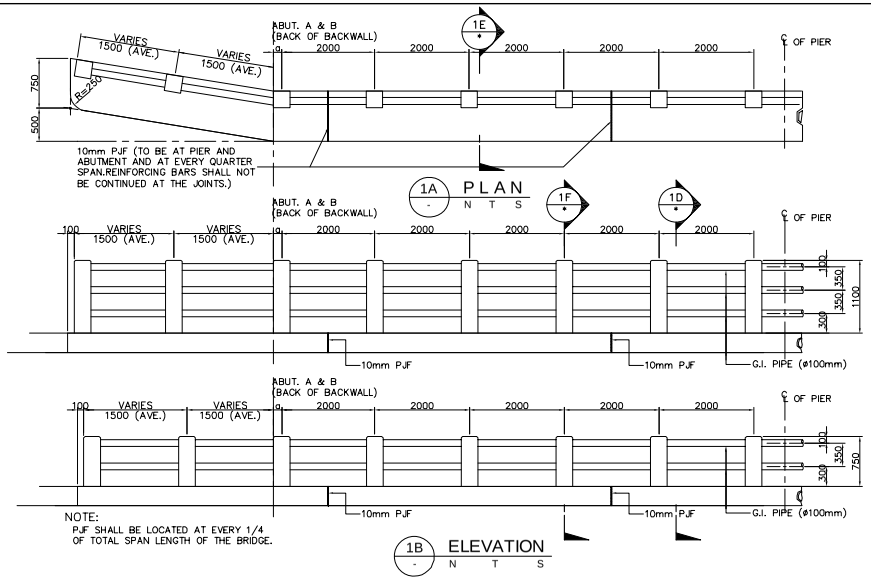
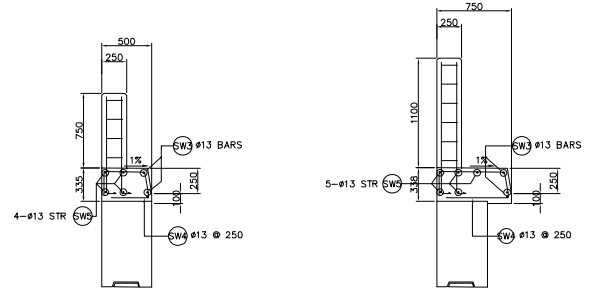
11. DET. OF STANDARD STRUCTURES

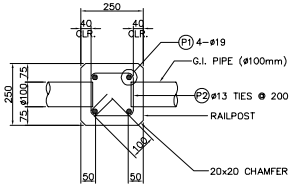


1A PLAN N T S

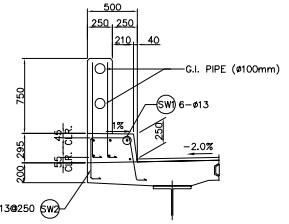
1B ELEVATION N T S

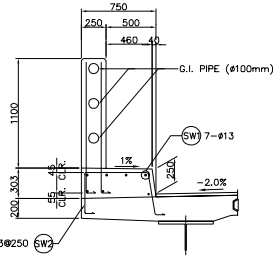


1H APPROACH RAIL SECTION
SCALE 1:50

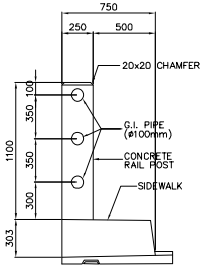


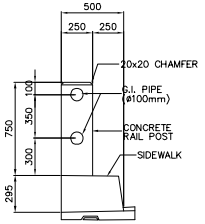
1C SECTION
SCALE 1:10



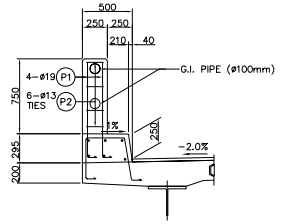


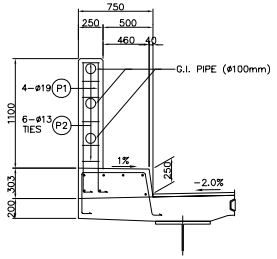
1E SECTION
SCALE 1:50





1D SECTION
SCALE 1:40





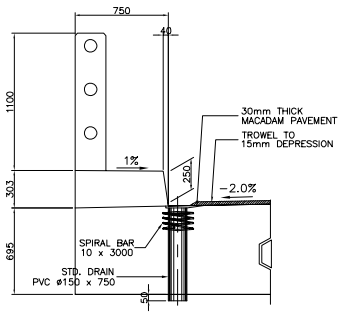
1F SECTION
SCALE 1:50

BAR SCHEDULE (PER 2M); W = 750							
STRUCTURE COMPONENT	BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
	P1	19	1.740	4	2.226	3.87	15.48
	P2	13	0.880	6	1.042	0.92	5.52
					SUB TOTAL =		21.00Kgs
	SW1	13	2.000	7	1.042	2.08	14.56
	SW2	13	1.890	8	1.042	1.97	15.76
					SUB TOTAL =		30.32Kgs
	SW3	13	2.000	2	1.042	2.08	4.16
	SW4	13	1.955	8	1.042	2.05	16.40
	SW5	13	2.000	5	1.042	2.08	10.40
					SUB TOTAL =		30.96Kgs

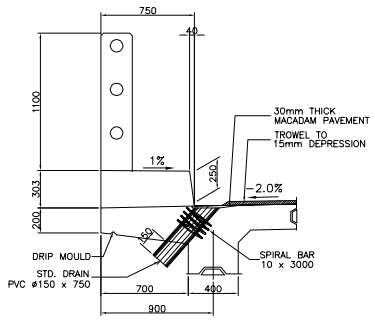
BAR SCHEDULE (PER 2M); W = 500							
STRUCTURE COMPONENT	BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
	P1	19	1.165	4	2.226	2.59	10.36
	P2	13	0.880	4	1.042	0.92	3.68
					SUB TOTAL =		14.04Kgs
	SW1	13	2.000	6	1.042	2.08	12.48
	SW2	13	1.610	8	1.042	1.68	13.44
					SUB TOTAL =		25.92Kgs
	SW3	13	2.000	2	1.042	2.08	4.16
	SW4	13	1.425	8	1.042	1.48	11.84
	SW5	13	2.000	4	1.042	2.08	8.32
					SUB TOTAL =		24.32Kgs

1 TYPICAL RAILING AND SIDEWALK DETAILS
SCALE AS SHOWN

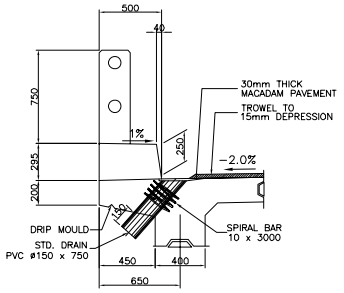
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: STANDARD DRAWINGS TYPICAL RAILING, SIDEWALK AND DRAIN DETAILS (1/2)	SCALE: AS SHOWN	DRAWING No: 11-1 Rev.



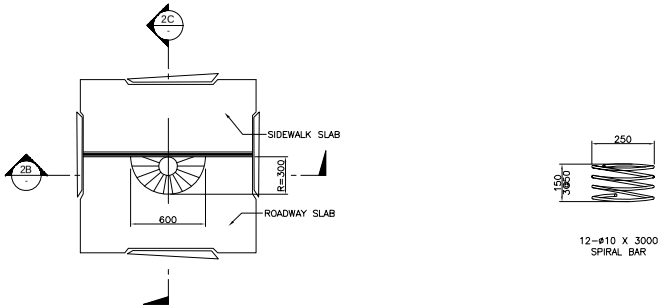
2C - SECTION (FLAT SLAB, 0.75m SIDEWALK)
SCALE 1:20



2C - SECTION (RCDG, 0.75m SIDEWALK)
SCALE 1:20



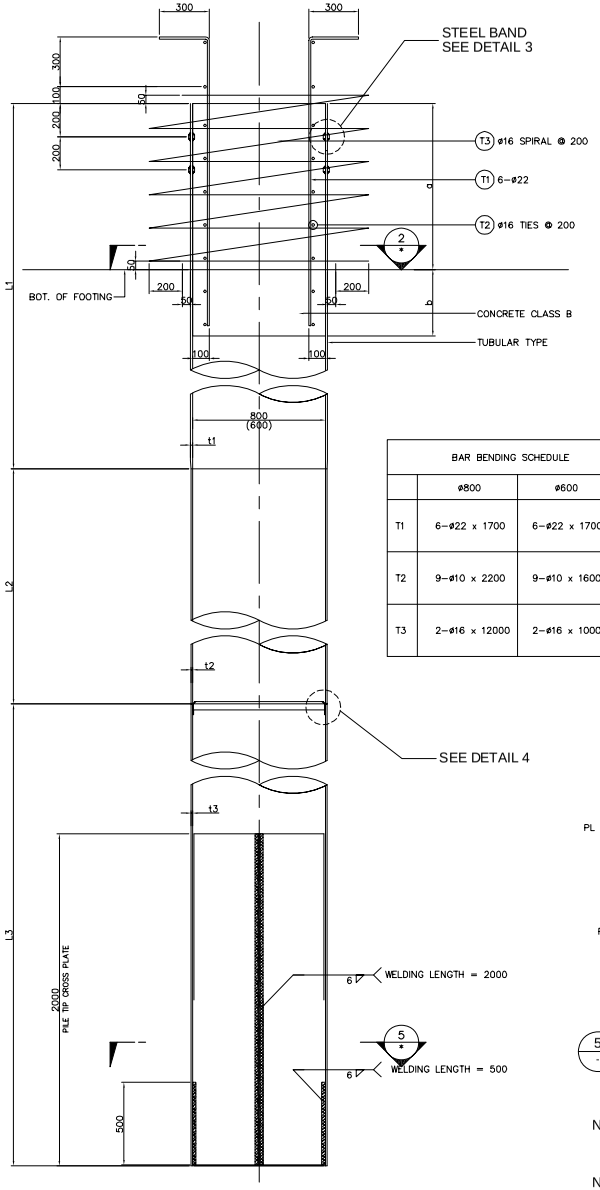
2C - SECTION (RCDG, 0.50m SIDEWALK)
SCALE 1:20



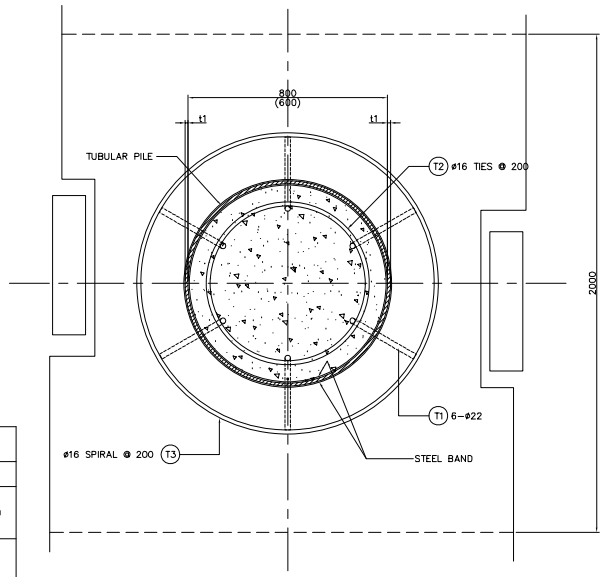
2A - SECTION
SCALE 1:20

2 - TYPICAL DRAIN DETAILS
SCALE 1:20

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: STANDARD DRAWINGS TYPICAL RAILING, SIDEWALK AND DRAIN DETAILS (2/2)	SCALE: AS SHOWN	DRAWING No: 11-2 Rev.

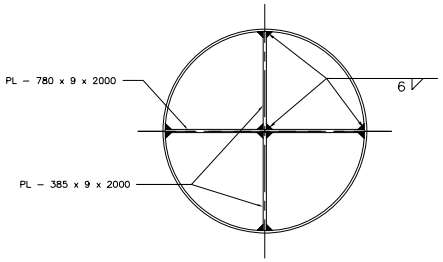


1 ELEVATION
SCALE 1:30



2 SECTION
SCALE 1:20

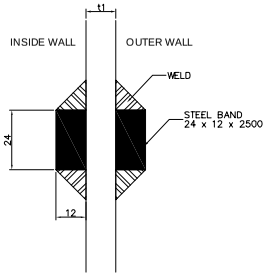
BAR BENDING SCHEDULE		
	ø800	ø600
T1	6–ø22 x 1700	6–ø22 x 1700
T2	9–ø10 x 2200	9–ø10 x 1600
T3	2–ø16 x 12000	2–ø16 x 10000



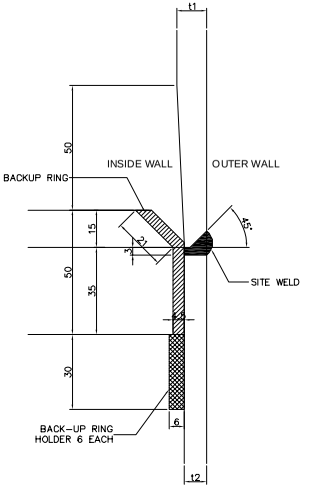
5 SECTION (DETAIL OF PILE TIP CROSS PLATE)
SCALE 1:20

Note1: The Pile Tip Cross Plate shall be attached to the tublar piles where a pile needs to be extended from the design lengt due to inadequacy of bearing force.

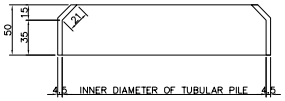
Note2: The contractor is allowed to improve the structure of the pile tip cross plate when approved by the contractor



3 STEEL BAND DETAIL
SCALE 1:2



4 DETAIL (PILE CONNECTION)
SCALE 1:2



6 BACKUP RING DETAIL
NOT TO SCALE

BRIDGE NAME		PILE DIMENSIONS									
		DIAMETER	a	b	L1	t1	L2	t2	L3	t3	Total L
BR–16 TELONANG I	ABUT. A1	800 mm	1000 mm	400 mm	17000 mm	9 mm	–	–	–	–	17000 mm
	PIER P1	800 mm	1000 mm	600 mm	9000 mm	19 mm	9000 mm	12 mm	4000 mm	9 mm	22000 mm
	ABUT. A2	800 mm	1000 mm	400 mm	19000 mm	9 mm	–	–	–	–	19000 mm
BR–19 SEPANG	ABUT. A1	800 mm	1000 mm	400 mm	9000 mm	14 mm	8000 mm	12 mm	–	–	17000 mm
	ABUT. A2	800 mm	1000 mm	400 mm	9000 mm	14 mm	8000 mm	12 mm	11000 mm	9 mm	28000 mm
BR–27 LAMAR	ABUT. A1	800 mm	1000 mm	400 mm	10000 mm	12 mm	–	–	–	–	10000 mm
	ABUT. A2	800 mm	1000 mm	400 mm	11000 mm	12 mm	15000 mm	9 mm	–	–	26000 mm
BR–34 EMANG	ABUT. A1	800 mm	1000 mm	400 mm	16500 mm	9 mm	–	–	–	–	16500 mm
	PIER P1	800 mm	800 mm	600 mm	10000 mm	19 mm	5000 mm	14 mm	3500 mm	9 mm	18500 mm
	ABUT. A2	800 mm	1000 mm	400 mm	18000 mm	9 mm	–	–	–	–	18000 mm
BR–35 KALBIR	ABUT. A1	800 mm	1000 mm	400 mm	6000 mm	12 mm	10000 mm	9 mm	–	–	16000 mm
	ABUT. A2	800 mm	1000 mm	400 mm	6000 mm	12 mm	9000 mm	9 mm	–	–	15000 mm

DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

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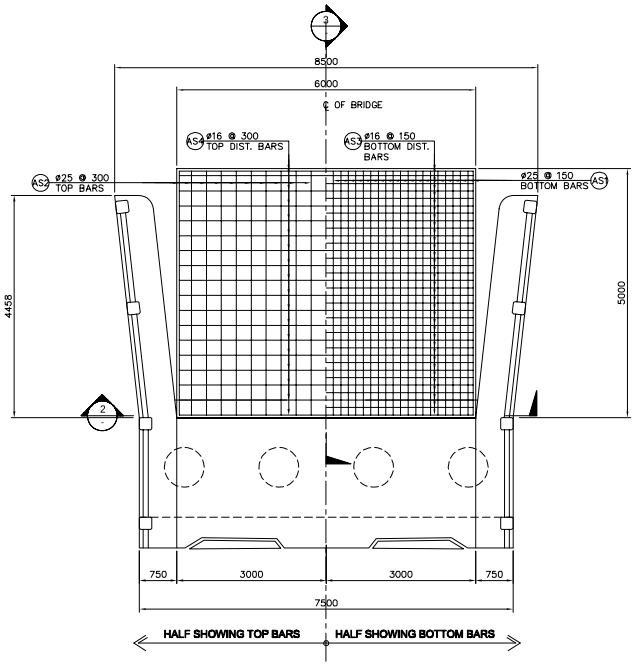
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE: STANDARD DRAWINGS
TUBULAR PILE DETAILS

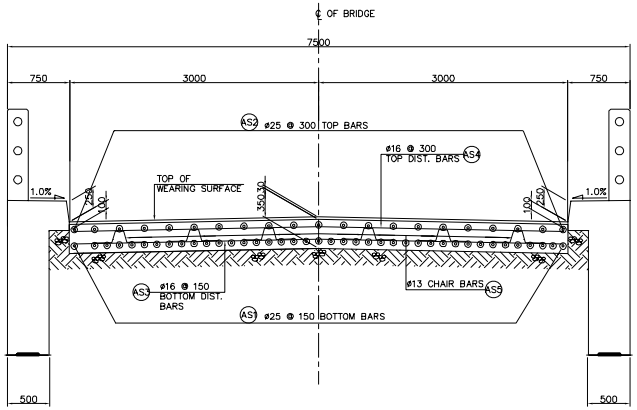
SCALE: AS SHOWN

DRAWING No: 11-3

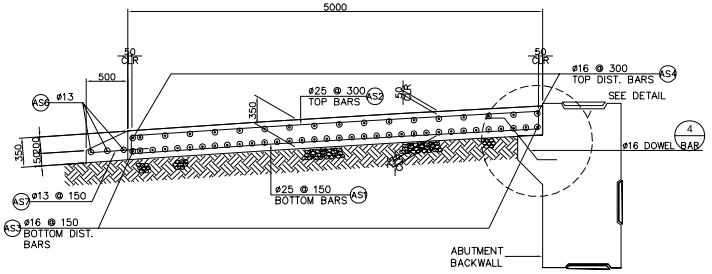
Rev.



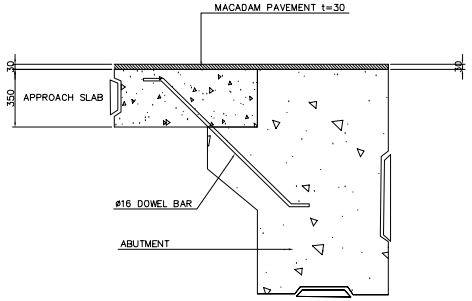
1 PLAN
SCALE 1:100



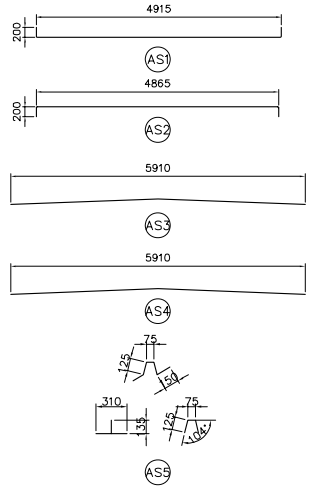
2 SECTION
SCALE 1:60



3 SECTION
SCALE 1:60



4 DETAIL
SCALE 1:30



5 BAR BENDING DIAGRAM
NOT TO SCALE

SCHEDULE OF REINFORCEMENT						
BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
AS1	29	4.915	40	3.853	18.94	757.60
AS2	29	4.865	21	3.853	18.74	393.54
AS3	16	5.910	34	1.578	9.33	317.22
AS4	16	5.910	18	1.578	9.33	167.94
AS5	13	0.625	24	1.042	0.65	15.60
AS6	13	5.910	3	1.042	0.16	18.48
AS7	13	0.750	41	1.042	0.78	31.98

TOTAL = 1,670.38 Kgs

DIRECTORATE GENERAL OF HIGHWAY
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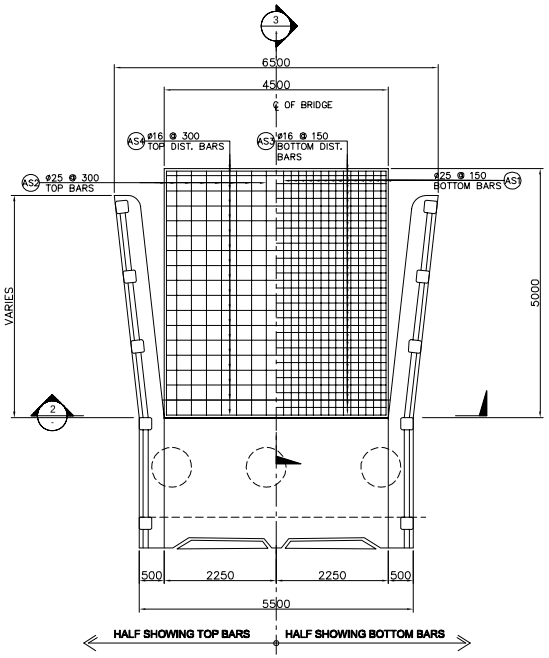
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE:
STANDARD DRAWINGS
TYPICAL APPROACH SLAB DETAILS
(CARRIAGE WAY WIDTH = 6.00m)

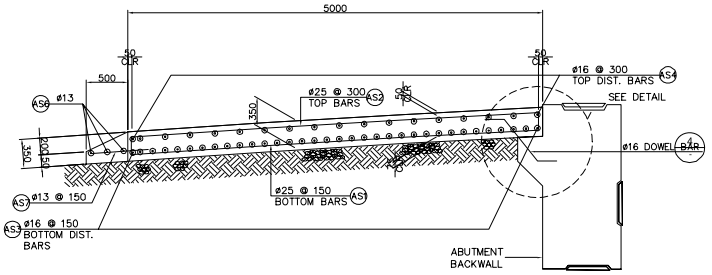
SCALE: AS SHOWN

DRAWING No: 11-4

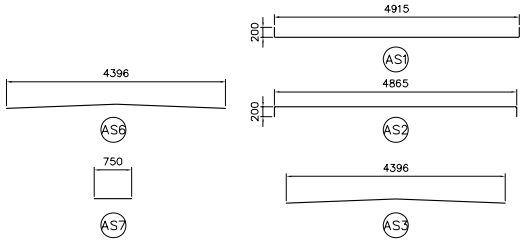
Rev.



