

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**NATIONAL WATER SUPPLY AND DRAINAGE BOARD
MINISTRY OF HOUSING AND PLANTATION INFRASTRUCTURE
DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

**THE DETAILED DESIGN STUDY
ON
GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT
IN
THE DEMOCRATIC SOCIALIST REPUBLIC
OF
SRI LANKA**

(DRAFT) TENDER DOCUMENTS

**VOLUME IV 4E
(PROCUREMENT OF PIPING MATERIALS FOR WATTEGAMA ROAD)**

MAY 2002

**NJS CONSULTANTS CO., LTD.
NIHON SUIDO CONSULTANTS CO., LTD.**

Drawing List

| Drawing No. | Drawing Title | Drawing No. | Drawing Title |
|-------------|--|-------------|---------------|
| 20 | <u>Transmission Main</u> | | |
| 20-C-08-01 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-02 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-03 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-04 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-05 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-06 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-07 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-08 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-09 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-10 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-11 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-12 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-13 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-14 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-15 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-16 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-17 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-18 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main | | |
| 20-C-08-19 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main Over Bridge 2/2 | | |
| 20-C-08-20 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main Over Bridge 2/5 | | |
| 20-C-08-21 | Katugastota Bridge Junction To Bangalawatta Junction - Transmission Main Over Bridge 4/5 | | |
| 20-C-08-22 | Typical Drawing for Installation of Air Valve and Washout | | |
| 20-C-08-23 | Butterfly Valve Chamber -.600mm PN16 | | |
| 20-C-08-24 | Chamber for Sluice Valves .200mm-.300mm PN16 | | |
| 20-C-08-25 | Typical Drawing for Culvert Crossing | | |
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| 20-C-08-27 | Typical Drawing of Pipe Laying for Vertical Depression Point | | |
| 20-C-08-28 | Thrust Block Details | | |
| 20-C-08-29 | General Earth Works for Pipe Laying | | |
| 20-S-08-01 | Katugastota Junction to Balanagala Junction Over Bridge 2/2 | | |
| 20-S-08-02 | Katugastota Junction to Balanagala Junction Over Bridge 2/2 | | |
| 20-S-08-03 | Katugastota Junction to Balanagala Junction Over Bridge 2/5 | | |
| 20-S-08-04 | Katugastota Junction to Balanagala Junction Over Bridge 2/5 | | |
| 20-S-08-05 | Katugastota Junction to Balanagala Junction Over Bridge 4/5 | | |
| 20-S-08-06 | Katugastota Junction to Balanagala Junction Over Bridge 4/5 | | |
| 20-S-08-07 | Butterfly Valve Chamber -.600mm PN16- R/F Details | | |
| 20-S-08-08 | Chamber for Sluice Valves .200mm-.300mm PN16 - R/F Details | | |

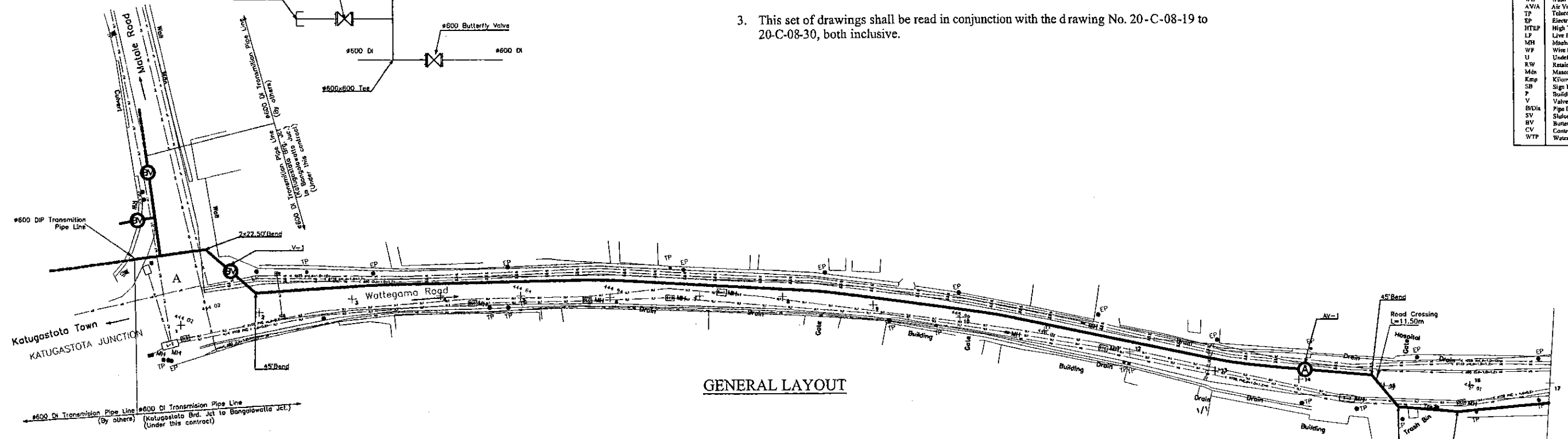
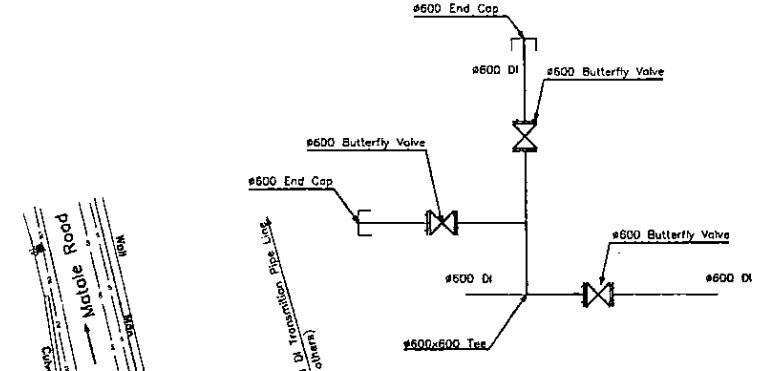


| Legend | |
|--------|-----------------------------|
| SLT | Telecom |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AV/A | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LJ | Live Fence |
| MH | Machole |
| WF | Wire Fence |
| U | Undefined Boundary |
| RW | Retaining Wall |
| Mdn | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| P | Building |
| V | Valve |
| EDn | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

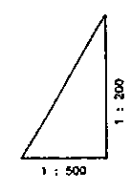
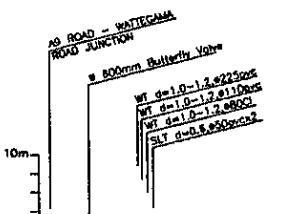
Notes:

1. Exact location for installation of valve on the pipeline shall be adjusted at site to suit the available space but without affecting its intended purpose and function.
2. The contractor shall programme his pipe laying activities including trench excavation based on this drawing and in conjunction with other related pipe line drawings for transmission, distribution, overflow and drain etc., particularly, in the vicinity of service reservoir.
3. This set of drawings shall be read in conjunction with the drawing No. 20-C-08-19 to 20-C-08-30, both inclusive.

PIPE JUNCTION DETAIL - A



GENERAL LAYOUT



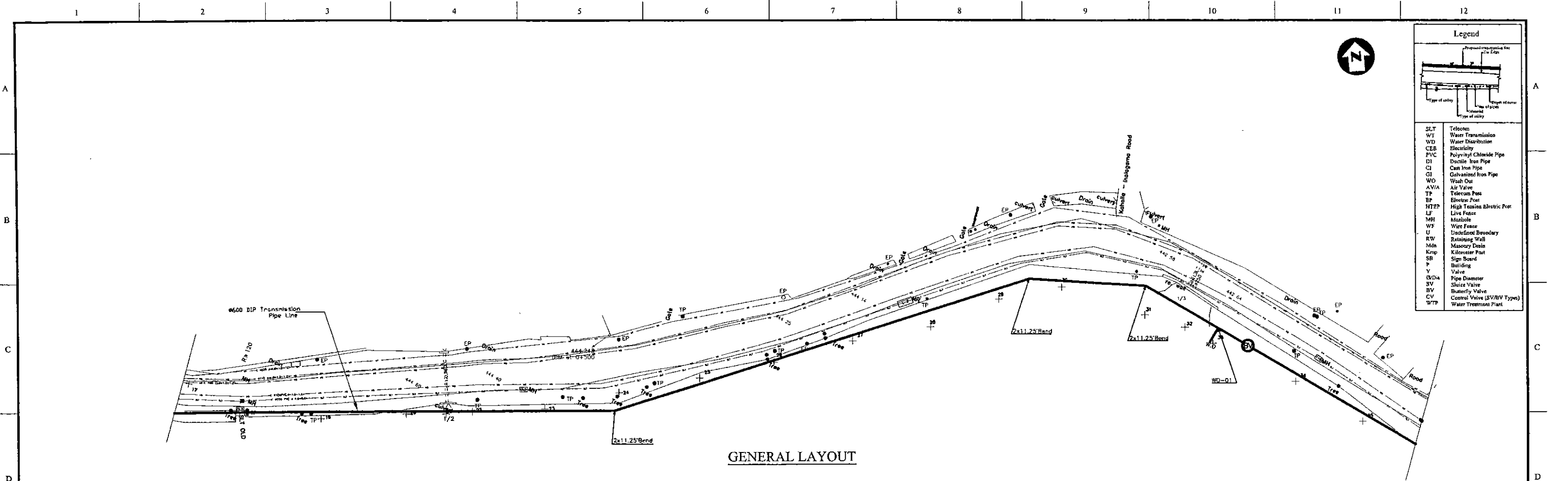
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| | | | | | | | | | | | | | | | | | |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Ground Elevation (m) | 444.02 | 444.09 | 444.10 | 444.35 | 444.84 | 444.84 | 445.20 | 445.48 | 445.75 | 445.88 | 446.31 | 446.38 | 446.81 | 446.88 | 448.81 | 448.88 | |
| Pipe Invert Level (m) (Pipe thickness to be Assume negligible) | 443.78 | 443.78 | 443.57 | 443.31 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | 443.37 | |
| Pipe Data | 600 DI (PUSH ON JOINT TYPE - T, 16 BAR) | | | | | | | | | | | | | | | | |
| Single Distance (m) | 0.00 | 18.74 | 21.00 | 20.31 | 18.00 | 20.21 | 20.09 | 19.33 | 20.08 | 20.01 | 20.31 | 18.83 | 19.34 | 19.73 | 18.80 | 20.22 | 19.10 |
| Cumulative Distance (m) | 0 | 18.74 | 39.74 | 60.05 | 78.05 | 98.26 | 118.35 | 137.68 | 157.76 | 177.77 | 198.08 | 216.91 | 235.74 | 254.47 | 273.27 | 292.49 | 311.59 |
| Station No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|--|--|---|--|---|-------------|------|-------|------------------------------|----------------|----------------------------|------------------|---|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | | | SHEET 01 OF 18 | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NIS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-01 |

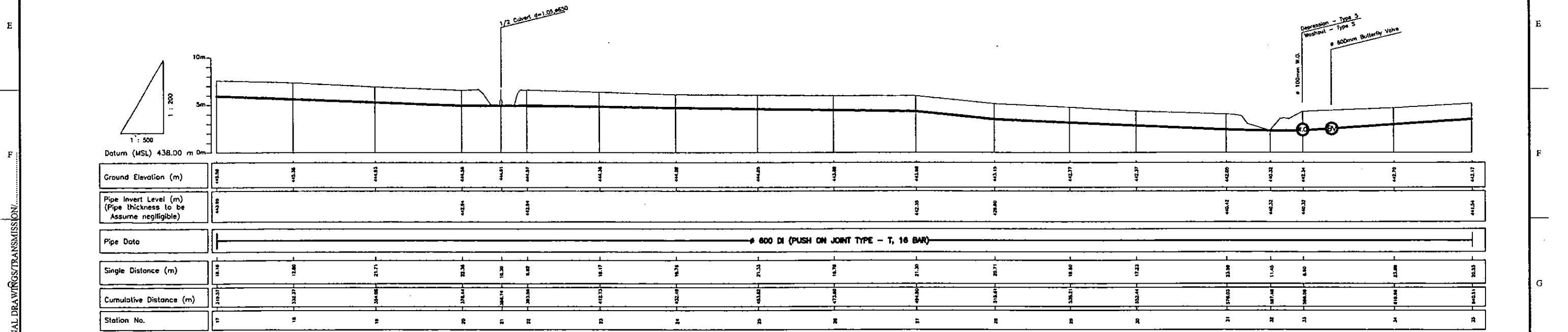
DATE: 24/04/2007 Wanni (CAD) / JM / FINAL DRAWINGS / TRANSMISSION



Legend

| | |
|------|-----------------------------|
| SLT | Telecom |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AVA | Air Valve |
| TP | Telecom Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Undefined Boundary |
| RW | Retaining Wall |
| Mds | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| B | Building |
| V | Valve |
| Ø/D | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

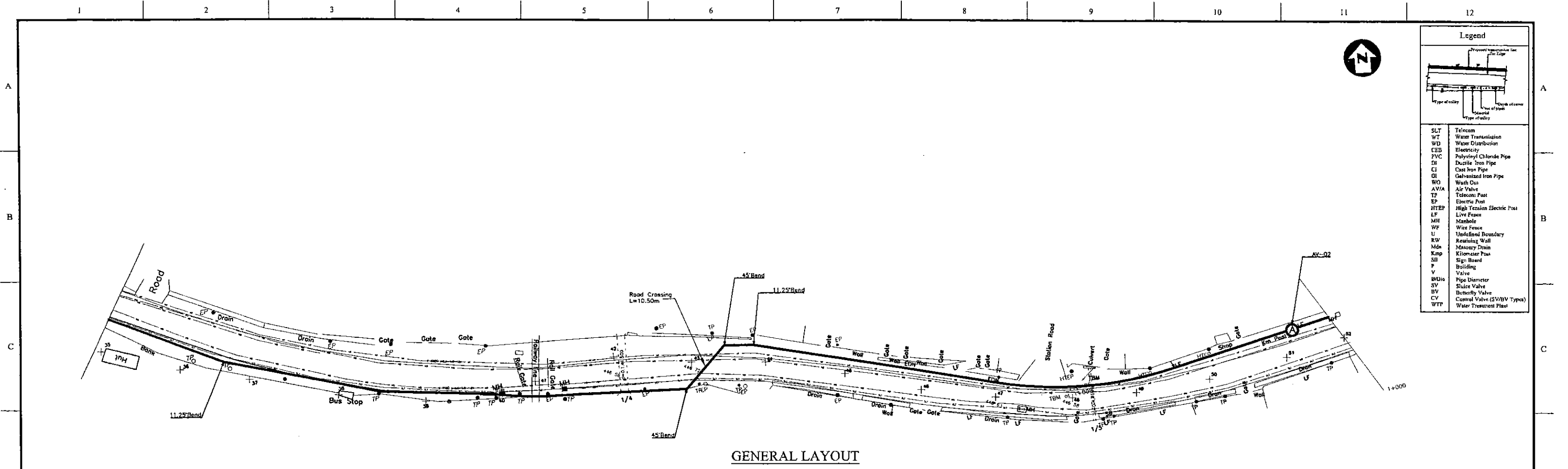
GENERAL LAYOUT



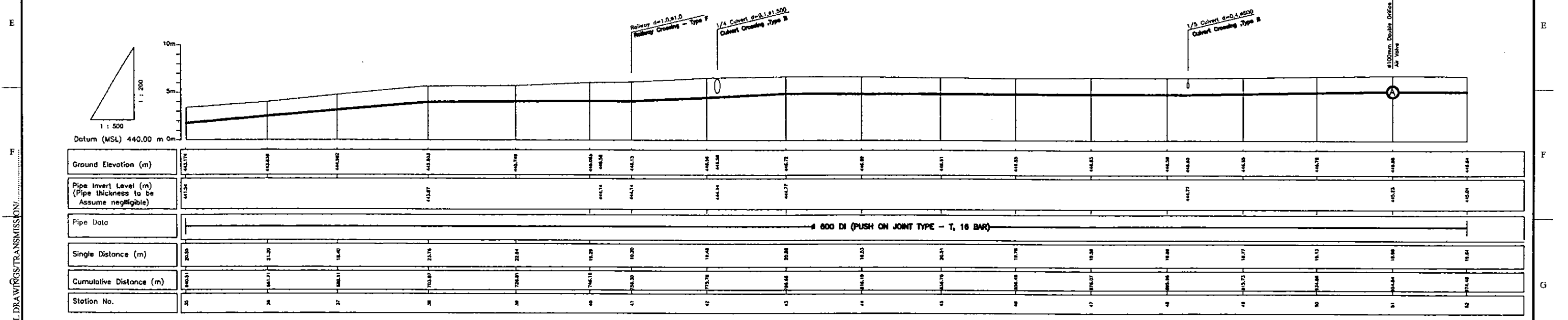
LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|---|--|--|--|--|---------------------|-----------------------|-----------------------|-------------------------------------|--------------------------------|------------------------------------|----------------------|--|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 02 OF 18 | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT): Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | CHECKED: | DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-02 | | | |

DATE: 24/04/2002 W:\am\1\DE\FINAL DRAWINGS\TRANSMISSION\...



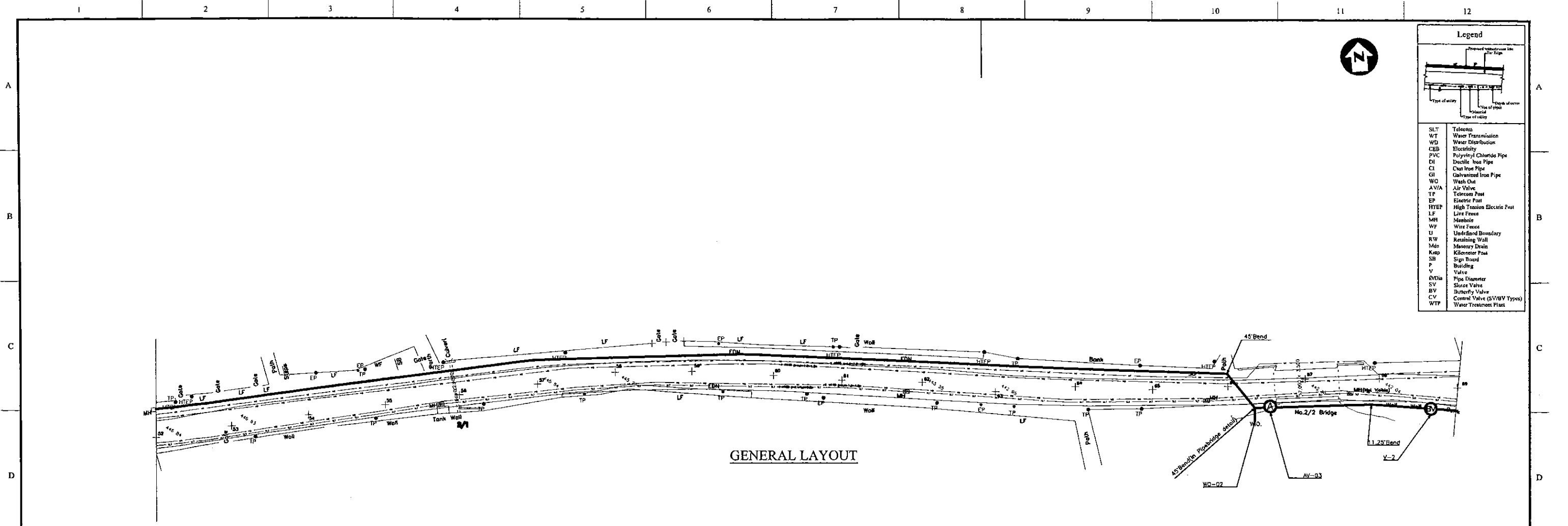
GENERAL LAYOUT



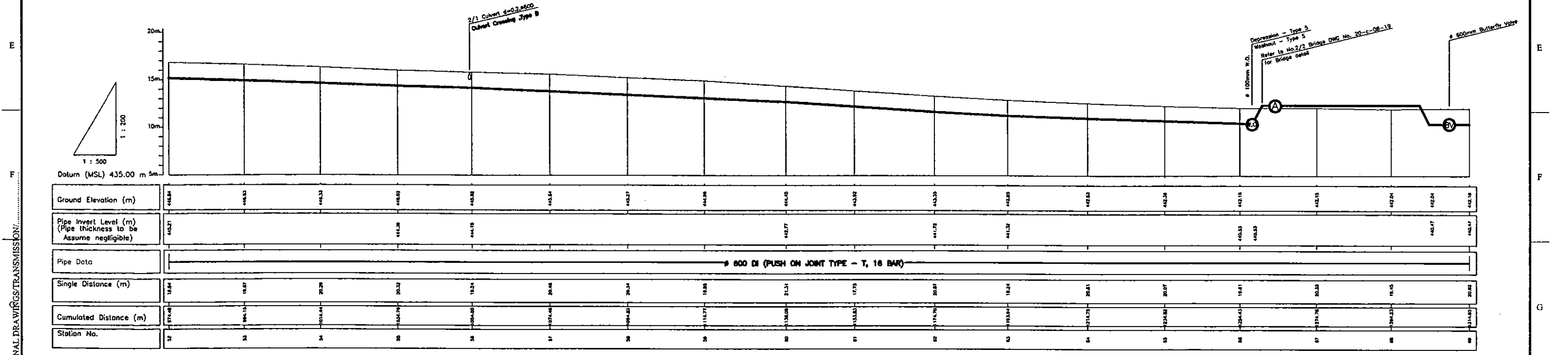
LONGITUDINAL SECTION

| | | | | | | | | | | | | | |
|---|--|---|--|--|-------------|------|-------|------------------------------------|-----------------------|-----------------------------------|--------------------------------|---|--|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | CONSULTANTS: JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | | | | | SHEET 03 OF 18 | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 | |
| | | | | | | | | CHECKED: AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-03 | | |
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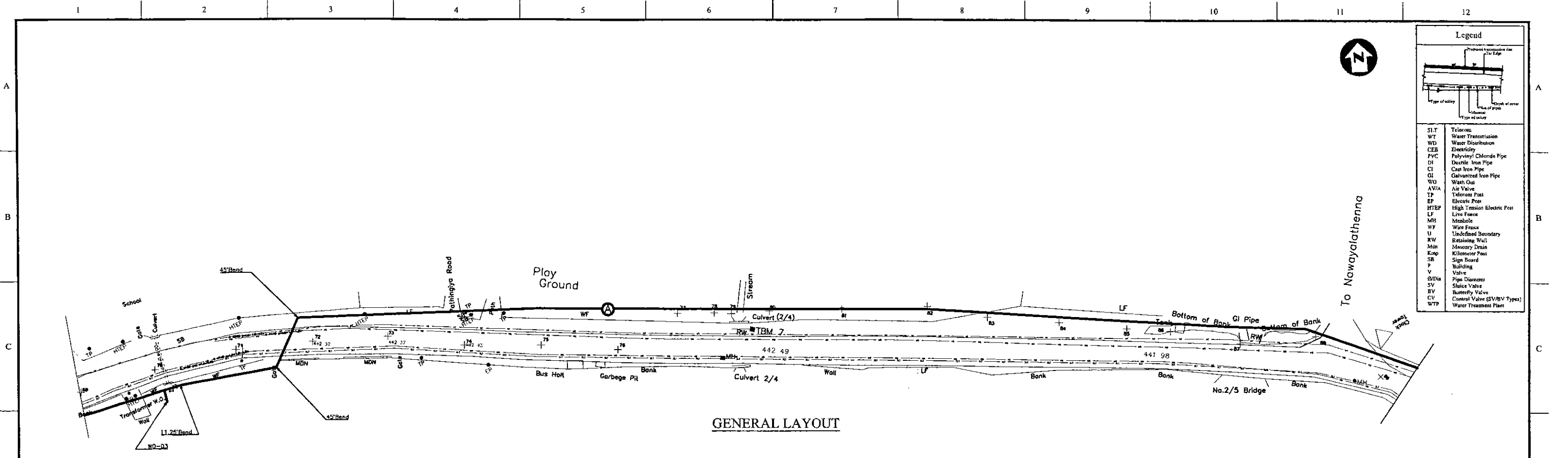
GENERAL LAYOUT



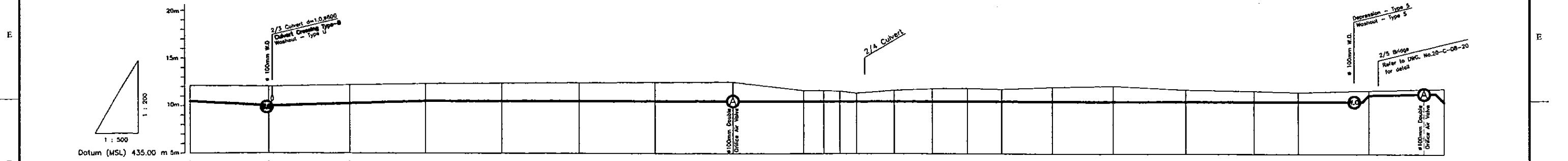
LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|--|--|---|--|---|-------------|------|-------|------------------------------|----------------|----------------------------|------------------|---|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | CONSULTANTS: JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 04 OF 18 | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Takedoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-04 |

DATE: 24/04/2002 Wanni (CAD) / JICA / FINAL DRAWINGS / TRANSMISSION



GENERAL LAYOUT



LONGITUDINAL SECTION

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Ground Elevation (m) | 442.10 | 442.04 | 442.19 | 442.32 | 442.27 | 442.43 | 442.48 | 442.51 | 441.801 | 441.801 | 441.822 | 441.400 | 441.718 | 441.808 | 441.284 | 441.281 | 442.003 | 442.174 | 441.792 | 441.837 | 441.318 | 441.728 | 441.825 | |
| Pipe Invert Level (m) (Pipe thickness to be Assume negligible) | 440.47 | 439.81 | 440.89 | 440.51 | 440.51 | 440.51 | 440.51 | 440.51 | 441.801 | 441.801 | 441.822 | 441.400 | 441.718 | 441.808 | 441.284 | 441.281 | 442.003 | 442.174 | 441.792 | 441.837 | 441.318 | 441.728 | 441.825 | |
| Pipe Data | ø 800 DI (PUSH ON JOINT TYPE - T, 16 BAR) | | | | | | | | | | | | | | | | | | | | | | | |
| Single Distance (m) | 26.87 | 30.55 | 21.29 | 18.90 | 18.80 | 26.14 | 19.96 | 26.21 | 18.24 | 9.58 | 4.00 | 5.82 | 8.80 | 19.98 | 8.90 | 22.22 | 15.94 | 18.88 | 17.26 | 11.27 | 18.14 | 20.03 | | |
| Cumulative Distance (m) | 1314.48 | 1345.03 | 1366.32 | 1385.22 | 1404.02 | 1430.16 | 1449.12 | 1475.33 | 1493.57 | 1511.81 | 1521.39 | 1525.39 | 1534.19 | 1554.09 | 1562.99 | 1585.21 | 1601.15 | 1617.03 | 1635.91 | 1653.17 | 1664.44 | 1682.58 | 1702.61 | 1722.64 |
| Station No. | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | |

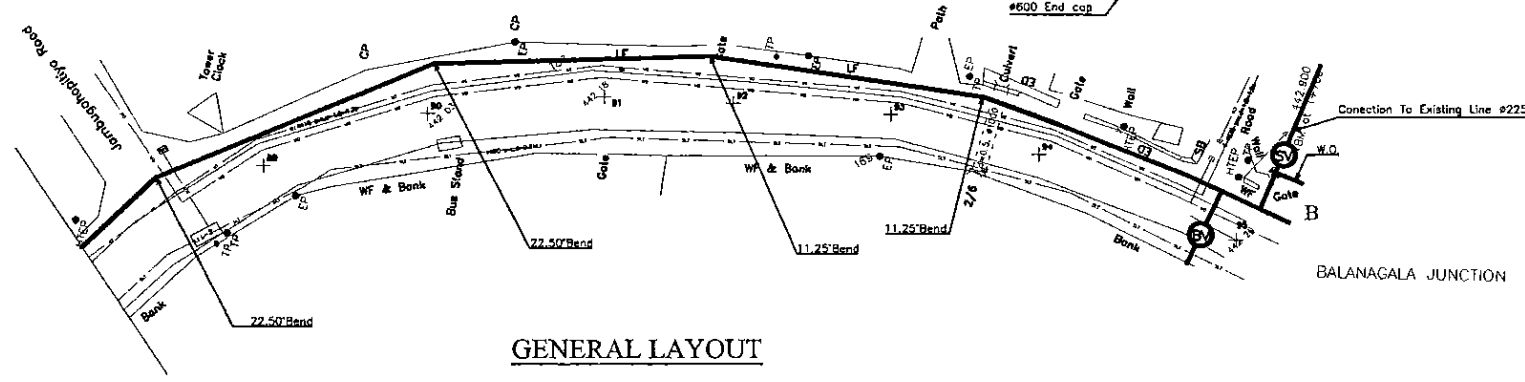
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|--|---|---|--|-------------|------|-------|--|--|--|--|---|------------------------------|----------------|----------------------------|-----------|-----------------------|------------|------------|------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | SHEET 05 OF 18 | | | | | | | | | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | <table border="1"> <tr> <td>REV.</td> <td>DESCRIPTION</td> <td>DATE</td> <td>SIGN.</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> | REV. | DESCRIPTION | DATE | SIGN. | | | | | <table border="1"> <tr> <td>DESIGNED: Taketoshi FUJIYAMA</td> <td>DRAWN: Kalinga</td> <td>PM: (CONSULTANT) Ikuo MIWA</td> <td>CE: (P&D)</td> </tr> <tr> <td>CHECKED: DESIGN CHIEF</td> <td>AGM: (P&D)</td> <td>DGM: (P&D)</td> <td>DATE: 31/05/2002</td> </tr> </table> | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 |
| REV. | DESCRIPTION | DATE | SIGN. | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | | | | | | | | | | | | | | | | |
| CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | | | | | | | | | | | | | | | | |
| | | | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 DRAWING NO.: 20-C-08-05 | | | | | | | | | | | | | | | | |

