

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

**DETAILED DESIGN STUDY ON  
THE BAGO RIVER BRIDGE  
CONSTRUCTION PROJECT**

**FINAL REPORT ATTACHMENTS**

**VOLUME V DRAFT TENDER DOCUMENT**

**PACKAGE 2**

**Volume - IV**

**DRAWINGS**

**DECEMBER 2017**

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**NIPPON KOEI CO., LTD.**

**ORIENTAL CONSULTANTS GLOBAL CO., LTD.**

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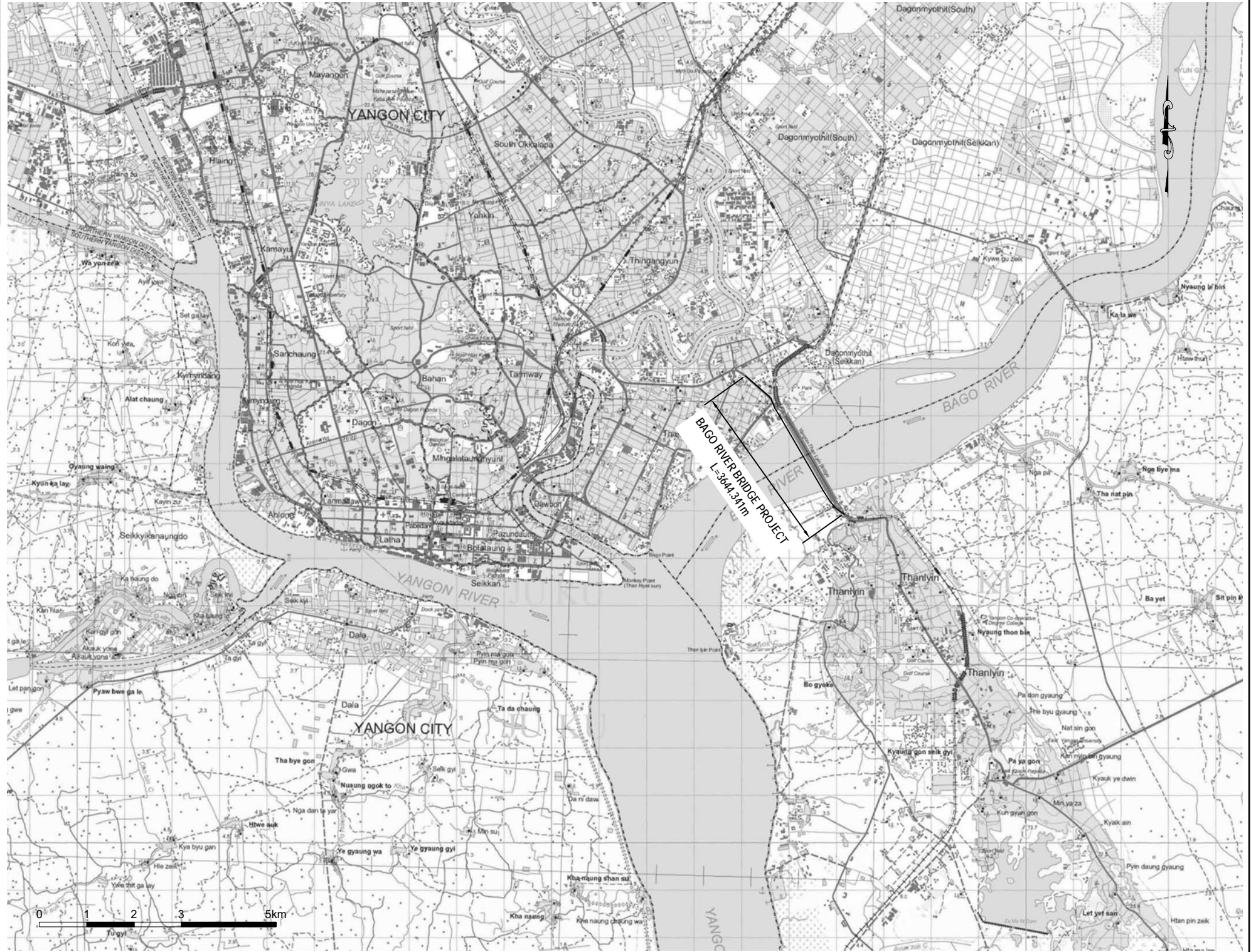
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## **A. GENERAL**

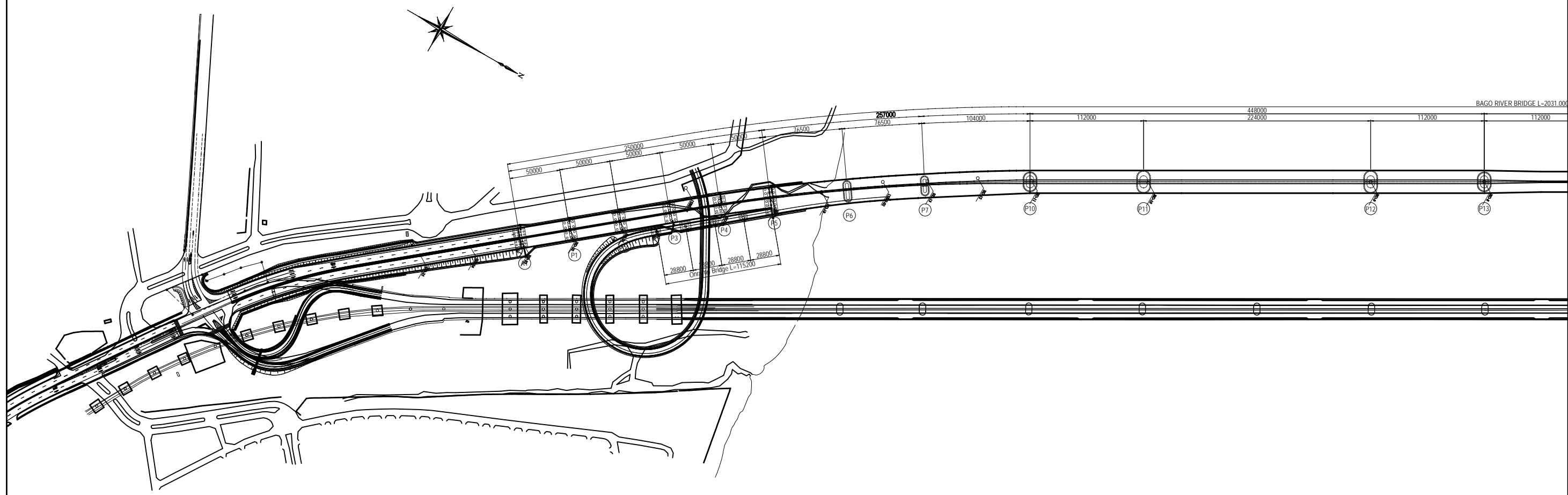
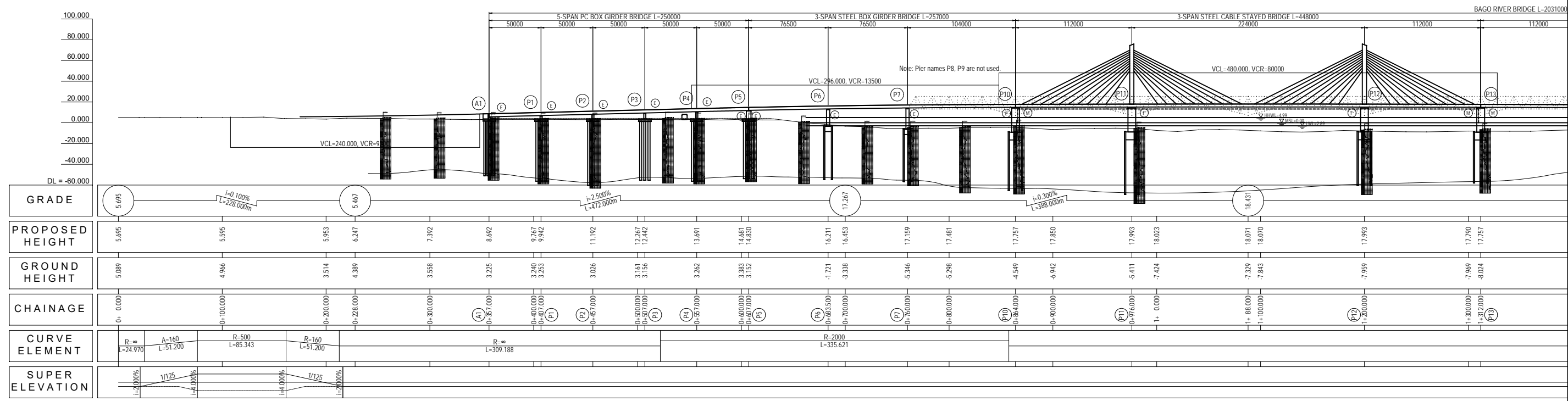


# LOCATION MAP

S=1:100,000



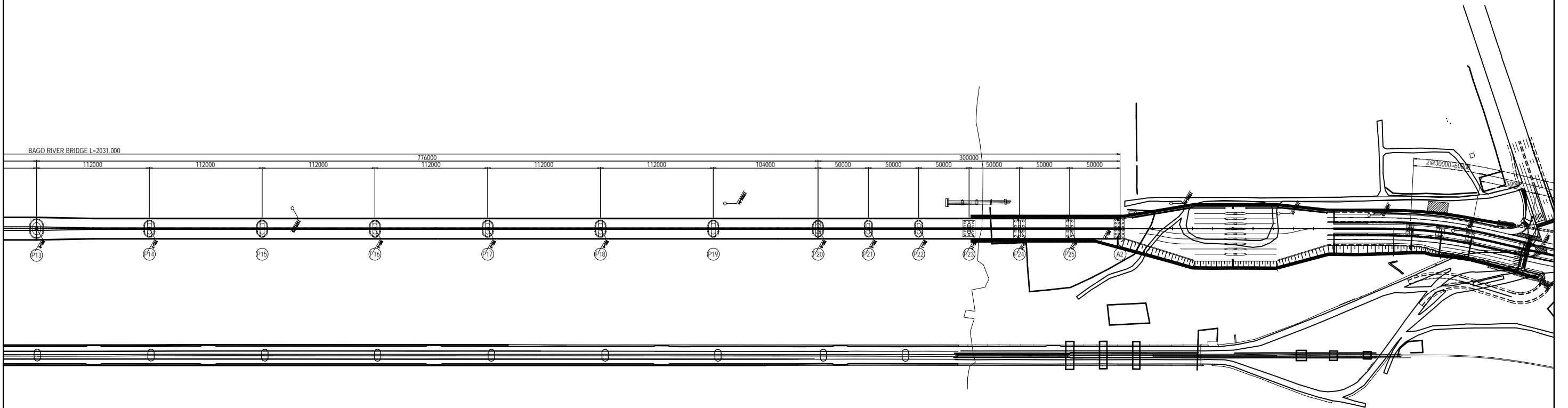
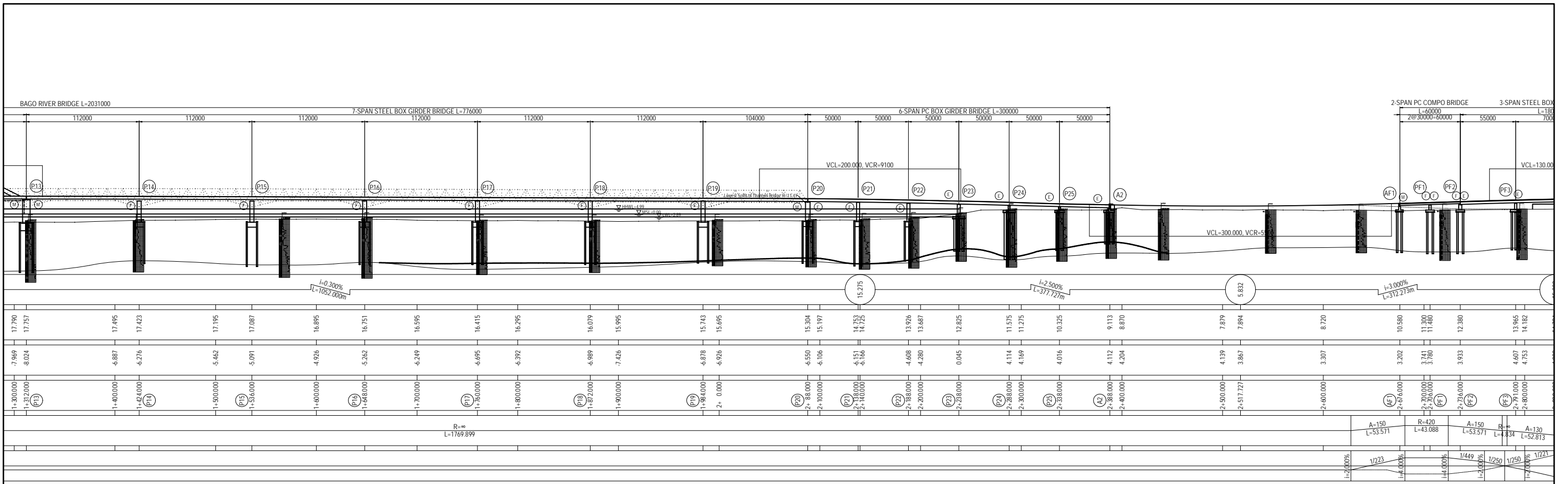
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE  LOCATION MAP	PACKAGE 2 DWG No. P2-GE-0001	
				PREPARED BY	T. HAYAKAWA				15 Sep.2017
				CHECKED BY	T. HAYAKAWA				22 Sep.2017
				APPROVED BY	Y. SANO				29 Sep.2017



Elevation represents above MSL unless otherwise indicated.

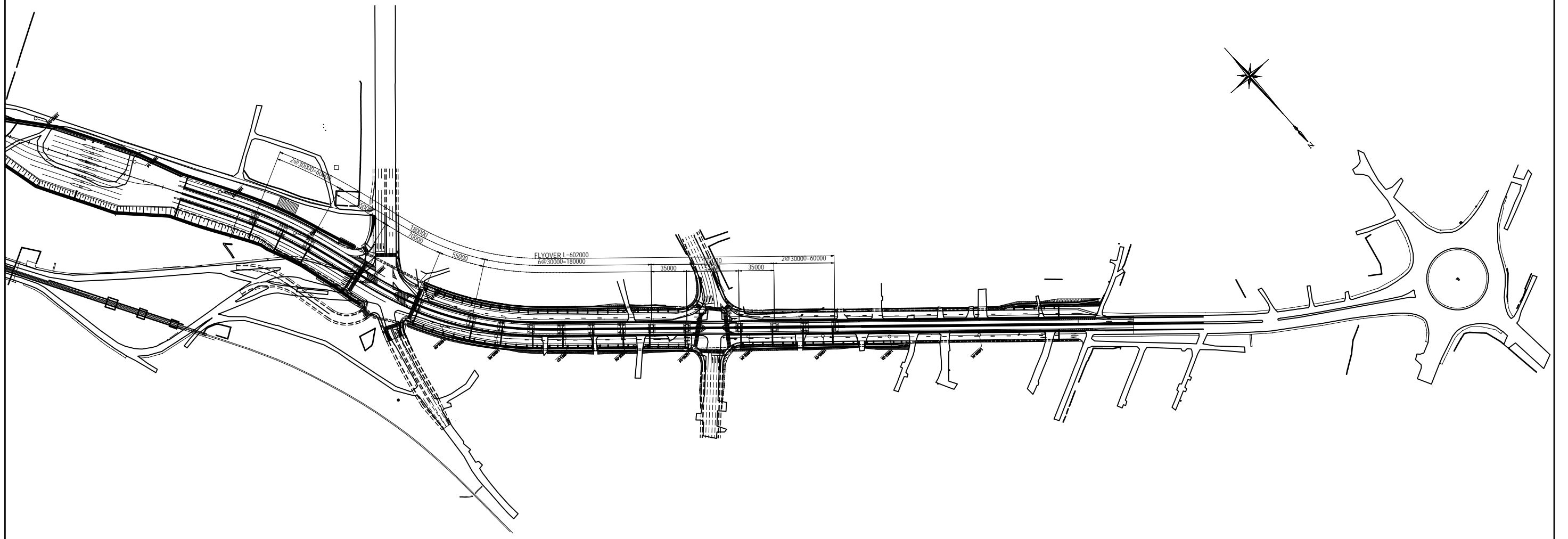
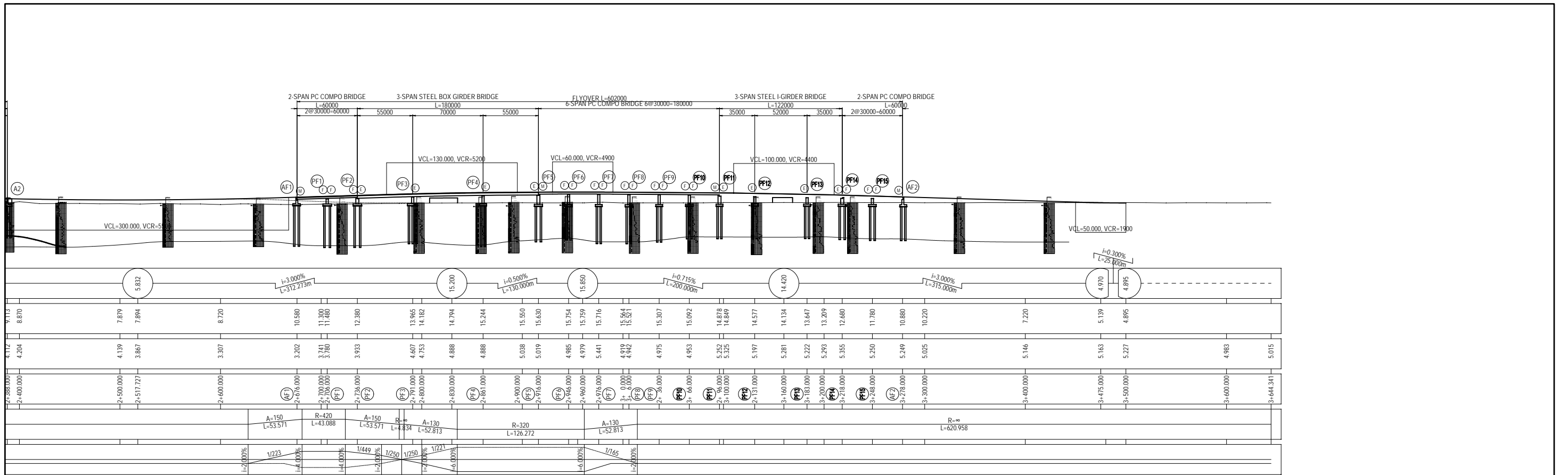
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE GENERAL VIEW OF BAGO RIVER BRIDGE (1)	PACKAGE 2 DWG No. P2-GE-0002	
				PREPARED BY	T. HAYAKAWA				27 Nov. 2017
				CHECKED BY	T. HAYAKAWA				28 Nov. 2017
				APPROVED BY	Y. SANO				29 Nov. 2017





Elevation represents above MSL unless otherwise indicated.

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 GENERAL VIEW OF BAGO RIVER BRIDGE (2)	PACKAGE 2 DWG No. P2-GE-0003	
				PREPARED BY	T. HAYAKAWA				27 Nov. 2017
				CHECKED BY	T. HAYAKAWA				28 Nov. 2017
				APPROVED BY	Y. SANO				29 Nov. 2017



Elevation represents above MSL unless otherwise indicated.

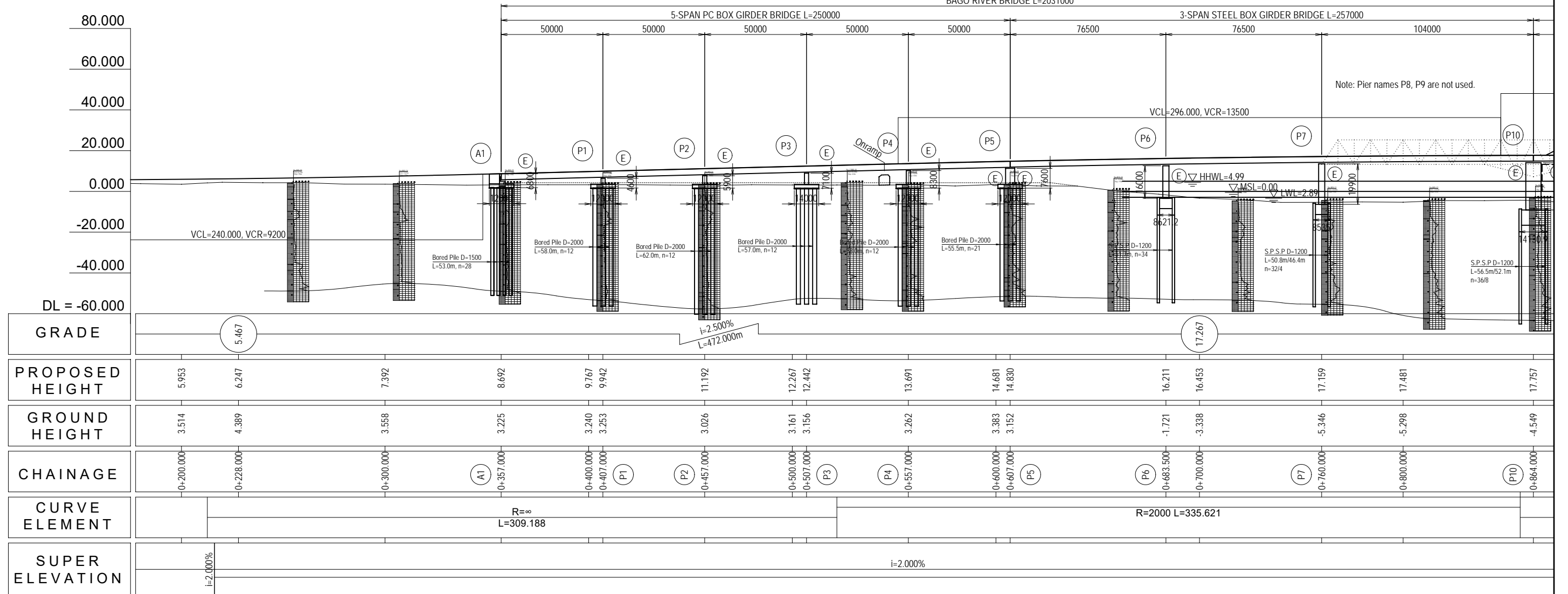
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE GENERAL VIEW OF BAGO RIVER BRIDGE (3)	PACKAGE	
				PREPARED BY	T. HAYAKAWA			27 Nov. 2017	2
				CHECKED BY	T. HAYAKAWA			28 Nov. 2017	DWG No.
				APPROVED BY	Y. SANO			29 Nov. 2017	P2-GE-0004

# GENERAL VIEW OF BAGO RIVER BRIDGE (4)

## LONGITUDINAL SECTION

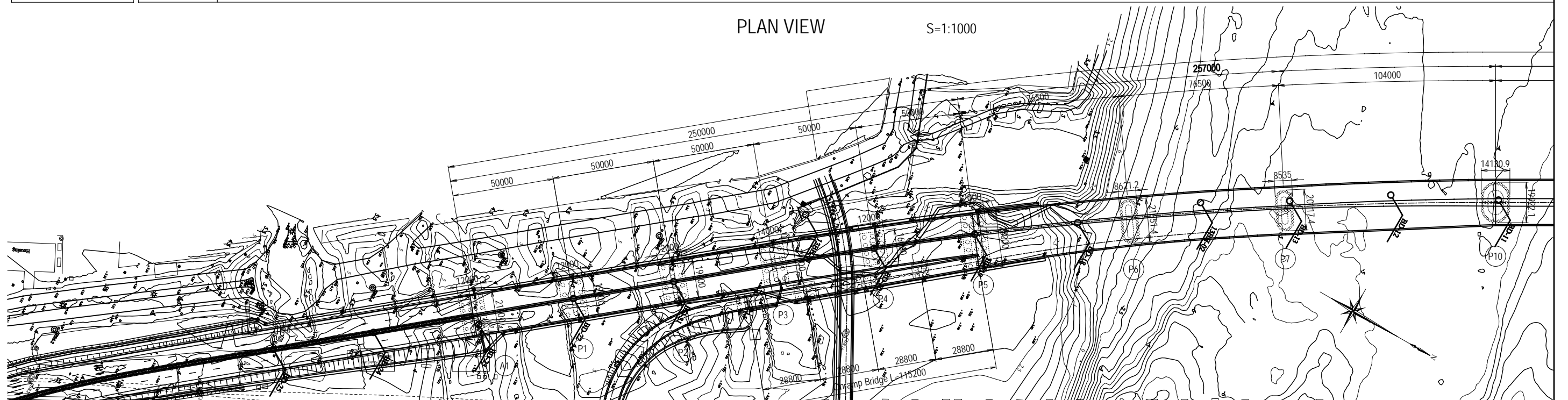
S=1:1000

BAGO RIVER BRIDGE L=2031000



## PLAN VIEW

S=1:1000



Elevation represents above MSL unless otherwise indicated.

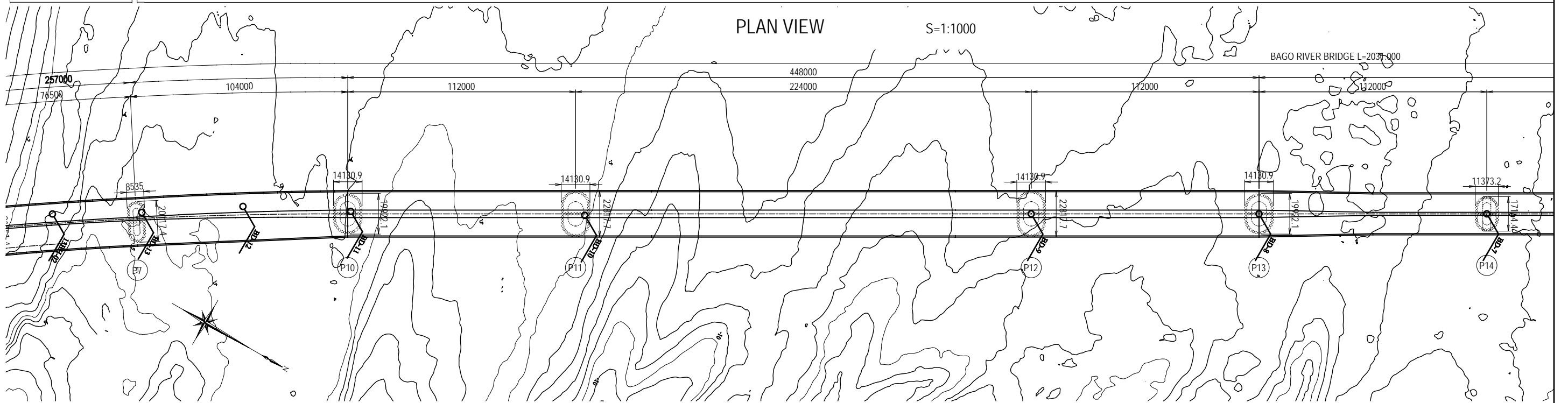
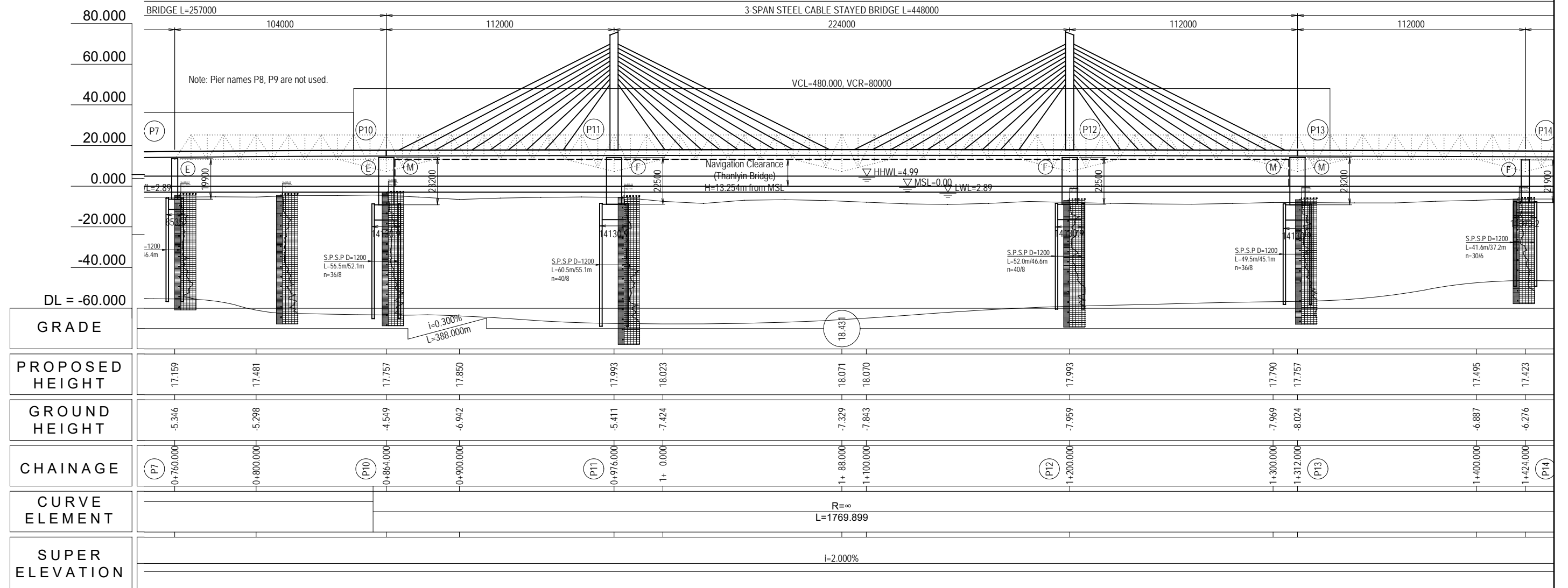
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JICA JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME PREPARED BY T. HAYAKAWA CHECKED BY T. HAYAKAWA APPROVED BY Y. SANO	SIGNATURE DATE 27 Nov. 2017 28 Nov. 2017 29 Nov. 2017	DRAWING TITLE GENERAL VIEW OF BAGO RIVER BRIDGE (4)	PACKAGE 2 DWG No. P2-GE-0005
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# GENERAL VIEW OF BAGO RIVER BRIDGE (5)

LONGITUDINAL SECTION S=1:1000

BAGO RIVER BRIDGE L=2031000

3-SPAN STEEL CABLE STAYED BRIDGE L=448000



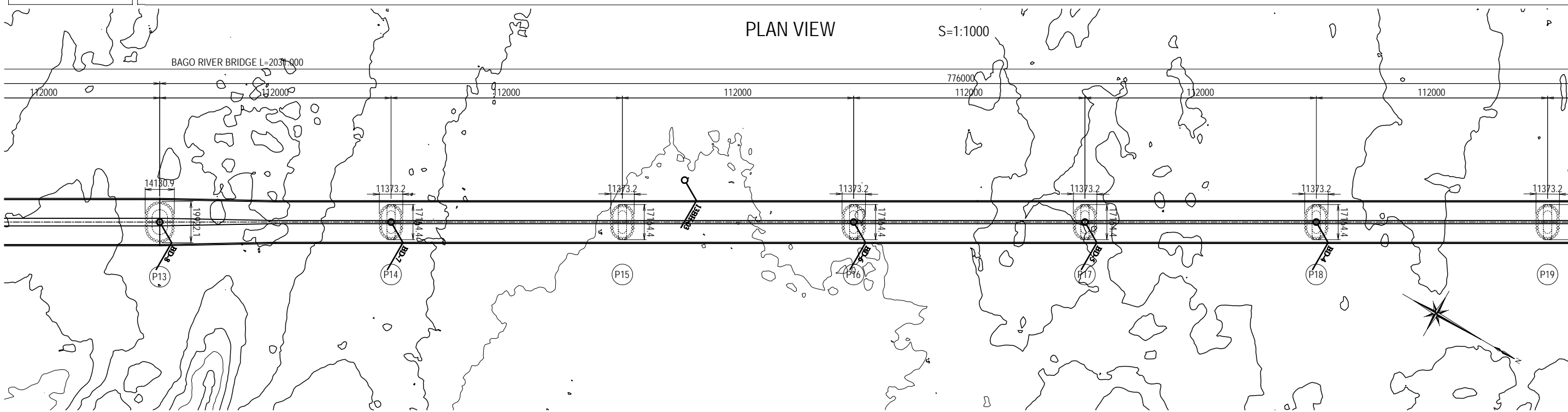
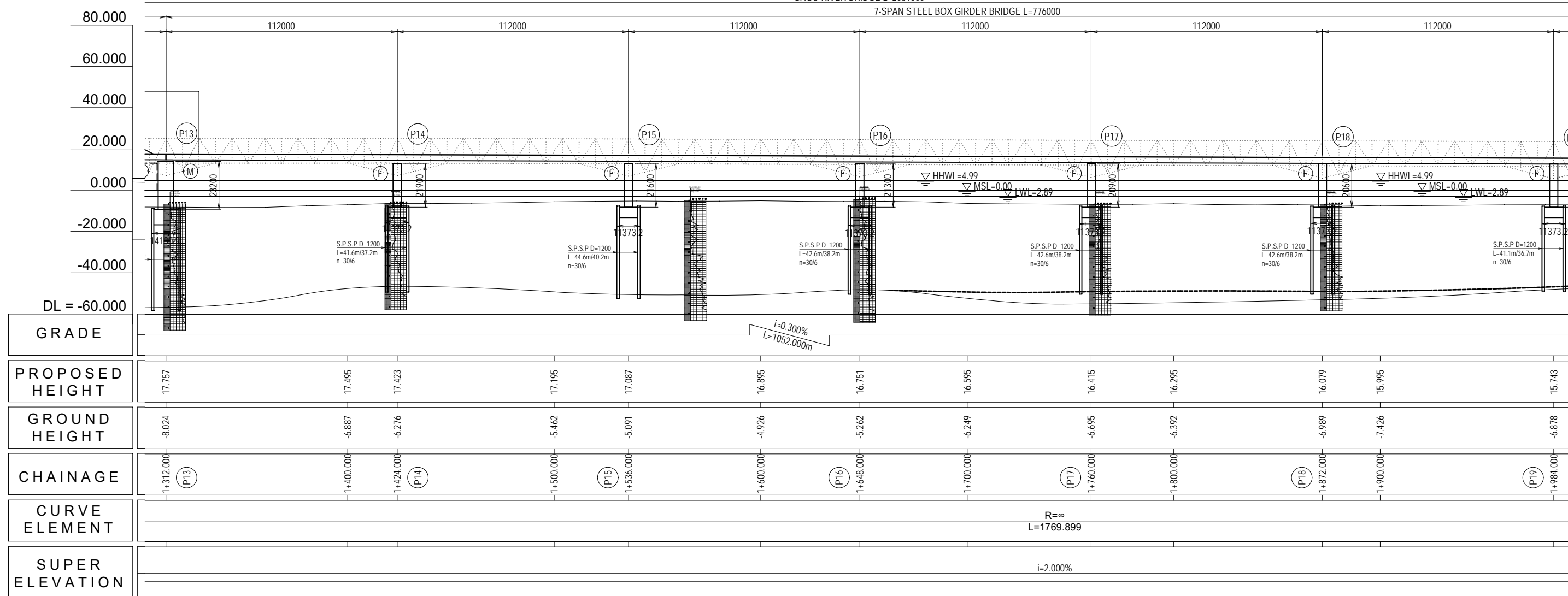
Elevation represents above MSL unless otherwise indicated.

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 GENERAL VIEW OF BAGO RIVER BRIDGE (5)	PACKAGE 2 DWG No. P2-GE-0006	
				PREPARED BY	T. HAYAKAWA				27 Nov. 2017
				CHECKED BY	T. HAYAKAWA				28 Nov. 2017
				APPROVED BY	Y. SANO				29 Nov. 2017

# GENERAL VIEW OF BAGO RIVER BRIDGE (6)

LONGITUDINAL SECTION S=1:1000

BAGO RIVER BRIDGE L=2031000  
7-SPAN STEEL BOX GIRDER BRIDGE L=776000

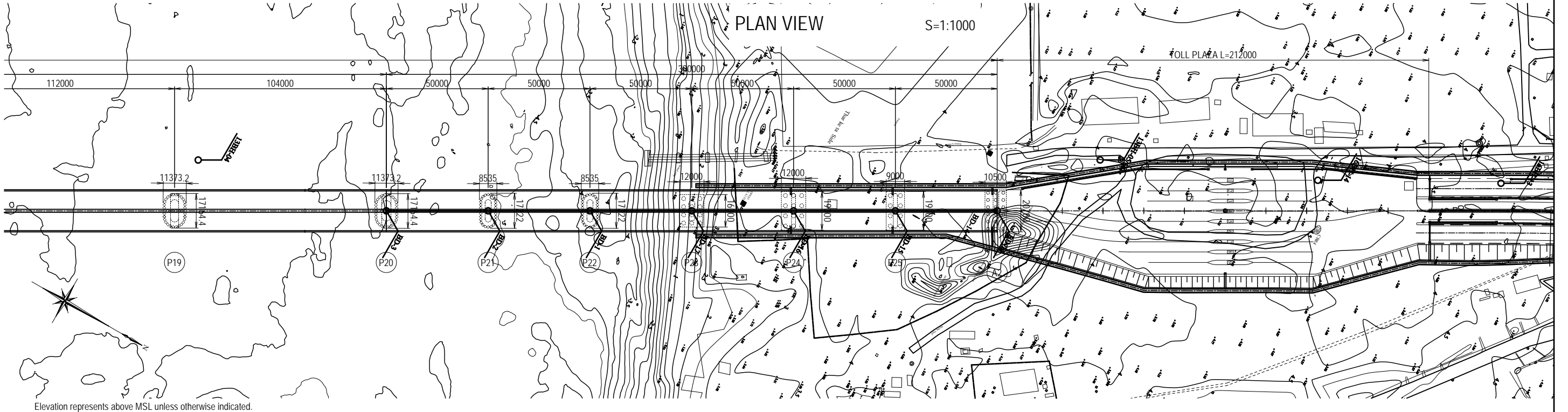
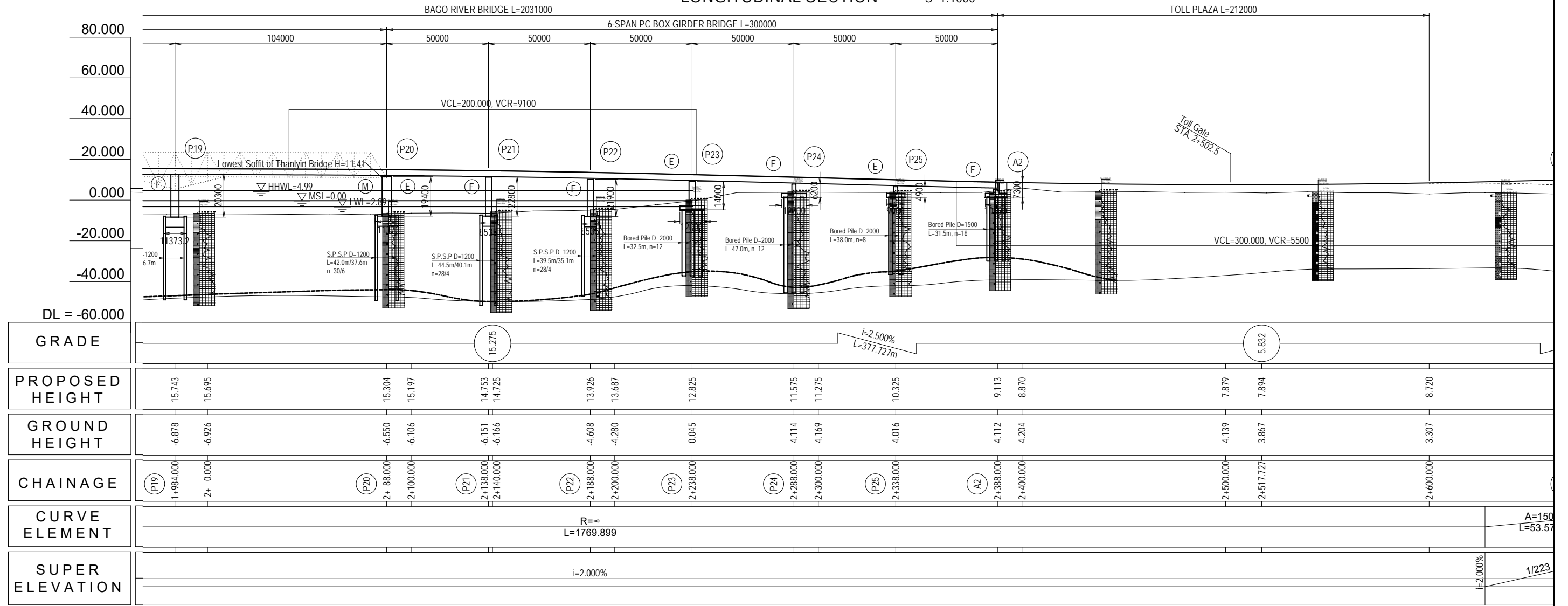


Elevation represents above MSL unless otherwise indicated.

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 GENERAL VIEW OF BAGO RIVER BRIDGE (6)	PACKAGE 2 DWG No. P2-GE-0007	
				PREPARED BY	T. HAYAKAWA				27 Nov. 2017
				CHECKED BY	T. HAYAKAWA				28 Nov. 2017
				APPROVED BY	Y. SANO				29 Nov. 2017

# GENERAL VIEW OF BAGO RIVER BRIDGE (7) LONGITUDINAL SECTION

S=1:1000



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.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>NAME</th> <th>SIGNATURE</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>27 Nov. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>28 Nov. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>29 Nov. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	T. HAYAKAWA		27 Nov. 2017	CHECKED BY	T. HAYAKAWA		28 Nov. 2017	APPROVED BY	Y. SANO		29 Nov. 2017	DRAWING TITLE GENERAL VIEW OF BAGO RIVER BRIDGE (7)	PACKAGE 2 DWG No. P2-GE-0008
	NAME	SIGNATURE	DATE																			
PREPARED BY	T. HAYAKAWA		27 Nov. 2017																			
CHECKED BY	T. HAYAKAWA		28 Nov. 2017																			
APPROVED BY	Y. SANO		29 Nov. 2017																			

Elevation represents above MSL unless otherwise indicated.

