

# DETAIL OF RUBBER BEARING(1) S=1:30

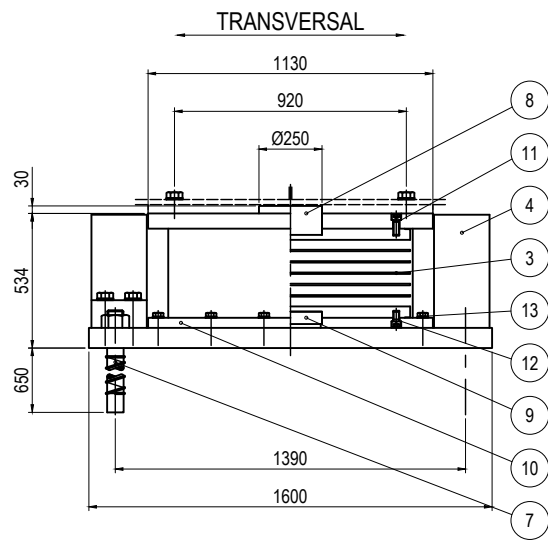
## DESIGN CRITERIA

REACTION FORCE		
ALL REACTION FORCE	R	3400 kN
DEAD LOAD REACTION FORCE	Rd	2100 kN
LONGITUDINAL HORIZONTAL FORCE (EARTHQUAKE)	Rh1e	1500 kN
TRANSVERSAL HORIZONTAL FORCE (EARTHQUAKE)	Rh2e	600 kN
UP LIFT FORCE (EARTHQUAKE)	V	210 kN
QUANTITY OF MOVE		
MAXIMAL VALUE	UB	±310 mm
RUBBER BEARING		
SHEAR MODULUS OF RIGIDITY	Ge	1.2 N/mm <sup>2</sup>
BREAKING STRAIN	yu	500 %
DISPLACEMENT TEST	ΔL	±351 mm
EQUIVALENT STIFFNESS	KB	4.628 kN/mm
ALLOWABLE SHEAR DISTORTION	ys	150 %
SECONDARY SHAPE FACTOR	S2	4.06
ROTATION CHECK LOAD	R1	2100 kN
ROTATIONAL VALUE	δr	1.631 mm
CHECK LOAD	R1L	700 kN
COMPRESSED DISPLACEMENT OF CHECK LOAD	δcL	0.710 mm
SUPPORT CONDITION		
LONGITUDINAL : ELASTICITY	TRANSVERSAL : FIXING	

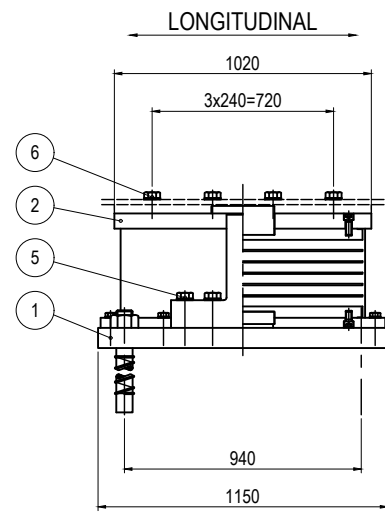
## MATERIALS

NUMBER	THE NAME OF AN ARTICLE	MATERIAL	NUMBER	MASS (Kg)	NOTES
①	BASE PLATE	SM490A	1	1136.5	
②	TOP BEARING	SM490A	1	510.7	
③	RUBBER BEARING	NR+SM490A+SS400	1	1086.0	
④	SIDE BLOCK	SM490A	2	353.1	
⑤	HEXAGON HEAD BOLT WITH WASHER		16	30.7	JIS B 1180
⑥	HEXAGON HEAD BOLT WITH WASHER		8	9.6	JIS B 1180
⑦	ANCHOR BOLT WITH NUT	SS400	4	91.1	JIS B 1181
⑧	SHEAR KEY	SM490A	1	44.3	
⑨	SHEAR KEY	SM490A	1	18.9	
⑩	BOTTOM BEARING	SM490A	1	377.7	
⑪	HEXAGON HOLE BOLT WITH WASHER		16	5.3	JIS B 1176
⑫	HEXAGON HOLE BOLT WITH WASHER		16	4.3	JIS B 1176
⑬	HEXAGON HEAD BOLT WITH WASHER		20	7.2	JIS B 1180
TOTAL WEIGHT				3675.4 (kg)	
CORROSION PROOF FOR OUTSIDE PL					
HOT-DIP GALVANIZED COATING OVER 550g/m <sup>2</sup> , 350g/m <sup>2</sup> (FOR BOLT, WASHER & NUT)					

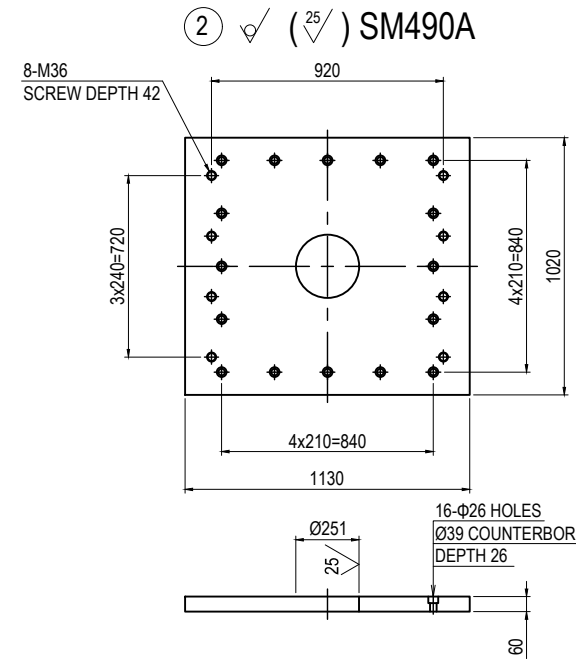
NOTES: 1- CIRCLE NUMBER IN MATERIAL TABLE INDICATES HOT-DIP GALVANIZED.  
 2- THIS DWG FOR REFERENCE.  
 3- TOP AND BOTTOM SURFACE OF RUBBER BEARING PAINTED WITH ORGANIC ZINC-RICH.  
 4- AFTER ASSEMBLE RUBBER BEARING, METAL OXIDE FILM BOLT (HEXAGON HOLE BOLT) PAINTED WITH HIGH-CONCENTRATION ZINC DUST.



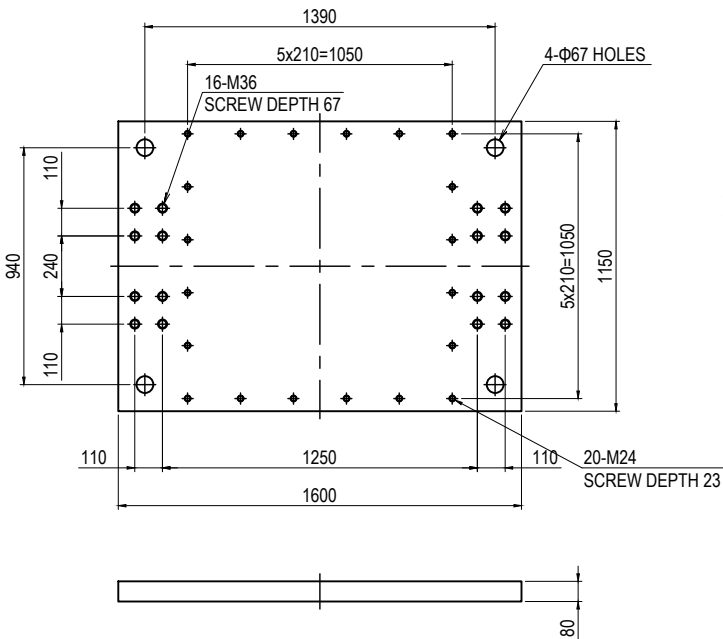
① SM490A



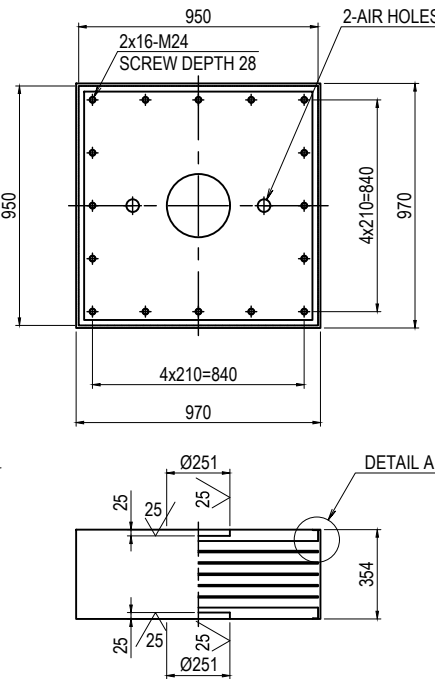
③ NR+SM490A+SS400



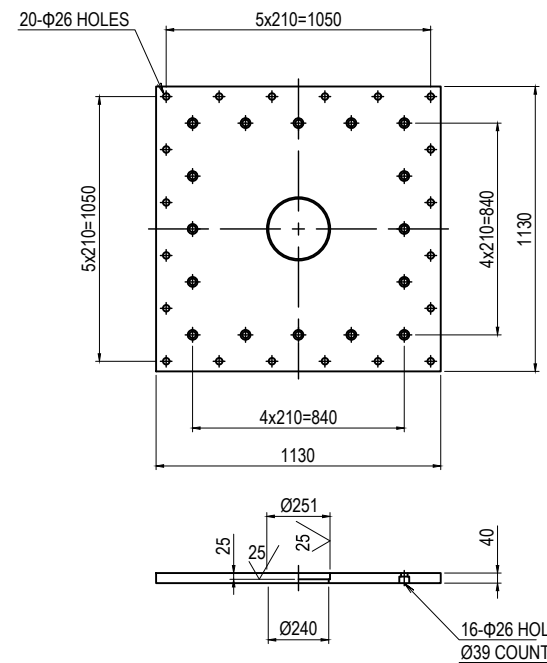
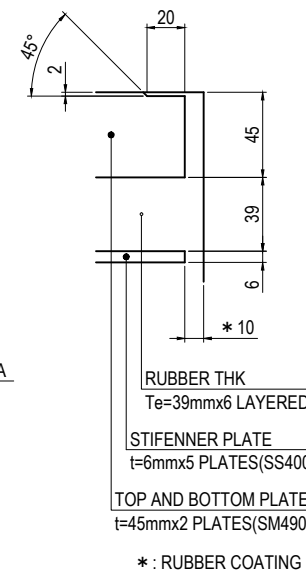
⑩ SM490A



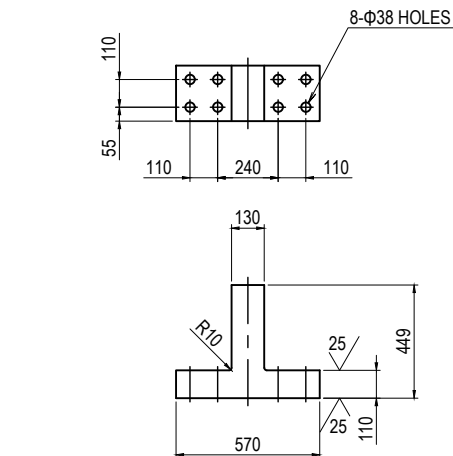
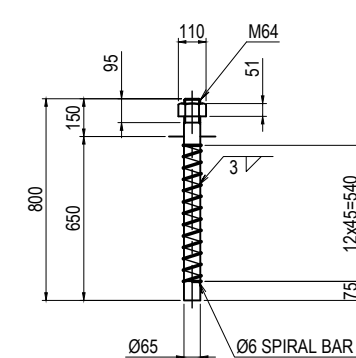
④ SM490A



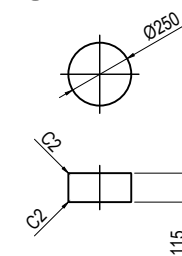
DETAIL A S=1:2



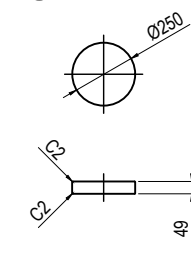
⑦ SS400



⑧ SM490A



⑨ SM490A



⑤ HEXAGON HEAD BOLT WITH WASHER M36x180 8.8

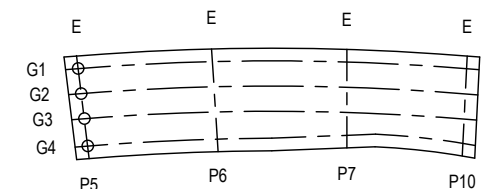
⑥ HEXAGON HEAD BOLT WITH WASHER M36x 8.8

⑪ HEXAGON HOLE BOLT M24x60 10.9

⑫ HEXAGON HOLE BOLT M24x40 10.9

⑬ HEXAGON HEAD BOLT WITH WASHER M24x65 8.8

## KEY PLAN



PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME S. IMADA	SIGNATURE <i>S. Imada</i>	DATE 29 Sept.2017	DRAWING TITLE DETAIL OF RUBBER BEARING(1)	PACKAGE 1
				CHECKED BY T. HAYAKAWA	<i>T. Hayakawa</i>	3 Oct.2017		DWG No.
				APPROVED BY Y. SANO	<i>Y. Sano</i>	6 Oct.2017		P1-SB-3001

# DETAIL OF RUBBER BEARING(2) S=1:30

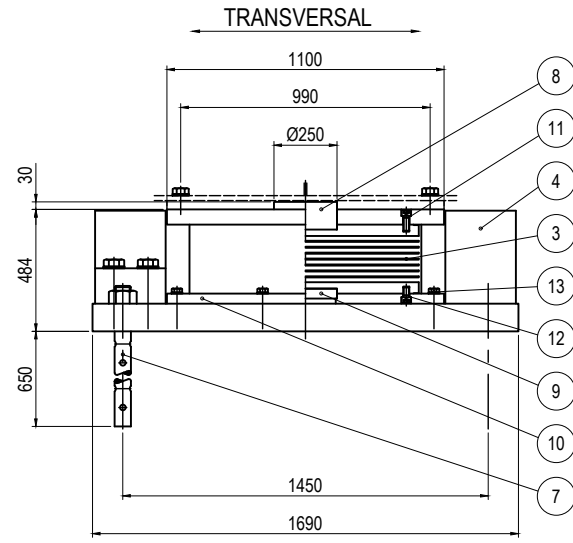
## DESIGN CRITERIA

REACTION FORCE		
ALL REACTION FORCE	R	7000 kN
DEAD LOAD REACTION FORCE	Rd	4800 kN
LONGITUDINAL HORIZONTAL FORCE (EARTHQUAKE)	Rh1e	1200 kN
TRANSVERSAL HORIZONTAL FORCE (EARTHQUAKE)	Rh2e	1500 kN
UP LIFT FORCE (EARTHQUAKE)	V	480 kN
QUANTITY OF MOVE		
MAXIMAL VALUE	UB	±180 mm
RUBBER BEARING		
SHEAR MODULUS OF RIGIDITY	Ge	1.2 N/mm <sup>2</sup>
BREAKING STRAIN	yu	500 %
DISPLACEMENT TEST	ΔL	±228 mm
EQUIVALENT STIFFNESS	KB	6.395 kN/mm
ALLOWABLE SHEAR DISTORTION	ys	150 %
SECONDARY SHAPE FACTOR	S2	5.92
ROTATION CHECK LOAD	R1	5000 kN
ROTATIONAL VALUE	δr	1.191 mm
SUPPORT CONDITION		
LONGITUDINAL : ELASTICITY	TRANSVERSAL : FIXING	

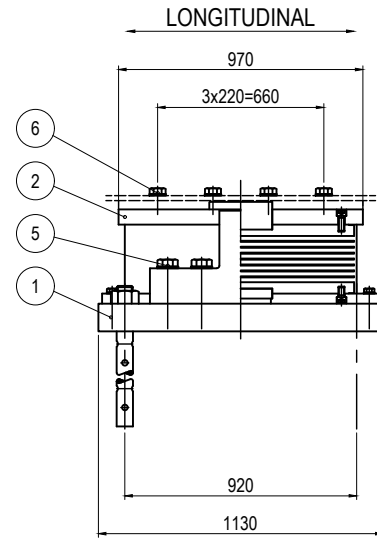
## MATERIALS

NUMBER	THE NAME OF AN ARTICLE	MATERIAL	NUMBER	MASS (Kg)	NOTES
①	BASE PLATE	SM490A	1	1620.7	
②	TOP BEARING	SM490A	1	470.4	
③	RUBBER BEARING	NR+SM490A+SS400	1	907.4	
④	SIDE BLOCK	SM490A OR SCW480N	2	583.7	
⑤	HEXAGON HEAD BOLT WITH WASHER	—	16	59.4	JIS B 1180
⑥	HEXAGON HEAD BOLT WITH WASHER	—	8	9.6	JIS B 1180
⑦	ANCHOR BOLT WITH NUT	SS400	4	94.2	JIS B 1181
⑧	SHEAR KEY	SM490A	1	42.4	
⑨	SHEAR KEY	SM490A	1	15.0	
⑩	BOTTOM BEARING	SM490A	1	358.2	
⑪	HEXAGON HOLE BOLT WITH WASHER	—	16	5.3	JIS B 1176
⑫	HEXAGON HOLE BOLT WITH WASHER	—	16	4.3	JIS B 1176
⑬	HEXAGON HEAD BOLT WITH WASHER	—	12	4.3	JIS B 1180
TOTAL WEIGHT				4174.9	(kg)
CORROSION PROOF FOR OUTSIDE PL					
HOT-DIP GALVANIZED COATING OVER 550g/m <sup>2</sup> , 350g/m <sup>2</sup> (FOR BOLT, WASHER & NUT)					

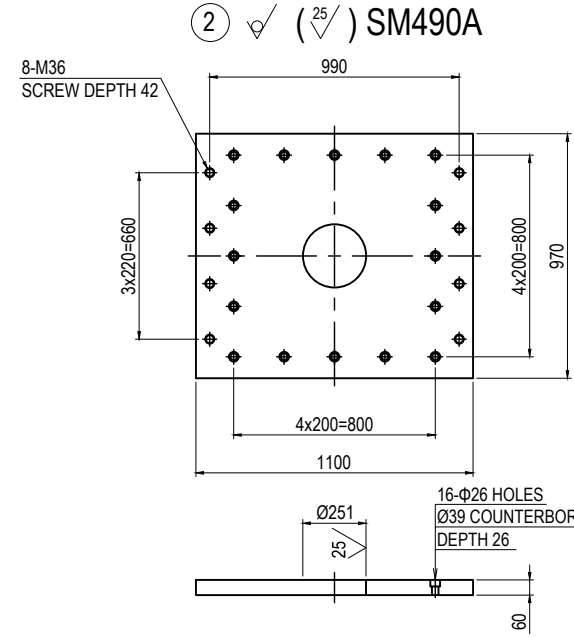
NOTES: 1- CIRCLE NUMBER IN MATERIAL TABLE INDICATES HOT-DIP GALVANIZED.  
 2- THIS DWG FOR REFERENCE.  
 3- TOP AND BOTTOM SURFACE OF RUBBER BEARING PAINTED WITH ORGANIC ZINC-RICH.  
 4- AFTER ASSEMBLE RUBBER BEARING, METAL OXIDE FILM BOLT (HEXAGON HOLE BOLT) PAINTED WITH HIGH-CONCENTRATION ZINC DUST.



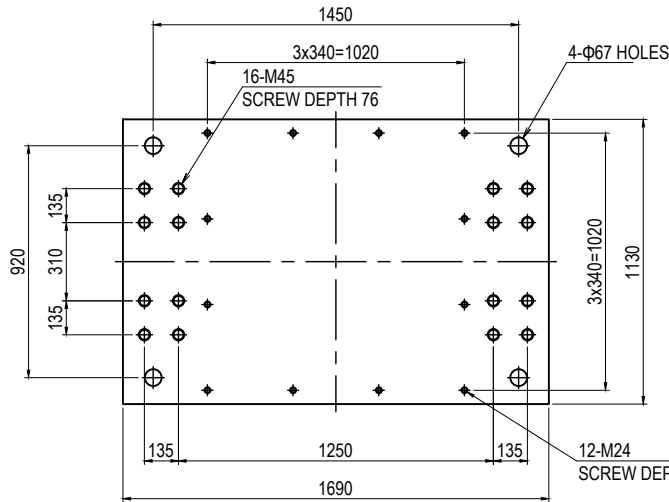
① ✓ (25/ ) SM490A



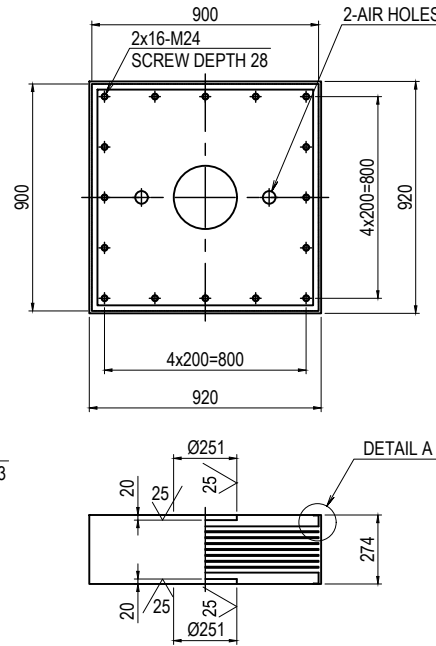
③ ✓ (25/ ) NR+SM490A+SS400



⑩ ✓ (25/ ) SM490A

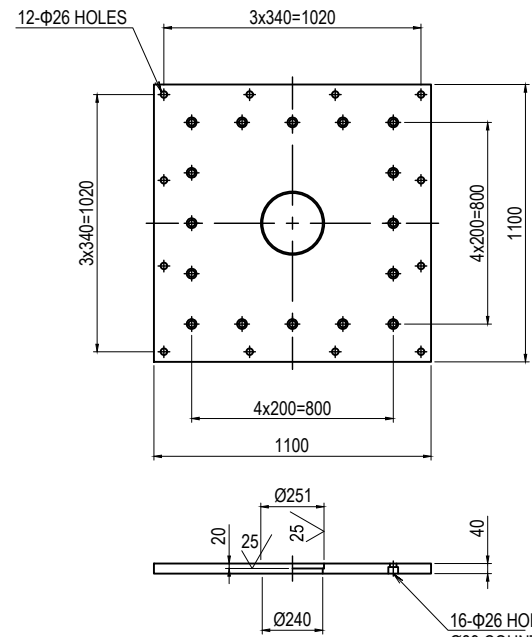


④ ✓ (25/ ) SM490A又はSCW480N

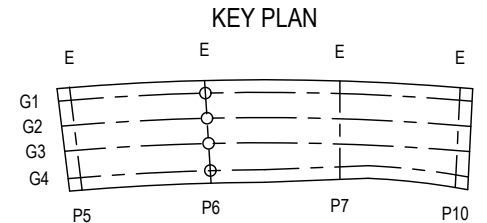
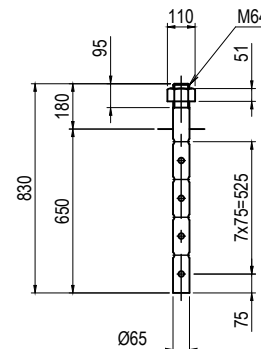


DETAIL A S=1:2

RUBBER THK  
Te=19mmx8 LAYERED  
STIFENNER PLATE  
t=4.5mmx7 PLATES(SS400)  
TOP AND BOTTOM PLATE  
t=45mmx2 PLATES(SM490A)  
\* : RUBBER COATING



⑦ ✓ SS400



- ⑧ 25/ SM490A
- ⑨ 25/ SM490A
- ⑤ HEXAGON HEAD BOLT WITH WASHER M45x220 8.8
- ⑥ HEXAGON HEAD BOLT WITH WASHER M36x 8.8
- ⑪ HEXAGON HOLE BOLT M24x60 10.9
- ⑫ HEXAGON HOLE BOLT M24x40 10.9
- ⑬ HEXAGON HEAD BOLT WITH WASHER M24x65 8.8

# DETAIL OF RUBBER BEARING(3) S=1:30

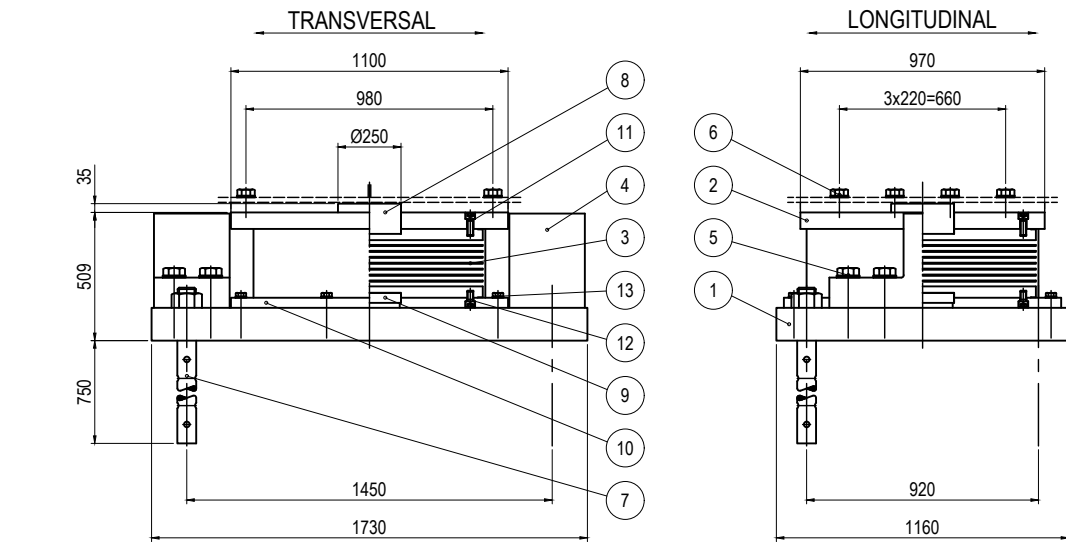
## DESIGN CRITERIA

REACTION FORCE		
ALL REACTION FORCE	R	8400 kN
DEAD LOAD REACTION FORCE	Rd	6000 kN
LONGITUDINAL HORIZONTAL FORCE (EARTHQUAKE)	Rh1e	1100 kN
TRANSVERSAL HORIZONTAL FORCE (EARTHQUAKE)	Rh2e	2000 kN
UP LIFT FORCE (EARTHQUAKE)	V	600 kN
QUANTITY OF MOVE		
MAXIMAL VALUE	UB	±170 mm
RUBBER BEARING		
SHEAR MODULUS OF RIGIDITY	Ge	1.2 N/mm <sup>2</sup>
BREAKING STRAIN	yu	500 %
DISPLACEMENT TEST	ΔL	±228 mm
EQUIVALENT STIFFNESS	KB	6.395 kN/mm
ALLOWABLE SHEAR DISTORTION	ys	150 %
SECONDARY SHAPE FACTOR	S2	5.92
ROTATION CHECK LOAD	R1	6200 kN
ROTATIONAL VALUE	δr	1.720 mm
SUPPORT CONDITION		
LONGITUDINAL : ELASTICITY	TRANSVERSAL : FIXING	

