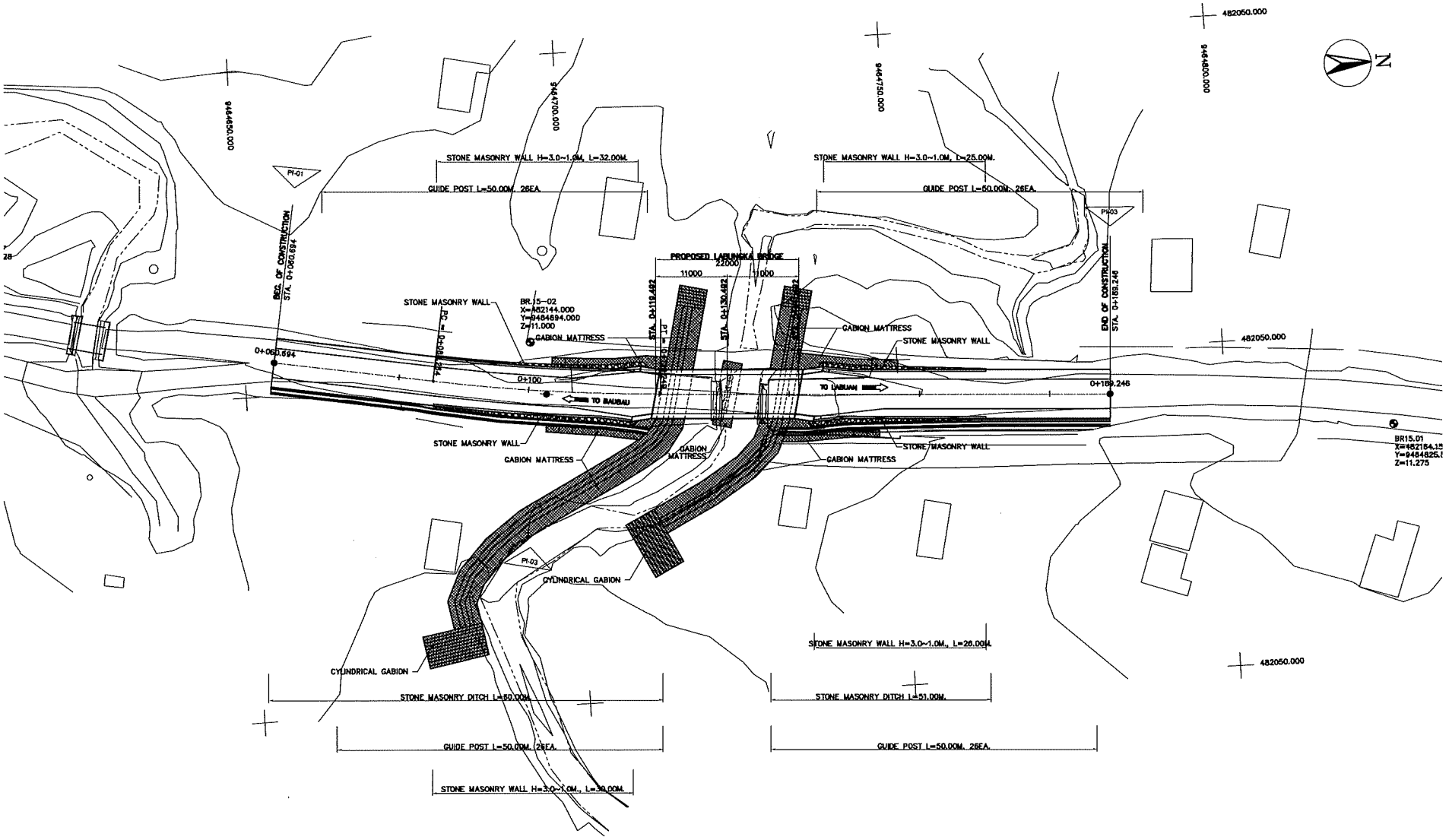
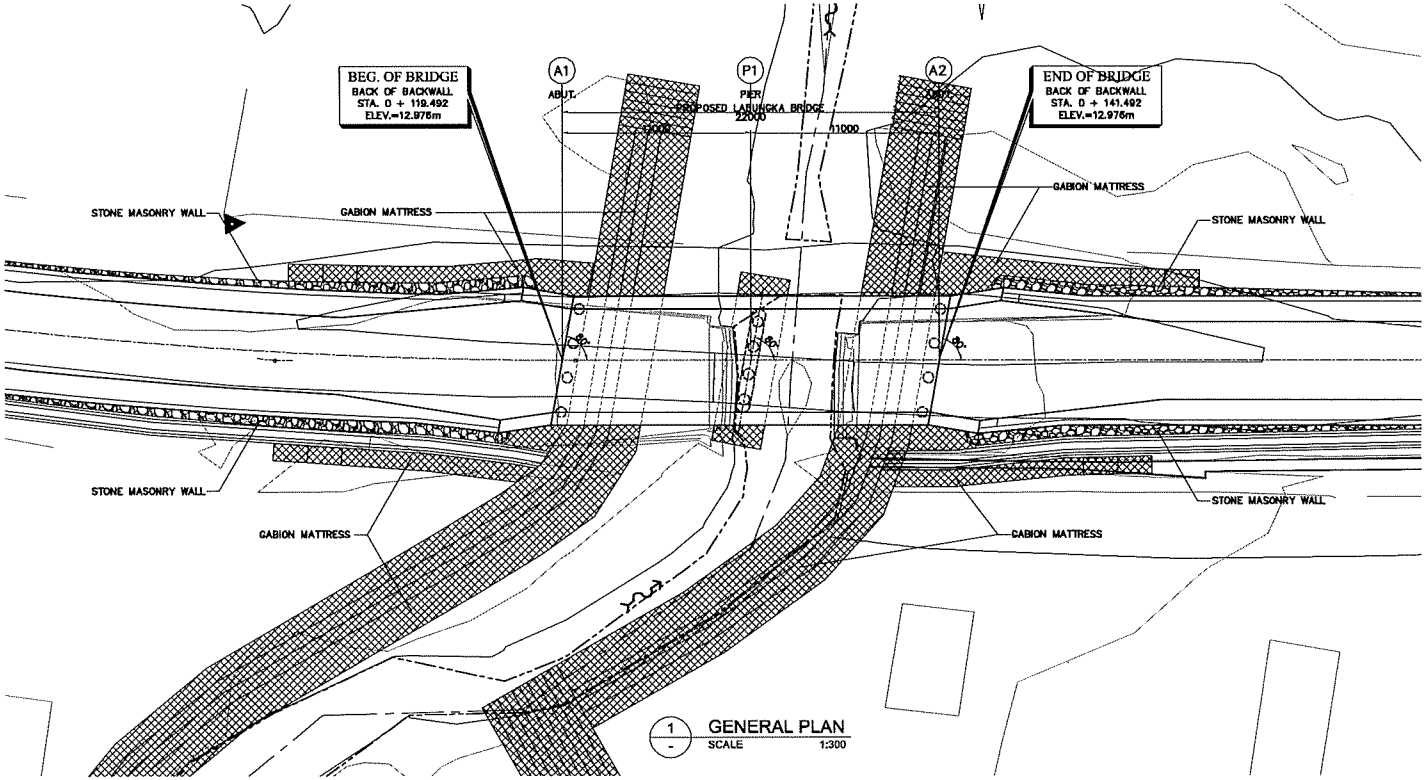
BR-15 LABUNGKA BRIDGE

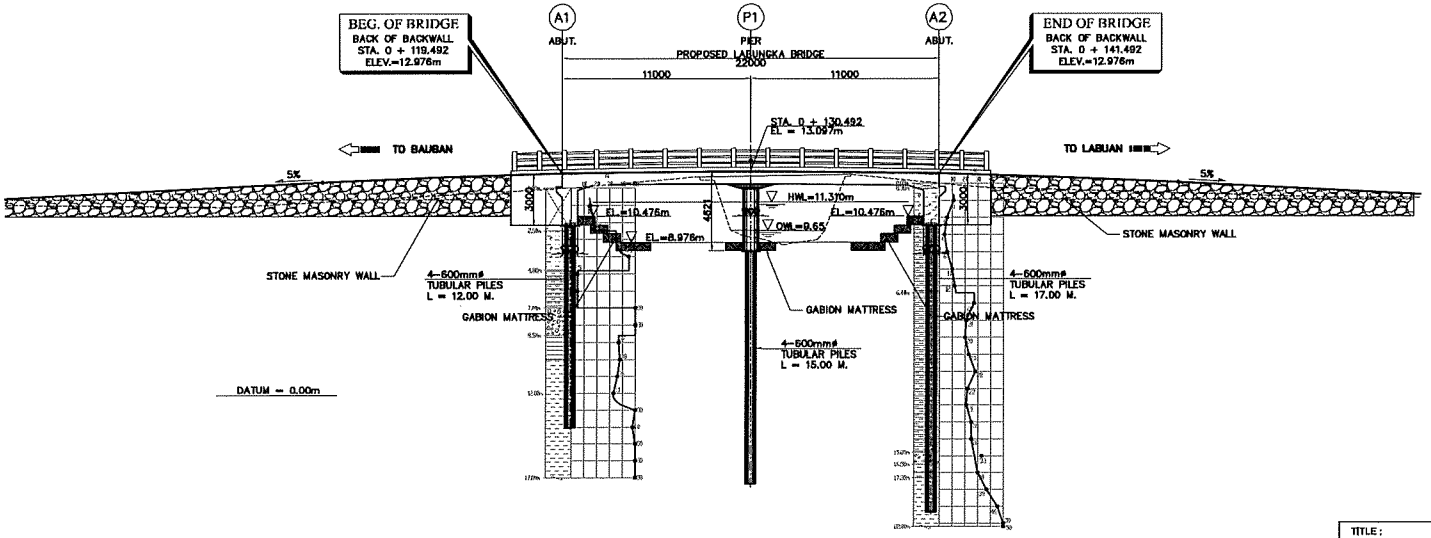
ELEMENTS OF CURVE										
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-01	0+060.694	9464654.570	482144.824	NO HORIZONTAL CURVE							-
PI-02	0+102.776	9464698.016	482152.116	6°40'53"	300.00	17.512	34.984	0.511	*	-	-
PI-03	0+189.246	9464782.383	482157.090	NO HORIZONTAL CURVE							-



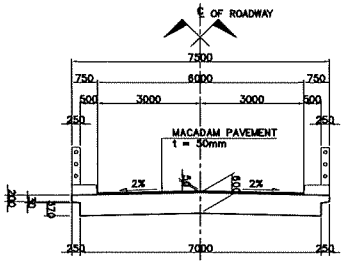
TITLE:	SCALE:	DRAWING No:	
BR-15 LABUNGKA BRIDGE SITE DEVELOPMENT PLAN	1 : 600	9-1	Rev.



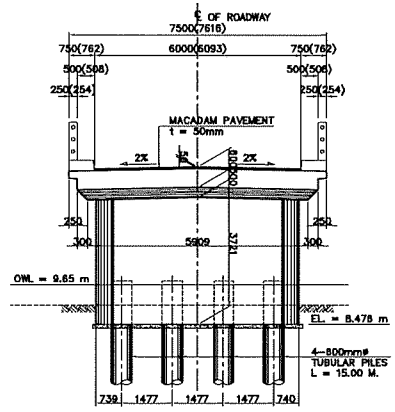
1 GENERAL PLAN
SCALE 1:300



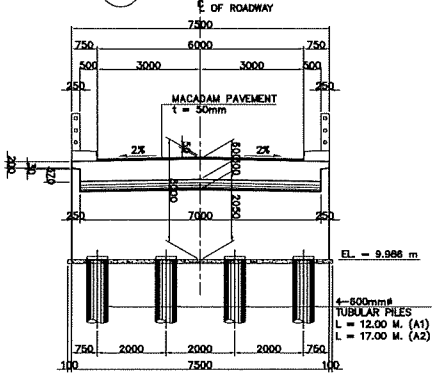
2 GENERAL ELEVATION
SCALE 1:300



3 SECTION @ MIDSPAN NEAR A2
SCALE 1:150

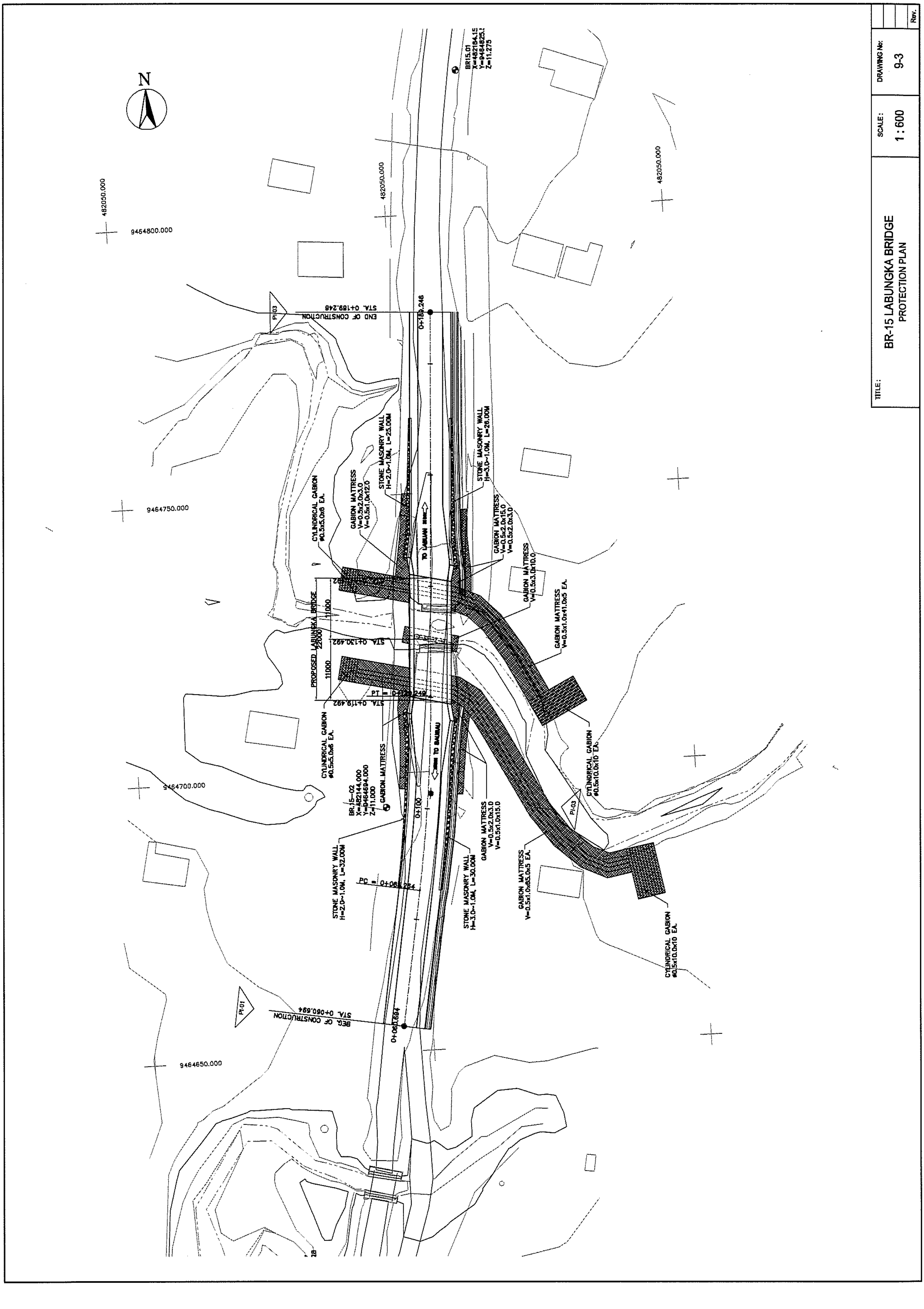


4 SECTION @ PIER
SCALE 1:150

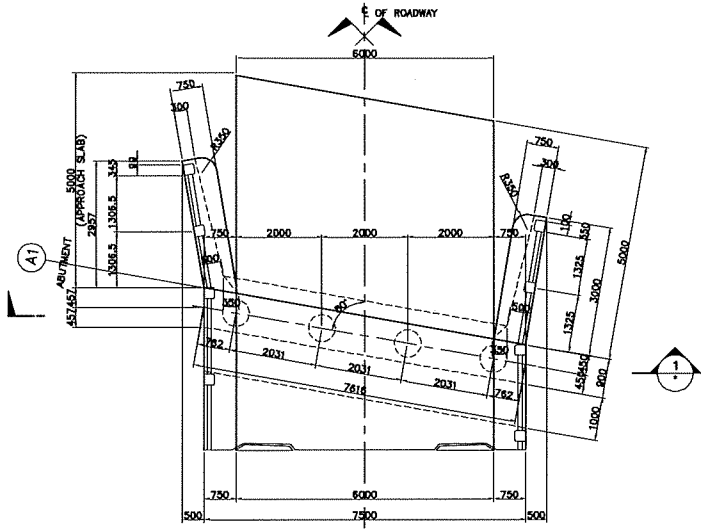


5 SECTION @ ABUTMENT A2
SCALE 1:150

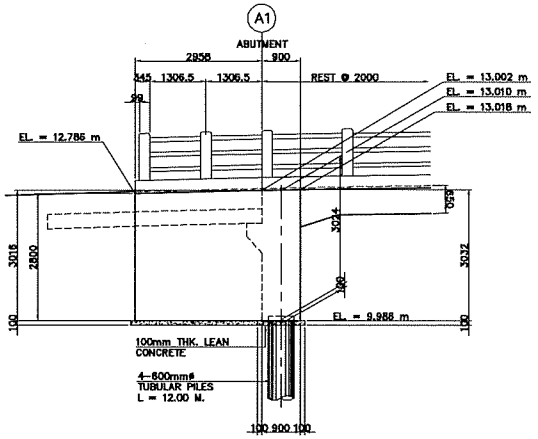
TITLE:	SCALE:	DRAWING No:	
BR-15 LABUNGKA BRIDGE GENERAL PLAN, ELEVATION & SECTIONS	1 : 300	9-2	Rev.



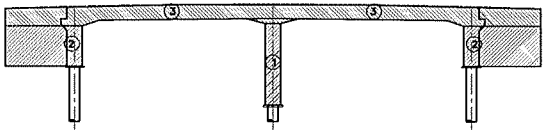
TITLE:
BR-15 LABUNGKA BRIDGE
PROTECTION PLAN
SCALE:
1 : 600
DRAWING No:
9-3
Rev.
N
PROPOSED LABUNGKA BRIDGE
22000
11000
11000
STA. 0+189.248
END OF CONSTRUCTION
STA. 0+060.694
BEG. OF CONSTRUCTION
STA. 0+130.492
STA. 0+119.492
PT = 0+122.249
PC = 0+064.254
TO LABUAN
TO BAUMAU
STONE MASONRY WALL
H=2.0~1.0M, L=25.00M
STONE MASONRY WALL
H=3.0~1.0M, L=26.00M
STONE MASONRY WALL
H=2.0~1.0M, L=32.00M
STONE MASONRY WALL
H=3.0~1.0M, L=30.00M
GABION MATTRESS
V=0.5x2.0x3.0
V=0.5x1.0x12.0
GABION MATTRESS
V=0.5x2.0x15.0
V=0.5x2.0x3.0
GABION MATTRESS
V=0.5x3.0x10.0
GABION MATTRESS
V=0.5x1.0x41.0x5 EA.
GABION MATTRESS
V=0.5x2.0x3.0
V=0.5x1.0x15.0
GABION MATTRESS
V=0.5x1.0x65.0x5 EA.
CYLINDRICAL GABION
Φ0.5x5.0x6 EA.
CYLINDRICAL GABION
Φ0.5x10.0x10 EA.
BR15.01
X=482184.15
Y=9464825.3
Z=11.275
BR-15-02
X=482144.000
Y=9464694.000
Z=11.000
482050.000
9464800.000
9464750.000
9464700.000
9464650.000



2 PLAN
SCALE 1:60



5 ELEVATION
SCALE 1:60

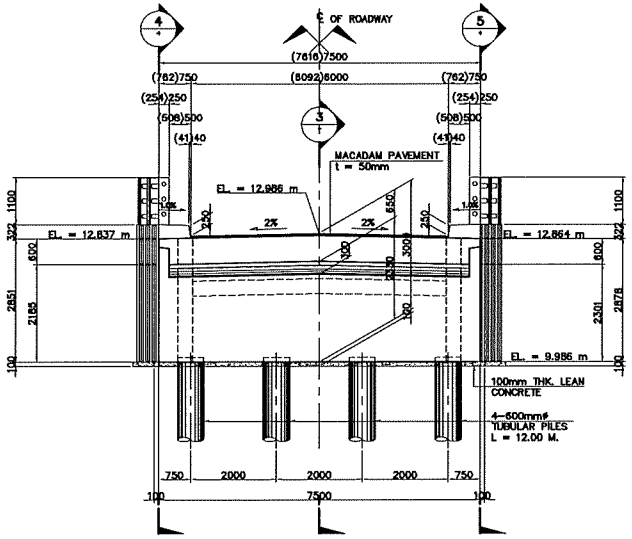


CONCRETE POURING SEQUENCE

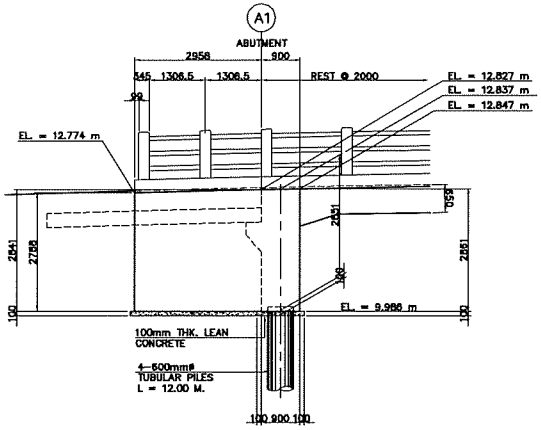
NOTE:

② AND ③ CAN BE POURED IN A SAME DAY.

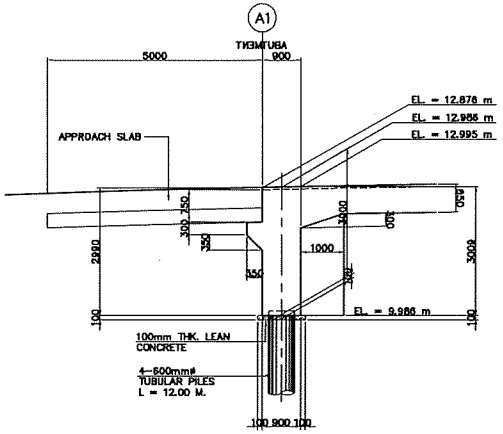
③ SHALL BE POURED STARTING FROM THE CENTER OF THE SPAN TO THE ABUTMENTS AND PIERS.



1 ELEVATION
SCALE 1:60



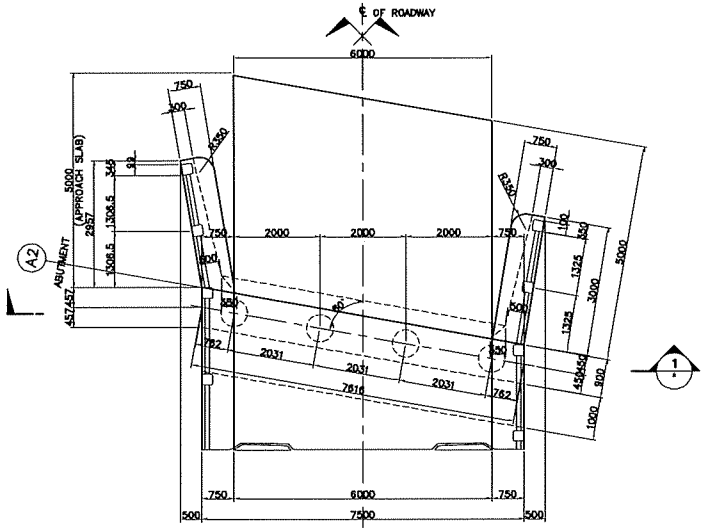
4 ELEVATION
SCALE 1:60



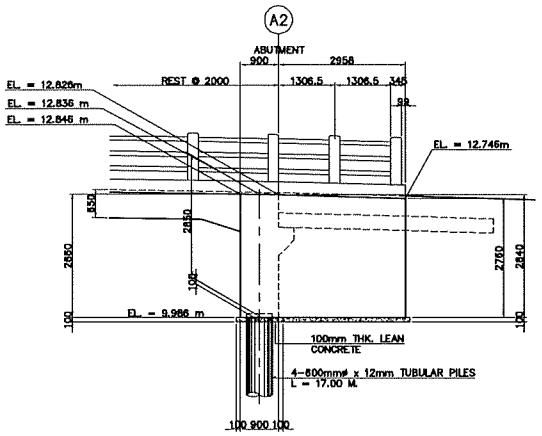
3 SECTION
SCALE 1:60

NOTE: PILES DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

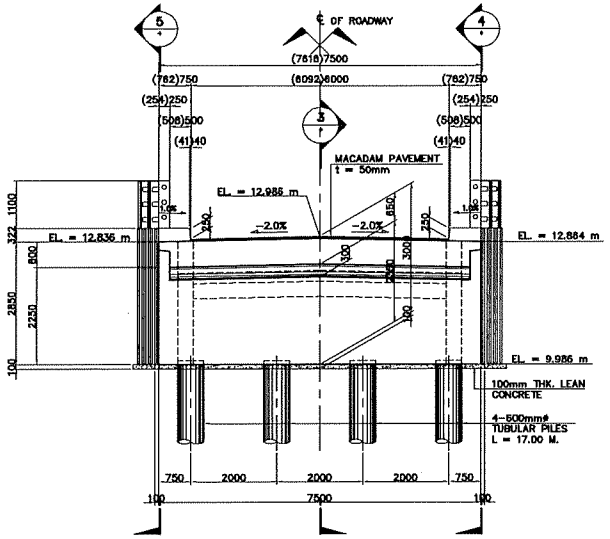
TITLE:	SCALE:	DRAWING No:	
BR-15 LABUNGKA BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (ABUTMENT A1)	AS SHOWN	9-4	Rev.



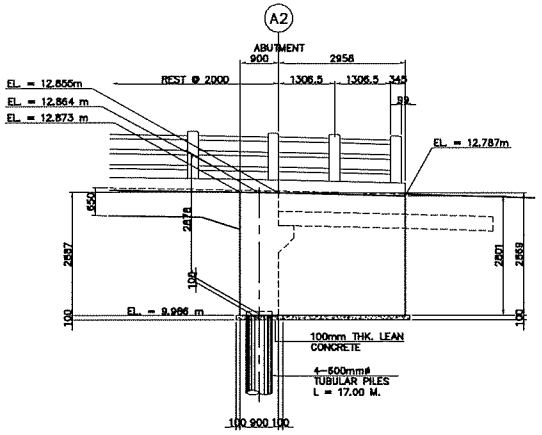
2 PLAN
SCALE 1:60



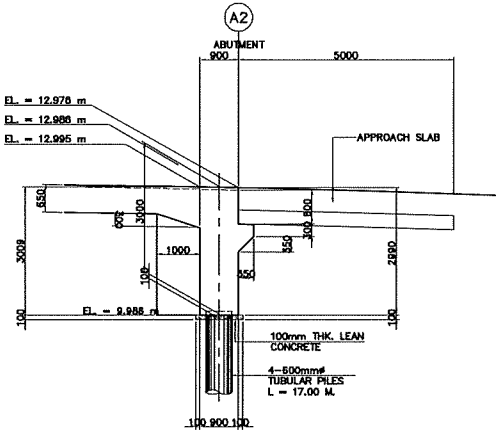
5 ELEVATION
SCALE 1:60



1 ELEVATION
SCALE 1:60



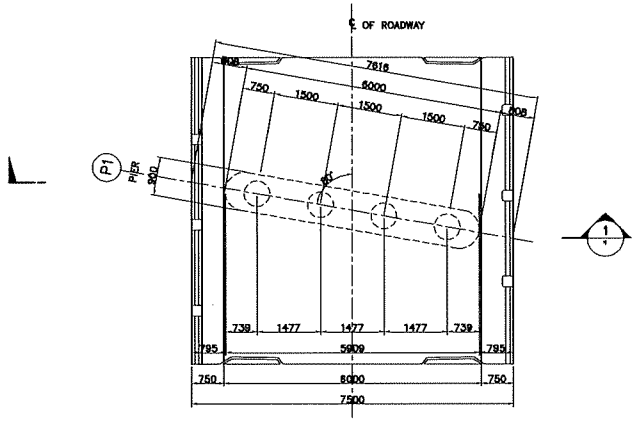
4 ELEVATION
SCALE 1:60



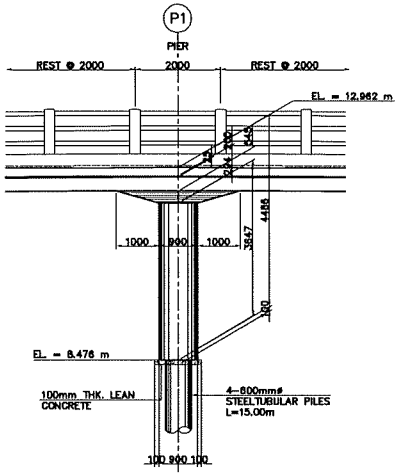
3 SECTION
SCALE 1:60

NOTE: PILES DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

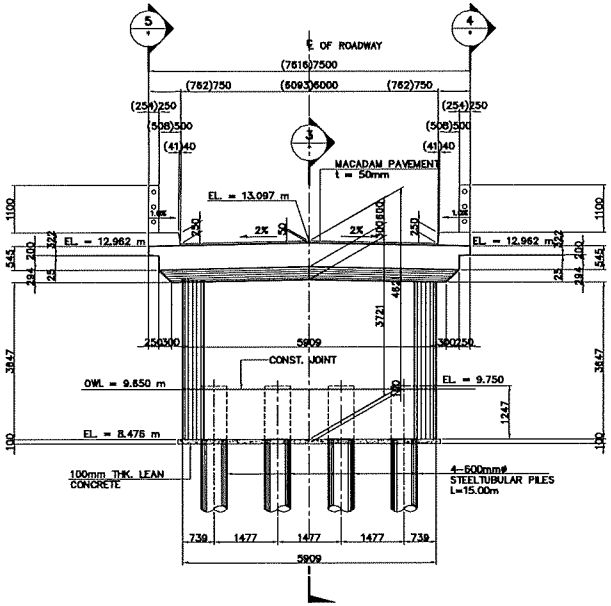
TITLE:	SCALE:	DRAWING No:	
BR-15 LABUNGKA BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (ABUTMENT A2)	AS SHOWN	9-5	Rev.



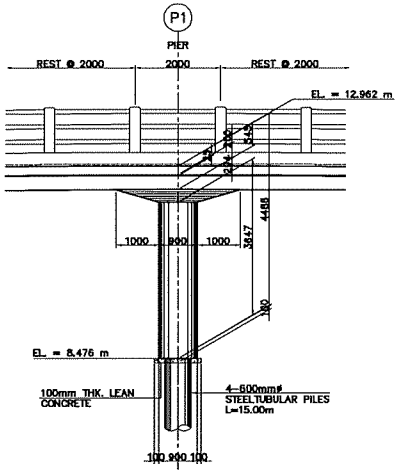
2 PLAN
SCALE 1:60



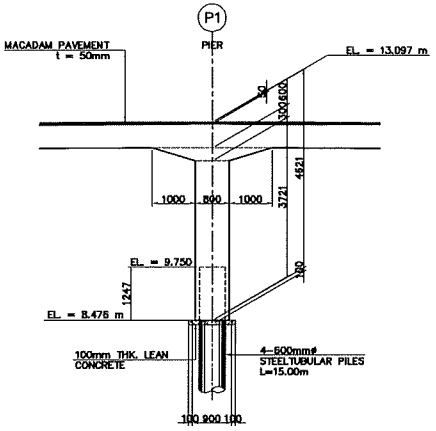
5 ELEVATION
SCALE 1:60



1 ELEVATION
SCALE 1:60



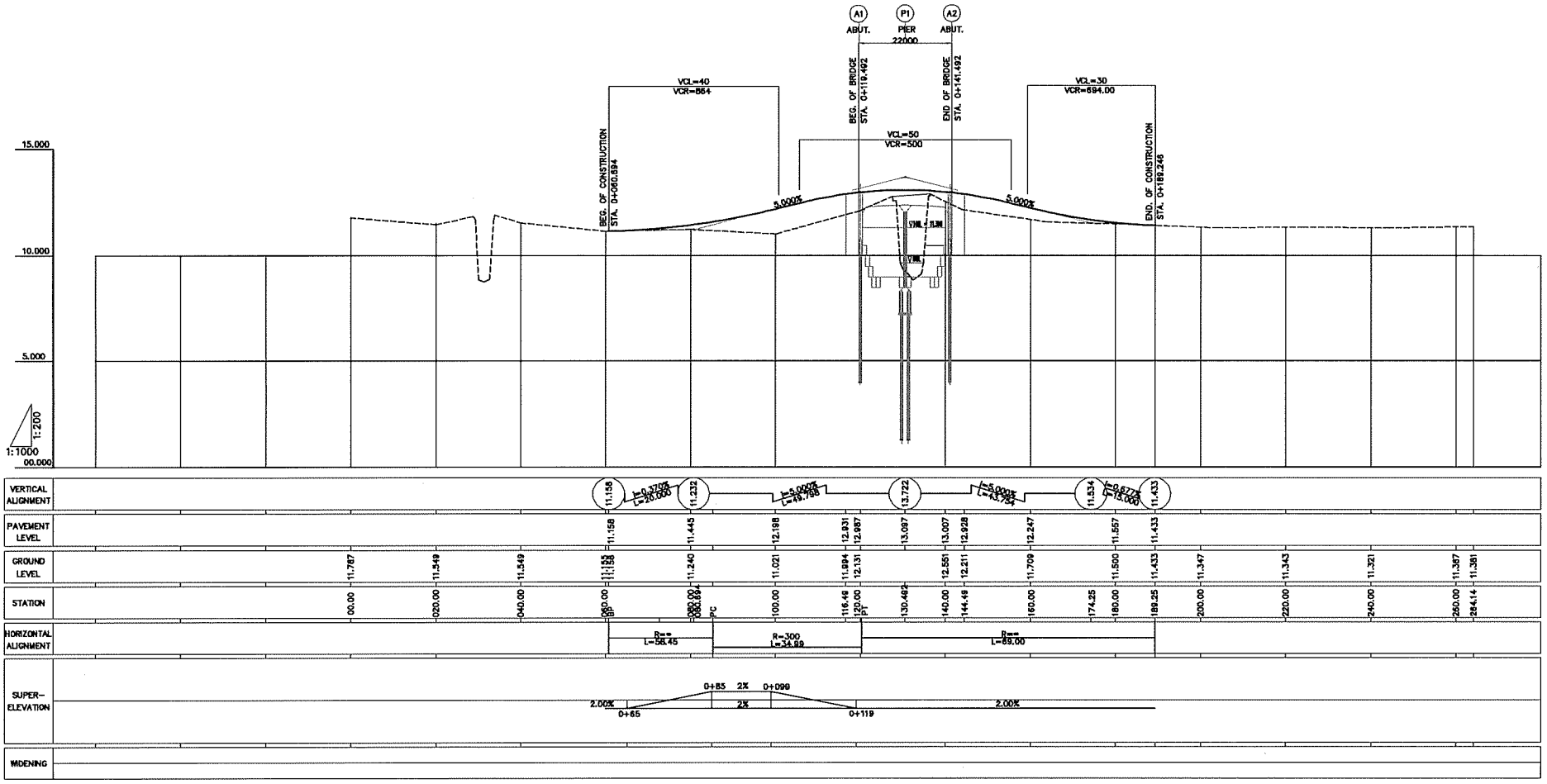
4 ELEVATION
SCALE 1:60



3 SECTION
SCALE 1:60

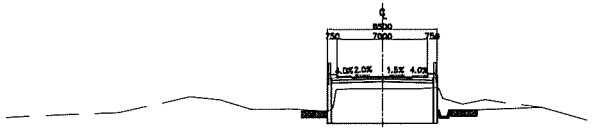
NOTE: PILES DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

TITLE:	SCALE:	DRAWING No:	
BR-15 LABUNGKA BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (PIER P1)	AS SHOWN	9-6	Rev.



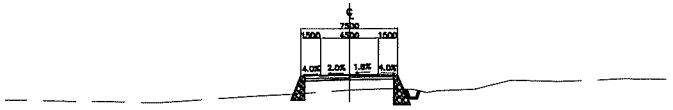
TITLE:	BR-15 LABUNGKA BRIDGE APPROACH ROAD PROFILE
SCALE:	H = 1:500 V = 1:200
DRAWING No:	9-7
Rev.	

NO.0+116.492 (A1 WING WALL EDGE)
GH=11.994
PH=12.931



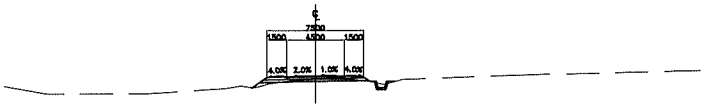
DL=5.00

NO.0+100.000
GH=11.021
PH=12.198



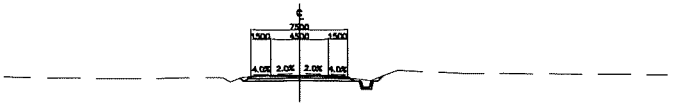
DL=5.00

NO.0+080.000
GH=11.240
PH=11.445



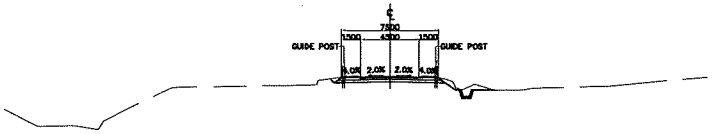
DL=5.00

NO.0+060.694
GH=11.158
PH=11.158



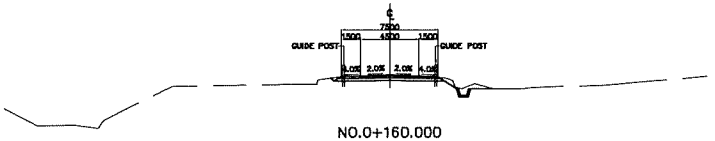
DL=5.00

NO.0+189.246
GH=11.433
PH=11.433



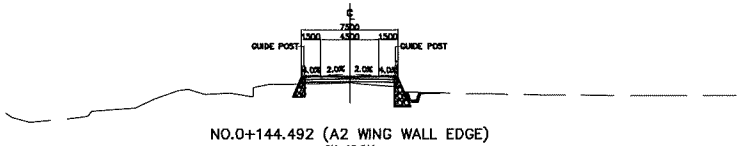
DL=5.00

NO.0+180.000
GH=11.500
PH=11.557

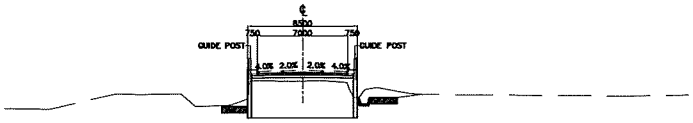


DL=5.00

NO.0+160.000
GH=11.709
PH=12.247



NO.0+144.492 (A2 WING WALL EDGE)
GH=12.211
PH=12.928



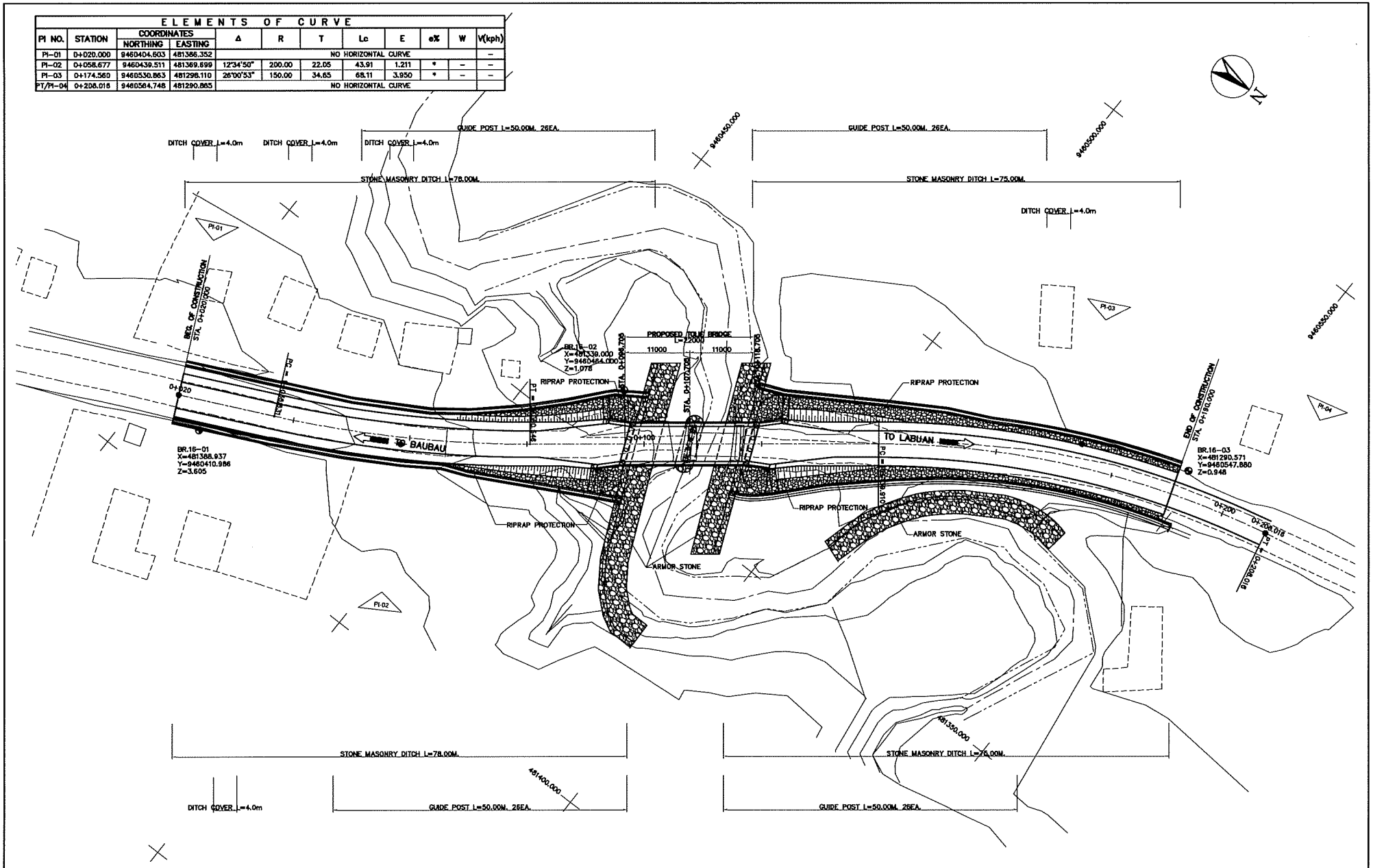
DL=5.00

DL=5.00

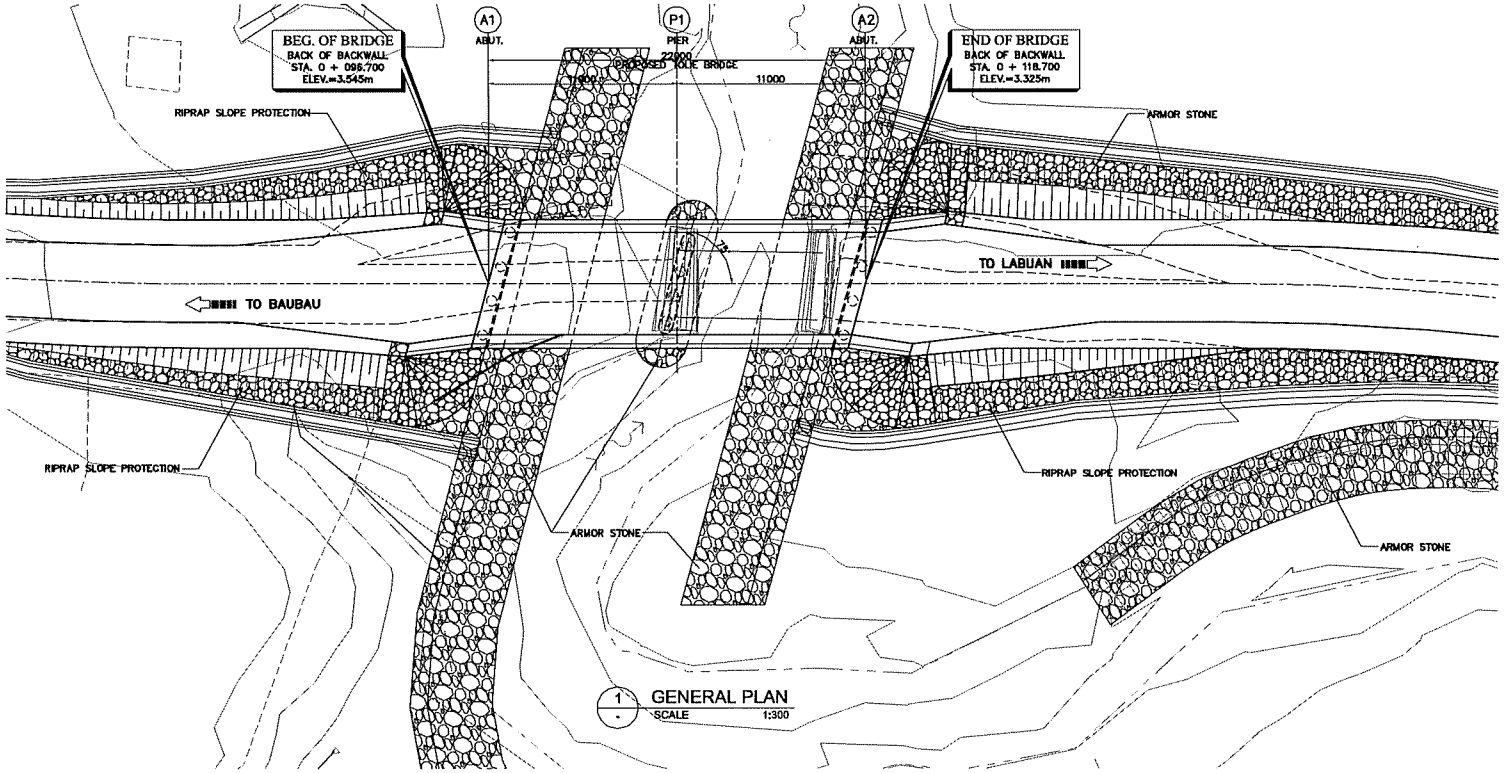
TITLE:	SCALE:	DRAWING No:	
BR-15 LABUNGKA BRIDGE APPROACH ROAD CROSS SECTIONS	1 : 400	9-8	Rev.

