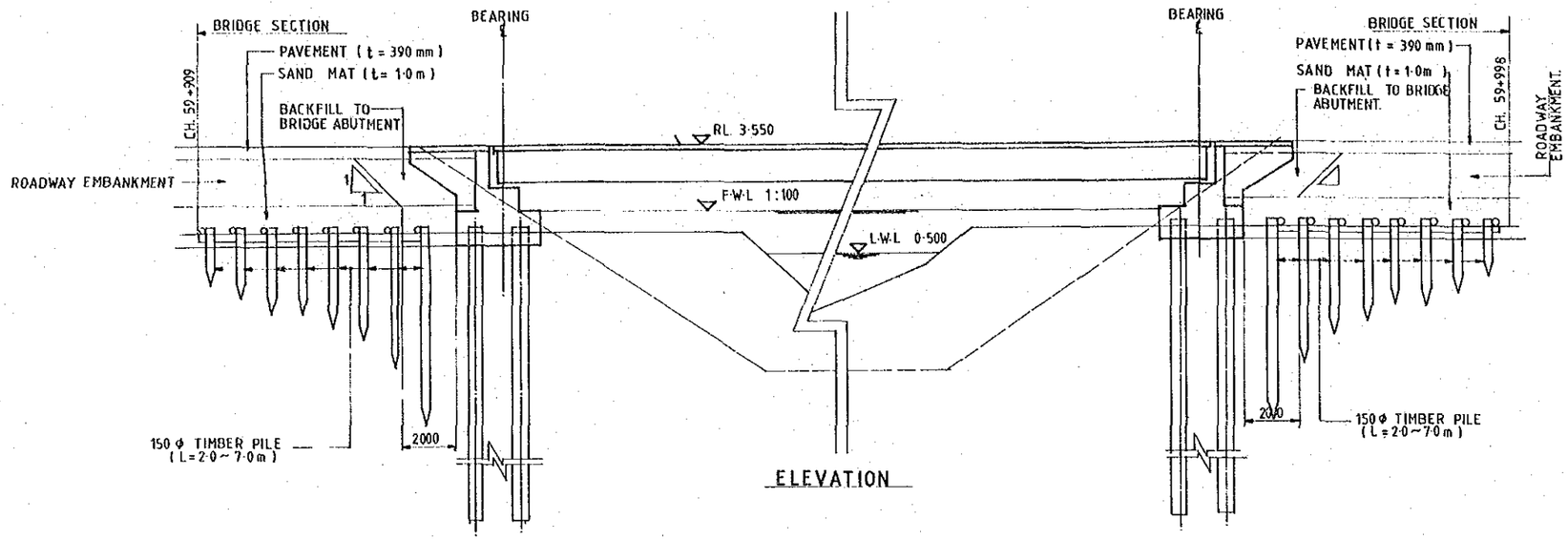
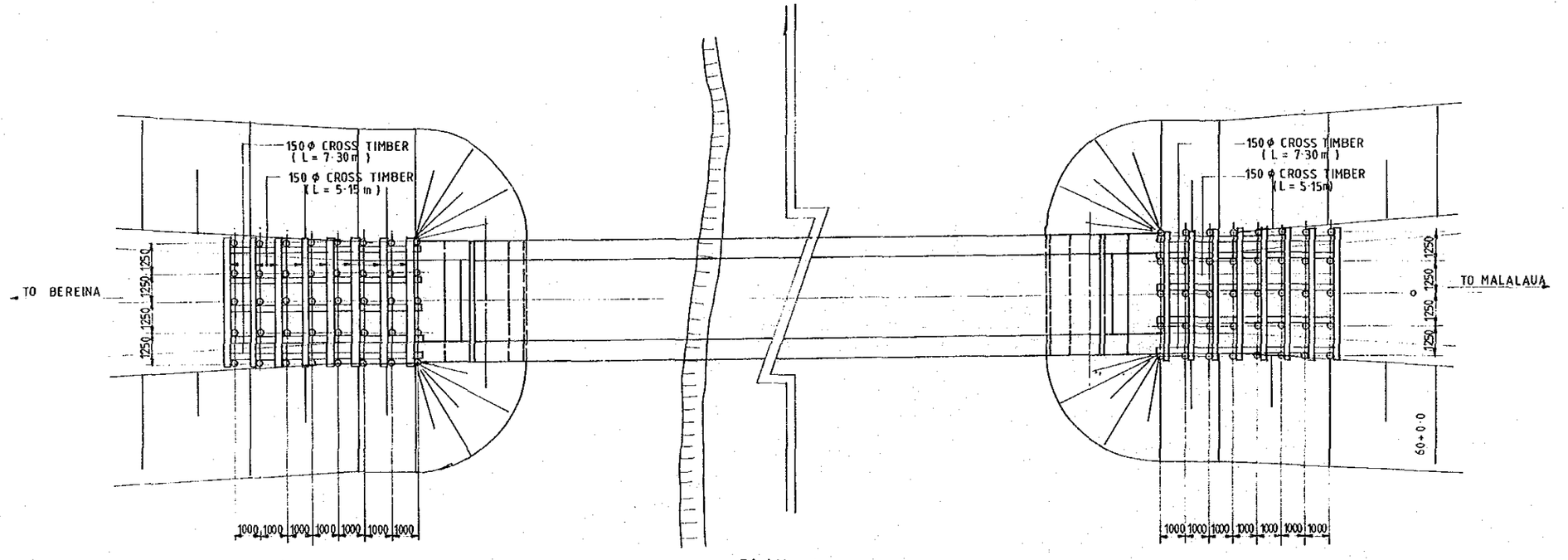


TABLE OF QUANTITIES				
DESCRIPTION		UNIT	QUANTITY	REMARKS
CLEARING AND GRUBBING AT BRIDGE SITE		ha	0·1	
EXCAVATION FOR STRUCTURAL FOUNDATIONS	TYPE C	m^3	0	
	TYPE D	m^3	41	
BACKFILL TO EXCAVATIONS FOR STRUCTURAL FOUNDATIONS		m^3	18·9	
BACKFILL TO BRIDGE ABUTMENT		m^3	103	
ROADWAY EMBANKMENT		m^3	297	
BEARING UNITS	TIMBER PILE	m	300·0	150 φ
	CROSS TIMBER	m	155·4	150 φ
SAND MAT		m^3	262	t = 230 mm

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



PLAN
SCALE : 1 :100

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.S

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
J. Maestro — Principal — 25 Sep. 1989 — Date

DRAWN: J.B.MAGGIO, M·S
CHECKED: 4 Dec
DESIGNED: [signature]
CHECKED: 4 Dec

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — 1/11/89 — PRINCIPAL ENGINEER
APPROVED — 1.11.89 — SECRETARY

SCALES

SHEET 240 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No. 5 - KAPURI BRIDGE
BEARING UNITS BACKFILL TO BRIDGE ABUTMENT AND OTHERS.
PAPUA NEW GUINEA
DEPARTMENT OF WORKS

DRAWING No. A1 88274

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
℄	CENTRELINE	FLG	FLANGE
℞	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 PLAN POSITION AT PILE TOP FOR ANY PILE = ±75mm

PILE CONTRACT LENGTHS

		SIZE
BEREINA ABUTMENT	13·4m × 6 no's	800ϕ x 12THK
BEREINA PIER	21·8m × 4 no's	1000ϕ x 12 thk
MALALAUA PIER	21·8m × 4 no's	1000ϕ x 12THK
MALALAUA ABUTMENT	9·4m × 6 no's	800ϕ x 12THK

MAXIMUM PILE WORKING LOADS

ABUTMENTS	1500 kN COMPRESSION	700 kN TENSION
PIERS	4500 kN COMPRESSION	3000 kN TENSION

THE TIPS OF THE PILES SHALL BE REINFORCED AS SHOWN
MIN SOCKET LENGTH INTO ROCK 4000mm ABUTS. 9000mm piers
PREVENTION PILE 14·0m × 2no's 800ϕ

4. CONCRETE

ALL CONCRETE SHALL BE GRADE 25. (f'_c = 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 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-117 (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

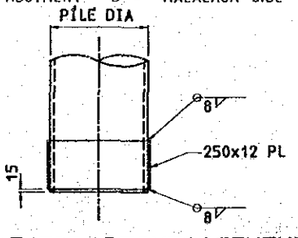
STEEL BEAMS TO BE PRECAMBERED TO THE UNSTRESSED PROFILE SHOWN ON THE DRAWINGS.

13. ERECTION

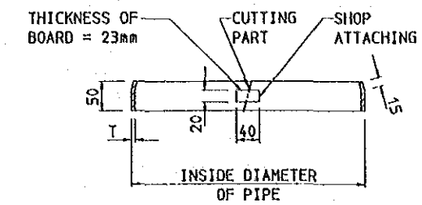
THE CONTRACTOR IS TO PROVIDE DETAILS OF ERECTION PROCEDURES TO THE ENGINEER PRIOR TO ERECTION OF THE GIRDERS. THIS IS TO ENSURE THAT THE ALLOWABLE STRESSES ON THE GIRDER SECTIONS ARE NOT EXCEEDED.

14.