## MATERIALS

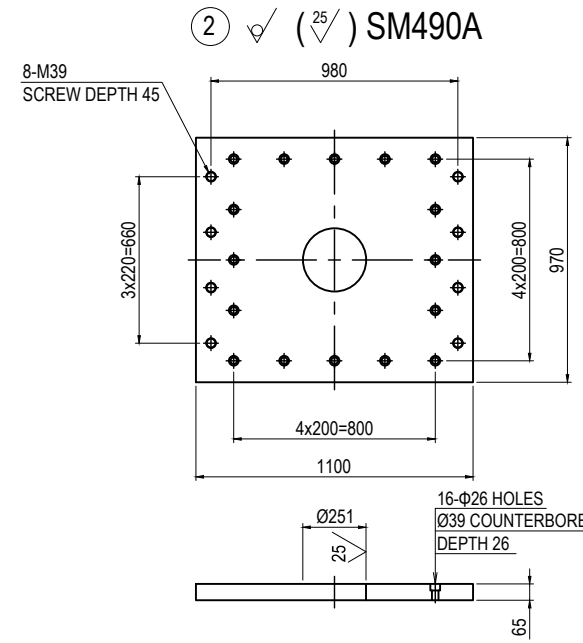
NUMBER	THE NAME OF AN ARTICLE	MATERIAL	NUMBER	MASS (Kg)	NOTES
①	BASE PLATE	SM490A	1	2008.6	
②	TOP BEARING	SM490A	1	509.3	
3	RUBBER BEARING	NR+SM490A+SS400	1	907.4	
④	SIDE BLOCK	SM490A OR SCW480N	2	568.1	
⑤	HEXAGON HEAD BOLT WITH WASHER	—	16	67.2	JIS B 1180
⑥	HEXAGON HEAD BOLT WITH WASHER	—	8	12.6	JIS B 1180
⑦	ANCHOR BOLT WITH NUT	SS400	4	143.6	JIS B 1181
⑧	SHEAR KEY	SM490A	1	46.2	
⑨	SHEAR KEY	SM490A	1	15.0	
⑩	BOTTOM BEARING	SM490A	1	358.2	
11	HEXAGON HOLE BOLT WITH WASHER	—	16	5.6	JIS B 1176
12	HEXAGON HOLE BOLT WITH WASHER	—	16	4.3	JIS B 1176
⑬	HEXAGON HEAD BOLT WITH WASHER	—	12	4.3	JIS B 1180
TOTAL WEIGHT			4650.4	(kg)	
CORROSION PROOF FOR OUTSIDE PL					
HOT-DIP GALVANIZED COATING OVER 550g/m <sup>2</sup> , 350g/m <sup>2</sup> (FOR BOLT, WASHER & NUT)					

- NOTES: 1- CIRCLE NUMBER IN MATERIAL TABLE INDICATES HOT-DIP GALVANIZED.  
 2- THIS DWG FOR REFERENCE.  
 3- TOP AND BOTTOM SURFACE OF RUBBER BEARING PAINTED WITH ORGANIC ZINC-RICH.  
 4- AFTER ASSEMBLE RUBBER BEARING, METAL OXIDE FILM BOLT (HEXAGON HOLE BOLT) PAINTED WITH HIGH-CONCENTRATION ZINC DUST.

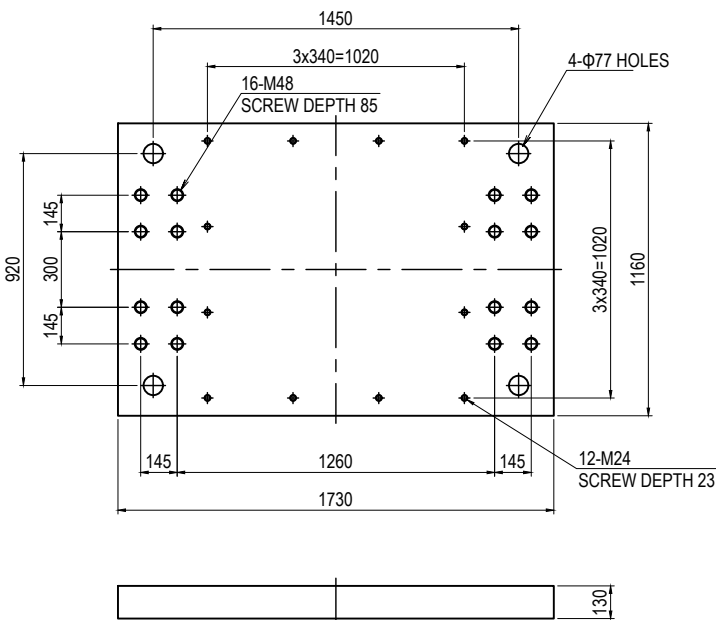


① (✓) SM490A

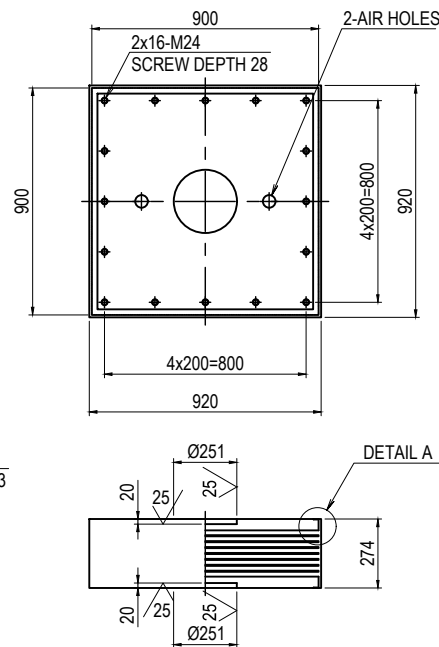
③ (✓) (25) NR+SM490A+SS400



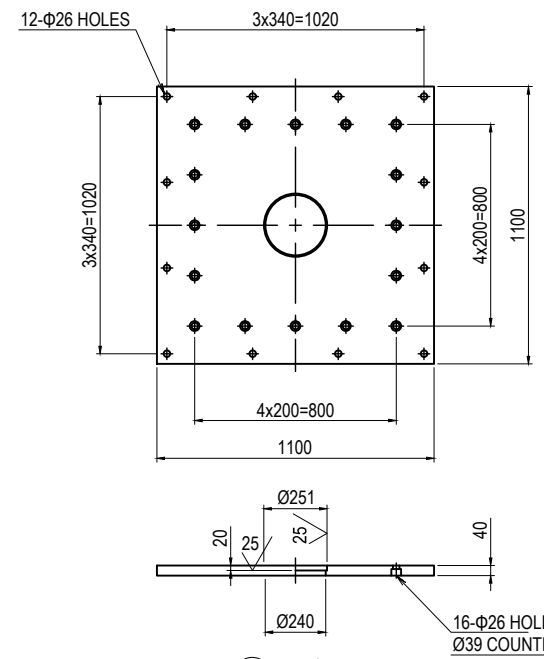
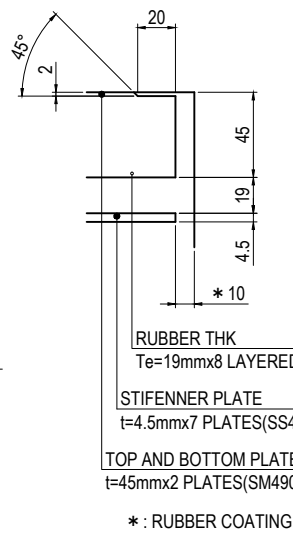
⑩ (✓) (25) SM490A



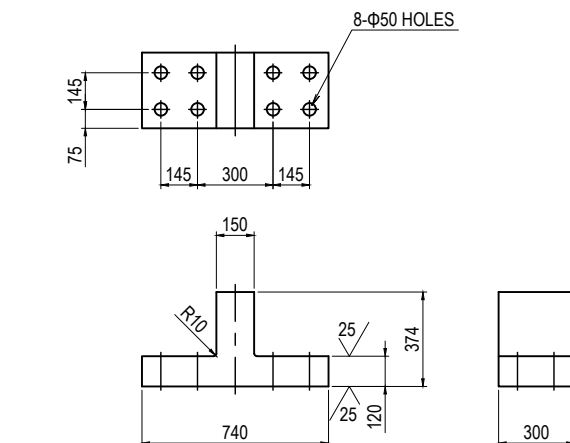
④ (✓) (25) SM490A又はSCW480N



DETAIL A S=1:2

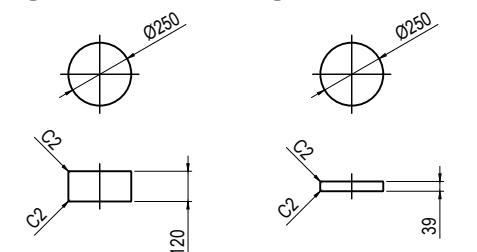


⑦ (✓) SS400

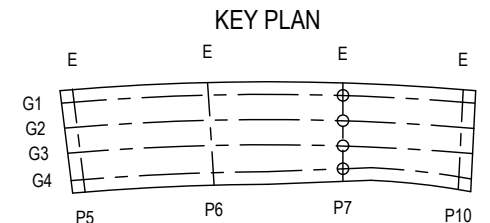
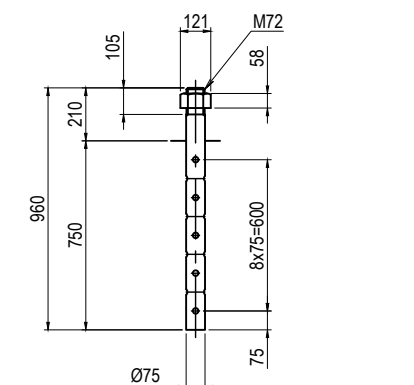


⑧ (25) SM490A

⑨ (25) SM490A



- ⑤ HEXAGON HEAD BOLT WITH WASHER M48x210 8.8
- ⑥ HEXAGON HEAD BOLT WITH WASHER M39x 8.8
- ⑪ HEXAGON HOLE BOLT M24x65 10.9
- ⑫ HEXAGON HOLE BOLT M24x40 10.9
- ⑬ HEXAGON HEAD BOLT WITH WASHER M24x65 8.8



# DETAIL OF RUBBER BEARING(4) S=1:30

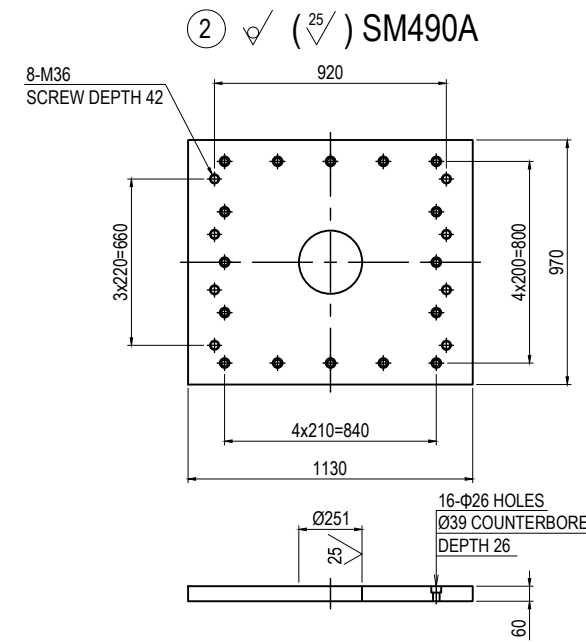
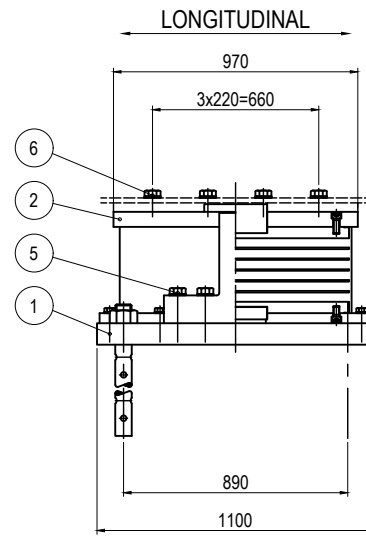
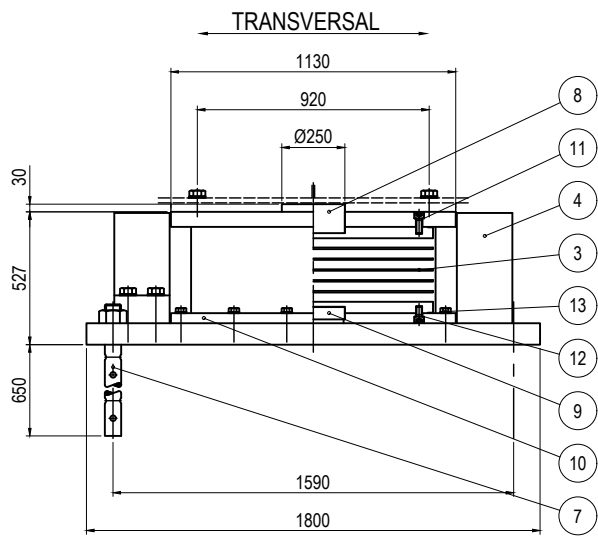
## DESIGN CRITERIA

REACTION FORCE		
ALL REACTION FORCE	R	4100 kN
DEAD LOAD REACTION FORCE	Rd	2500 kN
LONGITUDINAL HORIZONTAL FORCE (EARTHQUAKE)	Rh1e	1400 kN
TRANSVERSAL HORIZONTAL FORCE (EARTHQUAKE)	Rh2e	700 kN
UP LIFT FORCE (EARTHQUAKE)	V	250 kN
QUANTITY OF MOVE		
MAXIMAL VALUE	UB	±286 mm
RUBBER BEARING		
SHEAR MODULUS OF RIGIDITY	Ge	1.2 N/mm <sup>2</sup>
BREAKING STRAIN	yu	500 %
DISPLACEMENT TEST	ΔL	±333 mm
EQUIVALENT STIFFNESS	KB	4.622 kN/mm
ALLOWABLE SHEAR DISTORTION	ys	150 %
SECONDARY SHAPE FACTOR	S2	4.05
ROTATION CHECK LOAD	R1	3200 kN
ROTATIONAL VALUE	δr	2.433 mm
CHECK LOAD	R1L	850 kN
COMPRESSED DISPLACEMENT OF CHECK LOAD	δcL	0.841 mm
SUPPORT CONDITION		
LONGITUDINAL : ELASTICITY	TRANSVERSAL : FIXING	

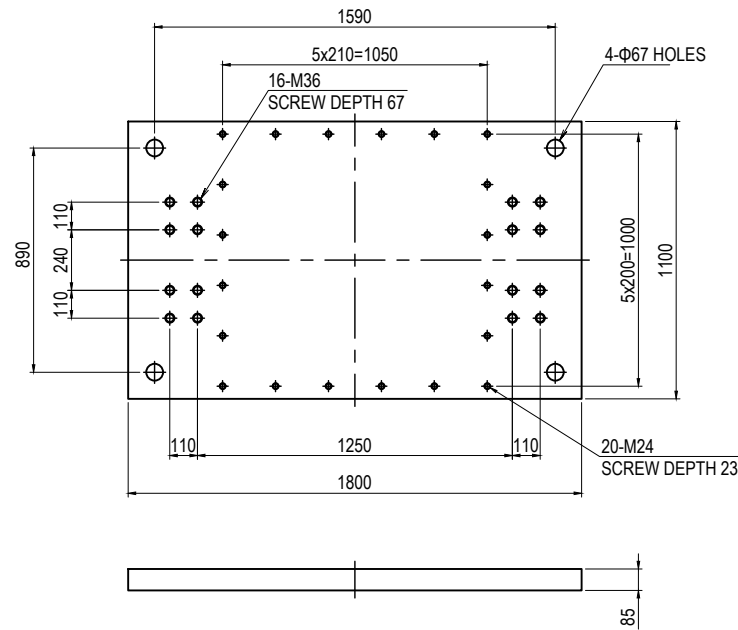
## MATERIALS

NUMBER	THE NAME OF AN ARTICLE	MATERIAL	NUMBER	MASS (Kg)	NOTES
①	BASE PLATE	SM490A	1	1301.5	
②	TOP BEARING	SM490A	1	484.1	
③	RUBBER BEARING	NR+SM490A+SS400	1	1015.8	
④	SIDE BLOCK	SM490A	2	347.7	
⑤	HEXAGON HEAD BOLT WITH WASHER		16	30.7	JIS B 1180
⑥	HEXAGON HEAD BOLT WITH WASHER		8	9.6	JIS B 1180
⑦	ANCHOR BOLT WITH NUT	SS400	4	91.6	JIS B 1181
⑧	SHEAR KEY	SM490A	1	44.3	
⑨	SHEAR KEY	SM490A	1	18.9	
⑩	BOTTOM BEARING	SM490A	1	360.0	
⑪	HEXAGON HOLE BOLT WITH WASHER		16	5.3	JIS B 1176
⑫	HEXAGON HOLE BOLT WITH WASHER		16	4.3	JIS B 1176
⑬	HEXAGON HEAD BOLT WITH WASHER		20	7.2	JIS B 1180
TOTAL WEIGHT				3721.0 (kg)	
CORROSION PROOF FOR OUTSIDE PL					
HOT-DIP GALVANIZED COATING OVER 550g/m <sup>2</sup> , 350g/m <sup>2</sup> (FOR BOLT, WASHER & NUT)					

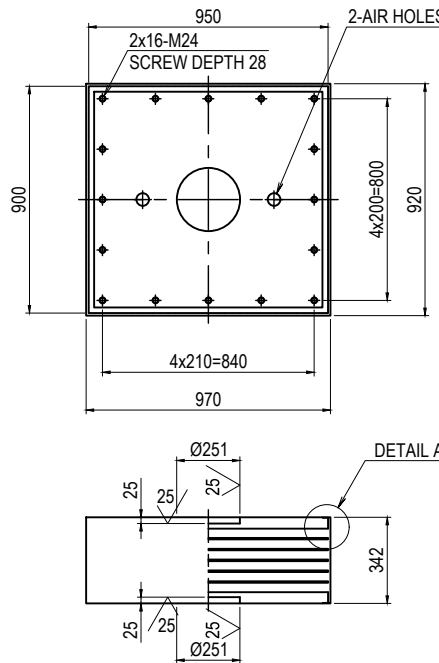
NOTES: 1- CIRCLE NUMBER IN MATERIAL TABLE INDICATES HOT-DIP GALVANIZED.  
 2- THIS DWG FOR REFERENCE.  
 3- TOP AND BOTTOM SURFACE OF RUBBER BEARING PAINTED WITH ORGANIC ZINC-RICH.  
 4- AFTER ASSEMBLE RUBBER BEARING, METAL OXIDE FILM BOLT (HEXAGON HOLE BOLT) PAINTED WITH HIGH-CONCENTRATION ZINC DUST.



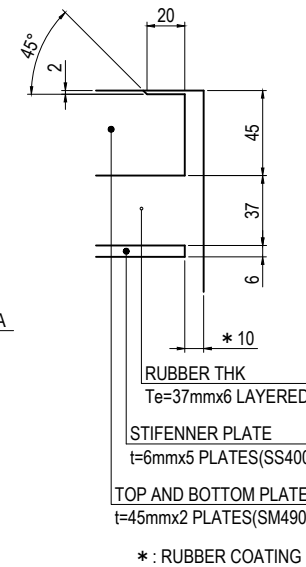
① SM490A



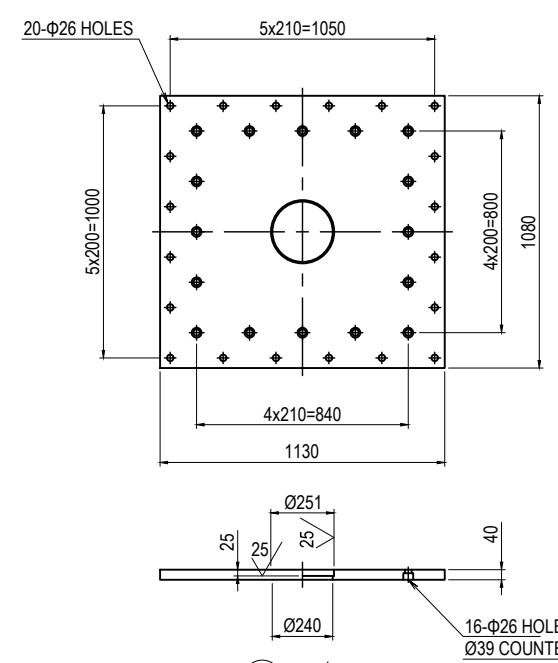
③ NR+SM490A+SS400



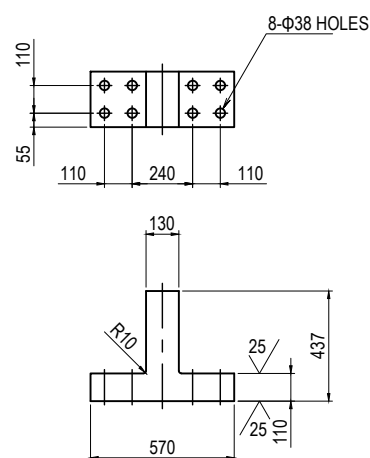
### DETAIL A S=1:2



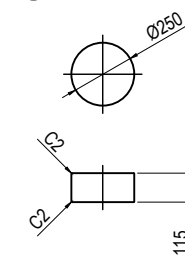
⑩ SM490A



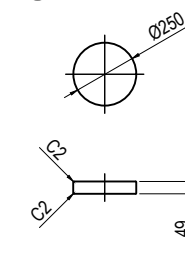
④ SM490A



⑧ SM490A



⑨ SM490A



⑤ HEXAGON HEAD BOLT WITH WASHER M36x180 8.8

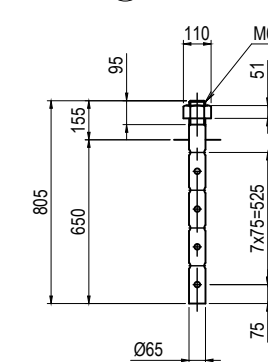
⑥ HEXAGON HEAD BOLT WITH WASHER M36x 8.8