# GENERAL NOTES (ROAD DESIGN)

## 1.0 SPECIFICATIONS

- 1.1 ALL WORKS SHALL COMPLY WITH THE AASHTO STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AND WITH THE SPECIAL PROVISIONS & SUPPLEMENTAL SPECIFICATIONS PERTAINING TO THIS PROJECT.

## 2.0 DIMENSIONS

- 2.1 DISTANCES AND ELEVATIONS SHOWN ON THE PLANS ARE IN METERS (m) UNLESS OTHERWISE SPECIFIED.  
2.2 DIMENSIONS OF CULVERTS, BRIDGES AND OTHER STRUCTURES ARE MEASURED AND EXPRESSED IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

## 3.0 STATIONING

- 3.1 STATIONING OF ROAD, BRIDGE, ELEMENTS OF CURVE FOR BOTH HORIZONTAL AND VERTICAL ALIGNMENTS ARE RECKONED FROM THE ROAD CENTERLINE.  
3.2 STATION TICK MARKS ARE SHOWN AT 20m INTERVAL AND STATION LABELS AT 100m INTERVAL. STATIONS ARE SHOWN ALSO AT LOCATIONS OF HORIZONTAL AND VERTICAL GEOMETRY.

## 4.0 HORIZONTAL AND VERTICAL ALIGNMENT

- 4.1 NO ALTERATION/CHANGE IN ALIGNMENT SHALL BE MADE UNLESS EXISTING FIELD CONDITIONS SO WARRANT AND ONLY UPON APPROVAL OF THE ENGINEER.  
4.2 FINISHED GRADE ELEVATIONS SHOWN ON THE PLAN AND PROFILE SHEET REFER TO THE FINISHED GRADE LEVEL AT ROAD CENTERLINE SHOWN ON THE TYPICAL ROADWAY SECTIONS. MODIFICATIONS CAN BE DONE ON DESIGN GRADES AND ELEVATIONS ONLY UPON APPROVAL OF THE ENGINEER.  
4.3 GROUND LEVEL SHOWN ON THE PLAN AND PROFILE SHEET REFERS TO THE ELEVATION OF THE ORIGINAL GROUND ALONG THE DESIGN ROAD CENTERLINE.

## 5.0 ROAD CONNECTIONS AND SHOULDER IMPROVEMENT

- 5.1 ROAD CONNECTIONS SHALL BE CONSTRUCTED BY THE CONTRACTOR AS SHOWN ON THE PLAN OR AS DIRECTED BY THE ENGINEER IN SUCH MANNER AS TO ENSURE SMOOTH CONNECTION AND GOOD RIDING QUALITY.  
5.2 THE SHOULDER STRUCTURE IS ASPHALT CONCRETE WITH VARYING WIDTHS. THE WIDTH MAY BE ADJUSTED DURING CONSTRUCTION TO SUIT EXISTING FIELD CONDITION UPON APPROVAL OF THE ENGINEER.

## 6.0 REMOVAL OF EXISTING UTILITIES, STRUCTURES AND OBSTRUCTIONS

- 6.1 ALL WORKS SHALL COMPLY WITH THE REQUIREMENTS AND CONDITIONS OF CONTRACT OF THE MINISTRY OF CONSTRUCTION.  
6.2 EXTREME PRECAUTION SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE ANY PORTION OF EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE THEREOF SHALL BE REPAIRED OR COMPENSATED ON THE ACCOUNT OF THE CONTRACTOR.

## 7.0 DRAINAGE STRUCTURES

- 7.1 EXACT LOCATIONS, SLOPES, OUTFALLS, AND INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE CONTRACTOR BEFORE MAKING ANY REMOVAL OR IMPROVEMENT. MINOR ADJUSTMENTS MAY BE MADE TO SUIT ACTUAL FIELD CONDITIONS UPON APPROVAL OF THE ENGINEER.  
7.2 EXISTING DRAINAGE STRUCTURES THAT ARE FAULTY, BROKEN DOWN, OR NOT IN GOOD WORKING CONDITION SHALL BE DETERMINED IN THE FIELD. RECONSTRUCTION, REPAIR AND/OR REPLACEMENT OF SAME SHALL BE DIRECTED BY THE ENGINEER, AND SHALL CONFORM TO THE STANDARDS SHOWN IN THE DRAWINGS.  
7.3 EXISTING DRAINAGE STRUCTURES OR PARTS THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT AND SHALL BE DEPOSITED AT A PLACE DESIGNATED BY THE ENGINEER WITHOUT ANY EXTRA COMPENSATION. EXTREME PRECAUTIONS SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING THE REMOVAL AND HANDLING OPERATION.  
7.4 PRIOR TO INSTALLATION OF PIPE CULVERTS AND OTHER DRAINAGE STRUCTURES, ALL MATERIALS SHALL BE TESTED TO CHECK ANY DEFECT AND CONFORMITY WITH TECHNICAL SPECIFICATIONS.  
7.5 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF MATERIALS INSTALLED AND FOUND TO BE DEFICIENT IN WORKMANSHIP AND QUALITY.  
7.6 INLETS AND OUTLETS OF NEW AND OPERATIONAL EXISTING CULVERTS SHALL BE CHANNELIZED AND CLEARED OF DEBRIS AND OBSTRUCTIONS. THIS SHALL BE CONSIDERED AS SUBSIDIARY WORK OF OTHER DRAINAGE PAY ITEMS.  
7.7 ANY REVISION, REMOVAL, CLEANING, UNCLOGGING AND/OR RE-LAYING OF DRAINAGE STRUCTURES AS DIRECTED BY THE ENGINEER TO SUIT EXISTING FIELD CONDITION SHALL BE CONSIDERED AS SUBSIDIARY WORK PERTAINING TO OTHER CONTRACT ITEMS. NO DIRECT PAYMENT SHALL BE MADE FOR THIS WORK UNLESS OTHERWISE SPECIFICALLY IDENTIFIED FOR PAYMENT IN THE BID SCHEDULE.

## 8.0 OPEN DITCHES (LINED CANAL AND EARTH DITCH)

- 8.1 ALL DITCHES SHALL COMPLY WITH THE REQUIRED STANDARDS.  
8.2 INVERT ELEVATIONS AND EXACT LOCATION AND DIMENSION OF OPEN DITCHES MAYBE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

## 9.0 MISCELLANEOUS STRUCTURES

- 9.1 LOCATION AND LENGTH OF GUARDRAILS, SLOPE PROTECTIONS SUCH AS GROUTED RIPRAP, STONE MASONRY RETAINING WALLS AND OTHER STRUCTURES ARE SUBJECT TO ADJUSTMENT TO SUIT EXISTING FIELD CONDITIONS UPON APPROVAL OF THE ENGINEER.  
9.2 GROUTED RIPRAP AND/OR RIPRAP, STONE MASONRY SHOULD BE WELL CONSTRUCTED AS SPECIFIED IN THE STANDARD SPECIFICATION FOR THE SAID ITEM.  
9.3 CUT SLOPE CONSTRUCTION SHALL BE DONE AT PACE WITH EMBANKMENT CONSTRUCTION TO AVOID SLIDING OF FILL MATERIALS.

## 10.0 OTHERS

- 10.1 ALL SCHEDULES/LISTINGS FOR GUARDRAILS, SLOPE PROTECTION STRUCTURES, PAVEMENT MARKINGS, ROAD SIGNS AND ALL OTHER RELATED SCHEDULES/LISTINGS SHOWN ON THE PLANS ARE SUBJECT TO ADJUSTMENT/MODIFICATION TO SUIT ACTUAL FIELD CONDITION. THE ENGINEER MAY ORDER IN WRITING THE CONSTRUCTION/INSTALLATION OF NEW STRUCTURES/OR MISCELLANEOUS ITEMS IF IN HIS OPINION IS DEEMED NECESSARY IN ADDITION TO THE APPROVED SCHEDULES AND LISTINGS.  
10.2 ADEQUATE ROAD SIGNAGE AND SAFETY PRECAUTION SHALL BE PROVIDED TO INFORM, WARN AND ALERT MOTORISTS DURING CONSTRUCTION.

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 GENERAL NOTES (ROAD DESIGN)	PACKAGE	
				PREPARED BY	T. HAYAKAWA			15 Sep.2017	2
				CHECKED BY	T. HAYAKAWA			22 Sep.2017	DWG No.
	APPROVED BY	Y. SANO		29 Sep.2017			P2-GE-1011		

# GENERAL NOTES (STEEL BOX GIRDER BRIDGE)

## 1. GENERAL DESCRIPTION

- 1) A bridge with 4-lane road with width 3.5m/lane have been provided.
- 2) All drawings are to be read in conjunction with the technical specification.
- 3) All chainages, coordinates and elevations are shown in meter.
- 4) All dimensions are shown in millimeters.
- 5) WGS84 UTM coordinate system is applied.
- 6) Vertical control is based on the BM. 76097 established by Myanmar Survey Department.

## 2. DESIGN CODES

The structure shall be designed in accordance with Specifications for Highway Bridges of Japan Road Associations (JSHB, 2012).

## 3. DESIGN LOADS

- 1) Dead loads
- 2) Live loads  
AASHTO HL-93
- 3) Effect of temperature  
+10°C to +40°C (25°C ± 15°C)
- 4) Wind load  
W=44.7m/sec
- 5) Effect of earthquake  
Horizontal seismic coefficient K=0.30
- 6) Earth pressure
- 7) Water pressure
- 8) Buoyant Force
- 9) Collision Load

## 4. RIVER CONDITION

	Elevation	Remarks
High Water Level (H.W.L.)	MSL +4.990	100 year flood
H.W.L. for temporary work	MSL +4.340	5 year flood
Low Water Level (L.W.L.)	MSL -2.39	Designed River Bed Level
River Bed Level	P14 MSL-6.276m	
	P15 MSL-5.091m	
	P16 MSL-5.262m	
	P17 MSL-6.695m	
	P18 MSL-6.989m	
	P19 MSL-6.878m	

## 5. CONCRETE

- 1) Unless otherwise indicated the strength of concrete shall be of the following grade based on 28 days cylinder strength.

Strength (MPa)	Structural member
30	Pier head and column : P14 through P19
24	RC concrete: concrete curb, foundation of lighting pole, connection with expansion joint Footing : P14 through P19
21	Seal concrete (Bottom slab concrete, Filling inside of SPSP)

- 2) All exposed edges of concrete shall be chamfered 20x20 mm unless noted otherwise.

## 6. REINFORCEMENT

- 1) Unless otherwise indicated reinforcement bar shall be high strength deformed bar confirming to the requirement of JIS G 3112.

Class	Yield point or 0.2% proof stress (MPa)	Tensile stress (MPa)	Structural member
SD390	>>390	>>560	Pier column axial rebar :P14 through P29
SD345	>>345	>>490	Superstructure, substructure, Stud rebar

- 2) Clear cover to reinforcement as follows unless otherwise stated on the component of drawings.

Structural member	Cover (mm)
Footing, Pier	70
Pier beam	50
Concrete curb etc.	30

- 3) Minimum requirements for development length and lap length for reinforcement bar shall be comply to the JSHB. Mechanical splice shall be used for the connection of reinforcement bars 35mm of diameter or exceeded instead of lap joint.

		SD345									
Diameter		D13	D16	D19	D22	D25	D29	D32	D35	D38	
Length la (mm)	$\sigma=40\text{N/mm}^2$	330	400	480	550	630	730	800	1160		
	$\sigma=36\text{N/mm}^2$	340	420	500	580	660	760	840	1210		
	$\sigma=30\text{N/mm}^2$	370	450	530	620	700	810	890	980	1060	
	$\sigma=24\text{N/mm}^2$	410	510	600	690	790	910	1010	1100	1190	
		SD390									
	$\sigma=30\text{N/mm}^2$	420	520	610	710	800	930	1030	1120	1220	
	$\sigma=24\text{N/mm}^2$	470	580	690	790	900	1050	1150	1260	1370	

## 7. STRUCTURAL STEEL

Structural steel for steel box girder shall comply with the below, unless otherwise indicated on the drawings.

Standard	Designation(Class)	Structural Member
JIS G 3101	SS400	Fabricated steel for main girder
JIS G 3106	SM400	Ditto
	SM490Y	Ditto
	SM520	Ditto
	SM570	Ditto
	SM570	Ditto
	SM570-H	Ditto
JS G 3444	STK400	Shapes
	STK490	Shapes
*	S10T	High strength bolt for splice joints
JIS B 1186	F8T	Galvanized high strength bolt
	F10T	High strength bolt

\* Applied to Technical Specification

## 8. STEEL PIPE SHEET PILE

- 1) Unless otherwise indicated steel pipe sheet pile shall be confirming to the requirement of JIS A 5530 or JIS G 3444.

Class	Yield point or proof stress (MPa)	Tensile stress (MPa)	Structural member
SKY490	>>315	>>490	Steel pipe sheet pile
SKY400	>>235	>>400	Steel pipe sheet pile
STK400	>>235	>>400	Joint pipe for steel pipe sheet pile

## 9. OTHER STRUCTURE

- 1) Bearings and Anchor bars shall satisfy the requirement of the force and displacement stated on the Drawings.
- 2) Expansion joint shall satisfy the requirement of the displacement stated on the Drawings.

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		15 Jun.2017	GENERAL NOTES (STEEL BOX GIRDER BRIDGE)	2
				CHECKED BY T. HAYAKAWA		20 Jun.2017		DWG No.
				APPROVED BY Y. SANO		21 Jun.2017		P2-GE-1021



# GENERAL NOTES (PC BOX GIRDER BRIDGE)

## 1. GENERAL DESCRIPTION

- 1) A bridge with 4-lane road with width 3.5m/lane have been provided.
- 2) All drawings are to be read in conjunction with the technical specification.
- 3) All chainages, coordinates and elevations are shown in meter.
- 4) All dimensions are shown in millimeters.
- 5) WGS84 UTM coordinate system is applied.
- 6) Vertical control is based on the BM. 76097 established by Myanmar Survey Department.
- 7) Dimensions shown in the drawing are ones after the period of calculation of creep and/or shrinkage.

## 2. DESIGN CODES

The structure shall be designed in accordance with Specifications for Highway Bridges of Japan Road Associations (JSHB, 2012).

## 3. DESIGN LOADS

- 1) Dead loads
- 2) Live loads  
AASHTO HL-93
- 3) Shrinkage and creep
- 4) Effect of temperature  
+10°C to +40°C (25°C ± 15°C)
- 5) Wind load  
W=44.7m/sec
- 6) Effect of earthquake  
Horizontal seismic coefficient K=0.30
- 7) Earth pressure
- 8) Water pressure
- 9) Buoyant Force

## 4. RIVER CONDITION

	Elevation	Remarks
High Water Level (H.W.L.)	MSL +4.990	100 year flood
H.W.L. for temporary work	MSL +4.340	5 year flood
Low Water Level (L.W.L.)	MSL -2.39	Designed River Bed Level
River Bed Level	A1 N/A	
	A2 side or P20~P22 MSL -7.490	

## 5. CONCRETE

- 1) Unless otherwise indicated the strength of concrete shall be of the following grade based on 28 days cylinder strength.

Strength (MPa)	Structural member
50	Precast segment & CIP portion for PC box girder
40	Main girder for PC-I GIRDER
30	RC CIP slab, crossbeam and connection for PC-I girder Pier head and column : P4 through P23 Cast-In-Place RC pile
24	RC concrete: general, wheel guard.... Abutment A1 , A2 and AO1 Pier for P1 to P3,P24,P25,PO1 to PO3 Footing : P4 through P23
21	Seal concrete (Bottom slab concrete, Filling inside of SPSP)
18	Blinding concrete, etc

- 2) Grouting mortar with  $f_{Dck} = 45\text{MPa}$  is used .
- 3) All exposed edges of concrete shall be chamfered 20x20 mm unless noted otherwise.

## 6. REINFORCEMENT

- 1) Unless otherwise indicated reinforcement bar shall be high strength deformed bar confirming to the requirement of JIS G 3112.

Class	Yield point or 0.2% proof stress (MPa)	Tensile stress (MPa)	Structural member
SD390	>>390	>>560	Pier column axial rebar :P4 through P23
SD345	>>345	>>490	Superstructure, substructure, Stud rebar
SD295	>>295	>>440	Accessories (saddle)

- 2) Clear cover to reinforcement as follows unless otherwise stated on the component of drawings.

Structural member	Cover (mm)
Cast in situ pile	120
Pile cap	70
Pier, abutment and approach slab	70
Pier beam	50
Main girder	35
Slab, wheel guard	30

- 3) Minimum requirements for development length and lap length for reinforcement bar shall be comply to the JSHB. Mechanical splice shall be used for the connection of reinforcement bars 35mm of diameter or exceeded instead of lap joint.

		SD345									
Diameter		D13	D16	D19	D22	D25	D29	D32	D35	D38	
Length la (mm)	$\sigma = 40\text{N/mm}^2$	330	400	480	550	630	730	800	1160		
	$\sigma = 36\text{N/mm}^2$	340	420	500	580	660	760	840	1210		
	$\sigma = 30\text{N/mm}^2$	370	450	530	620	700	810	890	980	1060	
	$\sigma = 24\text{N/mm}^2$	410	510	600	690	790	910	1010	1100	1190	
		SD390									
Length la (mm)	$\sigma = 30\text{N/mm}^2$	420	520	610	710	800	930	1030	1120	1220	
	$\sigma = 24\text{N/mm}^2$	470	580	690	790	900	1050	1150	1260	1370	

## 7. PRESTRESSING STEEL

- 1) Unless otherwise indicated prestressing steel shall be low relaxation strand confirming to the requirement of JIS G 3536 or JIS G 3109.

Class	Grade	Structural member
19S15.2mm ECF strand	SWPR7BL	External tendon for PC box girder
12S15.2mm strand	SWPR7BL	Internal tendon for PC box girder(longitudinal)
3S12.7mm strand	SWPR7BL	Internal tendon for PC box girder(transverse)
4S15.2mm strand	SWPR7BL	Internal tendon for PC box girder(crossbeam)
$\phi 32$ bar	SWPR930/1080	Internal tendon for PC box girder(crossbeam)
12S12.7mm strand	SWPR7BL	Internal tendon for PC-I girder(longitudinal)
1S19.3mm strand	SWPR7A	Internal tendon for precast PC panel of PC -I girder
$\phi 32$ bar	SWPR930/1080	Internal tendon for PC-I girder(crossbeam)

## 8. STEEL PIPE SHEET PILE

- 1) Unless otherwise indicated steel pipe sheet pile shall be confirming to the requirement of JIS A 5530 or JIS G 3444.

Class	Yield point or proof stress (MPa)	Tensile stress (MPa)	Structural member
SKY490	>>315	>>490	Steel pipe sheet pile
SKY400	>>235	>>400	Steel pipe sheet pile
STK400	>>235	>>400	Joint pipe for steel pipe sheet pile

## 9. OTHER STRUCTURE

- 1) Bearings and Anchor bars shall satisfy the requirement of the force and displacement stated on the Drawings.
- 2) Expansion joint shall satisfy the requirement of the displacement stated on the Drawings.















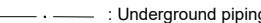

Note : This general notes is not applicable to the following structures;

- Cable stayed bridge
- Piers P10 through P13

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 GENERAL NOTES (PC BOX GIRDER BRIDGE)	PACKAGE	
				PREPARED BY	M. OHYAMA			15 Jun.2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun.2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun.2017	P2-GE-1031

# GENERAL NOTES (LIGHTING)

## LEGEND



























-  : Concrete pole
-  : Steel pole
-  : Traffic signal controller
-  : Vehicle traffic signal
-  : Arrow sign traffic signal
-  : Pedestrian signal
-  : Push-button switch
-  : Junction box
-  : Power supply box
-  : Pull box
-  : Hand hole
-  : Raising underground pipe
-  : Base mounted pole signal head pole (with arm)
-  : Pedestrian signal head pole (with push-button)
-  : Underground piping
-  : Underground wiring
- SVV : Control -use vinyl insulated vinyl sheathed cable
- IV : Indoor PVC
- E : Grounding
- G : Vehicle traffic signal : Green light
- Y : Vehicle traffic signal : Yellow light
- R : Vehicle traffic signal : Red light
- A : Arrow traffic signal : Green light
- PG : Pedestrian signal lamp : Green light
- PR : Pedestrian signal lamp : Red light
- COM : Common for all indication





## GENERAL NOTES

1. THE ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT SUPERVISION OF THE DUTY REGISTERED ELECTRICAL ENGINEER.
2. THE CONTRACTOR SHALL SECURE ALL PERMITS AND PAY ALL FEES REQUIRED FOR ELECTRICAL INSTALLATION WORKS AND FURNISH THE OWNER, THROUGH THE ENGINEER, THE FINAL CERTIFICATE OF ELECTRICAL INSPECTION AND APPROVAL FROM PROPER GOVERNMENT AUTHORITIES FOR THE COMPLETE ELECTRICAL WORKS.
3. ALL ELECTRICAL MATERIALS TO BE USED SHALL BE BRAND NEW AND APPROVED TYPES.
4. ALL UNDERGROUND CONDUIT PIPES AND CONDUIT RUN EMBEDDED IN CONCRETE SHALL BE HIGH-DENSITY POLYETHYLENE (HDPE)..
5. UNPROTECTED CONDUIT RISERS AND EXPOSED CONDUIT SHALL BE GAS PIPE(GP).
6. ALL CONDUIT RUN SHALL BE PROVIDED WITH A 14mm<sup>2</sup> BARE COPPER GROUND WIRE AND SHALL BE TERMINATED AT MAIN DISTRIBUTION PANEL BOARD, ALL EQUIPMENT, METALLIC PARTS AND SURFACES SHALL BE EFFECTIVELY GROUNDED.
7. ALL STREET LUMINAIRE ASSEMBLIES INCLUDING POLES SHALL WITHSTAND UP TO 180 KpH GUSTING WINDS WITHOUT PERMANENT DEFORMATION.
8. THE ELECTRICAL SERVICE VOLTAGE FOR THAKETA SIDE SHALL BE 11KV/240V SECONDARY, 3-PHASE 4 WIRE, 50 HERTZ AC.
9. THE ELECTRICAL SERVICE VOLTAGE FOR THANLYIN SIDE SHALL BE 6.6KV/240V SECONDARY, 3-PHASE 4 WIRE, 50 HERTZ AC.
10. THE CONTRACTOR SHALL EXERCISE EXTREME CARE IN REMOVING EXISTING INSTALLATIONS, APPROPRIATE TOOLS AND EQUIPMENT SHALL BE UTILIZED TO MINIMIZED DAMAGE.
11. ALL FEEDER LINES AND BRANCH CIRCUITS SHALL BE INSTALLED AS INDICATED ON PLANS, INDIVIDUAL FEEDER AND BRANCH CIRCUIT AND HOMERUNS SHALL NOT BE COMBINED IN THE SAME RACEWAY UNLESS SPECIFIED.
12. LOCATIONS OF ELECTRICAL EQUIPMENT AND DEVICES INCLUDING CONDUIT ROUTINGS SHOWN IN THE DRAWINGS ARE APPROXIMATE LOCATION ONLY. CONTRACTOR SHALL ALLOW FOR NECESSARY FIELD ADJUSTMENTS TO SUIT ACTUAL CONDITION AT SITE.
13. SUBMIT COMPLETE TECHNICAL TECHNICAL SPECIFICATIONS OF MATERIALS/EQUIPMENTS AND SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER PRIOR TO START OF INSTALLATION.

## ABBREVIATIONS:

- A : AMPERE
- AC : ALTERNATING CURRENT
- AF : AMPERE FRAME
- AT : AMPERE TRIP
- BCW : BARE COPPER WIRE
- C : CONDUIT
- CB : CIRCUIT BREAKER
- CHH : COMMUNICATION HANDHOLE
- CT : CURRENT TRANSFORMER
- DF : DEMAND FACTOR
- DIA : DIAMETER
- ECB : ENCLOSED CIRCUIT BREAKER
- EHH : ELECTRICAL HANDHOLE
- EL : ELEVATION
- (GND) : GROUND
- ATS : AUTOMATIC TRANSFER SWICH
- HID : HIGH INTENSITY DISCHARGE LAMP
- HZ : HERTZ
- IMC : INTERMEDIATE METAL CONDUIT
- IND'L : INDUSTRIAL
- KVA : KILOVOLT AMPERE
- KW : KILOWATT
- KWHR : KILOWATT HOUR
- KAIC : KILOAMPERE INTERRUPTIG CAPACITY
- LED : LIGHT EMITTING DIODE
- LP : LIGHTING PANEL BOARD
- LTG : LIGHTING
- MDP : MAIN DISTRIBUTION PANEL BOARD
- MTD : MOUNTED
- P,Ø : POLE, PHASE
- PVC : POLYVINYL CHLORIDE
- uPVC : UNPLASTICIZED POLYVINYL CHLORIDE
- ROW : RIGHT OF WAY
- STA : STATION
- SDBC : SOFT DRAWN BARE COPPER WIRE
- TW : THERMOPLASTIC MOISTURE RESISTANT
- TYP : TYPICAL
- THW : THERMOPLASTIC HEAT AND MOISTURE RESISTANT
- V : VOLT / VOLTAGE
- VA : VOLT - AMPERE
- W : WATT
- XLPE : CORSS-LINKED POLYETHYLENE INSULATED CABLES
- TEI : TARLAC ELECTRIC INCORPORATED

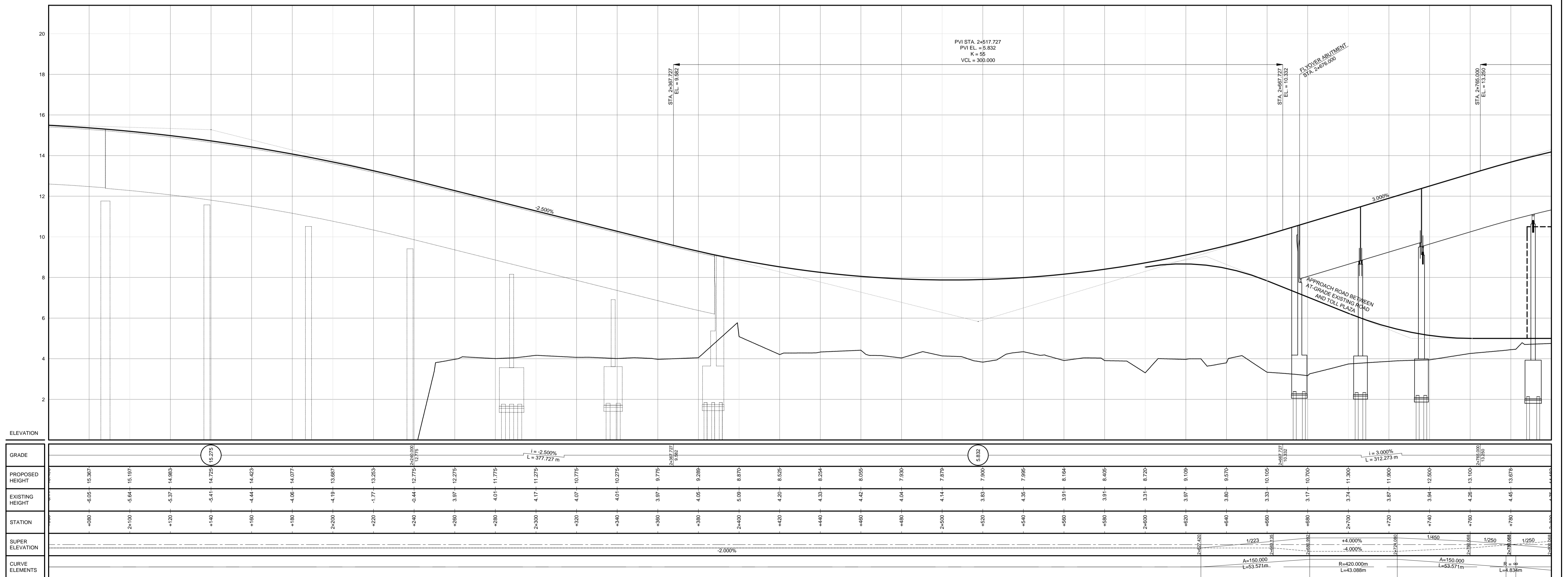
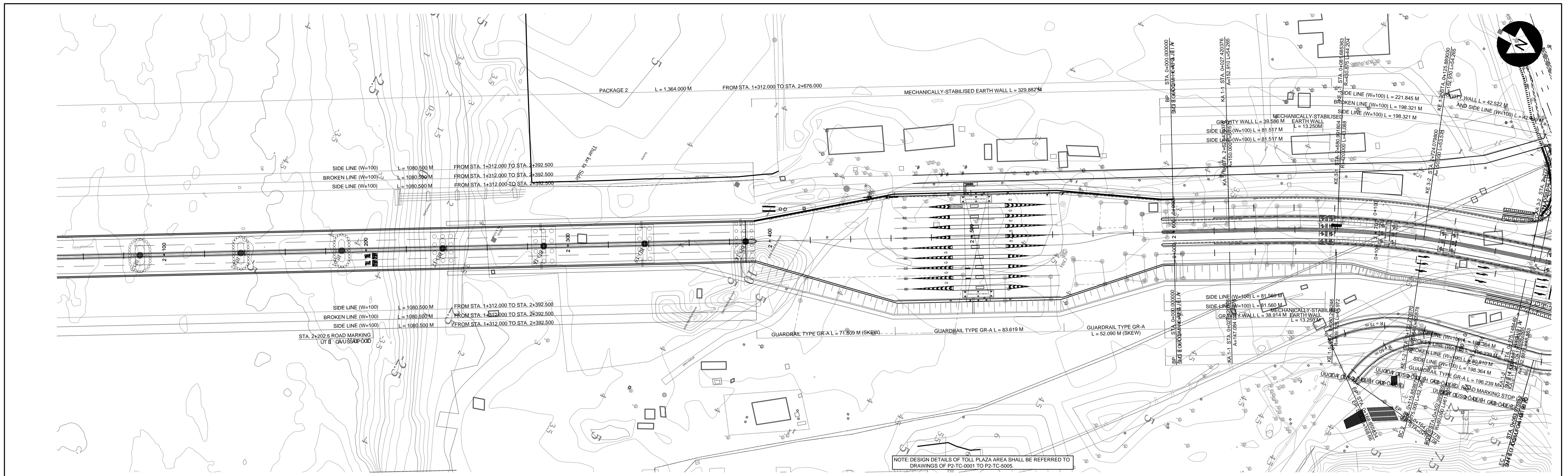
-  : MOLD-CASE CIRCUIT BREAKER
-  : AMPERE TRIPPING
-  : GROUNDING
-  : CONTACTOR
-  : VOLTMETER CHANGE OVER SWITCH
-  : AMMETER CHANGOVER SWITCH
-  : CURRENT TRANSFORMER
-  : DIESEL ENGINE
-  : GENERATOR
-  : EXITER
-  : AMPERE METER
-  : VOLTAGE METER
-  : FREQUENCY METER
-  : BATTERY
-  : AUTOMATIC VOLTAGE LEGULATOR
-  : LOW VOLTAGE RELAY
-  : OVER VOLTAGE
-  : OVERCURRENT RELAY
-  : LIGHTING PANEL
-  : KILOWATT HR.METER
-  : POWER TRANSFORMER
-  : PRIMARY CUTOUT (PE) WITH POWER FUSE (PF)
-  : LIGHTING ARRESTER (LA)
-  : CURRENT FUSE
-  : MAIN DISTRIBUTION PANEL
-  : POWER FUSE

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 T. HAYAKAWA T. HAYAKAWA Y. SANO	SIGNATURE   	DATE 15 Sep.2017 22 Sep.2017 29 Sep.2017	DRAWING TITLE <b>GENERAL NOTES (LIGHTING)</b>	PACKAGE 2 DWG No. P2-GE-1041
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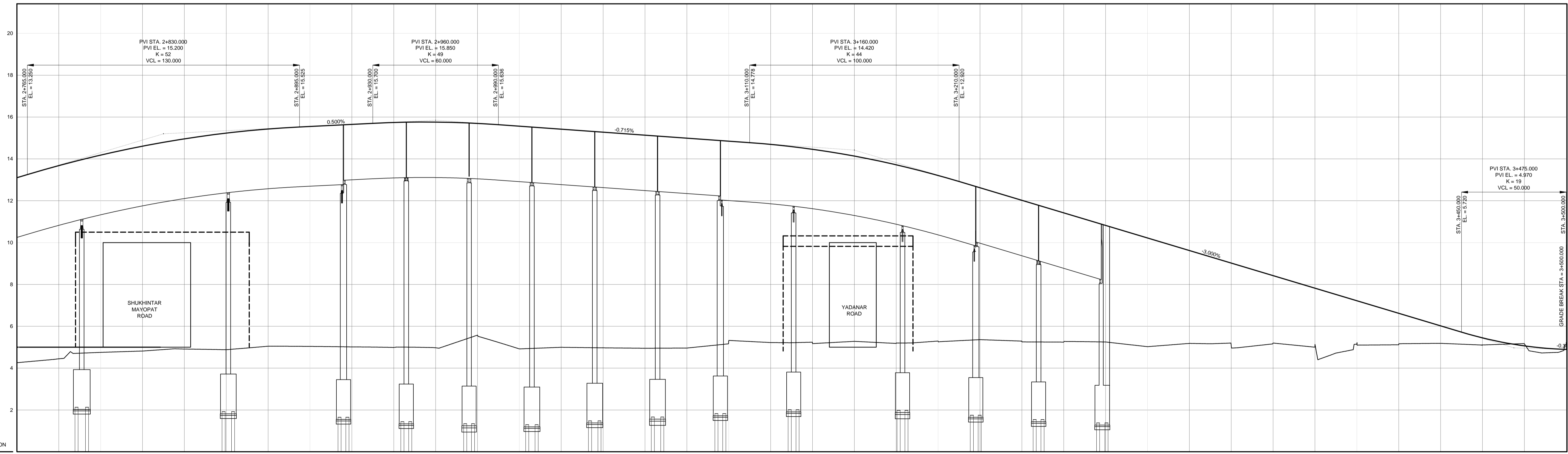
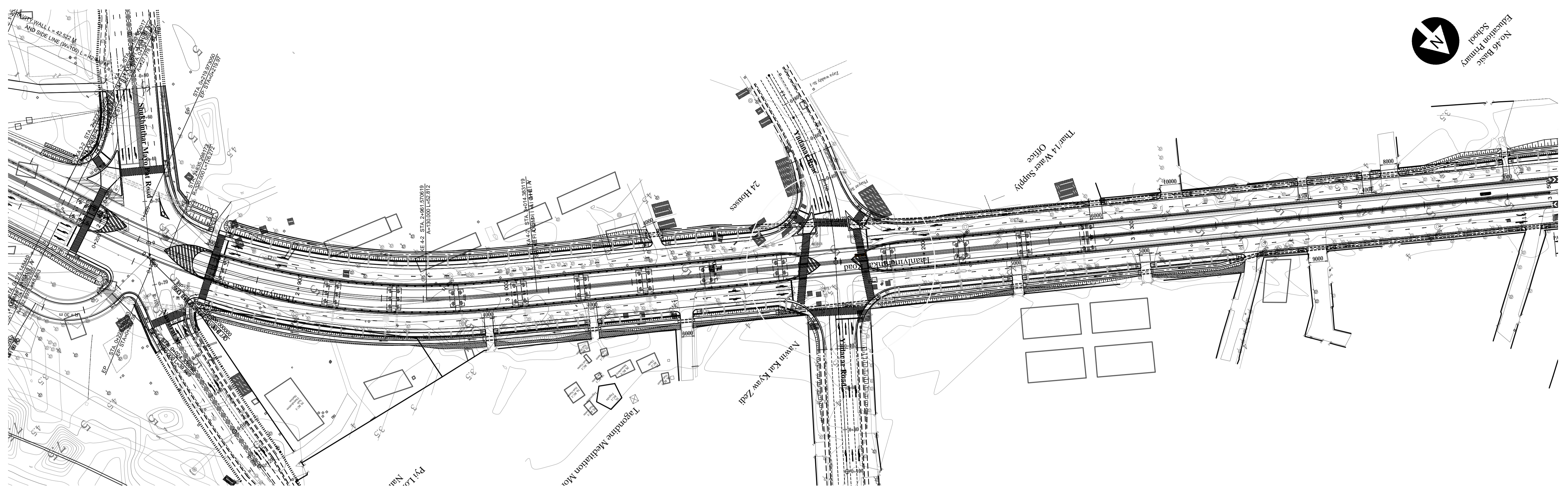


## **B. ROAD DESIGN**

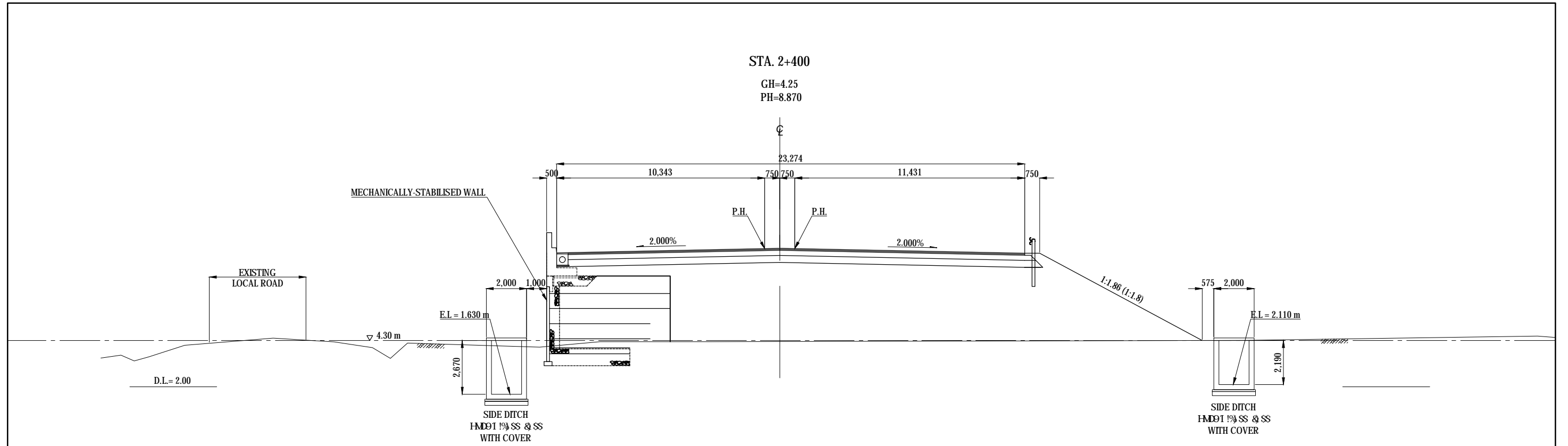




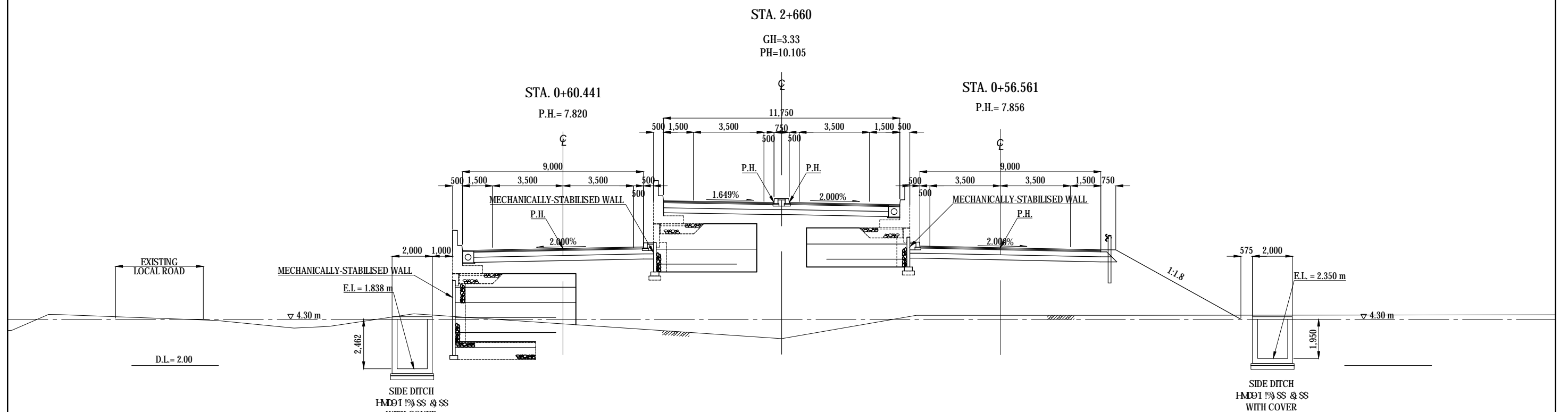
PROJECT NAME <b>DETAILED DESIGN ON          BAGO RIVER BRIDGE          CONSTRUCTION PROJECT</b>	FINANCED BY <b>JAPAN INTERNATIONAL          COOPERATION AGENCY</b>	COUNTERPART <b>REPUBLIC OF THE UNION OF MYANMAR          MINISTRY OF CONSTRUCTION          DEPARTMENT OF BRIDGE</b>	JICA STUDY TEAM <b>NIPPON KOEI CO., LTD.          ORIENTAL CONSULTANTS GLOBAL CO., LTD.          METROPOLITAN EXPRESSWAY COMPANY LIMITED          CHODAI CO., LTD.          NIPPON ENGINEERING CONSULTANTS CO., LTD.</b>	NAME	SIGNATURE	DATE	DRAWING TITLE <b>PLAN AND PROFILE (2/3)</b>	PACKAGE <b>2</b> DWG No. <b>P2-RD-0110</b>	
				PREPARED BY	E. YOKOTA				15 JUNE 2017
				CHECKED BY	T. HAYAKAWA				20 JUNE 2017
				APPROVED BY	Y. SANO		21 JUNE 2017		



STATION	GRADE	PROPOSED HEIGHT	EXISTING HEIGHT	SUPER ELEVATION	CURVE ELEMENTS
2+785.000	13.250			1/250	R=∞ L=4.834m
2+800.000	13.676	4.45	4.45	1/250	A=130.000 L=52.812m
2+830.000	14.182	4.75	4.75	1/220	R=320.000m L=126.272m
2+860.000	14.609	4.82	4.82	1/220	
2+890.000	15.059	4.91	4.91	1/220	
2+920.000	15.550	4.98	4.98	1/220	
2+950.000	15.950	5.05	5.05	1/220	
2+980.000	16.400	5.04	5.04	1/220	
3+010.000	16.850	5.01	5.01	1/220	
3+040.000	17.300	4.99	4.99	1/220	
3+070.000	17.750	4.97	4.97	1/220	
3+100.000	18.200	5.08	5.08	1/220	
3+130.000	18.650	4.92	4.92	1/220	
3+160.000	19.100	5.00	5.00	1/220	
3+190.000	19.550	4.97	4.97	1/220	
3+220.000	20.000	4.95	4.95	1/220	
3+250.000	20.450	5.22	5.22	1/220	
3+280.000	20.900	5.18	5.18	1/220	
3+310.000	21.350	5.28	5.28	1/220	
3+340.000	21.800	5.21	5.21	1/220	
3+370.000	22.250	5.20	5.20	1/220	
3+400.000	22.700	5.36	5.36	1/220	
3+430.000	23.150	5.25	5.25	1/220	
3+460.000	23.600	5.24	5.24	1/220	
3+490.000	24.050	5.25	5.25	1/220	
3+520.000	24.500	5.02	5.02	1/220	
3+550.000	24.950	5.16	5.16	1/220	
3+580.000	25.400	5.06	5.06	1/220	
3+610.000	25.850	5.20	5.20	1/220	
3+640.000	26.300	5.13	5.13	1/220	
3+670.000	26.750	5.15	5.15	1/220	
3+700.000	27.200	5.12	5.12	1/220	
3+730.000	27.650	5.18	5.18	1/220	
3+760.000	28.100	5.11	5.11	1/220	
3+790.000	28.550	5.16	5.16	1/220	
3+820.000	29.000	5.00	5.00	1/220	
3+850.000	29.450	4.86	4.86	1/220	



TRANSITION SECTION BETWEEN BAGO RIVER BRIDGE AND TOLL PLAZA WITH MECHANICALLY-STABILISED WALL AT THE LEFT SIDE



EMBANKMENT SECTION BETWEEN THE TOLL PLAZA AND FLYOVER WITH THE APPLICATION OF MECHANICALLY-STABILISED WALL

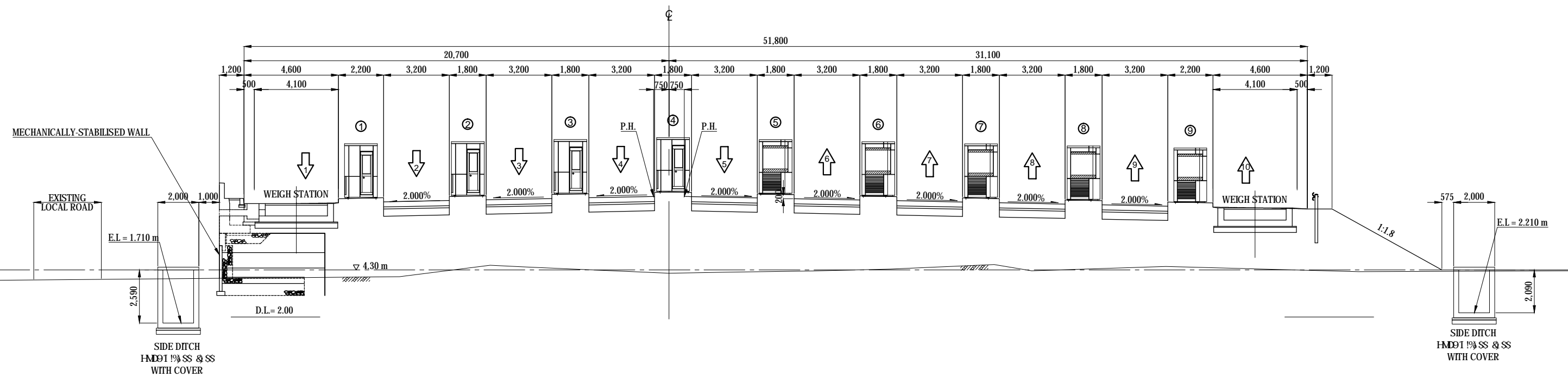
NOTE: ELEVATION IS BASED ON MSL (MEAN SEA LEVEL).  
ELEVATION OF 4.30 M SHOWN IN THE DRAWING IS THE PROPOSED HEIGHT OF CONSTRUCTION YARD.