DATE: 24/04/2002 Wami CAD / D3 / FINAL DRAWINGS / TRANSMISSION

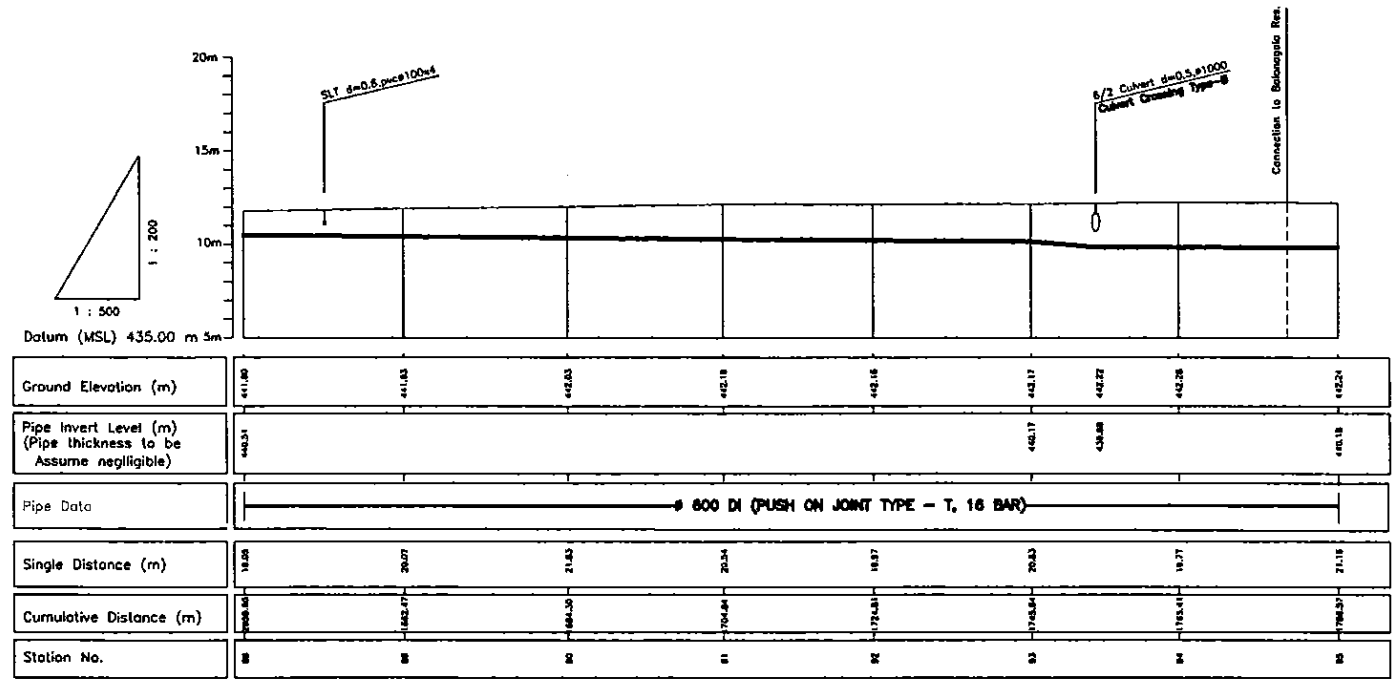
PIPE JUNCTION DETAIL - B



| Legend | |
|--------|-----------------------------|
| SLT | Telephone |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AV/A | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MB | Manhole |
| WF | Wire Fence |
| U | Undefined Boundary |
| KW | Retaining Wall |
| Mdn | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| P | Building |
| V | Valve |
| Ø/Dia | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

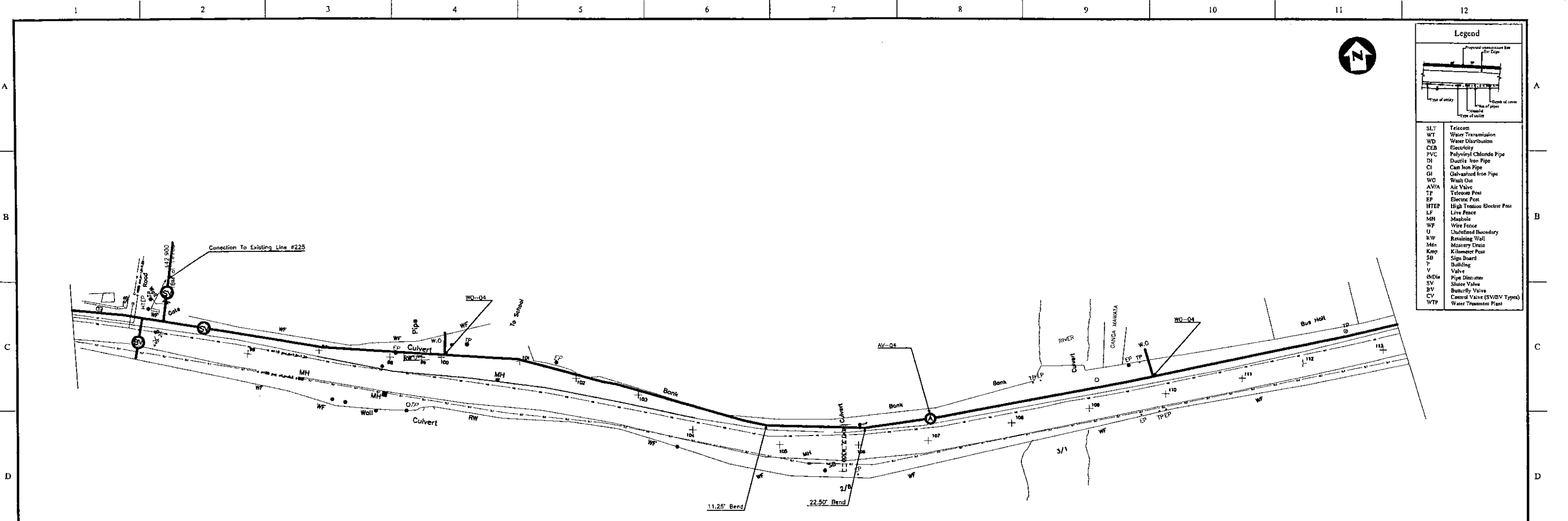


GENERAL LAYOUT



LONGITUDINAL SECTION

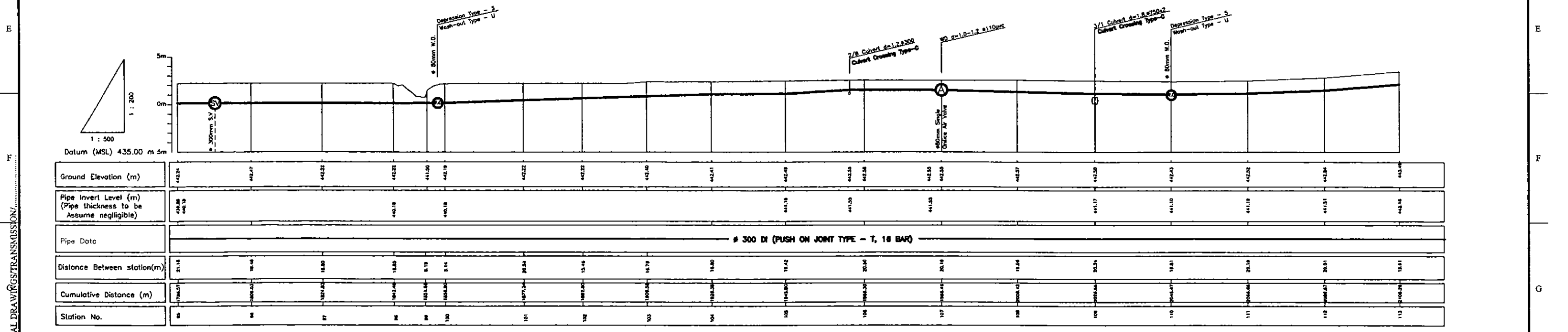
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|---|--|---|--|--|--|--|---------------------------------|-------------------|-------------------------------|----------------------------|--|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 06 OF 18 | |
| | | | | | | REV. 1 DESCRIPTION DATE SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-06 | |



Legend

| | |
|-------|-----------------------------|
| SLT | Telecom |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WD | Wash Duct |
| AV/A | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| MTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Unclassified Boundary |
| RW | Retaining Wall |
| Md | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| B | Building |
| V | Valve |
| Ø/Dia | Pipe Diameter |
| SV | Slide Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

GENERAL LAYOUT



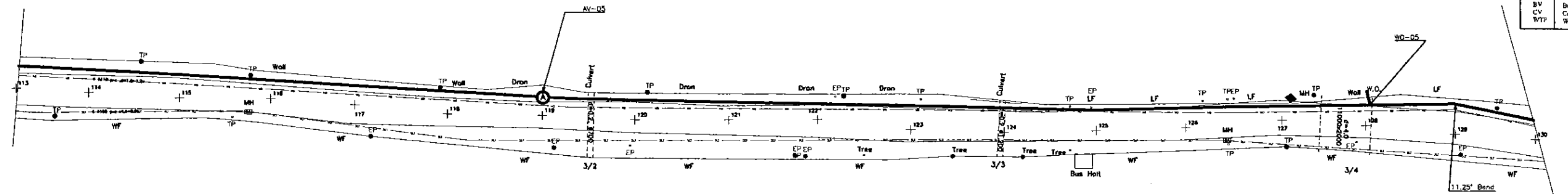
LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|--|--|---|--|---|-------------|------|-------|------------------------------|----------------|----------------------------|------------------|---|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | | | SHEET 07 OF 18 | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-07 |

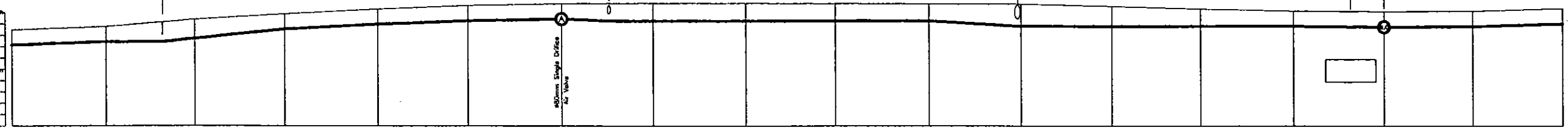
DATE: 2/04/2002 W:\final DRAWINGS\TRANSMISSION\...



| Legend | |
|--------|-----------------------------|
| SLT | Telephone |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WD | Wash Out |
| AV/A | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Misdebe |
| WF | Wire Fence |
| U | Undefined Boundary |
| RW | Retaining Wall |
| Mds | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| Y | Building |
| V | Valve |
| Ø/Dia | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |



GENERAL LAYOUT

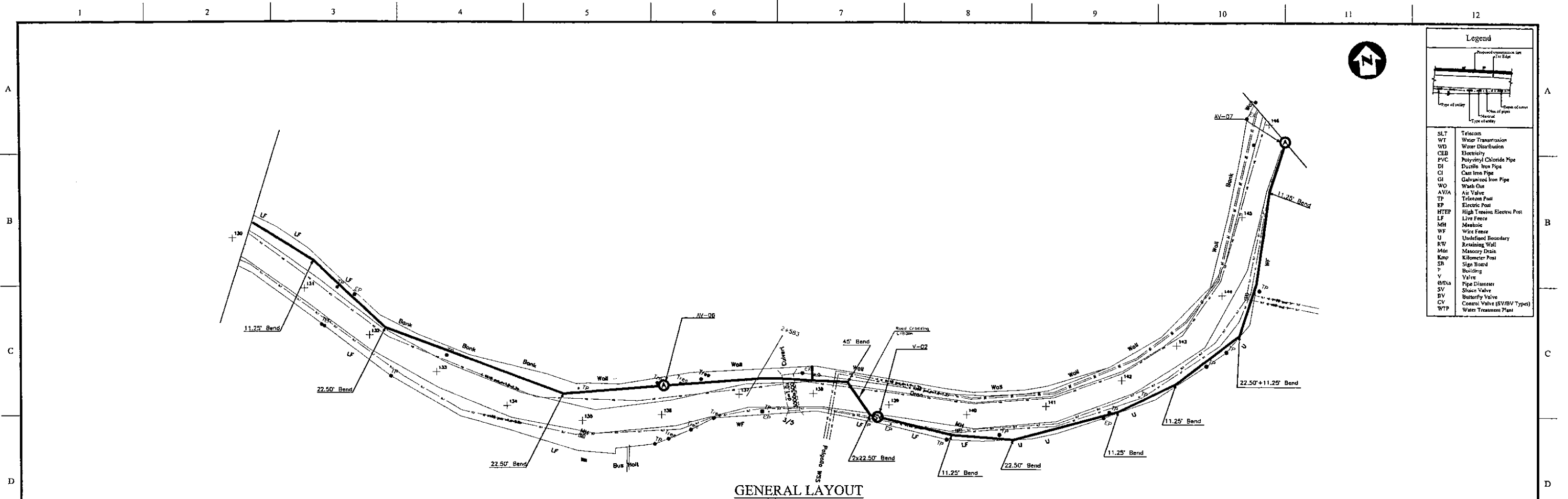


| | | | | | | | | | | | | | | | | | | | |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Ground Elevation (m) | 443.49 | 443.78 | 444.41 | 444.41 | 444.88 | 443.32 | 443.53 | 443.81 | 443.83 | 443.83 | 443.78 | 443.78 | 443.78 | 443.33 | 443.14 | 442.88 | 443.13 | 443.38 | |
| Pipe Invert Level (m) (Pipe thickness to be Assume negligible) | 442.18 | 442.43 | 442.44 | 442.55 | 443.28 | 444.20 | 444.48 | 444.28 | 444.28 | 444.28 | 444.28 | 443.81 | 443.81 | 443.81 | 443.81 | 443.78 | 443.80 | 444.05 | |
| Pipe Data | Ø 300 DI (PUSH ON JOINT TYPE - T, 16 BAR) | | | | | | | | | | | | | | | | | | |
| Distance Between station(m) | 18.41 | 20.41 | 19.80 | 18.74 | 20.26 | 18.77 | 20.26 | 19.98 | 20.23 | 19.42 | 20.35 | 20.07 | 18.24 | 19.28 | 20.18 | 18.88 | 19.28 | 18.78 | |
| Cumulative Distance (m) | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | |
| Station No. | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | |

LONGITUDINAL SECTION

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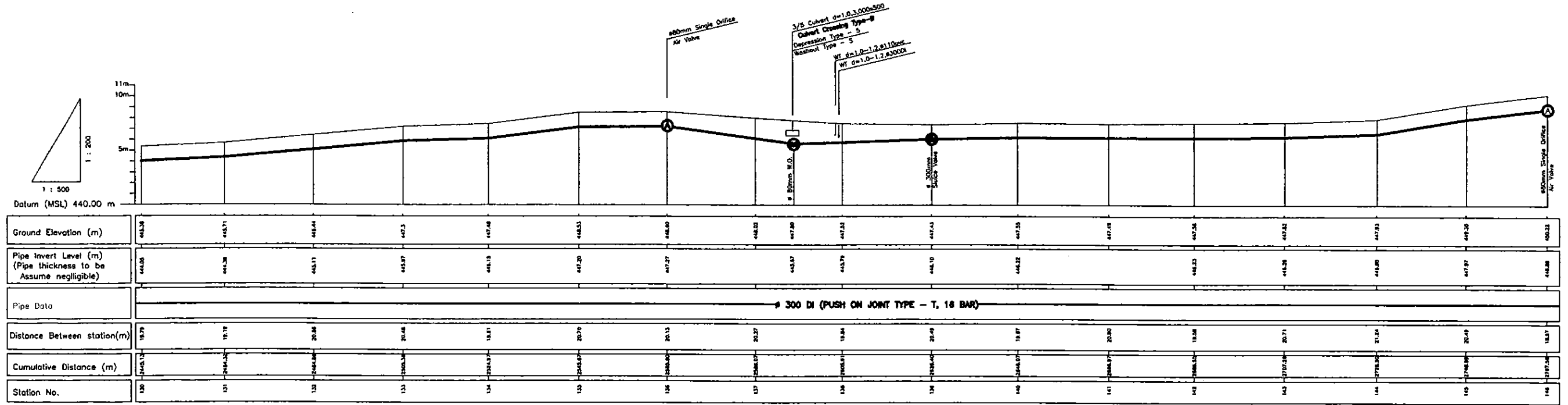
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| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | JAPAN INTERNATIONAL COOPERATION AGENCY | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 08 OF 18 | |
| NATIONAL WATER SUPPLY & DRAINAGE BOARD | CONSULTANTS: | | REV. | DESCRIPTION | DATE | SIGN. | |
| | NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 | |
| | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-08 |



Legend

| | |
|------|-----------------------------|
| SLT | Telephone |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AVA | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Underland Boundary |
| RW | Right of Way |
| Md | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| V | Valve |
| VDia | Pipe Diameter |
| SV | Shock Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

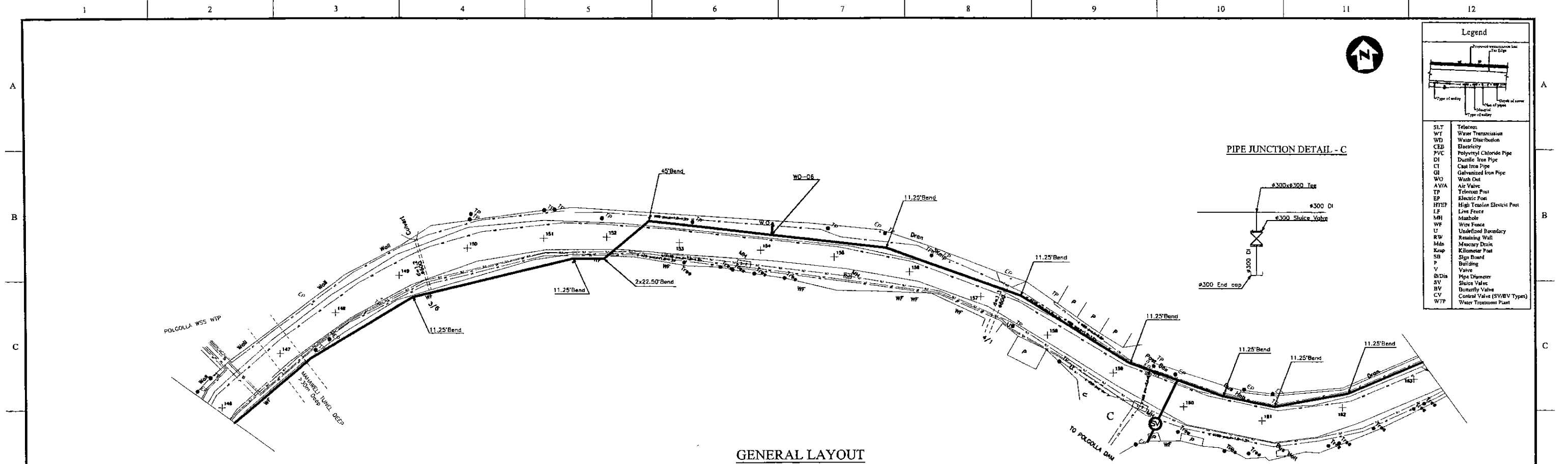
GENERAL LAYOUT



LONGITUDINAL SECTION

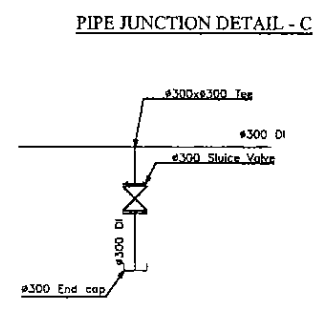
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|---|-------------|--|-------|---|--|-----------------------|-------------|-----------------------|-------|--------------------------------|--|--|--|--|--|--|--|--|--|--|--|-------------------------------------|--|-----------------------|--|------------------------------------|--|----------------------|--|
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | <table border="1"> <tr><th>REV.</th><th>DESCRIPTION</th><th>DATE</th><th>SIGN.</th></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table> | | REV. | DESCRIPTION | DATE | SIGN. | | | | | | | | | | | | | DESIGNED: Taketoshi FUJIYAMA | | DRAWN: Kalinga | | PM: (CONSULTANT): Ikuo MIWA | | CE: (P&D) | |
| REV. | DESCRIPTION | DATE | SIGN. | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | CHECKED: DESIGN CHIEF | | AGM: (P&D) | | DGM: (P&D) | | DATE: 31/05/2002 | | | | | | | | | | | | | | | | | | | |
| DATE: 24/04/2002 | | Wanni (CAD) | | DATE: 31/05/2002 | | DATE: 31/05/2002 | | DATE: 31/05/2002 | | DRAWING NO.: 20-C-08-09 | | | | | | | | | | | | | | | | | | | |

DATE: 24/04/2002 Wanni (CAD) FINAL DRAWINGS/TRANSMISSION

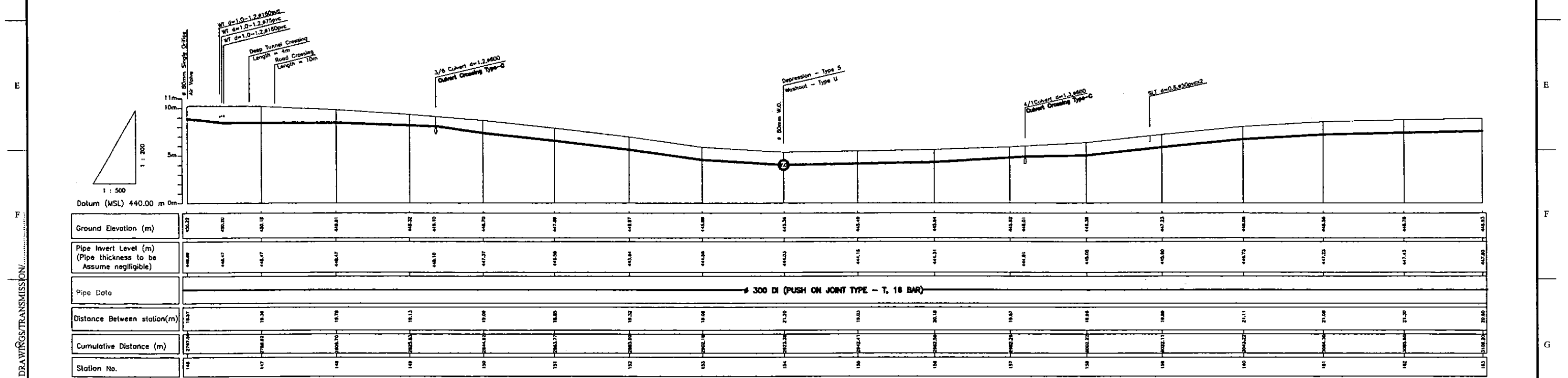


Legend

| | |
|------|-----------------------------|
| SLT | Telephone |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AV/A | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| UB | Underground Boundary |
| RW | Retaining Wall |
| Mdn | Miscary Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| P | Building |
| V | Valve |
| SD/S | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |



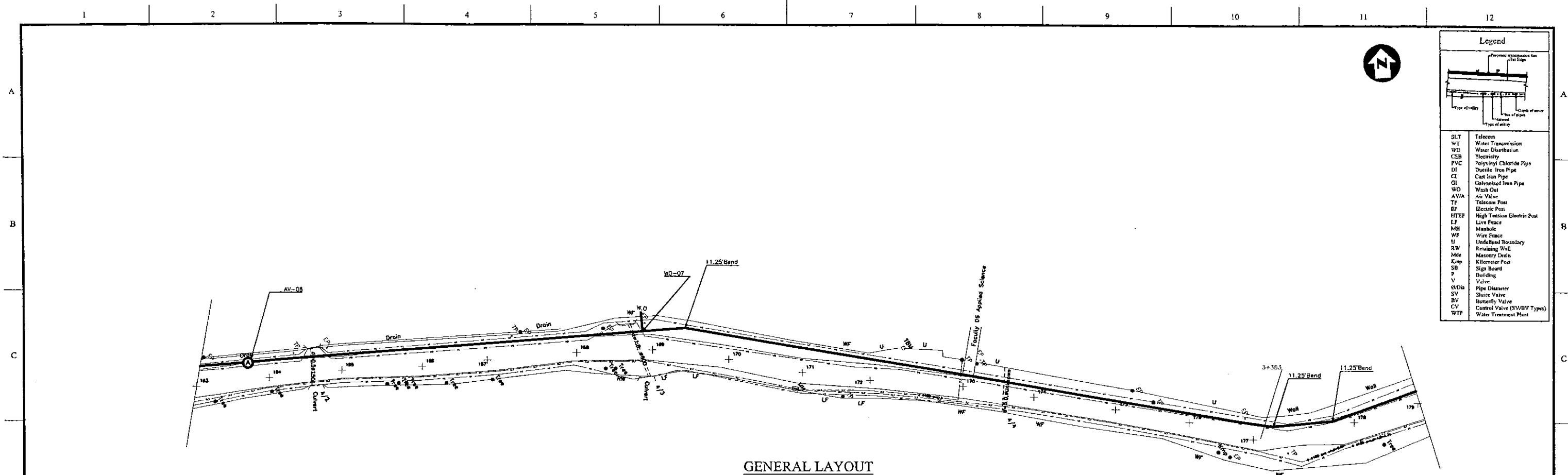
GENERAL LAYOUT



LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|---|--|---|--|--|-------------|------|-------|-------------------------------------|-----------------------|-----------------------------------|-------------------------|---|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | | | SHEET 10 OF 18 | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-10 |

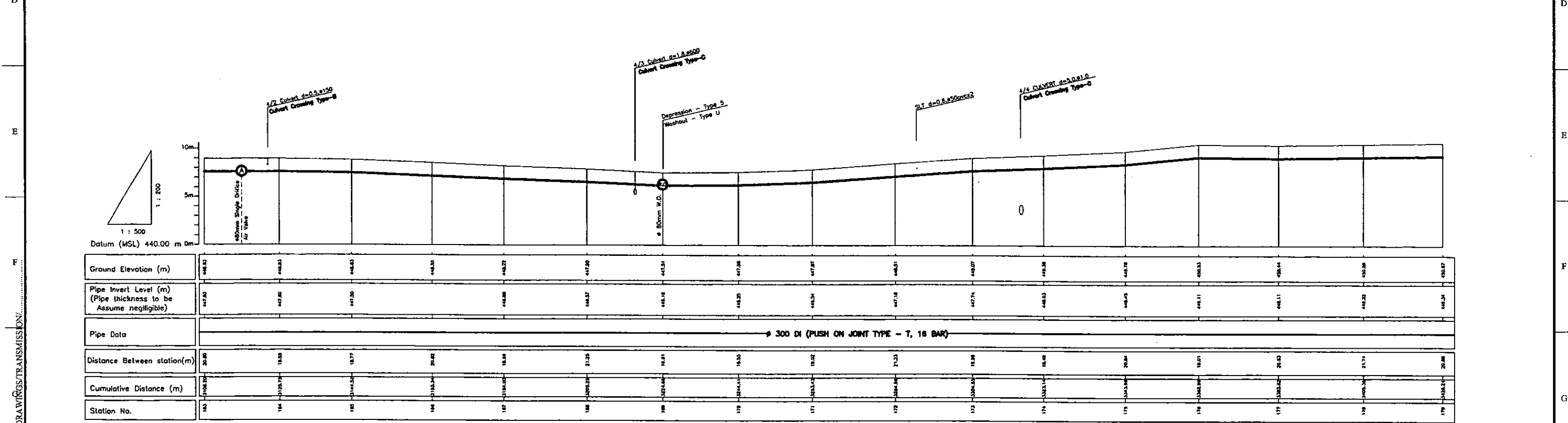
DATE: 24/04/2002 11:00 AM ICD/ FINAL DRAWINGS/TRANSMISSION/