⑪ HEXAGON HOLE BOLT M24x60 10.9

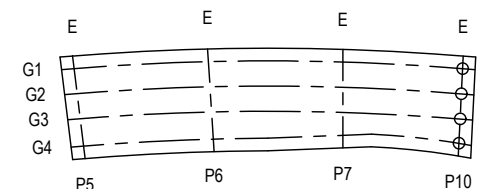
⑫ HEXAGON HOLE BOLT M24x40 10.9

⑬ HEXAGON HEAD BOLT WITH WASHER M24x65 8.8

⑦ SS400



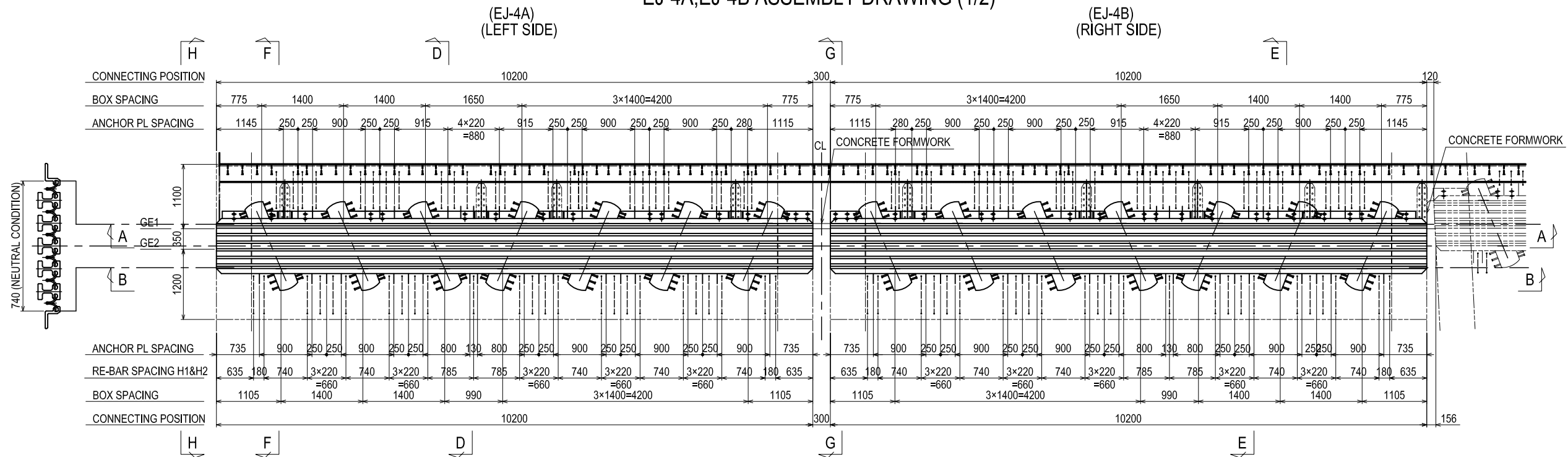
### KEY PLAN



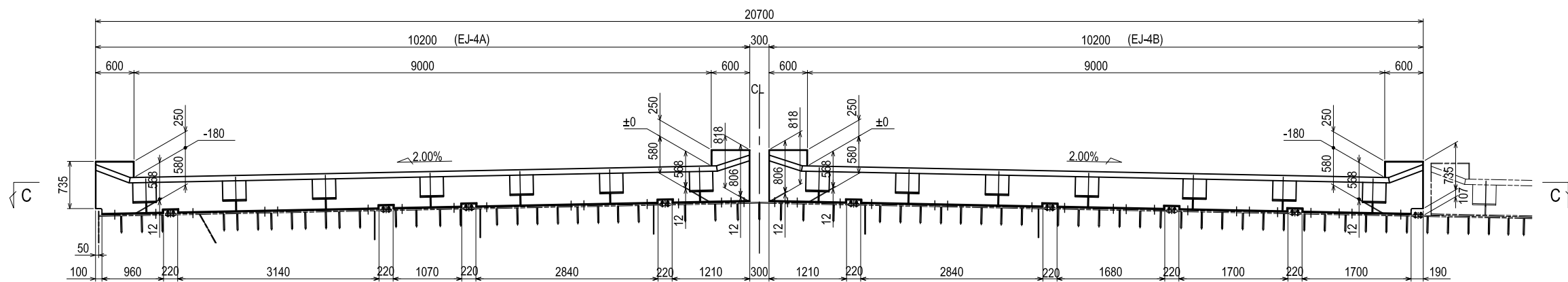


# EXPANSION JOINT PIER P5 MAIN ROAD (1) S=1:80

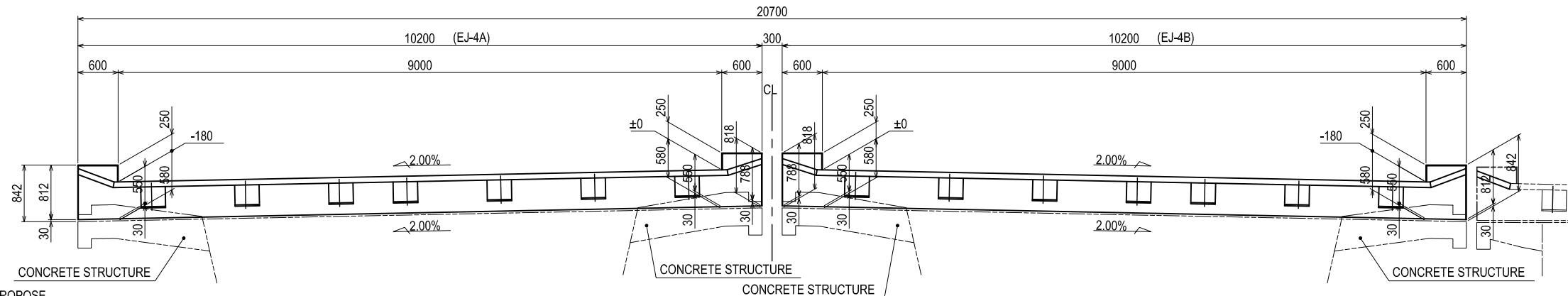
## EJ-4A,EJ-4B ASSEMBLY DRAWING (1/2)



SECTION A-A  
(PIER P5 TO P10 SIDE)



SECTION B-B  
(ABUTMENT A1 TO PIER P5 SIDE)



### NOTES:

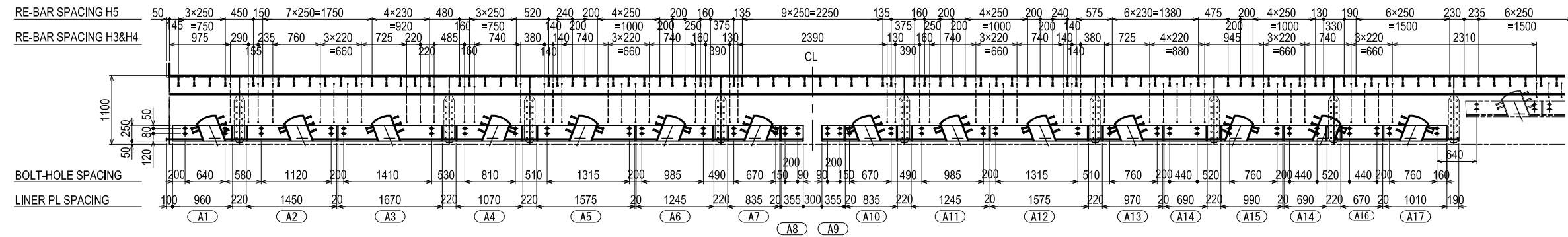
- 1 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY S. IMADA	<i>S. Imada</i>	27 Nov.2017	EXPANSION JOINT PIER P5 MAIN ROAD (1)	1
				CHECKED BY T. HAYAKAWA	<i>T. Hayakawa</i>	28 Nov.2017		DWG No.
				APPROVED BY Y. SANO	<i>Y. Sano</i>	29 Nov.2017		P1-SB-3011

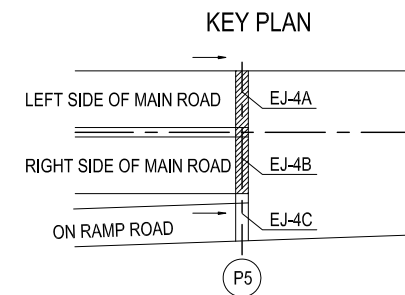
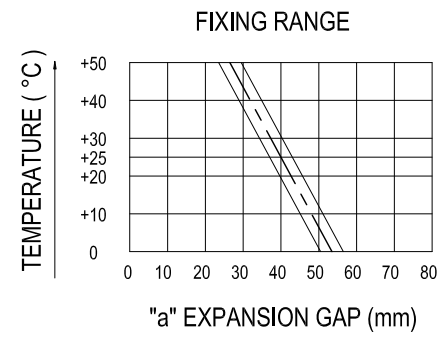
# EXPANSION JOINT PIER P5 MAIN ROAD (2) S=1:80

## EJ-4A,EJ-4B ASSEMBLY DRAWING (2/2)

### SECTION C-C (PIER P5 TO P10 SIDE)



DESIGN CRITERIA	
LOAD (WHEEL LOAD)	72.5 kN
THERMAL RANGE	0°C~+50°C
CONTINUOUS THERMAL DISPLACEMENT	162 mm
CONTINUOUS AMOUNT OF RESERVE	32 mm
CONTINUOUS DISPLACEMENT (TOTAL)	194 mm
SEISMIC DISPLACEMENT	444 mm



#### NOTES:

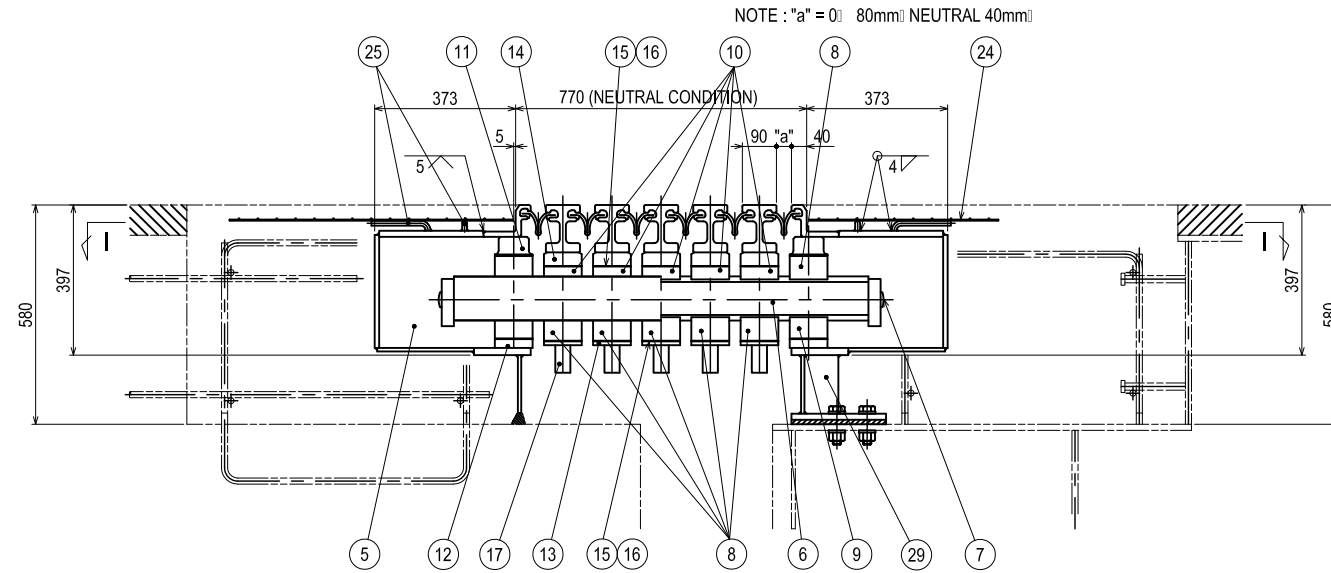
- 1 - THIS DRAWING SHOWS THE CONDITION OF EXPANSION GAP "a"=40mm(AT 25) PER CELL.
- 2 - PAINTING : CONCRETE BONDING SECTIONS PAINTED WITH ZINC-RICH PRIMER (15mm),AND FOR SECTIONS REMAINING MODIFIED EPOXY RESIN IS PAINTED TWICE (TOP COATING: BLACK).
- 3 - FOR WELDING POINTS WITHOUT INSTRUCTIONS, IMPLEMENT FILLET WELDING OF 6mm.
- 4 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECTED TO THE ENGINEER'S APPROVAL.

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO.,LTD. NIPPON ENGINEERING CONSULTANTS CO.,LTD.	PREPARED BY S. IMADA		27 Nov.2017	EXPANSION JOINT PIER P5 MAIN ROAD (2)	1
				CHECKED BY T. HAYAKAWA		28 Nov.2017		DWG No.
				APPROVED BY Y. SANO		29 Nov.2017		P1-SB-3012

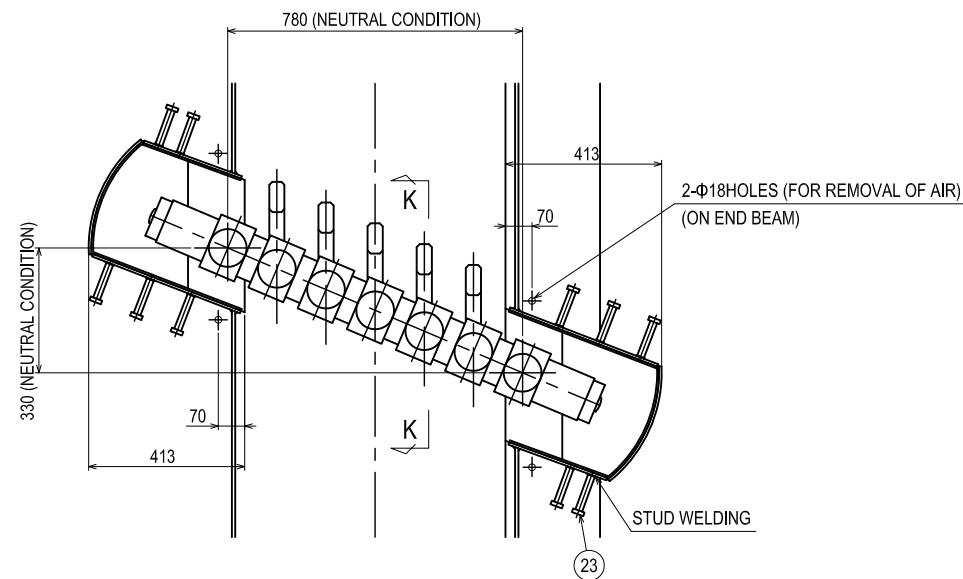
# EXPANSION JOINT PIER P5 MAIN ROAD (3) S=1:20

## EJ-4A,EJ-4B DETAIL DRAWING(1/3)

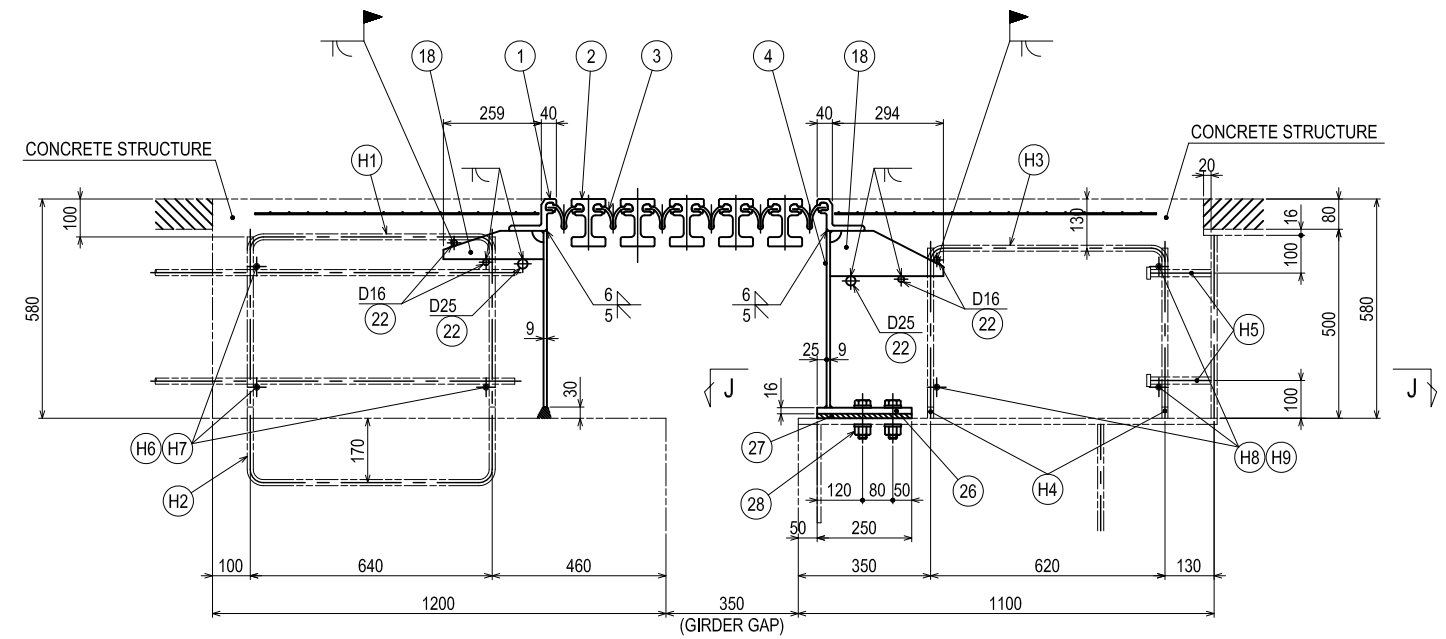
SECTION D-D



SECTION I-I



SECTION E-E

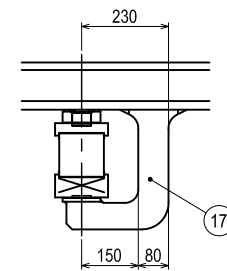


A1-P5 SIDE

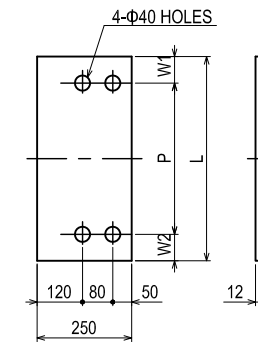
SECTION J-J

NOTE : MAKE SURE THAT THE BOLT HOLE OF THE GIRDER IS A LONG HOLE TO THE BRIDGE AXIAL DIRECTION.

SECTION K-K



(27) LINER PL



P5-P10 SIDE

NO.	THE NAME OF AN ARTICLE	MATERIAL
1	END BEAM	S355J2+AR
2	MIDDLE BEAM	S355J2+N
3	SEAL RUBBER	CR
4	WEB	SM490A
5	BOX	SM490A
6	SUPPORTING BEAM	SM490A
7	BUSH	POLYETHYLENE
8	SPRING	NR
9	EB BEARING	NR
10	MB BEARING	NR
11	SPRING-FACE A	SM490A
12	BEARING-FACE A	SM490A
13	SPRING-FACE B	SM490A
14	BEARING-FACE B	SM490A
15	SUS DISK	SUS316L
16	SLIPPING DISK	METALLOPLAST
17	PROTECTIVE PL	SM490A
18	ANCHOR	SM490A
19	COVER	SM490A
20	PL	SM490A
21	END PL	SM490A
22	REINFORCING BAR	SD345
23	STUD	JIS B1198
24	WELDED WIRE FABRIC	SUS304
25	WIRE RACK	SR235
26	BOTTOM FLANGE	SM490A
27	LINER	SS400
28	HTB	F10T
29	SUPPORT	SM490A
30	INSTALLATION JIG	SS400

	L	P	W1	W2	NOS.
A1	960	640	200	120	1
A2	1450	1120	240	90	1
A3	1670	1410	90	170	1
A4	1070	810	140	120	1
A5	1575	1315	170	90	1
A6	1245	985	90	170	1
A7	835	670	100	65	1
A8	355	200	65	90	1
A9	355	200	90	65	1
A10	835	670	65	100	1
A11	1245	985	170	90	1
A12	1575	1315	90	170	1
A13	970	760	120	90	1
A14	690	440	90	160	2
A15	990	760	140	90	1
A16	670	440	140	90	1
A17	1010	760	90	160	1

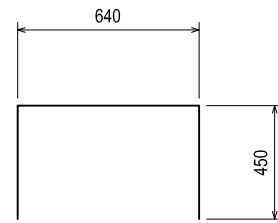
**NOTES:**

- 1 - THIS DRAWING SHOWS THE CONDITION OF EXPANSION GAP "a"=40mm(AT 25) PER CELL.
- 2 - PAINTING : CONCRETE BONDING SECTIONS PAINTED WITH ZINC-RICH PRIMER (15mm),AND FOR SECTIONS REMAINING MODIFIED EPOXY RESIN IS PAINTED TWICE (TOP COATING: BLACK).
- 3 - FOR WELDING POINTS WITHOUT INSTRUCTIONS, IMPLEMENT FILLET WELDING OF 6mm.
- 4 - (22) SITE WELDING IS IMPLEMENTED PARTIALLY ON THE RE-BAR.
- 5 - (H) BE SURE TO MAKE PREPARATION FOR RE-BAR AND STUDS AT TIME OF SUPERSTRUCTURE WORK.
- 6 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECTED TO THE ENGINEER'S APPROVAL.

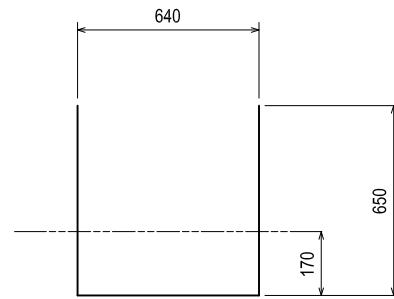
# EXPANSION JOINT PIER P5 MAIN ROAD (4) S=1:10

## EJ-4A,EJ-4B DETAIL DRAWING(2/3)

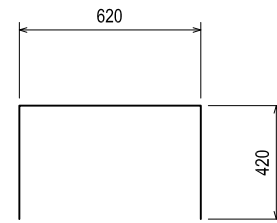
H1 25-D16x1540L(LEFT SIDE)  
25-D16x1540L(RIGHT SIDE)



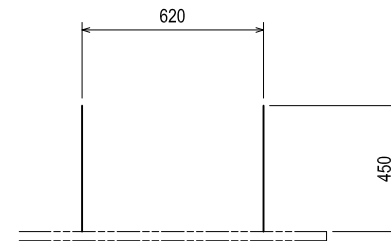
H2 25-D16x1940L(LEFT SIDE)  
25-D16x1940L(RIGHT SIDE)



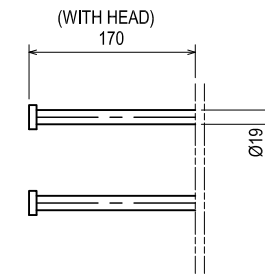
H3 50-D16x1460L



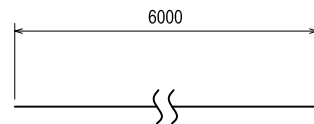
H4 100-D16x450L



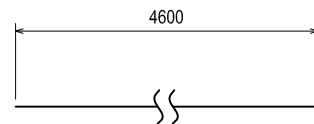
H5 166-Ø19x170L



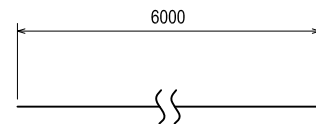
H6 3-D16x6000L(LEFT SIDE)  
3-D16x6000L(RIGHT SIDE)



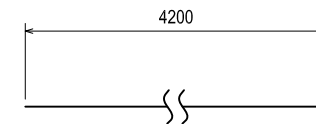
H7 3-D16x4600L(LEFT SIDE)  
3-D16x4600L(RIGHT SIDE)



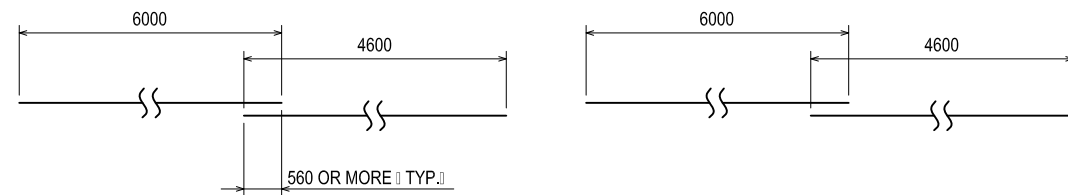
H8 9-D16x6000L



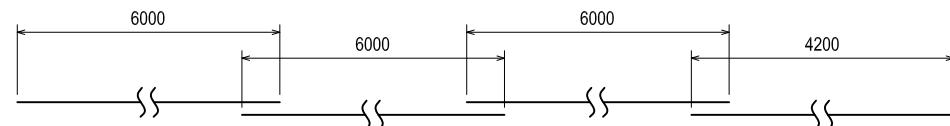
H9 3-D16x4200L



H6 H7



H8 H9



### NOTES:

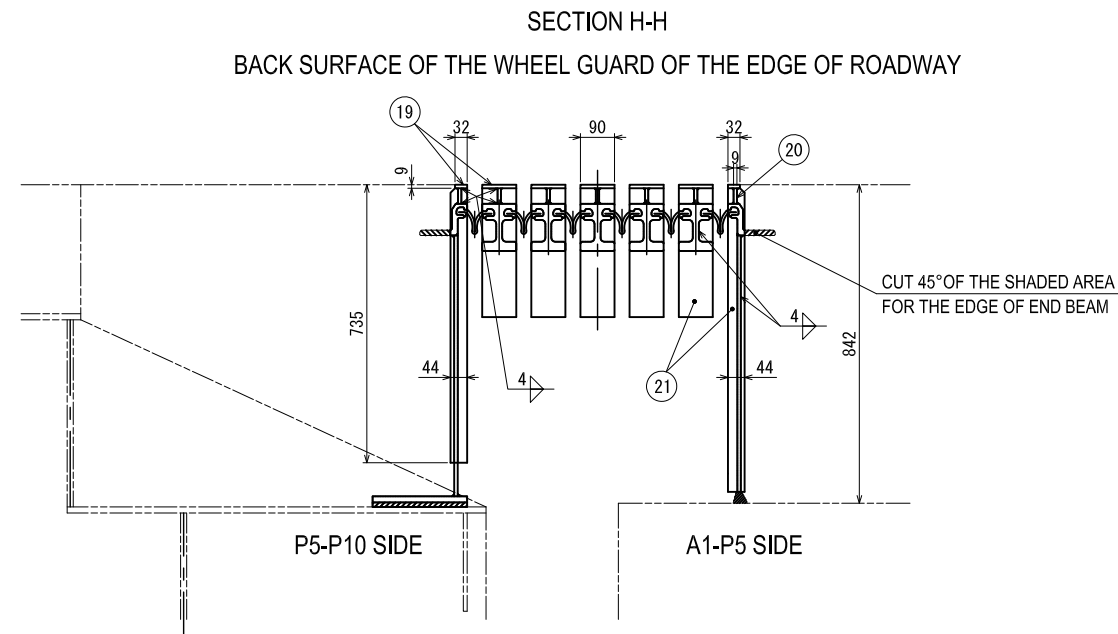
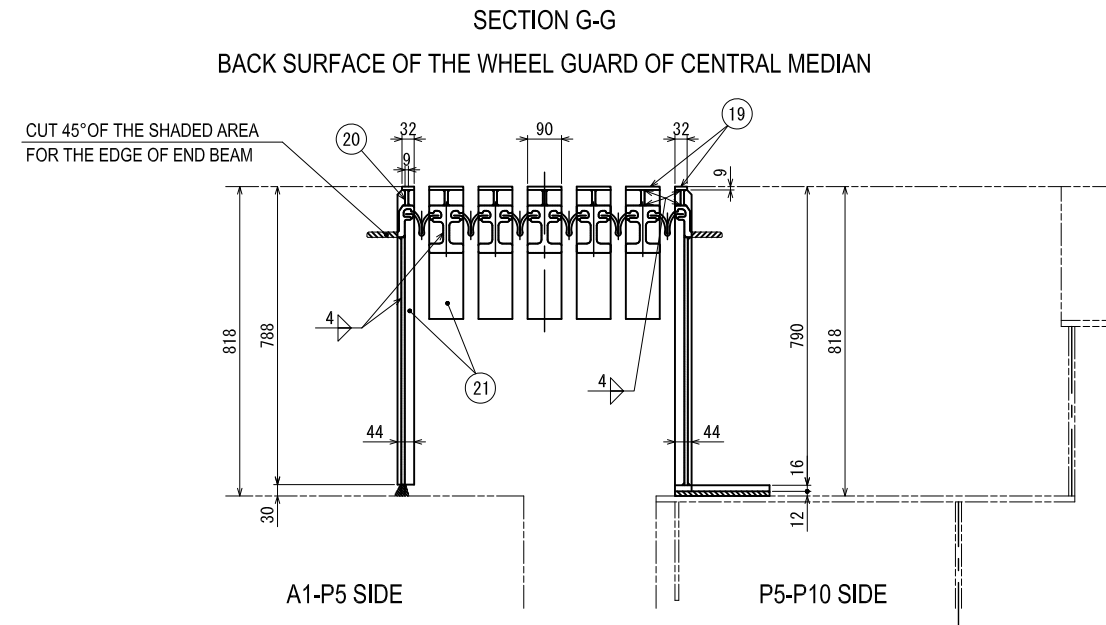
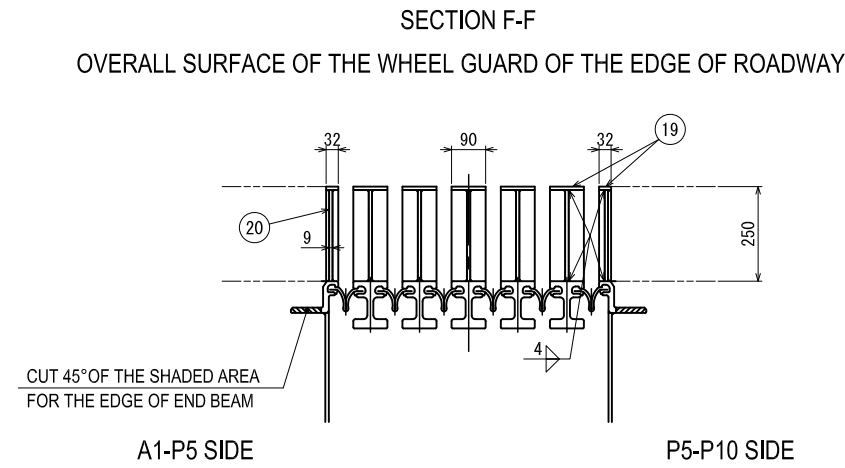
- 1-(H) BE SURE TO MAKE PREPARATIONS FOR RE-BAR AT TIME OF SUPERSTRUCTURE WORK.
- 2-(H4)(H5) BE SURE TO IMPLEMENT RE-BAR AT THE TIME OF FABRICATION OF THE DECK PL.
- 3 - CUT OFF ON-SITE THE SURPLUS LENGTH OF THE RE-BAR.

