

THE GOVERNMENT OF PAPUA NEW GUINEA

THE DETAILED DESIGN  
ON  
ROAD CONSTRUCTION PROJECT  
IN  
BEREINA - MALALUA

TENDER DOCUMENTS

(Volume IV - 2)

JANUARY 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

PAPUA NEW GUINEA

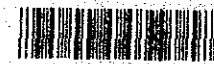


DEPARTMENT OF WORKS

TRANS-ISLAND HIGHWAY

**BEREINA TO MALALAU ROAD CONSTRUCTION PROJECT**  
**CENTRAL/GULF PROVINCES**

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TENDER DOCUMENTS

FOR

LOT-II MIARU RIVER TO MALALAU SECTION

CONTRACT NO. SC. 120-33-814/B

CH 33+500 TO CH 80+596

VOLUME IV-2

DRAWINGS

DOCUMENT NO. \_\_\_\_\_



LOT - II  
LIST OF DRAWINGS

| TITLE OF DRAWING  | DRAWING NO. | TITLE OF DRAWING  | DRAWING NO.             | TITLE OF DRAWING                       | DRAWING NO.                 |
|---|-------------|---|-------------------------|--|-----------------------------|
| <b>GENERAL DRAWINGS</b>   |             | <b>PLAN, ELEVATIONS SECTIONS AND DETAILS</b>            |                         | <b>PLAN &amp; LONGITUDINAL SECTION</b> |                             |
| SITE AND LOCALITY PLAN  | A1/ 88051   | DOOR & WINDOW SCHEDULE                                  | A1/ 87794               | CH 67+100 --- CH 67+800                | A1/ 88128                   |
| ABBREVIATION AND LEGEND   | A1/ 87761   | JOINERY ELEVATIONS                                      | A1/ 87795               | CH 67+800 --- CH 68+500                | A1/ 88129                   |
| PLANS LAYOUT, CO-ORDINATES OF CONTROL POINT AND INTERSECTION POINTS | A1/ 88052   | PLANS, ELEVATIONS, ELECTRICAL LEGEND AND WIRING DIAGRAM | A1/ 87796               | CH 68+500 --- CH 69+200                | A1/ 88130                   |
|   |             | SECTIONS DETAILS  |                         | CH 69+200 --- CH 69+900                | A1/ 88131                   |
|   |             |   |                         | CH 69+900 --- CH 70+600                | A1/ 88132                   |
|   |             |   |                         | CH 70+600 --- CH 71+300                | A1/ 88133                   |
|   |             |   |                         | CH 71+300 --- CH 72+000                | A1/ 88134                   |
|   |             |   |                         | CH 72+000 --- CH 72+700                | A1/ 88135                   |
|   |             |   |                         | CH 72+700 --- CH 73+400                | A1/ 88136                   |
|   |             |   |                         | CH 73+400 --- CH 74+100                | A1/ 88137                   |
|   |             |   |                         | CH 74+100 --- CH 74+500                | A1/ 88138                   |
|   |             |   |                         | CH 74+500 --- CH 75+200                | A1/ 88139                   |
|   |             |   |                         | CH 75+200 --- CH 75+900                | A1/ 88140                   |
|   |             |   |                         | CH 75+900 --- CH 76+600                | A1/ 88141                   |
|   |             |   |                         | CH 76+600 --- CH 77+300                | A1/ 88142                   |
|   |             |   |                         | CH 77+300 --- CH 78+000                | A1/ 88143                   |
|   |             |   |                         | CH 78+000 --- CH 78+700                | A1/ 88144                   |
|   |             |   |                         | CH 78+700 --- CH 79+400                | A1/ 88145                   |
|   |             |   |                         | CH 79+400 --- CH 80+100                | A1/ 88146                   |
|   |             |   |                         | CH 80+100 --- CH 80+596.596            | A1/ 88147                   |
| <b>STANDARD DRAWINGS</b>  |             | <b>LIST OF PLAN &amp; LONGITUDINAL SECTION</b>          |                         | <b>LIST OF CROSS SECTION</b>           |                             |
| TYPICAL CROSS SECTION ( FILL & CUT SECTION )                        | A1/ 88053   | PLAN & LONGITUDINAL SECTION                             | CH 33+500 --- CH 33+700 | CROSS SECTIONS                         | CH 33+500 --- CH 33+700     |
| " " " ( SAND MAT t=0.5m & ALIKA SWAMP )                             | A1/ 88054   | " " "   | CH 33+700 --- CH 34+400 | " "                                    | CH 33+750 --- CH 33+807.55  |
| " " " ( SAND MAT t=1.0m )   | A1/ 88055   | " " "   | CH 34+400 --- CH 35+100 | " "                                    | CH 33+810.249 --- CH 33+936 |
| " " " ( SAND MAT t=1.0m, t=0.5m )                                   | A1/ 88056   | " " "   | CH 35+100 --- CH 35+800 | " "                                    | CH 33+941 --- CH 33+150     |
| TYPICAL PAVEMENT SECTION FOR ROAD CH.33+500 TO CH.80+596            | A1/ 88057   | " " "   | CH 35+800 --- CH 36+500 | " "                                    | CH 34+200 --- CH 34+350     |
| SUPERELEVATION  | A1/ 87766   | " " "   | CH 36+500 --- CH 37+200 | " "                                    | CH 34+400 --- CH 34+750     |
|   |             | " " "   | CH 37+200 --- CH 37+700 | " "                                    | CH 34+800 --- CH 34+200     |
|   |             | " " "   | CH 37+700 --- CH 38+400 | " "                                    | CH 35+250 --- CH 35+600     |
|   |             | " " "   | CH 38+400 --- CH 39+100 | " "                                    | CH 35+650 --- CH 35+850     |
|   |             | " " "   | CH 39+100 --- CH 39+800 | " "                                    | CH 35+900 --- CH 36+150     |
|   |             | " " "   | CH 39+800 --- CH 40+500 | " "                                    | CH 36+200 --- CH 36+419     |
|   |             | " " "   | CH 40+500 --- CH 41+200 | " "                                    | CH 36+425 --- CH 36+450     |
|   |             | " " "   | CH 41+200 --- CH 41+900 | " "                                    | CH 36+475 --- CH 36+500     |
|   |             | " " "   | CH 41+900 --- CH 42+600 | " "                                    | CH 36+525 --- CH 36+678     |
|   |             | " " "   | CH 42+600 --- CH 43+300 | " "                                    | CH 36+700 --- CH 37+000     |
|   |             | " " "   | CH 43+300 --- CH 44+000 | " "                                    | CH 37+025 --- CH 37+125     |
|   |             | " " "   | CH 44+000 --- CH 44+700 | " "                                    | CH 37+150 --- CH 37+300     |
|   |             | " " "   | CH 44+700 --- CH 45+400 | " "                                    | CH 37+336 --- CH 37+583     |
|   |             | " " "   | CH 45+400 --- CH 46+100 | " "                                    | CH 37+600 --- CH 37+725     |
|   |             | " " "   | CH 46+100 --- CH 46+800 | " "                                    | CH 37+750 --- CH 37+990     |
|   |             | " " "   | CH 46+800 --- CH 47+500 | " "                                    | CH 38+000 --- CH 38+300     |
|   |             | " " "   | CH 47+500 --- CH 48+200 | " "                                    | CH 38+350 --- CH 38+550     |
|   |             | " " "   | CH 48+200 --- CH 48+900 | " "                                    | CH 38+600 --- CH 38+850     |
|   |             | " " "   | CH 48+900 --- CH 49+600 | " "                                    | CH 38+900 --- CH 39+150     |
|   |             | " " "   | CH 49+600 --- CH 50+300 | " "                                    | CH 39+200 --- CH 39+500     |
|   |             | " " "   | CH 50+300 --- CH 51+000 | " "                                    | CH 39+550 --- CH 39+900     |
|   |             | " " "   | CH 51+000 --- CH 51+700 | " "                                    | CH 39+950 --- CH 40+297     |
|   |             | " " "   | CH 51+700 --- CH 52+400 | " "                                    | CH 40+600 --- CH 40+600     |
|   |             | " " "   | CH 52+400 --- CH 53+100 | " "                                    | CH 40+650 --- CH 40+900     |
|   |             | " " "   | CH 53+100 --- CH 53+800 | " "                                    | CH 40+950 --- CH 41+400     |
|   |             | " " "   | CH 53+800 --- CH 54+500 | " "                                    | CH 41+500 --- CH 42+000     |
|   |             | " " "   | CH 54+500 --- CH 55+200 | " "                                    | CH 42+100 --- CH 42+800     |
|   |             | " " "   | CH 55+200 --- CH 55+900 | " "                                    | CH 42+831 --- CH 43+395     |
|   |             | " " "   | CH 55+900 --- CH 56+600 | " "                                    | CH 43+400 --- CH 43+900     |
|   |             | " " "   | CH 56+600 --- CH 57+300 | " "                                    | CH 44+000 --- CH 44+300     |
|   |             | " " "   | CH 57+300 --- CH 58+000 | " "                                    | CH 44+350 --- CH 44+800     |
|   |             | " " "   | CH 58+000 --- CH 58+700 | " "                                    |                             |
|   |             | " " "   | CH 58+700 --- CH 59+400 | " "                                    |                             |
|   |             | " " "   | CH 59+400 --- CH 60+100 | " "                                    |                             |
|   |             | " " "   | CH 60+100 --- CH 60+800 | " "                                    |                             |
|   |             | " " "   | CH 60+800 --- CH 61+500 | " "                                    |                             |
|   |             | " " "   | CH 61+500 --- CH 62+200 | " "                                    |                             |
|   |             | " " "   | CH 62+200 --- CH 62+900 | " "                                    |                             |
|   |             | " " "   | CH 62+900 --- CH 63+600 | " "                                    |                             |
|   |             | " " "   | CH 63+600 --- CH 64+300 | " "                                    |                             |
|   |             | " " "   | CH 64+300 --- CH 65+000 | " "                                    |                             |
|   |             | " " "   | CH 65+000 --- CH 65+700 | " "                                    |                             |
|   |             | " " "   | CH 65+700 --- CH 66+400 | " "                                    |                             |
|   |             | " " "   | CH 66+400 --- CH 67+100 | " "                                    |                             |

|  |  |   |   |  |  |  |   |
|--|--|---|---|--|--|--|---|
|  |  | SURVEY<br><b>JICA</b><br>Date<br>VERTICAL DATUM<br>MEAN SEA LEVEL<br>HORIZONTAL DATUM | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY<br>Principal<br>25 Sep. 1989 Date | DRAWN<br>K. E.<br>CHECKED<br>DESIGNED<br>CHECKED | RECOMMENDED<br>PROJECT ENGINEER<br>APPROVED<br>SECRETARY | SCALES<br>SHEET OF<br>PROJECT No.<br>S.C. 120-33-814/B | CENTRAL GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION<br>LIST OF DRAWINGS<br>CH 33+500 - CH 80+596 1/2<br>PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS<br>DRAWING No.<br>A1 |
|--|--|---|---|--|--|--|---|

31/08/1989

LOT - II  
LIST OF DRAWING

| TITLE OF DRAWING             | DRAWING NO                 | TITLE OF DRAWING | DRAWING NO   | TITLE OF DRAWING            | DRAWING NO |
|------------------------------|----------------------------|------------------|--|-----------------------------|------------|
| <b>LIST OF CROSS SECTION</b> |                            |                  |  |                             |            |
| CROSS SECTION                | CH44+900 — CH 45 + 000     | A1/ 88184        | CROSS SECTION  | CH78 + 200 — CH78 + 573     | A1/ 88243  |
| " "                          | CH45+100 — CH 45 + 900     | A1/ 88185        | " "  | CH78 + 600 — CH79 + 075     | A1/ 88244  |
| " "                          | CH46+000 — CH 46 + 400     | A1/ 88186        | " "  | CH79 + 050 — CH79 + 400     | A1/ 88245  |
| " "                          | CH46+450 — CH 47 + 000     | A1/ 88187        | " "  | CH79 + 477 — CH80 + 000     | A1/ 88246  |
| " "                          | CH47+100 — CH 48 + 800     | A1/ 88188        | " "  | CH80 + 100 — CH80 + 450     | A1/ 88247  |
| " "                          | CH47+900 — CH 48 + 600     | A1/ 88189        | " "  | CH80 + 500 — CH80 + 596-107 | A1/ 88248  |
| " "                          | CH48+638 — CH 49 + 300     | A1/ 88190        |  |                             |            |
| " "                          | CH49+400 — CH 49 + 950     | A1/ 88191        | <b>BRIDGES</b>   |                             |            |
| " "                          | CH49+975 — CH 50 + 600     | A1/ 88192        | <b>BRIDGE NO.4 - MIARU BRIDGE</b>  |                             |            |
| " "                          | CH50+700 — CH 51 + 300     | A1/ 88193        | GENERAL NOTES AND DRAWING LIST   |                             |            |
| " "                          | CH51+400 — CH 51 + 900     | A1/ 88194        | GENERAL ARRANGEMENT  |                             |            |
| " "                          | CH52+000 — CH 52 + 650     | A1/ 88195        | ABUTMENT PLANS, SECTIONS & DETAILS   |                             |            |
| " "                          | CH52+700 — CH 53 + 400     | A1/ 88196        | PIER DETAILS   |                             |            |
| " "                          | CH53+500 — CH 54 + 200     | A1/ 88197        | DECK SLAB DETAILS  |                             |            |
| " "                          | CH54+300 — CH 55 + 000     | A1/ 88198        | STEEL WORK DETAIL SHEET 1  |                             |            |
| " "                          | CH55+100 — CH 55 + 900     | A1/ 88199        | STEEL WORK DETAIL SHEET 2  |                             |            |
| " "                          | CH56+000 — CH 56 + 800     | A1/ 88200        | HANDRAILING / IMPACT ANGLE DETAILS   |                             |            |
| " "                          | CH56+900 — CH 57 + 800     | A1/ 88201        | BAR BENDING SCHEDULE SHEET 1   |                             |            |
| " "                          | CH57+900 — CH 58 + 600     | A1/ 88202        | BAR BENDING SCHEDULE SHEET 2   |                             |            |
| " "                          | CH58+700 — CH 59 + 200     | A1/ 88203        | BEARING BP. B-103 (FIXED)  |                             |            |
| " "                          | CH59+300 — CH 59 + 887     | A1/ 88204        | BEARING BP. B-104 (MOVABLE)  |                             |            |
| " "                          | CH59+900 — CH 59 + 990-1   | A1/ 88205        | RIVER BANK PROTECTION, BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS |                             |            |
| " "                          | CH59+992 — CH 60 + 09J     | A1/ 88206        | <b>BRIDGE NO.5 - KARURI RIVER</b>  |                             |            |
| " "                          | CH60+020 — CH 60 + 400     | A1/ 88207        | GENERAL NOTES AND DRAWING LIST   |                             |            |
| " "                          | CH60+429 — CH 61 + 200     | A1/ 88208        | GENERAL ARRANGEMENT  |                             |            |
| " "                          | CH61+300 — CH 62 + 100     | A1/ 88209        | ABUTMENT PLAN, SECTION & DETAILS   |                             |            |
| " "                          | CH62+200 — CH 63 + 100     | A1/ 88210        | PIER DETAILS   |                             |            |
| " "                          | CH63+200 — CH 64 + 000     | A1/ 88211        | DECK SLAB DETAILS  |                             |            |
| " "                          | CH64+100 — CH 65 + 725     | A1/ 88212        | STEEL WORK DETAIL SHEET 1  |                             |            |
| " "                          | CH64+749 — CH 65 + 030     | A1/ 88213        | STEEL WORK DETAIL SHEET 2  |                             |            |
| " "                          | CH65+100 — CH 65 + 661     | A1/ 88214        | HANDRAILING / IMPACT ANGLE DETAILS   |                             |            |
| " "                          | CH65+700 — CH 66 + 219     | A1/ 88215        | BAR BENDING SCHEDULE SHEET 1   |                             |            |
| " "                          | CH66+300 — CH 66 + 800     | A1/ 88216        | BAR BENDING SCHEDULE SHEET 2   |                             |            |
| " "                          | CH66+900 — CH 67 + 166     | A1/ 88217        | BEARING BP. B-101 (FIXED)  |                             |            |
| " "                          | CH67+172 — CH 67 + 300-5   | A1/ 88218        | BEARING BP. B-102 (MOVABLE)  |                             |            |
| " "                          | CH67+302 — CH 67 + 600     | A1/ 88219        | BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS                        |                             |            |
| " "                          | CH67+650 — CH 68 + 300     | A1/ 88220        | <b>BRIDGE NO.6 - LAKEKAMU BRIDGE</b>   |                             |            |
| " "                          | CH67+400 — CH 68 + 667     | A1/ 88221        | GENERAL NOTES AND DRAWING LIST   |                             |            |
| " "                          | CH68+673 — CH 68 + 801-5   | A1/ 88222        | GENERAL ARRANGEMENT  |                             |            |
| " "                          | CH68+803 — CH 68 + 900     | A1/ 88223        | ABUTMENT - REINFORCEMENT & CONCRETE DETAILS                                  |                             |            |
| " "                          | CH69+000 — CH 69 + 700     | A1/ 88224        | PIER DETAILS   |                             |            |
| " "                          | CH69+735 — CH 70 + 000     | A1/ 88225        | DECK STEEL WORK GENERAL ARRANGEMENT  |                             |            |
| " "                          | CH70+100 — CH 70 + 700     | A1/ 88226        | GIRDER DETAILS SHEET 1   |                             |            |
| " "                          | CH70+800 — CH 71 + 400     | A1/ 88227        | GIRDER DETAILS SHEET 2   |                             |            |
| " "                          | CH71+494 — CH 71 + 900     | A1/ 88228        | GIRDER LAUNCHING DETAILS   |                             |            |
| " "                          | CH72+000 — CH 72 + 700     | A1/ 88229        | GIRDER ERECTION PROCEDURE  |                             |            |
| " "                          | CH72+800 — CH 73 + 400     | A1/ 88230        | DECK SECTIONS  |                             |            |
| " "                          | CH73+500 — CH 74 + 100     | A1/ 88231        | DECK CONSTRUCTION PROCEDURE  |                             |            |
| " "                          | CH74+159 — CH 74 + 700     | A1/ 88232        | DECK SLAB DETAILS  |                             |            |
| " "                          | CH74+725 — CH 75 + 300     | A1/ 88233        | STEELWORK DETAILS SHEET 1  |                             |            |
| " "                          | CH75+400 — CH 75 + 874     | A1/ 88234        | STEELWORK DETAILS SHEET 2  |                             |            |
| " "                          | CH75+879 — CH 75 + 954-151 | A1/ 88235        | HANDRAILING / IMPACT ANGLE DETAILS   |                             |            |
| " "                          | CH75+956-850 — CH 76 + 000 | A1/ 88236        | BAR BENDING SCHEDULE SHEET 1   |                             |            |
| " "                          | CH76+026 — CH 76 + 500     | A1/ 88237        | BAR BENDING SCHEDULE SHEET 2   |                             |            |
| " "                          | CH76+600 — CH 77 + 100     | A1/ 88238        | BEARING BP. B-101 (FIXED)  |                             |            |
| " "                          | CH77+177 — CH 77 + 211-4   | A1/ 88239        | BEARING BP. B-102 (MOVABLE)  |                             |            |
| " "                          | CH77+214-099 — CH 77 + 289 | A1/ 88240        | BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS                        |                             |            |
| " "                          | CH77+294 — CH 77 + 600     | A1/ 88241        | <b>BRIDGE NO.9 - SAPPAHARO BRIDGE</b>  |                             |            |
| " "                          | CH77+650 — CH 78 + 146     | A1/ 88242        | GENERAL NOTES AND DRAWING LIST   |                             |            |

**BRIDGE NO.7 - TAURI BRIDGE**

|   |           |
|---|-----------|
| GENERAL NOTES AND DRAWING LIST                        | A1/ 88293 |
| GENERAL ARRANGEMENT                                   | A1/ 88294 |
| ABUTMENT PLAN REINFORCEMENT & CONCRETE DETAILS        | A1/ 88295 |
| PIER DETAILS  | A1/ 88296 |
| DECK STEELWORK GENERAL ARRANGEMENT                    | A1/ 88297 |
| GIRDER DETAILS SHEET 1                                | A1/ 88298 |
| GIRDER DETAILS SHEET 2                                | A1/ 88299 |
| GIRDER LAUNCHING DETAILS                              | A1/ 88300 |
| GIRDER ERECTION PROCEDURE                             | A1/ 88301 |
| DECK SECTIONS   | A1/ 88302 |
| DECK CONSTRUCTION PROCEDURE                           | A1/ 88303 |
| DECK SLAB DETAILS                                     | A1/ 88304 |
| HANDRAILING / IMPACT ANGLE DETAILS                    | A1/ 88305 |
| BAR BENDING SCHEDULE SHEET 1                          | A1/ 88306 |
| BAR BENDING SCHEDULE SHEET 2                          | A1/ 88307 |
| BEARING BP. B-104 (MOVABLE)                           | A1/ 88308 |
| BEARING BP. B-117 (FIXED)                             | A1/ 88309 |
| BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS | A1/ 88310 |

**BRIDGE NO.8 - MAKARA BRIDGE**

|   |           |
|---|-----------|
| GENERAL NOTES AND DRAWING LIST                        | A1/ 88311 |
| GENERAL ARRANGEMENT                                   | A1/ 88312 |
| ABUTMENT PLANS SECTIONS & DETAILS                     | A1/ 88313 |
| PIER DETAILS  | A1/ 88314 |
| DECK SLAB DETAILS                                     | A1/ 88315 |
| STEEL WORK DETAILS SHEET 1                            | A1/ 88316 |
| STEEL WORK DETAIL SHEET 2                             | A1/ 88317 |
| HANDRAILING / IMPACT ANGLE DETAILS                    | A1/ 88318 |
| BAR BENDING SCHEDULE SHEET 1                          | A1/ 88319 |
| BAR BENDING SCHEDULE SHEET 2                          | A1/ 88320 |
| BEARING BP. B-101 (FIXED)                             | A1/ 88321 |
| BEARING BP. B-102 (MOVABLE)                           | A1/ 88322 |
| BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS | A1/ 88323 |

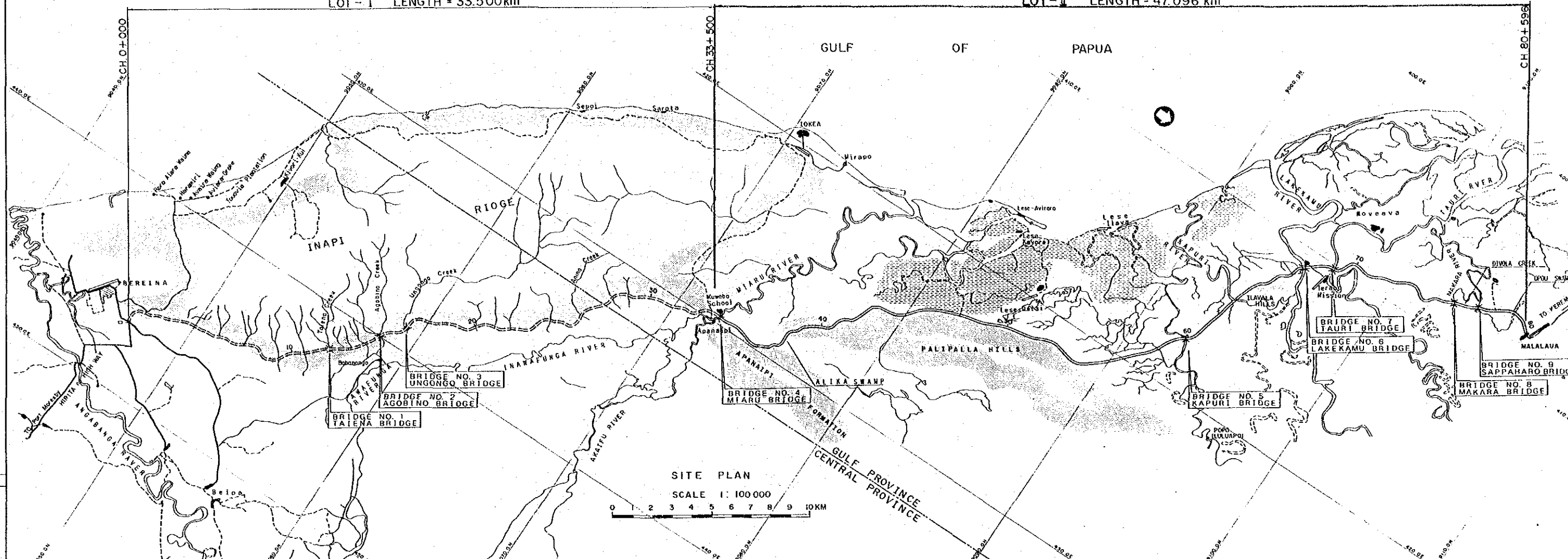
**BRIDGE NO.9 - SAPPAHARO BRIDGE**

|   |           |
|---|-----------|
| GENERAL NOTES AND DRAWING LIST                        | A1/ 88324 |
| GENERAL ARRANGEMENT                                   | A1/ 88325 |
| ABUTMENT PLAN & DETAILS (MALALAU ABUTMENT)            | A1/ 88326 |
| ABUTMENT PLAN & DETAILS (BEREINA ABUTMENT)            | A1/ 88327 |
| PIER DETAILS  | A1/ 88328 |
| DECK SLAB DETAILS                                     | A1/ 88329 |
| STEELWORK DETAILS SHEET 1                             | A1/ 88330 |
| STEELWORK DETAILS SHEET 2                             | A1/ 88331 |
| HANDRAILING / IMPACT ANGLE DETAILS                    | A1/ 88332 |
| BAR BENDING SCHEDULE SHEET 1                          | A1/ 88333 |
| BAR BENDING SCHEDULE SHEET 2                          | A1/ 88334 |
| BEARING BP. B-101 (FIXED)                             | A1/ 88335 |
| BEARING BP. B-102 (MOVABLE)                           | A1/ 88336 |
| BEARING UNITS, BACKFILL TO BRIDGE ABUTMENT AND OTHERS | A1/ 88337 |

|                       |  |   |  |                                |  |                                       |  |                            |  |                                   |  |   |  |                   |  |
|-----------------------|--|---|--|--------------------------------|--|---------------------------------------|--|----------------------------|--|-----------------------------------|--|---|--|-------------------|--|
| SURVEY<br><b>JICA</b> |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K. E.                 |  | RECOMMENDED                           |  | SCALES                     |  | CENTRAL GULF PROVINCES            |  |   |  |                   |  |
|                       |  |   |  | CHECKED<br><i>C. A. D.</i>     |  | PROJECT ENGINEER<br><i>B. Karunan</i> |  | APPROVED<br><i>M. Maga</i> |  | PROJECT No.<br>S. C. 120-33-814/B |  | LIST OF DRAWINGS<br>CH. 33+500 CH. 80+596 2/2 |  | DRAWING No.<br>A1 |  |
|                       |  | VERTICAL DATUM<br>MEAN SEA LEVEL                  |  | DESIGNED<br><i>A. Mayas</i>    |  | CHECKED<br><i>J. Karunan</i>          |  | DATE<br>25.10.89           |  | SHEET OF                          |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS          |  | REV.              |  |
|                       |  | HORIZONTAL DATUM                                  |  | PRINCIPAL<br><i>J. Karunan</i> |  | DATE<br>25 Sep. 1989                  |  | SECRETARY<br><i>P. S.</i>  |  | BY                                |  | APP'D   |  | DATE              |  |
|                       |  | SURVEY BOOK No. S                                 |  | EXECUTIVE ENGINEER             |  |                                       |  |                            |  | AMENDMENTS                        |  |   |  |                   |  |

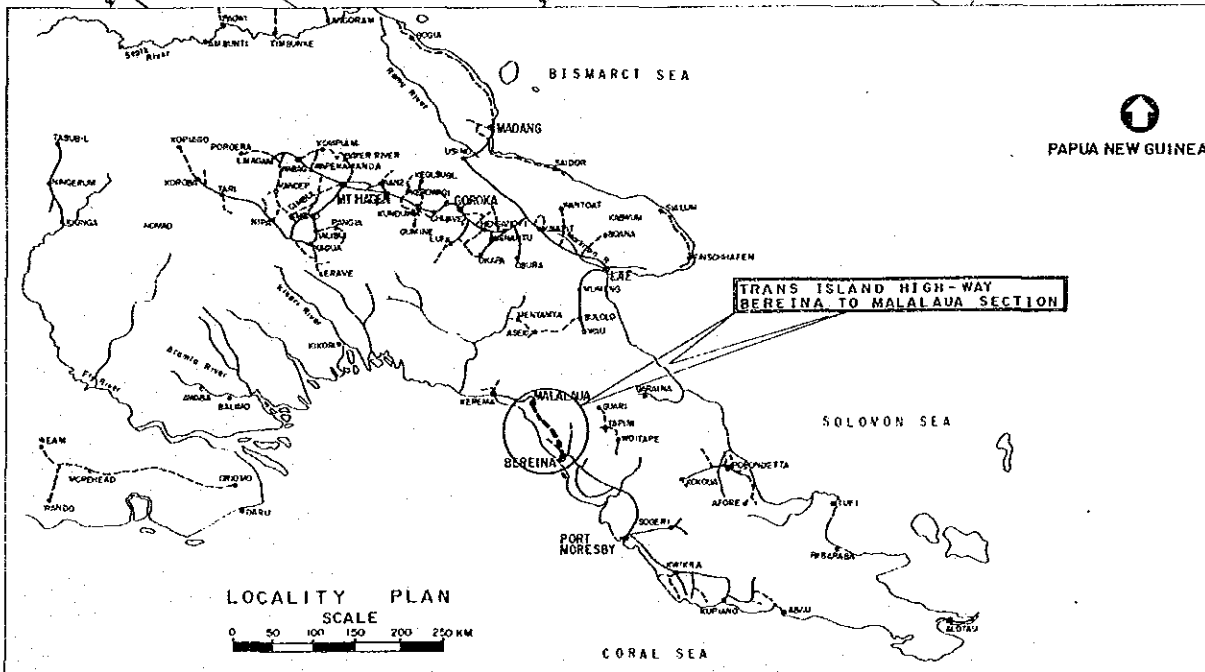
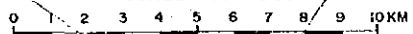
LOT - I LENGTH = 33.500km

LOT - II LENGTH = 47.096 km



SITE PLAN

SCALE 1:100 000



LOCALITY PLAN

SCALE 1:250 000

|     |            |    |       |      |                                  |   |                               |                    |                      |  |   |                         |
|-----|------------|----|-------|------|----------------------------------|---|-------------------------------|--------------------|----------------------|--|---|-------------------------|
| REV | AMENDMENTS | BY | APP'D | DATE | SURVEY                           | DESIGN                                  | DRAWN                         | RECOMMENDED        | SCALES               | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION<br>SITE AND LOCALITY PLAN | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS | DRAWING No.<br>AI 88051 |
|     |            |    |       |      | JICA                             | JAPAN INTERNATIONAL CO-OPERATION AGENCY | K.E.                          | <i>[Signature]</i> |                      |  |   |                         |
|     |            |    |       |      | VERTICAL DATUM<br>MEAN SEA LEVEL |   | CHECKED<br><i>[Signature]</i> | PRINCIPAL ENGINEER | APPROVED<br>25.10.89 |  |   |                         |
|     |            |    |       |      | HORIZONTAL DATUM                 |   | DESIGNED<br>A. Magalis        | EXECUTIVE ENGINEER | SECRETARY            |  |   |                         |
|     |            |    |       |      | SURVEY BOOK NO. S                | Principal<br><i>[Signature]</i>         | CHECKED<br>P. Kawokani        |                    |                      |  | PROJECT No.<br>S.C. 120-33-814/B        |                         |
|     |            |    |       |      | 25 Sep. 1989<br>Date             |   |                               |                    |                      |  | SHEET 1 OF 303                          |                         |

| ABBREVIATION | FULL WORDS               |
|--------------|--------------------------|
| B.C.         | BEGINNING OF CURVE       |
| B.H.         | BORE HOLE                |
| E            | CENTRELINE               |
| CH./ch       | CHAINAGE                 |
| COR.         | CORRUGATED               |
| C.S.P.       | CORRUGATED STEEL PIPE    |
| Dia.         | DIAMETER                 |
| ∅            | PIPE DIAMETER            |
| D.L.         | DATUM LINE               |
| Drg.No.      | DRAWING NUMBER           |
| E.C.         | END OF CURVE             |
| ELEV.        | ELEVATION                |
| e            | SUPERELEVATION (%)       |
| F.L.         | FLOOD LEVEL              |
| Galv.        | GALVANISED               |
| G.H.         | GROUND HEIGHT            |
| G.R.         | GUARD RAIL               |
| H.W.L.       | HIGH WATER LEVEL         |
| I.L.         | INVERT LEVEL             |
| I.P.         | INTERSECTION POINT       |
| I.A.         | INTERSECTION ANGLE       |
| Km.          | KILOMETRE                |
| L.           | LENGTH                   |
| Lc.          | LENGTH OF CURVE          |
| L.H.S.       | LEFT HAND SIDE           |
| m.           | METRE                    |
| mm.          | MILLIMETRE               |
| ML.          | MATCH LINE               |
| NO.          | NUMBER                   |
| N.T.S.       | NOT TO SCALE             |
| Pvt.         | PAVEMENT                 |
| R.           | RADIUS OF CIRCULAR CURVE |
| R.L.         | REDUCED LEVEL            |
| REF.         | REFERENCE                |
| R.O.W.       | RIGHT OF WAY             |
| R.H.S.       | RIGHT HAND SIDE          |
| std.         | STANDARD                 |
| T            | THICK                    |
| T            | TANGENT LENGTH           |
| V.C.L.       | VERTICAL CURVE LENGTH    |
| V.C.R.       | VERTICAL CURVE RADIUS    |
| W.L.         | WATER LEVEL              |
| ∞            | INFINITY                 |

| DETAIL                              | SYMBOL          |
|-------------------------------------|-----------------|
| Traverse Point                      | JP 29<br>Q12 34 |
| Minor Leveling                      | 12 12           |
| Spot Height                         | 12 12           |
| Formed Roads                        | — — — — —       |
| Unformed Roads                      | - - - - -       |
| Track                               | — — — — —       |
| Embankment                          | — — — — —       |
| Buildings                           | — — — — —       |
| Public Building                     | LAE HOSPITAL    |
| Position Approximate Observed       | — — — — —       |
| Fence                               | — — — — —       |
| Special Use Areas Fenced            | — — — — —       |
| Unfenced                            | — — — — —       |
| Lake / Reservoir                    | — — — — —       |
| River / Creek                       | — — — — —       |
| River / Creek Symbolized            | — — — — —       |
| Subject To Inundation during Floods | — — — — —       |
| Subject To Inundation during Floods | — — — — —       |
| Swamp                               | — — — — —       |
| Direction of Flow                   | — — — — —       |
| Seasonal Stream                     | — — — — —       |
| Forest                              | — — — — —       |
| Secondary Growth                    | SG              |
| Large Isolated Tree                 | ○               |
| Mangrove                            | — — — — —       |
| Palms                               | — — — — —       |
| Plantation                          | PL              |
| Food Garden                         | — — — — —       |
| Scattered Trees                     | — — — — —       |
| Grassland                           | — — — — —       |
| Staff Gauge                         | — — — — —       |
| Contours Index                      | — — — — —       |
| Standard                            | — — — — —       |
| Half                                | — — — — —       |
| Supplementary                       | — — — — —       |
| Depression                          | — — — — —       |
| Road Bridge                         | — — — — —       |
| Power Poles                         | — — — — —       |
| Tank                                | ○<br>TANK       |
| Provincial Boundary                 | — — — — —       |
| Design Centreline Road              | — — — — —       |
| Drain Water Flow                    | — — — — —       |
| Pipe Culvert                        | — — — — —       |
| Reno Mattress                       | — — — — —       |
| Slope (Cut & Fill)                  | — — — — —       |
| Level Cut                           | — — — — —       |
| Level Fill                          | — — — — —       |

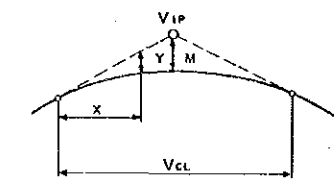
**SYMBOLS FOR SOIL AND ROCK**

| Soil/Rock Type | Symbol    |
|----------------|-----------|
| TOP SOIL       | — — — — — |
| PEAT           | — — — — — |
| SAND           | — — — — — |
| SILT           | — — — — — |
| CLAY           | — — — — — |
| SANDSTONE      | — — — — — |
| SILTY MUDSTONE | — — — — — |
| LIMESTONE      | — — — — — |
| BOGWOOD        | — — — — — |
| CONGLOMERATE   | — — — — — |
| AGGLOMERATE    | — — — — — |

FOR THE VERTICAL CURVES THE PARAMETERS GIVEN IN THE DRAWINGS ARE THE RADIUS AND THE CURVE LENGTH. HOWEVER FOR SETTING OUT PURPOSES, PARABOLIC CURVE MAY BE ASSUMED AS GIVEN BY THE EQUATION BELOW.

$$R = \frac{Vcl}{A} \quad Y = \frac{A}{2Vcl} \times X^2$$

- WHERE :-
- R Radius of vertical curve
  - Vcl Vertical curve length
  - A Algebraic difference of tangent grades
  - Y Vertical offset
  - X Horizontal distance from the curve end
  - M Mid - Ordinate
  - Vip Vertical intersection point
  - ELEV Elevation of Vertical Intersection point

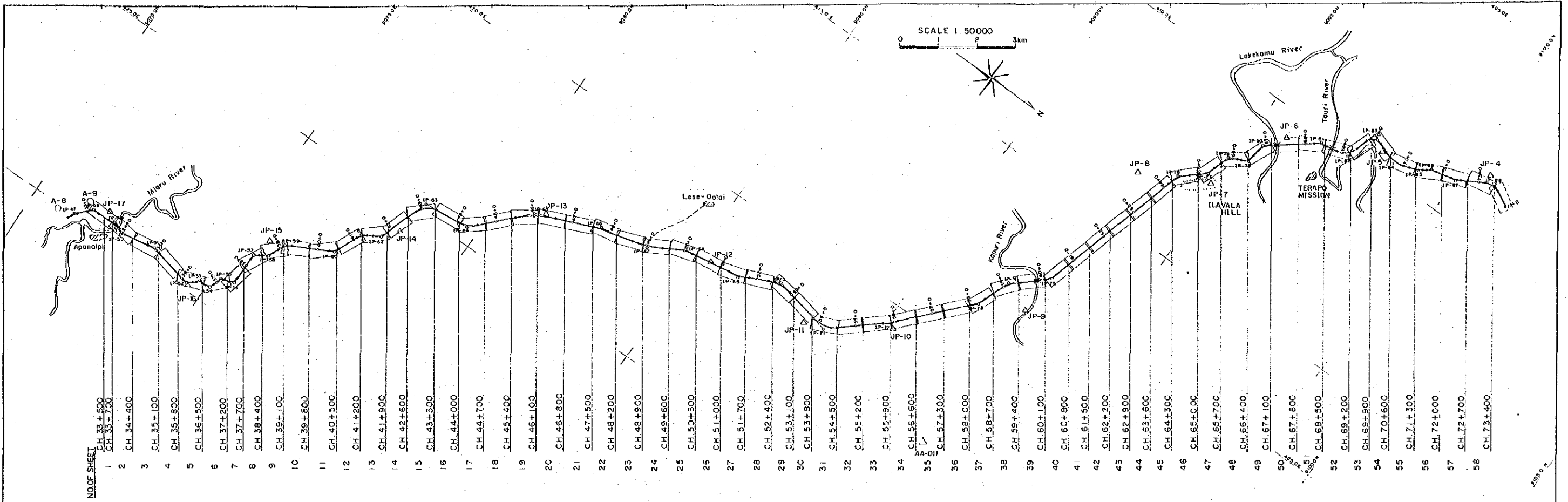


**VERTICAL CURVE**

**GENERAL NOTES**

- VERTICAL CONTROL**  
ALL ELEVATIONS IN THIS PROJECT ARE BASED ON MEAN SEA LEVEL DATUM WHICH WAS ESTABLISHED BY TIDAL OBSERVATION AT IOKEA GULF PROVINCE IN DECEMBER 1987.
- HORIZONTAL CONTROL**  
THE HORIZONTAL CONTROL AND ALIGNMENT CALCULATIONS IN THIS PROJECT ARE BASED ON THE AUSTRALIAN GRID DATUM (U.T.M. ZONE 55). THE TOPOGRAPHIC MAPS WERE MADE BY PHOTOGRAMETRIC METHOD, USING AERIAL PHOTOGRAPHY WHICH WERE TAKEN IN DECEMBER 1987.