Legend

| | |
|-------|----------------------------|
| SLT | Telecom |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AVA | Air Valve |
| TP | Telecom Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Underpass |
| RW | Retaining Wall |
| M&E | Masonry Details |
| Kmp | Kilometer Post |
| SB | Sign Board |
| B | Building |
| V | Valve |
| Ø/Dia | Pipe Diameter |
| SV | Sluice Valve |
| BV | Bonnet Valve |
| CV | Control Valve (SV/BV Type) |
| WTP | Water Treatment Plant |

GENERAL LAYOUT

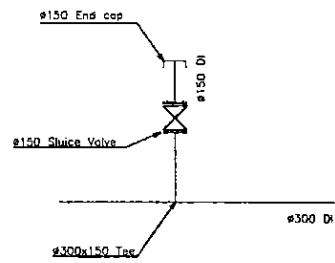


LONGITUDINAL SECTION

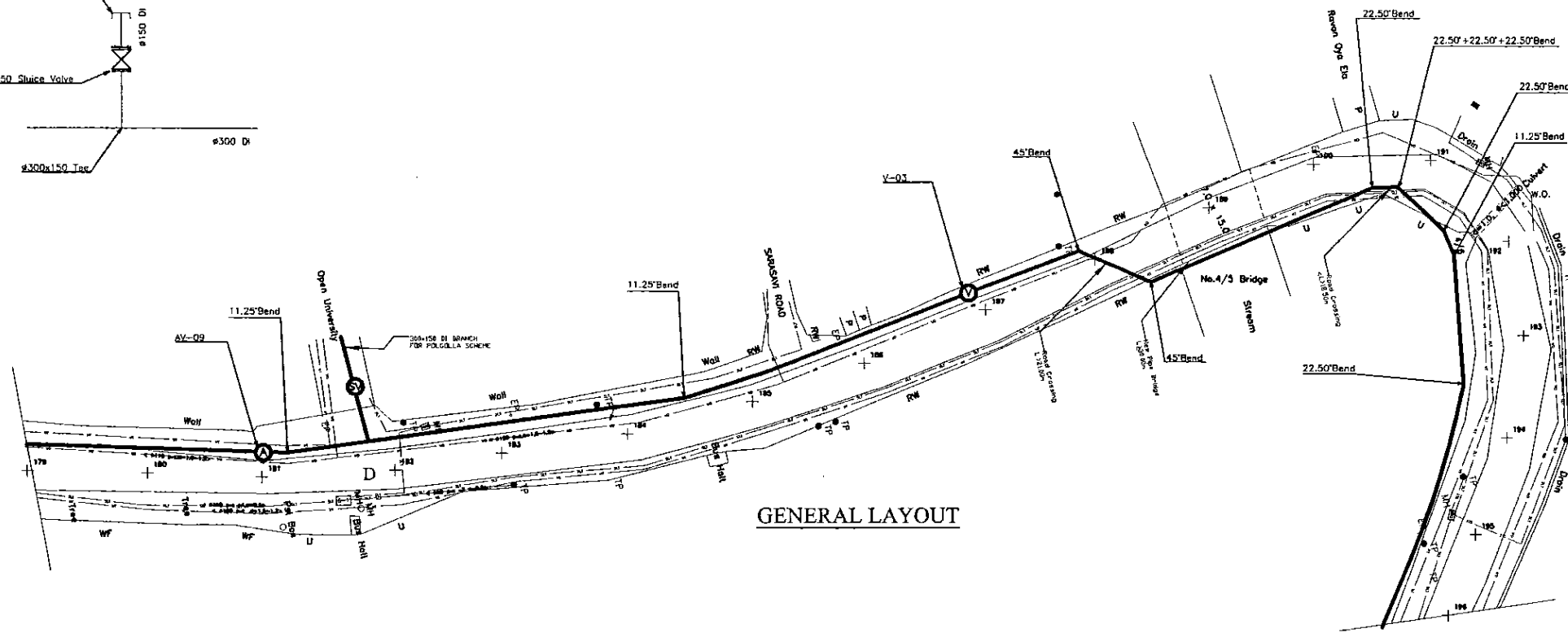
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|---|--|---|--|--|-------------|------------|-------|-------------------------------------|-----------------------|-----------------------------------|-----------|--|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 11 OF 18 | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | CHECKED: DESIGN CHIEF | | AGM: (P&D) | | DGM: (P&D) | | DATE: 31/05/2002 | | DRAWING NO.: 20-C-08-11 |

DATE: 24/04/2002 17:00 FINAL DRAWINGS TRANSMISSION

PIPE JUNCTION DETAIL - D

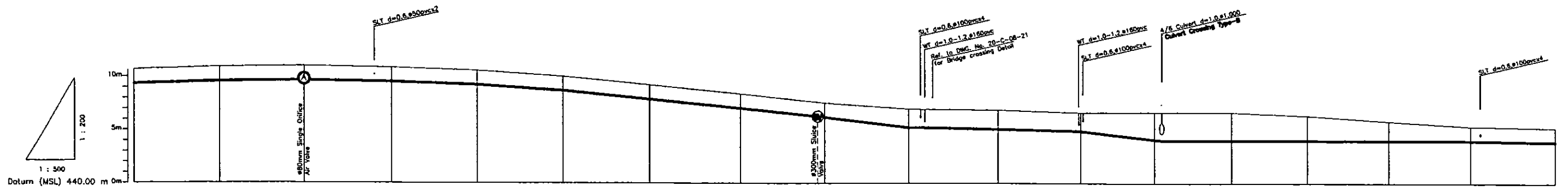


GENERAL LAYOUT



Legend

| | |
|-------|-----------------------------|
| SLT | Telecom |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Waste Oil |
| AWA | Air Valve |
| TP | Telecom Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Masthole |
| WF | Wire Fence |
| U | Undefined Boundary |
| AW | Excising Wall |
| Mde | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| F | Building |
| V | Valve |
| Ø/Dia | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

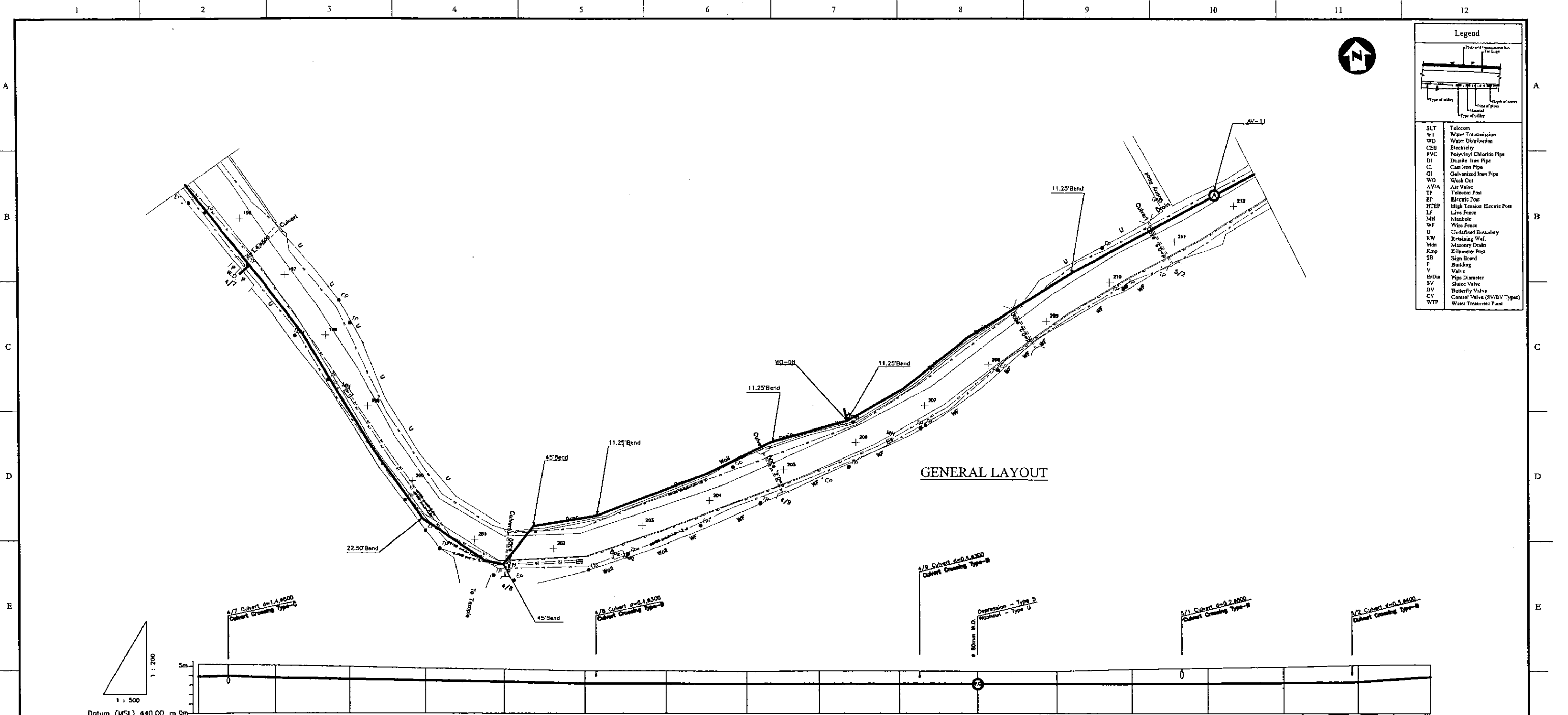


| | | | | | | | | | | | | | | | | | |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Ground Elevation (m) | 490.87 | 490.57 | 490.36 | 490.13 | 490.06 | 489.99 | 489.81 | 489.58 | 489.34 | 489.07 | 488.88 | 488.65 | 488.38 | 488.15 | 487.92 | 487.65 | 487.42 |
| Pipe Invert Level (m) (Pipe thickness to be Assume negligible) | 485.3 | 485.4 | 485.5 | 485.6 | 485.7 | 485.8 | 485.9 | 486.0 | 486.1 | 486.2 | 486.3 | 486.4 | 486.5 | 486.6 | 486.7 | 486.8 | 486.9 |
| Pipe Data | Ø 300 DI (PUSH ON JOINT TYPE - T, 16 BAR) | | | | | | | | | | | | | | | | |
| Distance Between station(m) | 20.38 | 20.14 | 19.79 | 20.37 | 19.82 | 19.96 | 20.17 | 20.82 | 19.71 | 19.34 | 20.33 | 19.67 | 17.79 | 17.81 | 18.92 | 19.28 | 19.87 |
| Cumulative Distance (m) | 0.00 | 20.38 | 40.52 | 60.89 | 80.71 | 100.67 | 120.84 | 141.66 | 161.37 | 181.08 | 200.75 | 220.42 | 240.11 | 257.90 | 275.82 | 295.10 | 314.97 |
| Station No. | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 |

LONGITUDINAL SECTION

| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | SHEET 12 OF 18 | | | | | | | | | | | | | | | | |
|--|---|---|------------------|-------------|------|-------|--|--|--|--|---|------------------------------|----------------|----------------------------|-----------|-----------------------|------------|------------|------------------|
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | <table border="1"> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>DATE</th> <th>SIGN.</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> | REV. | DESCRIPTION | DATE | SIGN. | | | | | <table border="1"> <tr> <td>DESIGNED: Taketoshi FUJIYAMA</td> <td>DRAWN: Kalinga</td> <td>PM: (CONSULTANT) Ikuo MIWA</td> <td>CE: (P&D)</td> </tr> <tr> <td>CHECKED: DESIGN CHIEF</td> <td>AGM: (P&D)</td> <td>DGM: (P&D)</td> <td>DATE: 31/05/2002</td> </tr> </table> | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 |
| REV. | DESCRIPTION | DATE | SIGN. | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | | | | | | | | | | | | | | | | |
| CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | | | | | | | | | | | | | | | | |
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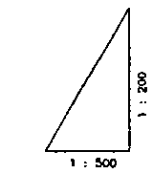
DATE: 24/04/2002 Wanni (CAD) / 17/04/2002 Wanni (CAD) FINAL DRAWINGS/TRANSMISSION



Legend

| | |
|------|-----------------------------|
| SLT | Telephone |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WD | Wash Dn |
| AVA | Air Valve |
| TP | Telephone Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Undefined Boundary |
| RW | Retaining Wall |
| Mdn | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| P | Building |
| V | Valve |
| ØDia | Pipe Diameter |
| SV | Slide Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

GENERAL LAYOUT



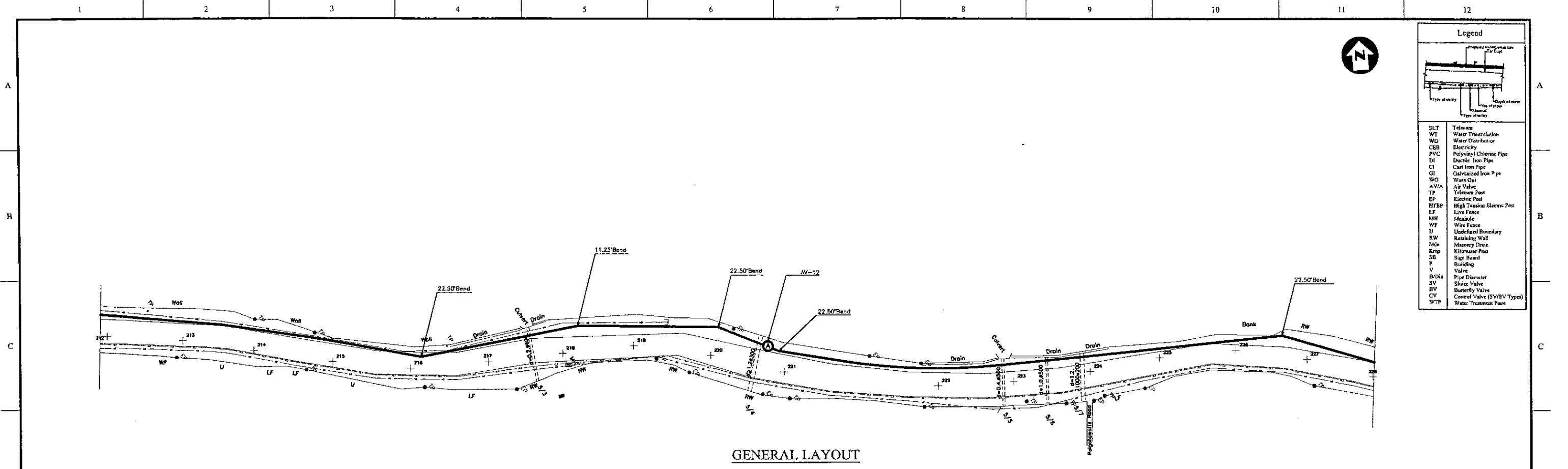
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|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Ground Elevation (m) | 445.54 | 445.16 | 445.10 | 444.86 | 444.80 | 444.88 | 444.98 | 444.53 | 444.48 | 444.52 | 444.50 | 444.45 | 444.46 | 444.71 | 444.78 | 444.82 | 444.87 | 445.14 | 445.15 | 445.24 | |
| Pipe Invert Level (m) (Pipe thickness to be Assume negligible) | 443.36 | 443.77 | | | 443.34 | | 443.16 | | | | | 443.12 | | | | 443.16 | | | 443.34 | | |
| Pipe Data | 300 DI (PUSH ON JOINT TYPE - T, 16 BAR) | | | | | | | | | | | | | | | | | | | | |
| Distance Between station(m) | 11.87 | 20.00 | 11.30 | 20.10 | 20.10 | 21.30 | 21.21 | 21.01 | 18.30 | 20.87 | 20.33 | 20.63 | 20.63 | 19.77 | 18.74 | 18.75 | 18.75 | 18.78 | 18.78 | 18.98 | |
| Cumulative Distance (m) | 11.87 | 31.87 | 43.17 | 63.27 | 83.37 | 104.67 | 125.88 | 146.89 | 165.19 | 184.06 | 204.39 | 225.02 | 245.65 | 265.42 | 284.16 | 302.91 | 321.66 | 340.44 | 359.22 | 378.00 | 396.98 |
| Station No. | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 |

LONGITUDINAL SECTION

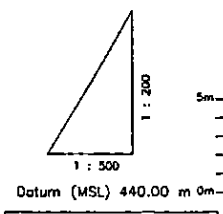
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|---|---|--|-------------------------------------|-----------------------|-----------------------------------|--------------------------------|--|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | JAPAN INTERNATIONAL COOPERATION AGENCY | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 13 OF 18 | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | REV. 1 DESCRIPTION DATE SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-13 | |

DATE: 24/04/2002 11:51 AM CAD: LTV/ FINAL DRAWINGS/TRANSMISSION/



| Legend | |
|--------|-----------------------------|
| SLT | Telephone |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AW/A | Air Valve |
| TP | Telecom Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Utilitiy Boundary |
| RW | Retaining Wall |
| Md | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| P | Building |
| V | Valve |
| B/Dia | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

GENERAL LAYOUT

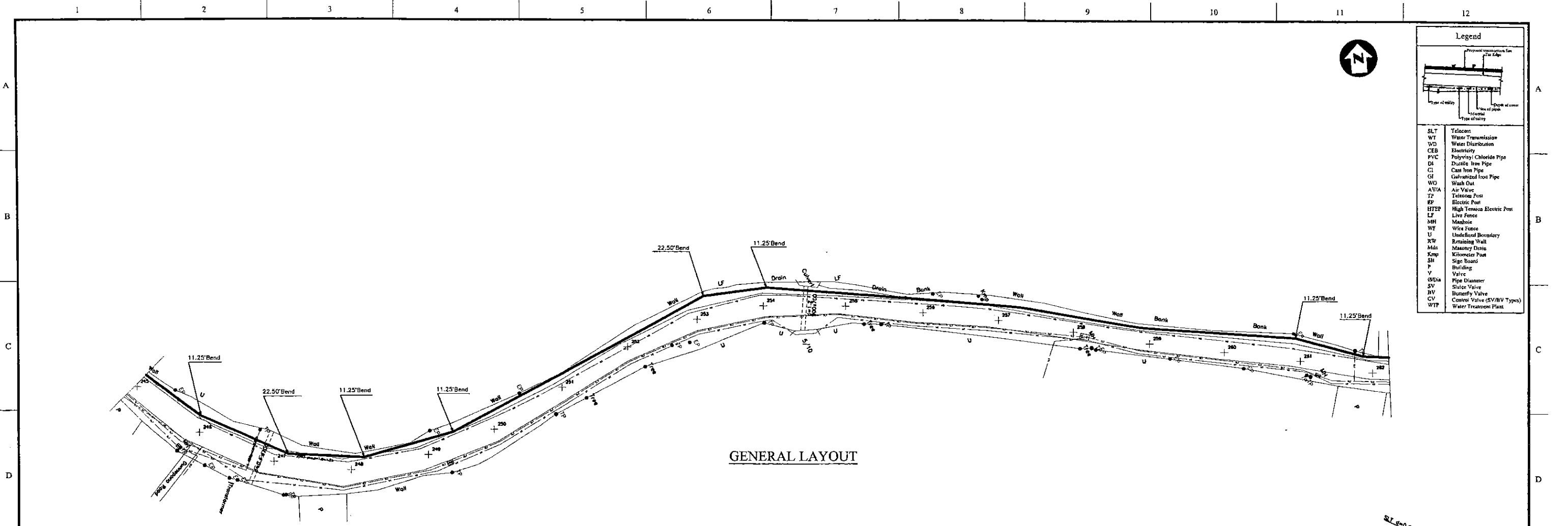


| Ground Elevation (m) | 443.24 | 443.22 | 443.12 | 443.04 | 442.96 | 442.82 | 442.76 | 442.51 | 442.41 | 442.31 | 442.22 | 442.15 | 442.05 | 441.95 | 441.86 | 441.76 | 441.67 | 441.57 | 441.47 | 441.37 | 441.27 | 441.17 | 441.07 | 440.97 | 440.87 | 440.77 | 440.67 | 440.57 | 440.47 | 440.37 | 440.27 | | |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Pipe Invert Level (m) (Pipe thickness to be Assume negligible) | | | | | | 443.34 | | | | | 443.32 | | | | | | 443.33 | | | | | | | | | | | | | | | | |
| Pipe Data | 300 DI (PUSH ON JOINT TYPE - T, 16 BAR) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Distance Between station(m) | 18.8 | 18.8 | 18.8 | 21.1 | 20.8 | 20.1 | 18.2 | 18.2 | 18.9 | 20.4 | 18.7 | 40.15 | 20.20 | 20.07 | 18.4 | 20.29 | 18.80 | 17.97 | | | | | | | | | | | | | | | |
| Cumulative Distance (m) | 0.00 | 18.80 | 37.60 | 58.70 | 79.50 | 100.30 | 118.50 | 137.70 | 156.60 | 175.50 | 194.90 | 235.05 | 255.25 | 275.32 | 293.72 | 314.01 | 332.81 | 350.78 | 368.75 | 386.72 | 404.69 | 422.66 | 440.63 | 458.60 | 476.57 | 494.54 | 512.51 | 530.48 | 548.45 | 566.42 | 584.39 | 602.36 | |
| Station No. | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | | | | | | | | | | | | | | | | |

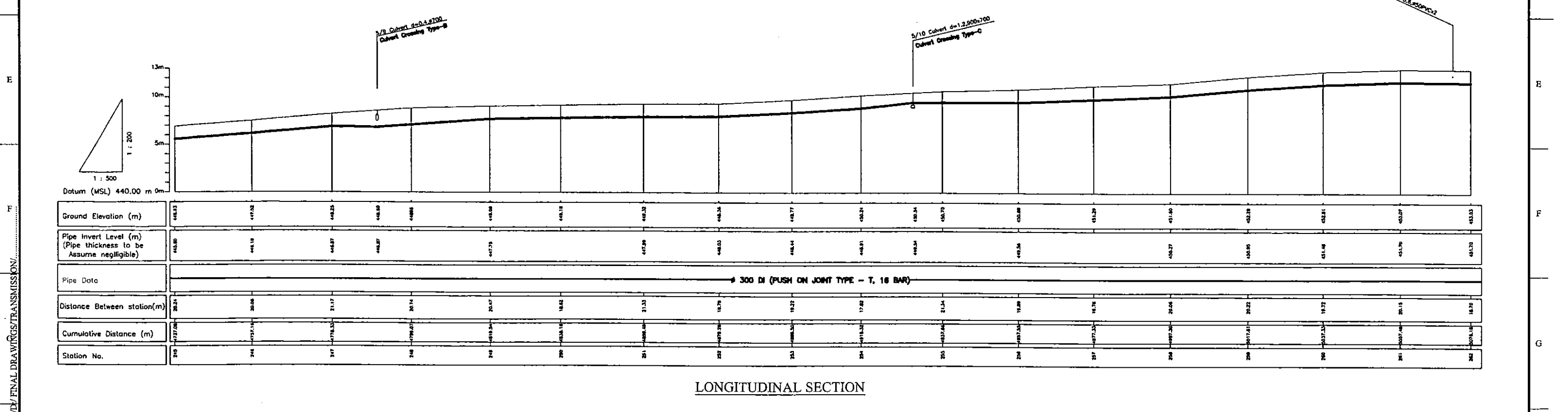
LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|--|--|---|--|---|-------------|------|-------|-----------------------------|----------------|----------------------------|------------------|---|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 14 OF 18 | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Takatoshi FUJYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-14 |

DATE: 24/04/2002 11:30 AM (CAD) / FINAL DRAWINGS/TRANSMISSION



GENERAL LAYOUT

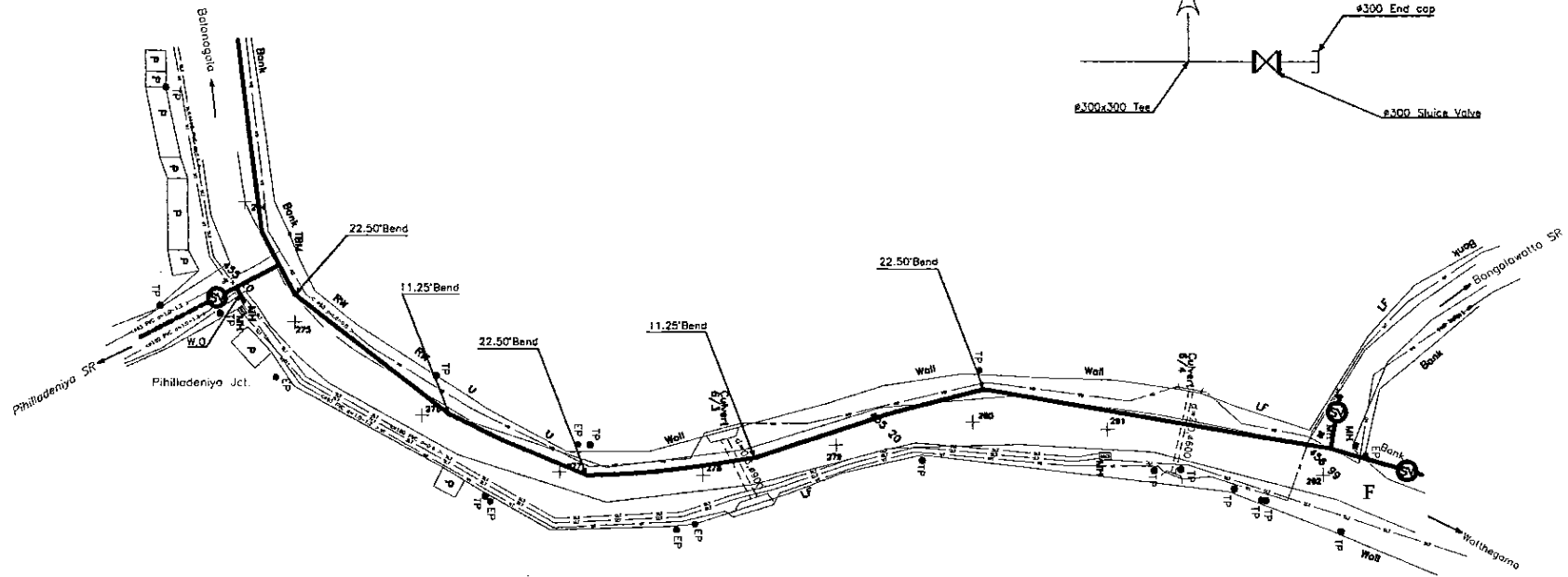
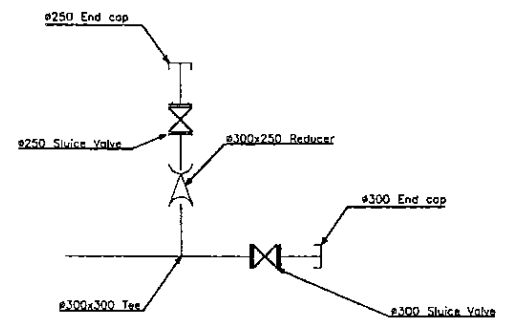


| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | JAPAN INTERNATIONAL COOPERATION AGENCY CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>REV.</th> <th>DESCRIPTION</th> <th>DATE</th> <th>SIGN.</th> <th>DESIGNED:</th> <th>DRAWN:</th> <th>PM: (CONSULTANT)</th> <th>CE: (P&D)</th> <th>SCALE:</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td>Taketoshi FUJIYAMA</td> <td>Kalinga</td> <td>Ikuo MIWA</td> <td> </td> <td>HORIZONTAL - 1:500 VERTICAL - 1:200</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td>CHECKED:</td> <td>AGM: (P&D)</td> <td>DGM: (P&D)</td> <td>DATE:</td> <td>DRAWING NO.:</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td>DESIGN CHIEF</td> <td> </td> <td> </td> <td>31/05/2002</td> <td>20-C-08-16</td> </tr> </table> | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: | | | | | Taketoshi FUJIYAMA | Kalinga | Ikuo MIWA | | HORIZONTAL - 1:500 VERTICAL - 1:200 | | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: | | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-16 |
|--|---|--|-------|--------------------|------------|------------------|------------|--|------------------|-----------|--------|--|--|--|--|--------------------|---------|-----------|--|--|--|--|--|--|----------|------------|------------|-------|--------------|--|--|--|--|--------------|--|--|------------|------------|
| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Taketoshi FUJIYAMA | Kalinga | Ikuo MIWA | | HORIZONTAL - 1:500 VERTICAL - 1:200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