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME S. IMADA T. HAYAKAWA Y. SANO	SIGNATURE <i>S. Imada</i> <i>T. Hayakawa</i> <i>Y. Sano</i>	DATE 27 Nov.2017 28 Nov.2017 29 Nov.2017	DRAWING TITLE EXPANSION JOINT PIER P5 MAIN ROAD (4)	PACKAGE 1 DWG No. P1-SB-3014
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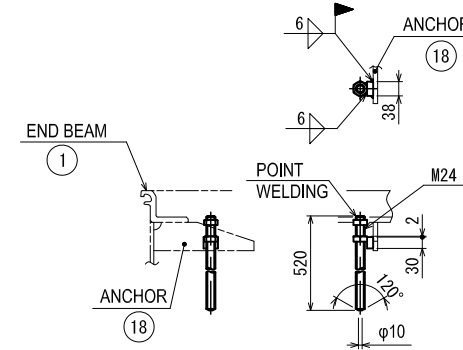
# EXPANSION JOINT PIER P5 MAIN ROAD (5) S=1:20

## EJ-4A,EJ-4B DETAIL DRAWING(3/3)



### 30 INSTALLATION JIG

NOTE : INSTALLATION ANCHOR PL BETWEEN BOXES OF PC BOX GIRDER, CUT OFF ON-SITE THE SURPLUS LENGTH OF THE RE-BAR.



NO.	THE NAME OF AN ARTICLE	MATERIAL
1	END BEAM	S355J2+AR
2	MIDDLE BEAM	S355J2+N
3	SEAL RUBBER	CR
4	WEB	SM490A
5	BOX	SM490A
6	SUPPORTING BEAM	SM490A
7	BUSH	POLYETHYLENE
8	SPRING	NR
9	EB BEARING	NR
10	MB BEARING	NR
11	SPRING-FACE A	SM490A
12	BEARING-FACE A	SM490A
13	SPRING-FACE B	SM490A
14	BEARING-FACE B	SM490A
15	SUS DISK	SUS316L
16	SLIPPING DISK	METALLOPLAST
17	PROTECTIVE PL	SM490A
18	ANCHOR	SM490A
19	COVER	SM490A
20	PL	SM490A
21	END PL	SM490A
22	REINFORCING BAR	SD345
23	STUD	JIS B1198
24	WELDED WIRE FABRIC	SUS304
25	WIRE RACK	SR235
26	BOTTOM FLANGE	SM490A
27	LINER	SS400
28	HTB	F10T
29	SUPPORT	SM490A
30	INSTALLATION JIG	SS400

### NOTES:

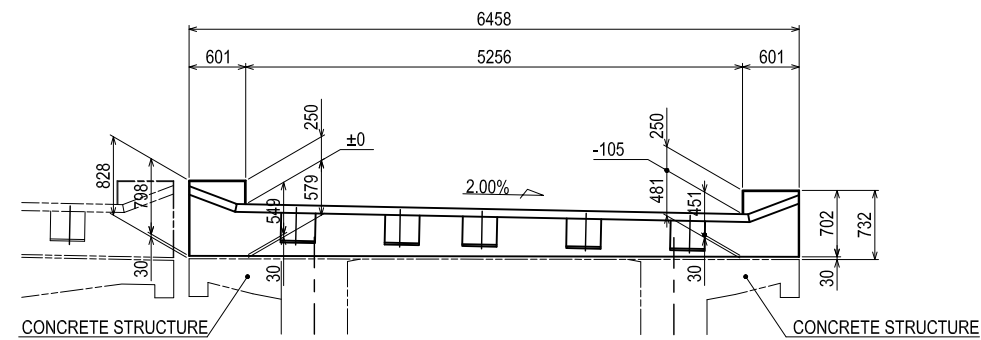
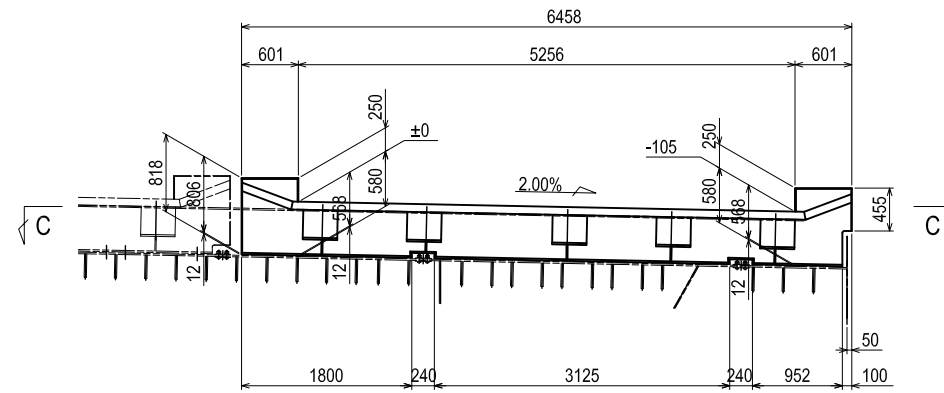
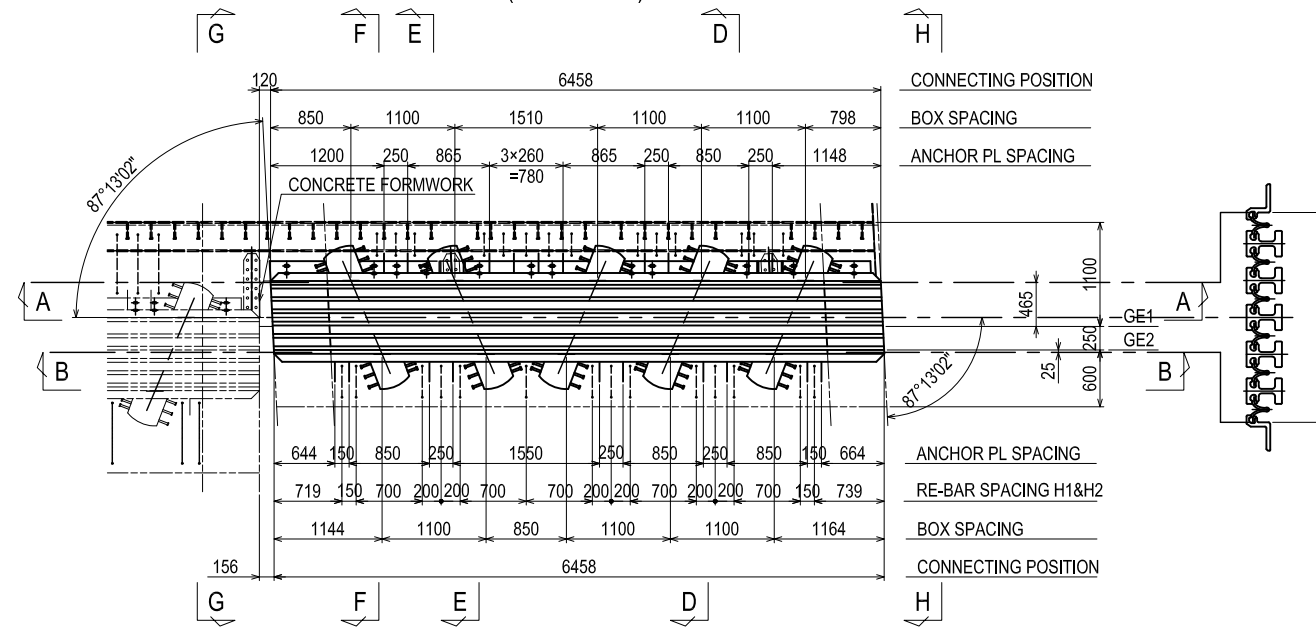
- 1 - THIS DRAWING SHOWS THE CONDITION OF EXPANSION GAP "A"=40mm(AT 25) PER CELL.
- 2 - PAINTING : CONCRETE BONDING SECTIONS PAINTED WITH ZINC-RICH PRIMER (15mm), AND FOR SECTIONS REMAINING MODIFIED EPOXY RESIN IS PAINTED TWICE (TOP COATING: BLACK).
- 3 - FOR WELDING POINTS WITHOUT INSTRUCTIONS, IMPLEMENT FILLET WELDING OF 6mm.
- 4 - (22) SITE WELDING IS IMPLEMENTED PARTIALLY ON THE RE-BAR.
- 5 - (H) BE SURE TO MAKE PREPARATION FOR RE-BAR AND STUDS AT TIME OF SUPERSTRUCTURE WORK.
- 6 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECTED TO THE ENGINEER'S APPROVAL.

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	S. IMADA	<i>S. Imada</i>	27 Nov.2017	EXPANSION JOINT PIER P5 MAIN ROAD (5)	1
				T. HAYAKAWA	<i>T. Hayakawa</i>	28 Nov.2017		DWG No.
				Y. SANO	<i>Y. Sano</i>	29 Nov.2017		P1-SB-3015

# EXPANSION JOINT PIER P5 ON RAMP (1) S=1:80

## EJ-4C ASSEMBLY DRAWING (1/2)

(EJ-4B)  
(RIGHT SIDE)



### NOTES:

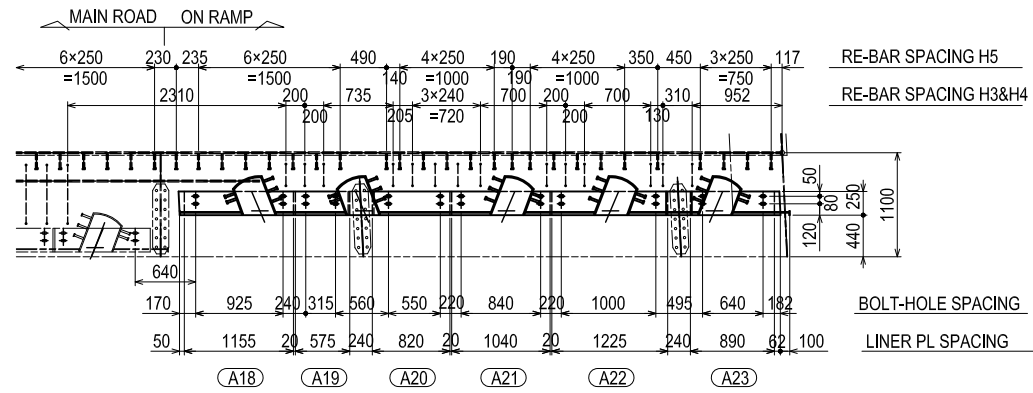
1 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	PREPARED BY S. IMADA	<i>S. Imada</i>	27 Nov.2017	EXPANSION JOINT PIER P5 ON RAMP (1)	1
				CHECKED BY T. HAYAKAWA	<i>T. Hayakawa</i>	28 Nov.2017		DWG No.
				APPROVED BY Y. SANO	<i>Y. Sano</i>	29 Nov.2017		P1-SB-3016

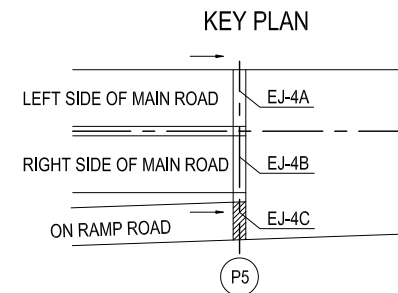
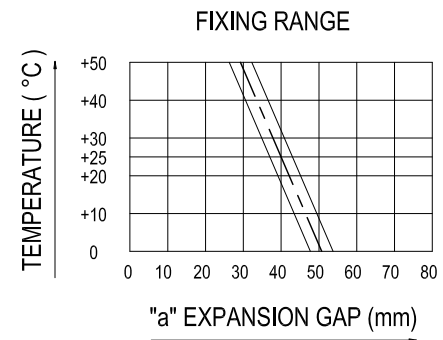
# EXPANSION JOINT PIER P5 ON RAMP (2) S=1:80

## EJ-4C ASSEMBLY DRAWING (2/2)

SECTION C-C  
(PIER P5 TO P10 SIDE)



DESIGN CRITERIA	
LOAD (WHEEL LOAD)	72.5 kN
THERMAL RANGE	0°C~+50°C
CONTINUOUS THERMAL DISPLACEMENT	129 mm
CONTINUOUS AMOUNT OF RESERVE	26 mm
CONTINUOUS DISPLACEMENT (TOTAL)	155 mm
SEISMIC DISPLACEMENT	444 mm



### NOTES:

- 1 - THIS DRAWING SHOWS THE CONDITION OF EXPANSION GAP "a"=40mm(AT 25) PER CELL.
- 2 - PAINTING : CONCRETE BONDING SECTIONS PAINTED WITH ZINC-RICH PRIMER (15mm),AND FOR SECTIONS REMAINING MODIFIED EPOXY RESIN IS PAINTED TWICE (TOP COATING: BLACK).
- 3 - FOR WELDING POINTS WITHOUT INSTRUCTIONS, IMPLEMENT FILLET WELDING OF 6mm.
- 4 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECTED TO THE ENGINEER'S APPROVAL.

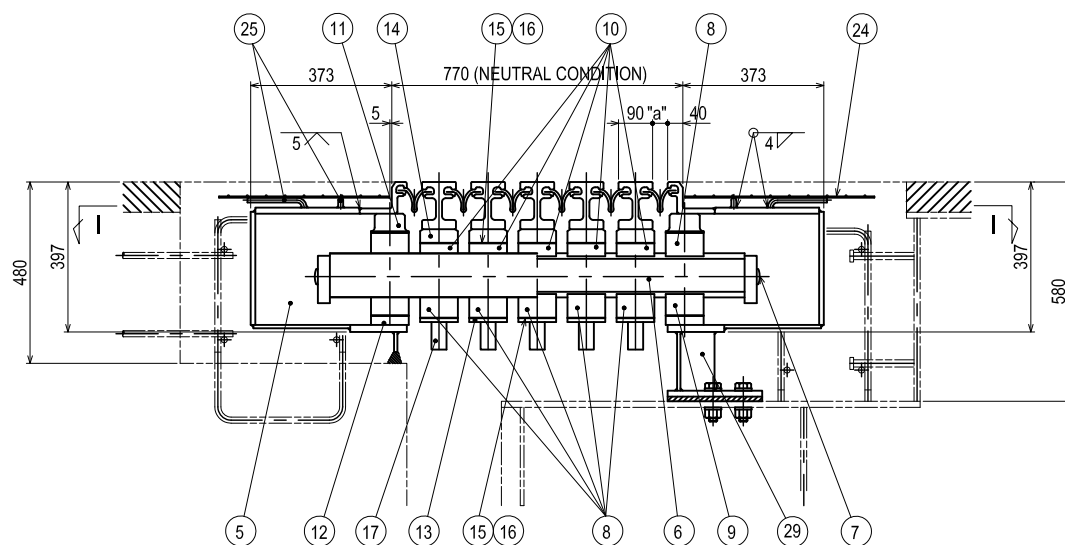
PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	PREPARED BY S. IMADA CHECKED BY T. HAYAKAWA APPROVED BY Y. SANO		27 Nov.2017 28 Nov.2017 29 Nov.2017	EXPANSION JOINT PIER P5 ON RAMP (2)	1 DWG No. P1-SB-3017

# EXPANSION JOINT PIER P5 ON RAMP (3) S=1:20

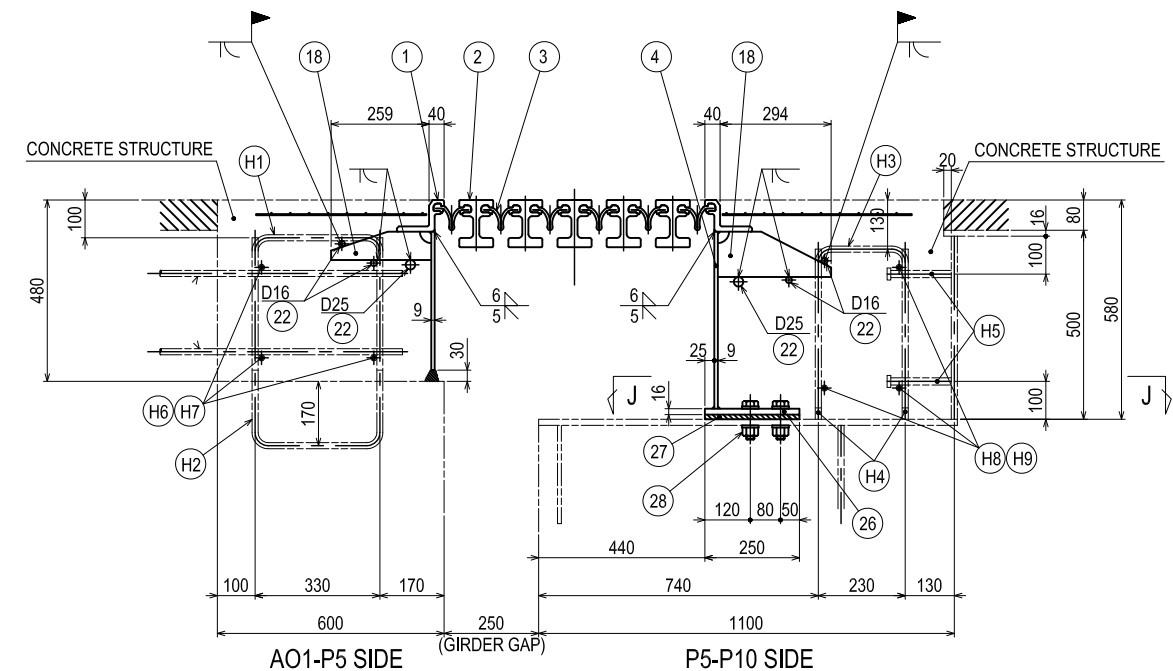
## EJ-4C DETAIL DRAWING(1/3)

SECTION D-D

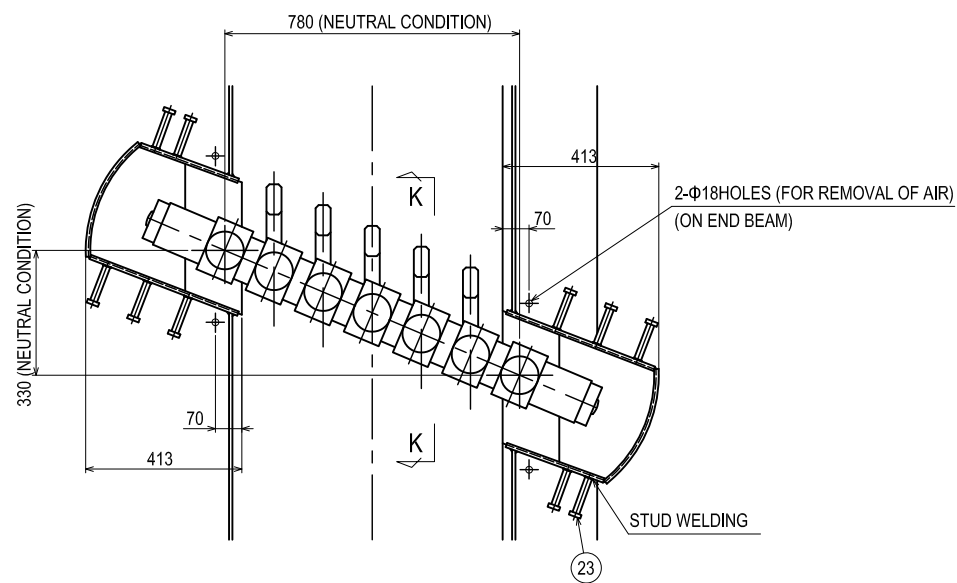
NOTE : "a" = 0 ( 80mm) NEUTRAL 40mm)



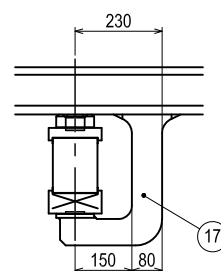
SECTION E-E



SECTION I-I

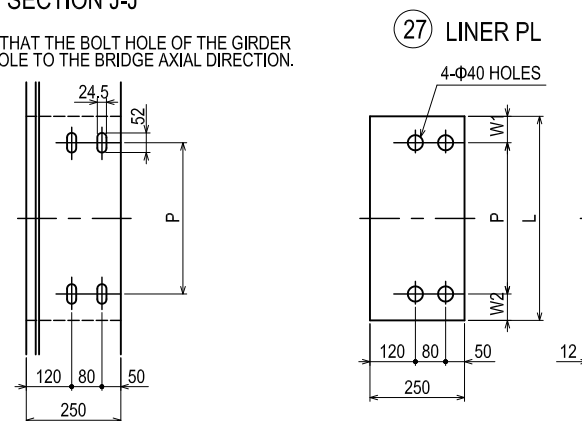


SECTION K-K



SECTION J-J

NOTE : MAKE SURE THAT THE BOLT HOLE OF THE GIRDER IS A LONG HOLE TO THE BRIDGE AXIAL DIRECTION.