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 TYPICAL CROSS SECTION (1/2)	PACKAGE	
				PREPARED BY	E. YOKOTA			15 JUNE 2017	2
				CHECKED BY	T. HAYAKAWA			20 JUNE 2017	DWG No.
				APPROVED BY	Y. SANO			21 JUNE 2017	P2-RD-0200



STA. 2+500

GH=4.14  
PH=7.879



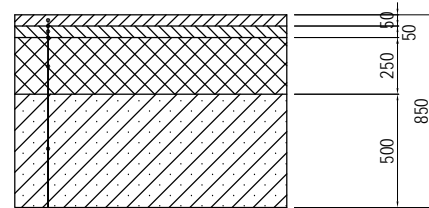
TOLLBOOTH SECTION WITH MECHANICALLY-STABILISED WALL AT THE LEFT SIDE S = 1:200

NOTE: ELEVATION IS BASED ON MSL (MEAN SEA LEVEL).  
ELEVATION OF 4.30 M SHOWN IN THE DRAWING IS THE PROPOSED HEIGHT OF CONSTRUCTION YARD.

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 TYPICAL CROSS SECTION (2/2)	PACKAGE	
				PREPARED BY	E. YOKOTA			15 JUNE 2017	2
				CHECKED BY	T. HAYAKAWA			20 JUNE 2017	DWG No.
				APPROVED BY	Y. SANO			21 JUNE 2017	P2-RD-0210

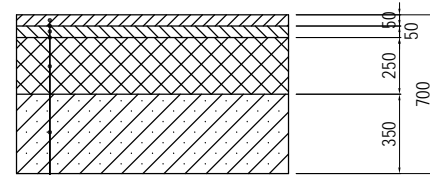
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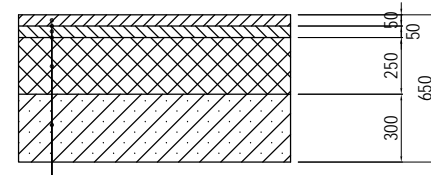
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TACK COAT 0.4 l/m<sup>2</sup>  
AC SURFACE BASE (t=50mm)  
PRIME COAT 0.4 l/m<sup>2</sup>  
BASE COURSE (t=250mm)  
SUB BASE (t=500mm)

Type E2



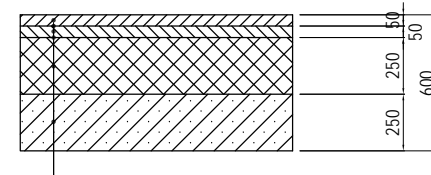
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SUB BASE (t=350mm)

Type E3



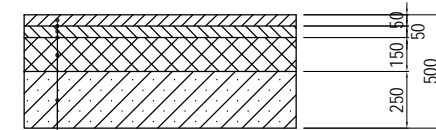
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PRIME COAT 0.4 l/m<sup>2</sup>  
BASE COURSE (t=250mm)  
SUB BASE (t=300mm)

Type E4



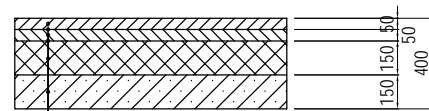
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SUB BASE (t=250mm)

Type E5



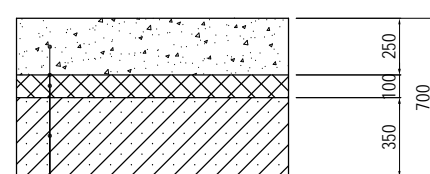
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TACK COAT 0.4 l/m<sup>2</sup>  
AC SURFACE BASE (t=50mm)  
PRIME COAT 0.4 l/m<sup>2</sup>  
BASE COURSE (t=150mm)  
SUB BASE (t=250mm)

Type E6



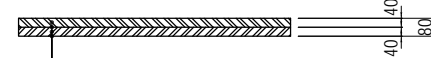
AC SURFACE COURSE (t=50mm)  
TACK COAT 0.4 l/m<sup>2</sup>  
AC SURFACE BASE (t=50mm)  
PRIME COAT 0.4 l/m<sup>2</sup>  
BASE COURSE (t=150mm)  
SUB BASE (t=150mm)

Type C



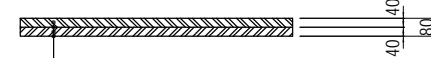
CONCRETE (t=250mm)  
PRIME COAT 0.4 l/m<sup>2</sup>  
BASE COURSE (t=100mm)  
SUB BASE (t=350mm)

Type B1  
(FOR CONCRETE DECK)



AC SURFACE COURSE (t=40mm)  
TACK COAT 0.4 l/m<sup>2</sup>  
AC SURFACE BASE (t=40mm)  
WATERPROOFING  
BONDING COAT

Type B2  
(FOR STEEL DECK)



POLYMER-MODIFIED ASPHALT II (t=40mm)  
TACK COAT 0.4 l/m<sup>2</sup>  
POLYMER-MODIFIED ASPHALT III-WF (t=40mm)  
WATERPROOFING  
BONDING COAT

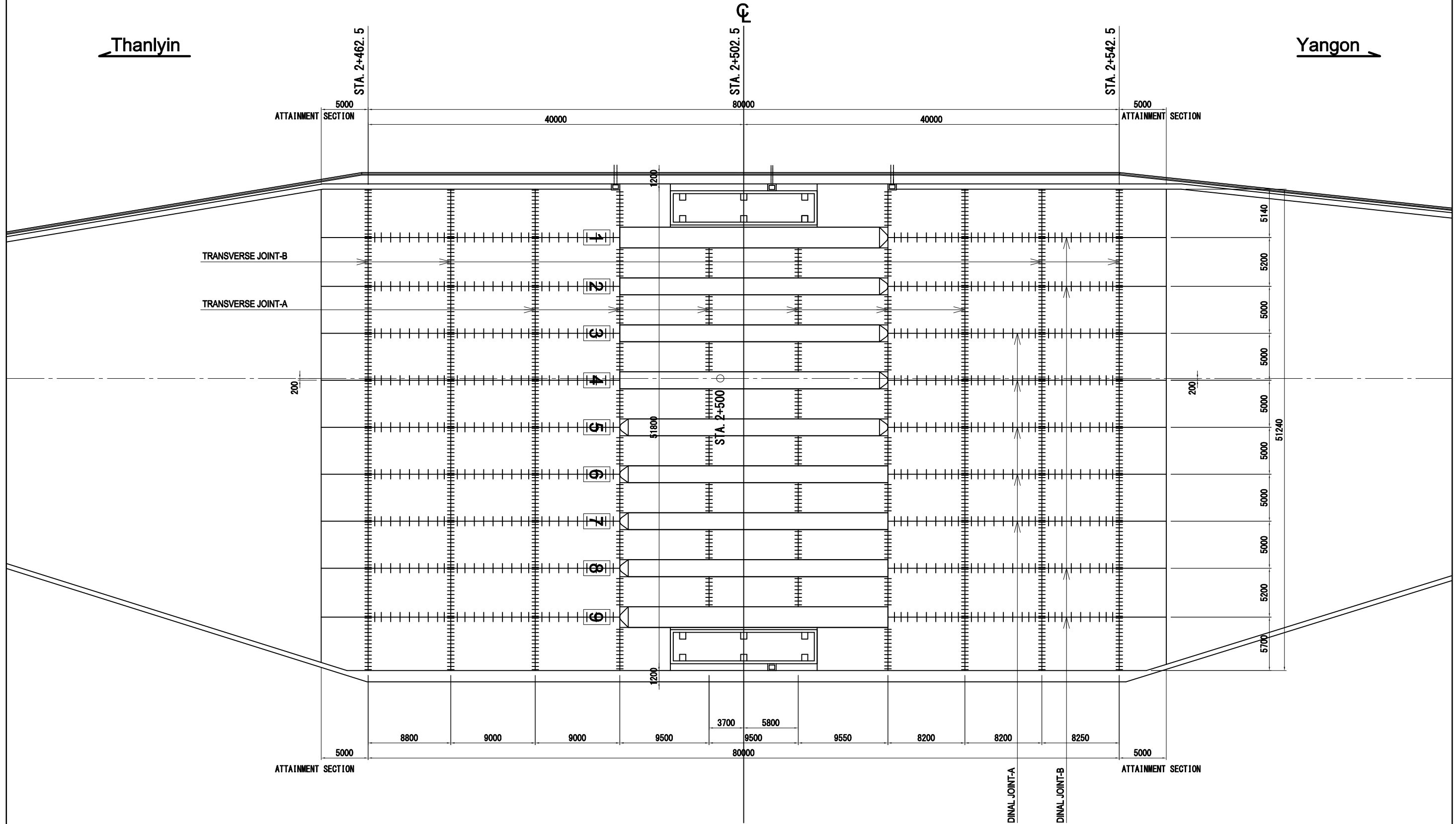
Side Walk



PRECAST CONCRETE PAVING BLOCK (300x300mm x t=60mm)  
SAND (t=30mm)  
SOIL AGGREGATE: C-30 (t=100mm)

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 PAVEMENT LAYER	PACKAGE	
				PREPARED BY	J.TSUCHIYA			15 Jun. 2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun. 2017	P2-RD-0300

# DETAIL OF CEMENT CONCRETE PAVEMENT(1) 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.

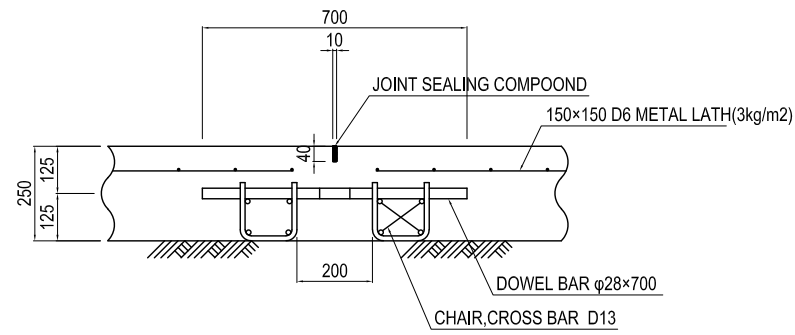
	NAME	SIGNATURE	DATE
PREPARED BY	J.TSUCHIYA		15 Jun. 2017
CHECKED BY	T. HAYAKAWA		20 Jun. 2017
APPROVED BY	Y. SANO		21 Jun. 2017

DRAWING TITLE  
 DETAIL OF CEMENT CONCRETE PAVEMENT(1)

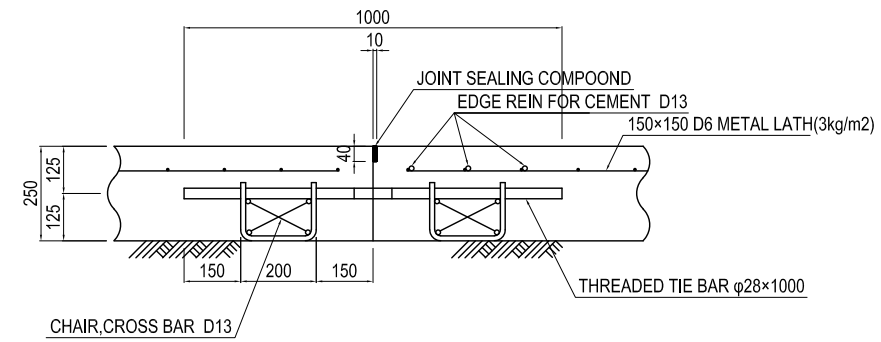
PACKAGE  
 2  
 DWG No.  
 P2-RD-0310

# DETAIL OF CEMENT CONCRETE PAVEMENT(2) S=1:20

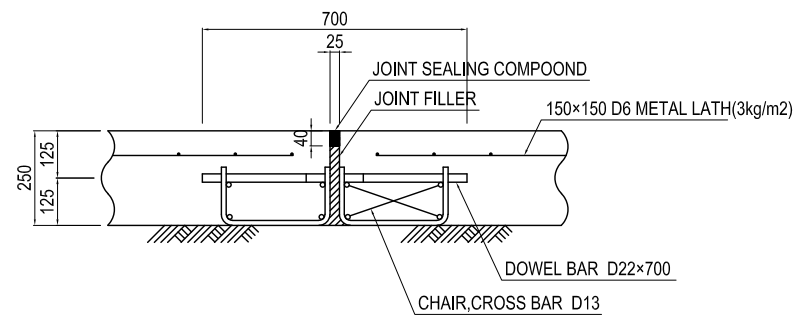
### TRANSVERSE JOINT-A



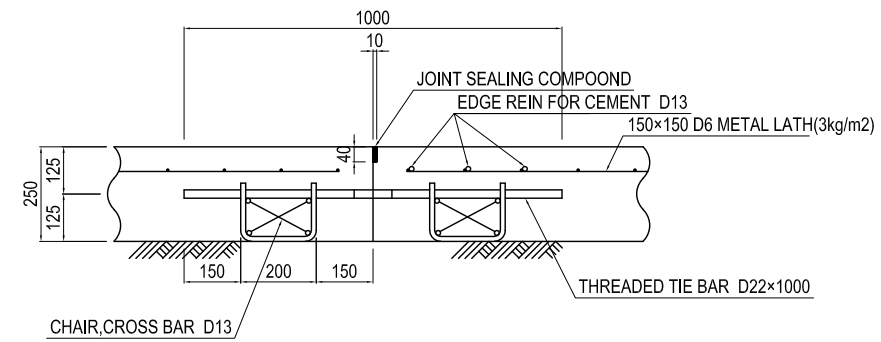
### LONGITUDINAL JOINT-A



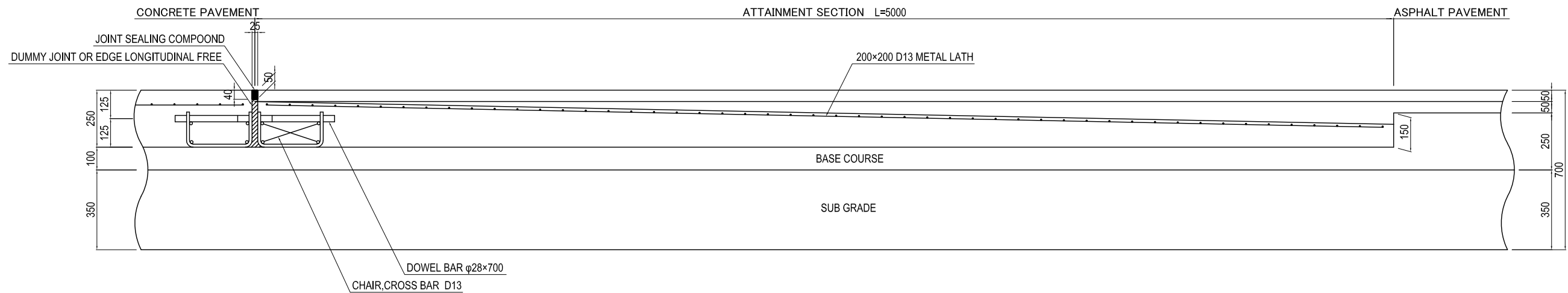
### TRANSVERSE JOINT-B



### LONGITUDINAL JOINT-B

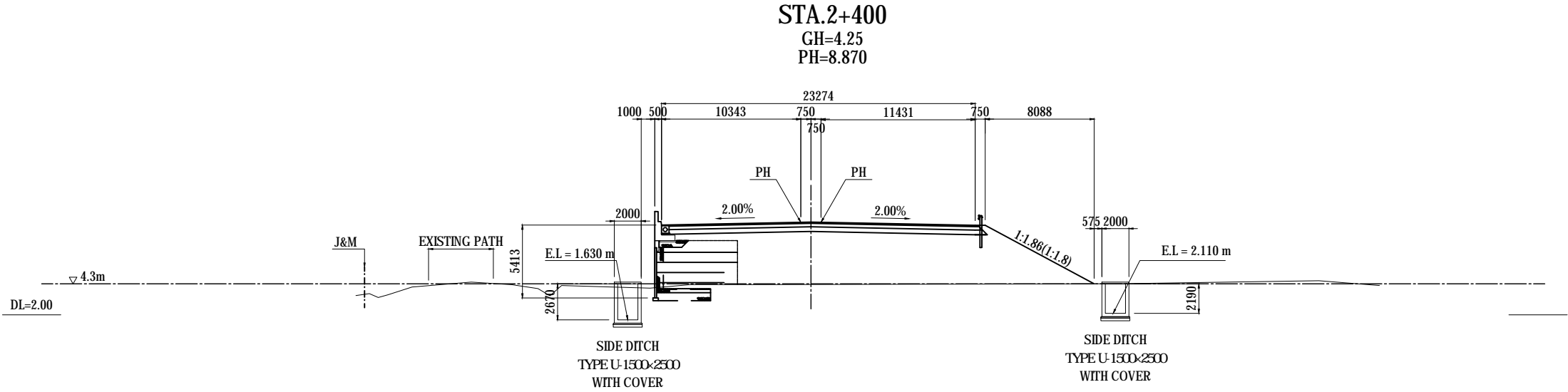
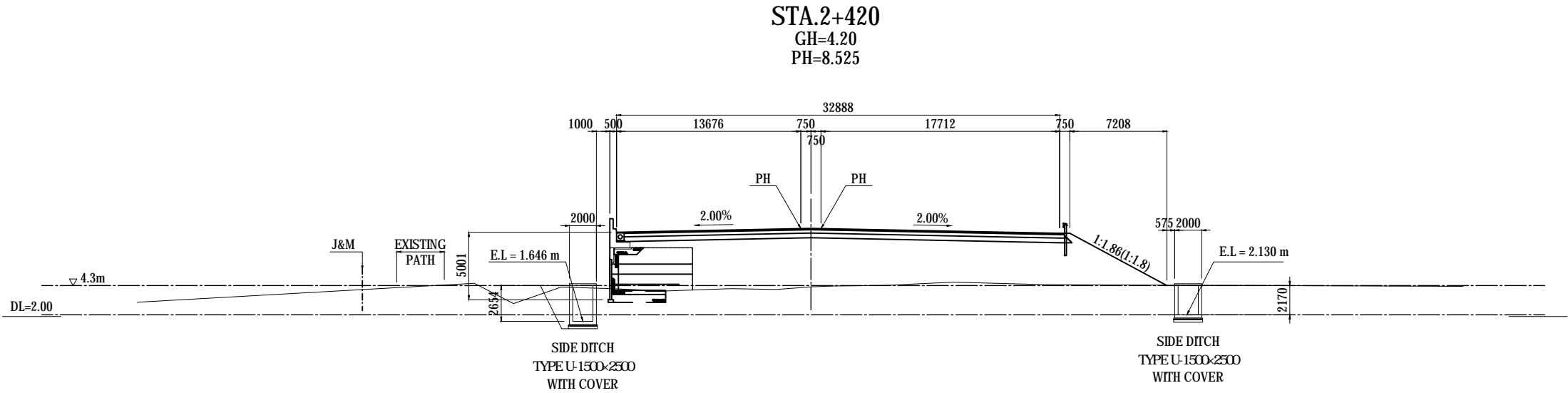


### ATTAINMENT SECTION



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.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">NAME</th> <th style="width: 15%;">SIGNATURE</th> <th style="width: 15%;">DATE</th> </tr> <tr> <td>PREPARED BY</td> <td>J.TSUCHIYA</td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td>21 Jun. 2017</td> </tr> </table>	NAME	SIGNATURE	DATE	PREPARED BY	J.TSUCHIYA	15 Jun. 2017	CHECKED BY	T. HAYAKAWA	20 Jun. 2017	APPROVED BY	Y. SANO	21 Jun. 2017	DRAWING TITLE DETAIL OF CEMENT CONCRETE PAVEMENT(2)	PACKAGE 2 DWG No. P2-RD-0320
NAME	SIGNATURE	DATE																
PREPARED BY	J.TSUCHIYA	15 Jun. 2017																
CHECKED BY	T. HAYAKAWA	20 Jun. 2017																
APPROVED BY	Y. SANO	21 Jun. 2017																

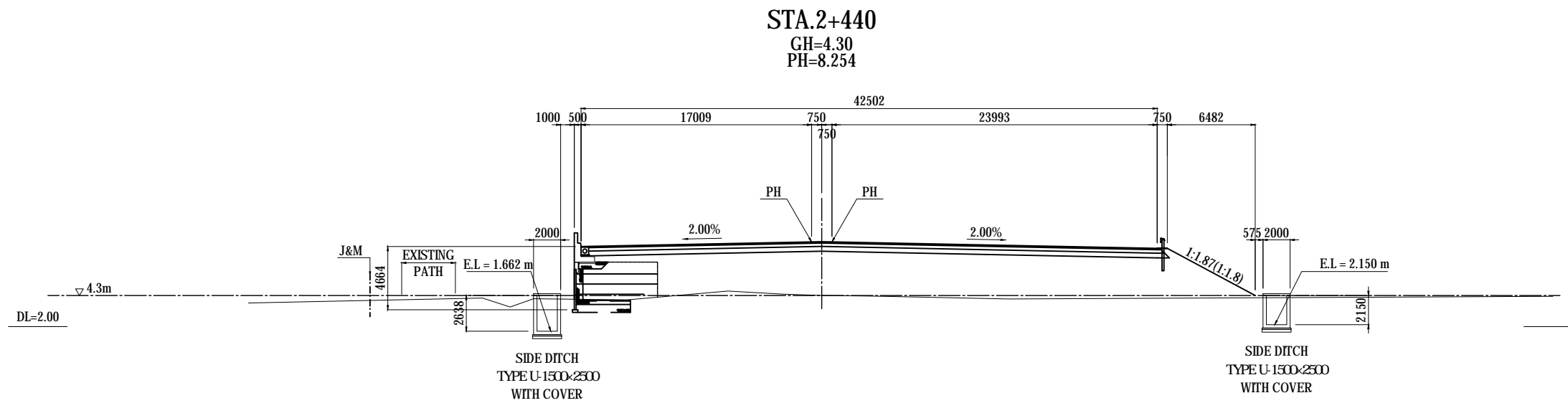
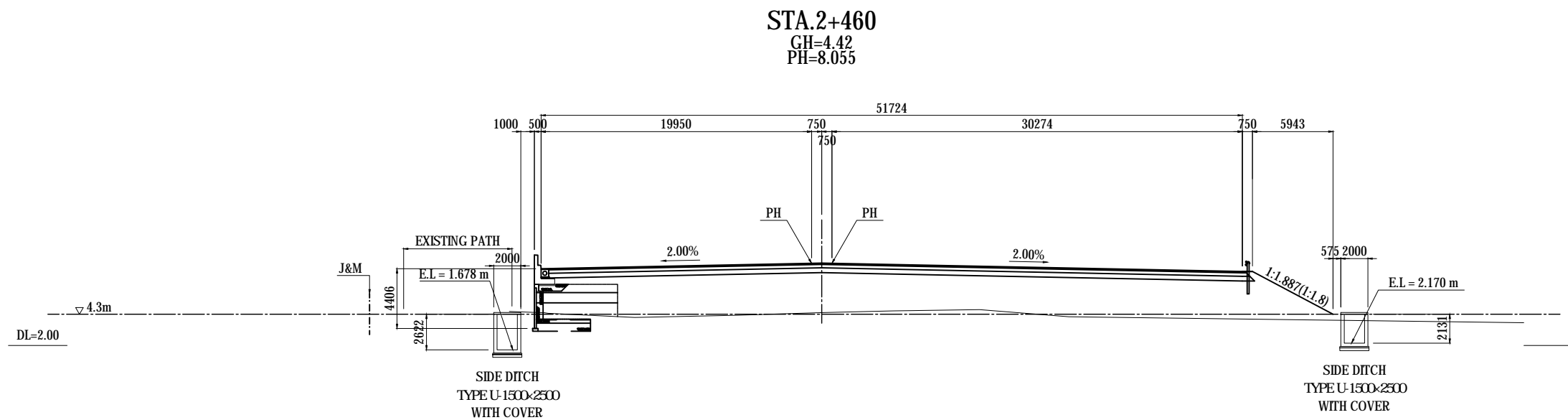
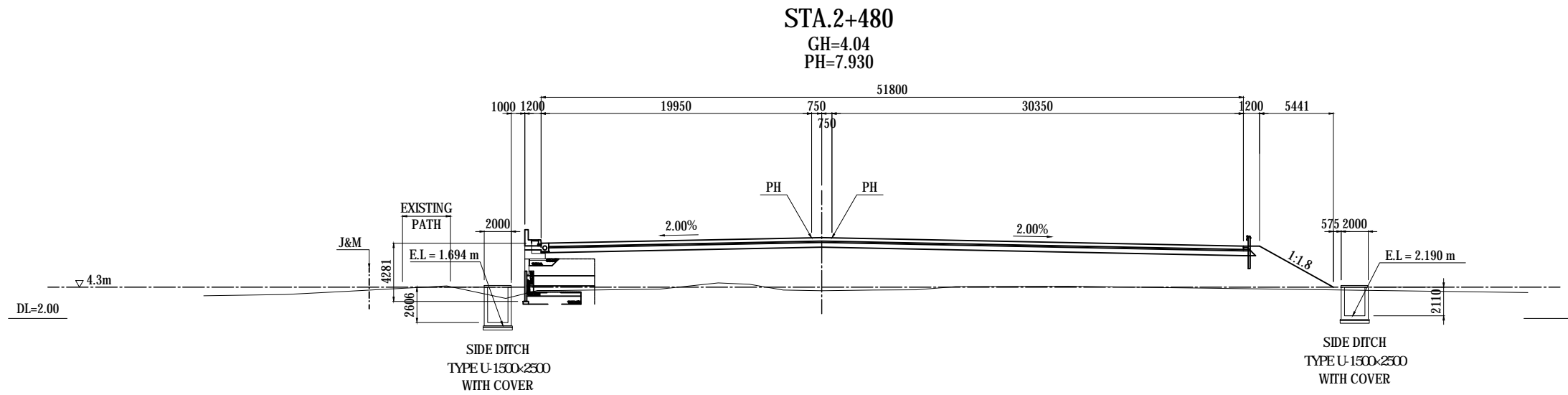
# CROSS SECTION MAIN ROAD (1) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

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 M. TORIU T. HAYAKAWA Y. SANO	SIGNATURE 	DATE 15 Jun. 2017 20 Jun. 2017 21 Jun. 2017	DRAWING TITLE <b>CROSS SECTION MAIN ROAD (1)</b>	PACKAGE 2 DWG No. P2-RD-0400
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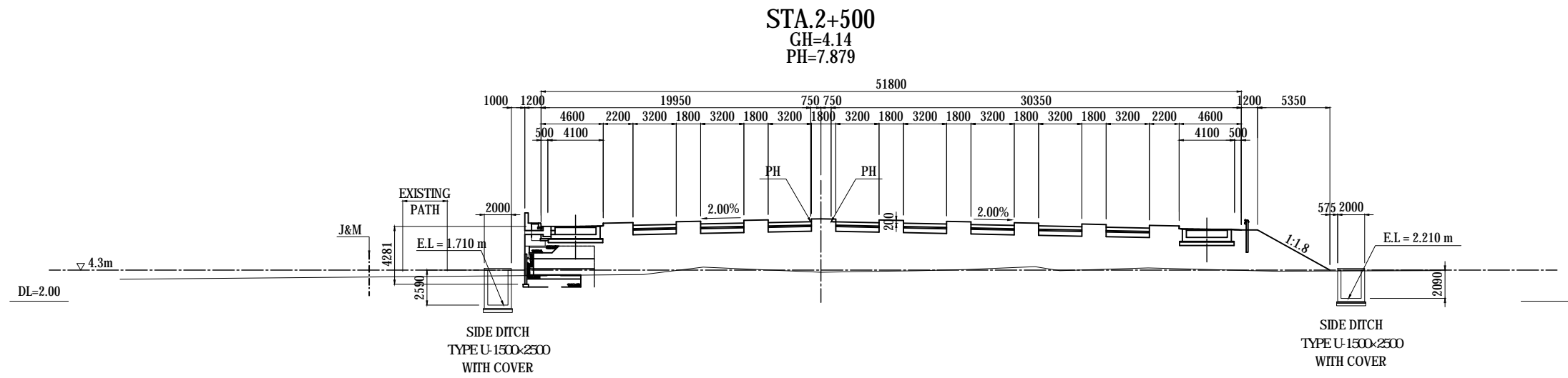
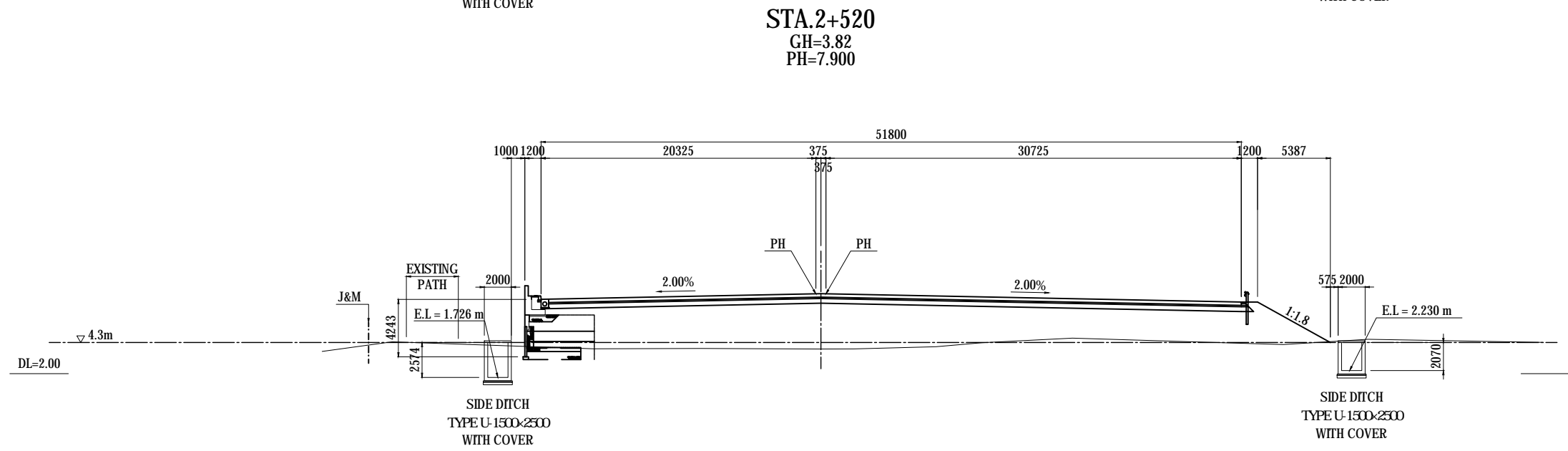
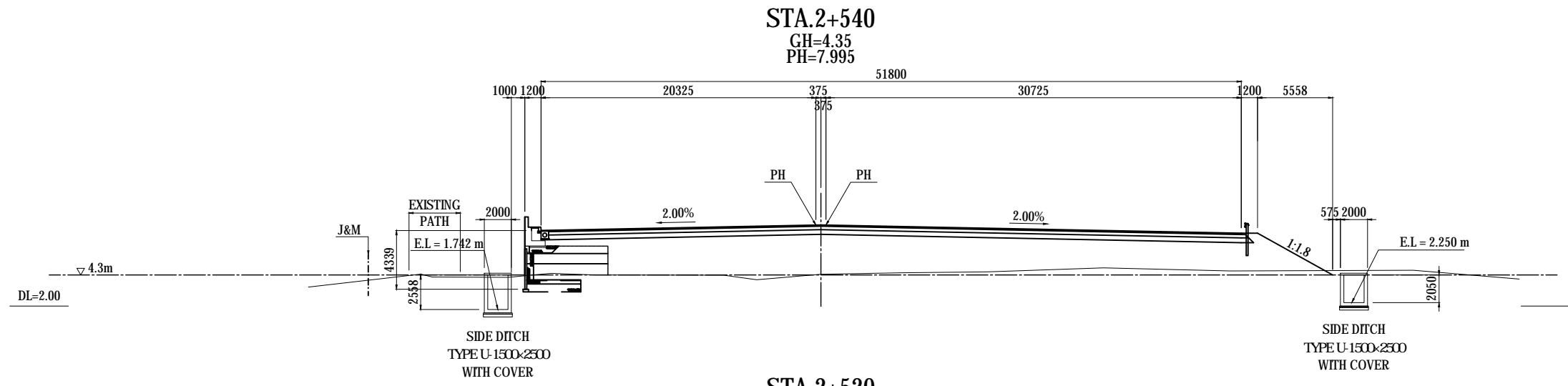
# CROSS SECTION MAIN ROAD (2) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

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>CROSS SECTION MAIN ROAD (2)</b>	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun. 2017	P2-RD-0410

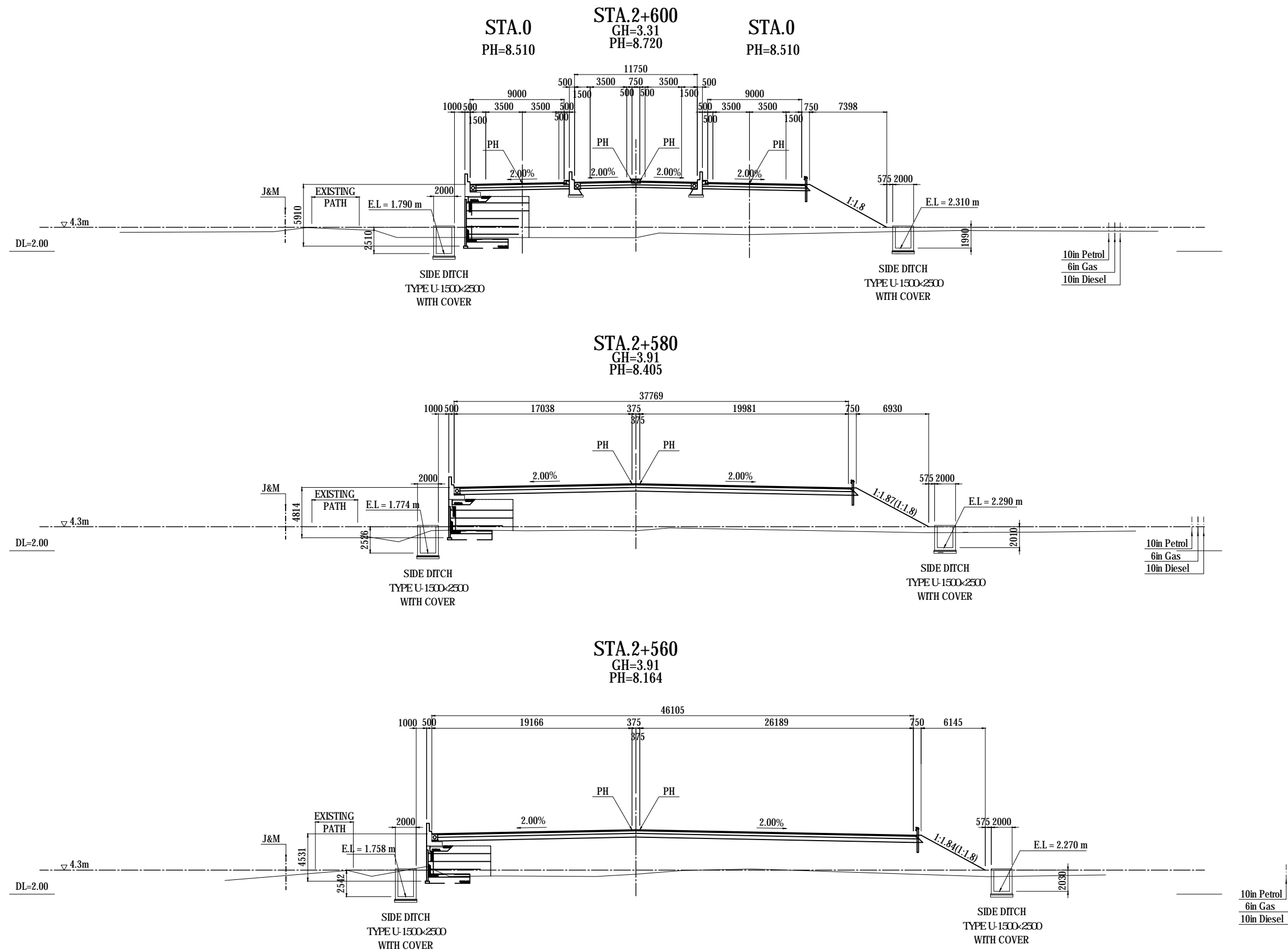
# CROSS SECTION MAIN ROAD (3) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

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>	NAME	SIGNATURE	DATE	DRAWING TITLE <b>CROSS SECTION MAIN ROAD (3)</b>	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun. 2017	P2-RD-0420