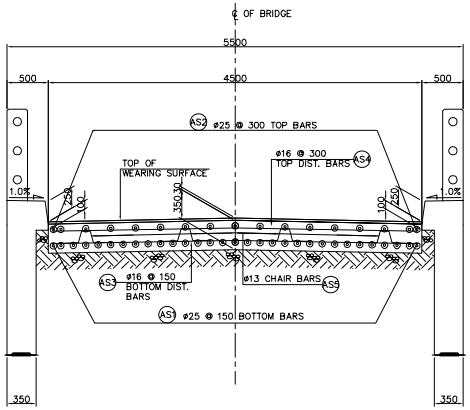
1 PLAN
SCALE 1:100



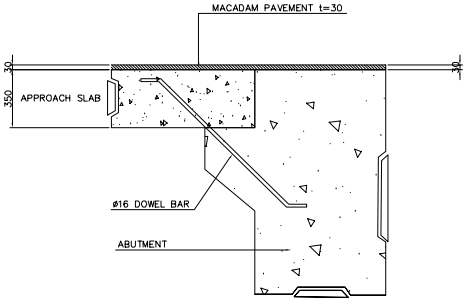
3 SECTION
SCALE 1:60



5 BAR BENDING DIAGRAM
NOT TO SCALE



2 SECTION
SCALE 1:60



4 DETAIL
SCALE 1:30

SCHEDULE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
AS1	25	4.915	31	3.853	18.94	587.14
AS2	25	4.865	17	3.853	18.94	318.58
AS3	16	4.396	34	1.578	6.94	235.96
AS4	16	4.396	18	1.578	6.94	124.92
AS5	13	0.625	16	1.042	0.65	10.40
AS6	13	4.396	3	1.042	0.58	13.74
AS7	13	0.750	31	1.042	0.78	24.18

TOTAL = 1,447.52 Kgs

DIRECTORATE GENERAL OF HIGHWAY
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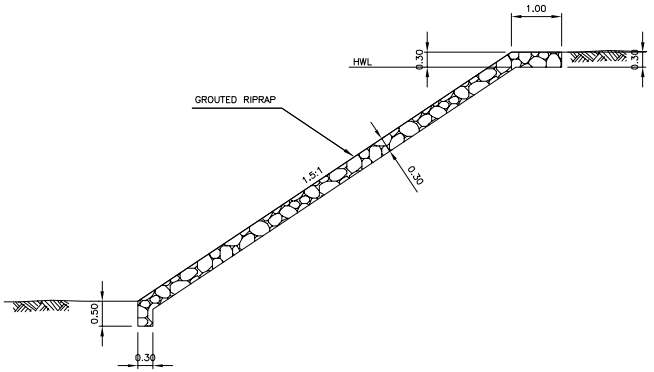
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE:
STANDARD DRAWINGS
TYPICAL APPROACH SLAB DETAILS
(CARRIAGE WAY WIDTH = 4.50m)

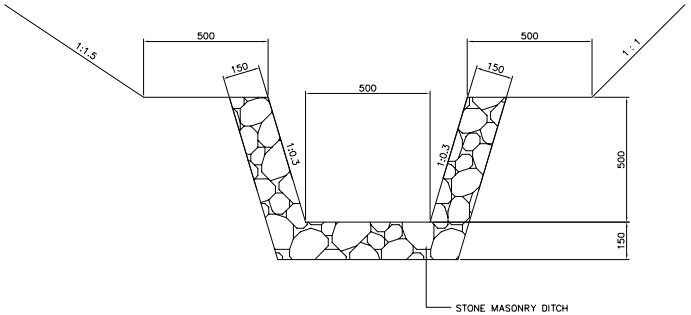
SCALE: AS SHOWN

DRAWING No: 11-5

Rev.

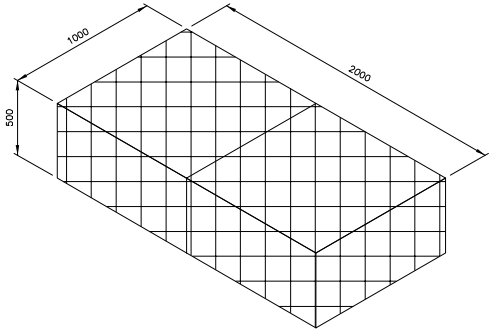


1 - GROUTED RIPRAP SLOPE PROTECTION
SCALE 1:100

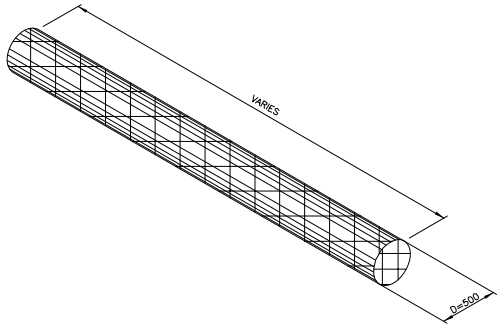


2 - STONE MASORY DITCH
SCALE 1:20

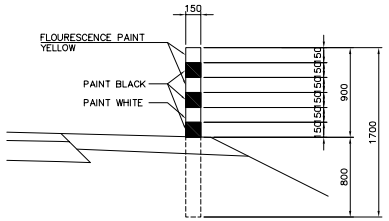
QUANTITY PER GUIDE POST	
CONCRETE CLASS " A "	0.038 m^3
BAR ø 10	39.5 kg
BAR ø 8	1.2 kg



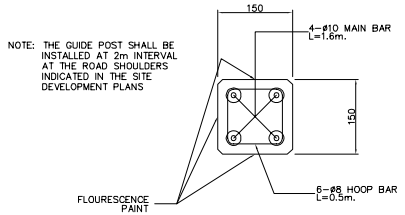
3 - GABION MATTRESS
NOT TO SCALE



4 - CYLINDRICAL GABION
NOT TO SCALE



5A - ELEVATION
SCALE 1:50



NOTE: THE GUIDE POST SHALL BE INSTALLED AT 2m INTERVAL AT THE ROAD SHOULDERS INDICATED IN THE SITE DEVELOPMENT PLANS

5B - SECTION
SCALE 1:10

5 - GUIDE POST
SCALE AS SHOWN

SCHEDULE OF REINFORCEMENT						
BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
1	16	1.432	209	1.578	2.26	472.34
2	16	0.523	209	1.578	0.83	173.47
3	16	43.42	6	1.578	68.52	411.12

TOTAL = 25.41Kgs

NOTE:
THE GABION MESH AND BOULDERS SHALL COMPLY WITH THE TECHNICAL SPECIFICATIONS OF THIS CONTRACT. GABION MATTRESS AND CYLINDRICAL GABION SHALL BE PLACED ON GEOTEXTILE FABRIC.

DIRECTORATE GENERAL OF HIGHWAY
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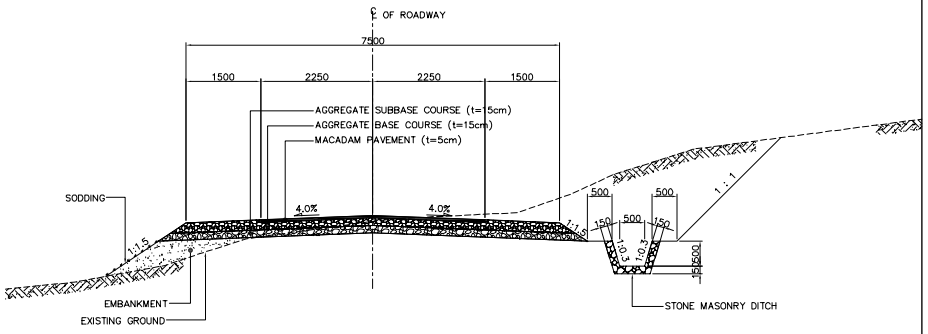
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE: STANDARD DRAWINGS
RIPRAP PROTECTION, GABION, STONE MASONRY DITCH & GUIDE POST

SCALE: AS SHOWN

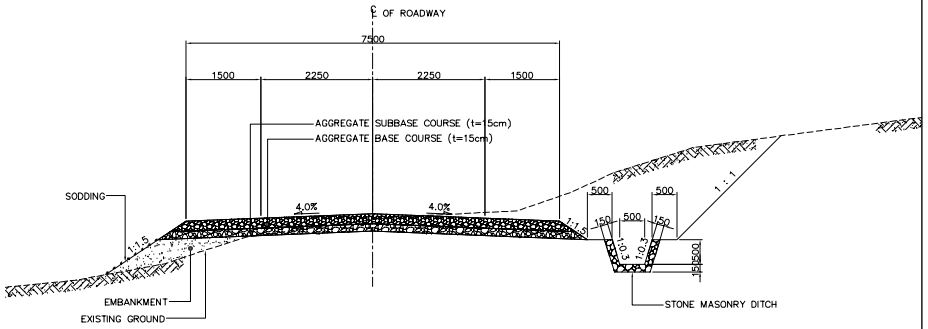
DRAWING No: 11-6

Rev.



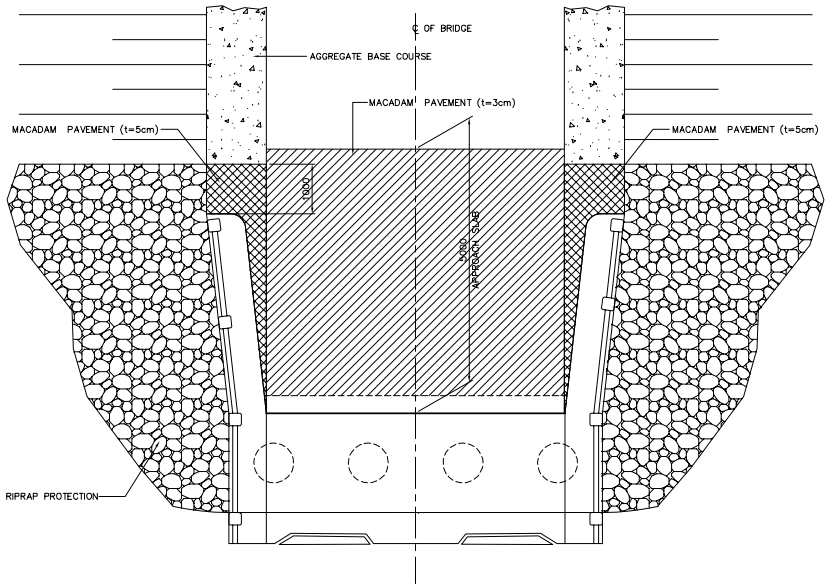
MACADAM PAVEMENT SECTION

1 APPROACH ROAD TYPICAL SECTION
SCALE 1:100

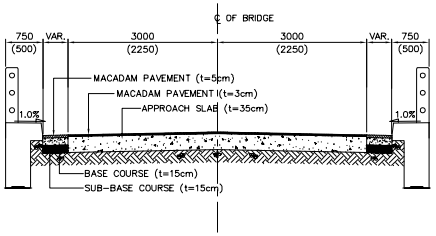


AGGREAGTE SURFACE SECTION

2 APPROACH ROAD TYPICAL SECTION
SCALE 1:100

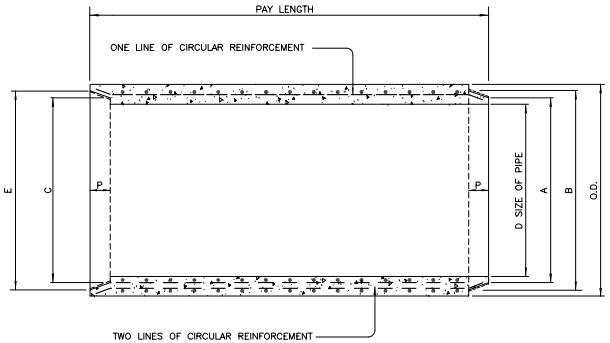


3 TYPICAL PLAN OF BRIDGE APPROACH
SCALE 1:100

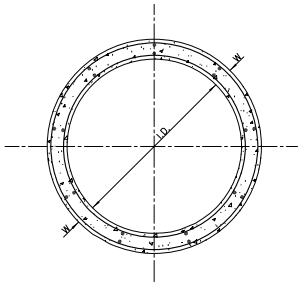


4 TYPICAL SECTION OF BRIDGE APPROACH
SCALE 1:100

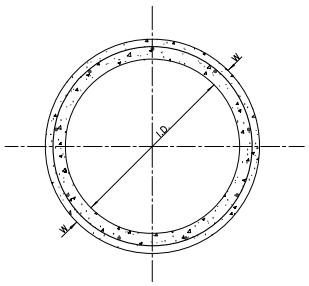
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: STANDARD DRAWINGS TYPICAL APPROACH ROAD SECTION	SCALE: 1 : 100	DRAWING No: 11-7 Rev.



1 - LONGITUDINAL SECTION - TONGUE & GROOVE TYPE
NOT TO SCALE



A - TWO LINES OF CIRCULAR REINFORCEMENT
NOT TO SCALE

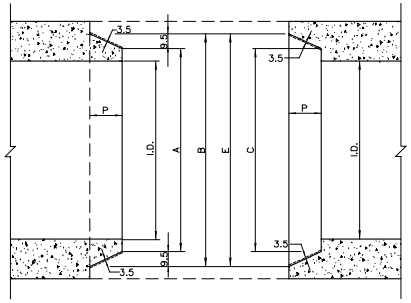


B - ONE LINE OF CIRCULAR REINFORCEMENT
NOT TO SCALE

STANDARD STRENGTH REINFORCED CONCRETE CULVERT

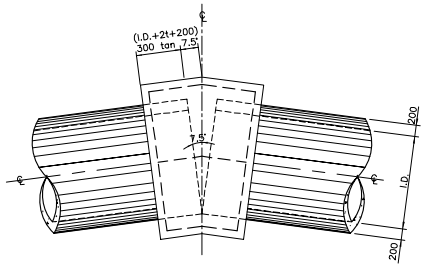
CONCRETE 3,500 PSI (24.1 MPa)									CONCRETE 4,500 PSI (31.0MPa)						STRENGTH TEST REQUIREMENTS, Kg. PER LINEAR m. OF PIPE	
SIZE OF PIPE mm.	WALL THICK-NESS mm.	TONGUE mm.		GROOVE mm.		DEPTH mm.	MINIMUM REINFORCEMENT mm PER LINEAR m. OF PIPE BARREL		WALL THICK-NESS mm.	TONGUE mm.		GROOVE mm.		DEPTH mm.	MIN. REINF. mm/LINEAR m. OF PIPE BARREL	THREE-EDGE BEARING METHOD	
I.D.	W	A	B	C	E	P	CIRCULAR REINF. IN CIRCULAR PIPE	ELLIPTICAL REINF. IN CIRCULAR PIPE	W	A	B	C	E	P	CIRCULAR REINF. IN CIRCULAR PIPE	LOAD TO PRODUCE A .254mm. CRACK	ULTIMATE LOAD
610	77	673	527	680	699	45	1 LINE 360	1LINE 275	64	661	680	502	686	45	1 LINE 424	4473	7455
910	102	1004	527	1011	1030	64	2 LINES 381 EACH	1 LINE 381	86	988	1007	502	1013	64	2 LINES 466 EACH	6039	9840

THE DISTANCE FROM THE CENTER LINE OF THE REINFORCEMENT TO THE NEAREST SURFACE OF THE CONCRETE IS ASSUMED AS 32mm. FOR PIPES WITH SHELL THICKNESS OF 64mm. OR MORE TEST-LOAD FOR SAND BEARING TEST SHALL BE ONE AND A HALF TIMES THOSE SPECIFIED IN THIS TABLE FOR THREE EDGE-BEARING TEST.

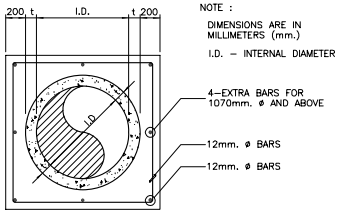


TONGUE END GROOVE END

STANDARD CONCRETE PIPE COLLAR		
PIPE DIAMETER (mm.)	CONCRETE (cu.m.)	REBARS (kg.)
610	0.656	10.0
910	1.056	12.5

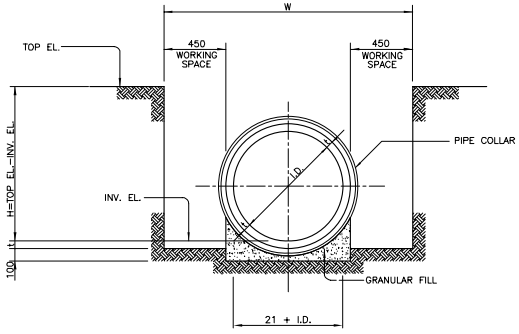


2a - PLAN
N T S



NOTE :
DIMENSIONS ARE IN MILLIMETERS (mm.)
I.D. - INTERNAL DIAMETER

2b - SECTION
N T S

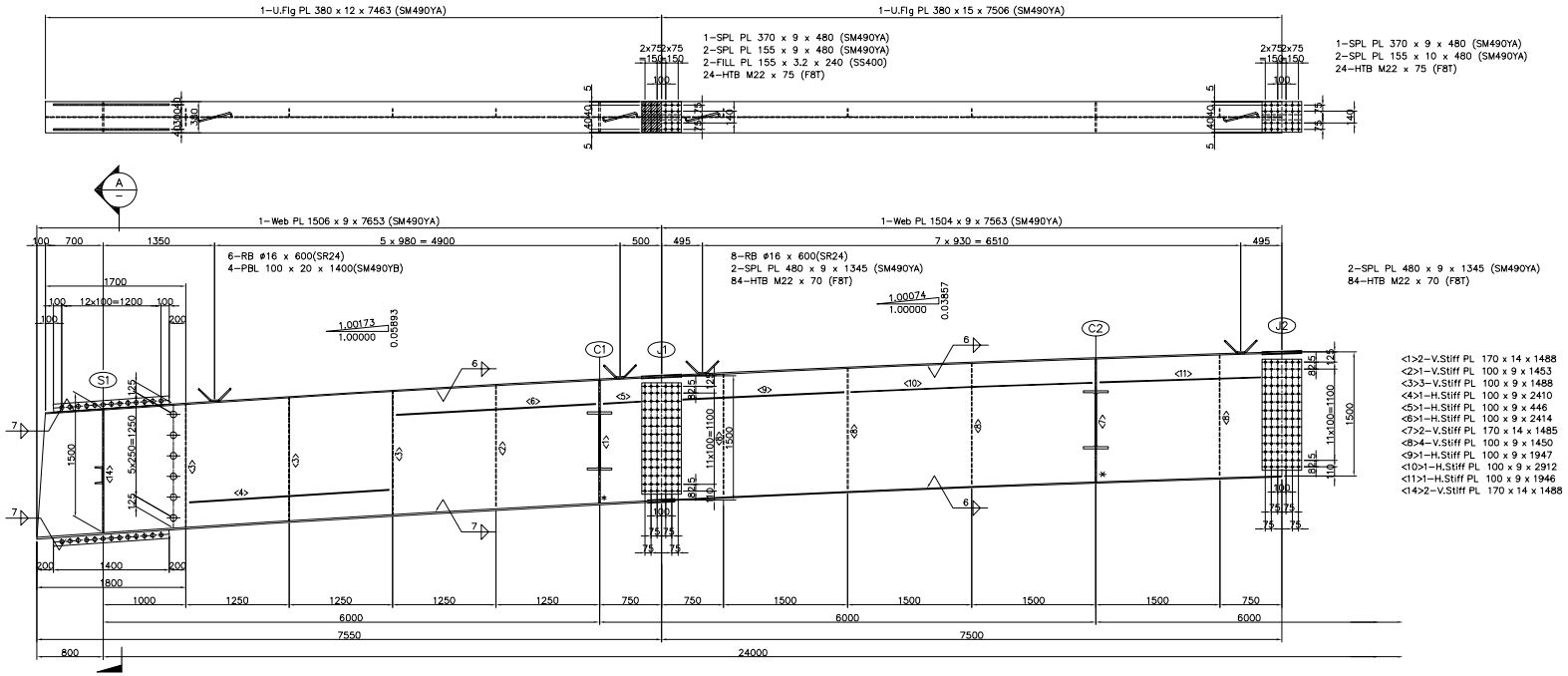


2 - PIPE COLLAR AT BEND DETAILS
NOT TO SCALE

3 - TRENCHING AND BEDDING DETAILS
NOT TO SCALE

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: STANDARD DRAWINGS REINFORCED CONCRETE PIPE CULVERT	SCALE: AS SHOWN / DRAWING No: 11-8 / Rev.