27 LINER PL

4-φ40 HOLES

	L	P	W1	W2	NOS.
A18	1155	925	120	110	1
A19	575	315	110	150	1
A20	820	550	170	100	1
A21	1040	840	100	100	1
A22	1225	1000	100	125	1
A23	890	640	130	120	1

NO.	THE NAME OF AN ARTICLE	MATERIAL
1	END BEAM	S355J2+AR
2	MIDDLE BEAM	S355J2+N
3	SEAL RUBBER	CR
4	WEB	SM490A
5	BOX	SM490A
6	SUPPORTING BEAM	SM490A
7	BUSH	POLYETHYLENE
8	SPRING	NR
9	EB BEARING	NR
10	MB BEARING	NR
11	SPRING-FACE A	SM490A
12	BEARING-FACE A	SM490A
13	SPRING-FACE B	SM490A
14	BEARING-FACE B	SM490A
15	SUS DISK	SUS316L
16	SLIPPING DISK	METALLOPLAST
17	PROTECTIVE PL	SM490A
18	ANCHOR	SM490A
19	COVER	SM490A
20	PL	SM490A
21	END PL	SM490A
22	REINFORCING BAR	SD345
23	STUD	JIS B1198
24	WELDED WIRE FABRIC	SUS304
25	WIRE RACK	SR235
26	BOTTOM FLANGE	SM490A
27	LINER	SS400
28	HTB	F10T
29	SUPPORT	SM490A
30	INSTALLATION JIG	SS400

**NOTES:**

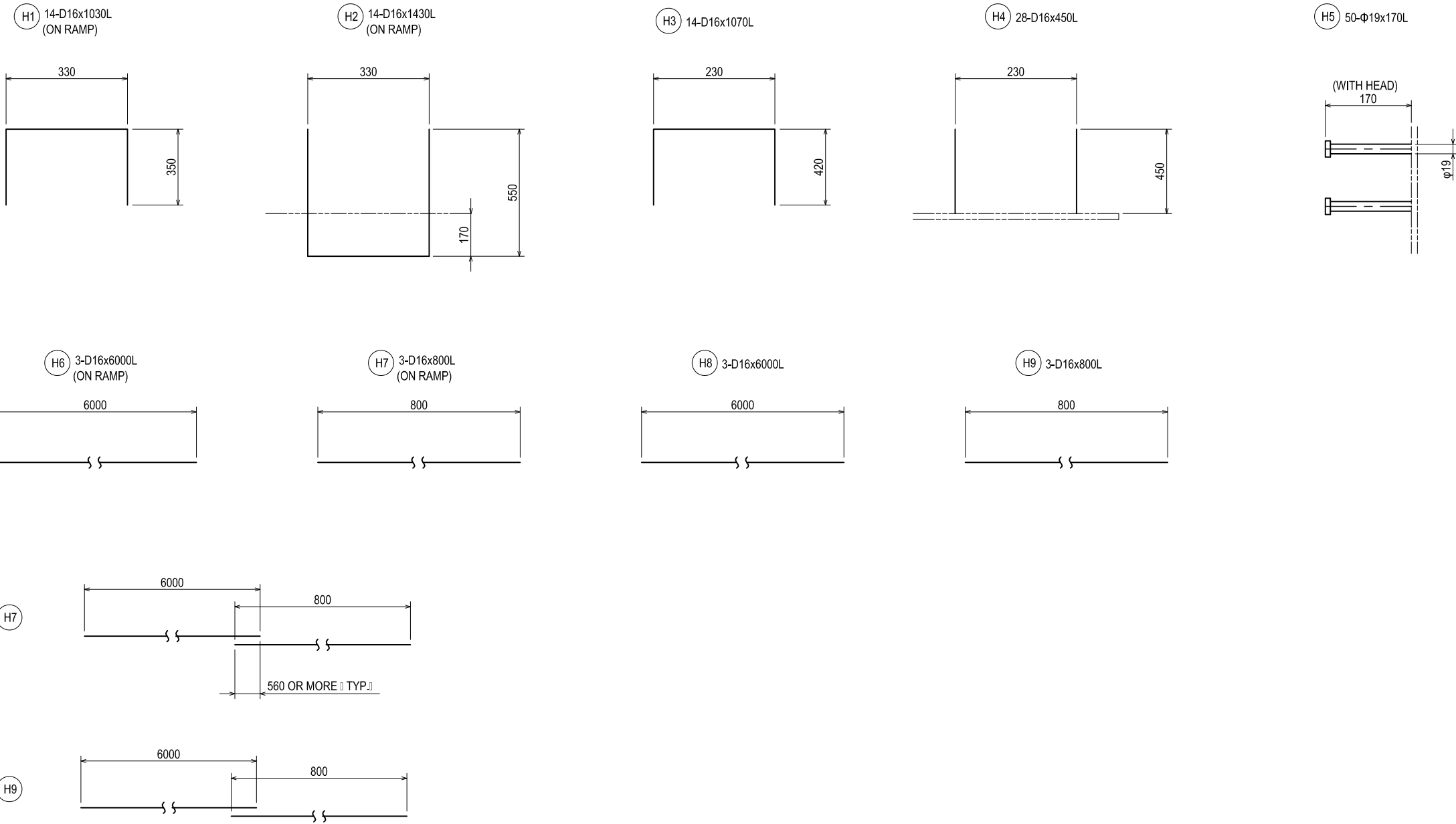
- THIS DRAWING SHOWS THE CONDITION OF EXPANSION GAP "a"=40mm( AT 25) PER CELL.
- PAINTING : CONCRETE BONDING SECTIONS PAINTED WITH ZINC-RICH PRIMER (15mm) AND FOR SECTIONS REMAINING MODIFIED EPOXY RESIN IS PAINTED TWICE (TOP COATING: BLACK).
- FOR WELDING POINTS WITHOUT INSTRUCTIONS, IMPLEMENT FILLET WELDING OF 6mm.
- ② SITE WELDING IS IMPLEMENTED PARTIALLY ON THE RE-BAR.
- (H) BE SURE TO MAKE PREPARATION FOR RE-BAR AND STUDS AT TIME OF SUPERSTRUCTURE WORK.
- THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.

PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	PREPARED BY	S. IMADA	27 Nov.2017	EXPANSION JOINT PIER P5 ON RAMP (3)	1
				CHECKED BY	T. HAYAKAWA	28 Nov.2017		DWG No.
				APPROVED BY	Y. SANO	29 Nov.2017		P1-SB-3018



# EXPANSION JOINT PIER P5 ON RAMP (4) S=1:10

## EJ-4C DETAIL DRAWING(2/3)



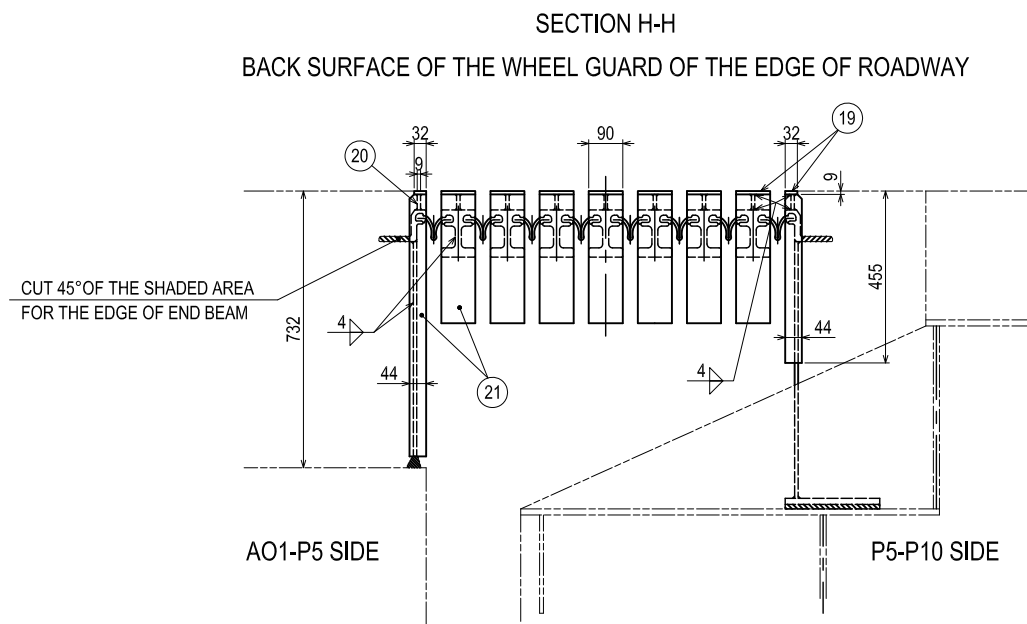
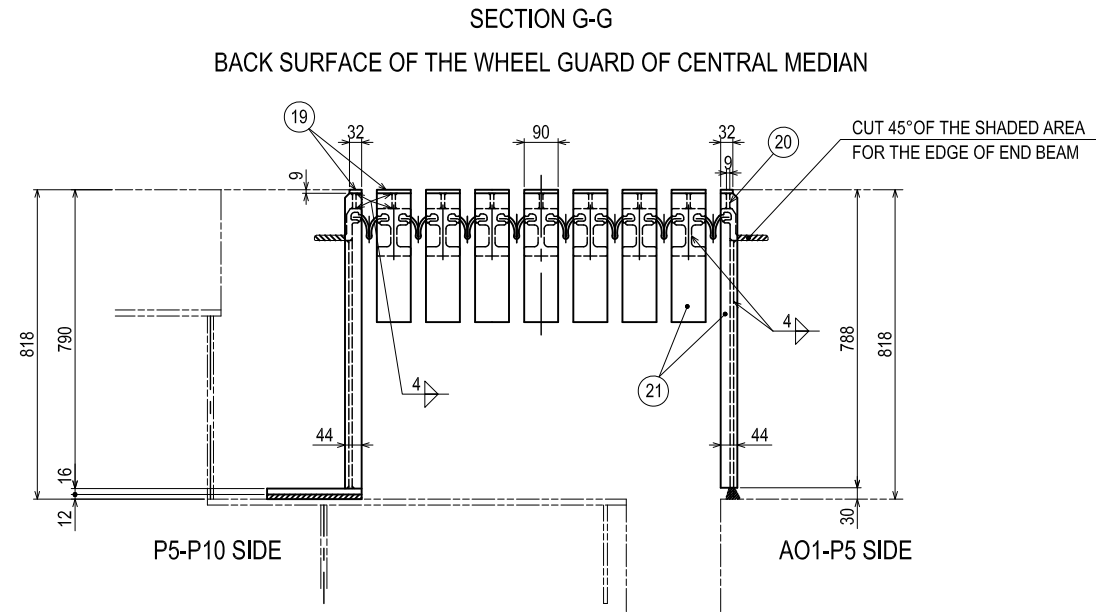
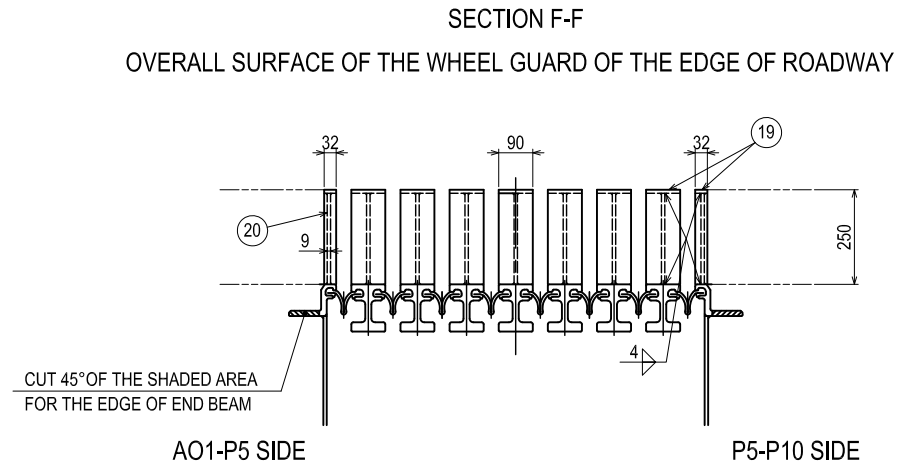
### NOTES:

- 1 - (H) BE SURE TO MAKE PREPARATIONS FOR RE-BAR AT TIME OF SUPERSTRUCTURE WORK.
- 2 - (H4) (H5) BE SURE TO IMPLEMENT RE-BAR AT THE TIME OF FABRICATION OF THE DECK PL.
- 3 - CUT OFF ON-SITE THE SURPLUS LENGTH OF THE RE-BAR.

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE EXPANSION JOINT PIER P5 ON RAMP (4)	PACKAGE	
				PREPARED BY	S. IMADA			27 Nov.2017	1
				CHECKED BY	T. HAYAKAWA			28 Nov.2017	DWG No.
				APPROVED BY	Y. SANO			29 Nov.2017	P1-SB-3019

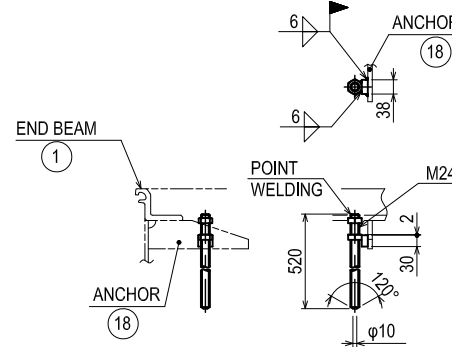
# EXPANSION JOINT PIER P5 ON RAMP (5) S=1:20

## EJ-4C DETAIL DRAWING(3/3)



### 30 INSTALLATION JIG

NOTE : INSTALLATION ANCHOR PL BETWEEN BOXES OF PC BOX GIRDER, CUT OFF ON-SITE THE SURPLUS LENGTH OF THE RE-BAR.



NO.	THE NAME OF AN ARTICLE	MATERIAL
1	END BEAM	S355J2+AR
2	MIDDLE BEAM	S355J2+N
3	SEAL RUBBER	CR
4	WEB	SM490A
5	BOX	SM490A
6	SUPPORTING BEAM	SM490A
7	BUSH	POLYETHYLENE
8	SPRING	NR
9	EB BEARING	NR
10	MB BEARING	NR
11	SPRING-FACE A	SM490A
12	BEARING-FACE A	SM490A
13	SPRING-FACE B	SM490A
14	BEARING-FACE B	SM490A
15	SUS DISK	SUS316L
16	SLIPPING DISK	METALLOPLAST
17	PROTECTIVE PL	SM490A
18	ANCHOR	SM490A
19	COVER	SM490A
20	PL	SM490A
21	END PL	SM490A
22	REINFORCING BAR	SD345
23	STUD	JIS B1198
24	WELDED WIRE FABRIC	SUS304
25	WIRE RACK	SR235
26	BOTTOM FLANGE	SM490A
27	LINER	SS400
28	HTB	F10T
29	SUPPORT	SM490A
30	INSTALLATION JIG	SS400

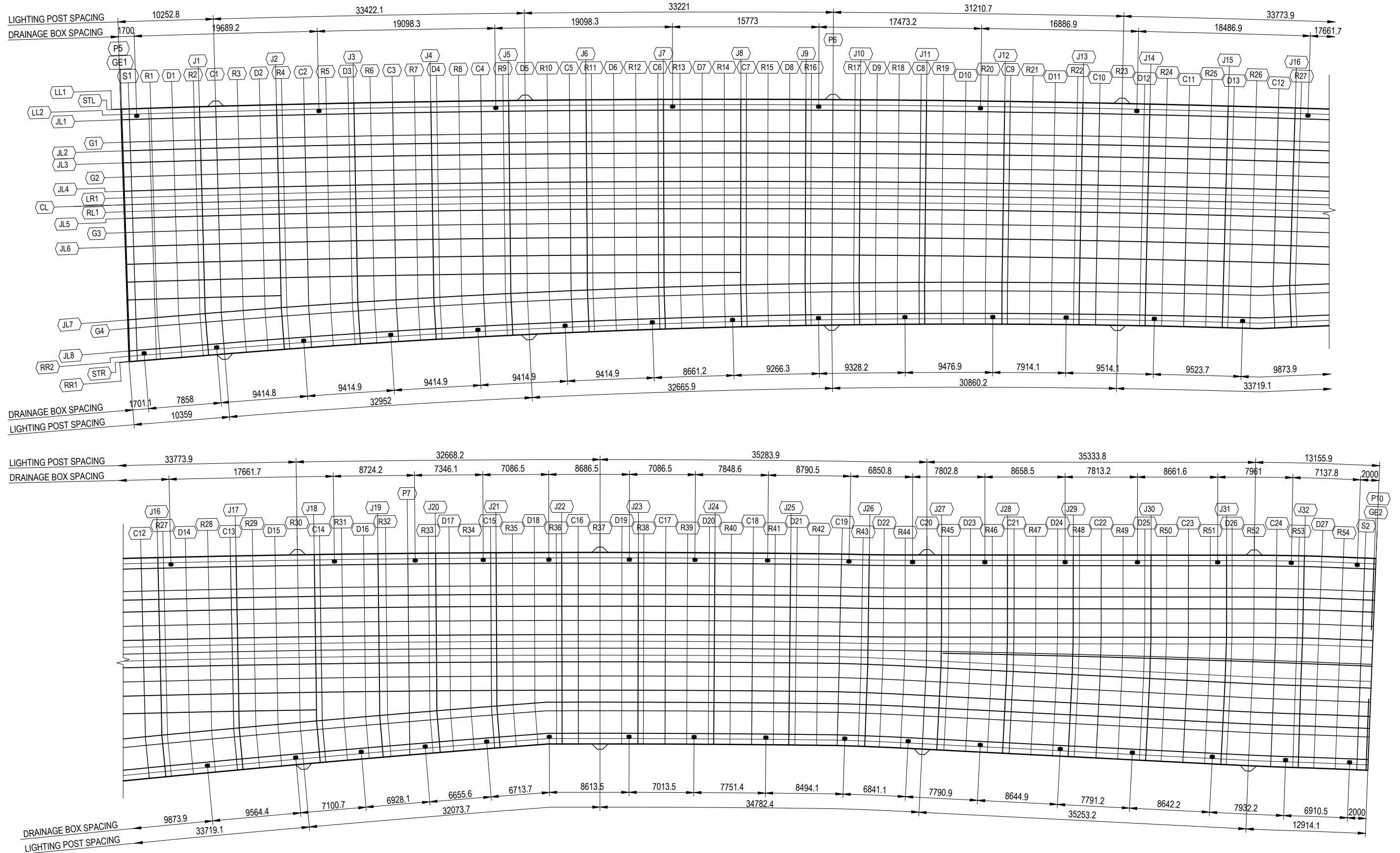
### NOTES:

- 1 - THIS DRAWING SHOWS THE CONDITION OF EXPANSION GAP "A"=40mm(AT 25) PER CELL.
- 2 - PAINTING : CONCRETE BONDING SECTIONS PAINTED WITH ZINC-RICH PRIMER (15mm), AND FOR SECTIONS REMAINING MODIFIED EPOXY RESIN IS PAINTED TWICE (TOP COATING: BLACK).
- 3 - FOR WELDING POINTS WITHOUT INSTRUCTIONS, IMPLEMENT FILLET WELDING OF 6mm.
- 4 - (H) SITE WELDING IS IMPLEMENTED PARTIALLY ON THE RE-BAR.
- 5 - (H) BE SURE TO MAKE PREPARATION FOR RE-BAR AND STUDS AT TIME OF SUPERSTRUCTURE WORK.
- 6 - THE CONTRACTOR HAS OPTION TO PROPOSE AN ALTERNATIVE EQUIVALENT TO THE SPECIFIED PRODUCT, WHICH SHALL BE SUBJECTED TO THE ENGINEER'S APPROVAL.


PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	S. IMADA	<i>S. Imada</i>	27 Nov.2017	EXPANSION JOINT PIER P5 ON RAMP (5)	1
				T. HAYAKAWA	<i>T. Hayakawa</i>	28 Nov.2017		DWG No.
				Y. SANO	<i>Y. Sano</i>	29 Nov.2017		P1-SB-3020


# ANCILLARY WORKS LAYOUT


S=1:400

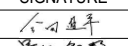
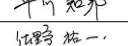



PROJECT NAME  
 DETAILED DESIGN ON  
 BAGO RIVER BRIDGE  
 CONSTRUCTION PROJECT

FINANCED BY  
 JAPAN INTERNATIONAL  
 COOPERATION AGENCY

COUNTERPART  
 REPUBLIC OF THE UNION OF MYANMAR  
 MINISTRY OF CONSTRUCTION  
 DEPARTMENT OF BRIDGE

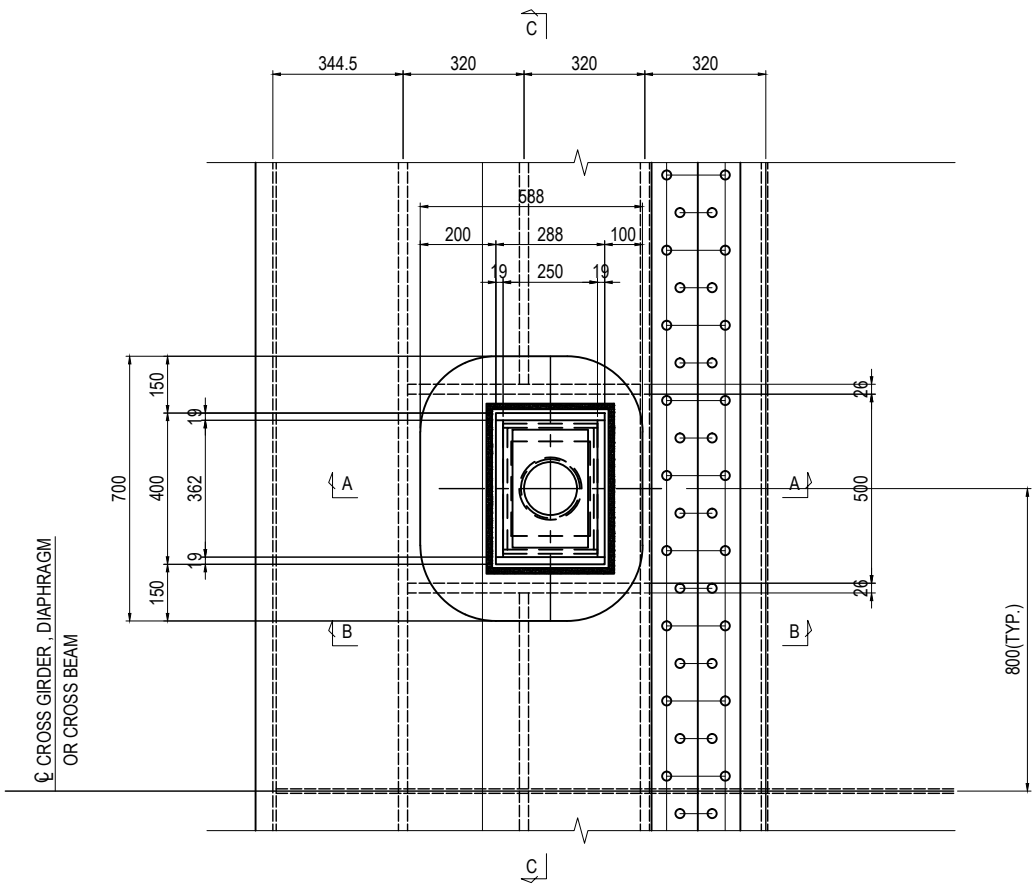
JICA STUDY TEAM  
 NIPPON KOEI CO., LTD.  
 ORIENTAL CONSULTANTS GLOBAL CO., LTD.  
 METROPOLITAN EXPRESSWAY COMPANY LIMITED  
 CHODAI CO., LTD.  
 NIPPON ENGINEERING CONSULTANTS CO., LTD.