# CROSS SECTION MAIN ROAD (4) S=1:400

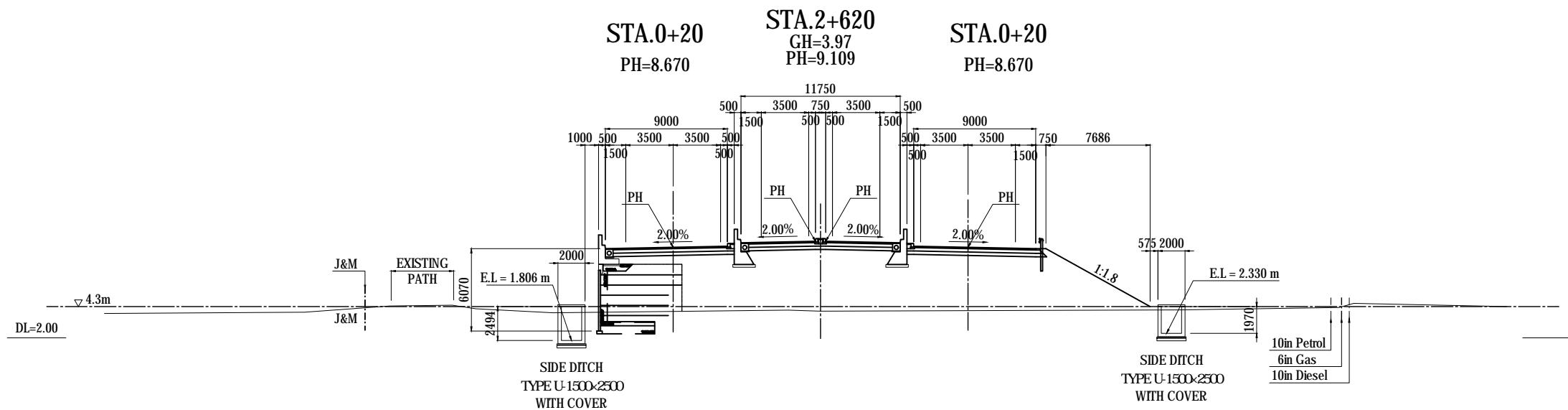
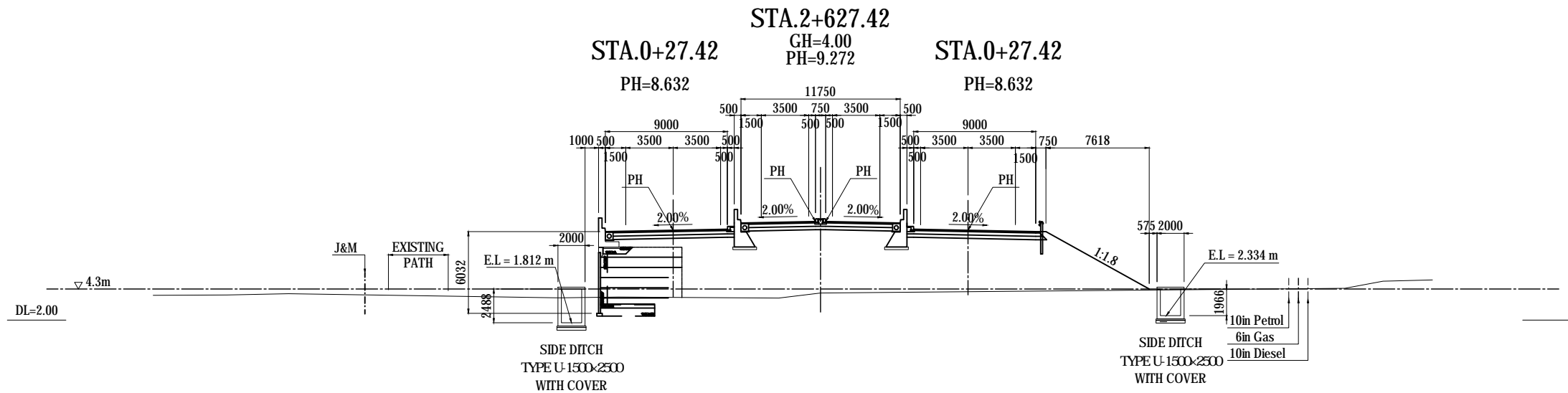
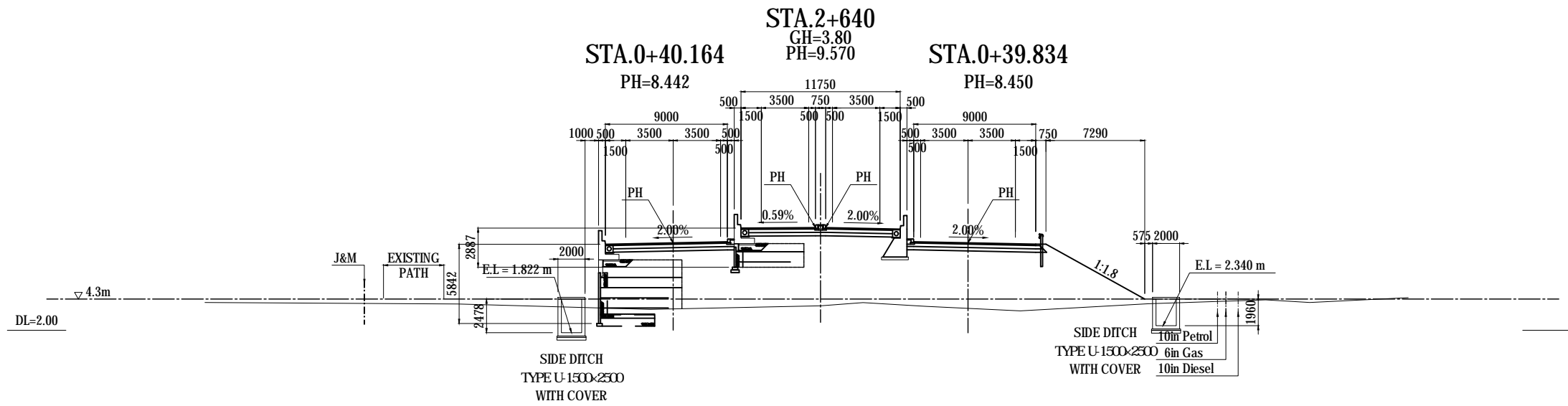


Note: Elevation is based on MSL (Mean Sea Level)

<small>PROJECT NAME</small> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<small>FINANCED BY</small> JAPAN INTERNATIONAL COOPERATION AGENCY	<small>COUNTERPART</small> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<small>JICA STUDY TEAM</small> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 20%;">NAME</th> <th style="width: 20%;">SIGNATURE</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	<small>DRAWING TITLE</small> CROSS SECTION MAIN ROAD (4)	<small>PACKAGE</small> 2 DWG No. P2-RD-0430
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			



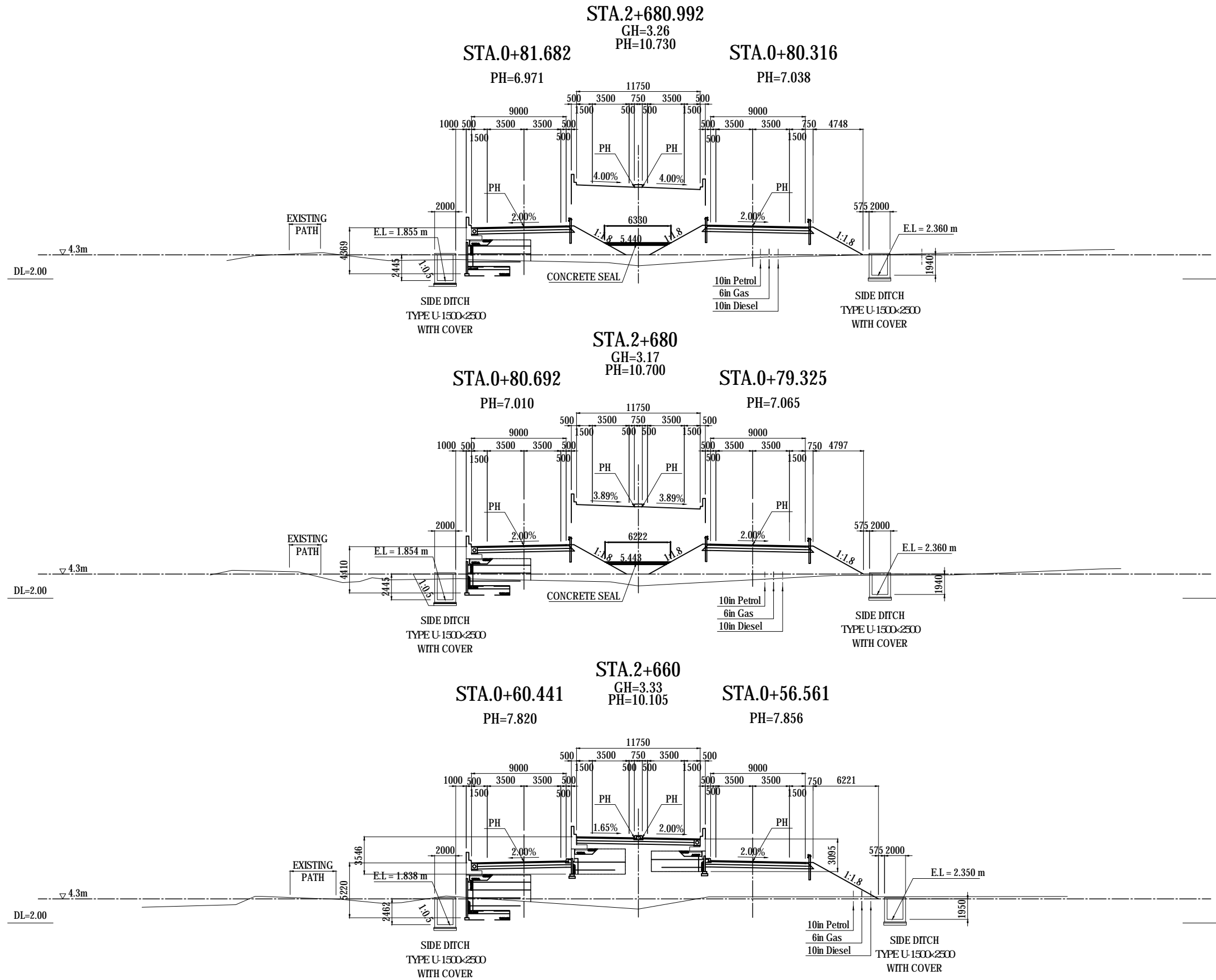
# CROSS SECTION MAIN ROAD (5) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

<small>PROJECT NAME</small> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<small>FINANCED BY</small> JAPAN INTERNATIONAL COOPERATION AGENCY	<small>COUNTERPART</small> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<small>JICA STUDY TEAM</small> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 30%;">NAME</th> <th style="width: 30%;">SIGNATURE</th> <th style="width: 30%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	<small>DRAWING TITLE</small> CROSS SECTION MAIN ROAD (5)	<small>PACKAGE</small> 2 DWG No. P2-RD-0440
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			

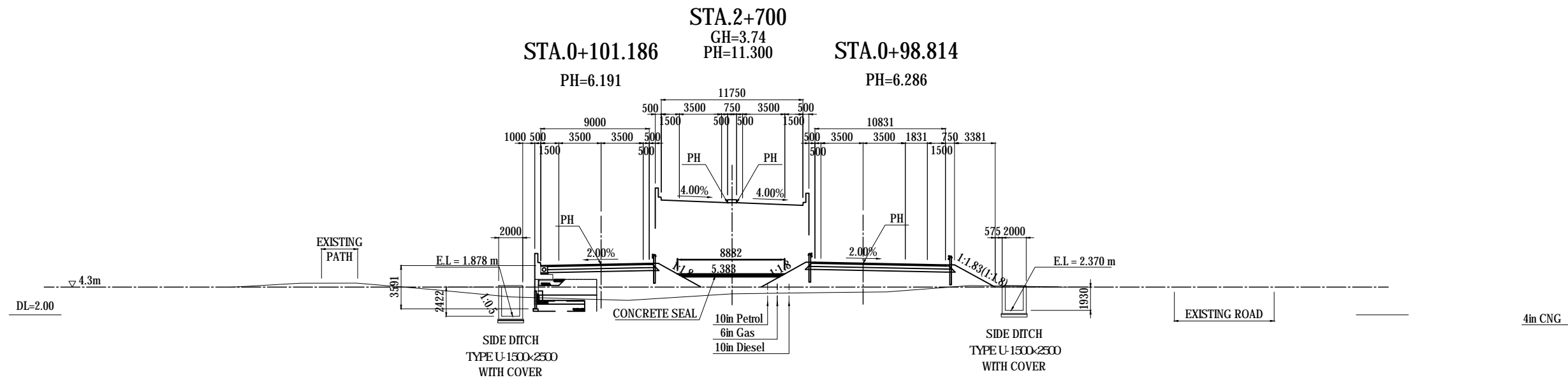
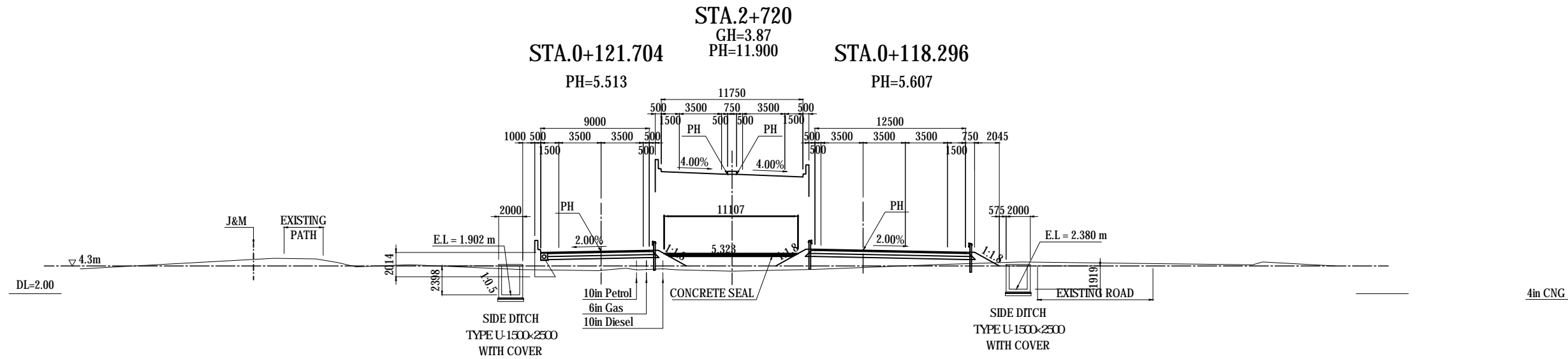
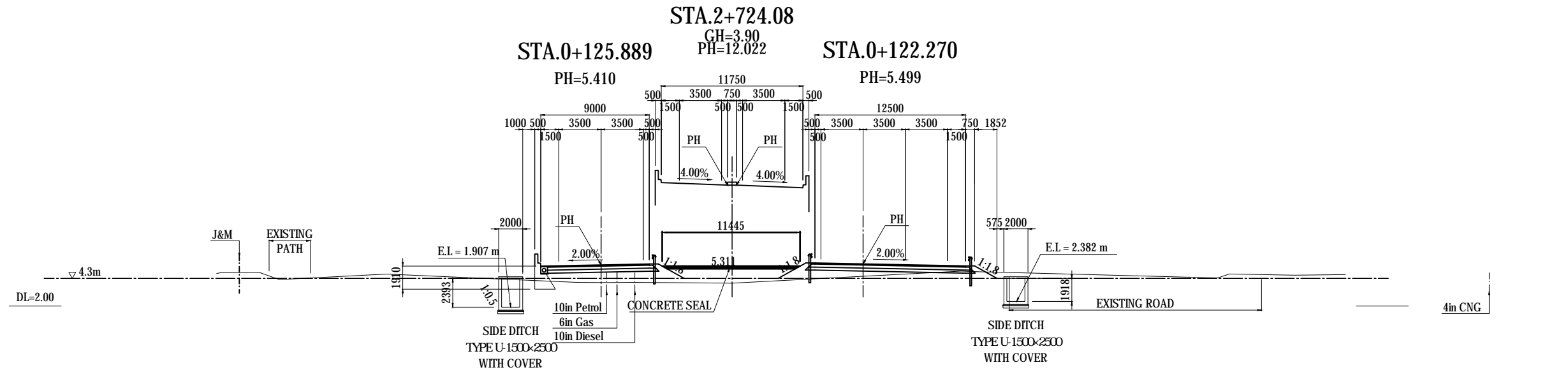
# CROSS SECTION MAIN ROAD (6) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

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 CHECKED BY APPROVED BY	M. TORIU T. HAYAKAWA Y. SANO	15 Jun. 2017 20 Jun. 2017 21 Jun. 2017	CROSS SECTION MAIN ROAD (6)	2 DWG No. P2-RD-0450

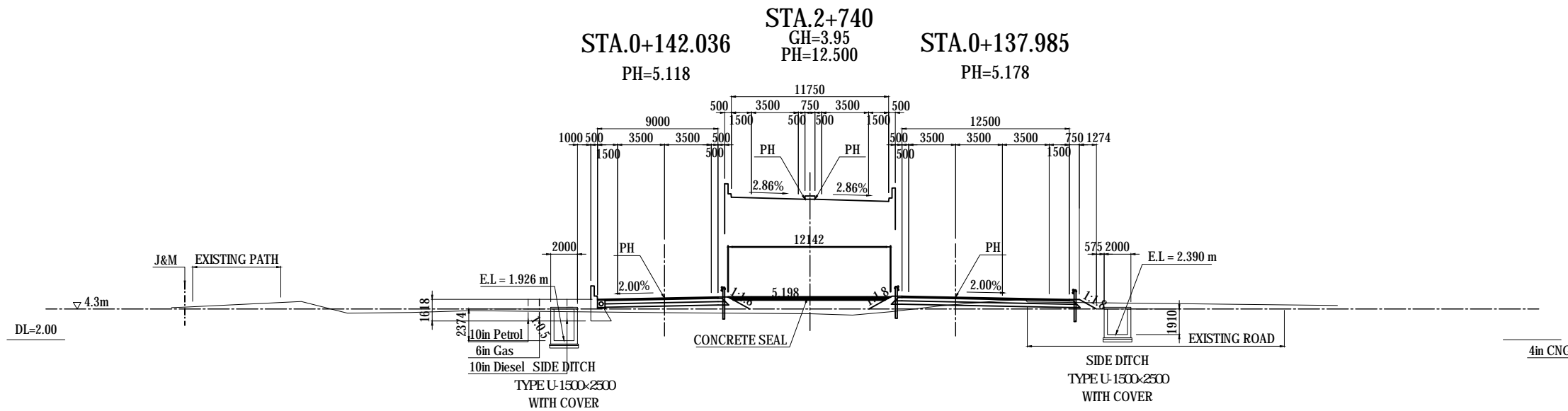
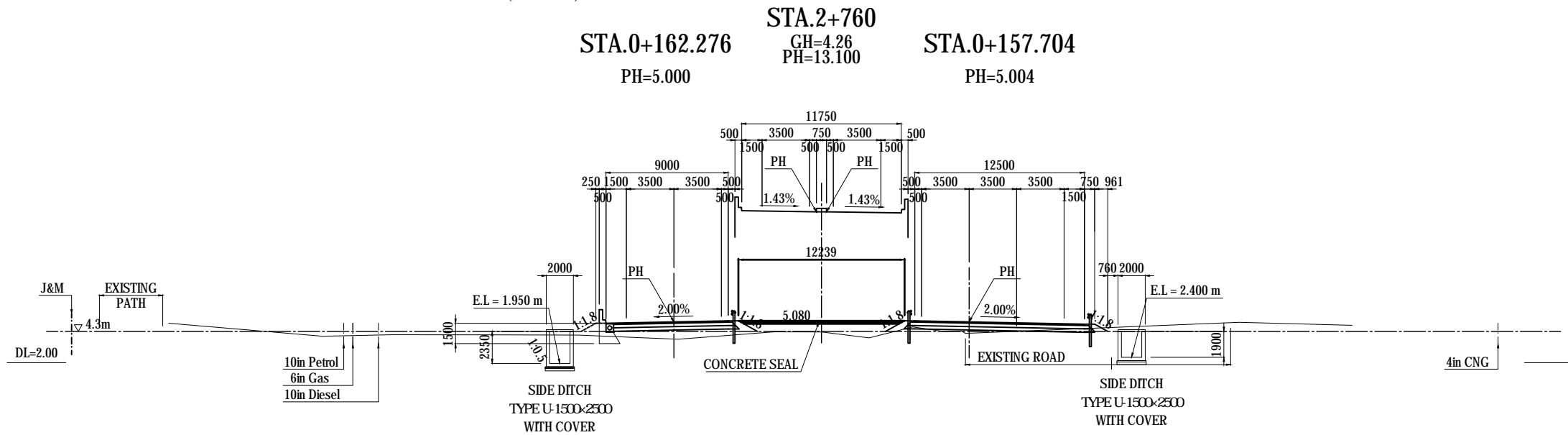
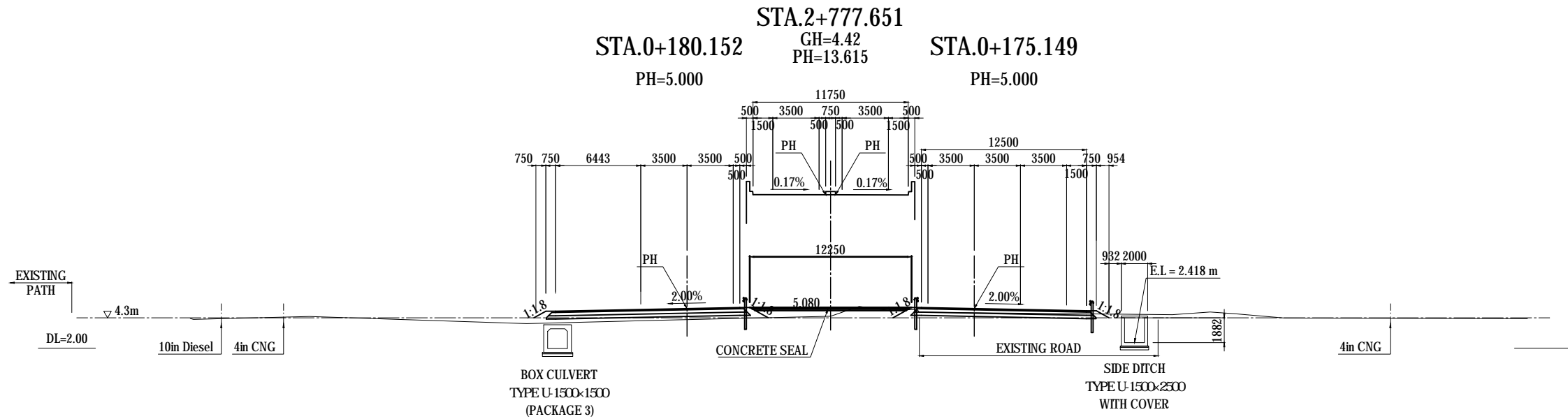
# CROSS SECTION MAIN ROAD (7) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

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.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 30%;">NAME</th> <th style="width: 20%;">SIGNATURE</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	DRAWING TITLE <h2 style="text-align: center;">CROSS SECTION MAIN ROAD (7)</h2>	PACKAGE 2 DWG No. P2-RD-0460
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			

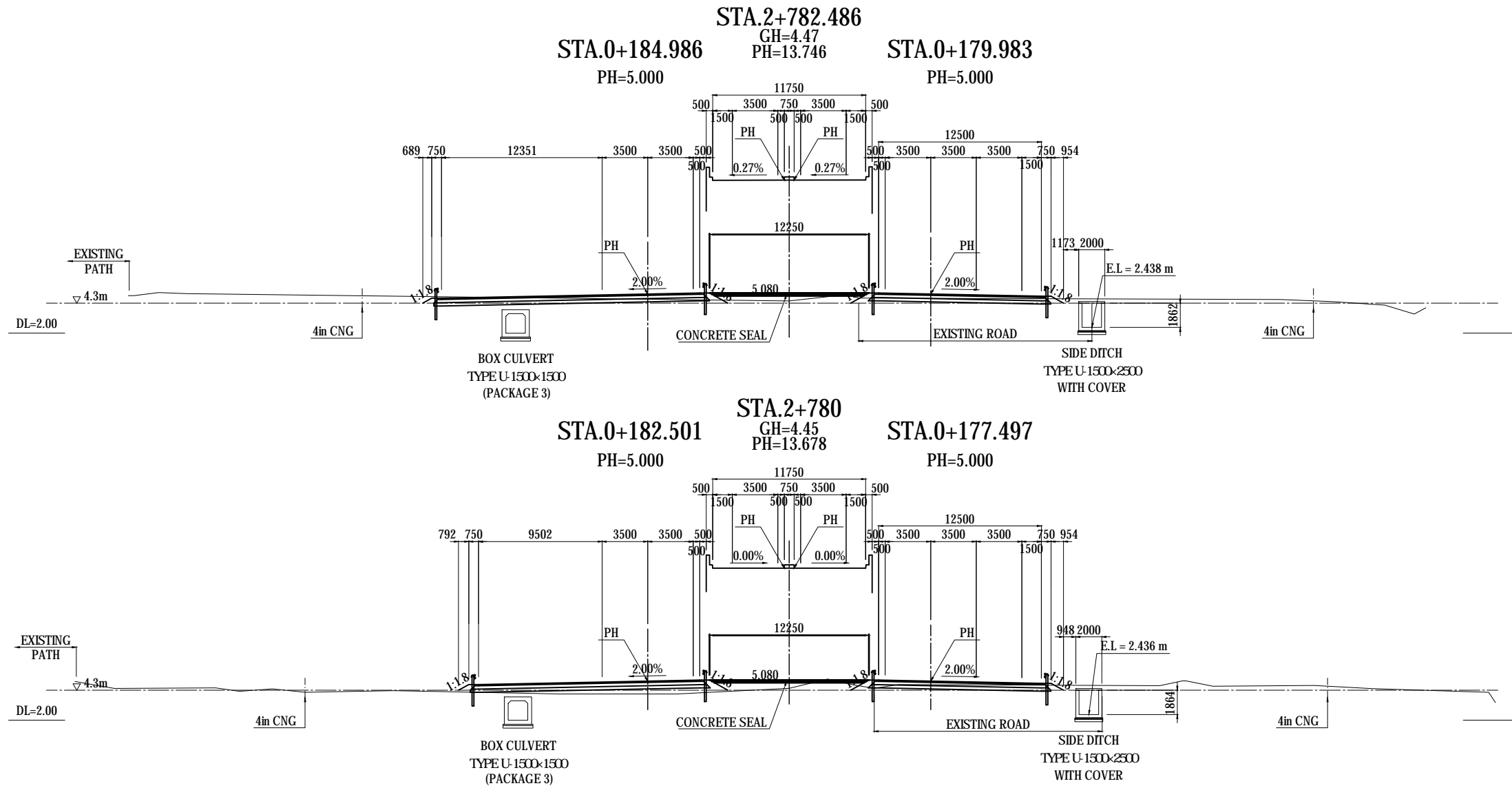
# CROSS SECTION MAIN ROAD (8) S=1:400



Note: Elevation is based on MSL (Mean Sea Level)

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 CROSS SECTION MAIN ROAD (8)	PACKAGE 2 DWG No. P2-RD-0470	
				PREPARED BY	M. TORIU				15 Jun. 2017
				CHECKED BY	T. HAYAKAWA				20 Jun. 2017
				APPROVED BY	Y. SANO				21 Jun. 2017

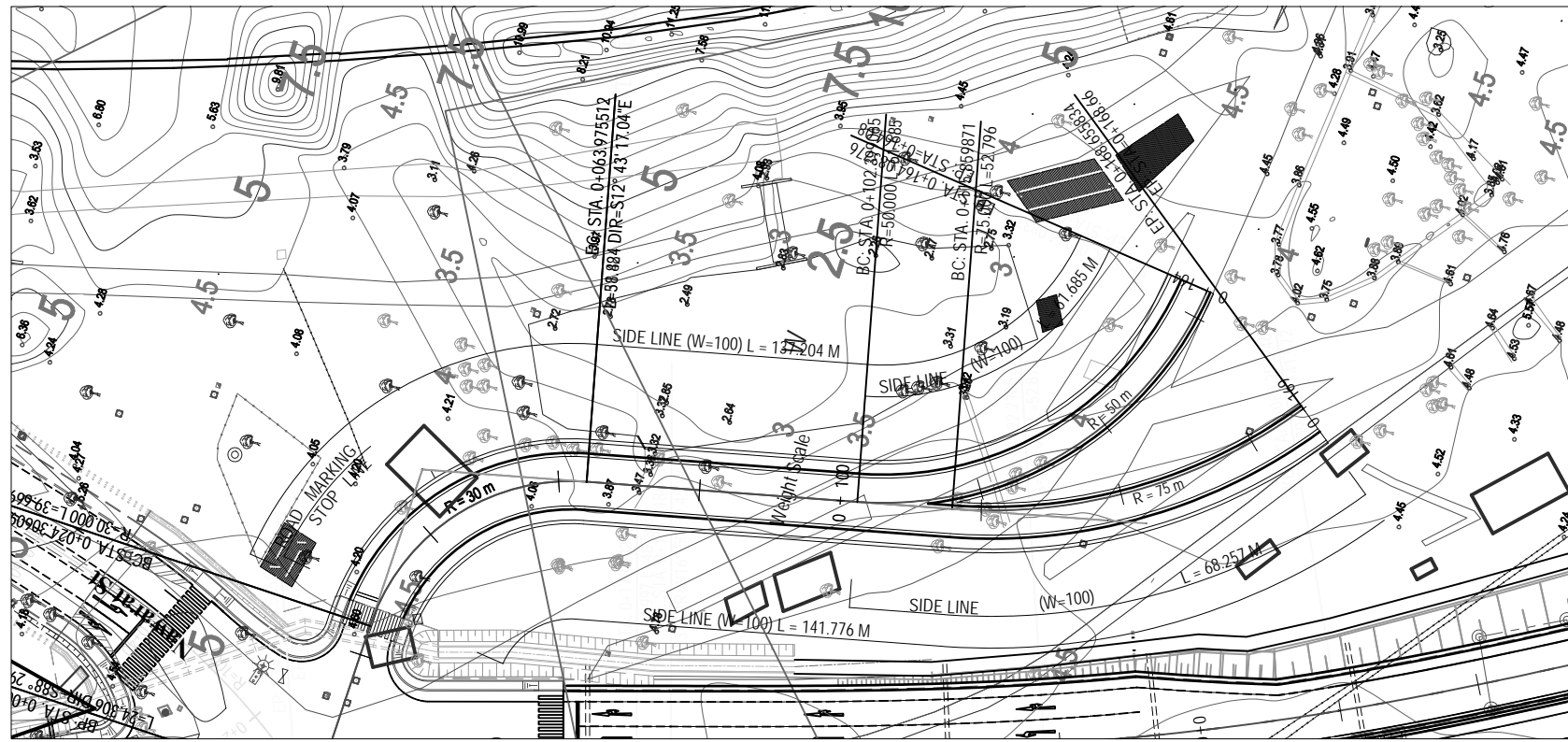
# CROSS SECTION MAIN ROAD (9) S=1:400



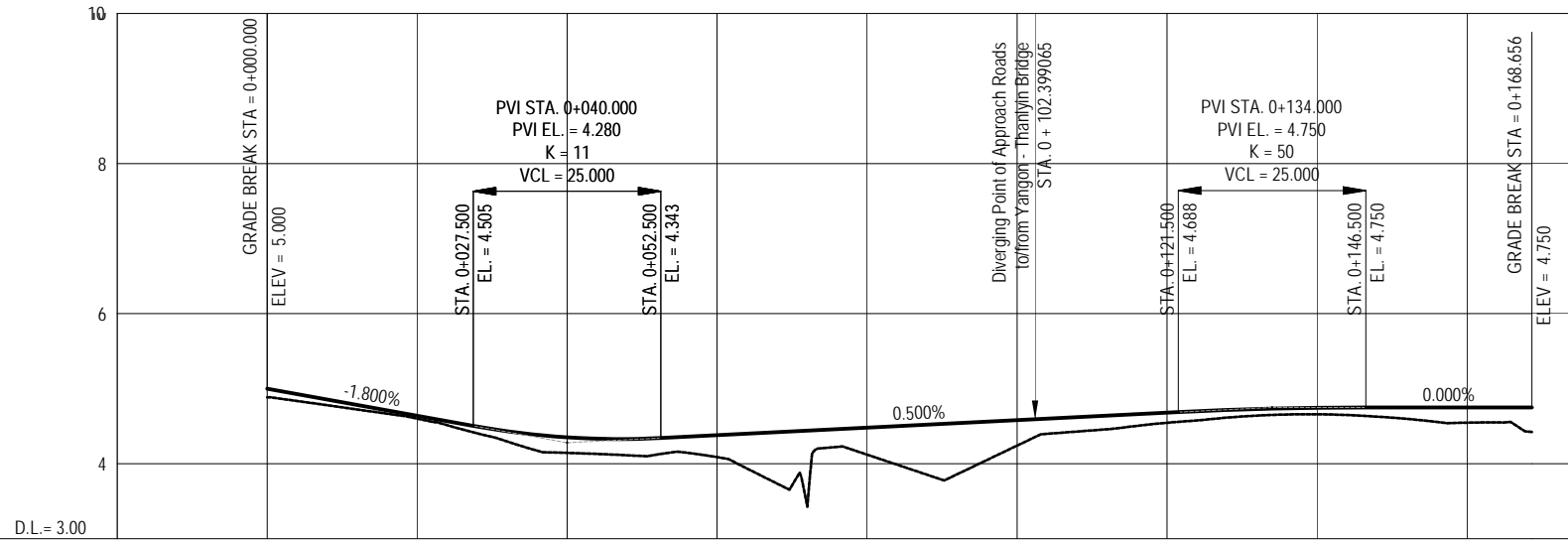
Note: Elevation is based on MSL (Mean Sea Level)

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.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 20%;">NAME</th> <th style="width: 20%;">SIGNATURE</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	DRAWING TITLE <b>CROSS SECTION MAIN ROAD (9)</b>	PACKAGE 2 DWG No. P2-RD-0480
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			

PLAN SCALE = 1:1000

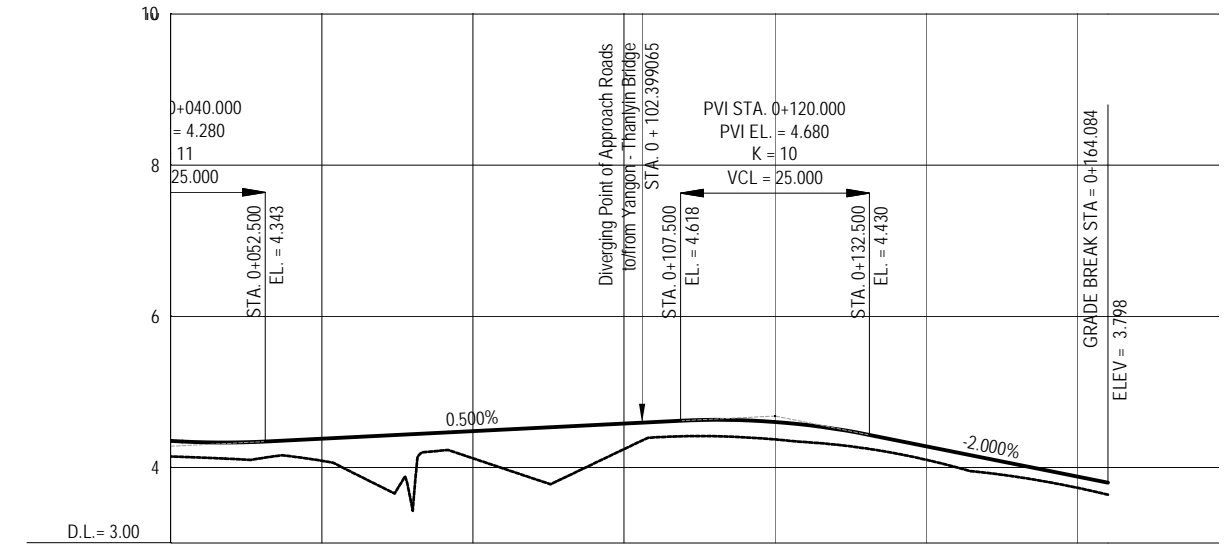


PROFILE SCALE H = 1:1000  
RELOCATION ROAD FROM SHUKHINTHAR MAYOPAT ROAD TO YANGON-THANLYIN BRIDGE



GRADE	5.000	4.505	4.280	4.343	4.380	4.480	4.580	4.688	4.750	4.750
PROPOSED HEIGHT	5.000	4.640	4.352	4.380	4.480	4.580	4.680	4.746	4.750	4.750
EXISTING HEIGHT	4.88	4.50	4.14	4.09	4.12	4.24	4.55	4.66	4.55	4.55
STATION	0+000	+020	+040	+060	+080	+100	+120	+140	+160	+164.084
CURVE ELEMENTS	R = ∞ L = 24.306m		R = 30.000m L = 39.669m		R = ∞ L = 51.884m			R = 75.000m L = 52.796m		

PROFILE SCALE H = 1:1000  
RELOCATION ROAD FROM YANGON-THANLYIN BRIDGE TO SHUKHINTHAR MAYOPAT ROAD



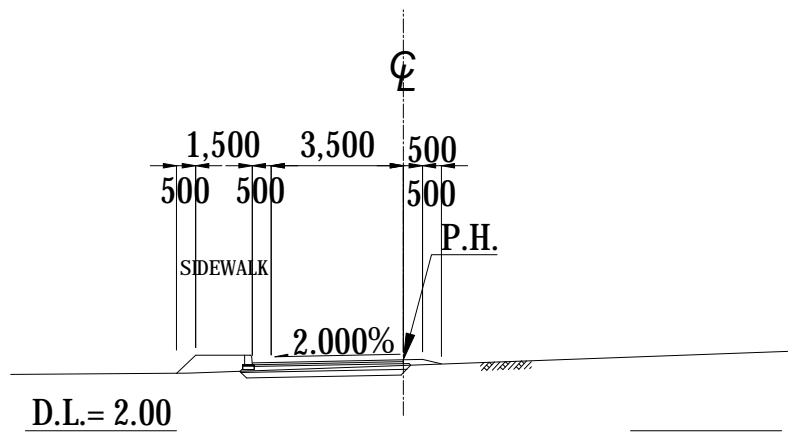
GRADE	4.280	4.343	4.480	4.580	4.680	4.430	3.880
PROPOSED HEIGHT	4.352	4.380	4.480	4.580	4.602	4.280	3.880
EXISTING HEIGHT	4.14	4.09	4.12	4.24	4.37	4.10	3.73
STATION	+060	+080	+100	+120	+140	+160	+164.084
CURVE ELEMENTS	R = 30.000m L = 39.669m		R = ∞ L = 38.424m			R = 50.000m L = 61.685m	

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 E. YOKOTA	SIGNATURE 	DATE 15 JUNE 2017	DRAWING TITLE RELOCATION ROAD BETWEEN SHUKHINTHAR MAYOPAT ROAD AND YANGON-THANLYIN BRIDGE PLAN AND PROFILE	PACKAGE 2
				PREPARED BY T. HAYAKAWA	SIGNATURE 	DATE 20 JUNE 2017		DWG No. P2-RD-1000
				CHECKED BY Y. SANO	SIGNATURE 	DATE 21 JUNE 2017		
				APPROVED BY 				

TYPICAL CROSS SECTION OF RELOCATION ROAD SCALE = 1:200

STA. 0+160

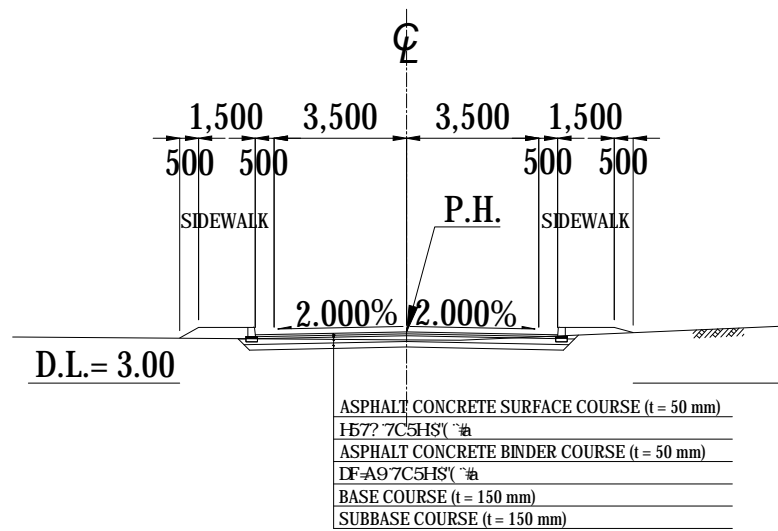
G.L.= 3.73  
P.H.= 3.880



TYPICAL CROSS SECTION OF RELOCATION ROAD  
FROM YANGON - THANLYIN BRIDGE TO SHUKHINTHAR MAYOPAT ROAD  
AFTER STA. 0+102.399