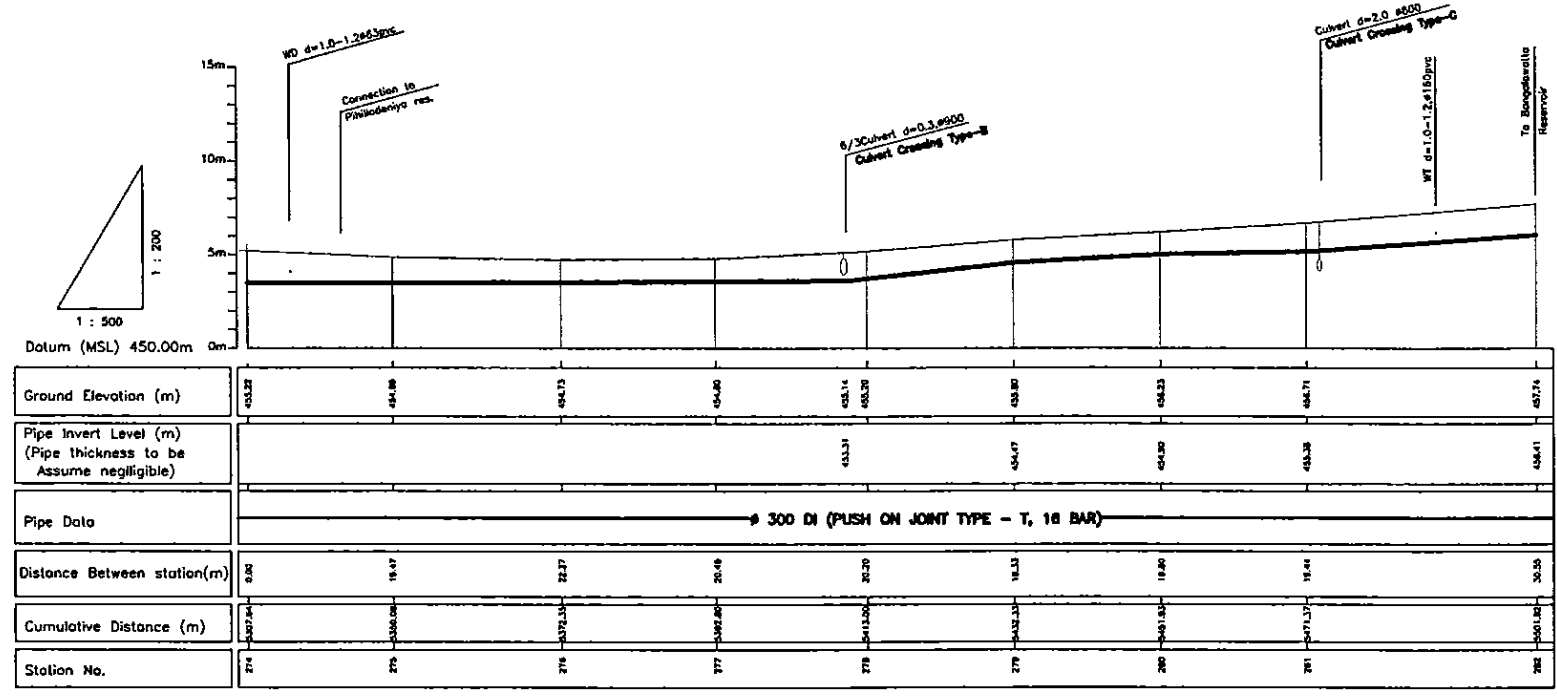


| Legend | |
|--------|-----------------------------|
| SLT | Telecom |
| WT | Water Transmission |
| WD | Water Distribution |
| CEB | Electricity |
| PVC | Polyvinyl Chloride Pipe |
| DI | Ductile Iron Pipe |
| CI | Cast Iron Pipe |
| GI | Galvanized Iron Pipe |
| WO | Wash Out |
| AV/A | Air Valve |
| TP | Telecom Post |
| EP | Electric Post |
| HTEP | High Tension Electric Post |
| LF | Live Fence |
| MH | Manhole |
| WF | Wire Fence |
| U | Underpass Boundary |
| RW | Retaining Wall |
| Mdn | Masonry Drain |
| Kmp | Kilometer Post |
| SB | Sign Board |
| P | Building |
| V | Valve |
| ØDi | Pipe Diameter |
| SV | Sluice Valve |
| BV | Butterfly Valve |
| CV | Control Valve (SV/BV Types) |
| WTP | Water Treatment Plant |

PIPE JUNCTION DETAIL - F



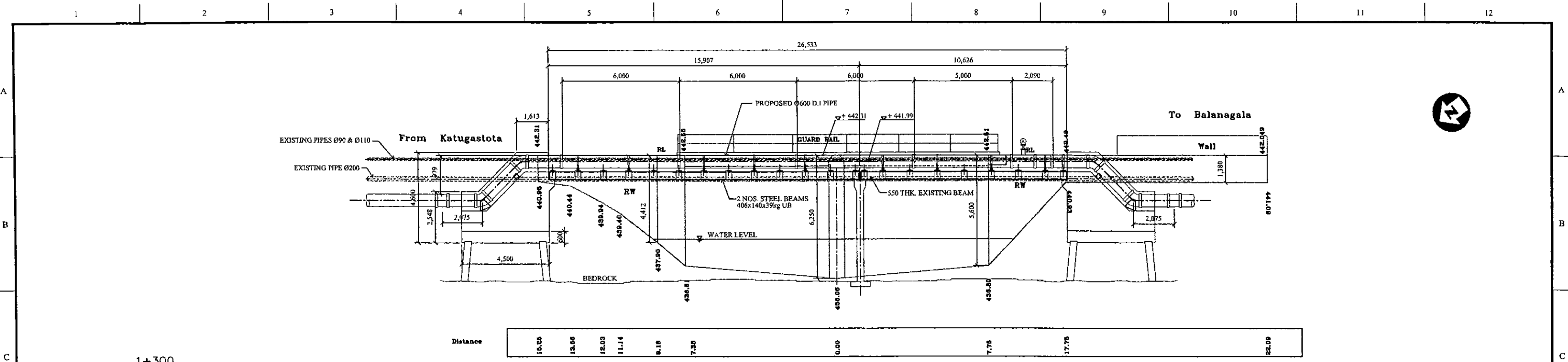
GENERAL LAYOUT



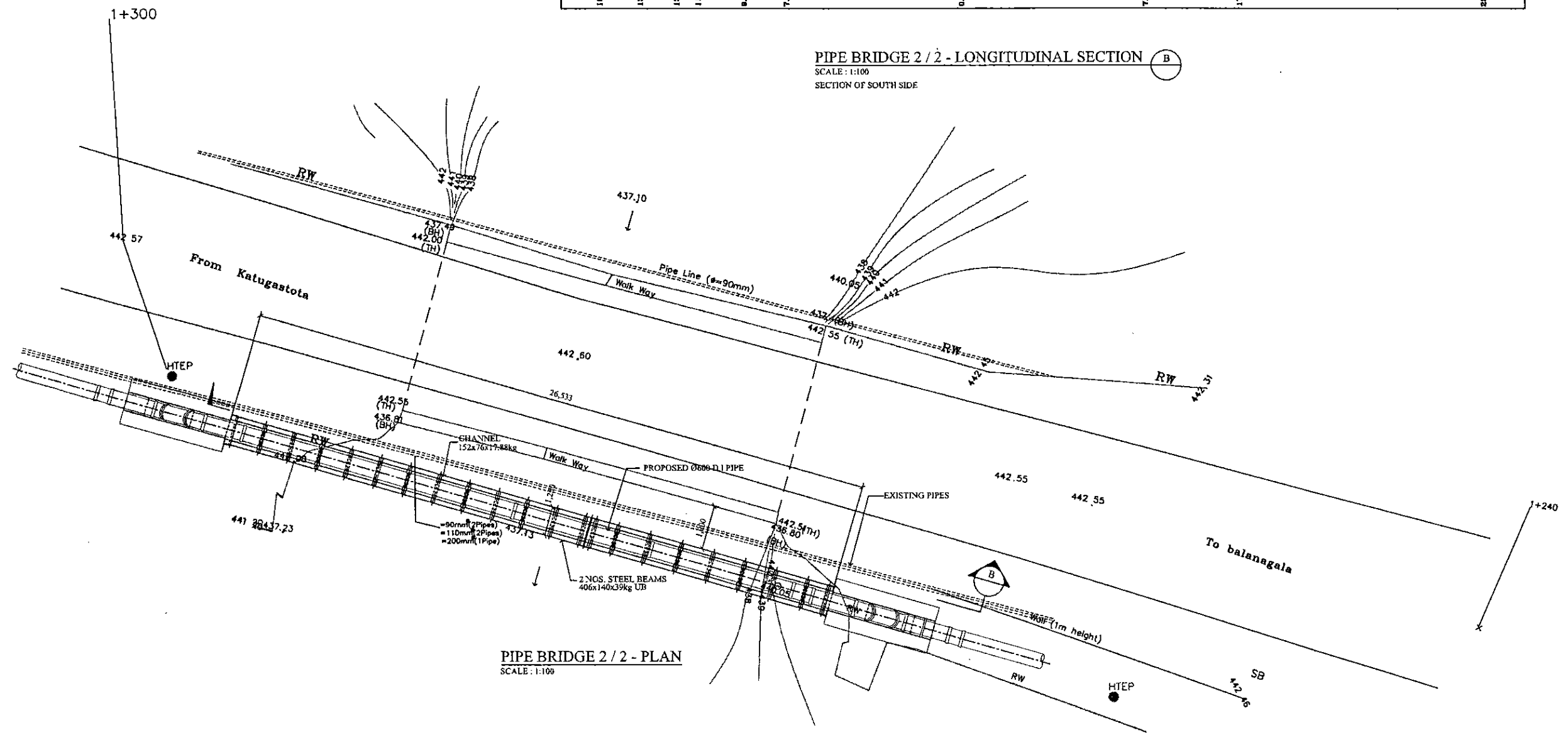
LONGITUDINAL SECTION

| | | | | | | | | | | | | |
|--|--|---|--|---|-------------|------|-------|------------------------------|----------------|----------------------------|------------------|---|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BANGALAWATTA JUNCTION - TRANSMISSION MAIN | | | | SHEET 18 OF 18 | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: HORIZONTAL - 1:500 VERTICAL - 1:200 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-18 |

DATE: 24/04/2002; W:\DWG\FINAL DRAWINGS\TRANSMISSION\...



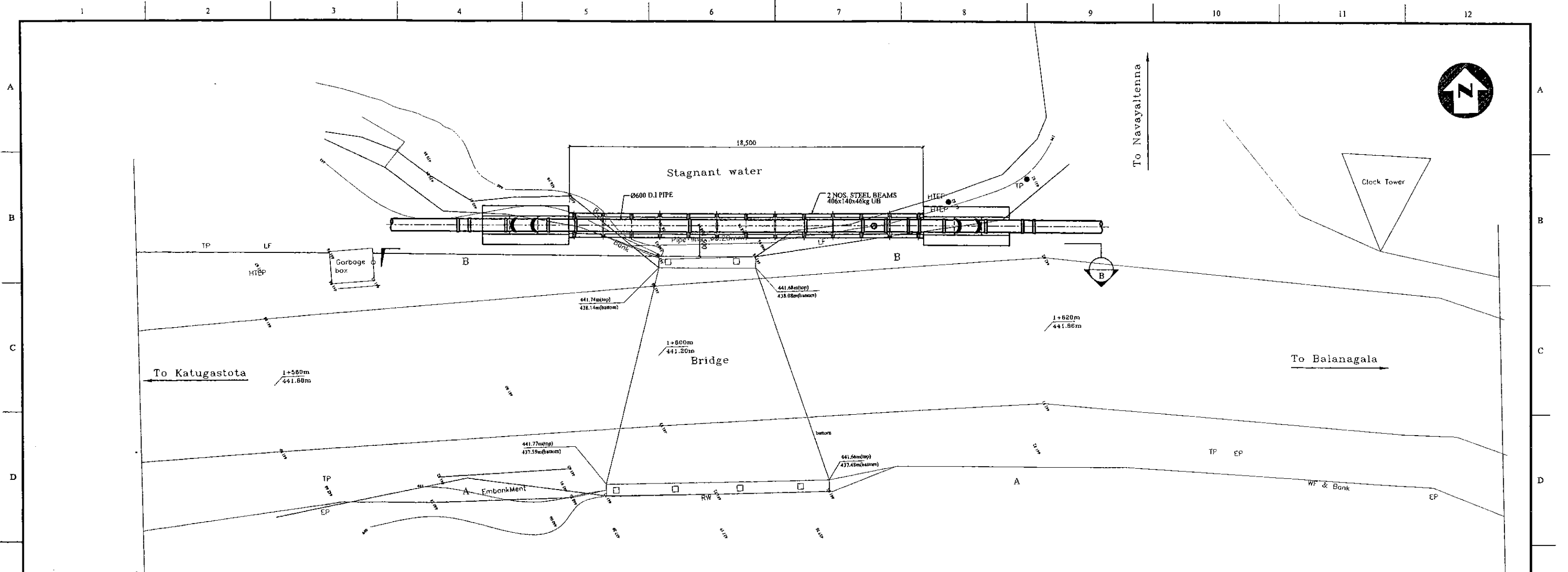
PIPE BRIDGE 2 / 2 - LONGITUDINAL SECTION
 SCALE: 1:100
 SECTION OF SOUTH SIDE



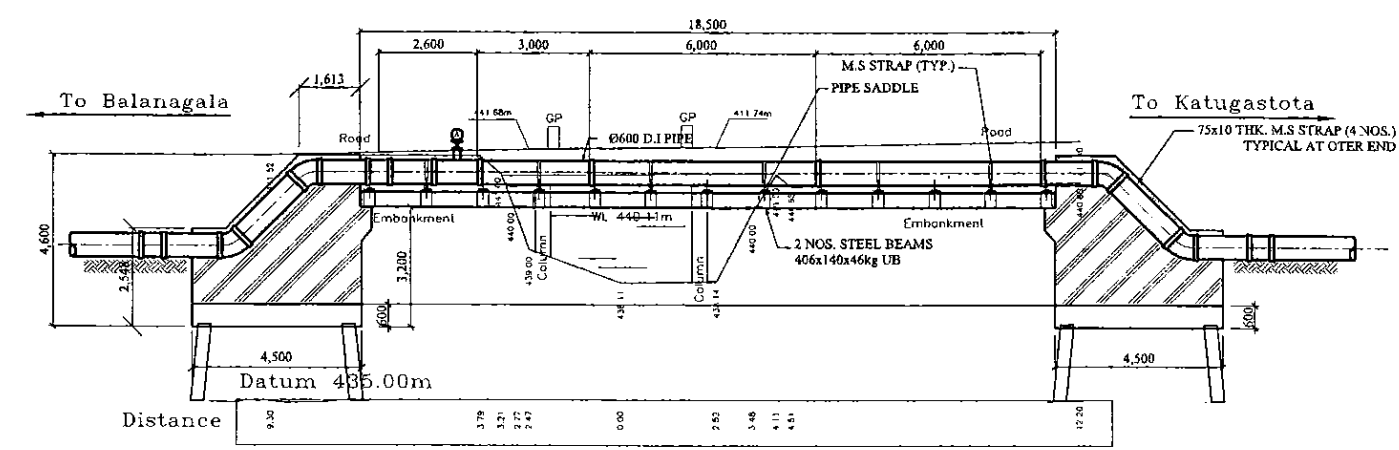
PIPE BRIDGE 2 / 2 - PLAN
 SCALE: 1:100

| | | | | | | | | | | | | |
|---|--|---|--|---|--------------------|-------------|--------------|-------------------------------------|-----------------------|-----------------------------------|-------------------------|--------------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION - TRANSMISSION MAIN OVER BRIDGE 2 / 2 | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NISC NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: SAM | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: 1:100 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-19 |

DATE: 24/04/2002 W:\DWG\FINAL DRAWING\CGS\TRANSMISSION\...



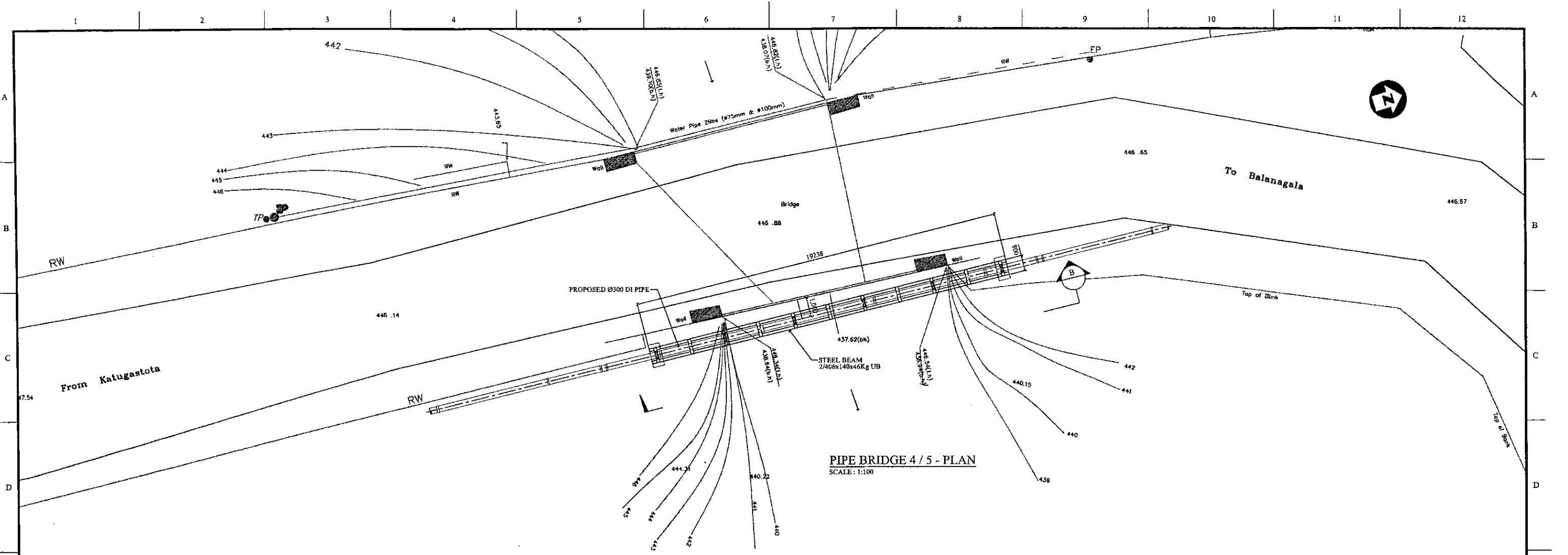
PLAN
SCALE: 1:100



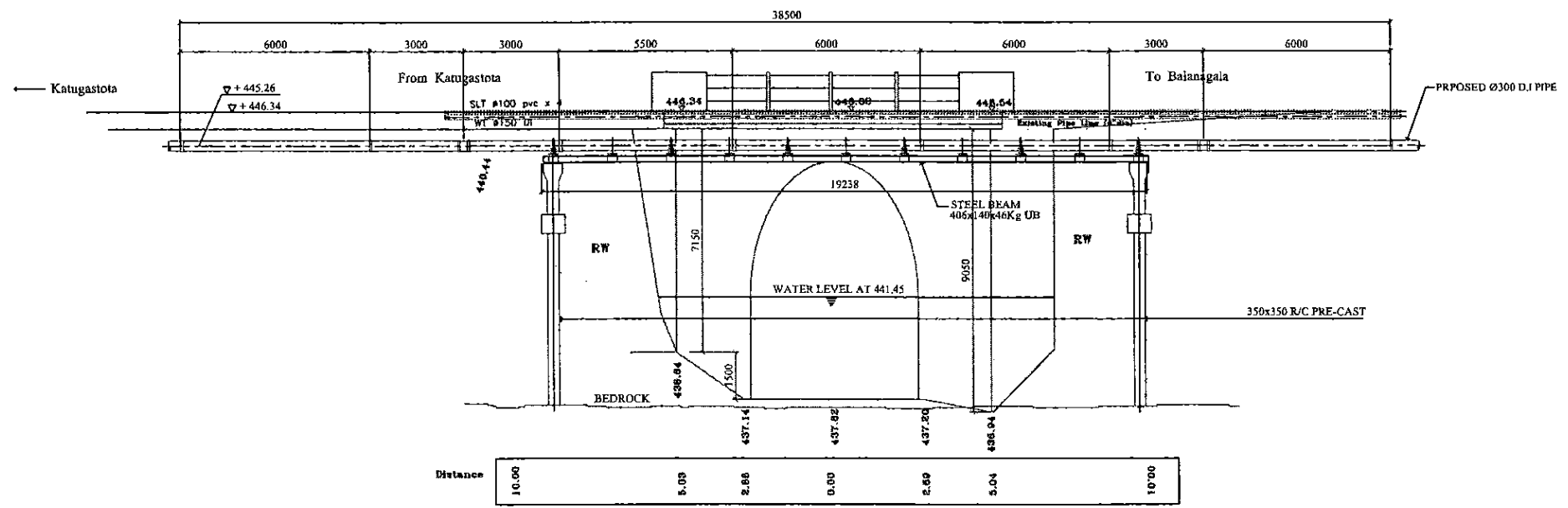
LONGITUDINAL SECTION - B
SCALE: 1:100

| | | | | | | | | | | | | |
|--|--|---|--|--|-------------|------|-------|------------------------------|------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA BRIDGE JUNCTION TO BALANAGALA - TRANSMISSION MAIN OVER BRIDGE 2/5 | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJUYAMA | DRAWN: SAM | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: 1:100 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-20 |

DATE: 24/04/2002 Wanni (CAD) / FINAL DRAWING / TRANSMISSION




PIPE BRIDGE 4 / 5 - PLAN
SCALE: 1:100




PIPE BRIDGE 4 / 5 - LONGITUDINAL SECTION (B)
SCALE: 1:100


DATE: 24/04/2002 W:\amr\CAD\175\FINAL DRAWINGS\TRANSMISSION\

PROJECT: **GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT**

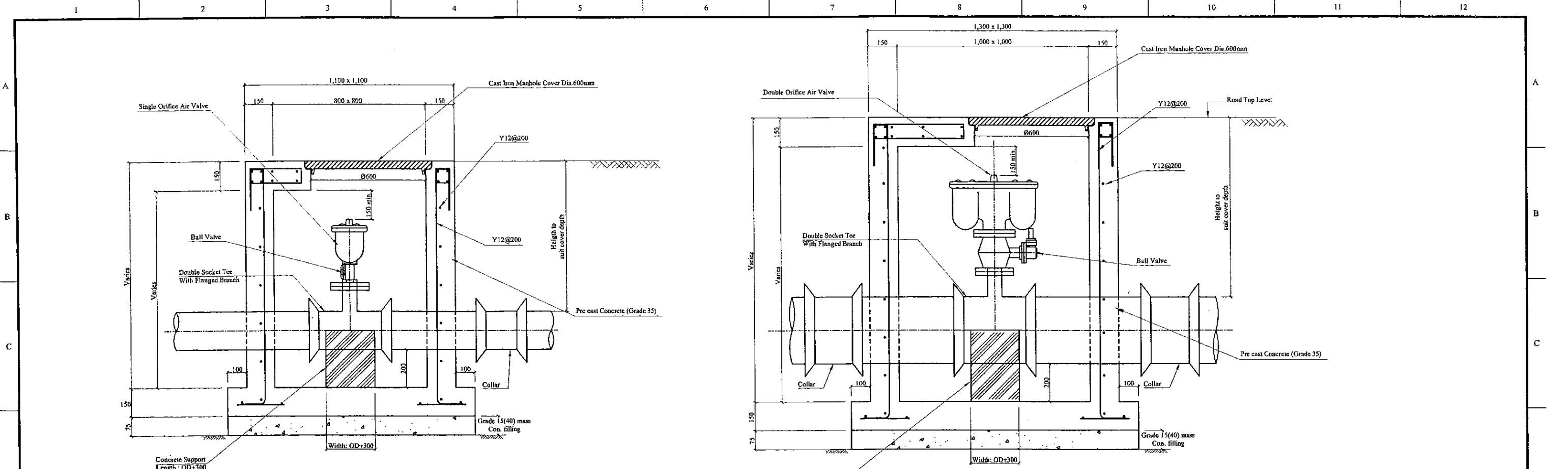
CLIENT:  **NATIONAL WATER SUPPLY & DRAINAGE BOARD**

CONSULTANTS:

 **NJS CONSULTANTS CO., LTD. - JAPAN**

 **NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN**

| TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION - TRANSMISSION MAIN OVER BRIDGE 4 / 5 | | | | | | | | | |
|---|-------------|------|-------|--------------------|------------|------------------|------------|--------------|--|
| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: | |
| | | | | Taketoshi FUJIYAMA | SAM | Ikuo MIWA | | 1:100 | |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: | |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-21 | |



SINGLE ORIFICE AIR VALVE CHAMBER

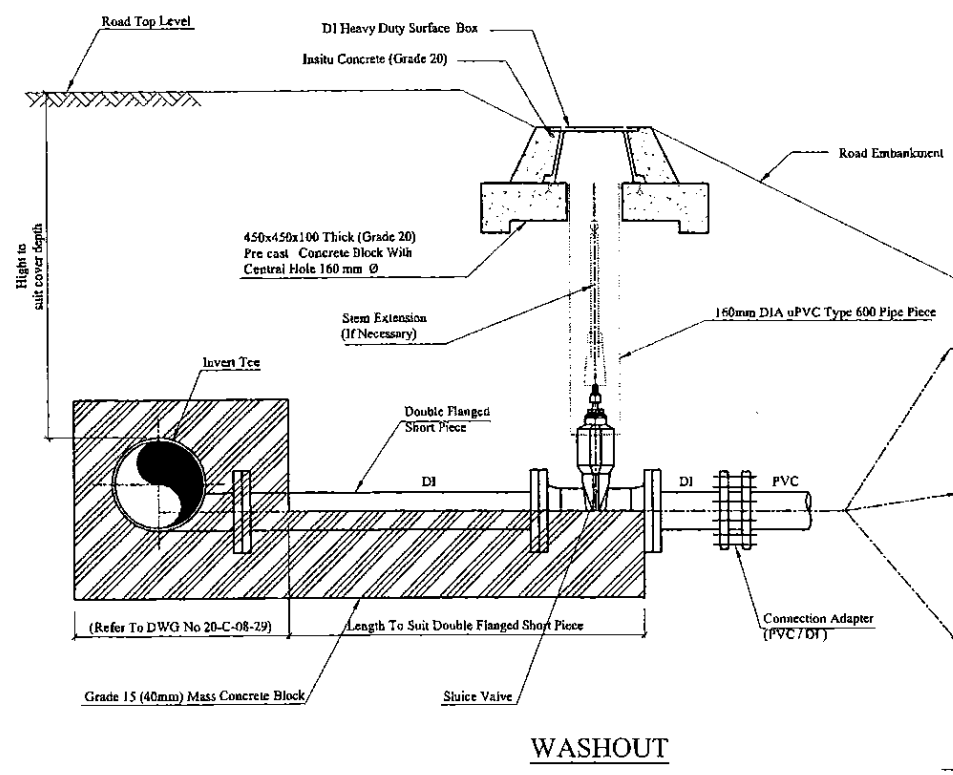
DOUBLE ORIFICE AIR VALVE CHAMBER

CRITERIA FOR AIR VALVE

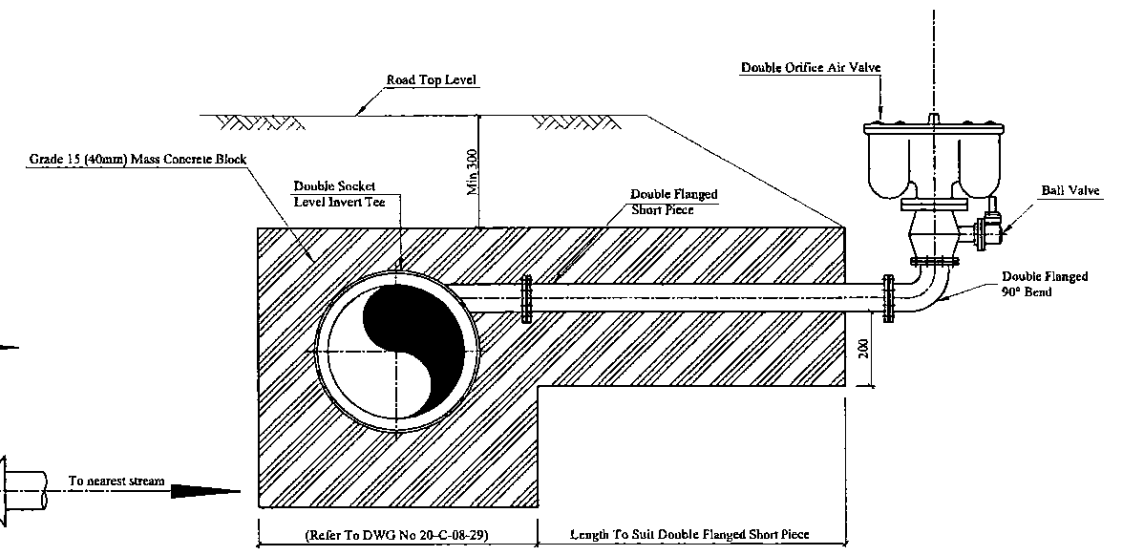
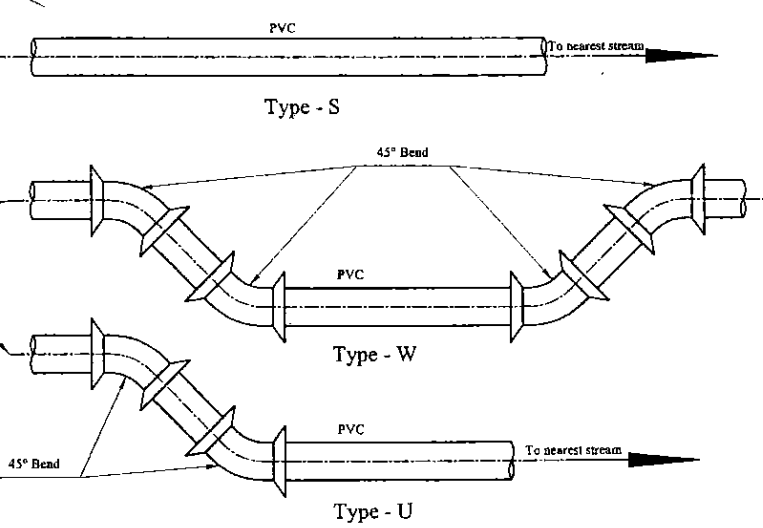
| MAIN PIPE | BRANCH PIPE | TYPE OF AIR VALVE |
|-------------|-------------|-------------------|
| ≤ Ø300 | Ø80 | SINGLE ORIFICE |
| Ø350 - Ø600 | Ø100 | DOUBLE ORIFICE |