ABUTMENT A - BEREINA SIDE
ABUTMENT B - MALALAUA SIDE



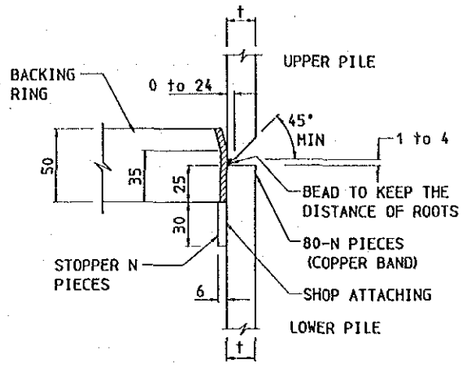
PILE TOE REINFORCEMENT (OPEN END)



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

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
88275	GENERAL NOTES AND DRAWING LIST
88276	GENERAL ARRANGEMENT
88277	ABUTMENT - REINFORCEMENT & CONCRETE DETAILS
88278	PIER DETAILS
88279	DECK STEELWORK GENERAL ARRANGEMENT
88280	GIRDER DETAILS SHEET 1
88281	GIRDER DETAILS SHEET 2
88282	GIRDER LAUNCHING DETAILS
88283	GIRDER ERECTION PROCEDURE
88284	DECK SECTIONS
88285	DECK CONSTRUCTION PROCEDURE
88286	DECK SLAB DETAILS
88287	HANDRAILING/IMPACT ANGLE DETAILS
88288	BAR BENDING SCHEDULE SHEET 1
88289	BAR BENDING SCHEDULE SHEET 2
88290	BEARING BP.B-104 (MOVABLE)
88291	BEARING BP.B-117 (FIXED)
88292	BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS.

REV.	AMENDMENTS	BY	APP'D	DATE

SURVEY: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK No.6

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
Principal — 25 Sep. 1989 Date

DRAWN: M.S
CHECKED
DESIGNED: M. Shimizu
CHECKED

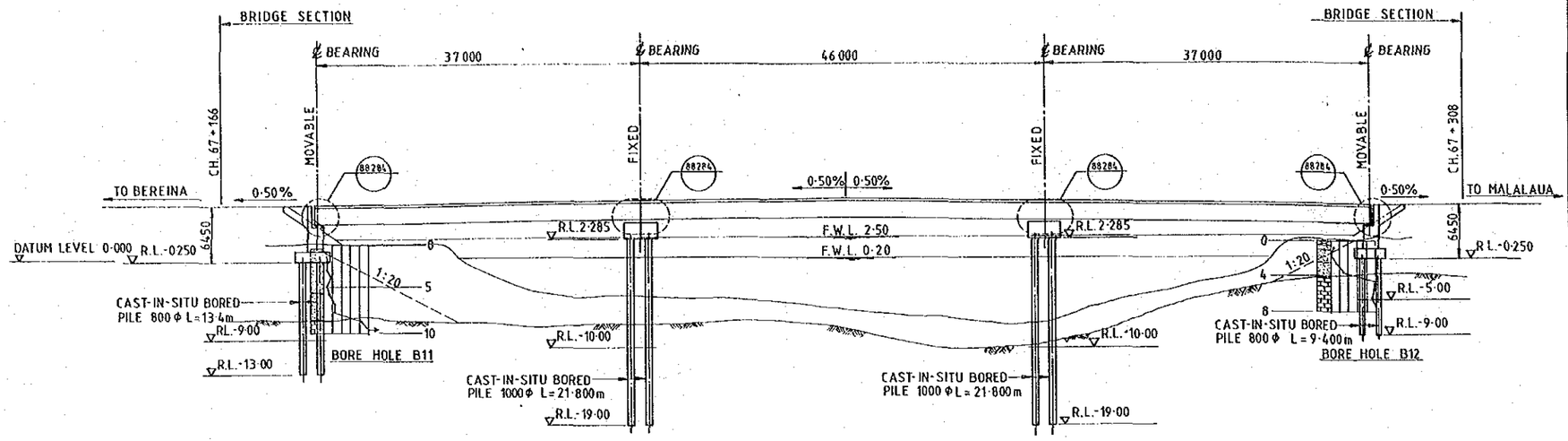
PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED 1/11/89 PRINCIPAL ENGINEER
APPROVED 1.11.89 FOR(TS) SECRETARY

SCALES

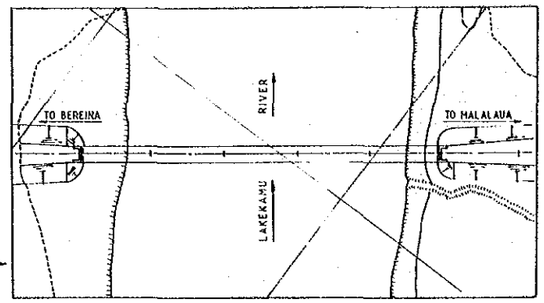
SHEET 241 OF 303
PROJECT No. S.C.120-33-814/B

CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6 - LAKEKAMU BRIDGE
GENERAL NOTES AND DRAWING LIST
PAPUA NEW GUINEA DEPARTMENT OF WORKS
DRAWING No. A1 88275
REV.

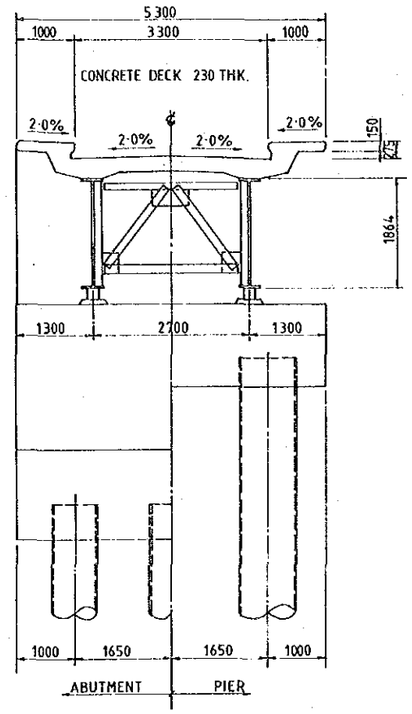


ELEVATION
SCALE 1:300

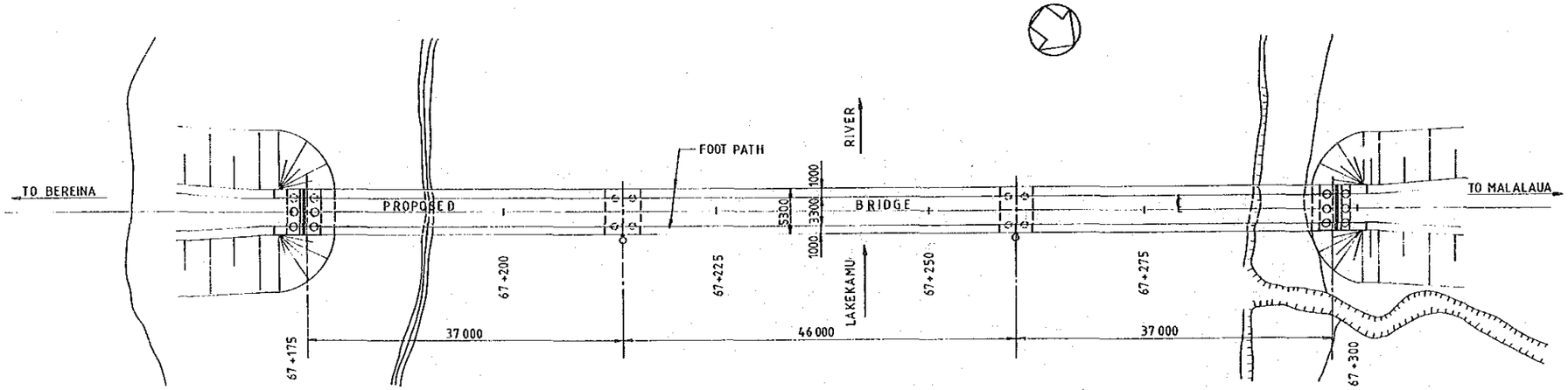
GRADE LEVELS	6.199 / 6.203 ; 6.280 ; 6.329 ; 6.351 ; 6.329 ; 6.280 ; 6.203 / 6.199
SURFACE LEVELS	1·81 ; 2·06
CHAINAGE	CH.67+176.20 / CH.67+177.00 ; CH.67+195.50 ; CH.67+214.00 ; CH.67+233.00 ; CH.67+260.00 ; CH.67+278.5 ; CH.67+297.00 / CH.67+297.8



LOCALITY PLAN
SCALE 1:1000



TYPICAL CROSS SECTION
SCALE 1:50



PLAN
SCALE 1:300

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

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 — Principal — 25 Sep. 1989 Date