STA. 0+040

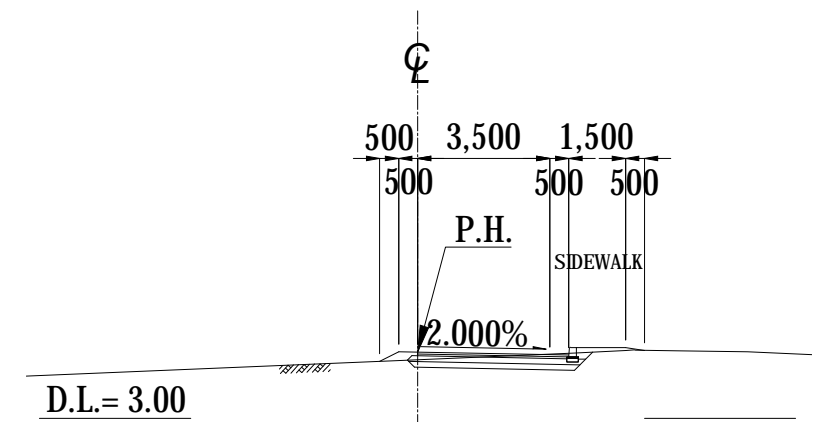
G.L.= 4.14  
P.H.= 4.352



TYPICAL CROSS SECTION OF RELOCATION ROAD  
FROM SHUKHINTHAR MAYOPAT ROAD TO STA. 0+102.399

STA. 0+160

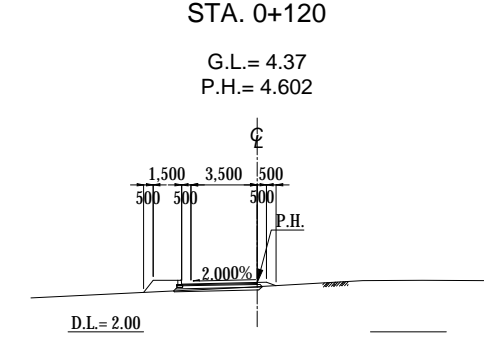
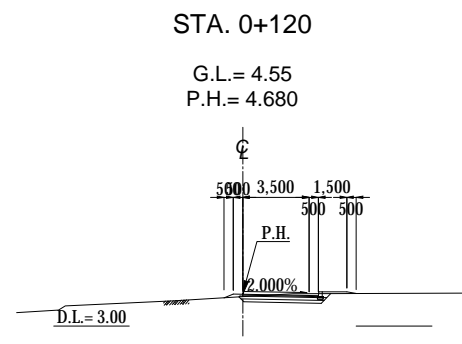
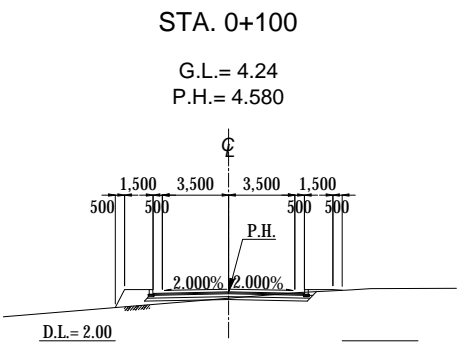
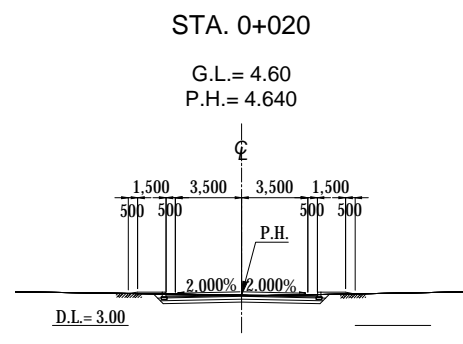
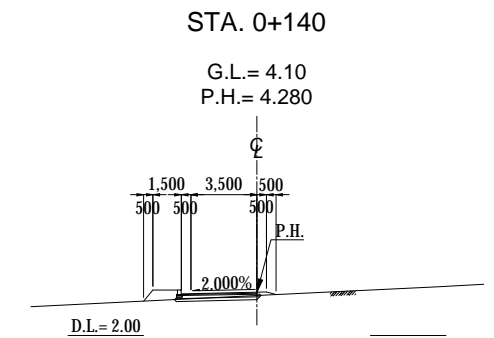
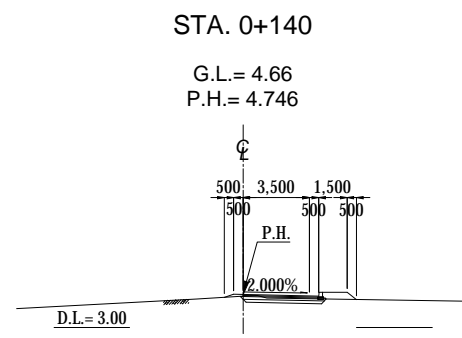
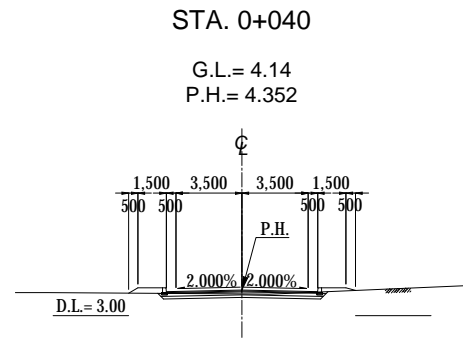
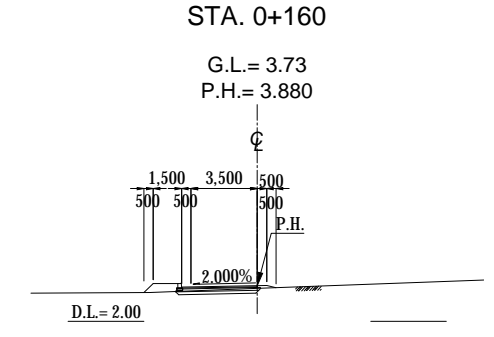
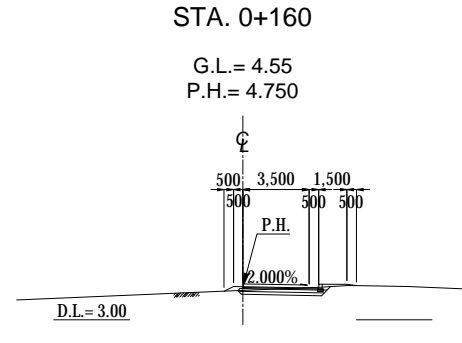
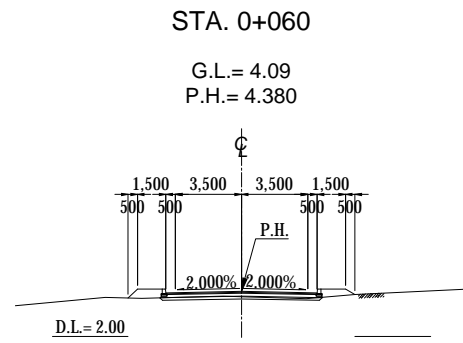
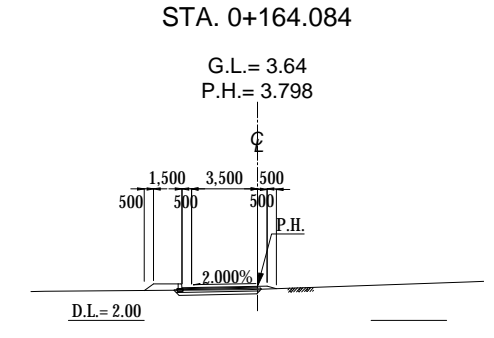
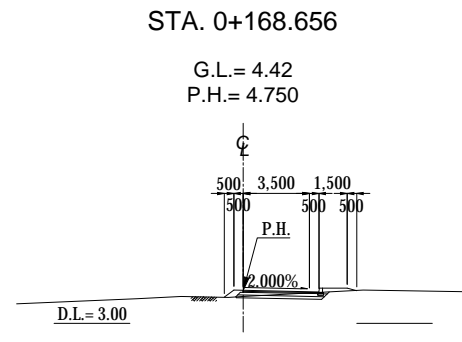
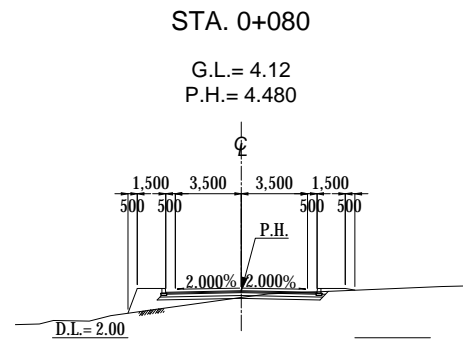
G.L.= 4.55  
P.H.= 4.750



TYPICAL CROSS SECTION OF RELOCATION ROAD  
FROM SHUKHINTHAR MAYOPAT ROAD TO YANGON - THANLYIN BRIDGE  
AFTER STA. 0+102.399

NOTE: ELEVATION IS BASED ON MSL (MEAN SEA LEVEL).

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 RELOCATION ROAD BETWEEN SHUKHINTHAR MAYOPAT ROAD AND YANGON-THANLYIN BRIDGE TYPICAL CROSS SECTION	PACKAGE	
				PREPARED BY	E. YOKOTA			15 JUNE 2017	2
				CHECKED BY	T. HAYAKAWA			20 JUNE 2017	DWG No.
				APPROVED BY	Y. SANO			21 JUNE 2017	P2-RD-1010



CROSS SECTION OF RELOCATION ROAD FROM SHUKHINTHAR MAYOPAT ROAD TO STA. 0+102.399

CROSS SECTION OF RELOCATION ROAD FROM SHUKHINTHAR MAYOPAT ROAD TO YANGON - THANLYN BRIDGE AFTER STA. 0+102.399

CROSS SECTION OF RELOCATION ROAD FROM YANGON - THANLYN BRIDGE TO SHUKHINTHAR MAYOPAT ROAD AFTER STA. 0+102.399

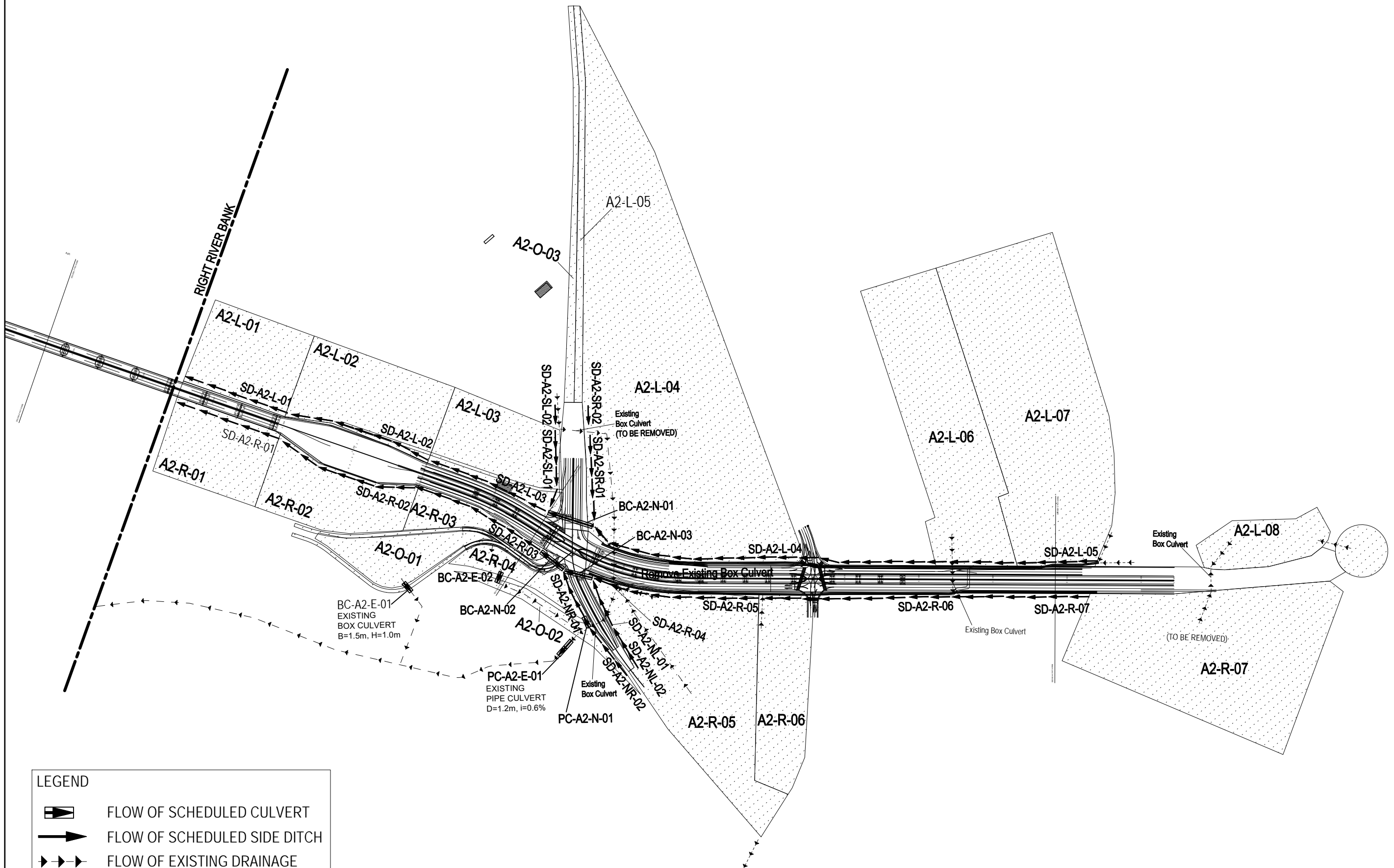
NOTE: ELEVATION IS BASED ON MSL (MEAN SEA LEVEL).

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 RELOCATION ROAD BETWEEN SHUKHINTHAR MAYOPAT ROAD AND YANGON-THANLYN BRIDGE CROSS SECTION	PACKAGE	
				PREPARED BY	E. YOKOTA			15 JUNE 2017	2
				CHECKED BY	T. HAYAKAWA			20 JUNE 2017	DWG No.
				APPROVED BY	Y. SANO			21 JUNE 2017	P2-RD-1020



# DRAINAGE SYSTEM PLAN AND OUTLETS (RIGHT RIVER BANK)

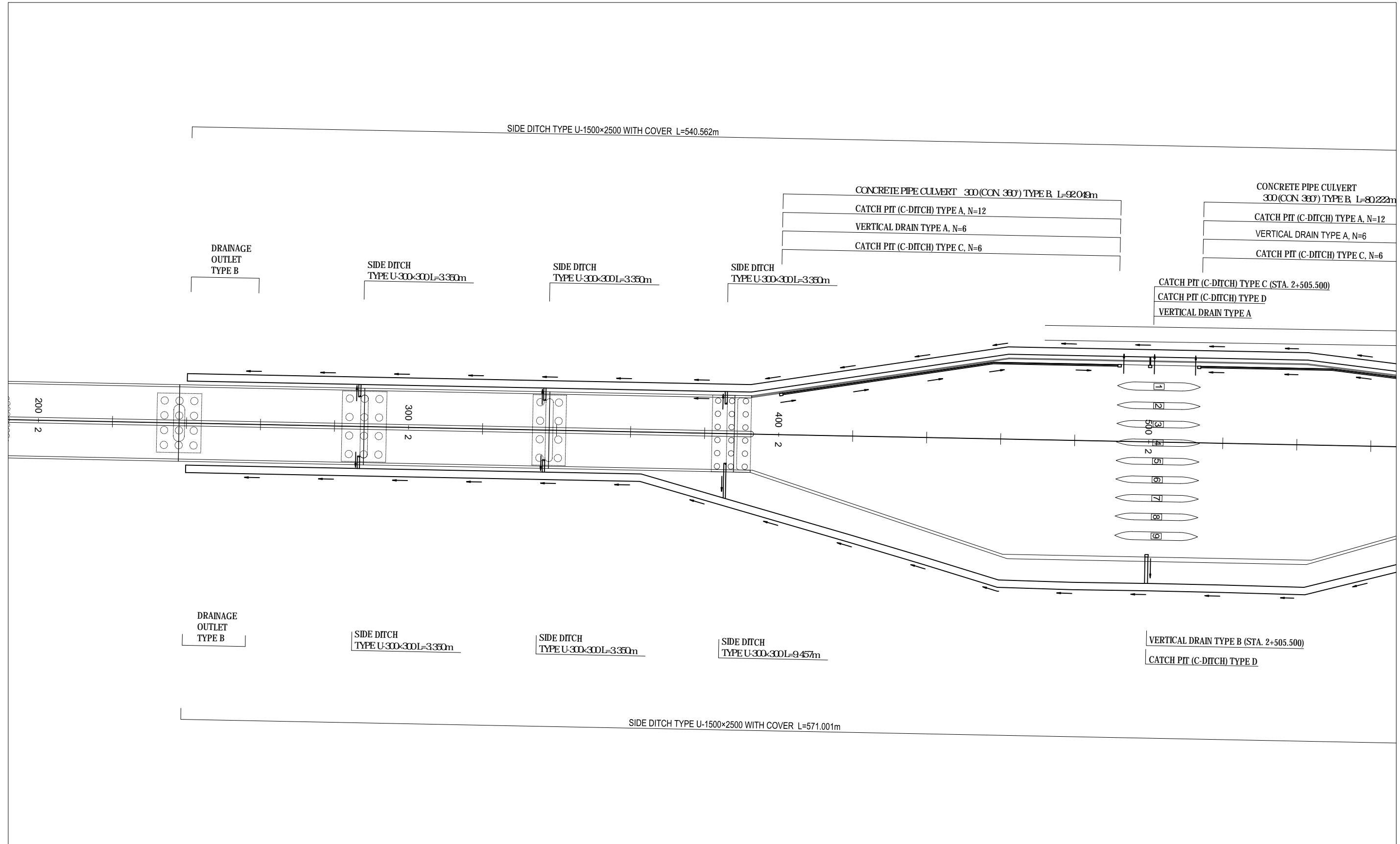
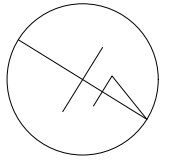
S= 1:5000



LEGEND	
	FLOW OF SCHEDULED CULVERT
	FLOW OF SCHEDULED SIDE DITCH
	FLOW OF EXISTING DRAINAGE
	CATCHMENT AREA

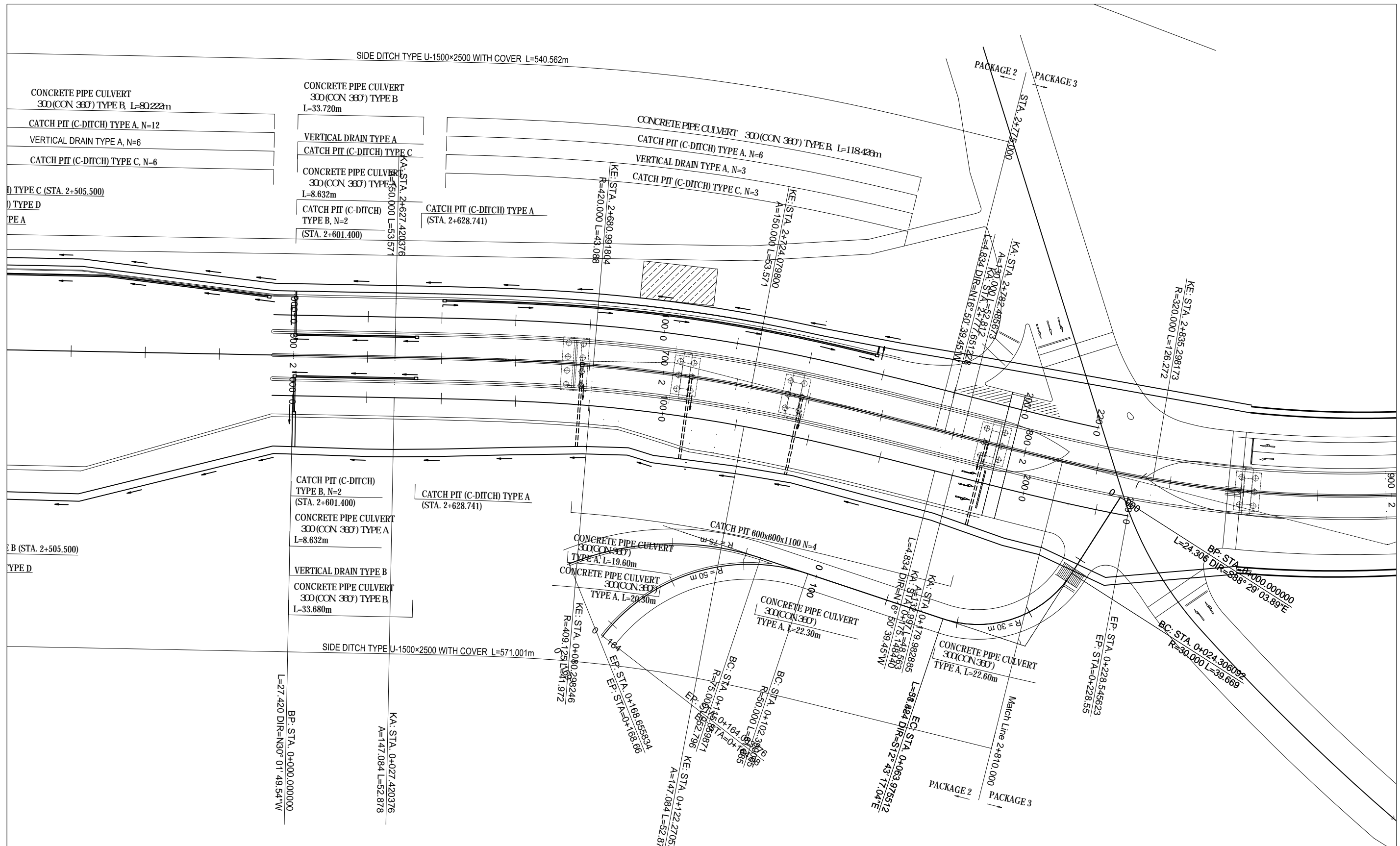
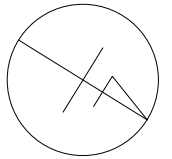
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DRAINAGE SYSTEM PLANS AND OUTLETS (RIGHT RIVER BANK) S= 1:5000	PACKAGE
				PREPARED BY		15 Jun. 2017		2
				CHECKED BY	T. HAYAKAWA	20 Jun. 2017		DWG No.
APPROVED BY	Y. SANO		21 Jun. 2017	P2-RD-3000				

# DRAINAGE SYSTEM PLAN (1) S= 1:1000



<small>PROJECT NAME</small> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<small>FINANCED BY</small> JAPAN INTERNATIONAL COOPERATION AGENCY	<small>COUNTERPART</small> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<small>JICA STUDY TEAM</small> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 20%;">NAME</th> <th style="width: 20%;">SIGNATURE</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	<small>DRAWING TITLE</small> DRAINAGE SYSTEM PLAN(1) S=1:1000	<small>PACKAGE</small> 2 DWG No. P2-RD-3010
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			

# DRAINAGE SYSTEM PLAN (2) S= 1:1000

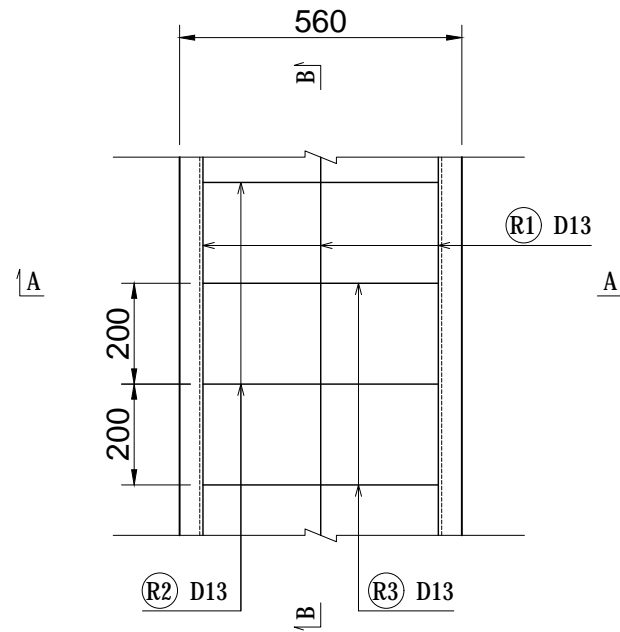


PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<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 M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>	NAME	SIGNATURE	DATE	PREPARED BY M. TORIU		15 Jun. 2017	CHECKED BY T. HAYAKAWA		20 Jun. 2017	APPROVED BY Y. SANO		21 Jun. 2017	DRAWING TITLE DRAINAGE SYSTEM PLAN(1) S=1:1000	PACKAGE 2 DWG No. P2-RD-3011
NAME	SIGNATURE	DATE																
PREPARED BY M. TORIU		15 Jun. 2017																
CHECKED BY T. HAYAKAWA		20 Jun. 2017																
APPROVED BY Y. SANO		21 Jun. 2017																

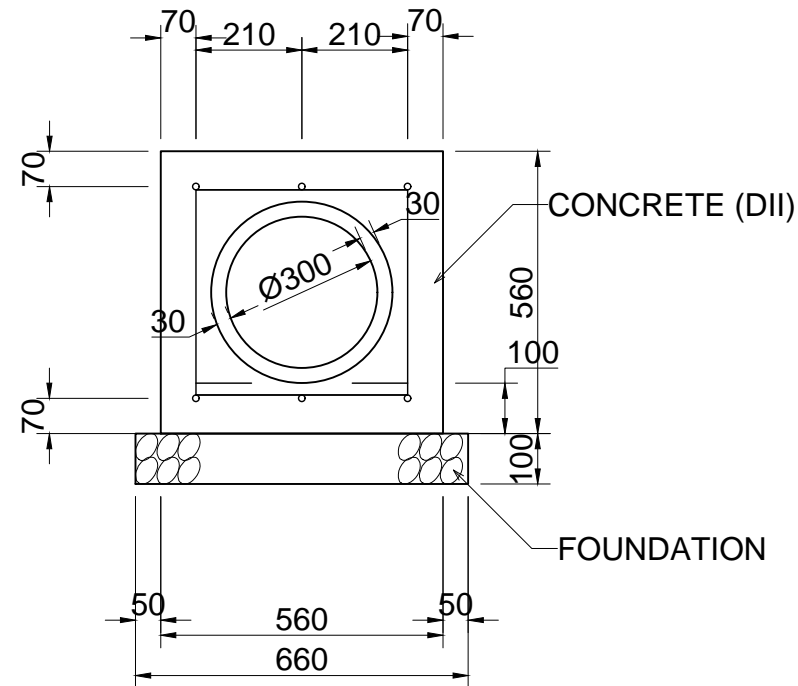
# DETAIL OF CONCRETE PIPE CULVERT 300 (CON 360°) TYPE A S= 1:15

## CONCRETE PIPE CULVERT 300 (CON 360°) TYPE A

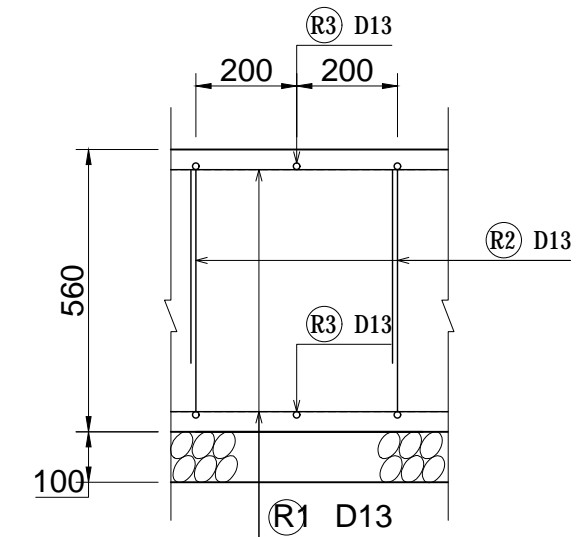
A - A



PLAN



SECTION A - A



SECTION B - B

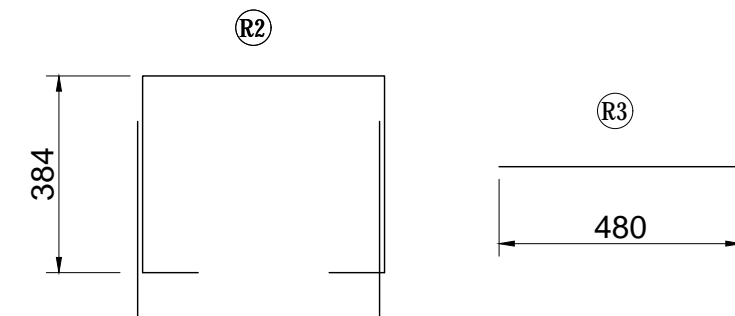
### WORK QUANTITIES PER UNIT (PER 10m)

ITEM	UNIT	QUANTITY	REMARKS
R.C.PIPE 300	m	10.000	JIS A 5303 CLASS 1
CONCRETE (DII)	m <sup>3</sup>	2.118	28 days = 240 kg/cm <sup>2</sup>
FOUNDATION	m <sup>2</sup>	6.600	GRAVEL / t=100mm
FORM	m <sup>2</sup>	11.200	

### WORK QUANTITIES PER UNIT FOR REINFORCEMENT BAR (PER 1.0m)

Dia	Nos	Length (mm/nos)	Unit Weight (kg/m)	Weight (kg)	Remarks
D13	6	1,000	0.995	5.970	(R1) / SD345
D13	5	420	0.995	2.090	(R2) / SD345
D13	5	1,310	0.995	6.517	(R3) / SD345
<b>TOTAL</b>				<b>14.557</b>	

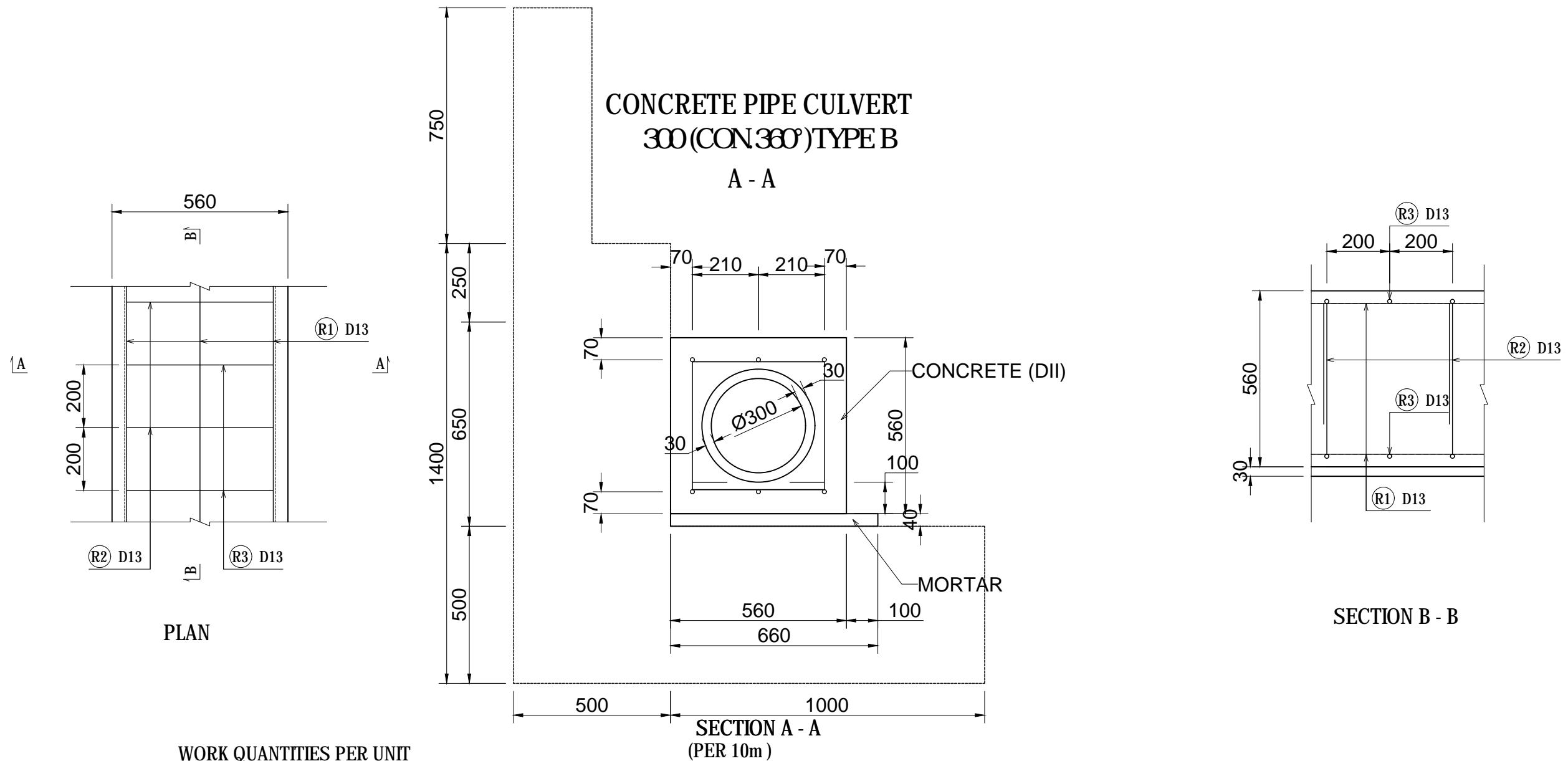
### DETAIL OF STEEL REINFORCEMENT



Note: Precast R.C. Pipe 300 Reinforced Spun and Centrifugal Reinforced Concrete Pipes shall be Selected.

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 PREPARED BY M. TORIU CHECKED BY T. HAYAKAWA APPROVED BY Y. SANO	SIGNATURE   	DATE 15 Jun. 2017 20 Jun. 2017 21 Jun. 2017	DRAWING TITLE DETAIL OF CONCRETE PIPE CULVERT 300 (CON 360°) TYPE A S=1:15	PACKAGE 2 DWG No. P2-RD-3020
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# DETAIL OF CONCRETE PIPE CULVERT 300 (CON 360°) TYPE B S= 1:15



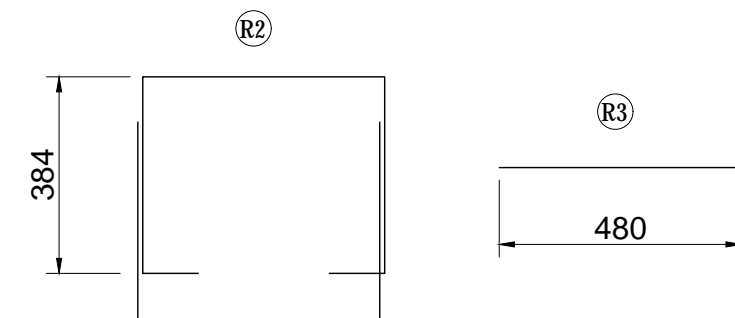
**WORK QUANTITIES PER UNIT**

ITEM	UNIT	QUANTITY	REMARKS
R.C.PIPE 300	m	10.000	JIS A 5303 CLASS 1
CONCRETE (DII)	m <sup>3</sup>	2.118	28 days = 240 kg/cm <sup>2</sup>
MORTAR	m <sup>2</sup>	0.264	
FORM	m <sup>2</sup>	11.200	

**WORK QUANTITIES PER UNIT FOR REINFORCEMENT BAR (PER 1.0m)**

Dia	Nos	Length (mm/nos)	Unit Weight (kg/m)	Weight (kg)	Remarks
D13	6	1,000	0.995	5.970	(R1) / SD345
D13	5	420	0.995	2.090	(R2) / SD345
D13	5	1,310	0.995	6.517	(R3) / SD345
<b>TOTAL</b>				<b>14.557</b>	

## DETAIL OF STEEL REINFORCEMENT

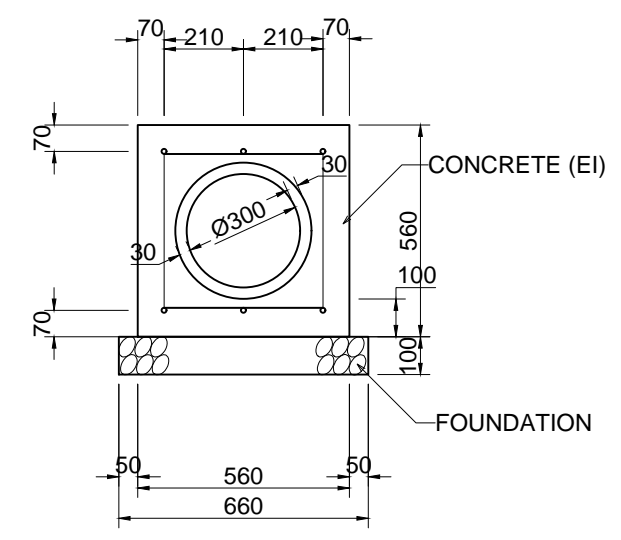
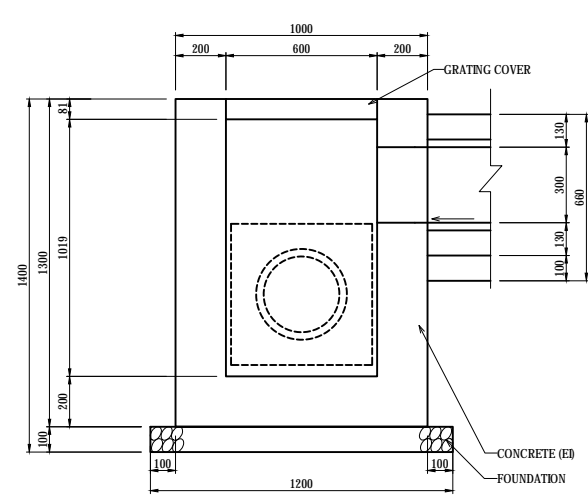
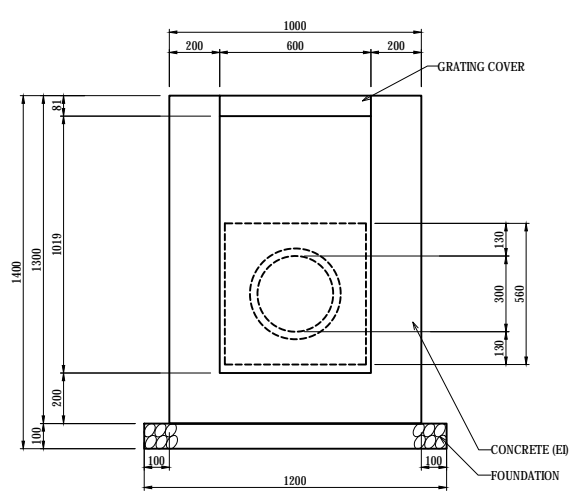
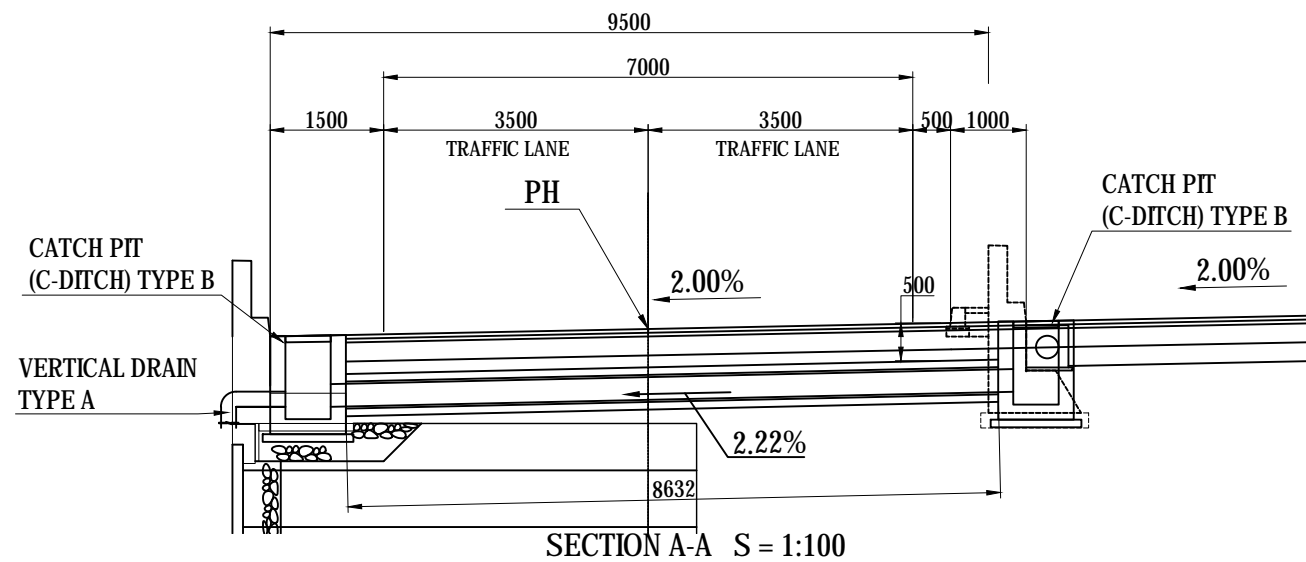
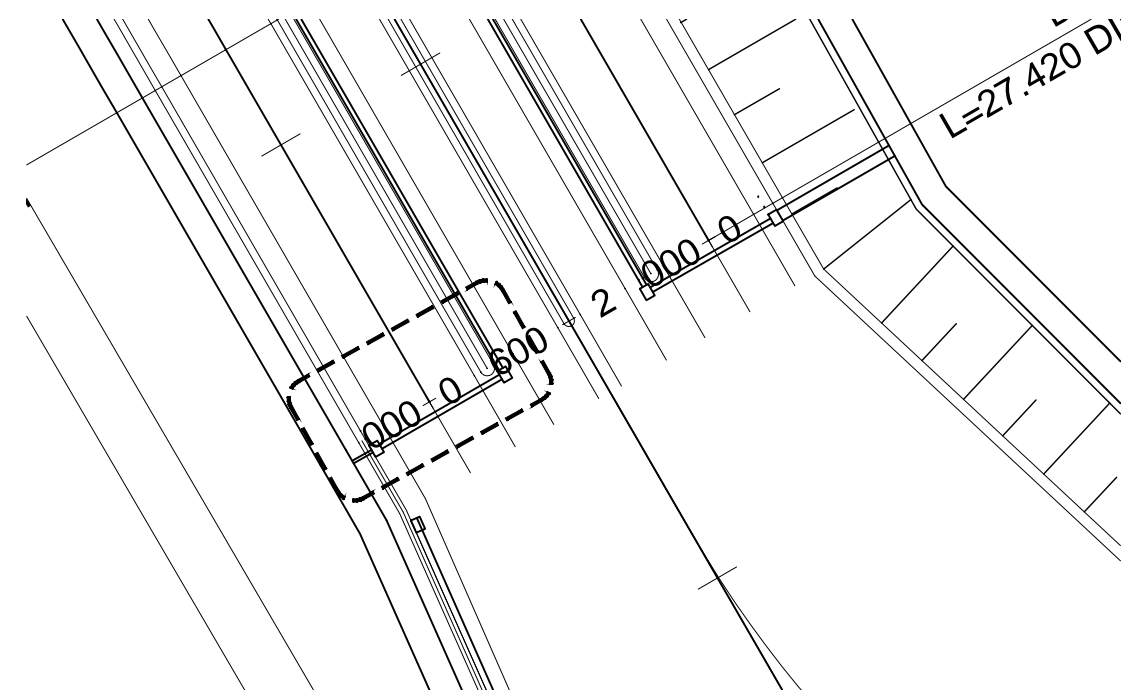
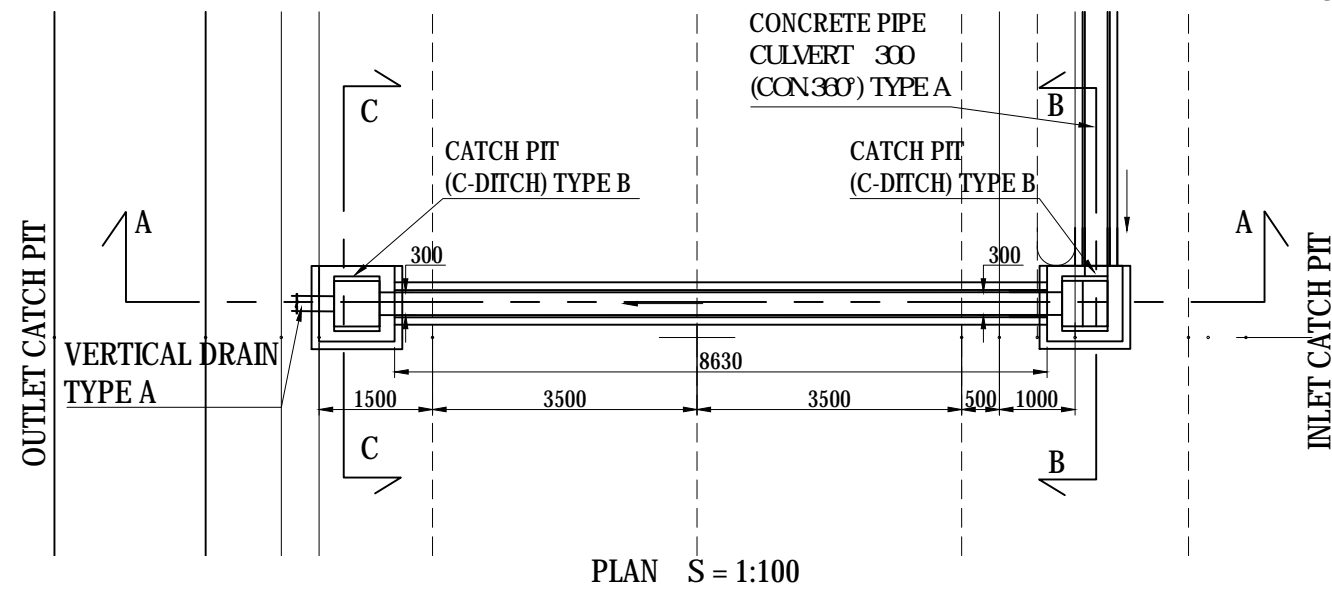
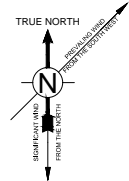


Note: Precast R.C. Pipe 300 Reinforced Spun and Centrifugal Reinforced Concrete Pipes shall be Selected.