|                               |  |   |  |          |  |                  |  |                                      |  |  |  |
|-------------------------------|--|---|--|----------|--|------------------|--|--------------------------------------|--|--|--|
| SURVEY                        |  | DESIGN                                  |  | DRAWN    |  | RECOMMENDED      |  | SCALES                               |  | CENTRAL / GULF PROVINCES                     |  |
| JICA                          |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | K.E.     |  | PROJECT ENGINEER |  | PROJECT No. S.C.120-33-814/B         |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| VERTICAL DATUM MEAN SEA LEVEL |  | Date 25 Sep. 1989                       |  | CHECKED  |  | APPROVED         |  | SHEET 2 OF 303                       |  | ABBREVIATIONS AND LEGEND                     |  |
| HORIZONTAL DATUM              |  | Principal                               |  | DESIGNED |  | SECRETARY        |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS |  | DRAWING No. A1/ 87761                        |  |
| SURVEY BOOK N9.5              |  | Date                                    |  | CHECKED  |  | SECRETARY        |  | REV.                                 |  | REV.   |  |



COORDINATES & ELEVATION OF CONTROL POINTS  
(Transformed to A. G. D. System)

| STATION | NORTHING    | EASTING    | ELEVATION | REMARKS |
|---------|-------------|------------|-----------|---------|
|         | m           | m          | m         |         |
| JP-01   | 9107203.223 | 407615.143 | 3.829     | ○       |
| JP-02   | 9106073.793 | 406638.694 | 4.087     | ○       |
| JP-03   | 9103050.449 | 408727.530 | 2.097     | ○       |
| JP-04   | 9100644.219 | 408533.637 | 1.116     | ○       |
| JP-05   | 9098070.701 | 409583.260 | 1.079     | ○       |
| JP-06   | 9095809.432 | 410735.873 | 2.404     | ○       |
| JP-07   | 9094811.330 | 412826.050 | 49.113    | ○       |
| JP-08   | 9093091.069 | 413604.391 | 1.895     | ○       |
| JP-09   | 9092782.001 | 418195.882 | 1.054     | * ○     |
| JP-10   | 9090197.294 | 420485.271 | 1.349     | ○       |
| JP-11   | 9088222.307 | 421753.653 | 89.121    | ○       |
| JP-12   | 9085402.348 | 421815.133 | 3.455     | ○       |
| JP-13   | 9081255.114 | 423215.145 | 4.687     | ○       |
| JP-14   | 9078370.690 | 425686.865 | 30.461    | ○       |
| JP-15   | 9075743.627 | 427705.989 | 63.836    | ○       |
| JP-16   | 9074610.527 | 429832.957 | 5.893     | * ○     |
| JP-17   | 9071897.393 | 429420.295 | 5.112     | ** ○    |
| JP-18   | 9069394.365 | 430442.978 | 18.073    | ○       |
| BESF    | 9045004.587 | 445676.212 | 8.312     | **○     |
| AA-009  | 9044837.418 | 442458.547 | 121.370   | **○     |

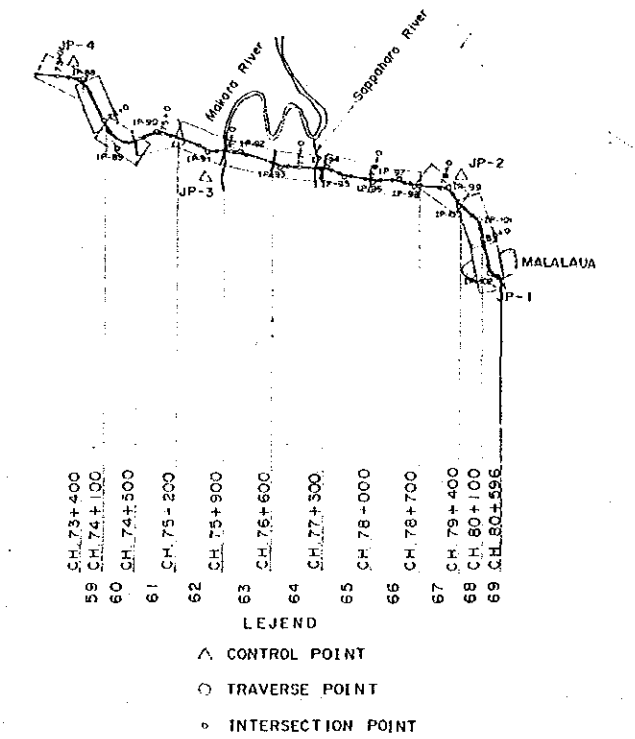
NOTES: \* ...Via JP-17  
 \*\* ...Direct Leveling  
 \*\*○ ...Control Point  
 ○ ...Monumented Point

COORDINATES OF INTERSECTION POINTS

| INO. | NORTHING    | EASTING    | BEARING   | DISTANCE |
|------|-------------|------------|-----------|----------|
|      | m           | m          |           | m        |
| 46   | 9070994.500 | 430314.000 | 296 42 24 | 361.573  |
| 47   | 9071157.000 | 429991.000 | 313 29 25 | 483.122  |
| 48   | 9071489.500 | 429640.500 | 358 29 25 | 626.217  |
| 49   | 9072115.500 | 429624.000 | 16 27 7   | 310.722  |
| 50   | 9072413.500 | 429712.000 | 350 25 37 | 953.021  |
| 51   | 9073335.500 | 429556.500 | 14 0 9    | 1239.842 |
| 52   | 9074538.500 | 429856.500 | 317 32 51 | 334.085  |
| 53   | 9074785.000 | 429631.000 | 352 38 20 | 318.105  |
| 54   | 9075098.500 | 429590.500 | 287 22 59 | 353.128  |
| 55   | 9075204.000 | 429253.500 | 341 51 52 | 363.034  |
| 56   | 9075549.000 | 429140.500 | 270 59 44 | 829.135  |
| 57   | 9075564.500 | 428248.500 | 330 28 52 | 377.503  |
| 58   | 9075893.000 | 428062.500 | 290 30 28 | 485.253  |
| 59   | 9076063.000 | 427608.000 | 332 54 4  | 1296.305 |
| 60   | 9077217.000 | 427017.500 | 294 20 6  | 829.525  |
| 61   | 9077558.000 | 426263.500 | 333 27 38 | 497.972  |
| 62   | 9078003.500 | 426041.000 | 290 5 24  | 1425.371 |
| 63   | 9078493.500 | 424702.500 | 354 41 25 | 1215.716 |
| 64   | 9079704.000 | 424590.000 | 315 16 37 | 1755.060 |
| 65   | 9080915.000 | 423355.000 | 338 11 11 | 1749.250 |
| 66   | 9082575.000 | 422705.000 | 346 18 52 | 1268.000 |
| 67   | 9083807.000 | 422405.000 | 332 20 12 | 980.025  |
| 68   | 9084675.000 | 421950.000 | 350 35 13 | 1525.541 |
| 69   | 9086180.000 | 421700.500 | 335 1 37  | 1102.584 |
| 70   | 9087179.500 | 421235.000 | 12 58 42  | 1582.936 |
| 71   | 9088722.000 | 421590.500 | 320 22 11 | 1756.738 |
| 72   | 9090075.000 | 420470.000 | 312 55 39 | 2287.573 |
| 73   | 9091633.000 | 418795.000 | 293 29 59 | 986.847  |

COORDINATES OF INTERSECTION POINTS

| INO. | NORTHING    | EASTING    | BEARING   | DISTANCE |
|------|-------------|------------|-----------|----------|
|      | m           | m          |           | m        |
| 74   | 9092026.500 | 417890.000 | 318 52 29 | 1114.849 |
| 75   | 9092866.500 | 417157.000 | 186 15 41 | 4210.440 |
| 76   | 9094045.500 | 413115.000 | 320 0 41  | 801.387  |
| 77   | 9094659.500 | 412600.000 | 285 31 19 | 678.236  |
| 78   | 9094841.000 | 411946.500 | 338 52 19 | 545.146  |
| 79   | 9095349.500 | 411750.000 | 277 24 50 | 565.730  |
| 80   | 9095422.500 | 411189.000 | 323 7 7   | 1482.100 |
| 81   | 9096608.000 | 410299.500 | 350 17 55 | 768.490  |
| 82   | 9097365.500 | 410170.000 | 287 10 31 | 899.095  |
| 83   | 9097631.000 | 409311.000 | 20 7 22   | 928.690  |
| 84   | 9098503.000 | 409630.500 | 337 45 52 | 624.976  |
| 85   | 9099081.500 | 409394.000 | 324 24 41 | 326.482  |
| 86   | 9099347.000 | 409204.000 | 347 38 29 | 765.145  |
| 87   | 9100006.500 | 409059.500 | 331 4 32  | 983.138  |
| 88   | 9100867.000 | 408584.000 | 28 51 2   | 1104.602 |
| 89   | 9101834.500 | 409117.000 | 301 16 20 | 621.263  |
| 90   | 9102157.000 | 408586.000 | 344 40 26 | 743.439  |
| 91   | 9102874.000 | 408389.500 | 330 27 14 | 447.148  |
| 92   | 9103263.000 | 408189.000 | 343 59 20 | 598.206  |
| 93   | 9103838.000 | 408004.000 | 328 54 31 | 654.526  |
| 94   | 9104394.500 | 407666.000 | 345 16 21 | 271.417  |
| 95   | 9104661.000 | 407597.000 | 335 50 18 | 401.976  |
| 96   | 9105028.000 | 407433.000 | 324 5 49  | 355.551  |
| 97   | 9105316.000 | 407224.500 | 339 54 27 | 245.970  |
| 98   | 9105547.000 | 407140.000 | 331 53 20 | 480.706  |
| 99   | 9105971.00  | 406913.500 | 17 41 18  | 291.270  |
| 100  | 9106248.500 | 407002.000 | 5 46 11   | 338.231  |
| 101  | 9106585.000 | 407036.000 | 43 29 54  | 634.139  |
| 102  | 9107107.083 | 407531.412 | 353 19 09 | 153.962  |
| EP   | 9107260.000 | 407513.500 |           |          |



LEGEND  
 △ CONTROL POINT  
 ○ TRAVERSE POINT  
 ○ INTERSECTION POINT

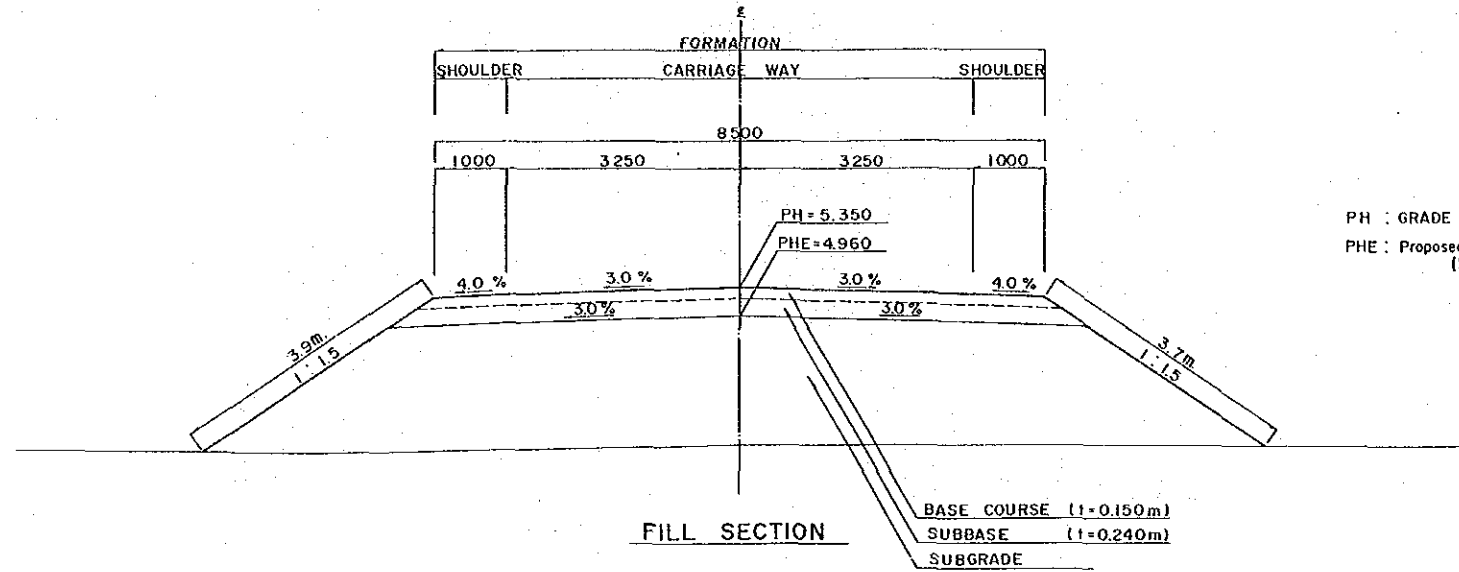
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|----------------------------------|--|---|--|------------------------|--|-----------------------------------|--|-------------------------------------|--|--|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.          |  | RECOMMENDED<br>Principal Engineer |  | SCALES<br>0 1 2 3 4 km<br>1 : 50000 |  | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | DESIGNED<br>A. Magala                             |  | CHECKED<br>A. Magala   |  | APPROVED<br>Principal Engineer    |  | PROJECT No.<br>S.C.120-33-811/B     |  | PLANS LAYOUT, COORDINATES OF CONTROL POINTS AND INTERSECTION POINTS      |  |
| HORIZONTAL DATUM                 |  | SURVEY BOOK No.8                                  |  | CHECKED<br>K. Karatani |  | EXECUTIVE ENGINEER                |  | SHEET 3 OF 303                      |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS<br>DRAWING No. A1/ 88052            |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | Date<br>25 Sep. 1989   |  | SECRETARY                         |  |                                     |  | REV.   |  |



CH. 34 + 500

PH = 5.350  
GH = 3.17

SCALE 1:50



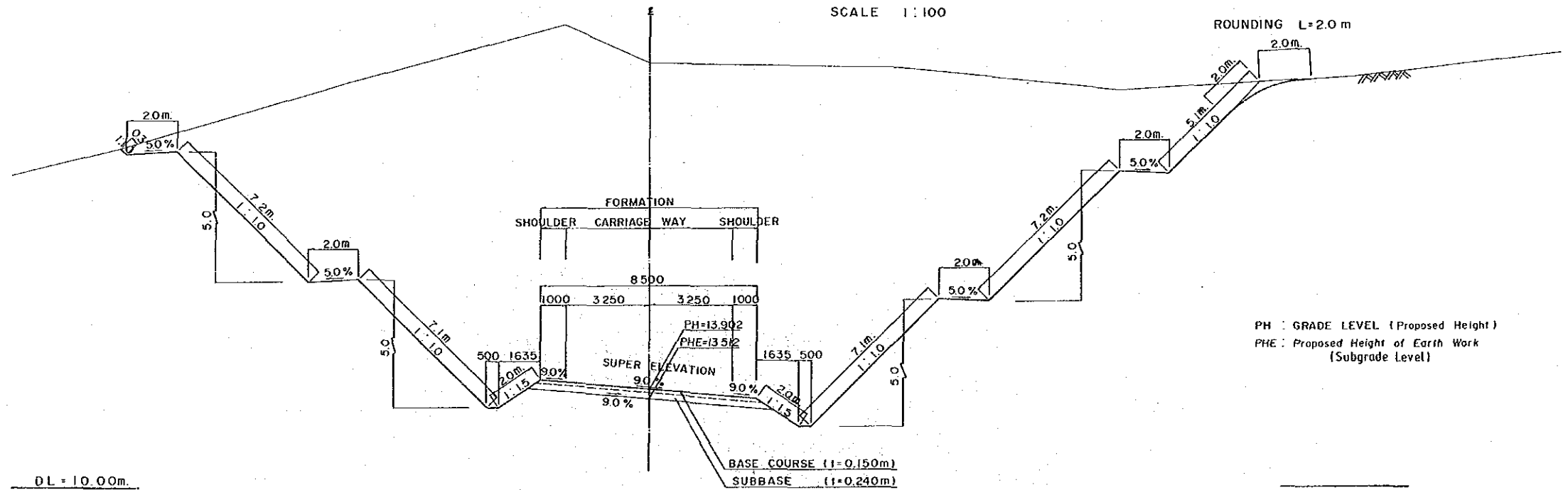
PH : GRADE LEVEL (Proposed Height)  
PHE : Proposed Height of Earth Work (Subgrade Level)

DL = 2.00m.

CH. 37 + 125

PH = 13.902  
GH = 26.67

SCALE 1:100



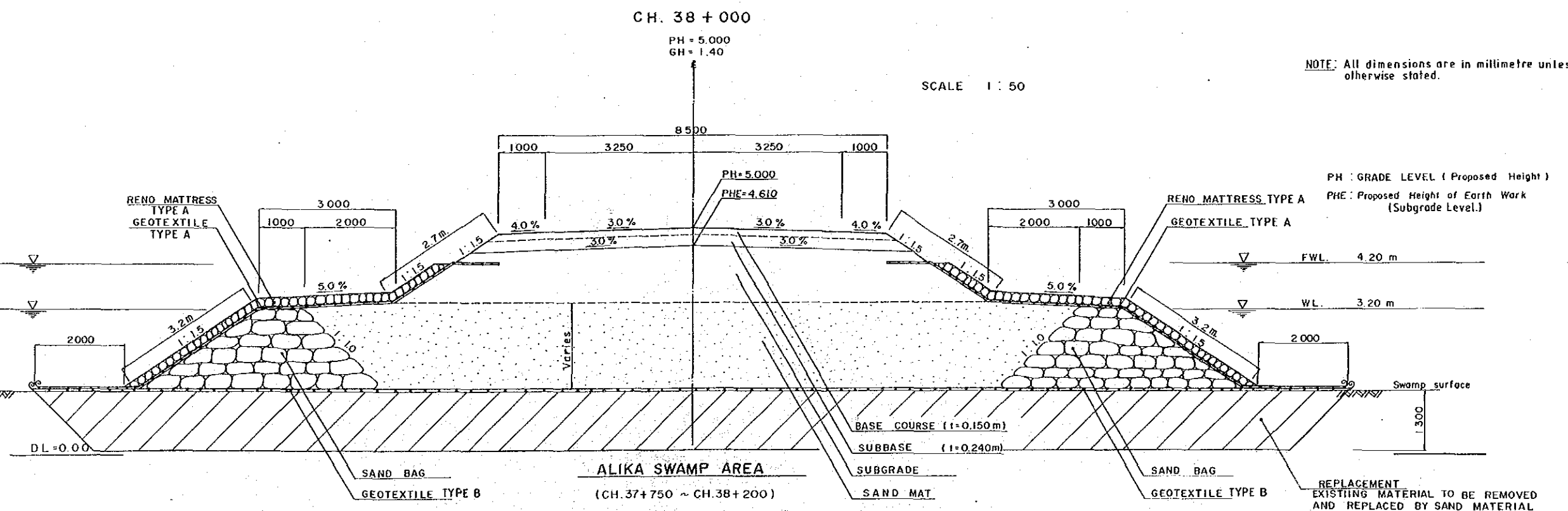
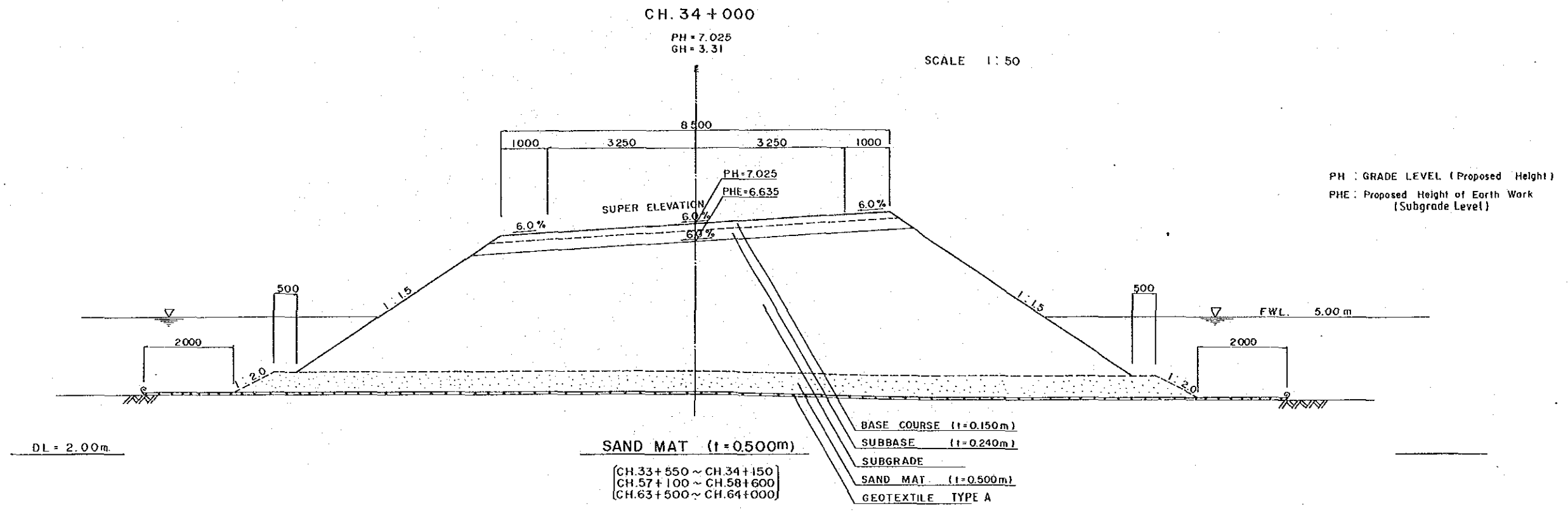
PH : GRADE LEVEL (Proposed Height)  
PHE : Proposed Height of Earth Work (Subgrade Level)

DL = 10.00m.

CUT SECTION

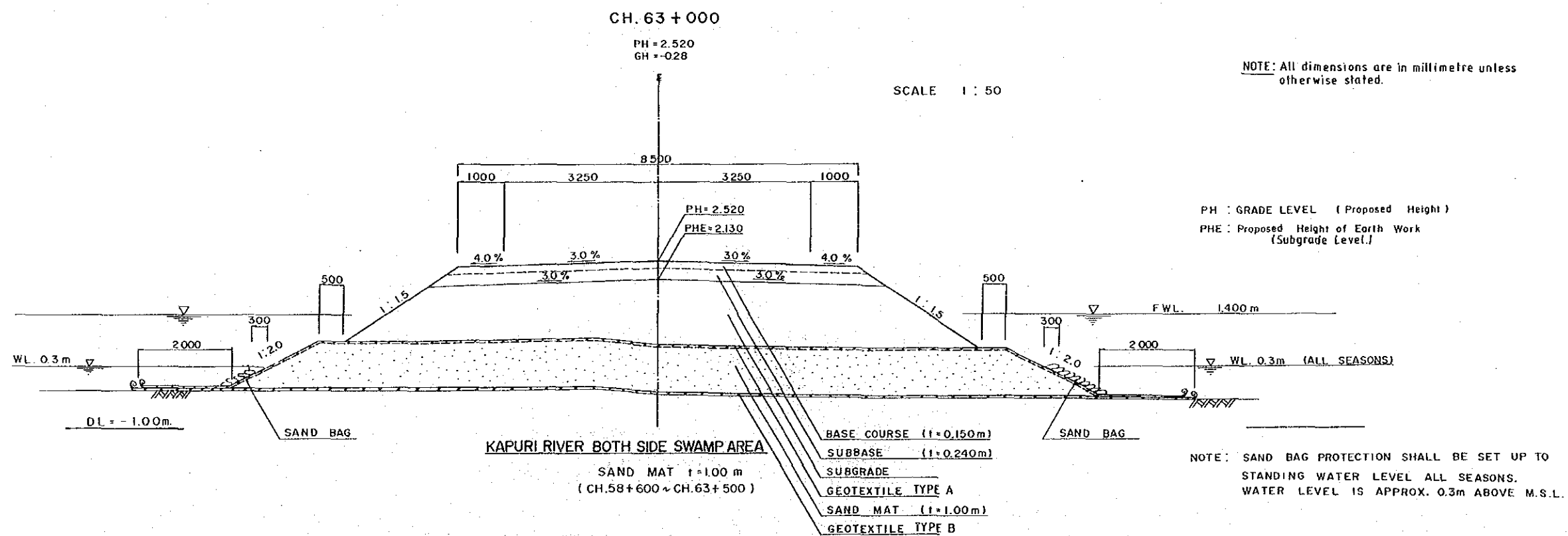
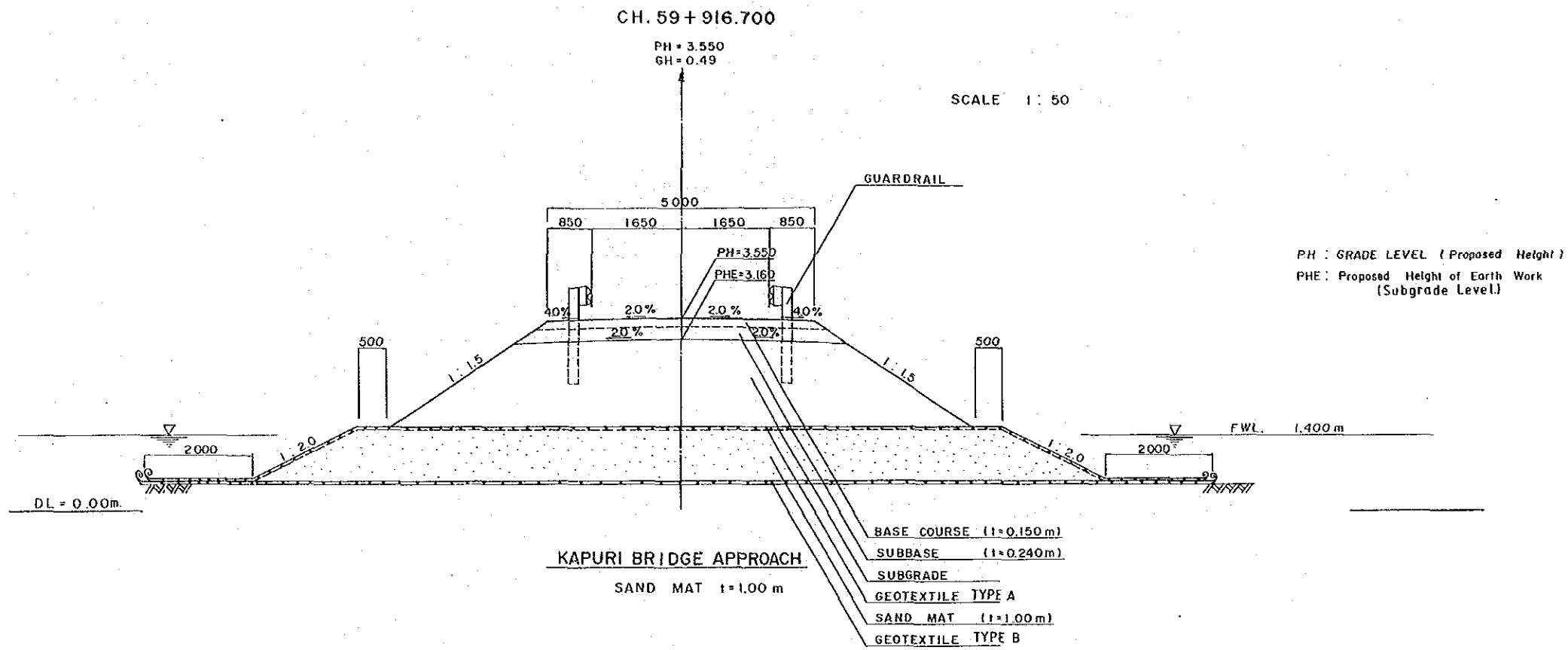
NOTE: All dimensions are in millimetre unless otherwise stated.

|                                   |  |   |  |                       |  |                                 |  |                                  |  |   |  |
|-----------------------------------|--|---|--|-----------------------|--|---------------------------------|--|----------------------------------|--|---|--|
| SURVEY<br><b>JICA</b>             |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.         |  | RECOMMENDED<br>M. Mag...        |  | SCALES<br>AS SHOWN               |  | CENTRAL / GULF PROVINCES                      |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL. |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY           |  | CHECKED<br>A. Mag...  |  | PROJECT ENGINEER<br>M. Mag...   |  | APPROVED<br>25.10.09             |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAGA SECTION |  |
| HORIZONTAL DATUM                  |  | Principal<br>J. H. ...                            |  | DESIGNED<br>A. Mag... |  | EXECUTIVE ENGINEER<br>M. Mag... |  | SECRETARY<br>F. J. ...           |  | TYPICAL CROSS SECTION (FILL & CUT SECTION)    |  |
| SURVEY BOOK N9.9                  |  | 25 Sep 1989                                       |  | CHECKED<br>P. Kawokom |  | SHEET 4 OF 303                  |  | PROJECT No.<br>S.C. 120-33-814/B |  | CH. 34 + 500, CH 37 + 125                     |  |
| AMENDMENTS                        |  | BY APP'D DATE                                     |  | EXECUTIVE ENGINEER    |  | DEPARTMENT OF WORKS             |  | DRAWING No.<br>A1/ 88053         |  | PAPUA NEW GUINEA                              |  |

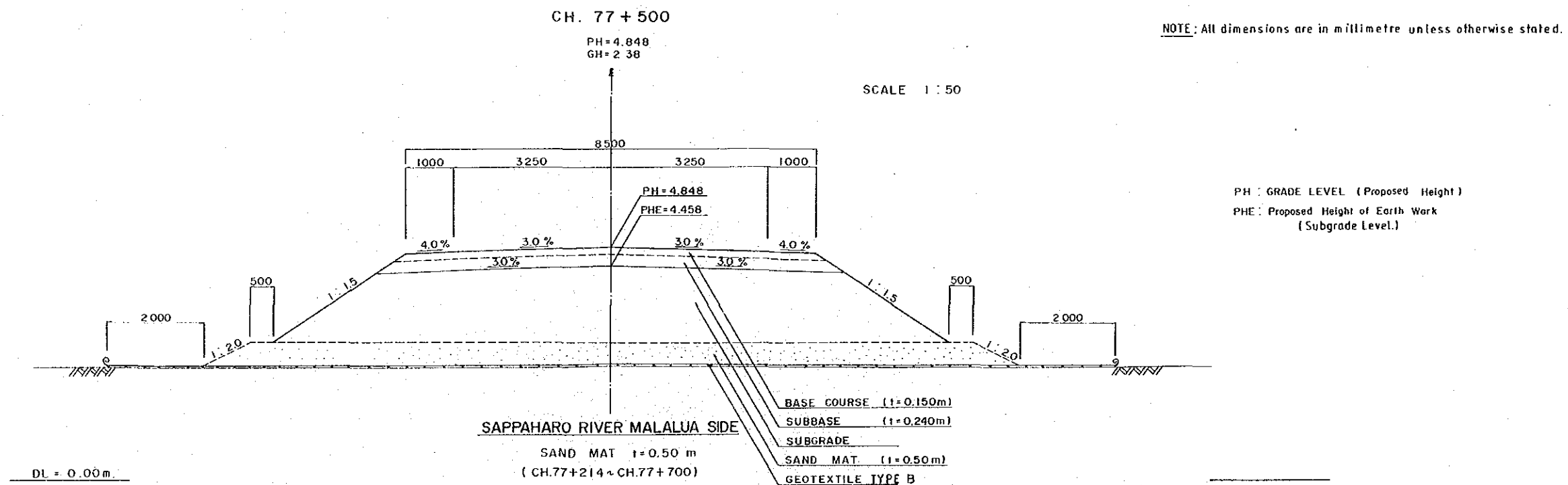
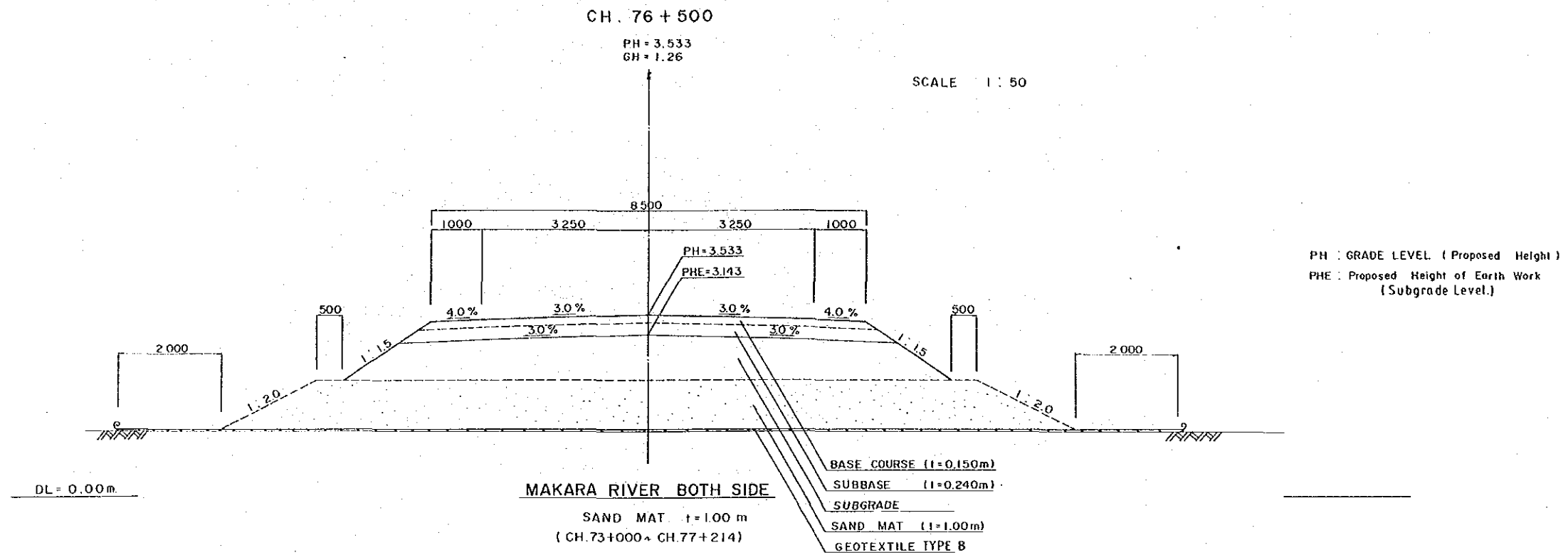


NOTE: All dimensions are in millimetre unless otherwise stated.

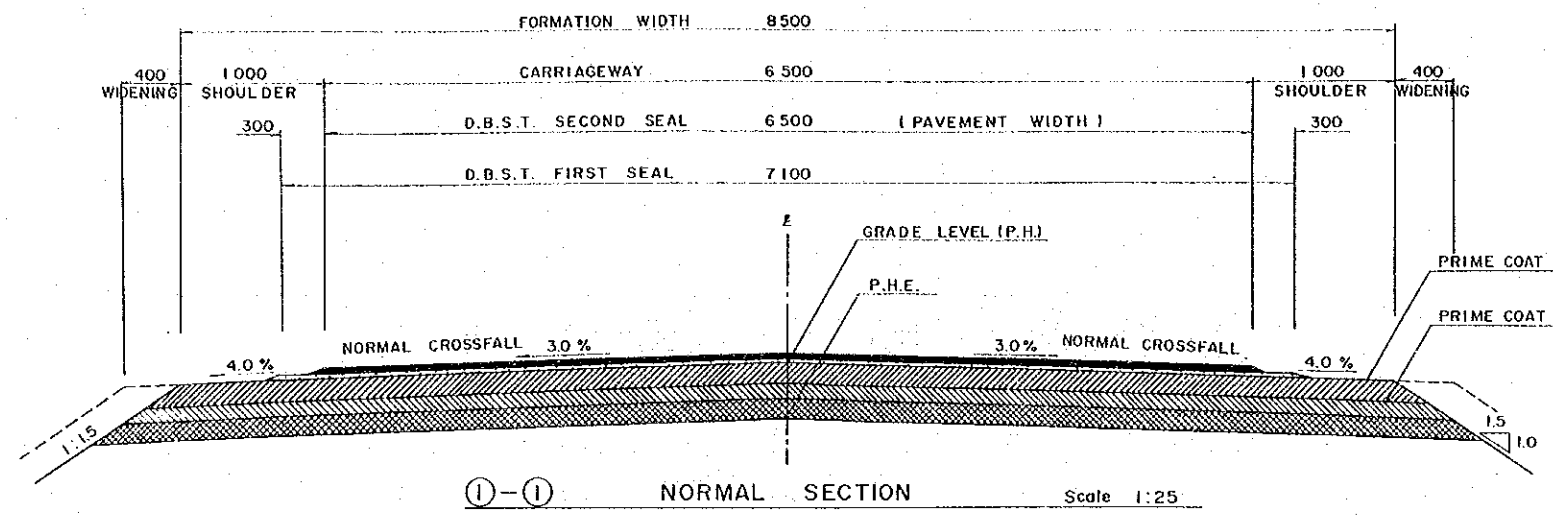
|                                  |            |   |       |                       |                      |                                  |  |                              |
|----------------------------------|------------|---|-------|-----------------------|----------------------|----------------------------------|--|------------------------------|
| SURVEY<br><b>JICA</b>            |            | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |       | DRAWN<br>K.E.         | RECOMMENDED          | SCALES<br>AS SHOWN               | CENTRAL / GULF PROVINCES   |                              |
| VERTICAL DATUM<br>MEAN SEA LEVEL |            | JAPAN INTERNATIONAL CO-OPERATION AGENCY           |       | CHECKED<br>A. Magako  | PROJECT ENGINEER     | PROJECT No.<br>S.C. 120-33-814/B | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION                       |                              |
| HORIZONTAL DATUM                 |            | Principal<br>J. H. H. H.                          |       | DESIGNED<br>A. Magako | APPROVED<br>28.10.89 |                                  | TYPICAL CROSS SECTION (SANDMAT 1=0.500 <sup>m</sup> , ALIKA SWAMP) |                              |
| REV.                             | AMENDMENTS | BY  | APP'D | DATE                  | 25 Sep. 1989         | SHEET 5 OF 303                   | CH 34+000, CH 38+000   |                              |
|                                  |            |   |       |                       | Executive Engineer   | PAPUA NEW GUINEA                 |  | DRAWING No.<br>A1/ 8 8 0 5 4 |
|                                  |            |   |       |                       | Secretary            | DEPARTMENT OF WORKS              |  |                              |



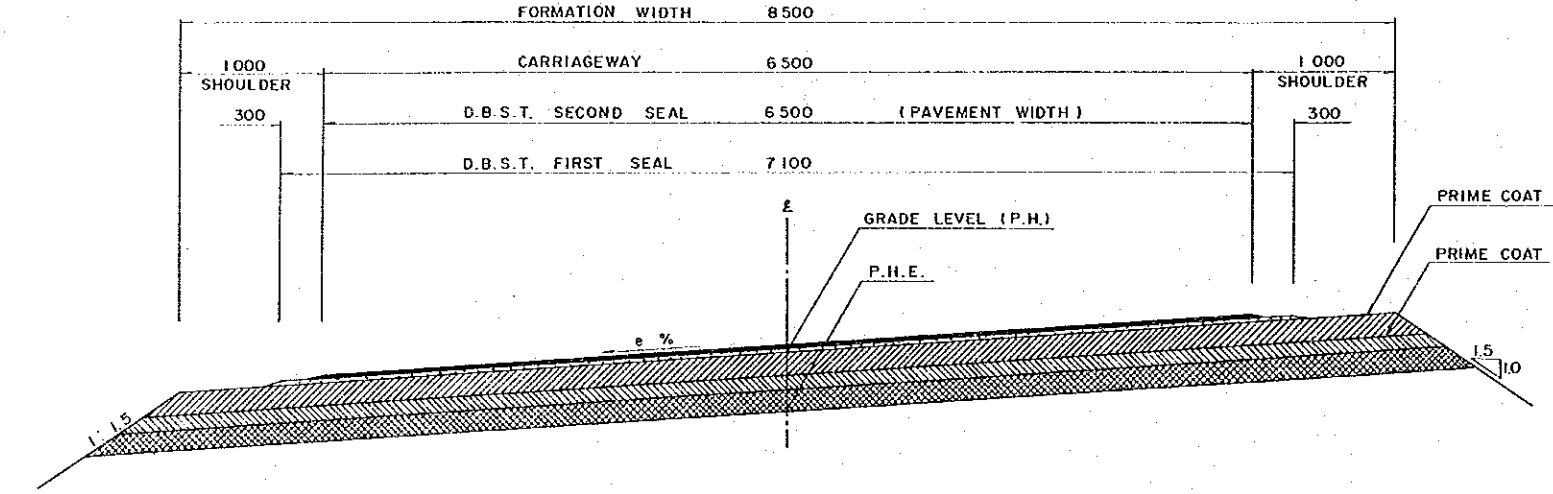
|                                  |  |   |  |                         |  |                                   |  |                                  |  |  |  |
|----------------------------------|--|---|--|-------------------------|--|-----------------------------------|--|----------------------------------|--|--|--|
| SURVEY<br>JICA                   |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K. E.          |  | RECOMMENDED<br>Principal Engineer |  | SCALES<br>AS SHOWN               |  | CENTRAL / GULF PROVINCES                     |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | Date  |  | CHECKED<br>A. Magala    |  | PROJECT ENGINEER                  |  | APPROVED<br>25.10.89             |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| HORIZONTAL DATUM                 |  | Date  |  | DESIGNED<br>A. Magala   |  | EXECUTIVE ENGINEER                |  | SECRETARY                        |  | TYPICAL CROSS SECTION (SAND MAT t=1.00m)     |  |
| SURVEY BOOK N°S                  |  | Date  |  | CHECKED<br>T. Kawalcomi |  | Principal                         |  | SHEET 6 OF 303                   |  | CH. 59 + 914 675 , CH. 63 + 000              |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | Date                    |  | Date                              |  | PROJECT No.<br>S.C. 120-33-814/B |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS      |  |
|                                  |  |   |  | 25 Sep. 1989            |  | 25.10.89                          |  |                                  |  | DRAWING No.<br>A1/ 88055                     |  |