DRAWN: M·S — CHECKED: Y. Doi — DESIGNED: — CHECKED: Y. Doi

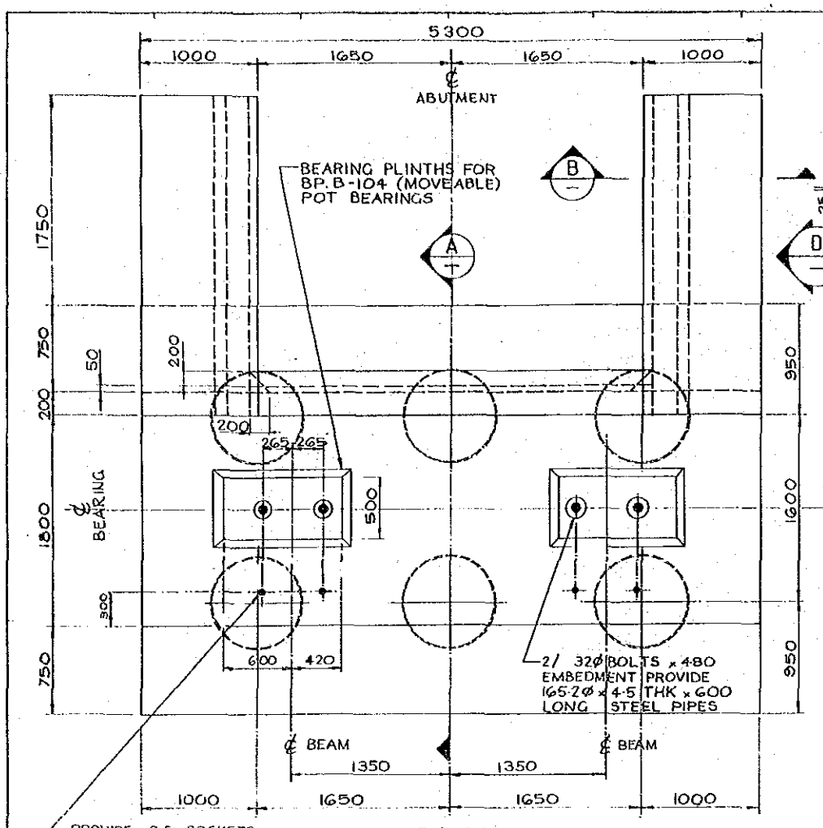
PROJECT ENGINEER 1/11/89 — EXECUTIVE ENGINEER 1/11/89

RECOMMENDED 1/11/89 PRINCIPAL ENGINEER — APPROVED 1·11·89 SECRETARY

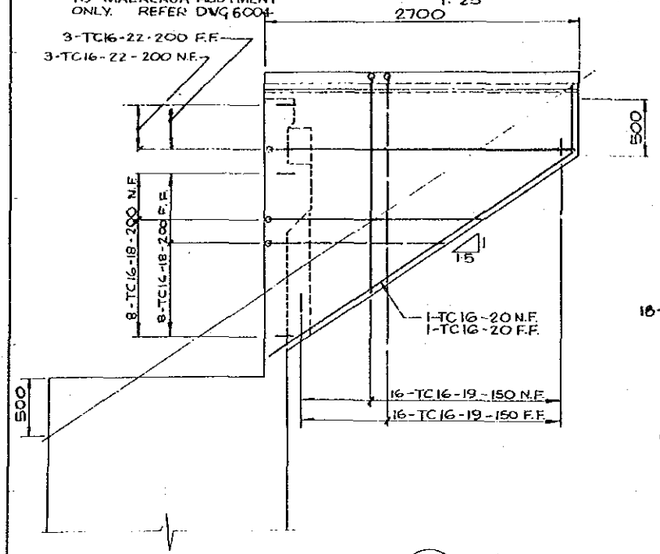
SCALES

SHEET 242 OF 303 — PROJECT No. S.C. 120-33-814/B

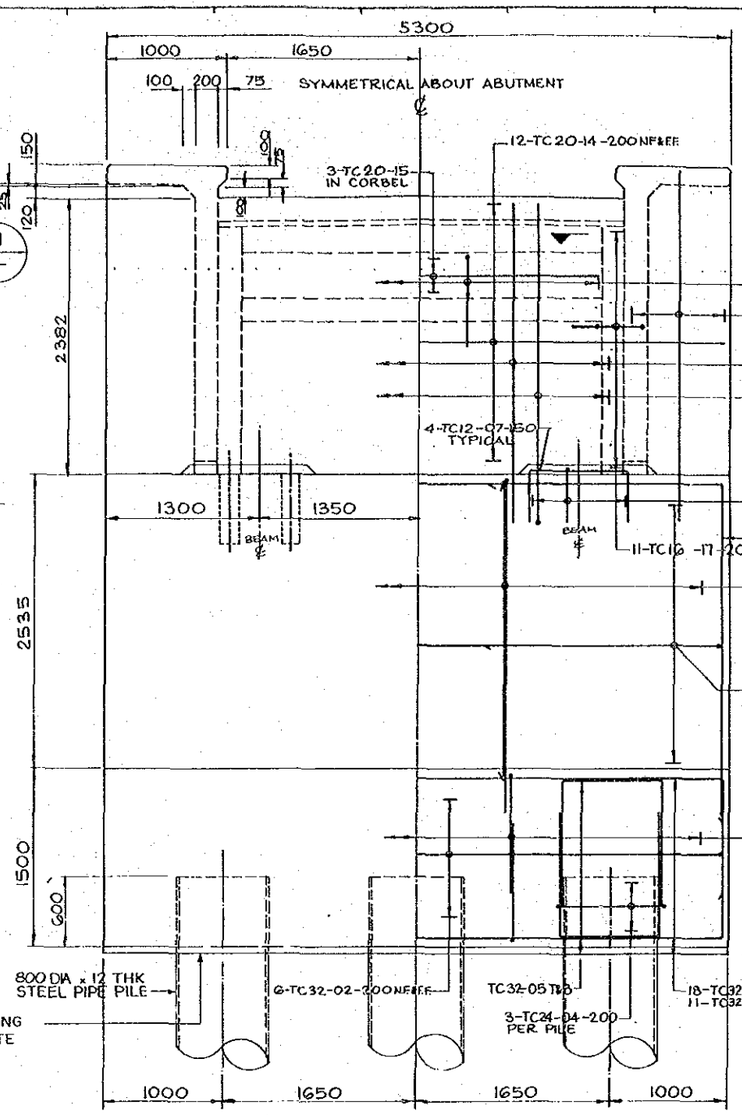
CENTRAL GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No. 6 — LAKEKAMU BRIDGE
GENERAL ARRANGEMENT
PAPUA NEW GUINEA DEPARTMENT OF WORKS — DRAWING No. A1 88276 — REV.



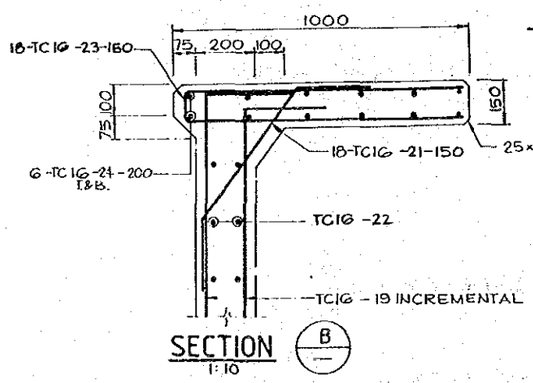
PLAN
1:25



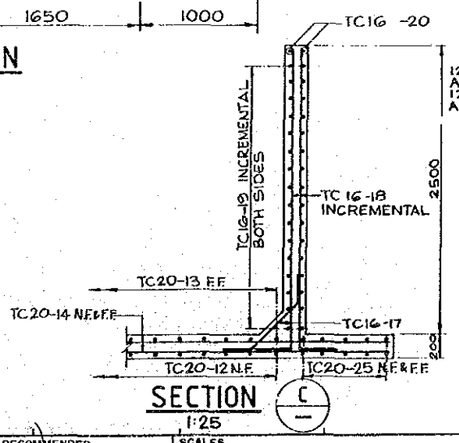
TYPICAL WINGWALL VIEW (D)
1:25



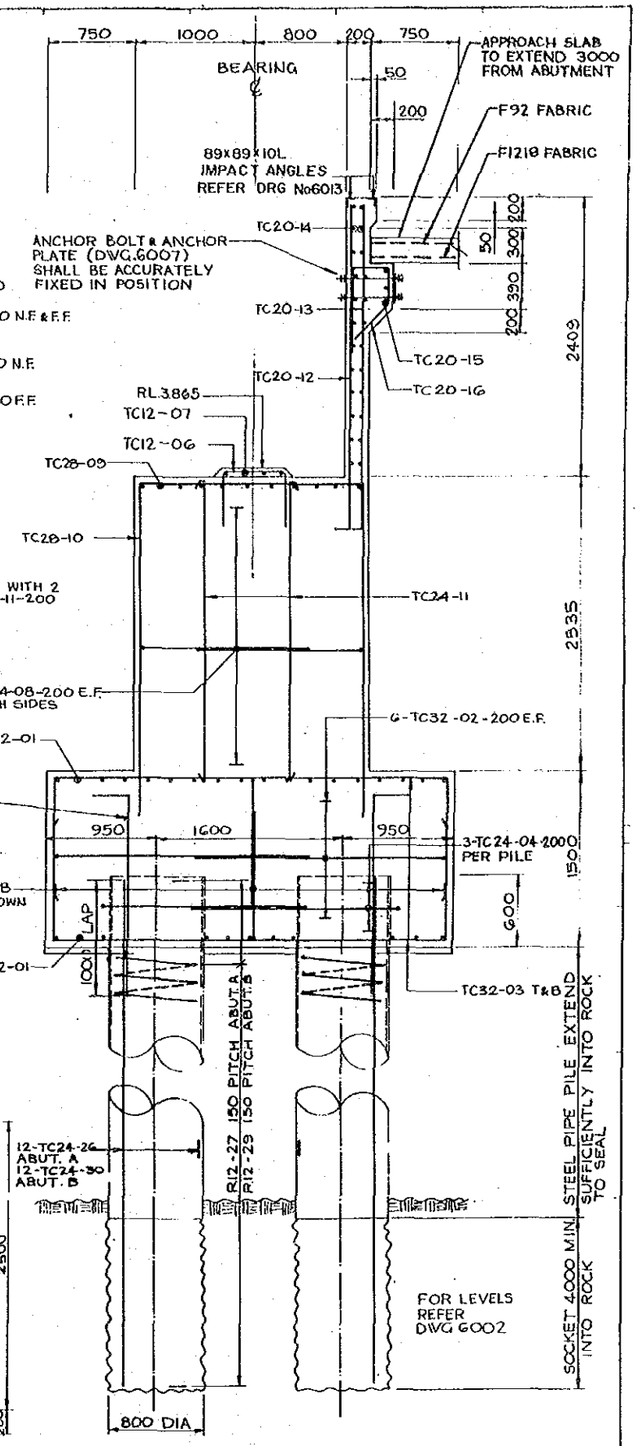
ELEVATION
1:25



SECTION (B)
1:10



SECTION (C)
1:25



SECTION (A)
1:25

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
Principal — 25 Sep. 1989 Date