BR-16 TOLIE BRIDGE

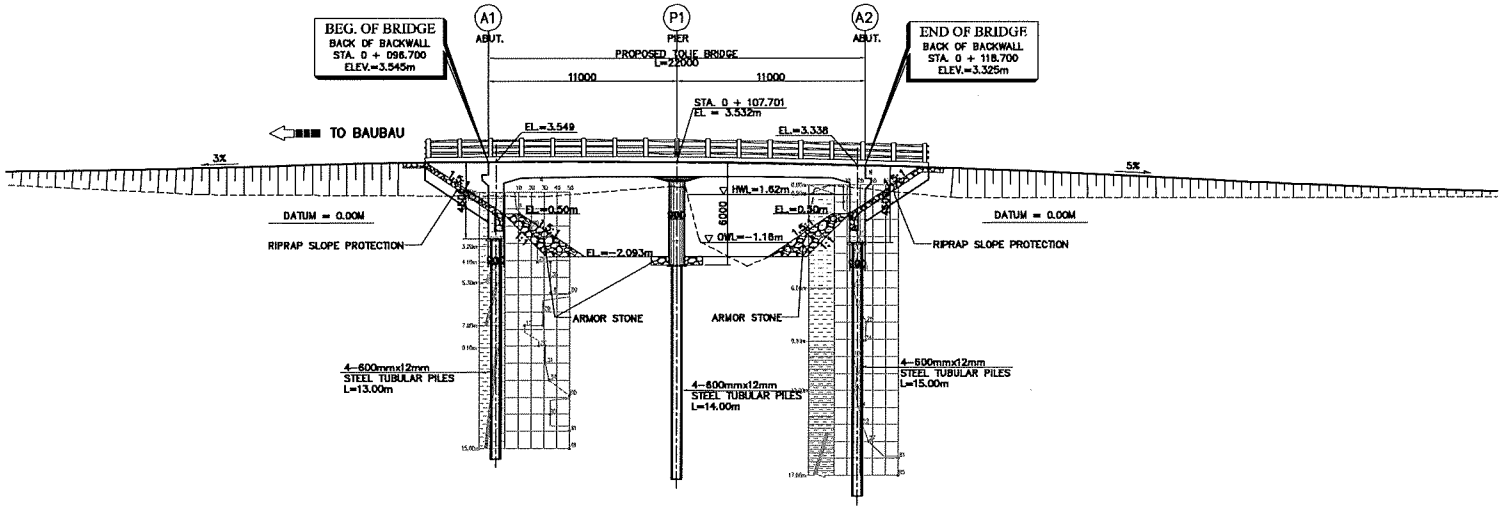
ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-01	0+020.000	9460404.603	481386.352	NO HORIZONTAL CURVE							–
PI-02	0+058.677	9460439.511	481369.699	12°34'50"	200.00	22.05	43.91	1.211	*	–	–
PI-03	0+174.560	9460530.863	481298.110	26°00'53"	150.00	34.65	68.11	3.950	*	–	–
PT/PI-04	0+208.018	9460564.748	481290.865	NO HORIZONTAL CURVE							



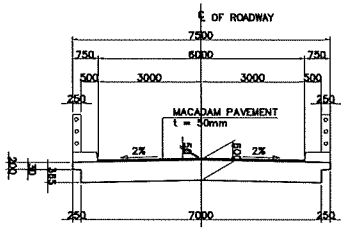
TITLE:	SCALE:	DRAWING No:	
BR-16 TOLIE BRIDGE SITE DEVELOPMENT PLAN	1 : 600	10-1	Rev.



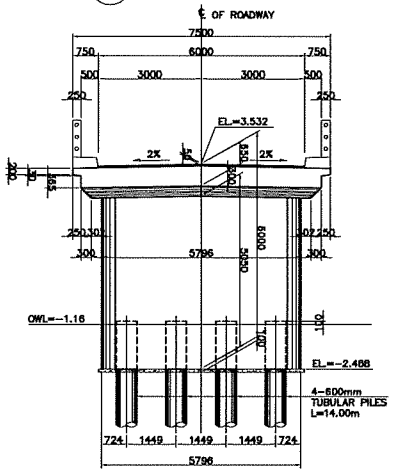
1 GENERAL PLAN
SCALE 1:300



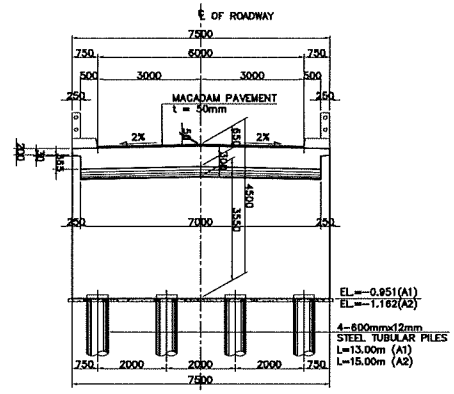
2 GENERAL ELEVATION
SCALE 1:300



3 SECTION @ MIDSPAN
SCALE 1:150

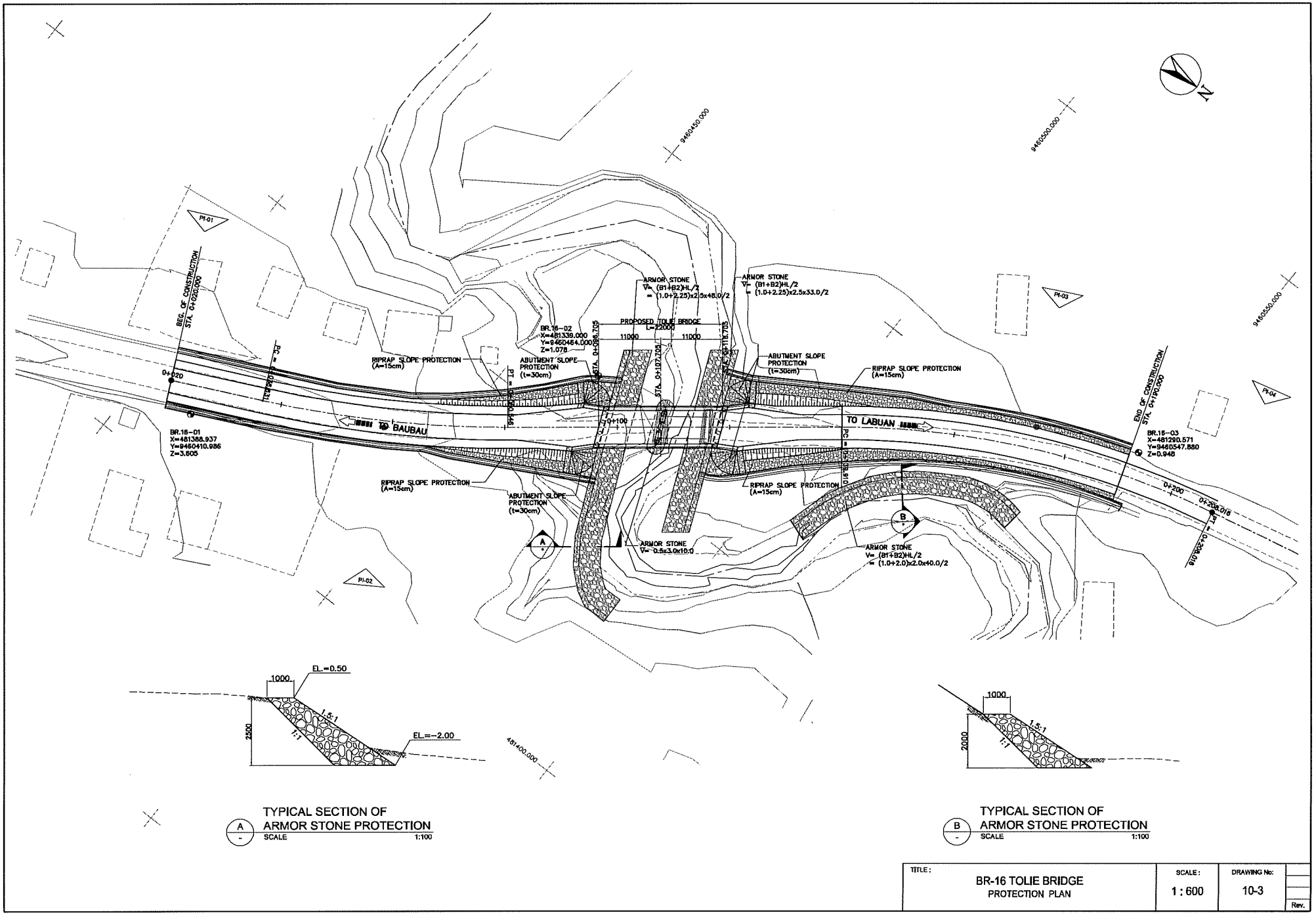


4 SECTION @ PIER
SCALE 1:150



5 SECTION @ ABUTMENT
SCALE 1:150

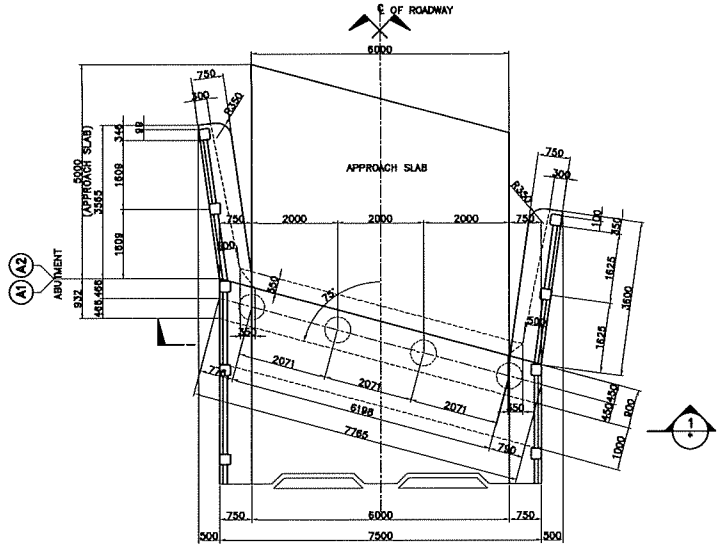
TITLE:	SCALE:	DRAWING No:	
BR-16 TOLIE BRIDGE GENERAL PLAN, ELEVATION & SECTIONS	AS SHOWN	10-2	Rev.



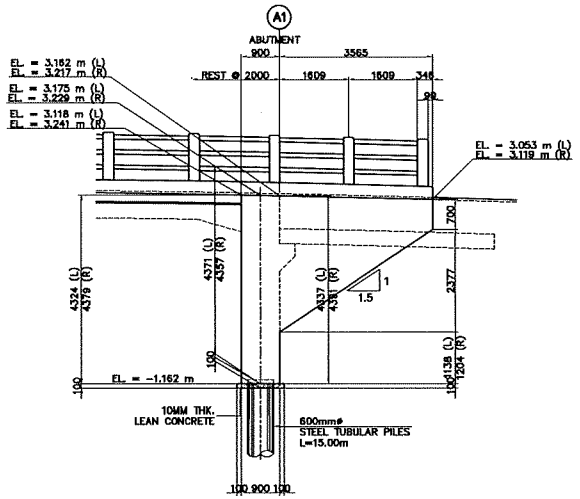
A - TYPICAL SECTION OF ARMOR STONE PROTECTION
SCALE 1:100

B - TYPICAL SECTION OF ARMOR STONE PROTECTION
SCALE 1:100

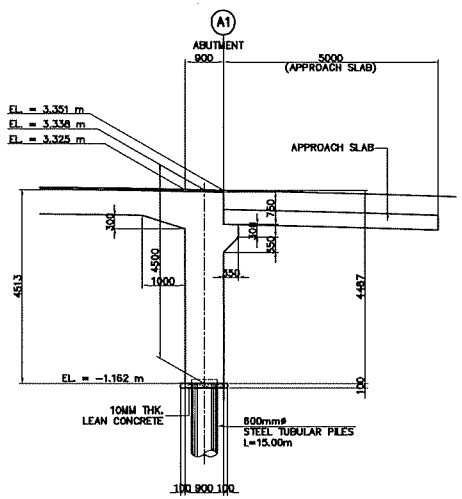
TITLE:	SCALE:	DRAWING No:	Rev.
BR-16 TOLIE BRIDGE PROTECTION PLAN	1 : 600	10-3	



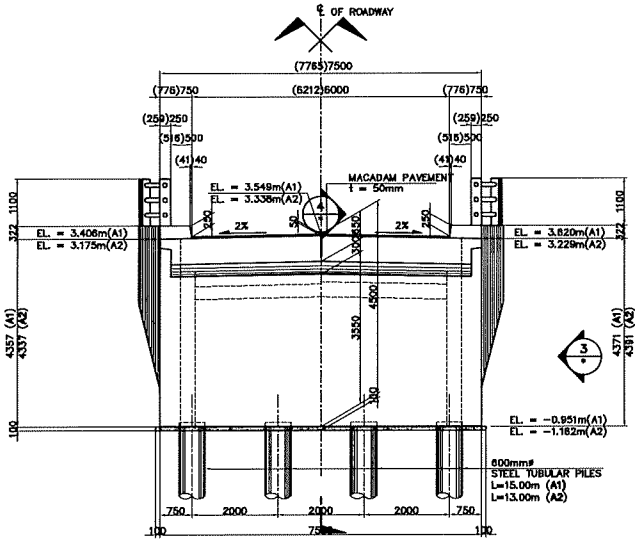
2 PLAN
SCALE 1:60



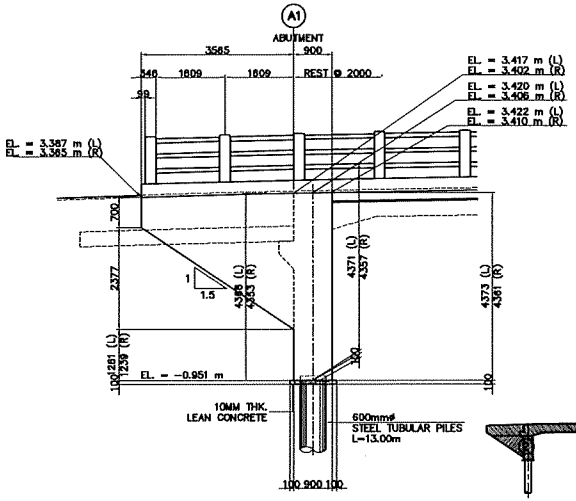
3 ELEVATION ABUT. A2
SCALE 1:60



4 ELEVATION ABUT. A2
SCALE 1:60



1 ELEVATION
SCALE 1:60



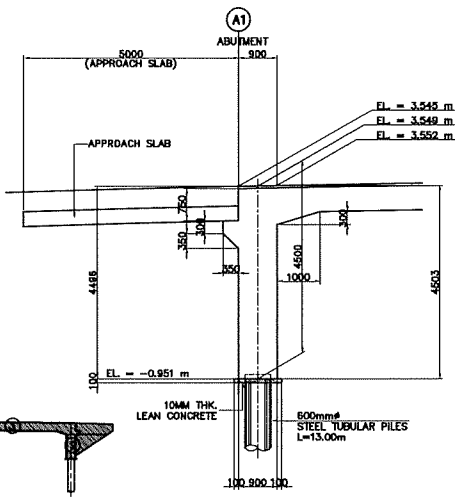
3 ELEVATION ABUT. A1
SCALE 1:60

CONCRETE POURING SEQUENCE

NOTE:

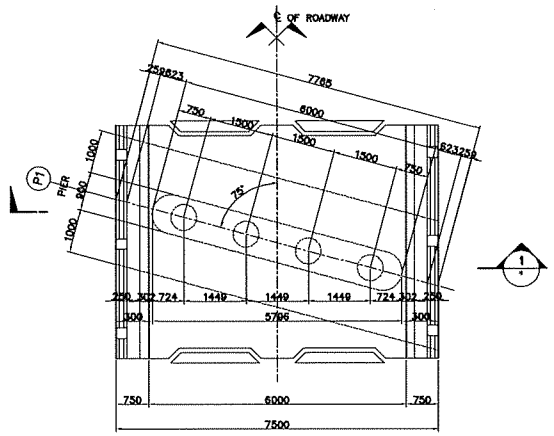
② AND ③ CAN BE POURED IN A SAME DAY,

③ SHALL BE POURED STARTING FROM THE CENTER OF THE SPAN TO THE ABUTMENTS AND PIERS.

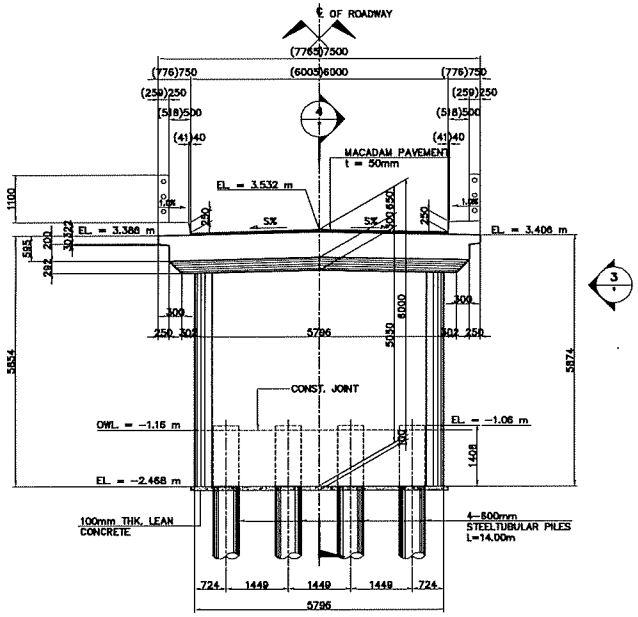


4 ELEVATION ABUT. A1
SCALE 1:60

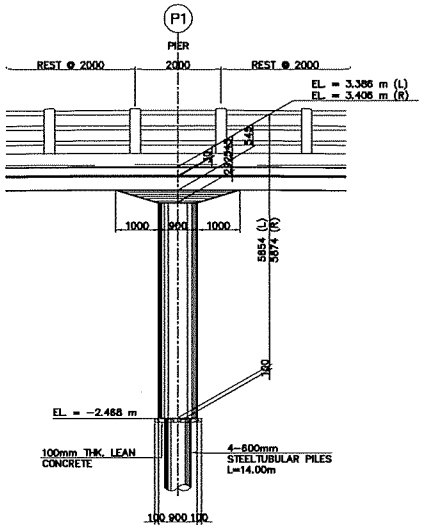
TITLE:	SCALE:	DRAWING No:	
BR-16 TOLIE BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (ABUT. A1 & A2)	AS SHOWN	10-4	Rev.



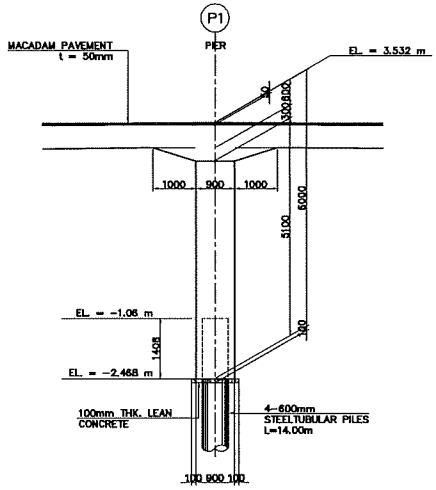
2 PLAN
SCALE 1:60



1 ELEVATION
SCALE 1:60

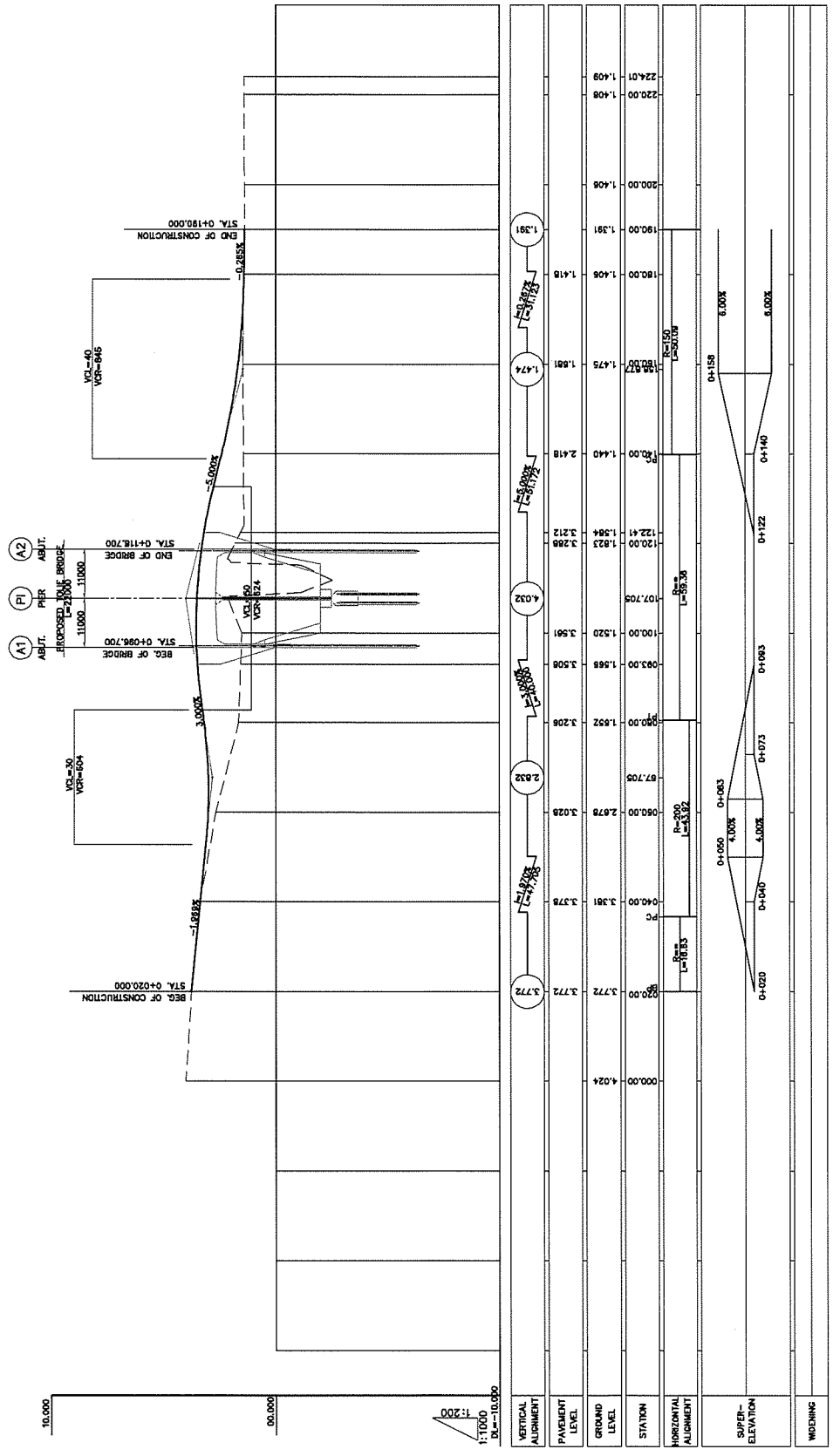


3 ELEVATION
SCALE 1:60



4 SECTION
SCALE 1:60

TITLE:	SCALE:	DRAWING No:	
BR-16 TOLIE BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (PIER P1)	AS SHOWN	10-5	Rev.



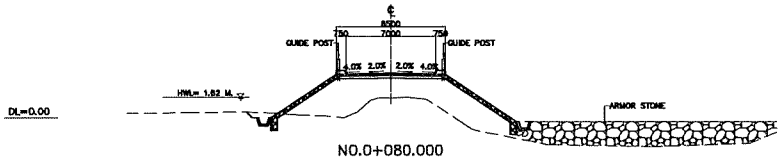
TITLE: BR-16 TOLIE BRIDGE
APPROACH ROAD PROFILE

SCALE: H = 1:1000 V = 1:200

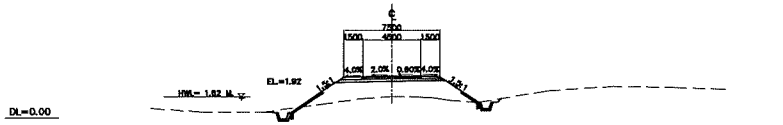
DRAWING No: 10-6

Rev.

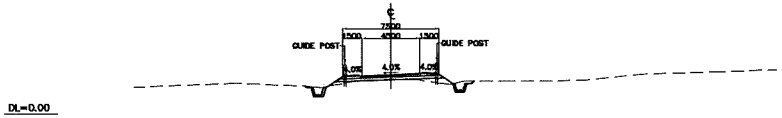
NO.0+093.000 (A1 WING WALL EDGE)
GH=1.566
PH=3.506



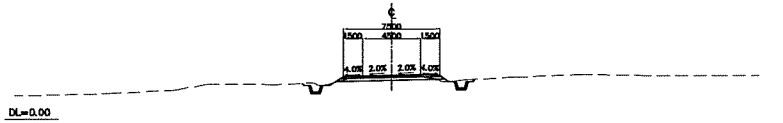
NO.0+080.000
GH=1.652
PH=3.206



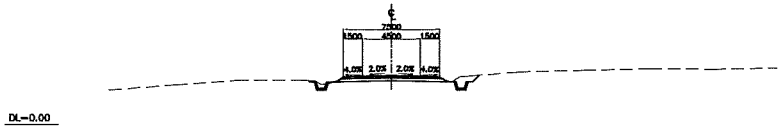
NO.0+060.000
GH=2.678
PH=3.028



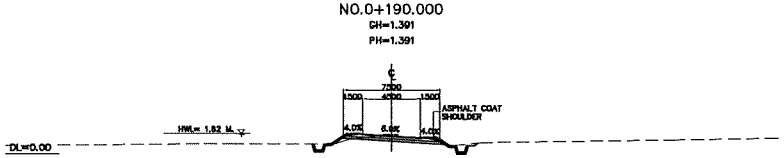
NO.0+040.000
GH=3.381
PH=3.378



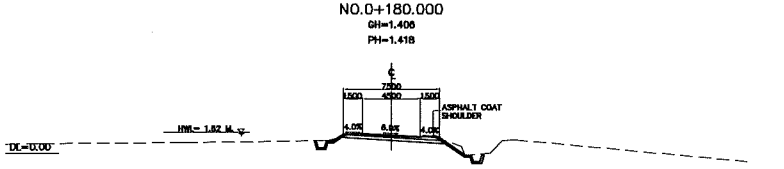
NO.0+020.000
GH=3.772
PH=3.772



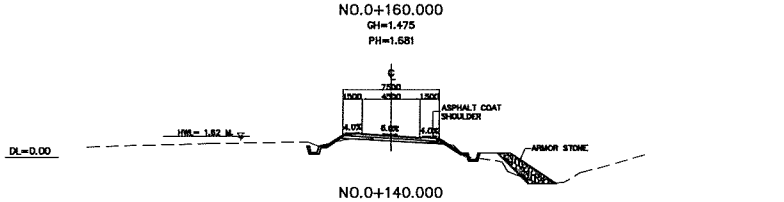
NO.0+190.000
GH=1.391
PH=1.391



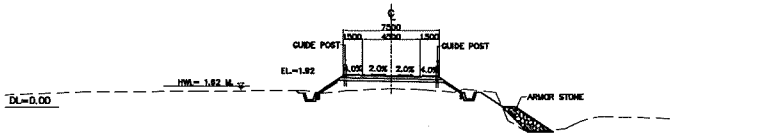
NO.0+180.000
GH=1.406
PH=1.418



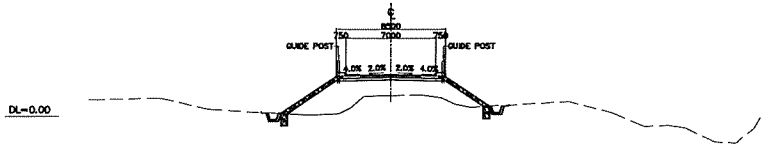
NO.0+160.000
GH=1.475
PH=1.581



NO.0+140.000
GH=1.440
PH=2.418



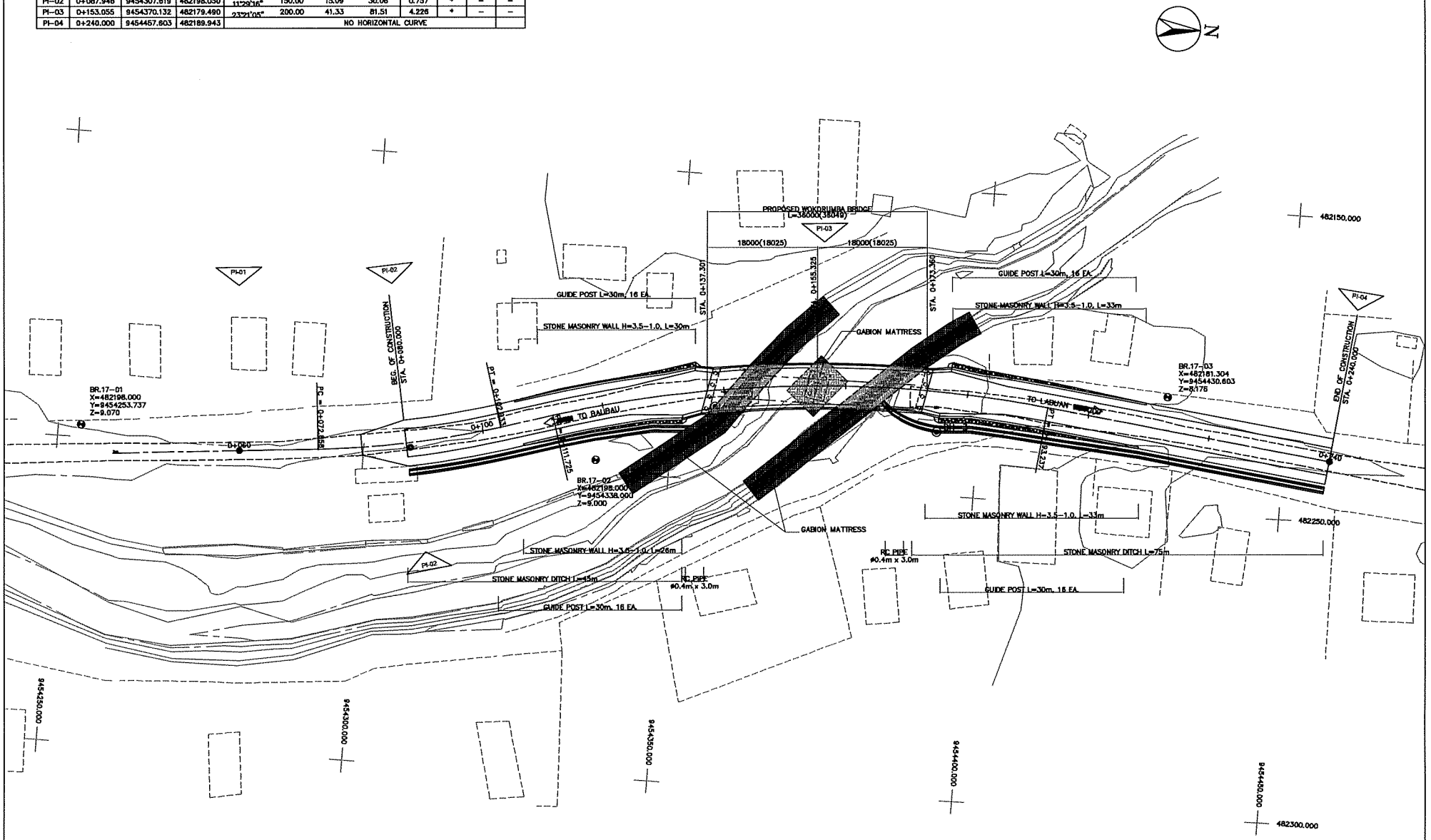
NO.0+122.400 (A2 WING WALL EDGE)
GH=1.584
PH=3.212



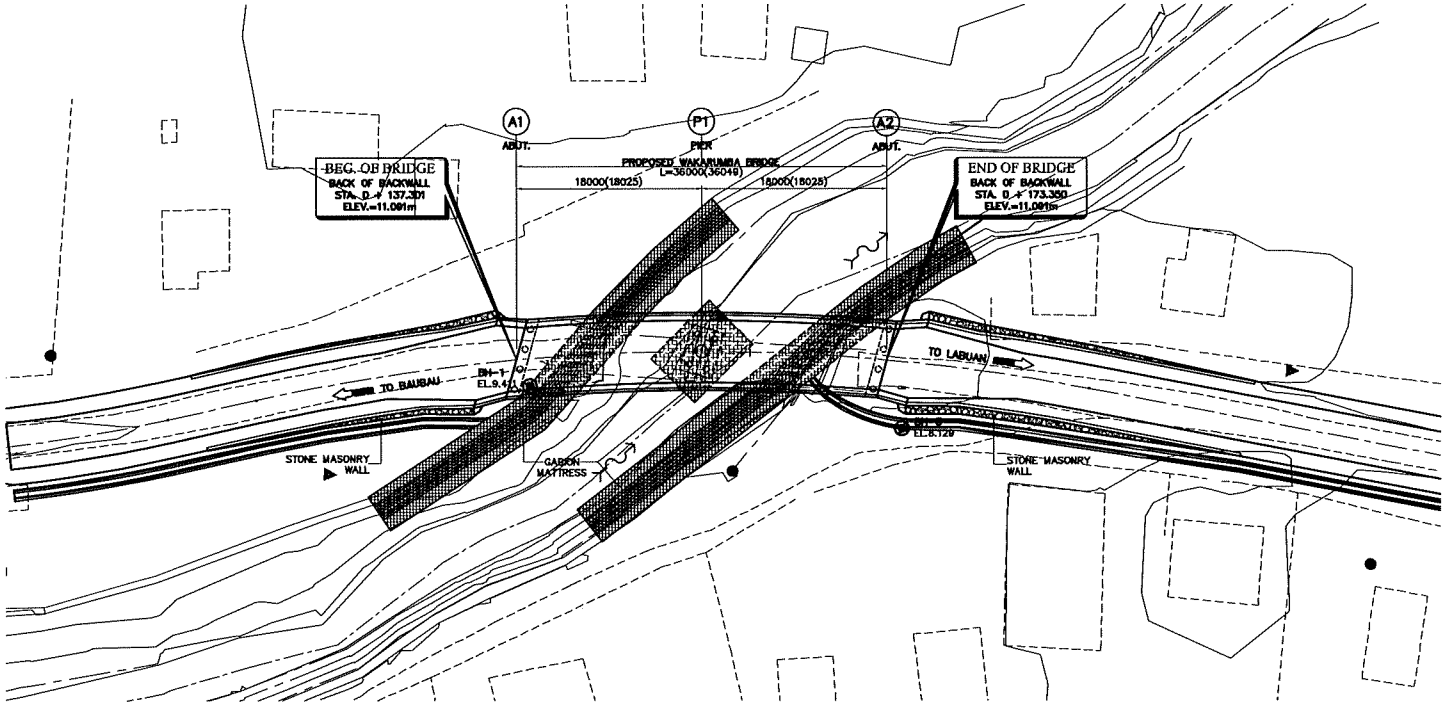
TITLE:	SCALE:	DRAWING No:	Rev.
BR-16 TOLIE BRIDGE APPROACH ROAD CROSS SECTIONS	1:400	10-7	

BR-17 WAKORUMBA BRIDGE

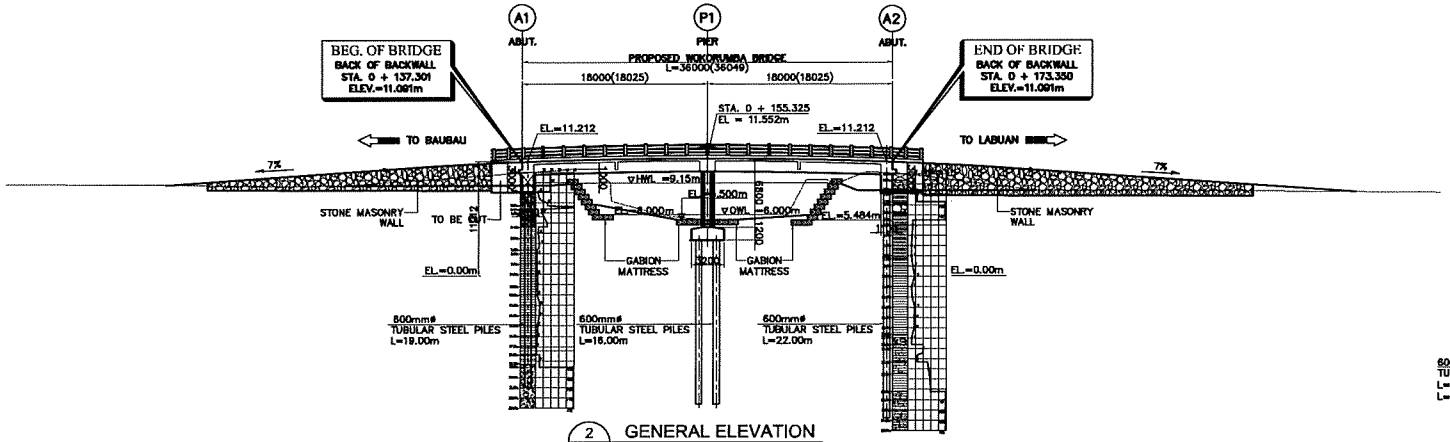
ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-01	0+060.000	9454279.782	482200.509	NO HORIZONTAL CURVE							–
PI-02	0+087.946	9454307.619	482198.050	11°29'16"	150.00	15.09	30.06	0.757	+	–	–
PI-03	0+153.055	9454370.132	482179.490	23°21'05"	200.00	41.33	81.51	4.226	+	–	–
PI-04	0+240.000	9454457.803	482189.943	NO HORIZONTAL CURVE							–



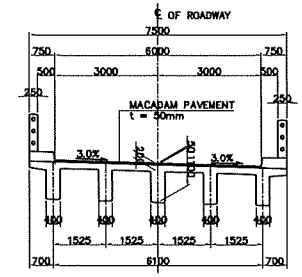
TITLE:	SCALE:	DRAWING No:	Rev.
BR-17 WOKORUMBA BRIDGE SITE DEVELOPMENT PLAN	1 : 600	11-1	



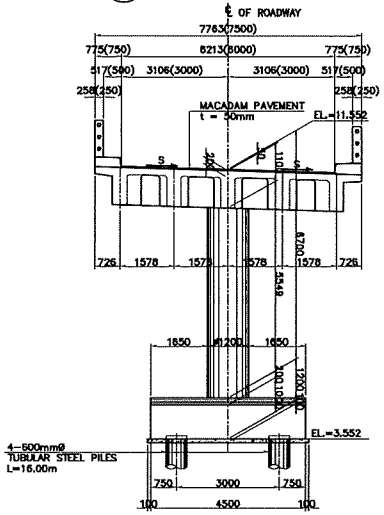
1 GENERAL PLAN
SCALE 1:500



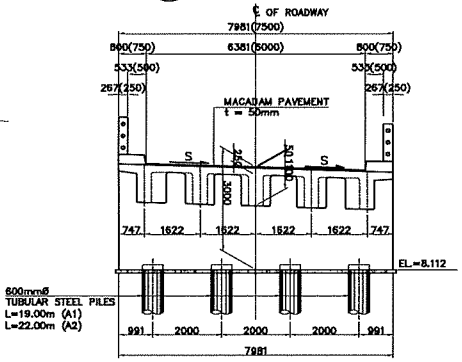
2 GENERAL ELEVATION
SCALE 1:500



3 SECTION @ MIDSPAN
SCALE 1:150

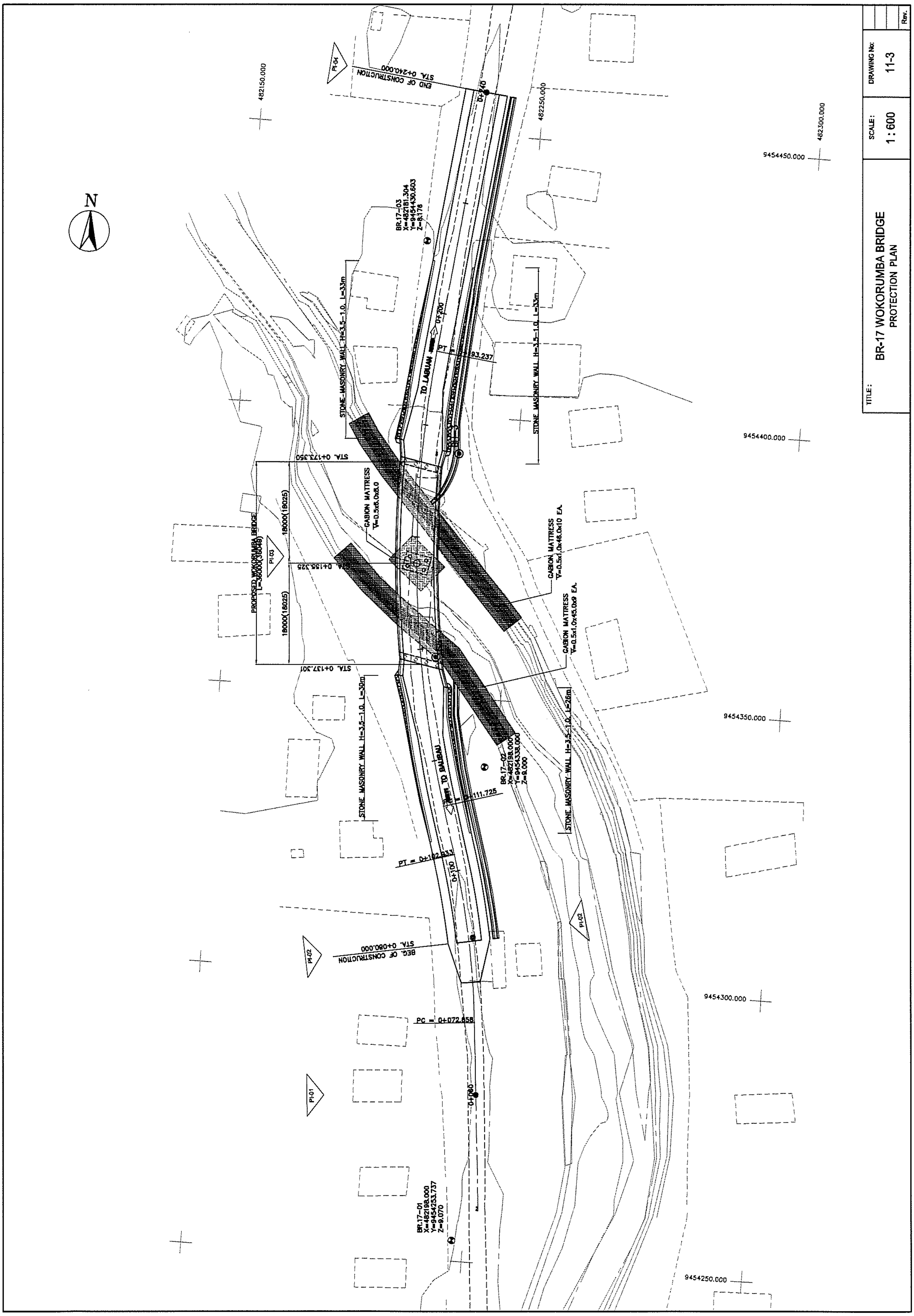


4 SECTION @ PIER
SCALE 1:150

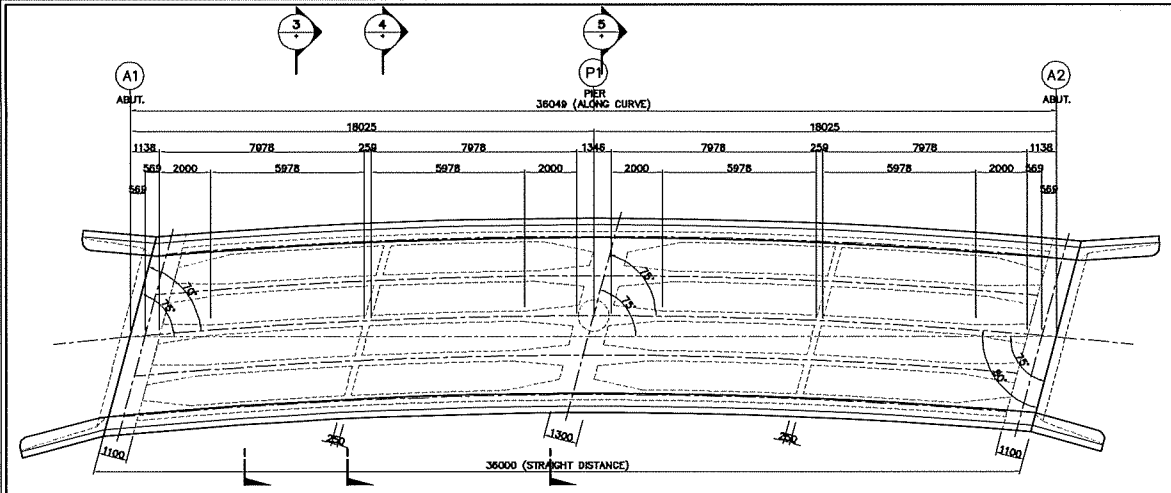


5 SECTION @ ABUTMENT
SCALE 1:150

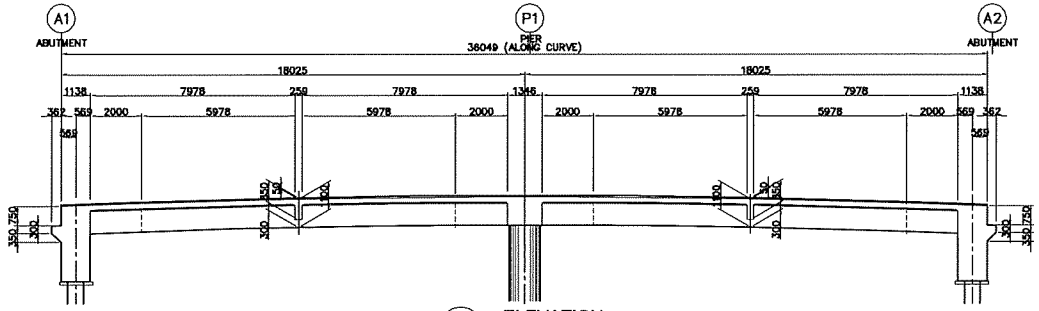
TITLE:	SCALE:	DRAWING No:	
BR-17 WOKORUMBA BRIDGE GENERAL PLAN, ELEVATION & SECTIONS	1 : 500	11-2	Rev.