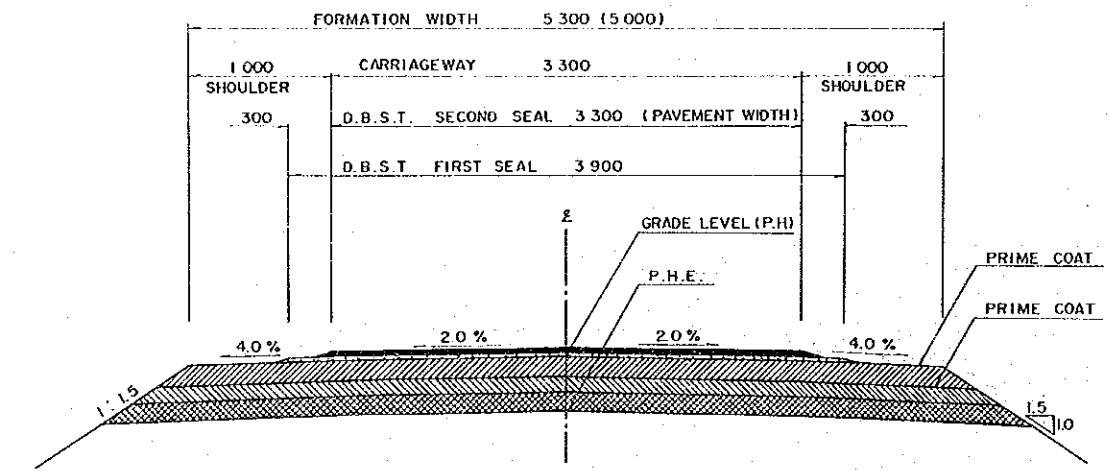
|                                  |  |   |  |                      |  |                                 |  |                                  |  |  |  |
|----------------------------------|--|---|--|----------------------|--|---------------------------------|--|----------------------------------|--|--|--|
| SURVEY<br>JICA                   |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.        |  | RECOMMENDED                     |  | SCALES<br>AS SHOWN               |  | CENTRAL / GULF PROVINCES                               |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY           |  | CHECKED<br>C. Magano |  | PROJECT ENGINEER<br>K. Kawakami |  | APPROVED<br>A. Lomax             |  | TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION           |  |
| HORIZONTAL DATUM                 |  | 25 Sep. 1989                                      |  | EXECUTIVE ENGINEER   |  | PRINCIPAL ENGINEER              |  | SHEET 7 OF 303                   |  | TYPICAL CROSS SECTION (SAND MAT t = 1.00m, t = 0.500m) |  |
| SURVEY BOOK No. 9                |  | Date  |  | EXECUTIVE ENGINEER   |  | SECRETARY                       |  | PROJECT No.<br>S.C. 120-33-814/B |  | CH 76 + 500, CH 77 + 500                               |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | EXECUTIVE ENGINEER   |  | SECRETARY                       |  | SHEET 7 OF 303                   |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS                   |  |
|                                  |  |   |  |                      |  |                                 |  |                                  |  | DRAWING No.<br>A1/ 88056                               |  |



①-① NORMAL SECTION Scale 1:25



②-② SUPERELEVATED SECTION Scale 1:25



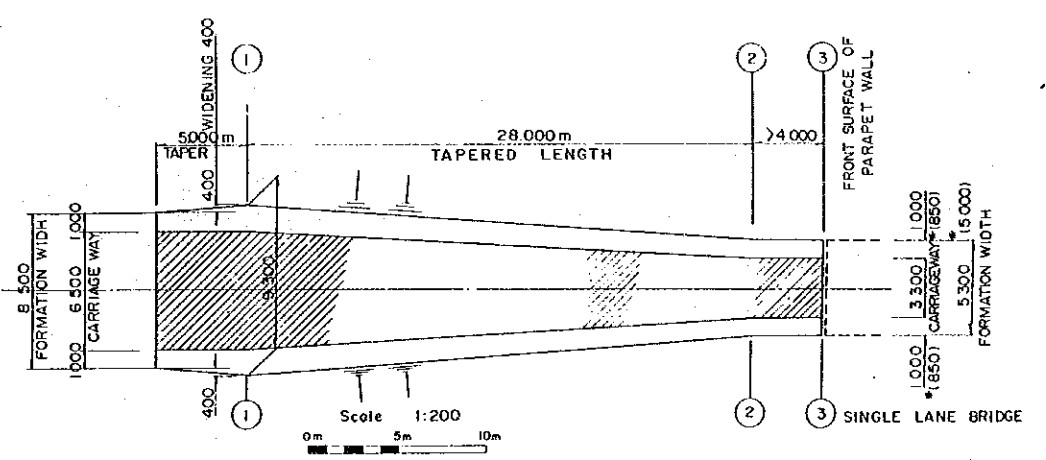
②-② APPROACH SECTION FOR SINGLE LANE BRIDGE Scale 1:25

CH.33+500 TO CH.80+596

D.B.S.T.

|                   |   |                          |  |
|-------------------|---|--------------------------|--|
| DOUBLE BITUMINOUS | SECOND SEAL   | Cover aggregate : 9.5mm  | 100-135 m <sup>3</sup> /m <sup>2</sup> |
|                   |   | Bitumen : 170            | 0.6-1.0 l/m <sup>2</sup>               |
| SURFACE TREATMENT | FIRST SEAL  | Cover aggregate : 19mm   | 65-85 m <sup>3</sup> /m <sup>2</sup>   |
|                   |   | Bitumen : 170            | 1.25-1.65 l/m <sup>2</sup>             |
|                   | PRIME COAT with Cutback bitumen                           | 0.4-0.8 l/m <sup>2</sup> |  |
|                   | 150mm COMPACTED BASE COURSE (CEMENT TREATED SANDY GRAVEL) |                          |  |
|                   | PRIME COAT with Cutback bitumen                           | 0.4-0.8 l/m <sup>2</sup> |  |
|                   | 100mm COMPACTED SUBBASE (CEMENT TREATED SANDY GRAVEL)     |                          |  |
|                   | 140mm COMPACTED SUBBASE (SANDY GRAVEL)                    |                          |  |

NOTE: ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

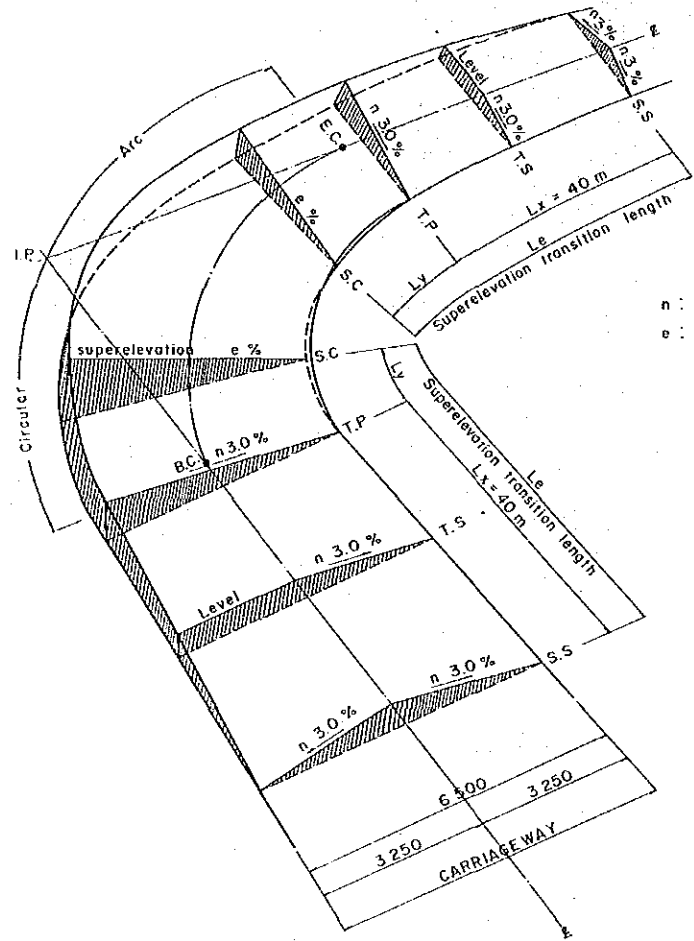


LOCATION OF APPROACH SECTION FOR SINGLE LANE BRIDGE

| ①             | ②    | ③        | NAME OF BRIDGE | ③'                | ②'   | ①'    |
|---------------|------|----------|----------------|-------------------|------|-------|
| CH.33<br>+778 | +806 | +810.250 | MIARU Br.      | CH.33<br>+903.750 | +908 | +936  |
| CH.59<br>+887 | +915 | +919.400 | KAPURI Br.     | CH.59<br>+987.400 | +992 | +1020 |
| CH.67<br>+144 | +172 | +176.200 | LAKEKAMU Br.   | CH.67<br>+297.800 | +302 | +330  |
| CH.68<br>+645 | +673 | +677.200 | TAURI Br.      | CH.68<br>+798.800 | +803 | +831  |
| CH.75<br>+879 | +907 | +911.800 | MAKARA Br.     | CH.75<br>+954.150 | +959 | +987  |
| CH.77<br>+182 | +210 | +214.100 | SAPPAHARO Br.  | CH.77<br>+256.450 | +261 | +289  |

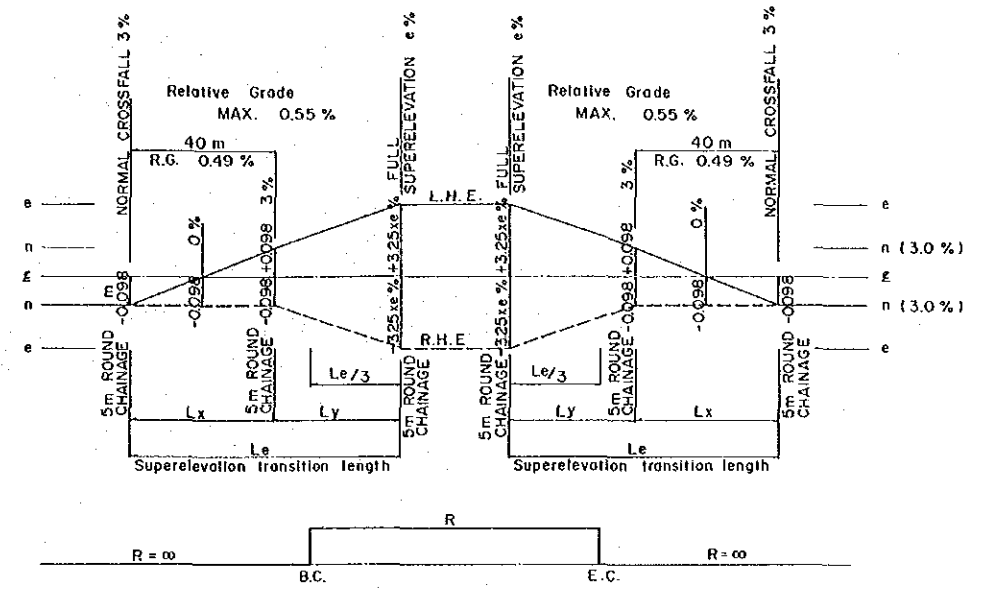
NOTES: ③, ③' are located front surface of parapet wall.  
① 5000 Formation width between ② and ③

|                                  |            |   |       |                                |                                 |                                |                  |  |                          |
|----------------------------------|------------|---|-------|--------------------------------|---------------------------------|--------------------------------|------------------|--|--------------------------|
| SURVEY<br>JICA                   |            | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |       | DRAWN<br>K.E.                  |                                 | RECOMMENDED<br>AS SHOWN        |                  | CENTRAL / GULF PROVINCES                       |                          |
| VERTICAL DATUM<br>MEAN SEA LEVEL |            | J. H. H. Principal                                |       | PROJECT ENGINEER<br>K. K. K.   |                                 | PRINCIPAL ENGINEER<br>M. M. M. |                  | TRANS-ISLAND HIGHWAY BEREINA-MALALAUUA SECTION |                          |
| HORIZONTAL DATUM                 |            | 25 Sep. 1989 Date                                 |       | DESIGNED<br>A. M. M.           |                                 | APPROVED<br>26.10.88           |                  | TYPICAL PAVEMENT SECTION FOR ROAD              |                          |
| SURVEY BOOK NO. 5                |            | Principal   |       | EXECUTIVE ENGINEER<br>T. K. K. |                                 | SECRETARY<br>S. S. S.          |                  | CH.33+500 TO CH.80+596                         |                          |
| REV.                             | AMENDMENTS | BY  | APP'D | DATE                           | PROJECT No.<br>S.C.120-33-814/B |                                | PAPUA NEW GUINEA |  | DRAWING No.<br>A1/ 88057 |

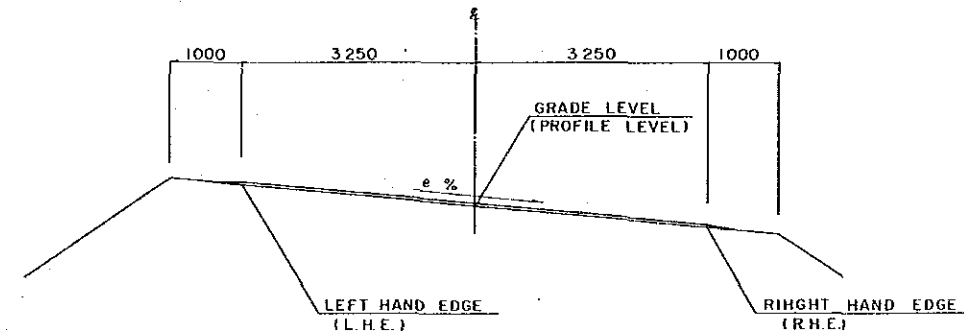


n : NORMAL CROSSFALL ON STRAIGHT (3%)  
 e : MAXIMUM SUPERELEVATION  
 (RELATED TO HORIZONTAL CURVATURE)

DEVELOPMENT OF SUPERELEVATION



SIMPLE CURVE  
 ( STRAIGHT — CIRCULAR — STRAIGHT )



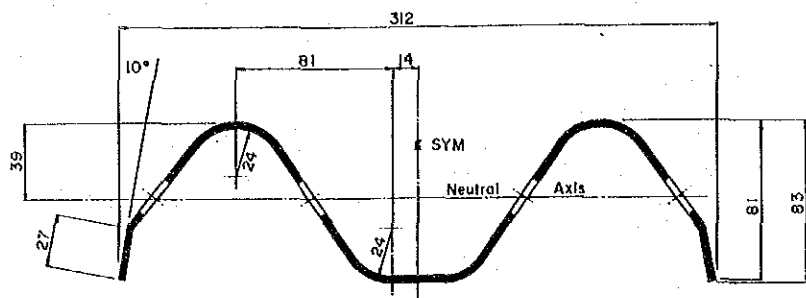
| SUPERELEVATION RATE e (%) | HORIZONTAL CURVE RADIUS R (m) |
|---------------------------|-------------------------------|
| 10                        | 155 ≤ R < 180                 |
| 9                         | 180 ≤ R < 220                 |
| 8                         | 220 ≤ R < 260                 |
| 7                         | 260 ≤ R < 320                 |
| 6                         | 320 ≤ R < 420                 |
| 5                         | 420 ≤ R < 580                 |
| 4                         | 580 ≤ R < 880                 |
| 3                         | 880 ≤ R                       |

RATE OF SUPERELEVATION RELATED TO HORIZONTAL CURVATURE

| RELATIVE GRADE n (%) ~ n (%) ~ e (%) | Le (m) | Lx (m) | Ly (m) | Le/3 (m) |
|--------------------------------------|--------|--------|--------|----------|
| -3.0 ~ +3.0 ~ +10.0                  | 90     | 40     | 50     | 30       |
| -3.0 ~ +3.0 ~ +9.0                   | 80     | 40     | 40     | 27       |
| -3.0 ~ +3.0 ~ +8.0                   | 75     | 40     | 35     | 25       |
| -3.0 ~ +3.0 ~ +7.0                   | 70     | 40     | 30     | 23       |
| -3.0 ~ +3.0 ~ +6.0                   | 60     | 40     | 20     | 20       |
| -3.0 ~ +3.0 ~ +5.0                   | 55     | 40     | 15     | —        |
| -3.0 ~ +3.0 ~ +4.0                   | 50     | 40     | 10     | —        |
| -3.0 ~ +3.0 ~ —                      | 40     | 40     | —      | —        |

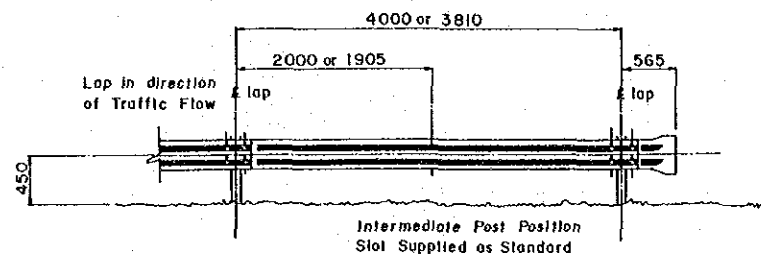
RELATIVE LENGTH IN DEVELOPMENT SUPERELEVATION

|                                  |  |   |  |                     |  |                         |  |                                      |  |  |  |
|----------------------------------|--|---|--|---------------------|--|-------------------------|--|--------------------------------------|--|--|--|
| SURVEY<br>JICA                   |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.       |  | RECOMMENDED<br>A. Magat |  | SCALES<br>N.T.S.                     |  | CENTRAL / GULP PROVINCES                     |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | HORIZONTAL DATUM                                  |  | CHECKED<br>A. Magat |  | APPROVED<br>24.10.89    |  | SHEET 9 OF 303                       |  | TRANS-ISLAND HIGHWAY HERAINA-MALALAU SECTION |  |
| SURVEY BOOK N°S                  |  | J. Mani   |  | EXECUTIVE ENGINEER  |  | SECRETARY               |  | PROJECT No.<br>S.C. 120-33-814/B     |  | SUPERELEVATION                               |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | 25 Sep. 1989        |  | Date                    |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS |  | DRAWING No.<br>A1/ 87766                     |  |

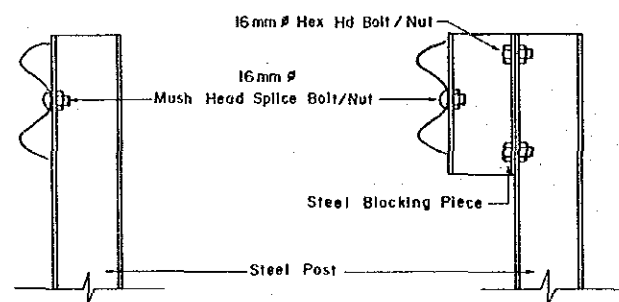


| T mm | A mm <sup>2</sup> | Z x 10 <sup>3</sup> mm <sup>3</sup> | I x 10 <sup>8</sup> mm <sup>4</sup> | Wt/m kg |
|------|-------------------|-------------------------------------|-------------------------------------|---------|
| 2.7  | 1284              | 122.45                              | 8030                                | 10.29   |

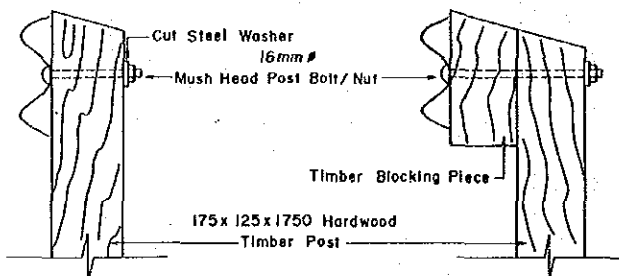
DIMENSIONS AND PHYSICAL PROPERTIES OF GUARDRAIL



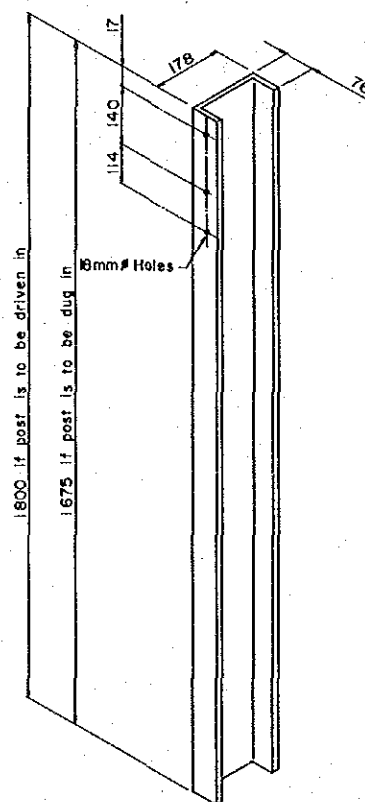
INSTALLATION



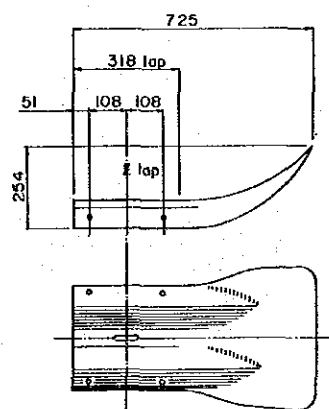
STEEL POST AS NORMALLY SUPPLIED WITH GUARDRAIL



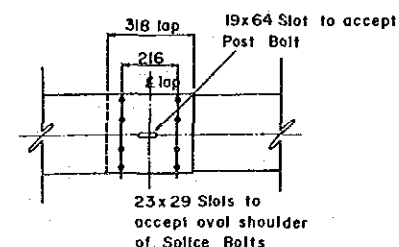
ALTERNATIVE TIMBER POSTS



STANDARD POSTS



STANDARD TERMINAL SECTION

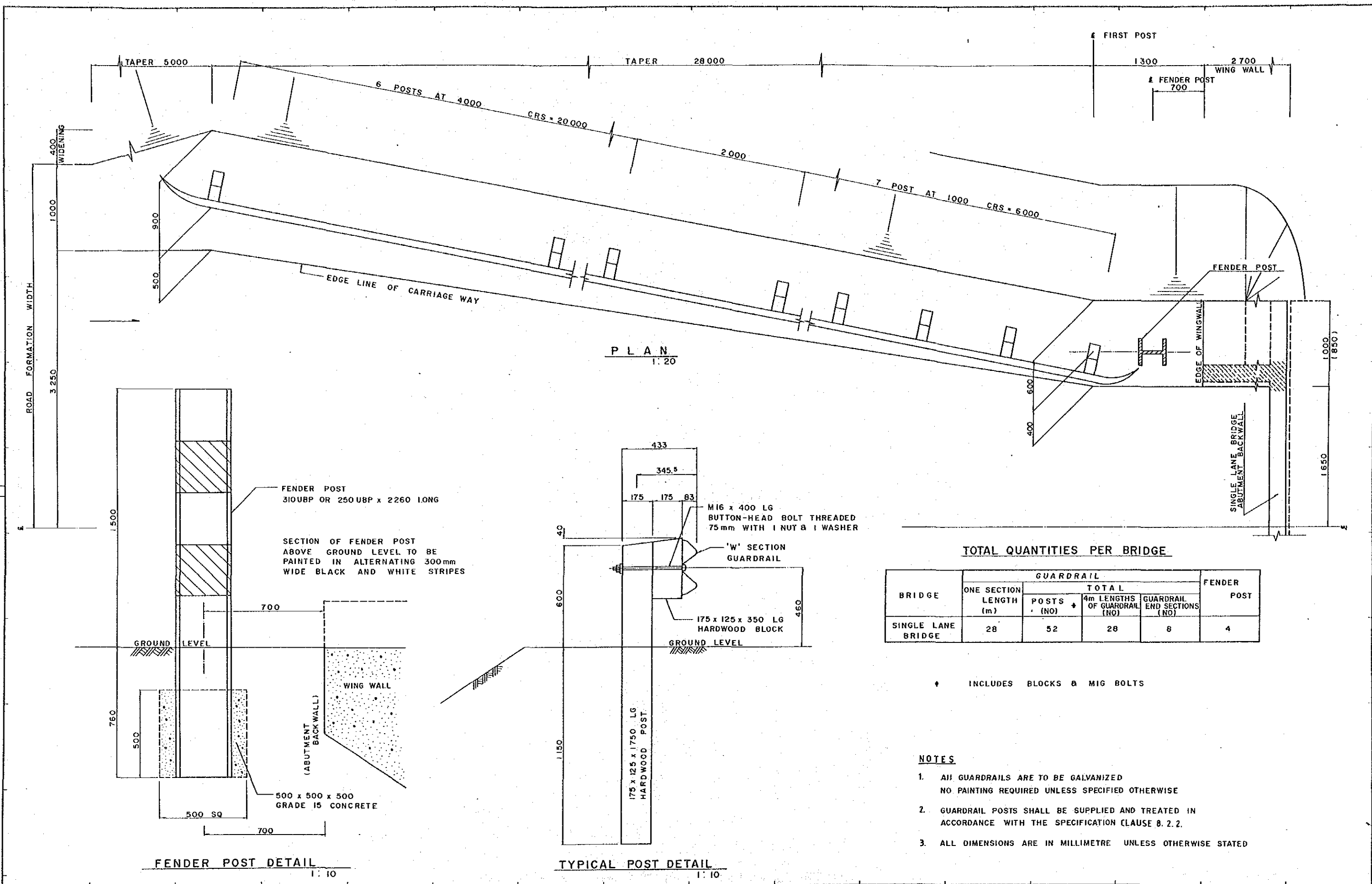


RAIL SPLICE

NOTES

- Guardrail to be installed as per manufacturers recommendations and to the specification.
- Where the guardrail is galvanized the following paint treatment shall be applied
  - Pretreat with "Dulux Lithoform N2 Z" or approved equivalent.
  - 1 coat of "Dulux PI Primer" or approved equivalent to a dry film thickness of 50 microns.
  - 2 coats of "Dulux Dureclor" or approved equivalent to a dry film thickness of 38 microns per coat.
- Where the guardrail is not galvanized the paint treatment shall be 2b and 2c above.
- Guardrail posts shall be treated in accordance with the specification.

|            |  |                                  |       |   |                    |                        |                    |                          |                                  |  |                          |
|------------|--|----------------------------------|-------|---|--------------------|------------------------|--------------------|--------------------------|----------------------------------|--|--------------------------|
|            |  | SURVEY<br><b>JICA</b>            |       | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |                    | DRAWN<br>K.E.          |                    | RECOMMENDED<br>P.M. Waye |                                  | CENTRAL / GULF PROVINCES                     |                          |
|            |  | Date                             |       | Date  |                    | PROJECT ENGINEER       |                    | PRINCIPAL ENGINEER       |                                  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |                          |
|            |  | VERTICAL DATUM<br>MEAN SEA LEVEL |       | Date<br>25 Sep. 1989                              |                    | DESIGNED<br>A. Magaro  |                    | APPROVED<br>24.10.89     |                                  | STANDARD GUARDRAIL                           |                          |
|            |  | HORIZONTAL DATUM                 |       | Date  |                    | CHECKED<br>Z. Kurokawa |                    | SECRETARY                |                                  | PAPUA NEW GUINEA DEPARTMENT OF WORKS         |                          |
| AMENDMENTS |  | BY                               | APP'D | DATE  | SURVEY BOOK N.Y.S. |                        | EXECUTIVE ENGINEER |                          | PROJECT No.<br>S.C. 120-33-814/B |  | DRAWING No.<br>A1/ 87772 |



**TOTAL QUANTITIES PER BRIDGE**

| BRIDGE             | ONE SECTION LENGTH (m) | GUARDRAIL    |                              |                             | FENDER POST |
|--------------------|------------------------|--------------|------------------------------|-----------------------------|-------------|
|                    |                        | POSTS (NO) † | 4m LENGTHS OF GUARDRAIL (NO) | GUARDRAIL END SECTIONS (NO) |             |
| SINGLE LANE BRIDGE | 28                     | 52           | 28                           | 8                           | 4           |

† INCLUDES BLOCKS & MIG BOLTS

**NOTES**

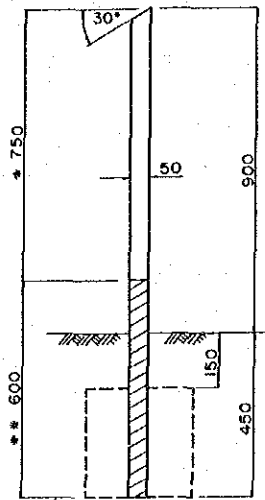
1. ALL GUARDRAILS ARE TO BE GALVANIZED  
NO PAINTING REQUIRED UNLESS SPECIFIED OTHERWISE
2. GUARDRAIL POSTS SHALL BE SUPPLIED AND TREATED IN ACCORDANCE WITH THE SPECIFICATION CLAUSE 8.2.2.
3. ALL DIMENSIONS ARE IN MILLIMETRE UNLESS OTHERWISE STATED

|  |            |  |       |  |       |  |    |            |             |   |  |
|--|------------|--|-------|--|-------|--|----|------------|-------------|---|--|
| <b>JICA</b><br>SURVEY<br>Date<br>VERTICAL DATUM<br>MEAN SEA LEVEL<br>HORIZONTAL DATUM<br>SURVEY BOOK NO. & |            | DESIGN<br><b>JAPAN INTERNATIONAL CO-OPERATION AGENCY</b><br>J. H. ...<br>Principal<br>25 Sep. 1989<br>Date |       | DRWN<br>K. E.<br>CHECKED<br>...<br>DESIGNED<br>...<br>CHECKED<br>... |       | RECOMMENDED<br>...<br>PROJECT ENGINEER<br>...<br>APPROVED<br>...<br>EXECUTIVE ENGINEER |    | SCALES<br> |             | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY (BEREINA-MALALAUJA SECTION)<br><b>GUARDRAIL &amp; FENDER POST DETAILS</b><br>(APPROACH FOR SINGLE LANE BRIDGE)<br>PAPER NEW GUINEA<br>DEPARTMENT OF WORKS<br>DRAWING No.<br><b>A1/ 88058</b> |  |
| REV.   | AMENDMENTS | BY   | APP'D | DATE   | SHEET | 11   | OF | 303        | PROJECT No. | S.C. 120-33-814/11  |  |

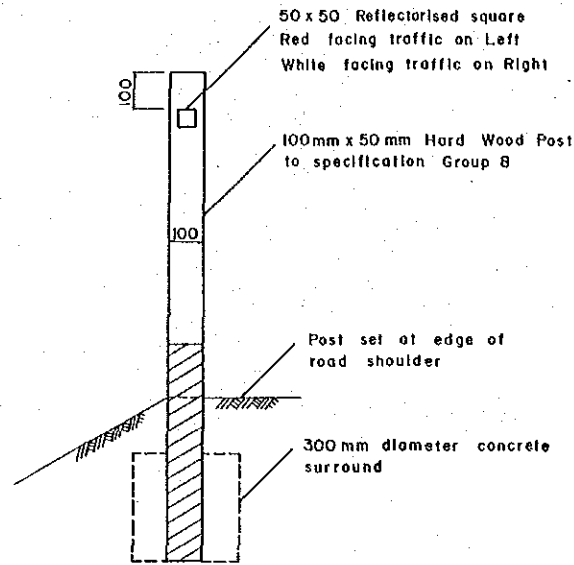


\* Upper 750 mm to be primed and painted with 1 coat of white undercoat and 1 coat of white enamel.

\*\* Lower 600 mm to be treated with 3 liberal coats of Creosote (3 hours drying time between coats)



SIDE VIEW  
1:10



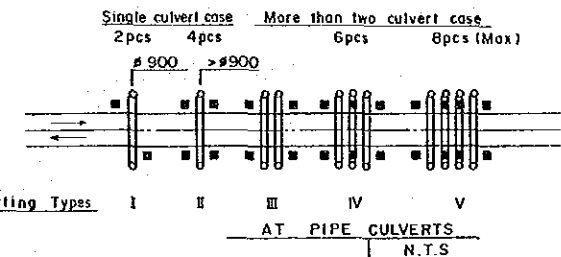
VIEW FROM APPROACHING TRAFFIC  
1:10

SPACING OF ROAD EDGE GUIDE POSTS

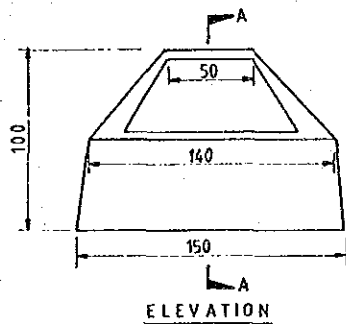
SPACING ON OUTER EDGE OF THE CURVES

| RADIUS    | SPACING ON OUTSIDE OF CURVE | DISTANCE FROM TP ON APPROACH |    |    |    | TYPE OF SETTING SPACING |
|-----------|-----------------------------|------------------------------|----|----|----|-------------------------|
|           |                             | L1                           | L2 | L3 | L4 |                         |
| 30        | 6                           | 8                            | 18 | 30 |    |                         |
| 31 50     | 8                           | 10                           | 25 | 40 |    |                         |
| 51 100    | 10                          | 12                           | 30 | 50 |    |                         |
| 101 200   | 12                          | 15                           | 35 | 60 | A  |                         |
| 201 300   | 15                          | 20                           | 45 | 70 | B  |                         |
| 301 400   | 20                          | 30                           | 60 |    | C  |                         |
| 401 500   | 30                          | 40                           |    |    | D  |                         |
| 501 600   | 40                          | 60                           |    |    | E  |                         |
| 601 1000  | 60                          |                              |    |    | F  |                         |
| 1001 2000 | 100                         |                              |    |    | G  |                         |
| OVER 2000 |                             |                              |    |    |    |                         |

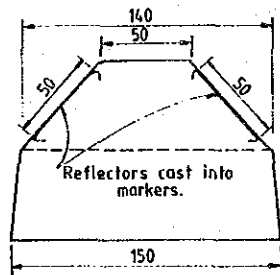
- CURVES**
  - INSIDE OF CURVES**  
To be placed at tangent points (TP)
  - OUTSIDE OF CURVES**  
To be placed at tangent points at even intervals around the curve and at approaches to curves as set out in the table.
- PIPE CULVERTS**  
At inlet and outlets on the approach side of the less than 900mm single culvert. Multiple culverts and/or more than 900mm single culverts to be placed as figure below.
- SINGLE LANE BRIDGE**  
In pairs at commencement of taper in width of formation and 10m before.