DRAWN: M-S
CHECKED
DESIGNED
CHECKED

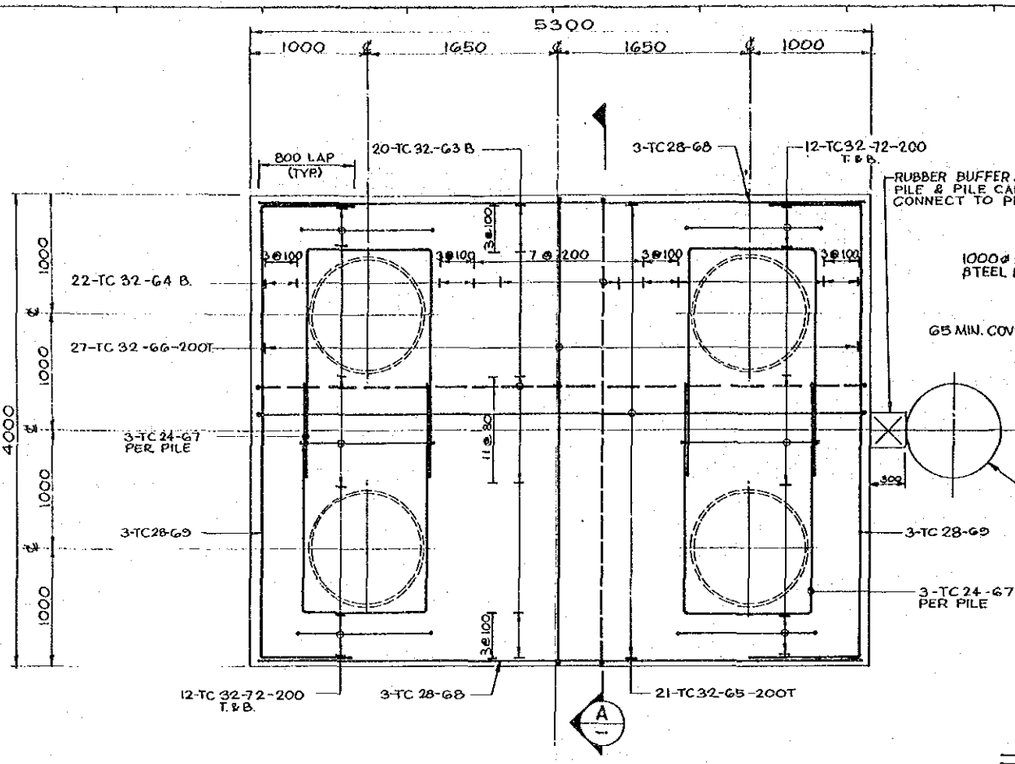
PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED 2/1/89 PRINCIPAL ENGINEER
APPROVED 1.11.89 FAGITO SECRETARY

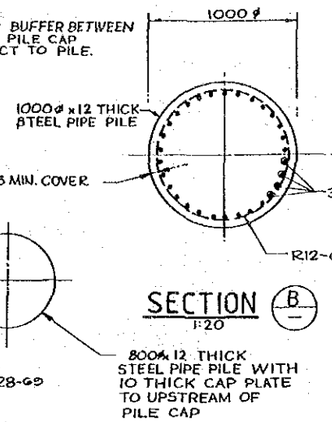
SCALES

SHEET 243 OF 303
PROJECT No. S.C. 120-33-814/B

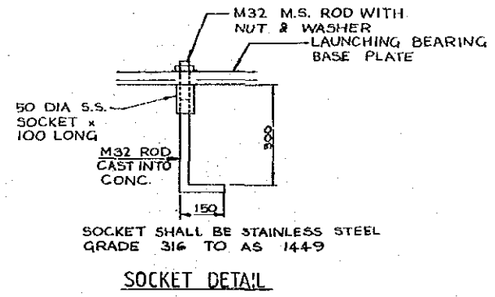
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6 - LAKEKAMU BRIDGE
ABUTMENT - REINFORCEMENT & CONCRETE DETAILS
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1/88277
REV.