12. TYPICAL DETAIL DESIGN (STEEL)



1 GIRDER G1, G3
SCALE 1:30

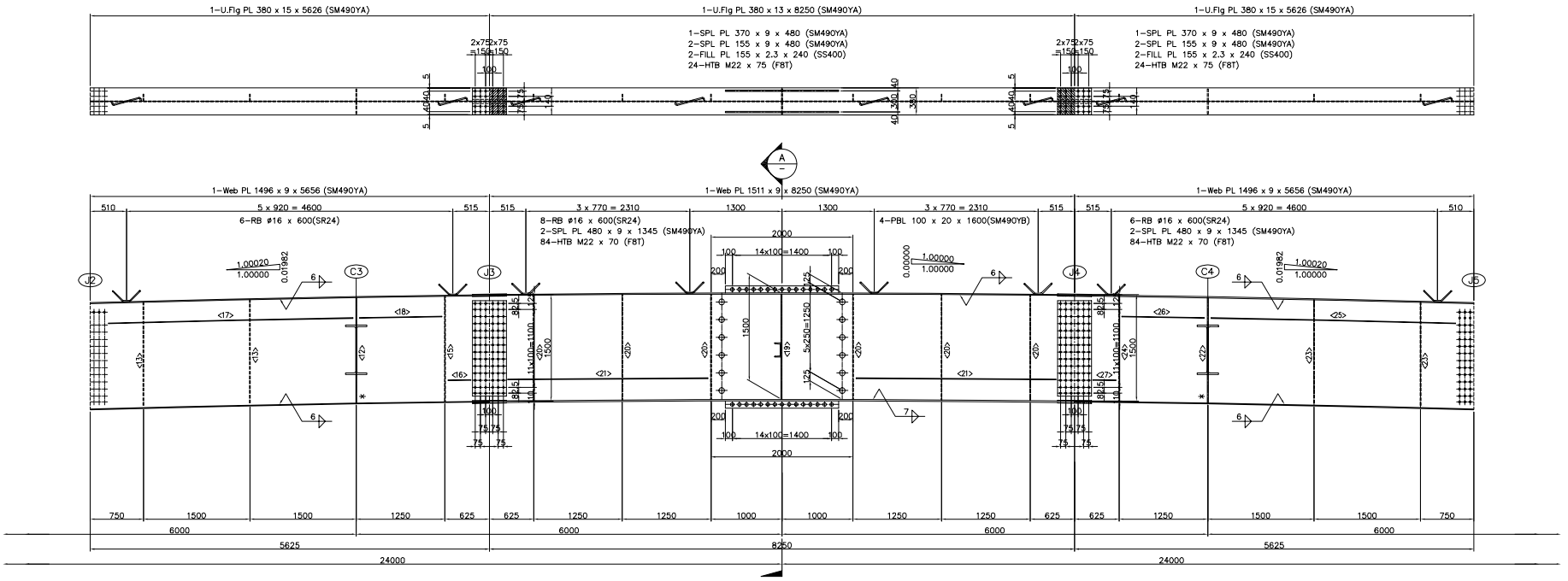
A SECTION
SCALE 1:30

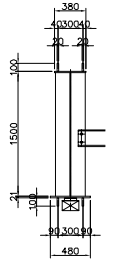
2 LAYOUT OF GIRDER
SCALE 1:300

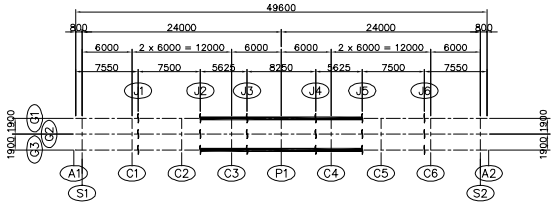
NOTES:

1. ALL MATERIALS SHALL BE SM400A UNLESS OTHERWISE NOTED.
2. SCALLOP NOT MENTIONED SPECIALLY IS ASSUMED TO BE R35
3. ⊕ THE SIGN SHOWS HIGH TENSILE STRENGTH BOLT M22(F8T)
4. REFER TO "GIRDER DETAIL" FOR DETAILS IN EACH PART
5. ＊ THE SIGN PART IS METAL TOUCH

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG BRIDGE MAIN GIRDER DETAILS (1/6)	SCALE: AS SHOWN	DRAWING No: 12-1 Rev.



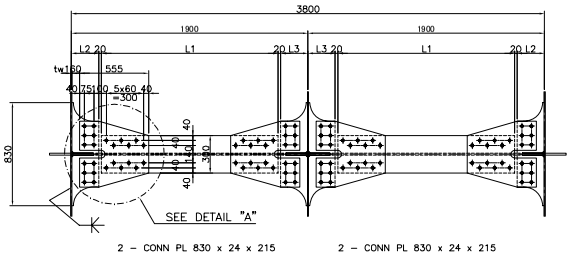


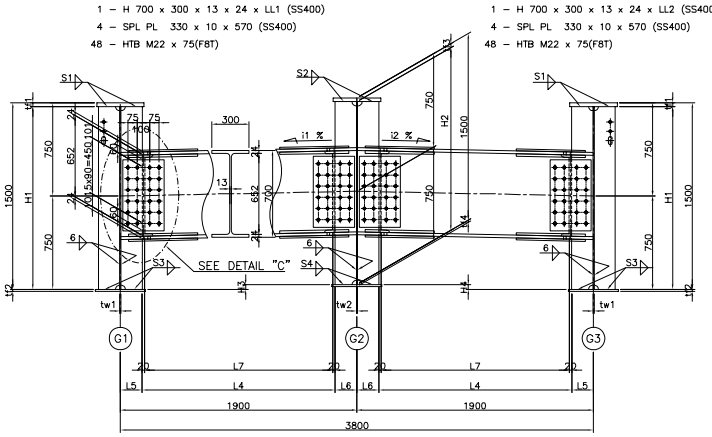


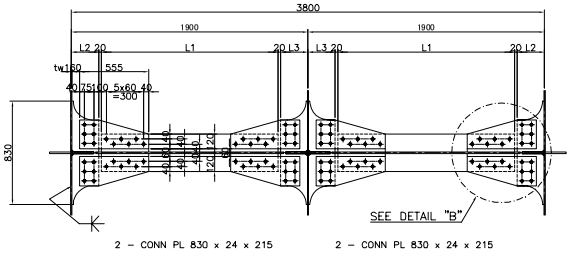
NOTES:

1. ALL MATERIALS SHALL BE SM400A UNLESS OTHERWISE NOTED.
2. SCALLOP NOT MENTIONED SPECIALLY IS ASSUMED TO BE R35
3. ⊕ THE SIGN SHOWS HIGH TENSILE STRENGTH BOLT M22(F8T)
4. REFER TO "GIRDER DETAIL" FOR DETAILS IN EACH PART
5. ＊ THE SIGN PART IS METAL TOUCH

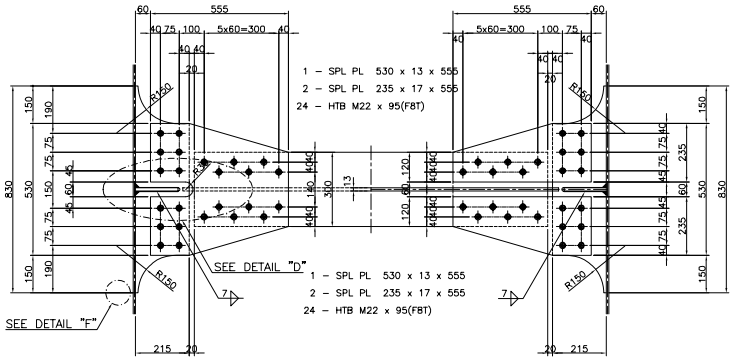
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG BRIDGE MAIN GIRDER DETAILS (2/6)	SCALE: AS SHOWN	DRAWING No: 12-2 Rev.





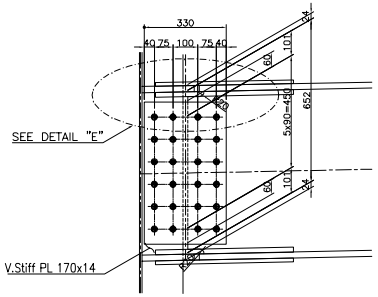


1 INTERMEDIATE CROSS BEAM
SCALE 1:20

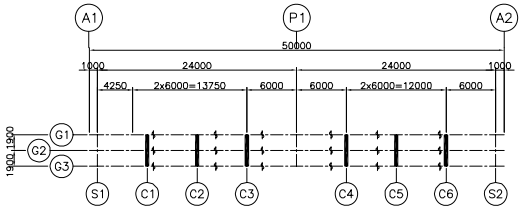


3 DETAIL "A"
SCALE 1:10

4 DETAIL "B"
SCALE 1:10



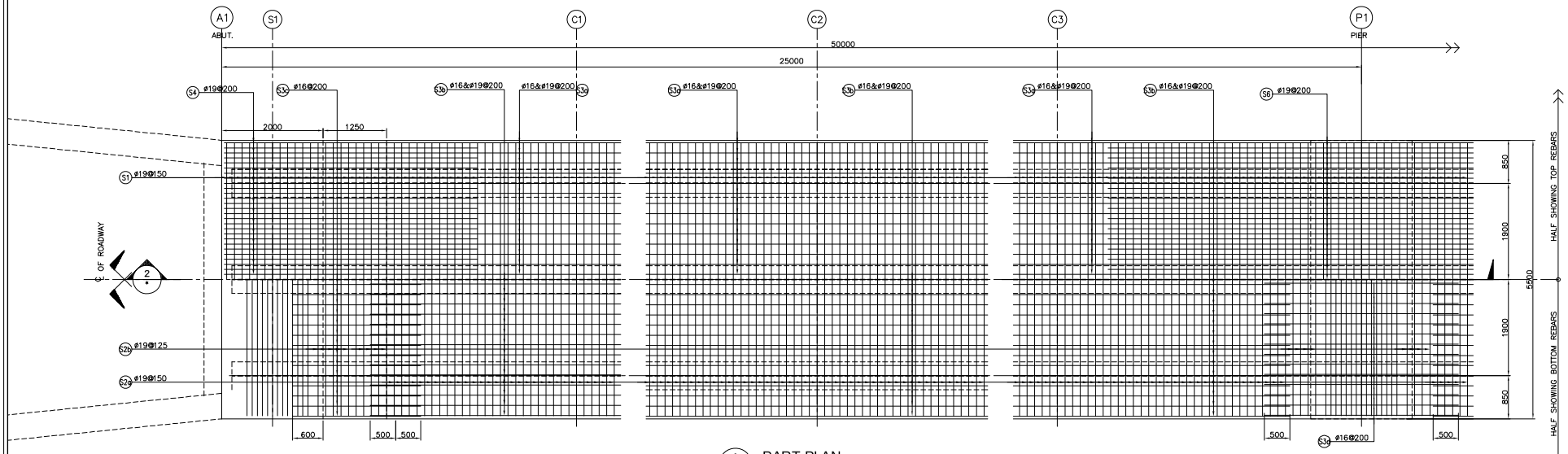
5 DETAIL "C"
SCALE 1:10



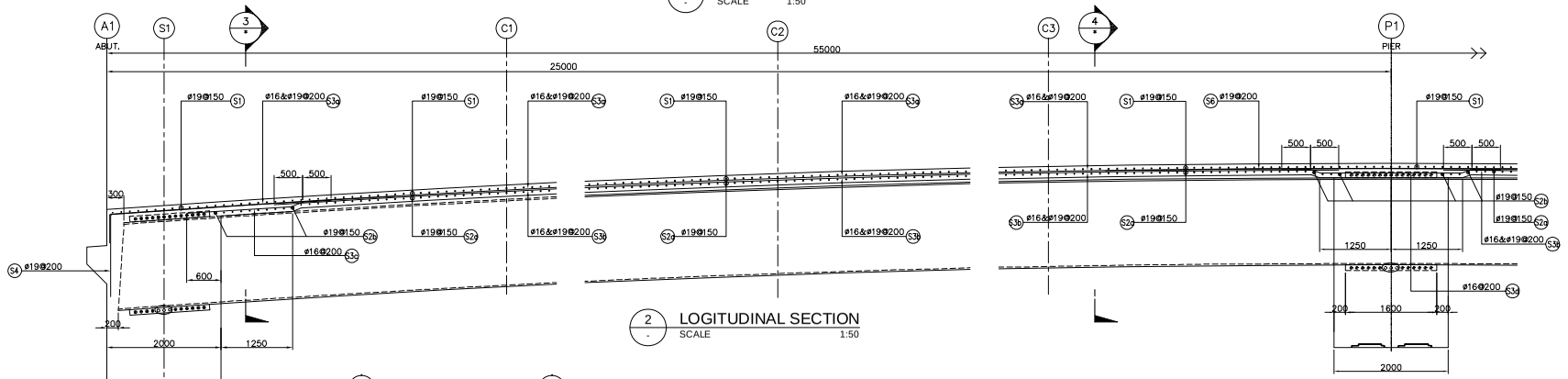
2 LAYOUT OF GIRDER
SCALE 1:300

NOTES:
1. ALL MATERIALS SHALL BE SM400A UNLESS OTHERWISE NOTED.
2. SCALLOP NOT MENTIONED SPECIALLY IS ASSUMED TO BE R35
3. ⊕ THE SIGN SHOWS HIGH TENSILE STRENGTH BOLT M22(F8T)
4. A DETAILED EACH PART MUST REFER TO "GIRDER DETAIL"

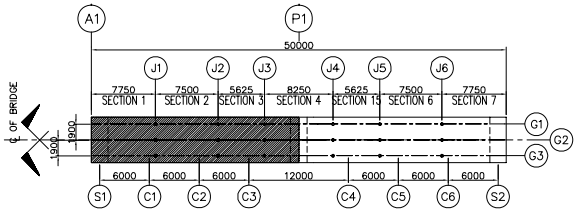
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG I BRIDGE INTERM. CROSS BEAM DETAILS (1/2)	SCALE: AS SHOWN	DRAWING No: 12-3 Rev.



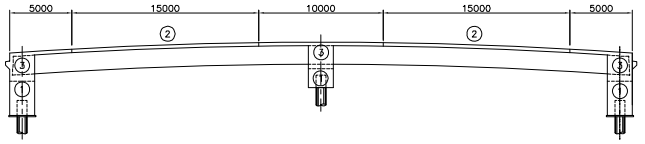
1 PART PLAN
SCALE 1:50



2 LOGITUDINAL SECTION
SCALE 1:50

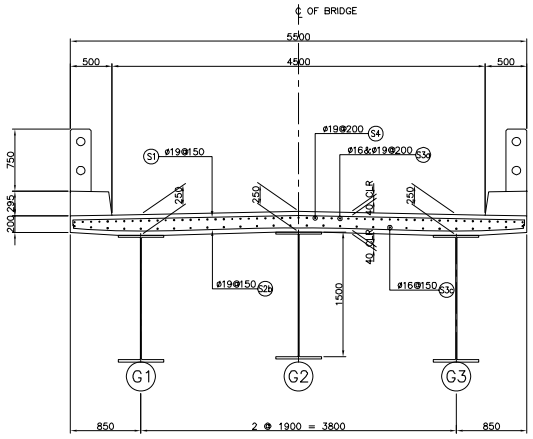


5 KEY PLAN
SCALE 1:300

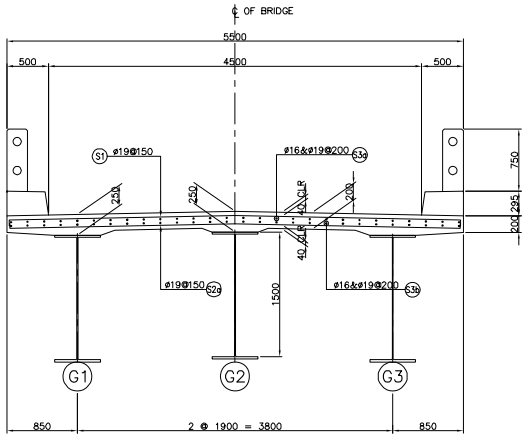


5 CONCRETE POURING SEQUENCE
SCALE 1:200

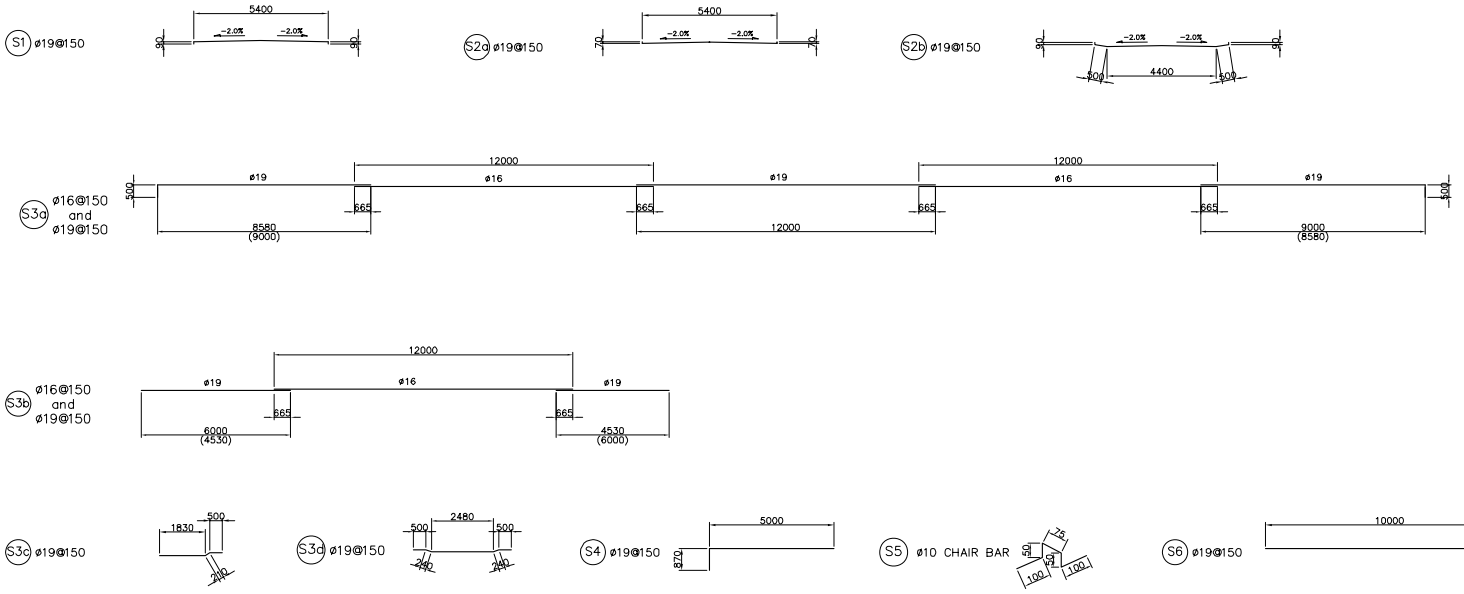
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG I BRIDGE DECK SLAB REINFORCEMENT DETAILS (1/2)	SCALE: AS SHOWN	DRAWING No: 12-4 Rev.



3 SECTION
SCALE 1:30



4 SECTION
SCALE 1:30



SCHEDULE OF REINFORCEMENT

BARK MARK	BAR SIZE	LENGTH OF BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
S1	D-19	5.580	334	2.226	12.42	4148.28
S2a	D-19	5.540	284	2.226	12.33	3501.72
S2b	D-19	5.580	26	2.226	12.42	322.92
S3a	D-16	24.000	28	1.578	37.87	1060.36
	D-19	30.580	28	2.226	68.07	1905.96
S3b	D-16	12.000	56	1.578	18.94	1060.64
	D-19	10.530	56	2.226	23.44	1312.64
S3c	D-19	2.540	56	2.226	5.65	316.40
S3d	D-19	3.960	28	2.226	8.81	246.68
S4	D-19	5.870	52	2.226	13.07	679.64
S5	D-10	0.375	135	0.617	0.23	31.05
S6	D-19	10.000	26	2.226	22.26	578.76
SD-40 TOTAL = 13852.41 Kgs.						