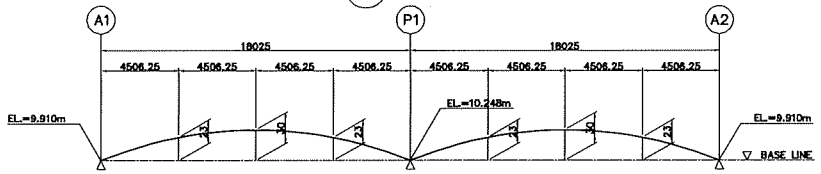
N
TITLE :
BR-17 WOKORUMBA BRIDGE
PROTECTION PLAN
SCALE :
1 : 600
DRAWING No:
11-3
Rev.
END OF CONSTRUCTION
STA. 0+240.000
BEG. OF CONSTRUCTION
STA. 0+080.000
PROPOSED WOKORUMBA BRIDGE
L=36000(36046)
18000(18025)
18000(18025)
STA. 0+173.350
STA. 0+155.325
STA. 0+137.301
GABION MATTRESS
V=0.5x6.0x8.0
GABION MATTRESS
V=0.5x1.0x48.0x10 EA.
GABION MATTRESS
V=0.5x1.0x45.0x9 EA.
STONE MASONRY WALL H=3.5-1.0, L=33m
STONE MASONRY WALL H=3.5-1.0, L=33m
STONE MASONRY WALL H=3.5-1.0, L=30m
STONE MASONRY WALL H=3.5-1.0, L=26m
TO LABUAN
TO BAUBAU
PT = 93.237
PT = 0+102.933
PC = 0+072.858
0+111.725
BR.17-03
X=482181.304
Y=9454430.603
Z=8.178
BR.17-02
X=482198.000
Y=9454338.000
Z=9.000
BR.17-01
X=482108.000
Y=9454253.737
Z=9.070
PI-01
PI-02
PI-03
PI-04
482150.000
482250.000
482300.000
9454450.000
9454400.000
9454350.000
9454300.000
9454250.000



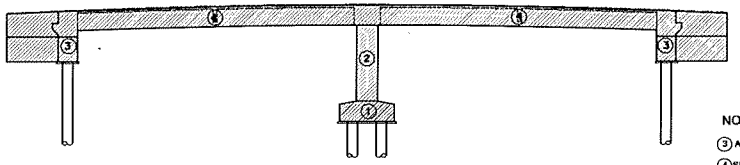
1 - PLAN
SCALE 1:100



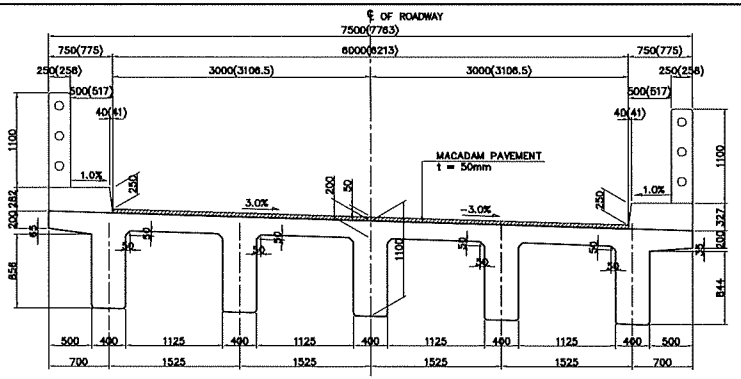
2 - ELEVATION
SCALE 1:100



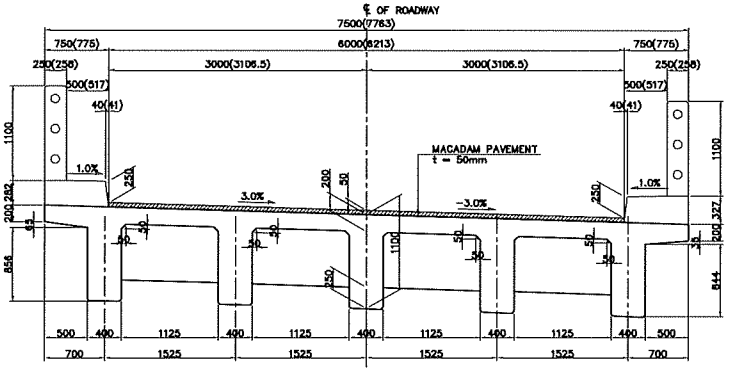
6 - CAMBER DIAGRAM
NOT TO SCALE



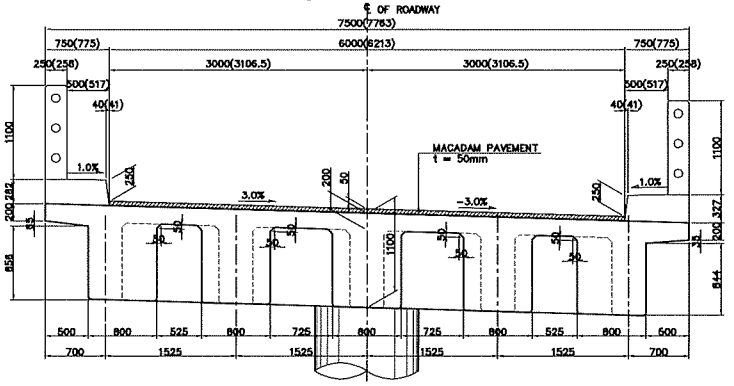
CONCRETE POURING SEQUENCE



3 - SECTION
SCALE 1:30



4 - SECTION
SCALE 1:30



5 - SECTION
SCALE 1:30

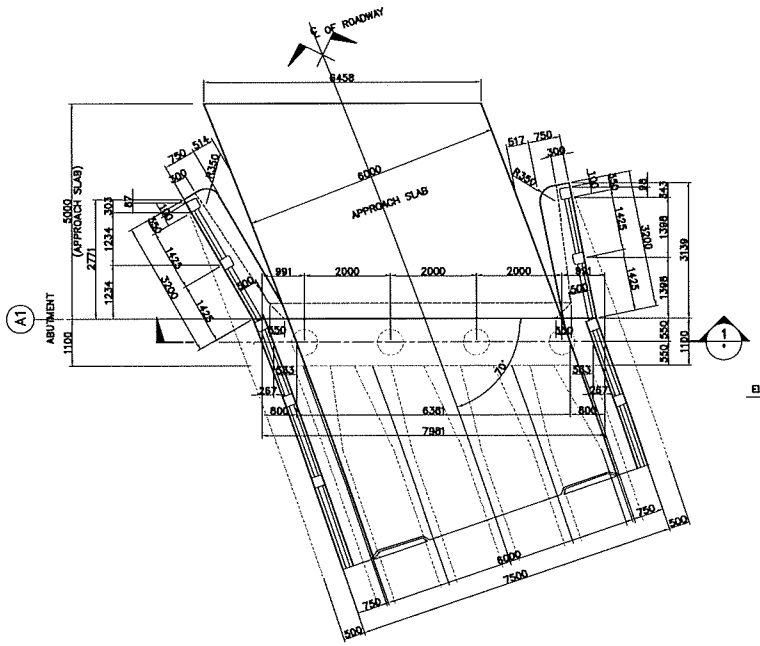
EL.=9.910m

NOTE:

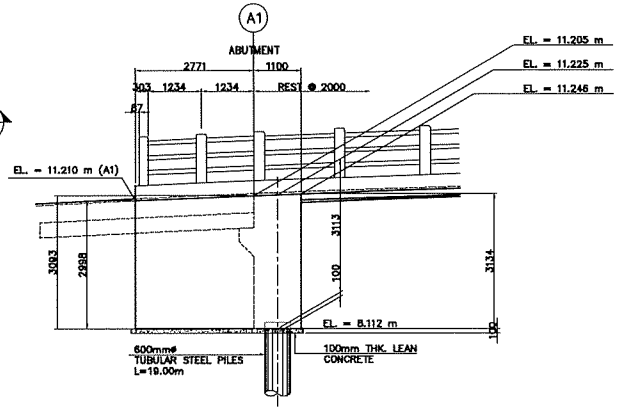
(3) AND (4) CAN BE POURED IN A SAME DAY.

(4) SHALL BE POURED STARTING FROM THE CENTER OF THE SPAN TO THE ABUTMENTS AND PIERS.

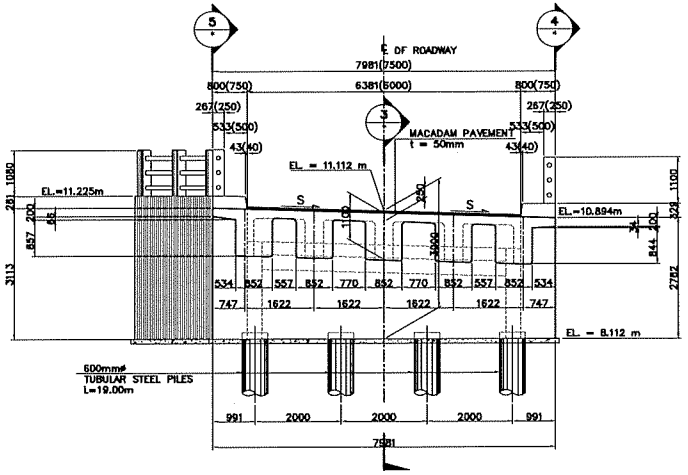
TITLE:	SCALE:	DRAWING No:	
BR-17 WAKORUMBA SUPERSTRUCTURE LAYOUT AND DIMENSIONS	AS SHOWN	11-4	Rev.



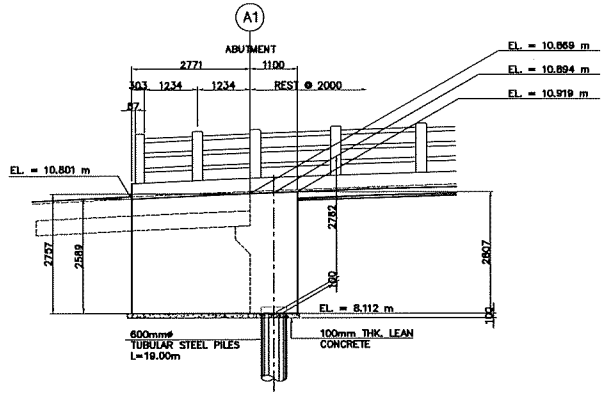
2 PLAN
SCALE 1:60



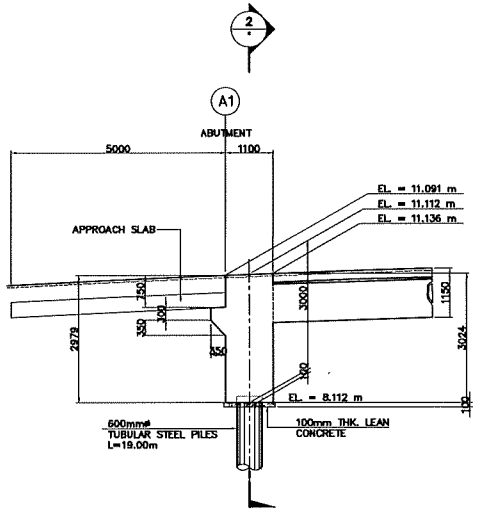
5 ELEVATION
SCALE 1:60



1 ELEVATION
SCALE 1:60



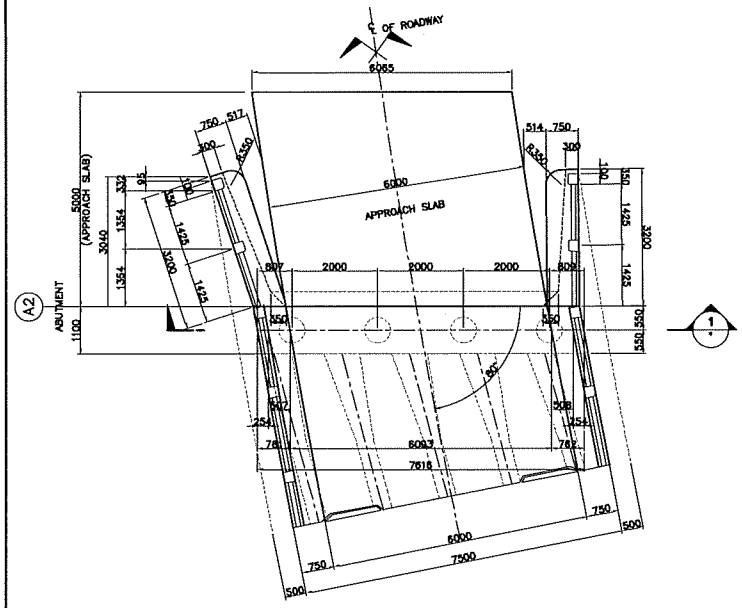
4 ELEVATION
SCALE 1:60



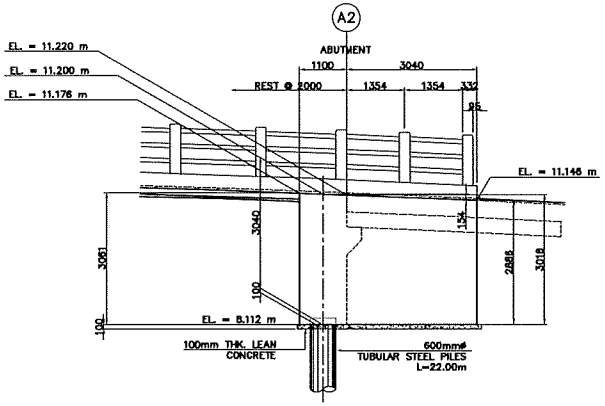
3 ELEVATION
SCALE 1:60

NOTE: PILE DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

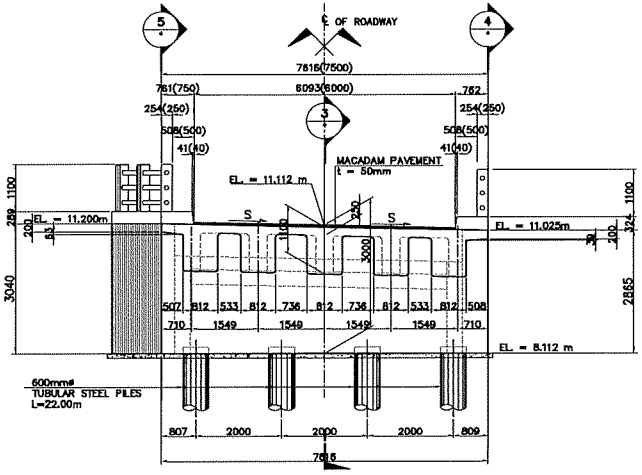
TITLE:	SCALE:	DRAWING No:	
BR-17 WOKORUMBA BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (ABUT. A1)	AS SHOWN	11-5	Rev.



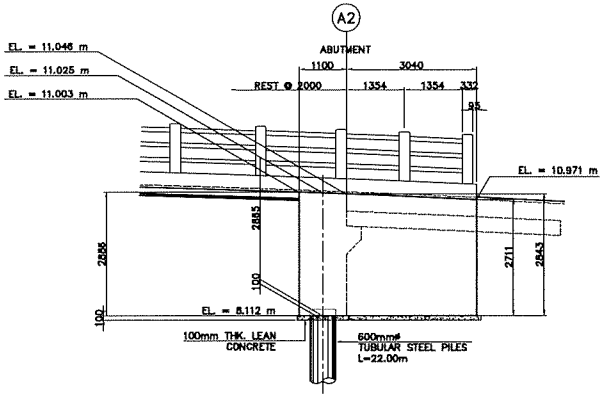
2 PLAN SCALE 1:60



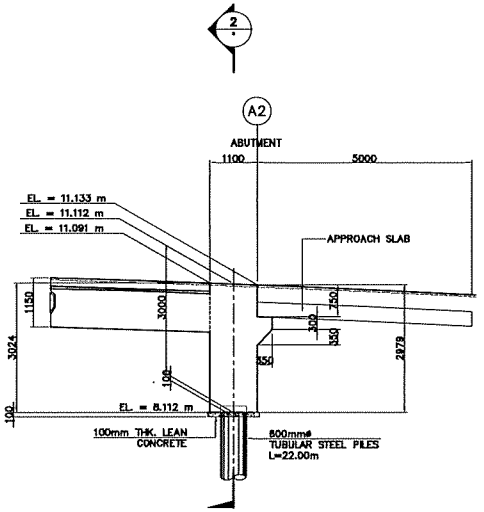
5 ELEVATION SCALE 1:60



1 ELEVATION SCALE 1:60



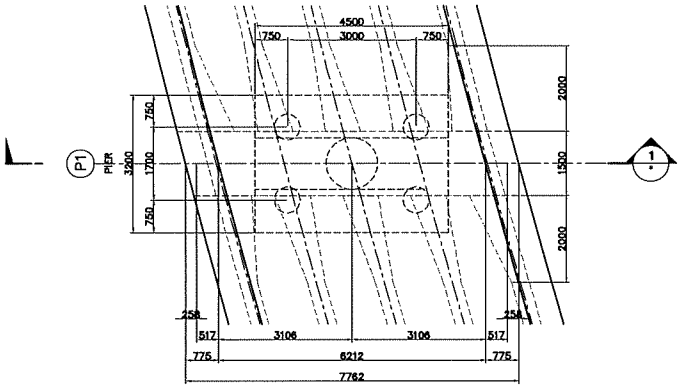
4 ELEVATION SCALE 1:60



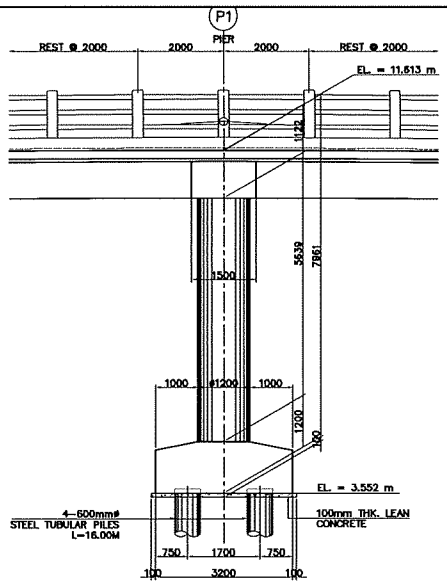
3 ELEVATION SCALE 1:60

NOTE: PILE DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

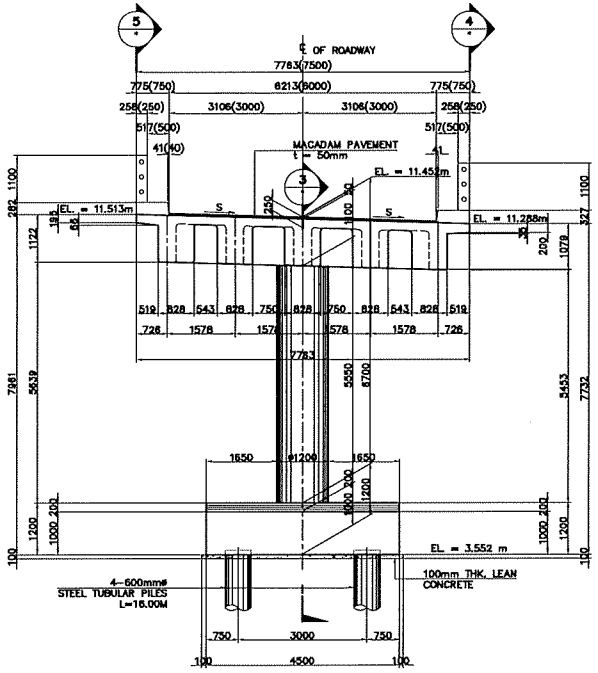
TITLE:	SCALE:	DRAWING No:	
BR-17 WOKORUMBA BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (ABUT. A2)	AS SHOWN	11-6	Rev.



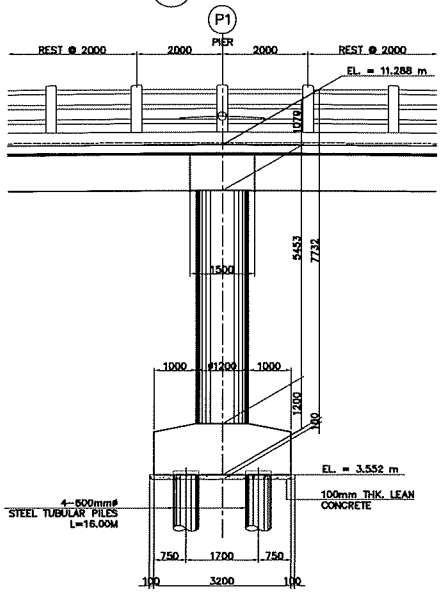
2 PLAN
SCALE 1:60



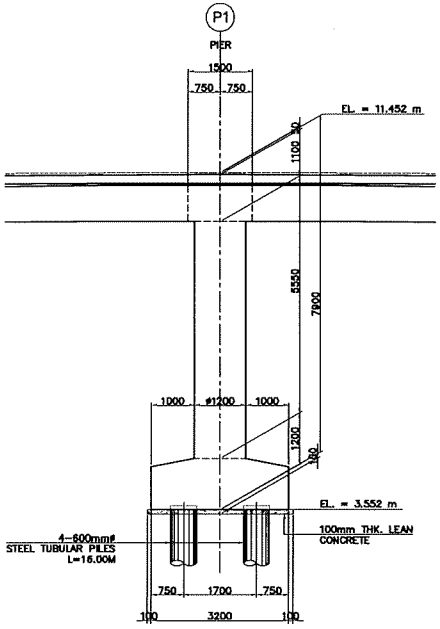
5 ELEVATION
SCALE 1:60



1 ELEVATION
SCALE 1:60



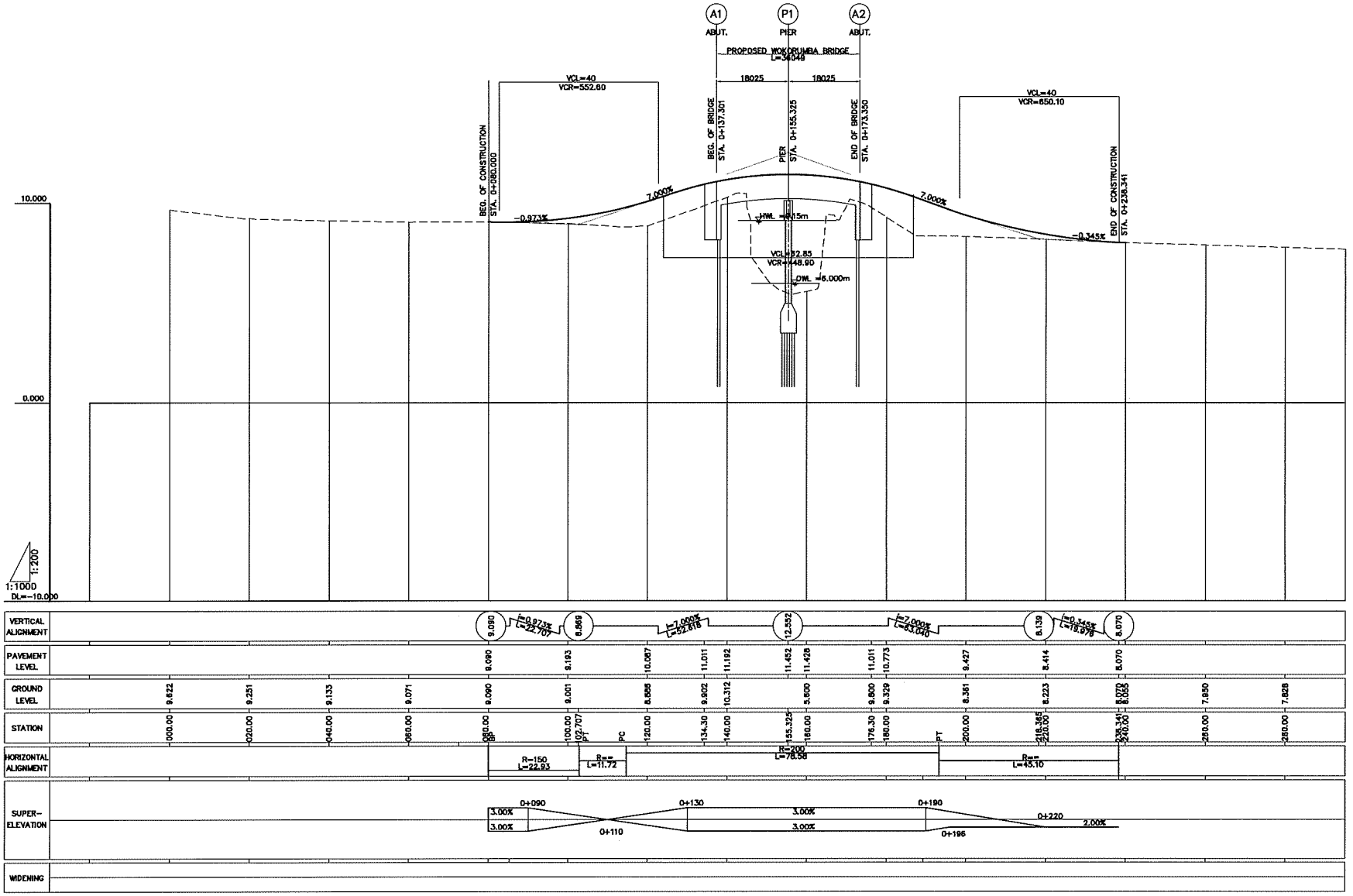
3 ELEVATION
SCALE 1:60



3 SECTION
SCALE 1:60

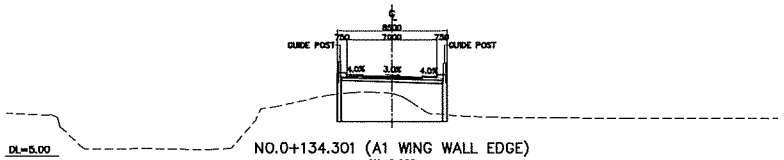
NOTE: PILE DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

TITLE:	SCALE:	DRAWING No:	
BR-17 WAKORUMBA BRIDGE SUBSTRUCTURE STRUCTURAL DIMENSION (PIER P1)	AS SHOWN	11-7	Rev.

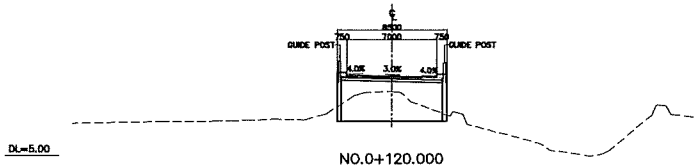


TITLE : BR-17 WOKORUMBA BRIDGE APPROACH ROAD PROFILE	SCALE : H = 1:1000 V = 1:200	DRAWING No: 11-8		Rev.

NO.0+176.301 (A2 WING WALL EDGE)
GH=9.800
PH=11.011



NO.0+134.301 (A1 WING WALL EDGE)
GH=9.902
PH=11.011



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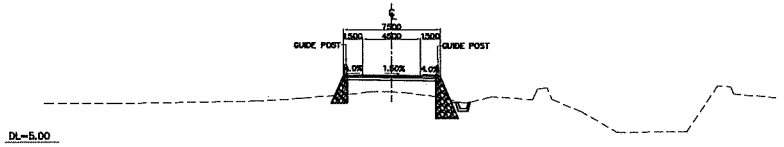

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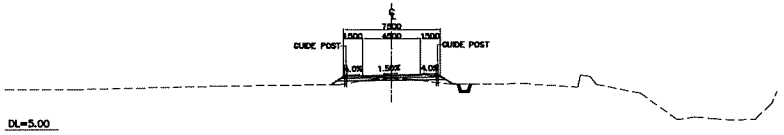

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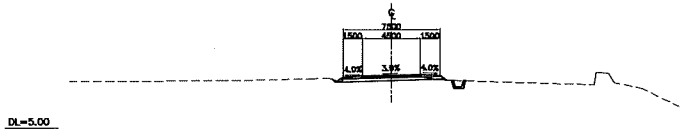

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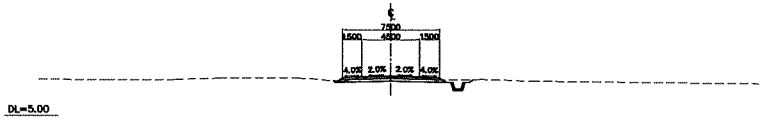

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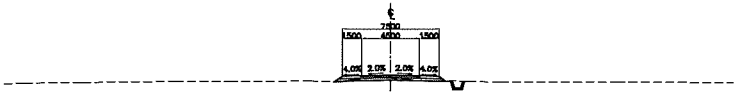

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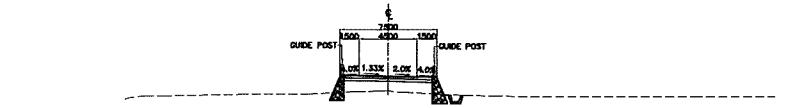
PH=9.427



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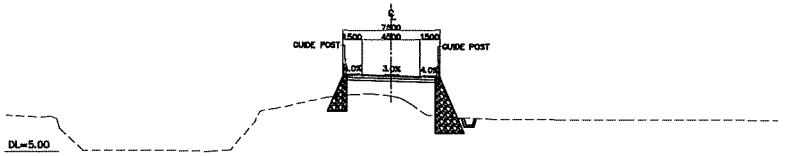
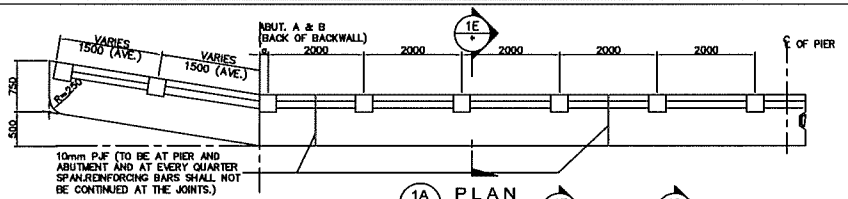
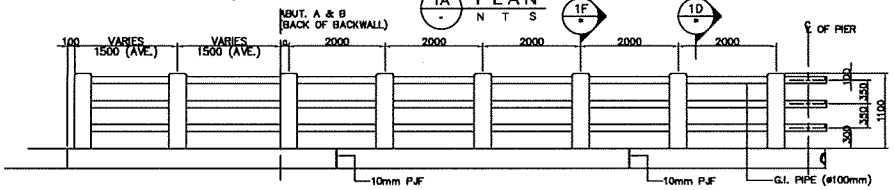


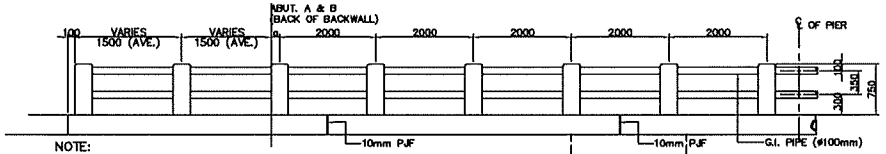
TITLE:	SCALE:	DRAWING No:	
BR-17 WOKORUMBA BRIDGE APPROACH ROAD CROSS SECTIONS	1 : 400	11-9	Rev.

DET. OF STANDARD STUCTURE

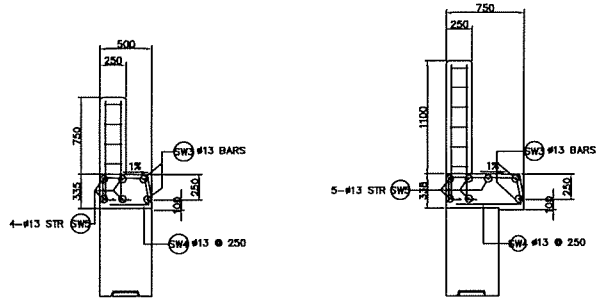


1A PLAN - N T S

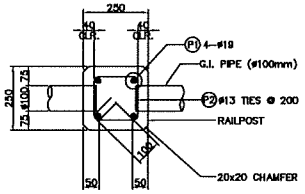




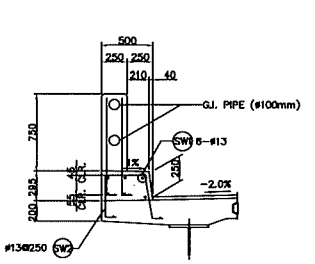
1B ELEVATION - N T S

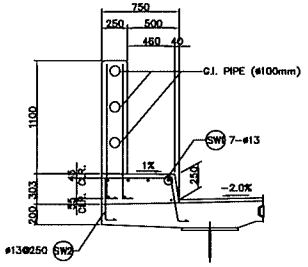


1H APPROACH RAIL SECTION
SCALE 1:50

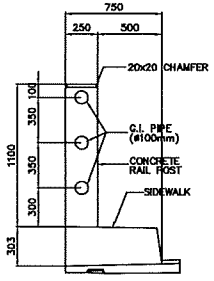


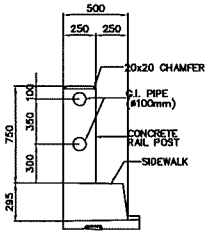
1C SECTION
SCALE 1:10



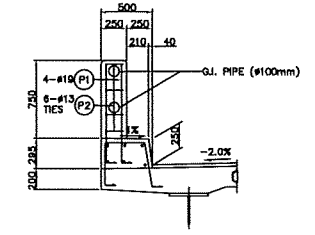


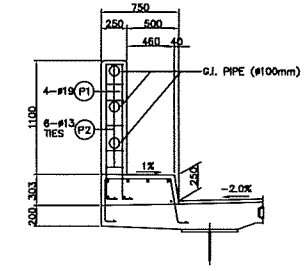
1E SECTION
SCALE 1:50





1D SECTION
SCALE 1:40





1F SECTION
SCALE 1:50

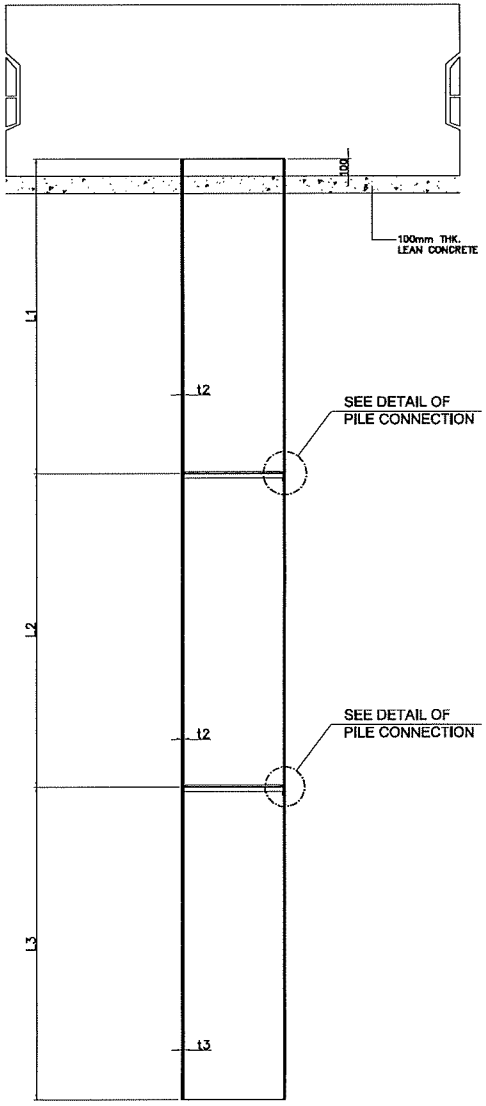
1 TYPICAL RAILING AND SIDEWALK DETAILS
SCALE AS SHOWN

SIDEWALK WIDTH=750								
STRUCTURE COMPONENT	BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.	REMARKS
CONCRETE RAIL POST	P1		1.573					QUANTITIES FOR ONE (1) CONCRETE RAIL POST
	P2		0.880					
BRIDGE SIDEWALK	SW1		1.0					QUANTITIES FOR ONE (1) METER LENGTH OF BRIDGE SIDEWALK
	SW2							
APPROACH SIDEWALK								QUANTITIES FOR ONE (1) METER LENGTH OF APPROACH SIDEWALK
							TOTAL = 15.44Kgs	

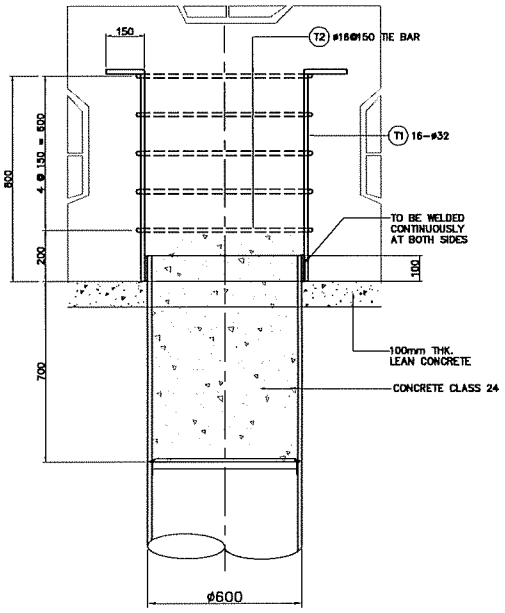
SCHEDULE OF REINFORCEMENT SIDEWALK WIDTH=500								
STRUCTURE COMPONENT	BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.	REMARKS
CONCRETE RAIL POST	P1	19	1.223	4	2.226	2.72	10.88	QUANTITIES FOR ONE (1) CONCRETE RAIL POST
	P2	13	0.880	4	1.042	0.92	3.68	
						SUB TOTAL =	14.56Kgs	
BRIDGE SIDEWALK	SW1	13	1.000	6	1.042	1.04	6.24	QUANTITIES FOR ONE (1) METER LENGTH OF BRIDGE SIDEWALK
	SW2	13	1.640	4	1.042	1.71	6.84	
						SUB TOTAL =	13.08Kgs	
APPROACH SIDEWALK	SW3	13	1.000	2	1.042	1.04	2.08	QUANTITIES FOR ONE (1) METER LENGTH OF APPROACH SIDEWALK
	SW4	13	1.425	4	1.042	1.48	5.92	
	SW5	13	1.000	4	1.042	1.04	4.16	
						SUB TOTAL =	12.16Kgs	

TITLE:	SCALE:	DRAWING No:	
STANDARD DRAWINGS TYPICAL RAILING, SIDEWALK AND DRAIN DETAILS	AS SHOWN	12-1	Rev.

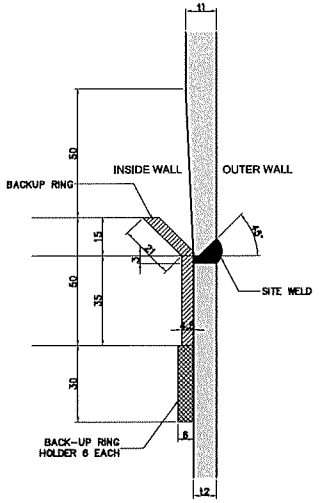
2-135



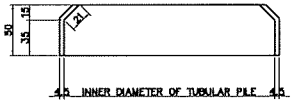
1 ELEVATION
SCALE 1:30



2 SECTION
SCALE 1:20



4 DETAIL (PILE CONNECTION)
SCALE 1:2

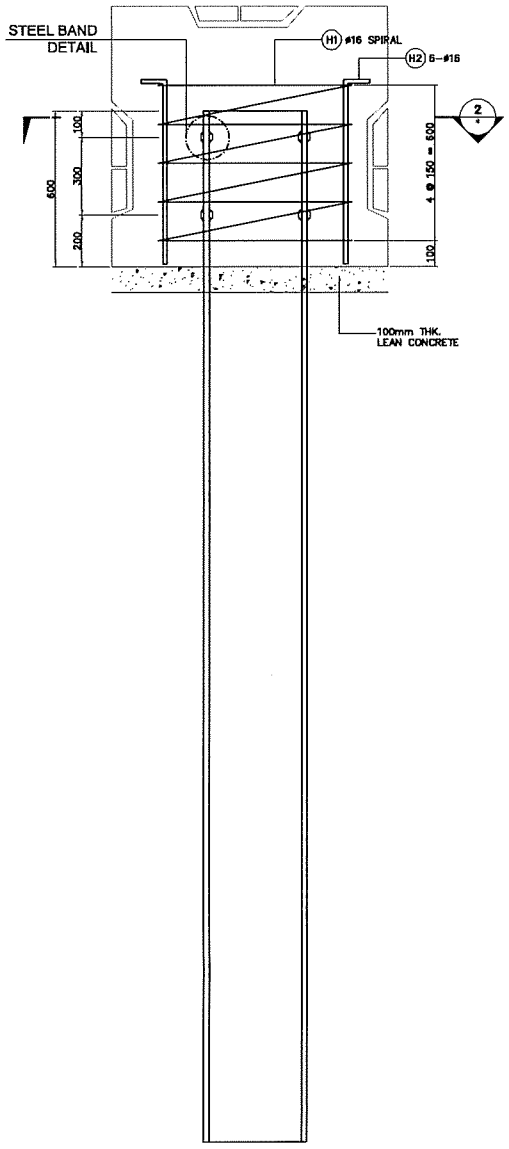


6 BACKUP RING DETAIL
NOT TO SCALE

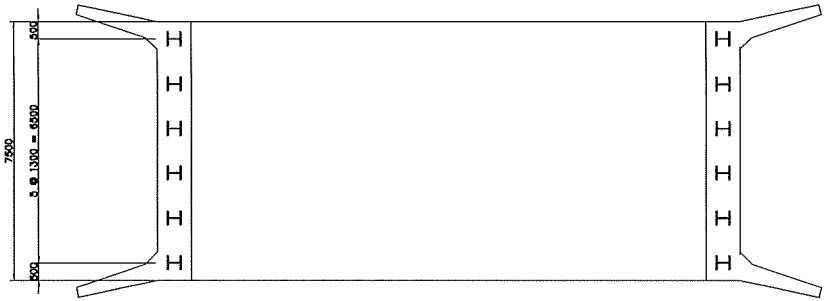
REINFORCING BAR SCHEDULE PER PILE				
BARK MARK	DIA	QTY.	a	b
T1	32	16	800	150
T2	16	5	2700	

BRIDGE NAME	SUBSTRUCTURE	PILE LENGTH (M)				PILE THICKNESS (MM)		
		L1	L2	L3	TOTAL	t1	t2	t3
BR-12 MALIGANO III	ABUT. A1&A2	12.0	12.0	2.0	26.0	12	9	9
	P1	12.0	11.0	–	23.0	16	9	–
BR-14 WAKAKA II	ABUT. A1&A2	12.0	3.0	–	15.0	12	9	–
	PIER P1	12.0	2.0	–	14.0	16	9	–
BR-15 LABUNGKA	ABUT. A1	12.0	–	–	12.0	12	–	–
	ABUT. A2	12.0	5.0	–	17.0	12	9	–
	PIER P1	6.0	–	–	6.0	12	–	–
BR-16 TOLIE	ABUT. A1	10.0	3.0	–	13.0	12	9	–
	ABUT. A2	12.0	3.0	–	15.0	12	9	–
	PIER P1	9.0	–	–	9.0	12	–	–
BR-17 WAKORUMBA	ABUT. A1	12.0	7.0	–	19.0	12	9	–
	ABUT. A2	12.0	10.0	–	22.0	12	9	–
	PIER P1	12.0	3.0	–	15.0	16	9	–

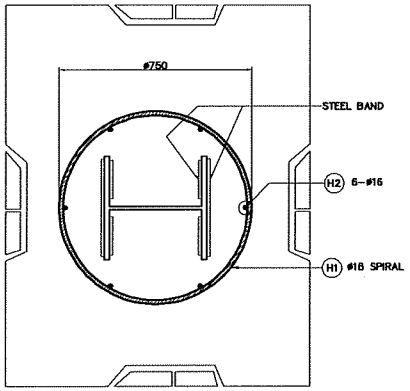
TITLE:	SCALE:	DRAWING No:	
STANDARD DRAWINGS TUBULAR PILE DETAILS	AS SHOWN	12-2	Rev.