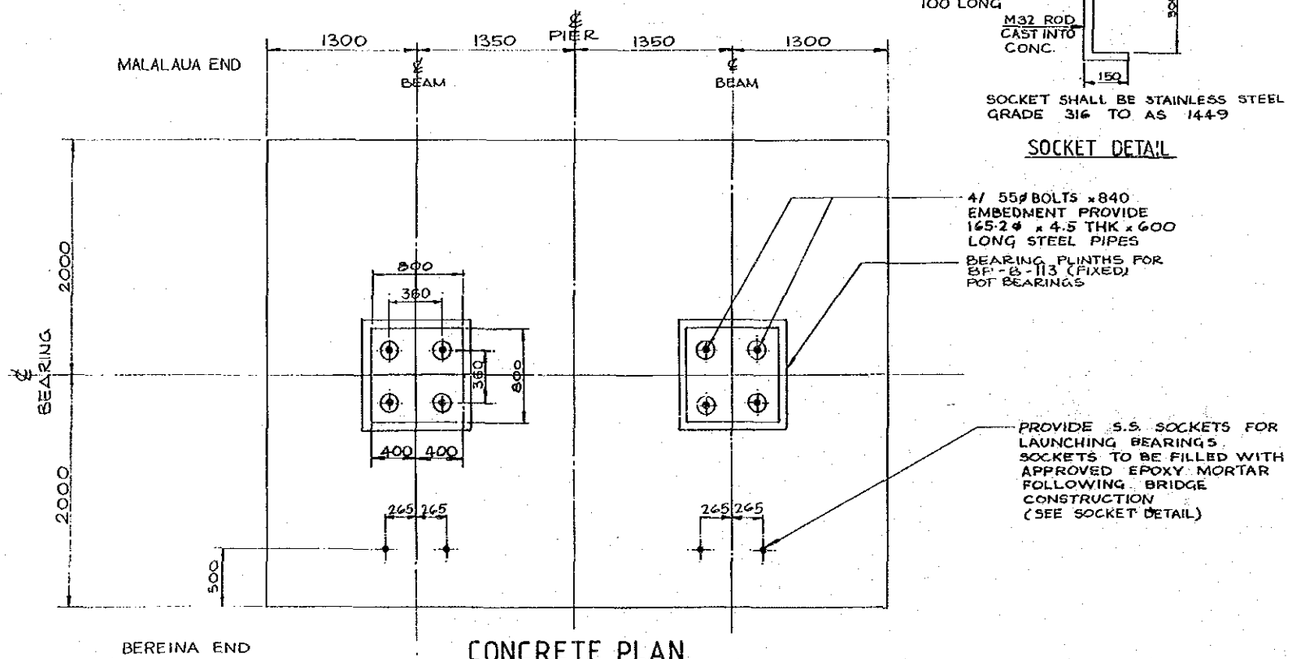
REINFORCEMENT PLAN
1:25



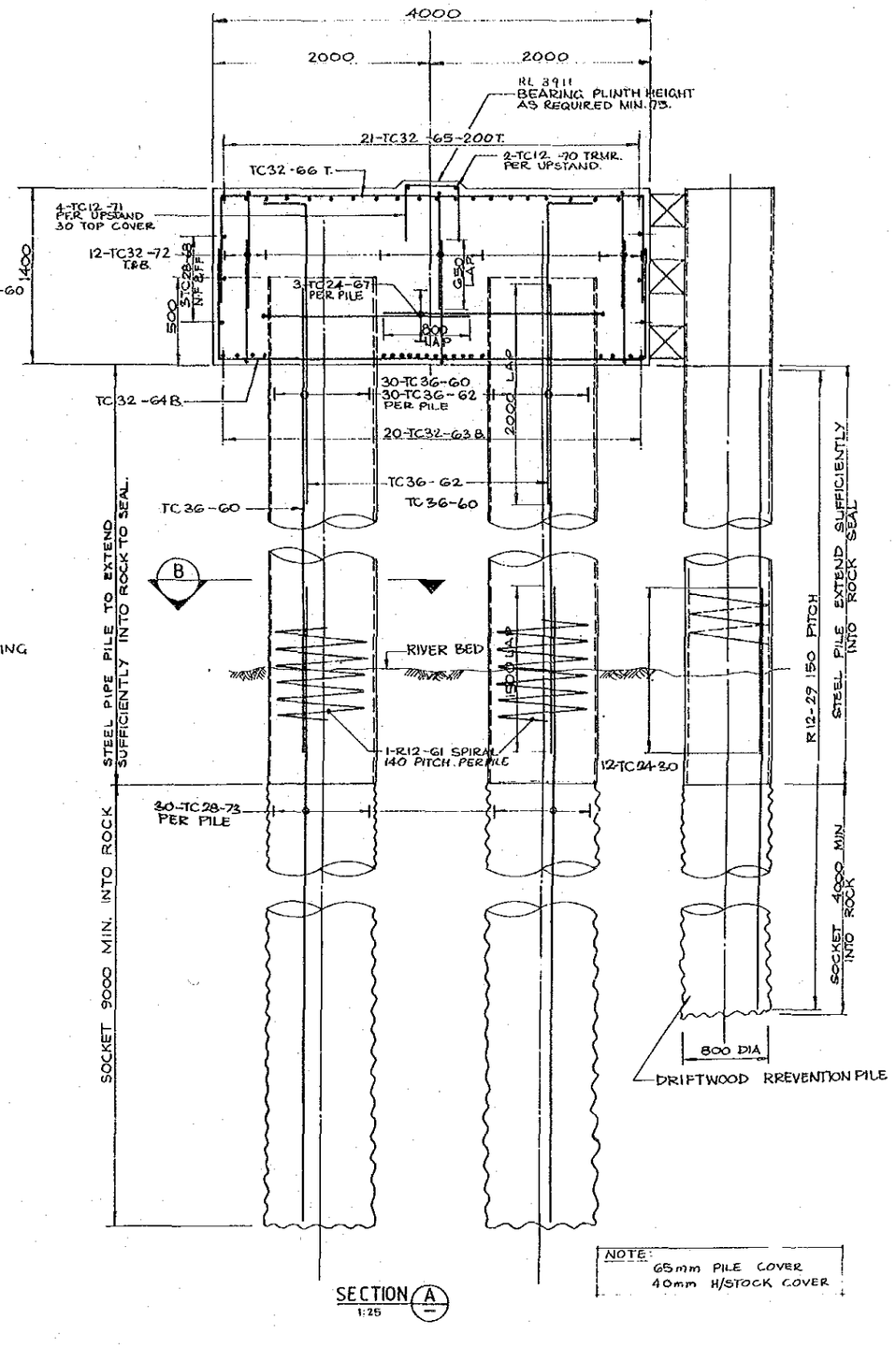
SECTION B
1:20



SOCKET DETAIL



CONCRETE PLAN
1:25



SECTION A
1:25

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

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
J. Yakushiji — Principal — 25 Sep. 1989 — Date

DRAWN: M.S P.G. 20/11/89
CHECKED: K. Ito
DESIGNED: H. Ishimaru
CHECKED: T. Ito

PROJECT ENGINEER: 1/11/89
EXECUTIVE ENGINEER: 16th 1/12/89

RECOMMENDED: 12/12/89 — PRINCIPAL ENGINEER
APPROVED: I. N. 89 — SECRETARY

SCALES

SHEET 244 OF 303

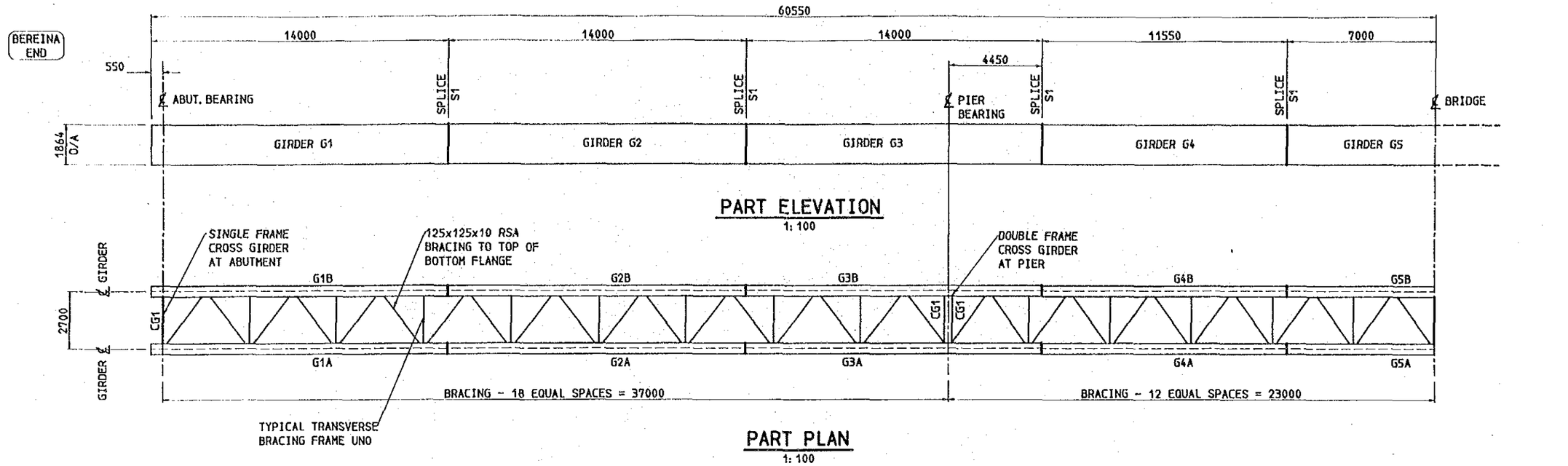
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6 - LAKEKAMU BRIDGE
PIER DETAILS

PAPUA NEW GUINEA DEPARTMENT OF WORKS

DRAWING No. A1 88278

REV.



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 — Principal — 25 Sep. 1989 Date

DRAWN: MKS, M·S
CHECKED:
DESIGNED:
CHECKED:

PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED: 1.11.89 ENG(TY) SECRETARY

SCALES

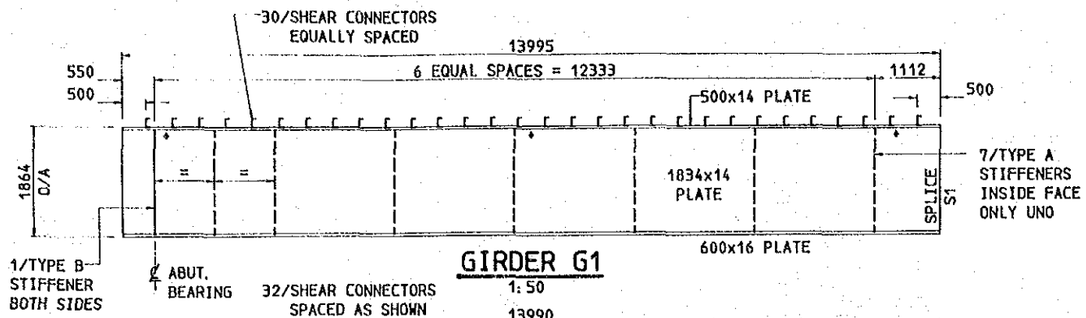
SHEET 245 OF 303

PROJECT No. S.C. 120-33-814/B

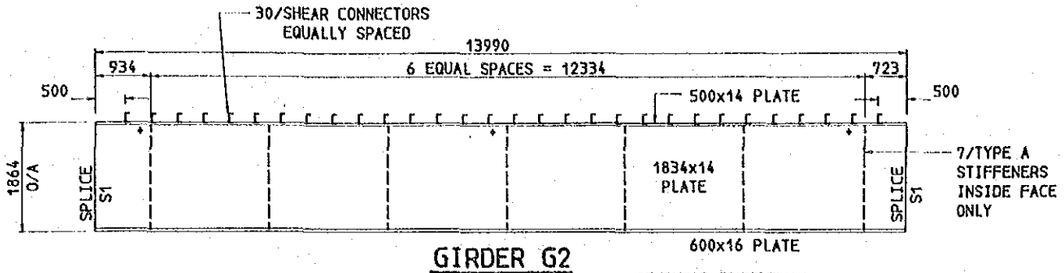
CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6 - LAKEKAMU BRIDGE
DECK STEELWORK GENERAL ARRANGEMENT