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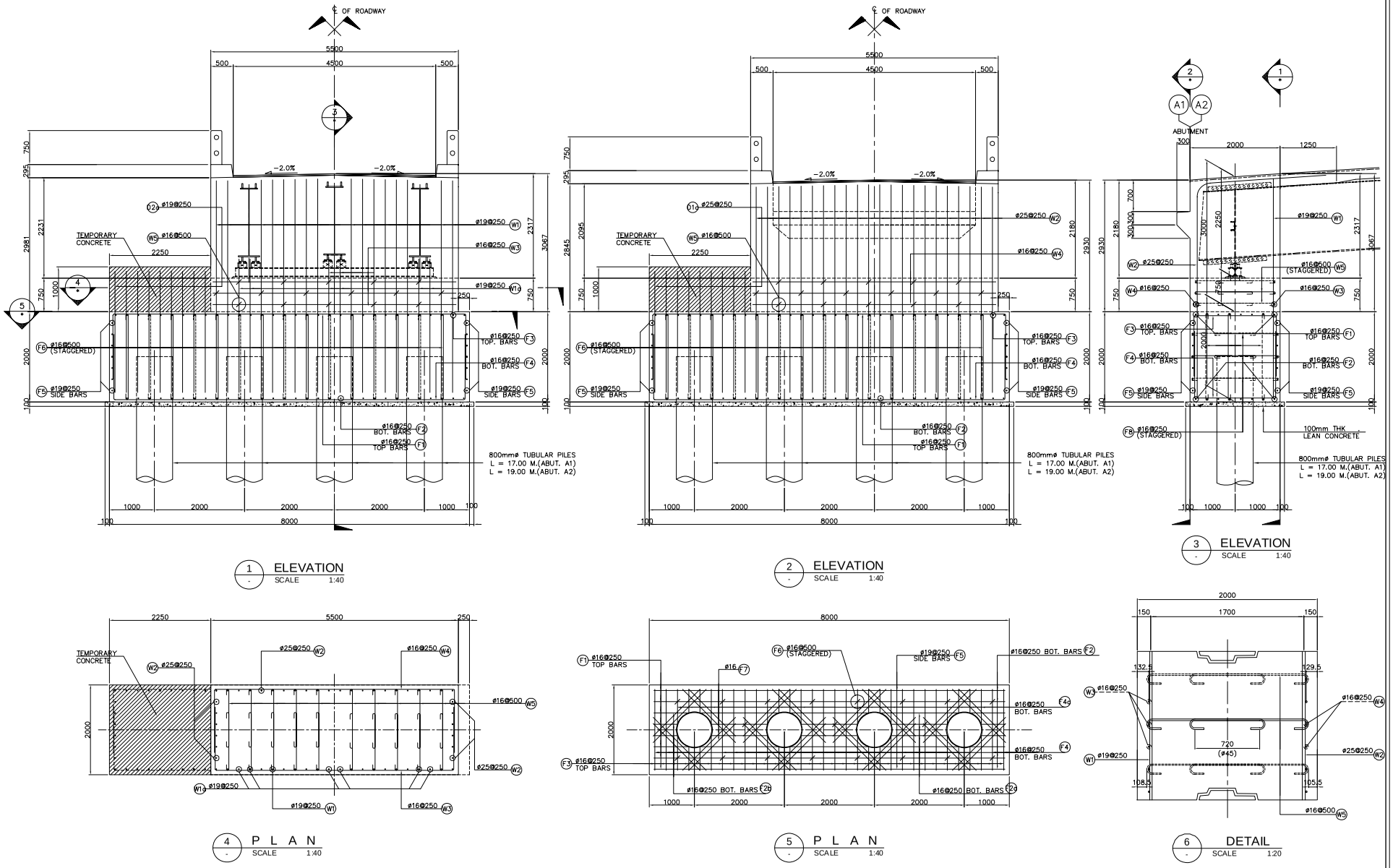
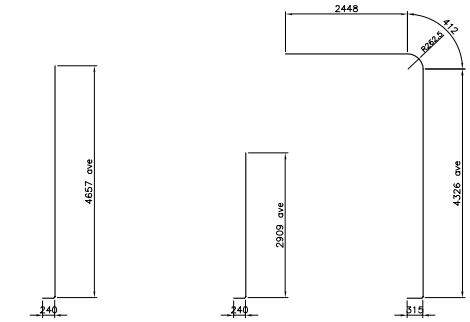
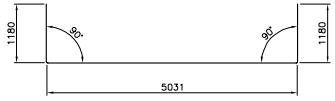


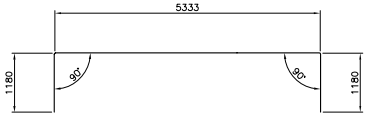
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG BRIDGE ABUTMENT A1 & A2 REINF. DETAILS (1/4)	SCALE: AS SHOWN	DRAWING No: 12-6 Rev.



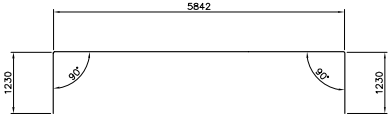
(W1) 28–ø19 x 4897 (W1a) 6–ø19 x 3149 (W2) 22–ø25 x 7501



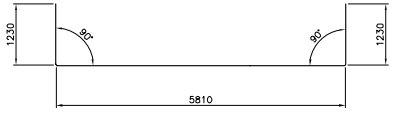
(W3) 3–ø16 x 7391



(W4) 3–ø16 x 7693

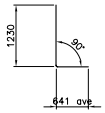


(F1) 8–ø16 x 8302

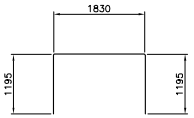


(F2) 4–ø16 x 8270

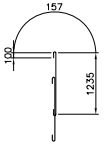
(F2a) 8–ø16 x 1481



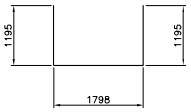
(F2b) 8–ø16 x 1871



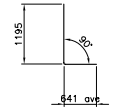
(F3) 24–ø16 x 4220



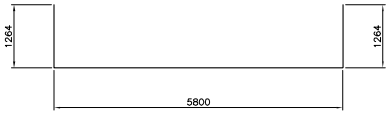
(W5) 16–ø16 x 3498



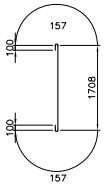
(F4) 12–ø16 x 4188



(F4a) 24–ø16 x 1836



(F5) 14–ø19 x 8328



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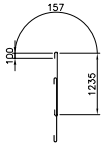


(F8) 19–ø16 x 3498

(F7) 24–ø16 x 1568

SCHEDULE OF REINFORCEMENT

	BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ABUTMENT	W1	D–19	4.897	28	2.226	10.90	305.20
	W1a	D–19	3.149	6	2.226	7.01	42.06
	W2	D–25	7.876	22	3.853	28.90	635.80
	W3	D–16	7.391	3	1.578	11.66	34.98
	W4	D–16	7.693	3	1.578	12.14	36.42
	W5	D–16	3.498	16	1.578	5.52	88.32
	F1	D–16	8.302	8	1.578	13.10	104.80
	F2	D–16	8.270	4	1.578	13.05	52.20
	F2a	D–16	1.481	8	1.578	2.34	18.72
	F2b	D–16	1.871	8	1.578	2.95	23.60
	F3	D–16	4.220	24	1.578	6.66	159.84
	F4	D–16	4.188	12	1.578	6.61	79.32
	F4a	D–16	1.836	24	1.578	2.90	69.60
	F5	D–19	8.328	14	2.226	18.54	259.56
	F6	D–16	2.222	14	1.578	3.51	49.14
	F7	D–16	1.568	24	1.578	2.47	59.28
	F8	D–16	3.498	19	1.578	5.52	104.88
					SD–40 TOTAL = 2123.72 Kgs.		

NOTE : QUANTITIES FOR 1 ABUTMENT ONLY
LAP SPLICE 35 BAR DIAMETER

DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

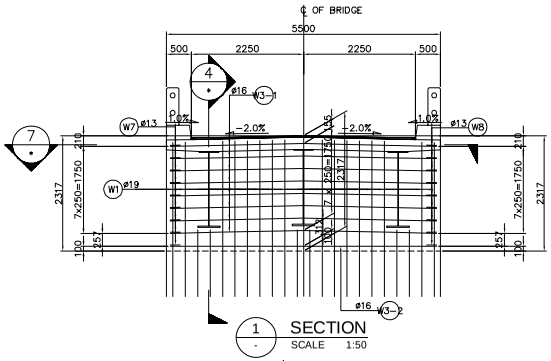
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE : BR-16 TELONANG BRIDGE
ABUTMENT A1 & A2 REINF. DETAILS (2/4)

SCALE : AS SHOWN

DRAWING No: 12-7

Rev.



1 SECTION
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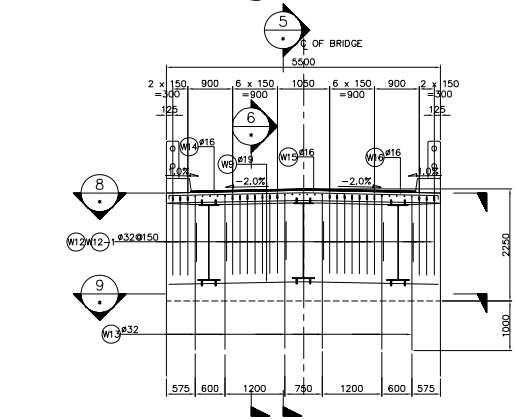

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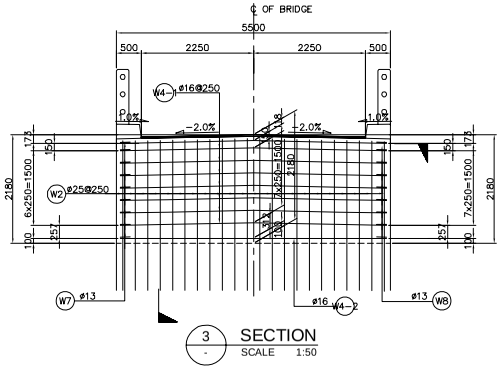
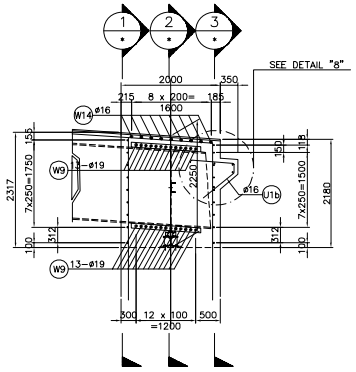
SCALE 1:50

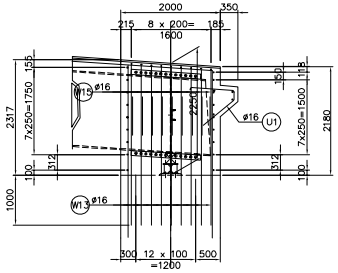


3 SECTION
SCALE 1:50

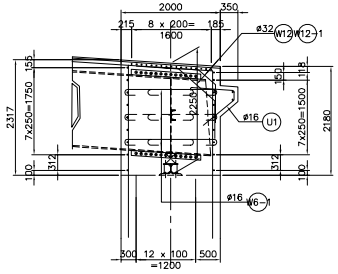
1 ABUTMENT DETAIL
SCALE 1:50



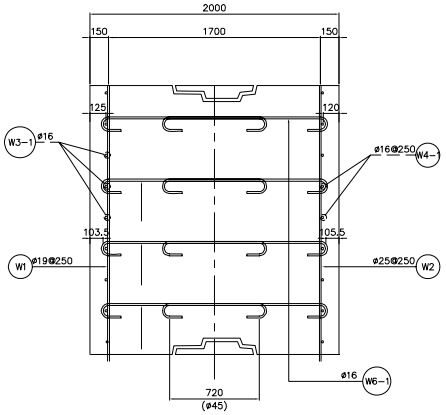
4 SECTION
SCALE 1:50



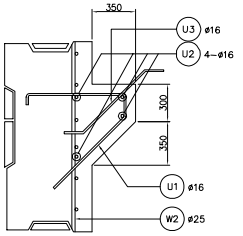
5 SECTION
SCALE 1:50



6 SECTION
SCALE 1:50

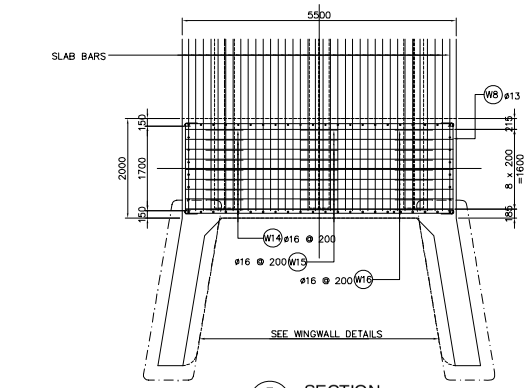


7 DETAIL
SCALE 1:20

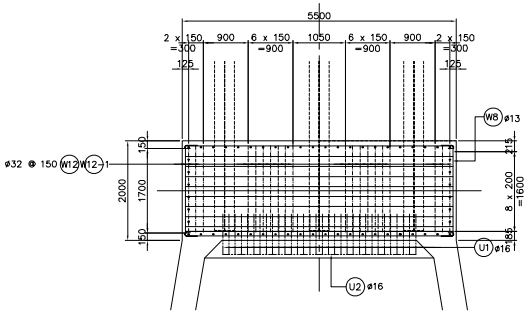


8 DETAIL
SCALE 1:20

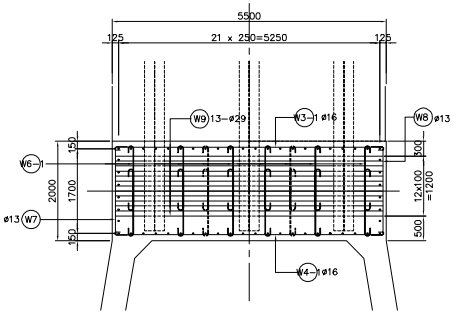
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG BRIDGE ABUT. A1 & A2 REINF. DETAILS (3/4)	SCALE: AS SHOWN	DRAWING No: 12-8 Rev.



7 - SECTION
SCALE 1:50

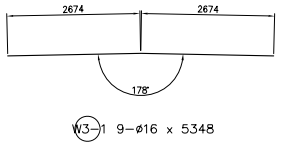


8 - SECTION
SCALE 1:50



9 - SECTION
SCALE 1:50

1 - ABUTMENT DETAIL
SCALE 1:50



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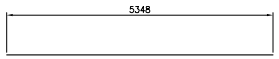
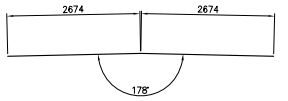
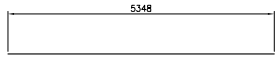


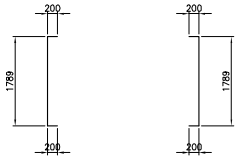
W3-2 1-ø16 x 5348



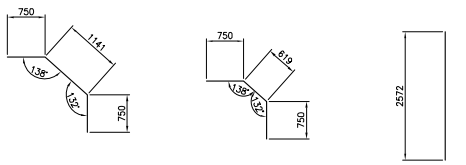
W4-1 9-ø16 x 5348



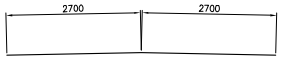
W4-2 1-ø16 x 5348



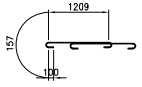
W7 10-ø13 x 2189 W8 10-ø13 x 2189



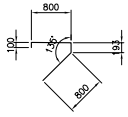
W12 20-ø32 x 2641 W12-1 20-ø32 x 2119 W13 57-ø16 x 2572



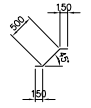
W9 26-ø19 x 5400



W6-1 14-ø16 x 3446



U1 24-ø16 x 1893



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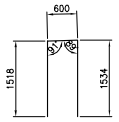
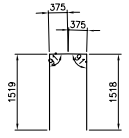
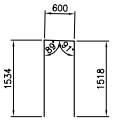


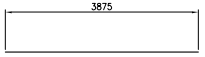
W14 9-ø16 x 3652



W15 9-ø16 x 3787



W16 9-ø16 x 3652



U2 4-ø16 x 3875

SCHEDULE OF REINFORCEMENT

	BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ABUTMENT	W3-1	D-16	5.348	9	1.578	8.44	75.96
	W3-2	D-16	5.348	1	1.578	8.44	8.44
	W4-1	D-16	5.348	9	1.578	8.44	75.96
	W4-2	D-16	5.348	1	1.578	8.44	8.44
	W6-1	D-16	3.446	14	1.578	5.44	76.16
	W7	D-13	2.189	10	1.042	2.28	22.80
	W8	D-13	2.189	10	1.042	2.28	22.80
	W9	D-19	5.400	26	2.226	12.02	312.52
	W12	D-32	2.641	20	6.313	16.67	333.40
	W12-1	D-32	2.119	20	6.313	13.38	267.60
	W13	D-16	2.572	57	1.578	4.06	231.42
	W14	D-16	3.652	9	1.578	5.76	51.84
	W15	D-16	3.787	9	1.578	5.98	53.82
	W16	D-16	3.652	14	1.578	5.44	76.16
	U1	D-16	1.893	24	1.578	2.99	71.76
	U2	D-16	3.875	4	1.578	6.11	24.44
	U3	D-16	0.800	32	1.578	1.26	40.32
						SD-40 TOTAL =	1,753.94 Kgs.

NOTE : QUANTITIES FOR 1 ABUTMENT ONLY

DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

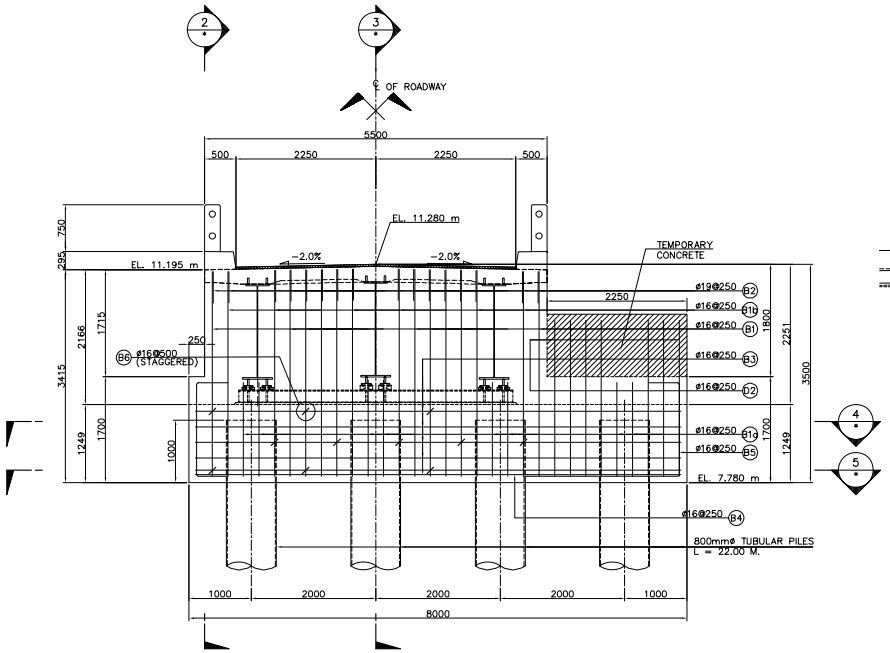
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE: BR-16 TELONANG BRIDGE ABUT. A1 & A2 REINF. DETAILS (4/4)

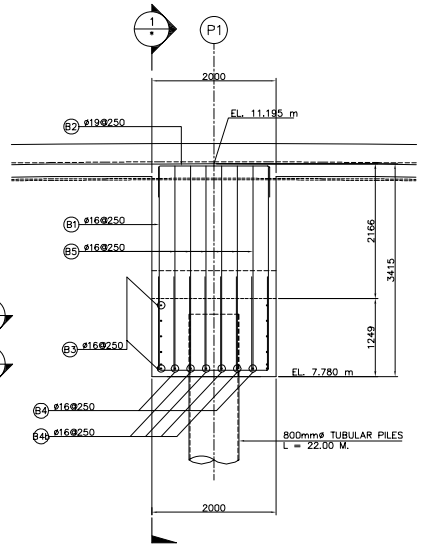
SCALE: AS SHOWN

DRAWING No: 12-9

Rev.