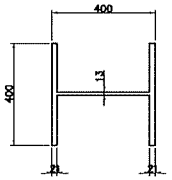
1 - ELEVATION
SCALE 1:20



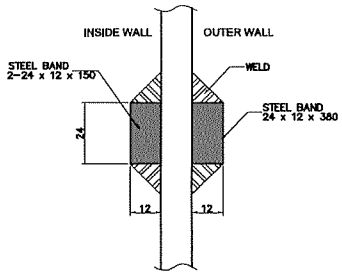
3 - LAYOUT OF STEEL H-PILES
NOT TO SCALE



2 - SECTION
SCALE 1:20



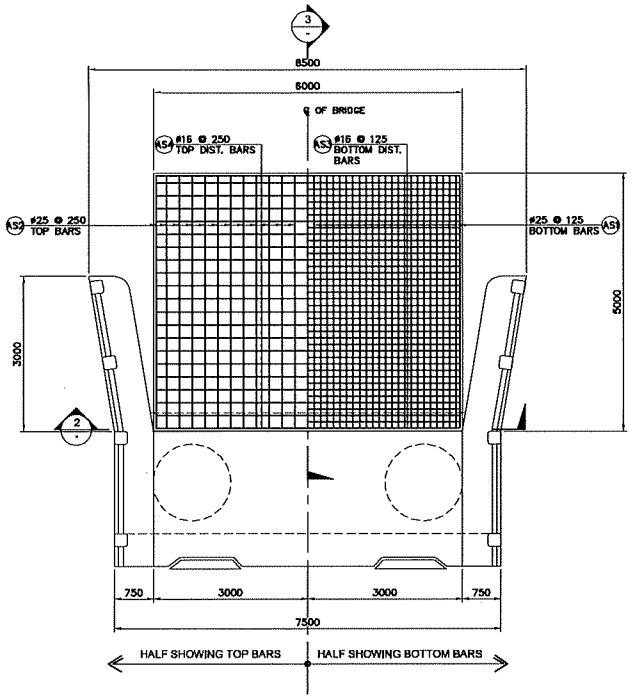
4 - STEEL H-PILE DETAIL
SCALE 1:20



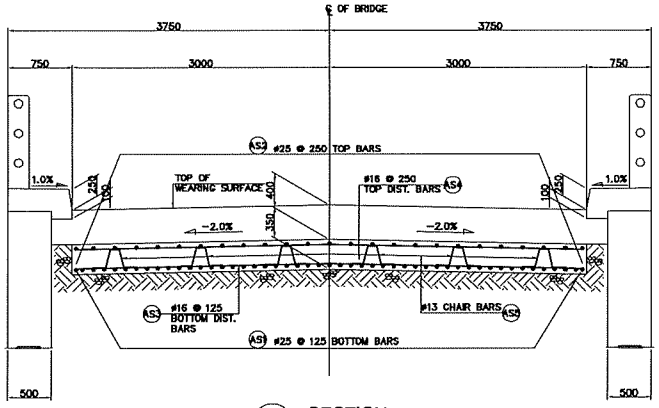
5 - STEEL BAND DETAIL
SCALE 1:2

REINFORCING BAR SCHEDULE PER PILE					
BARK MARK	DIA	QTY.	a	b	L
H1	#16	1	12000		12000
H2	#16	6	700	100	800

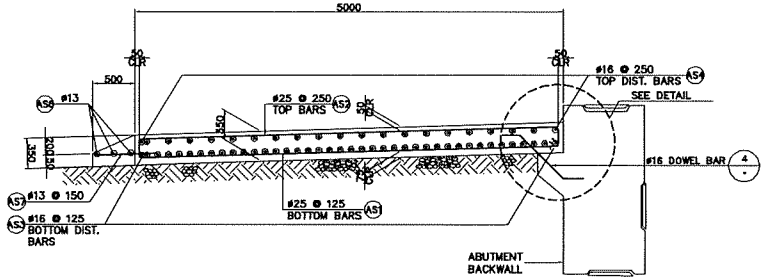
TITLE:	SCALE:	DRAWING No:	
STANDARD DRAWINGS STEEL H - PILE DETAILS	AS SHOWN	12-3	Rev.



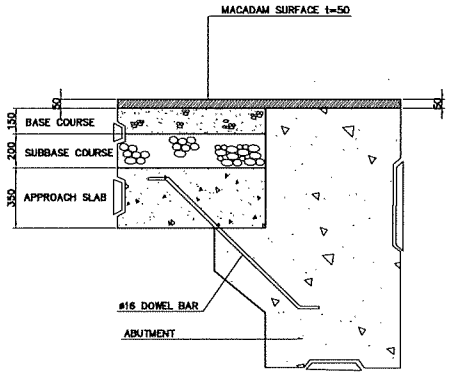
1 / - PLAN
SCALE 1:100



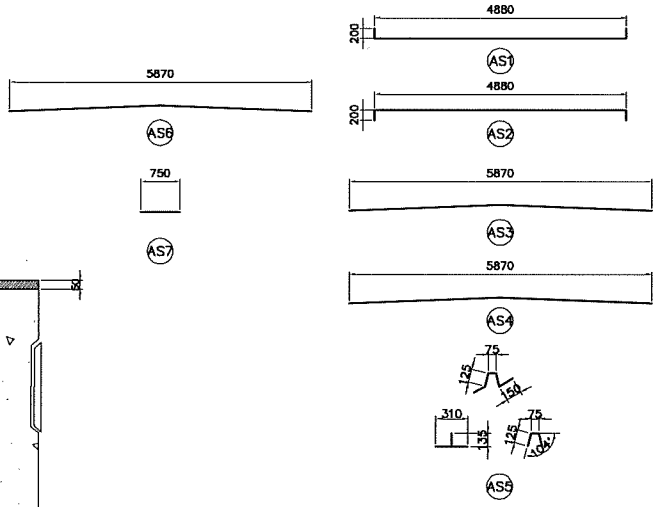
2 / - SECTION
SCALE 1:60



3 / - SECTION
SCALE 1:60



4 / - DETAIL
SCALE 1:30



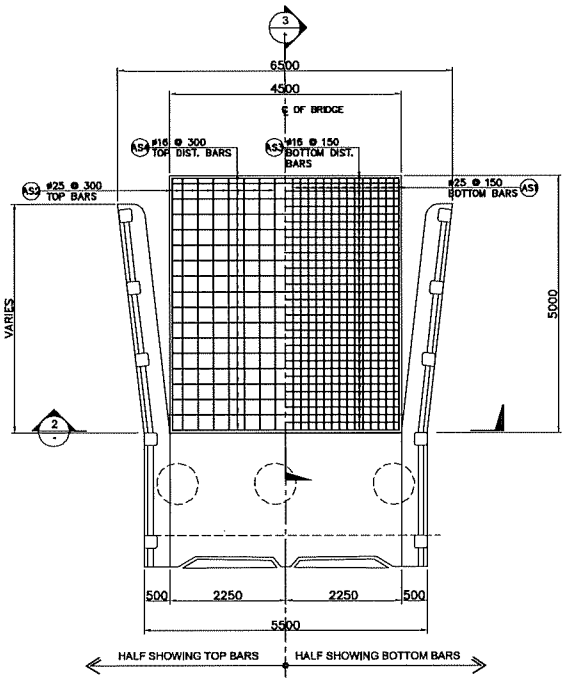
5 / - BAR BENDING DIAGRAM
NOT TO SCALE

SCHEDULE OF REINFORCEMENT

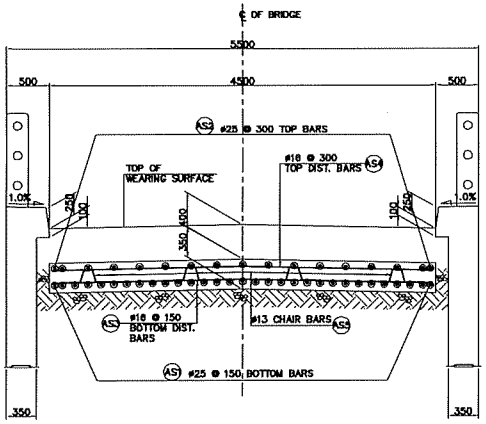
BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
AS1	25	5.28	48	3.853	20.34	976.32
AS2	25	5.28	25	3.853	20.34	508.50
AS3	16	5.87	39	1.578	9.26	361.14
AS4	16	5.87	20	1.578	9.26	185.20
AS5	13	0.625	24	1.042	0.65	15.60
AS6	13	5.87	3	1.042	6.12	18.36
AS7	13	0.750	48	1.042	0.78	34.44

TOTAL = 2,099.56Kgs

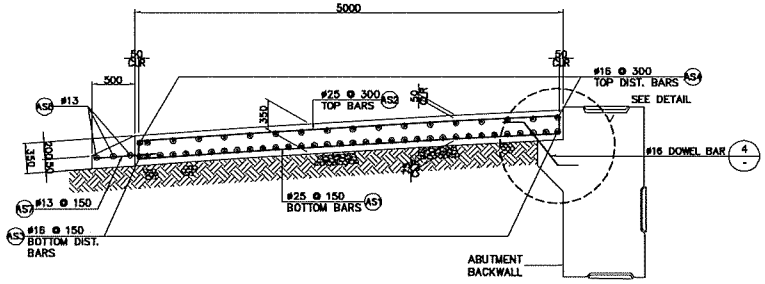
TITLE:	SCALE:	DRAWING No:	
STANDARD DRAWINGS TYPICAL APPROACH SLAB DETAILS (CARRIAGE WAY WIDTH = 6.00M)	AS SHOWN	12-4	Rev.



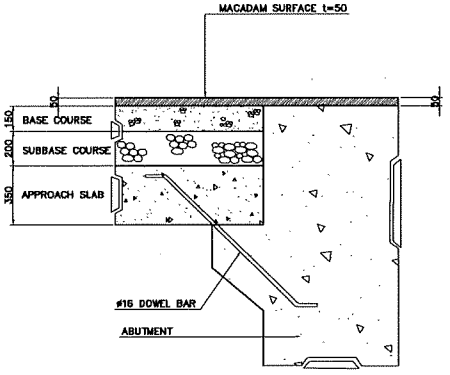
1 PLAN
SCALE 1:100



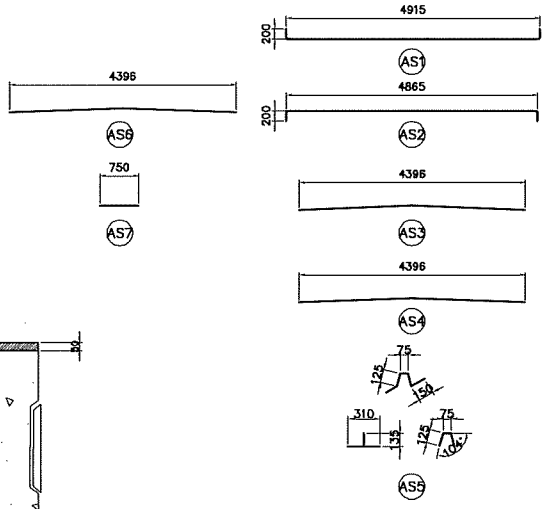
2 SECTION
SCALE 1:60



3 SECTION
SCALE 1:60



4 DETAIL
SCALE 1:30



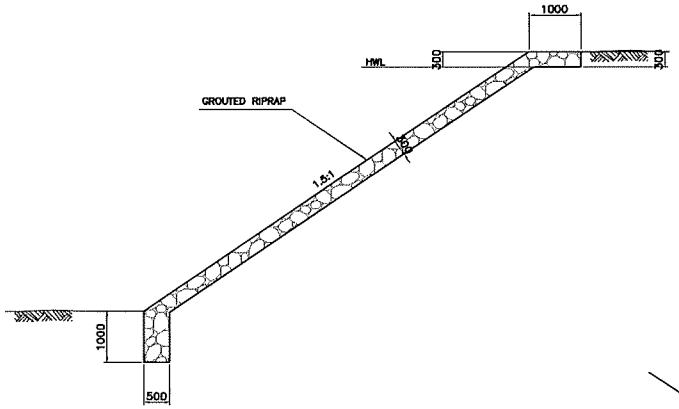
5 BAR BENDING DIAGRAM
NOT TO SCALE

SCHEDULE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
AS1	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	4.58	13.74
AS7	13	0.750	31	1.042	0.78	24.18

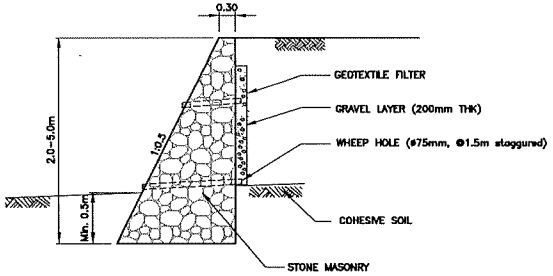
TOTAL = 1,447.52 Kgs

TITLE:	SCALE:	DRAWING No:	Rev.
STANDARD DRAWINGS TYPICAL APPROACH SLAB DETAILS (CARRIAGE WAY WIDTH = 4.50M)	AS SHOWN	12-5	

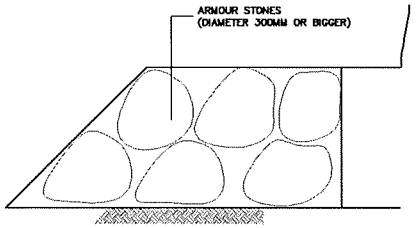


1 - RIPRAP PROTECTION (FOR ABUTMENT PROTECTION)
SCALE 1:100

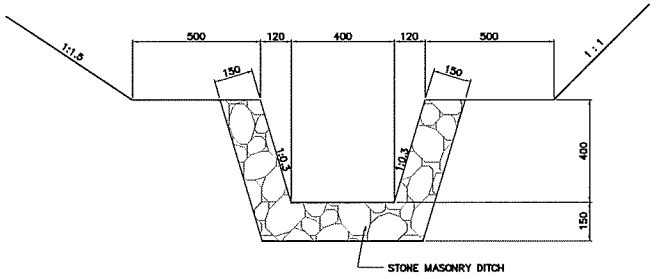
NOTE:
RIPRAP PROTECTION FOR EMBANKMENT SLOPE IS SHOWN TYPICAL APPROACH ROAD SECTION.



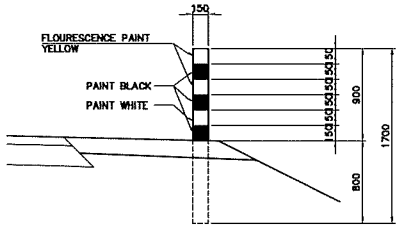
3 - STONE MASONRY WALL
SCALE 1:100



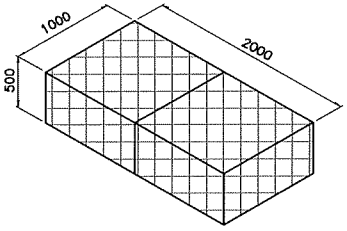
4 - ARMOUR STONES
SCALE 1:20



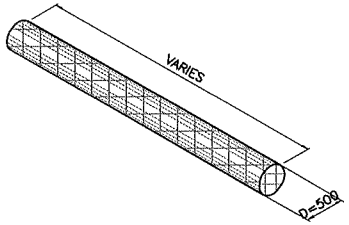
2 - STONE MASORY DITCH
SCALE 1:20



7A - ELEVATION
SCALE 1:50

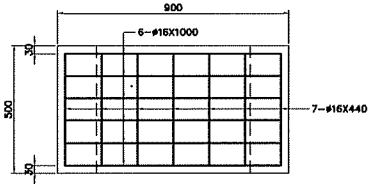


5 - GABION MATTRESS
NOT TO SCALE

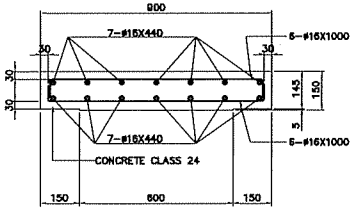


6 - CYLINDRICAL GABION
NOT TO SCALE

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.

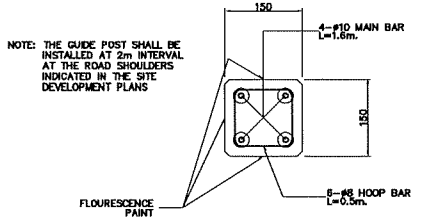


PLAN



SECTION

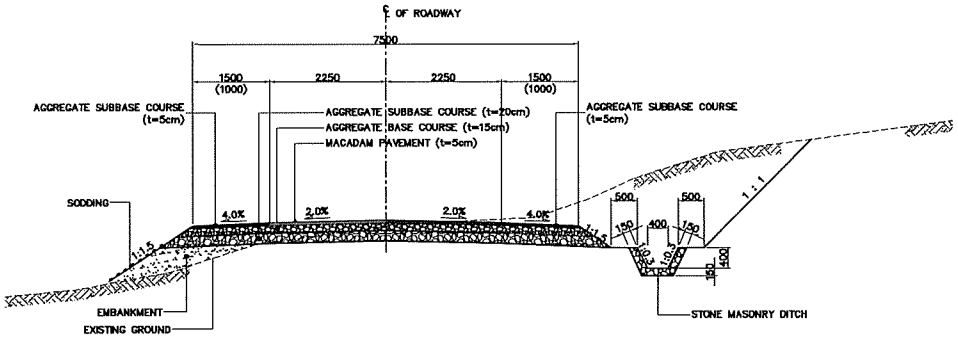
DITCH COVER



7B - SECTION
SCALE 1:10

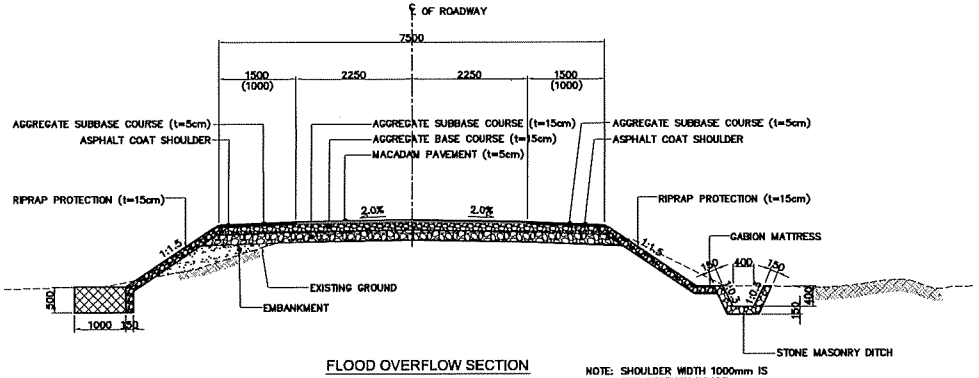
7 - GUIDE POST
SCALE AS SHOWN

TITLE:	SCALE:	DRAWING No:	
STANDARD DRAWINGS RIPRAP PORTECTION, GABION, STONE MASONRY DITCH & GUIDE POST	AS SHOWN	12-6	Rev.



CUT & EMBANKMENT SECTION

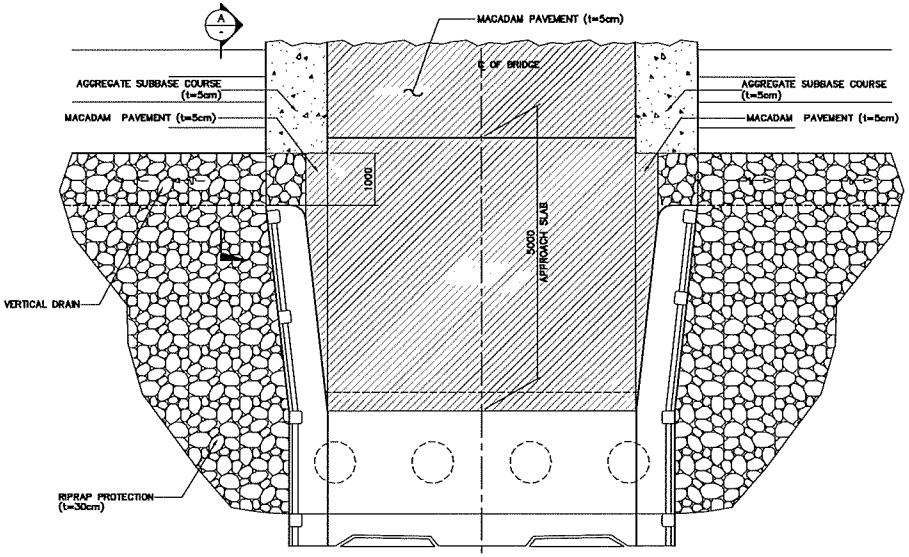
1 - APPROACH ROAD TYPICAL SECTION
SCALE 1:100



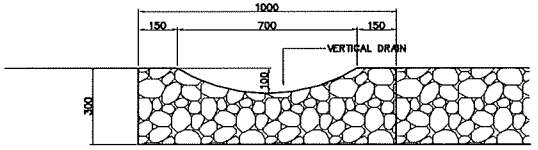
FLOOD OVERFLOW SECTION

NOTE: SHOULDER WIDTH 1000mm IS FOR REGENCY ROADS.

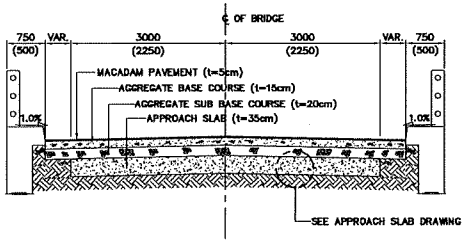
2 - APPROACH ROAD TYPICAL SECTION
SCALE 1:100



3 - TYPICAL PLAN OF BRIDGE APPROACH
SCALE 1:100



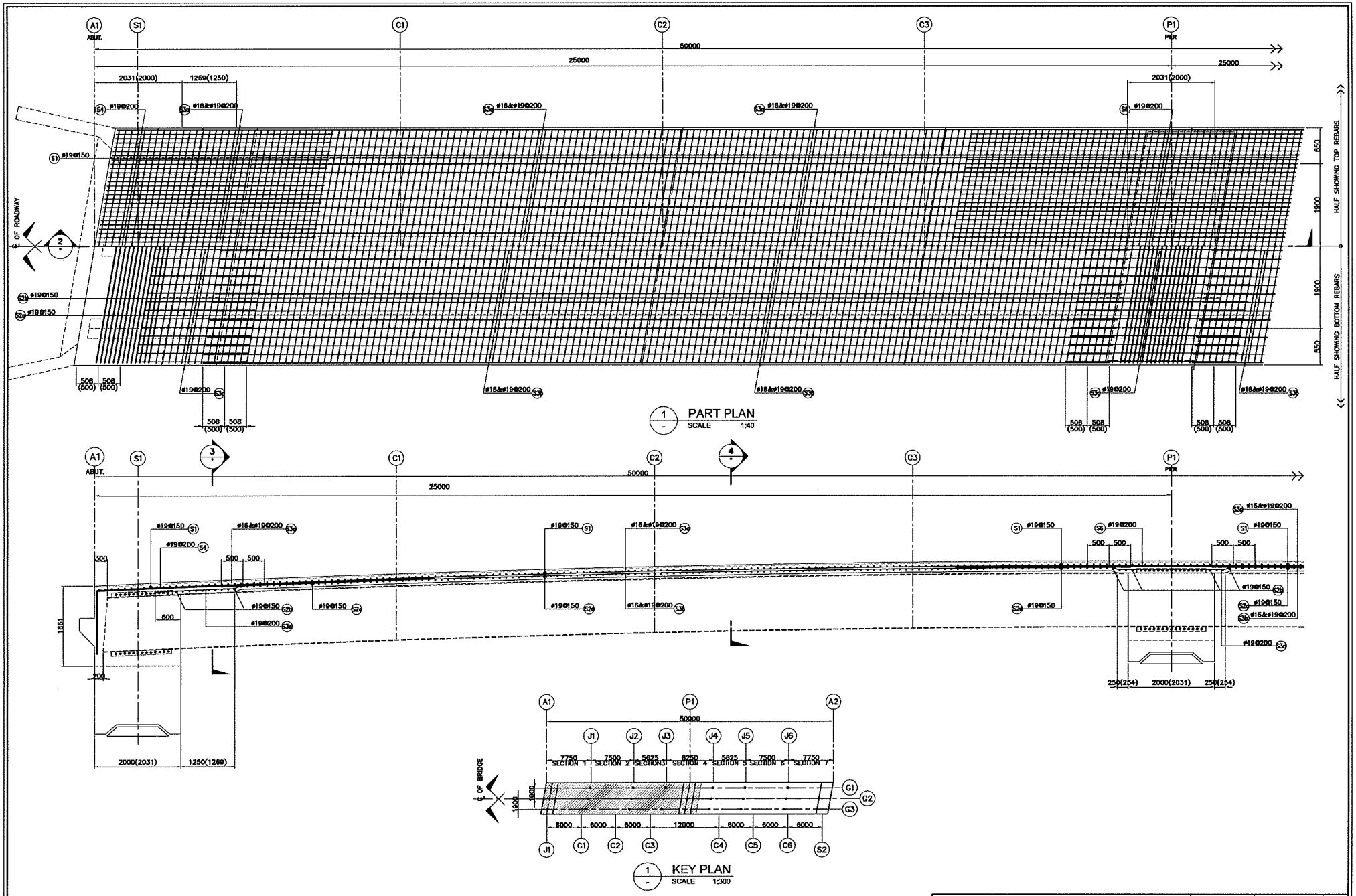
4 - SECTION A
SCALE 1:15



5 - TYPICAL SECTION OF BRIDGE APPROACH
SCALE 1:100

TITLE:	SCALE:	DRAWING No:	
STANDARD DRAWINGS TYPICAL APPROACH ROAD SECTION	AS SHOWN	12-7	Rev.

TYP. DETAIL DESIGN (STEEL GIRDER)

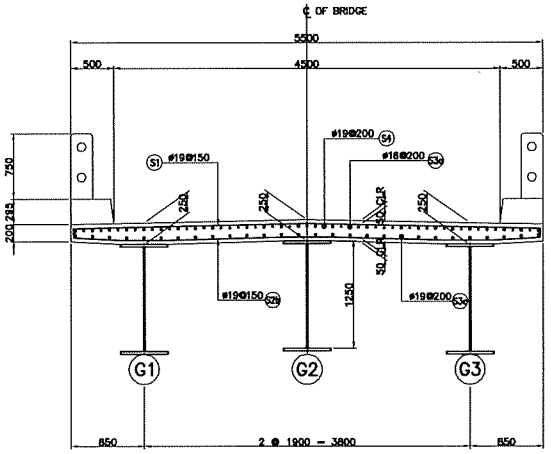


TITLE:
BR-01 RORAYA III BRIDGE
DECK SLAB REINFORCEMENT DETAILS (1 of 2)

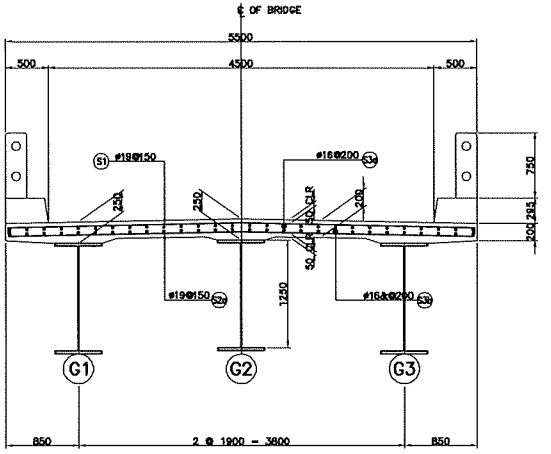
SCALE: AS SHOWN

DRAWING No: 13-1

Rev.

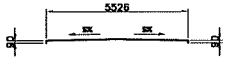


3 SECTION
SCALE 1:30

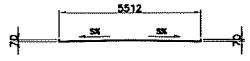


4 SECTION
SCALE 1:30

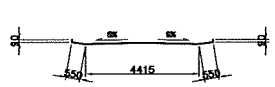
S1 ø19@150



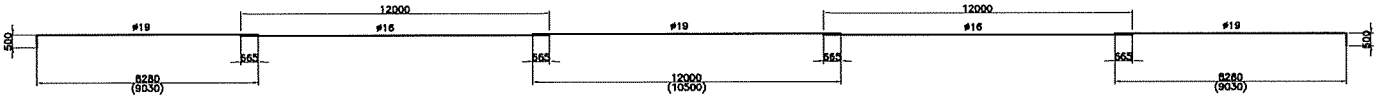
S2a ø19@150



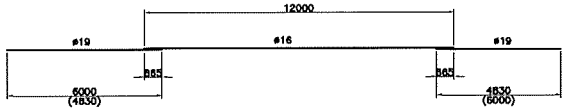
S2b ø19@150



S3a ø16@200 and ø19@200



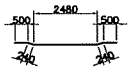
S3b ø16@200 and ø19@200



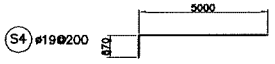
SCHEDULE OF REINFORCEMENT						
BARK MARK	BAR SIZE	LENGTH OF BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
S1	D-19	5.706	334	2.226	12.70	4241.80
S2a	D-19	5.652	276	2.226	12.58	3472.08
S2b	D-19	5.695	28	2.226	12.68	355.04
S3a	D-16	29.560	28	2.226	65.80	1842.40
	D-19	24.000	28	1.578	37.87	1060.36
S3b	D-19	10.830	56	2.226	24.11	1350.16
	D-16	12.000	56	1.578	18.94	1060.64
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	54	2.226	13.07	705.78
S5	D-10	0.375	36	0.617	0.23	8.28
S6	D-19	10.000	27	2.226	22.26	601.02
SD-40 TOTAL = 15,260.64 Kgs.						

S3c ø19@200

S3d ø19@200

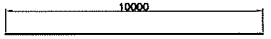


S4 ø19@200

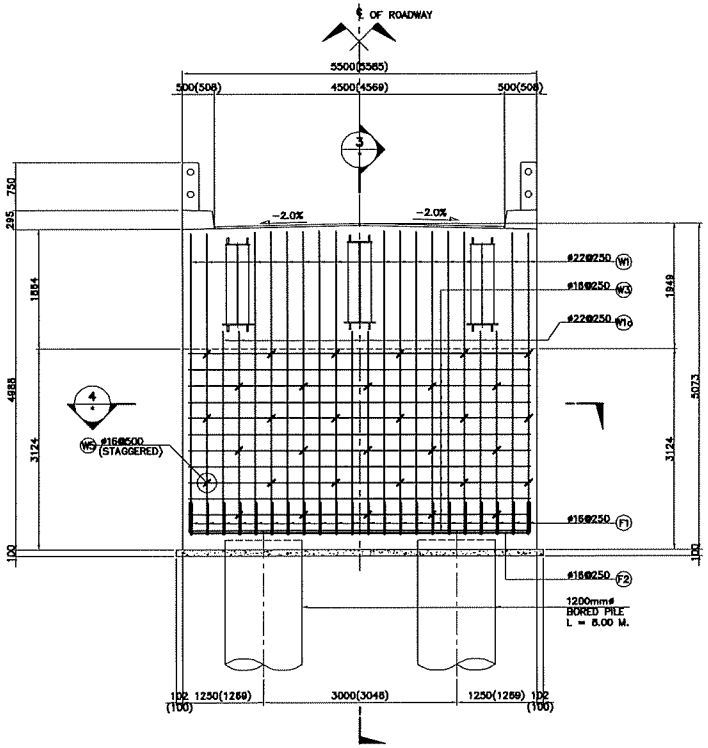


S5 ø10 CHAIR BAR

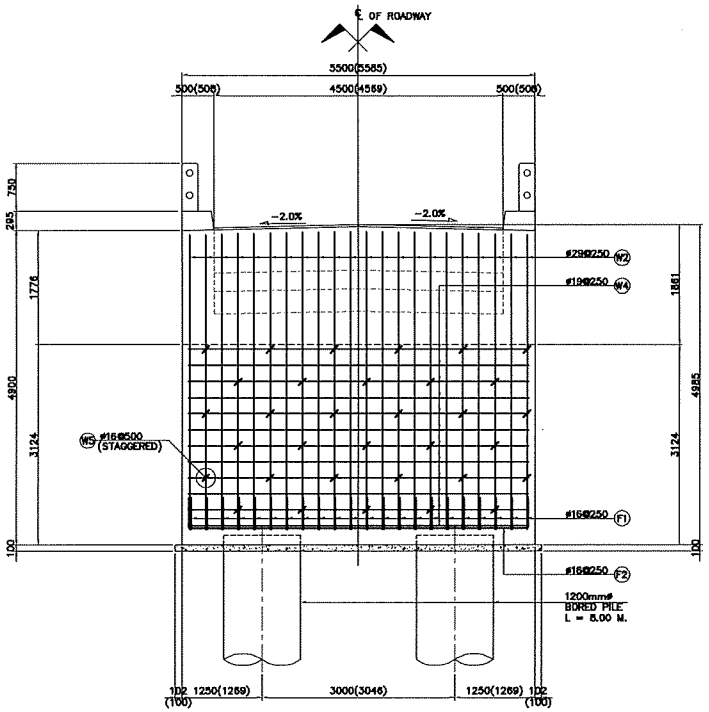
S6 ø19@200



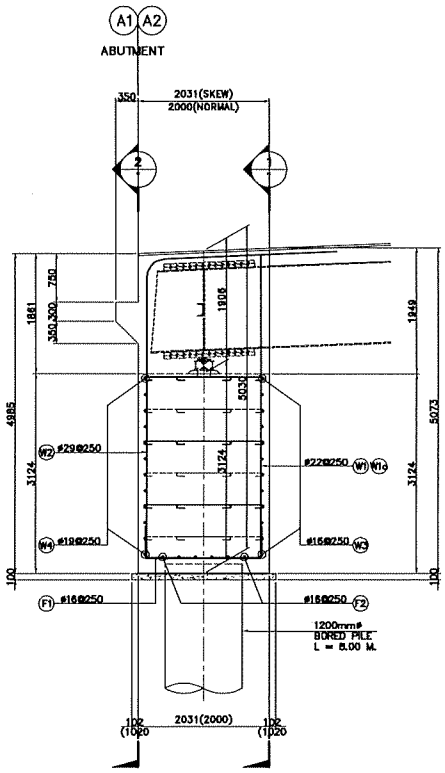
TITLE:	SCALE:	DRAWING No:	
BR-01 RORAYA III BRIDGE DECK SLAB REINFORCEMENT DETAILS (2 of 2)	AS SHOWN	13-2	Rev.



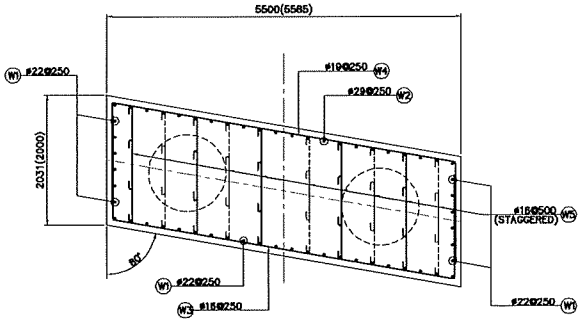
1 - ELEVATION
SCALE 1:40



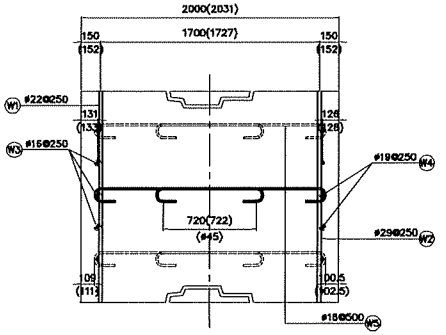
2 - ELEVATION
SCALE 1:40



3 - ELEVATION
SCALE 1:40

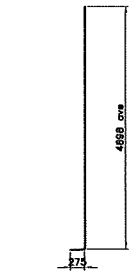


4 - P L A N
SCALE 1:40

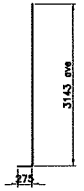


5 - DETAIL
SCALE 1:20

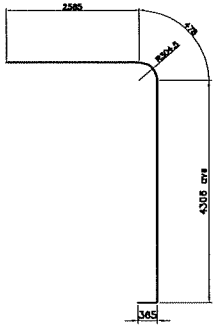
TITLE:	SCALE:	DRAWING No:	
BR-01 RORAYA III BRIDGE ABUT. A1 & A2 REINF. DETAILS (1 of 4)	AS SHOWN	13-3	Rev.



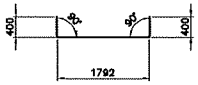
(W1) 28–ø22 x 4973



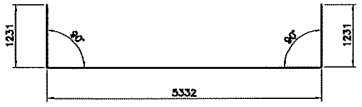
(W1a) 6–ø22 x 3418



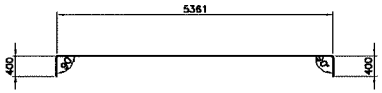
(W2) 22–ø29 x 7734



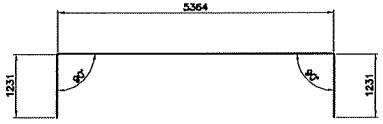
(F1) 22–ø16 x 2592



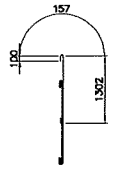
(W3) 12–ø16 x 7794



(F2) 6–ø16 x 6161



(W4) 12–ø19 x 7926



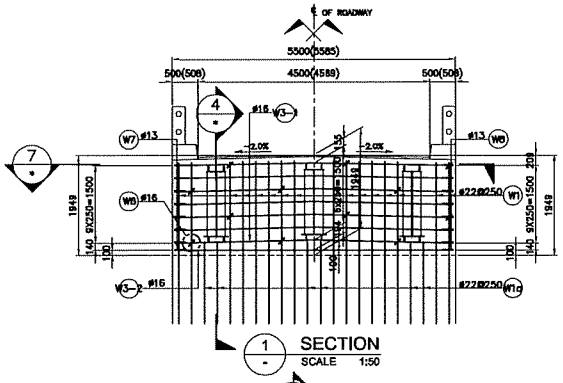
(W5) 33–ø16 x 3632

SCHEDULE OF REINFORCEMENT

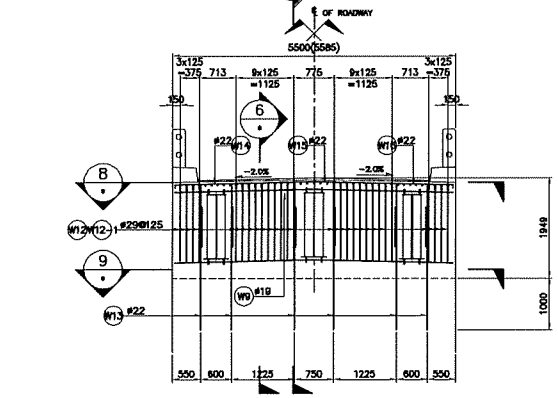
	BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ABUTMENT A1 & A2	W1	D–22	4.973	28	2.984	14.84	415.52
	W1a	D–22	3.418	6	2.984	10.20	61.20
	W2	D–29	7.734	22	5.185	40.10	882.20
	W3	D–16	7.794	12	1.578	12.30	147.60
	W4	D–19	7.826	12	2.226	17.42	209.04
	W0	D–16	3.632	33	1.578	5.73	189.09
	F1	D–16	2.592	22	1.578	4.09	89.98
	F2	D–16	8.181	6	1.578	9.72	58.32
						SD–40 TOTAL =	2052.95 Kgs.

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

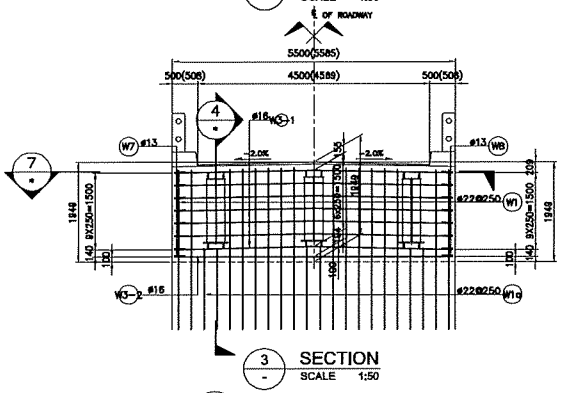
TITLE:	SCALE:	DRAWING No:	
BR-01 RORAYA III BRIDGE ABUT. A1 & A2 REINF. DETAILS (2 of 4)	AS SHOWN	13-4	Rev.



1 SECTION
SCALE 1:50

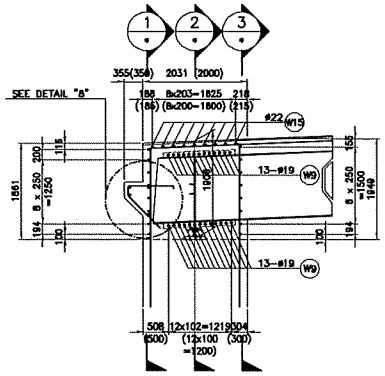


2 SECTION
SCALE 1:50

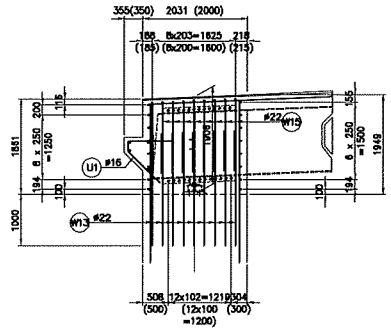


3 SECTION
SCALE 1:50

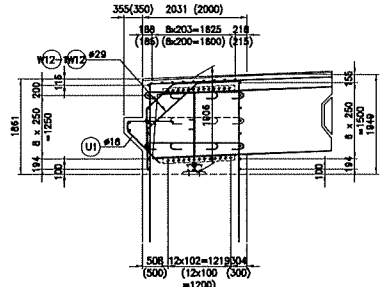
1 ABUTMENT DETAIL
SCALE 1:50



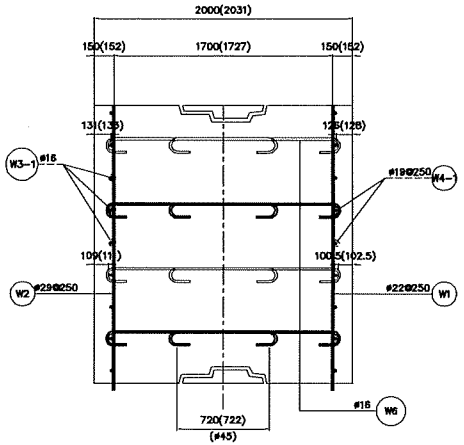
4 SECTION
SCALE 1:50



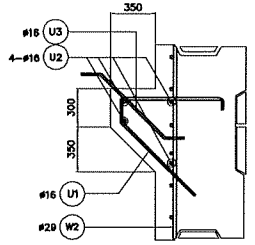
5 SECTION
SCALE 1:50



6 SECTION
SCALE 1:50

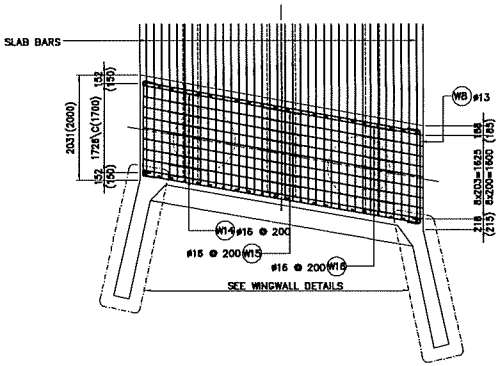


7 DETAIL
SCALE 1:20

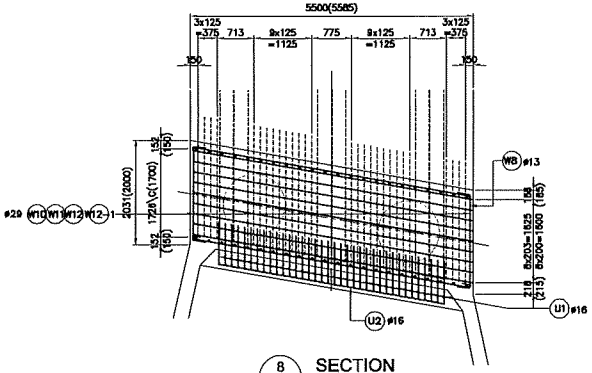


8 DETAIL
SCALE 1:20

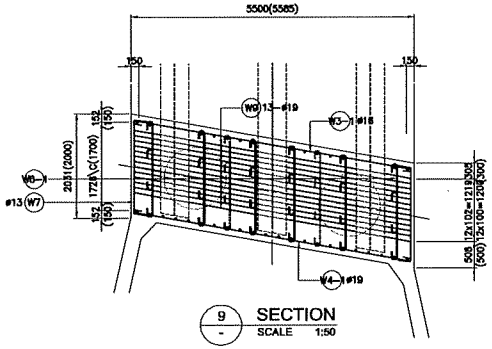
TITLE:	SCALE:	DRAWING No:	
BR-01 RORAYA III BRIDGE ABUT. A1 & A2 REINF. DETAILS (3 of 4)	AS SHOWN	13-5	Rev.