PAPUA NEW GUINEA DEPARTMENT OF WORKS

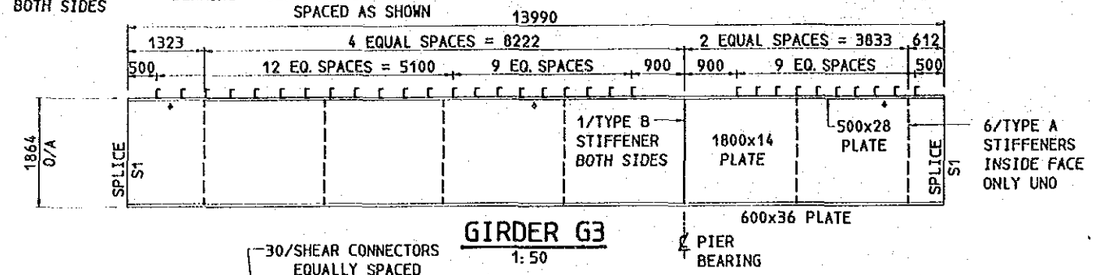
DRAWING No. A1/ 88279 REV



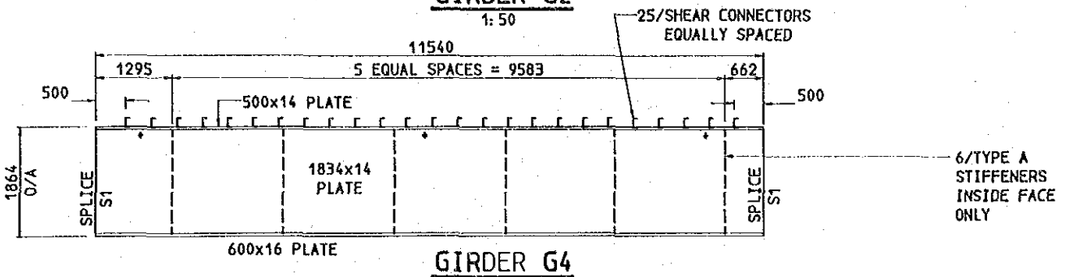
GIRDER G1
1: 50



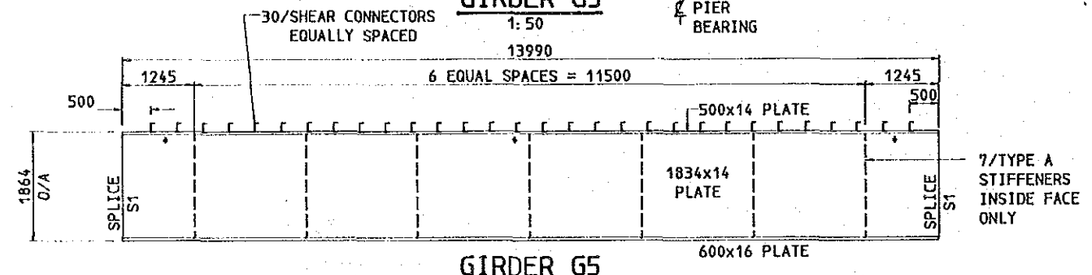
GIRDER G2
1: 50



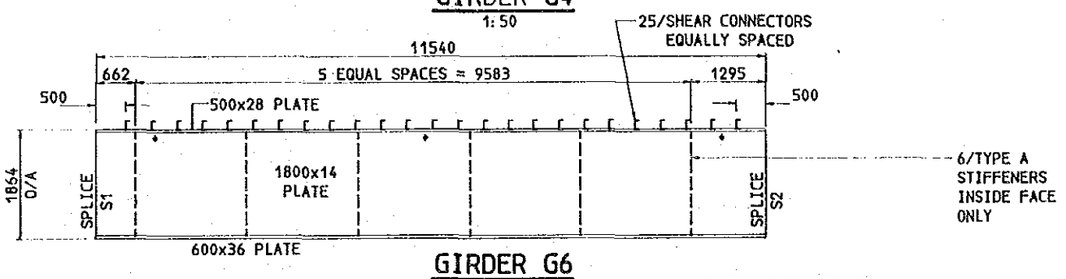
GIRDER G3
1: 50



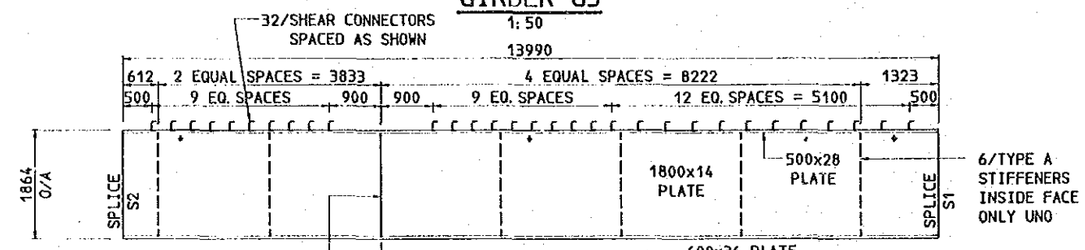
GIRDER G4
1: 50



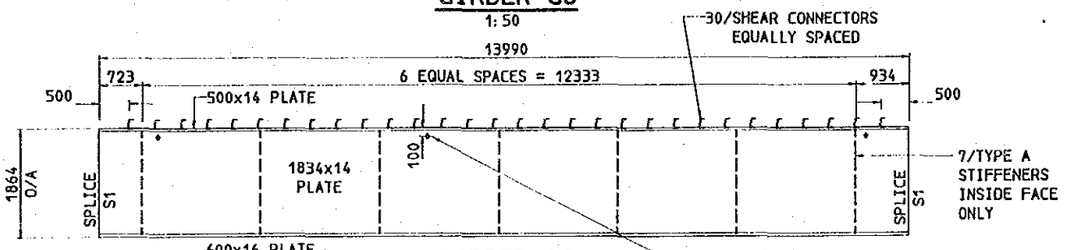
GIRDER G5
1: 50



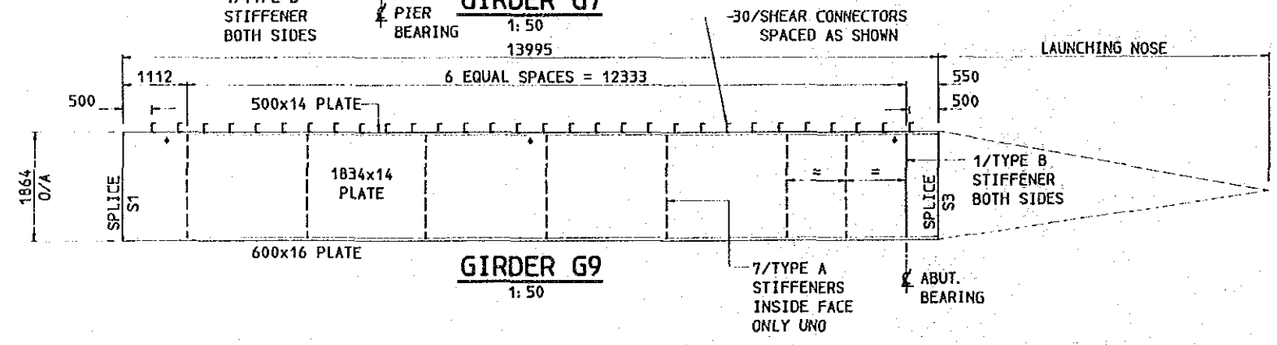
GIRDER G6
1: 50



GIRDER G7
1: 50



GIRDER G8
1: 50



GIRDER G9
1: 50

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
Principal — 25 Sep. 1989 Date

DRAWN: MKS, M·S
CHECKED
DESIGNED
CHECKED

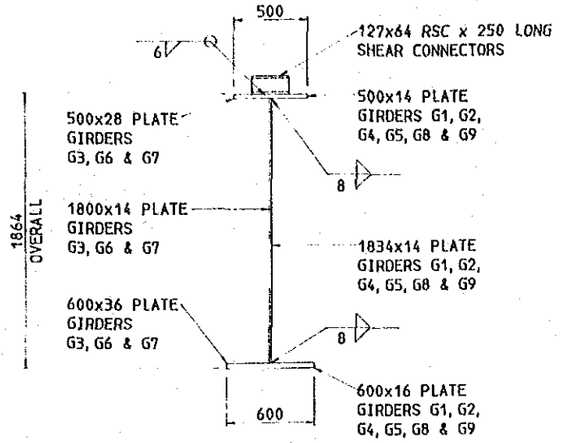
PROJECT ENGINEER 11/9/89
EXECUTIVE ENGINEER 11/9/89

RECOMMENDED 11/9/89 PRINCIPAL ENGINEER
APPROVED SECRETARY

SCALES

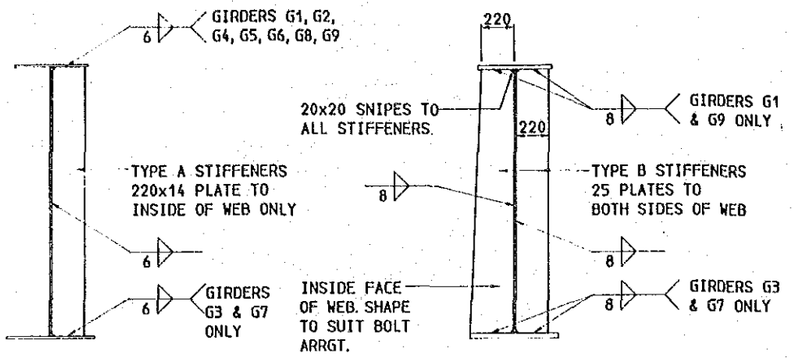
SHEET 246 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6- LAKEKAMU BRIDGE
GIRDER DETAILS SHEET 1
PAPUA NEW GUINEA DEPARTMENT OF WORKS
DRAWING No. A1/ 88280
REV