1 SECTION
SCALE 1:40



2 SECTION
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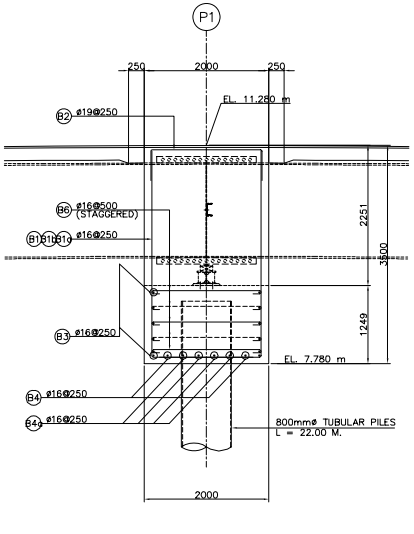
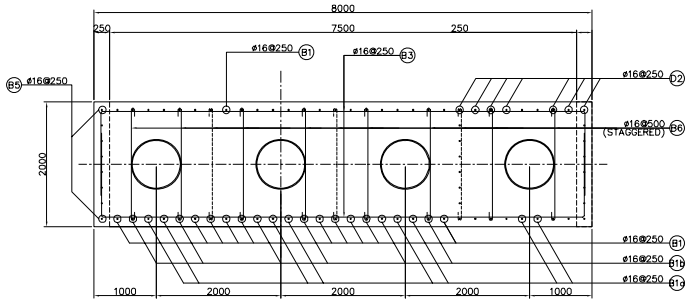


3 SECTION
SCALE 1:40



4 SECTION
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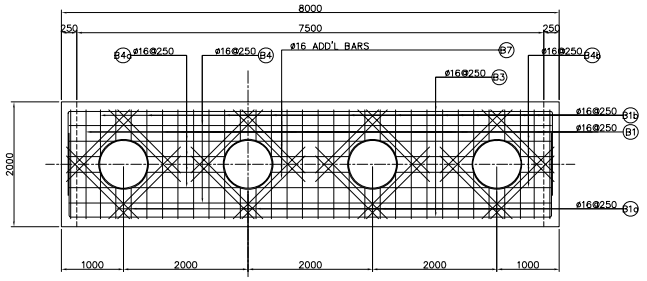
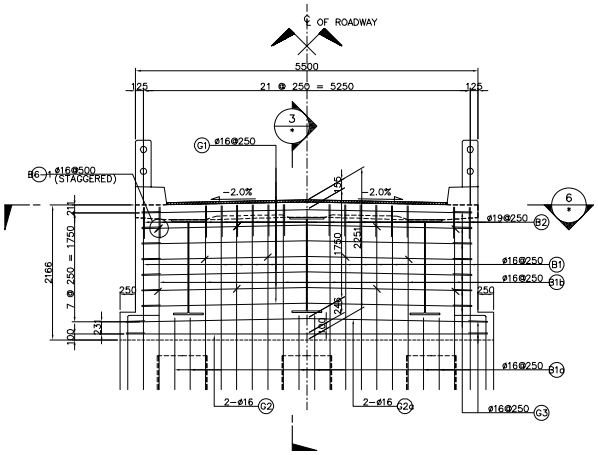
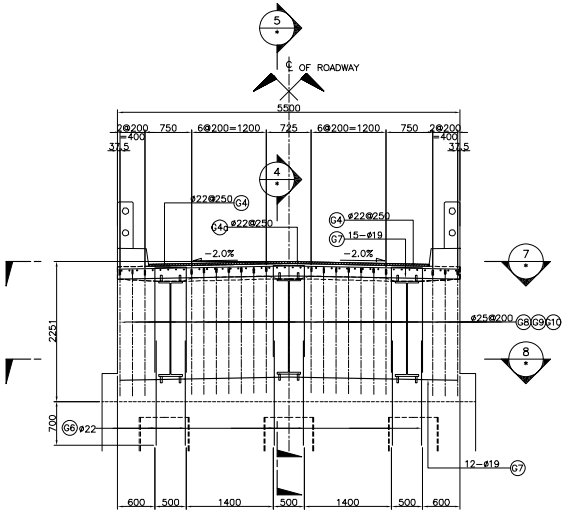


5 SECTION
SCALE 1:40

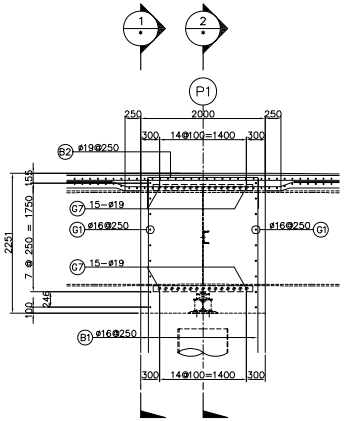
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG I BRIDGE PIER P1 REINFORCEMENT DETAILS (1/3)	SCALE: AS SHOWN	DRAWING No: 12-10 Rev.



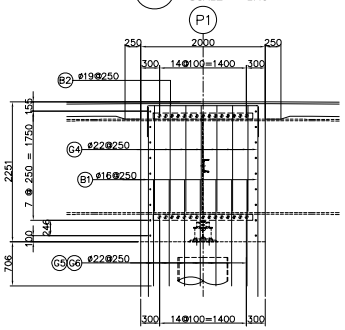
1 SECTION
SCALE 1:40



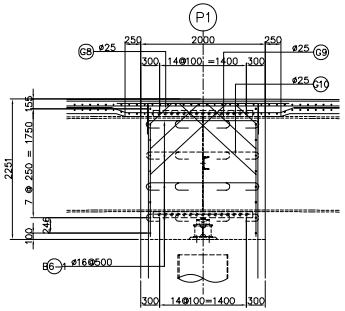
2 SECTION
SCALE 1:40



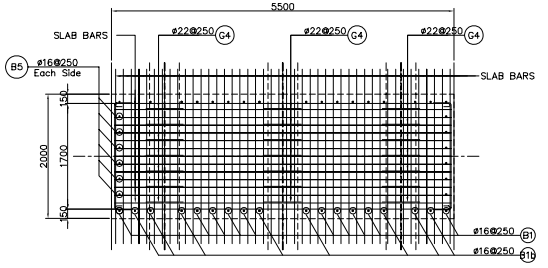
3 SECTION
SCALE 1:40



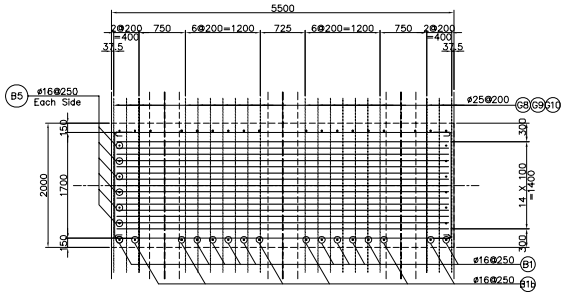
4 SECTION
SCALE 1:40



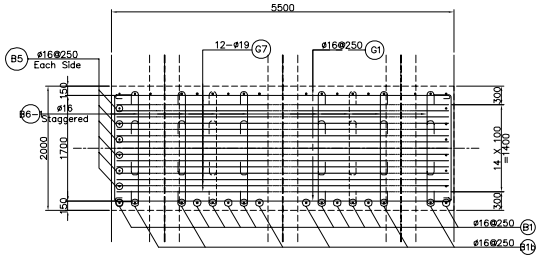
5 SECTION
SCALE 1:40



6 SECTION
SCALE 1:40

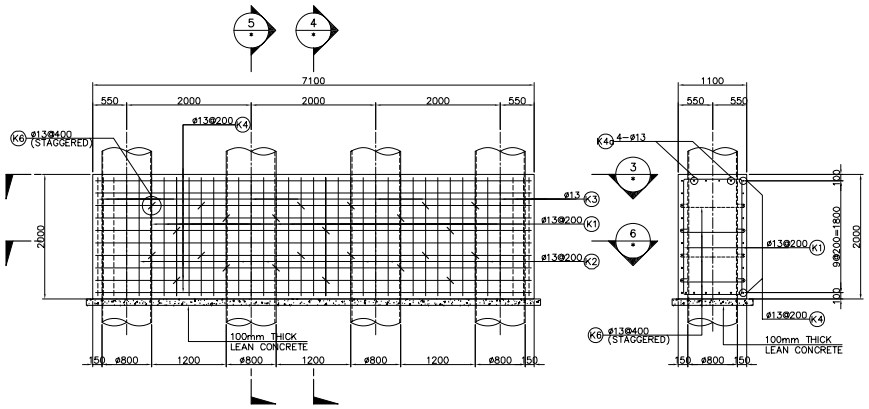


7 SECTION
SCALE 1:40



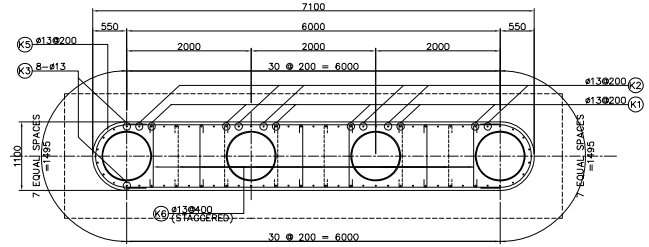
8 SECTION
SCALE 1:40

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG I BRIDGE PIER P1 REINFORCEMENT DETAILS (2/3)	SCALE: AS SHOWN	DRAWING No: 12-11 Rev.

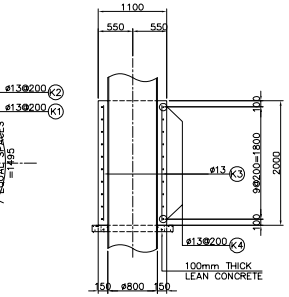


1 ELEVATION
SCALE 1:40

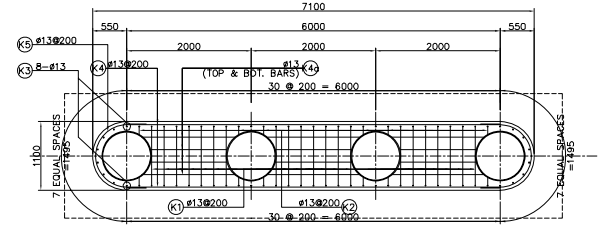
4 SECTION
SCALE 1:40



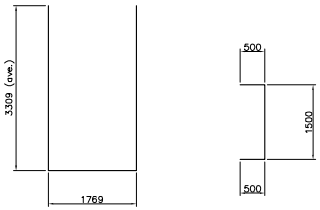
2 SECTION
SCALE 1:40



5 SECTION
SCALE 1:40

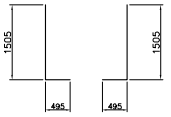


3 SECTION
SCALE 1:40

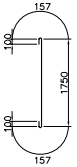


B1 10 – ø16 X 8387

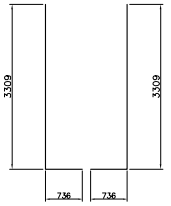
B5 16 – ø16 X 2500



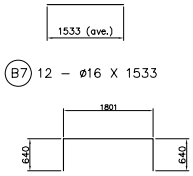
B1a 6 – ø16 X 4000



B6 8 – ø16 X 2264

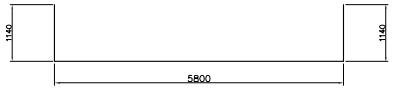


B1b 6 – ø16 X 8090

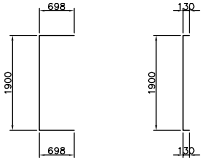


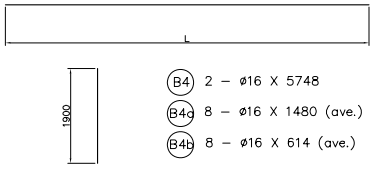
B7 12 – ø16 X 1533

B2 16 – ø19 X 3081



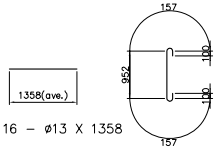
B3 10 – ø16 X 8080



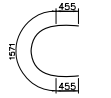


B4 2 – ø16 X 5748
B4a 8 – ø16 X 1480 (ave.)
B4b 8 – ø16 X 614 (ave.)

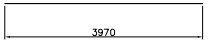
K1 28 – ø13 X 3296 K2 8 – ø13 X 2160 K3 16 – ø13 X 1900



K4a 16 – ø13 X 1358

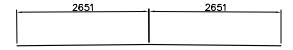


K5 20 – ø13 X 2481

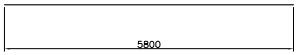


K4 120 – ø13 X 3970

NOTE:
1. DIMENSIONS ARE TABULATED OUT TO OUT OF BARS.

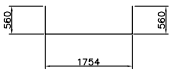


G1 14 – ø16 X 5302

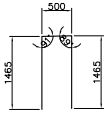


G2 2 – ø16 X 5800

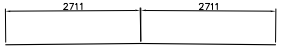
G2a 2 – ø16 X 5802



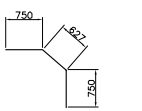
G3 18 – ø16 X 2874

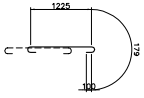


G4 21 – ø22 X 3430

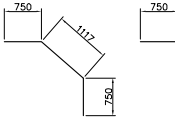


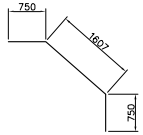
G7 30 – ø19 X 5422





G8 40 – ø25 X 2127 B6–1 12 – ø16 X 3566





G9 40 – ø25 X 2617 G10 40 – ø25 X 3107

G5 21 – ø22 X 1677 G6 21 – ø22 X 1677

SCHEDULE OF REINFORCEMENT

PIER P1

BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
B1	D–16	8.387	10	1.578	13.23	132.30
B1a	D–16	4.000	6	1.578	6.31	37.86
B1b	D–16	8.090	6	1.578	12.77	76.62
B2	D–19	3.081	16	2.226	6.86	109.76
B3	D–16	8.080	10	1.578	12.75	127.50
B4	D–16	5.748	2	1.578	9.07	18.14
B4a	D–16	1.480	8	1.578	2.34	18.72
B4b	D–16	0.614	8	1.578	0.97	7.76
B5	D–16	2.500	16	1.578	3.95	63.20
B6	D–16	2.264	8	1.578	3.57	28.56
B6–1	D–16	3.566	12	1.578	5.63	67.56
B7	D–16	1.533	12	1.578	2.42	29.04
G1	D–16	5.302	14	1.578	8.37	117.18
G2	D–16	5.800	2	1.578	9.15	18.30
G2a	D–16	5.802	2	1.578	9.16	18.32
G3	D–16	2.874	18	1.578	4.54	81.72
G4	D–22	3.430	21	2.984	10.24	215.04
G5	D–22	1.677	21	2.984	5.00	105.00
G6	D–22	1.677	21	2.984	5.00	105.00
G7	D–19	5.422	30	2.226	12.07	362.10
G8	D–25	2.127	40	3.853	8.20	328.00
G9	D–25	2.617	40	3.853	10.08	403.20
G10	D–25	3.107	40	3.853	11.97	478.80
K1	D–13	3.296	28	1.042	3.43	96.04
K2	D–13	2.160	8	1.042	2.25	18.00
K3	D–13	1.900	16	1.042	1.98	31.68
K4	D–13	3.970	20	1.042	4.14	82.80
K4a	D–13	1.367	16	1.042	1.42	22.72
K5	D–13	2.481	20	1.042	2.59	51.80
K6	D–13	1.466	16	1.042	1.53	24.48
					SD–40 TOTAL =	3,324.24 Kgs.

DIRECTORATE GENERAL OF HIGHWAY
MINISTRY OF PUBLIC WORKS
THE REPUBLIC OF INDONESIA

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

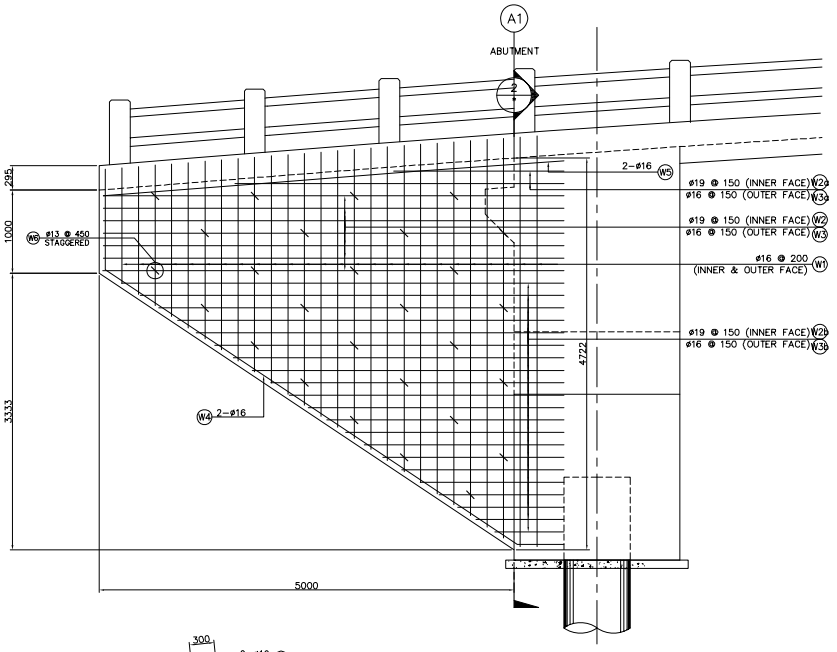
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE:
BR-16 TELONANG I BRIDGE
PIER P1 REINFORCEMENT DETAILS (3/3)

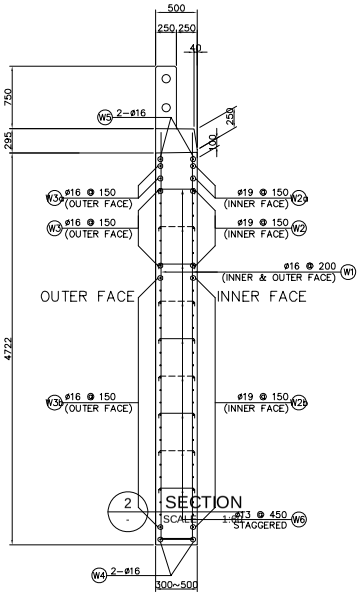
SCALE: AS SHOWN

DRAWING No: 12-12

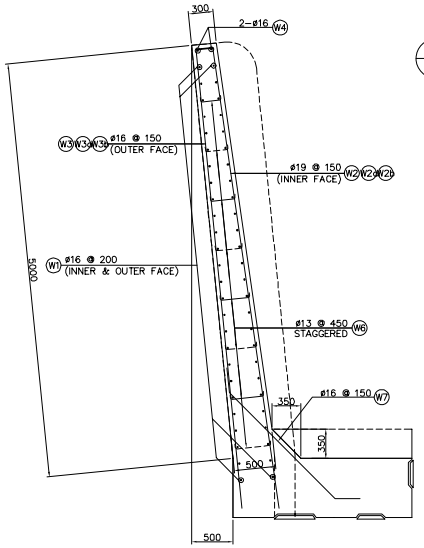
Rev.



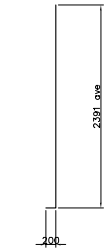
1 WINGWALL ELEVATION
SCALE 1:60



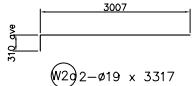
2 SECTION



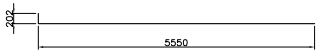
3 P L A N
SCALE 1:60



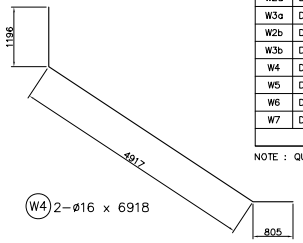
W1 52–ø16 x 2591



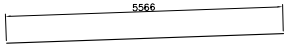
W2a 2–ø19 x 3317
W3a 2–ø16 x 3317



W2 7–ø19 x 5752
W3 7–ø16 x 5752

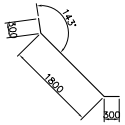


W4 2–ø16 x 6918

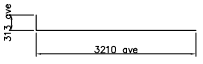


W5 2–ø16 x 5566

W6 16–ø13 x 590



W7 19–ø16 x 2400



W2b 8–ø19 x 3523
W3b 8–ø16 x 3523

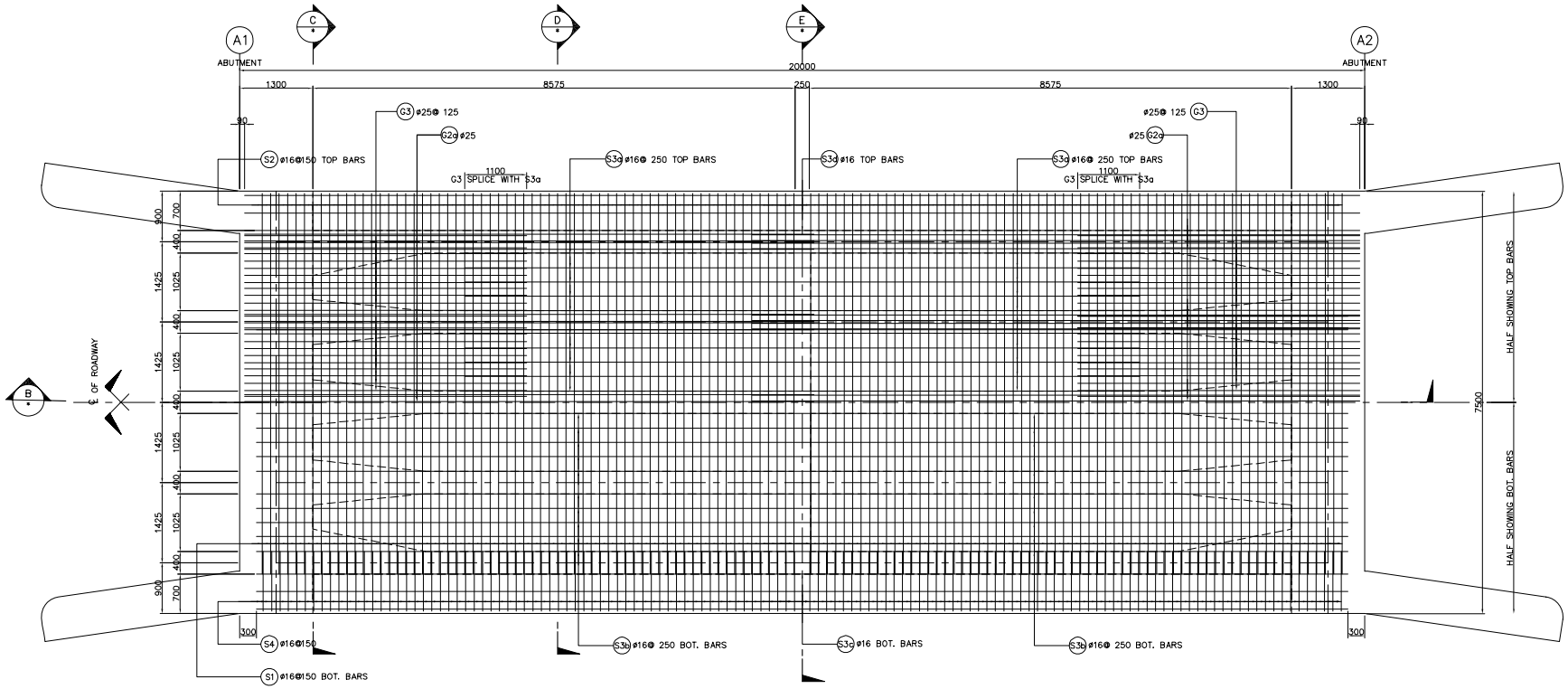
SCHEDULE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
W1	D–16	2.591	52	1.578	4.09	212.68
W2	D–19	5.752	7	2.226	12.80	89.60
W3	D–16	5.752	7	1.578	9.08	63.56
W2a	D–19	3.317	2	2.226	7.38	14.76
W3a	D–16	3.317	2	1.578	5.23	10.46
W2b	D–19	3.523	8	2.226	7.84	62.72
W3b	D–16	3.523	8	1.578	5.56	44.48
W4	D–16	6.918	2	1.578	10.92	21.84
W5	D–16	5.566	2	1.578	8.78	17.56
W6	D–13	0.590	16	1.042	0.61	9.76
W7	D–16	1.929	19	1.578	3.04	57.76
					SD–40 TOTAL=	605.18Kgs

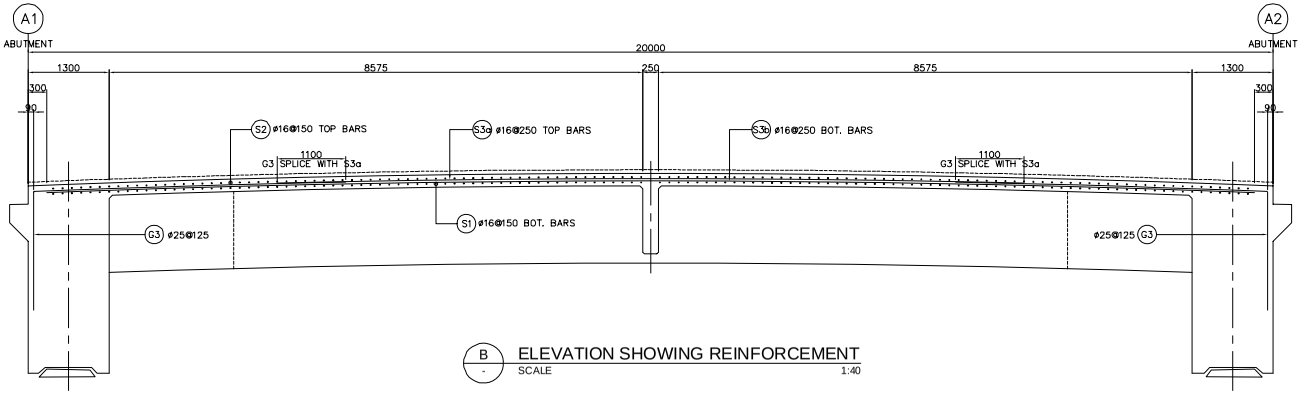
NOTE : QUANTITIES FOR 1 WINGWALL ONLY

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-16 TELONANG I BRIDGE ABUTMENT A1 WINGWALL DETAILS	SCALE: AS SHOWN DRAWING No: 12-13 Rev.