CRITERIA FOR WASH OUT

| MAIN PIPE | BRANCH PIPE |
|-------------|-------------|
| ≤ Ø300 | Ø80 |
| Ø350 - Ø600 | Ø100 |



WASHOUT

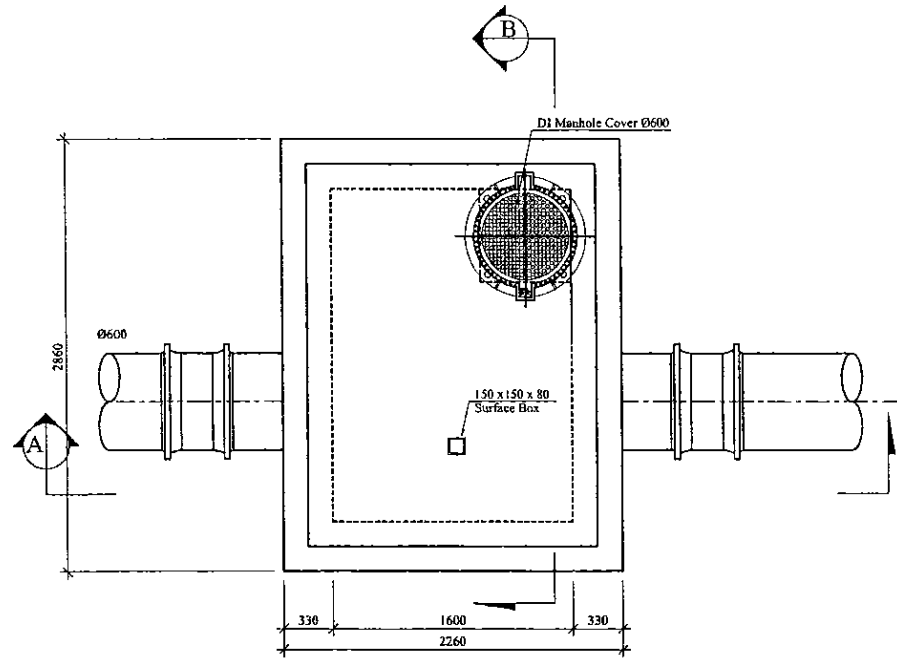


AIR VALVE WITH OUT CHAMBER

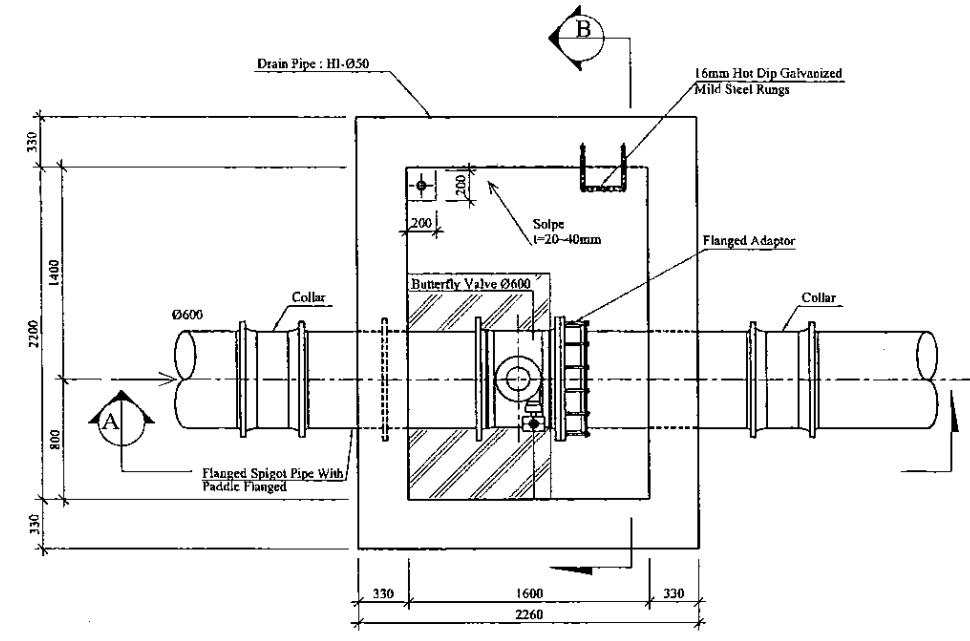
- NOTE**
- The thickness of the binding layer specified in the drawing is for normal soil types. However, if the structure is founded on very weak soil such as peat, a ground stabilization method, as directed by the Engineer, shall be followed.
 - The Valve Boxes for Washout may be on the bank of the road.
 - The top of the Air Valve Chamber should be at the same level as the Road Top Level.
 - All sluice valves less than 150mm dia will have no chambers and will be installed scumtier to wash out valves heavy-duty surface boxes at the road level to operate them.

| | | | | | | | | | | |
|---|---|--|-------------|------|-------|------------------------------------|-----------------------|-----------------------------------|-------------------------|--------------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | JAPAN INTERNATIONAL COOPERATION AGENCY | TITLE: TYPICAL DRAWING FOR INSTALATION OF AIR VALVE AND WASHOUT | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJYAMA | DRAWN: Kalinga | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: AS SHOWN |
| | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-22 |

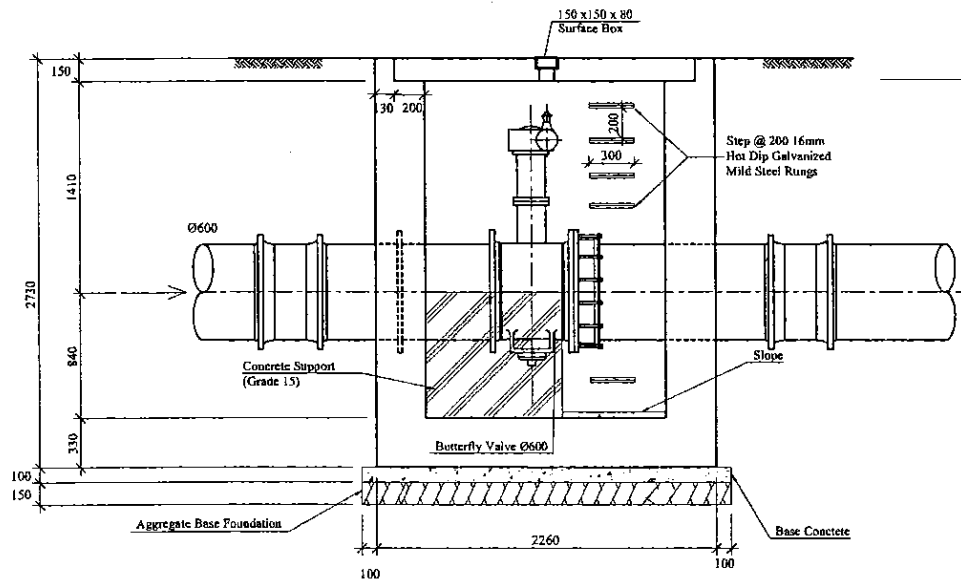
DATE: 24/04/2002 Wanni/CAD UZ/ FINAL DRAWINGS/TRANSMISSION/



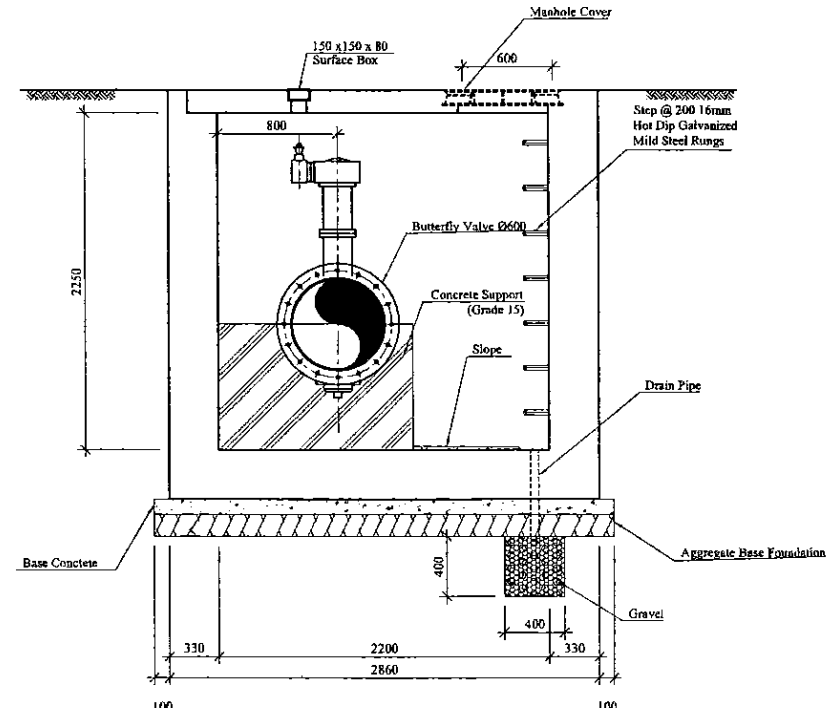
TOP PLAN
SCALE : - 1:25



SECTIONAL PLAN
SCALE : - 1:25




SECTION A
SCALE : - 1:25




SECTION B
SCALE : - 1:25


DATE: 24/04/2002 Wanni CAD / UDA / FINAL DRAWINGS / TRANSMISSION

PROJECT: **GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT**

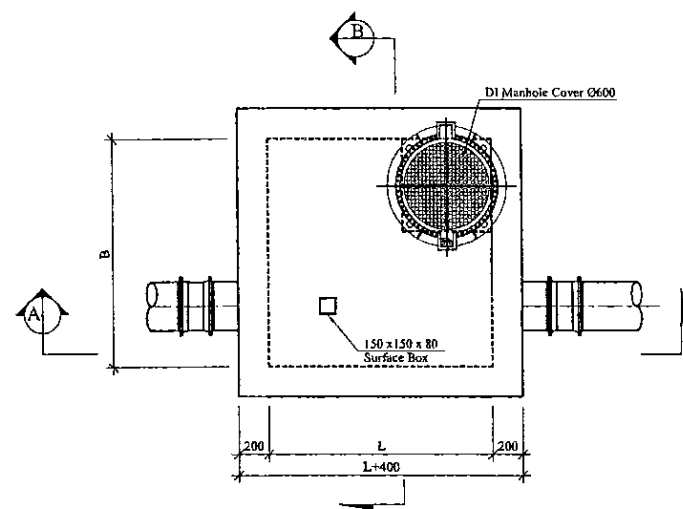
CLIENT:  **NATIONAL WATER SUPPLY & DRAINAGE BOARD**

CONSULTANTS:

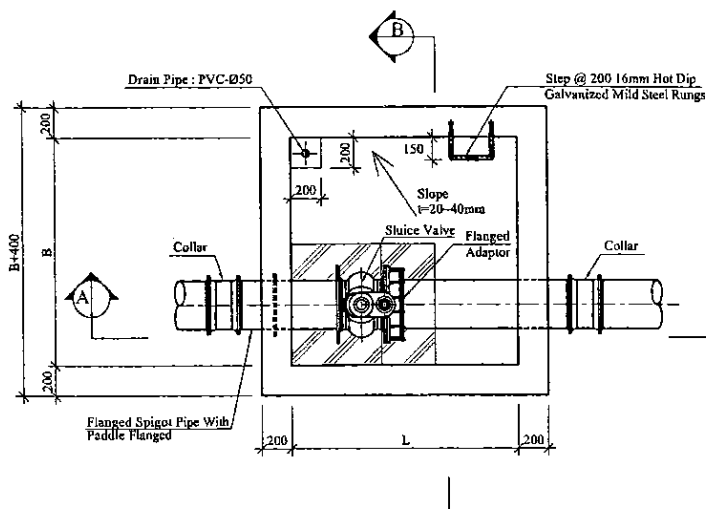
 **NJS CONSULTANTS CO., LTD. - JAPAN**

 **NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN**

| TITLE: BUTTERFLY VALVE CHAMBER- Ø600mm PN16 | | | | | | | | | |
|---|-------------|------|-------|-------------------|------------|------------------|------------|--------------|--|
| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: | |
| | | | | Taketoshi FUJYAMA | Udita | Ikuo MIWA | | SCALE 1:25 | |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: | |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-23 | |



TOP PLAN
SCALE: 1:25



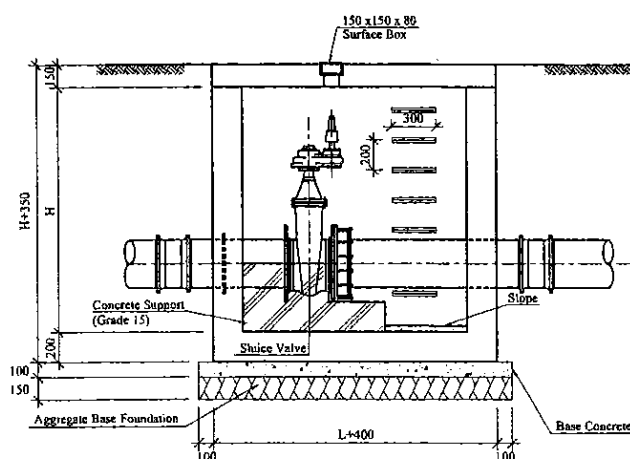
SECTIONAL PLAN (C)
SCALE: 1:25

DIMENSION OF VALVE CHAMBER.

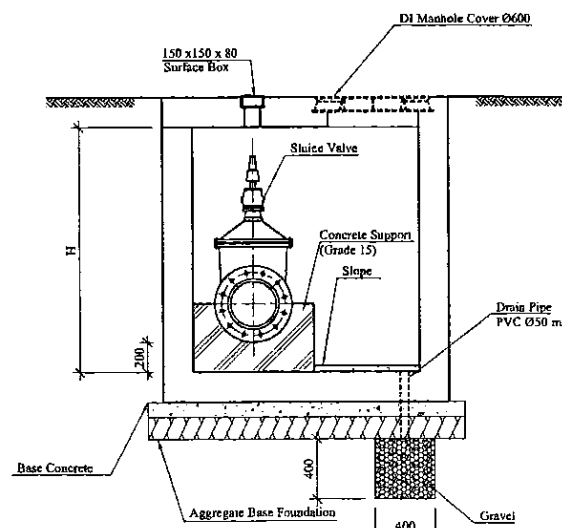
| DIA OF VALVE (mm) | LENGTH OF CHAMBER(L) (mm) | WIDTH OF CHAMBER(B) (mm) | HEIGHT OF CHAMBER(H) (mm) |
|-------------------|---------------------------|--------------------------|---------------------------|
| 300 | 1400 | 1500 | 1850 |
| 250 | 1400 | 1500 | 1800 |
| 200 | 1400 | 1400 | 1600 |

NOTE:-

01. THE HEIGHT OF CHAMBER (H) MAY BE CHANGED TO SUIT SITE CONDITIONS.



SECTION (A)
SCALE: 1:25



SECTION (B)
SCALE: 1:25

DATE: 24/04/2002; W:\ammi\CAD\1\2\1\FINAL DRAWINGS\TRANSMISSION\

PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: CHAMBERS FOR GEARED SLUICE VALVES (VERTICAL TYPE) Ø200mm-Ø300mm PN16

CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD

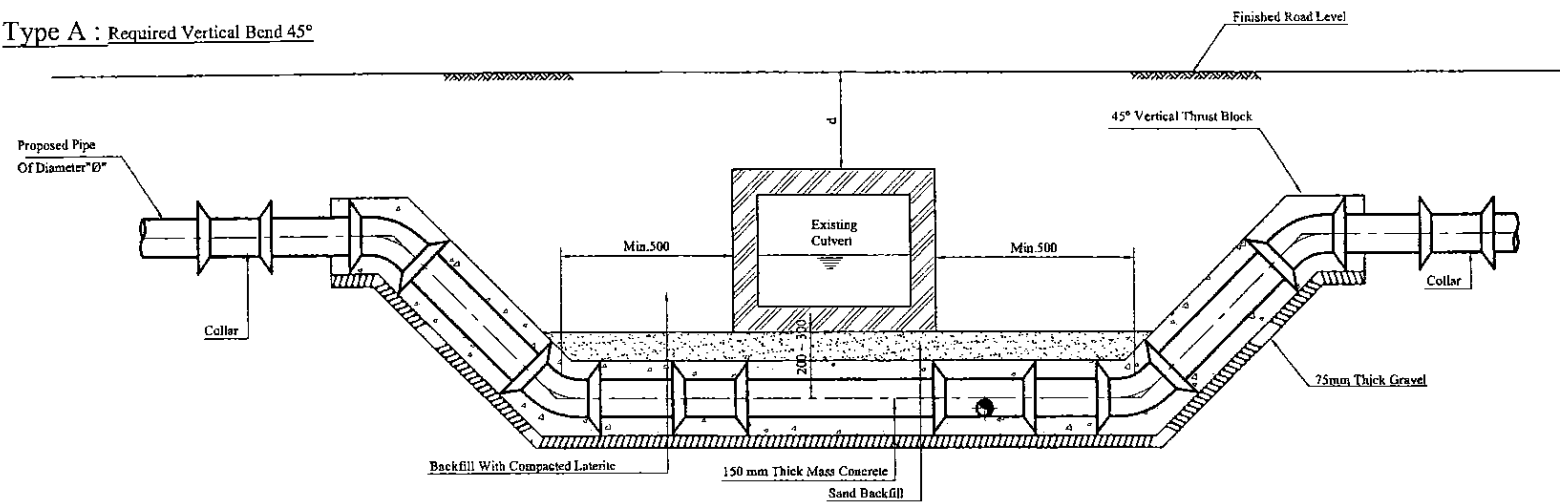
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN
NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN

| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: |
|------|-------------|------|-------|--------------------|------------|------------------|------------|--------------|
| | | | | Taketoshi FUJIYAMA | Udita | Ikuo MIWA | | SCALE 1:25 |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-24 |

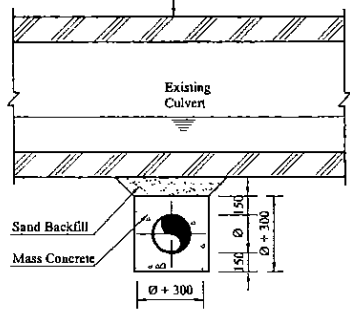
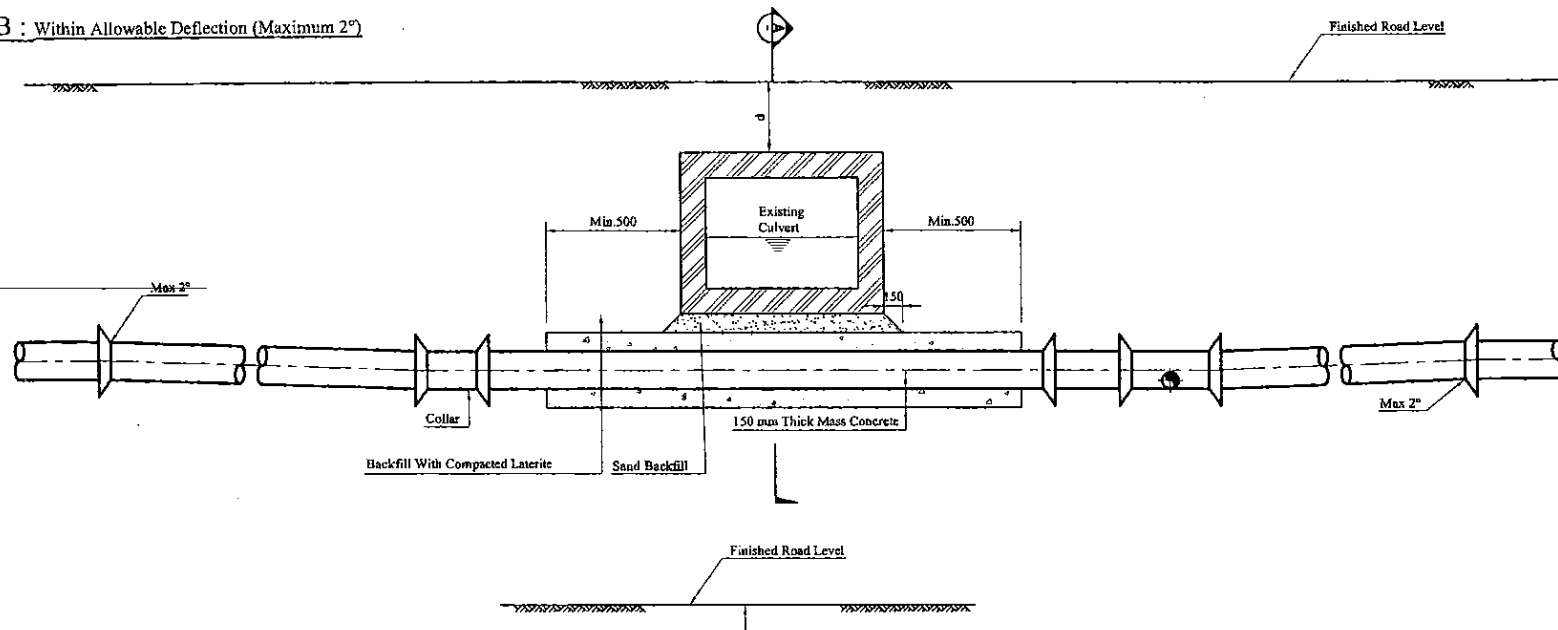
PIPE UNDER CROSSING THE CULVERT

Applicable to all types of culverts - $d \leq \phi + 400\text{mm}$

Type A : Required Vertical Bend 45°



Type B : Within Allowable Deflection (Maximum 2°)

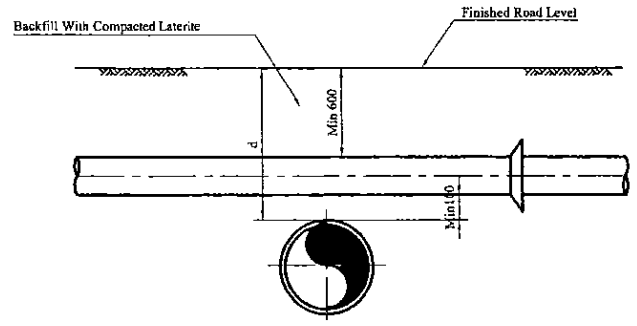


SECTION (A)

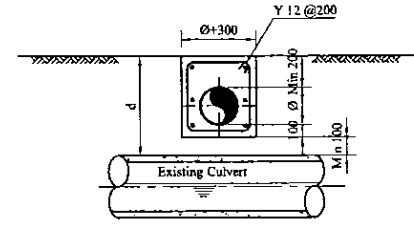
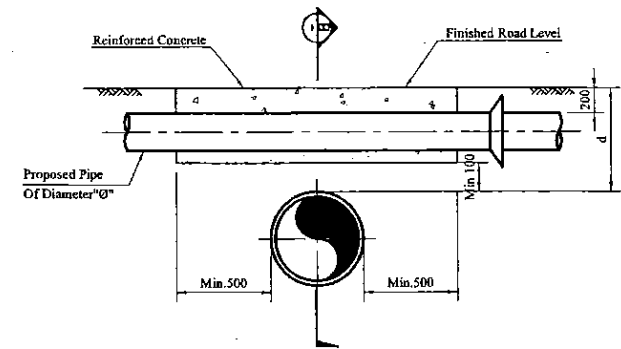
PIPE OVER CROSSING THE CULVERT

Applicable to all types of culverts

Type C $d \geq \phi + 700\text{mm}$



Type D : $\phi + 400\text{mm} \leq d < \phi + 700\text{mm}$



SECTION (B)

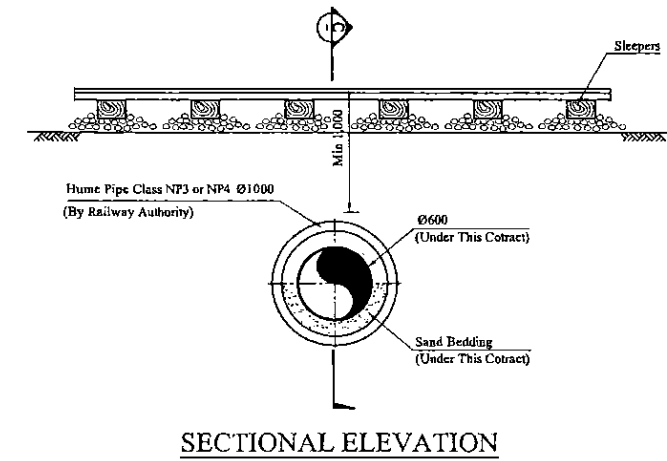
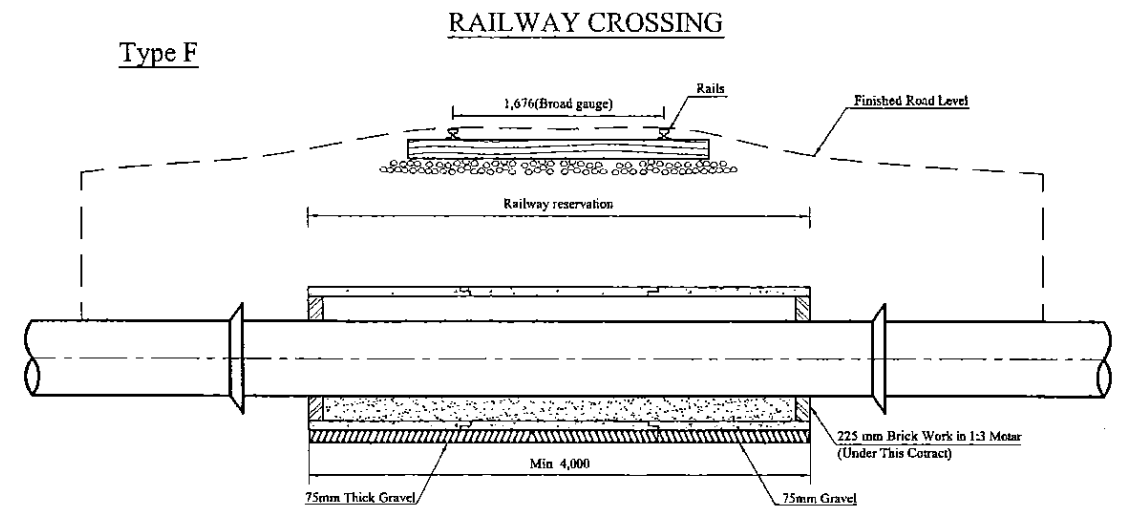
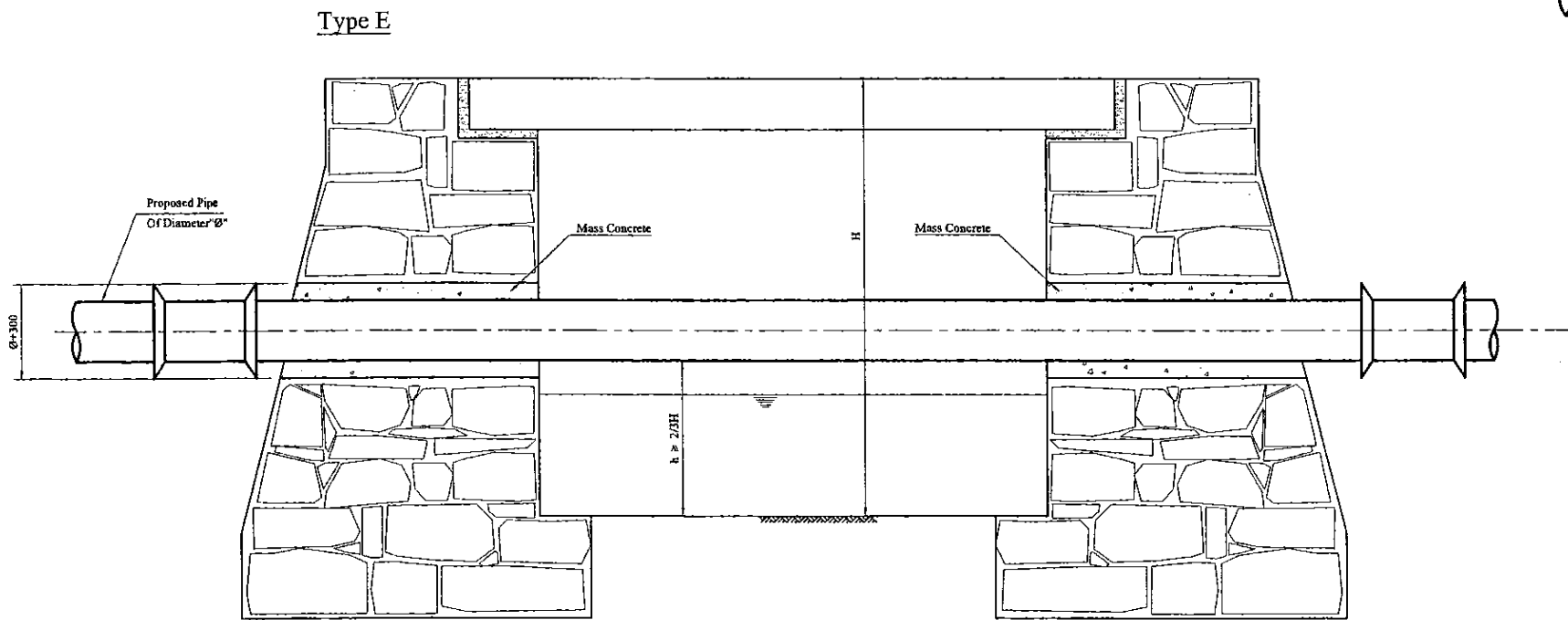
NOTES :

1. THE SPACE BETWEEN INVERT OF THE CULVERT & BOTTOM OF THE TRENCH IN TYPE A, & B SHALL BE FILLED WITH SAND TO THE FULL TRENCH WIDTH.
2. FOR OVER CROSSING TYPES D, CONCRETE SURROUND THE PIPE SHALL MINIMUM OF 4 Nos. OF 12 mm TOR STEEL BARS AT EACH CORNERS & 6mm MILD LINKS AROUND MAIN BARS 200mm INTERVALS WITH A CONCRETE COVER OF 40mm GRADE 25 (20mm) CONCRETE SHOULD BE USED FOR ALL REINFORCED CONCRETE SECTIONS.
3. ALL MASS CONCRETE SHALL BE GRADE 15(40mm)
4. IN THE EVENT OF UNDER CROSSING ALL TYPES OF CULVERTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR USING AN APPROPRIATE SUPPORTING SYSTEM, AS APPROVED BY THE ENGINEER, UNDERNEATH THE CULVERT TO PROTECT IT FROM ANY POSSIBLE FAILURE.
5. REFER TO DRAWING NO 20-C-08-01, 02 FOR THRUST BLOCK DETAIL.