TYPICAL SECTION

1: 20

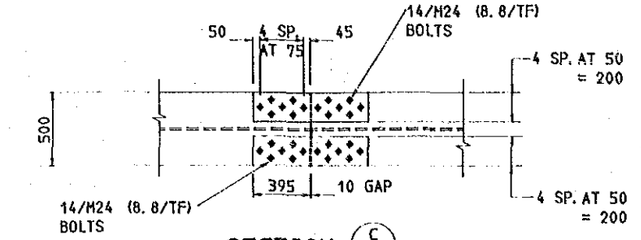


SECTION TYPE A STIFFENER

1: 20

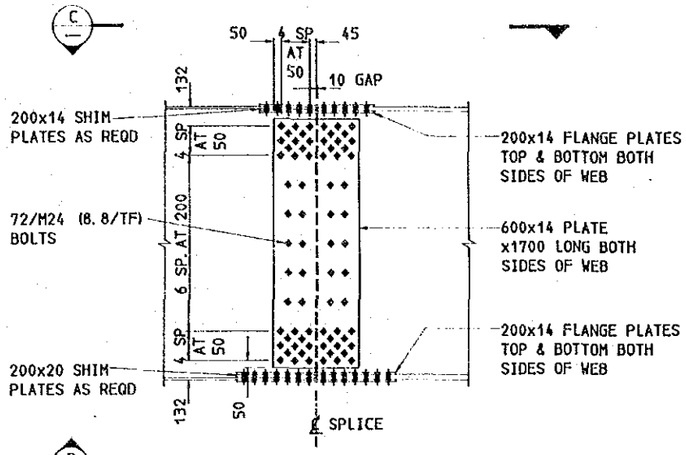
SECTION TYPE B STIFFENER

1: 20



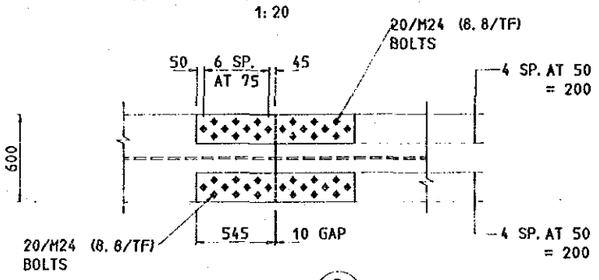
SECTION C

1: 20



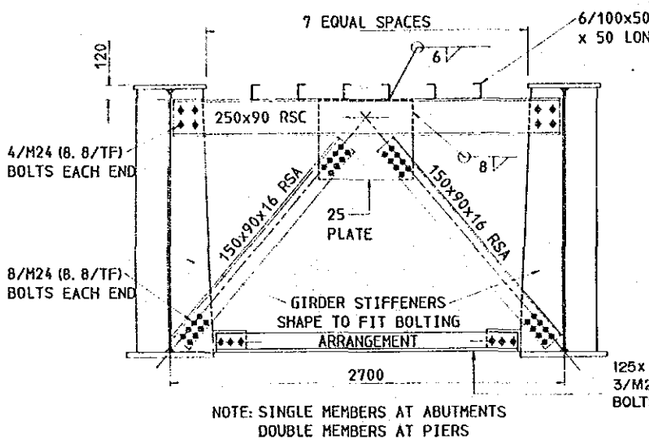
SPLICE S1 ELEVATION

1: 20



SECTION D

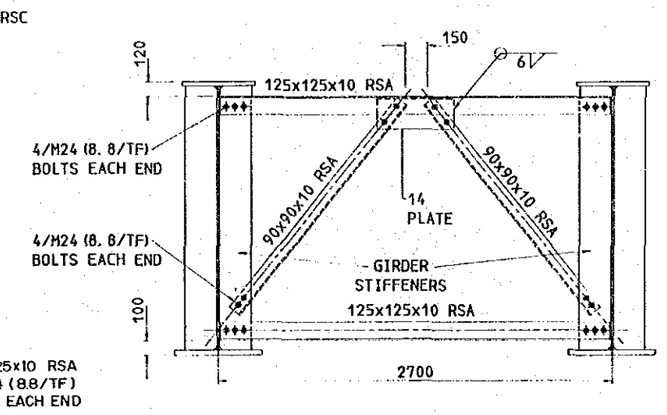
1: 20



NOTE: SINGLE MEMBERS AT ABUTMENTS
DOUBLE MEMBERS AT PIERS

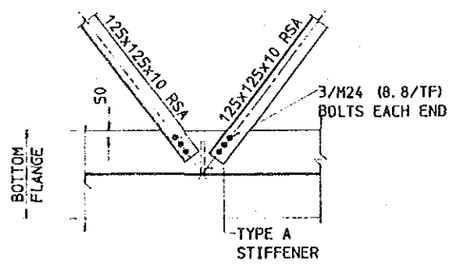
SECTION CROSS GIRDER CG1

1: 20



SECTION - TYPICAL TRANSVERSE BRACING FRAME

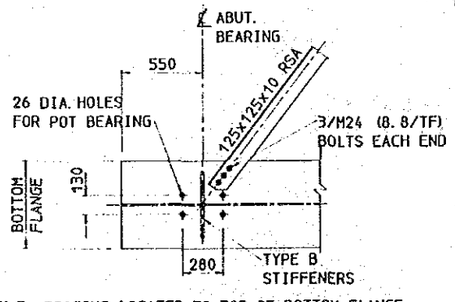
1: 20



N. B. BRACING LOCATED TO TOP OF BOTTOM FLANGE

TYPICAL BRACING DETAIL

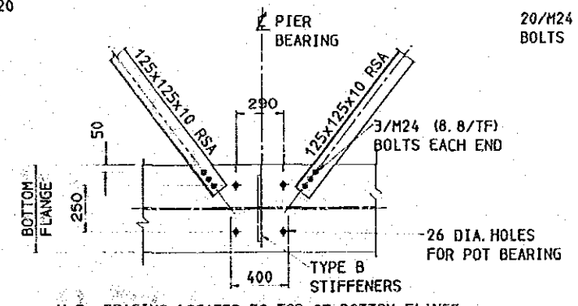
1: 20



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

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
J. Yakuwa — Principal — 25 Sep. 1989 — Date

DRAWN: MKS, M.S
CHECKED
DESIGNED
CHECKED

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED 1. 11. 89 — FAS(N) SECRETARY

SCALES

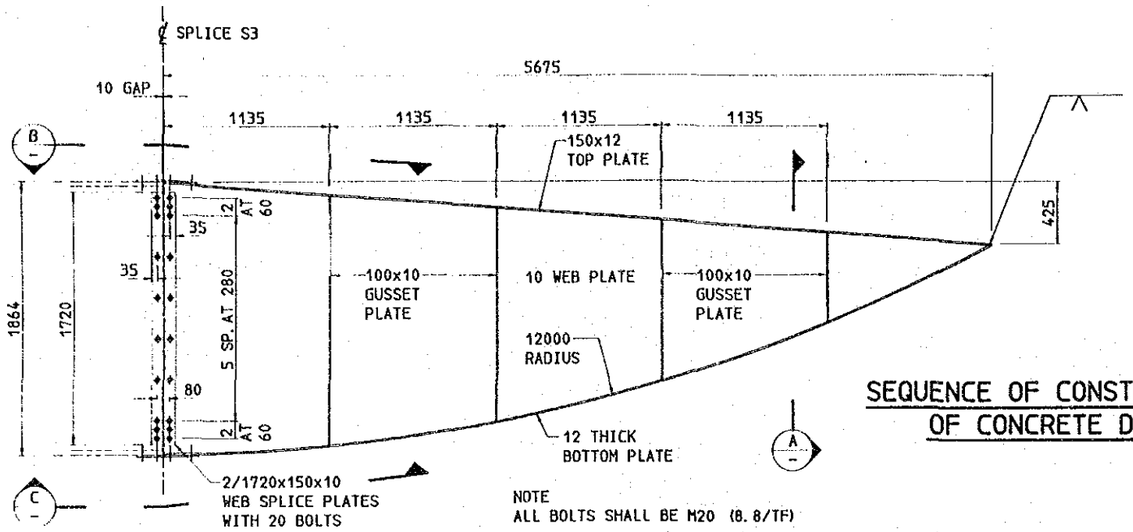
SHEET 247 OF 303

PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6- LAKEKAMU BRIDGE
GIRDER DETAILS SHEET 2

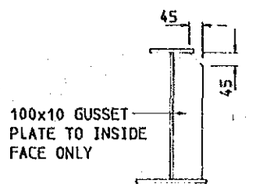
PAPUA NEW GUINEA DEPARTMENT OF WORKS

DRAWING No. A1 88281

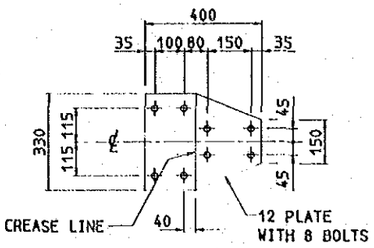


NOTE
ALL BOLTS SHALL BE M20 (8.8/TF)

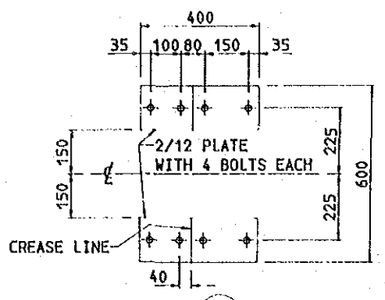
SEQUENCE OF CONSTRUCTION OF CONCRETE DECK



SECTION A
1: 10

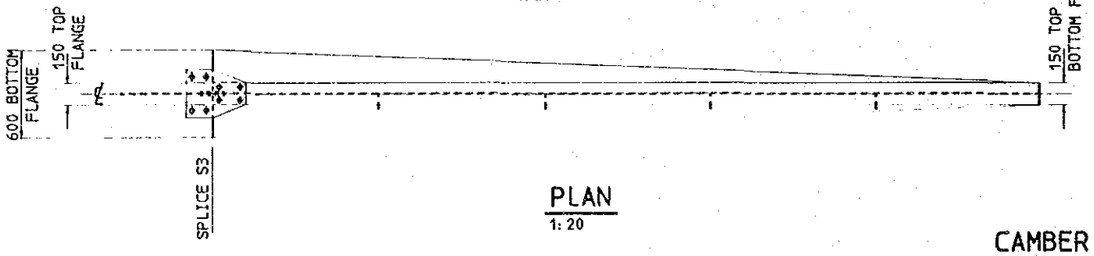


VIEW B 1: 10
(TOP FLANGE SPLICE PLATE)