13. TYPICAL DETAIL DESIGN (RCDG)

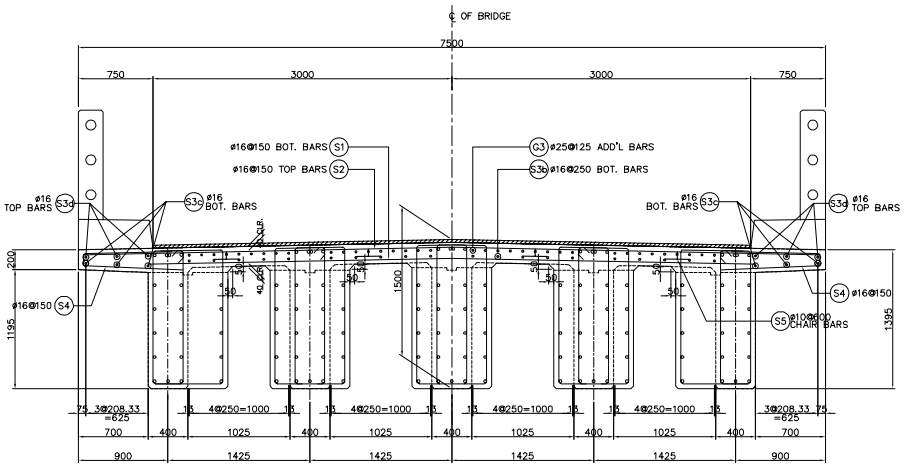


A PLAN SHOWING REINFORCEMENT
SCALE 1:40

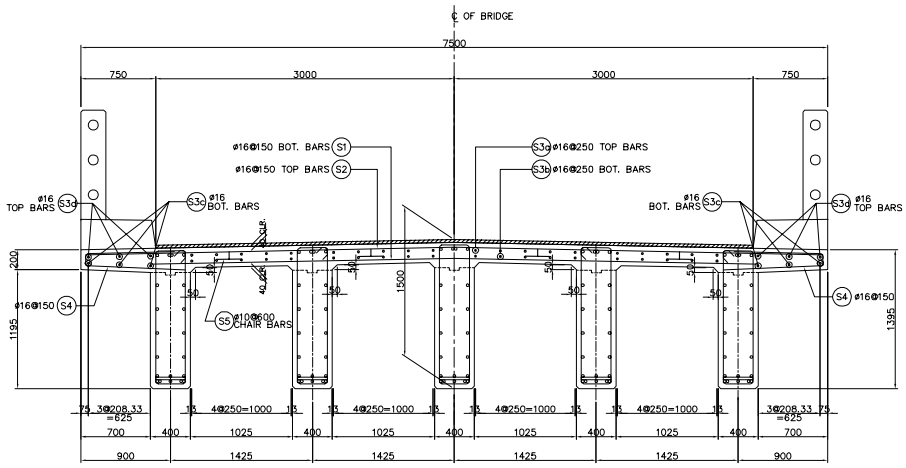


B ELEVATION SHOWING REINFORCEMENT
SCALE 1:40

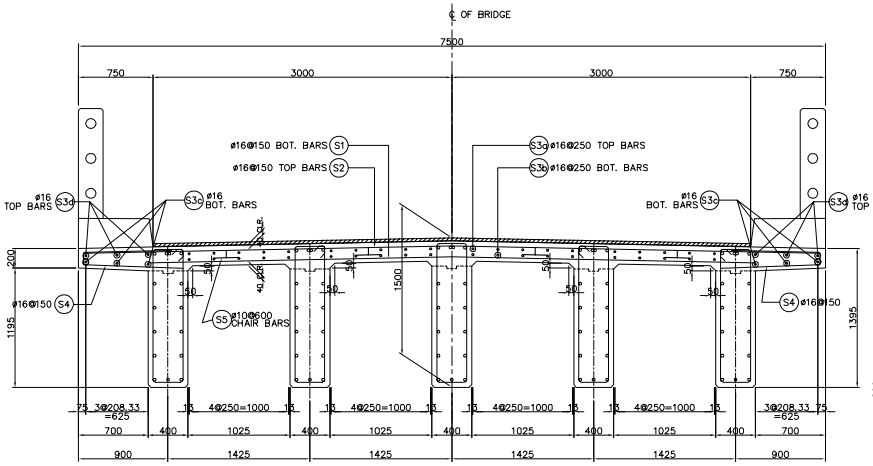
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE DECK SLAB REINF. DETAILS (1/2)	SCALE: AS SHOWN	DRAWING No: 13-1 Rev.



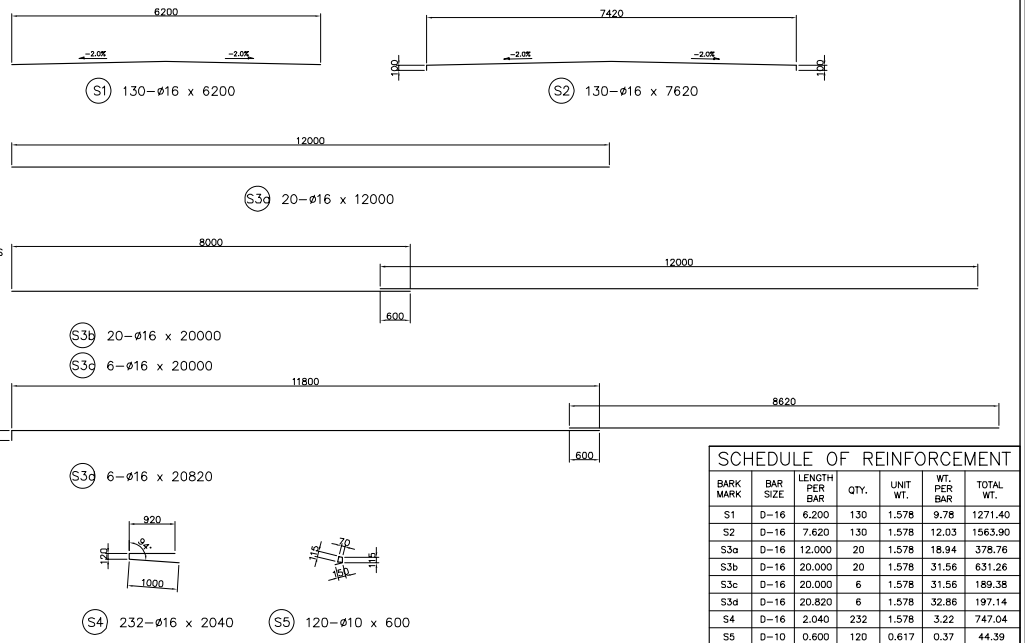
C SECTION
SCALE 1:25



E SECTION
SCALE 1:25



D SECTION
SCALE 1:25



SCHEDULE OF REINFORCEMENT

BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
S1	D–16	6.200	130	1.578	9.78	1271.40
S2	D–16	7.620	130	1.578	12.03	1563.90
S3a	D–16	12.000	20	1.578	18.94	378.76
S3b	D–16	20.000	20	1.578	31.56	631.26
S3c	D–16	20.000	6	1.578	31.56	189.38
S3d	D–16	20.820	6	1.578	32.86	197.14
S4	D–16	2.040	232	1.578	3.22	747.04
S5	D–10	0.600	120	0.617	0.37	44.39
					SD–40 TOTAL =	5,023.27 Kgs.

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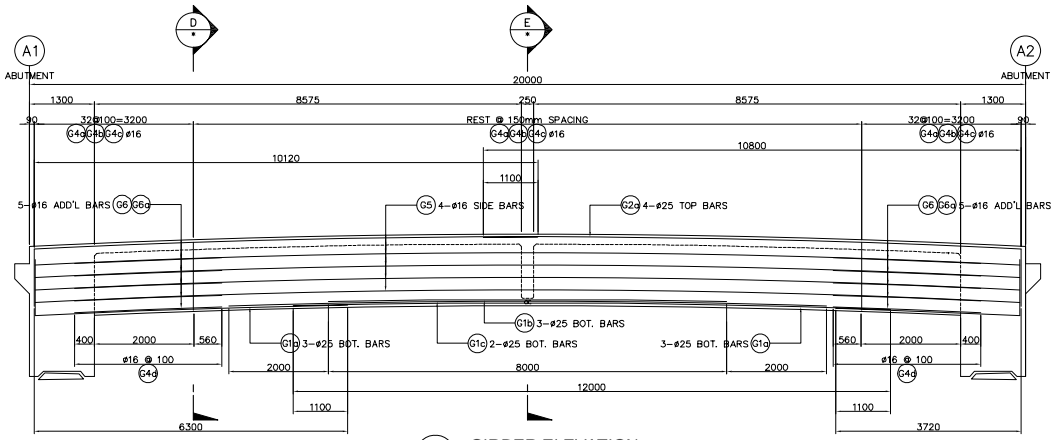
THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA

TITLE:
BR-32 PETAIN III BRIDGE
DECK SLAB REINF. DETAILS (2/2)

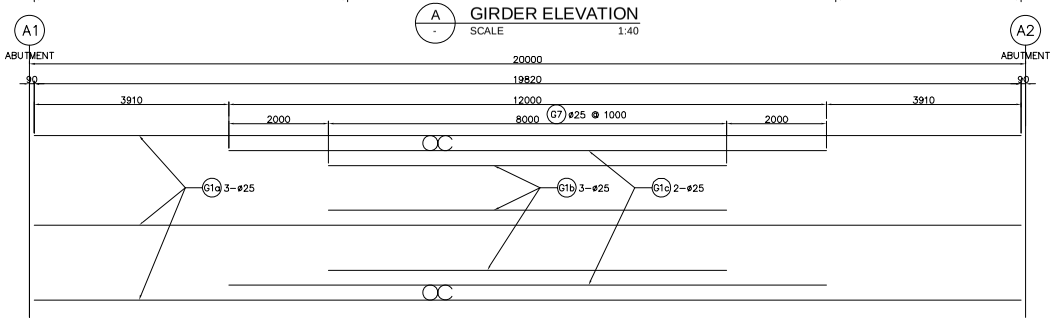
SCALE: AS SHOWN

DRAWING No: 13-2

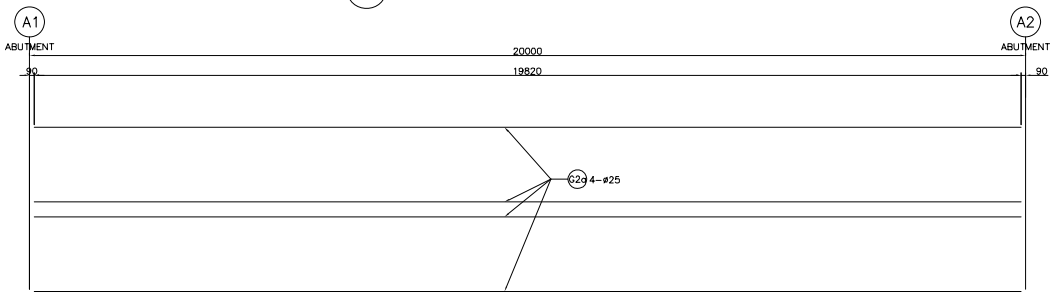
Rev.



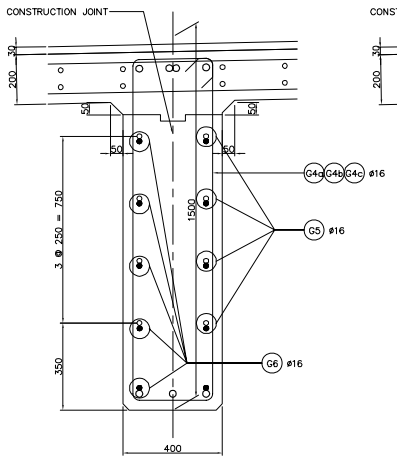
A - GIRDER ELEVATION
SCALE 1:40



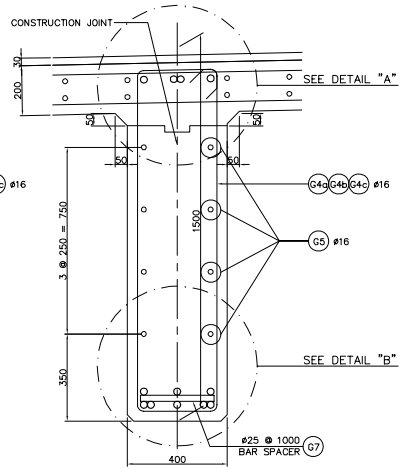
B - BOTTOM BAR SCHEMATIC DIAGRAM
SCALE 1:40



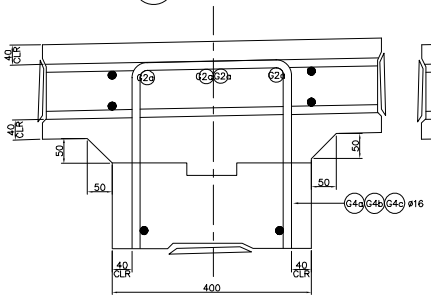
C - TOP BAR SCHEMATIC DIAGRAM
SCALE 1:40



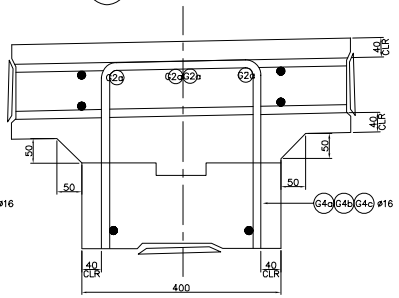
D - SECTION
SCALE 1:10



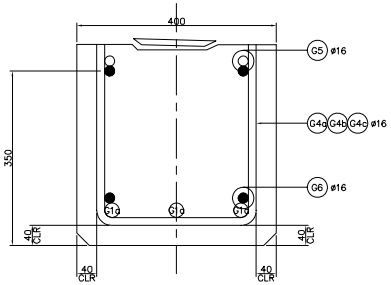
E - SECTION
SCALE 1:10



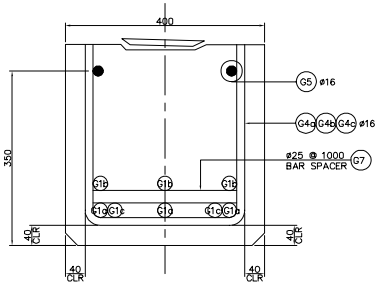
D - DETAIL "A" (NEAR SUPPORT)
SCALE 1:5



E - DETAIL "A" (MIDSPAN)
SCALE 1:5

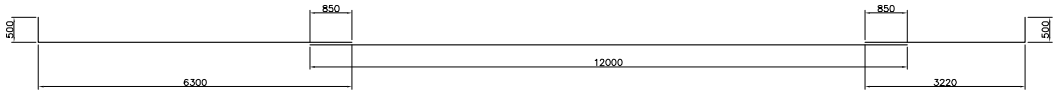


D - DETAIL "B" (NEAR SUPPORT)
SCALE 1:5



E - DETAIL "B" (MIDSPAN)
SCALE 1:5

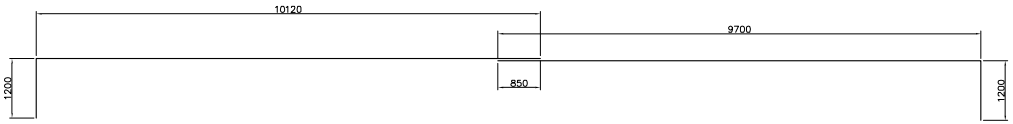
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE GIRDER ELEVATION, BOTTOM BAR LAYOUT & SECTION (1/2)	SCALE: AS SHOWN	DRAWING No: 13-3 Rev.



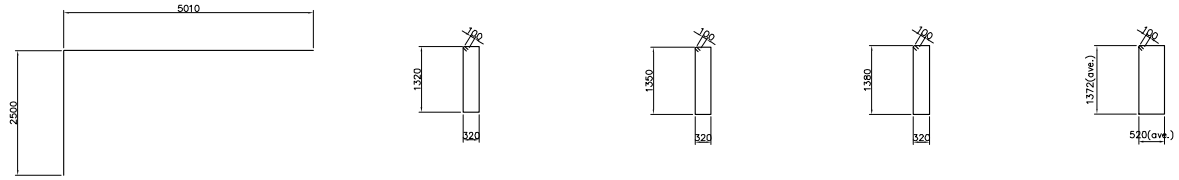
G1a 15–ø25 x 22520

G1b 15–ø25 x 8000

G1c 10–ø25 x 12000



G2a 20–ø29 x 22220



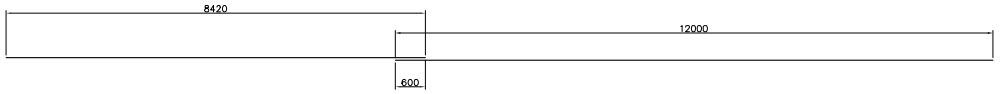
G3 72–ø25 x 7510

G4a 308–ø16 x 3480

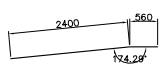
G4b 308–ø16 x 3540

G4c 154–ø16 x 3600

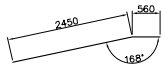
G4d 300–ø16 x 3984 (ave.)