7 SECTION
SCALE 1:50

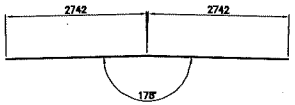


8 SECTION
SCALE 1:50

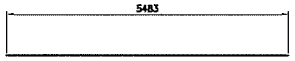


9 SECTION
SCALE 1:50

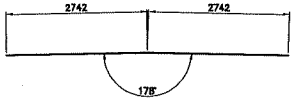
1 ABUTMENT DETAIL
SCALE 1:50



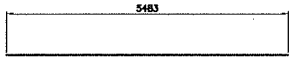
W3-1 7-#16 x 5484



W3-2 1-#16 x 5483



W4-1 7-#19 x 5484



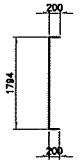
W4-2 1-#19 x 5483

SCHEDULE OF REINFORCEMENT

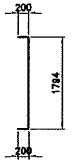
	BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ABUTMENT	W3-1	D-16	5.484	7	1.578	8.65	60.55
	W3-2	D-16	5.483	1	1.578	8.65	8.65
	W4-1	D-19	5.484	7	2.226	12.21	85.47
	W4-2	D-19	5.483	1	2.226	12.21	12.21
	W6	D-16	3.484	12	1.578	5.50	66.00
	W7	D-13	2.194	8	1.042	2.29	18.32
	W8	D-13	2.194	8	1.042	2.29	18.32
	W9	D-19	5.484	26	2.226	12.21	317.46
	W12	D-29	2.834	24	5.185	14.69	352.56
	W12-1	D-29	2.224	24	5.185	11.53	276.72
	W13	D-22	2.377	48	2.984	7.09	340.32
	W14	D-22	3.059	8	2.984	9.13	73.04
	W15	D-22	3.274	8	2.984	9.77	78.16
	W16	D-22	3.059	8	2.984	9.13	73.04
	U1	D-16	1.905	24	1.578	3.01	72.24
	U2	D-16	4.510	4	1.578	7.12	28.48
	U3	D-16	1.600	24	1.578	2.53	60.59
					SD-40 TOTAL =		1942.13 Kgs.

NOTE : QUANTITIES FOR 1 ABUTMENT ONLY

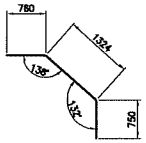
1.27 30.48



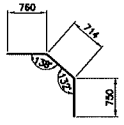
W7 8-#13 x 2194



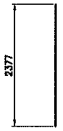
W8 8-#13 x 2194



W12 24-#29 x 2834

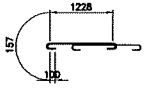


W12-1 24-#29 x 2224

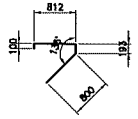


W13 48-#22 x 2377

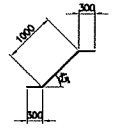
W9 26-#19 x 5484



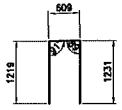
W6 12-#16 x 3484



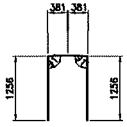
U1 24-#16 x 1905



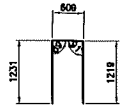
U3 24-#16 x 1600



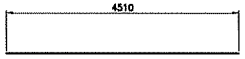
W14 8-#22 x 3059



W15 8-#22 x 3274

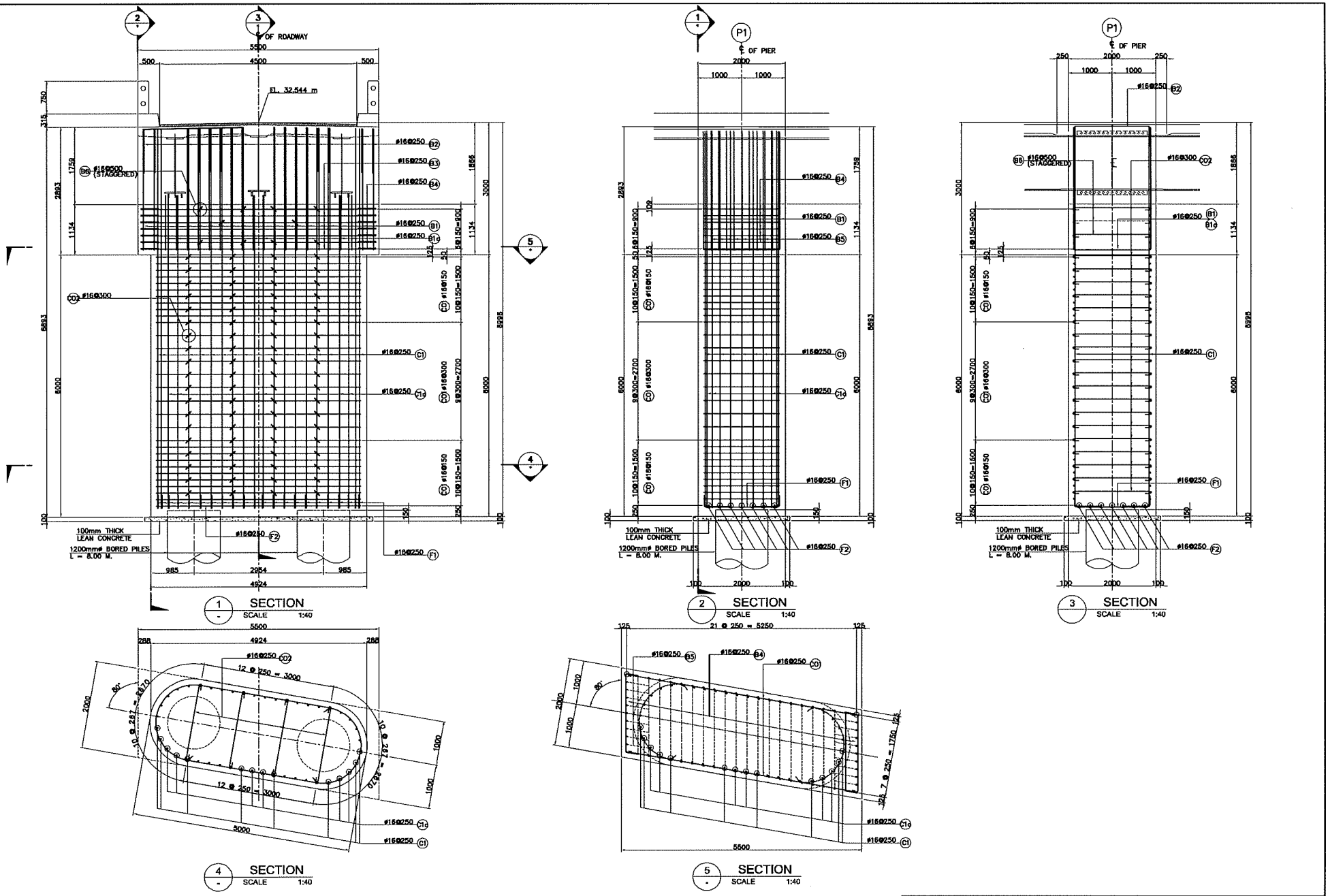


W16 8-#22 x 3059

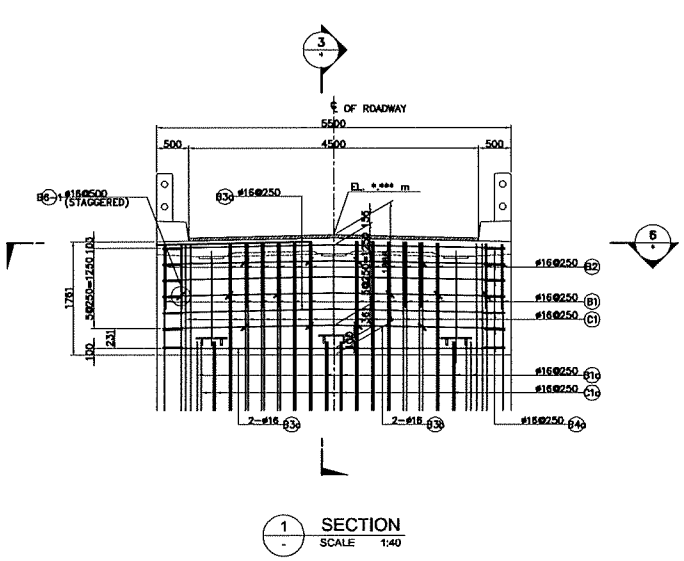


U2 4-#16 x 4510

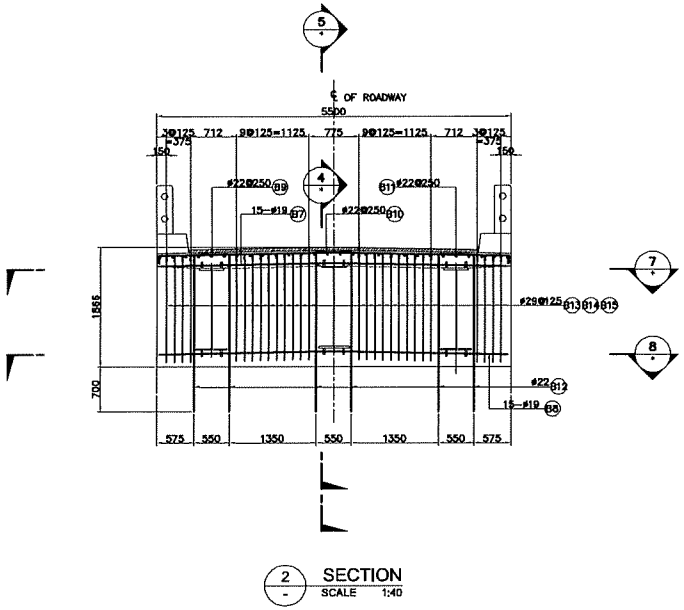
TITLE:	SCALE:	DRAWING No:	Rev.
BR-01 RORAYA III BRIDGE ABUT. A1 & A2 REINF. DETAILS (4 of 4)	AS SHOWN	13-6	



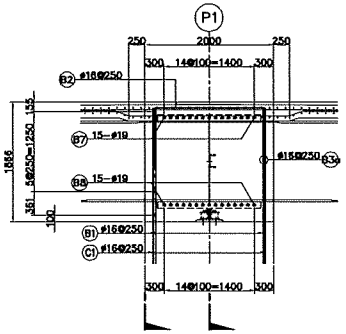
TITLE:	SCALE:	DRAWING No:	Rev.
BR-01 RORAYA III BRIDGE PIER P1 REINFORCEMENT DETAILS (1 of 3)	AS SHOWN	13-7	



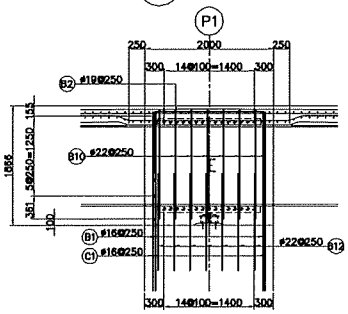
1 SECTION
SCALE 1:40



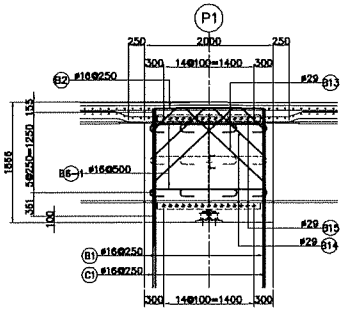
2 SECTION
SCALE 1:40



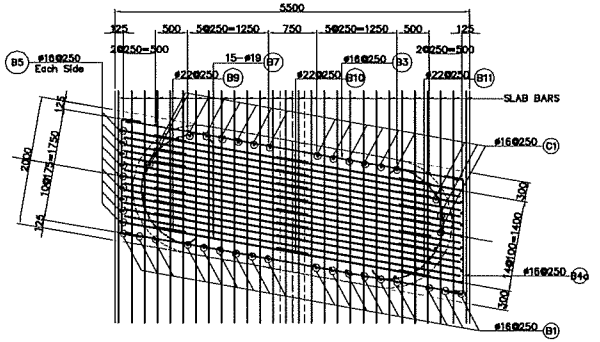
3 SECTION
SCALE 1:40



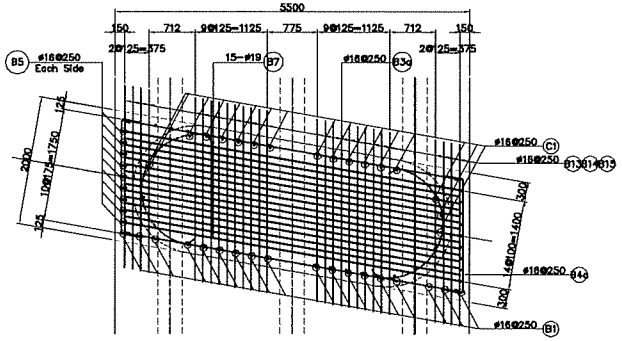
4 SECTION
SCALE 1:40



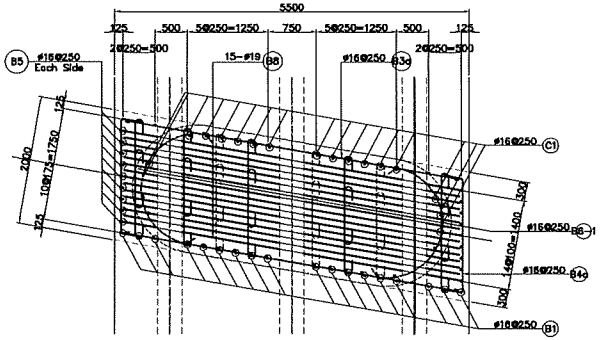
5 SECTION
SCALE 1:40



6 SECTION
SCALE 1:40

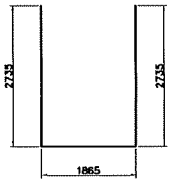


7 SECTION
SCALE 1:40

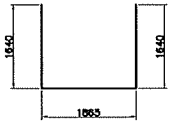


8 SECTION
SCALE 1:40

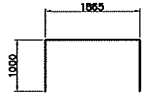
TITLE:	SCALE:	DRAWING No:	
BR-01 RORAYA III BRIDGE PIER P1 REINFORCEMENT DETAILS (2 of 3)	AS SHOWN	13-8	Rev.



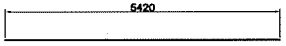
(B1) 16 – ø16 X 7335



(B1a) 6 – ø16 X 5145

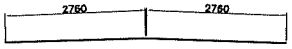


(B2) 16 – ø16 X 3865

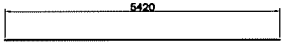


(B3) 14 – ø16 X 5420

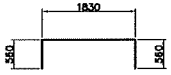
(B3a) 10 – ø16 X 5440



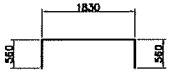
(B3b) 2 – ø16 X 5520



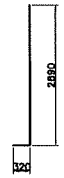
(B3c) 2 – ø16 X 5420



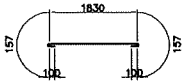
(B4) 14 – ø16 X 2950



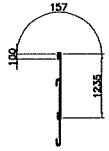
(B4a) 14 – ø16 X 2950



(B5) 18 – ø16 X 3010



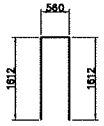
(B6) 10 – ø16 X 2344



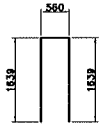
(B6-1) 14 – ø16 X 3498

(B7) 15 – ø19 X 5502

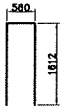
(B8) 15 – ø19 X 5502



(B9) 8 – ø22 X 3779

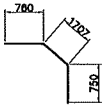


(B10) 8 – ø22 X 3738

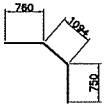


(B11) 8 – ø22 X 3779

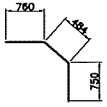
(B12) 48 – ø22 X 2200



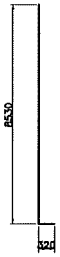
(B13) 56 – ø29 X 3217



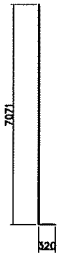
(B14) 56 – ø29 X 2604



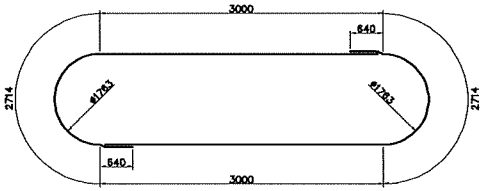
(B15) 56 – ø29 X 1994



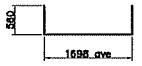
(C1) 32 – ø16 X 8850



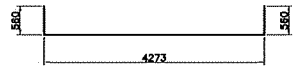
(C1a) 12 – ø16 X 7391



(CO1) 30 – ø16 X 12708



(F1) 17 – ø16 X 2818



(F2) 9 – ø16 X 5393

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

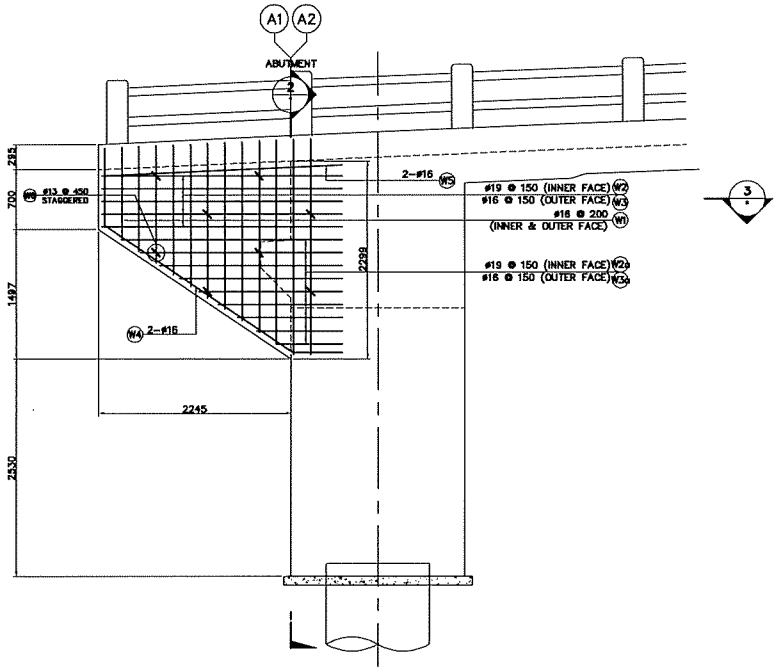
SCHEDULE OF REINFORCEMENT

PIER P1

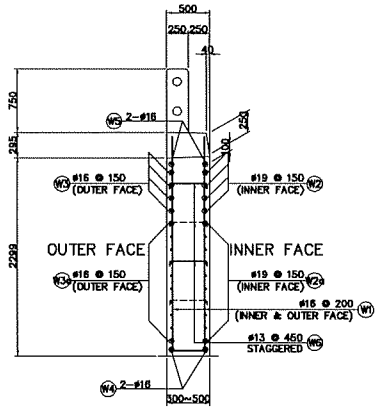
BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
B1	D-16	7.335	16	1.578	11.57	185.12
B1a	D-16	5.145	6	1.578	8.12	48.72
B2	D-16	3.865	16	1.578	6.10	97.60
B3	D-16	5.420	14	1.578	8.55	119.70
B3a	D-19	5.440	10	2.226	8.58	85.80
B3b	D-16	5.520	2	1.578	8.71	17.42
B3c	D-16	5.420	2	1.578	8.55	17.10
B4	D-16	2.950	14	1.578	4.66	65.24
B4a	D-16	2.950	14	1.578	4.66	65.24
B5	D-16	3.010	18	1.578	4.75	85.50
B6	D-16	2.344	10	1.578	3.70	37.00
B6-1	D-16	3.498	14	1.578	5.52	77.28
B7	D-19	5.502	15	2.226	12.25	183.75
B8	D-19	5.502	15	2.226	12.25	183.75
B9	D-22	3.779	8	2.984	11.28	90.24
B10	D-22	3.838	8	2.984	11.45	91.60
B11	D-22	3.779	8	2.984	11.28	90.24
B12	D-22	2.200	48	2.984	6.56	314.88
B13	D-29	3.217	58	5.185	16.68	934.08
B14	D-29	2.504	58	5.185	13.50	758.00
B15	D-29	1.994	56	5.185	10.34	579.04
C1	D-16	8.850	32	1.578	13.97	447.04
C1a	D-16	7.391	12	1.578	11.66	139.92
CO1	D-16	12.708	30	1.578	20.05	601.50
F1	D-16	2.818	17	1.578	4.45	75.65
F2	D-16	5.393	9	1.578	8.51	76.59

SD-40 TOTAL = 5,466.00 Kgs.

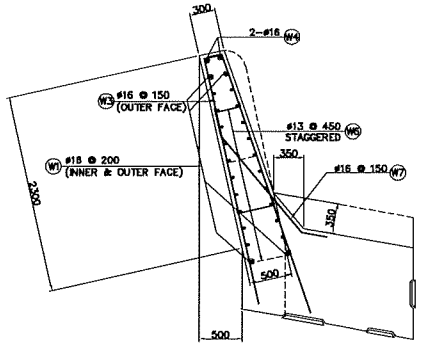
TITLE:	SCALE:	DRAWING No:	Rev.
BR-01 RORAYA III BRIDGE PIER P1 REINFORCEMENT DETAILS (3 of 3)	AS SHOWN	13-9	



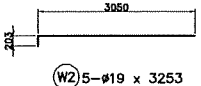
1 - WINGWALL ELEVATION
SCALE 1:60



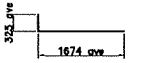
2 - SECTION
SCALE 1:60



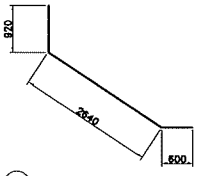
3 - PLAN
SCALE 1:60



W1 24-ø16 x 2106



W2a 9-ø19 x 1999
W3a 9-ø16 x 1999



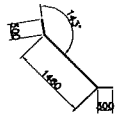
W4 2-ø16 x 4160

SCHEDULE OF REINFORCEMENT						
BAR MARK	BAR SIZE	BAR LENGTH (mm)	QTY.	UNIT WT. (Kg.m)	WT. PER BAR	TOTAL WT.
W1	D-16	2106	24	1.578	3.32	79.68
W2	D-19	3253	5	2.226	7.24	36.20
W2a	D-19	1999	9	2.226	4.45	40.05
W3	D-16	3253	5	1.578	5.13	25.65
W3a	D-16	1999	9	1.578	3.15	28.35
W4	D-16	4160	2	1.578	6.56	13.12
W5	D-16	2810	2	1.578	4.43	8.86
W6	D-13	590	8	1.042	0.61	4.88
W7	D-16	2060	15	1.578	3.25	48.75
SD-40 TOTAL= 285.54Kgs						

NOTE : QUANTITIES FOR 1 WINGWALL ONLY

W5 2-ø16 x 2810

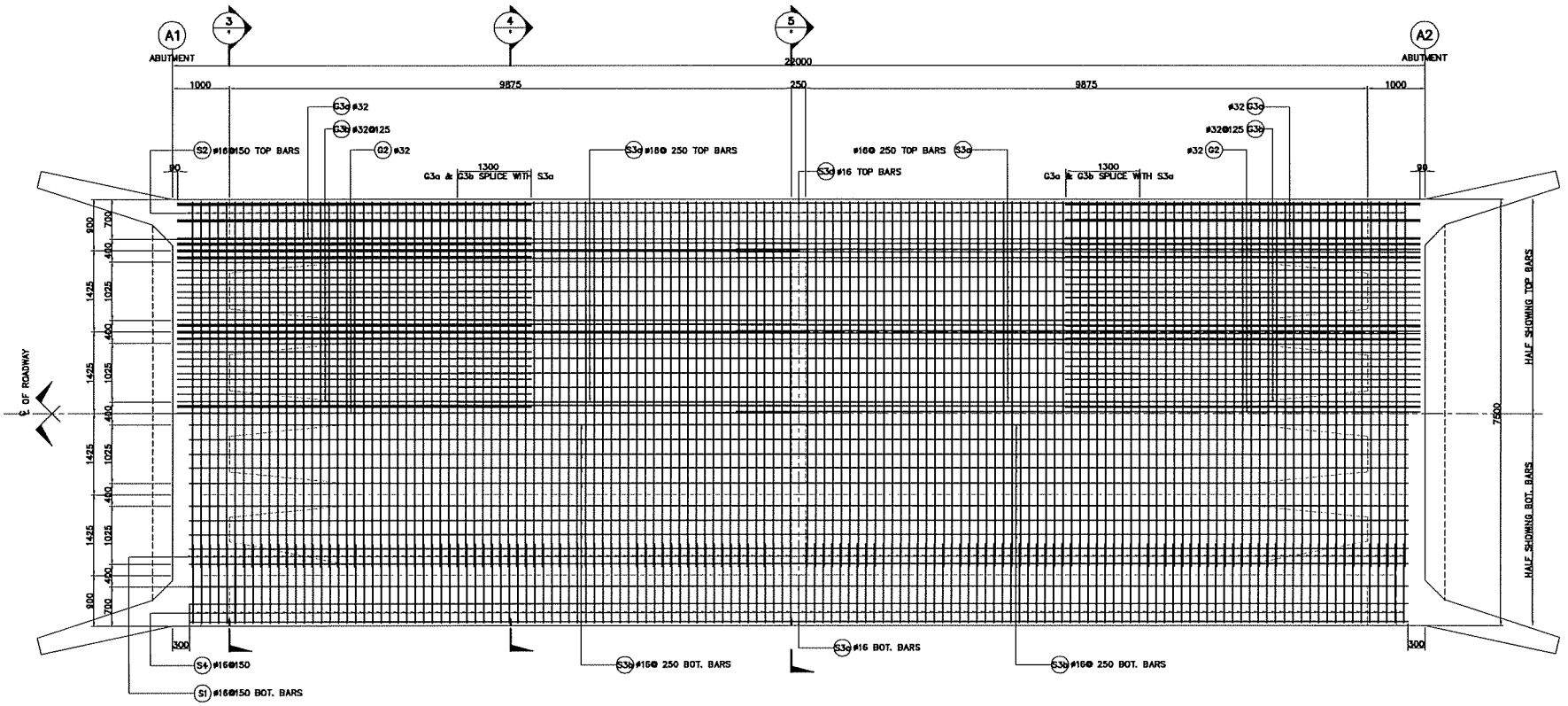
W6 8-ø13 x 590



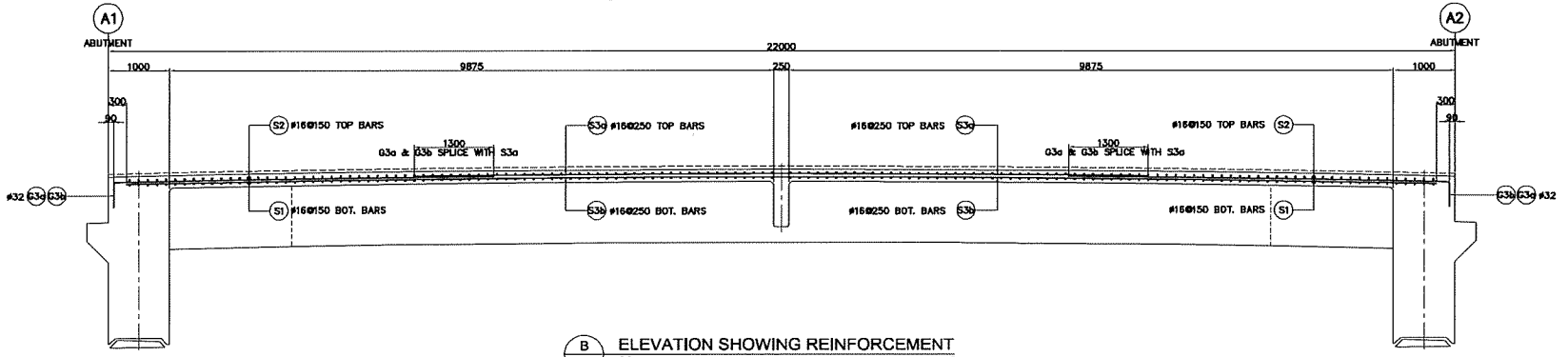
W7 15-ø16 x 2060

TITLE :	SCALE :	DRAWING No:	
BR-01 RORAYA III BRIDGE ABUTMENT A1 & A2 WINGWALL DETAILS	AS SHOWN	13-10	Rev.

TYP. DETAIL DESIGN (RC GIRDER BRIDGE)

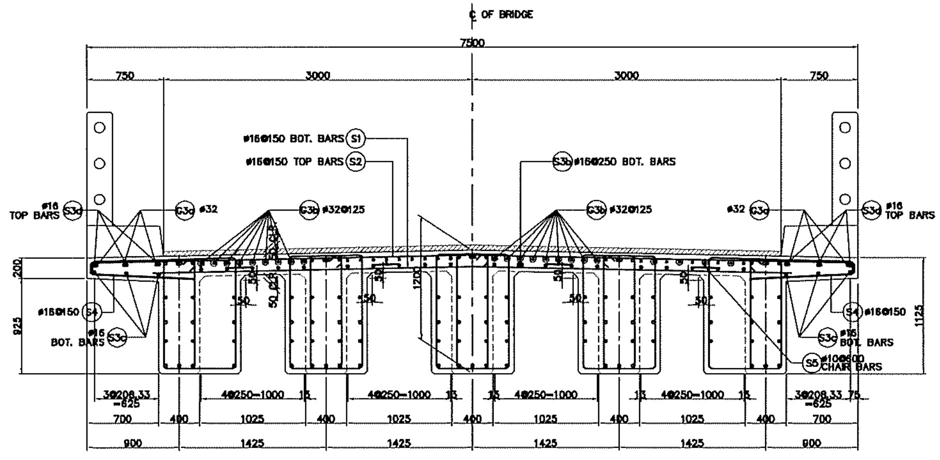


A — PLAN SHOWING REINFORCEMENT
SCALE 1:40

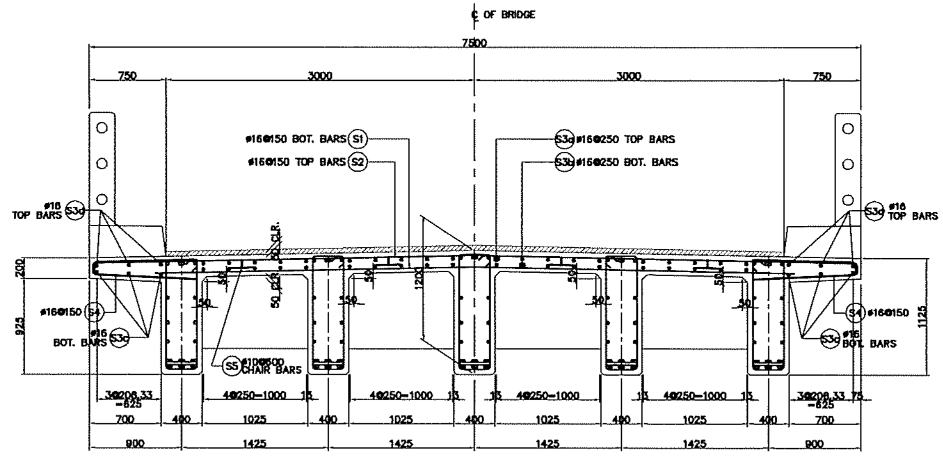


B — ELEVATION SHOWING REINFORCEMENT
SCALE 1:40

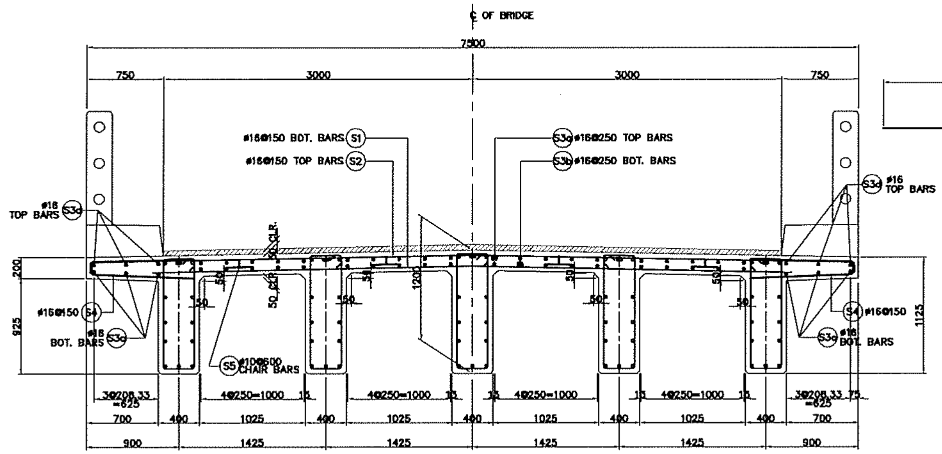
TITLE:	SCALE:	DRAWING No:	
BR-03 PINNANGO BRIDGE DECK SLAB REINFORCEMENT DETAILS (1 of 2)	AS SHOWN	14-1	Rev.



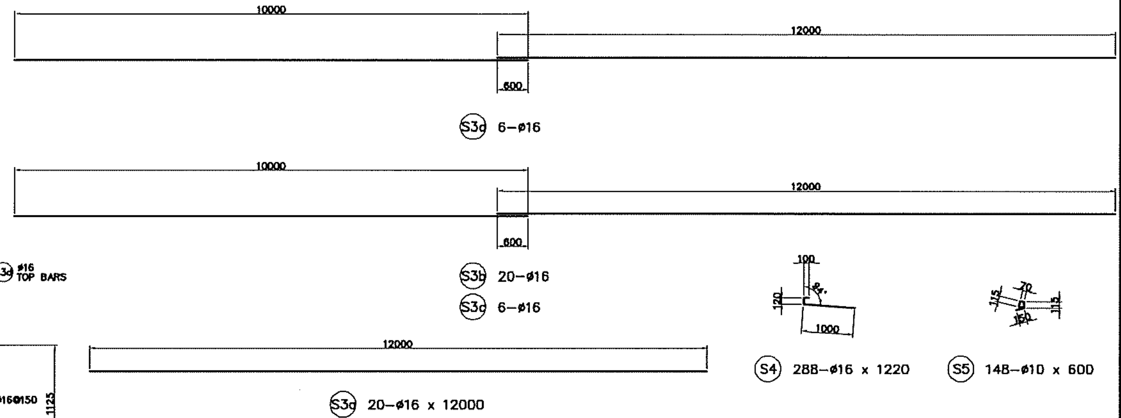
C SECTION
SCALE 1:25

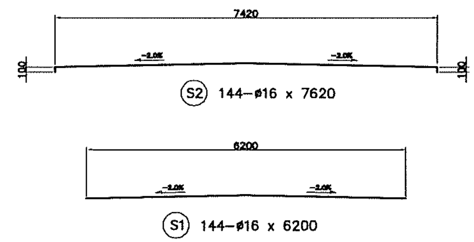


E SECTION
SCALE 1:25



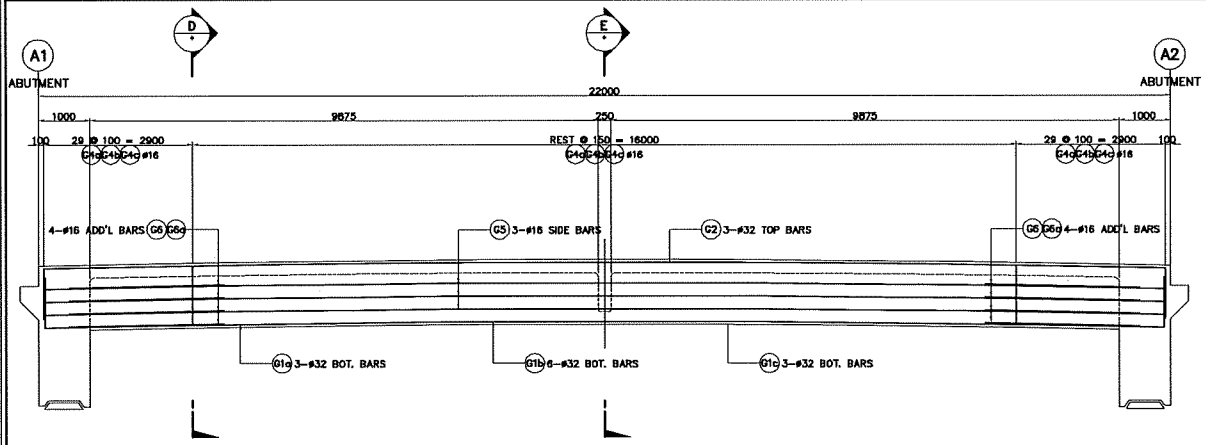
D SECTION
SCALE 1:25



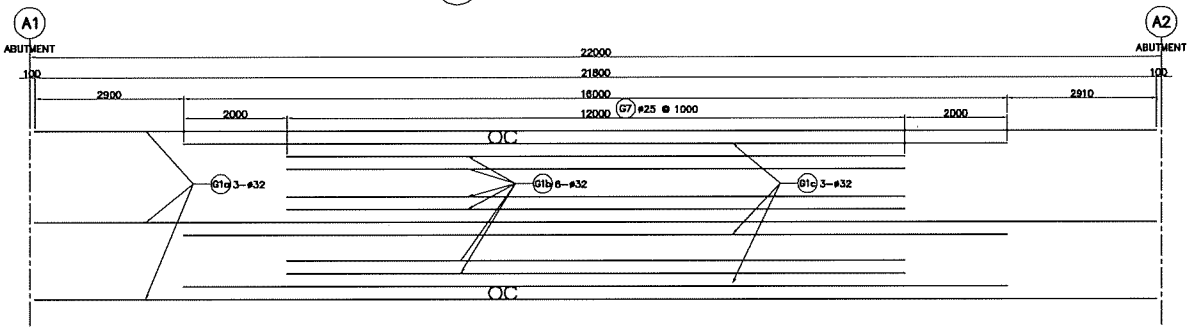


SCHEDULE OF REINFORCEMENT						
BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
S1	D-16	6.200	144	1.578	9.78	1408.32
S2	D-16	7.620	144	1.578	12.02	1730.88
S3a	D-16	12.000	20	1.578	18.94	378.80
S3b	D-16	22.000	20	1.578	34.72	694.40
S3c	D-16	22.000	6	1.578	34.72	208.32
S3d	D-16	22.000	6	1.578	34.72	208.32
S4	D-16	1.220	288	1.578	1.93	555.84
S5	D-10	0.600	148	0.617	0.37	54.76
SD-40 TOTAL = 5239.64 Kgs.						

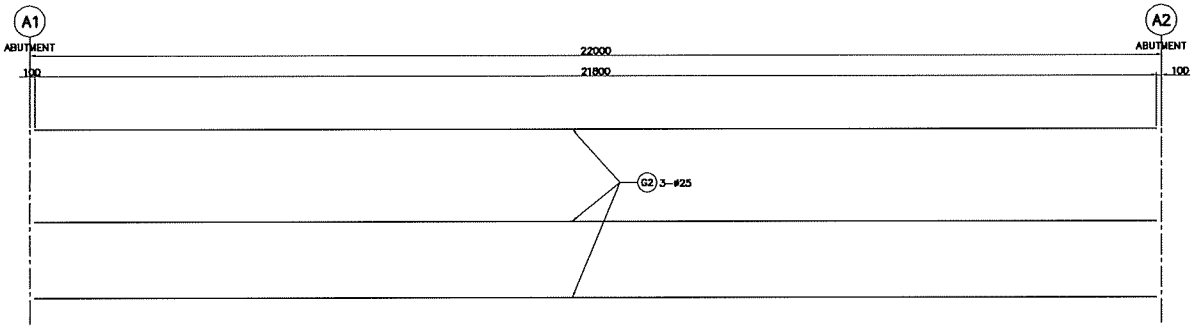
TITLE:	SCALE:	DRAWING No:	
BR-03 PINNANGO BRIDGE DECK SLAB REINFORCEMENT DETAILS (2 of 2)	AS SHOWN	14-2	Rev.



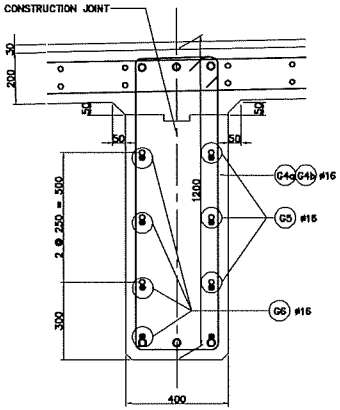
A GIRDER ELEVATION
SCALE 1:50



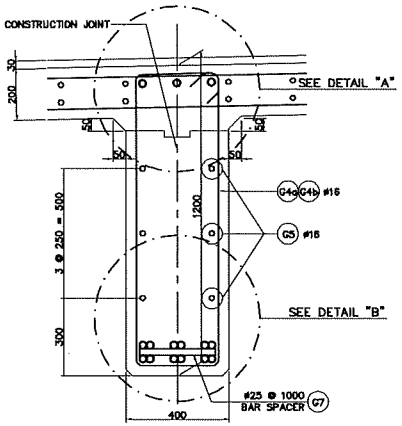
B BOTTOM BAR SCHEMATIC DIAGRAM
SCALE 1:50



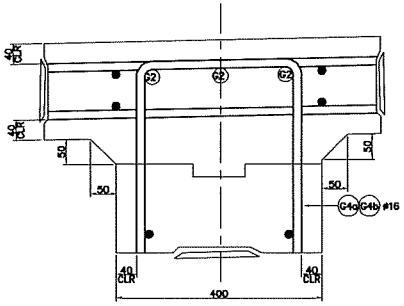
C TOP BAR SCHEMATIC DIAGRAM
SCALE 1:50



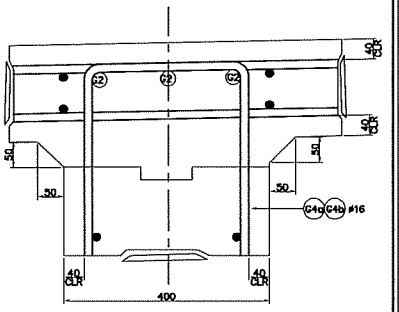
D SECTION
SCALE 1:10



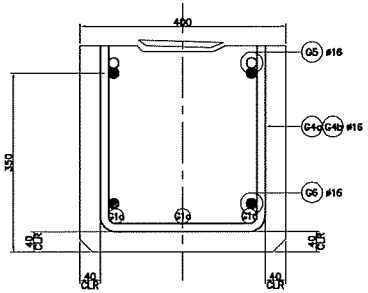
E SECTION
SCALE 1:10



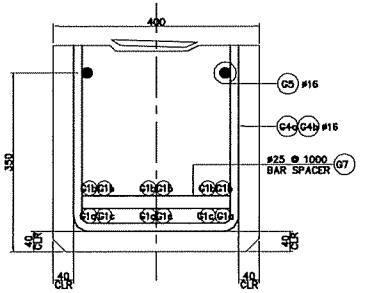
D DETAIL "A" (NEAR SUPPORT)
SCALE 1:5



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



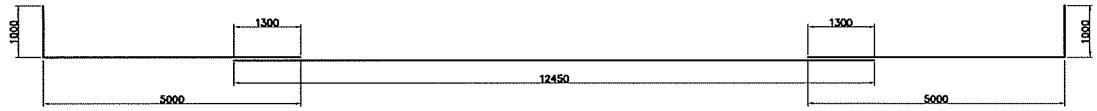
D DETAIL "B" (NEAR SUPPORT)
SCALE 1:5



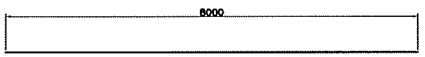
E DETAIL "B" (MIDSPAN)
SCALE 1:5

TITLE:	SCALE:	DRAWING NO.
BR-03 PINNANGO BRIDGE GIRDER ELEVATION, BOTTOM BAR LAYOUT & SECTION (1 of 2)	AS SHOWN	14-3

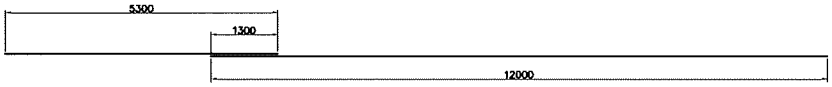
Rev.