	NAME	SIGNATURE	DATE
PREPARED BY	S. IMADA		29 Sept.2017
CHECKED BY	T. HAYAKAWA		3 Oct.2017
APPROVED BY	Y. SANO		6 Oct.2017

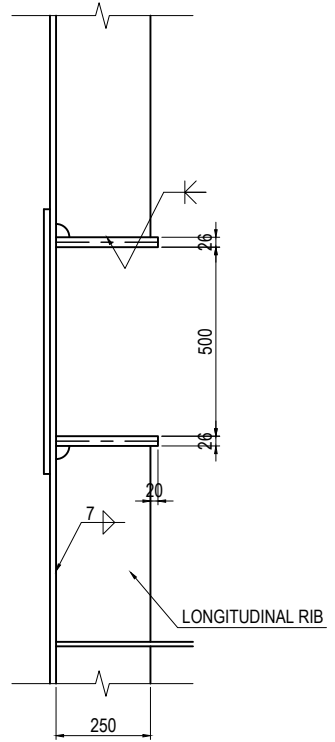
DRAWING TITLE  
 ANCILLARY WORKS LAYOUT

PACKAGE  
 1  
 DWG No.  
 P1-SB-3021

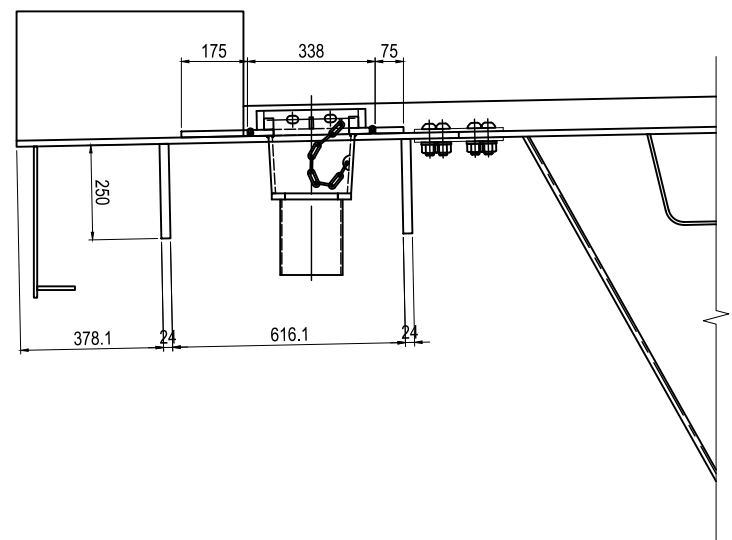
# DETAIL OF DRAINAGE (1) S=1:20



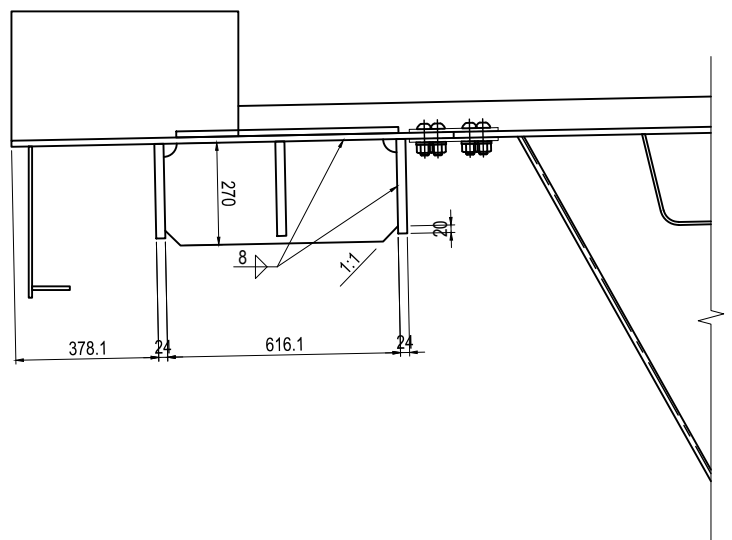
SECTION C-C



SECTION A-A



SECTION B-B

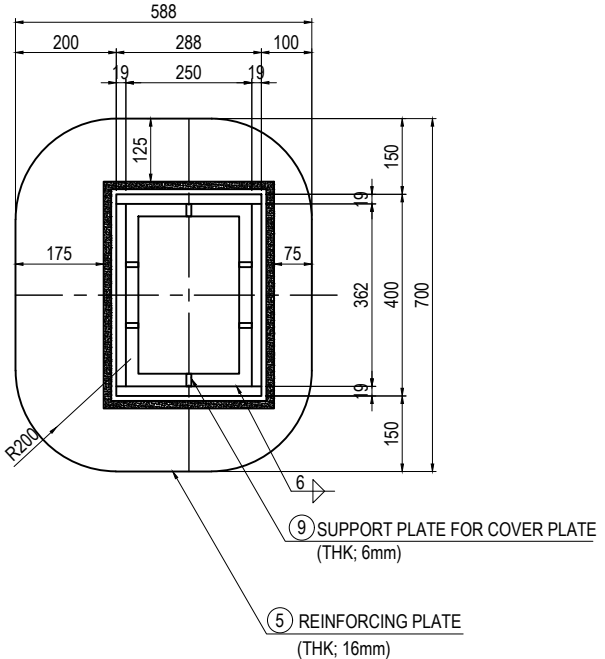


PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DETAIL OF DRAINAGE (1)	PACKAGE	
				PREPARED BY	S. IMADA			29 Sept.2017	1
				CHECKED BY	T. HAYAKAWA			3 Oct.2017	DWG No.
				APPROVED BY	Y. SANO			6 Oct.2017	P1-SB-3022

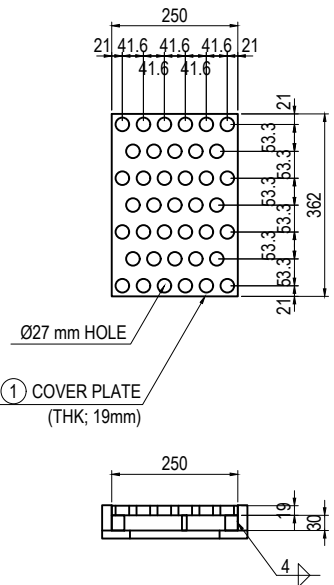
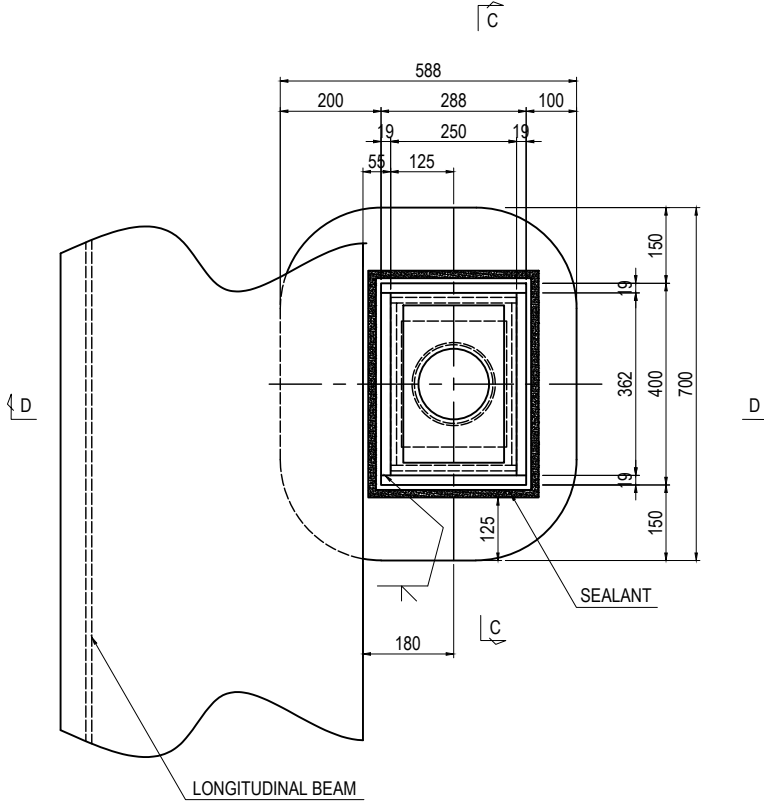


# DETAIL OF DRAINAGE (2) S=1:15

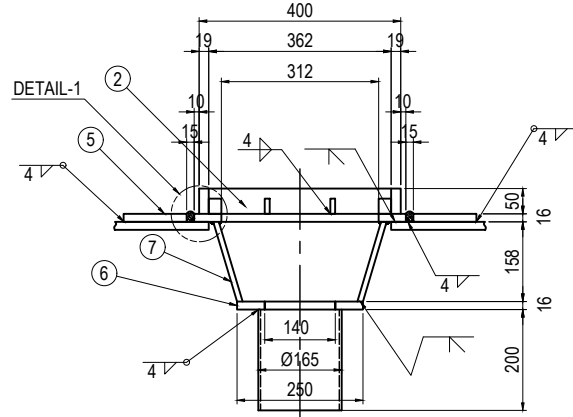
SECTION A-A



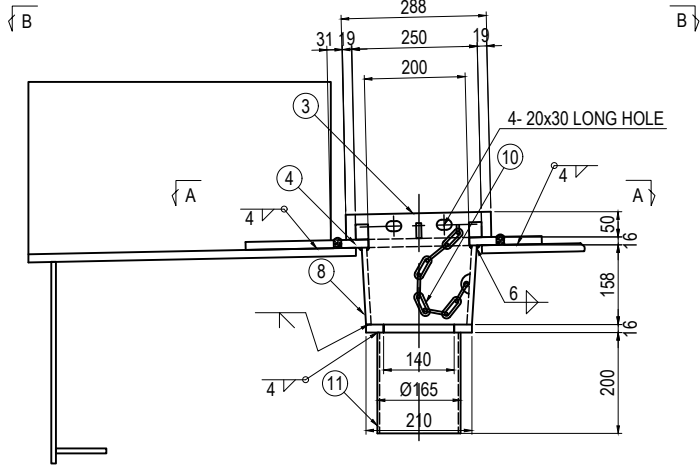
SECTION B-B



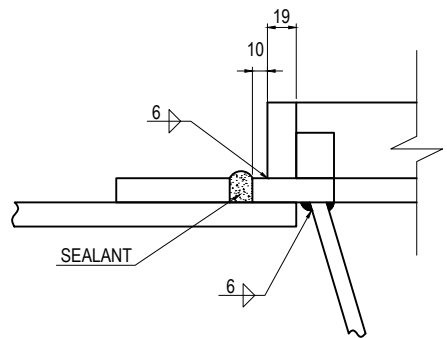
SECTION C-C



SECTION D-D



DETAIL -1 S=1:5



- ① 1-COVER PL 250x19x362 (SS400)
- ② 2-PL 50x19x362
- ③ 2-PL 50x19x288
- ④ 1-PL 308x16x420
- ⑤ 1-REINFORCING PL 588x16x700
- ⑥ 1-PL 210x16x250
- ⑦ 2-PL 165x10x229
- ⑧ 2-PL 157x10x322
- ⑨ 6-PL 25x10x30
- ⑩ 1-Chain 5Φx250(SUS304)
- ⑪ 1-PIPE Φ165.2x4.5x200(STK400)

PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DETAIL OF DRAINAGE (2)	PACKAGE 1 DWG No. P1-SB-3023	
				PREPARED BY	S. IMADA				29 Sept.2017
				CHECKED BY	T. HAYAKAWA				3 Oct.2017
				APPROVED BY	Y. SANO				6 Oct.2017

# DETAIL OF DRAINAGE (3)

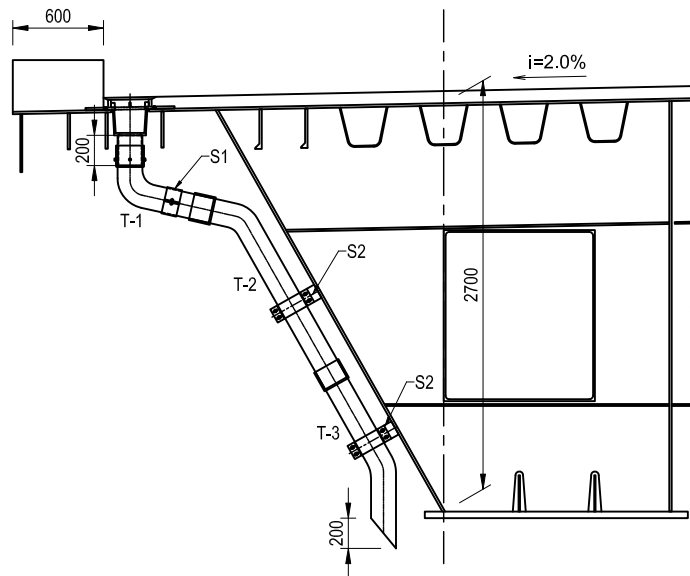
S=1:50

## MATERIAL LIST

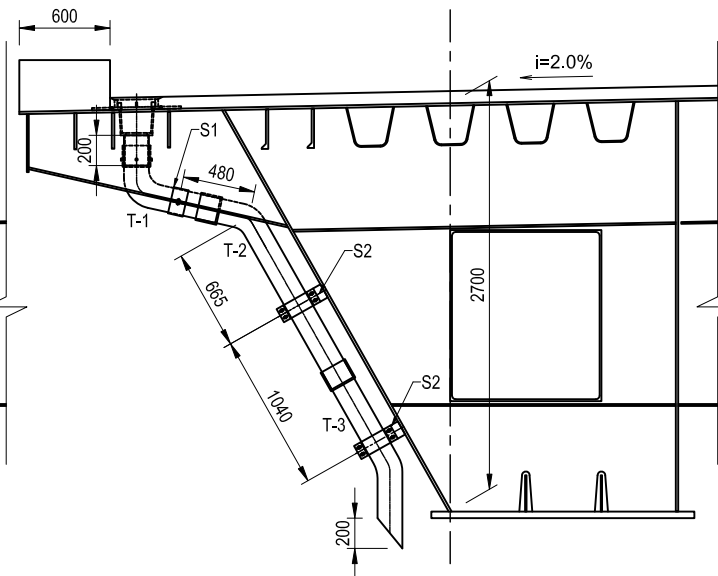
No.	Item	Size	Material	Width (mm)	Length (mm)	Thickness (mm)	Area (mm <sup>2</sup> )	Used Area (mm <sup>2</sup> )	Unit Weight (kg/m <sup>2</sup> )	Weight (kg/pce)	Number	Weight(kg)	Total Length (m)	Remarks
1.	Cover Plate (Thk; 19 mm)	250x362x19 mm	SS400	250	362	19	90500	68170.29	7850	10.17	1	10.17	-	
2.	Plate (Thk; 19 mm)	50x362x19 mm	SM400	50	362	19	18100	18100	7850	2.70	2	5.4	-	*
3.	Plate (Thk; 19 mm)	50x288x19 mm	SM400	50	288	19	14400	14400	7850	2.15	2	4.30	-	*
Sub-Total												19.87		
4.	Plate (Thk; 16 mm)	308x420x16 mm	SM400	308	420	16	129360	66960	7850	8.41	1	8.41	-	*
5.	Reinforcing Plate (Thk; 16 mm)	588x700x16 mm	SM400	588	700	16	411600	259500	7850	32.59	1	32.59	-	*
6.	Plate (Thk; 16 mm)	210x250x16 mm	SM400	210	250	16	52500	37106.65	7850	4.66	1	4.66	-	
Sub-Total												45.66		
7.	Plate (Thk; 10 mm)	165x229x10 mm	SM400	165	229	10	37785	36217.50	7850	2.84	2	5.68	-	*
8.	Plate (Thk; 10 mm)	157x322x10 mm	SM400	157	322	10	50554	44902	7850	3.52	2	7.04	-	*
9.	Plate (Thk; 10 mm)	25x30x10 mm	SM400	25	30	10	750	750	7850	0.06	6	0.36	-	*
Sub-Total												13.08		
10.	Chain 5 mmØ x 250	-	SUS304	-	-	-	-	-	-	-	1	-	-	*
11.	Plate (Thk; 8 mm)	100x140x8 mm	SM400A	100	140	8	14000	14000	7850	0.88	1	0.88	-	
12.	Plate (Thk; 8 mm)	100x106x8 mm	SM400A	100	106	8	10600	10600	7850	0.67	2	1.34	-	
Sub-Total												2.22		
13.	FB (Thk; 6 mm)	100x491x6 mm	SS400	100	491	6	49100	49100	7850	2.31	1	2.31	-	*
14.	FB (Thk; 6 mm)	100x365x6 mm	SS400	100	365	6	36500	36500	7850	1.72	4	6.88	-	*
Sub-Total												9.19		
15.	BN (M12x40(2-W))	-	JIS B 3507	-	-	-	-	-	-	-	4	-	-	*
16.	BN (M12x40(2-W))	-	JIS B 3507	-	-	-	-	-	-	-	8	-	-	*
Sub-Total												12		
17.	BN (M12x45(2-W))	-	JIS B 3507	-	-	-	-	-	-	-	4	-	-	*
18.	T1	-	VP150A	-	718	-	-	-	-	-	1	-	0.718	
19.	T2	-	VP150A	-	1456	-	-	-	-	-	1	-	1.456	
20.	T3	-	VP150A	-	1063	-	-	-	-	-	1	-	1.063	
Sub-Total												3.237		
21.	Sleeve	-	VP150A	-	142	-	-	-	-	-	3	-	0.426	
Total												90.02		

Note: The Notation (\*) in the table shows galvanized material in accordance with the Specifications.

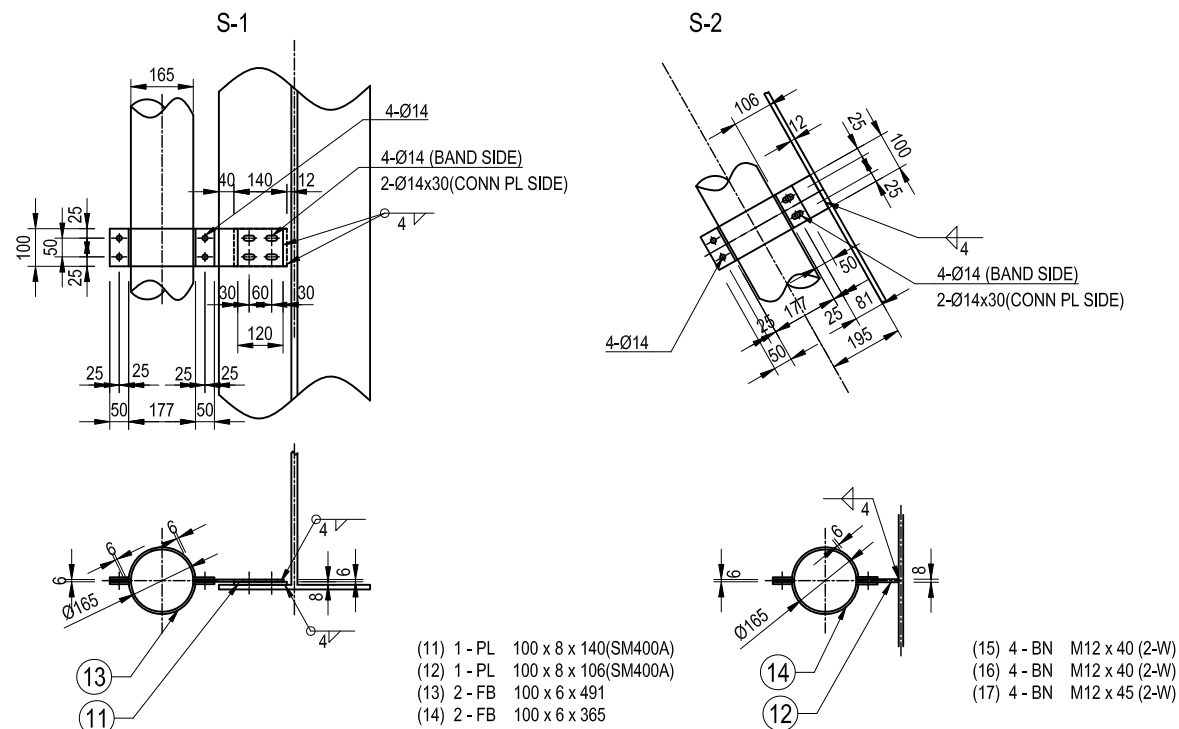
### CROSS SECTION(1)



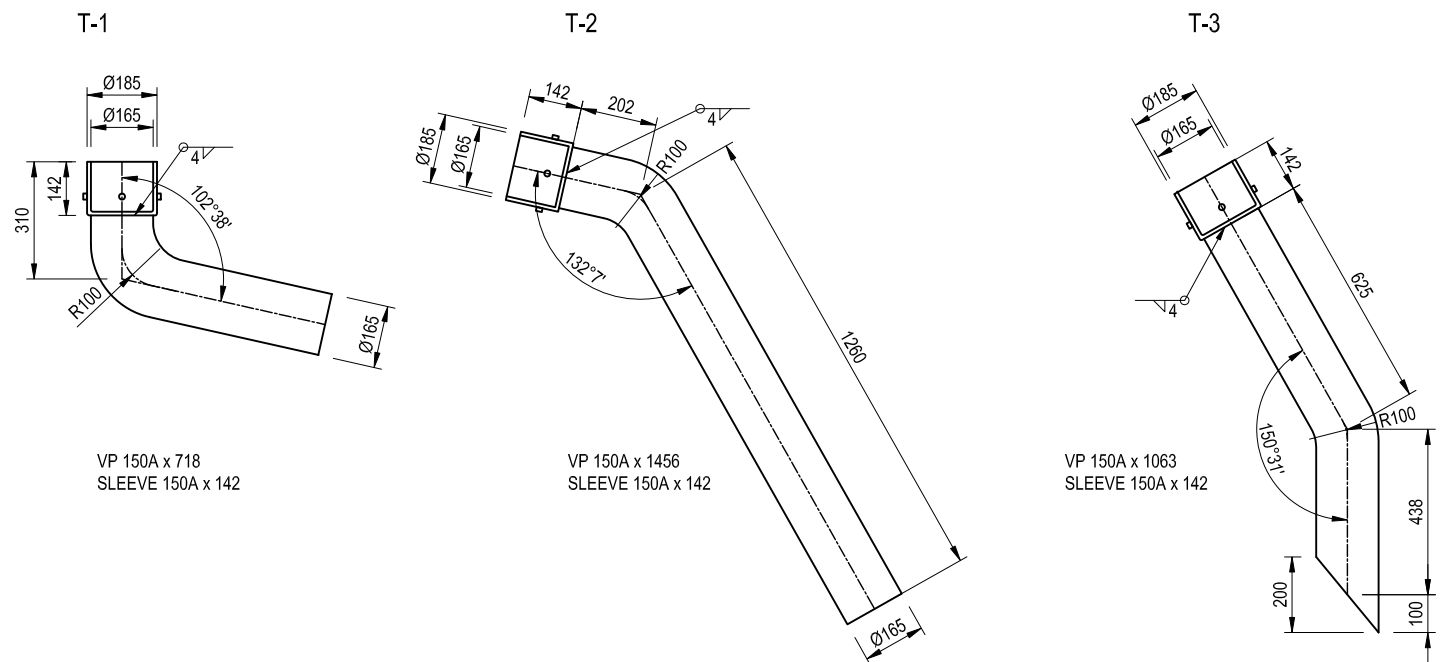
### CROSS SECTION(2)



### SUPPORT DEVICES S=1:20



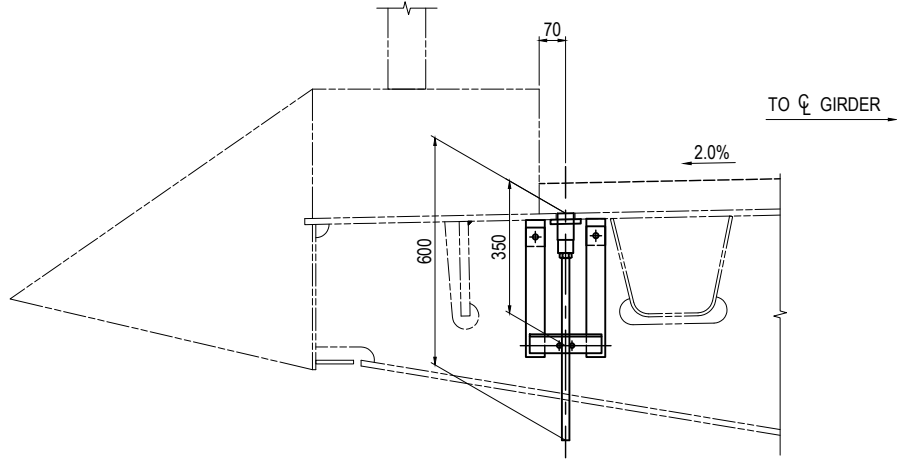
### BENDING PIPE S=1:20



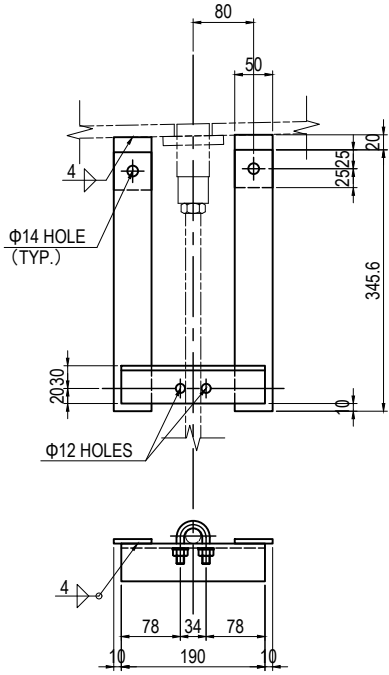
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY jica JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DETAIL OF DRAINAGE (3)	PACKAGE 1 DWG No. P1-SB-3024
				PREPARED BY	S. IMADA	29 Sept.2017		
				CHECKED BY	T. HAYAKAWA	3 Oct.2017		
				APPROVED BY	Y. SANO	6 Oct.2017		

# DETAIL OF DRAINAGE (4) S=1:20

## DETAIL OF FLOOR DRAINAGE

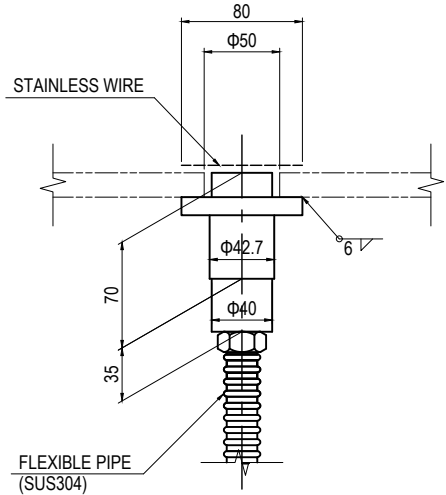


STEADY PIECE DETAIL S=1:10

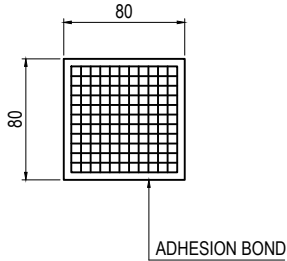


- 2-PL 50x6x70(SM400A)
- 2-PL 50x6x346(SS400)
- 1-L 50x50x6x190(SS400)
- 2-BN M12x35(1-W,1-UNut)(SS400)
- 1-U.BOLT M10(15C)(2-W)(SS400)
- 2-WASHER M10(SS400)

FLEXIBLE PIPE DETAIL S=1:5



STAINLESS WIRE DETAIL S=1:5



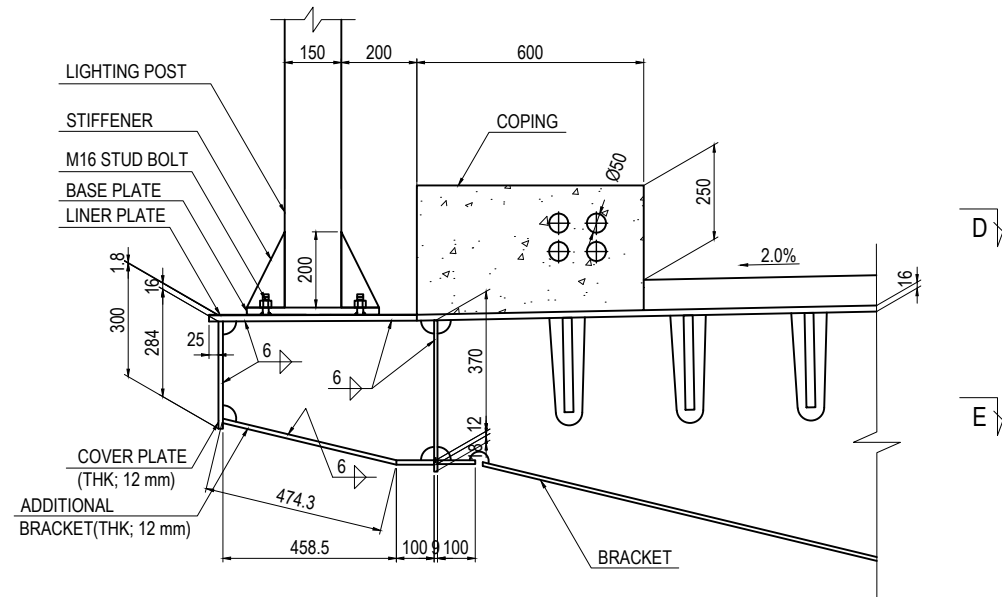
**NOTES:**

- 1 - HOT-DIP GALVANIZED COATING OVER 550g/m<sup>2</sup>, 350g/m<sup>2</sup> (FOR BOLT, WASHER & NUT AND MEMBER WITH A THICKNESS OF LESS THAN 3.2mm)
- 2 - Floor Drainage shall be installed at maximum 5m interval and Quantity is estimated at nos.116.