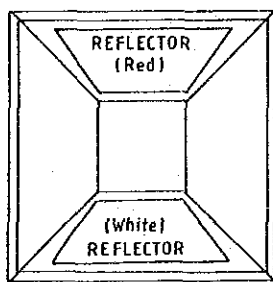
Setting Types I II III IV V  
AT PIPE CULVERTS  
N.T.S



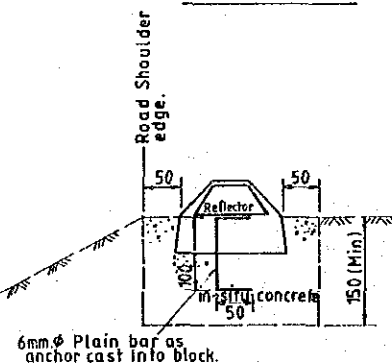
ELEVATION



SECTION A-A



PLAN

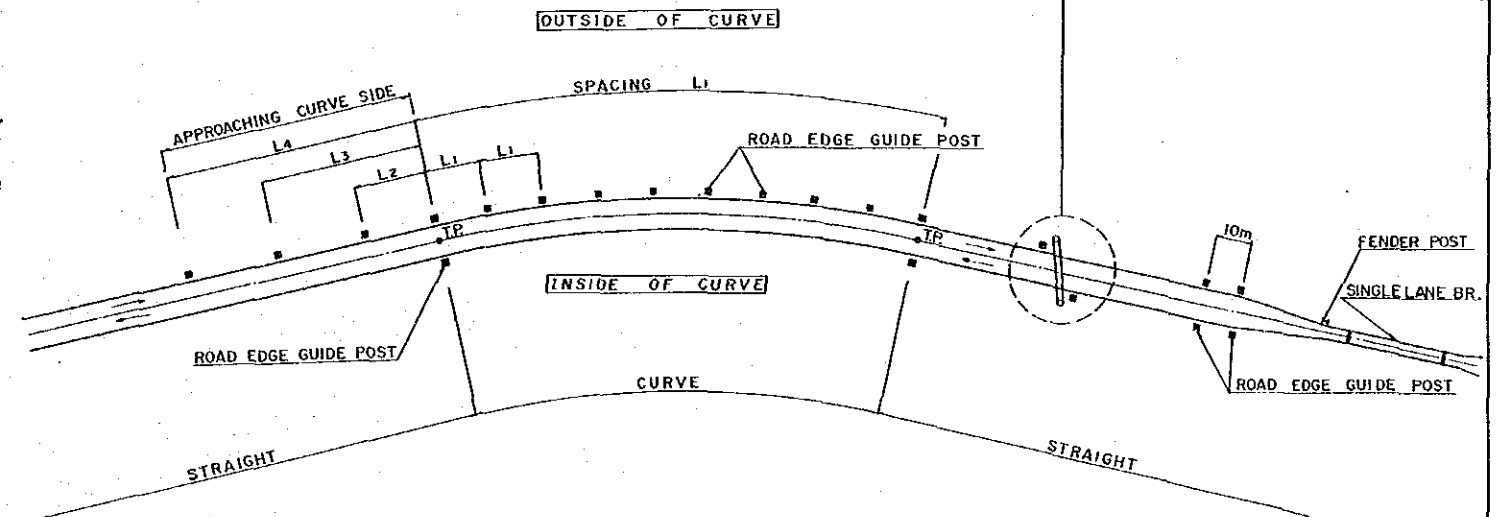


INSTALLATION VIEW

NOTES

- Scale 1:2 unless shown otherwise.
- Markers to be painted with two coats of road paint (WHITE).
- Concrete Grade 15
- Reflectors to be coated aluminium colours conforming to Australian Standard AS1743 1975
- All dimensions in millimetres
- Spacing of road edge guide markers on straights, crests inside of curves culverts and bridges shall be in accordance with AS1742 Part 2 - 1982
- Spacing of road edge guide markers on an outside of curves shall be as set out in the table below.
- To be placed at tangent point on both sides.

| RADIUS    | SPACING ON OUTSIDE OF CURVES |
|-----------|------------------------------|
| 30        | 6                            |
| 31 50     | 8                            |
| 51 100    | 10                           |
| 101 200   | 12                           |
| 201 300   | 15                           |
| 301 400   | 20                           |
| 401 500   | 30                           |
| 501 600   | 40                           |
| 601 1000  | 60                           |
| 1001 2000 | 100                          |
| OVER 2000 | 150                          |



LOCATION OF ROAD EDGE GUIDE POSTS  
1:1000

ROAD EDGE MARKERS  
1:5

|                                  |  |   |  |                        |  |                                |  |  |  |
|----------------------------------|--|---|--|------------------------|--|--------------------------------|--|--|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.          |  | RECOMMENDED<br>AS SHOWN        |  | CENTRAL / GULF PROVINCES                     |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | Date  |  | CHECKED<br>A.M. Magati |  | PRINCIPAL ENGINEER<br>24.10.85 |  | TRANS-ISLAND HIGHWAY BERBINA-MALALAU SECTION |  |
| HORIZONTAL DATUM                 |  | Date  |  | CHECKED<br>Kawakami    |  | EXECUTIVE ENGINEER             |  | ROAD EDGE GUIDE POST & ROAD EDGE MARKERS     |  |
| SURVEY BOOK NO. 8                |  | Date  |  | CHECKED<br>Kawakami    |  | SECRETARY                      |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS         |  |
| REV. AMENDMENTS                  |  | BY APP'D DATE                                     |  | SHEET 12 OF 303        |  | PROJECT No. S.C. 120-33-814/B  |  | DRAWING No. A1/ 87774                        |  |

SCHEDULE OF ROAD EDGE GUIDE POST

CURVES

| CURVE NO. | CHAINAGE           |              | SETTING TYPE | QUANTITY (NOS) |               |                  | TOTAL |
|-----------|--------------------|--------------|--------------|----------------|---------------|------------------|-------|
|           | BEGINNING OF CURVE | END OF CURVE |              | APPROACH SIDE  | TANGENT POINT | OUTSIDE OF CURVE |       |
| 49        | 33+648.184         | 33+773.581   | C            | 2              | 4             | 6                | 12    |
| 50        | 33+942.512         | 34+096.948   | C            | 2              | 4             | 12               | 18    |
| 51        | 34+744.705         | 35+156.180   | F            | 0              | 4             | 6                | 10    |
| 52        | 36+026.288         | 36+321.886   | B            | 3              | 4             | 19               | 26    |
| 53        | 36+419.044         | 36+566.035   | B            | 3              | 4             | 9                | 16    |
| 54        | 36+678.215         | 36+906.001   | A            | 3              | 4             | 18               | 25    |
| 55        | 37+028.120         | 37+218.296   | A            | 3              | 4             | 15               | 22    |
| 56        | 37+336.051         | 37+583.430   | A            | 3              | 4             | 20               | 27    |
| 57        | 38+196.120         | 38+445.292   | B            | 3              | 4             | 16               | 23    |
| 58        | 38+540.181         | 38+819.248   | C            | 2              | 4             | 13               | 19    |
| 59        | 38+965.113         | 39+335.067   | D            | 1              | 4             | 12               | 17    |
| 60        | 40+297.521         | 40+566.764   | C            | 2              | 4             | 13               | 19    |
| 61        | 41+112.202         | 41+385.350   | C            | 2              | 4             | 13               | 19    |
| 62        | 41+542.440         | 41+920.774   | D            | 1              | 4             | 12               | 17    |
| 63        | 42+831.417         | 43+395.016   | D            | 1              | 4             | 18               | 23    |
| 64        | 44+026.107         | 44+542.027   | F            | 0              | 4             | 8                | 12    |
| 68        | 49+782.212         | 50+228.152   | G            | 0              | 4             | 4                | 8     |
| 69        | 51+255.563         | 51+798.711   | G            | 0              | 4             | 5                | 9     |
| 70        | 52+284.186         | 52+946.562   | F            | 0              | 4             | 11               | 15    |
| 71        | 53+814.903         | 54+503.547   | F            | 0              | 4             | 11               | 15    |
| 73        | 57+936.912         | 58+411.620   | G            | 0              | 4             | 4                | 8     |
| 74        | 58+843.415         | 59+463.852   | G            | 0              | 4             | 6                | 10    |
| 75        | 60+087.680         | 60+429.382   | F            | 1              | 4             | 8                | 13    |
| 76        | 64+160.851         | 64+749.901   | F            | 0              | 4             | 9                | 13    |
| 77        | 65+030.655         | 65+452.024   | F            | 0              | 4             | 7                | 11    |
| 78        | 65+661.774         | 66+127.341   | D            | 1              | 4             | 15               | 20    |
| 79        | 66+219.177         | 66+583.876   | C            | 2              | 4             | 18               | 24    |
| 80        | 66+778.921         | 67+097.999   | C            | 2              | 4             | 15               | 21    |
| 81        | 68+242.305         | 68+574.374   | F            | 0              | 4             | 5                | 9     |
| 82        | 68+866.503         | 69+417.358   | D            | 1              | 4             | 18               | 23    |
| 83        | 69+735.580         | 70+157.362   | B            | 2              | 4             | 28               | 34    |
| 84        | 70+424.864         | 71+164.157   | F            | 0              | 4             | 12               | 16    |
| 85        | 71+308.029         | 71+494.475   | F            | 0              | 4             | 3                | 7     |
| 86        | 71+603.982         | 71+847.248   | E            | 1              | 4             | 6                | 11    |
| 87        | 72+253.486         | 72+542.615   | F            | 0              | 4             | 4                | 8     |
| 88        | 73+159.475         | 73+562.821   | C            | 2              | 4             | 20               | 26    |
| 89        | 74+159.143         | 74+617.703   | B            | 3              | 4             | 30               | 37    |
| 90        | 74+752.401         | 75+131.153   | D            | 1              | 4             | 12               | 17    |
| 91        | 75+550.874         | 75+799.062   | F            | 0              | 4             | 4                | 8     |
| 92        | 76+026.540         | 76+215.526   | F            | 0              | 4             | 3                | 7     |
| 93        | 76+612.905         | 76+823.464   | F            | 0              | 4             | 3                | 7     |
| 94        | 77+300.208         | 77+443.011   | D            | 1              | 4             | 4                | 9     |
| 95        | 77+560.754         | 77+723.957   | F            | 0              | 4             | 2                | 6     |
| 96        | 77+940.592         | 78+146.973   | F            | 0              | 4             | 3                | 7     |
| 97        | 78+315.653         | 78+481.219   | E            | 1              | 4             | 4                | 9     |
| 98        | 78+573.788         | 78+713.737   | F            | 0              | 4             | 2                | 6     |
| 99        | 79+022.975         | 79+214.820   | B            | 3              | 4             | 12               | 19    |
| 100       | 79+331.039         | 79+477.256   | F            | 0              | 4             | 2                | 6     |
| 101       | 79+626.225         | 79+850.113   | C            | 2              | 4             | 11               | 17    |
| 102       | 80+364.704         | 80+531.105   | A            | 3              | 4             | 13               | 20    |

PIPE CULVERTS

| REF. NO. | CHAINAGE | DIA. OF PIPE (m) | NO. OF BARRELS | TYPE OF SETTING | REMARKS |
|----------|----------|------------------|----------------|-----------------|---------|
| 115      | 33+580   | 2 100            | 1              | II              |         |
| 116      | 33+595   | 2 100            | 1              | II              |         |
| 117      | 33+610   | 2 100            | 1              | II              |         |
| 118      | 33+655   | 2 100            | 1              | II              |         |
| 119      | 33+715   | 2 100            | 1              | II              |         |
| 120      | 33+760   | 2 100            | 1              | II              |         |
| 121      | 33+785   | 2 100            | 1              | II              |         |
| 122      | 34+050   | 2 100            | 1              | II              |         |
| 123      | 34+510   | 1 500            | 1              | II              |         |
| 124      | 34+690   | 1 500            | 2              | II              |         |
| 125      | 35+100   | 900              | 1              | I               |         |
| 126      | 35+560   | 1 500            | 2              | II              |         |
| 127      | 35+707   | 900              | 1              | I               |         |
| 128      | 35+960   | 1 500            | 4              | V               |         |
| 129      | 36+075   | 900              | 1              | I               |         |
| 130      | 36+285   | 900              | 1              | I               |         |
| 131      | 36+420   | 900              | 1              | I               |         |
| 132      | 36+715   | 1 500            | 4              | V               |         |
| 133      | 36+910   | 900              | 1              | I               |         |
| 134      | 37+300   | 1 200            | 1              | II              |         |
| 135      | 37+410   | 1 200            | 1              | II              |         |
| 136      | 37+600   | 900              | 1              | I               |         |
| 137      | 37+855   | 2 100            | 1              | II              |         |
| 138      | 37+905   | 2 100            | 1              | II              |         |
| 139      | 37+955   | 2 100            | 1              | II              |         |
| 140      | 37+980   | 2 100            | 3              | IV              |         |
| 141      | 38+005   | 2 100            | 1              | II              |         |
| 142      | 38+055   | 2 100            | 1              | II              |         |
| 143      | 38+105   | 2 100            | 1              | II              |         |
| 144      | 38+385   | 900              | 1              | I               |         |
| 145      | 38+505   | 1 500            | 1              | II              |         |
| 146      | 38+765   | 900              | 1              | I               |         |
| 147      | 39+195   | 2 100            | 1              | II              |         |
| 148      | 39+535   | 2 100            | 1              | II              |         |
| 149      | 39+843   | 900              | 1              | I               |         |
| 150      | 39+772   | 900              | 1              | I               |         |
| 151      | 40+010   | 2 100            | 1              | II              |         |
| 152      | 40+355   | 900              | 1              | I               |         |
| 153      | 40+675   | 900              | 1              | I               |         |
| 154      | 41+015   | 1 200            | 1              | II              |         |
| 155      | 41+150   | 900              | 1              | I               |         |
| 156      | 41+945   | 1 500            | 3              | IV              |         |
| 157      | 42+300   | 900              | 1              | I               |         |
| 158      | 42+510   | 900              | 1              | I               |         |
| 159      | 42+730   | 1 500            | 5              | V               |         |
| 160      | 43+180   | 900              | 2              | II              |         |
| 161      | 43+535   | 900              | 2              | II              |         |
| 162      | 43+835   | 1 500            | 3              | IV              |         |
| 163      | 44+525   | 900              | 1              | I               |         |
| 164      | 44+775   | 1 500            | 4              | V               |         |

|                                  |  |   |  |                                      |  |                                   |  |                                 |  |   |  |  |
|----------------------------------|--|---|--|--------------------------------------|--|-----------------------------------|--|---------------------------------|--|---|--|--|
| SURVEY<br>JICA<br>Date           |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.<br>Checked<br>Designed |  | RECOMMENDED<br>Principal Engineer |  | SCALES<br>1:1000                |  | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION<br>SCHEDULE OF ROAD EDGE GUIDE POST<br>CH.33+500 ~ CH.80+596 1/3 |  |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | Principal   |  | Checked<br>Designed                  |  | Approved<br>Principal Engineer    |  | PROJECT No.<br>S.C.120-33-814/B |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS<br>DRAWING No.<br>A1/ 88059   |  |  |
| HORIZONTAL DATUM                 |  | Date<br>25 Sep. 1989                              |  | Checked<br>Designed                  |  | Approved<br>Principal Engineer    |  | SHEET<br>13 OF 303              |  |   |  |  |
| SURVEY BOOK No.                  |  | BY  |  | APPD                                 |  | DATE                              |  | REV                             |  |   |  |  |

SCHEDULE OF ROAD EDGE GUIDE POST

PIPE CULVERTS

| REF. NO. | CHAINAGE | DIA. OF PIPE (m) | NO. OF BARRELS | TYPE OF SETTING | REMARKS |
|----------|----------|------------------|----------------|-----------------|---------|
| 165      | 45 + 080 | 1 200            | 1              | II              |         |
| 166      | 45 + 335 | 900              | 1              | I               |         |
| 167      | 45 + 693 | 1 500            | 3              | IV              |         |
| 168      | 45 + 835 | 1 500            | 3              | IV              |         |
| 169      | 46 + 530 | 1 200            | 1              | II              |         |
| 170      | 46 + 807 | 1 500            | 1              | II              |         |
| 171      | 46 + 890 | 1 500            | 5              | V               |         |
| 172      | 46 + 970 | 1 200            | 2              | II              |         |
| 173      | 47 + 265 | 1 200            | 1              | II              |         |
| 174      | 47 + 645 | 1 200            | 1              | II              |         |
| 175      | 47 + 920 | 1 500            | 3              | IV              |         |
| 176      | 48 + 260 | 1 500            | 1              | II              |         |
| 177      | 48 + 560 | 1 500            | 3              | IV              |         |
| 178      | 48 + 915 | 1 200            | 2              | III             |         |
| 179      | 49 + 350 | 1 500            | 2              | III             |         |
| 180      | 49 + 570 | 1 500            | 2              | III             |         |
| 181      | 49 + 815 | 1 200            | 1              | I               |         |
| 182      | 50 + 125 | 900              | 1              | I               |         |
| 183      | 50 + 440 | 900              | 1              | I               |         |
| 184      | 50 + 640 | 1 500            | 3              | IV              |         |
| 185      | 50 + 750 | 1 500            | 1              | II              |         |
| 186      | 50 + 930 | 1 500            | 1              | II              |         |
| 187      | 51 + 210 | 1 500            | 2              | II              |         |
| 188      | 51 + 430 | 900              | 1              | I               |         |
| 189      | 51 + 635 | 1 200            | 1              | II              |         |
| 190      | 51 + 780 | 1 200            | 1              | II              |         |
| 191      | 52 + 200 | 1 500            | 2              | III             |         |
| 192      | 52 + 355 | 1 500            | 2              | III             |         |
| 193      | 52 + 970 | 1 500            | 2              | III             |         |
| 194      | 53 + 350 | 1 500            | 1              | II              |         |
| 195      | 53 + 845 | 1 200            | 1              | II              |         |
| 196      | 54 + 165 | 900              | 1              | I               |         |
| 197      | 54 + 290 | 1 500            | 1              | I               |         |
| 198      | 56 + 650 | 900              | 1              | I               |         |
| 199      | 57 + 335 | 900              | 1              | I               |         |
| 200      | 57 + 940 | 900              | 1              | I               |         |
| 201      | 58 + 315 | 900              | 1              | I               |         |
| 202      | 58 + 700 | 900              | 1              | I               |         |
| 203      | 58 + 750 | 900              | 1              | I               |         |
| 204      | 58 + 800 | 900              | 1              | I               |         |
| 205      | 58 + 850 | 900              | 1              | I               |         |
| 206      | 58 + 900 | 900              | 1              | I               |         |
| 207      | 58 + 950 | 900              | 1              | I               |         |
| 208      | 59 + 000 | 900              | 1              | I               |         |
| 209      | 59 + 050 | 900              | 1              | I               |         |
| 210      | 59 + 100 | 900              | 1              | I               |         |
| 211      | 59 + 150 | 900              | 1              | I               |         |
| 212      | 59 + 200 | 900              | 1              | I               |         |
| 213      | 59 + 250 | 900              | 1              | I               |         |
| 214      | 59 + 300 | 900              | 1              | I               |         |

PIPE CULVERTS

| REF. NO. | CHAINAGE | DIA. OF PIPE (m) | NO. OF BARRELS | TYPE OF SETTING | REMARKS |
|----------|----------|------------------|----------------|-----------------|---------|
| 215      | 59 + 350 | 900              | 1              | I               |         |
| 216      | 59 + 400 | 900              | 1              | I               |         |
| 217      | 59 + 450 | 900              | 1              | I               |         |
| 218      | 59 + 500 | 900              | 1              | I               |         |
| 219      | 59 + 550 | 900              | 1              | I               |         |
| 220      | 59 + 600 | 900              | 1              | I               |         |
| 221      | 59 + 650 | 900              | 1              | I               |         |
| 222      | 59 + 700 | 900              | 1              | I               |         |
| 223      | 59 + 750 | 900              | 1              | I               |         |
| 224      | 59 + 800 | 900              | 1              | I               |         |
| 225      | 59 + 850 | 900              | 1              | I               |         |
| 226      | 59 + 900 | 900              | 1              | I               |         |
| 227      | 60 + 100 | 900              | 1              | I               |         |
| 228      | 60 + 150 | 900              | 1              | I               |         |
| 229      | 60 + 200 | 900              | 1              | I               |         |
| 230      | 60 + 250 | 900              | 1              | I               |         |
| 231      | 60 + 300 | 900              | 1              | I               |         |
| 232      | 60 + 350 | 900              | 1              | I               |         |
| 233      | 60 + 400 | 900              | 1              | I               |         |
| 234      | 60 + 450 | 900              | 1              | I               |         |
| 235      | 60 + 500 | 900              | 1              | I               |         |
| 236      | 60 + 550 | 900              | 1              | I               |         |
| 237      | 60 + 600 | 900              | 1              | I               |         |
| 238      | 60 + 650 | 900              | 1              | I               |         |
| 239      | 60 + 700 | 900              | 1              | I               |         |
| 240      | 60 + 750 | 900              | 1              | I               |         |
| 241      | 60 + 800 | 900              | 1              | I               |         |
| 242      | 60 + 850 | 900              | 1              | I               |         |
| 243      | 60 + 900 | 900              | 1              | I               |         |
| 244      | 60 + 950 | 900              | 1              | I               |         |
| 245      | 61 + 000 | 900              | 1              | I               |         |
| 246      | 61 + 050 | 900              | 1              | I               |         |
| 247      | 61 + 100 | 900              | 1              | I               |         |
| 248      | 61 + 150 | 900              | 1              | I               |         |
| 249      | 61 + 200 | 900              | 1              | I               |         |
| 250      | 61 + 250 | 900              | 1              | I               |         |
| 251      | 61 + 300 | 900              | 1              | I               |         |
| 252      | 61 + 350 | 900              | 1              | I               |         |
| 253      | 61 + 400 | 900              | 1              | I               |         |
| 254      | 61 + 450 | 900              | 1              | I               |         |
| 255      | 61 + 500 | 900              | 1              | I               |         |
| 256      | 61 + 550 | 900              | 1              | I               |         |
| 257      | 61 + 600 | 900              | 1              | I               |         |
| 258      | 61 + 650 | 900              | 1              | I               |         |
| 259      | 61 + 700 | 900              | 1              | I               |         |
| 260      | 61 + 750 | 900              | 1              | I               |         |
| 261      | 61 + 800 | 900              | 1              | I               |         |
| 262      | 61 + 876 | 900              | 1              | I               |         |
| 263      | 62 + 082 | 2 100            | 1              | II              |         |
| 264      | 62 + 265 | 1 200            | 1              | II              |         |

|      |            |    |       |      |                                   |   |                               |                                |                 |   |   |                          |
|------|------------|----|-------|------|-----------------------------------|---|-------------------------------|--------------------------------|-----------------|---|---|--------------------------|
| REV. | AMENDMENTS | BY | APP'D | DATE | SURVEY                            | DESIGN                                  | DRAWN                         | RECOMMENDED                    | SCALES          | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION<br>SCHEDULE OF ROAD EDGE GUIDE POST<br>CH.33+500 - CH.80+596 2/3 | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS | DRAWING No.<br>A1/ 88060 |
|      |            |    |       |      | JICA                              | JAPAN INTERNATIONAL CO-OPERATION AGENCY | K.E.                          | <i>[Signature]</i>             |                 |   |   |                          |
|      |            |    |       |      | VERTICAL DATUM<br>MEAN SEA LEVEL. |   | CHECKED<br><i>[Signature]</i> | PROJECT ENGINEER               |                 |   |   |                          |
|      |            |    |       |      | HORIZONTAL DATUM                  |   | DESIGNED<br>A. Magalis        | APPROVED<br><i>[Signature]</i> |                 |   |   |                          |
|      |            |    |       |      | SURVEY BOOK No. 6                 | 25 Sep. 1989                            | CHECKED<br>Z. Kaurkosi        | EXECUTIVE ENGINEER             | SHEET 14 OF 303 | PROJECT No.<br>S.C. 120-33-814/B  |   |                          |

**SCHEDULE OF ROAD EDGE GUIDE POST**

**PIPE CULVERTS**

| REF. NO. | CHAINAGE | DIA. OF PIPE (m/m) | NO. OF BARRELS | TYPE OF SETTING | REMARKS |
|----------|----------|--------------------|----------------|-----------------|---------|
| 265      | 62 + 570 | 1 200              | I              | II              |         |
| 266      | 62 + 770 | 2 100              | I              | II              |         |
| 267      | 62 + 956 | 2 100              | I              | II              |         |
| 268      | 63 + 100 | 2 100              | I              | II              |         |
| 269      | 63 + 260 | 2 100              | I              | II              |         |
| 270      | 63 + 400 | 2 100              | I              | II              |         |
| 271      | 63 + 510 | 2 100              | I              | II              |         |
| 272      | 63 + 590 | 1 200              | I              | II              |         |
| 273      | 63 + 735 | 900                | I              | I               |         |
| 274      | 64 + 270 | 900                | I              | I               |         |
| 275      | 65 + 260 | 900                | I              | I               |         |
| 276      | 65 + 765 | 900                | I              | I               |         |
| 277      | 66 + 045 | 900                | I              | I               |         |
| 278      | 66 + 760 | 2 100              | I              | II              |         |
| 279      | 67 + 570 | 900                | I              | I               |         |
| 280      | 68 + 000 | 900                | I              | I               |         |
| 281      | 68 + 880 | 900                | I              | I               |         |
| 282      | 69 + 040 | 900                | I              | I               |         |
| 283      | 69 + 265 | 900                | I              | I               |         |
| 284      | 69 + 705 | 900                | I              | I               |         |
| 285      | 69 + 900 | 900                | I              | I               |         |
| 286      | 70 + 135 | 900                | I              | I               |         |
| 287      | 70 + 300 | 900                | I              | I               |         |
| 288      | 70 + 550 | 900                | I              | I               |         |
| 289      | 70 + 700 | 900                | I              | I               |         |
| 290      | 71 + 100 | 900                | I              | I               |         |
| 291      | 71 + 435 | 900                | I              | I               |         |
| 292      | 72 + 030 | 900                | I              | I               |         |
| 293      | 72 + 240 | 900                | I              | I               |         |
| 294      | 73 + 350 | 900                | I              | I               |         |
| 295      | 73 + 760 | 900                | I              | I               |         |
| 296      | 74 + 285 | 900                | I              | I               |         |
| 297      | 74 + 600 | 900                | I              | I               |         |
| 298      | 75 + 300 | 900                | I              | I               |         |
| 299      | 76 + 346 | 2 100              | I              | II              |         |
| 300      | 76 + 520 | 900                | I              | I               |         |
| 301      | 77 + 290 | 900                | I              | I               |         |
| 302      | 77 + 395 | 900                | I              | I               |         |
| 303      | 79 + 015 | 2 100              | I              | II              |         |
| 304      | 79 + 140 | 900                | I              | I               |         |

**SINGE LANE BRIDGES**

| BRIDGE NAME  | UNIT | QUANTITY | REMARKS |
|--------------|------|----------|---------|
| MIARU Br.    | NO.  | 8        | 4 x 2   |
| KAPULI Br.   | NO.  | 8        | 4 x 2   |
| LAKEKAMU Br. | NO.  | 8        | 4 x 2   |
| TAURI Br.    | NO.  | 8        | 4 x 2   |
| MAKARA Br.   | NO.  | 8        | 4 x 2   |
| SAPPHARO Br. | NO.  | 8        | 4 x 2   |

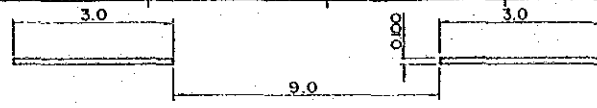
**SIDE DITCH PIPE CULVERTS**

| REF. NO. | CHAINAGE          | DIA. OF PIPE (m/m) | NO. OF BARRELS | TYPE OF SETTING | REMARKS |
|----------|-------------------|--------------------|----------------|-----------------|---------|
| 1003     | 33+521<br>~33+541 | 900                | I              | I               | LHS     |
| 1004     | 33+521<br>~33+539 | 900                | I              | I               | RHS     |
| 1005     | 80+308<br>~80+327 | 900                | I              | I               | LHS     |
| 1006     | 80+360<br>~80+381 | 900                | I              | I               | RHS     |
| 1007     | 80+388<br>~80+395 | 900                | I              | I               | RHS     |
| 1008     | 80+436<br>~80+457 | 900                | I              | I               | RHS     |
| 1009     | 80+523<br>~80+541 | 900                | I              | I               | LHS     |
| 1010     | 80+532<br>~80+552 | 900                | I              | I               | RHS     |

|      |  |            |  |    |       |      |   |  |   |  |   |  |  |  |            |  |  |  |      |
|------|--|------------|--|----|-------|------|---|--|---|--|---|--|--|--|------------|--|--|--|------|
| REV. |  | AMENDMENTS |  | BY | APP'D | DATE | SURVEY<br><b>JICA</b><br>Date<br>VERTICAL DATUM<br>MEAN SEA LEVEL.<br>HORIZONTAL DATUM<br>SURVEY BOOK NRS |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY<br>J. J. J. J.<br>Principal<br>25 Sep. 1989<br>Date |  | DRAWN<br>K.E.<br>C. J. A.<br>PROJECT ENGINEER<br>A. M. J. J.<br>CHECKED<br>EXECUTIVE ENGINEER |  | RECOMMENDED<br>APPROVED<br>PRINCIPAL ENGINEER<br>SECRETARY |  | SCALES<br> |  | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION<br>SCHEDULE OF ROAD EDGE GUIDE POST<br>CH.33+500 - CH.80+596 3/3<br>PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS<br>DRAWING No.<br>A1/ 88061 |  | REV. |
|------|--|------------|--|----|-------|------|---|--|---|--|---|--|--|--|------------|--|--|--|------|

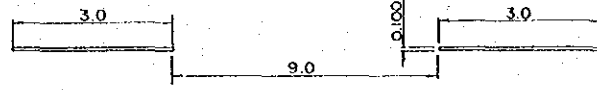
① SEPARATION LINE

To separate opposing traffic movements. Overtaking or right turning movements may be made across it in both directions. On multi lane roads, the line segment to gap proportions may be reversed to distinguish the separation line from lane lines.



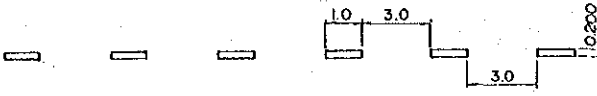
② LANE LINES

To indicate the portion of the road assigned to a single file of vehicles moving in one direction. Overtaking and right turning movements may be made across it.



③ CONTINUITY LINE

To indicate the edge of that portion of a carriageway assigned to through traffic, and which is intended to be crossed by traffic turning at an intersection, or entering or leaving an auxiliary lane at its start or finish.



④ LANE LINES

To separate lanes of traffic moving in the same direction, where lane changing is prohibited.



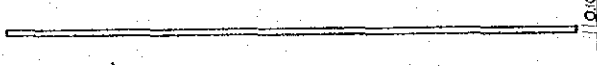
⑤ TRANSITION LINES

To deflect vehicles laterally at points at which:  
(a) the width of the carriageway changes to a greater or lesser number of lanes; or  
(b) Traffic has to negotiate median traffic islands, salty zones, or obstructions on the road.



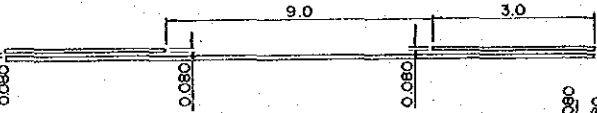
⑥ EDGE LINES

To delineate the outer edge of the travelled way.



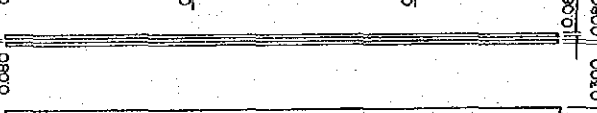
⑦ ONE WAY BARRIER LINE

To take the place of a single separation line where overtaking is permitted in one direction only.



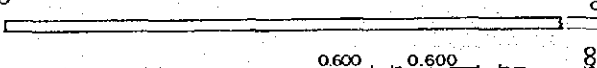
⑧ TWO WAY BARRIER LINE

To take the place of single separation line where overtaking is not permitted in either direction.



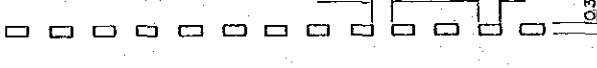
⑨ STOP LINES

To indicate the point behind which vehicles are legally required to stop.



⑩ HOLDING LINES

To indicate the safe position for a vehicle to be held at a "Give Way" sign.



⑪ PEDESTRIAN CROSSING

To indicate a full time pedestrian priority crossing. The bars are placed parallel with the  $\Sigma$  of the Road.



⑫ CROSSWALK MARKINGS

To be used in conjunction with midblock or intersection signals to define pedestrian crossing.



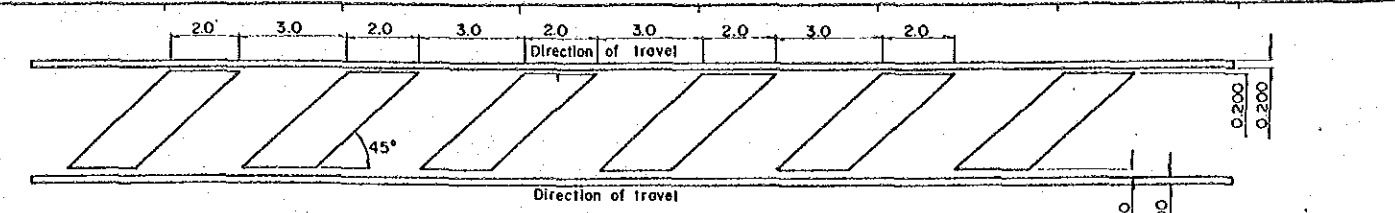
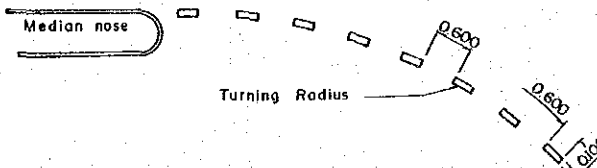
⑬ PART TIME PEDESTRIAN CROSSING MARKING

To indicate crossings which operate only part time e.g. school crossing.

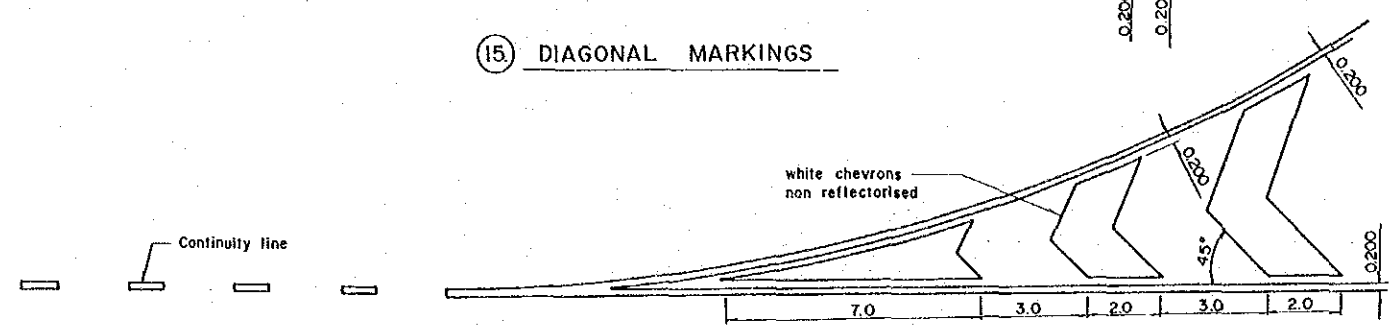


⑭ TURN LINES

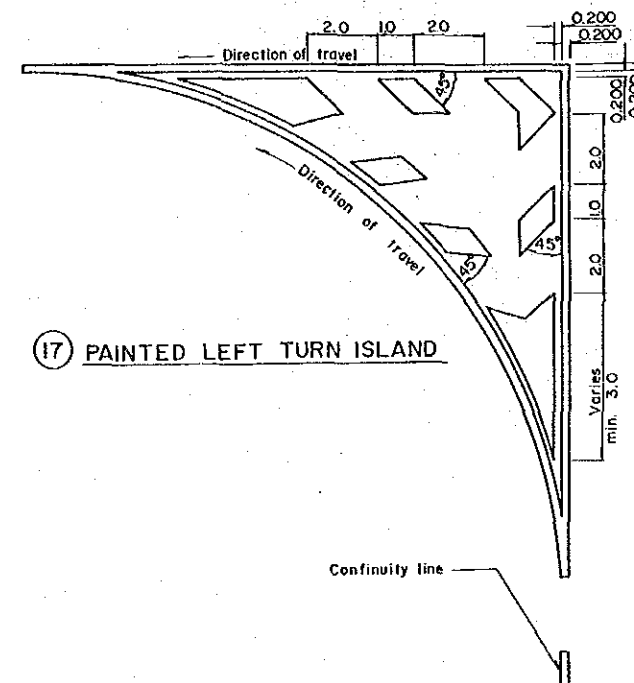
To indicate the proper course to be followed by turning vehicles at major or complex intersections.



⑮ DIAGONAL MARKINGS



⑯ WHITE CHEVRON MARKING



⑰ PAINTED LEFT TURN ISLAND

NOTES

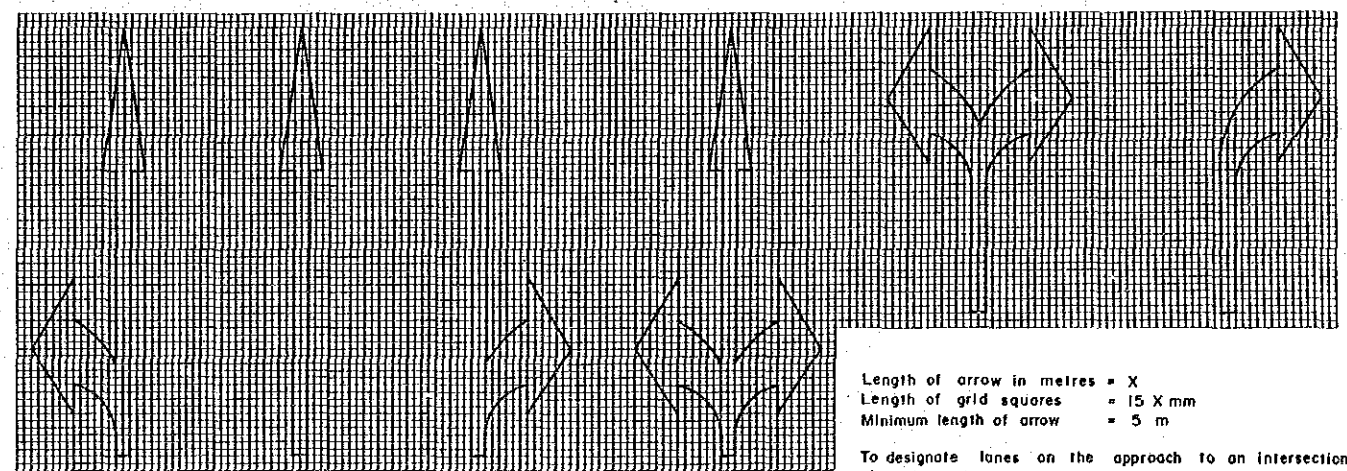
A. COLOUR: The colour of the pavement marking shall be white, except for the alternative uses of yellow specified below.  
(i) The unbroken portion of barrier lines, and  
(ii) Parking lines to indicate areas whose use is restricted. Where yellow is used, the colour shall be Golden yellow, colour N 356 in A.S.K 185, colours for specific purposes.

B. REFLECTORS: Self cleansing reflective pavement markers should be used in conjunction with painted pavement markings and mountable type kerbing. Reflectors should be spaced at 12m intervals in lit areas, and 24m intervals in unlit areas.

C. MESSAGES ON PAVEMENTS: To conform to section 7.5.3 of A.S.1742 part 1 1975

D. PAVEMENT MARKING PAINT: To conform to Specification Clause 8.3

E. DIMENSION: All dimensions are in metres unless otherwise stated.



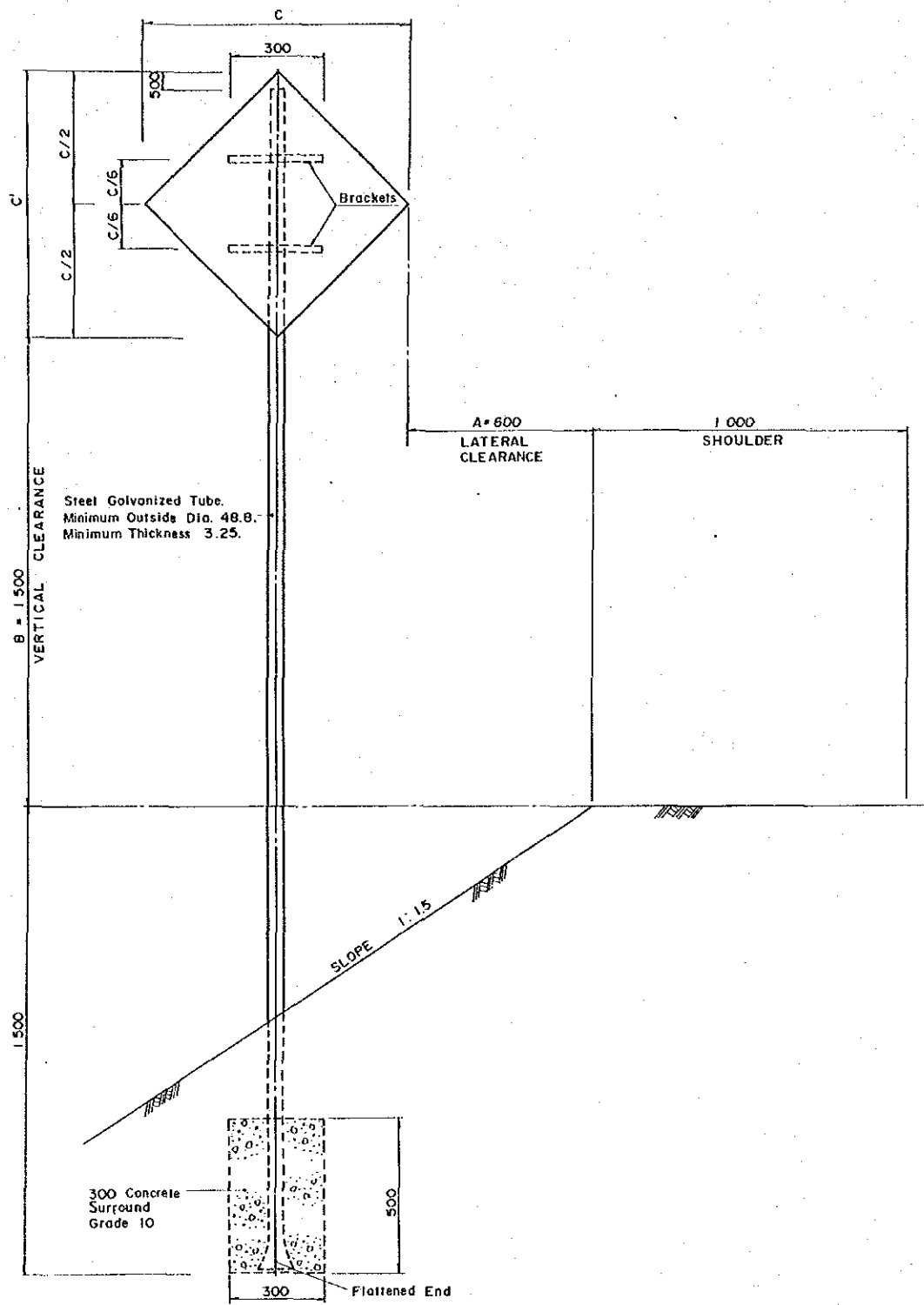
⑱ PAVEMENT ARROWS

Length of arrow in metres = X  
Length of grid squares = 15 X mm  
Minimum length of arrow = 5 m

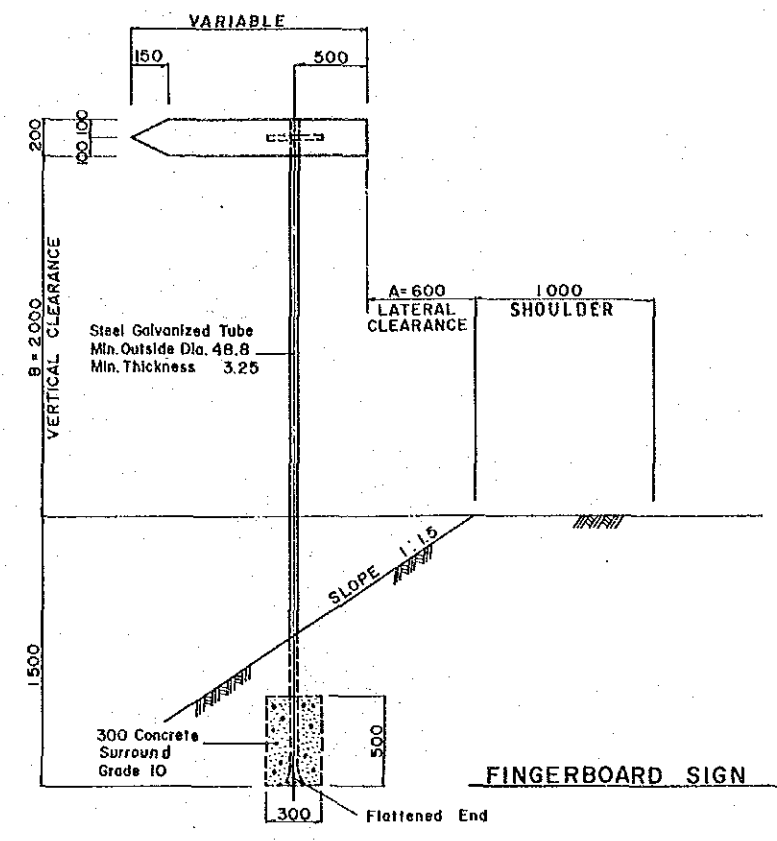
To designate lanes on the approach to an intersection  
Three arrows to be placed in each lane at a Spacing of 25m

|                                   |  |   |  |                       |  |                                   |  |                                      |  |  |  |
|-----------------------------------|--|---|--|-----------------------|--|-----------------------------------|--|--------------------------------------|--|--|--|
| SURVEY<br>JICA                    |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.         |  | RECOMMENDED<br>Principal Engineer |  | SCALES                               |  | CENTRAL / GULF PROVINCES                         |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL. |  | J. Malin<br>25 Sep. 1989                          |  | CHECKED<br>A. Magatho |  | APPROVED<br>Executive Engineer    |  | PROJECT No.<br>S.C.120-33-814/B      |  | TRANS-ISLAND HIGHWAY (BEREINA-MALALAUUA SECTION) |  |
| HORIZONTAL DATUM                  |  | Date  |  | CHECKED<br>K. Kankam  |  | SECRETARY                         |  | SHEET 16 OF 303                      |  | PAVEMENT MARKINGS                                |  |
| SURVEY BOOK NOS                   |  | BY APP'D DATE                                     |  | EXECUTIVE ENGINEER    |  | SECRETARY                         |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS |  | DRAWING No.<br>A1/ 87777                         |  |