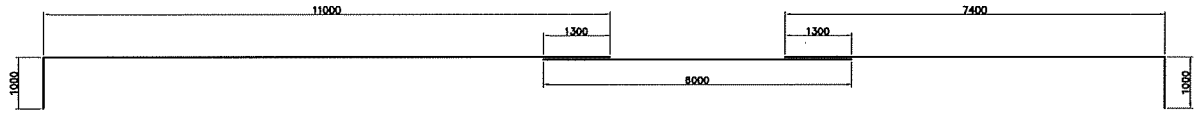
G1a 15–ø32 x 26400



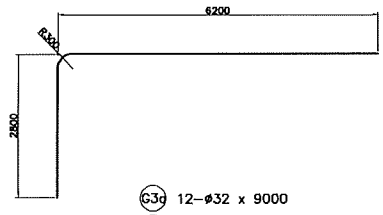
G1b 15–ø25 x 8000



G1c 10–ø25 x 12000

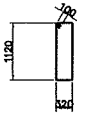


G2 20–ø32 x 22220

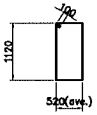


G3a 12–ø32 x 9000

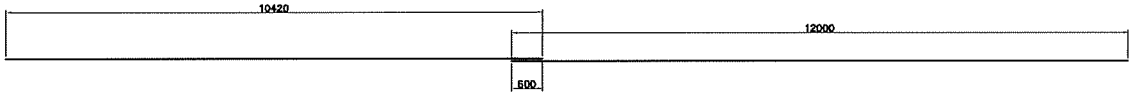
G3b 36–ø32 x 9000



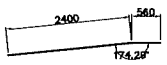
G4a 830–ø16 x 3080



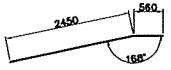
G4b 290–ø16 x 3480 (ave.)



G5 30–ø16 x 22420



G6 48–ø16 x 2960



G6a 16–ø16 x 3010
(EXTERIOR GIRDER)

G7 65–ø25 x 320

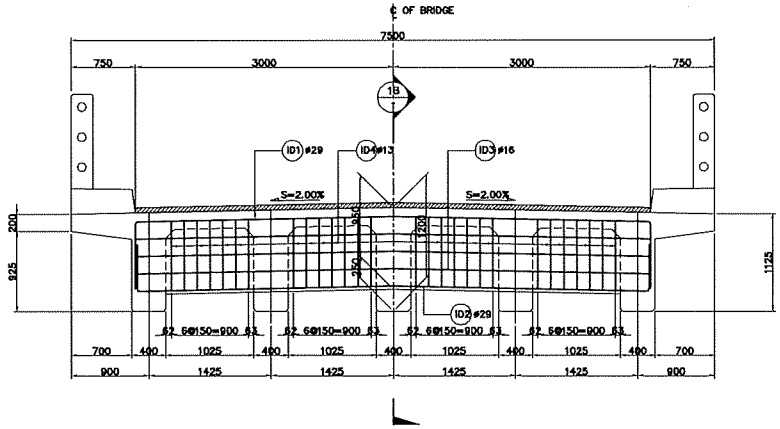
SCHEDULE OF REINFORCEMENT

BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
G1a	D–32	26.400	15	6.313	166.66	2499.90
G1b	D–32	12.000	30	6.313	75.76	2272.80
G1c	D–32	17.300	15	6.313	109.21	1638.15
G2	D–32	26.400	15	6.313	166.66	2499.90
G3a	D–32	9.000	12	6.313	56.82	681.84
G3b	D–32	9.000	36	6.313	56.82	2045.52
G4a	D–16	3.080	830	1.578	4.86	4033.80
G4b	D–16	3.480(ave)	290	1.578	5.49	1592.10
G5	D–16	22.420	30	1.578	35.38	1061.40
G6	D–16	2.960	48	1.578	4.67	224.16
G6a	D–16	3.010	16	1.578	4.75	76.00
G7	D–25	0.320	65	3.853	1.23	79.95
					SD–40 TOTAL =	18705.52 Kgs.

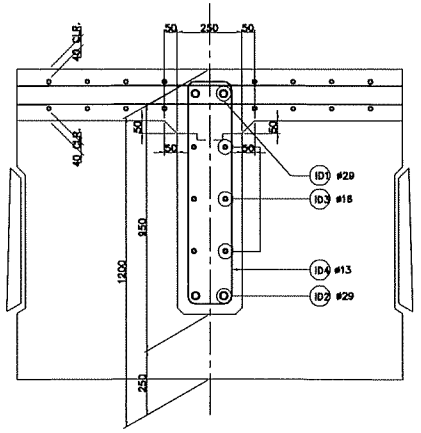
NOTE : QUANTITIES FOR 5 GIRDERS

TITLE:	SCALE:	DRAWING NO.
BR-03 PINNANGO BRIDGE GIRDER ELEVATION, BOTTOM BAR LAYOUT & SECTION (2 of 2)	AS SHOWN	14-4

Rev.

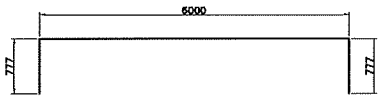


1A ELEVATION
SCALE 1 : 30

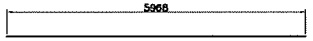


1B SECTION
SCALE 1 : 10

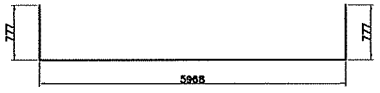
1 INTERMEDIATE DIAPHRAGM DETAIL
SCALE AS SHOWN



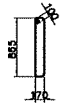
ID1 2–ø29 x 7554



ID3 6–ø16 x 5968



ID2 2–ø29 x 7522

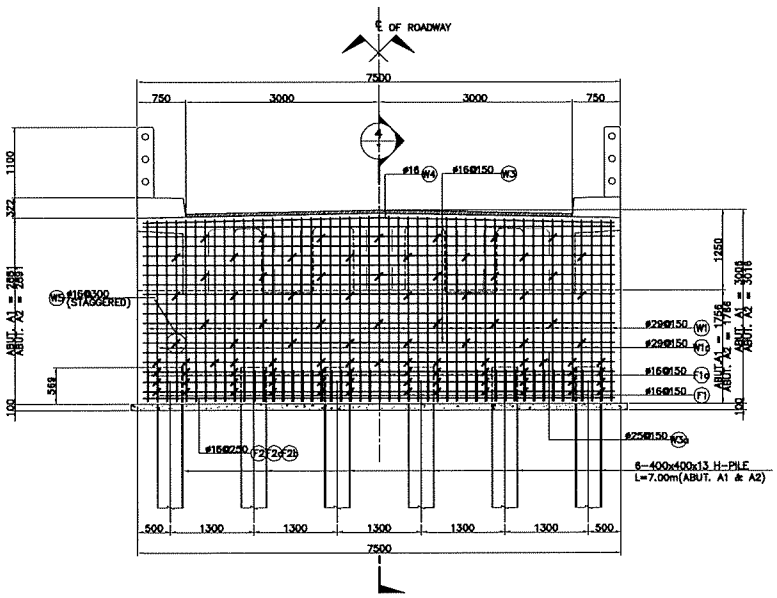


ID4 28–ø13 x 2270

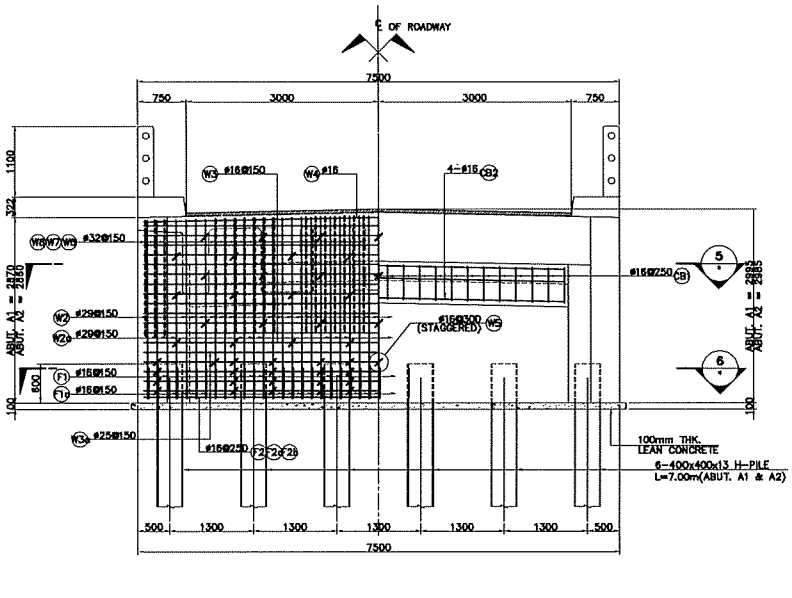
SCHEDULE OF REINFORCEMENT						
BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ID1	D–29	7.554	2	5.185	39.17	78.34
ID2	D–29	7.522	2	5.185	39.00	78.00
ID3	D–16	5.968	6	1.578	9.42	56.52
ID4	D–13	2.270	28	1.042	2.37	66.36
					SD–40 TOTAL=	279.22Kgs

QUANTITIES FOR 1 WINGWALL ONLY

TITLE:	SCALE:	DRAWING No:	
BR-03 PINNANGO BRIDGE DIAPHRAGM DETAILS	AS SHOWN	14-5	Rev.

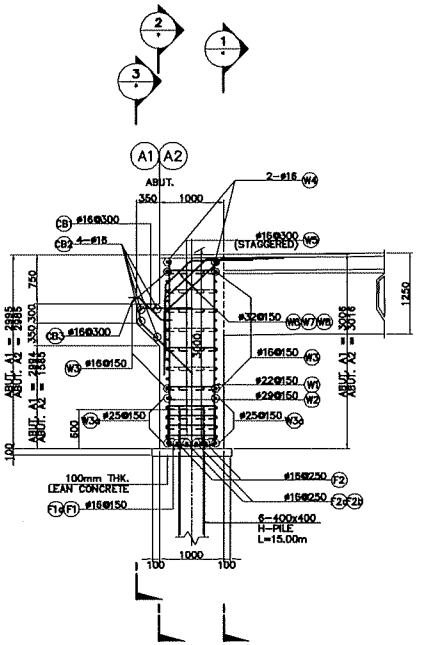


1 ELEVATION
SCALE 1:40

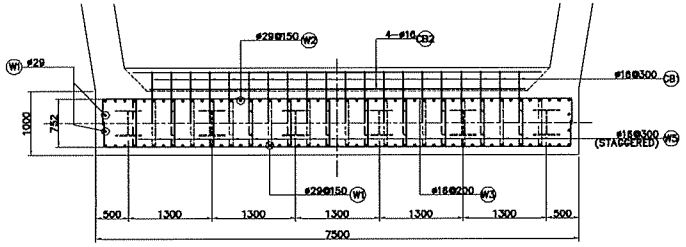


2 ELEVATION
SCALE 1:40

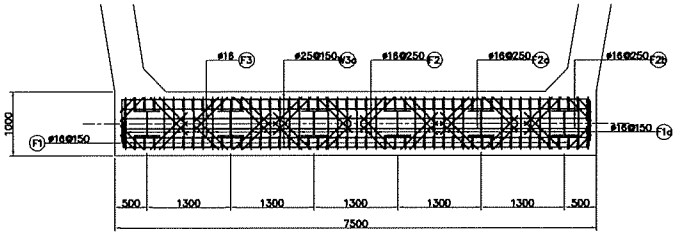
3 ELEVATION
SCALE 1:40



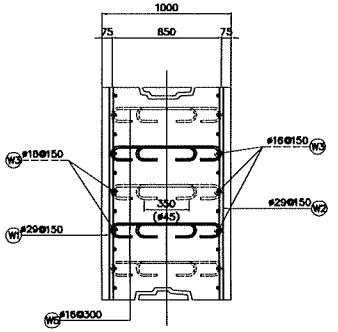
4 ELEVATION
SCALE 1:40



5 PLAN
SCALE 1:40



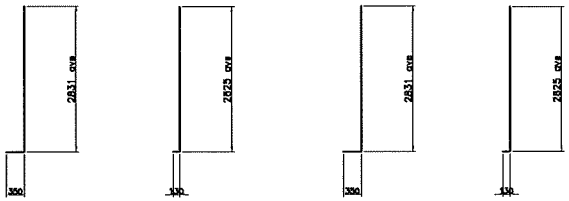
6 PLAN
SCALE 1:40



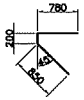
7 DETAIL
SCALE 1:20

TITLE:	SCALE:	DRAWING NO.
BR-03 PINNANGO BRIDGE ABUT. A1 & A2 REINF. DETAILS (1 of 2)	AS SHOWN	14-6

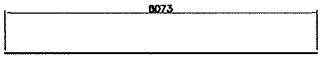
Rev.



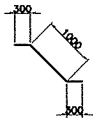
W1 35–ø29 x 3181 W1a 18–ø29 x 2955 W2 31–ø29 x 3181 W2a 18–ø29 x 2955



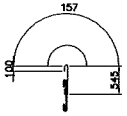
CB1 20–ø16 x 1830



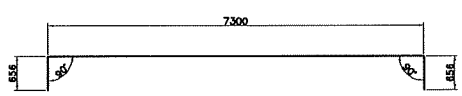
CB2 4–ø16 x 6073



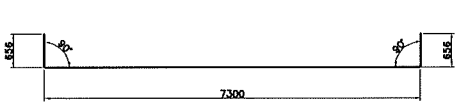
CB3 20–ø16 x 1600



W5 57–ø16 x 2118

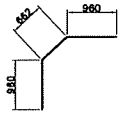


W4 2–ø16 x 8612

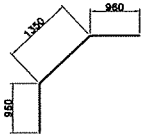


W3 26–ø16 x 8612

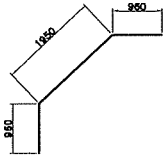
W3a 12–ø25 x 8612



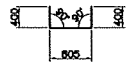
W6 34–ø32 x 2582



W7 34–ø32 x 3270

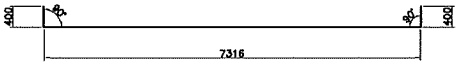


W8 34–ø32 x 3870



F1 33–ø16 x 1605

F1a 32–ø16 x 600



F2 2–ø16 x 8116

F2a 10–ø16 x 1285

F2b 4–ø16 x 793

F3 24–ø16 x 710

SCHEDULE OF REINFORCEMENT

ABUTMENT A1 & A2

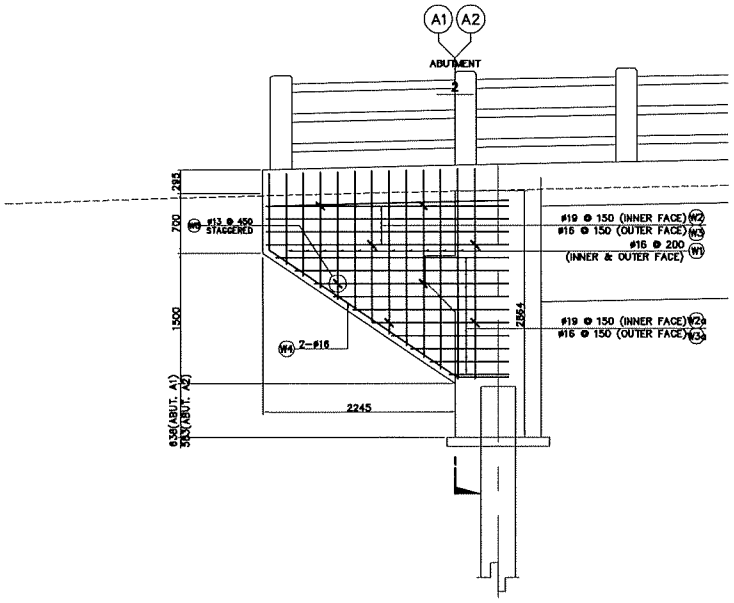
BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
W1	D-29	3.181	35	5.185	16.49	577.15
W1a	D-29	2.955	18	5.185	15.32	275.76
W2	D-29	2.181	31	5.185	11.31	350.61
W2a	D-29	2.955	18	5.185	15.32	275.76
W3	D-16	8.612	26	1.578	13.59	353.34
W3a	D-25	8.612	12	3.853	33.18	398.16
W4	D-16	8.612	2	1.578	13.59	27.18
W5	D-16	2.118	117	1.578	3.34	391.04
W6	D-32	2.582	34	6.313	16.30	554.20
W7	D-32	3.270	34	6.313	20.64	701.76
W8	D-32	3.870	34	6.313	24.43	830.62
CB1	D-16	1.830	20	1.578	2.89	57.80
CB2	D-16	6.073	4	1.578	9.58	38.32
CB3	D-16	1.600	20	1.578	2.53	50.50
F1	D-16	1.605	33	1.578	2.53	83.49
F1a	D-16	0.600	32	1.578	0.95	30.40
F2	D-16	8.116	2	1.578	12.81	25.62
F2a	D-16	1.285	10	1.578	2.03	20.30
F2b	D-16	0.793	4	1.578	1.25	5.00
F3	D-16	0.710	24	1.578	1.12	26.88

SD-40 TOTAL = 5,073.89 Kgs.

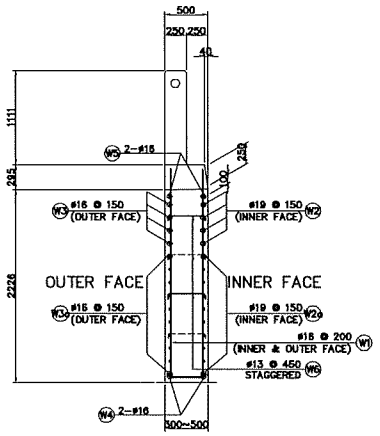
NOTE : QUANTITIES FOR 1 ABUTMENT ONLY

TITLE:	SCALE:	DRAWING NO.
BR-03 PINNANGO BRIDGE ABUT. A1 & A2 REINF. DETAILS (2 of 2)	AS SHOWN	14-7

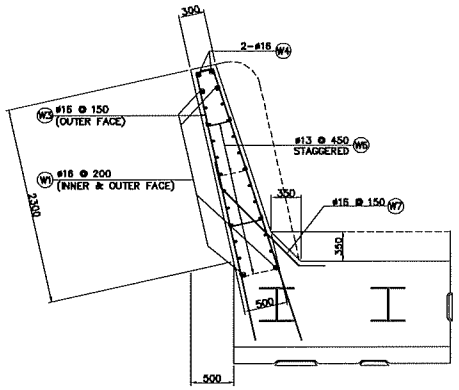
Rev.



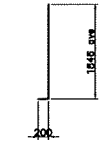
1 - WINGWALL ELEVATION
SCALE 1:60



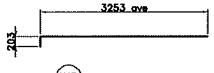
2 - SECTION
SCALE 1:60



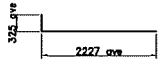
3 - PLAN
SCALE 1:60



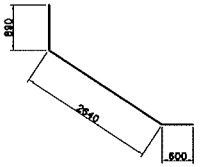
W1 24-ø16 x 2046



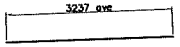
W2 4-ø19 x 33456
W3 4-ø19 x 33456



W2a 10-ø19 x 2552
W3a 10-ø16 x 2552

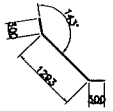


W4 2-ø16 x 4130



W5 2-ø16 x 3237

W6 8-ø13 x 590



W7 15-ø16 x 1893

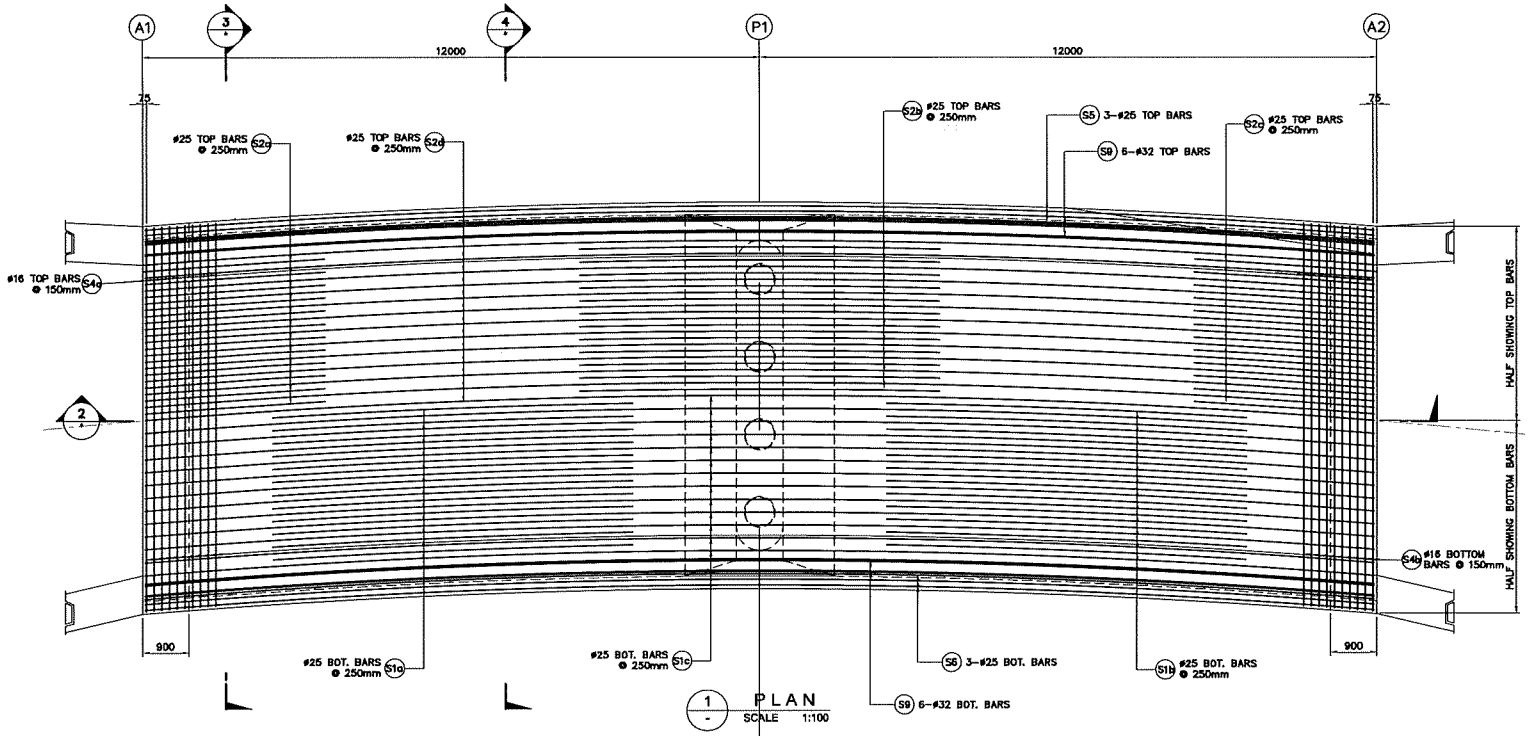
SCHEDULE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR LENGTH (mm)	QTY.	UNIT WT. (Kg.m)	WT. PER BAR	TOTAL WT.
W1	D-16	2.046	24	1.578	3.23	77.52
W2	D-19	3.456	4	2.225	7.69	30.76
W2a	D-19	2.552	10	2.225	5.68	56.80
W3	D-16	3.456	4	1.578	5.45	21.80
W3a	D-16	2.552	10	1.578	4.03	40.30
W4	D-16	4.130	2	1.578	6.52	13.04
W5	D-16	3.237	2	1.578	5.11	10.22
W6	D-13	0.590	8	1.042	0.61	4.88
W7	D-16	1.893	15	1.578	2.99	44.85
				SD-40 TOTAL=		300.17 Kgs

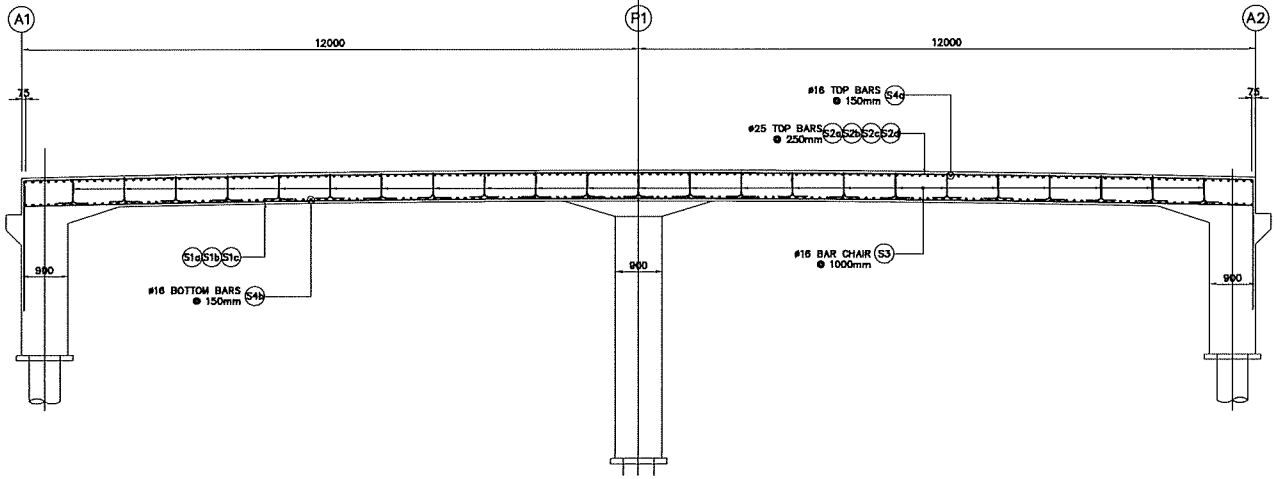
NOTE : QUANTITIES FOR 1 WINGWALL ONLY

TITLE:	SCALE:	DRAWING No:	
BR-03 PINNANGO BRIDGE ABUTMENT A1 & A2 WINGWALL DETAILS	AS SHOWN	14-8	Rev.

TYP. DETAIL DESIGN (RC SLAB BRIDGE)



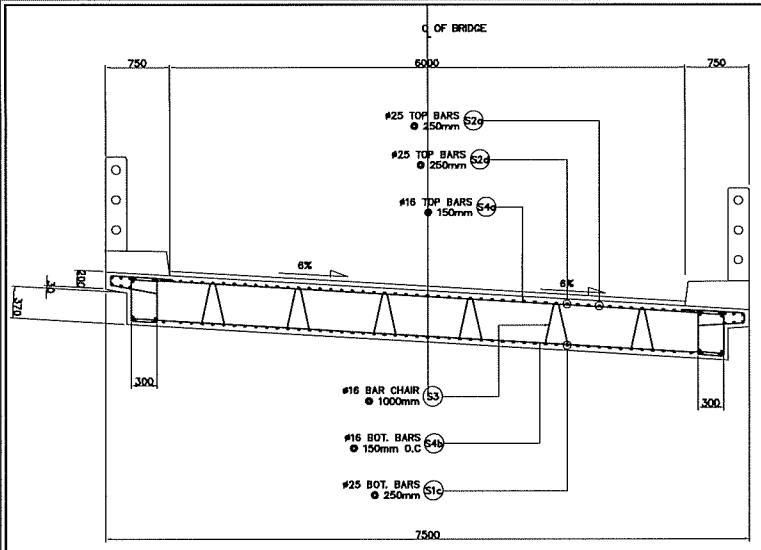
1 - PLAN
SCALE 1:100



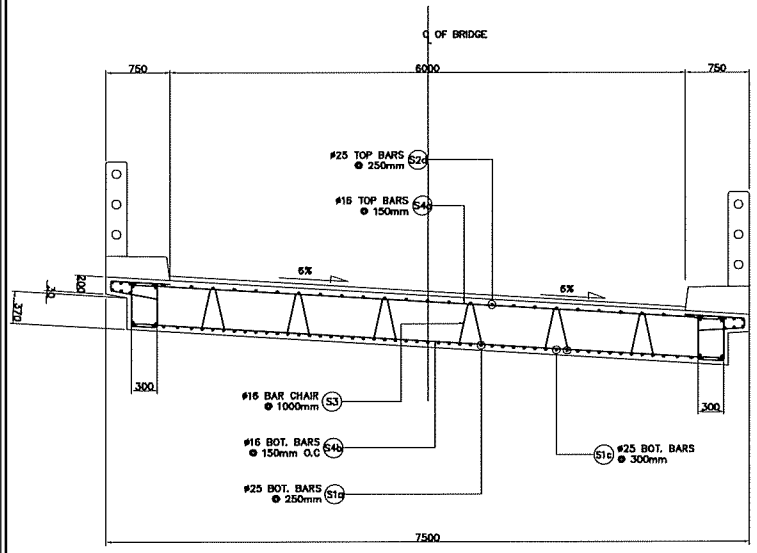
2 - SECTION
SCALE 1:100

TITLE:	SCALE:	DRAWING NO.
BR-14 WAKAKA II BRIDGE DECK SLAB REINF. DETAILS (1 of 2)	AS SHOWN	15-1

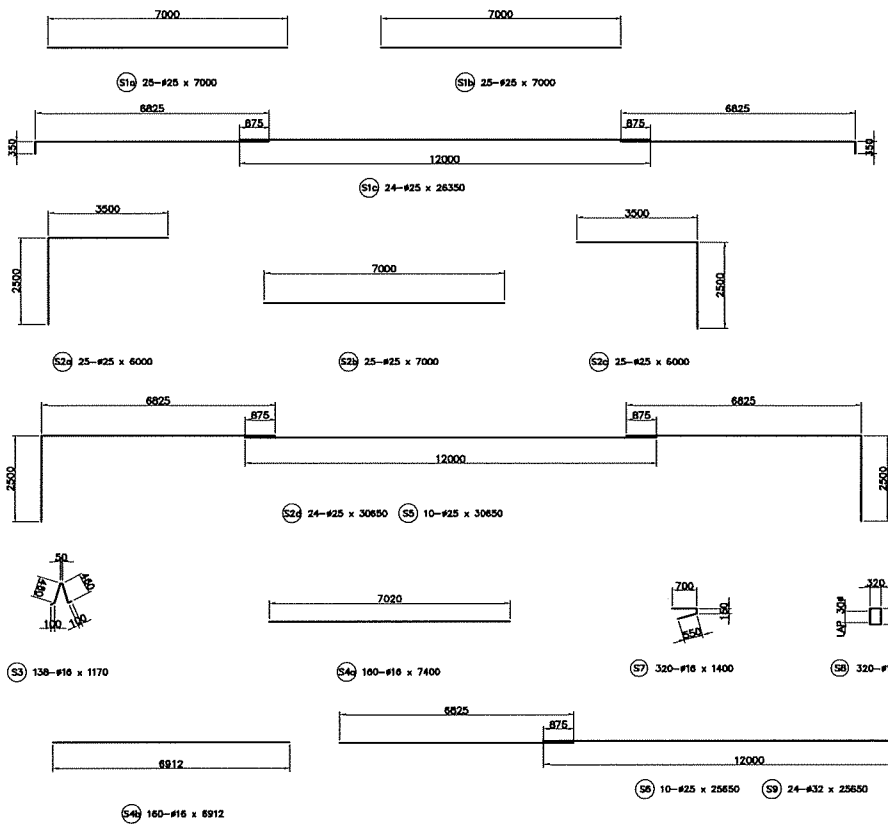
Rev.

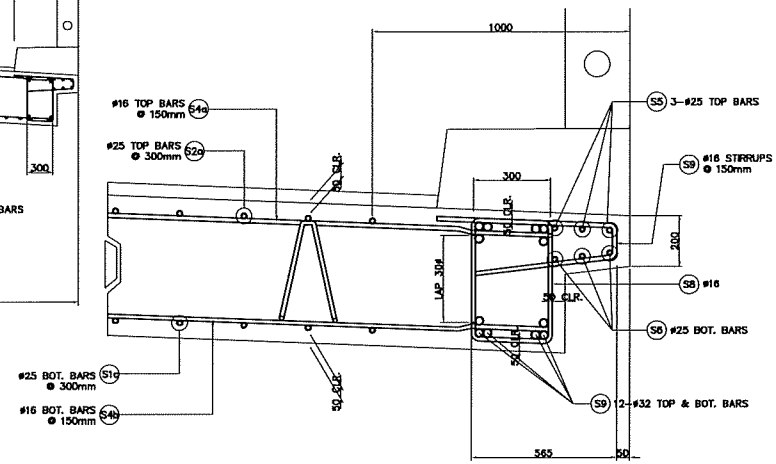


3 SECTION
SCALE 1:60



4 SECTION
SCALE 1:60





5 DETAIL
SCALE 1:20

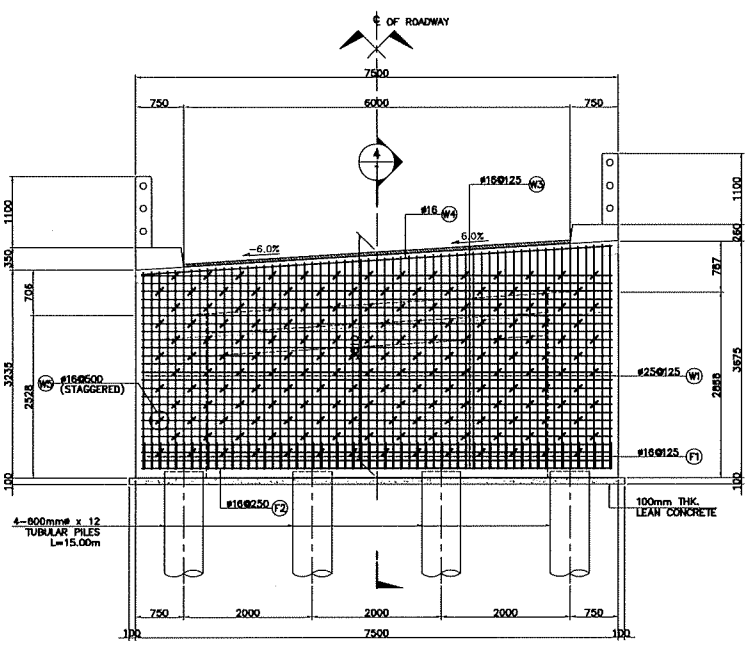
SCHEDULE OF REINFORCEMENT

BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
S1a	D-25	7.000	18	3.853	26.97	485.46
S1b	D-25	7.000	18	3.853	26.97	485.46
S1c	D-25	26.350	19	3.853	101.53	1929.07
S2a	D-25	6.000	18	3.853	23.12	416.16
S2b	D-25	7.000	18	3.853	26.97	485.46
S2c	D-25	6.000	18	3.853	23.12	416.16
S2d	D-25	30.650	19	3.853	118.09	2243.71
S3	D-16	1.170	138	1.578	1.85	255.30
S4a	D-16	7.020	160	1.578	11.08	1772.80
S4b	D-16	6.912	160	1.578	10.91	1745.60
S5	D-25	30.650	10	3.853	118.09	1180.90
S6	D-25	25.650	10	3.853	98.83	988.30
S7	D-16	1.400	320	1.578	2.21	707.20
S8	D-16	2.080	320	1.578	3.28	1049.60
S9	D-32	25.650	24	6.313	161.93	3886.32

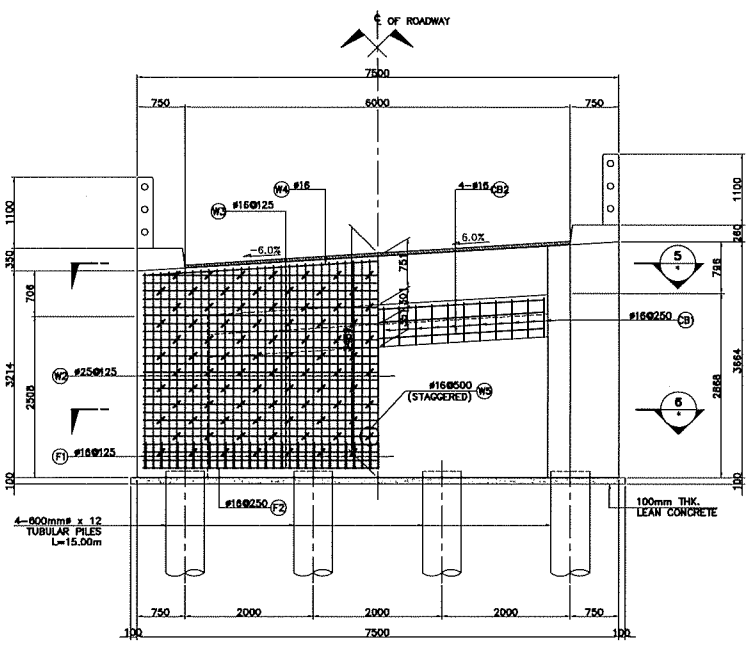
SD-40 TOTAL = 18,047.50 Kgs.

TITLE:	SCALE:	DRAWING NO.
BR-14 WAKAKA II BRIDGE DECK SLAB REINF. DETAILS (2 of 2)	AS SHOWN	15-2

Rev.

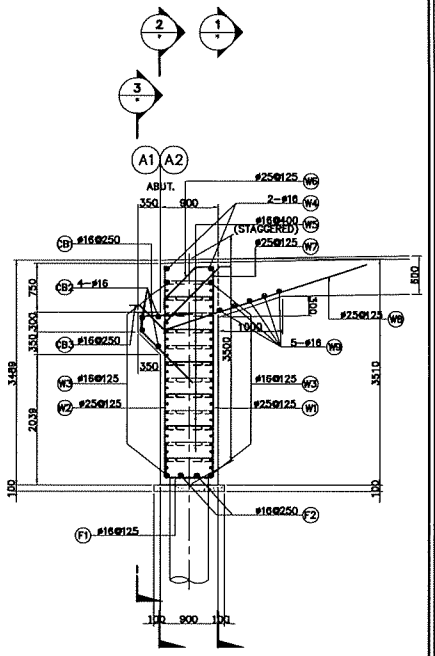


1 - ELEVATION
SCALE 1:40

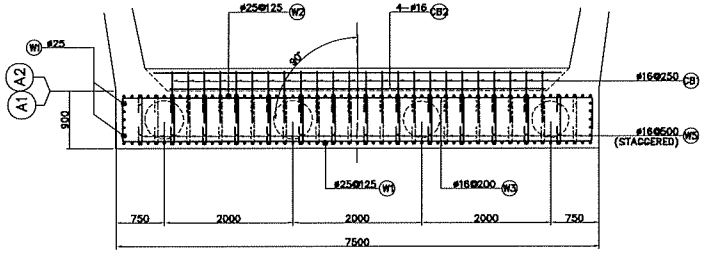


2 - ELEVATION
SCALE 1:40

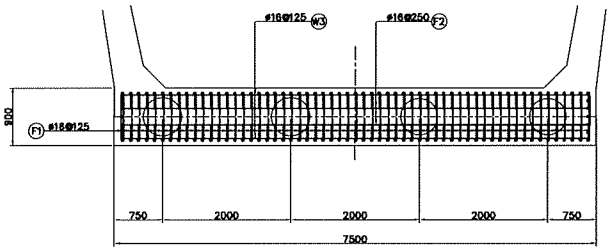
3 - ELEVATION
SCALE 1:40



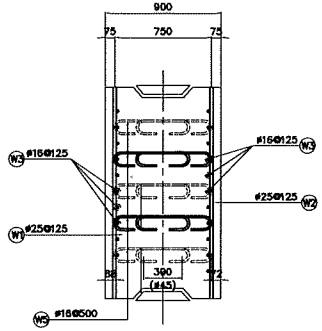
4 - ELEVATION
SCALE 1:40



5 - PLAN
SCALE 1:40

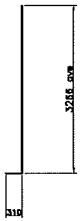


6 - PLAN
SCALE 1:40

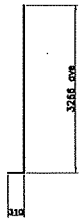


7 - DETAIL
SCALE 1:20

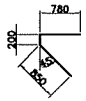
TITLE:	SCALE:	DRAWING No:	
BR-14 WAKAKA II BRIDGE ABUT. A1 & A2 REINF. DETAILS (1 of 2)	AS SHOWN	15-3	Rev.



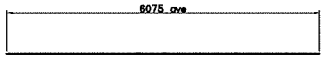
W1 64–ø25 x 3576



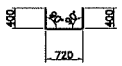
W2 60–ø25 x 3576



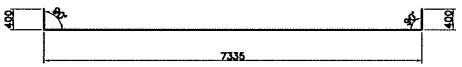
CB1 24–ø16 x 1830



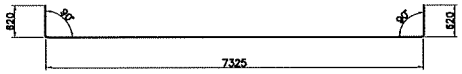
CB2 4–ø16 x 6075



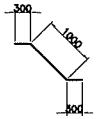
F1 60–ø16 x 1520



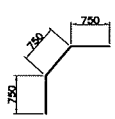
F2 2–ø16 x 8135



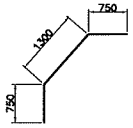
W3 50–ø16 x 8565



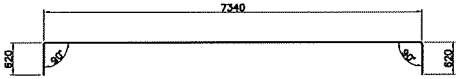
CB3 24–ø16 x 1600



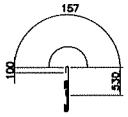
W6 55–ø25 x 2250



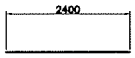
W7 55–ø25 x 2800



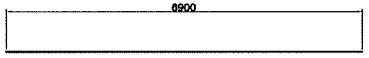
W4 2–ø16 x 8580



W5 168–ø16 x 2088



W8 55–ø25 x 2400



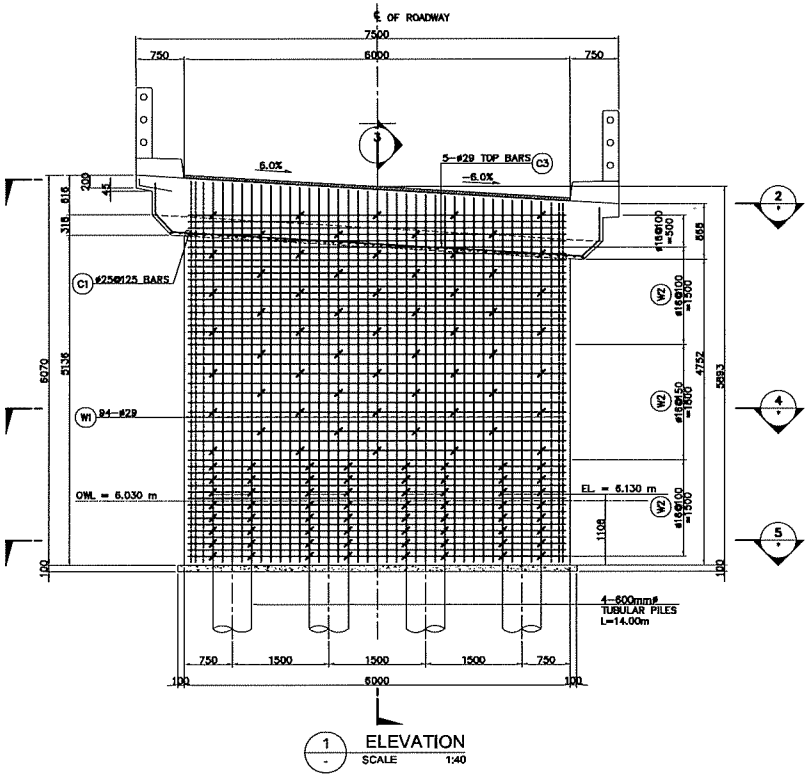
W9 5–ø16 x 6900

SCHEDULE OF REINFORCEMENT

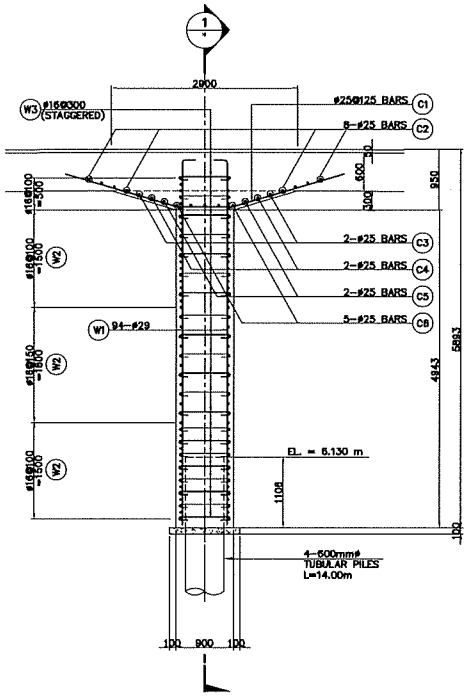
	BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
ABUTMENT A1-A2	W1	D-25	3.576	64	3.853	13.78	881.92
	W2	D-25	3.576	60	3.853	13.78	826.80
	W3	D-16	8.565	50	1.578	13.52	676.00
	W4	D-16	8.580	2	1.578	13.54	27.08
	W5	D-16	2.088	168	1.578	3.29	552.72
	W6	D-25	2.250	55	3.853	8.67	476.85
	W7	D-25	2.280	55	3.853	10.79	593.45
	W8	D-25	2.400	55	3.853	9.25	508.75
	W9	D-16	6.900	5	1.578	10.89	54.45
	F1	D-16	1.520	60	1.578	2.40	144.00
	F2	D-16	8.135	2	1.578	12.84	25.68
	CB1	D-16	1.830	24	1.578	2.89	69.36
	CB2	D-16	6.075	4	1.578	9.59	38.36
	CB3	D-16	1.100	24	1.578	2.52	60.48
						SD-40 TOTAL =	4,935.90 Kgs.