G5 40–ø16 x 20420



G6 60–ø16 x 2960



G6a 20–ø16 x 3010
(EXTERIOR GIRDER)

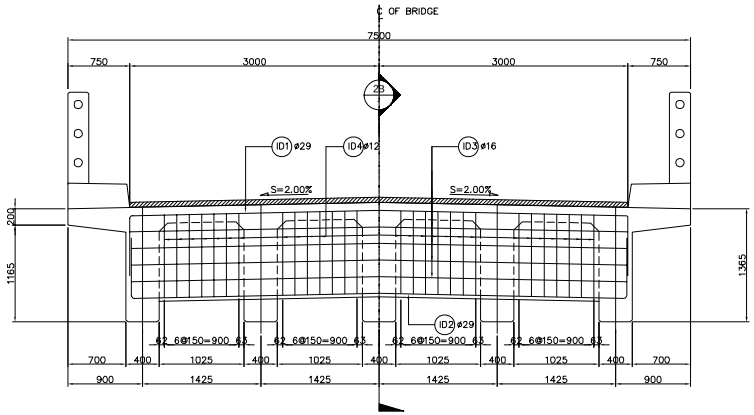
G7 45–ø25 x 320

SCHEDULE OF REINFORCEMENT

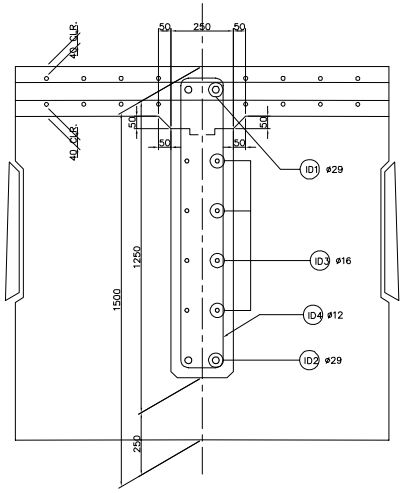
BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
G1a	D–25	22.520	15	3.853	86.77	1301.55
G1b	D–25	8.000	15	3.853	30.82	462.30
G1c	D–25	12.000	10	3.853	46.24	462.40
G2a	D–25	22.220	20	3.853	85.61	1712.20
G3	D–25	7.510	72	3.853	28.94	2083.68
G4a	D–16	3.480	308	1.578	5.49	1691.54
G4b	D–16	3.540	308	1.578	5.59	1720.70
G4c	D–16	3.600	154	1.578	5.68	874.93
G4d	D–16	3.984ave.	300	1.578	6.29	1886.22
G5	D–16	20.420	40	1.578	32.23	1289.04
G6	D–16	2.960	60	1.578	4.67	280.28
G6a	D–16	3.010	20	1.578	4.75	95.01
G7	D–25	0.320	45	3.853	1.23	55.48
					SD–40 TOTAL =	13915.25 Kgs.

NOTE : QUANTITIES FOR 5 GIRDERS

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE GIRDER ELEVATION, BOTTOM BAR LAYOUT & SECTION (2/2)	SCALE: AS SHOWN	DRAWING No: 13-4 Rev.

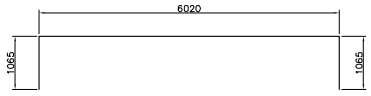


1A ELEVATION
SCALE 1 : 30

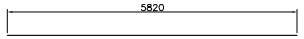


1B SECTION
SCALE 1 : 10

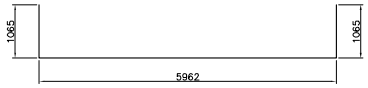
1 INTERMEDIATE DIAPHRAGM DETAIL
SCALE AS SHOWN



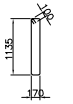
1D1 2–ø29 x 8150



1D3 8–ø16 x 5820



1D2 2–ø29 x 8092



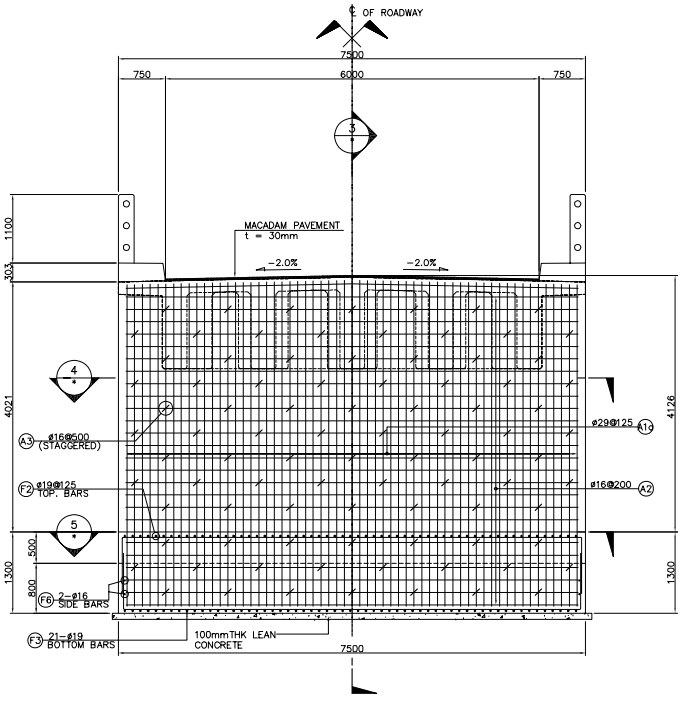
1D4 28–ø12 x 2810

SCHEDULE OF REINFORCEMENT

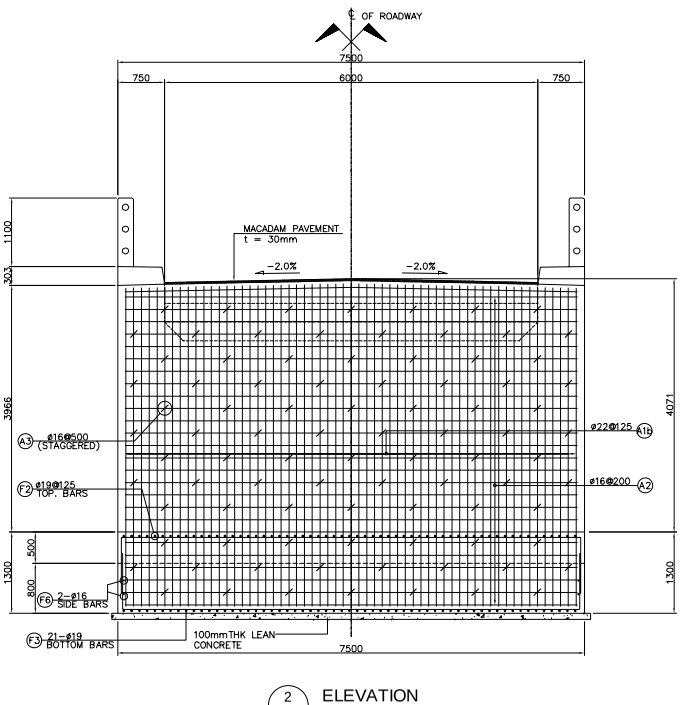
BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ID1	D–29	8.150	2	5.185	42.254	84.51
ID2	D–29	8.092	2	5.185	41.953	83.91
ID3	D–16	5.820	8	1.578	9.185	73.48
ID4	D–12	2.810	28	0.888	2.494	69.85
					SD–40 TOTAL=	311.74Kgs

QUANTITIES FOR 1 WINGWALL ONLY

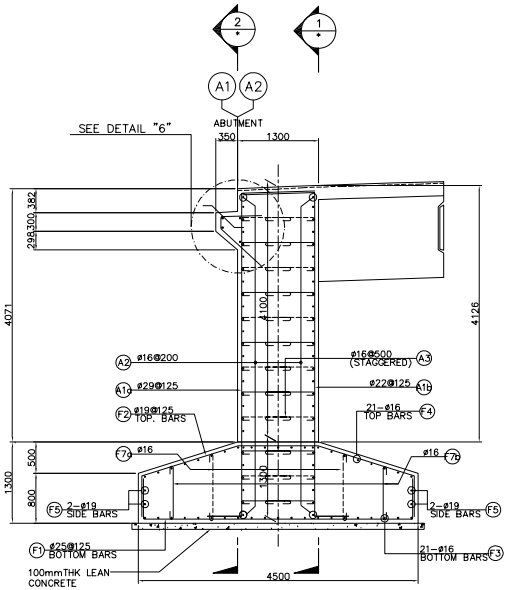
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE DIAPHRAGM DETAILS	SCALE: AS SHOWN	DRAWING No: 13-5 Rev.



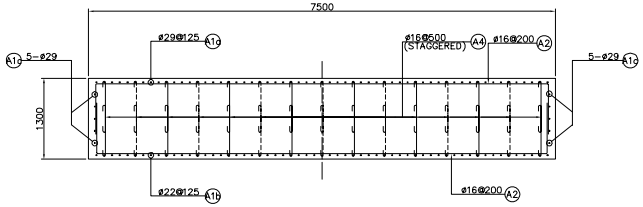
1 ELEVATION
SCALE 1:40



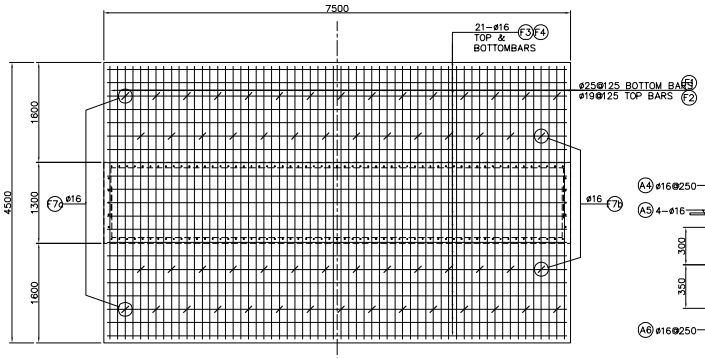
2 ELEVATION
SCALE 1:40



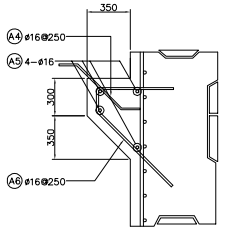
3 ELEVATION
SCALE 1:40



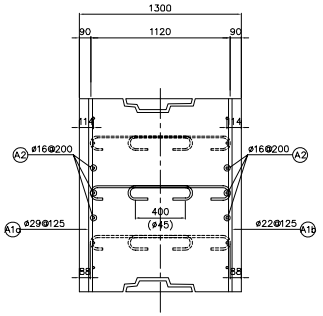
4 PLAN
SCALE 1:40



5 PLAN
SCALE 1:40

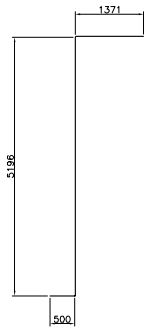


6 DETAIL
SCALE 1:20

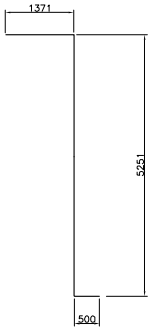


7 DETAIL
SCALE 1:20

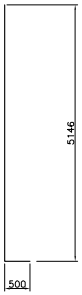
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE ABUT. A1 & A2 REINF. DETAILS (1/2)	SCALE: AS SHOWN	DRAWING No: 13-6 Rev.



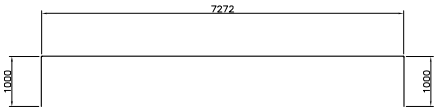
A1a 59–ø29 x 7067



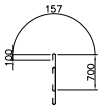
A1b 59–ø22 x 7122



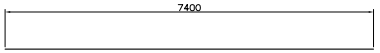
A1c 10–ø29 x 5646



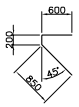
A2 54 –ø16 x 9272



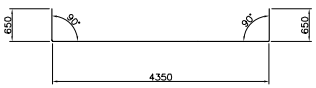
A3 90–ø16 x 2428 A4 28–ø16 x 1100



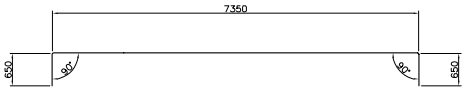
A5 4–ø16 x 7400



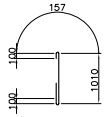
A6 28–ø16 x 1650



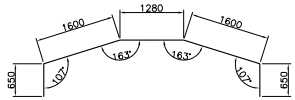
F1 59–ø25 x 5650



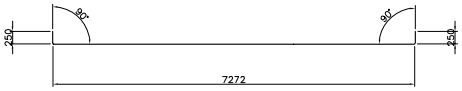
F4 21–ø16 x 8650



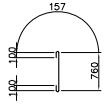
F7a 28–ø16 x 1524



F2 59–ø19 x 5780



F5 4–ø19 x 7772



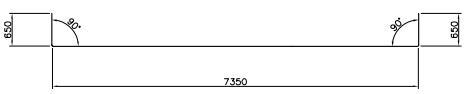
F7b 30–ø16 x 1274

SCHEDULE OF REINFORCEMENT

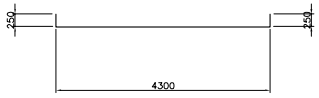
ABUTMENT A1–A2

BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
A1a	D–29	7.067	59	5.185	36.64	2161.76
A1b	D–22	7.122	59	2.984	21.25	1253.75
A1c	D–29	5.646	10	5.185	29.27	292.70
A2	D–16	9.272	54	1.578	14.63	790.02
A3	D–16	2.428	90	1.578	3.83	344.70
A4	D–16	1.100	28	1.578	1.74	48.72
A5	D–16	7.400	4	1.578	11.68	46.72
A6	D–16	1.650	28	1.578	2.60	72.80
F1	D–25	5.650	59	3.853	21.77	1284.43
F2	D–19	5.780	59	2.226	12.87	759.33
F3	D–16	8.650	21	1.578	13.65	286.65
F4	D–16	8.650	21	1.578	13.65	286.65
F5	D–19	7.772	4	2.226	21.53	69.20
F6	D–16	5.780	4	2.226	17.30	51.48
F7a	D–16	1.524	28	1.578	2.40	67.20
F7b	D–16	1.274	30	1.578	2.01	60.30
					SD–40 TOTAL =	7876.41 Kgs.

QUATITIES ARE FOR 1 ABUTMENT ONLY
LAP SPLICE 35 BAR DIAMETER

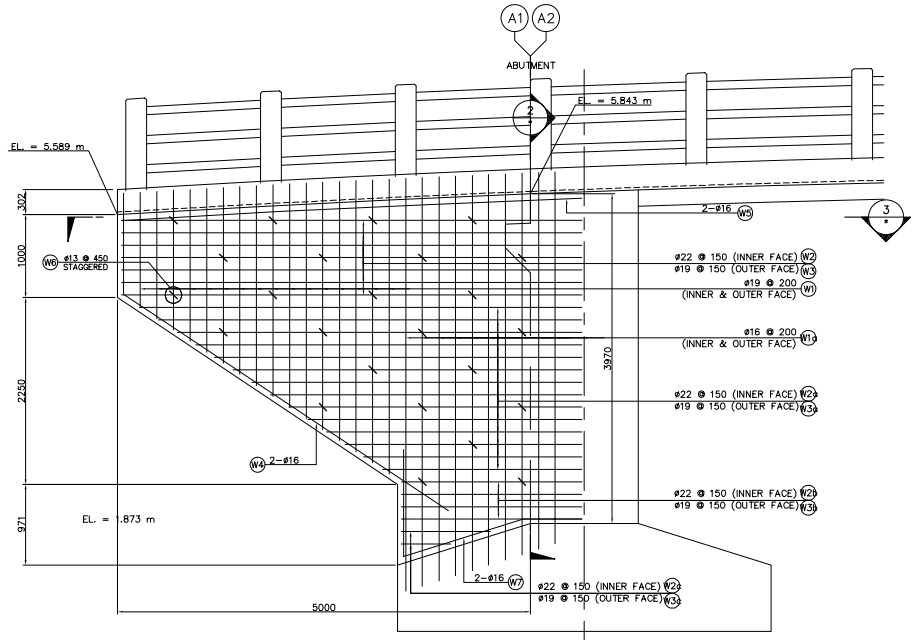


F3 21–ø16 x 8650

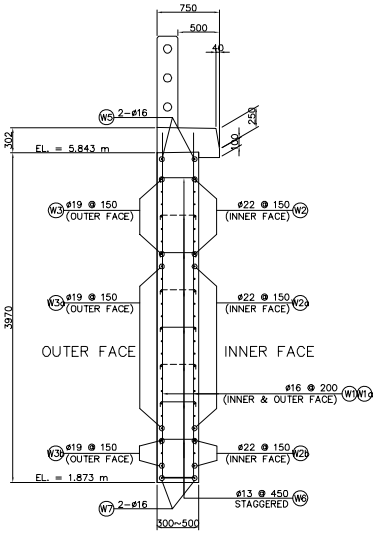


F6 4–ø19 x 4800

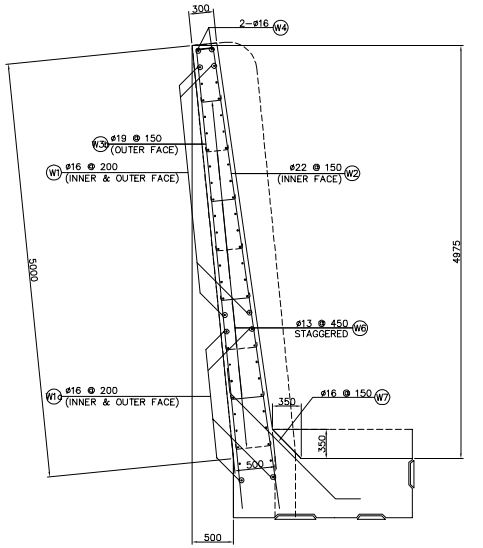
DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE ABUT. A1 & A2 REINF. DETAILS (2/2)	SCALE: AS SHOWN	DRAWING No: 13-7 Rev.



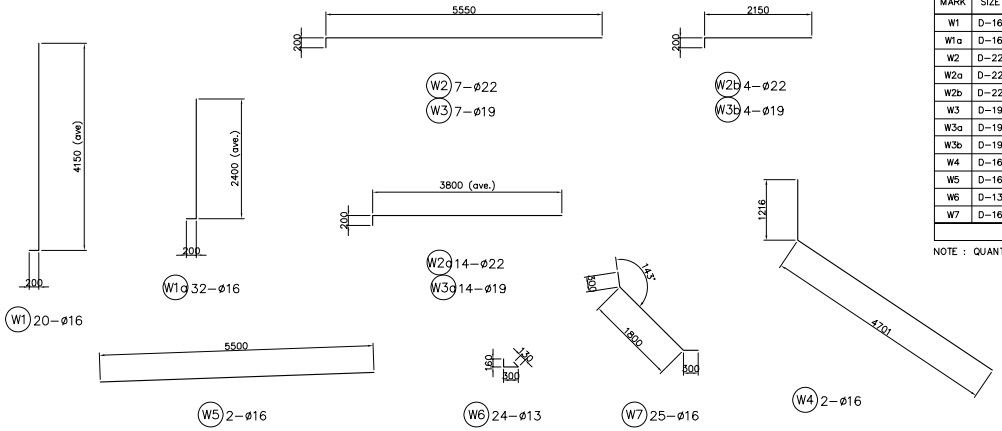
1 - WINGWALL ELEVATION
SCALE 1:60



2 - SECTION
SCALE 1:60



3 - P L A N
SCALE 1:60



SCHEDULE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
W1	D–16	4.350ave.	20	1.578	6.68	137.20
W1a	D–16	2.600ave.	32	1.578	4.10	131.20
W2	D–22	5.750	7	2.984	17.16	120.12
W2a	D–22	4.000ave.	14	2.984	11.94	167.16
W2b	D–22	2.350	4	2.984	7.01	28.04
W3	D–19	5.750	7	2.226	12.80	89.60
W3a	D–19	4.000ave.	14	2.226	8.90	124.60
W3b	D–19	2.350	4	2.226	5.23	20.92
W4	D–16	5.917	2	1.578	9.34	18.68
W5	D–16	5.500	2	1.578	8.68	17.36
W6	D–13	0.590ave.	24	1.042	0.61	14.64
W7	D–16	1.929	25	1.578	3.04	76.00
					SD–40 TOTAL=	945.52 Kgs

NOTE : QUANTITIES FOR 1 WINGWALL ONLY

DIRECTORATE GENERAL OF HIGHWAY MINISTRY OF PUBLIC WORKS THE REPUBLIC OF INDONESIA	JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	THE PREPARATORY SURVEY ON THE PROJECT FOR CONSTRUCTION OF BRIDGES IN THE PROVINCE OF NUSA TENGGARA BARAT, PHASE-3 IN THE REPUBLIC OF INDONESIA	TITLE: BR-32 PETAIN III BRIDGE ABUTMENT A1&A2 WINGWALL DETAILS	SCALE: AS SHOWN DRAWING No: 13-8 Rev.

2.2.4 Implementation Plan

2.2.4.1 Implementation Policy

(1) Basic Condition of the Project Implementation

The basic conditions for the project implementation are as follows:

- This project, if approved, will be implemented in accordance with the Japan's grant scheme after the signing of the Exchange of Notes and Grant Agreement between the Government of Japan and the Government of Indonesia.
- The Directorate General of highway of the Ministry of Public Works is responsible for implementing the Project.
- The detailed design, assistance in tendering and construction supervision of the project will be undertaken by a Japanese consulting firm in accordance with a contract between the Ministry of Public Works and the consulting firm.
- The construction will be undertaken by a successful Japanese tenderer who wins the contract with the Ministry of Public Works.

(2) Implementation Policy

Construction Planning

- Construction methods and schedules are planned with consideration of local natural conditions such as climate, topography, geology and hydrology.
- Common methods which do not require special equipment and technique are planned.
- Constructability and safety are considered in the construction planning.
- Full attention is paid to the environmental preservation during the construction.
- Temporary detours are provided if necessary for public traffic.

Construction supervision planning

- Appropriate technical specifications and quality control requirements are established and included in the contract documents.
- Organization of construction management by a contractor and construction supervision by a consultant are planned to meet the standardized construction management requirements.
- Counter-measures for preventing accidents are secured.

Material procurement planning

- All materials, equipments and laborers required for the project are procured from Indonesia.
- The materials and equipment for the Project are planned in transportable size and specifications since the transportation route condition is bad and trailer truck is not possible to transport them.
- Cost efficiency is considered in selection of materials and equipment and construction

planning.

2.2.4.2 Implementation Condition

(1) Safety Measure

Safety measures should be established to prevent accident in the construction.