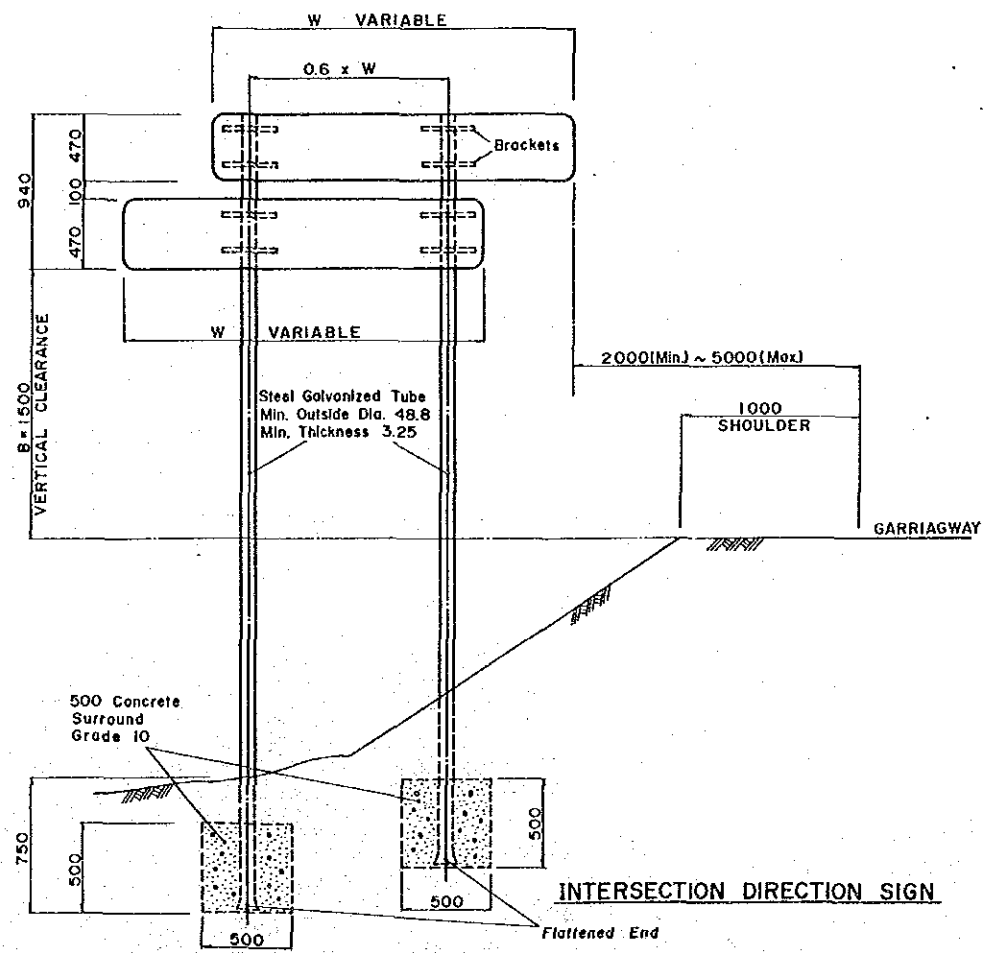




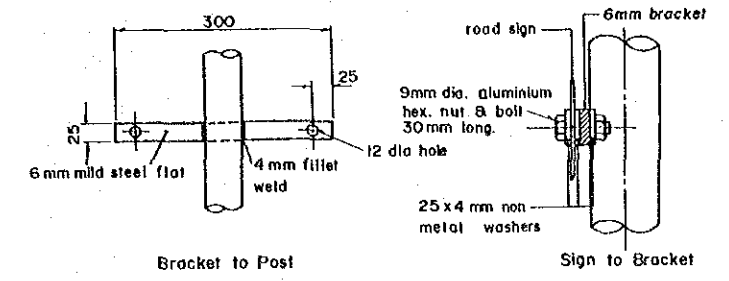
REGULATORY SIGN, WARNING SIGN



FINGERBOARD SIGN



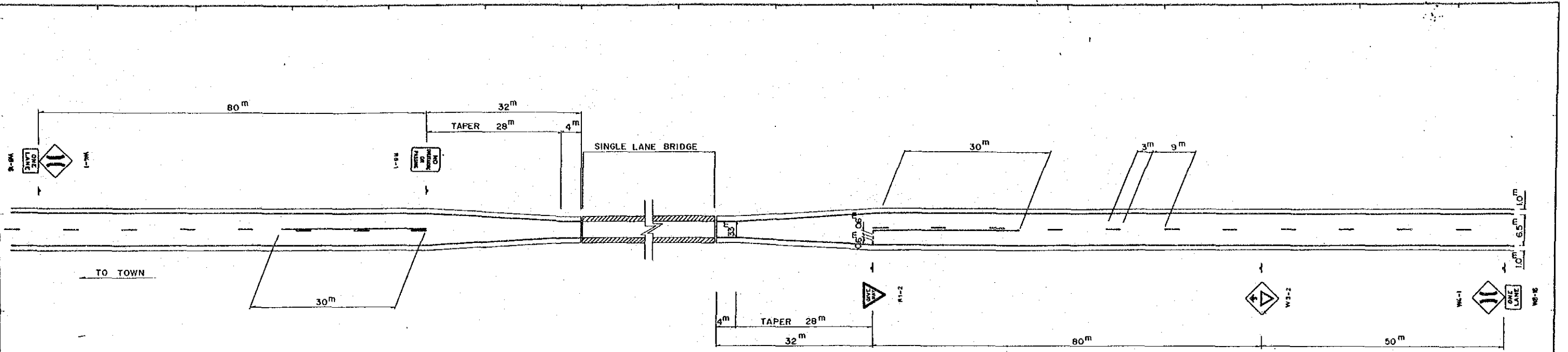
INTERSECTION DIRECTION SIGN



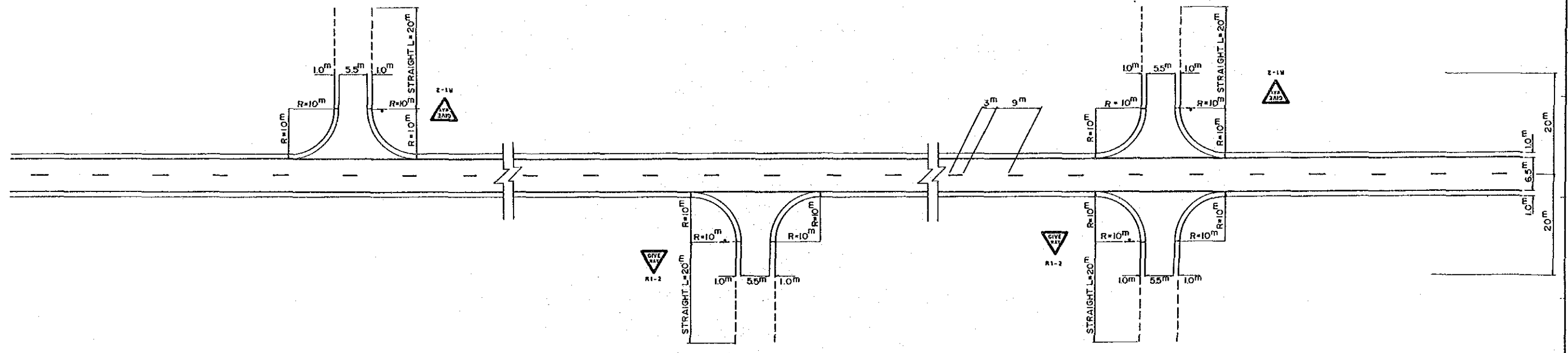
FIXING DETAILS

- NOTES**
- For dimensions A and B refer to AS1742 Part 2 Appendix C Section 2.3
  - Positioning and size of signs shall be in accordance with AS1742 and AS1743
  - Dimension C is dependant on type and size specified.
  - Point treatment of unprotected metal surfaces shall be as follows:- one coat Dulux PI primer, plus two coats of Dulux Durecor in coastal areas or two coats of Dulux Ferrador in non coastal areas. All surfaces to be treated should be dry, clean and free from loose material.
  - All dimensions are in millimetres unless otherwise stated.

|                                  |  |   |  |                                |  |                                   |  |                                 |  |  |  |
|----------------------------------|--|---|--|--------------------------------|--|-----------------------------------|--|---------------------------------|--|--|--|
| SURVEY<br><b>JICA</b><br>Date    |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.                  |  | RECOMMENDED<br>Principal Engineer |  | SCALES                          |  | CENTRAL / GULF PROVINCES                       |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY           |  | CHECKED<br>PROJECT ENGINEER    |  | APPROVED<br>Principal Engineer    |  | SHEET 18 OF 303                 |  | TRANS-ISLAND HIGHWAY (BEREINA-MALALAU SECTION) |  |
| HORIZONTAL DATUM                 |  | Principal   |  | DESIGNED<br>EXECUTIVE ENGINEER |  | SECRETARY                         |  | PROJECT No.<br>S.C.120-33-814/B |  | ROAD SIGNS                                     |  |
| SURVEY BOOK No.8                 |  | Date<br>25 Sep. 1989                              |  | CHECKED<br>EXECUTIVE ENGINEER  |  | SECRETARY                         |  | PAPUA NEW GUINEA                |  | DRAWING No.<br>A1/ 8779                        |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | EXECUTIVE ENGINEER             |  | SECRETARY                         |  | DEPARTMENT OF WORKS             |  | DRAWING No.<br>A1/ 8779                        |  |



APPROACH FOR SINGLE LANE BRIDGE



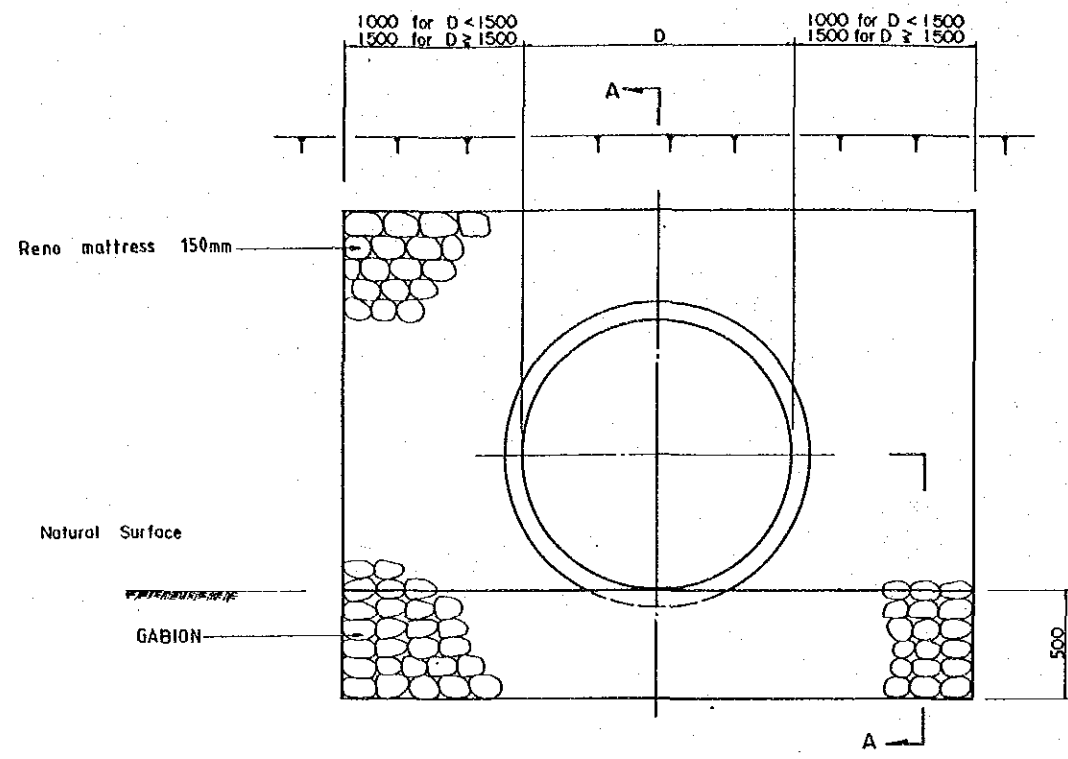
CONNECTION WITH SMALL TRACKS

|                                  |  |   |  |  |  |  |  |  |  |  |  |
|----------------------------------|--|---|--|--|--|--|--|--|--|--|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.                            |  | RECOMMENDED<br><i>[Signature]</i>      |  | SCALES<br>0 10 20 30 m<br>1 : 400          |  | CENTRAL / GULF PROVINCES                       |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | HORIZONTAL DATUM                                  |  | CHECKED<br><i>[Signature]</i>            |  | PROJECT ENGINEER<br><i>[Signature]</i> |  | APPROVED<br>25.10.89<br><i>[Signature]</i> |  | TRANS-ISLAND HIGHWAY (BEREINA-MALALAU SECTION) |  |
| SURVEY BOOK NO.                  |  | 25 Sep. 1989                                      |  | EXECUTIVE ENGINEER<br><i>[Signature]</i> |  | SECRETARY<br><i>[Signature]</i>        |  | SHEET 19 OF 303                            |  | ROAD SIGN FOR BRIDGE APPROACH AND INTERSECTION |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | Principal<br><i>[Signature]</i>          |  | Date                                   |  | PROJECT No.<br>S.C.120-33-814/B            |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS        |  |
|                                  |  |   |  |  |  |  |  |  |  | DRAWING No.<br>A1/ 87780                       |  |

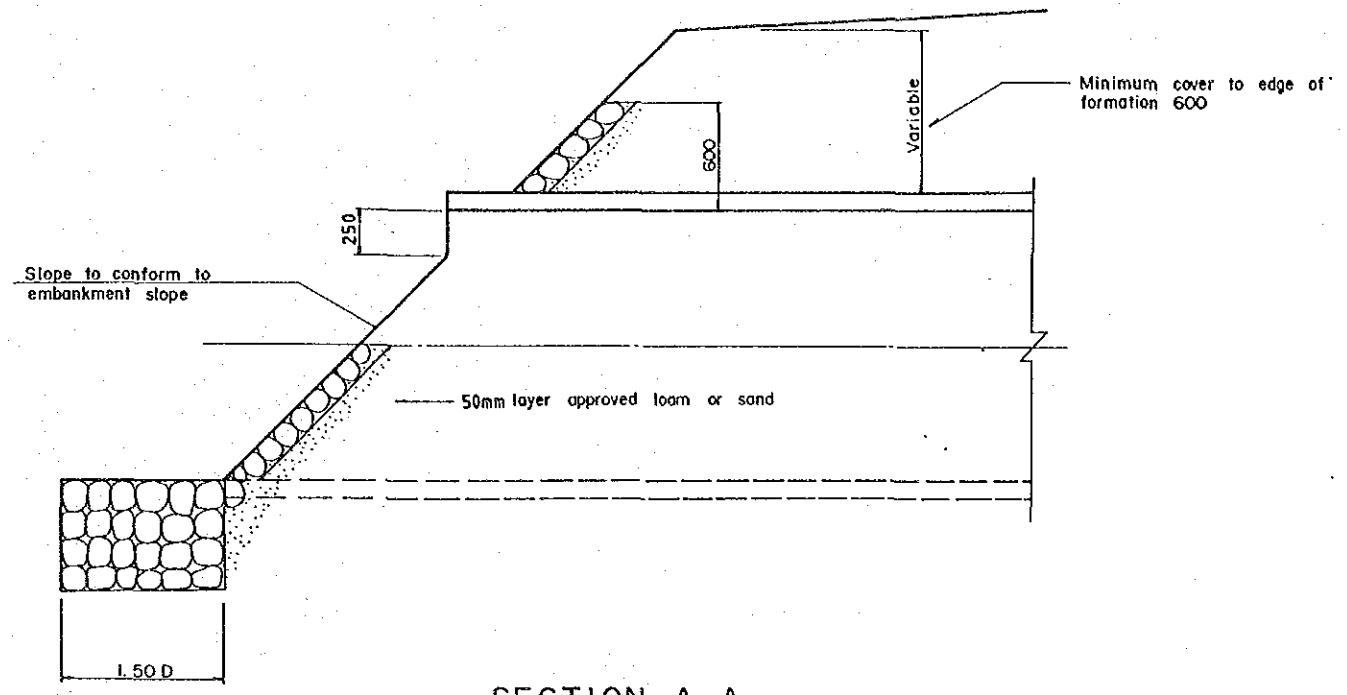


| SIGN     | INTERSECTION DIRECTION SIGN |      |     | FINGER BOARD |      |     | FINGER BOARD |      |     | GIVE WAY |      |     | NO OVERTAKING OR PASSING |      |     | GIVE WAY AHEAD |      |        | ONE LANE BRIDGE                         |      |     | SCHOOL    |      |     |
|----------|-----------------------------|------|-----|--------------|------|-----|--------------|------|-----|----------|------|-----|--------------------------|------|-----|----------------|------|--------|---|------|-----|-----------|------|-----|
|          |                             |      |     |              |      |     |              |      |     |          |      |     |                          |      |     |                |      |        |   |      |     |           |      |     |
| TYPE     | G 2                         |      |     | G 3-1        |      |     | G 3-2        |      |     | R 1-2A   |      |     | R 6-1A                   |      |     | W 3-2A         |      |        | W 4-1A<br>W 8-16A                       |      |     | W 6-4A    |      |     |
| SIZE     | 1920 x 470                  |      |     | 1260 x 200   |      |     | 2600 x 200   |      |     | 750      |      |     | 750 x 900                |      |     | 750 x 750      |      |        | 600 x 600 (W4-1A)<br>600 x 400 (W8-16A) |      |     | 600 x 600 |      |     |
| LOCATION | CH.                         | SIDE | NO. | CH.          | SIDE | NO. | CH.          | SIDE | NO. | CH.      | SIDE | NO. | CH.                      | SIDE | NO. | CH.            | SIDE | NO.    | CH.                                     | SIDE | NO. | CH.       | SIDE | NO. |
|          | 33+515                      | R    | 1   | 34+170       | R    | 1   | 34+160       | L    | 1   | 33+525   | R    | 1   | 33+778                   | L    | 1   | 34+16          | R    | 1      | 33+698                                  | L    | 1   | 33+580    | R    | 1   |
|          |                             |      |     | 49+390       | L    | 1   | 49+400       | R    | 1   | 33+535   | L    | 1   | 60+20                    | R    | 1   | 59+807         | L    | 1      | 34+66                                   | R    | 1   | 80+250    | L    | 1   |
|          |                             |      |     | 54+110       | R    | 1   | 54+100       | L    | 1   | 33+936   | R    | 1   | 67+330                   | R    | 1   | 67+64          | L    | 1      | 59+757                                  | L    | 1   | 80+595    | R    | 1   |
|          |                             |      |     | 67+615       | L    | 1   | 67+625       | R    | 1   | 34+155   | R    | 1   | 68+645                   | L    | 1   | 68+911         | R    | 1      | 60+100                                  | R    | 1   |           |      |     |
|          |                             |      |     | 67+675       | R    | 1   | 67+665       | L    | 1   | 49+405   | L    | 1   | 75+987                   | R    | 1   | 75+799         | L    | 1      | 67+14                                   | L    | 1   |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 54+95    | R    | 1   | 77+289                   | R    | 1   | 77+102         | L    | 1      | 67+410                                  | R    | 1   |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 59+887   | L    | 1   |                          |      |     |                |      | 68+565 | L                                       | 1    |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 67+144   | L    | 1   |                          |      |     |                |      | 68+961 | R                                       | 1    |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 67+625   | L    | 1   |                          |      |     |                |      | 75+749 | L                                       | 1    |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 67+660   | R    | 1   |                          |      |     |                |      | 76+67  | R                                       | 1    |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 68+505   | L    | 1   |                          |      |     |                |      | 77+52  | L                                       | 1    |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 68+831   | R    | 1   |                          |      |     |                |      | 77+369 | R                                       | 1    |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 75+879   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 77+182   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 78+185   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 79+435   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 79+785   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 80+320   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 80+370   | R    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 80+445   | R    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 80+540   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 80+535   | R    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
|          |                             |      |     |              |      |     |              |      |     | 80+595   | L    | 1   |                          |      |     |                |      |        |   |      |     |           |      |     |
| QUANTITY | 1                           |      |     | 5            |      |     | 5            |      |     | 23       |      |     | 6                        |      |     | 6              |      |        | 12                                      |      |     | 3         |      |     |

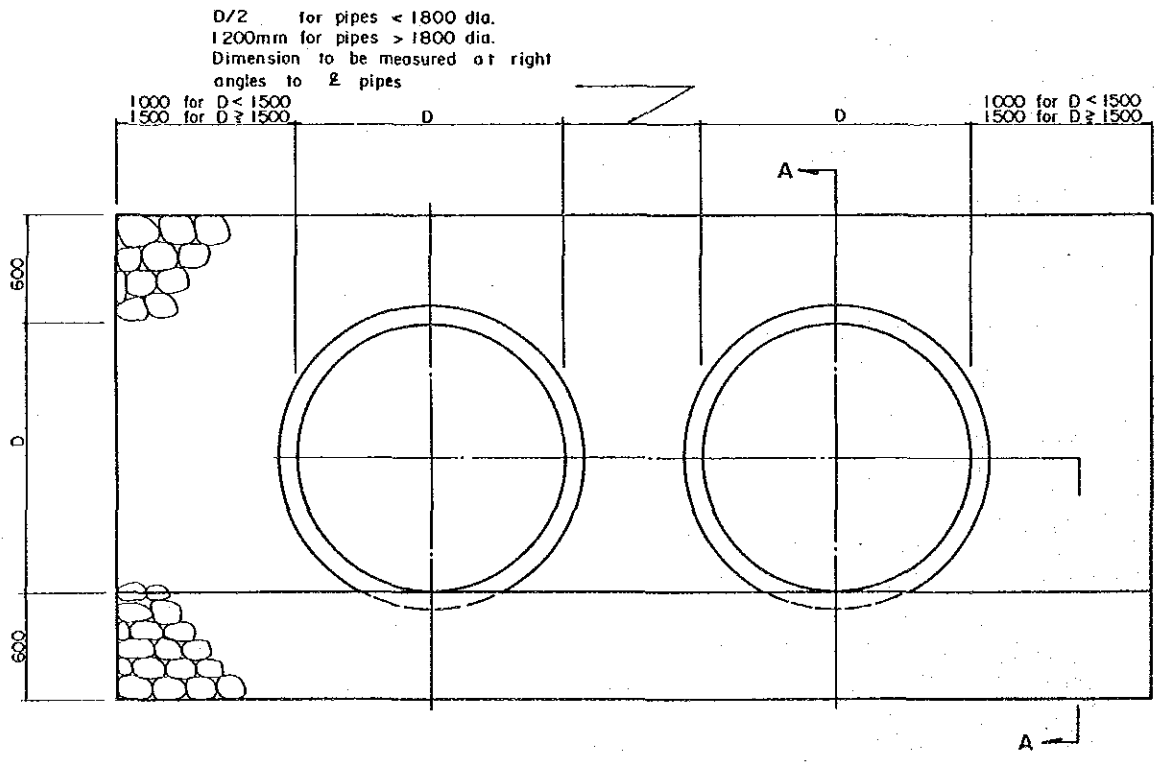
|                               |            |  |       |  |                   |   |                               |  |                 |            |                                      |   |                       |  |  |
|-------------------------------|------------|--|-------|--|-------------------|---|-------------------------------|--|-----------------|------------|--------------------------------------|---|-----------------------|--|--|
| SURVEY<br><b>JICA</b><br>Date |            | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY<br>Principal: <i>J. Yamada</i><br>Date: 25 Sep. 1989 |       | DRAWN<br>K.E.<br>Checked: <i>CRA</i><br>Designed: <i>A. Nagai</i><br>Checked: <i>T. Kawakami</i> |                   | RECOMMENDED<br><i>[Signature]</i><br>PROJECT ENGINEER |                               | APPROVED<br><i>[Signature]</i><br>26.10.89<br>PRINCIPAL ENGINEER |                 | SCALES<br> |                                      | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION<br>SCHEDULE OF ROAD SIGNS<br>CH. 33+500 - CH. 80+596 |                       |  |  |
| REV.                          | AMENDMENTS | BY   | APP'D | DATE   | SURVEY BOOK NO. 8 |   | PROJECT No. S.C. 120-33-814/B |  | SHEET 20 OF 303 |            | PAPUA NEW GUINEA DEPARTMENT OF WORKS |   | DRAWING No. A1/ 88063 |  |  |



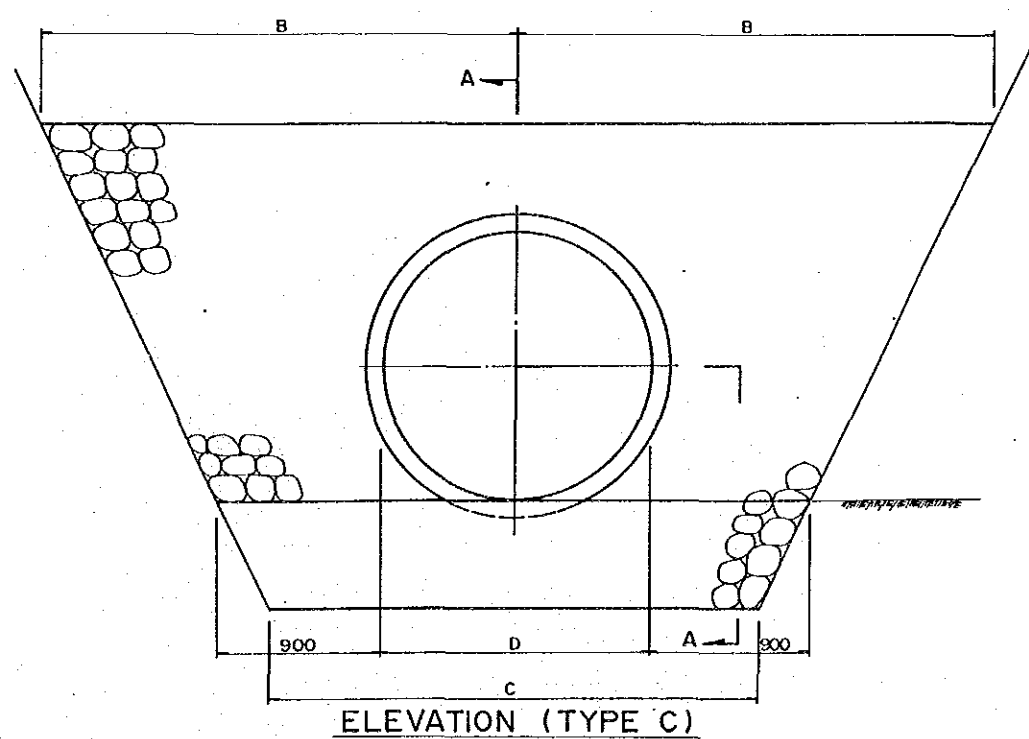
ELEVATION (TYPE A)



SECTION A-A



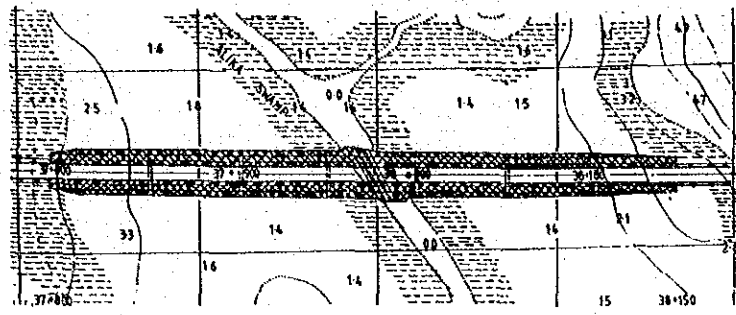
ELEVATION (TYPE B)



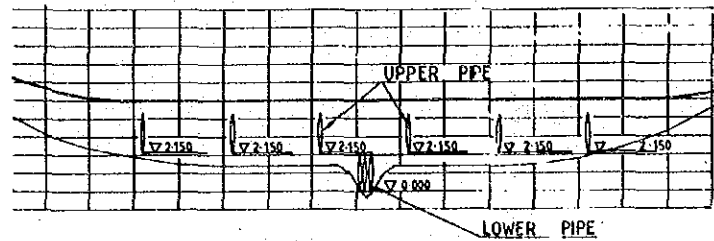
ELEVATION (TYPE C)

- STANDARD NOTES**
- Each elevation type shown on the drawing, shall be used on the following conditions;
    - Type A) Singular Culverts
    - Type B) Multiple Culverts
    - Type C) To be used when in steep narrow gullies and Distance B measured  $D + 600$ mm above pipe invert is less than  $3D$ . When B is greater than  $3D$  standard rectangular protection works shall be used.
  - Reno mattress shall be applied in accordance with Specification Clause 18.1 Gabions and Reno Mattress

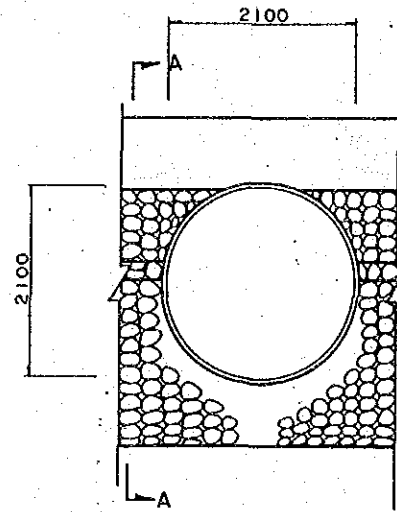
|                                  |  |   |  |                                 |  |   |  |  |  |
|----------------------------------|--|---|--|---------------------------------|--|---|--|--|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>PROJECT ENGINEER       |  | RECOMMENDED<br>PRINCIPAL ENGINEER             |  | CENTRAL / GULF PROVINCES                     |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | J. Yamada<br>Principal                            |  | 25 Sep. 1989<br>Date            |  | APPROVED<br>24. 10. 89<br>FAS(1)<br>SECRETARY |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| SURVEY BOOK NO.S                 |  | Principal   |  | EXECUTIVE ENGINEER              |  | SHEET 21 OF 303                               |  | STANDARD CULVERT HEADWALLS                   |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | PROJECT No.<br>S.C.120-33-814/B |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS       |  | DRAWING No.<br>A1 87782                      |  |



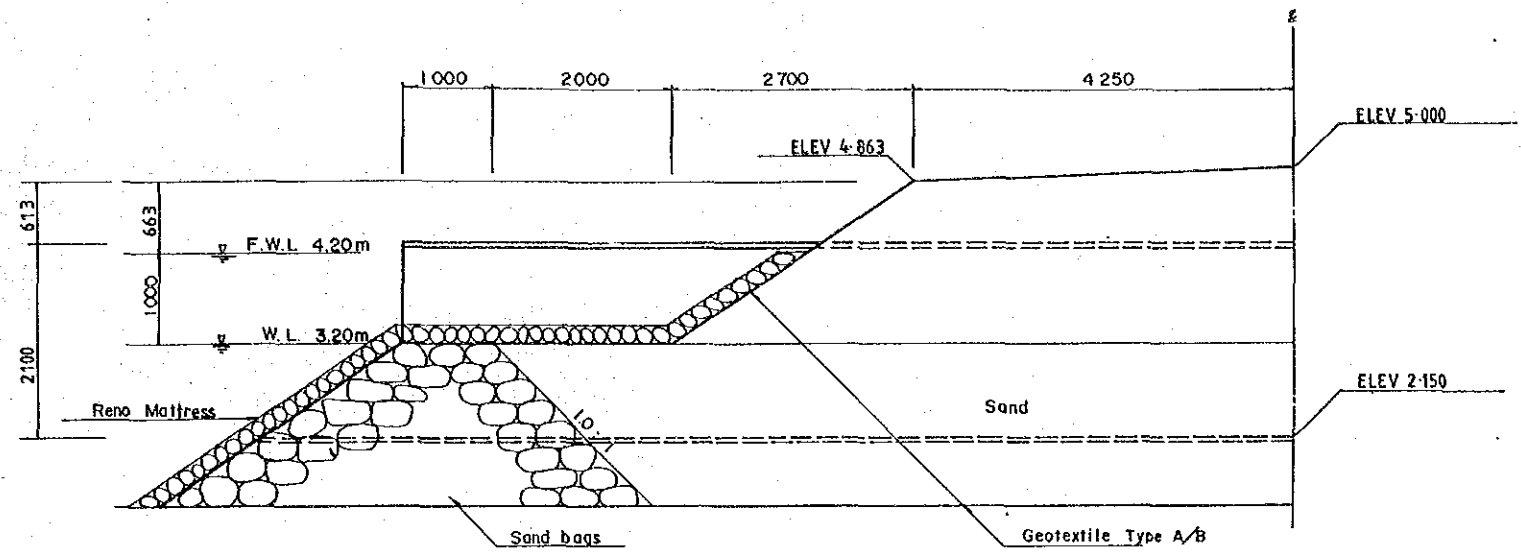
PLAN  
Scale 1:2000



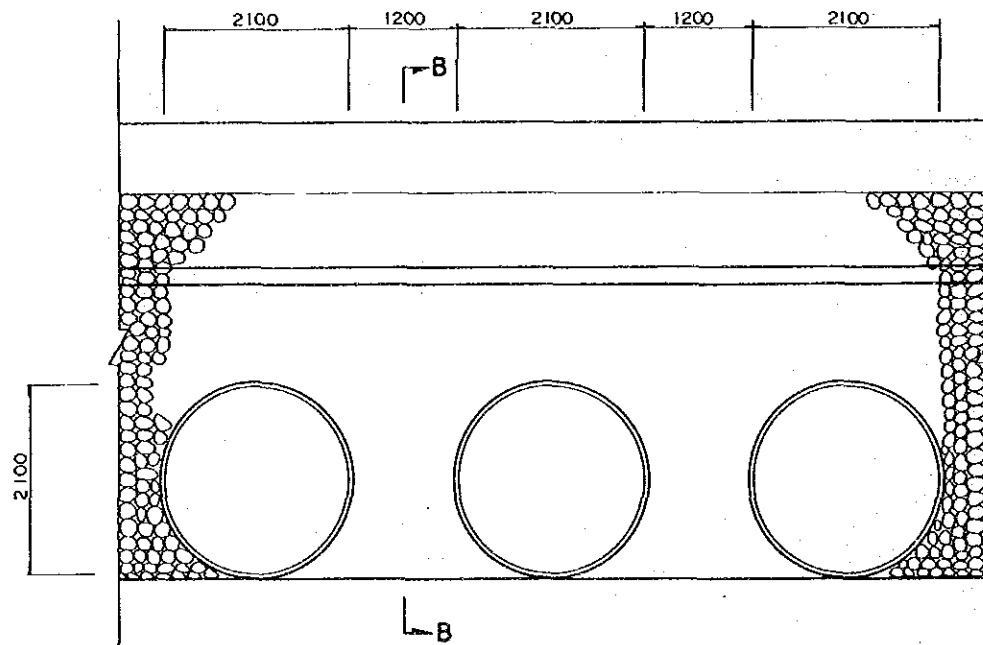
LONGITUDINAL SECTION  
Scale 1:2000



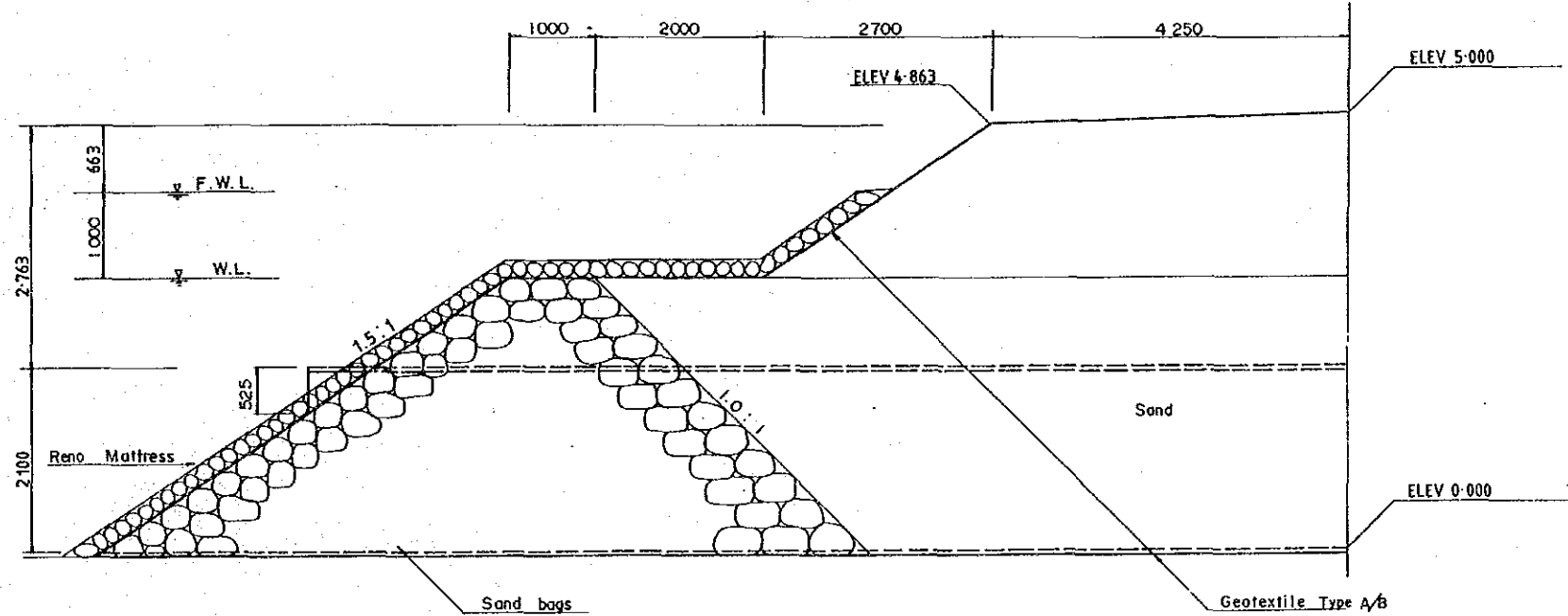
UPPER PIPE ELEVATION



SECTION A-A  
Scale 1:40



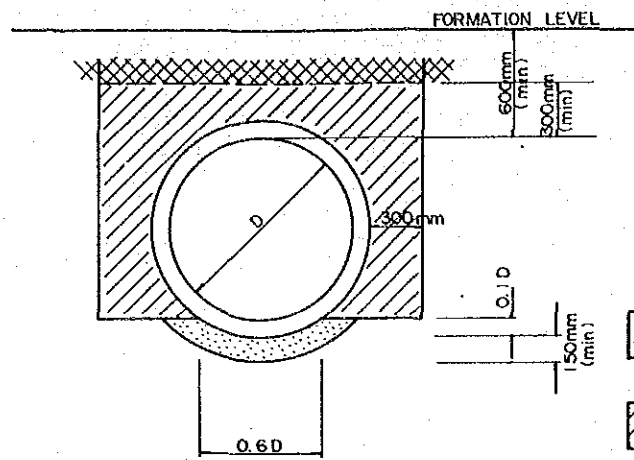
LOWER PIPES ELEVATION



SECTION B-B  
Scale 1:40

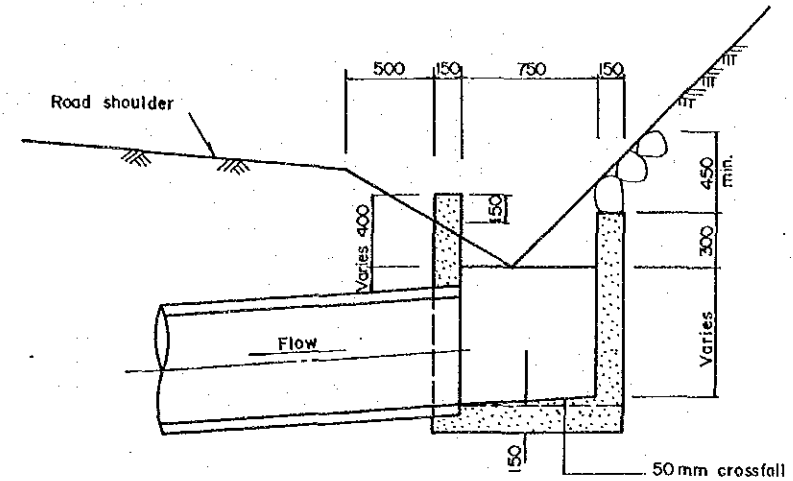
Note: All dimensions are in millimetre unless otherwise stated.