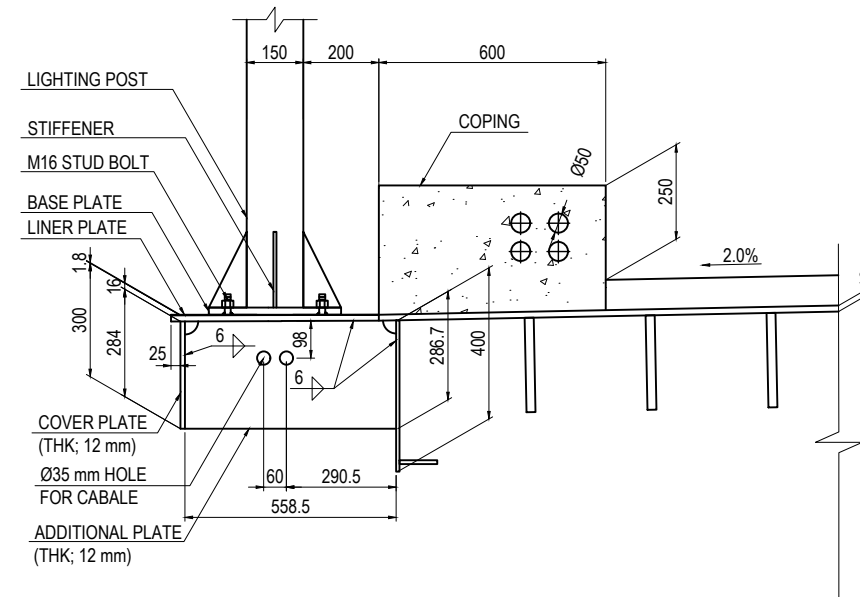
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE	
				PREPARED BY	S. IMADA				29 Sept.2017
				CHECKED BY	T. HAYAKAWA				3 Oct.2017
				APPROVED BY	Y. SANO				6 Oct.2017
							DETAIL OF DRAINAGE (4)	1	
								DWG No.	
								P1-SB-3025	

# DETAIL OF BRACKET FOR LIGHTING POST S=1:20

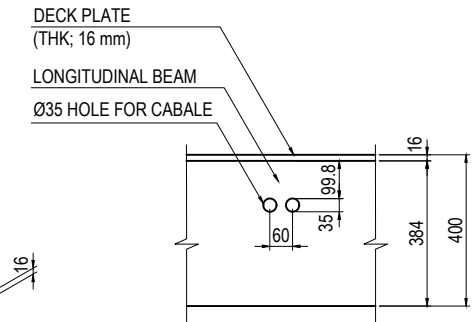
### SECTION A-A



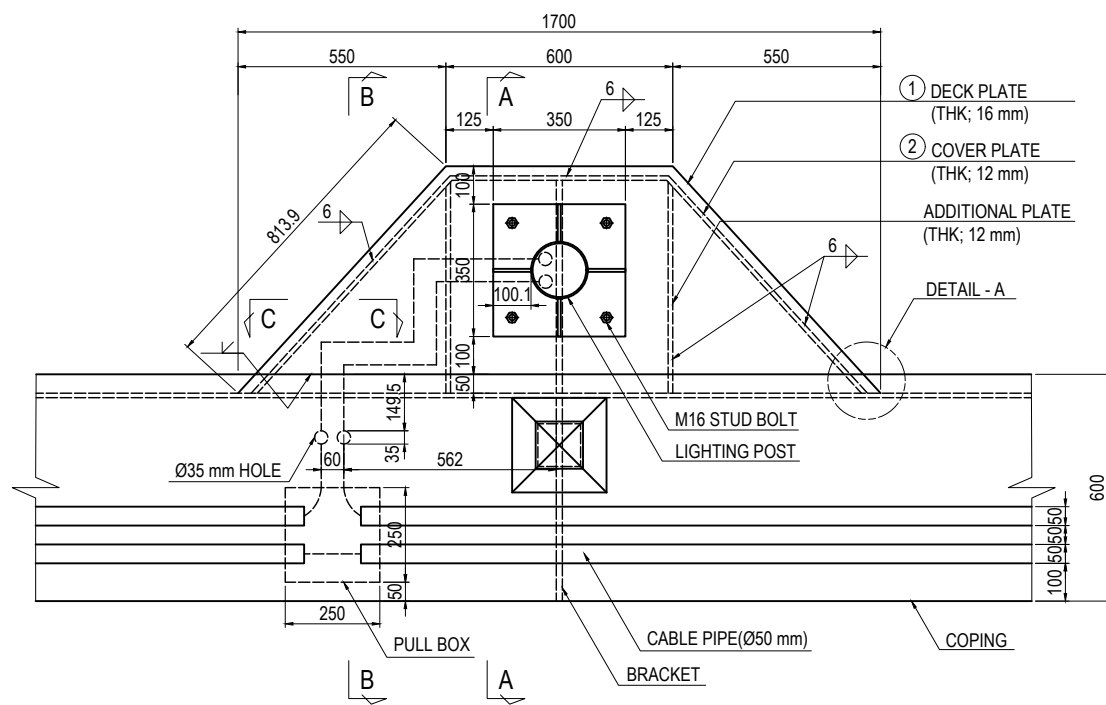
### SECTION B-B



### SECTION C-C

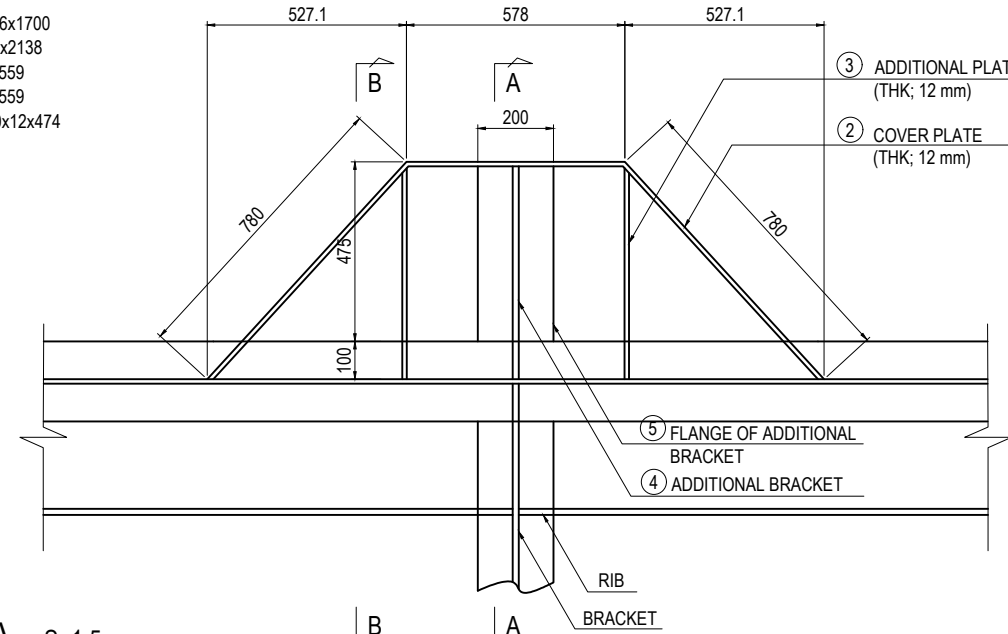


### SECTION D-D

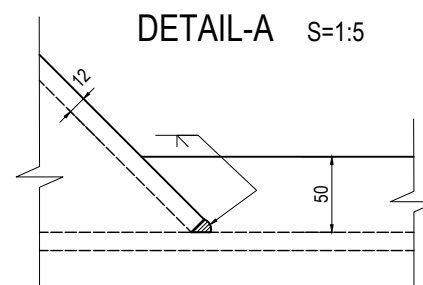


### SECTION E-E

- ① 1-DECK PL 550x16x1700
- ② 1-WEB PL 284x12x138
- ③ 2-RIB PL 287x12x559
- ④ 1-RIB PL 364x12x559
- ⑤ 1-FLANGE PL 200x12x474



### DETAIL-A S=1:5

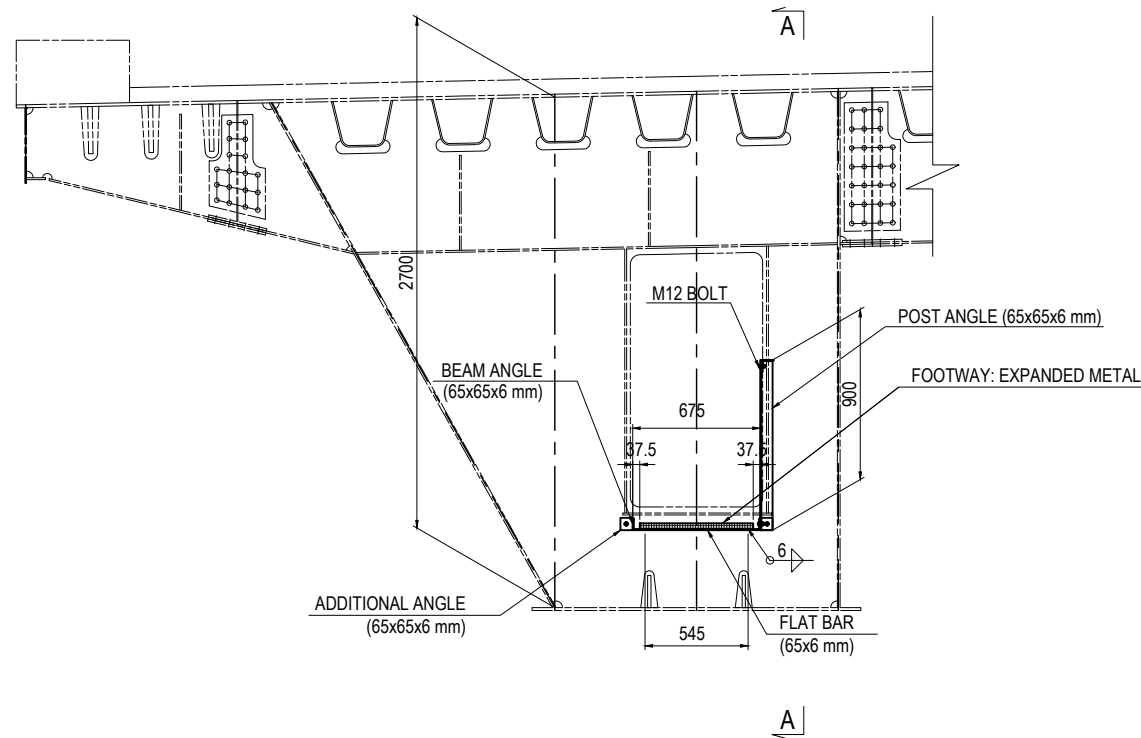


PROJECT NAME <b>DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT</b>	FINANCED BY <b>JAPAN INTERNATIONAL COOPERATION AGENCY</b>	COUNTERPART <b>REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE</b>	JICA STUDY TEAM <b>NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NAME</th> <th style="width: 10%;">SIGNATURE</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>S. IMADA</td> <td>29 Sept.2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td>3 Oct.2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td>6 Oct.2017</td> </tr> </tbody> </table>	NAME	SIGNATURE	DATE	PREPARED BY	S. IMADA	29 Sept.2017	CHECKED BY	T. HAYAKAWA	3 Oct.2017	APPROVED BY	Y. SANO	6 Oct.2017	DRAWING TITLE <b>DETAIL OF BRACKET FOR LIGHTING POST</b>	PACKAGE 1 DWG No. P1-SB-3026
NAME	SIGNATURE	DATE																
PREPARED BY	S. IMADA	29 Sept.2017																
CHECKED BY	T. HAYAKAWA	3 Oct.2017																
APPROVED BY	Y. SANO	6 Oct.2017																

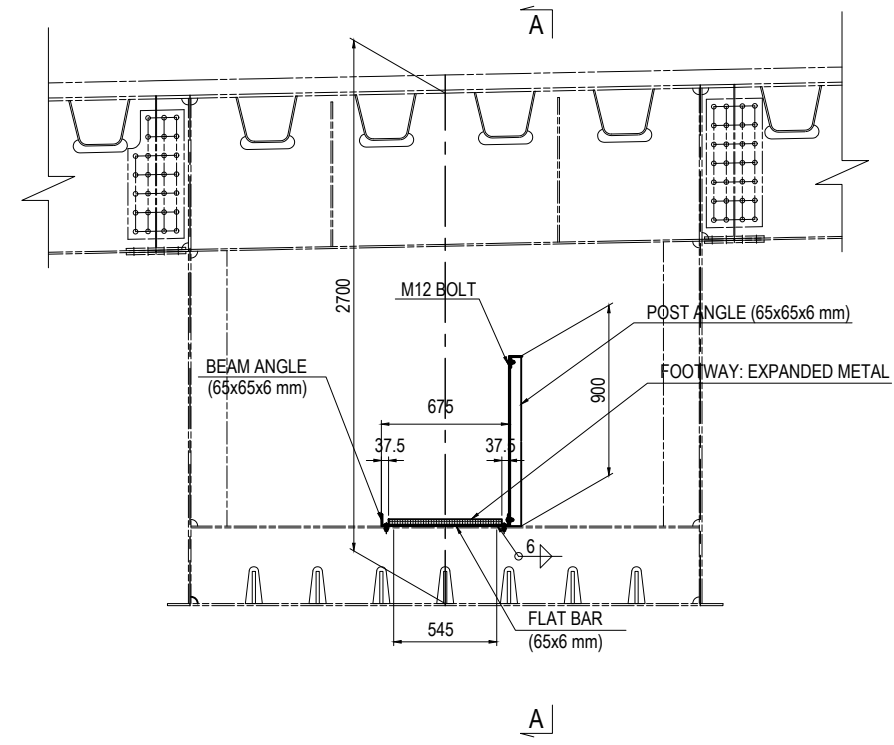


# INSPECTION WALKWAY (1) S=1:40

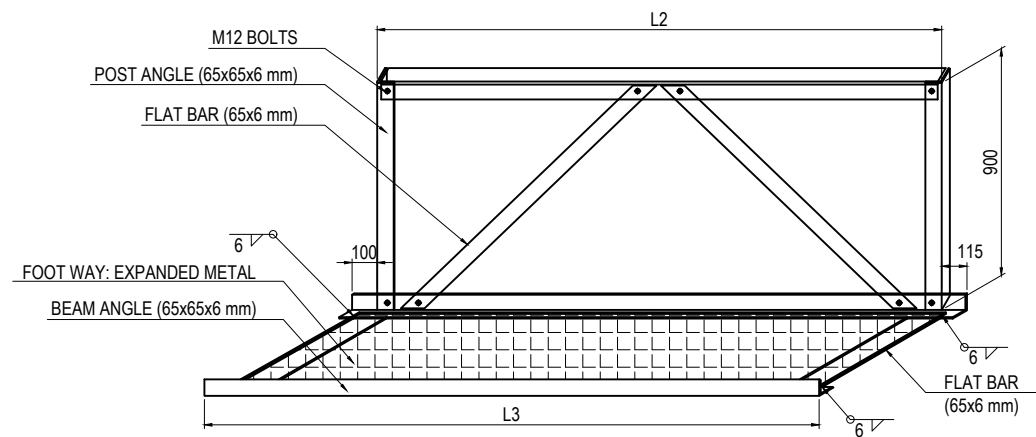
## CROSS GIRDER & DIAPHRAGM SECTION



## CROSS BEAM SECTION



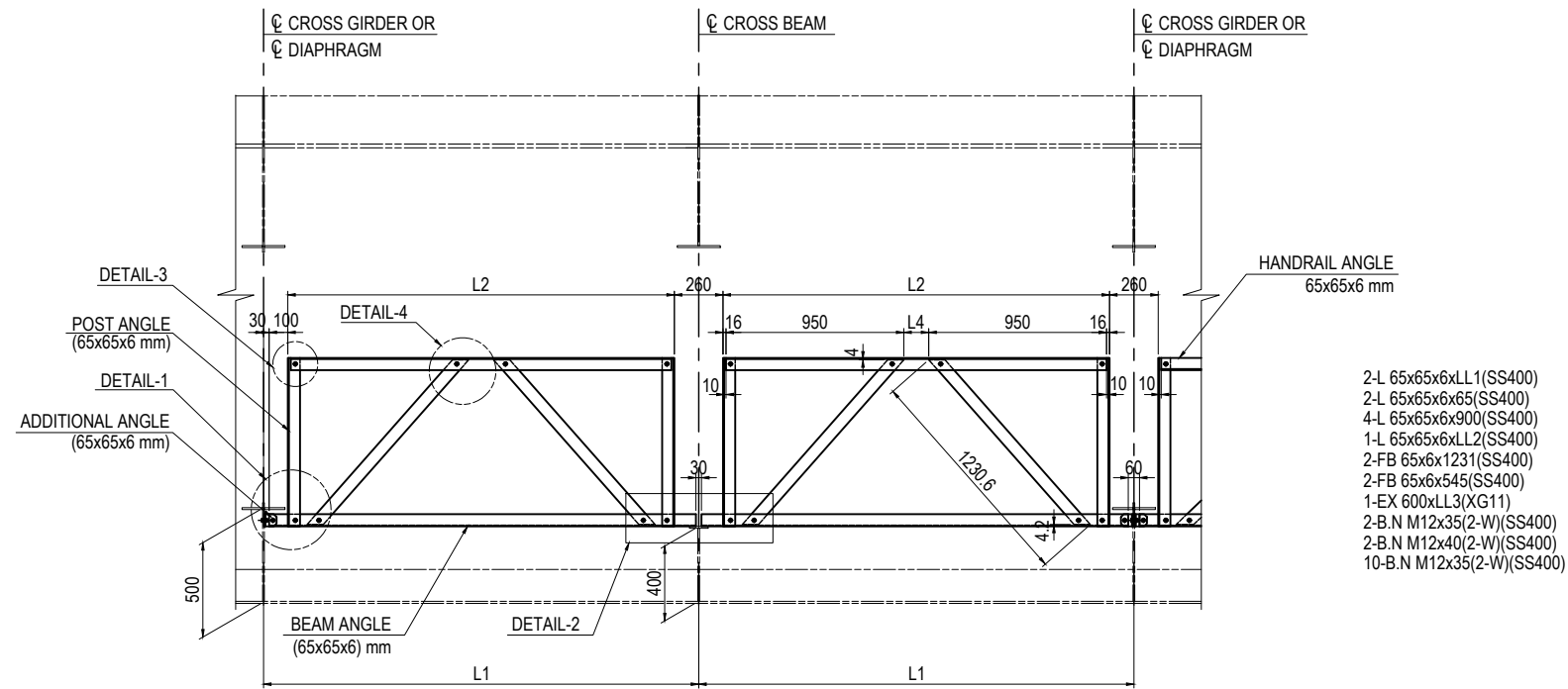
## INSPECTION WALKWAY UNIT S=1:30



PROJECT NAME	FINANCED BY	COUNTERPART	JICA STUDY TEAM	NAME	SIGNATURE	DATE	DRAWING TITLE	PACKAGE
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	S. IMADA	<i>S. Imada</i>	29 Sept. 2017	INSPECTION WALKWAY (1)	1
				T. HAYAKAWA	<i>T. Hayakawa</i>	3 Oct. 2017		DWG No.
				Y. SANO	<i>Y. Sano</i>	6 Oct. 2017		P1-SB-3031

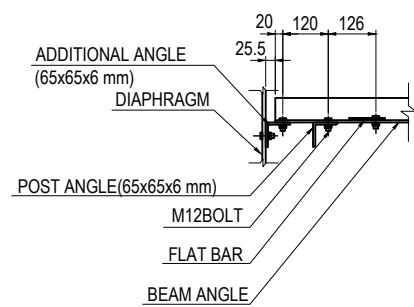
# INSPECTION WALKWAY (2) S=1:40

## SECTION A - A

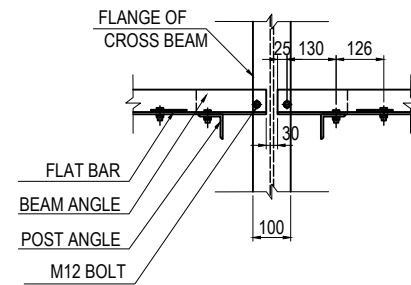


- 2-L 65x65x6xLL1(SS400)
- 2-L 65x65x6x65(SS400)
- 4-L 65x65x6x900(SS400)
- 1-L 65x65x6xLL2(SS400)
- 2-FB 65x6x1231(SS400)
- 2-FB 65x6x545(SS400)
- 1-EX 600xLL3(XG11)
- 2-B.N M12x35(2-W)(SS400)
- 2-B.N M12x40(2-W)(SS400)
- 10-B.N M12x35(2-W)(SS400)

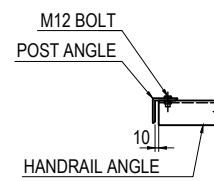
DETAIL - 1



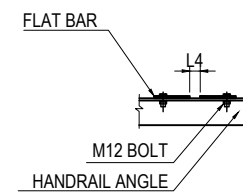
DETAIL - 2



DETAIL - 3



DETAIL - 4 S=1:20



PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE <b>INSPECTION WALKWAY (2)</b>	PACKAGE	
				PREPARED BY	S. IMADA			29 Sept.2017	1
				CHECKED BY	T. HAYAKAWA			3 Oct.2017	DWG No.
				APPROVED BY	Y. SANO			6 Oct.2017	P1-SB-3032