NOTE : QUANTITIES FOR 1 ABUTMENT ONLY

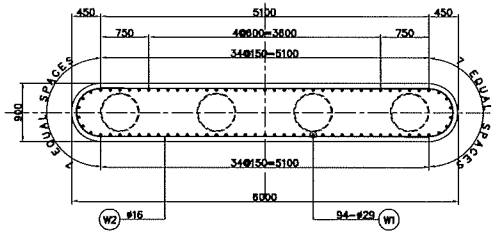
TITLE:	SCALE:	DRAWING No:	
BR-14 WAKAKA II BRIDGE ABUT. A1 & A2 REINF. DETAILS (2 of 2)	AS SHOWN	15-4	Rev.



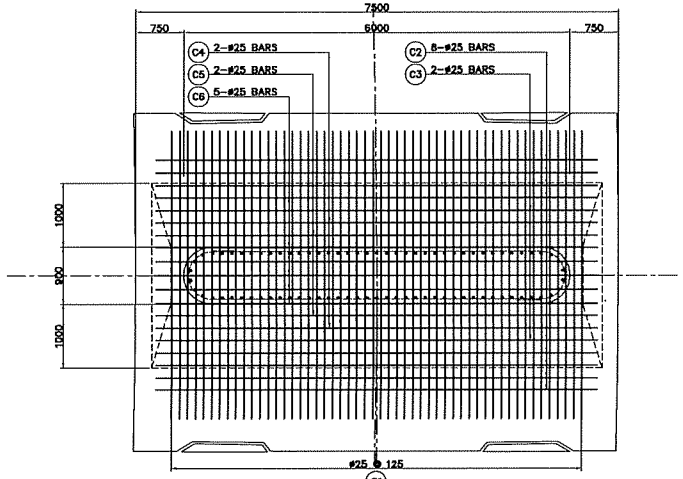
1 - ELEVATION
SCALE 1:40



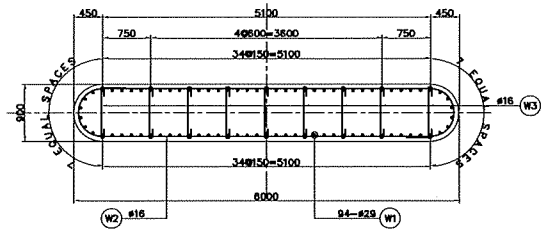
3 - ELEVATION
SCALE 1:40



5 - SECTION
SCALE 1:40



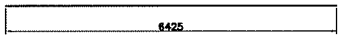
2 - PLAN
SCALE 1:40



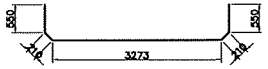
4 - PLAN
SCALE 1:40

TITLE:	SCALE:	DRAWING No:	
BR-14 WAKAKA BRIDGE PIER P1 REINFORCEMENT DETAIL (1 of 2)	AS SHOWN	15-5	Rev.

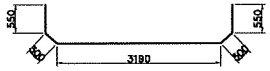
C1 49–ø25 x 4500



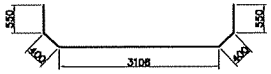
C2 8–ø25 x 6900



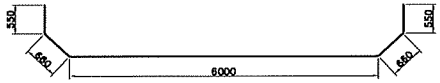
C3 2–ø25 x 4793



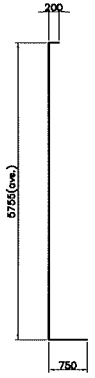
C4 2–ø25 x 4890



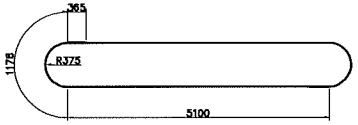
C5 2–ø25 x 5008



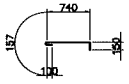
C6 5–ø25 x 8420



W1 94–ø29 x 6355



W2 49–ø16 x 12921



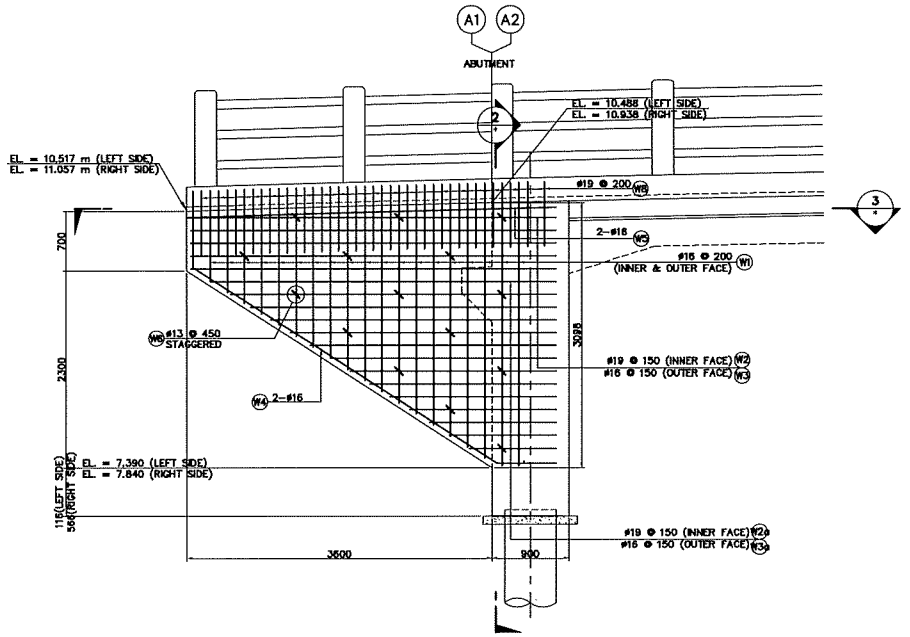
W3 126–ø16 x 1147

SCHEDULE OF REINFORCEMENT

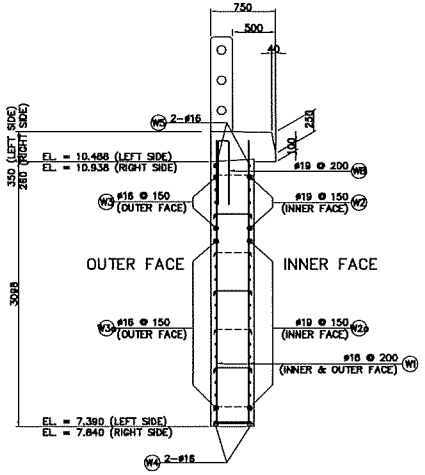
	BARK MARK	BAR SIZE	LENGTH PER BAR	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
PIER P1	C1	D–25	3.800	49	3.853	17.34	849.66
	C2	D–25	6.900	8	3.853	26.59	2121.72
	C3	D–25	4.793	2	3.853	18.47	36.94
	C4	D–25	4.890	2	3.853	18.84	37.68
	C5	D–25	5.008	2	3.853	19.30	38.60
	C6	D–25	8.420	5	3.853	32.44	162.20
	W1	D–29	6.355	94	5.185	32.95	3,097.30
	W2	D–16	12.921	49	1.578	20.39	999.11
	W3	D–16	1.147	126	1.578	1.81	228.05
						SD–40 TOTAL =	5,662.27 Kgs.

NOTE : QUANTITIES FOR 1 ABUTMENT ONLY

TITLE:	SCALE:	DRAWING No:	
BR-14 WAKAKA BRIDGE PIER P1 REINFORCEMENT DETAIL (2 of 2)	AS SHOWN	15-6	Rev.



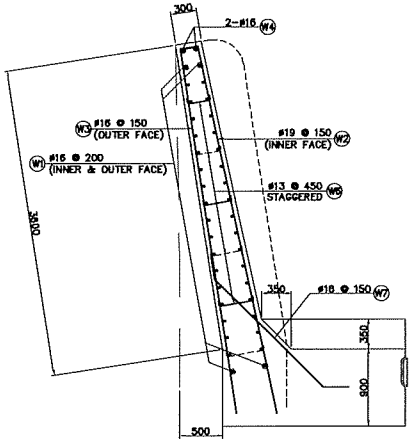
1 - WINGWALL ELEVATION
SCALE 1:60



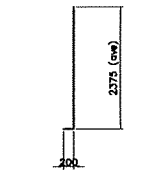
2 - SECTION
SCALE 1:60

SCHEDULE OF REINFORCEMENT						
BAR MARK	BAR SIZE	BAR LENGTH	QTY.	UNIT WT.	WT. PER BAR	TOTAL WT.
W1	D-16	2.575	38	1.578	4.04	154.28
W2	D-19	4.410	5	2.226	9.82	49.10
W2a	D-19	2.335	14	2.226	5.20	72.80
W3	D-16	4.410	5	1.578	6.96	34.80
W3a	D-16	2.335	14	1.578	3.68	51.52
W4	D-16	5.750	2	1.578	9.07	18.14
W5	D-16	4.210	2	1.578	6.64	13.28
W6	D-13	0.590	15	1.042	0.61	9.15
W7	D-16	2.400	20	1.578	3.79	75.80
W8	D-19	1.630	21	2.226	3.63	76.23
					SD-40 TOTAL=	555.10 Kgs

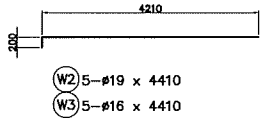
NOTE : QUANTITIES FOR 1 WINGWALL ONLY



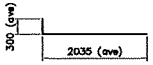
3 - P L A N
SCALE 1:60



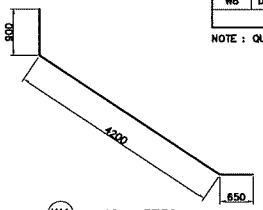
W1 38-ø16 x 2575



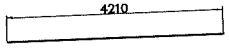
W2 5-ø19 x 4410
W3 5-ø16 x 4410



W2a 14-ø19 x 2335
W3a 14-ø16 x 2335

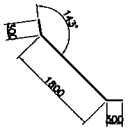


W4 2-ø16 x 5750



W5 2-ø16 x 4210

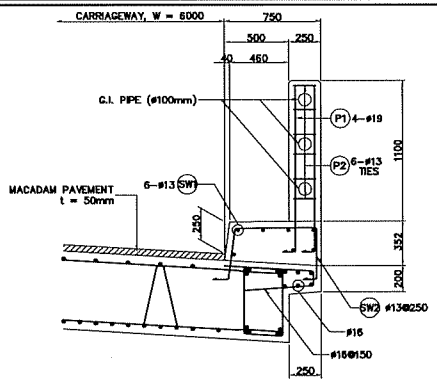
W6 15-ø13 x 590



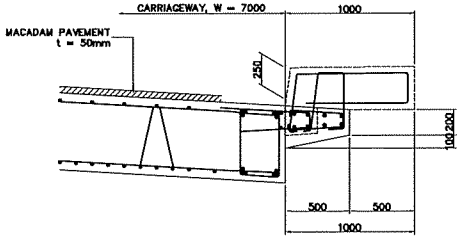
W7 20-ø16 x 2400

W8 21-ø19 x 1630

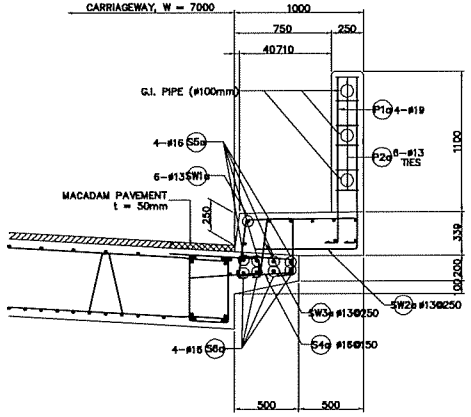
TITLE:	SCALE:	DRAWING NO.
BR-14 WAKAKA BRIDGE ABUTMENT A1 & A2 WINGWALL DETAILS	AS SHOWN	15-7



ORIGINAL STRUCTURE

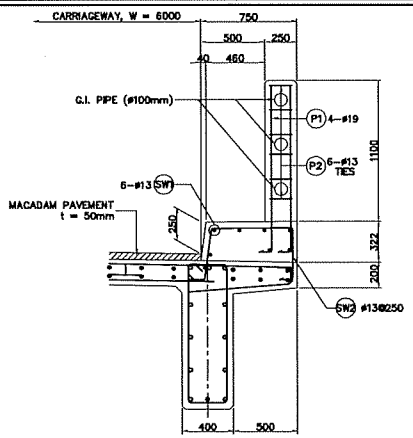


1. REMOVE RAILING AND CURB.
2. CHIP OFF OVERHANG CONCRETE & EXPOSED REINFORCING BARS.
3. SET ADDITIONAL REINFORCING BARS & CONCRETE OVERHANG SLAB.

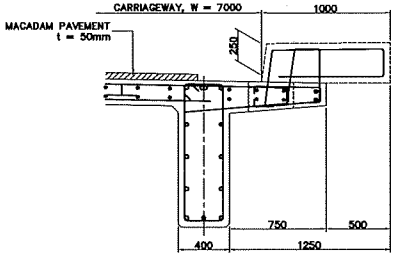


4. SET ADDITIONAL BARS OF CURB AND RAILING.
5. CONCRETE CURB AND RAILING.
6. PROVIDE PAVEMENT FOR WIDENED AREA.

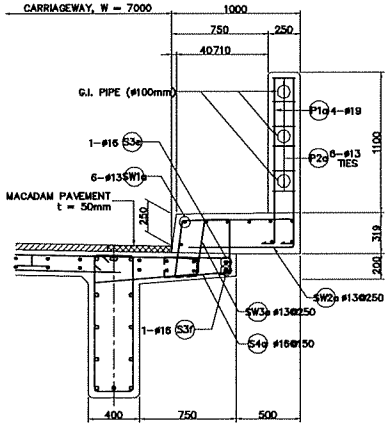
1 - DETAIL OF FUTURE WIDENING FOR RCSL
SCALE 1:20



ORIGINAL STRUCTURE

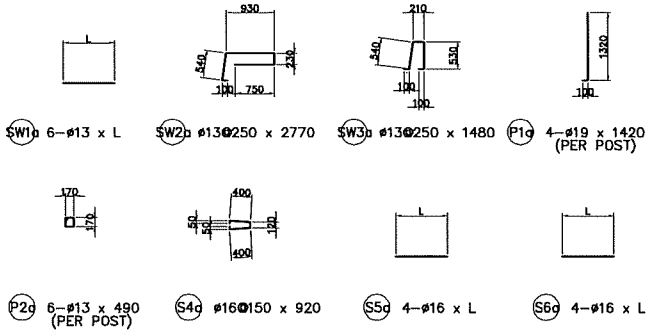


1. REMOVE RAILING AND CURB.
2. CHIP OFF OVERHANG CONCRETE & EXPOSED REINFORCING BARS.
3. SET ADDITIONAL REINFORCING BARS & CONCRETE OVERHANG SLAB.

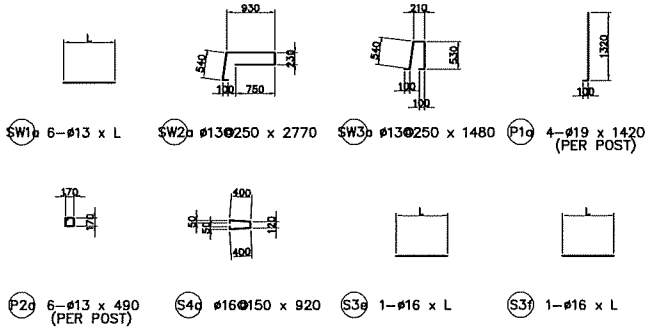


4. SET ADDITIONAL BARS OF CURB AND RAILING.
5. CONCRETE CURB AND RAILING.
6. PROVIDE PAVEMENT FOR WIDENED AREA.

2 - DETAIL OF FUTURE WIDENING FOR RCDG
SCALE 1:20



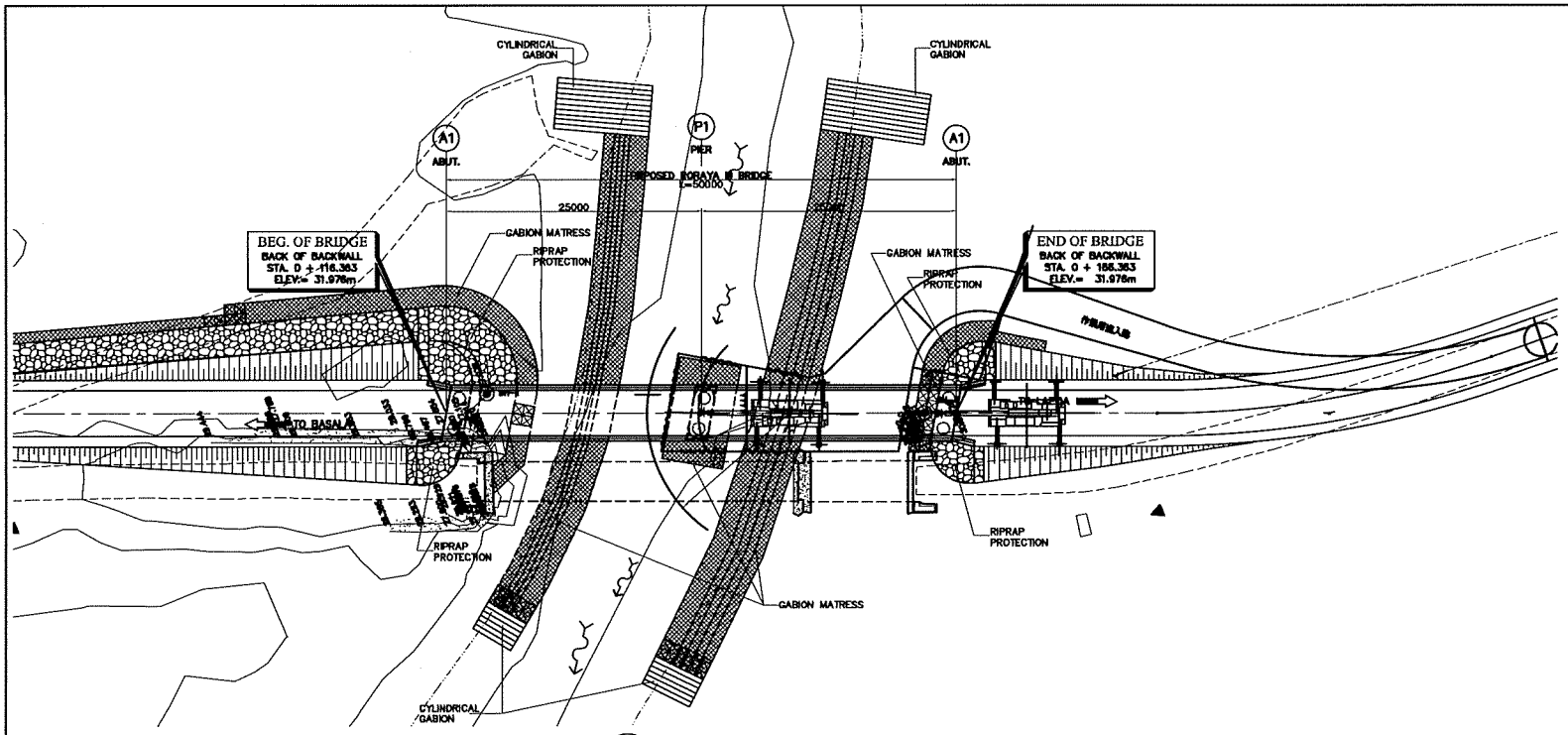
3 - BAR BENDING DIAGRAM FOR RCSL WIDENING
SCALE 1:50



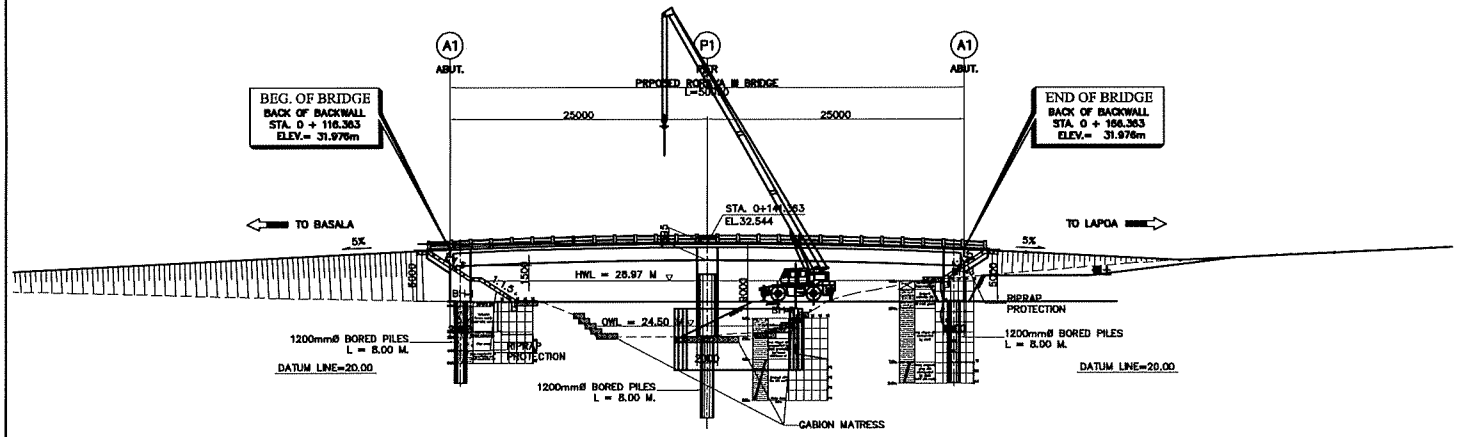
4 - BAR BENDING DIAGRAM FOR RCDG WIDENING
SCALE 1:50

TITLE:	SCALE:	DRAWING NO.
TYPICAL DETAIL OF FUTURE WIDENING FOR BR. NO. 8 to BR. NO. 17	AS SHOWN	16-1

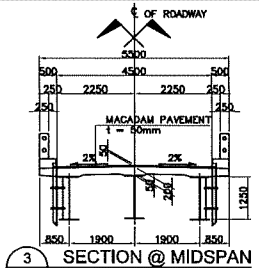
Rev.



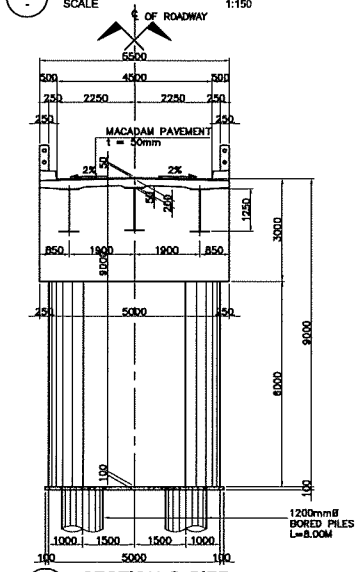
1 - GENERAL PLAN
SCALE 1:500



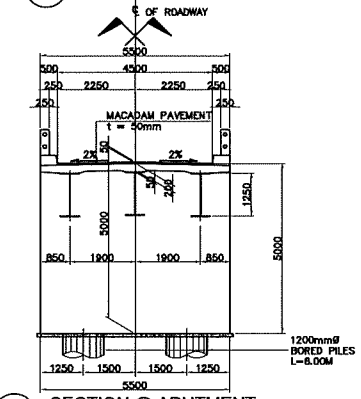
2 - GENERAL ELEVATION
SCALE 1:500



3 - SECTION @ MIDSPAN
SCALE 1:150

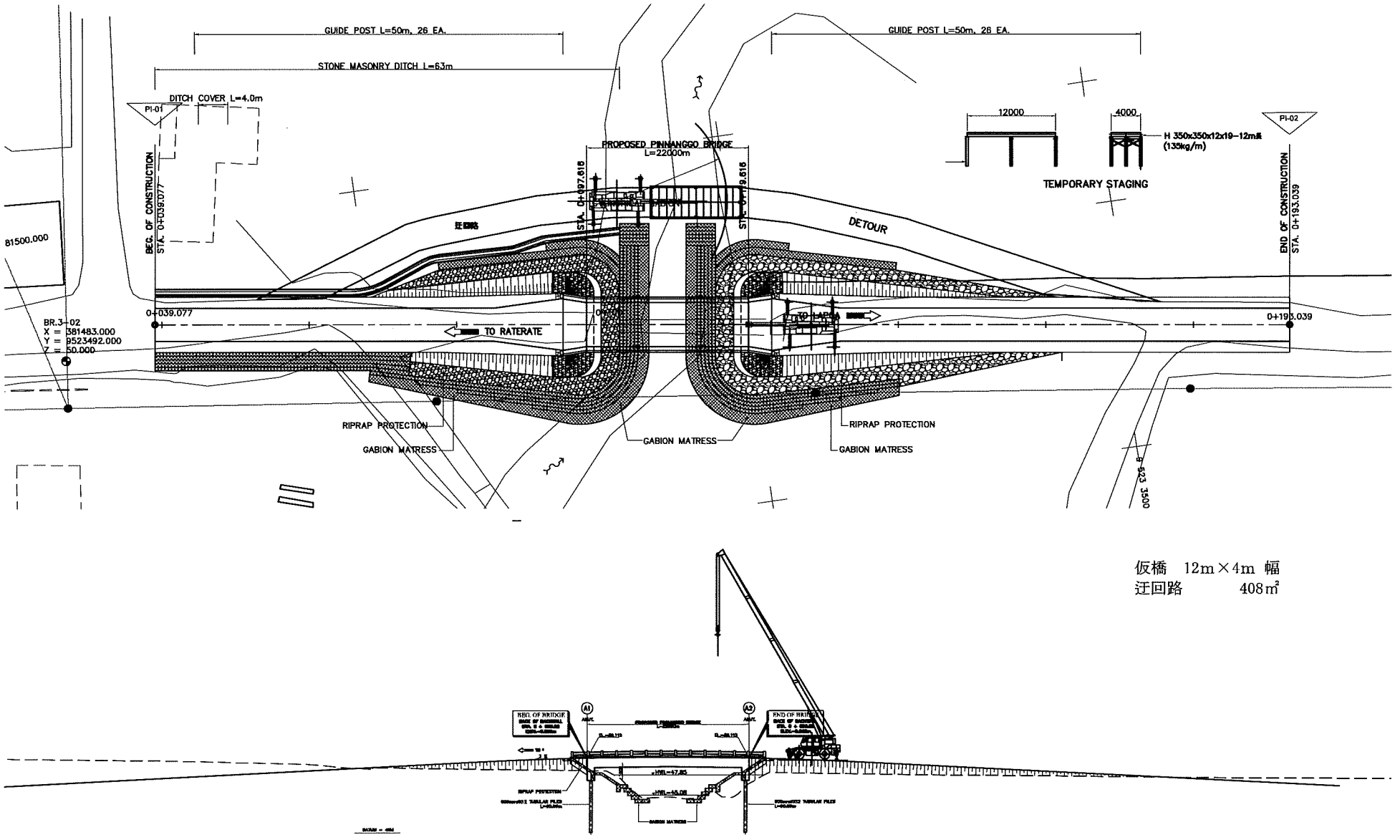


3 - SECTION @ PIER
SCALE 1:150

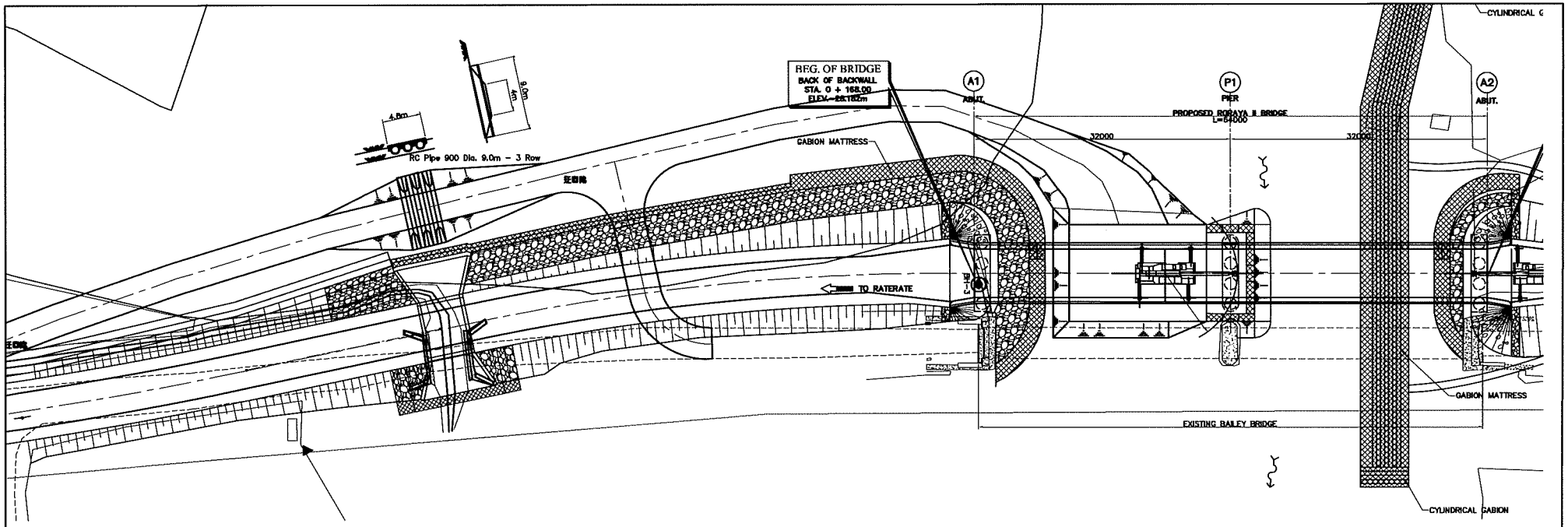


4 - SECTION @ ABUTMENT
SCALE 1:150

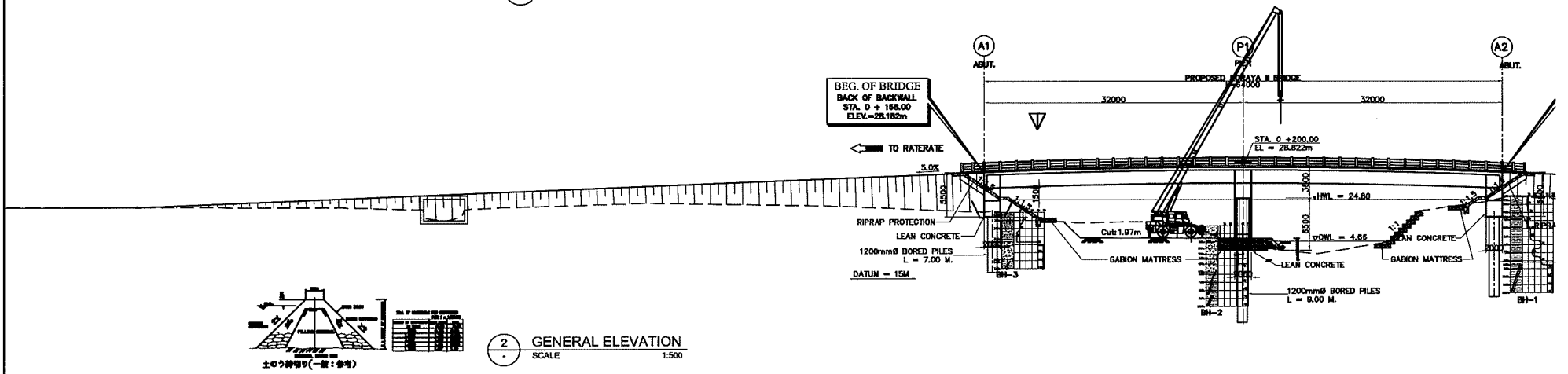
TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-01 RORAYA III BRIDGE	AS SHOWN	1	Rev.



TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-03 PINNANGO BRIDGE	1:600	2	Rev.



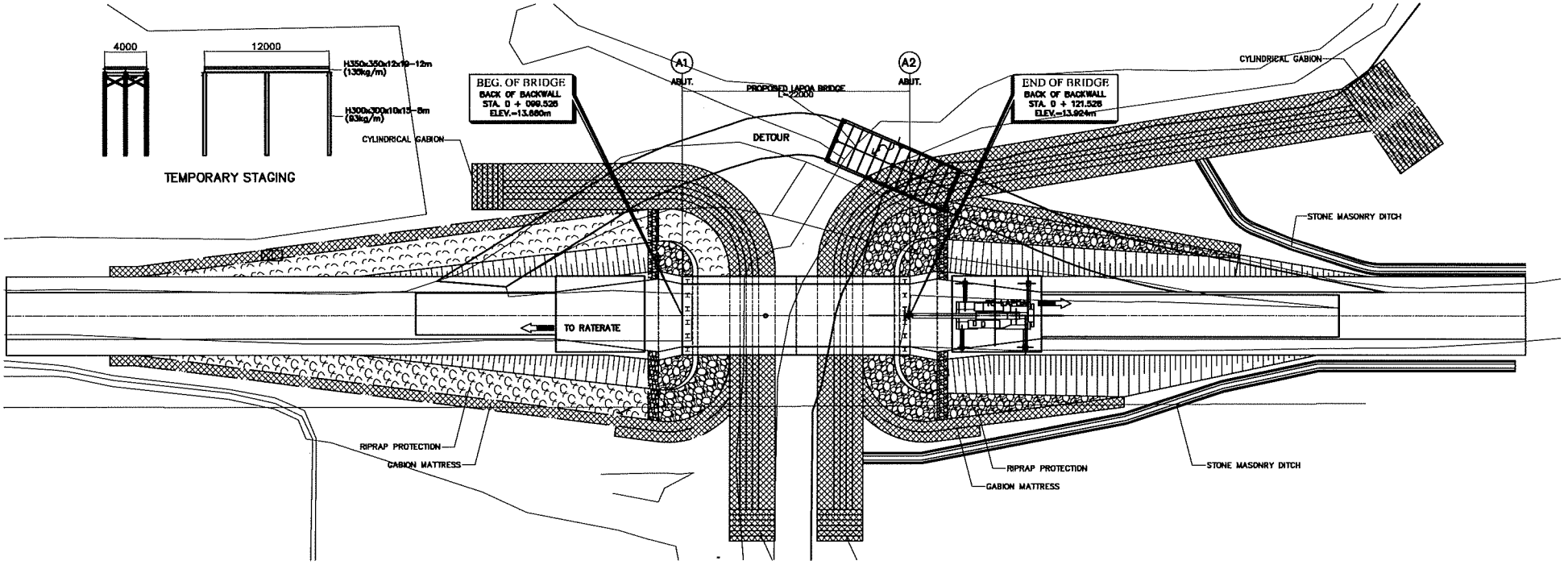
1 - GENERAL PLAN
SCALE 1:500



土のう詳細図(一般:参考)

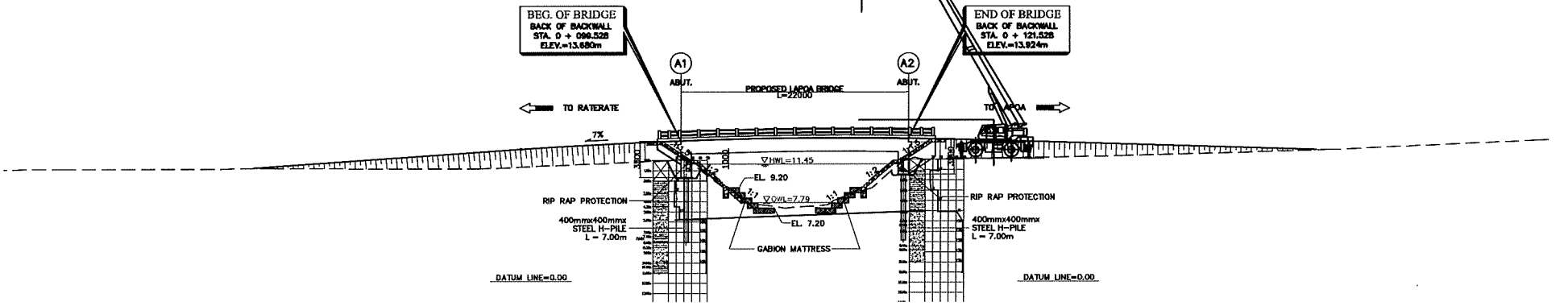
2 - GENERAL ELEVATION
SCALE 1:500

TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-04 RORAYA II BRIDGE	AS SHOWN	3	Rev.



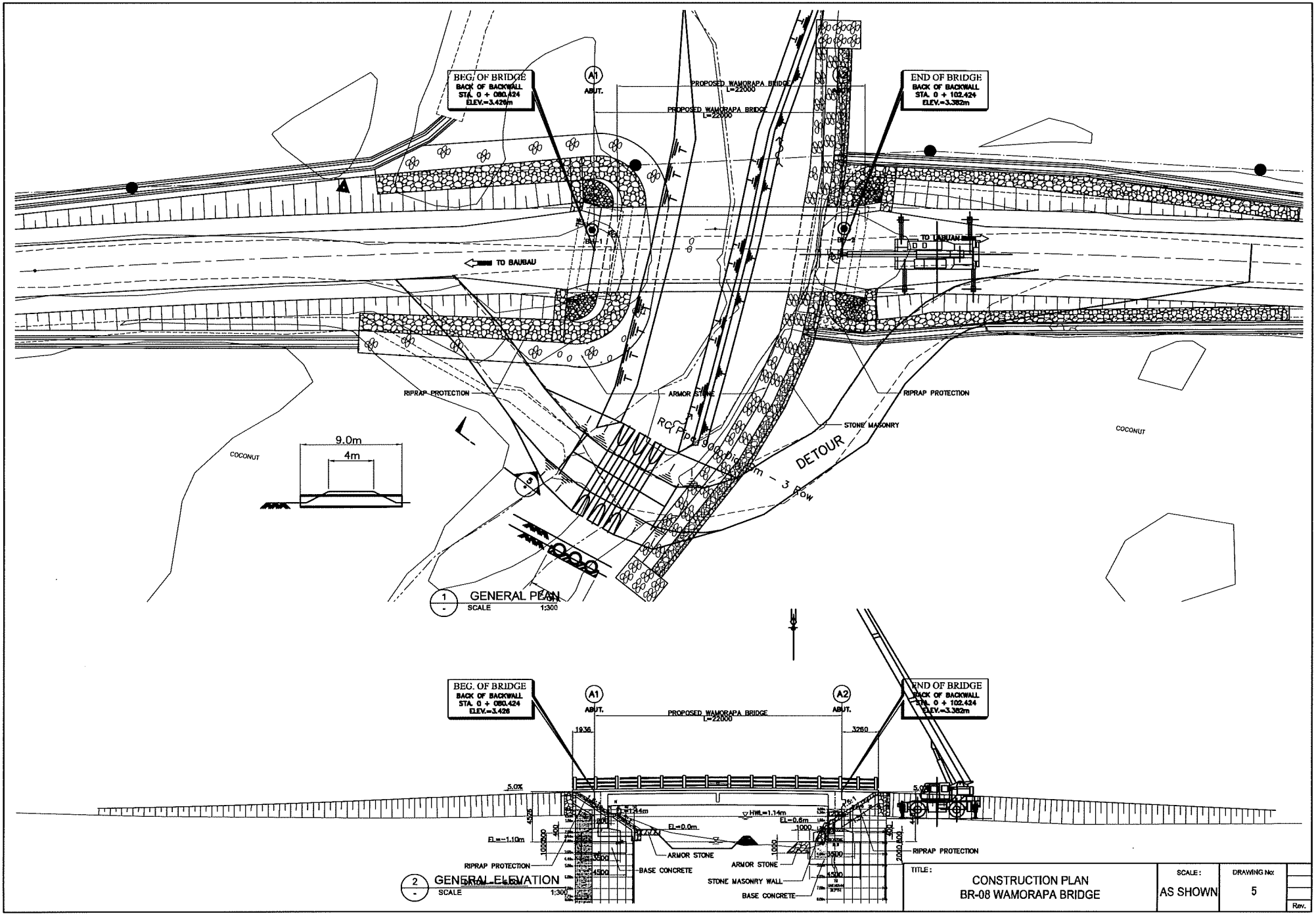
1 GENERAL PLAN
SCALE 1:400

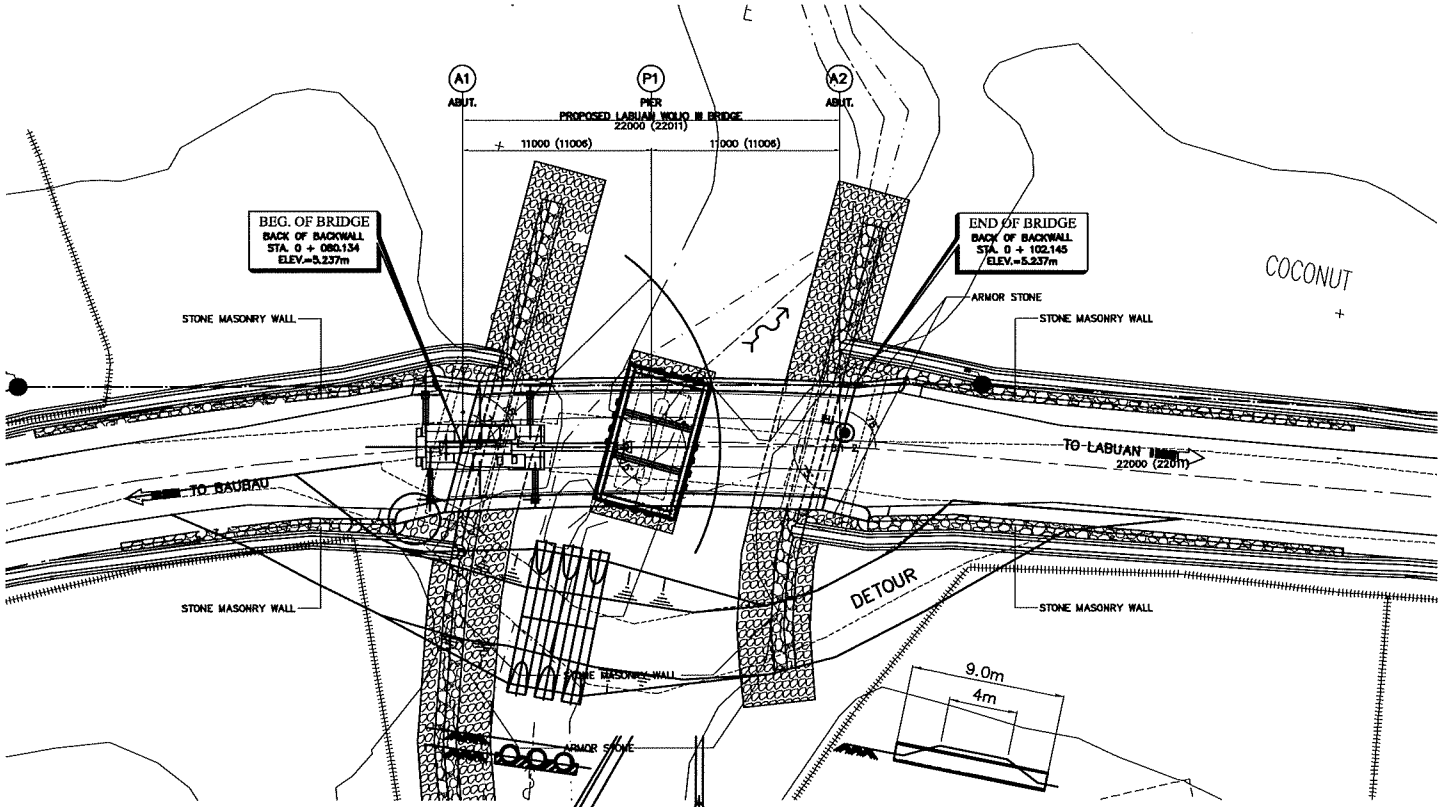
仮橋　12m×4m 幅
迂回路　288㎡



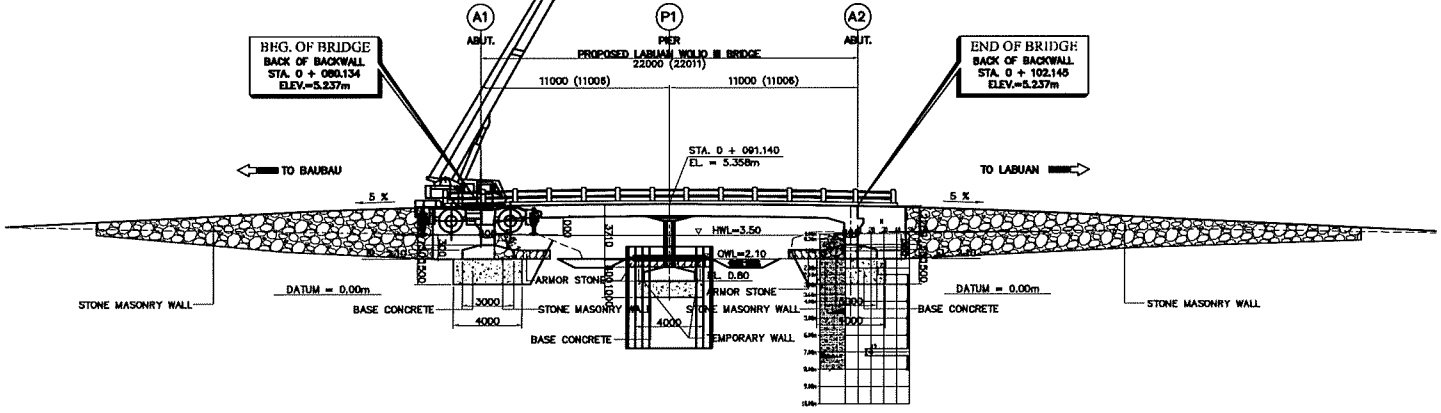
2 GENERAL ELEVATION
SCALE 1:400

TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-07 LAPOA BRIDGE	AS SHOWN	4	Rev.