|      |  |            |  |    |       |      |                   |  |   |  |              |  |              |  |              |  |  |  |
|------|--|------------|--|----|-------|------|-------------------|--|---|--|--------------|--|--------------|--|--------------|--|--|--|
| REV. |  | AMENDMENTS |  | BY | APP'D | DATE | SURVEY            |  | DESIGN                                  |  | DRAWN        |  | RECOMMENDED  |  | SCALES       |  | CENTRAL / GULF PROVINCES                     |  |
|      |  |            |  |    |       |      | JICA              |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | E. J. K. K.  |  | M. M. M.     |  | 1:40         |  | TRANS-ISLAND HIGHWAY BEIGENA-MALALAU SECTION |  |
|      |  |            |  |    |       |      | Date              |  | Date                                    |  | Date         |  | Date         |  | 1:40         |  | CULVERT HEADWALLS IN ALIKA SWAMP AREA        |  |
|      |  |            |  |    |       |      | VERTICAL DATUM    |  | Principal                               |  | Principal    |  | Principal    |  | Principal    |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS         |  |
|      |  |            |  |    |       |      | MEAN SEA LEVEL    |  | 25 Sep. 1989                            |  | 25 Sep. 1989 |  | 25 Sep. 1989 |  | 25 Sep. 1989 |  | DRAWING No. A1 88064                         |  |
|      |  |            |  |    |       |      | HORIZONTAL DATUM  |  | Date                                    |  | Date         |  | Date         |  | Date         |  | PROJECT No. S.C.120-33-814/B                 |  |
|      |  |            |  |    |       |      | SURVEY BOOK No. 8 |  | Date                                    |  | Date         |  | Date         |  | Date         |  | SHEET 22 OF 303                              |  |



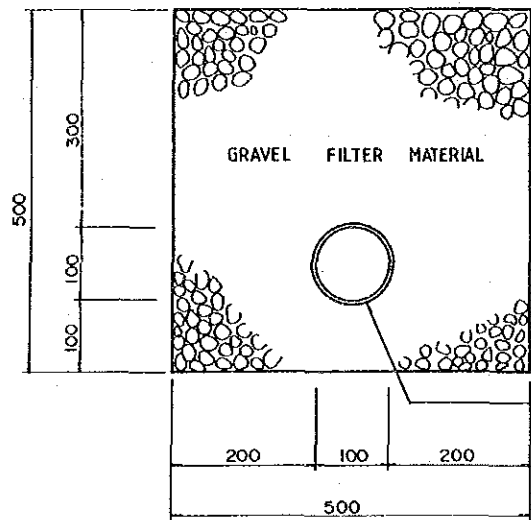
CULVERT BEDDING

- KEY:
- Bedding sand or other approved fine granular material.
  - Backfill material to comply with Clause 7.5 of the Specification
  - Embankment fill material to comply with Clause 4.15 of the Specification

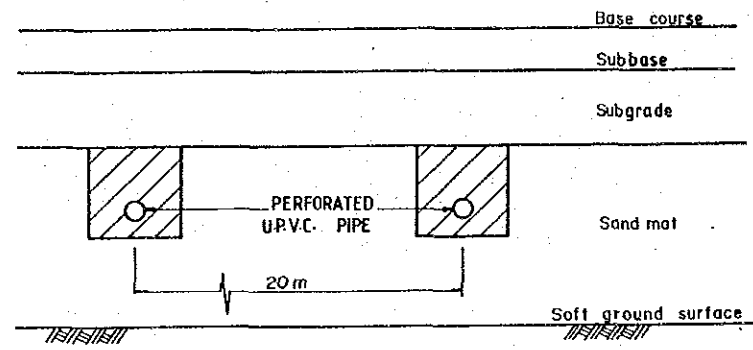


SECTION B-B

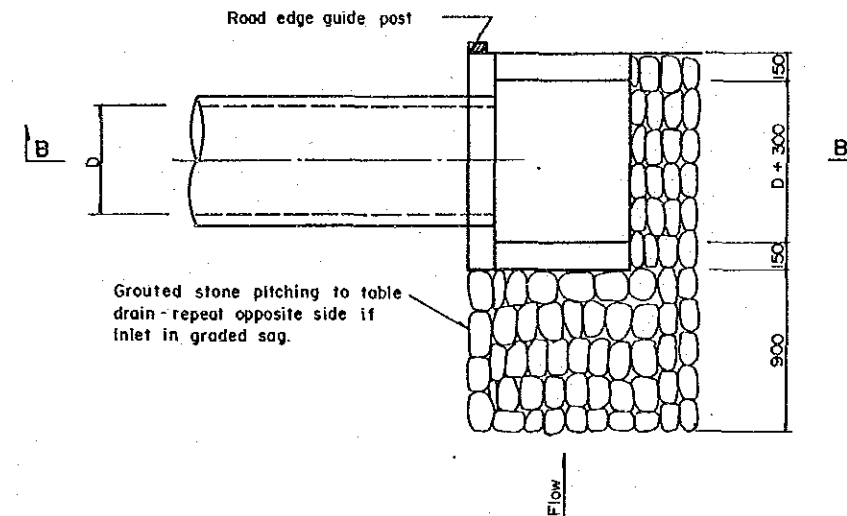
TYPE 'C' - CONCRETE  
TYPE 'D' - MASONRY



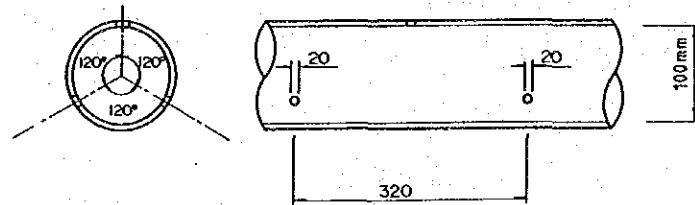
TYPICAL CROSS SECTION OF SUBSOIL DRAIN



LOCATION OF SUBSOIL DRAIN



PLAN  
STANDARD INLET PIT 600-900 DIA



DETAIL OF PERFORATED U-PVC PIPE

SUBSOIL DRAIN

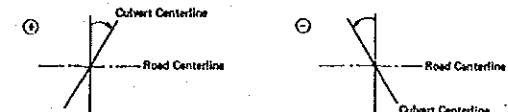
|                                  |            |   |       |                           |                    |                                  |                    |   |   |
|----------------------------------|------------|---|-------|---------------------------|--------------------|----------------------------------|--------------------|---|---|
| SURVEY<br><b>JICA</b>            |            | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |       | DRAWN<br>7. Kamekuni      |                    | RECOMMENDED<br>M. S. S.          |                    | CENTRAL / GULF PROVINCES                              |   |
| VERTICAL DATUM<br>MEAN SEA LEVEL |            | HORIZONTAL DATUM                                  |       | CHECKED<br>7. Kamekuni    |                    | DESIGNED<br>E. A. A.             |                    | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION          |   |
| SURVEY BOOK NOS                  |            | Date<br>25 Sep. 1989                              |       | PROJECT ENGINEER<br>W. S. |                    | APPROVED<br>24.10.89<br>F. S. S. |                    | CULVERT BEDDING, SUBSOIL DRAIN AND STANDARD INLET PIT |   |
| REV.                             | AMENDMENTS | BY  | APP'D | DATE                      | EXECUTIVE ENGINEER | SECRETARY                        | SCALES<br>AS SHOWN | PROJECT No.<br>S.C. 120-33-814/B                      | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS |
|                                  |            |   |       |                           |                    |                                  | BHEEY 23 OF 303    | DRAWING No.<br>A1 87783                               |   |



**CULVERT SCHEDULE**

| REF NO | CHAINAGE | TYPE | NO OF PIPES | DIA  | SKEW ANGLE IN DEGREES | DISTANCE MEASURED ALONG PIPE FROM ROAD |        | FINISHED ROAD LEVEL | INLET / OUTLET STRUCTURE | REMARKS |
|--------|----------|------|-------------|------|-----------------------|--|--------|---------------------|--------------------------|---------|
|        |          |      |             |      |                       | LHS                                    | RHS    |                     |                          |         |
| 155    | 41+150   | CSP  | 1           | 900  |                       | 8.263                                  | 7.079  | 5.720               | Type A                   |         |
| 156    | 41+945   | CSP  | 3           | 1500 |                       | 7.600                                  | 7.637  | 5.683               | Type B                   |         |
| 157    | 42+300   | CSP  | 1           | 900  |                       | 6.883                                  | 6.756  | 4.650               | Type A                   |         |
| 158    | 42+510   | CSP  | 1           | 900  |                       | 6.986                                  | 7.108  | 3.852               | Type A                   |         |
| 159    | 42+730   | CSP  | 5           | 1500 |                       | 7.706                                  | 7.630  | 3.016               | Type B                   |         |
| 160    | 43+180   | CSP  | 2           | 900  |                       | 7.398                                  | 6.127  | 2.750               | Type B                   |         |
| 161    | 43+535   | CSP  | 2           | 900  |                       | 7.384                                  | 6.490  | 5.805               | Type B                   |         |
| 162    | 43+835   | CSP  | 3           | 1500 |                       | 7.730                                  | 7.278  | 4.300               | Type B                   |         |
| 163    | 44+525   | CSP  | 1           | 900  |                       | 6.726                                  | 6.692  | 4.539               | Type A                   |         |
| 164    | 44+775   | CSP  | 4           | 1500 |                       | 6.202                                  | 6.015  | 5.725               | Type B                   |         |
| 165    | 45+080   | CSP  | 1           | 1200 |                       | 8.356                                  | 7.387  | 5.230               | Type A                   |         |
| 166    | 45+335   | CSP  | 1           | 900  |                       | 5.922                                  | 5.754  | 5.045               | Type A                   |         |
| 167    | 45+693   | CSP  | 3           | 1500 |                       | 6.495                                  | 6.337  | 5.331               | Type B                   |         |
| 168    | 45+855   | CSP  | 3           | 1500 |                       | 6.616                                  | 6.528  | 4.035               | Type B                   |         |
| 169    | 46+530   | CSP  | 1           | 1200 |                       | 7.395                                  | 6.004  | 6.815               | Type A                   |         |
| 170    | 46+807   | CSP  | 1           | 1500 | + 25°                 | 7.074                                  | 6.447  | 6.228               | Type A                   |         |
| 171    | 46+890   | CSP  | 5           | 1500 |                       | 6.352                                  | 6.030  | 5.378               | Type B                   |         |
| 172    | 46+970   | CSP  | 2           | 1200 |                       | 6.300                                  | 5.946  | 4.582               | Type B                   |         |
| 173    | 47+265   | CSP  | 1           | 1200 |                       | 6.558                                  | 6.187  | 4.648               | Type A                   |         |
| 174    | 47+645   | CSP  | 1           | 1200 |                       | 6.099                                  | 5.643  | 5.511               | Type A                   |         |
| 175    | 47+920   | CSP  | 3           | 1500 |                       | 7.198                                  | 6.784  | 7.710               | Type B                   |         |
| 176    | 48+260   | CSP  | 1           | 1500 |                       | 6.774                                  | 6.231  | 7.280               | Type A                   |         |
| 177    | 48+560   | CSP  | 3           | 1500 |                       | 6.404                                  | 5.827  | 8.120               | Type B                   |         |
| 178    | 48+915   | CSP  | 2           | 1200 |                       | 6.383                                  | 5.619  | 6.286               | Type B                   |         |
| 179    | 49+350   | CSP  | 2           | 1500 |                       | 6.954                                  | 5.599  | 9.579               | Type B                   |         |
| 180    | 49+570   | CSP  | 2           | 1500 |                       | 7.246                                  | 6.577  | 6.349               | Type B                   |         |
| 181    | 49+815   | CSP  | 1           | 1200 |                       | 6.608                                  | 6.163  | 5.555               | Type A                   |         |
| 182    | 50+125   | CSP  | 1           | 900  |                       | 6.490                                  | 5.770  | 4.625               | Type A                   |         |
| 183    | 50+440   | CSP  | 1           | 900  |                       | 6.119                                  | 5.507  | 10.317              | Type A                   |         |
| 184    | 50+640   | CSP  | 3           | 1500 |                       | 6.870                                  | 6.370  | 8.460               | Type B                   |         |
| 185    | 50+750   | CSP  | 1           | 1500 |                       | 7.950                                  | 7.330  | 7.038               | Type A                   |         |
| 186    | 50+930   | CSP  | 1           | 1500 |                       | 7.043                                  | 5.785  | 8.680               | Type A                   |         |
| 187    | 51+210   | CSP  | 2           | 1500 |                       | 11.614                                 | 11.125 | 9.680               | Type B                   |         |
| 188    | 51+430   | CSP  | 1           | 900  |                       | 6.726                                  | 6.105  | 8.920               | Type A                   |         |
| 189    | 51+635   | CSP  | 1           | 1200 |                       | 6.472                                  | 5.799  | 6.480               | Type A                   |         |
| 190    | 51+780   | CSP  | 1           | 1200 |                       | 6.192                                  | 5.810  | 5.300               | Type A                   |         |
| 191    | 52+200   | CSP  | 2           | 1500 |                       | 6.294                                  | 6.003  | 5.850               | Type B                   |         |
| 192    | 52+355   | CSP  | 2           | 1500 |                       | 6.744                                  | 6.654  | 4.920               | Type B                   |         |
| 193    | 52+970   | CSP  | 2           | 1500 |                       | 6.805                                  | 6.713  | 4.560               | Type B                   |         |
| 194    | 53+350   | CSP  | 1           | 1500 |                       | 7.374                                  | 6.883  | 5.700               | Type B                   |         |

**NOTES**

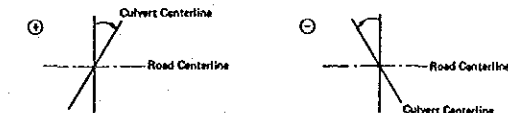
- 1) General  
The Culvert Schedule contains all of CSP pipes to be installed in accordance with the standard drawing details (Drawing No. A1/87782, A1/87783).
- 2) Chainage  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the designed road centerline. Where multiple culverts occur the chainage given refers to the intersection between the designed road centerline and the centerline of the multiple system.
- 3) Type  
Refers to the type of pipe:  
CSP : Corrugated Steel Pipe
- 4) Number of Pipes  
Indicates the number of proposed pipes at the chainage given in Column (2).
- 5) Diameter  
Indicates the diameter of proposed culverts.
- 6) Skew Angle in Degrees  
The angle of skew should be determined as follows:  

- 7) Distance Measured Along Pipe From Road  
This refers to the length of the pipe to be installed to both the left hand side (LHS) and the right hand side (RHS) of designed road centerline, measured along the centerline of the culvert. LHS and RHS is that when viewed in the direction of increasing chainage. The total culvert length is obtained by adding the LHS length to the RHS length.
- 8) Finished Road Center Level  
Refers to the proposed finished road level of the culvert chainage at the designed road centerline.
- 9) Inlet/Outlet Structure  
Refers to the type of culvert shown on the standard drawing details (Drawing No. A1/87782).
- 10) Inlet/Outlet Invert Level  
Pipe Culverts should be installed on the ground level except when being directed.
- 11) Culverts at Intersections and Feeder Roads  
Ref. No. 1001 - 1002:  
These culverts shall be installed on the feeder road derived from the at-grade intersection (CH. 33 + 425).  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the feeder roads centerline.  
Ref. No. 1003 - 1010:  
These culverts shall be installed on at-grade intersections as shown on the drawing at each culvert location. The chainage given for each culvert indicates the location for inlet/outlet.


|                                  |  |   |  |   |  |                                   |  |                         |  |  |  |
|----------------------------------|--|---|--|---|--|-----------------------------------|--|-------------------------|--|--|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>B. K. K. K.                    |  | RECOMMENDED<br>A. B. B. B.        |  | SCALES<br>1:1000        |  | CENTRAL GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | HORIZONTAL DATUM                                  |  | CHECKED<br>F. J. J. J.                  |  | PROJECT ENGINEER<br>A. B. B. B.   |  | APPROVED<br>S. C. S. S. |  | CULVERT SCHEDULE<br>CH. 41 + 150 TO CH 53 + 350                        |  |
| SURVEY BOOK NO. 1                |  | Date 25 Sep. 1989                                 |  | CHECKED<br>T. K. K. K.                  |  | EXECUTIVE ENGINEER<br>A. B. B. B. |  | SHEET 25 OF 303         |  | PROJECT No. S.C. 120-33-814/B  |  |
| REV. AMENDMENTS                  |  | BY APP'D DATE                                     |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS |  | DRAWING No. A1 88066              |  |                         |  |  |  |

**CULVERT SCHEDULE**

| REF NO | CHAINAGE | TYPE | NO OF PIPES | DIA  | SKEW ANGLE IN DEGREES | DISTANCE MEASURED ALONG PIPE FROM ROAD |       | FINISHED ROAD & LEVEL | INLET / OUTLET STRUCTURE | REMARKS |
|--------|----------|------|-------------|------|-----------------------|--|-------|-----------------------|--------------------------|---------|
|        |          |      |             |      |                       | LHS                                    | RHS   |                       |                          |         |
| 195    | 53+845   | CSP  | 1           | 1200 |                       | 6.229                                  | 6.282 | 4.738                 | Type A                   |         |
| 196    | 54+165   | CSP  | 1           | 900  |                       | 6.466                                  | 6.791 | 3.938                 | Type A                   |         |
| 197    | 54+290   | CSP  | 1           | 1500 |                       | 6.843                                  | 6.977 | 3.625                 | Type A                   |         |
| 198    | 56+650   | CSP  | 1           | 900  |                       | 5.673                                  | 5.730 | 2.455                 | Type A                   |         |
| 199    | 57+335   | CSP  | 1           | 900  |                       | 6.432                                  | 6.456 | 2.250                 | Type A                   |         |
| 200    | 57+940   | CSP  | 1           | 900  |                       | 7.014                                  | 7.048 | 2.592                 | Type A                   |         |
| 201    | 58+315   | CSP  | 1           | 900  |                       | 6.074                                  | 6.136 | 2.924                 | Type A                   |         |
| 202    | 58+700   | CSP  | 1           | 900  |                       | 6.400                                  | 6.437 | 2.233                 | Type A                   |         |
| 203    | 58+750   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 204    | 58+800   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 205    | 58+850   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 206    | 58+900   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 207    | 58+950   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 208    | 59+000   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 209    | 59+050   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 210    | 59+100   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 211    | 59+150   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 212    | 59+200   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 213    | 59+250   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 214    | 59+300   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 215    | 59+350   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 216    | 59+400   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 217    | 59+450   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 218    | 59+500   | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 219    | 59+550   | CSP  | 1           | 900  |                       | 6.201                                  | 6.237 | 2.200                 | Type A                   |         |
| 220    | 59+600   | CSP  | 1           | 900  |                       | 6.201                                  | 6.237 | 2.200                 | Type A                   |         |
| 221    | 59+650   | CSP  | 1           | 900  |                       | 5.953                                  | 5.987 | 2.234                 | Type A                   |         |
| 222    | 59+700   | CSP  | 1           | 900  |                       | 6.357                                  | 6.393 | 2.504                 | Type A                   |         |
| 223    | 59+750   | CSP  | 1           | 900  |                       | 6.779                                  | 6.819 | 2.987                 | Type A                   |         |
| 224    | 59+800   | CSP  | 1           | 900  |                       | 7.317                                  | 7.360 | 3.347                 | Type A                   |         |
| 225    | 59+850   | CSP  | 1           | 900  |                       | 7.736                                  | 7.781 | 3.527                 | Type A                   |         |
| 226    | 60+050   | CSP  | 1           | 900  |                       | 7.586                                  | 7.631 | 3.527                 | Type A                   |         |
| 227    | 60+100   | CSP  | 1           | 900  |                       | 7.268                                  | 7.822 | 3.347                 | Type A                   |         |
| 228    | 60+150   | CSP  | 1           | 900  |                       | 6.880                                  | 7.431 | 2.987                 | Type A                   |         |
| 229    | 60+200   | CSP  | 1           | 900  |                       | 6.457                                  | 7.005 | 2.504                 | Type A                   |         |
| 230    | 60+250   | CSP  | 1           | 900  |                       | 6.203                                  | 6.750 | 2.234                 | Type A                   |         |
| 231    | 60+300   | CSP  | 1           | 900  |                       | 6.451                                  | 6.999 | 2.200                 | Type A                   |         |
| 232    | 60+350   | CSP  | 1           | 900  |                       | 6.451                                  | 6.999 | 2.200                 | Type A                   |         |
| 233    | 60+400   | CSP  | 1           | 900  |                       | 6.152                                  | 6.698 | 2.200                 | Type A                   |         |
| 234    | 60+450   | CSP  | 1           | 900  |                       | 5.902                                  | 6.082 | 2.200                 | Type A                   |         |

NOTES

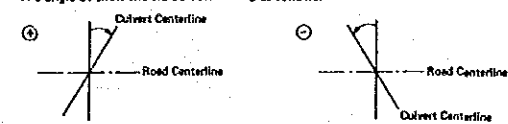
- 1) General  
The Culvert Schedule contains all of CSP pipes to be installed in accordance with the standard drawing details (Drawing No. A1/87782, A1/87783).
- 2) Chainage  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the designed road centerline. Where multiple culverts occur the chainage given refers to the intersection between the designed road centerline and the centerline of the multiple system.
- 3) Type  
Refers to the type of pipe:  
CSP : Corrugated Steel Pipe
- 4) Number of Pipes  
Indicates the number of proposed pipes at the chainage given in Column (2).
- 5) Diameter  
Indicates the diameter of proposed culverts.
- 6) Skew Angle In Degrees  
The angle of skew should be determined as follows:  

- 7) Distance Measured Along Pipe From Road  
This refers to the length of the pipe to be installed to both the left hand side (LHS) and the right hand side (RHS) of designed road centerline, measured along the centerline of the culvert. LHS and RHS is that when viewed in the direction of increasing chainage. The total culvert length is obtained by adding the LHS length to the RHS length.
- 8) Finished Road Center Level  
Refers to the proposed finished road level of the culvert chainage at the designed road centerline.
- 9) Inlet/Outlet Structure  
Refers to the type of culvert shown on the standard drawing details (Drawing No. A1/87782).
- 10) Inlet/Outlet Invert Level  
Pipe Culverts should be installed on the ground level except when being directed.
- 11) Culverts at Intersections and Feeder Roads  
Ref. No. 1001 - 1002:  
These culverts shall be installed on the feeder road derived from the at-grade intersection (CH. 33 + 426).  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the feeder roads centerline.  
Ref. No. 1003 - 1010:  
These culverts shall be installed on at-grade intersections as shown on the drawing at each culvert location. The chainage given for each culvert indicates the location for inlet/outlet.


|                 |  |    |       |      |                  |                               |   |  |  |  |   |                                 |                 |                     |  |
|-----------------|--|----|-------|------|------------------|-------------------------------|---|--|--|--|---|---------------------------------|-----------------|---------------------|--|
| REV. AMENDMENTS |  | BY | APP'D | DATE | SURVEY BOOK NO'S | SURVEY<br><b>JICA</b><br>Date | DESIGN<br><b>JAPAN INTERNATIONAL CO-OPERATION AGENCY</b><br>Principal<br>Date: 25 Sep. 1989 | DRAWN<br>Checked: <i>Z. Kawanishi</i><br>Designed: <i>Z. Kawanishi</i><br>Checked: <i>Z. Kawanishi</i> | RECOMMENDED<br><i>B. Kawanishi</i><br>PROJECT ENGINEER | APPROVED<br><i>Z. Kawanishi</i><br>25.9.89<br>EXECUTIVE ENGINEER | SCALES<br> | PROJECT No.<br>S.C.120-33-814/B | SHEET 26 OF 303 | DEPARTMENT OF WORKS | CENTRAL GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAUUA SECTION<br>CULVERT SCHEDULE<br>CH. 53+845 TO CH. 60+450<br>DRAWING No. A1 88067 |
|-----------------|--|----|-------|------|------------------|-------------------------------|---|--|--|--|---|---------------------------------|-----------------|---------------------|--|

**CULVERT SCHEDULE**

| REF NO. | CHAINAGE | TYPE | NO OF PIPES | DIA  | SKEW ANGLE IN DEGREES | DISTANCE MEASURED ALONG PIPE FROM ROAD |       | FINISHED ROAD & LEVEL | INLET / OUTLET STRUCTURE | REMARKS |
|---------|----------|------|-------------|------|-----------------------|--|-------|-----------------------|--------------------------|---------|
|         |          |      |             |      |                       | LHS                                    | RHS   |                       |                          |         |
| 235     | 60 + 500 | CSP  | 1           | 900  |                       | 5.753                                  | 5.785 | 2.200                 | Type A                   |         |
| 236     | 60 + 550 | CSP  | 1           | 900  |                       | 6.052                                  | 6.086 | 2.200                 | Type A                   |         |
| 237     | 60 + 600 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 238     | 60 + 650 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 239     | 60 + 700 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 240     | 60 + 750 | CSP  | 1           | 900  |                       | 6.948                                  | 6.989 | 2.200                 | Type A                   |         |
| 241     | 60 + 800 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 242     | 60 + 850 | CSP  | 1           | 900  |                       | 6.500                                  | 6.538 | 2.200                 | Type A                   |         |
| 243     | 60 + 900 | CSP  | 1           | 900  |                       | 6.500                                  | 6.538 | 2.200                 | Type A                   |         |
| 244     | 60 + 950 | CSP  | 1           | 900  |                       | 6.500                                  | 6.538 | 2.200                 | Type A                   |         |
| 245     | 61 + 000 | CSP  | 1           | 900  |                       | 6.500                                  | 6.538 | 2.200                 | Type A                   |         |
| 246     | 61 + 050 | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 247     | 61 + 100 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 248     | 61 + 150 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 249     | 61 + 200 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 250     | 61 + 250 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 251     | 61 + 300 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 252     | 61 + 350 | CSP  | 1           | 900  |                       | 6.799                                  | 6.838 | 2.200                 | Type A                   |         |
| 253     | 61 + 400 | CSP  | 1           | 900  |                       | 6.500                                  | 6.538 | 2.200                 | Type A                   |         |
| 254     | 61 + 450 | CSP  | 1           | 900  |                       | 6.500                                  | 6.538 | 2.200                 | Type A                   |         |
| 255     | 61 + 500 | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 256     | 61 + 550 | CSP  | 1           | 900  |                       | 6.351                                  | 6.387 | 2.200                 | Type A                   |         |
| 257     | 61 + 600 | CSP  | 1           | 900  |                       | 6.812                                  | 6.852 | 2.209                 | Type A                   |         |
| 258     | 61 + 650 | CSP  | 1           | 900  |                       | 6.854                                  | 6.894 | 2.237                 | Type A                   |         |
| 259     | 61 + 700 | CSP  | 1           | 900  |                       | 6.908                                  | 6.948 | 2.273                 | Type A                   |         |
| 260     | 61 + 750 | CSP  | 1           | 900  |                       | 6.963                                  | 7.004 | 2.310                 | Type A                   |         |
| 261     | 61 + 800 | CSP  | 1           | 900  |                       | 7.166                                  | 7.208 | 2.346                 | Type A                   |         |
| 262     | 61 + 876 | CSP  | 1           | 900  | + 30°                 | 8.255                                  | 8.165 | 2.394                 | Type A                   |         |
| 263     | 62 + 082 | CSP  | 1           | 2100 | + 30°                 | 7.705                                  | 7.522 | 2.549                 | Type A                   |         |
| 264     | 62 + 265 | CSP  | 1           | 1200 |                       | 7.075                                  | 6.959 | 2.682                 | Type A                   |         |
| 265     | 62 + 570 | CSP  | 1           | 1200 |                       | 7.093                                  | 7.010 | 2.905                 | Type A                   |         |
| 266     | 62 + 770 | CSP  | 1           | 2100 | + 30°                 | 7.678                                  | 8.952 | 2.888                 | Type A                   |         |
| 267     | 62 + 956 | CSP  | 1           | 2100 | - 30°                 | 8.290                                  | 8.465 | 2.590                 | Type A                   |         |
| 268     | 63 + 100 | CSP  | 1           | 2100 |                       | 6.955                                  | 6.864 | 2.360                 | Type A                   |         |
| 269     | 63 + 260 | CSP  | 4           | 2100 |                       | 6.883                                  | 6.801 | 2.215                 | Type A                   |         |
| 270     | 63 + 400 | CSP  | 1           | 2100 |                       | 6.772                                  | 6.717 | 2.250                 | Type A                   |         |
| 271     | 63 + 510 | CSP  | 1           | 2100 |                       | 6.866                                  | 6.710 | 2.278                 | Type A                   |         |
| 272     | 63 + 590 | CSP  | 1           | 1200 |                       | 6.356                                  | 5.942 | 2.298                 | Type A                   |         |
| 273     | 63 + 735 | CSP  | 1           | 900  |                       | 5.913                                  | 6.344 | 2.334                 | Type A                   |         |
| 274     | 64 + 270 | CSP  | 1           | 900  |                       | 6.089                                  | 6.256 | 2.468                 | Type A                   |         |

**NOTES**

- General**  
The Culvert Schedule contains all of CSP pipes to be installed in accordance with the standard drawing details (Drawing No. A1/87782, A1/87783).
- Chainage**  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the designed road centerline. Where multiple culverts occur the chainage given refers to the intersection between the designed road centerline and the centerline of the multiple system.
- Type**  
Refers to the type of pipe:  
CSP : Corrugated Steel Pipe
- Number of Pipes**  
Indicates the number of proposed pipes at the chainage given in Column (2).
- Diameter**  
Indicates the diameter of proposed culverts.
- Skew Angle In Degrees**  
The angle of skew should be determined as follows:  

- Distance Measured Along Pipe From Road**  
This refers to the length of the pipe to be installed to both the left hand side (LHS) and the right hand side (RHS) of designed road centerline, measured along the centerline of the culvert. LHS and RHS is that when viewed in the direction of increasing chainage. The total culvert length is obtained by adding the LHS length to the RHS length.
- Finished Road Center Level**  
Refers to the proposed finished road level of the culvert chainage at the designed road centerline.
- Inlet/Outlet Structure**  
Refers to the type of culvert shown on the standard drawing details (Drawing No. A1/87782).
- Inlet/Outlet Invert Level**  
Pipe Culverts should be installed on the ground level except when being directed.
- Culverts at Intersections and Feeder Roads**  
Ref. No. 1001 - 1002:  
These culverts shall be installed on the feeder road derived from the at-grade intersection (CH. 33 + 425).  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the feeder roads centerline.  
Ref. No. 1003 - 1010:  
These culverts shall be installed on at-grade intersections as shown on the drawing at each culvert location. The chainage given for each culvert indicates the location for inlet/outlet.

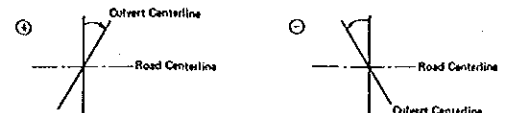
|                               |            |   |       |   |                 |  |                               |   |  |   |  |  |  |
|-------------------------------|------------|---|-------|---|-----------------|--|-------------------------------|---|--|---|--|--|--|
| SURVEY<br><b>JICA</b><br>Date |            | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY<br>Principal<br>25 Sep. 1989 Date |       | DRAWN<br>CHECKED<br>DESIGNED<br>CHECKED |                 | RECOMMENDED<br>PROJECT ENGINEER<br>APPROVED<br>PRINCIPAL ENGINEER<br>SECRETARY |                               | SCALES<br> |  | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MATALAUA SECTION<br>CULVERT SCHEDULE<br>CH. 60 + 500 TO CH 64 + 270<br>PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS<br>DRAWING No. A1 88068 |  |  |  |
| REV.                          | AMENDMENTS | BY  | APP'D | DATE                                    | SHEET 27 OF 303 |  | PROJECT No. S.C. 120-33-814/B |   |  |   |  |  |  |



**CULVERT SCHEDULE**

| REF NO | CHAINAGE            | TYPE | NO OF PIPES | DIA  | SKEW ANGLE IN DEGREES | DISTANCE MEASURED ALONG PIPE FROM ROAD |       | FINISHED ROAD LEVEL | INLET / OUTLET STRUCTURE | REMARKS |
|--------|---------------------|------|-------------|------|-----------------------|--|-------|---------------------|--------------------------|---------|
|        |                     |      |             |      |                       | LHS                                    | RHS   |                     |                          |         |
| 275    | 65 + 260            | CSP  | 1           | 900  |                       | 5.622                                  | 6.269 | 3.478               | Type A                   |         |
| 276    | 65 + 765            | CSP  | 1           | 900  |                       | 6.391                                  | 5.800 | 3.981               | Type A                   |         |
| 277    | 66 + 045            | CSP  | 1           | 900  |                       | 5.245                                  | 5.959 | 3.773               | Type A                   |         |
| 278    | 66 + 760            | CSP  | 1           | 2100 |                       | 6.582                                  | 6.475 | 3.058               | Type A                   |         |
| 279    | 67 + 570            | CSP  | 1           | 900  |                       | 5.825                                  | 5.753 | 2.813               | Type A                   |         |
| 280    | 68 + 000            | CSP  | 1           | 900  |                       | 6.112                                  | 6.371 | 2.813               | Type A                   |         |
| 281    | 68 + 880            | CSP  | 1           | 900  |                       | 8.919                                  | 9.509 | 4.961               | Type A                   |         |
| 282    | 69 + 040            | CSP  | 1           | 900  |                       | 5.532                                  | 6.254 | 2.843               | Type A                   |         |
| 283    | 69 + 265            | CSP  | 1           | 900  |                       | 5.552                                  | 6.230 | 2.843               | Type A                   |         |
| 284    | 69 + 705            | CSP  | 1           | 900  |                       | 5.786                                  | 5.692 | 2.843               | Type A                   |         |
| 285    | 69 + 900            | CSP  | 1           | 900  |                       | 7.245                                  | 6.405 | 2.768               | Type A                   |         |
| 286    | 70 + 135            | CSP  | 1           | 900  |                       | 6.250                                  | 5.420 | 1.708               | Type A                   |         |
| 287    | 70 + 300            | CSP  | 1           | 900  |                       | 5.767                                  | 5.661 | 1.963               | Type A                   |         |
| 288    | 70 + 550            | CSP  | 1           | 900  |                       | 5.666                                  | 5.762 | 2.363               | Type A                   |         |
| 289    | 70 + 700            | CSP  | 1           | 900  |                       | 6.002                                  | 6.052 | 2.572               | Type A                   |         |
| 290    | 71 + 100            | CSP  | 1           | 900  |                       | 6.443                                  | 6.423 | 2.243               | Type A                   |         |
| 291    | 71 + 435            | CSP  | 1           | 900  |                       | 5.964                                  | 6.408 | 1.942               | Type A                   |         |
| 292    | 72 + 030            | CSP  | 1           | 900  |                       | 5.655                                  | 5.616 | 2.211               | Type A                   |         |
| 293    | 72 + 240            | CSP  | 1           | 900  |                       | 5.771                                  | 5.573 | 2.434               | Type A                   |         |
| 294    | 73 + 350            | CSP  | 1           | 900  |                       | 7.844                                  | 7.249 | 2.651               | Type A                   |         |
| 295    | 73 + 760            | CSP  | 1           | 900  |                       | 6.733                                  | 6.594 | 3.096               | Type A                   |         |
| 296    | 74 + 285            | CSP  | 1           | 900  |                       | 7.389                                  | 8.189 | 3.411               | Type A                   |         |
| 297    | 74 + 600            | CSP  | 1           | 900  |                       | 6.398                                  | 7.363 | 3.600               | Type A                   |         |
| 298    | 75 + 300            | CSP  | 1           | 900  |                       | 6.567                                  | 6.530 | 4.020               | Type A                   |         |
| 299    | 76 + 346            | CSP  | 1           | 2100 | + 30°                 | 9.545                                  | 8.393 | 3.451               | Type A                   |         |
| 300    | 76 + 520            | CSP  | 1           | 900  |                       | 6.818                                  | 6.766 | 3.582               | Type A                   |         |
| 301    | 77 + 290            | CSP  | 1           | 900  |                       | 6.715                                  | 6.687 | 5.049               | Type A                   |         |
| 302    | 77 + 375            | CSP  | 1           | 900  |                       | 6.479                                  | 6.042 | 4.993               | Type A                   |         |
| 303    | 79 + 015            | CSP  | 1           | 2100 |                       | 6.746                                  | 6.412 | 4.442               | Type A                   |         |
| 304    | 79 + 140            | CSP  | 1           | 900  |                       | 6.821                                  | 5.762 | 4.410               | Type A                   |         |
|        |                     | CSP  |             |      |                       |  |       |                     |                          |         |
|        |                     | CSP  |             |      |                       |  |       |                     |                          |         |
| 1003   | 33 + 521 ~ 33 + 541 | CSP  | 1           | 900  |                       | 20.000                                 |       | —                   | Type A                   |         |
| 1004   | 33 + 521 ~ 33 + 539 | CSP  | 1           | 900  |                       | 18.000                                 |       | —                   | Type A                   |         |
| 1005   | 80 + 308 ~ 80 + 327 | CSP  | 1           | 900  |                       | 19.000                                 |       | —                   | Type A                   |         |
| 1006   | 80 + 360 ~ 80 + 381 | CSP  | 1           | 900  |                       | 21.000                                 |       | —                   | Type A                   |         |
| 1007   | 80 + 388 ~ 80 + 395 | CSP  | 1           | 900  |                       | 7.000                                  |       | —                   | Type A                   |         |
| 1008   | 80 + 436 ~ 80 + 457 | CSP  | 1           | 900  |                       | 21.000                                 |       | —                   | Type A                   |         |
| 1009   | 80 + 523 ~ 80 + 541 | CSP  | 1           | 900  |                       | 18.000                                 |       | —                   | Type A                   |         |
| 1010   | 80 + 532 ~ 80 + 552 | CSP  | 1           | 900  |                       | 20.000                                 |       | —                   | Type A                   |         |

**NOTES**

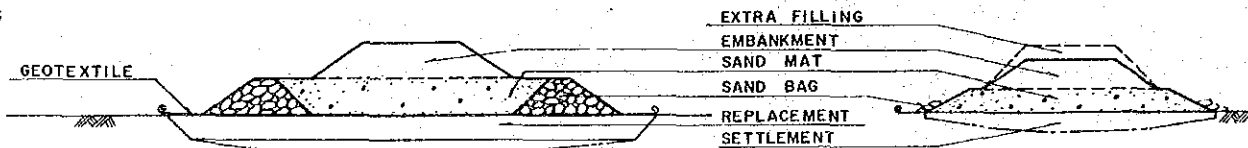
- General**  
The Culvert Schedule contains all of CSP pipes to be installed in accordance with the standard drawing details (Drawing No. A1/87782, A1/87783).
- Chainage**  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the designed road centerline. Where multiple culverts occur the chainage given refers to the intersection between the designed road centerline and the centerline of the multiple system.
- Type**  
Refers to the type of pipe:  
CSP - Corrugated Steel Pipe
- Number of Pipes**  
Indicates the number of proposed pipes at the chainage given in Column (2).
- Diameter**  
Indicates the diameter of proposed culverts.
- Skew Angle in Degrees**  
The angle of skew should be determined as follows:  

- Distance Measured Along Pipe From Road**  
This refers to the length of the pipe to be installed to both the left hand side (LHS) and the right hand side (RHS) of designed road centerline, measured along the centerline of the culvert. LHS and RHS is that when viewed in the direction of increasing chainage. The total culvert length is obtained by adding the LHS length to the RHS length.
- Finished Road Center Level**  
Refers to the proposed finished road level of the culvert chainage at the designed road centerline.
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Refers to the type of culvert shown on the standard drawing details (Drawing No. A1/87782).
- Inlet/Outlet Invert Level**  
Pipe Culverts should be installed on the ground level except when being directed.
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Ref. No. 1001 - 1002:  
These culverts shall be installed on the feeder road derived from the at-grade intersection (CH. 33 + 425).  
The chainage given for each culvert is the chainage at the intersection of the culvert centerline with the feeder roads centerline.  
Ref. No. 1003 - 1010:  
These culverts shall be installed on at-grade intersections as shown on the drawing at each culvert location. The chainage given for each culvert indicates the location for inlet/outlet.

|                                  |  |   |  |                               |  |                                   |  |  |  |   |  |                         |  |                         |  |
|----------------------------------|--|---|--|-------------------------------|--|-----------------------------------|--|--|--|---|--|-------------------------|--|-------------------------|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br><i>[Signature]</i>   |  | RECOMMENDED<br><i>[Signature]</i> |  | SCALES<br>1:1000                         |  | CENTRAL GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAUUA SECTION<br>CULVERT SCHEDULE<br>CH.65+260 TO CH79+140 AND ON SIDE DITCH |  |                         |  |                         |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | HORIZONTAL DATUM                                  |  | CHECKED<br><i>[Signature]</i> |  | DESIGNED<br><i>[Signature]</i>    |  | APPROVED<br><i>[Signature]</i>           |  | PROJECT No.<br>S.C.120-33-814/B   |  | SHEET 28 OF 303         |  | DRAWING No.<br>A1 88069 |  |
| AMENDMENTS                       |  | BY APP'D DATE                                     |  | SURVEY BOOK No.9              |  | 25 Sep. 1989                      |  | EXECUTIVE ENGINEER<br><i>[Signature]</i> |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS   |  | DRAWING No.<br>A1 88069 |  | REV.                    |  |