<small>PROJECT NAME</small> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<small>FINANCED BY</small> JAPAN INTERNATIONAL COOPERATION AGENCY	<small>COUNTERPART</small> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<small>JICA STUDY TEAM</small> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NAME</th> <th>SIGNATURE</th> <th>DATE</th> </tr> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td>21 Jun. 2017</td> </tr> </table>	NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU	15 Jun. 2017	CHECKED BY	T. HAYAKAWA	20 Jun. 2017	APPROVED BY	Y. SANO	21 Jun. 2017	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DRAWING TITLE</th> <th>PACKAGE</th> </tr> <tr> <td rowspan="3" style="text-align: center;">                     DETAIL OF CONCRETE PIPE CULVERT 300 (CON 360°)                      TYPE B S=1:15                 </td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">DWG No.</td> </tr> <tr> <td style="text-align: center;">P2-RD-3021</td> </tr> </table>	DRAWING TITLE	PACKAGE	DETAIL OF CONCRETE PIPE CULVERT 300 (CON 360°) TYPE B S=1:15	2	DWG No.	P2-RD-3021
NAME	SIGNATURE	DATE																					
PREPARED BY	M. TORIU	15 Jun. 2017																					
CHECKED BY	T. HAYAKAWA	20 Jun. 2017																					
APPROVED BY	Y. SANO	21 Jun. 2017																					
DRAWING TITLE	PACKAGE																						
DETAIL OF CONCRETE PIPE CULVERT 300 (CON 360°) TYPE B S=1:15	2																						
	DWG No.																						
	P2-RD-3021																						

# GENERAL VIEW OF CONCRETE PIPE CULVERT (1)

STA. 2+601.400 (L)

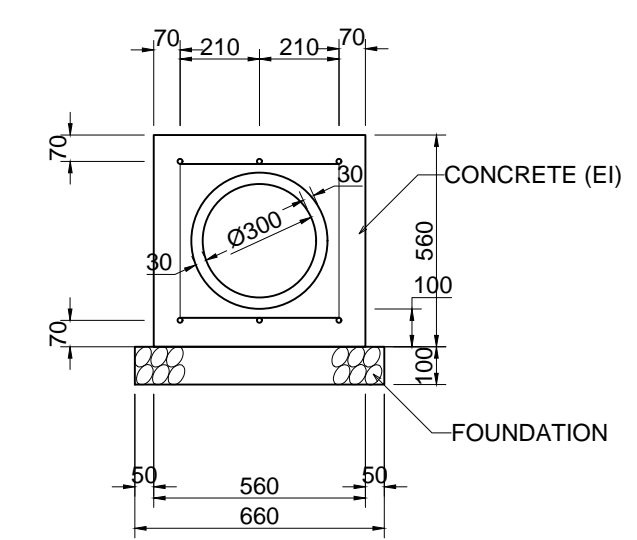
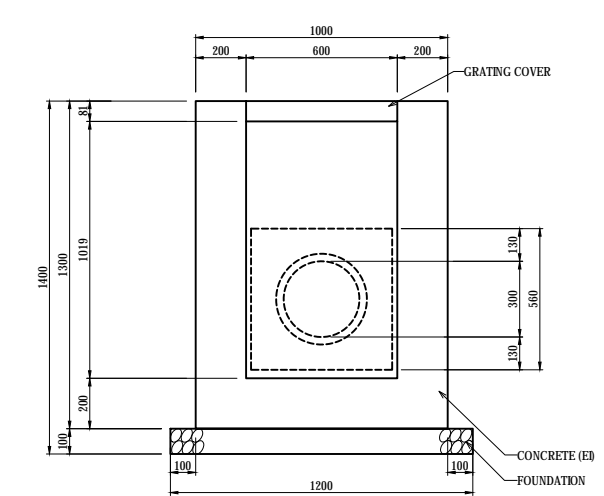
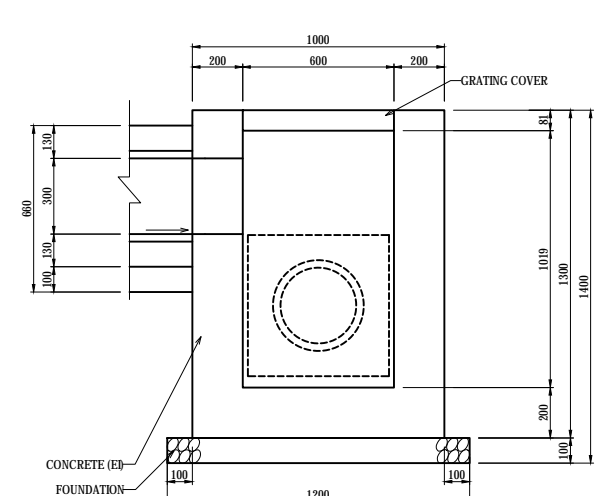
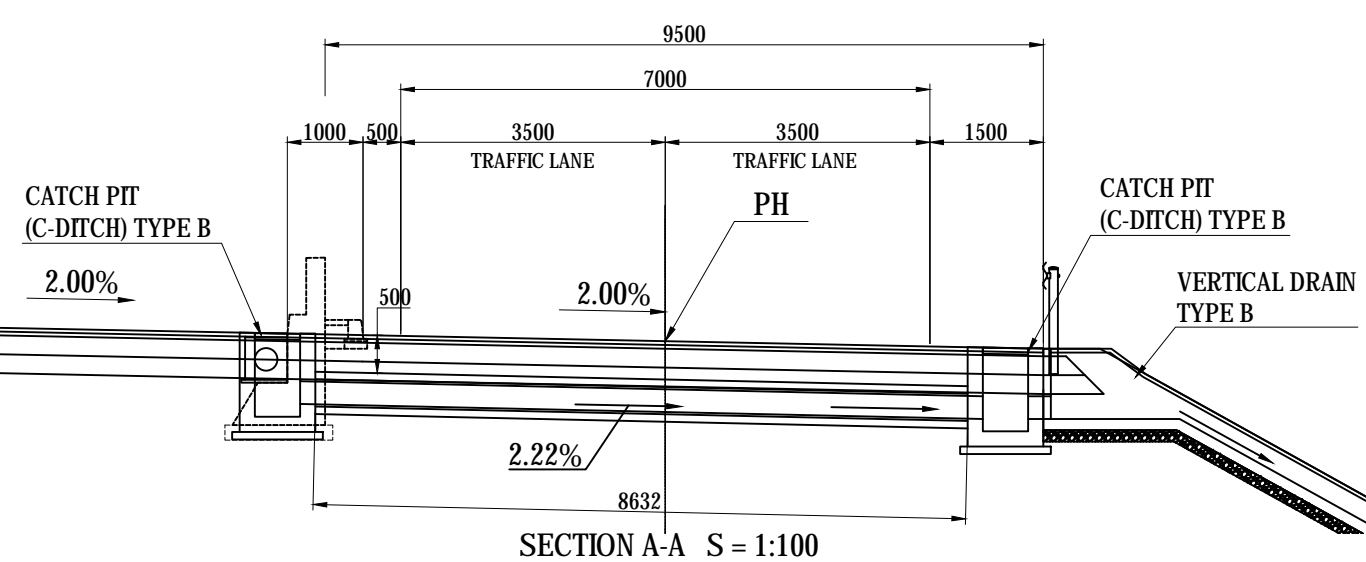
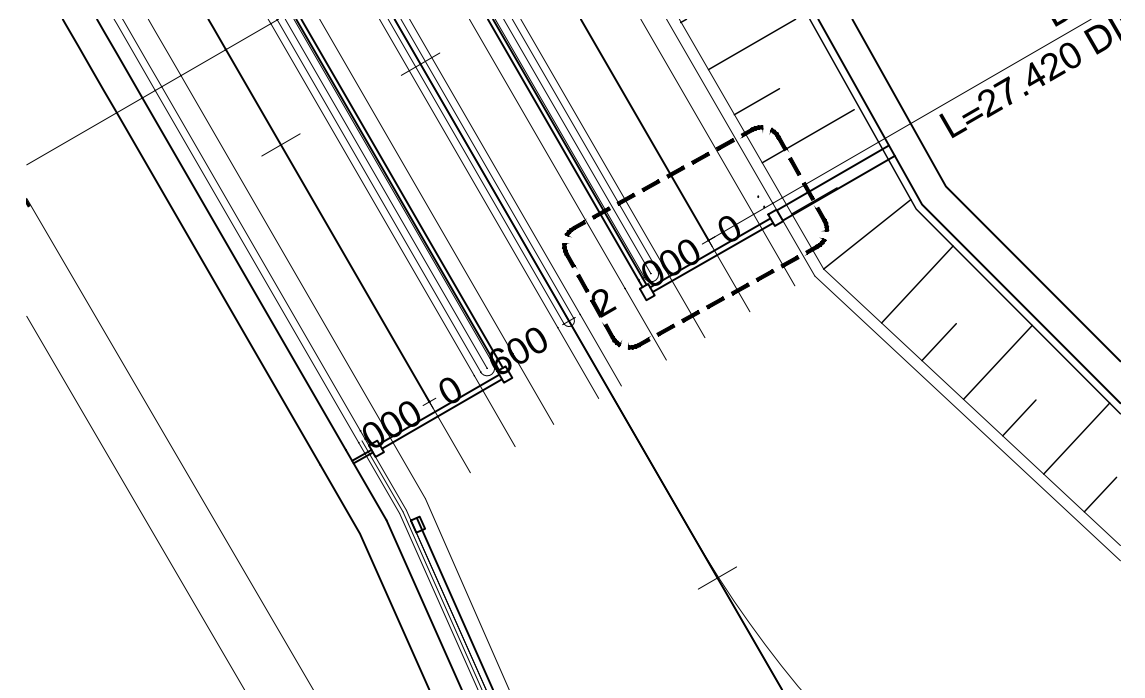
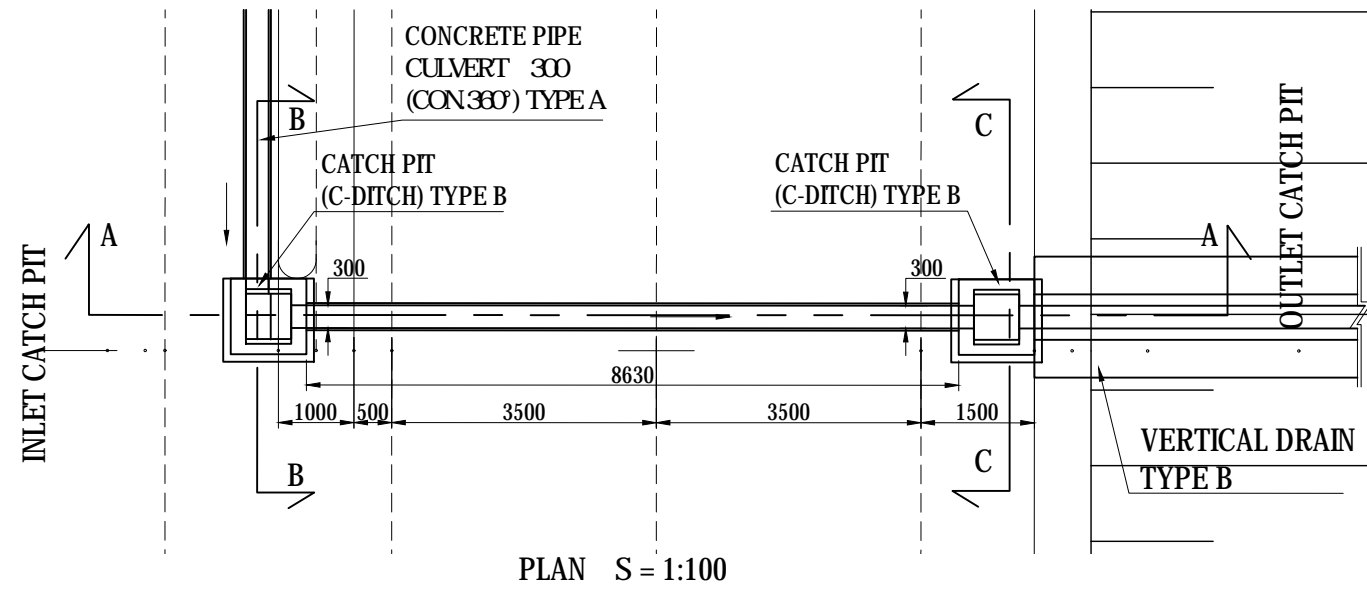
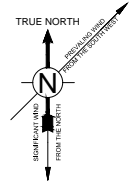


CONCRETE PIPE CULVERT 300 (CON.300) TYPE A

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 GENERAL VIEW OF CONCRETE PIPE CULVERT (1) STA. 2+600 (L)	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	DWG No.
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	P2-RD-3030
				APPROVED BY	Y. SANO			21 Jun. 2017	

# GENERAL VIEW OF CONCRETE PIPE CULVERT (2)

STA.2+601.400 (R)

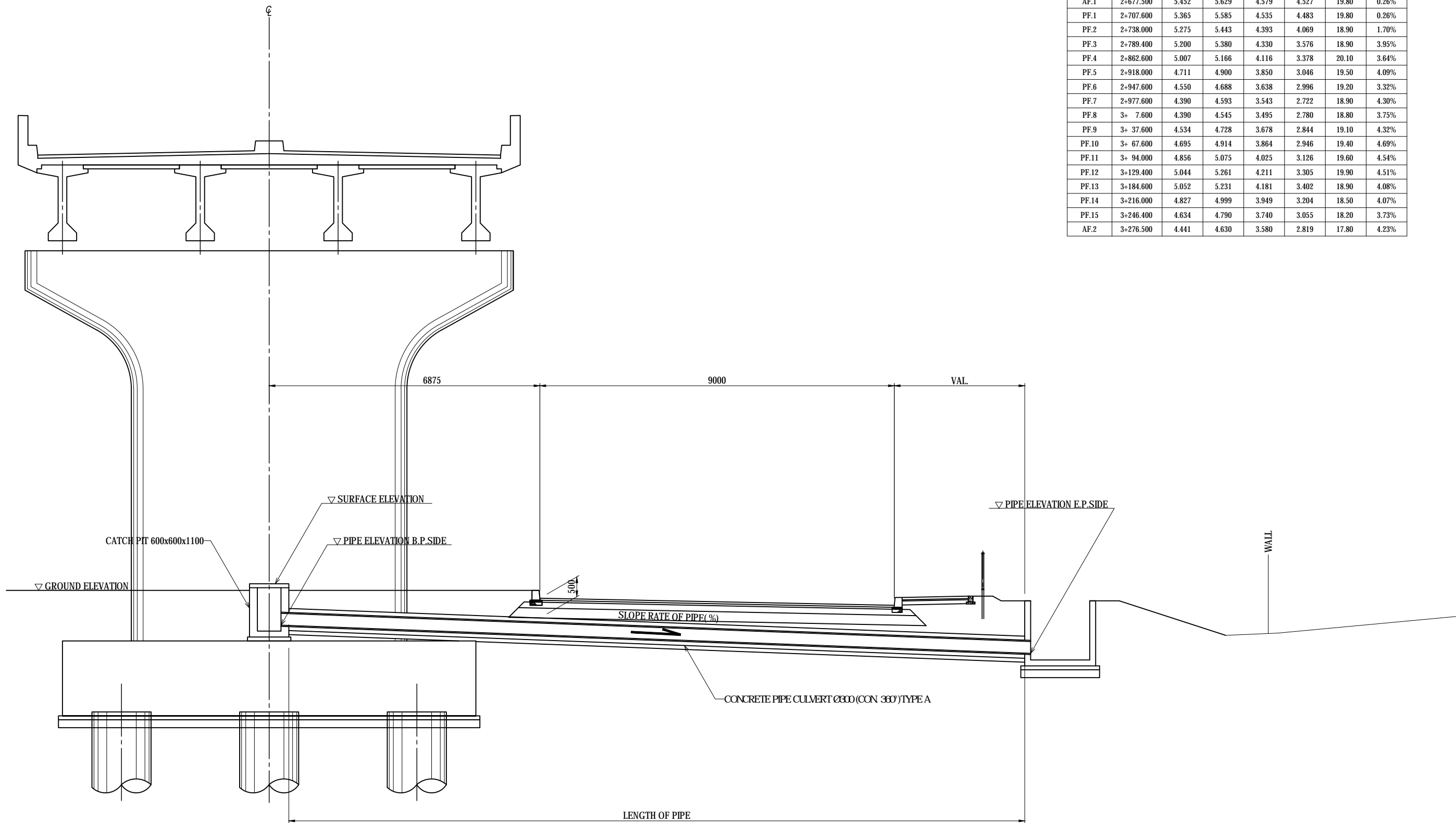


PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE GENERAL VIEW OF CONCRETE PIPE CULVERT (2) STA. 2+600 (R)	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	DWG No.
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	P2-RD-3031
				APPROVED BY	Y. SANO			21 Jun. 2017	

# GENERAL VIEW OF CONCRETE PIPE CULVERT (3) S=1:100

## CONCRETE PIPE CULVERT Ø300 (CON 360°) TYPE A

No.	STA.	GROUND ELEVATION (EL.m)	SURFACE ELEVATION (EL.m)	PIPE ELEVATION B.P.SIDE (EL.m)	PIPE ELEVATION E.P.SIDE (EL.m)	LENGTH OF PIPE (m)	SLOPE RATE OF PIPE (%)
AF.1	2+677.500	5.452	5.629	4.579	4.527	19.80	0.26%
PF.1	2+707.600	5.365	5.585	4.535	4.483	19.80	0.26%
PF.2	2+738.000	5.275	5.443	4.393	4.069	18.90	1.70%
PF.3	2+789.400	5.200	5.380	4.330	3.576	18.90	3.95%
PF.4	2+862.600	5.007	5.166	4.116	3.378	20.10	3.64%
PF.5	2+918.000	4.711	4.900	3.850	3.046	19.50	4.09%
PF.6	2+947.600	4.550	4.688	3.638	2.996	19.20	3.32%
PF.7	2+977.600	4.390	4.593	3.543	2.722	18.90	4.30%
PF.8	3+ 7.600	4.390	4.545	3.495	2.780	18.80	3.75%
PF.9	3+ 37.600	4.534	4.728	3.678	2.844	19.10	4.32%
PF.10	3+ 67.600	4.695	4.914	3.864	2.946	19.40	4.69%
PF.11	3+ 94.000	4.856	5.075	4.025	3.126	19.60	4.54%
PF.12	3+129.400	5.044	5.261	4.211	3.305	19.90	4.51%
PF.13	3+184.600	5.052	5.231	4.181	3.402	18.90	4.08%
PF.14	3+216.000	4.827	4.999	3.949	3.204	18.50	4.07%
PF.15	3+246.400	4.634	4.790	3.740	3.055	18.20	3.73%
AF.2	3+276.500	4.441	4.630	3.580	2.819	17.80	4.23%



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 	NAME	SIGNATURE	DATE	DRAWING TITLE <b>GENERAL VIEW OF CONCRETE PIPE CULVERT (3) CONCRETE PIPE CULVERT Ø300 (CON. 360°)TYPE A</b>	PACKAGE	
				PREPARED BY	K. TACHIBANA			15 JUNE 2017	2
				CHECKED BY	T. HAYAKAWA			20 JUNE 2017	DWG No.
				APPROVED BY	Y. SANO			21 JUNE 2017	P2-RD-3032



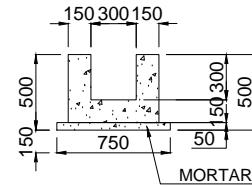
# DETAIL OF SIDE DITCH (1)

S=1:50

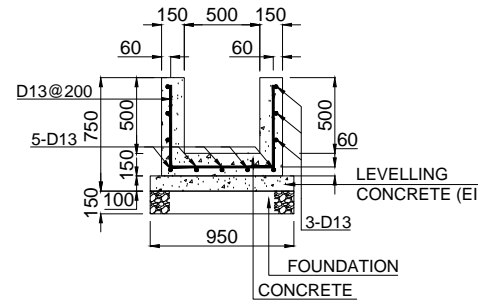
**NOTES:**

1. Concrete Class DII  
(240kg/cm<sup>2</sup>)
2. Steel Reinforcement  
SD345
3. Pit of Steel Reinforcement  
is 200mm

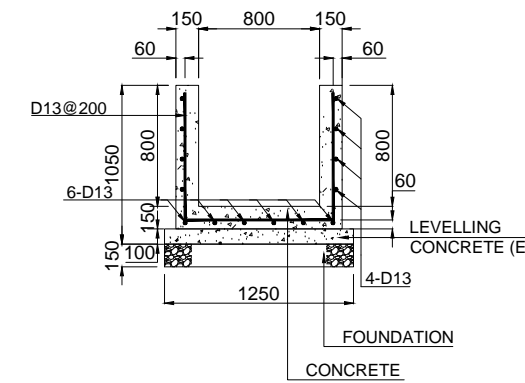
**SIDE DITCH TYPE U-300×300**



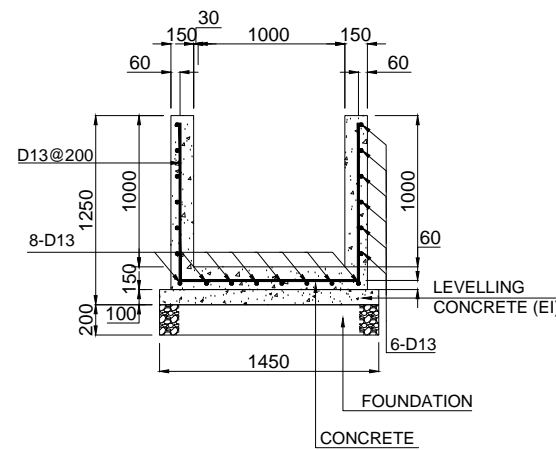
**SIDE DITCH TYPE U-500×500**



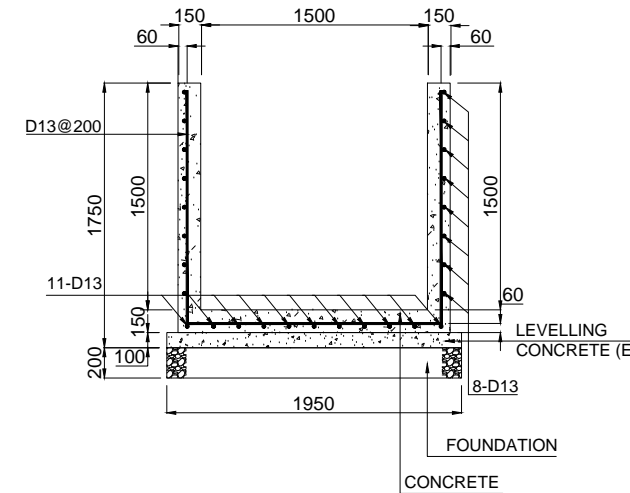
**SIDE DITCH TYPE U-800×800**



**SIDE DITCH TYPE U-1000×1000**



**SIDE DITCH TYPE U-1500×1500**



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 SIDE DITCH (1) S=1:50	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	DWG No.
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	P2-RD-3040
				APPROVED BY	Y. SANO			21 Jun. 2017	

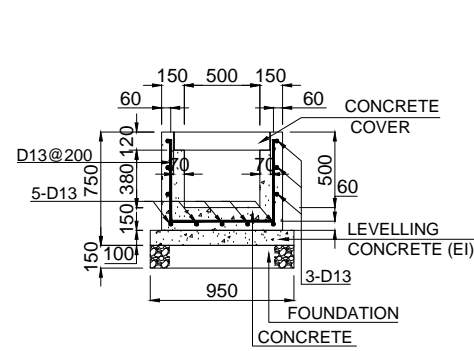
# DETAIL OF SIDE DITCH (2)

S=1:50

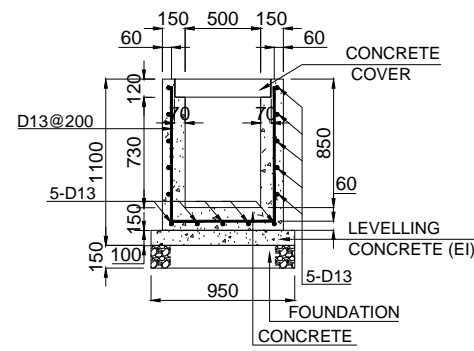
### NOTES:

1. Concrete Class DII (240 kg/cm<sup>2</sup>)
2. Steel Reinforcement SD345
3. Pit of Steel Reinforcement is 200mm

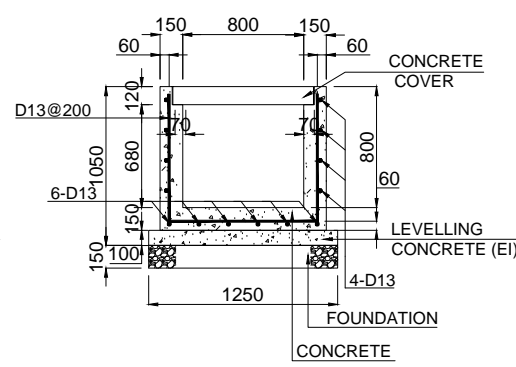
SIDE DITCH TYPE U-500x500 WITH COVER



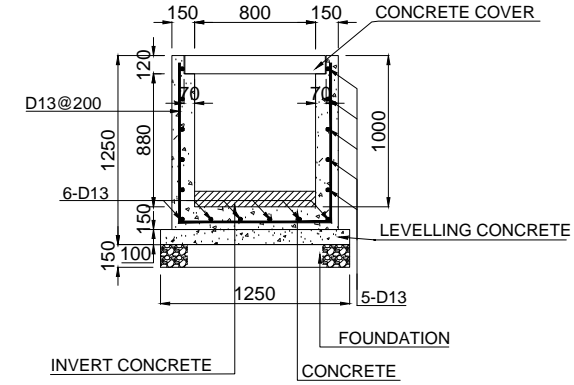
SIDE DITCH TYPE U-500x850 WITH COVER



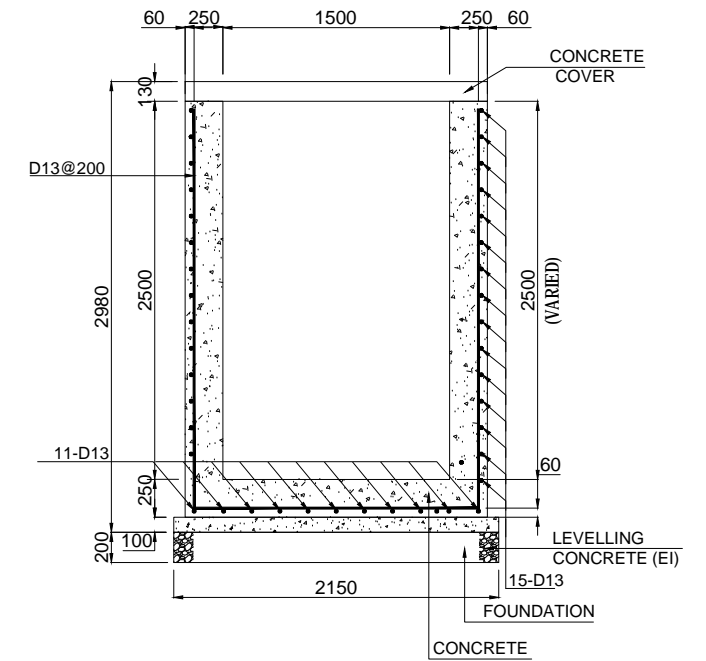
SIDE DITCH TYPE U-800x800 WITH COVER



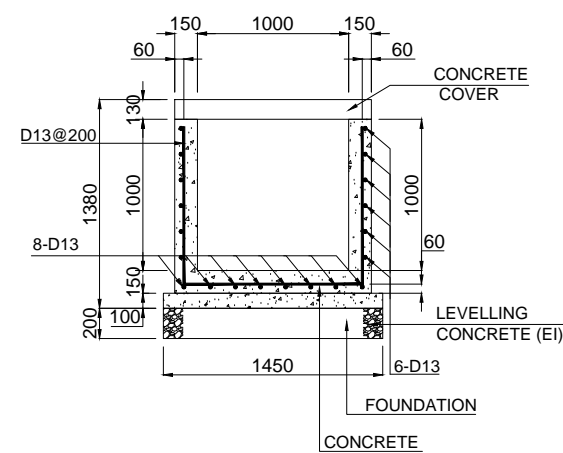
SIDE DITCH TYPE U-800x1000 WITH COVER



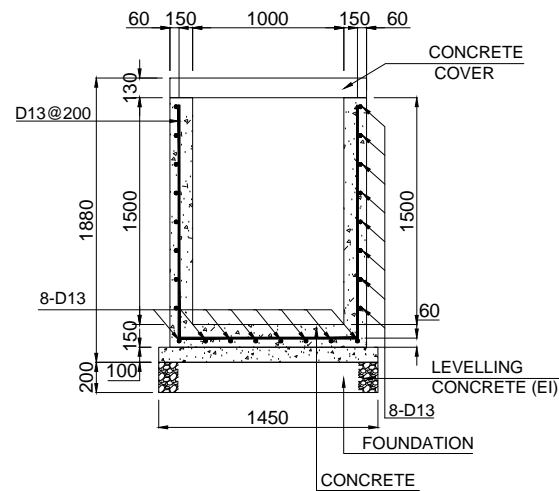
SIDE DITCH TYPE U-1500x2500 WITH COVER



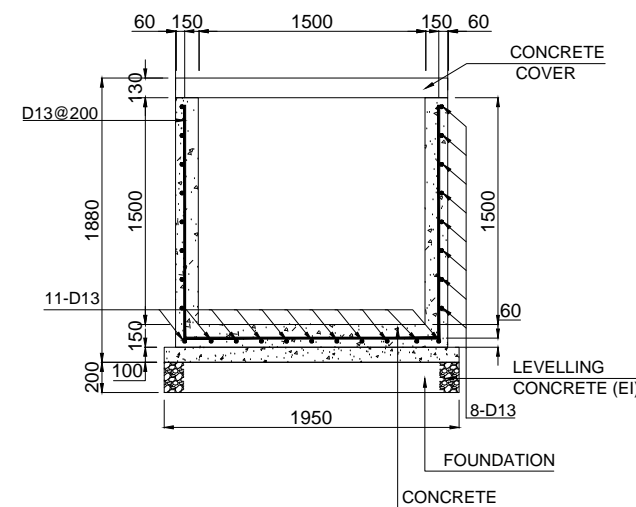
SIDE DITCH TYPE U-1000x1000 WITH COVER



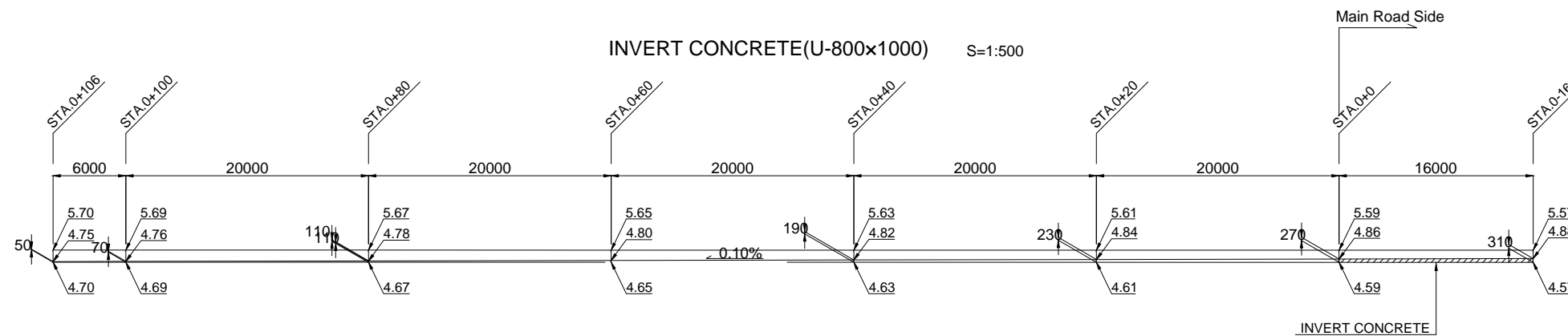
SIDE DITCH TYPE U-1000x1500 WITH COVER



SIDE DITCH TYPE U-1500x1500 WITH COVER



INVERT CONCRETE (U-800x1000) S=1:50

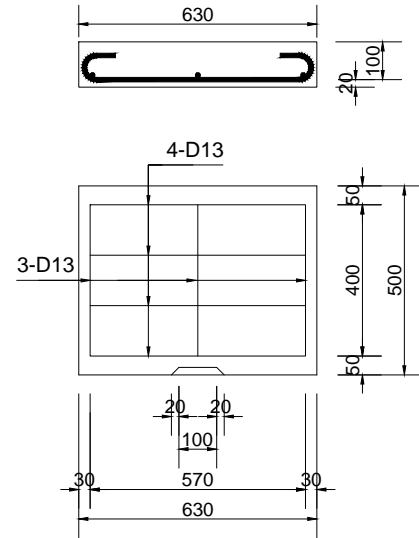


PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DETAIL OF SIDE DITCH (2) S=1:50, 1:500	PACKAGE 2 DWG No. P2-RD-3041	
				PREPARED BY	M. TORIU				15 Jun. 2017
				CHECKED BY	T. HAYAKAWA				20 Jun. 2017
				APPROVED BY	Y. SANO				21 Jun. 2017

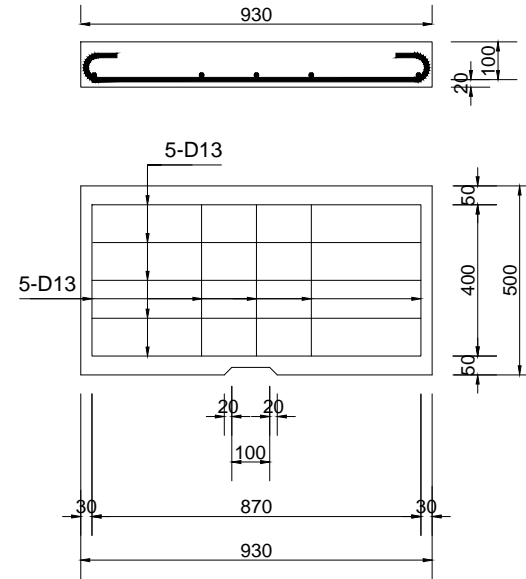
# DETAIL OF SIDE DITCH (3)

S=1:20

CONCRETE COVER  
SIDE DITCH TYPE U-500×500 WITH COVER



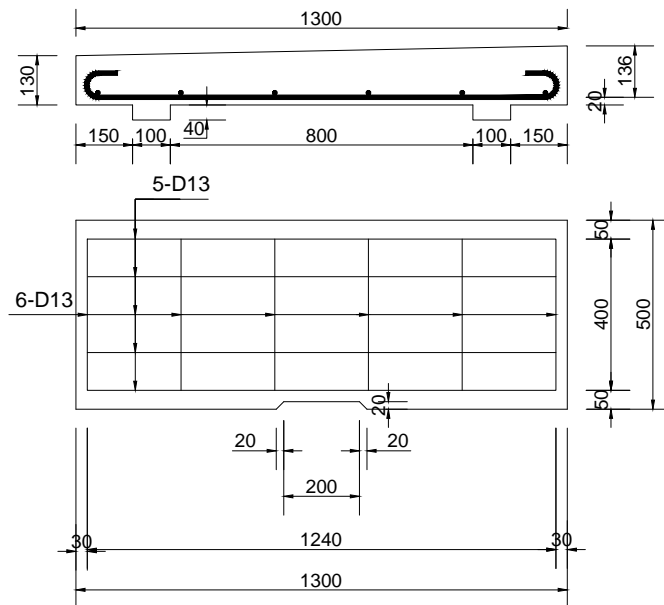
CONCRETE COVER  
SIDE DITCH TYPE U-800×800 WITH COVER  
SIDE DITCH TYPE U-800×1000 WITH COVER



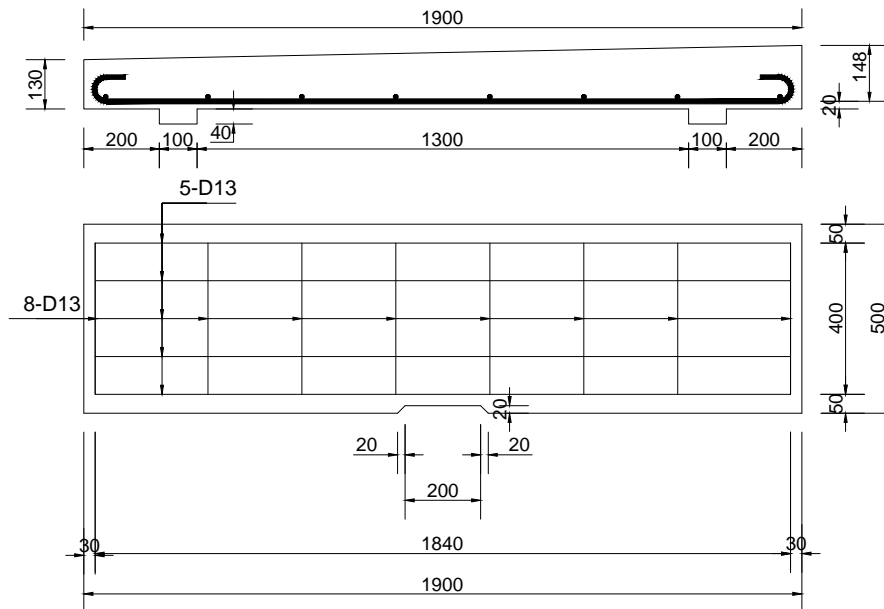
NOTES:

1. Concrete Class DII (240kg/cm<sup>3</sup>)
2. Steel Reinforcement SD345
3. Pit of Steel Reinforcement is 200mm

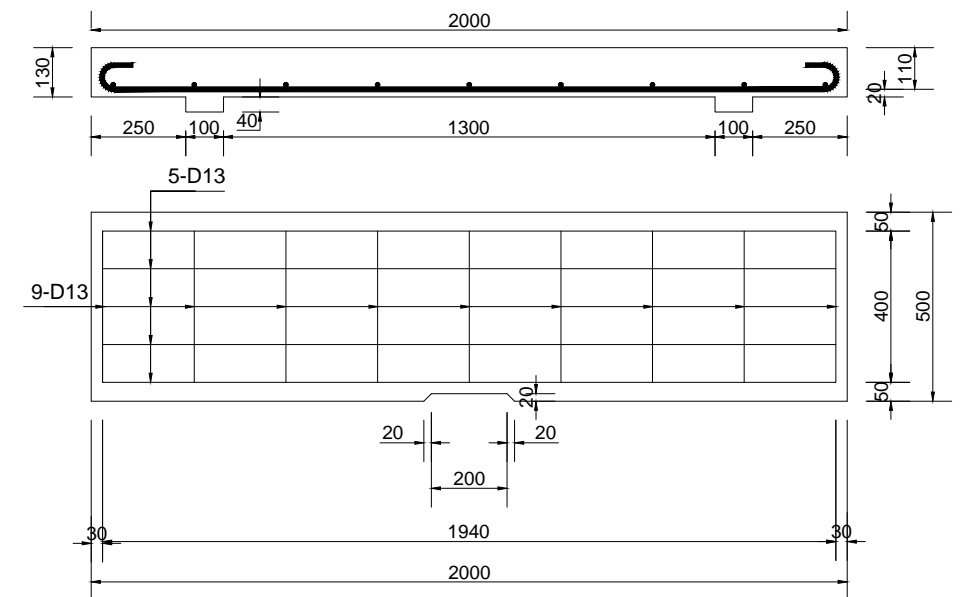
CONCRETE COVER  
SIDE DITCH TYPE U-1000×1000 WITH COVER  
SIDE DITCH TYPE U-1000×1500 WITH COVER



CONCRETE COVER  
SIDE DITCH TYPE U-1500×1700 WITH COVER



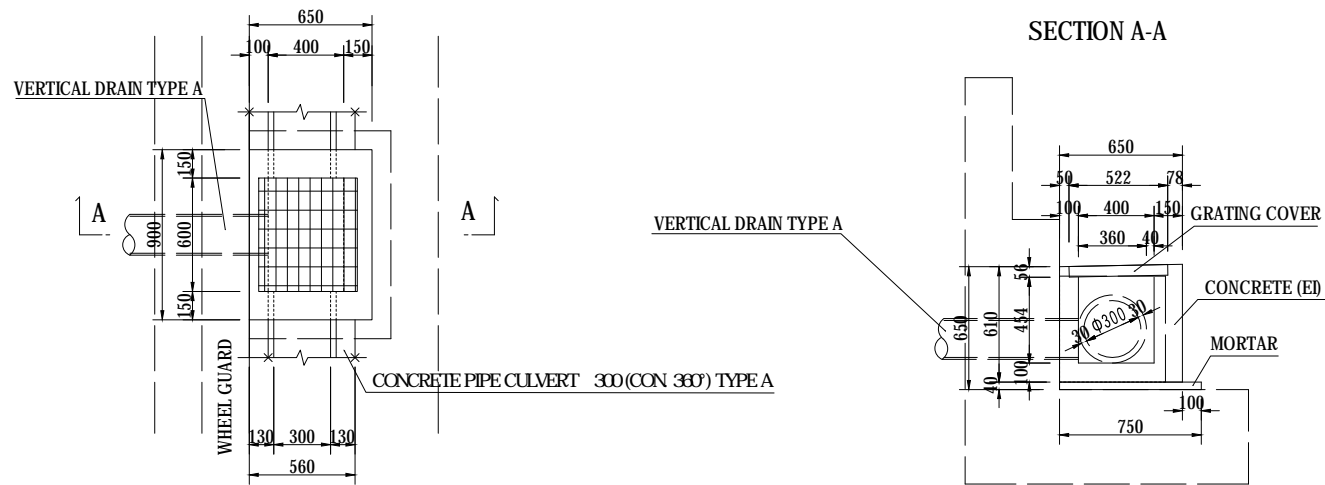
CONCRETE COVER  
SIDE DITCH TYPE U-1500×2500 WITH COVER



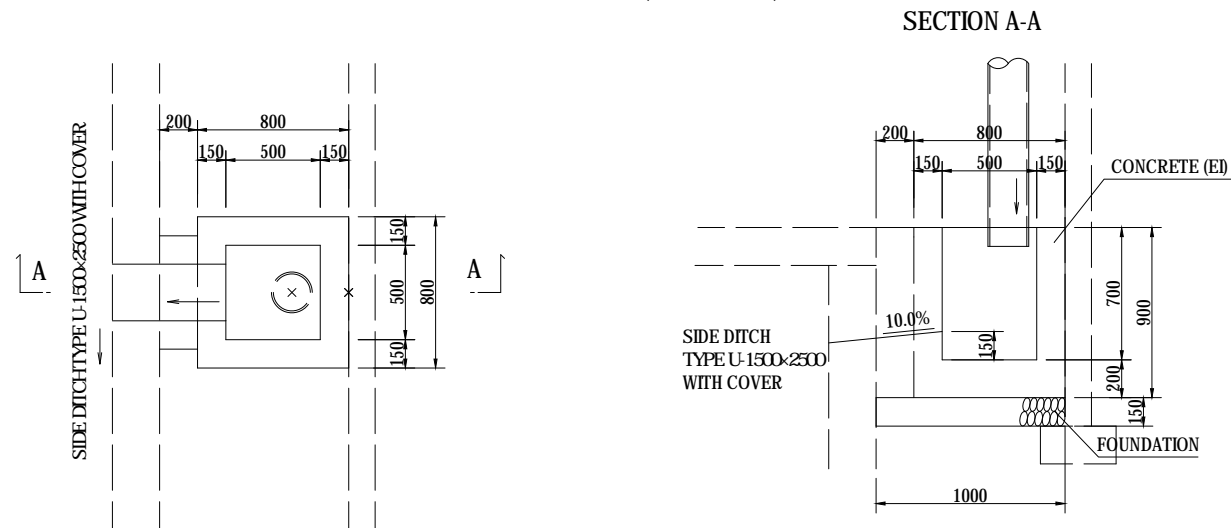
PROJECT NAME DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	FINANCED BY jica JAPAN INTERNATIONAL COOPERATION AGENCY	COUNTERPART REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	JICA STUDY TEAM NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	NAME	SIGNATURE	DATE	DRAWING TITLE DETAIL OF SIDE DITCH (3) S=1:20	PACKAGE
				PREPARED BY	M. TORIU	15 Jun. 2017		2
				CHECKED BY	T. HAYAKAWA	20 Jun. 2017		DWG No.
				APPROVED BY	Y. SANO	21 Jun. 2017		P2-RD-3042

# DETAIL OF CATCH PIT (1)

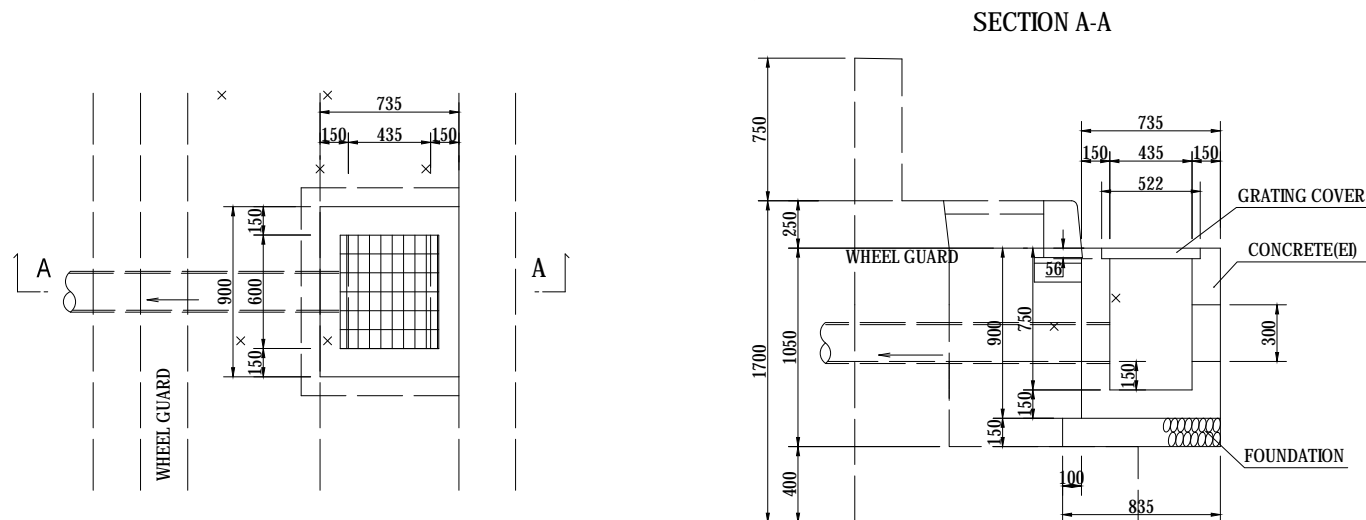
## DETAIL OF CATCH PIT (C-DITCH) TYPE A S=1:40



## DETAIL OF CATCH PIT (C-DITCH) TYPE C S=1:40



## DETAIL OF CATCH PIT (C-DITCH) TYPE D S=1:40



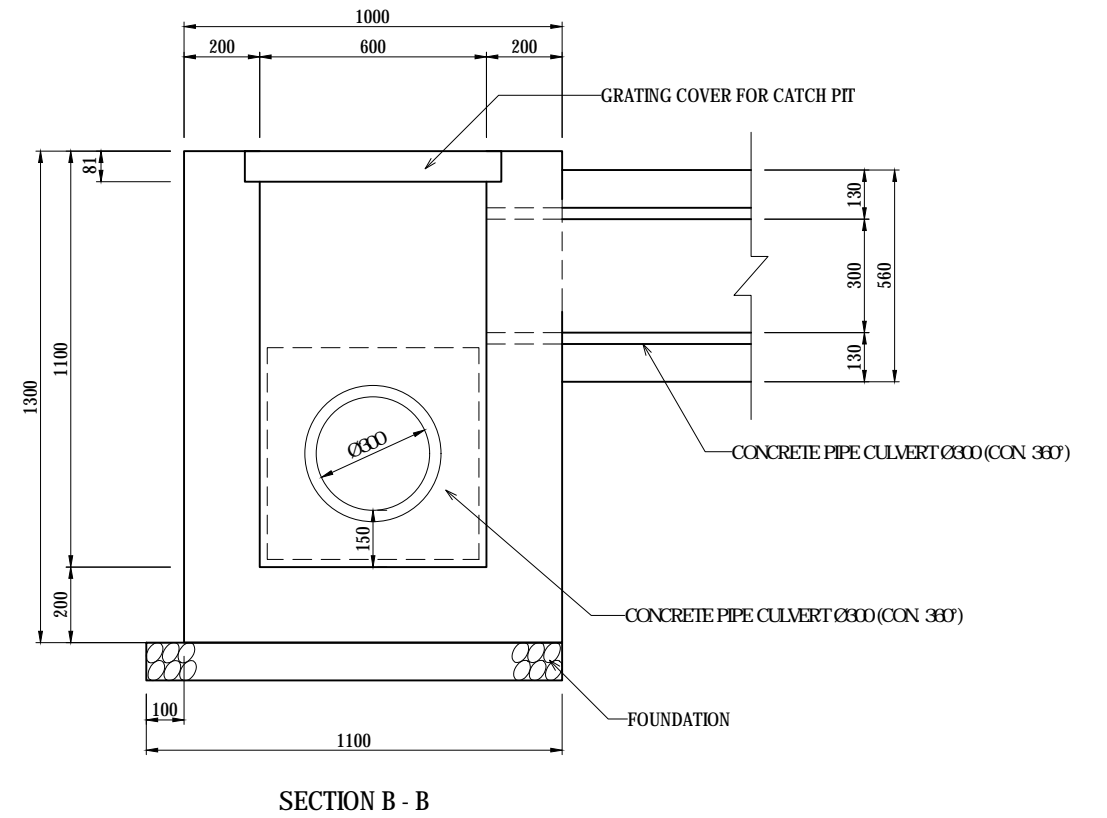
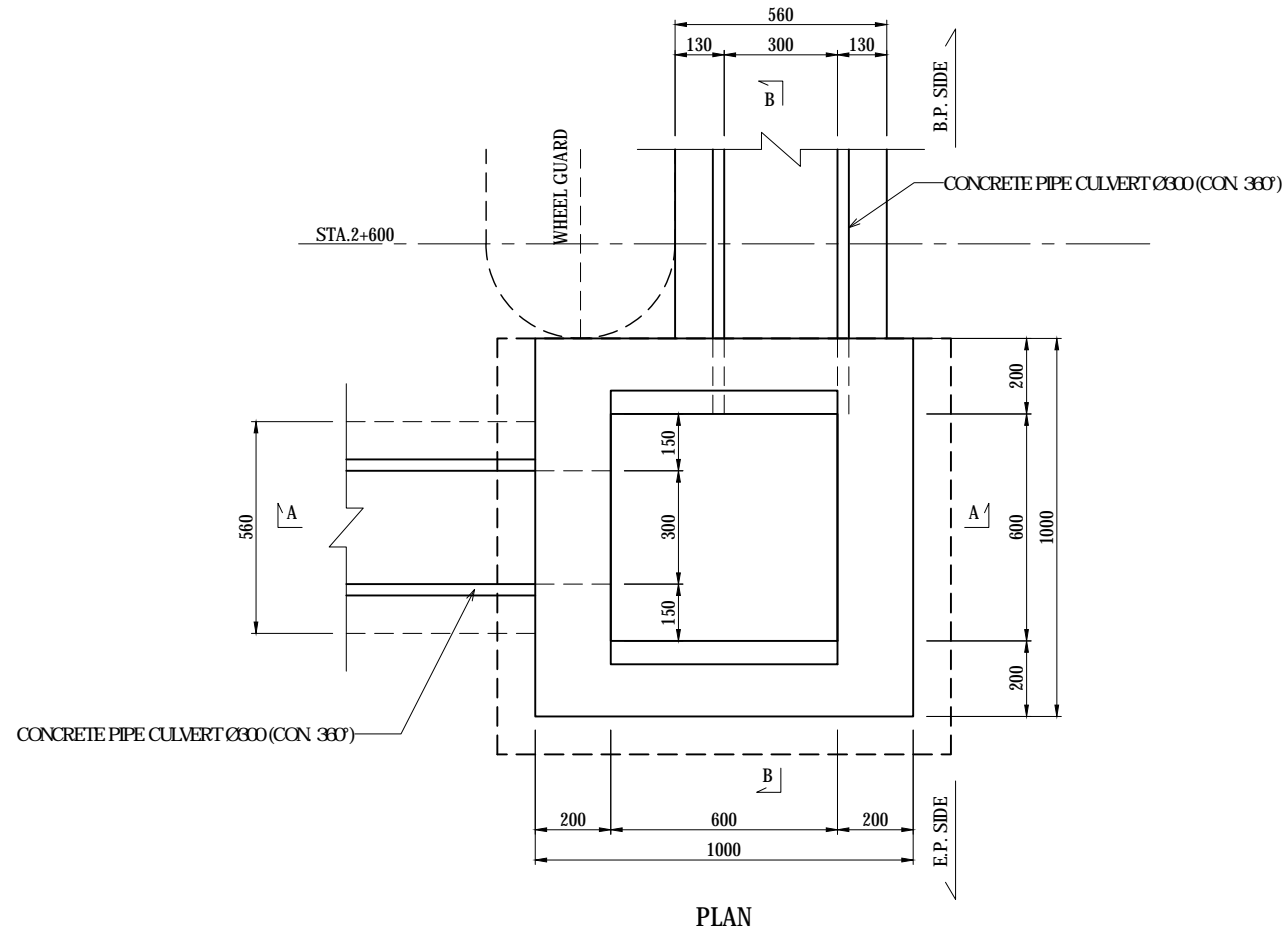
## SCHEDULE OF CATCH PIT & VERTICAL DRAIN

PACKAGE	ROAD	SIDE	STATION	CATCH PIT (C-DITCH)				VERTICAL DRAIN TYPE A	VERTICAL DRAIN TYPE B			
				TYPE A	TYPE B	TYPE C	TYPE D					
				Nos.	Nos.	Nos.	Nos.	Nos.	Nos.			
1	MAIN	LEFT	325.000	1	-	1	-	1	-			
			305.000	1	-	-	-	-	-			
			285.000	1	-	1	-	1	-			
			270.000	1	-	-	-	-	-			
			260.000	1	-	1	-	1	-			
TOTAL				5	-	3	-	3	-			
2	MAIN	LEFT	2413.416	1	-	-	-	-	-			
			2428.416	1	-	1	-	1	-			
			2438.416	1	-	-	-	-	-			
			2448.416	1	-	1	-	1	-			
			2453.416	1	-	-	-	-	-			
			2458.416	1	-	1	-	1	-			
			2463.416	1	-	-	-	-	-			
			2468.416	1	-	1	-	1	-			
			2473.416	1	-	-	-	-	-			
			2478.416	1	-	1	-	1	-			
			2483.416	1	-	-	-	-	-			
			2488.416	1	-	1	-	1	-			
			2505.500	-	-	1	1	1	-			
			2518.741	1	-	1	-	1	-			
			2523.741	1	-	-	-	-	-			
			2528.741	1	-	1	-	1	-			
			2533.741	1	-	-	-	-	-			
			2538.741	1	-	1	-	1	-			
			2543.741	1	-	-	-	-	-			
			2548.741	1	-	1	-	1	-			
			2553.741	1	-	-	-	-	-			
			2558.741	1	-	1	-	1	-			
			2568.741	1	-	-	-	-	-			
			2578.741	1	-	1	-	1	-			
			2588.741	1	-	-	-	-	-			
			RIGHT			2505.500	-	-	-	1	-	1
			FLYOVER	LEFT	2601.400	-	2	1	-	1	-	
					2628.741	1	-	-	-	-	-	
RIGHT	2601.400	-		2	-	-	-	1				
	2628.741	1		-	-	-	-	-				
ON-RAMP	LEFT	2645.000	1	-	-	-	-	-				
		2675.000	1	-	-	-	-					
		2705.000	1	-	1	-	1	-				
		2730.000	1	-	1	-	1	-				
		2745.000	1	-	-	-	-	-				
		2755.000	1	-	1	-	1	-				
TOTAL				32	4	17	2	17	2			

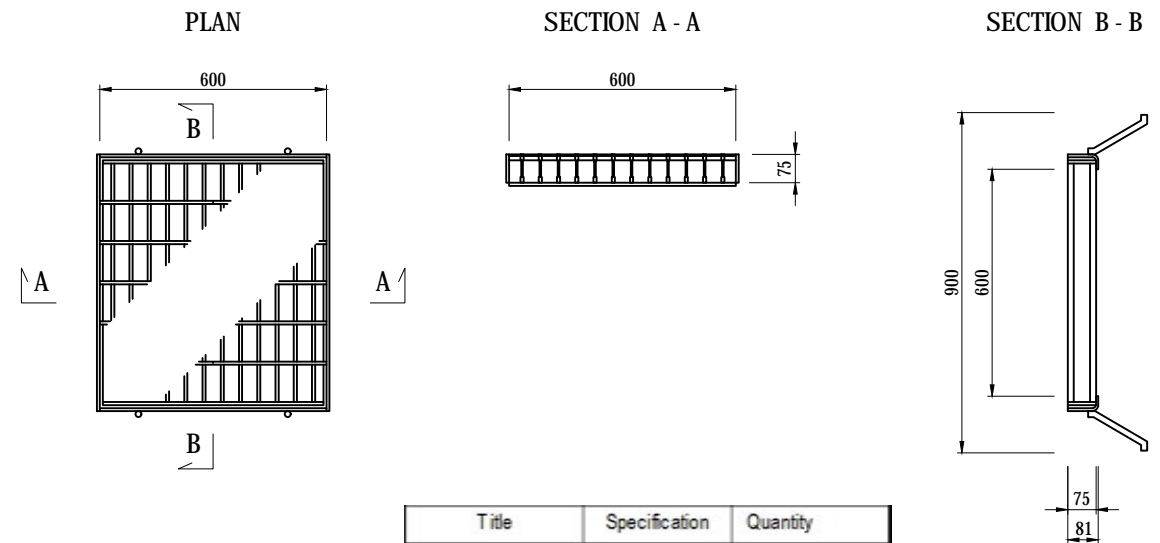
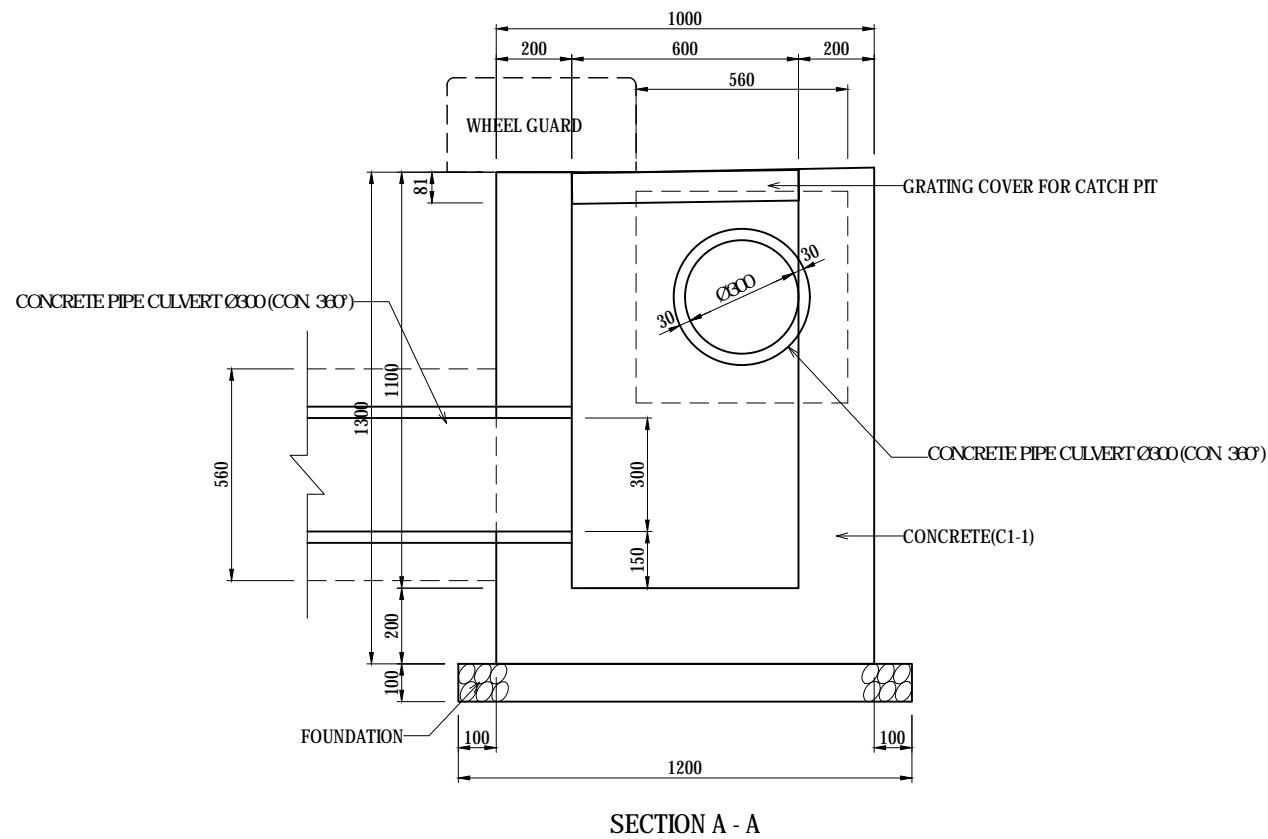
# DETAIL OF CATCH PIT (2) S=1:20

## CATCH PIT (C-DITCH) TYPE B

Note  
1. Specification of Plain Concrete should be CLASS EI



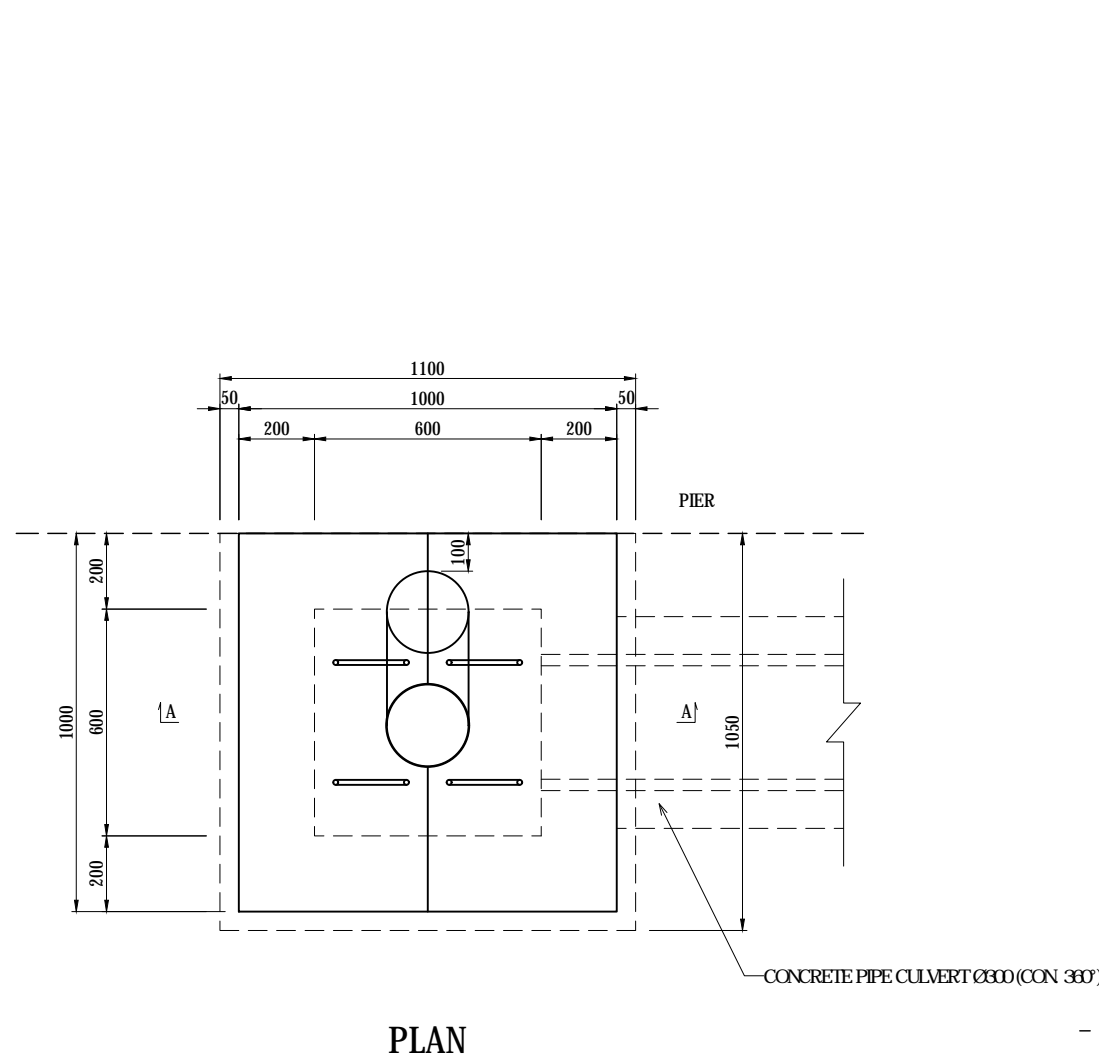
### DETAIL OF GRATING COVER FOR CATCH PIT



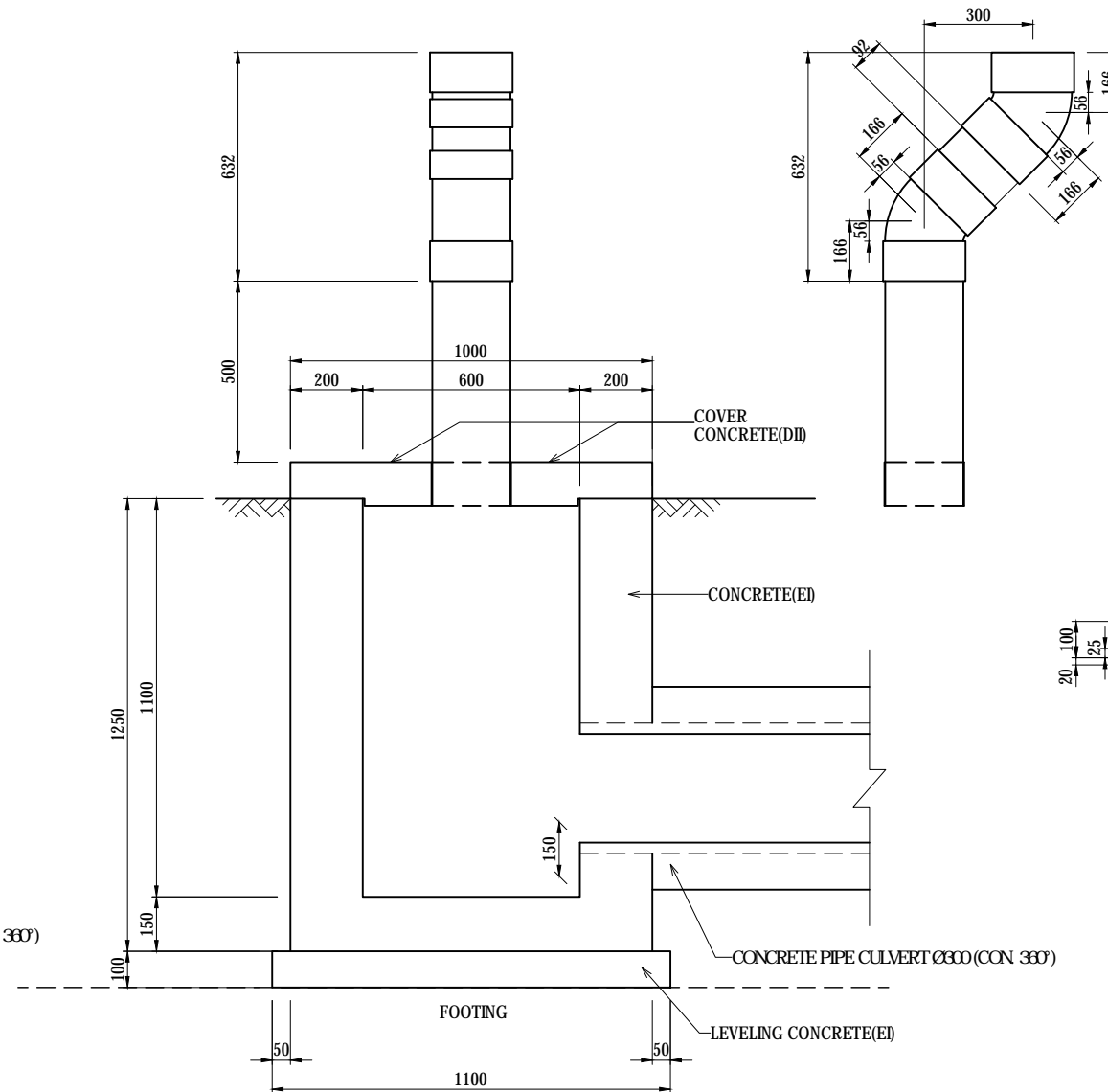
Title	Specification	Quantity
Body		
Concrete	18N/mm <sup>2</sup>	8.570 m <sup>3</sup>
Reinforcing bar		kg
Form		78.40 m <sup>2</sup>
Foundation	t=100	13.20 m <sup>2</sup>
Cover		
Grating Cover		10 each

# DETAIL OF CATCH PIT (3) S=1:20

CATCH PIT 600x600x1100

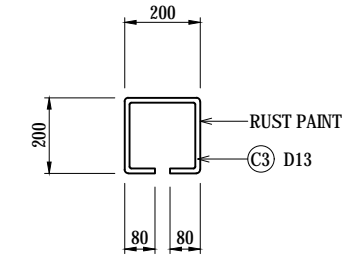


PLAN

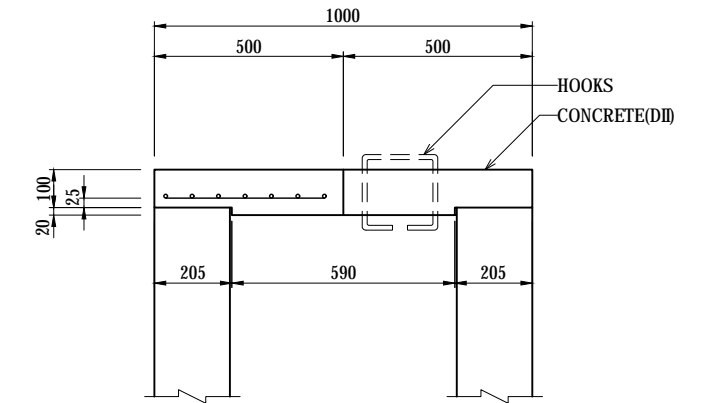


SECTION A - A

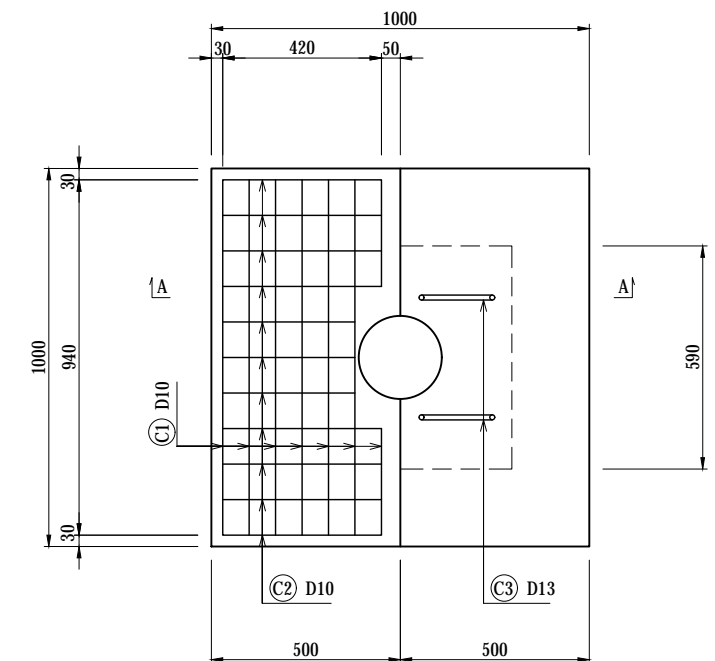
## DETAIL OF HOOKS



## DETAIL OF COVER SECTION A - A



## PLAN

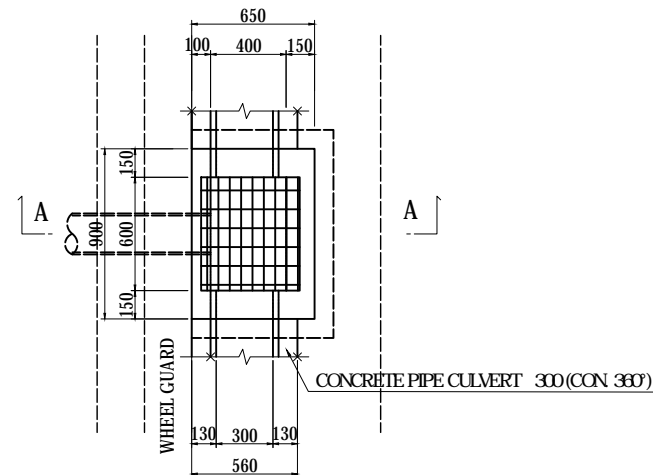


QUANTITY		Per 10 each	
Title	Specification	Quantity	
<b>Body</b>			
Concrete	18 N/mm <sup>2</sup>	8.40	m <sup>3</sup>
Form		80.60	m <sup>2</sup>
Leveling Concrete	t=100	11.55	m <sup>2</sup>
<b>Cover</b>			
Concrete	DII	1.03	m <sup>3</sup>
Reinforcing Bar	D13	150.73	kg
Form		7.20	m <sup>2</sup>
Pipe	VP 200	8.50	m
Peipe Elbow	45°	20	each

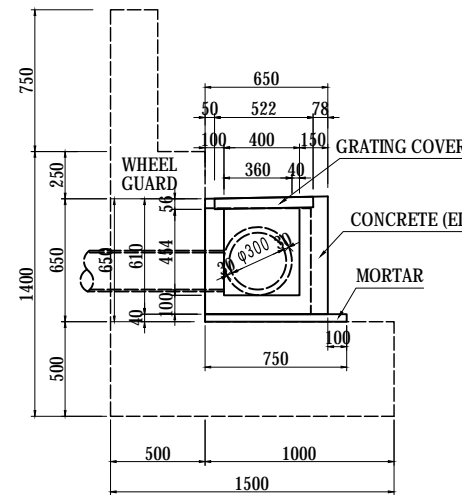
- Note
1. Specification of Plain Concrete should be CLASS E1
  2. Specification of Reinforced Concrete should be CLASS DII
  3. Specification of Steel reinforcement bar should be SD345

# VERTICAL DRAIN TYPE A (1)

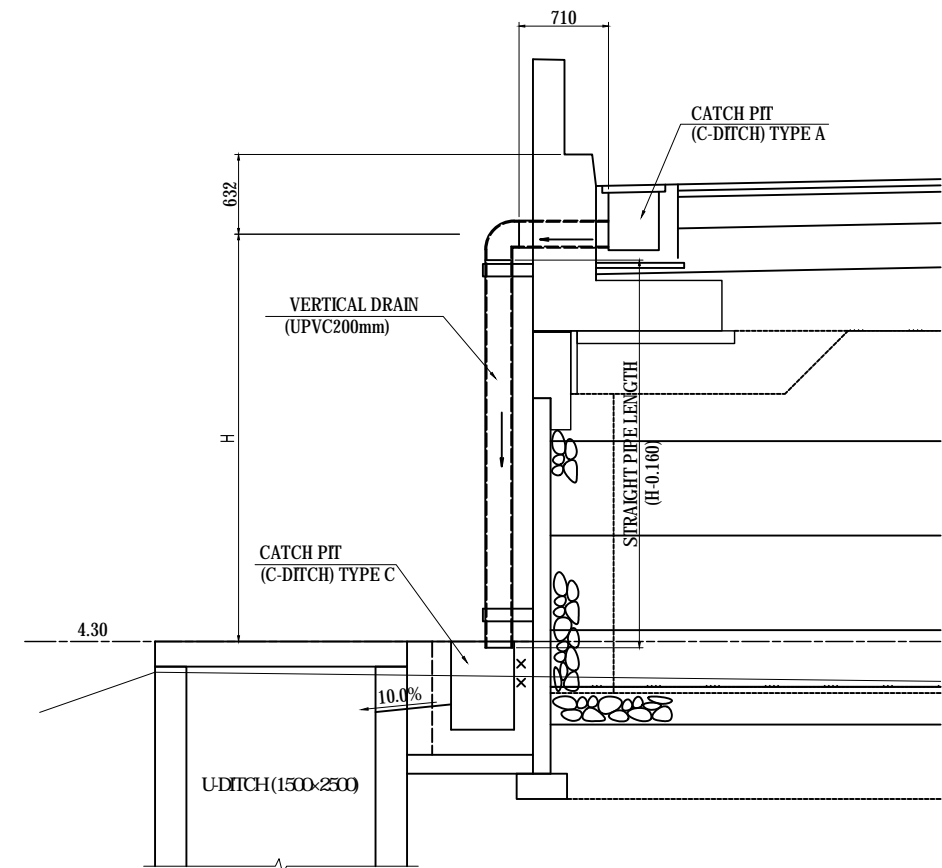
DETAIL OF CATCH PIT (C-DITCH) TYPE A S=1:20



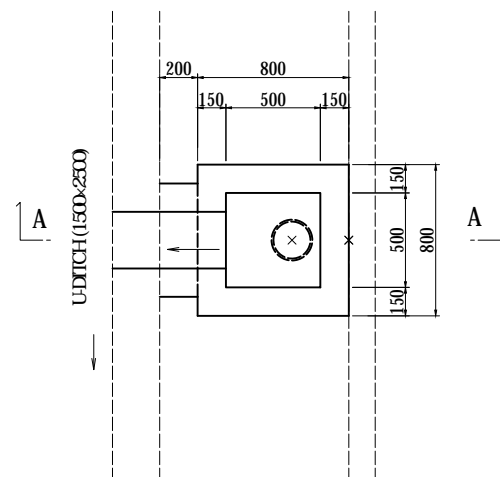
SECTION A-A



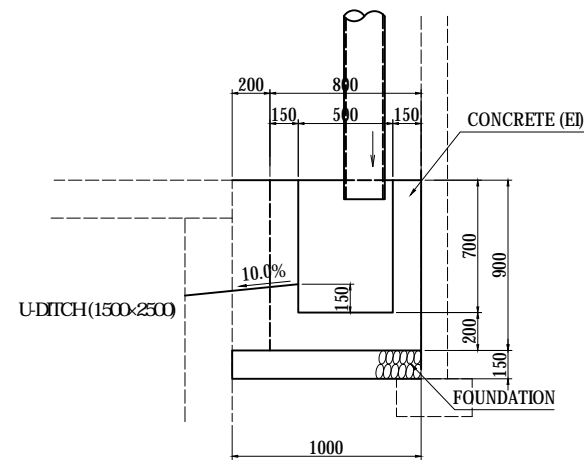
DETAIL OF VERTICAL DRAIN S=1:30



DETAIL OF CATCH PIT (C-DITCH) TYPE C S=1:20



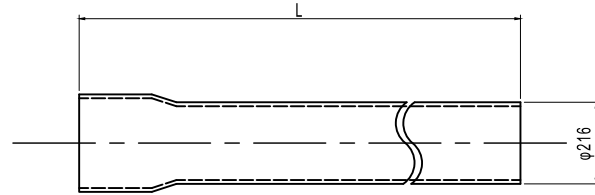
SECTION A-A



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.	M. TORIU	<i>[Signature]</i>	15 Jun. 2017	VERTICAL DRAIN TYPE A (1)	2
				T. HAYAKAWA	<i>[Signature]</i>	20 Jun. 2017		DWG No.
				Y. SANO	<i>[Signature]</i>	21 Jun. 2017		P2-RD-3060