DATE: 24/04/2002 Wanni (CAD) / FINAL DRAWINGS / TRANSMISSION

| | | | | | | | | | | | | |
|--|--|---|--|---|-------------|------|-------|------------------------------|--------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: TYPICAL DRAWING FOR CULVERT CROSSING | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Udita | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: NOT TO SCALE |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-25 |

PIPE CROSSING THROUGH THE CULVERT
Applicable to rectangular culverts only



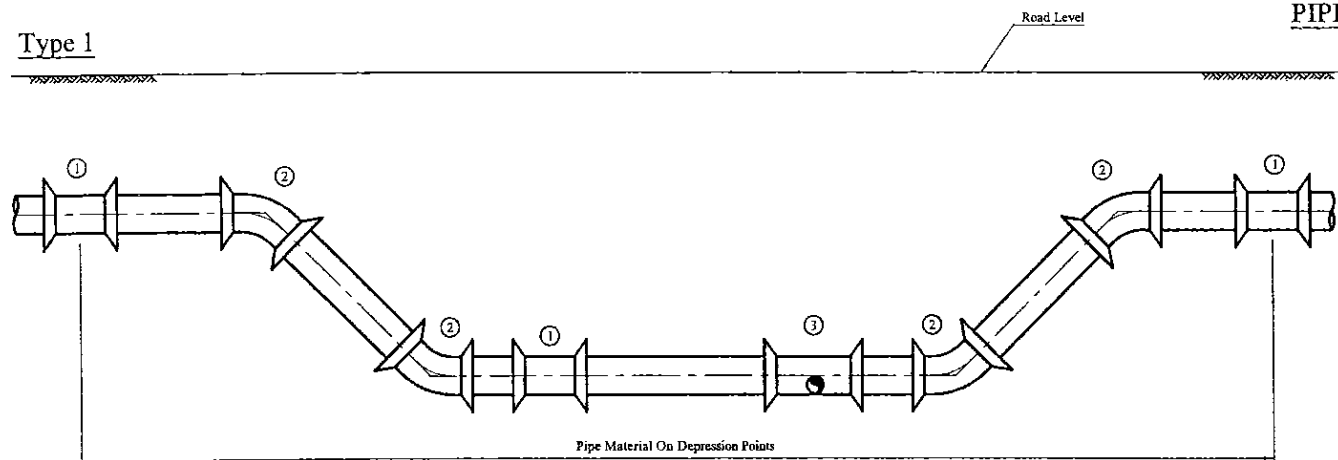
NOTES:
Refer to Drawing No. 20-C-08-25

DATE: 24/04/2002 FILE: CAD / FINAL DRAWINGS / TRANSMISSION /

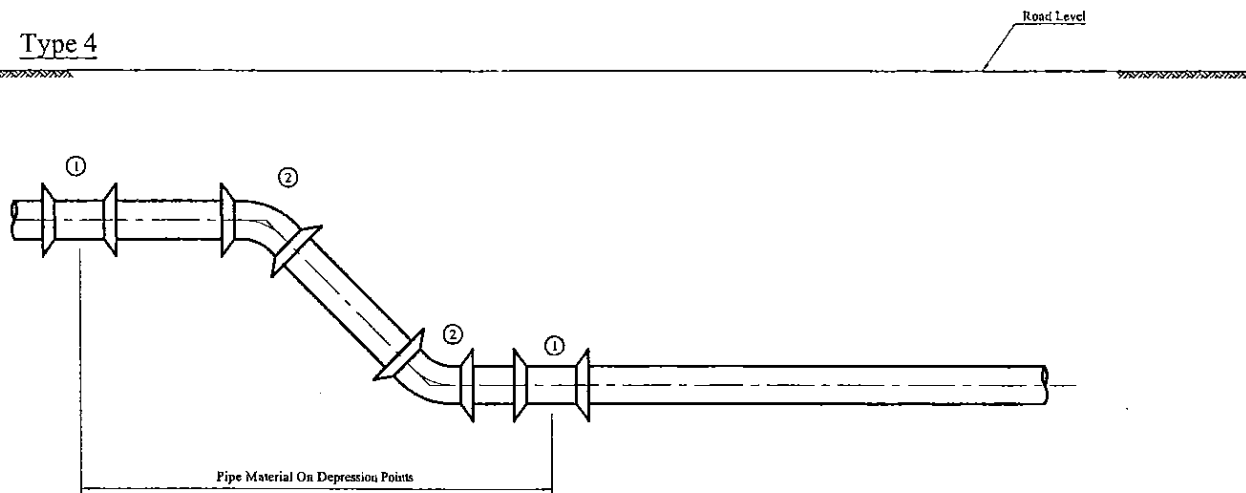
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|--|--|---|--|--|-------------|------|-------|------------------------------|--------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: TYPICAL DRAWING FOR CULVERT CROSSING & RAILWAY CROSSING | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Udita | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: NOT TO SCALE |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-C-08-26 |

PIPE LAYING TYPES

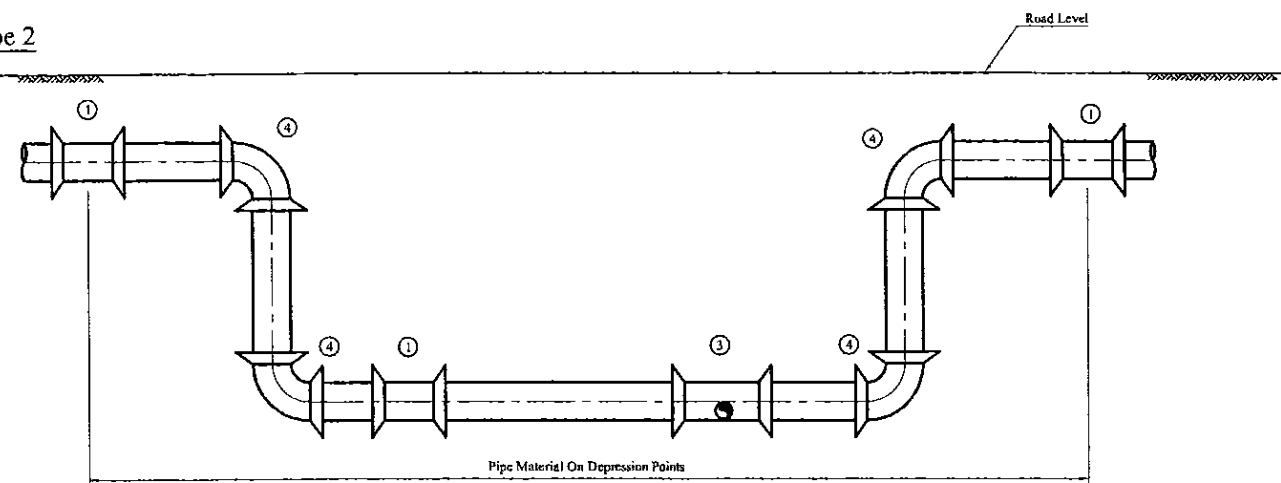
Type 1



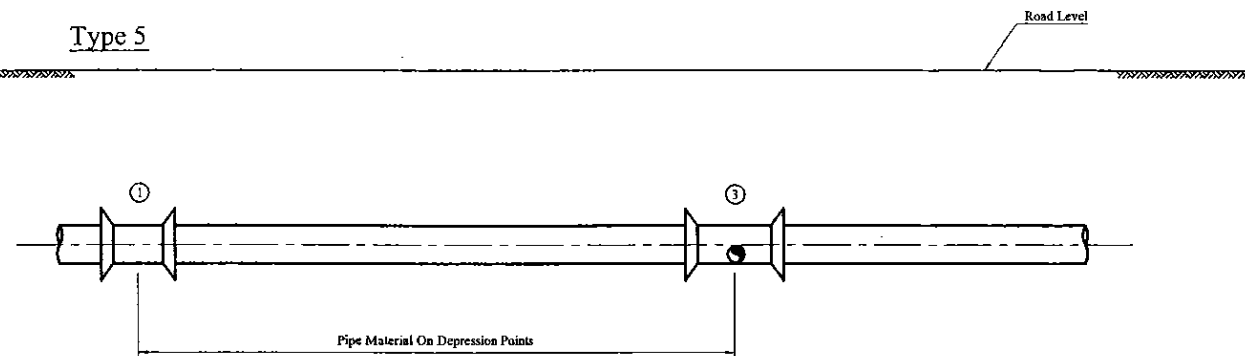
Type 4



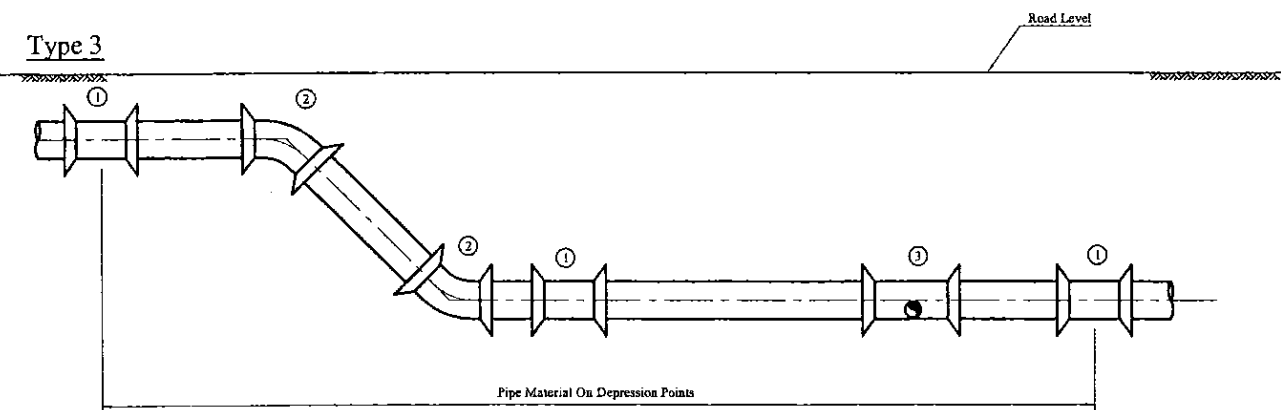
Type 2



Type 5



Type 3



LIST OF MATERIALS

| NO | PIPES | TYPE 1 | TYPE 2 | TYPE 3 | TYPE 4 | TYPE 5 |
|----|--|--------|--------|--------|--------|--------|
| 1 | COLLAR | 3 | 3 | 3 | 2 | 1 |
| 2 | DOUBLE SOCKET 45° BEND | 4 | 0 | 2 | 2 | 0 |
| 3 | DOUBLE SOCKET INVERT TEE WITH FLANGED BRANCH | 1 | 1 | 1 | 0 | 1 |
| 4 | DOUBLE SOCKET 90° BEND | 0 | 4 | 0 | 0 | 0 |

PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT



JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: TYPICAL DRAWING OF PIPE LAYING FOR VERTICAL DEPRESSION POINT

CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD

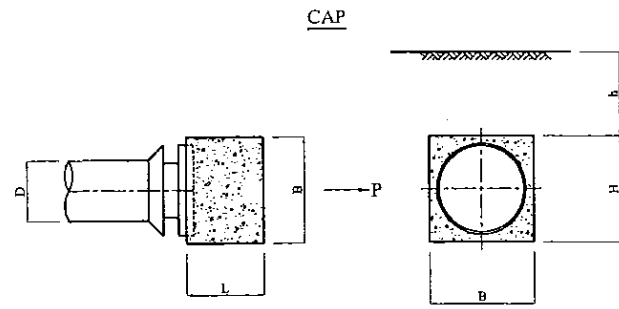


CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN
NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN

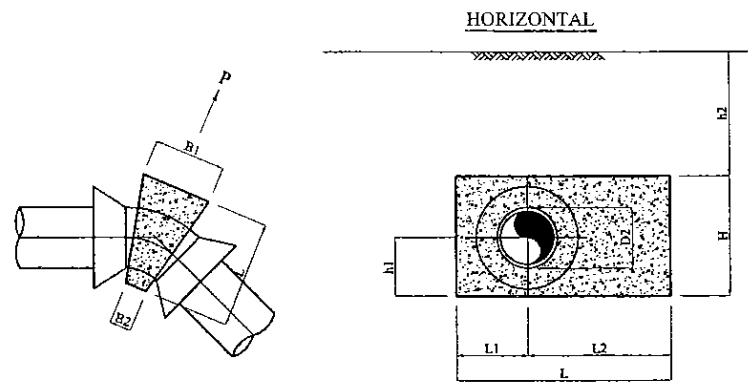


| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: |
|------|-------------|------|-------|--------------------|------------|------------------|------------|--------------|
| | | | | Taketoshi FUJIYAMA | Udita | Ikuo MIWA | | NOT TO SCALE |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-27 |

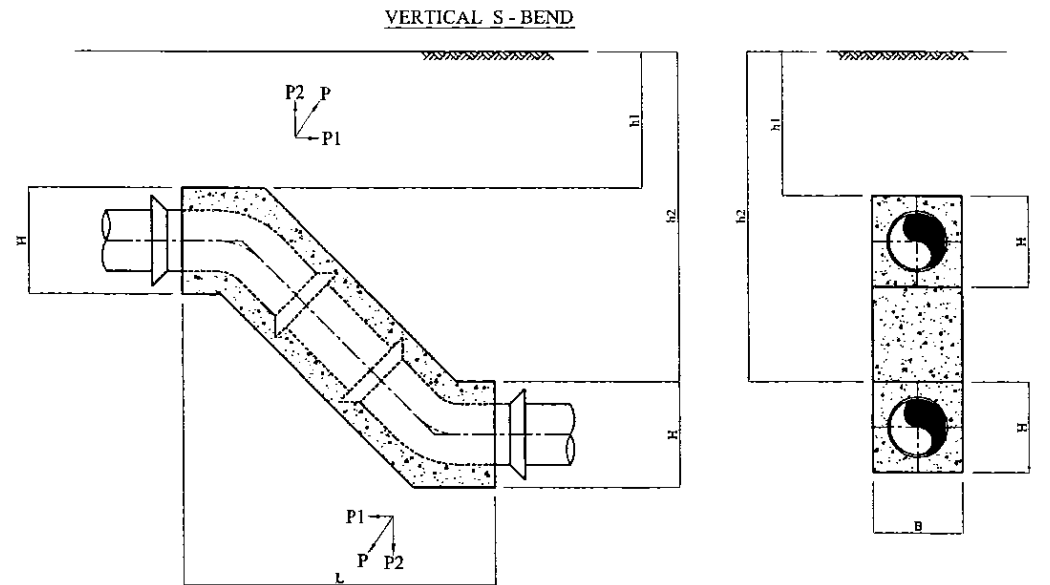
DATE: 24/04/2002



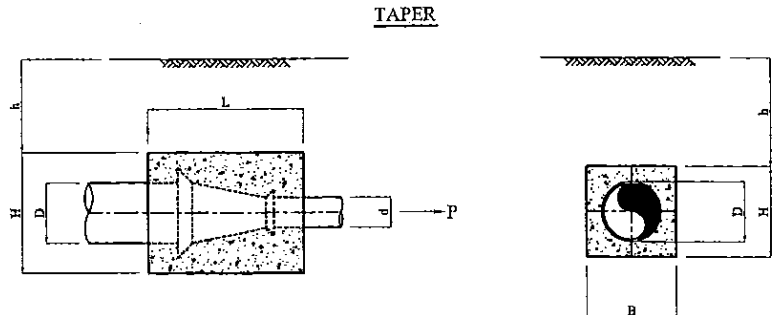
| Water pressure (bar) | Pipe nominal outside D (mm) | Dimension | | | | Form Work (m ²) | Volume of Concrete (m ³) |
|----------------------|-----------------------------|-----------|-------|-------|-------|-----------------------------|--------------------------------------|
| | | B (m) | H (m) | L (m) | h (m) | | |
| 16 | 150 | 0.90 | 0.90 | 0.50 | 0.625 | 3.42 | 0.41 |
| 16 | 200 | 1.10 | 1.10 | 1.10 | 0.550 | 7.26 | 1.34 |
| 16 | 250 | 1.40 | 1.30 | 1.10 | 0.475 | 9.58 | 2.01 |
| 16 | 300 | 1.60 | 1.50 | 1.50 | 0.400 | 14.10 | 3.60 |
| 16 | 500 | 2.80 | 1.80 | 2.80 | 0.350 | 35.84 | 14.12 |
| 16 | 600 | 3.50 | 1.80 | 3.60 | 0.400 | 50.76 | 22.68 |



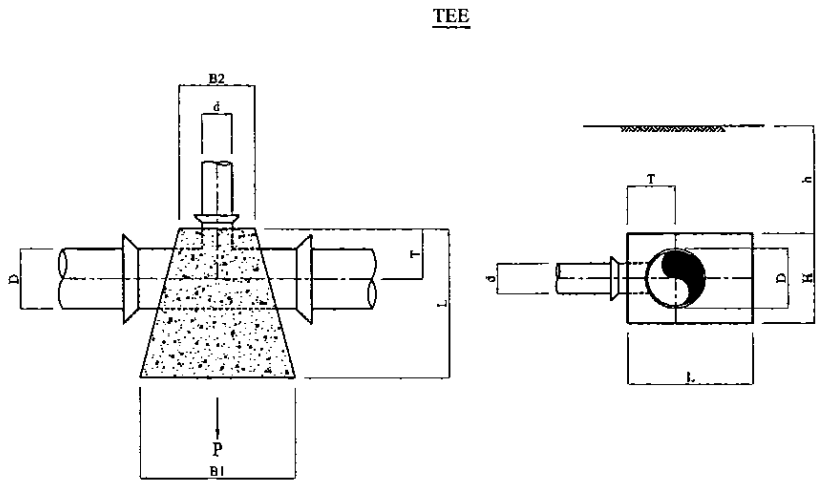
| Water Pressure (bar) | Pipe nominal bend (mm) | Degree of bend (Deg.) | Dimension | | | | | | | | Form Work (m ²) | Volume of Concrete (m ³) |
|----------------------|------------------------|-----------------------|-----------|--------|-------|-------|--------|--------|--------|--------|-----------------------------|--------------------------------------|
| | | | B1 (m) | B2 (m) | H (m) | L (m) | L1 (m) | L2 (m) | h1 (m) | h2 (m) | | |
| 16 | 150 | 11.25 | 0.10 | 0.10 | 0.40 | 0.40 | 0.20 | 0.20 | 0.20 | 0.89 | 0.56 | 0.02 |
| 16 | 200 | 11.25 | 0.20 | 0.10 | 0.50 | 0.50 | 0.20 | 0.30 | 0.25 | 0.86 | 0.81 | 0.04 |
| 16 | 200 | 22.50 | 0.30 | 0.20 | 0.60 | 0.75 | 0.30 | 0.45 | 0.30 | 0.81 | 1.43 | 0.11 |
| 16 | 200 | 45.00 | 0.50 | 0.20 | 1.00 | 1.00 | 0.50 | 0.50 | 0.50 | 0.61 | 2.42 | 0.34 |
| 16 | 225 | 11.25 | 0.20 | 0.10 | 0.50 | 0.50 | 0.20 | 0.30 | 0.25 | 0.86 | 0.81 | 0.04 |
| 16 | 225 | 22.50 | 0.30 | 0.20 | 0.60 | 0.75 | 0.30 | 0.45 | 0.30 | 0.81 | 1.43 | 0.11 |
| 16 | 225 | 45.00 | 0.50 | 0.20 | 1.00 | 1.00 | 0.50 | 0.50 | 0.50 | 0.61 | 2.42 | 0.34 |
| 16 | 250 | 11.25 | 0.30 | 0.20 | 0.60 | 0.60 | 0.30 | 0.30 | 0.30 | 0.84 | 1.21 | 0.08 |
| 16 | 250 | 22.50 | 0.60 | 0.30 | 0.80 | 1.00 | 0.40 | 0.60 | 0.40 | 0.74 | 2.64 | 0.34 |
| 16 | 250 | 45.00 | 0.70 | 0.30 | 1.20 | 1.30 | 0.60 | 0.70 | 0.60 | 0.54 | 3.82 | 0.76 |
| 16 | 300 | 11.25 | 0.50 | 0.20 | 0.60 | 0.80 | 0.30 | 0.50 | 0.30 | 0.86 | 1.80 | 0.15 |
| 16 | 300 | 22.50 | 0.60 | 0.30 | 1.00 | 1.10 | 0.50 | 0.60 | 0.50 | 0.66 | 3.01 | 0.46 |
| 16 | 300 | 45.00 | 0.80 | 0.30 | 1.40 | 1.50 | 0.70 | 0.80 | 0.70 | 0.46 | 4.72 | 1.12 |
| 16 | 350 | 11.25 | 0.60 | 0.20 | 0.70 | 0.95 | 0.35 | 0.60 | 0.35 | 0.84 | 2.30 | 0.23 |
| 16 | 350 | 22.50 | 0.70 | 0.30 | 1.00 | 1.30 | 0.50 | 0.80 | 0.50 | 0.69 | 3.62 | 0.60 |
| 16 | 350 | 45.00 | 0.90 | 0.30 | 1.50 | 1.65 | 0.75 | 0.90 | 0.75 | 0.44 | 5.46 | 1.43 |
| 16 | 400 | 11.25 | 0.60 | 0.30 | 0.80 | 1.00 | 0.40 | 0.60 | 0.40 | 0.82 | 2.64 | 0.30 |
| 16 | 400 | 22.50 | 0.70 | 0.30 | 1.20 | 1.40 | 0.60 | 0.80 | 0.60 | 0.62 | 4.02 | 0.78 |
| 16 | 400 | 45.00 | 1.00 | 0.40 | 1.60 | 2.00 | 0.80 | 1.20 | 0.80 | 0.42 | 7.07 | 2.15 |
| 16 | 500 | 11.25 | 0.70 | 0.30 | 1.00 | 1.20 | 0.50 | 0.70 | 0.50 | 0.77 | 3.42 | 0.50 |
| 16 | 500 | 22.50 | 0.90 | 0.30 | 1.40 | 1.70 | 0.70 | 1.00 | 0.70 | 0.57 | 5.45 | 1.31 |
| 16 | 500 | 45.00 | 1.50 | 0.60 | 1.60 | 2.80 | 0.80 | 2.00 | 0.80 | 0.47 | 12.08 | 4.52 |
| 16 | 600 | 11.25 | 0.80 | 0.40 | 1.20 | 1.40 | 0.60 | 0.80 | 0.60 | 0.72 | 4.54 | 0.83 |
| 16 | 600 | 22.50 | 1.00 | 0.40 | 1.60 | 2.10 | 0.80 | 1.30 | 0.80 | 0.52 | 7.31 | 2.16 |
| 16 | 600 | 45.00 | 2.00 | 1.00 | 1.80 | 3.20 | 1.00 | 2.20 | 0.90 | 0.42 | 18.24 | 8.23 |
| 16 | 700 | 11.25 | 0.80 | 0.40 | 1.40 | 1.60 | 0.70 | 0.90 | 0.70 | 0.67 | 5.22 | 1.10 |
| 16 | 700 | 22.50 | 1.20 | 0.50 | 1.80 | 2.40 | 0.90 | 1.50 | 0.90 | 0.47 | 9.57 | 3.35 |
| 16 | 700 | 45.00 | 2.70 | 1.00 | 2.00 | 3.70 | 1.00 | 2.70 | 1.00 | 0.37 | 24.89 | 13.07 |



| Water pressure (bar) | Pipe nominal outside dia. (mm) | Degree of bend (Deg.) | Dimension | | | | | Form work (m ²) | Volume of Concrete (m ³) |
|----------------------|--------------------------------|-----------------------|-----------|-------|-------|--------|--------|-----------------------------|--------------------------------------|
| | | | B (m) | H (m) | L (m) | h1 (m) | h2 (m) | | |
| 16 | 150 | 45 | 0.80 | 0.60 | 2.80 | 0.78 | 1.78 | 8.44 | 1.47 |
| 16 | 200 | 45 | 1.00 | 0.50 | 3.20 | 0.85 | 1.85 | 7.73 | 1.67 |
| 16 | 250 | 45 | 1.00 | 0.70 | 4.00 | 0.78 | 1.78 | 13.34 | 2.83 |
| 16 | 300 | 45 | 1.00 | 0.90 | 5.00 | 0.70 | 1.70 | 21.12 | 4.43 |
| 16 | 350 | 45 | 1.30 | 0.90 | 5.00 | 0.73 | 1.73 | 21.12 | 5.73 |
| 16 | 400 | 45 | 1.50 | 0.70 | 5.00 | 0.85 | 1.85 | 16.14 | 4.91 |
| 16 | 500 | 45 | 1.80 | 0.80 | 5.60 | 0.85 | 1.85 | 20.53 | 7.33 |
| 16 | 600 | 45 | 2.20 | 0.90 | 6.00 | 0.85 | 1.85 | 24.72 | 10.67 |