EARTHWORKS SCHEDULE CH.33+500 - CH.80+596

| NO. | WORK ITEM                                       | SECTION | UNIT           | SECTION                            |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | TOTAL                                 |              |                |
|-----|---|---------|----------------|------------------------------------|------------------------------------|---|---|-------------------------------------|--|-------------------------------------|---|--------------------------------------|---|-------------------------------------|--|--------------------------------------|---------------------------------------|--------------|----------------|
|     |   |         |                | 1                                  | 2                                  | 3~11 *1   | 12  | 13~16 *2                            | 17   | 18                                  | 19  | 20~22 *3                             | 23  | 24                                  | 25   | 26,27 *4                             | CH. 33 + 500<br>WHOLE<br>CH. 80 + 596 | ROAD<br>WORK | BRIDGE<br>WORK |
|     |   |         |                | CH.33+500<br>CH.33+800<br>L= 300m. | CH.33+800<br>CH.33+914<br>L= 114m. | CH.33+914<br>ALIKA SWAMP<br>CH.59+909<br>L=25,995m. | CH.59+909<br>KAPURI Br.<br>CH.59+998<br>L= 89m. | CH.59+998<br>CH.67+166<br>L=7,168m. | CH.67+166<br>LAKEKAMU Br.<br>CH.67+308<br>L= 142m. | CH.67+308<br>CH.68+667<br>L=1,359m. | CH.68+667<br>TAURI Br.<br>CH.68+809<br>L= 142m. | CH.68+809<br>CH.75+901<br>L= 7,092m. | CH.75+901<br>MAKARA Br.<br>CH.75+965<br>L= 64m. | CH.75+965<br>CH.77+204<br>L=1,239m. | CH.77+204<br>SAPPAHARO Br.<br>CH.77+267<br>L= 63m. | CH.77+267<br>CH.80+596<br>L= 3,329m. |                                       |              |                |
| 1   | EXCAVATION                                      |         | m <sup>3</sup> |                                    |                                    | 258   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 258                                   | 258          |                |
|     |   |         | m <sup>3</sup> |                                    |                                    | 155,728   |   | 4,963                               |  |                                     |   |                                      |   |                                     |  |                                      | 160,691                               | 160,691      |                |
|     |   |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   | 50                                  |  |                                      | 50                                    |              | 50             |
|     |   |         | m <sup>3</sup> | 293                                |                                    | 89,045  |   | 5,889                               |  | 497                                 |   |                                      |   |                                     |  | 4,028                                | 99,752                                | 99,752       |                |
|     |   |         | m <sup>3</sup> | 293                                |                                    | 245,031   |   | 10,852                              |  | 497                                 |   |                                      |   |                                     | 50   | 4,028                                | 260,751                               | 260,701      | 50             |
| 2   | EMBANKMENT                                      |         | m <sup>3</sup> | 8,036                              | 495                                | 362,066   | 297   | 69,620                              | 883  | 22,240                              | 968   | 68,215                               | 180   | 9,354                               | 100  | 12,024                               | 554,478                               | 551,555      | 2,923          |
|     | (COMPACTED VOLUME)-2 SETTLEMENT                 |         | m <sup>3</sup> | 1,161                              | 72                                 | 7,410   | 85  | 12,011                              | 72   | 1,641                               | 55  | 11,141                               | 71  | 4,365                               | 48   | 1,282                                | 39,414                                | 39,011       | 403            |
|     | -3 EXTRA FILLING                                |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  | 967                                 |   |                                      |   |                                     |  |                                      | 967                                   | 967          |                |
|     |   |         | m <sup>3</sup> | 9,197                              | 567                                | 369,476   | 382   | 81,631                              | 955  | 24,848                              | 1,023   | 79,356                               | 251   | 13,719                              | 148  | 13,306                               | 594,859                               | 591,533      | 3,326          |
| 3   | BORROW  |         | m <sup>3</sup> | 7,787                              | 495                                | 138,161   | 297   | 59,899                              | 883  | 21,818                              | 968   | 68,215                               | 180   | 9,354                               | 100  | 8,600                                | 316,757                               | 313,834      | 2,923          |
|     | (COMPACTED VOLUME)-2 SETTLEMENT                 |         | m <sup>3</sup> | 1,161                              | 72                                 | 6,410   | 85  | 12,011                              | 72   | 1,641                               | 55  | 11,141                               | 71  | 4,365                               | 48   | 1,282                                | 38,414                                | 38,011       | 403            |
|     | -3 EXTRA FILLING                                |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  | 967                                 |   |                                      |   |                                     |  |                                      | 967                                   | 967          |                |
|     |   |         | m <sup>3</sup> | 8,948                              | 567                                | 144,571   | 382   | 71,910                              | 955  | 24,426                              | 1,023   | 79,356                               | 251   | 13,719                              | 148  | 9,882                                | 356,138                               | 352,812      | 3,326          |
| 4   | UNSUITABLE MATERIAL                             |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  | (Provisional)                        | 16,500                                | 16,500       |                |
|     | -2 SWAMP (ALIKA SWAMP)                          |         | m <sup>3</sup> |                                    |                                    | 9,352   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 9,352                                 | 9,352        |                |
| 5   | EXCAVATION FOR STRUCTURAL FOUNDATION            |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      |                                       |              |                |
|     | -1 TYPE C MATERIAL                              |         | m <sup>3</sup> | 67                                 | 507                                | 500   | 41  | 187                                 | 186  | 5                                   | 166   | 42                                   | 65  | 12                                  | 77   | 17                                   | 1,872                                 | 830          | 1,042          |
|     | -2 TYPE D MATERIAL                              |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      |                                       |              |                |
| 6   | FILLING TO STRUCTURAL FOUNDATIONS               |         | m <sup>3</sup> |                                    | 246                                |   | 122   |                                     | 552  |                                     | 576   |                                      | 92  |                                     | 69   |                                      | 1,657                                 |              | 1,657          |
| 7   | SAND MAT MATERIAL                               |         | m <sup>3</sup> | 2,329                              | 143                                | 38,209  | 262   | 54,805                              |  |                                     |   | 41,983                               | 238   | 17,920                              | 205  | 2,915                                | 159,009                               | 158,161      | 848            |
|     | -2 SAND BAG FOR ALIKA                           |         | m <sup>3</sup> |                                    |                                    | 3,655   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 3,655                                 | 3,655        |                |
|     | -3 SAND BAG FOR KAPURI                          |         | m <sup>3</sup> |                                    |                                    | 107   |   | 853                                 |  |                                     |   |                                      |   |                                     |  |                                      | 960                                   | 960          |                |
|     | -4 REPLACEMENT                                  |         | m <sup>3</sup> |                                    |                                    | 9,352   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 9,352                                 | 9,352        |                |
|     | -5 SETTLEMENT                                   |         | m <sup>3</sup> |                                    |                                    | 4,013   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 4,013                                 | 4,013        |                |
|     |   |         | m <sup>3</sup> | 2,329                              | 143                                | 55,336  | 262   | 55,658                              |  |                                     |   | 41,983                               | 238   | 17,920                              | 205  | 2,915                                | 176,989                               | 176,141      | 848            |
| 8   | GEOTEXTILE FABRIC                               |         | m <sup>2</sup> |                                    |                                    | 35,269  | 325   | 76,623                              |  |                                     |   |                                      |   |                                     |  |                                      | 112,217                               | 111,892      | 325            |
|     | -2 TYPE - B                                     |         | m <sup>2</sup> | 5,897                              | 320                                | 70,495  | 317   | 83,592                              |  |                                     |   | 59,883                               | 304   | 25,723                              | 266  | 8,900                                | 255,697                               | 254,490      | 1,207          |
| 9   | SUBSOIL DRAIN                                   |         | lin. m         |                                    |                                    | 1,902   |   | 2,925                               |  | 803                                 |   |                                      |   |                                     |  |                                      | 5,630                                 | 5,630        |                |
| 10  | RENO MATTRESS                                   |         | m <sup>3</sup> | 39                                 |                                    | 343   |   | 137                                 |  | 4                                   |   | 36                                   |   | 7                                   |  | 11                                   | 577                                   | 577          |                |
|     | -2 TYPE - A FOR SLOPE ALIKA                     |         | m <sup>3</sup> |                                    |                                    | 752   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 752                                   | 752          |                |
|     | -3 TYPE - B                                     |         | m <sup>3</sup> |                                    | 342                                |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      | 342                                   |              | 342            |
| 11  | GABION  |         | m <sup>3</sup> | 112                                | 90                                 | 833   |   | 311                                 |  | 8                                   |   | 70                                   |   | 20                                  |  | 28                                   | 1,472                                 | 1,382        | 90             |
| 12  | SETTLEMENT PLATE                                |         | NO.            | 3                                  |                                    | 54  |   | 57                                  |  | 18                                  |   | 42                                   |   | 15                                  |  | 6                                    | 195                                   | 195          |                |
| 13  | DISPLACEMENT PEG                                |         | NO.            | 2                                  |                                    | 28  |   | 38                                  |  | 12                                  |   | 28                                   |   | 10                                  |  | 4                                    | 122                                   | 122          |                |
| 14  | EXCAVATION FOR INTERSECTIONS                    |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      |                                       |              |                |
|     | -1 TYPE C MATERIAL                              |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      |                                       |              |                |
|     | -2 TYPE D MATERIAL                              |         | m <sup>3</sup> |                                    |                                    |   |   |                                     |  |                                     |   |                                      |   |                                     |  |                                      |                                       |              |                |
| 15  | EMBANKMENT FOR INTERSECTIONS (COMPACTED VOLUME) |         | m <sup>3</sup> | 251                                |                                    | 377   |   |                                     |  | 251                                 |   | 126                                  |   |                                     |  | 1,130                                | 2,135                                 | 2,135        |                |

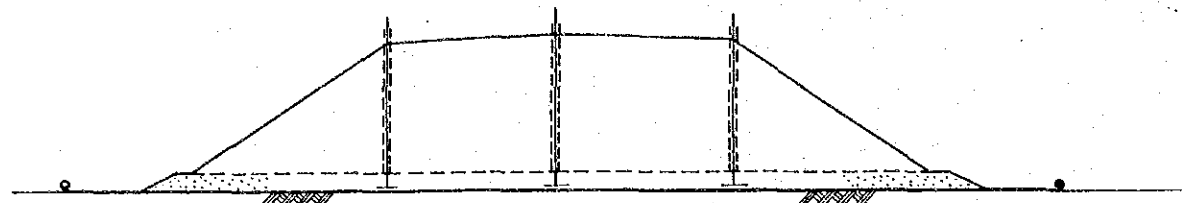
NOTES



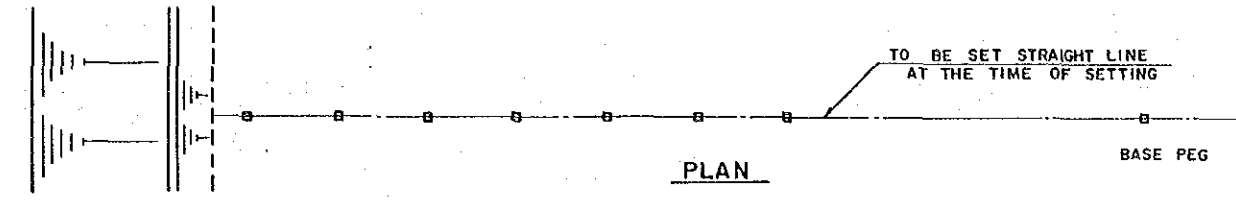
SECTIONS

- X-1 3 CH. 33+914 - CH. 34+150
- 4 CH. 34+150 - CH. 37+750
- 5 CH. 37+750 - CH. 38+200 ALIKA SWAMP
- 6 CH. 38+200 - CH. 47+500
- 7 CH. 47+500 - CH. 51+200
- 8 CH. 51+200 - CH. 54+000
- 9 CH. 54+000 - CH. 57+100
- 10 CH. 57+100 - CH. 58+600
- 11 CH. 58+600 - CH. 59+909
- X-2 13 CH. 59+998 - CH. 63+500
- 14 CH. 63+500 - CH. 64+000
- 15 CH. 64+000 - CH. 67+100
- 16 CH. 67+100 - CH. 67+166
- X-3 20 CH. 68+809 - CH. 69+000
- 21 CH. 69+000 - CH. 73+000
- 22 CH. 73+000 - CH. 75+901
- X-4 26 CH. 77+267 - CH. 77+700
- 27 CH. 77+700 - CH. 80+596

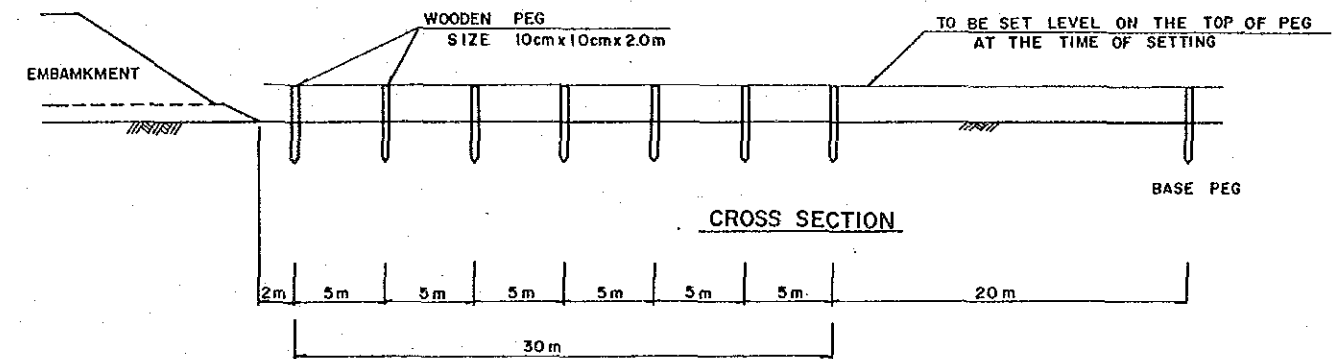
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| SURVEY<br><b>JICA</b>             |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.         |  | RECOMMENDED<br>Principal Engineer |  | SCALES               |  | CENTRAL / GULF PROVINCES<br>TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION<br>EARTHWORKS SCHEDULE<br>CH.33+500 - CH.80+596 |  |                                  |  |   |  |                          |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL. |  | DATE<br>25 Sep. 1989                              |  | CHECKED<br>A. Magabio |  | PROJECT ENGINEER<br>K. K. K.      |  | APPROVED<br>S. C. S. |  | SHEET<br>29 OF 303   |  | PROJECT No.<br>S.C. 120-33-814/B |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS |  | DRAWING No.<br>A1/ 88070 |  |
| HORIZONTAL DATUM                  |  | SURVEY BOOK No.                                   |  | CHECKED<br>K. K. K.   |  | EXECUTIVE ENGINEER                |  | SECRETARY            |  | SHEET  |  | PROJECT No.                      |  | PAPUA NEW GUINEA                        |  | DRAWING No.              |  |



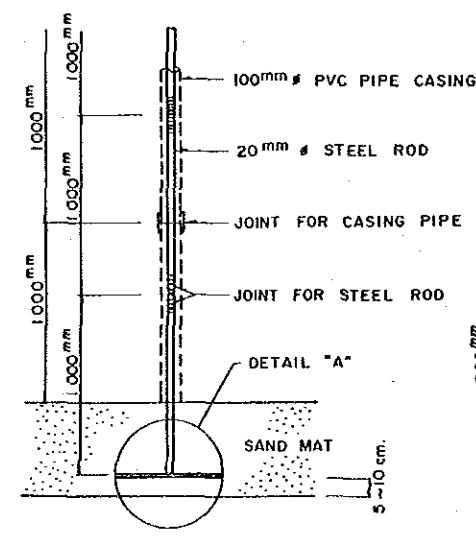
ARRANGEMENT OF THE SETTLEMENT PLATES



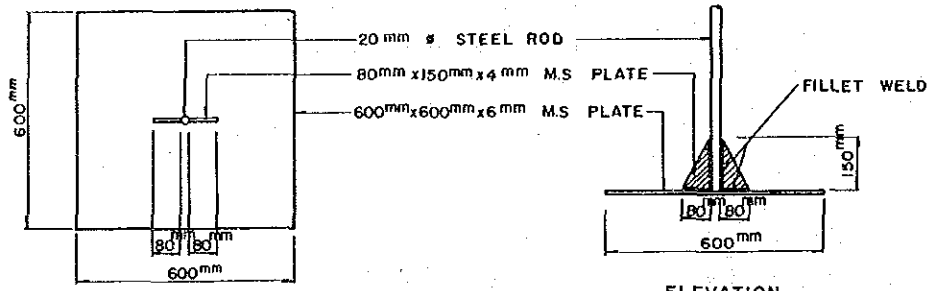
PLAN



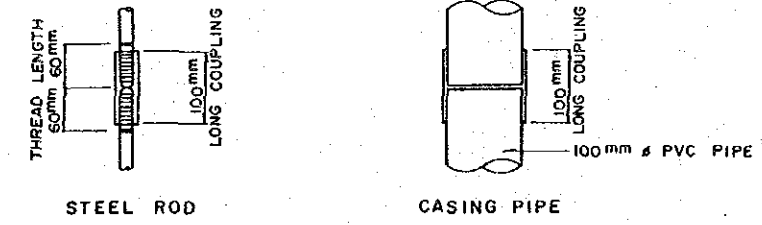
CROSS SECTION



SETTLEMENT PLATE  
Scale 1:20



DETAIL "A"  
Scale 1:10



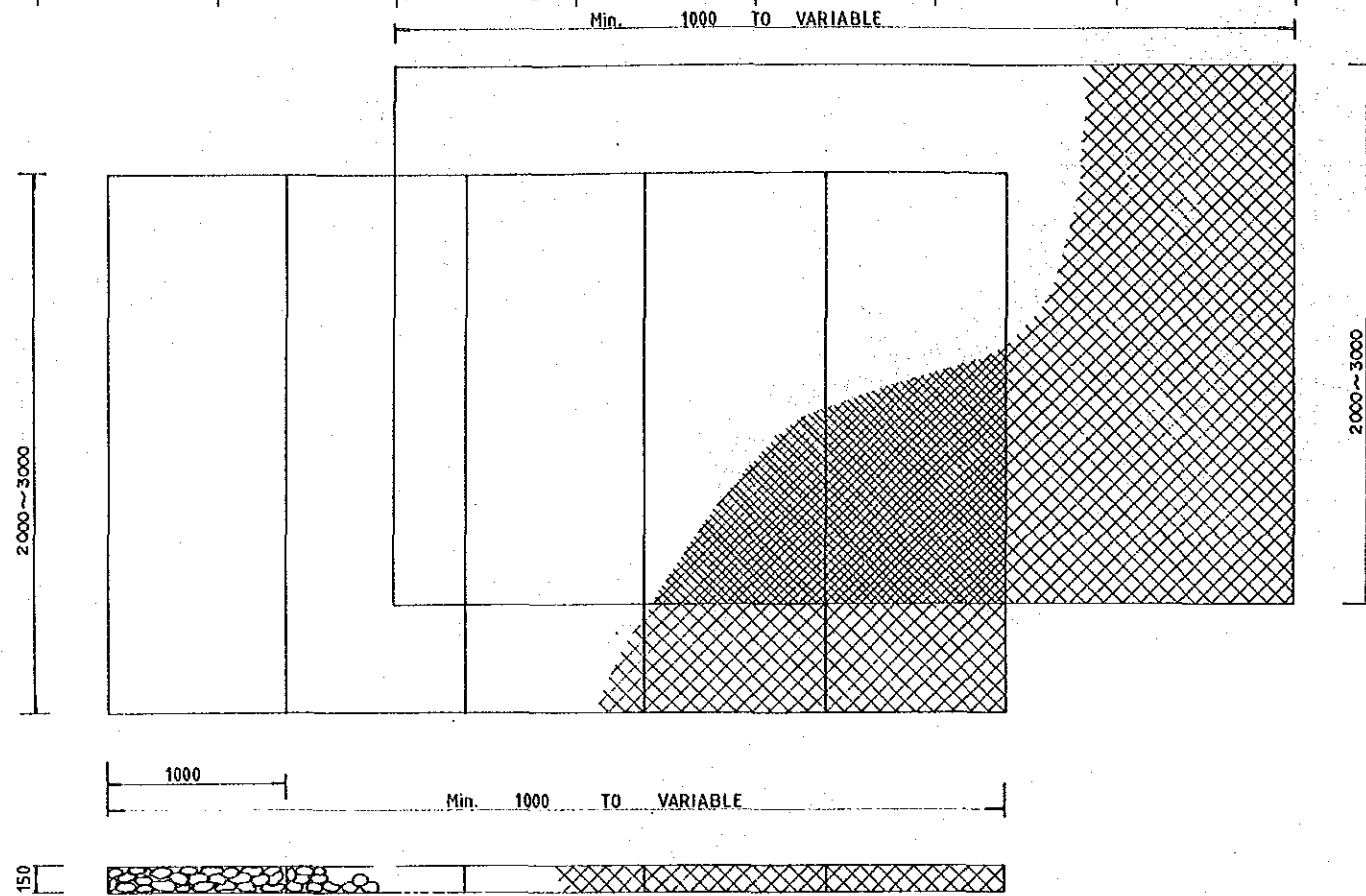
JOINT DETAILS  
Scale 1:5

LAYOUT FOR DISPLACEMENT PEG

NOTES : SETTLEMENT PLATE AND DISPLACEMENT PEG SHALL BE APPLIED FOR SOFT GROUND WHICH SECTIONS ARE AS FOLLOWS;

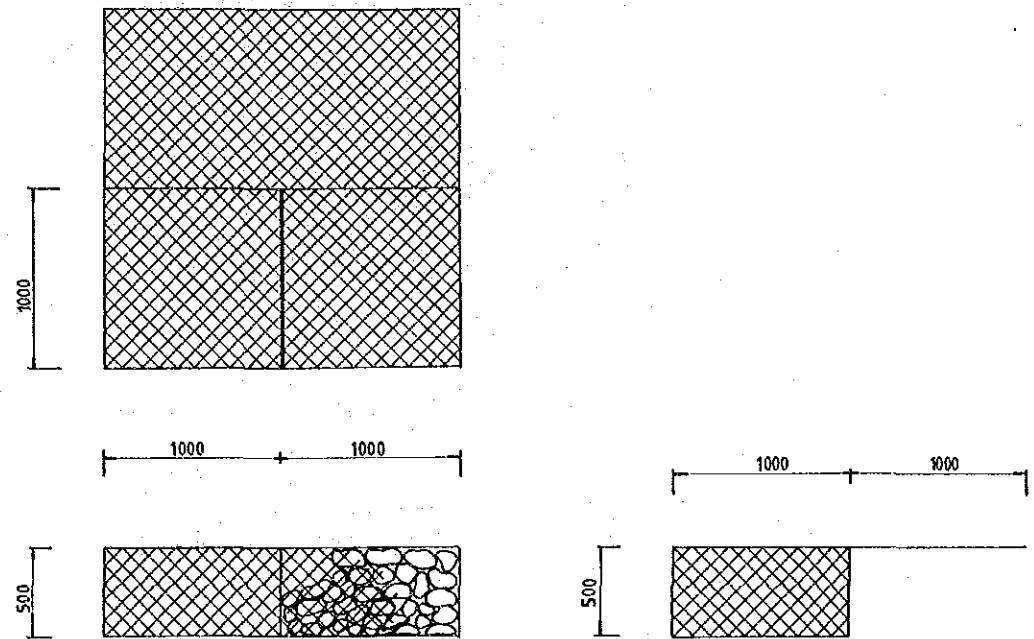
|        |                          | SETTLEMENT PLATE AT 250m INTERVAL (Nos) | DISPLACEMENT PEG AT 250m INTERVAL (Nos) |
|--------|--------------------------|---|---|
| SEC. 1 | CH. 33+500 TO CH. 33+800 | 3                                       | 2                                       |
| SEC. 3 | CH. 33+914 TO CH. 34+150 | 3                                       | 2                                       |
| SEC. 5 | CH. 37+750 TO CH. 38+200 | 12                                      | -                                       |
| SEC.10 | CH. 57+100 TO CH. 58+600 | 21                                      | 14                                      |
| SEC.11 | CH. 58+600 TO CH. 59+909 | 18                                      | 12                                      |
| SEC.13 | CH. 59+998 TO CH. 63+500 | 45                                      | 30                                      |
| SEC.14 | CH. 63+500 TO CH. 64+000 | 9                                       | 6                                       |
| SEC.16 | CH. 67+100 TO CH. 64+166 | 3                                       | 2                                       |
| SEC.18 | CH. 67+308 TO CH. 68+809 | 18                                      | 12                                      |
| SEC.20 | CH. 68+809 TO CH. 69+000 | 6                                       | 4                                       |
| SEC.22 | CH. 73+000 TO CH. 75+901 | 36                                      | 24                                      |
| SEC.24 | CH. 75+965 TO CH. 77+204 | 15                                      | 10                                      |
| SEC.26 | CH. 77+265 TO CH. 77+700 | 6                                       | 4                                       |

|                                  |            |  |       |                               |                                  |  |                    |  |   |  |                          |
|----------------------------------|------------|--|-------|-------------------------------|----------------------------------|--|--------------------|--|---|--|--------------------------|
| SURVEY<br><b>JICA</b><br>Date    |            | DESIGN<br><b>JAPAN INTERNATIONAL CO-OPERATION AGENCY</b> |       | DRAWN<br><b>K.E.</b>          |                                  | RECOMMENDED<br><i>[Signature]</i>        |                    | SCALES<br>AS SHOWN                           |   | CENTRAL / GULF PROVINCES                     |                          |
| VERTICAL DATUM<br>MEAN SEA LEVEL |            | HORIZONTAL DATUM   |       | CHECKED<br><i>[Signature]</i> |                                  | PROJECT ENGINEER<br><i>[Signature]</i>   |                    | APPROVED<br>26. 10. 81<br><i>[Signature]</i> |   | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |                          |
| SURVEY BOOK NO. 8                |            | 25 Sep. 1989<br>Date                                     |       | CHECKED<br><i>[Signature]</i> |                                  | EXECUTIVE ENGINEER<br><i>[Signature]</i> |                    | SECRETARY<br><i>[Signature]</i>              |   | SETTLEMENT PLATE AND DISPLACEMENT PEG        |                          |
| REV.                             | AMENDMENTS | BY   | APP'D | DATE                          | PROJECT No.<br>S.C. 120-33-814/B |  | SHEET<br>30 OF 303 |  | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS |  | DRAWING No.<br>A1/ 88071 |



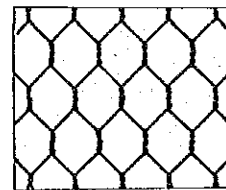
**RENO MATTRESS TYPE (A)**

NOTE: TYPE (B) THICKNESS 230 mm



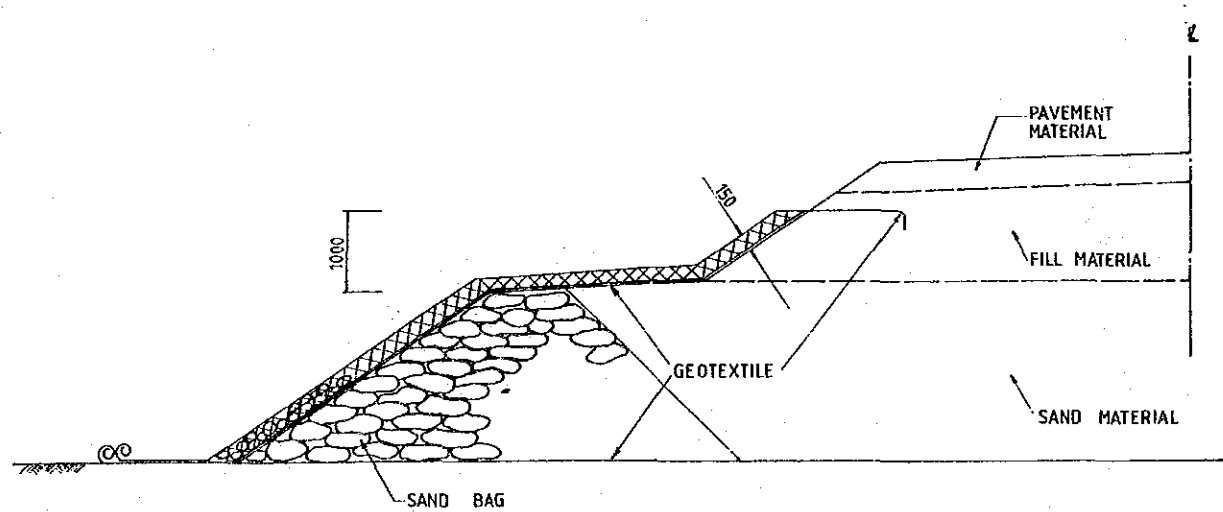
**GABION**

NOTE: ALL DIMENSIONS ARE IN MILLIMETRE UNLESS OTHERWISE STATED

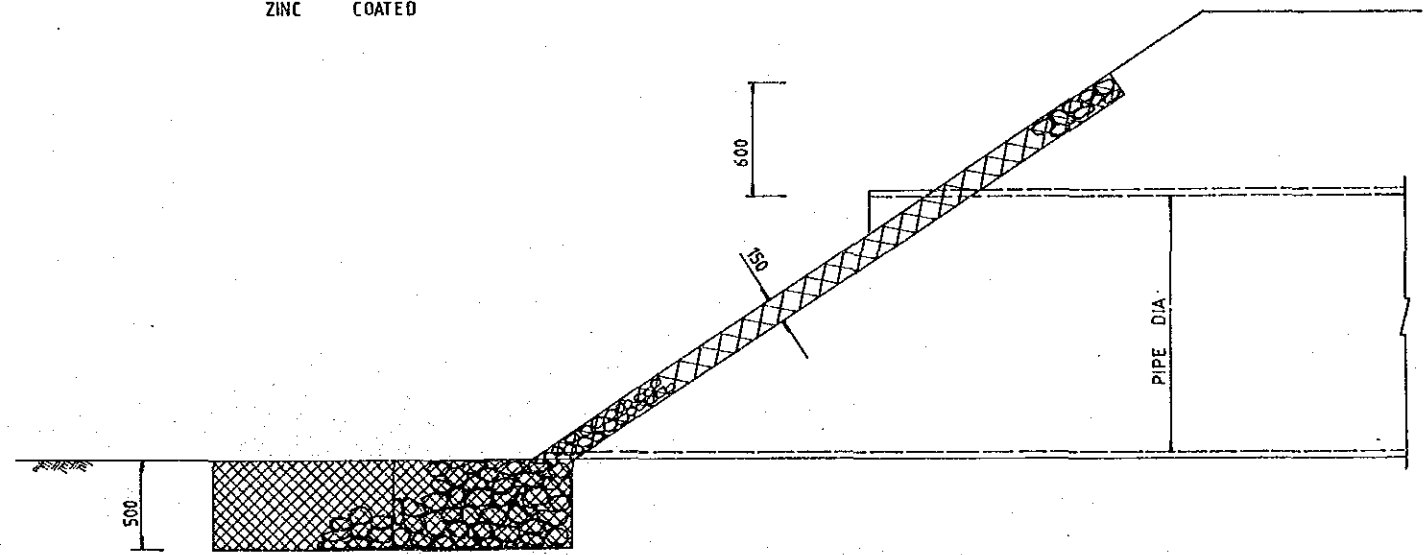


**MESH**

SIZE : 50x70  
 WIRE :  $\phi$  2.0mm  
 DOUBLE TWISTED HEXAGONAL MESH  
 ZINC COATED



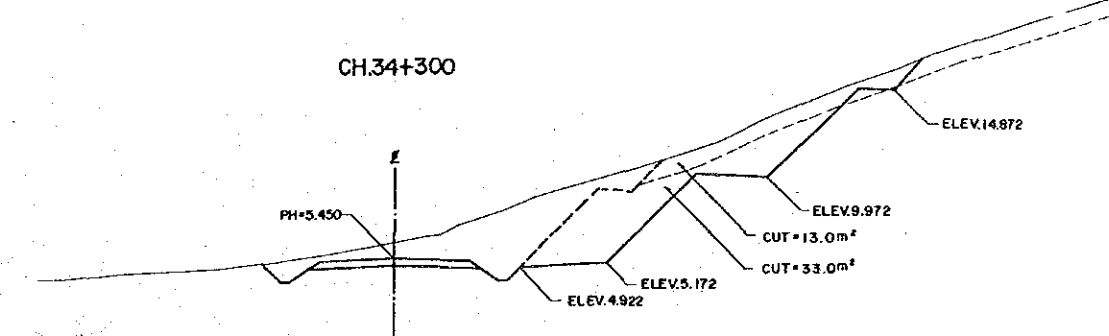
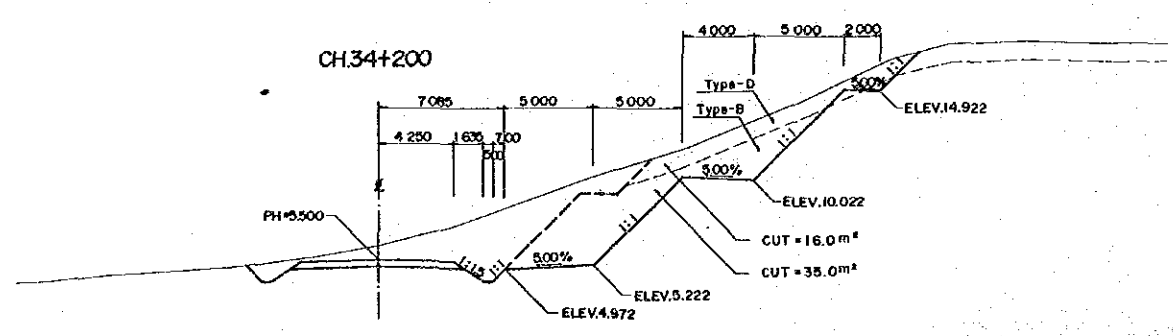
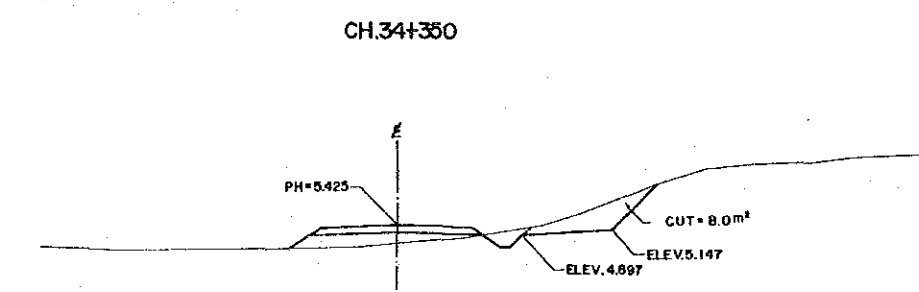
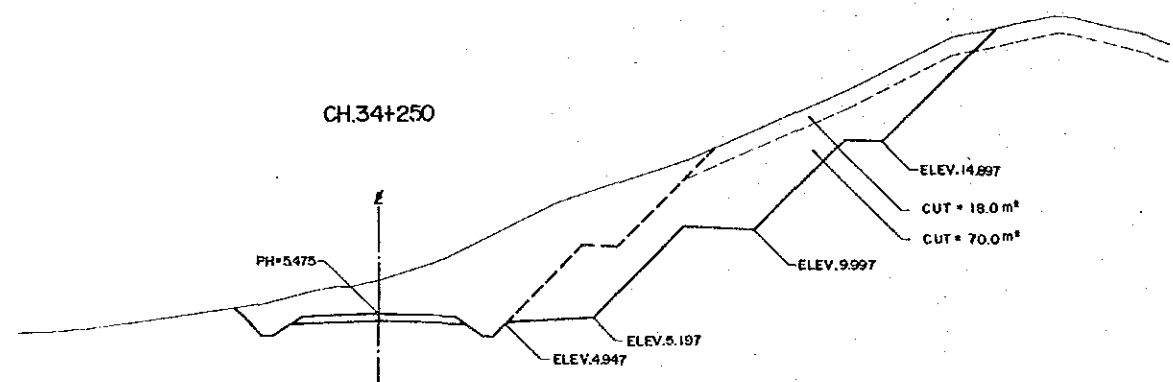
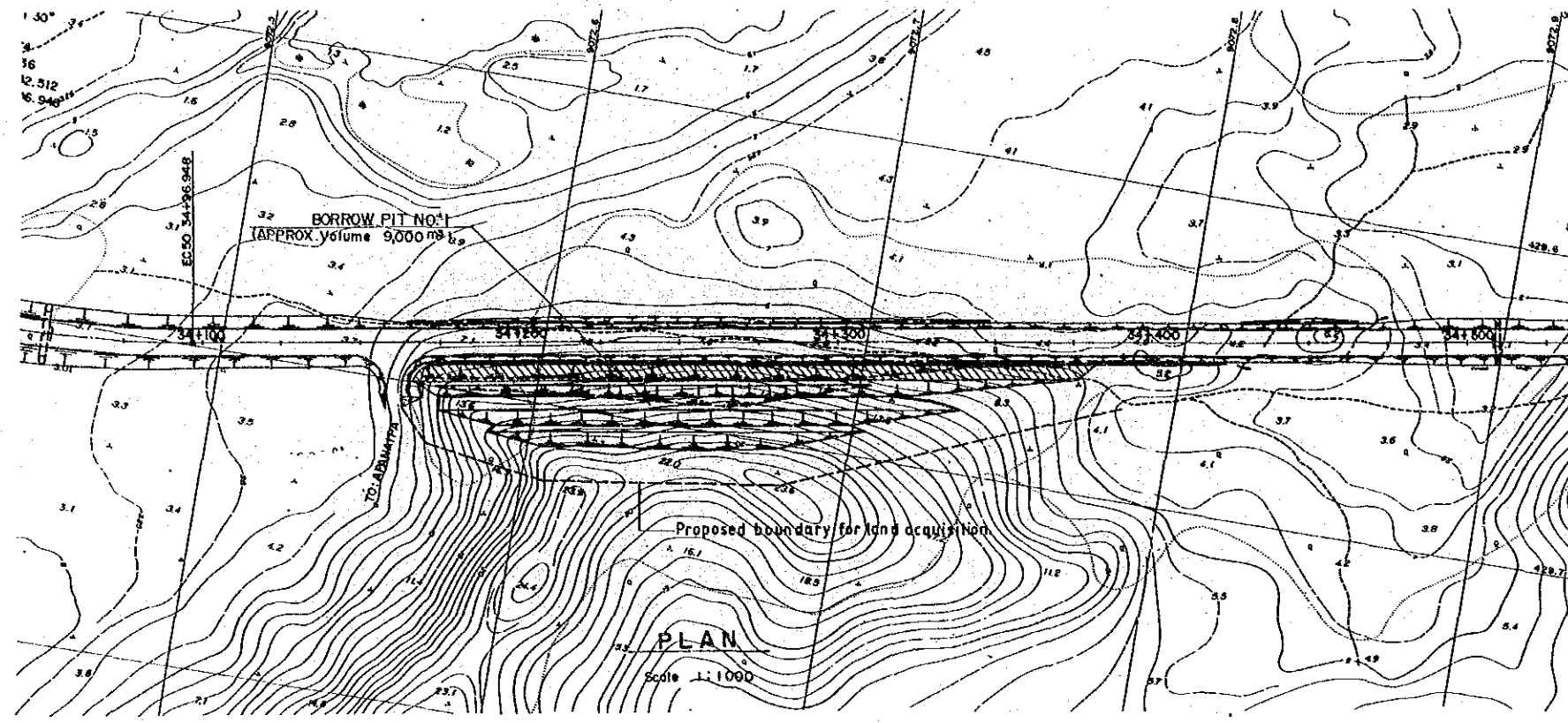
**RENO MATTRESS FOR ALIKA SWAMP**