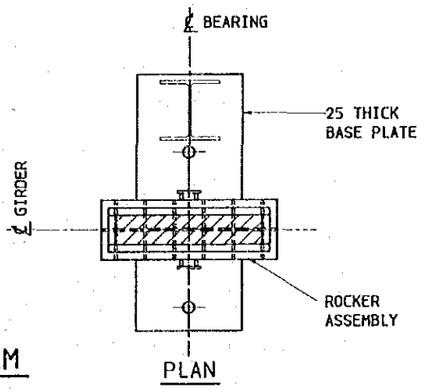
VIEW C 1: 10
(BOTTOM FLANGE SPLICE PLATE)

ELEVATION LAUNCHING NOSE
1: 20

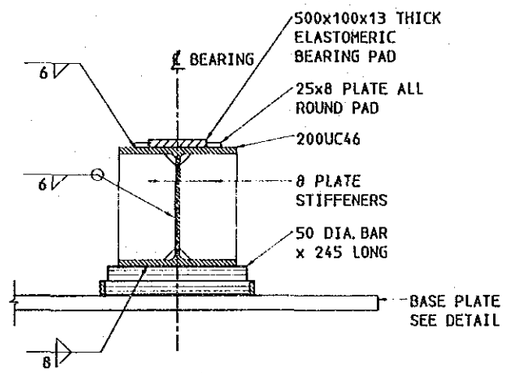


PLAN
1: 20

CAMBER DIAGRAM



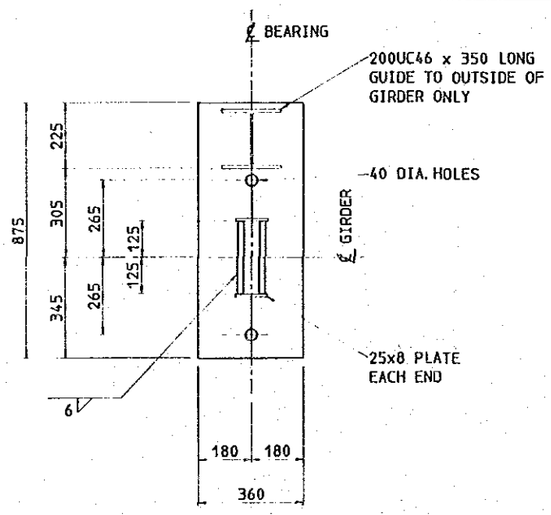
PLAN



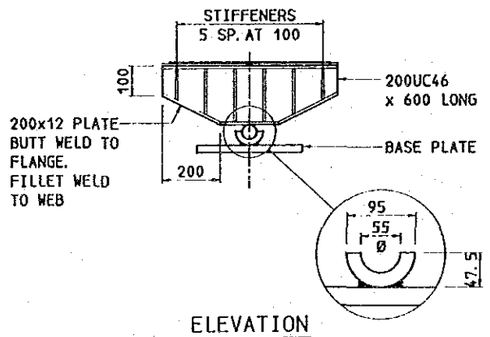
SECTION THROUGH
ROCKER ASSEMBLY
1: 5

NOTE

THE DETAILS SHOWN ON THIS DRAWING ARE FOR REFERANCE ONLY. THE CONTRACTOR SHALL DESIGN THE TEMPORARY WORK FOR HIS LAUNCHING SYSTEM FOR THE CONSTRUCTION OF BRIDGE 6 TO SUIT HIS METHOD OF WORKING



LAUNCHING BEARING BASE PLATE
1: 10



ELEVATION

LAUNCHING BEARING ASSEMBLY
1: 10

NOTES

1. ELASTOMERIC BEARING TO COMPLY WITH THE FOLLOWING
   (i) LAYERS OF BEARING FROM TOP DOWN SHALL BE
      (a) 1mm P. T. F. E. (UNFILLED)
      (b) 2mm ELASTOMER
      (c) 2mm STEEL PLATE
      (d) 4mm ELASTOMER
      (e) 2mm STEEL PLATE
      (e) 2mm ELASTOMER
   (ii) 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.
   (iii) STEEL AND RUBBER USED IN THE BEARINGS SHALL COMPLY WITH A. S. 1523.
2. STEEL SHALL BE GRADE 250.
3. 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.
4. 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: JICA — Date
VERTICAL DATUM: MEAN SEA LEVEL
HORIZONTAL DATUM:
SURVEY BOOK NO.S:

DESIGN: JAPAN INTERNATIONAL CO-OPERATION AGENCY
Principal 25 Sep. 1989 Date

DRAWN: MKS, M.S
CHECKED:
DESIGNED:
CHECKED:

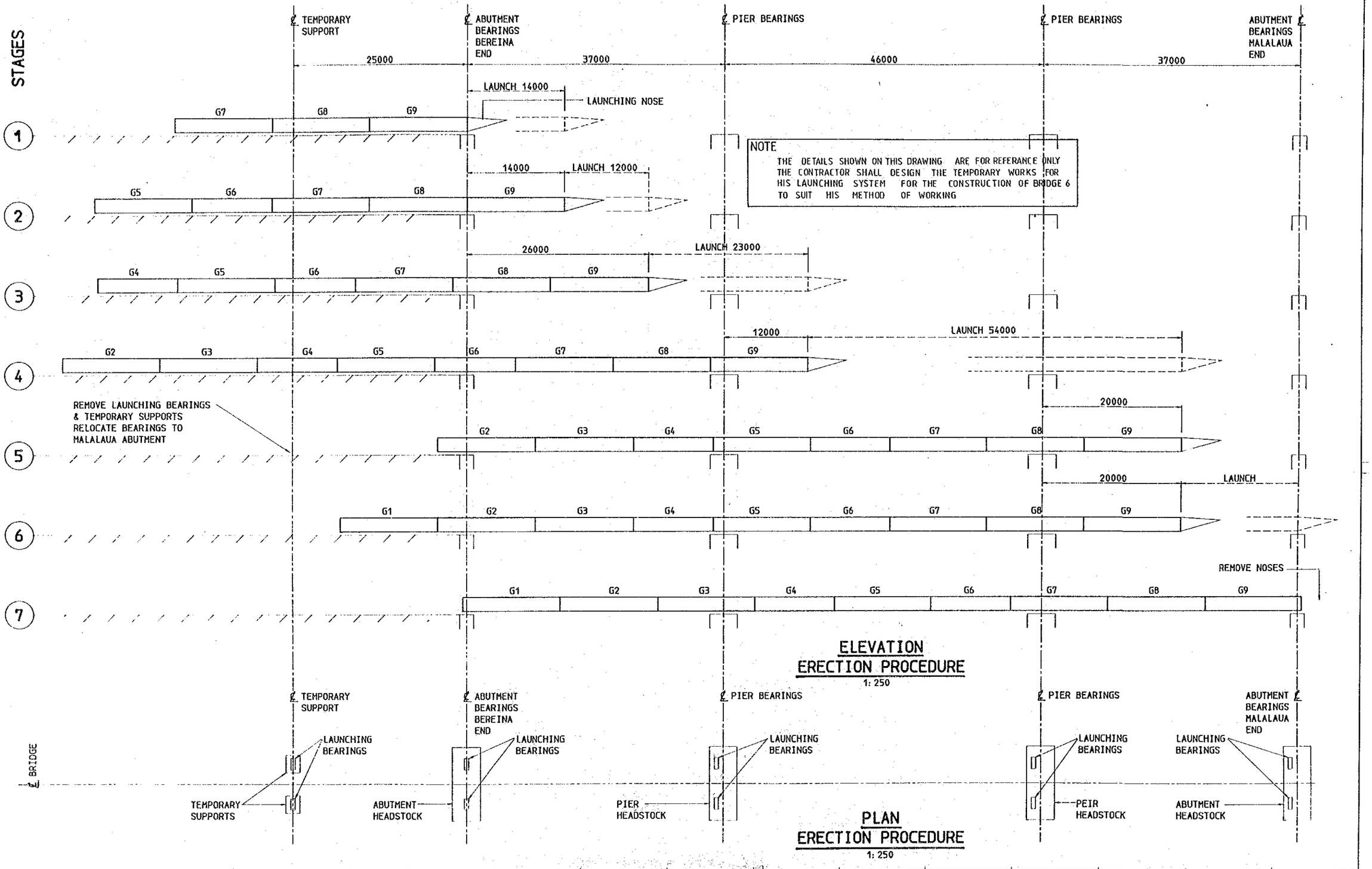
PROJECT ENGINEER 1/11/89
EXECUTIVE ENGINEER 1/11/89

RECOMMENDED: PRINCIPAL ENGINEER
APPROVED: 1.11.89 SECRETARY

SCALES

SHEET 248 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No.6 - LAKEKAMU BRIDGE
GIRDER LAUNCHING DETAILS
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1 88282



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
J. Yahiro — Principal — 25 Sep. 1989 — Date

DRAWN: MKS, M.S
CHECKED:
DESIGNED:
CHECKED:

PROJECT ENGINEER — 1/11/89
EXECUTIVE ENGINEER — 1/11/89

RECOMMENDED — PRINCIPAL ENGINEER
APPROVED — L.A. 89 — SECRETARY

SCALES

SHEET 249 OF 303
PROJECT No. S.C. 120-33-814/B

CENTRAL / GULF PROVINCES
TRANS-ISLAND HIGHWAY BEREINA-MALALAUA SECTION
BRIDGE No. 6- LAKEKAMU BRIDGE
GIRDER ERECTION PROCEDURE
PAPUA NEW GUINEA
DEPARTMENT OF WORKS
DRAWING No. A1 88283