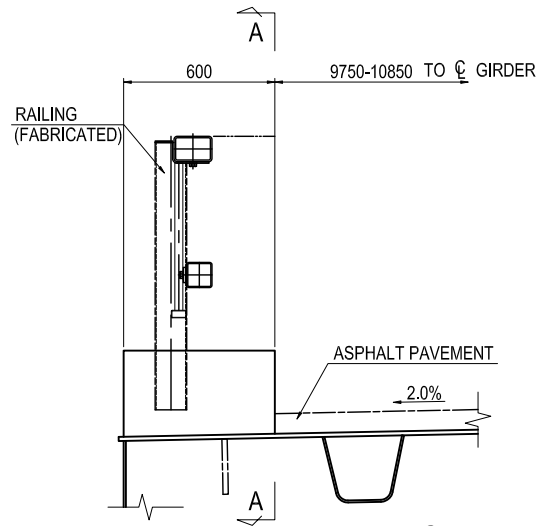


# DETAIL OF RAILING (1)

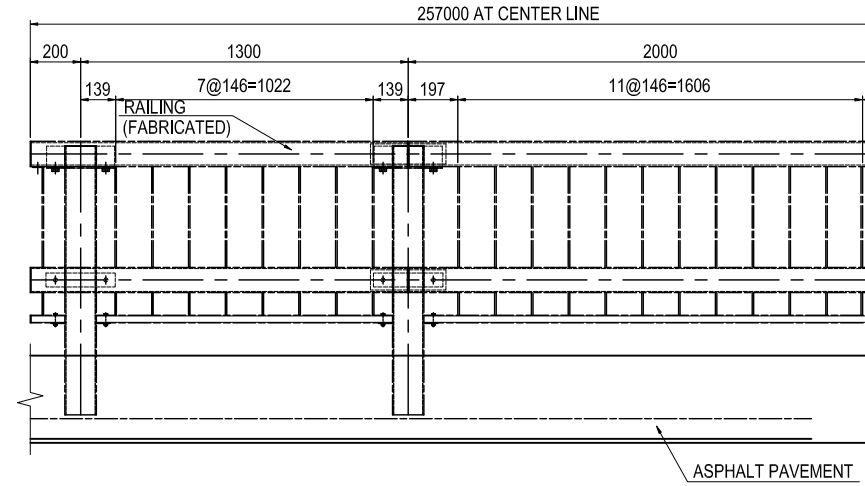
S=1:20

## COMPOSITE BARRIER

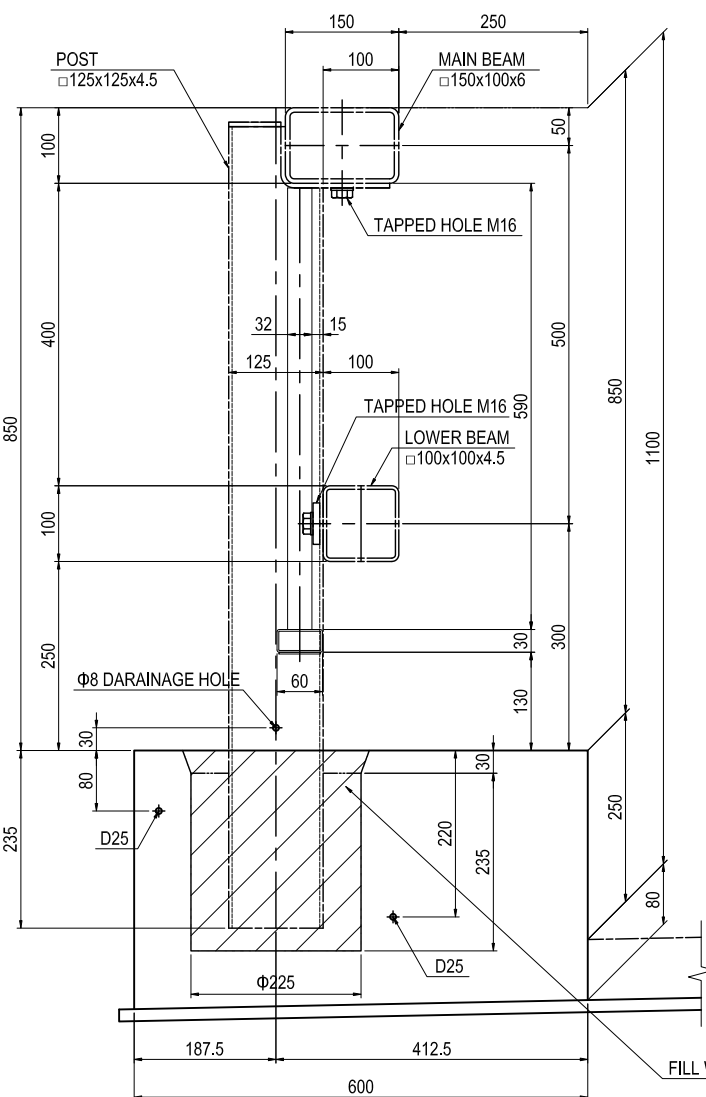
TYPICAL CROSS SECTION S=1:30



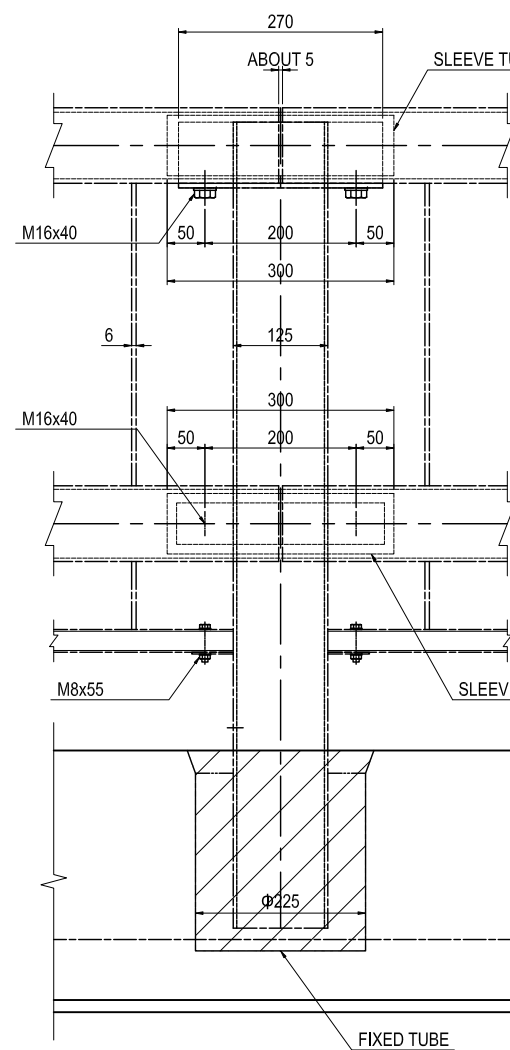
SECTION A-A S=1:30



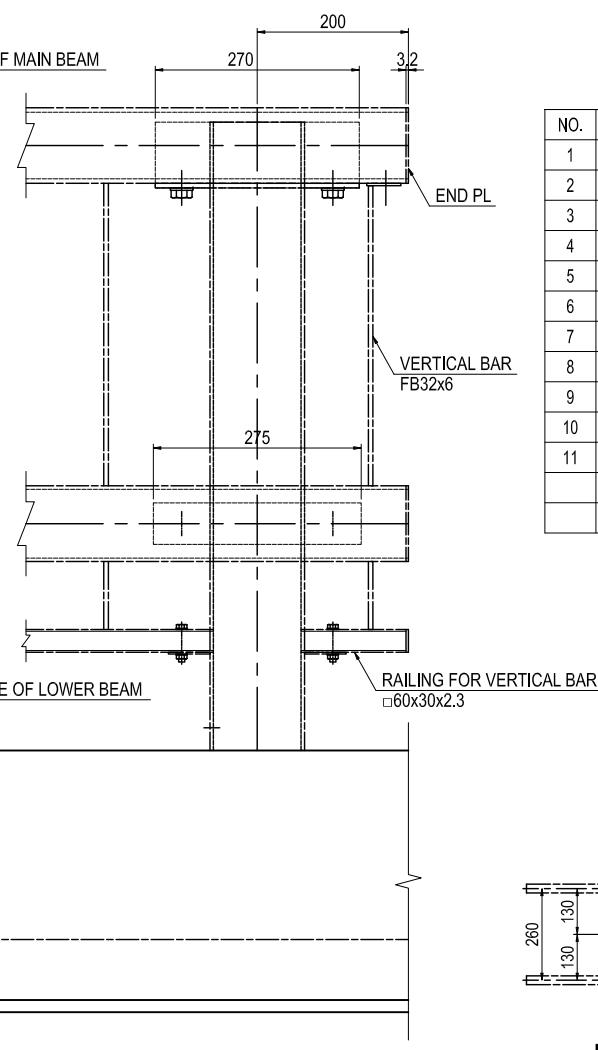
COMPOSITE BARRIER DETAIL S=1:10



JOINT DETAIL S=1:10



END POST DETAIL S=1:10



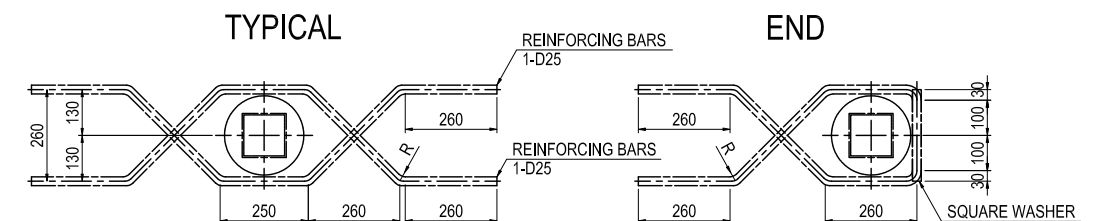
SUMMARY OF MEMBERS

									PER 10m	
NO.	MEMBER	SIZE DIMENSIONS	Q'TY	UNIT WEIGHT	WEIGHT PER UNIT	GROSS WEIGHT	MATERIAL	PAINTED AREA		
1	POST	□125x125x4.5	5		20.69	103.5	STKR 400	2.7m <sup>2</sup>		
2	MAIN BEAM	□150x100x6.0	5	21.70	43.29	216.5	STKR 400	5.0m <sup>2</sup>		
3	LOWER BEAM	□100x100x4.5	5	13.10	26.13	130.7	STKR 400	4.0m <sup>2</sup>		
4	SLEEVE TUBE OF MAIN BEAM	L=300	5		6.51	32.6	SS400			
5	SLEEVE TUBE OF LOWER BEAM	L=300	5		3.71	18.6	SS400			
6	RAILING FOR VERTICAL BAR	□60x30x2.3	5	2.98	5.55	27.8	STKR 400	1.7m <sup>2</sup>		
7	VERTICAL BAR	FB32x6	10		0.89	53.4	SS400	2.6m <sup>2</sup>		
8	HEXAGON BOLT	M16x40	10		0.12	1.2	GRADE 8.8			
9	HEXAGON BOLT	M16x40	10		0.12	1.2	GRADE 6.8			
10	HEXAGON BOLT	M8x55	10		0.04	0.4	GRADE 4.6			
11	FIXED TUBE	Φ225	5		-	-	SPCC			
TOTAL						585.9		18.0m <sup>2</sup>		

MASS PER 1m 58.6kg/m  
(EXCLUDING END SPAN)

MEMBER	SIZE DIMENSIONS	Q'TY	REMARKS
REINFORCING BAR (TYPICAL)	D25x1550	3208kg	SD345
REINFORCING BAR (END)	D25x1200	38kg	SD345

REINFORCING BARS DETAIL



**NOTES:**

1 - INSTALLATION OF REINFORCING BAR SHALL BE ADJUSTED IN ACCORDANCE WITH REINFORCING BAR ARRANGEMENT OF THE CONCRETE CURB.

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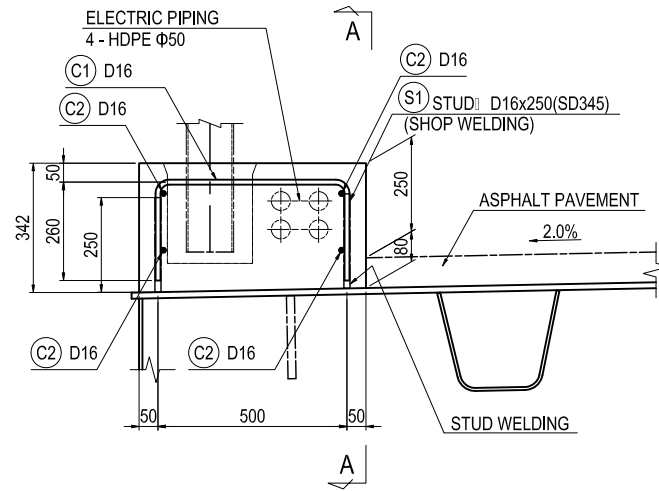


# DETAIL OF RAILING (3) S=1:20

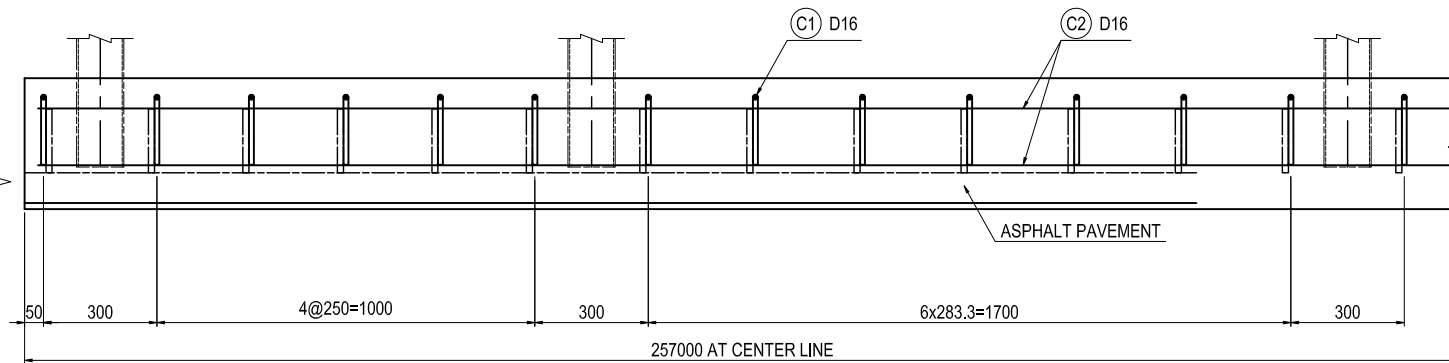
## DETAIL OF COPING AND MEDIAN

### WHEEL GUARD DETAIL

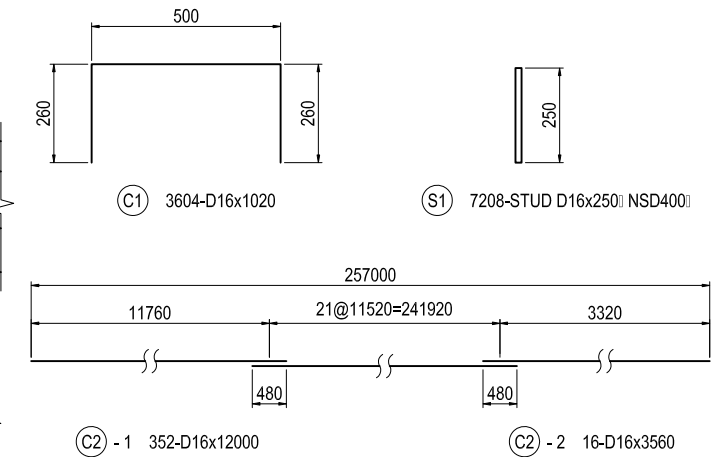
#### CROSS SECTION OF WHEEL GUARD



#### SECTION A-A

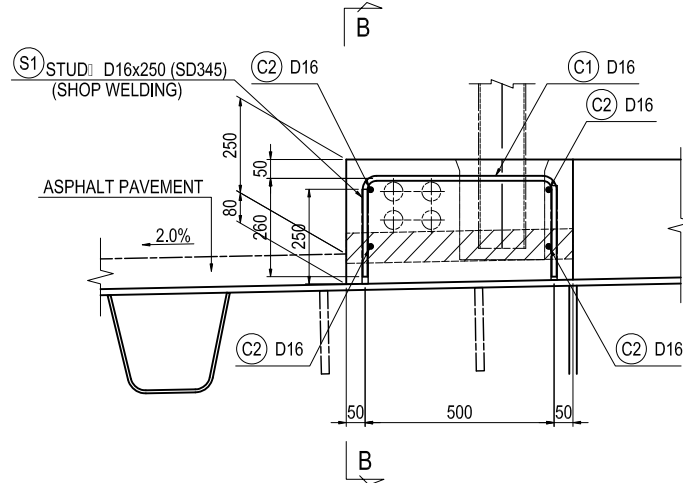


#### REINFORCING BAR BENDING SCHEDULE

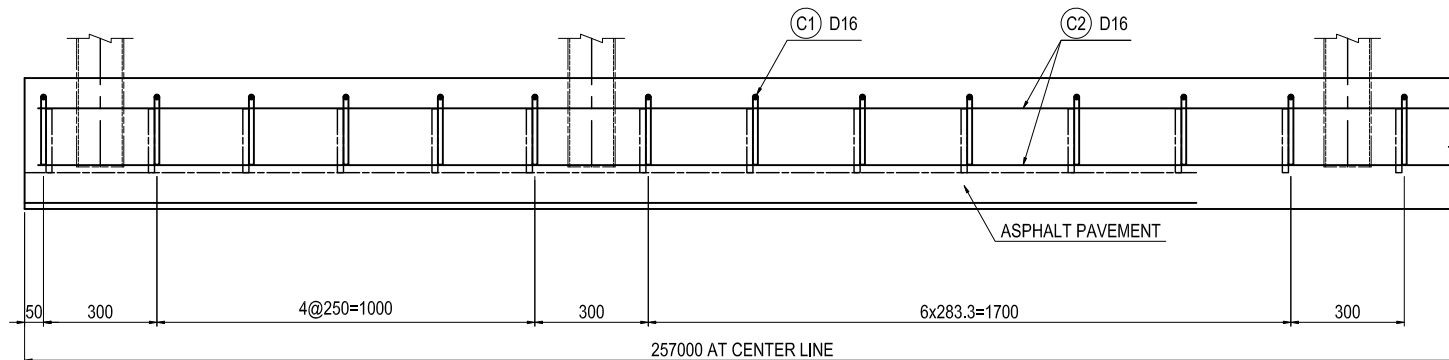


### MEDIAN STRIP DETAIL

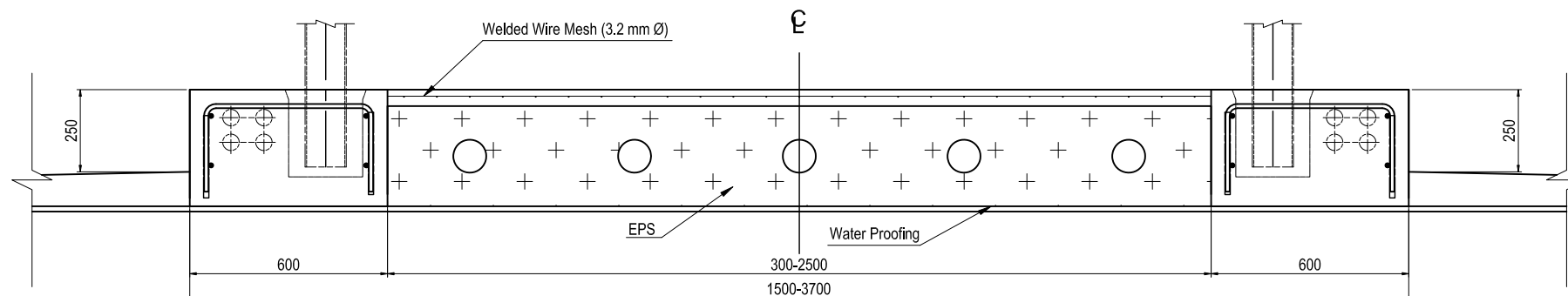
#### CROSS SECTION OF MEDIAN STRIP



#### SECTION B-B



### CROSS SECTION OF MEDIAN



#### SUMMARY OF MEMBERS

MEMBER	Q'TY	REMARKS
REINFORCING BAR	12410kg	SD345
STUD	2811kg	SD345 FOR STUD WELDING
CONCRETE(COPING)	204.53m <sup>3</sup>	σ <sub>ck</sub> =24N /mm <sup>2</sup>
COVER CONCRETE	3.94m <sup>3</sup>	σ <sub>ck</sub> =24N /mm <sup>2</sup>
FORM	430.77 m <sup>2</sup>	
EPS	22.07 m <sup>3</sup>	
Welded Wire Mesh	78.8 m <sup>2</sup>	3.2 mm φ
Waterproofing	78.8 m <sup>2</sup>	

#### NOTES:

1 - STUD SHALL BE INSTALLED AND INCLUDED IN THE SCOPE OF FABRICATION OF STEEL GIRDER.

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(REFERENCE) QUANTITY TABLE OF SUPER STRUCTURE

Not to Scale

Quantity of Main Girder

unit: kg

Category	Grade	Thickness・Size	Main Girder	Deck Plate Including Cross Beam	Sum
PL	SM570-H	44--41	30,781		30,781
	SM570	38--10	138,191		138,191
	SM520C-H	57--41	35,976	1,728	37,704
	SM490YB	40--17	377,544	82,216	459,760
	SM490YA	16--9	713,831	298,605	1,012,436
	SM490C	53--41	6,265		6,265
	SM490B	38		418	418
	SM400A	32--6	184,601	944,033	1,128,634
	SS400	21--2.3	13,024	147,802	160,826
	Sum	Subtotal	1,500,213	1,474,802	2,975,015
U-Shape	SM490YA	320*240*8		92,871	92,871
	SM400A	320*240*8		194,269	194,269
	Sum	Subtotal		287,140	287,140
TCB	S10T	M 22	48,752	63,654	112,406
HTB	F10T	M 22	1,810	10,149	11,959
TCB&HTB	Sum	Subtotal	50,562	73,803	124,365
FB	SS400	50*6	758	115	873
	Sum	Subtotal	758	115	873
RB	SS400	13 φ	254		254
	Sum	Subtotal	254		254
BN	SS400	M 12		485	485
	SUS304	M 16		82	82
	Sum	Subtotal		567	567
Pipe	STK400	165.2*4.5		486	486
	Sum	Subtotal		486	486
Chain	SUS304	5*18*42*250		54	54
Sum Total			1,551,787	1,836,967	3,388,754

Quantity of Accessories

unit: kg

Category	Grade	Thickness・Size	Inspection Walkway	Expansion Joint Support (P5)	Total
Expanded Metal	XG11	600	8,605		8,605
Flat Bar	SS400	65x6	4,752		4,752
Angle	SS400	65x65x6	26,475		26,475
Bolt, Nut	SS400	M12	1,296		1,296
Rebar&Stud	SD345	19--16		1,239	1,239
Total			41,128	1,239	42,367

Quantity of Bearing & Expansion Joint

Bearing Type		P5	P6	P7	P10
		Elastomer	Elastomer	Elastomer	Elastomer
Capacity	Rmax (KN)	3400	7000	8400	4100
	Displacement X(mm)	±310	±180	±170	±286
	Displacement Y(mm)	Fix	Fix	Fix	Fix
Numbers		4	4	4	4

Expansion Joint (P5)	Width	Length	Capacity	Concrete (24MPa)
Modular Type Joint (Main)	1.04 m	20.7 m	444 mm	9.9 m3
Modular Type Joint (Ramp)	0.78 m	6.5 m	444 mm	3.1 m3

Quantity of Drainage

Material	Number	Total Length
VP with steel fittings	54	182.466 m

Quantity of Painting Area

Unit M2

Painting System	C-5	D-5	F-11	F-12	J	E
	Exterior surface	Interior surface	Exterior surface of bolted connection	Interior surface of bolted connection	Contact surface of bolted connection	Interior surface of steel deck in contact with concrete
Area	18335.64	18918.32	2549.8	1297.72	7941.49	7308.43

(REFERENCE) QUANTITY TABLE OF SUB STRUCTURE

Not to Scale

QUANTITY TABLE OF RC PIER COLUMN AND BEAM STRUCTURE

Structure Component	Work Item	Specification	Division	Unit	Quantity		Total
					P6 PIER	P7 PIER	
Pier Column and Beam (Reinforced Concrete Structure)	Concrete	$\sigma_{ck}=30N/mm^2$		m <sup>3</sup>	774.4	797.5	1,571.9
	Re-bar	SD345	D 13	kg	—	—	—
			D16 ~ D25	"	43,078	55,164	98,242
			D29 ~ D32	"	48,900	7,241	56,141
			D 35	"	—	—	—
			D 38	"	—	59,792	59,792
			D 51	"	—	—	—
			Total	"	91,978	122,197	214,175
	SD345	D 32	Point	342	—	342	
		D 38	"	—	422	422	
		Total	"	342	422	764	

QUANTITY TABLE OF STEEL PIPE SHEET PILE FOUNDATION

Structure Component	Work Item	Division	Unit	Quantity		Total	Remark				
				P6 PIER	P7 PIER						
Steel pipe well	Steel pipe length( $\phi 1200mm$ )			m/Number	59.5	61.5	—				
		Pile number			Number	34	32	66	Outside Steel Pipe Well		
					"	0	4	4	Diaphragm Steel Sheet Pipe Wall		
			Total		"	34	36	70			
	Pile extension				m	2,023.0	2,214.0	4,237.0			
	Steel pipe well	Steel pipe weight	$\phi 1200$	t=14mm	t	660.552	676.488	1,337.040	SKY400		
				t=16mm	"	190.536	261.536	452.072	SKY400		
		Accessories weight	$\phi 165.2$	Reinforcement Band	t=11mm	"	163.200	185.292	348.492	STK400	
					PL t= 9mm	t	2.720	2.880	5.600	SS400	
					Members for Perimeter Field Welding (Backing Ring Stopper)	PL t=14mm	"	0.408	0.432	0.840	SS400
						PL t=16mm	"	—	—	—	SS400
					Sling	PL t=22mm	"	1.224	1.296	2.520	SM490A
					Interlocking Toe	PL t=12mm	Piece	68	74	142	SS400
					In-situ Attached Interlocking		Point	68	74	142	STK400
					Precut		"	68	74	142	
	Excavation inside	Pile inside			m <sup>3</sup>	374.1	325.9	700.0			
		Pile head			"	0.0	28.1	28.1			
	Concrete filling	Fill concrete		$\sigma_{ck}=21N/mm^2$	m <sup>3</sup>	319.9	301.1	621.0	Correction factor=0.04		
		Pile head		$\sigma_{ck}=24N/mm^2$	"	0.0	5.4	5.4			
	Cleaning inside joint pipe				m	1,738.7	1,850.5	3,589.2			
	Mortar filling inside joint pipe	$\sigma_{ck}=21N/mm^2$	Mortar length		m	1,679.9	1,813.4	3,493.3	Mortar=2.5m <sup>3</sup> /100m		
			Mortar quantity		m <sup>3</sup>	44.1	47.6	91.7	Correction factor=0.05		
	Sealing inside joint pipe	$\sigma_{ck}=0.2N/mm^2$	Sealing length		m	271.7	348.5	620.2			
			Sealing quantity		m <sup>3</sup>	7.8	9.9	17.7			
			Sealing bag		m	543.4	697.0	1,240.4			
	Excavation inside the well				m <sup>3</sup>	993.2	807.4	1,800.6			
	Backfill inside the well				m <sup>3</sup>	218.0	119.5	337.5			
	Surplus soil (waste soil)				m <sup>3</sup>	775.2	687.9	1,463.1			
Footing concrete	$\sigma_{ck}=24N/mm^2$			m <sup>3</sup>	482.8	436.4	919.2	Correction factor=0.09			
Bottom slab concrete	$\sigma_{ck}=21N/mm^2$			m <sup>3</sup>	263.1	228.0	491.1				
Spread sand				m <sup>3</sup>	60.4	52.3	112.7				
Pile head	Shear Connector		PL-32 $\times$ 16 $\times$ 3597	kg	—	116	116				
	Stopper		PL-25 $\times$ 9 $\times$ 50	"	—	2	2				
Pile head Re-bar	Re-bar	SD345	D 13	kg	—	168	168				
			D16 ~ D25	"	—	341	341				
			D29 ~ D32	"	—	—	—				
			Total	"	—	509	509				
Footing Re-bar	Re-bar	SD345	D 13	kg	—	—	—				
			D16 ~ D25	"	6,285	5,399	11,684				
			D29 ~ D32	"	21,007	7,878	28,885				
			D 35	"	—	—	—				
			D 38	"	—	17,760	17,760				
			D 51	"	—	—	—				
	Total	"	27,292	31,037	58,329						
	Mechanical splice	SD345	D 38	Point	—	82	82				
			D 51	"	—	—	—				
	Welding of the dowel	Welding of the dowel stage			Stage	748	768	1,516			
Welding of the dowel Weight			kg	7,364	7,474	14,838					