**GABION AND RENO MATTRESS FOR OUTLET AND INLET PIPE CULVERT**

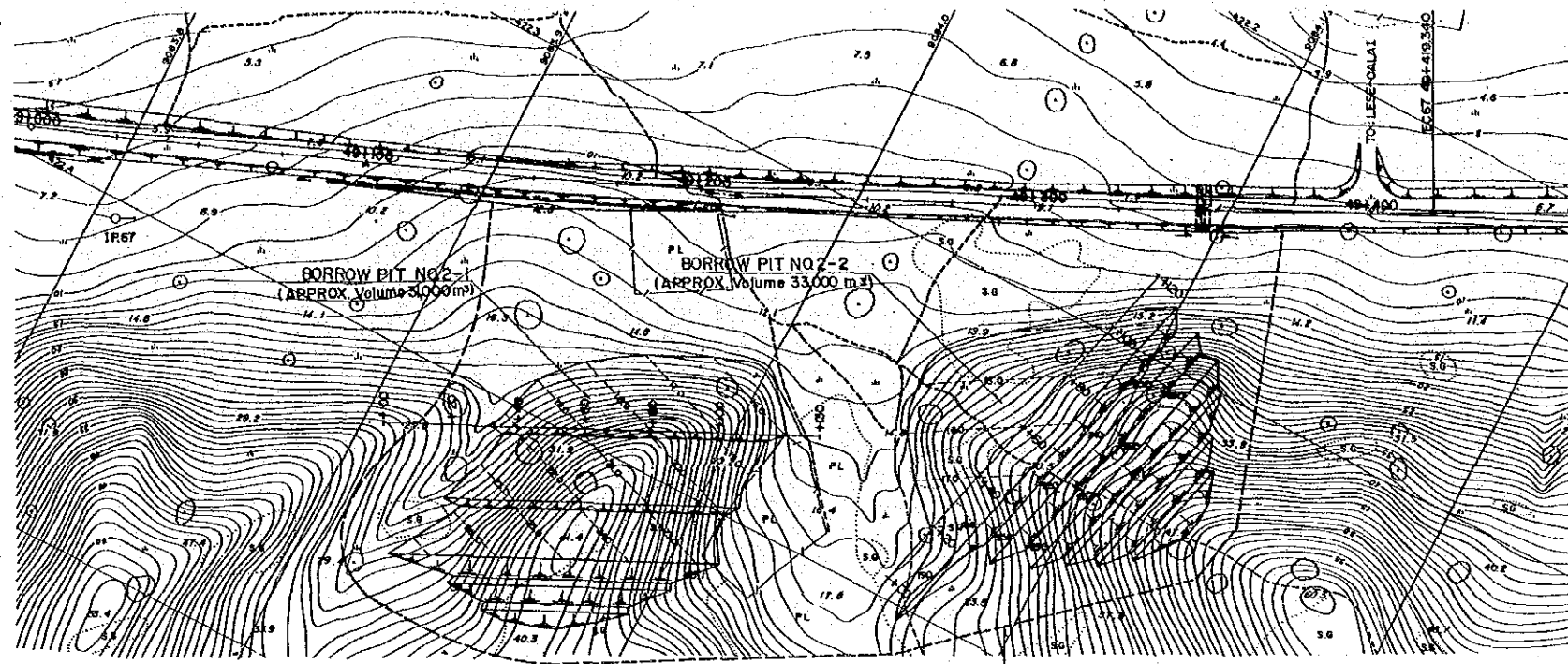
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| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.        |  | RECOMMENDED                     |  | SCALES<br>AS SHOWN               |  | CENTRAL / GULF PROVINCES                     |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | Principal<br>25 Sep. 1989                         |  | CHECKED<br>A. Magaka |  | PROJECT ENGINEER<br>L. Kule     |  | APPROVED<br>40. 10. 89           |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| HORIZONTAL DATUM                 |  | Principal   |  | CHECKED<br>I. Kankom |  | EXECUTIVE ENGINEER<br>I. Kankom |  | PRINCIPAL ENGINEER<br>H. Magaka  |  | RENO MATTRESS AND GABION                     |  |
| SURVEY BOOK NO. 8                |  | Date  |  | Principal            |  | EXECUTIVE ENGINEER              |  | SECRETARY<br>FAS(1)              |  | PAPUA NEW GUINEA DEPARTMENT OF WORKS         |  |
| AMENDMENTS                       |  | BY  |  | APP'D                |  | DATE                            |  | PROJECT No.<br>S.C. 120-33-814/B |  | DRAWING No.<br>A1 88072                      |  |
| REV.                             |  | BY  |  | APP'D                |  | DATE                            |  | SHEET 31 OF 303                  |  | A.Y.   |  |

34  
2/1  
3/2



CROSS SECTIONS  
Scale 1:200

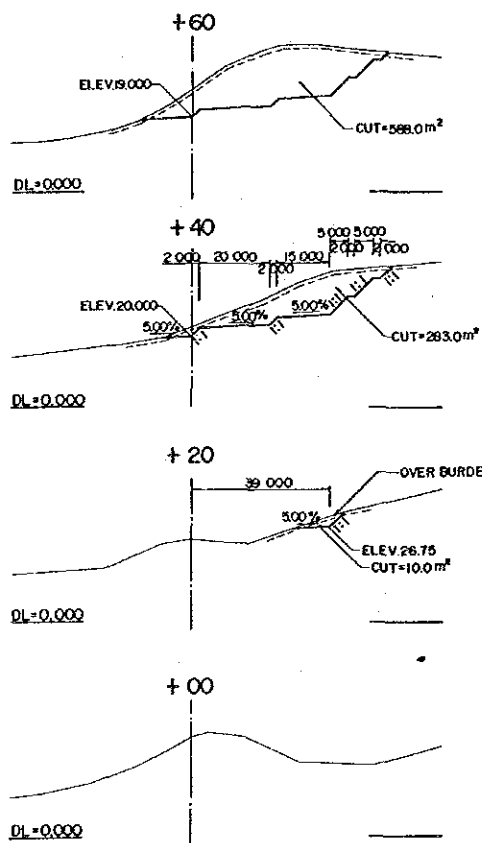
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| SURVEY                            |  | DESIGN                                  |  | DRAWN              |  | RECOMMENDED        |  | SCALES            |  | CENTRAL / GULF PROVINCES                     |  |
| JICA                              |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | K.E.               |  | [Signature]        |  | AS SHOWN          |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL. |  | [Signature]                             |  | C. [Signature]     |  | PRINCIPAL ENGINEER |  | [Signature]       |  | BORROW PIT NO. 1                             |  |
| HORIZONTAL DATUM                  |  | [Signature]                             |  | A. Magano          |  | APPROVED           |  | [Signature]       |  | PLAN & CROSS SECTIONS                        |  |
| SURVEY BOOK NO. 8                 |  | 25 Sep. 1989                            |  | [Signature]        |  | [Signature]        |  | PROJECT No.       |  | PAPUA NEW GUINEA                             |  |
| AMENDMENTS                        |  | BY APP'D DATE                           |  | EXECUTIVE ENGINEER |  | SECRETARY          |  | S.C. 120-33-814/B |  | DRAWING No.                                  |  |
|                                   |  |   |  |                    |  |                    |  | SHEET 32 OF 303   |  | DEPARTMENT OF WORKS                          |  |
|                                   |  |   |  |                    |  |                    |  |                   |  | A1/ 88073                                    |  |



**PLAN**

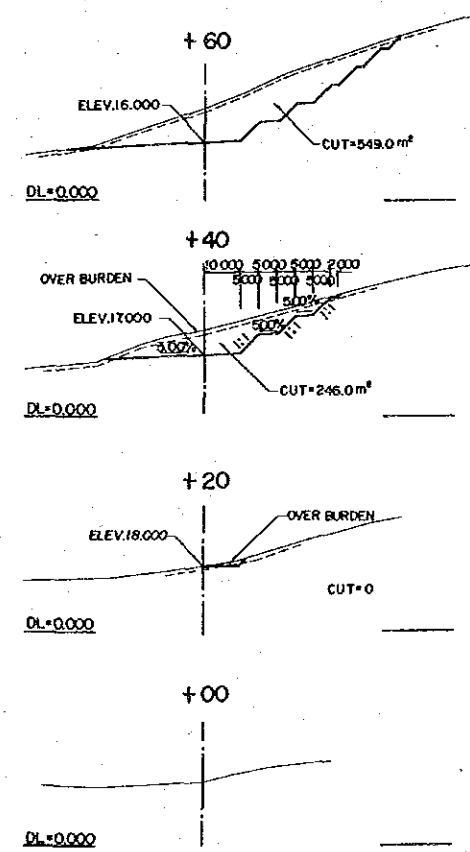
Scale 1:1000

Proposed boundary for land acquisition.



**CROSS SECTIONS OF BORROW PIT NO.2-1**

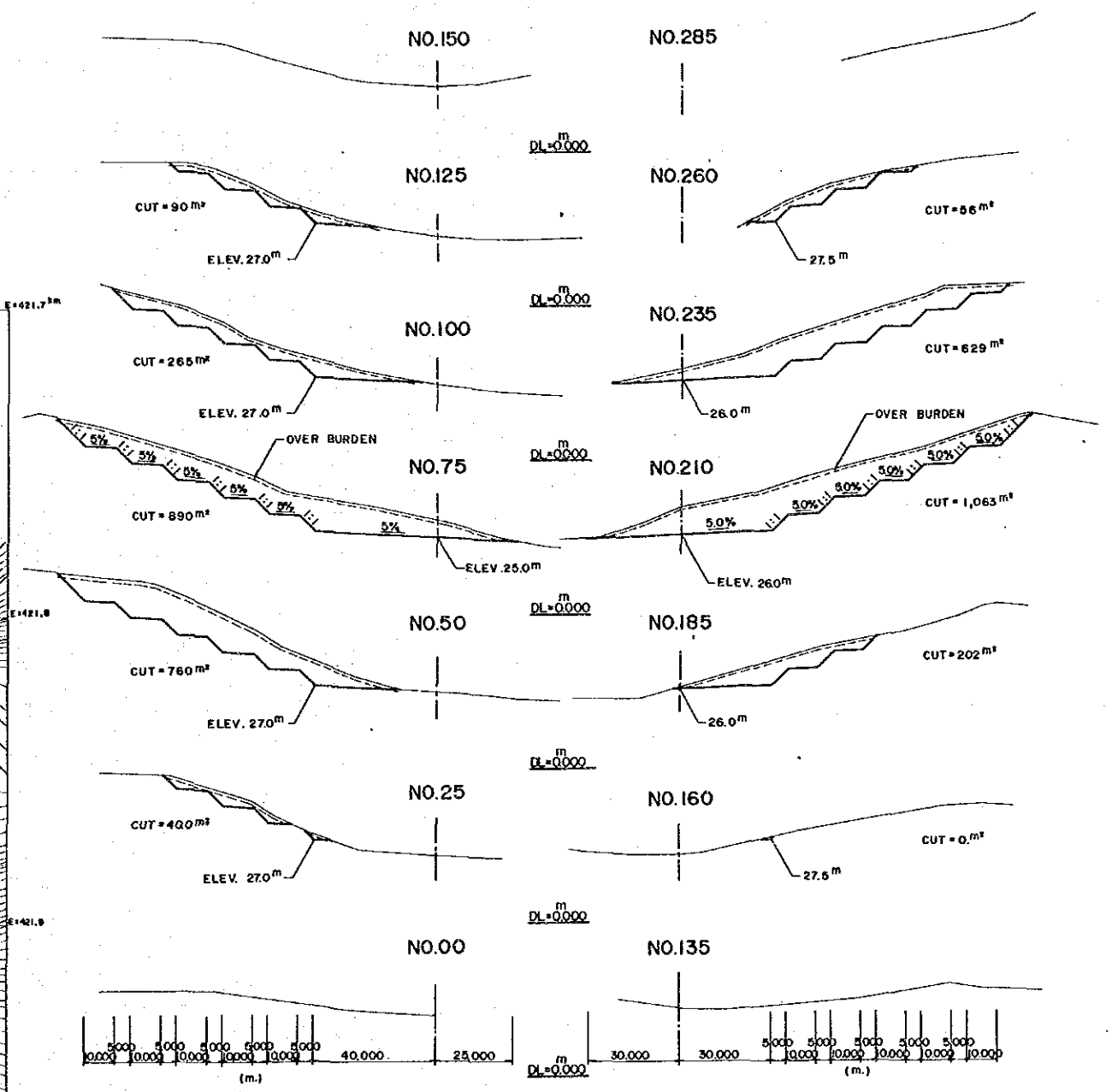
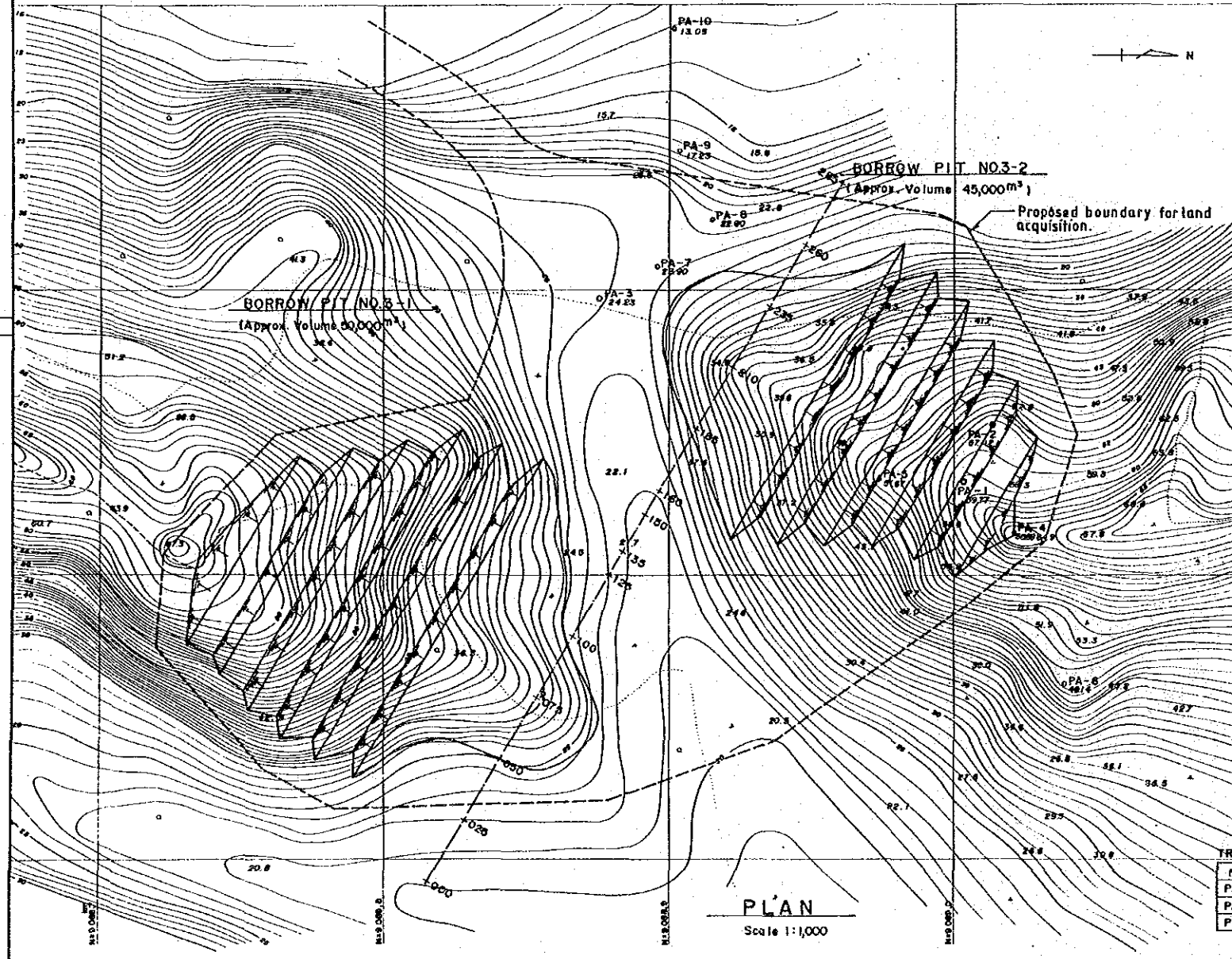
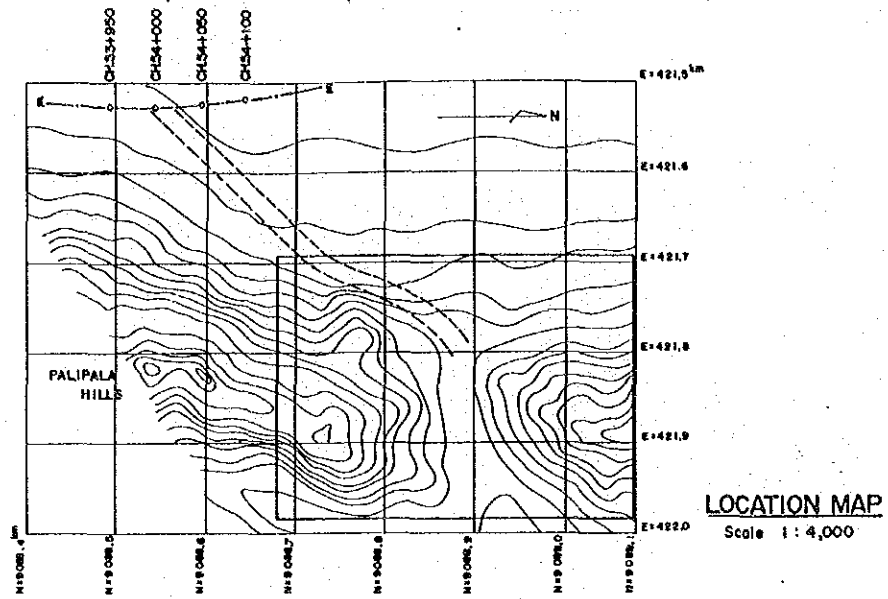
Scale 1:1000



**CROSS SECTIONS OF BORROW PIT NO.2-2**

Scale 1:1000

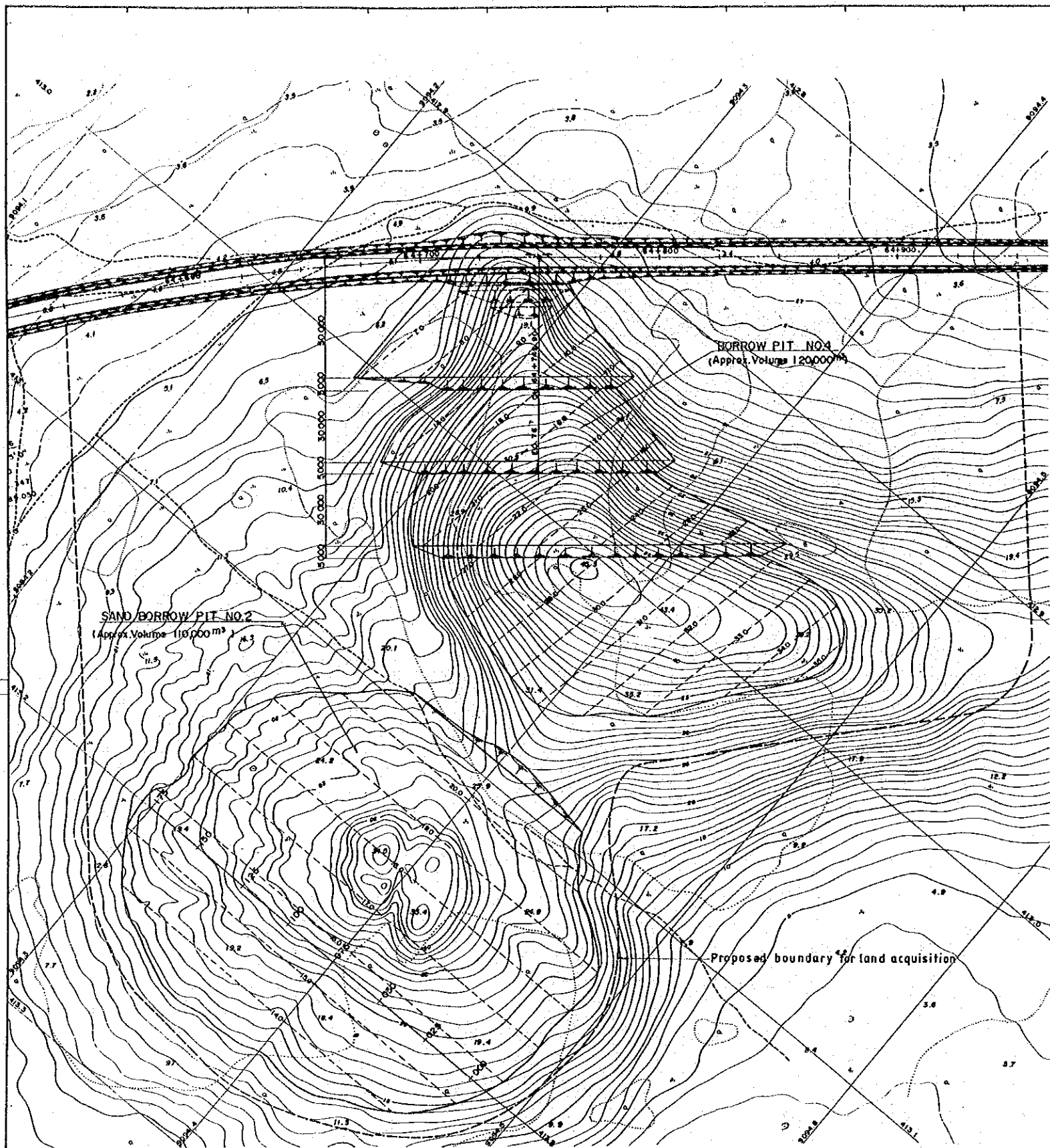
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|------|-----------------------------------|--|---|----|-------|------|----------------------|--|----------------------|--|-----------------------------------|--|----------------------------------|--|--|--|--------------------------|--|
| REV. | AMENDMENTS                        |  |   | BY | APP'D | DATE | SURVEY               |  | DESIGN               |  | DRAWN                             |  | RECOMMENDED                      |  | SCALES                                       |  | CENTRAL / GULF PROVINCES |  |
|      | JICA                              |  | JAPAN INTERNATIONAL CO-OPERATION AGENCY |    |       |      | K. E.                |  | PROJECT ENGINEER     |  | PRINCIPAL ENGINEER                |  | AS SHOWN                         |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |                          |  |
|      | VERTICAL DATUM<br>MEAN SEA LEVEL. |  | HORIZONTAL DATUM                        |    |       |      | S. C. 120            |  | APPROVED             |  | SECRETARY                         |  | PROJECT No.<br>S.C. 120-33-814/B |  | DRAWING No.<br>A1/ 88074                     |  |                          |  |
|      | SURVEY BOOK No.8                  |  | Principal<br>J. Malino                  |    |       |      | Date<br>25 Sep. 1989 |  | Checked<br>A. Magara |  | Executive Engineer<br>R. Kawakami |  | AS (15)                          |  | DEPARTMENT OF WORKS                          |  |                          |  |



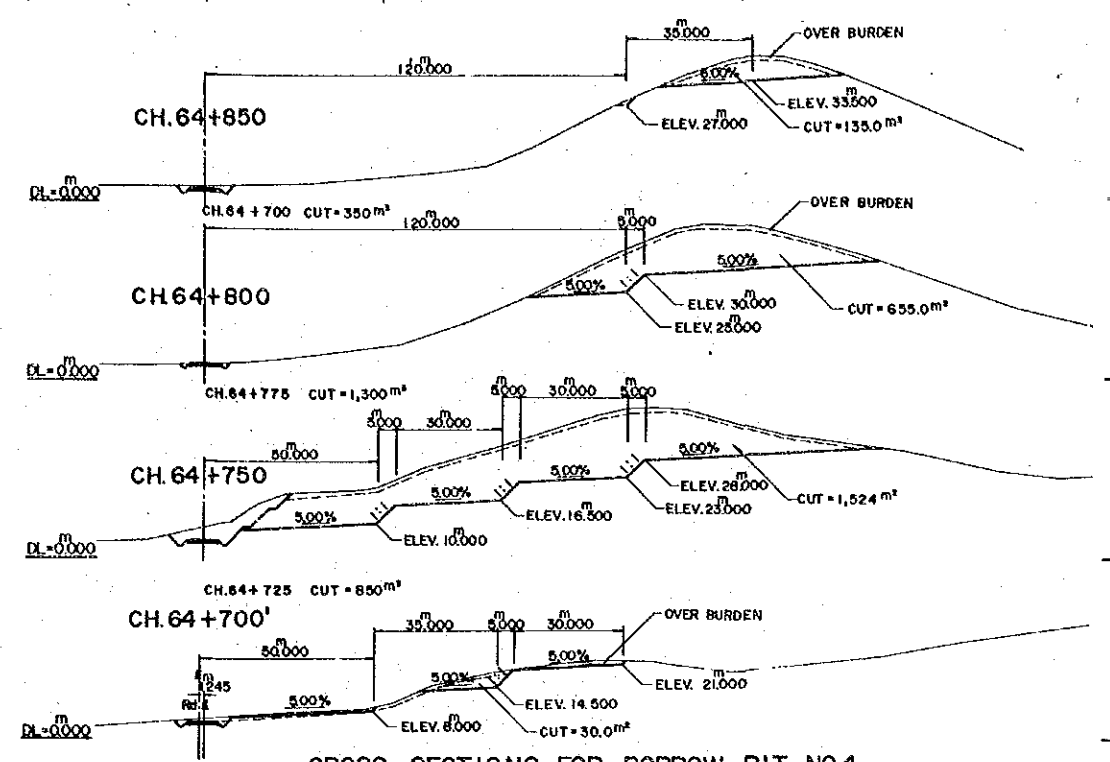
TRAVERSE POINT

| NO.  | NORTHING(m)  | EASTING(m) | ELEV(m) |
|------|--------------|------------|---------|
| PA-1 | 9,089,003.44 | 421,867.16 | 59.77   |
| PA-2 | 9,089,901.34 | 421,847.23 | 57.12   |
| PA-3 | 9,088,675.58 | 421,902.88 | 24.23   |

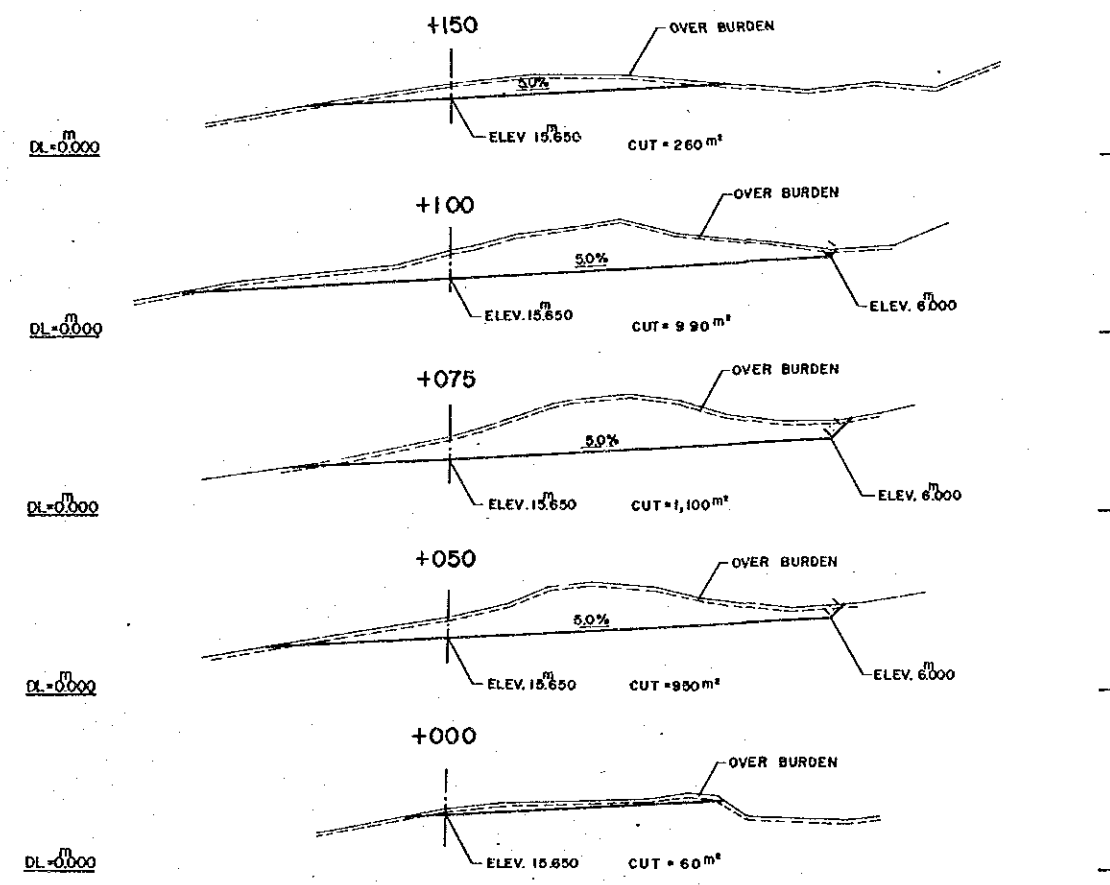
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|----------------------------------|--|---|--|------------------------|--|---------------------------------|--|--|--|
| SURVEY<br><b>JICA</b>            |  | DESIGN<br>JAPAN INTERNATIONAL CO-OPERATION AGENCY |  | DRAWN<br>K.E.          |  | RECOMMENDED<br>[Signature]      |  | CENTRAL / GULF PROVINCES                     |  |
| VERTICAL DATUM<br>MEAN SEA LEVEL |  | HORIZONTAL DATUM                                  |  | CHECKED<br>[Signature] |  | PROJECT ENGINEER<br>[Signature] |  | TRANS-ISLAND HIGHWAY BEREINA-MALALAU SECTION |  |
| SURVEY BOOK NO. 8                |  | 25 Sep. 1989                                      |  | DESIGNED<br>A. Magara  |  | APPROVED<br>[Signature]         |  | BORROW PIT NO. 3-1 & 3-2                     |  |
| BY                               |  | APP'D   |  | DATE                   |  | AS SHOWN                        |  | PLAN & CROSS SECTIONS                        |  |
| AMENDMENTS                       |  | BY  |  | APP'D                  |  | DATE                            |  | FAPUA NEW GUINEA DEPARTMENT OF WORKS         |  |
| REV.                             |  | BY  |  | APP'D                  |  | DATE                            |  | DRAWING No. A1/ 88075                        |  |



**PLAN**  
Scale: 1:1,000



**CROSS SECTIONS FOR BORROW PIT NO. 4**  
Scale 1:1,000

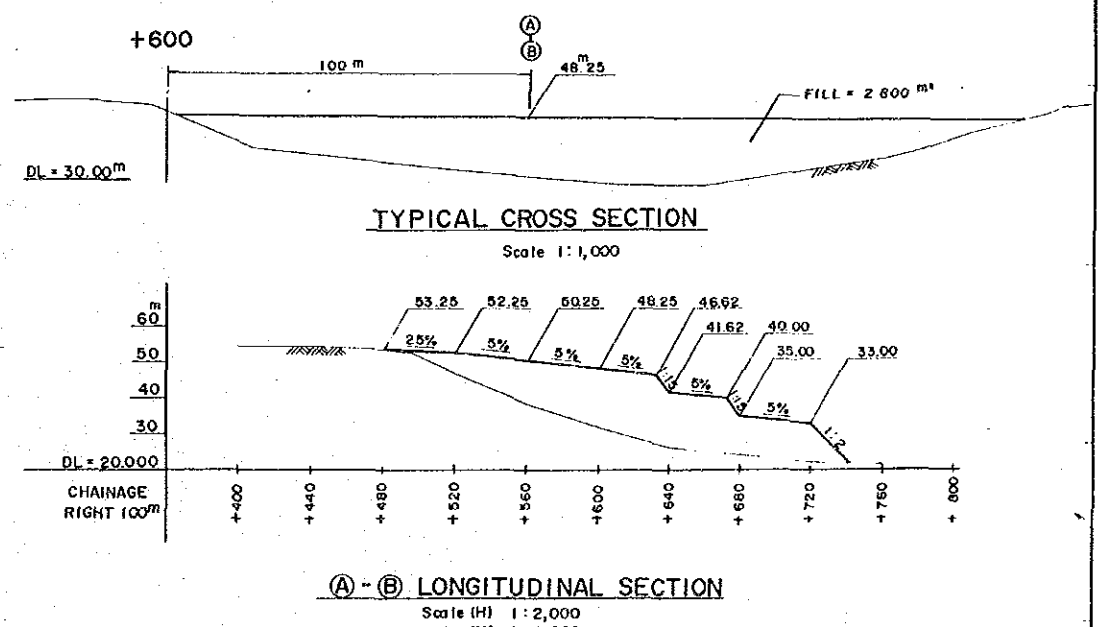
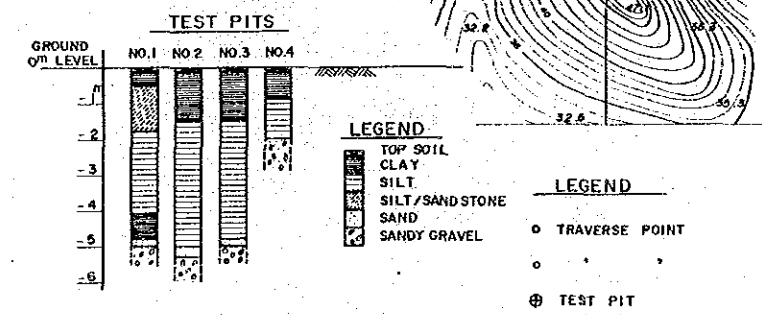
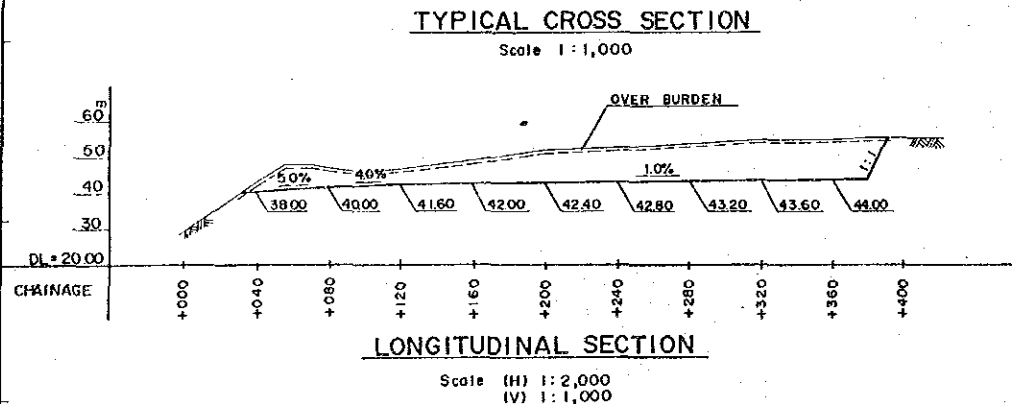
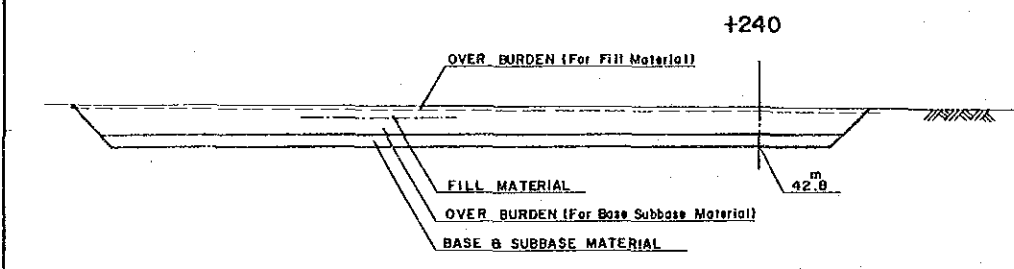
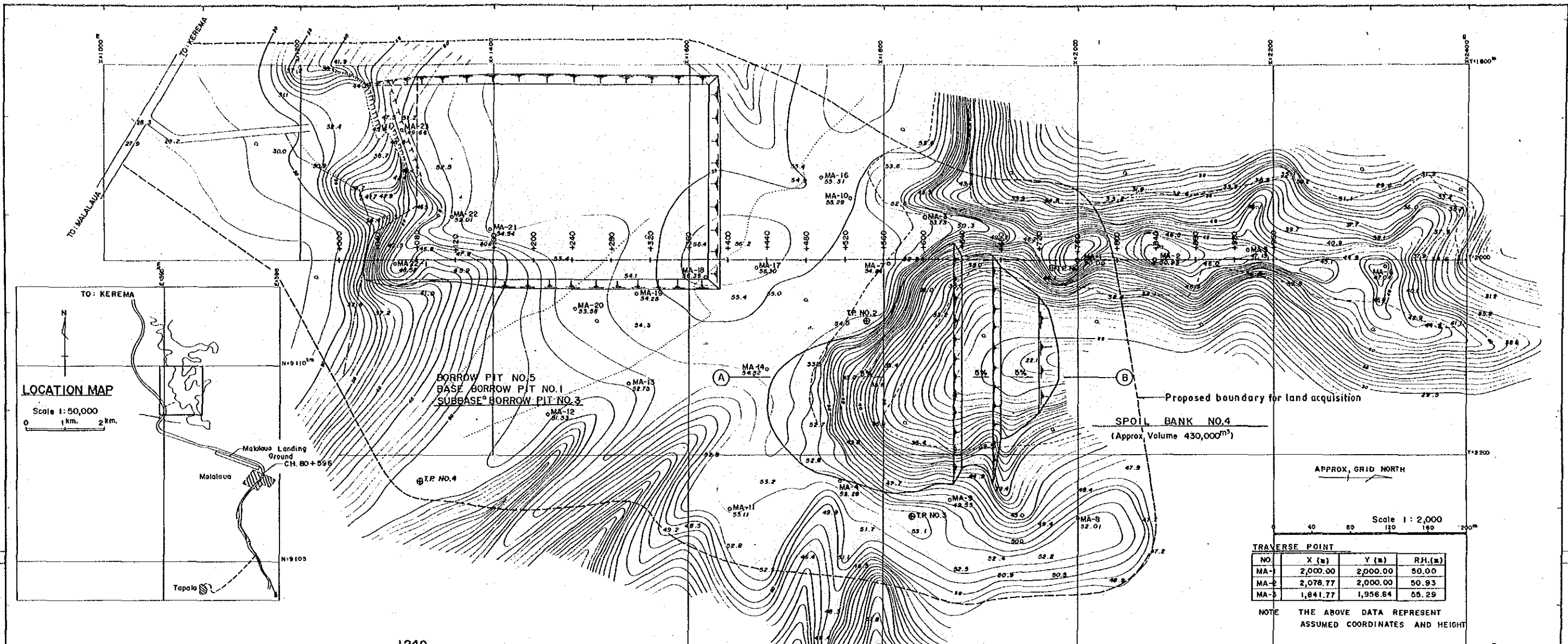


**CROSS SECTIONS FOR SAND BORROW PIT NO. 2**  
Scale 1:1,000

|  |            |  |       |   |  |  |  |  |  |  |  |
|--|------------|--|-------|---|--|--|--|--|--|--|--|
| <b>JICA</b><br>Date: _____<br>VERTICAL DATUM: MEAN SEA LEVEL.<br>HORIZONTAL DATUM: _____<br>SURVEY BOOK NOS: _____ |            | <b>JAPAN INTERNATIONAL CO-OPERATION AGENCY</b><br>Date: 25 Sep. 1989<br>Principal: J. Harada |       | <b>DESIGN</b><br>DRAWN: K.E.<br>CHECKED: [Signature]<br>DESIGNED: A. Magate<br>CHECKED: [Signature] |  | <b>RECOMMENDED</b><br>PROJECT ENGINEER: [Signature]<br>PRINCIPAL ENGINEER: [Signature]<br>APPROVED: 26. 10. 89<br>SECRETARY: [Signature] |  | <b>SCALES</b><br>AS SHOWN<br>SHEET 35 OF 303<br>PROJECT No. S.C.120-33-814/R |  | <b>CENTRAL / GULF PROVINCES</b><br>TRANS-ISLAND HIGHWAY BEREINA-MALALUA SECTION<br>BORROW PIT NO.4 AND SAND BORROW PIT NO.2<br>PLAN & CROSS SECTIONS<br>PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS<br>DRAWING No. A1/ 88076 |  |
| REV.   | AMENDMENTS | BY   | APP'D | DATE  |  |  |  |  |  |  |  |

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|      |            |    |       |      |                                  |   |                        |                      |                                 |   |   |
|------|------------|----|-------|------|----------------------------------|---|------------------------|----------------------|---------------------------------|---|---|
| REV. | AMENDMENTS | BY | APP'D | DATE | SURVEY                           | DESIGN                                  | DRAWN                  | RECOMMENDED          | SCALES                          | CENTRAL / GULF PROVINCES  |   |
|      |            |    |       |      | JICA                             | JAPAN INTERNATIONAL CO-OPERATION AGENCY | K. E.                  | [Signature]          | AS SHOWN                        | TRANS-ISLAND HIGHWAY HERERINA-MALALAUVA SECTION                                       |   |
|      |            |    |       |      | VERTICAL DATUM<br>MEAN SEA LEVEL |   | CHECKED<br>[Signature] | PROJECT ENGINEER     | APPROVED<br>25.10.89            | BORROW PIT NO.5, BASE BORROW PIT NO.1,<br>SUBBASE BORROW PIT NO.3 AND SPOIL BANK NO.4 |   |
|      |            |    |       |      | HORIZONTAL DATUM                 |   | DESIGNED<br>A. Magatis | EXECUTIVE ENGINEER   | SECRETARY                       | SHEET 36 OF 303   | PAPUA NEW GUINEA<br>DEPARTMENT OF WORKS |
|      |            |    |       |      | SURVEY BOOK REF.                 | Principal<br>J. [Signature]             | CHECKED<br>[Signature] | 25 Sep. 1989<br>Date | PROJECT No.<br>S.C.120-33-814/B | DRAWING No.<br>A1/ 88077  |   |