| Water pressure (bar) | Pipe nominal outside diameter | | Dimension | | | | Form Work (m ²) | Volume of Concrete (m ³) |
|----------------------|-------------------------------|---------------------|-----------|-------|-------|-------|-----------------------------|--------------------------------------|
| | Larger Pipe D (mm) | Smaller Pipe d (mm) | B (m) | H (m) | L (m) | h (m) | | |
| 16 | 200 | 150 | 0.80 | 0.70 | 0.75 | 0.75 | 0.36 | 0.34 |
| 16 | 250 | 200 | 0.90 | 0.80 | 0.75 | 0.73 | 0.36 | 0.42 |
| 16 | 300 | 250 | 1.00 | 0.90 | 0.75 | 0.70 | 0.36 | 0.51 |
| 16 | 350 | 250 | 1.40 | 1.20 | 1.26 | 0.58 | 1.02 | 1.86 |
| 16 | 600 | 350 | 2.40 | 2.00 | 2.76 | 0.30 | 4.89 | 12.09 |



| Water pressure (bar) | Pipe nominal outside diameter | | Dimension | | | | | | Form Work (m ²) | Volume of Concrete (m ³) |
|----------------------|-------------------------------|--------------------|-----------|--------|-------|-------|-------|-------|-----------------------------|--------------------------------------|
| | Main Pipe D (mm) | Branch Pipe d (mm) | B1 (m) | B2 (m) | H (m) | L (m) | T (m) | h (m) | | |
| 16 | 200 | 200 | 1.50 | 1.00 | 0.60 | 1.70 | 0.60 | 0.80 | 7.47 | 1.22 |
| 16 | 250 | 200 | 1.50 | 1.00 | 0.80 | 1.50 | 0.60 | 0.70 | 7.28 | 1.42 |
| 16 | 300 | 300 | 1.70 | 1.00 | 1.40 | 1.80 | 0.70 | 0.45 | 10.48 | 3.26 |
| 16 | 350 | 300 | 1.70 | 1.00 | 1.40 | 1.80 | 0.70 | 0.45 | 10.48 | 3.22 |
| 16 | 400 | 300 | 1.70 | 1.00 | 1.40 | 1.80 | 0.70 | 0.45 | 10.48 | 3.18 |
| 16 | 500 | 500 | 3.00 | 1.00 | 1.80 | 3.10 | 0.80 | 0.35 | 22.86 | 10.71 |
| 16 | 500 | 400 | 2.20 | 0.90 | 1.80 | 2.30 | 0.80 | 0.30 | 15.11 | 6.04 |
| 16 | 600 | 600 | 3.30 | 2.00 | 2.20 | 3.40 | 0.80 | 0.20 | 33.15 | 18.94 |
| 16 | 600 | 200 | 1.20 | 0.80 | 1.00 | 1.30 | 0.50 | 0.60 | 5.92 | 1.00 |
| 16 | 700 | 600 | 3.30 | 2.00 | 2.20 | 3.40 | 0.80 | 0.20 | 33.15 | 18.70 |

| Water pressure (bar) | Pipe nominal outside diameter | | Dimension | | | | | | Form Work (m ²) | Volume of Concrete (m ³) |
|----------------------|-------------------------------|--------------------|-----------|--------|-------|-------|-------|-------|-----------------------------|--------------------------------------|
| | Main Pipe D (mm) | Branch Pipe d (mm) | B1 (m) | B2 (m) | H (m) | L (m) | T (m) | h (m) | | |
| 16 | 150 | 80 | 0.40 | 0.30 | 0.40 | 0.40 | 0.20 | 0.20 | 0.97 | 0.05 |
| 16 | 200 | 80 | 0.40 | 0.30 | 0.40 | 0.40 | 0.20 | 0.20 | 0.97 | 0.05 |
| 16 | 250 | 80 | 0.40 | 0.30 | 0.40 | 0.40 | 0.25 | 0.20 | 0.97 | 0.04 |
| 16 | 300 | 80 | 0.40 | 0.30 | 0.40 | 0.40 | 0.25 | 0.20 | 0.97 | 0.03 |
| 16 | 350 | 100 | 0.50 | 0.30 | 0.60 | 0.70 | 0.30 | 0.30 | 1.75 | 0.13 |
| 16 | 400 | 100 | 0.50 | 0.30 | 0.60 | 0.70 | 0.30 | 0.30 | 1.75 | 0.12 |
| 16 | 500 | 100 | 0.50 | 0.30 | 0.70 | 0.60 | 0.35 | 0.35 | 1.65 | 0.08 |
| 16 | 600 | 100 | 0.50 | 0.30 | 0.80 | 0.60 | 0.40 | 0.40 | 1.73 | 0.06 |

PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT

CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD

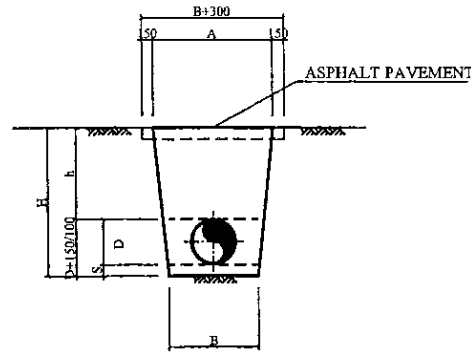
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN; NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

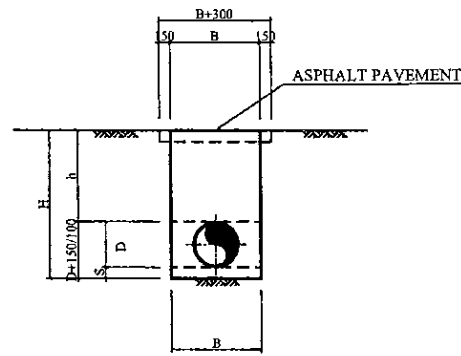
TITLE: THRUST BLOCK DETAILS - WATTEGAMA

| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: |
|------|---------------------------------|------------|-------|--------------------|------------|------------------|------------|--------------|
| 1 | Table of Tee for Wash Out Added | 12-02-2002 | XX | Taketoshi FUJIYAMA | Ravi U. | Ikuo MIWA | | NOT TO SCALE |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-C-08-28 |

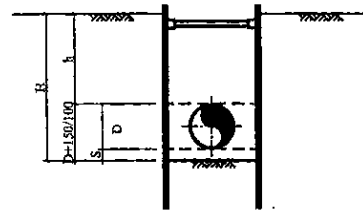
DATE: 24/04/2002 W:\nani\CAD\17\ FINAL DRAWINGS\TRANSMISSION



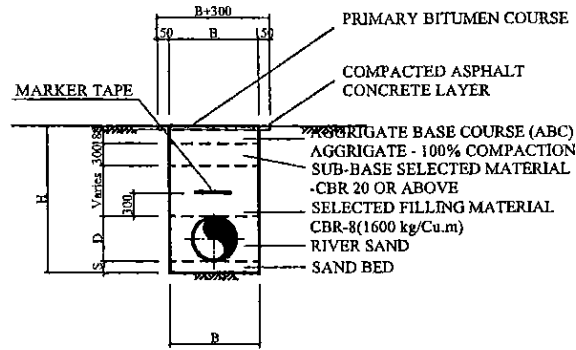
MANUAL EXCAVATION



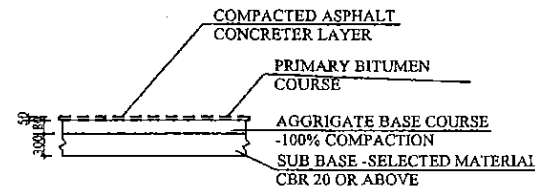
MACHINE EXCAVATION



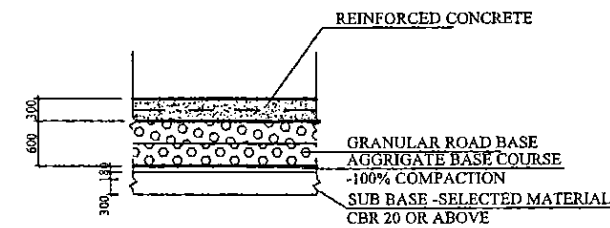
EXCAVATION WITH SHEET PILE



BACKFILL



TARRED PAVEMENT



CONCRETE PAVEMENT

NOTE :-
1. RIVER SAND MAY BE USED AS A GRANULAR FILLING DURING BACK FILLING.

Manual Excavation

| Pipe Material | Pipe Diameter: D (mm) | Trench Width: A (m) | Trench Width: B (m) | Sand Bed Thickness: S (m) | Depth of Cover: h (m) | Excavation Depth: H (m) | |
|---------------|-----------------------|---------------------|---------------------|---------------------------|-----------------------|-------------------------|------|
| uPVC | 63 or Less | 0.60 | 0.50 | 0.10 | 1.00 | 1.17 | |
| | 75 | | | | | 1.18 | |
| | 90 | | | | | 1.19 | |
| | 110 | | | | | 1.21 | |
| | 140 | | | | | 1.24 | |
| | 160 | | | | | 1.26 | |
| DIP | 225 | 0.80 | 0.60 | 0.10 | 1.00 | 1.33 | |
| | 200 | | | | | 1.30 | |
| | 250 | | | | | 1.35 | |
| | DIP | 300 | 0.85 | 0.65 | 0.15 | 1.00 | 1.40 |
| | | 350 | | | | | 1.50 |
| | | 400 | | | | | 1.55 |
| | | 450 | 0.90 | 0.75 | 1.60 | | |
| | | 500 | 1.00 | 0.80 | 1.65 | | |
| | | 600 | 1.10 | 0.85 | 1.75 | | |
| | | 700 | 1.30 | 1.00 | 1.85 | | |
| | | 800 | 1.50 | 1.10 | 1.95 | | |

Machine Excavation

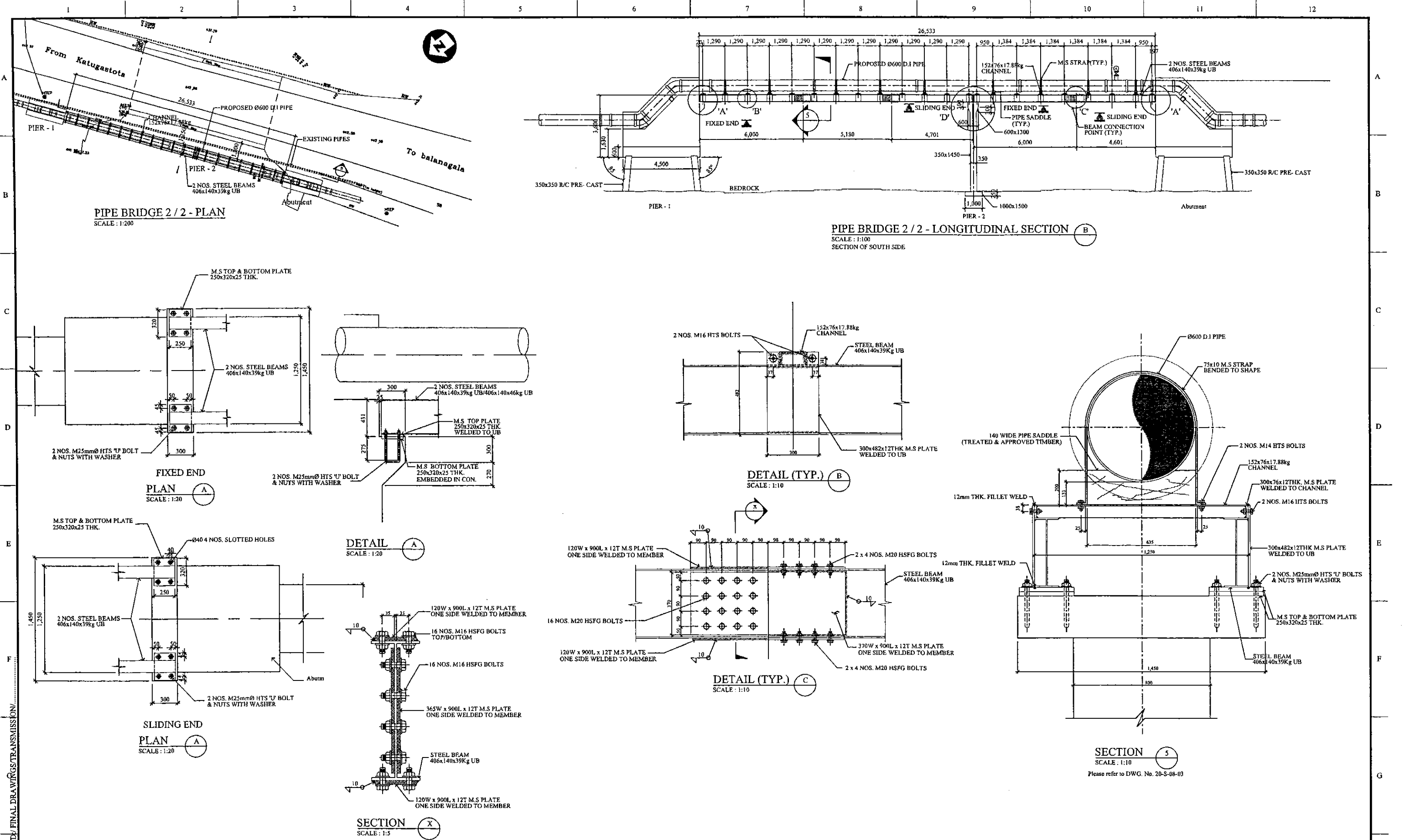
| Pipe Material | Pipe Diameter: D (mm) | Trench Width: B (m) | Sand Bed Thickness: S (m) | Depth of Cover: h (m) | Excavation Depth: H (m) | |
|---------------|-----------------------|---------------------|---------------------------|-----------------------|-------------------------|------|
| uPVC | 63 or Less | 0.70 | 0.10 | 1.00 | 1.17 | |
| | 75 | | | | 1.18 | |
| | 90 | | | | 1.19 | |
| | 110 | | | | 1.21 | |
| | 140 | | | | 1.24 | |
| | 160 | | | | 1.26 | |
| DIP | 225 | 0.80 | 0.10 | 1.00 | 1.33 | |
| | 200 | | | | 1.30 | |
| | 250 | | | | 1.35 | |
| | DIP | 300 | 0.90 | 0.15 | 1.00 | 1.40 |
| | | 350 | | | | 1.50 |
| | | 400 | | | | 1.55 |
| | | 450 | 1.00 | 1.60 | | |
| | | 500 | 1.10 | 1.75 | | |
| | | 600 | 1.30 | 1.85 | | |
| | | 700 | 1.50 | 1.95 | | |

Excavation with Sheet Pile

| Pipe Material | Pipe Diameter: D (mm) | Trench Width: B (m) | Sand Bed Thickness: S (m) | Depth of Cover: h (m) | Excavation Depth: H (m) | |
|---------------|-----------------------|---------------------|---------------------------|-----------------------|-------------------------|------|
| uPVC | 63 or Less | 0.90 | 0.10 | 1.00 | 1.17 | |
| | 75 | | | | 1.18 | |
| | 90 | | | | 1.19 | |
| | 110 | | | | 1.21 | |
| | 140 | | | | 1.24 | |
| | 160 | | | | 1.26 | |
| DIP | 225 | 1.00 | 0.10 | 1.00 | 1.33 | |
| | 200 | | | | 1.30 | |
| | 250 | | | | 1.35 | |
| | DIP | 300 | 1.05 | 0.15 | 1.00 | 1.40 |
| | | 350 | | | | 1.50 |
| | | 400 | | | | 1.55 |
| | | 450 | 1.10 | 1.60 | | |
| | | 500 | 1.15 | 1.65 | | |
| | | 600 | 1.20 | 1.75 | | |
| | | 700 | 1.25 | 1.85 | | |
| | | 800 | 1.45 | 1.95 | | |

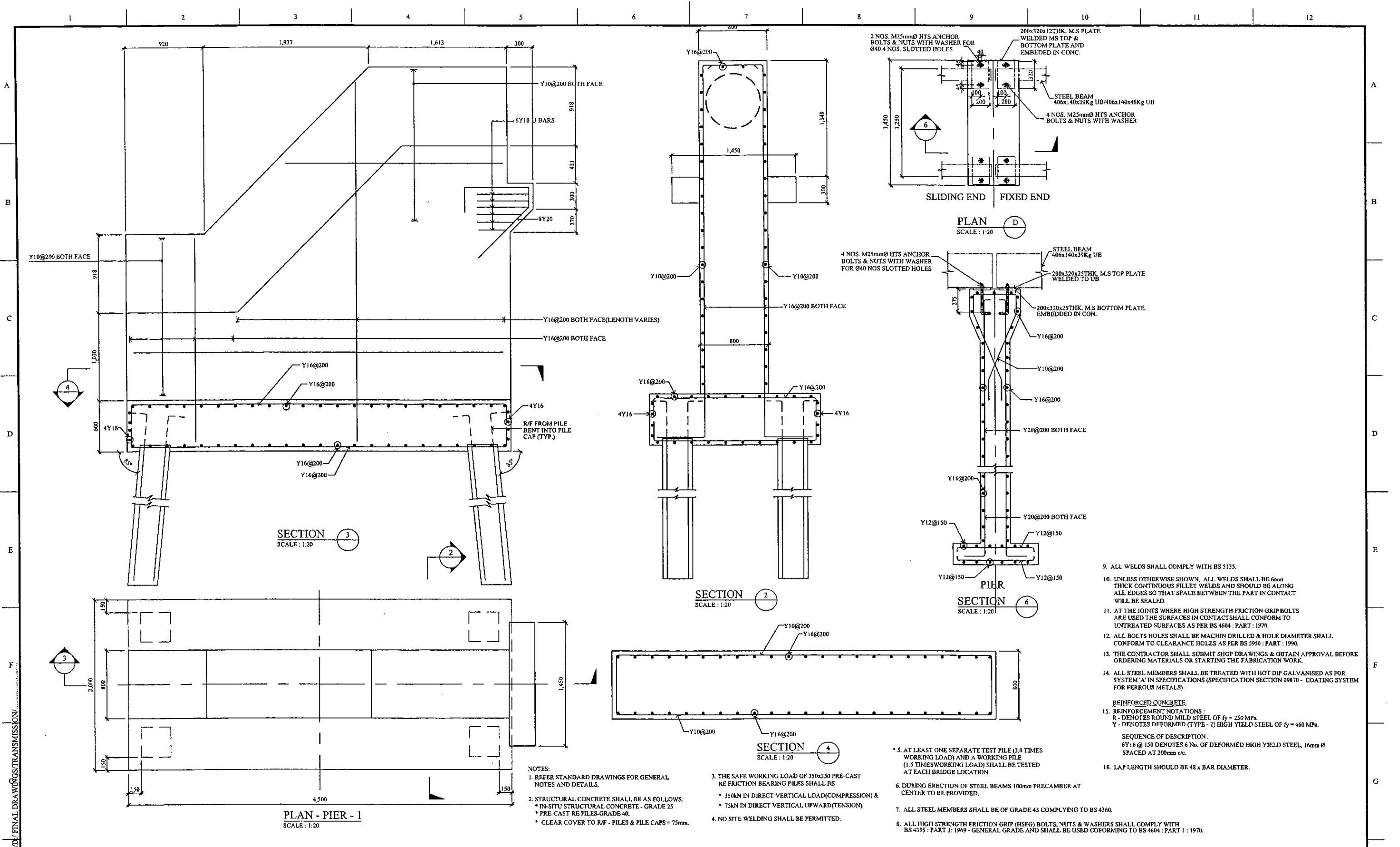
DATE: 24/04/2002 FINAL DRAWINGS TRANSMISSION

| | | | | | |
|--|--|---|------------------|--|---------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: GENERAL EARTH WORKS FOR PIPE LAYING | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | DESIGNED: Taketoshi FUJIYAMA | DRAWN: Kalinga |
| | | REV. XX | DESCRIPTION XXXX | DATE XX | SIGN. XX |
| | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) |
| | | | | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) |
| | | | | DATE: 31/05/2002 | SCALE: NOT TO SCALE |
| | | | | DRAWING NO.: 20-C-08-29 | |



| | | | | | | | | | | | | |
|--|--|---|--|--|-------------|------|-------|--------------------------|------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION - TRANSMISSION MAIN OVER BRIDGE 2 / 2 | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: L. JAYAWARDENA | DRAWN: SAM | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: 1:100 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-S-08-01 |

DATE: 24/04/2007 11:50 AM CAD 1/DV FINAL DRAWINGS TRANSMISSION



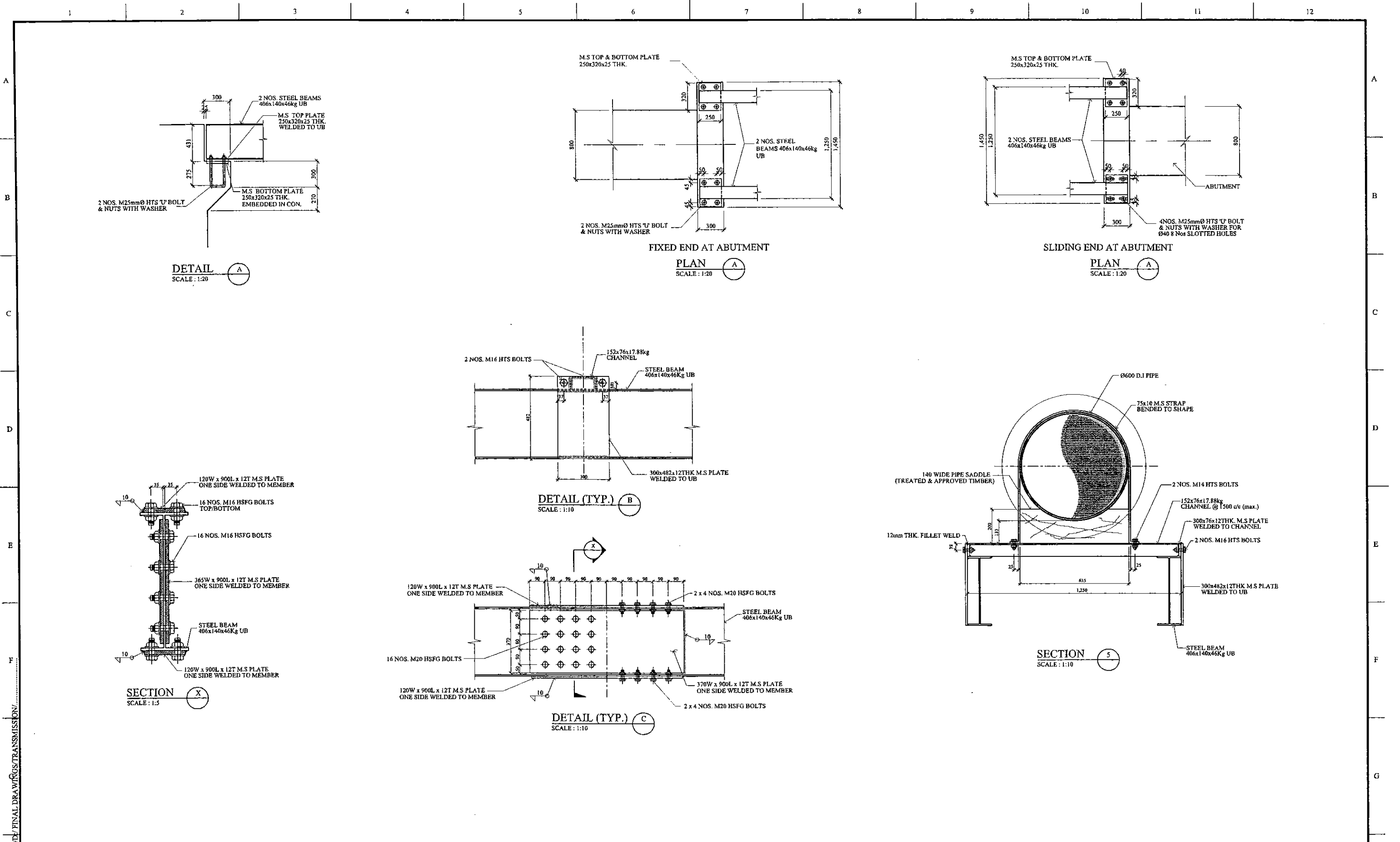
- NOTES:**
- REFER STANDARD DRAWINGS FOR GENERAL NOTES AND DETAILS.
 - STRUCTURAL CONCRETE SHALL BE AS FOLLOWS.
 - IN-SITU STRUCTURAL CONCRETE - GRADE 25
 - PRE-CAST RE PILES-GRADE 40.
 - CLEAR COVER TO R/F - PILES & PILE CAPS = 75mm.
 - THE SAFE WORKING LOAD OF 350kN 30 PRE-CAST RE FRICTION BEARING PILES SHALL BE
 - 350kN IN DIRECT VERTICAL LOAD (COMPRESSION) &
 - 75kN IN DIRECT VERTICAL UPWARD (TENSION).
 - NO SITE WELDING SHALL BE PERMITTED.

- AT LEAST ONE SEPARATE TEST PILE (3.0 TIMES WORKING LOAD) AND A WORKING PILE (1.5 TIMES WORKING LOAD) SHALL BE TESTED AT EACH BRIDGE LOCATION.
- DURING ERECTION OF STEEL BEAMS 100mm PRECAMBER AT CENTER TO BE PROVIDED.
- ALL STEEL MEMBERS SHALL BE OF GRADE 43 COMPLYING TO BS 4360.
- ALL HIGH STRENGTH FRICTION GRIP (HSFG) BOLTS, NUTS & WASHERS SHALL COMPLY WITH BS 4395 : PART 1: 1969 - GENERAL GRADE AND SHALL BE USED COFORMING TO BS 4604 : PART 1 : 1970.

- ALL WELDS SHALL COMPLY WITH BS 5135.
 - UNLESS OTHERWISE SHOWN, ALL WELDS SHALL BE 6mm THICK CONTINUOUS FILLET WELDS AND SHOULD BE ALONG ALL EDGES SO THAT SPACE BETWEEN THE PART IN CONTACT WILL BE SEALED.
 - AT THE JOINTS WHERE HIGH STRENGTH FRICTION GRIP BOLTS ARE USED THE SURFACES IN CONTACT SHALL CONFORM TO UNTREATED SURFACES AS PER BS 4604 : PART : 1970.
 - ALL BOLTS HOLES SHALL BE MACHIN DRILLED & HOLE DIAMETER SHALL CONFORM TO CLEARANCE HOLES AS PER BS 2950 : PART : 1990.
 - THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS & OBTAIN APPROVAL BEFORE ORDERING MATERIALS OR STARTING THE FABRICATION WORK.
 - ALL STEEL MEMBERS SHALL BE TREATED WITH HOT DIP GALVANISED AS FOR SYSTEM 'A' IN SPECIFICATIONS (SPECIFICATION SECTION 09870 - COATING SYSTEM FOR FERROUS METALS)
- REINFORCED CONCRETE**
- REINFORCEMENT NOTATIONS:
 - R - DENOTES ROUND MILD STEEL OF $f_y = 250$ MPa.
 - Y - DENOTES DEFORMED (TYPE - 2) HIGH YIELD STEEL OF $f_y = 460$ MPa.
- SEQUENCE OF DESCRIPTION:
6Y16 @ 150 DENOTES 6 No. OF DEFORMED HIGH YIELD STEEL, 16mm Ø SPACED AT 200mm c/c.
 - LAP LENGTH SHOULD BE 48 x BAR DIAMETER.