Accidents prone to happen in bridge construction

- Falling down of girder : Breaking of hangers, overturning of crane are major cause
- Scaffolding / support collapse: Inadequate support or soil strength is major cause
- Excavation slope failure: lack of support, inadequate strength of support are major cause
- Falling down of worker: Lack or ignorance of using safety device is major cause

Safety measure in construction site

- Safety officers are deployed
- Construction plan including temporary works is submitted and checked.
- Works are checked whether they are compliant with the construction plan.
- Construction plan is informed to all related persons.
- Action should be taken when failure and accident happen.

Safety measure in transportation

- Safety seminars are given to drivers.
- Driving at night should be avoided.
- Transportation plans are submitted and checked.

(2) Transportation Condition

Transportable construction equipment

The Project road passes through steep mountains and there are many road sections steeper than 15% and sharp curves with radius less than 15 m. Semi-trailer may not pass through such substandard road sections. As the result, crawler type equipments are not available for the Project since only semi-trailer can carry such equipment. Only small-sized construction equipments transportable by trucks or self-propelled equipment are possible to be procured.

Transportation through sea route

Padas Port in Sumbawa Besar has enough capacity for landing large-sized goods. However, there are mountainous road sections between the port and the Project site that makes transportation of large-sized materials and equipment by semi-trailer difficult. Instead, a landing craft is available, as it was used in Phase-2 of the Project, for transportation of large-sized materials such as reinforcing bars, steel girders and large construction equipments from Jakarta to a beach close to Lunyuk.

(3) Construction Sequence of Integral Type Bridges

Integral type bridges should be constructed with the sequences similar to what was assumed in the design analysis and constructed symmetrically. Additionally the concrete pouring sequences should be planned so as to avoid cracking due to deformation caused by the weight of subsequent concrete pouring. The construction sequences should be clearly instructed in the construction plans and the construction should be executed in accordance with the instructions.

(4) Temporary Detour Road

Temporary detour roads for public traffic and for construction vehicles are planned for the bridges which are planned to be constructed on the existing road. The temporary detour roads plan is shown in Appendix-7.

(5) Observance of UKL & UPL

UKL & UPL approved by BLHP and the Recommendation from BLHP should be observed in the construction of the project bridges. Environmental monitoring reports should be prepared and report to the concerned agencies every 6 month. The major contents of the UKL & UPL are as shown in Table 2.2-7. The environmental monitoring form is shown in Annex-6 of Minutes of Discussions (Appendix-4).

Table 2.2-7 Major Contents of UKL&UPL

The major items of emvironmental impact management to be taken in the construction of project bridges are as follows.

1. Land acquisiton

   The forest land owned by regency can be used for the project without compensation. However, private land and trees should be compensated based on the deliberated rate in accordance with laws and regulations.

2. Employment opportunity creation

   Local manpower should be maximum utilized. Wage should referred to regency minimum wage. Training is given to laborers to improve their skills.

3. Air and noise pollution mitigation

   To water routinely on the dusty roads, install dust-collector of plant if necessary, secur distance of base camp from residential area, regulate vehicle speed slower than 40 km/hr and ban overtime work. To clear and vegitate the area where camps were.

4. Riverwater pollution prevention

   To treat polluted water properly, discharge muddy water after clearing, install septic tanks for every camps and treat rubbish properly but not to dump directly.

5. Soil pollution prevention

   To store fuel and oil in a storage, collect waste oil then send to oil treatment plant, collect spilled oil immediately before it discharges to the river by rainwater and treat toxic and hazardous substances in accordance with law and regulation.

6. Traffic control and safety

   To install flag man for transporting heavy equipments, hold safety campaign for students, install warning signs and traffic safety signs and regulate max driving speed to be 40 km/hr.

7. Accident prevention

   To let workers wear safety devices (helmet, musk, earplug, safety shoe, goggle, etc.)

8. Health control

   To manitain camp sanitary and prevent malaria and hemorrahagic fever by covering breding spots and fill water ponds.

9. Road damage

   To limit the size and weigh of heavy equipments which are to use the road and repair the road immediately when damaged.

10. Disruption of utility

    To relocate power poles, coordinate with regency government and Sumbawa Electric Enterprise (PLN).

11. Gravel quarring

    To ban quarring river gravel within 500m from any bridge.

12. Preservation of forest

    To ban fire, cut trees, hunting animals in the forest, and install sign boards of these information.

13. Post construction environmental management

    To ban construciton buildings close to bridges and control traffic operation.

2.2.4.3 Scope of Works

Responsibilities of both Japanese and Indonesian governments are shown on Table 2.2-8.

Table 2.2-8 Responsibilities of Both Governments

Items	Contents	Undertaken by		Remarks
		Japan	Indonesia	
Procurement of materials and equipment	Procurement and delivery	○		
Preparation work	Improvement of Project road		○	
	Construction of bridges excluded from Japan's grant		○	
	Land acquisition for construction		○	
	Rent temporary work areas		○	For detour, camp, work yards
	Securing borrow pit and disposal area		○	
	Relocation/removal of construction obstacles		○	
	Other preparation work	○		
Construction works	Bridge construction	○		

2.2.4.4 Construction Supervision Plan

A Japanese consultant will carry out the detailed design, assistance in tendering and construction supervision in accordance with the contract between the Ministry of Public Works and the consultant.

(1) Detailed Design

Major works in the detailed design to be carried out by the consultant are as follows:

Detailed Design

- Commencement meeting with the Directorate General of Highways and site survey
- Detailed design and preparation of drawings
- Quantity calculation and cost re-estimate

The time required for the detailed design is estimated 1 month.

(2) Assistance in Tendering

Major items of the services in the assistance in tendering are as follows:

- Preparation of tender documents (conducted simultaneously with the detailed design)
- Tender publication
- Pre-qualification
- Assistance in tendering
- Tender evaluation
- Contract facilitation

The time required for the assistance in tendering is estimated 3 months.

(3) Construction Supervision

The consultant will carry out the supervision of the construction works executed by the contractor. Major items of the construction supervision are as follows:

- Inspection and approval of site survey
- Inspection and approval of construction plan
- Quality control
- Progress control
- Measurement of work
- Inspection of safety aspects
- Management of environmental requirements
- Final inspection and hand-over

The required construction period is estimated 20 months. For the construction supervision, a Japanese-national engineer is required to be stationed on the site. Additionally, an Indonesian engineer is planned to be stationed on the site.

2.2.4.5 Quality Control Plan

Quality control plan for concrete work, earthwork and pavement work and plate girder fabrication work are shown on Table 2.2-9 to Table 2.2-11, respectively.

Table 2.2-9 Quality Control Plan for Concrete Work

Item	Test	Test Method (Specification)	Frequency of Test
Cement	Physical property test	AASHTO M85	Once before trial mix. Thereafter, once every 500 m^3 concreting or when the material brand is changed.
Fine aggregate	Physical property test	AASHTO M6	Once before trial mix. Thereafter, once every 500m^3 concreting or when supplying place is changed (with confirmation of the supplier's data).
	Sieve analysis	AASHTO T27	Once a month.
Coarse aggregate	Physical property test	AASHTO M80	Once before trial mix. Thereafter, once every 500m^3 concreting or when the material source is changed (with confirmation of the supplier's data).
	Sieve analysis	AASHTO T27	Once a month.
Water	Quality test	AASHTO T26	Once before trial mix.
Concrete	Slump test	AASHTO T119	Twice a day
	Air content test	AASHTO T121	Twice a day
	Compressive strength test	AASHTO T22	6 specimens per placement or 6 specimens per 75 m^3 when concrete volume in one placement is big (3 specimens for 7 days strength test and 3 specimens for 28 days strength test).
	Temperature	—	Twice a day
	Salinity test	—	Twice a day

Table 2.2-10 Quality Control Plan for Earthwork and Pavement Work

Item	Test	Test Method (Specification)	Frequency of Test
Embankment	Density test (compaction test)	AASHTO T191	Once every 500 m^2
Base course	Site density test (compaction test)	AASHTO T191	Once every 1,000 m^2
	Sieve analysis	AASHTO T27	Once every 500m^3
Asphalt pavement	Temperature of asphalt mixture	-	5 times a day.
	Abrasion	AASHTO T96	Once every 1,500m^3 or when the material source is changed (with confirmation of the supplier's data).

Table 2.2-11 Quality Control Plan for Plate Girder Fabrication Work

Item	Test	Test Method (Specification)	Frequency of Test
Steel plate	Mill sheet quality test	JISG3101	Before work
High tensile bolt	Mill sheet quality test	JISB0205/Z2201	Before work
Galvanizing	Weighing test	JISH0401	Every work
Welding	X-ray radio graphic flaw detection, Liquid penetration test	JISG3106	Every work
Shop assembly	Japanese Road Association Specifications	JISG3101	Every bridge
Fabrication factory	ISO 9001 Certified Factory		

2.2.4.6 Procurement Plan

All construction materials and equipments necessary for the Project are available in Indonesia. Equipments owned by local contractors will be rented for the project. The material and equipment procurement plan is shown on Table 2.2-12Table .

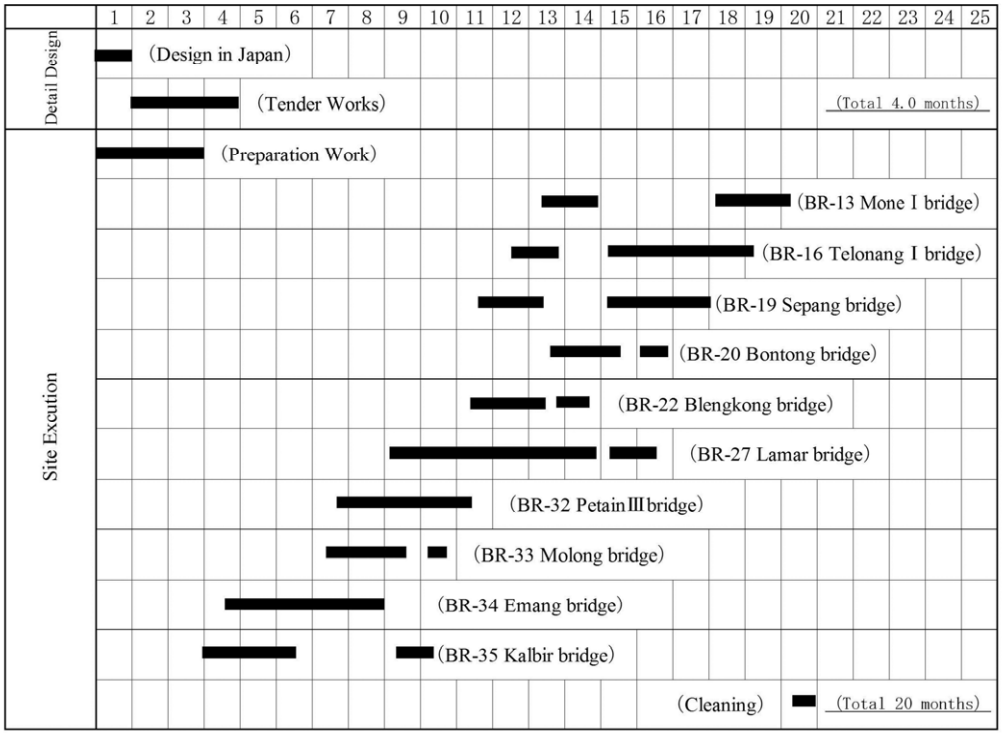
Table 2.2-12 Material and Equipment Procurement Plan

Item	Procured from			Remarks
	Indonesia	Japan	Third Country	
Construction Materials				
Crushed stone	○			
Cement	○			
Sand	○			
Boulder	○			
Aggregate	○			
Asphalt	○			
Reinforcing bar	○			
Concrete additives	○			
Steel girder	○			
Gabion	○			
Steel tubular pile	○			
Guardrail	○			
Timber	○			
Plywood	○			
Timber support	○			
Fuel, oil	○			
Equipments				
Bulldozer	○			
Backhoe	○			
Hydraulic clamshell	○			
Dump truck	○			
Crane mounted truck	○			
Loader	○			
Diesel hammer	○			
Vibratory hammer	○			
Breaker	○			
Motor grader	○			
Road roller	○			
Tire roller	○			
Vibratory roller	○			
Tamper	○			
Concrete mixing plant	○			
Truck mixer	○			
Asphalt kettle	○			
Water tanker	○			
Propotion (%)	100	0	0	

2.2.4.7 Implementation Schedule

The implementation schedule of the Project is shown on Table 2.2-13. The construction can be implemented during rainy seasons since the river water level becomes high just after strong rains only.

Table 2.2-13 Implementation Schedule



2.3 OBLIGATIONS OF THE RECIPIENT COUNTRY

The following works should be undertaken by the government of Indonesia on condition that the grant aid by the Government of Japan is extended to the project:

Directorate General of Highways of Ministry of Public Works

- Being responsible to coordinate with the local governments to execute their undertakings as the implementation agency
- Management to comply with environmental UKL and UPL.
- Conduct periodical environmental monitoring and reporting to BLHP and JICA.
- Allocating budget for the banking service on the basis of the Banking Arrangement of the Grant Aid.
- To exempt Japanese nationals engaged in the project from customs duties, internal taxes and other fiscal levies, which may be imposed in Indonesia
- To welcome Japanese nationals, whose services may be required in connection with the supply of the products and the services under the verified contract, such facilities as may be necessary for their entry into Indonesia and stay therein for the performance of their work

NTB Provincial Government

- Construction of 6 small bridges (BR-10 (Labihe I), BR-11 (Labihe II), BR-12 (Labihe III), BR-14 (Mone II), BR-17 (Telonang II), BR-21 (Bon Jati)) along the Project road.
- Pavement of very steep sections along the Project Road (Total about 3 km).
- Repair of the Project road
- Maintenance of the bridges after the final hand-over to the Provincial Government

Sumbawa Regency Government

- Land acquisition necessary for the construction of bridges and their approach roads. The land acquisition should be completed before the tendering. The necessary land acquisition areas are shown on Table 2.2-3 in Section 2.2.1.3.
- Securing area for temporary detour and temporary work yards. (Temporary detour plan is shown in Appendix-6.)

2.4 PROJECT OPERATION AND MAINTENANCE PLAN

(1) Operation and Maintenance System

Maintenance of the project bridges after completion will be undertaken by the Department of Public Works of Nusa Tenggara Barat Provincial Government. Routine maintenance of roads and bridges such as cleaning, inspection and minor repairs are undertaken by own maintenance staff of the Provincial Department of Public Works. While periodic repair and rehabilitation of roads and bridges are undertaken by contractors. The Provincial Department of Public Works has staff and equipments for the road and bridge maintenance.

(2) Maintenance Work Items

Necessary maintenance works for the project bridges are as follows:

Routine Maintenance

- Cleaning: Cleaning of bridge deck, drain basin, road side ditches and cutting grass on road shoulders and slope.
- Inspection: Identifying damages / defects such as pavement crack, bridge structure deformation / collapse, slope failure, scouring protection damage / washout, etc.
- Repair: Sealing of pavement cracks, patching on potholes, leveling road shoulders, repairing gabions / riprap.

Periodic Maintenance

Repairing the identified damages: Repair of bridge structures, repainting, etc.

(3) Considerations in Maintenance

The maintenance of the Project bridges will be executed as the part of present road and bridge maintenance system. The major items to be considered are as follows:

- It is important that routine maintenance shall be executed in good care and damages shall be repaired immediately before becoming serious because repair cost will becomes higher if damages are neglected for longer time.
- Since revetment is seldom installed at riverbanks in Indonesia, river alignment changes sideways due to riverbank erosions. Before the river alignment change reaches the bridge site, revetment or any other river control structure shall be installed.
- There are many extremely steep sections (steeper than 20%) along the Project road. Such sections should be paved and maintained to keep the road passable safely.
- Frequent watering for the slope sodding is required until it roots down into the ground.

2.5 PROJECT COST ESTIMATION

2.5.1 Initial Cost Estimation

(1) Cost Born by the Government of Japan

The project will be implemented in accordance with the Japan's Grant Aid scheme and the cost will be determined before concluding the Exchange of Note for the project.

(2) Cost Born by the Government of Indonesia Rp 18.7 Billion

Cost Born by Ministry of Public Works

- Bank commission Rp 50 M

Cost Born by Nusa Tenggara Barat Provincial Government

- Cost for 6 small bridge construction	Rp	6,000 M
- Cost for pavement of very steep road sections	Rp	7,500 M
- Cost for repair of the project road	Rp	5,000 M
	Rp	18,500 M

Cost Born by Sumbawa Regency Government

- Cost for land acquisition	Rp	150 M
- Cost for land rent for temporary detour	Rp	10 M
	Rp	160 M

(3) Conditions in Cost Estimation

- Estimated timing : November, 2011
- Exchange rate : Rp 1.0 = Yen 0.0104
- Others: The project is implemented in accordance with the system of Japan's Grant Aid.

2.5.2 Maintenance Cost

The annual cost for maintenance of 10 Project bridges is Rp 155 M. The breakdown of the maintenance work items and the cost is shown in Table 2.5-1.

Table 2.5-1 Maintenance Works and Annual Cost

Maintenance Work			Frequency	Each Time Cost (Rp /Time)	Annual Cost (Rp /Year)
Routine Maintenance	Cleaning	Bridge deck	1 time / yr	13,000,000	13,000,000
		Drain basin			
		Approach road			
		Grass cutting			
	Inspection	Pavement crack	1 time / yr	90,000,000	10,000,000
		Bridge deformation / damage			
		Slope failure			
		Gabion/riprap damage/washout			
	Repair	Pavement crack seal	1 time / 2 yr	70,000,000	35,000,000
		Pavement patching			
		Gravel surface patching			
		Repair gabions			
Periodic Maintenance	Repair / Rehabili-tation	Macadam re-pavement	1 time /10 yr	420,000,000	42,000,000
		Gravel re-surfacing	1 time / 5 yr	170,000,000	34,000,000
		Repaining of steel girders	1 time / 50 yr	600,000,000	12,000,000
		Bridge member repair	1 time / 50 yr	85,000,000	1,700,000
		Gabion / riprap repair	1 time / 20 yr	86,000,000	4,300,000
		Ditch repair	1 time / 20 yr	40,000,000	2,000,000
		Guide post repair	1 time / 20 yr	20,000,000	1,000,000
Total					155,000,000

The annual cost required for the routine and periodic maintenance for the 10 Project bridges are some 0.25 % of the 2010 total road and bridge maintenance budget of Nusa Tenggara Barat Provincial Government. No financial budgeting problem is expected.

2.6 OTHER RELEVANT ISSUES

To implement the Project efficiently, the following matters should be considered:

- The responsible implementation agency, Directorate General of Highways (DGH) of the Ministry of Public Works, is desired to maintain a project management office in the Province of Nusa Tenggara Barat for the management and coordination for the project

- The responsibilities of each party should be executed timely. Especially, land acquisition and relocation/removal of obstructions should be executed by the Regencies after the signing of Exchange of Note but no later than the commencement of the tendering. Ideally, the Regencies designate a representative from each Regency office to be assigned to coordinate with the consultant and contractor and other Project related parties.

- The construction site is located in the remote area where medical services rarely available. Therefore, it is necessary to secure measures to prevent accidents and disease and to establish an emergency medical system for the cases of accidents occur.

- The Environmental Management Measures (UKL) and Environmental Monitoring Measures (UPL) approved by the BLHP should be observed in the implementation of the project. Also the measures proposed in this study to mitigate the provable negative environmental impacts should be taken. The periodic environmental monitoring should be undertaken and reported to the concerned agencies.

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATIONS

3.1 Project Effects

(1) Beneficial Population

The direct beneficiaries of the project are the residents in the southern Sumbawa Island with a population of approximately 120,000 people, whereas the indirect beneficiaries are the people of Sumbawa Island (Approximately 1,200,000).

(2) Quantitative Effects

- Presently, common vehicles (2-wheel drive vehicles) cannot pass through the Sumbawa South Ring Road due to lack of bridges and bad road condition. It will be passable for common vehicles all throughout the years after the project. (The passable duration becomes 12 month from zero per year.)

- Presently it takes about 4 hours 30 minutes to drive from Tongoloka to Lunyuk (about 60 km) by a 4-wheel vehicle, it will take only 3 hours after the project.

(3) Qualitative Effects

- People in the southern Sumbawa can travel easily and transport goods effectively with the improvement of the bridges and road. This will activate socio-economic activities in the area that will raise the living standards of the people. In other word, the project will contribute to the socio-economic development of the areas.

- The improvement of the living standards of the transmigrated areas will result the increase of the transmigration and development of the areas. As the result, the project will contribute to the success of the transmigration programs.

- When a road is closed by a disaster in the northern area, the traffic can go to the destination by detouring to the south ring road (the project road).

3.2 Recommendations

Since the project will make significant effects as mentioned above and contribute to the improvement of the residents' living condition, the project will be worth being implemented under the Japan's grant aid.

In order to realize, enlarge and sustain the effects of the Project, responsibilities to be undertaken by the Indonesian side are as follows:

- To make Sumbawa South Ring Road passable for common vehicles, pavement of steep road

sections, construction of remaining small bridges and repair of road and drainage along the Project road are necessary. These works should be undertaken by Indonesian side before the completion of the Project.

- To adequately carry out maintenance and repair works to keep the road and bridges in good condition and in order to maximize their serviceable lives. It is advisable to involve road users and residents in the road and bridge maintenance not only the maintenance by the government.