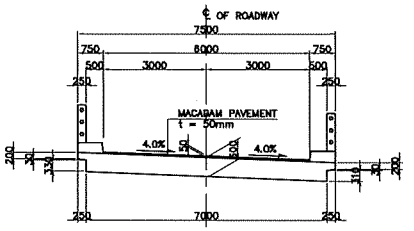

BEG. OF BRIDGE
BACK OF BACKWALL
STA. 0 + 080.424
ELEV.=3.428m
END OF BRIDGE
BACK OF BACKWALL
STA. 0 + 102.424
ELEV.=3.382m
A1
ABUT.
A2
PROPOSED WAMORAPA BRIDGE
L=22000
TO SAUSAU
TO TABUAN
RIPRAP PROTECTION
ARMOR STONE
STONE MASONRY
RCP Pipe Culvert
DETOUR
COCONUT
9.0m
4m
GENERAL PLAN
SCALE 1:300
BEG. OF BRIDGE
BACK OF BACKWALL
STA. 0 + 080.424
ELEV.=3.428
END OF BRIDGE
BACK OF BACKWALL
STA. 0 + 102.424
ELEV.=3.382m
PROPOSED WAMORAPA BRIDGE
L=22000
1936
3280
5.0%
HWL=1.14m
EL=0.6m
EL=0.0m
EL=-1.10m
ARMOR STONE
BASE CONCRETE
STONE MASONRY WALL
RIPRAP PROTECTION
GENERAL ELEVATION
SCALE 1:300
TITLE:
CONSTRUCTION PLAN
BR-08 WAMORAPA BRIDGE
SCALE:
AS SHOWN
DRAWING No:
5
Rev.



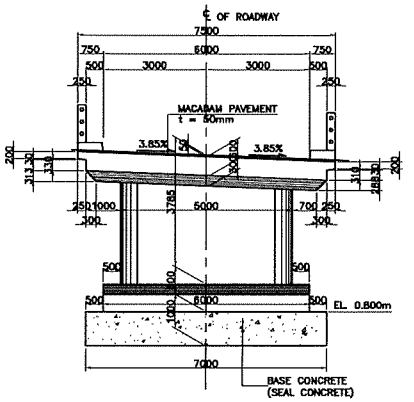
1 GENERAL PLAN
SCALE 1:300



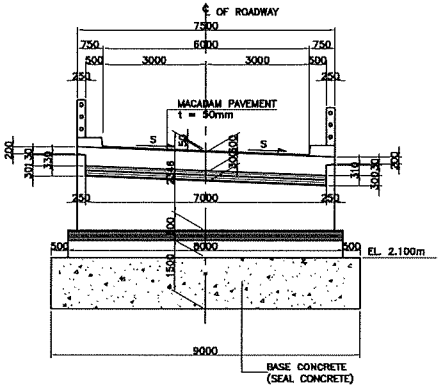
2 GENERAL ELEVATION
SCALE 1:300



3 SECTION @ MIDSPAN
SCALE 1:150

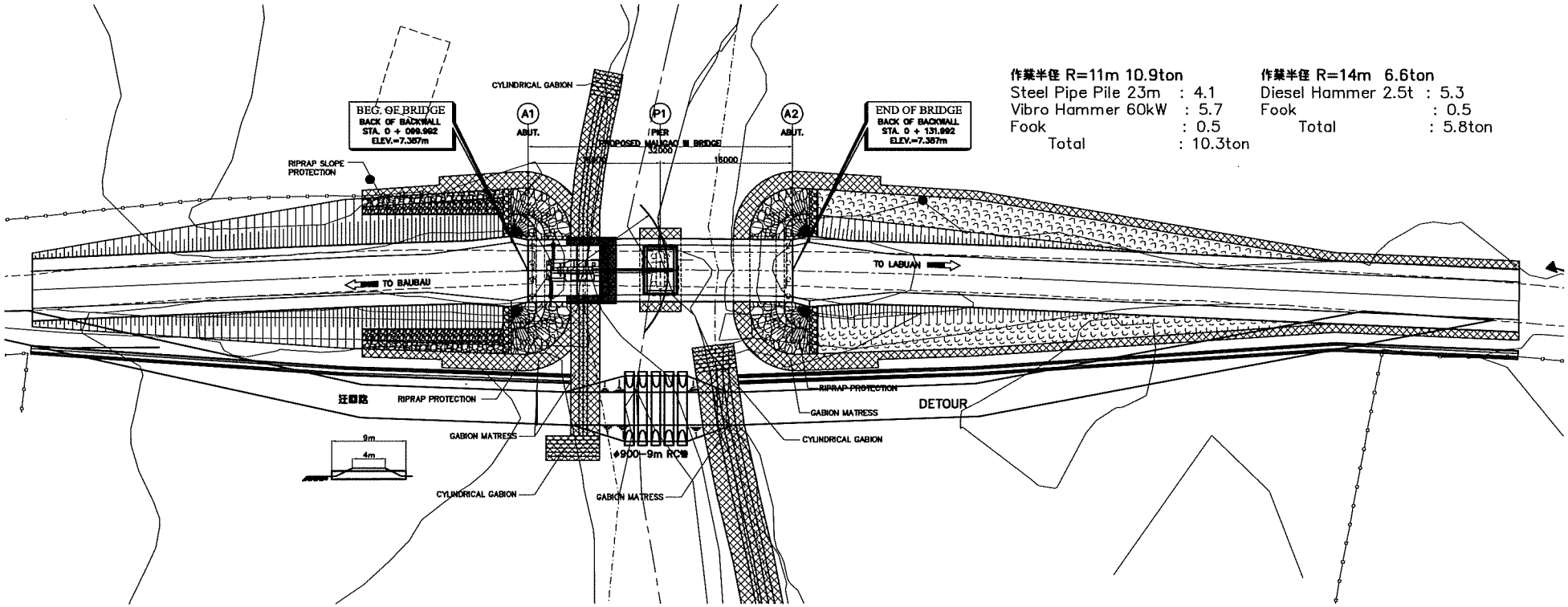


4 SECTION @ PIER
SCALE 1:150

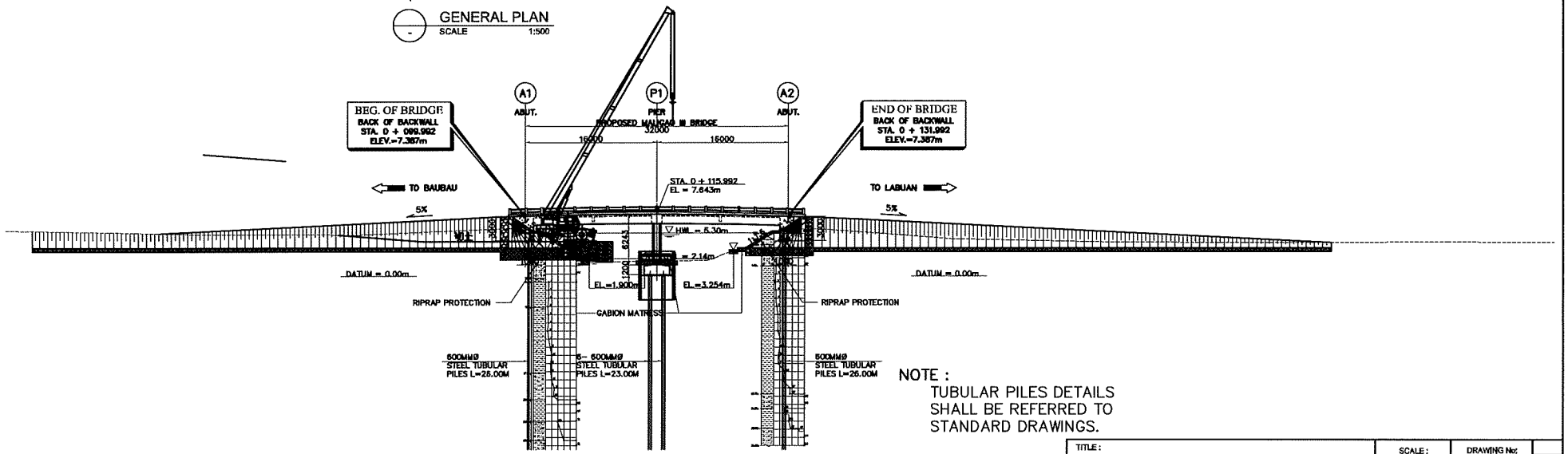


5 SECTION @ ABUTMENT
SCALE 1:150

TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-09 LABUAN WOLIO BRIDGE	AS SHOWN	6	Rev.



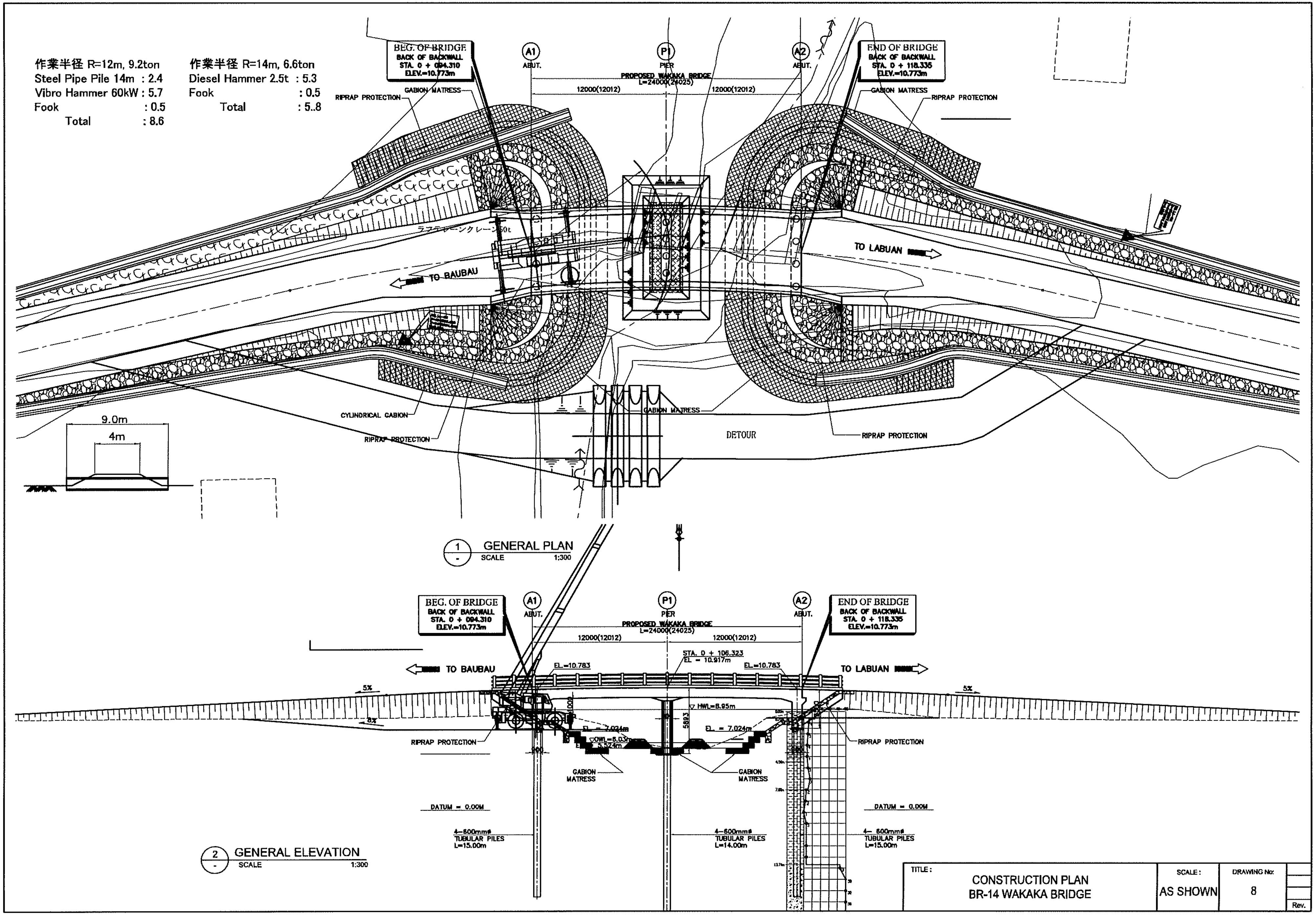
1 GENERAL PLAN
SCALE 1:500



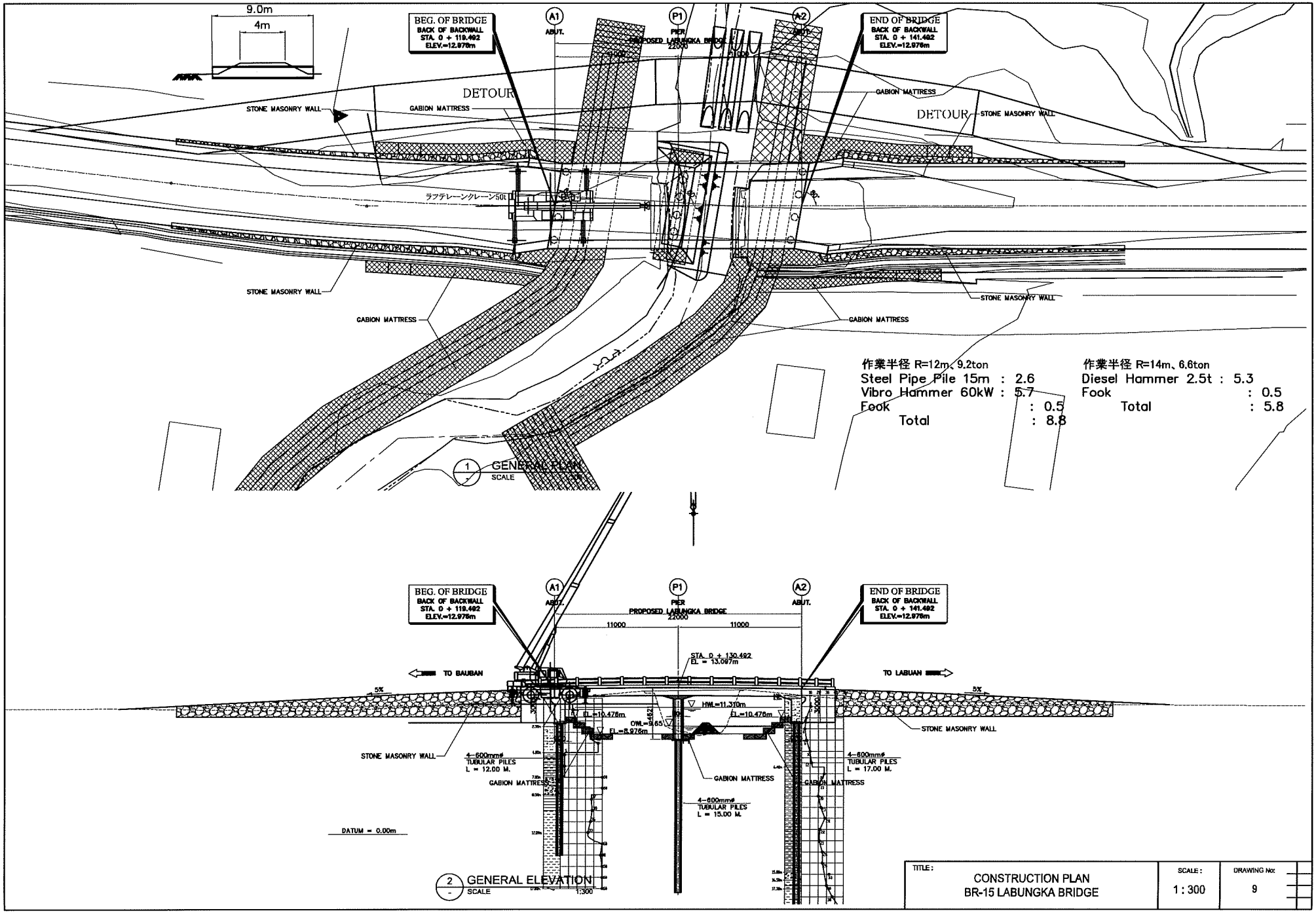
2 GENERAL ELEVATION
SCALE 1:500

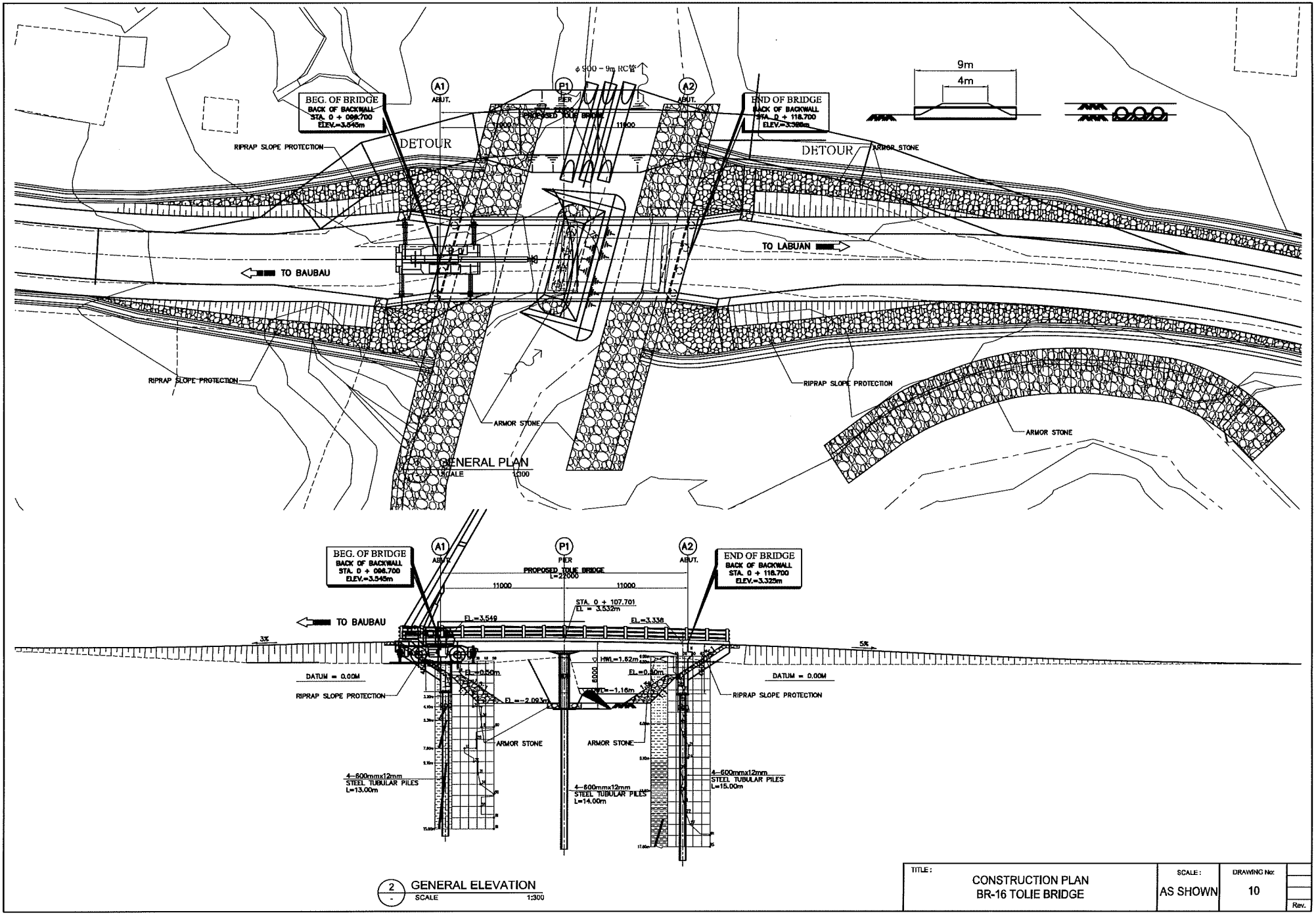
NOTE :
TUBULAR PILES DETAILS SHALL BE REFERRED TO STANDARD DRAWINGS.

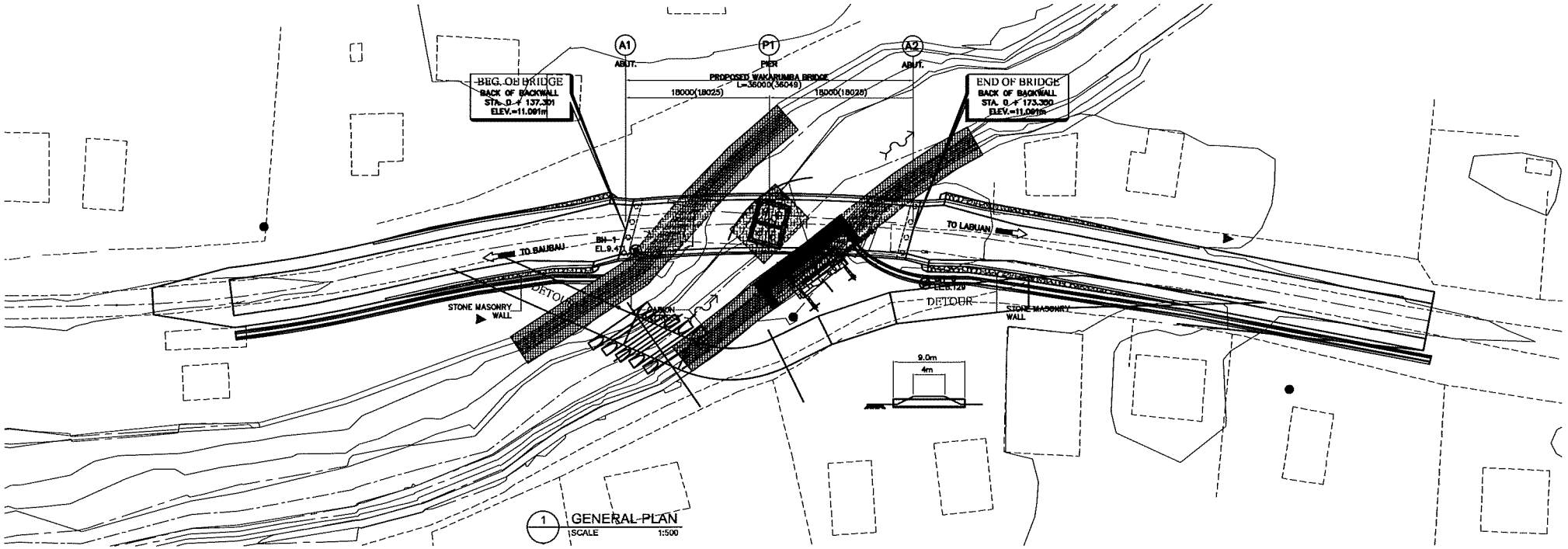
TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-12 MALIGANO III BRIDGE	AS SHOWN	7	Rev.



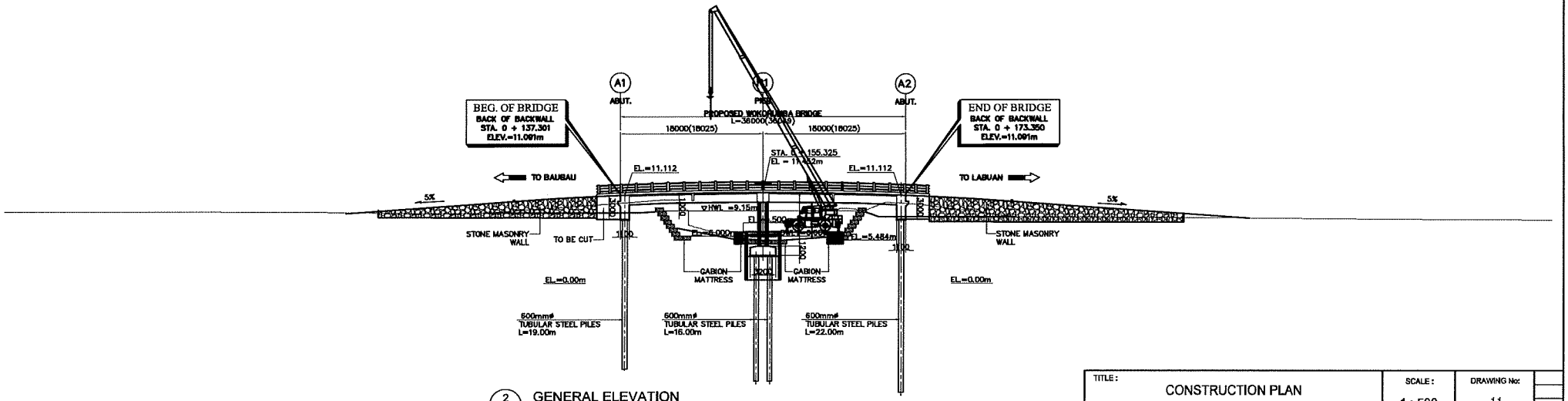
作業半径 R=12m, 9.2ton
Steel Pipe Pile 14m : 2.4
Vibro Hammer 60kW : 5.7
Fook : 0.5
Total : 8.6
作業半径 R=14m, 6.6ton
Diesel Hammer 2.5t : 5.3
Fook : 0.5
Total : 5..8
BEG. OF BRIDGE
BACK OF BACKWALL
STA. 0 + 094.310
ELEV.=10.773m
END OF BRIDGE
BACK OF BACKWALL
STA. 0 + 118.335
ELEV.=10.773m
A1 ABUT.
P1 PIER
A2 ABUT.
PROPOSED WAKAKA BRIDGE
L=24000(24025)
12000(12012)
12000(12012)
RIPRAP PROTECTION
GABION MATRESS
TO LABUAN
TO BAUBAU
CYLINDRICAL GABION
DETOUR
9.0m
4m
1 GENERAL PLAN
SCALE 1:300
EL.=10.783
STA. 0 + 106.323
EL = 10.917m
HWL=8.95m
EL = 7.024m
OWL=5.03
5.524m
5%
DATUM = 0.00M
4– 600mmφ
TUBULAR PILES
L=15.00m
4– 600mmφ
TUBULAR PILES
L=14.00m
2 GENERAL ELEVATION
SCALE 1:300
TITLE :
CONSTRUCTION PLAN
BR-14 WAKAKA BRIDGE
SCALE :
AS SHOWN
DRAWING No:
8
Rev.


9.0m
4m
BEG. OF BRIDGE
BACK OF BACKWALL
STA. 0 + 119.492
ELEV.=12.976m
A1
ABUT.
P1
PIER
A2
ABUT.
END OF BRIDGE
BACK OF BACKWALL
STA. 0 + 141.492
ELEV.=12.976m
PROPOSED LABUNGKA BRIDGE
22000
11000
11000
DETOUR
DETOUR
STONE MASONRY WALL
GABION MATTRESS
STONE MASONRY WALL
GABION MATTRESS
STONE MASONRY WALL
GABION MATTRESS
ラフテレーンクレーン50t
作業半径 R=12m、9.2ton
Steel Pipe Pile 15m : 2.6
Vibro Hammer 60kW : 5.7
Fook : 0.5
Total : 8.8
作業半径 R=14m、6.6ton
Diesel Hammer 2.5t : 5.3
Fook : 0.5
Total : 5.8
1 GENERAL PLAN
SCALE
TO BAUBAN
TO LABUAN
STA. 0 + 130.492
EL. = 13.097m
5%
5%
HWL=11.310m
EL.=10.478m
EL.=10.478m
OWL=9.65
EL.=8.976m
STONE MASONRY WALL
STONE MASONRY WALL
4-600mmø
TUBULAR PILES
L = 12.00 M.
GABION MATTRESS
GABION MATTRESS
4-600mmø
TUBULAR PILES
L = 15.00 M.
4-600mmø
TUBULAR PILES
L = 17.00 M.
GABION MATTRESS
DATUM = 0.00m
2 GENERAL ELEVATION
SCALE
1:300
TITLE:
CONSTRUCTION PLAN
BR-15 LABUNGKA BRIDGE
SCALE:
1 : 300
DRAWING No:
9


BEG. OF BRIDGE
BACK OF BACKWALL
STA. 0 + 088.700
ELEV.=3.545m
A1
ABUT.
P1
PIER
A2
ABUT.
END OF BRIDGE
BACK OF BACKWALL
STA. 0 + 118.700
ELEV.=3.325m
PROPOSED TOLIE BRIDGE
L=22000
11000
11000
DETOUR
DETOUR
RIPRAP SLOPE PROTECTION
ARMOR STONE
TO LABUAN
TO BAUBAU
RIPRAP SLOPE PROTECTION
RIPRAP SLOPE PROTECTION
ARMOR STONE
ARMOR STONE
GENERAL PLAN
SCALE 1:300
9m
4m
STA. 0 + 107.701
EL = 3.532m
EL.=3.549
EL.=3.338
3%
5%
DATUM = 0.00M
DATUM = 0.00M
HWL=1.62m
EL.=0.50m
EL.=0.00m
EL.=-2.093m
LWL=-1.16m
RIPRAP SLOPE PROTECTION
RIPRAP SLOPE PROTECTION
ARMOR STONE
ARMOR STONE
4-600mmx12mm
STEEL TUBULAR PILES
L=13.00m
4-600mmx12mm
STEEL TUBULAR PILES
L=14.00m
4-600mmx12mm
STEEL TUBULAR PILES
L=15.00m
2
GENERAL ELEVATION
SCALE 1:300
TITLE:
CONSTRUCTION PLAN
BR-16 TOLIE BRIDGE
SCALE:
AS SHOWN
DRAWING No:
10
Rev.



1 GENERAL PLAN
SCALE 1:500



2 GENERAL ELEVATION
SCALE 1:500

TITLE:	SCALE:	DRAWING No:	
CONSTRUCTION PLAN BR-17 WOKORUMBA BRIDGE	1 : 500	11	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 aid scheme after the signing of the Exchange of Notes (E/N) and the Grant Agreement (G/A) between the Government of Japan and the Government of Indonesia.
- The Directorate General of highway of the Ministry of Public Works is responsible for the implementation of 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 Planning Policy

Implementation Schedule

- The Project will be implemented in two stages. Since the ferry project which will connect to Amolengu in mainland and Labuan in Buton Island is scheduled to start the operation in 2013, the construction of 4 bridges in the mainland of Southeast Sulawesi Province will be implemented in the first stage and the construction of 7 bridges along Buton South-North Road will be implemented in the second stage to adjust the timing between the ferry project and this Project.

  The Project road improvement including the construction of small bridges are being implemented by the Indonesian side is scheduled to be completed upon the completion of the Project bridges.

Construction Planning

- Materials and equipment transportation plan and construction plan can be executed easily and safely.
- Environmental and social impact are minimized and the impact mitigation measures should be palnned. (Please refer the detail in Section 2.2.1.3.)
- Site conditions are considered in the construction plan.
- Cost saving is considered in the construction plan.
- Material procurement plan and construction supervision plan should be made to guarantee the work quality.

Material and Equipment Procurement Planning

- Light, small and multi-purpose construction equipments are selected because the

construction sites are remote.

- Instead of trailer truck, 15 ton trucks are used for transportation of the construction equipments because the roads leading to the sites are too narrow (4.5m) and winding for trailer truck to pass. (Please refer to Figure 2.2-4)
- Some roads leading to the sites are paved. However, the pavement is not strong and heavy vehicles have never passed the pavement. The pavement possibly be broken by heavy trucks. Therefore, 6-ton truck which is small and common in Southeast Sulawesi Province is used for transportation of aggregate, soil and other materials.
- Crushed aggregate is available in the mainland of Southeast Sulawesi Province. It is purchased for the construction of bridges in the mainland of Southeast Sulawesi Province. While, crushed aggregate is not available in Buton Island, therefore, a transportable crushing plant is procured for production of crushed aggregate using river gravel in Buton. (Please refer to Figure 2.2-5.)
- A portable concrete mixer (blade mix type) is procured for production of concrete. (Please refer to Figure 2.2-6.)
- Usually, crawler cranes are used for pile driving, however, crawler crane is too big to be transported to the sites. Instead, a raftterrain crane, a vibro-hammer and a pile driver are procured for the pile driving. (Please refer to Figure 2.2-7: Vibro-hammer is used for the initial pile driving until the pile stands stably then diesel hammer is used.)
- Baubau port is farther than 100km from the sites in Buton Island and the road condition is not good in the mountainous sections along the road, therefore, materials from Jakarta is transported by landing craft which can unload the material on the beach near the construction sites.

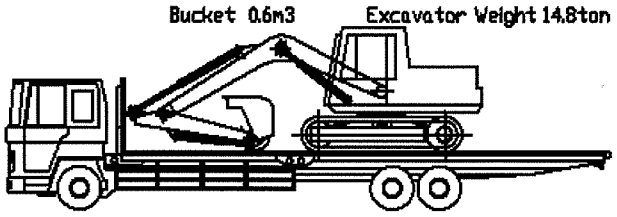


Figure 2.2-4 Construction Equipment Transportation Plan (using 15-ton truck)

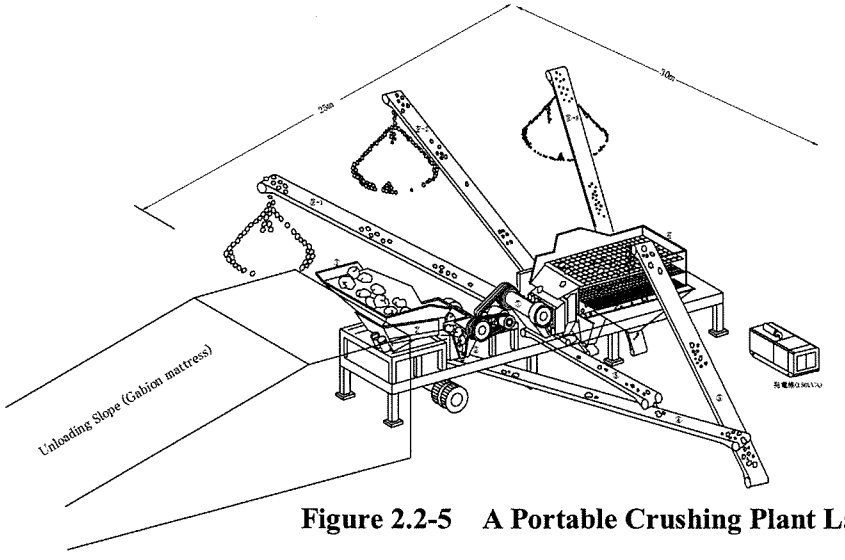


Figure 2.2-5 A Portable Crushing Plant Layout

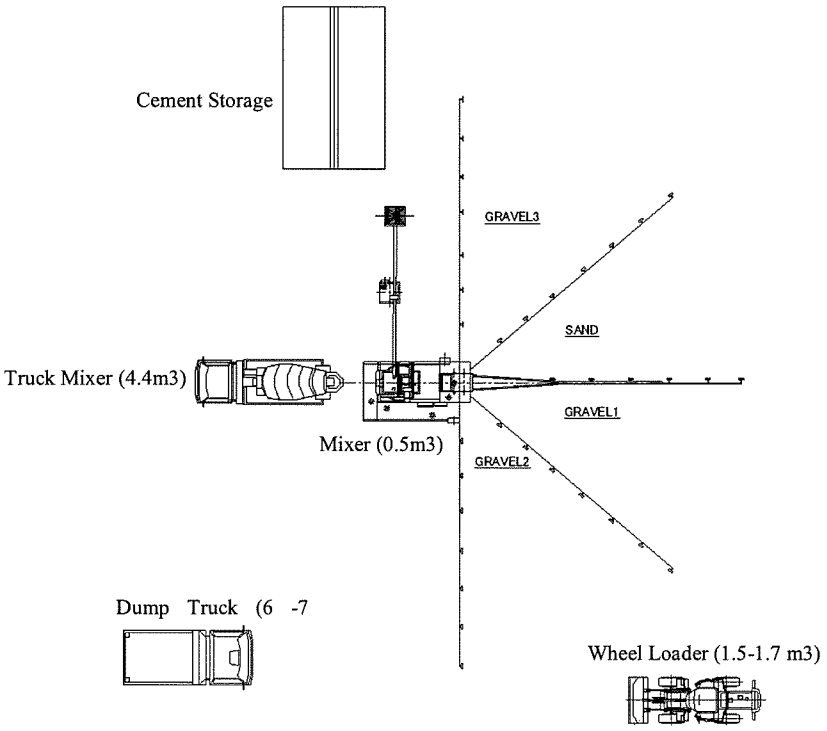


Figure 2.2-6 A Portable Concrete Mixing Plant Layout

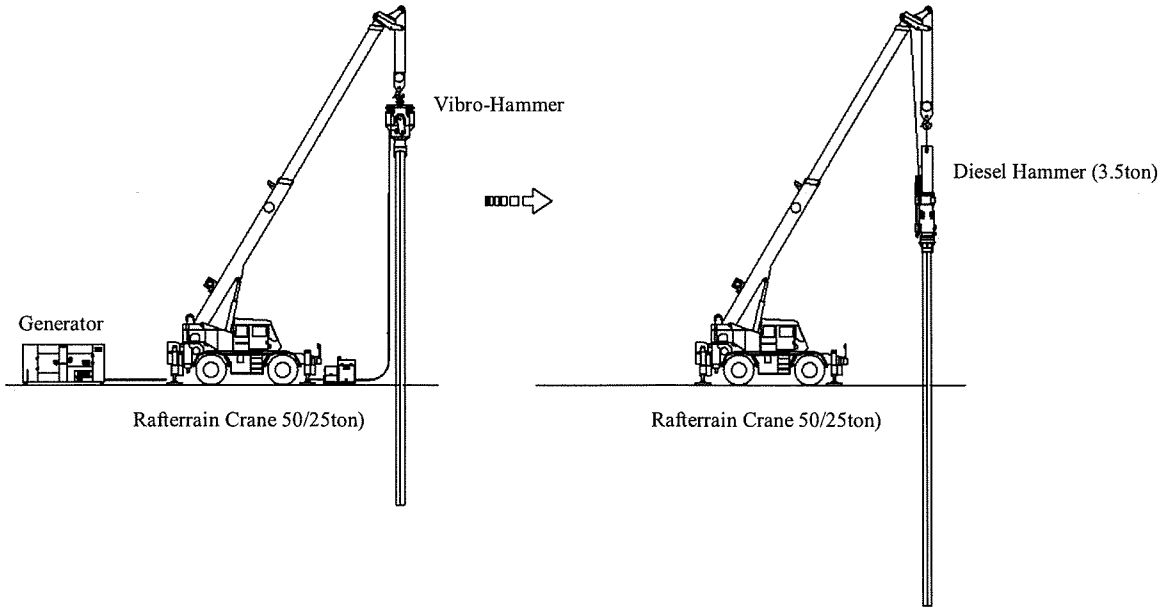


Figure 2.2-7 Pile Driving using Rafterrain Crane, Vibro-Hammer and Diesel Hammer

Cost Efficiency

- Multi-purpose equipments are procured.
- Number of equipments and their lease period are minimized by proposing the optimum construction schedule.
- Locally available materials and equipments are utilized in construction.
- Materials and equipments are selected on the basis of comparison on quality and cost including transportation and other costs.
- Construction is divided into 2 stages, however, all Project bridges are designed in the first stage.

Construction supervision planning

- Appropriate technical specifications and quality control requirements are established and specified in the contract documents.
- Organization of the contractor and the supervision consultant are planned to satisfy the standardized construction management requirements.
- Countermeasures for preventing accidents are secured.

2.2.4.2 Implementation Condition

(1) Safety Measure

Safety measures should be established to prevent accident during construction.

Accidents common 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 when failure or accident happens should be trained.

Safety measure in transportation

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

(2) Construction Sequence of Integral Type Bridges

Integral type bridges should be constructed with the sequences which were 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 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.

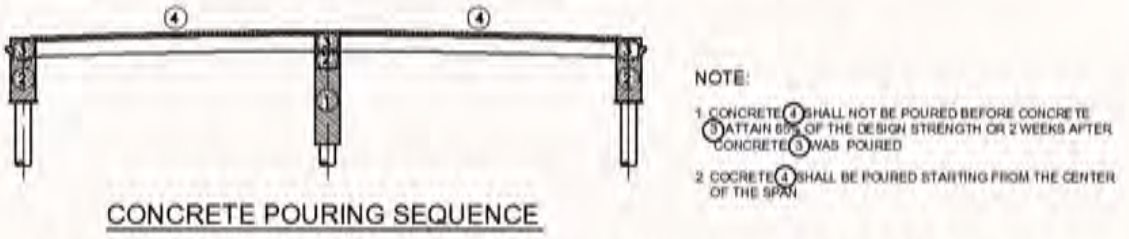


Figure 2.2-8 A Sample of Concrete Pouring Sequence of Integral Type Bridge

(3) Temporary Work Plan and Temporary Detour Plan

Temporary platforms and access roads are planned for construction of foundations and substructures. Temporary cofferdams are planned for construction of piers in the river. Such temporary facilities are planned by taking constructability, cost, safety, environmental impact and so on. Temporary work plan including temporary detour of the Project bridges are shown in the last pages of the outline drawings in this report.

2.2.4.3 Scope of Works

Responsibilities of both Japanese and Indonesian governments are shown on Table 2.2-13.

Table 2.2-13 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		○	
	Acquisition of lots for construction		○	
	Leasing temporary work areas		○	For detour, camp, work yards
	Securing borrow pit and disposal area		○	
	Other preparation work	○		
Construction works	Bridge construction	○		

2.2.4.4 Consultant 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 estimate

The time required for the detailed design is estimated 4 months for Stage-1 and 1 month for Stage-2.

(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 for both Stage-1 and Stage-2.

(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
- Final inspection and hand-over

The required construction period is estimated 14 months for Stage-1 and 14.5 months for

Stage-2.

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 2.2-14 to 16, respectively.

Table 2.2-14 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 500m^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 2.2-15 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 2.2-16 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 2.2-17.

Table 2.2-17 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	○			
Steel H-pile	○			
Timber	○			
Plywood	○			
Timber support	○			
Fuel, oil	○			
Equipments				
Bulldozer	○			
Backhoe	○			
Dump truck	○			
Crane mounted truck	○			
Loader	○			
Diesel hammer	○			
Vibratory hammer	○			
Breaker	○			
Motor grader	○			
Road roller	○			
Tire roller	○			
Vibratory roller	○			
Tamper	○			
Concrete mixing plant	○			
Crushing Plant	○			
Truck mixer	○			
Asphalt kettle	○			
Water tanker	○			

2.2.4.7 Implementation Schedule

The implementation schedule of the Project is shown on Table 2.2-18.

Table 2.2-18 Implementation Schedule

Stage	Item		Month 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Stage-1	Design	Detailed Design	(Total 14 months)																
		Tendering									(Total 13 months)								
	Construction	Preparation																	
		No.1 Roraya III																	
		No.3 Pinnango																	
		No.4 Roraya II																	
		No.7 Lapoa														(Total 14 months)			
		Demobilization																	

Stage	Item		Month 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Stage-2	Design	Detailed Design	(Total 11 months)																
		Tendering					(Total 13 months)												
	Construction	Preparartion																	
		No.8 Wamorapa																	
		No.9 Labuan Wolio III																	
		No.12 Maligano III																	
		No.14 Wakaka II																	
		No.15 Labungka																	
		No.16 Tolie																	
		No.17 Wakorumba												(Total 14.5 months)					
		Demobilization																	