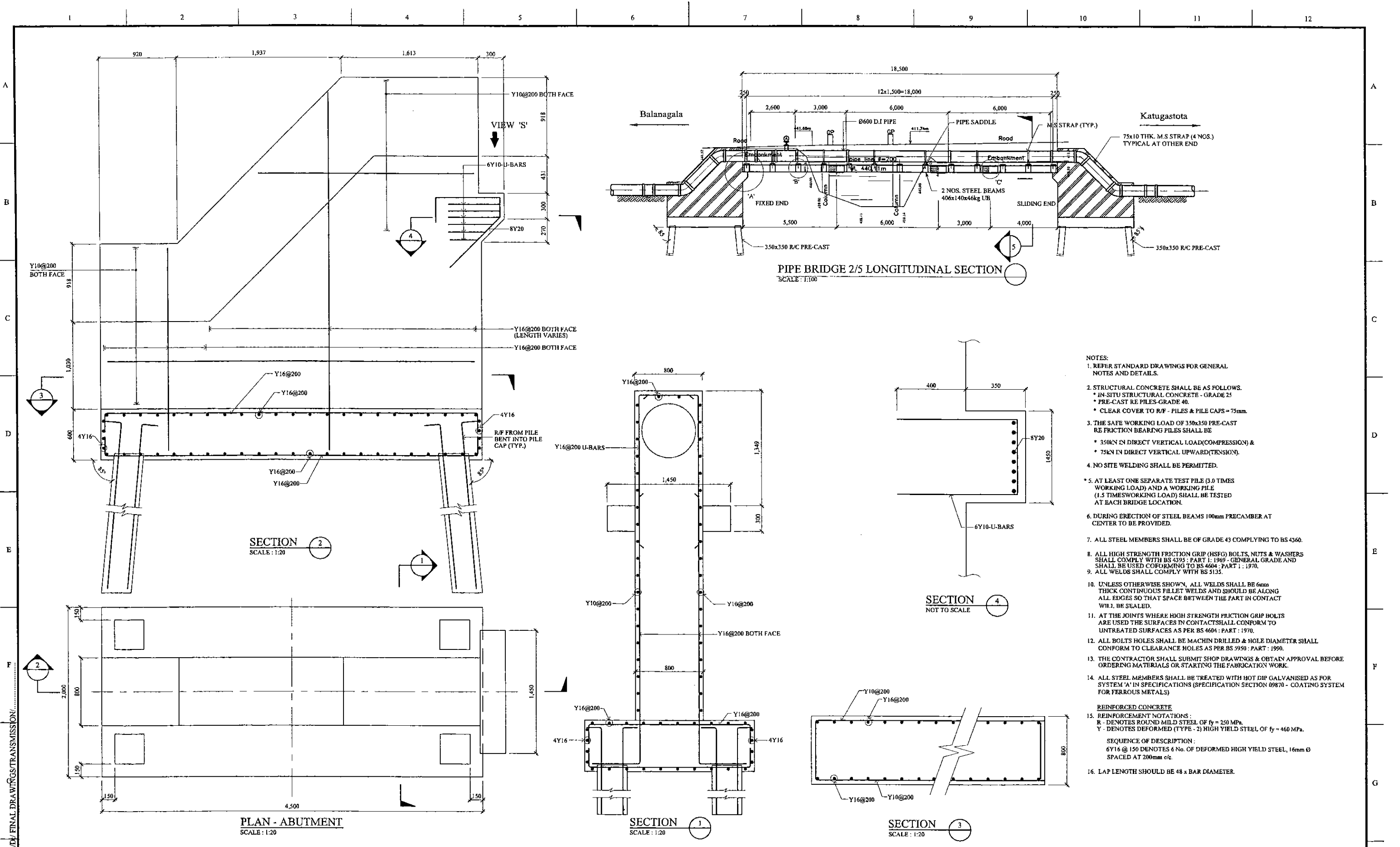
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|--|--|---|--|--|-------------|------|-------|--------------------------|------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION - TRANSMISSION MAIN OVER BRIDGE 2 / 2 | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: L. JAYAWARDENA | DRAWN: SAM | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: 1:100 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-S-08-02 |

DATE: 24/04/2002 Wanni / CAD / I/DK / FINAL DRAWINGS / TRANSMISSION



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|--|--|---|--|--|-------------|------|-------|--------------------------|----------------|-----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION OVER BRIDGE 2/5 | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: L. JAYAWARDENA | DRAWN: Ravi U. | PM: (CONSULTANT) Ikuro MIWA | CE: (P&D) | SCALE: 1:100 |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-S-08-03 |

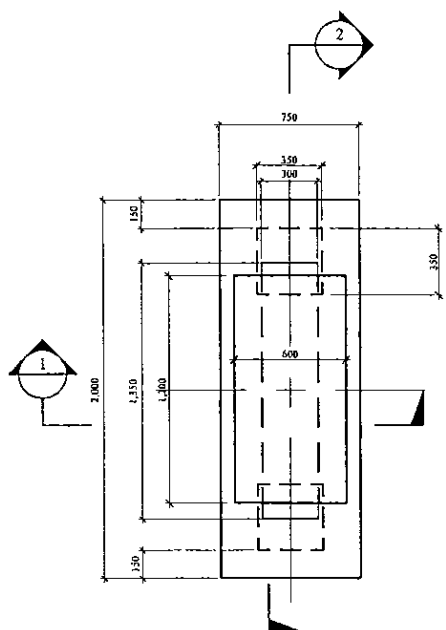
DATE: 24/04/2002 Wanni (CAD) / FINAL DRAWINGS / TRANSMISSION



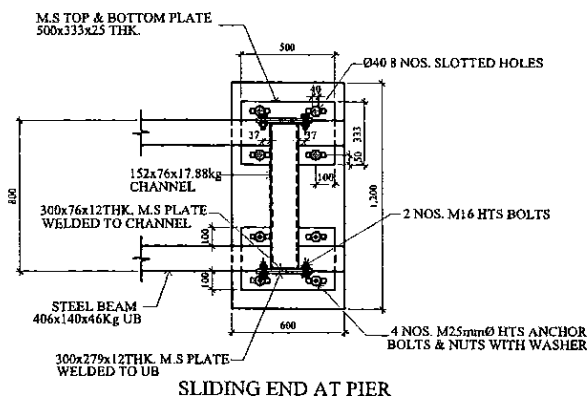
- NOTES:**
- REFER STANDARD DRAWINGS FOR GENERAL NOTES AND DETAILS.
 - STRUCTURAL CONCRETE SHALL BE AS FOLLOWS.
 - IN SITU STRUCTURAL CONCRETE - GRADE 25
 - PRE-CAST RE PILES - GRADE 40.
 - CLEAR COVER TO R/F - PILES & PILE CAPS = 75mm.
 - THE SAFE WORKING LOAD OF 350x350 PRE-CAST RE FRICTION BEARING PILES SHALL BE
 - 350KN IN DIRECT VERTICAL LOAD (COMPRESSION) &
 - 75KN IN DIRECT VERTICAL UPWARD (TENSION).
 - NO SITE WELDING SHALL BE PERMITTED.
 - AT LEAST ONE SEPARATE TEST PILE (3.0 TIMES WORKING LOAD) AND A WORKING PILE (1.5 TIMES WORKING LOAD) SHALL BE TESTED AT EACH BRIDGE LOCATION.
 - DURING ERECTION OF STEEL BEAMS 100mm PRECAMBER AT CENTER TO BE PROVIDED.
 - ALL STEEL MEMBERS SHALL BE OF GRADE 43 COMPLYING TO BS 4360.
 - ALL HIGH STRENGTH FRICTION GRIP (HSFG) BOLTS, NUTS & WASHERS SHALL COMPLY WITH BS 4395 : PART 1: 1969 - GENERAL GRADE AND SHALL BE USED CONFORMING TO BS 4604 : PART 1 : 1970.
 - ALL WELDS SHALL COMPLY WITH BS 5135.
 - UNLESS OTHERWISE SHOWN, ALL WELDS SHALL BE 6mm THICK CONTINUOUS FILLET WELDS AND SHOULD BE ALONG ALL EDGES SO THAT SPACE BETWEEN THE PART IN CONTACT WILL BE SEALED.
 - AT THE JOINTS WHERE HIGH STRENGTH FRICTION GRIP BOLTS ARE USED THE SURFACES IN CONTACT SHALL CONFORM TO UNTREATED SURFACES AS PER BS 4604 : PART : 1970.
 - ALL BOLTS HOLES SHALL BE MACHIN DRILLED & HOLE DIAMETER SHALL CONFORM TO CLEARANCE HOLES AS PER BS 950 : PART : 1990.
 - THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS & OBTAIN APPROVAL BEFORE ORDERING MATERIALS OR STARTING THE FABRICATION WORK.
 - ALL STEEL MEMBERS SHALL BE TREATED WITH HOT DIP GALVANISED AS FOR SYSTEM 'A' IN SPECIFICATIONS (SPECIFICATION SECTION 09870 - COATING SYSTEM FOR FERROUS METALS)
- REINFORCED CONCRETE**
15. REINFORCEMENT NOTATIONS:
 R - DENOTES ROUND MILD STEEL OF $f_y = 250$ MPa.
 Y - DENOTES DEFORMED (TYPE - 2) HIGH YIELD STEEL OF $f_y = 460$ MPa.
- SEQUENCE OF DESCRIPTION:
 6Y16 @ 150 DENOTES 6 No. OF DEFORMED HIGH YIELD STEEL, 16mm ϕ SPACED AT 200mm c/c.
16. LAP LENGTH SHOULD BE 48 x BAR DIAMETER.

| | | | | | | | | | | | | |
|--|--|---|--|--|-------------|------|-------|--------------------------|----------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION OVER BRIDGE 2/5 | | | | | SHEET 1 OF 1 | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: L. JAYAWARDENA | DRAWN: Ravi U. | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: AS SHOWN |
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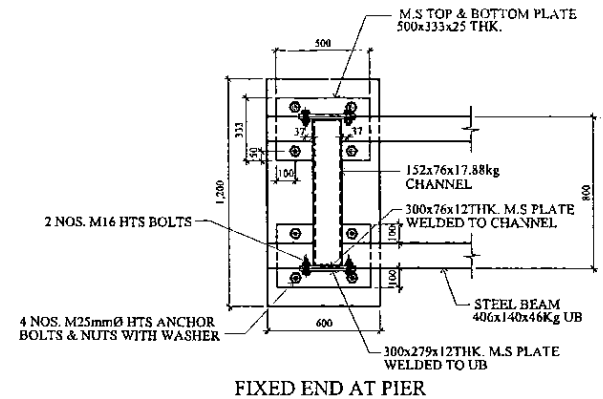
DATE: 24/04/2002 Wanni (CAD) / DV FINAL DRAWINGS/TRANSMISSION



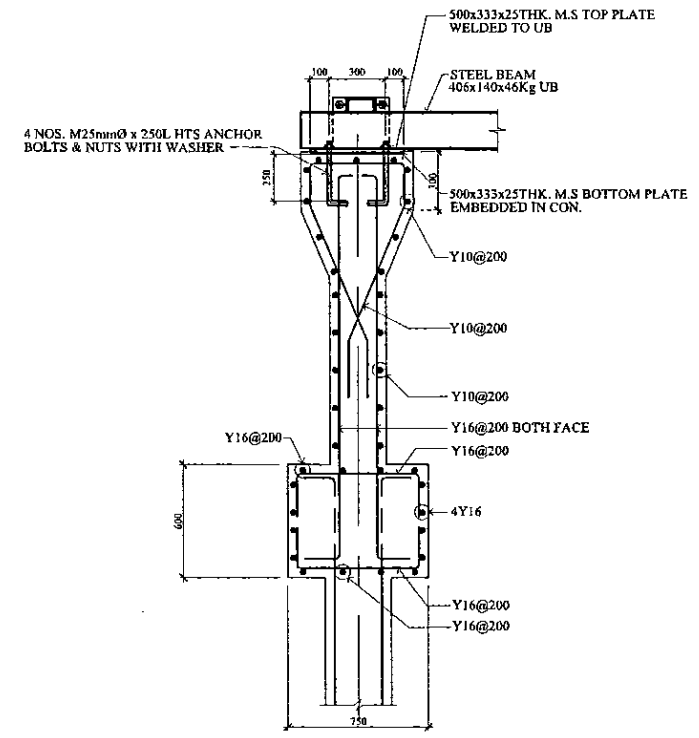
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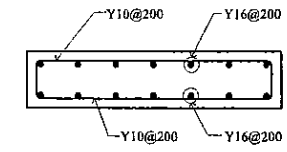
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PLAN
SCALE: 1:20



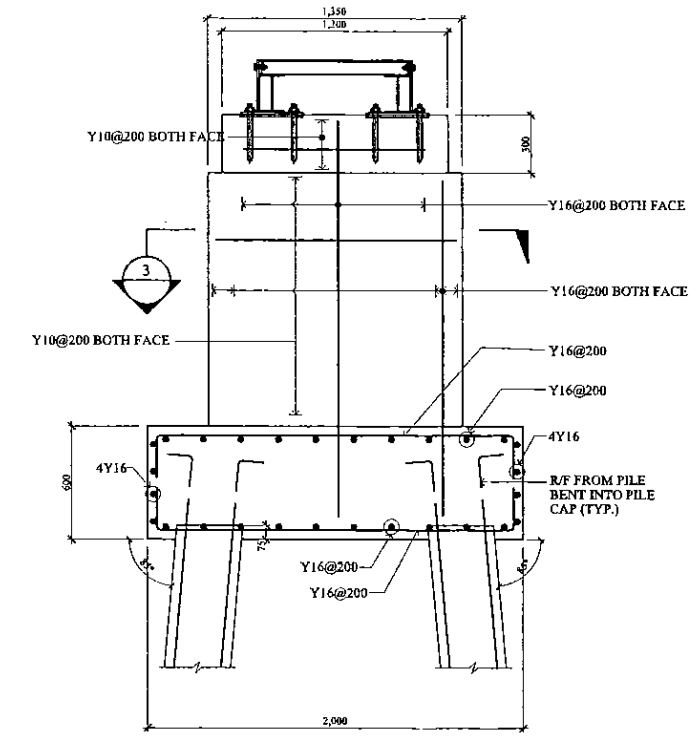
FIXED END AT PIER
PLAN
SCALE: 1:20



SECTION 1
SCALE: 1:20



SECTION 3
SCALE: 1:20



SECTION 2
SCALE: 1:20

NOTES:

- REFER STANDARD DRAWINGS FOR GENERAL NOTES AND DETAILS
- STRUCTURAL CONCRETE SHALL BE AS FOLLOWS:
* IN-SITU STRUCTURAL CONCRETE - GRADE 25
* PRE-CAST RE PILES- GRADE 40
* CLEAR COVER TO R/F - PILES & PILE CAPS = 75mm
- THE SAFE WORKING LOAD OF 350kx50 PRE-CAST RE FRICTION BEARING PILES SHALL BE:
* 350kN IN DIRECT VERTICAL LOAD (COMPRESSION) &
* 75kN IN DIRECT VERTICAL UPWARD (TENSION).
- NO SITE WELDING SHALL BE PERMITTED.
- AT LEAST ONE SEPARATE TEST PILE (3.0 TIMES WORKING LOAD) AND A WORKING PILE (1.5 TIMES WORKING LOAD) SHALL BE TESTED AT EACH BRIDGE LOCATION.
- DURING ERECTION OF STEEL BEAMS 100mm PRECAMBER AT CENTER TO BE PROVIDED.
- ALL STEEL MEMBERS SHALL BE OF GRADE 43 COMPLYING TO BS 4360.
- ALL HIGH STRENGTH FRICTION GRIP (HSFG) BOLTS, NUTS & WASHERS SHALL COMPLY WITH BS 4395 - PART 1: 1969 - GENERAL GRADE AND SHALL BE USED COFORMING TO BS 4604 - PART 1: 1970.
- ALL WELDS SHALL COMPLY WITH BS 5135.
- UNLESS OTHERWISE SHOWN, ALL WELDS SHALL BE 6mm THICK CONTINUOUS FILLET WELDS AND SHOULD BE ALONG ALL EDGES SO THAT SPACE BETWEEN THE PART IN CONTACT WILL BE SEALED.
- AT THE JOINTS WHERE HIGH STRENGTH FRICTION GRIP BOLTS ARE USED THE SURFACES IN CONTACT SHALL CONFORM TO UNTREATED SURFACES AS PER BS 4604 - PART: 1970.
- ALL BOLTS HOLES SHALL BE MACHIN DRILLED & HOLE DIAMETER SHALL CONFORM TO CLEARANCE HOLES AS PER BS 5950 - PART: 1990.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS & OBTAIN APPROVAL BEFORE ORDERING MATERIALS OR STARTING THE FABRICATION WORK.
- ALL STEEL MEMBERS SHALL BE TREATED WITH HOT DIP GALVANISED AS FOR SYSTEM 'A' IN SPECIFICATIONS (SPECIFICATION SECTION 09870 - COATING SYSTEM FOR FERROUS METALS)

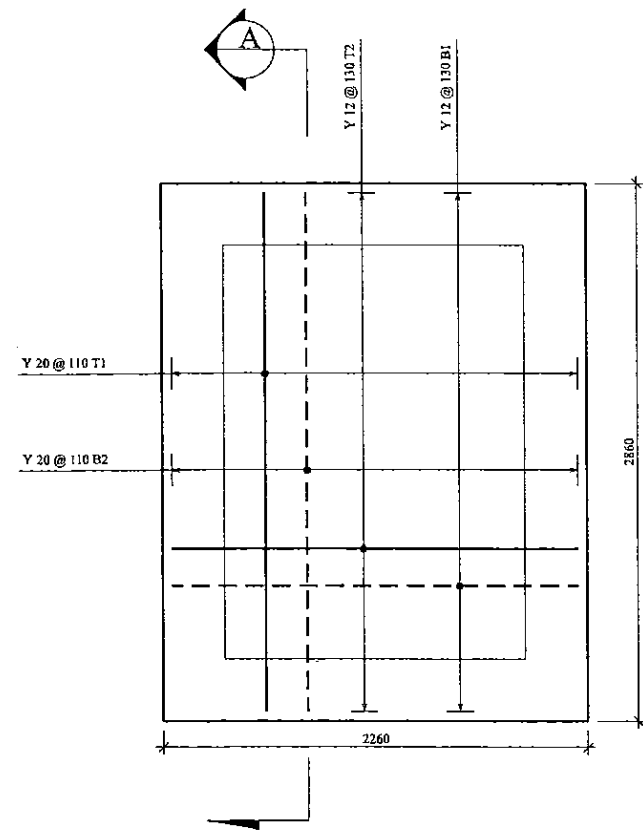
REINFORCED CONCRETE
15. REINFORCEMENT NOTATIONS:
R - DENOTES ROUND MILD STEEL OF $f_y = 250 \text{ MPa}$
Y - DENOTES DEFORMED (TYPE - 2) HIGH YIELD STEEL OF $f_y = 460 \text{ MPa}$.

SEQUENCE OF DESCRIPTION:
6Y16 @ 150 DENOTES 6 No. OF DEFORMED HIGH YIELD STEEL, 16mm Ø SPACED AT 200mm c/c.

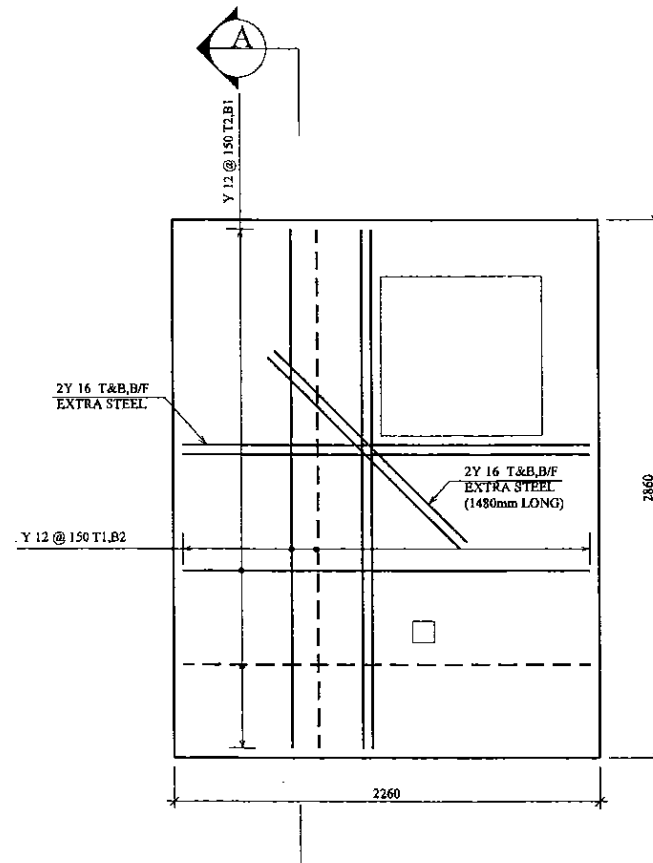
16. LAP LENGTH SHOULD BE 48 x BAR DIAMETER.

| | | | | | | | | | | | | |
|--|--|---|--|--|-------------|------|-------|--------------------------|------------|----------------------------|------------------|-------------------------|
| PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT | | JICA JAPAN INTERNATIONAL COOPERATION AGENCY | | TITLE: KATUGASTOTA JUNCTION TO BALANAGALA JUNCTION - TRANSMISSION MAIN OVER BRIDGE 4 / 5 | | | | | | | | |
| CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD | | CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN | | REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: L. JAYAWARDENA | DRAWN: SAM | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: AS SHOWN |
| | | | | | | | | CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-S-08-06 |

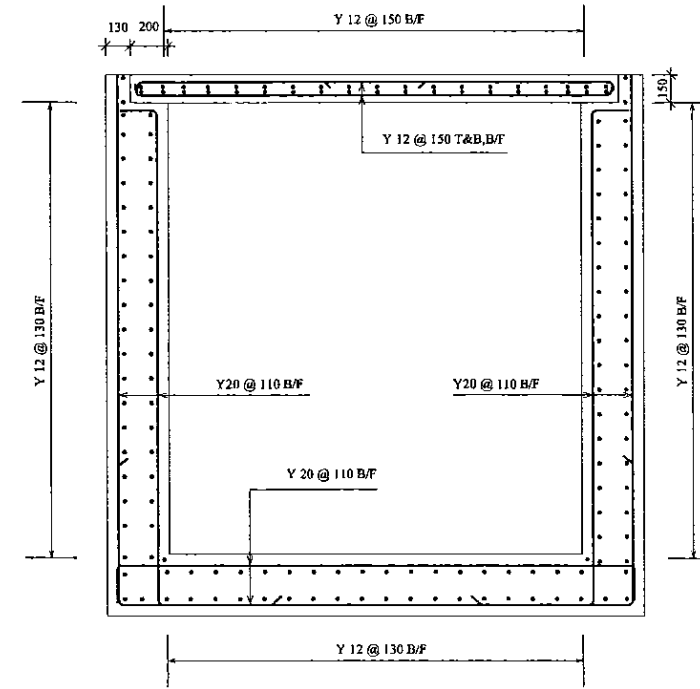
DATE: 24/04/2007 11:00 AM FINAL DRAWINGS/TRANSMISSION



BASE SLAB PLAN
SCALE :- 1:20



COVER SLAB PLAN
SCALE :- 1:20



SECTION A-A
SCALE :- 1:20

NOTE :-

- 01. THE HEIGHT CHAMBER(H) MAY BE CHANGED TO SUITE SITE CONDITIONS.
- 02. FOR DETAILS OF OPENINGS REFER DWG.No 00-STD-S-02.
- 03. ALL REINFORCED CONCRETE SHALL BE GRADE 25 (20mm) AND MASS CONCRETE MAY BE GRADE 15 (40mm).
- 04. COVERS FOR REINFORCEMENT BARS SHALL BE 50mm.

PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: VALVE CHAMBER Ø600mm PN 16 - REINFORCEMENT DETAILS

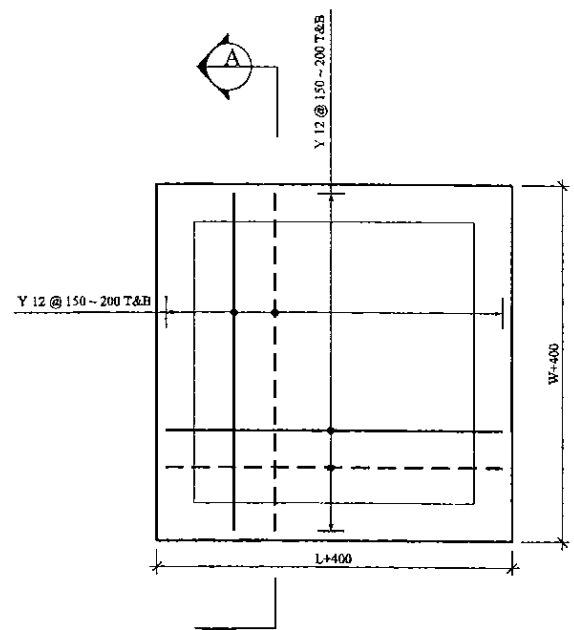
CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN
NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN

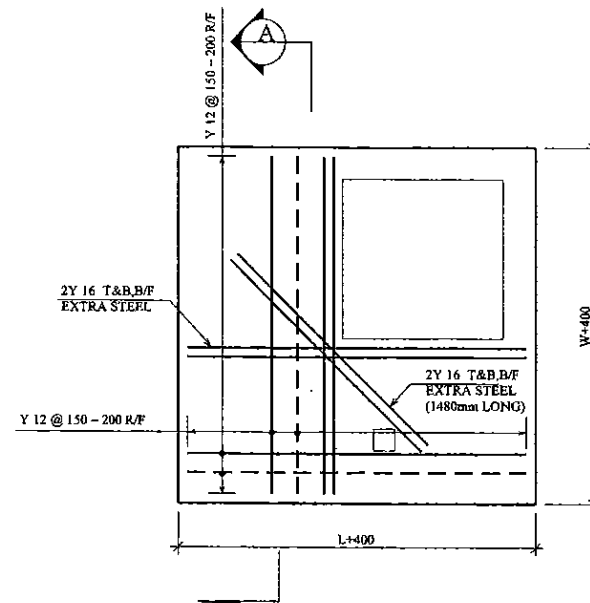
| REV. | DESCRIPTION | DATE | SIGN. |
|------|-------------|------|-------|
| XX | XXXX | XX | XX |

| | | | | |
|-----------------------------|-----------------|-------------------------------|---------------------|----------------------------|
| DESIGNED: L. JAYAWARDENA | DRAWN: Udita | PM: (CONSULTANT) Ikuo MIWA | CE: (P&D) | SCALE: 1:20 |
| CHECKED: DESIGN CHIEF | AGM: (P&D) | DGM: (P&D) | DATE: 31/05/2002 | DRAWING NO.: 20-S-08-07 |

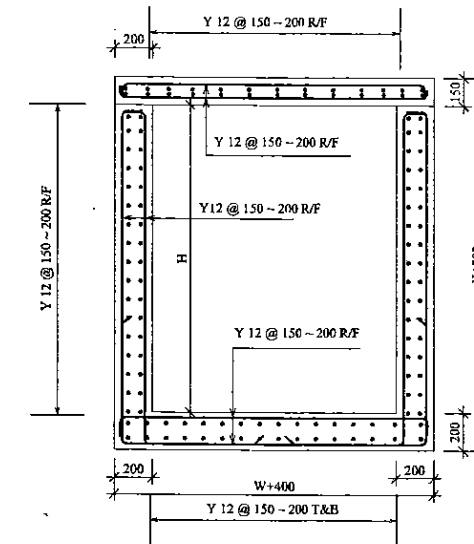
DATE: 24/04/2002 Wamini (CAD) / FINAL DRA WIRGS/TRANSMISSION/



BASE SLAB PLAN
SCALE :- 1:20



COVER SLAB PLAN
SCALE :- 1:20



SECTION A-A
SCALE :- 1:20

DIMENSION OF VALVE CHAMBER & REINFORCEMENT DETAIL.

| DIA OF VALVE mm | LENGTH OF CHAMBER(L) mm | WIDTH OF CHAMBER(W) mm | HEIGHT OF CHAMBER(H) mm | VERTICAL STEEL (T&B) | HORIZONTAL STEEL (T&B) |
|--------------------|----------------------------|---------------------------|----------------------------|----------------------|------------------------|
| 300 | 1400 | 1500 | 1850 | Y12 @ 150 | Y12 @ 150 |
| 250 | 1400 | 1500 | 1800 | Y12 @ 175 | Y12 @ 175 |
| 200 | 1400 | 1400 | 1600 | Y12 @ 200 | Y12 @ 200 |

NOTE:-

01. THE HEIGHT OF CHAMBER (H) MAY BE CHANGED TO SUIT SITE CONDITIONS.
02. FOR DETAILS OF OPENINGS REFER TO DWG.No 00-STD-S-02.
03. ALL REINFORCED CONCRETE SHALL BE GRADE 25 (20mm) AND MASS CONCRETE MAY BE GRADE 15 (40mm).
04. COVERS FOR REINFORCEMENT BARS SHALL BE 50mm.

PROJECT: GREATER KANDY WATER SUPPLY AUGMENTATION PROJECT



JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: CHAMBERS FOR GEARED SLUICE VALVES (VERTICAL TYPE) Ø80mm-Ø300mm PN16 - REINFORCEMENT DETAIL

CLIENT: NATIONAL WATER SUPPLY & DRAINAGE BOARD



CONSULTANTS:
 NJS CONSULTANTS CO., LTD. - JAPAN
 NIHON SUIDO CONSULTANTS CO., LTD. - JAPAN

| REV. | DESCRIPTION | DATE | SIGN. | DESIGNED: | DRAWN: | PM: (CONSULTANT) | CE: (P&D) | SCALE: |
|------|-------------|------|-------|----------------|------------|------------------|------------|--------------|
| XX | XXXX | XX | XX | L. JAYAWARDENA | Udita | Ikuo MIWA | | 1:20 |
| | | | | CHECKED: | AGM: (P&D) | DGM: (P&D) | DATE: | DRAWING NO.: |
| | | | | DESIGN CHIEF | | | 31/05/2002 | 20-S-08-08 |

DATE: 24/04/2002 11:51 AM CAD: 1/10 FINAL DRAWINGS TRANSMISSION