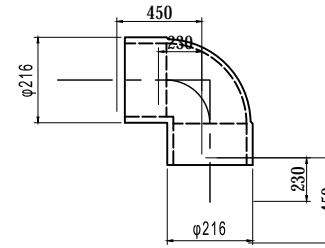
## VERTICAL DRAIN TYPE A (2)

**UPVC200mm(8inch) S=1:10**  
(O.D.216mm)

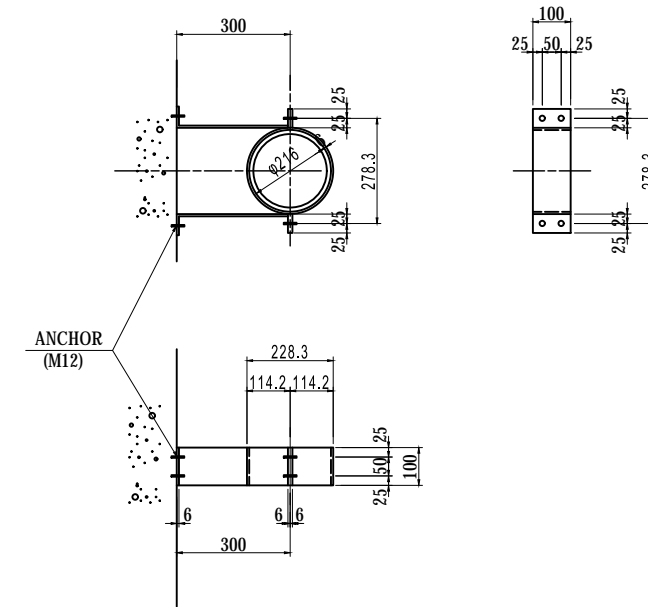


Note: UPVC pipes one end with Socket shape

**JOINT (90°) 200mm(8inch) S=1:10**



**PIPE BRACE S=1:10**  
(200mm)

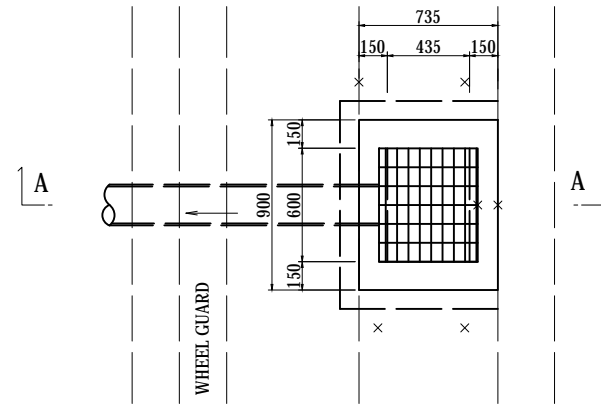


Vertical Drain Location	Ground	H	Pipe Length (m)			JOINT (nos.)	Remark	
			Straight	Cross	Total			
PK1(Thanlyin side)	0+260.000	4.30	1.684	1.524	0.710	2.8570	1	
	0+285.000	4.30	2.261	2.101	0.710	3.434	1	
	0+325.000	4.30	3.074	2.914	0.710	4.247	1	
				<b>Total</b>		<b>10.538</b>	<b>3</b>	
PK2(Thaketa side)	2+428.400	4.30	3.429	3.268	0.710	4.601	1	
	2+448.400	4.30	3.125	2.965	0.710	4.298	1	
	2+458.400	4.30	2.996	2.836	0.710	4.169	1	
	2+468.400	4.30	2.920	2.760	0.973	4.356	1	
	2+478.400	4.30	2.859	2.699	0.973	4.295	1	
	2+488.400	4.30	2.849	2.689	0.973	4.285	1	
	2+505.500	4.30	2.719	2.559	0.973	4.155	1	CATCH PIT TYPE C
	2+518.700	4.30	2.814	2.654	0.973	4.250	1	
	2+528.700	4.30	2.853	2.693	0.973	4.289	1	
	2+538.700	4.30	2.901	2.741	0.973	4.337	1	
	2+548.700	4.30	2.987	2.827	0.710	4.160	1	
	2+558.700	4.30	3.086	2.926	0.710	4.259	1	
	2+578.700	4.30	3.363	3.203	0.710	4.536	1	
	2+600.000	4.30	3.728	3.568	0.710	4.901	1	
	2+705.000	4.30	1.246	1.086	0.710	2.419	1	
2+730.000	4.30	0.277	0.117	0.710	1.450	1		
2+755.000	4.30	0.218	0.058	0.710	1.391	1		
				<b>Total</b>		<b>66.151</b>	<b>17</b>	

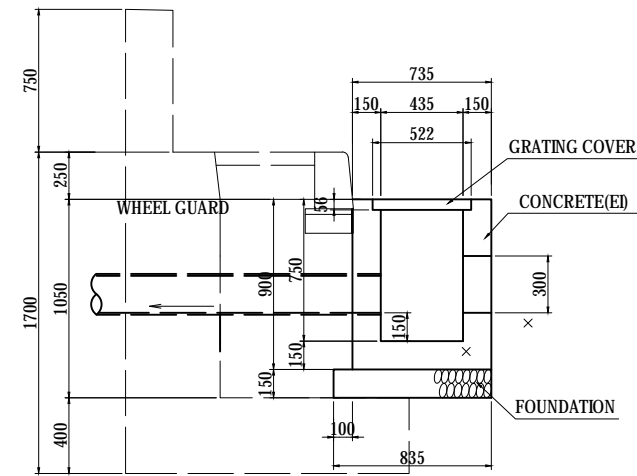


# VERTICAL DRAIN TYPE A (3)

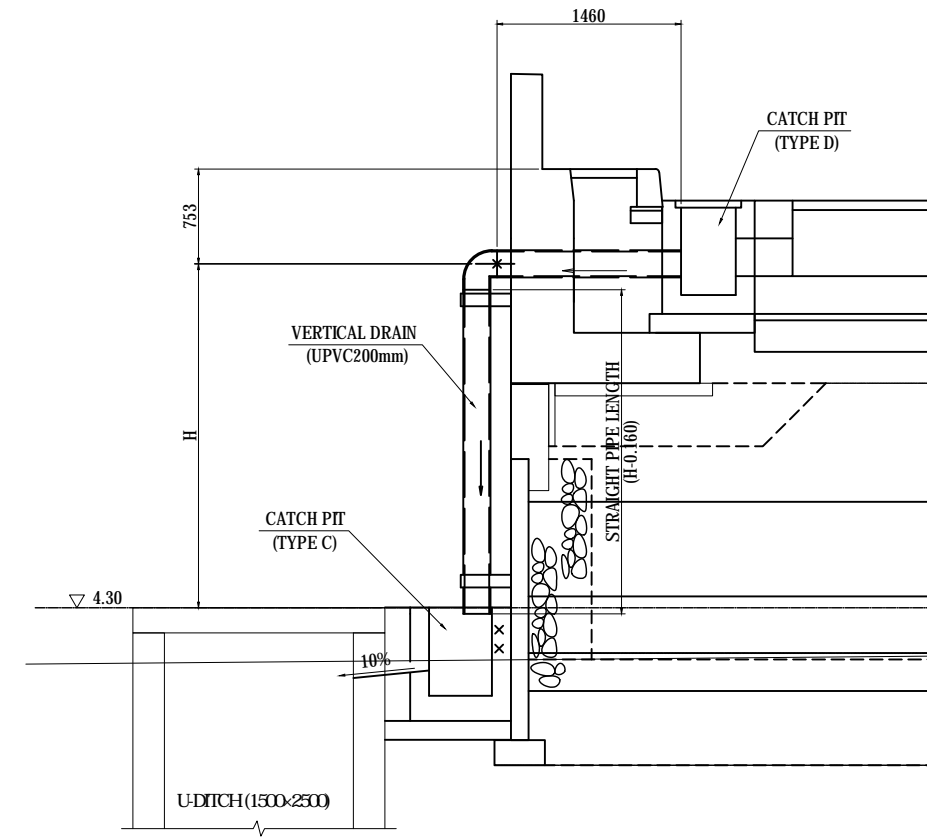
DETAIL OF CATCH PIT (C-DITCH) TYPE D S=1:20  
(STA.2+505.500)



SECTION A-A



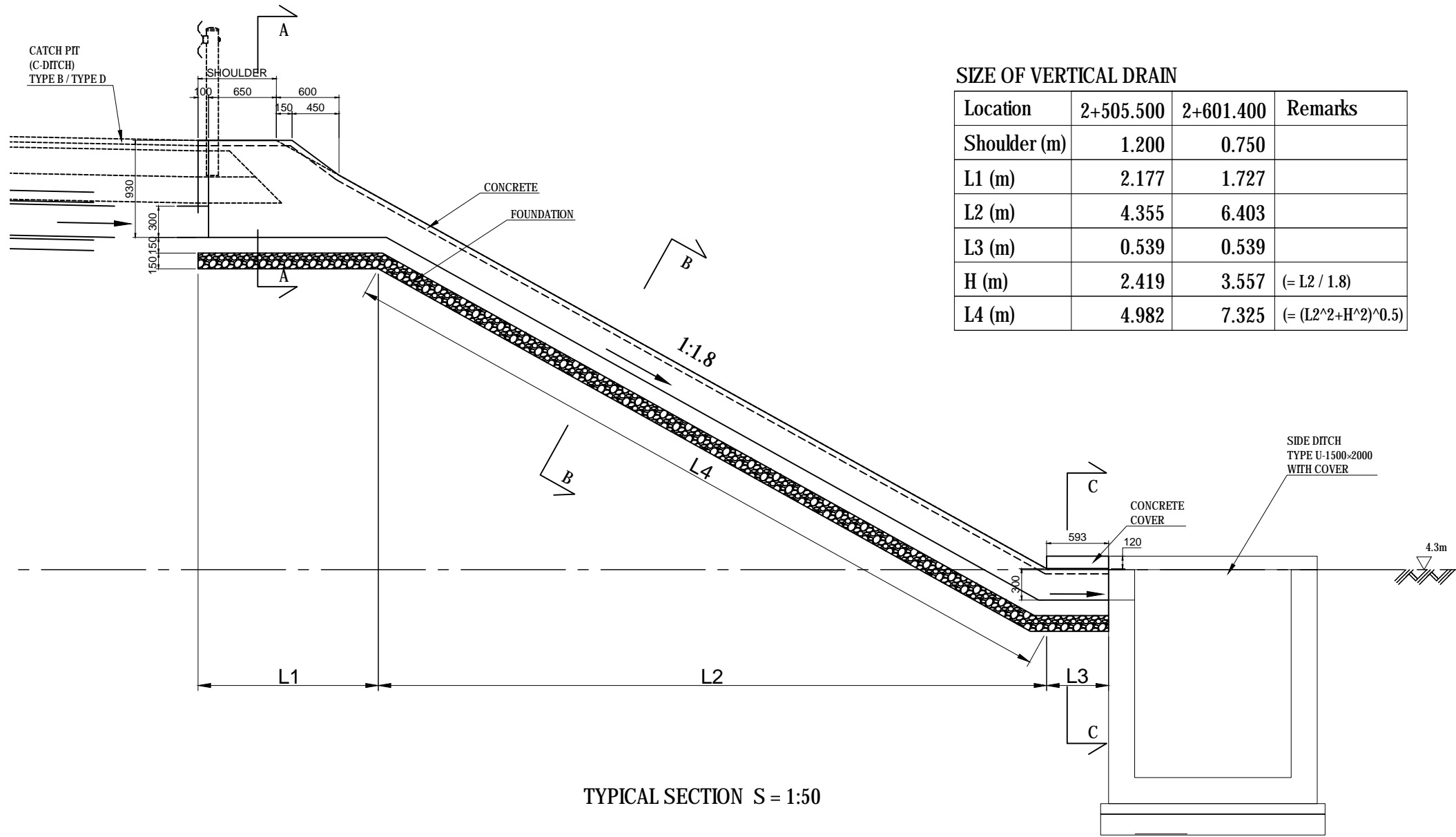
DETAIL OF VERTICAL DRAIN S=1:30  
(STA.2+505.500)



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 VERTICAL DRAIN TYPE A (3)	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun. 2017	P2-RD-3062

# VERTICAL DRAIN TYPE B

Note : Steel Reinforcement SD345



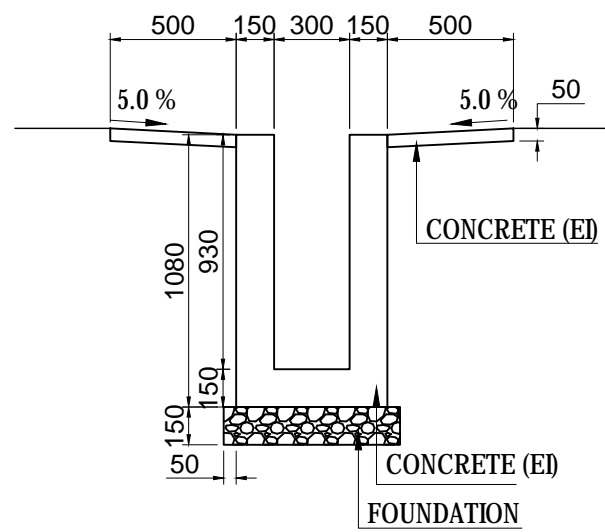
SIZE OF VERTICAL DRAIN			
Location	2+505.500	2+601.400	Remarks
Shoulder (m)	1.200	0.750	
L1 (m)	2.177	1.727	
L2 (m)	4.355	6.403	
L3 (m)	0.539	0.539	
H (m)	2.419	3.557	(= L2 / 1.8)
L4 (m)	4.982	7.325	(= (L2^2+H^2)^0.5)

UNIT QUANTITY ( SECTION A-A) Per 1.0m		
Item	Qty	Remarks
Concrete (m3)	0.419	180 kg/cm2
Foundation (m3)	0.105	Gravel / t=150mm
Form (m2)	4.120	

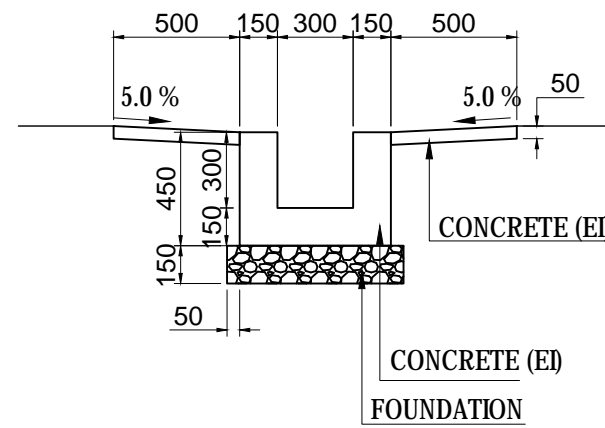
UNIT QUANTITY ( SECTION B-B) Per 1.0m		
Item	Qty	Remarks
Concrete (m3)	0.230	180 kg/cm2
Foundation (m3)	0.105	Gravel / t=150mm
Form (m2)	1.600	

UNIT QUANTITY ( SECTION C-C) Per 1.0m		
Item	Qty	Remarks
Concrete (m3)	0.302	180 kg/cm2
Foundation (m3)	0.105	Gravel / t=150mm
Form (m2)	1.600	
Reinforcement Bar (kg)	7.012	D13, SD345

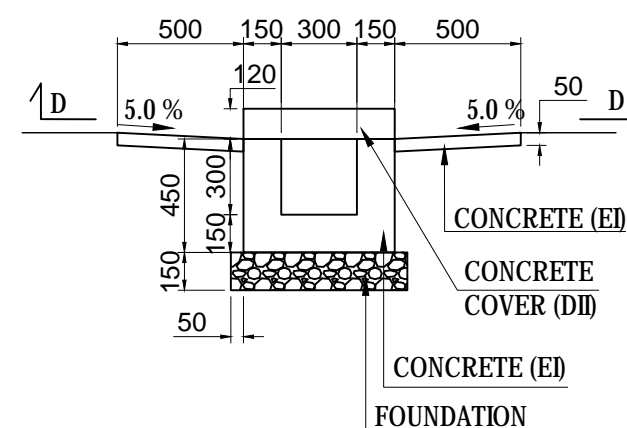
TYPICAL SECTION S = 1:50



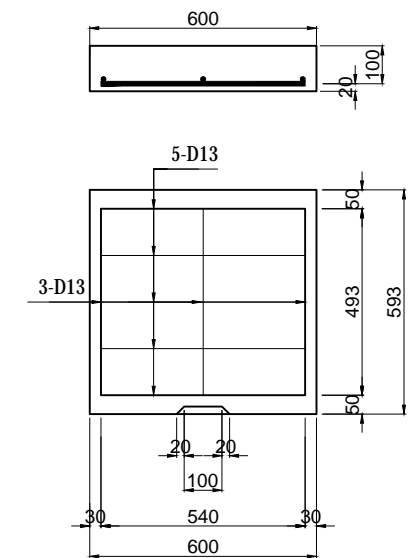
SECTION A-A S = 1:30



SECTION B-B S = 1:30



SECTION C-C S = 1:30

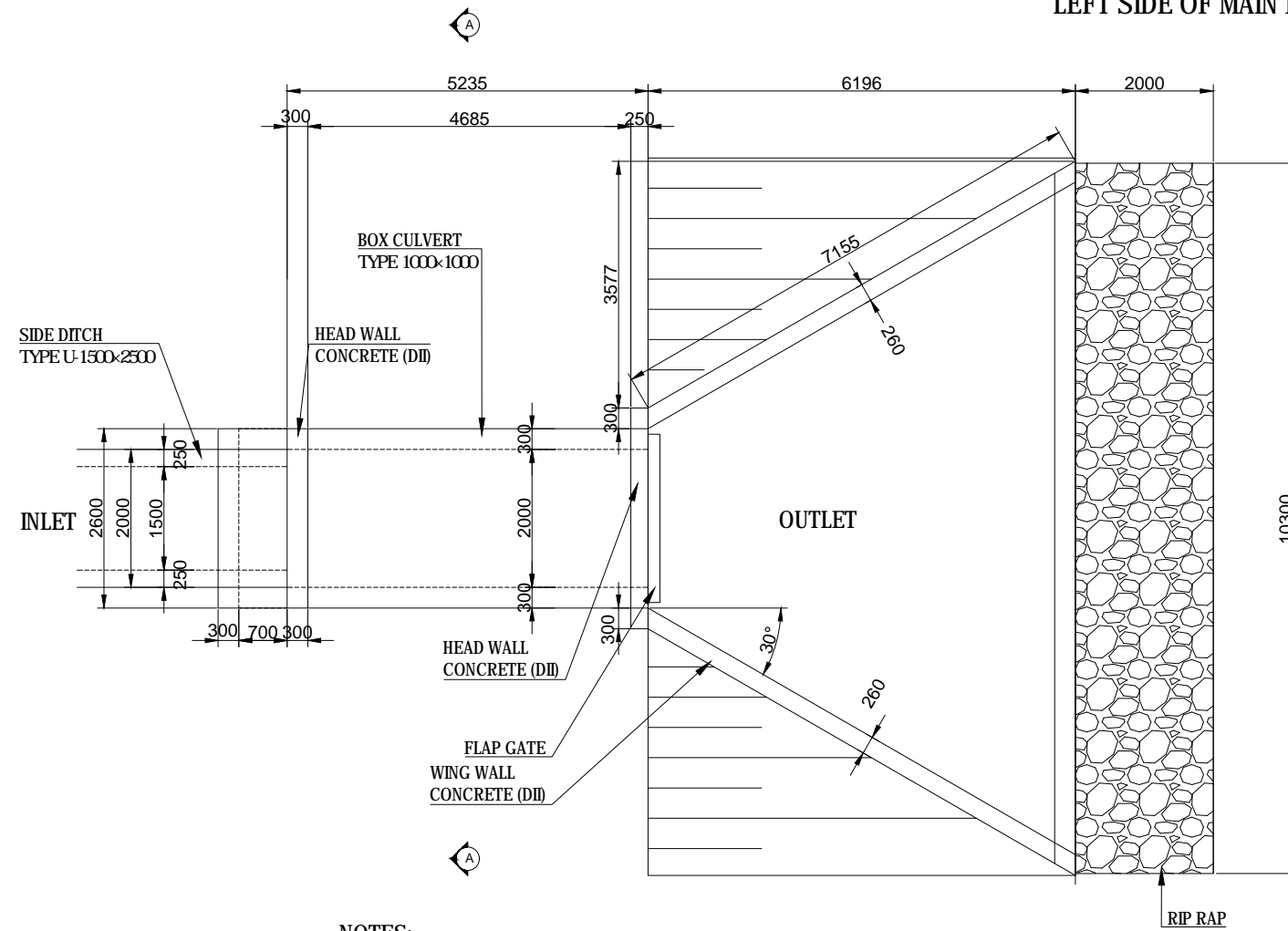


SECTION D-D CONCRETE COVER S = 1:20

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 M. TORIU T. HAYAKAWA Y. SANO	SIGNATURE   	DATE 15 Jun. 2017 20 Jun. 2017 21 Jun. 2017	DRAWING TITLE <b>VERTICAL DRAIN TYPE B</b>	PACKAGE 2 DWG No. P2-RD-3063
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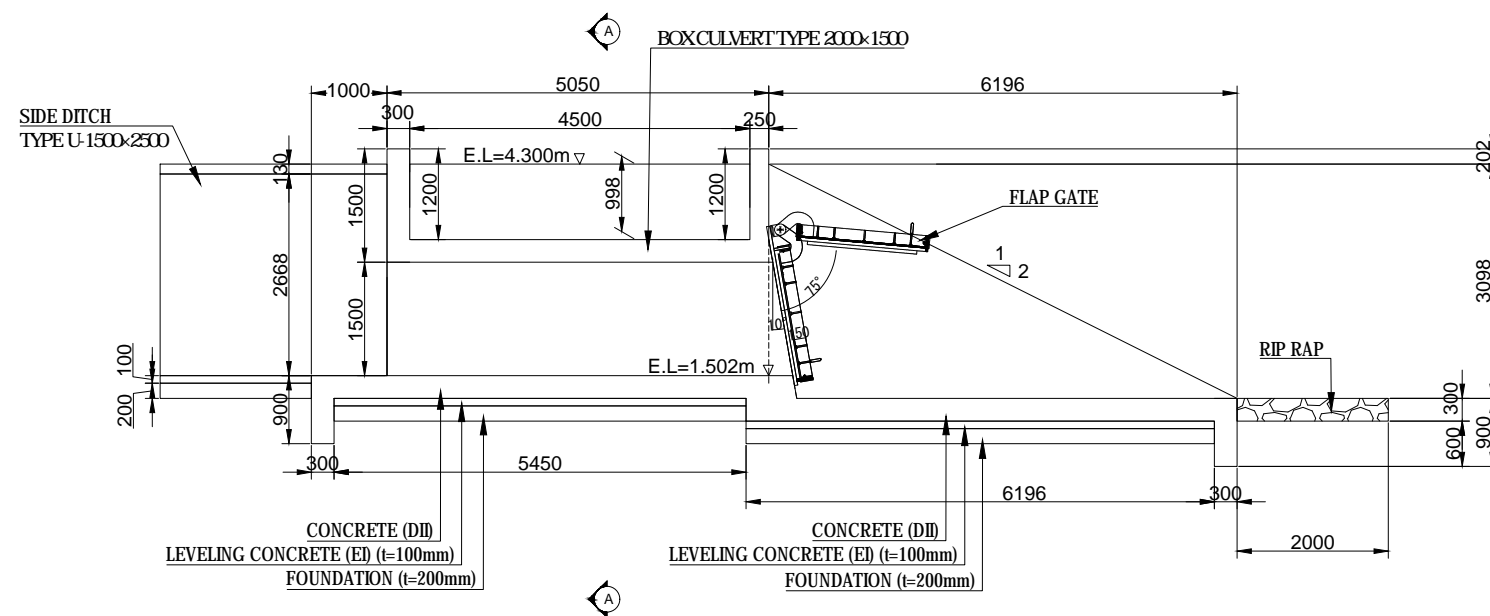
# DRAINAGE OUTLET TYPE-B (1)

LEFT SIDE OF MAIN ROAD S=1:100



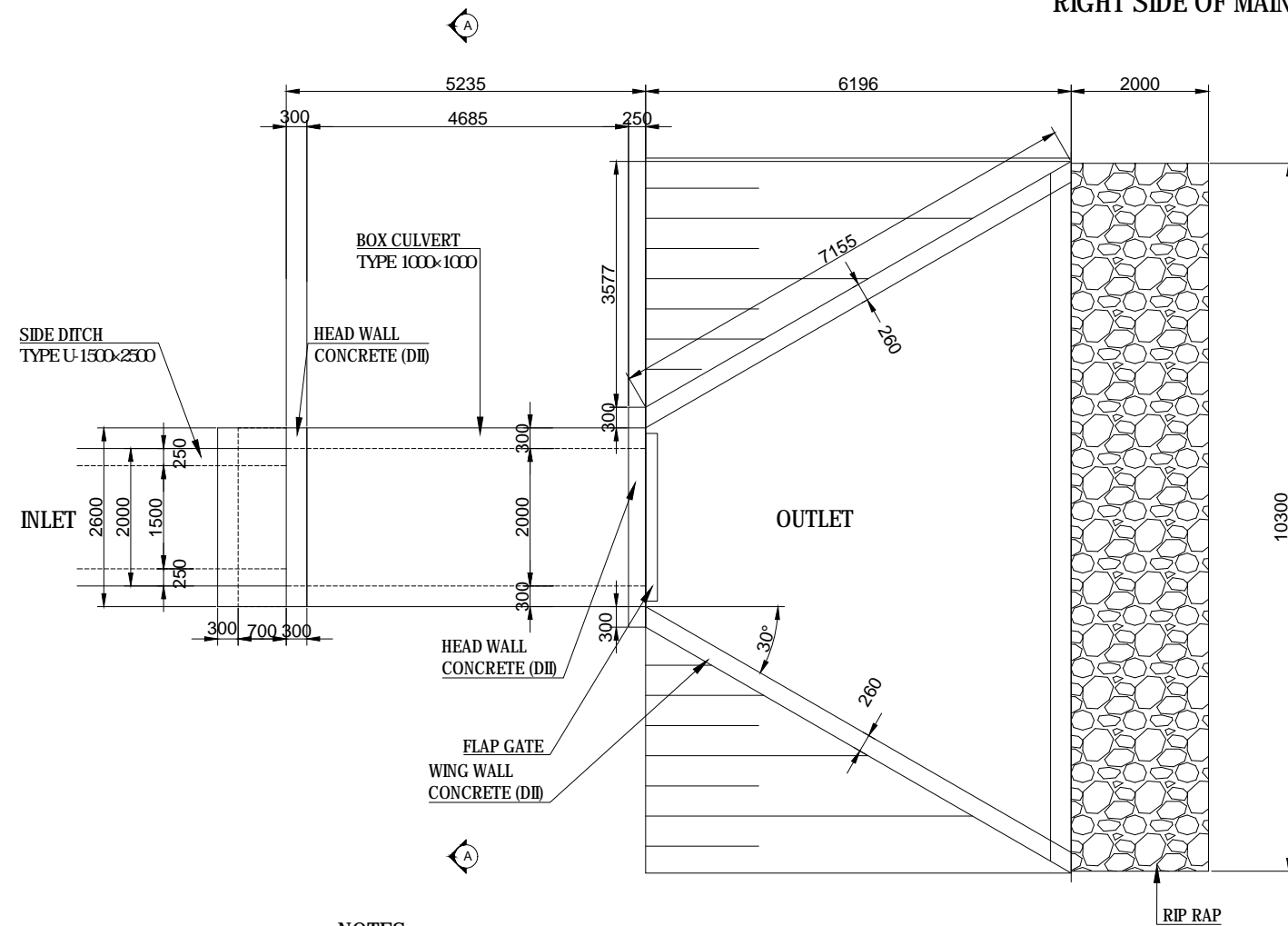
- NOTES:
1. Concrete Class DII (240 kg/cm<sup>3</sup>)
  2. Steel Reinforcement SD345

LOCATION		RIGHT RIVER BANK
INSIDE DIMENSION	WIDTH	2.000 m
	HEIGHT	1.500 m
TOTAL BOX CULVERT LENGTH		5.050 m
UNIT WEIGHT	REINFORCED CONCRETE	24.5 kN/m <sup>3</sup>
	SOIL	18.0 kN/m <sup>3</sup>
CONCRETE DESIGN STRENGTH		24.0 N/mm <sup>3</sup>
ALLOWABLE STRESS	COMPRESSIVE STRESS DUE TO BENDING	8 N/mm <sup>3</sup>
	SHEARING STRESS	0.39 N/mm <sup>3</sup>
	TENSILE STRESS (SD345)	160 N/mm <sup>3</sup>
COEFFICIENT OF EARTH PRESSURE		0.5000
IMPACT COEFFICIENT		-
SEISMIC COEFFICIENT		-
ANGLE OF SKEW		90°00
RADIUS OF CURVATURE		R=
GRADIENT OF BOX CULVERT		i = 0.080 %



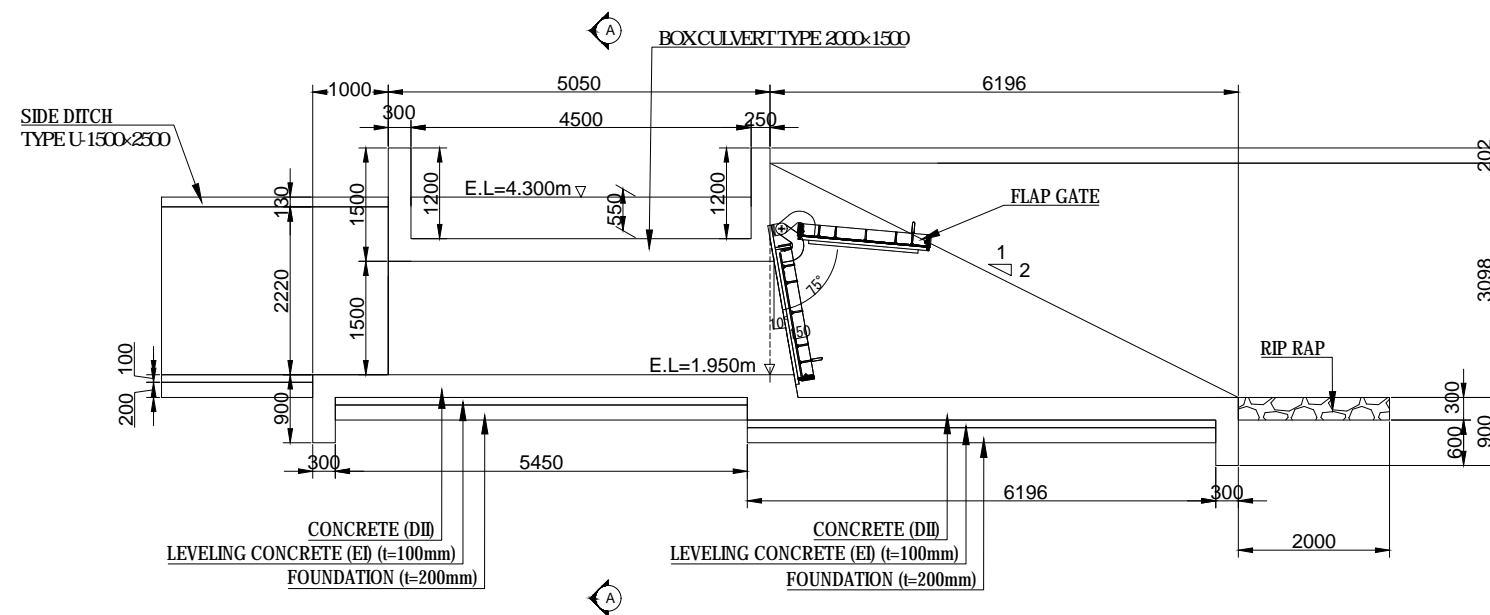
# DRAINAGE OUTLET TYPE-B (2)

RIGHT SIDE OF MAIN ROAD S=1:100



- NOTES:  
 1. Concrete Class DII (240 kg/cm<sup>3</sup>)  
 2. Steel Reinforcement SD345

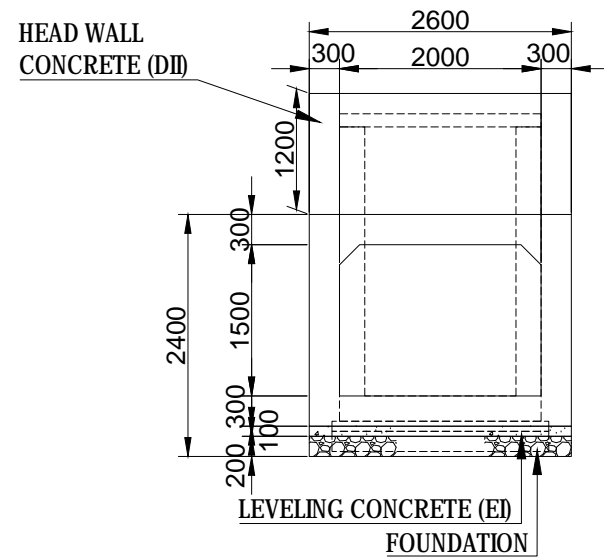
LOCATION		RIGHT RIVER BANK
INSIDE DIMENSION	WIDTH	2.000 m
	HEIGHT	1.500 m
TOTAL BOX CULVERT LENGTH		5.050 m
UNIT WEIGHT	REINFORCED CONCRETE	24.5 kN/m <sup>3</sup>
	SOIL	18.0 kN/m <sup>3</sup>
CONCRETE DESIGN STRENGTH		24.0 N/mm <sup>3</sup>
ALLOWABLE STRESS	COMPRESSIVE STRESS DUE TO BENDING	8 N/mm <sup>3</sup>
	SHEARING STRESS	0.39 N/mm <sup>3</sup>
	TENSILE STRESS (SD345)	160 N/mm <sup>3</sup>
COEFFICIENT OF EARTH PRESSURE		0.5000
IMPACT COEFFICIENT		-
SEISMIC COEFFICIENT		-
ANGLE OF SKEW		90°00
RADIUS OF CURVATURE		R=
GRADIENT OF BOX CULVERT		i= 0.100 %



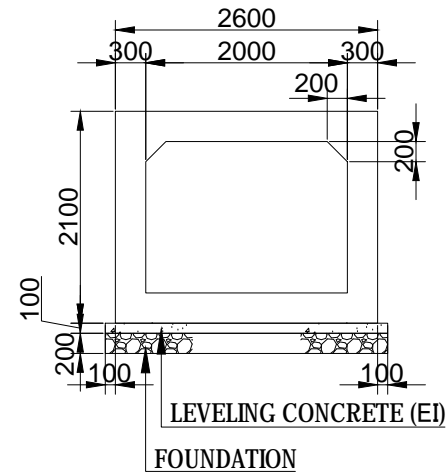
## DRAINAGE OUTLET TYPE-B (3)

INLET AND OUTLET FOR TYPE B S=1:100, S=1:75

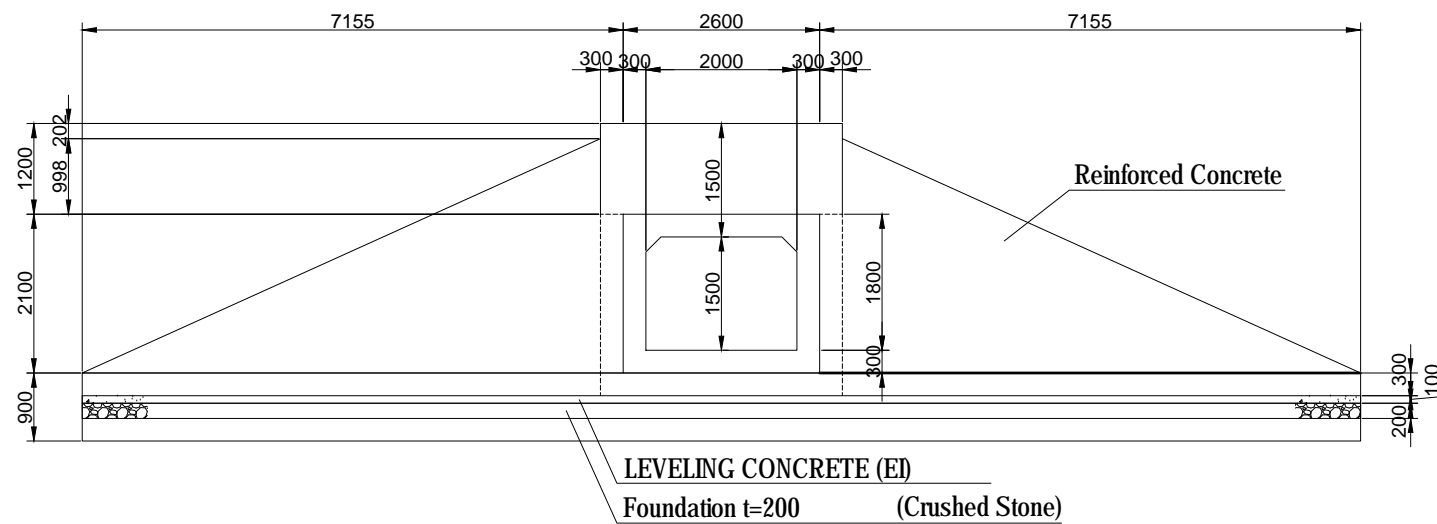
FRONT ELEVATION (INLET) S=1:75



SECTION A-A S=1:75



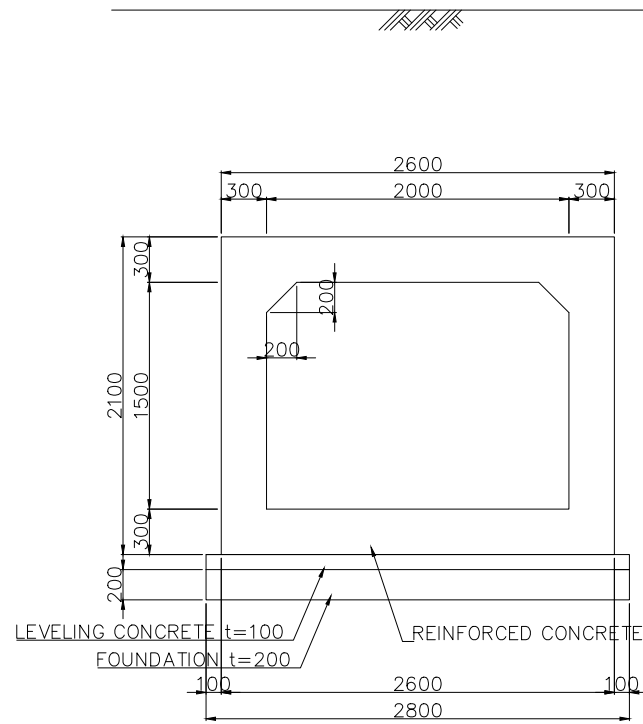
FRONT ELEVATION (OUTLET) S=1:100



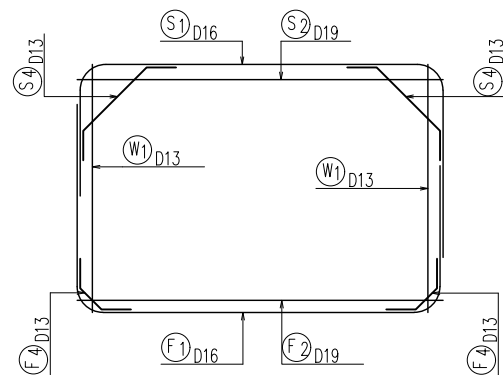
No.	Description	Width	Length	Thickness	Height	Number	Unit	Quantity
		W	L	T	H			
1	Box 2000x1500		5.050				m	5.050
2	Leveling concrete						m <sup>3</sup>	4.258
	Outlet Slab1	3.200	6.146	0.100		1	m <sup>3</sup>	1.967
	Outlet Slab2	3.577	5.896	0.100		1	m <sup>3</sup>	2.109
	Inlet Slab	2.600	0.700	0.100		1	m <sup>3</sup>	0.182
3	Foundation						m <sup>3</sup>	8.515
	Outlet Slab1	3.200	6.146	0.200		1	m <sup>3</sup>	3.933
	Outlet Slab2	3.577	5.896	0.200		1	m <sup>3</sup>	4.218
	Inlet Slab	2.600	0.700	0.200		1	m <sup>3</sup>	0.364
4	Reinforced Concrete (DII)						m <sup>3</sup>	26.919
	Inlet Front Slab	2.600	0.700	0.300		1	m <sup>3</sup>	0.546
	Inlet Head Wall1	2.600		0.300	3.900	1	m <sup>3</sup>	3.042
	Inlet Head Wall2	2.600		0.300	1.500	-1	m <sup>3</sup>	-1.170
	Outlet Slab1	3.200	6.446	0.300		1	m <sup>3</sup>	6.188
	Outlet Slab2	3.577	6.196	0.300		1	m <sup>3</sup>	6.649
	Outlet Slab3	3.200	0.500	0.300		1	m <sup>3</sup>	0.480
	Outlet Wing Wall1	7.155		0.260	3.098	1	m <sup>3</sup>	5.763
	Outlet Wing Wall2	10.300		0.300	0.900	1	m <sup>3</sup>	2.781
	Outlet Wing Wall3	0.300		0.250	3.300	2	m <sup>3</sup>	0.495
	Outlet Head Wall	2.600		0.250	3.300	1	m <sup>3</sup>	2.145
5	Formwork of out-let						m <sup>2</sup>	90.673
	Inlet Wall1	2.600			3.900	2	m <sup>2</sup>	20.280
	Inlet Wall2	2.600			1.500	-2	m <sup>2</sup>	-7.800
	Outlet Slab	10.300			0.900	2	m <sup>2</sup>	18.540
	Outlet Wing Wall1	7.155			3.098	2	m <sup>2</sup>	44.332
	Outlet Wing Wall2	0.300			3.400	4	m <sup>2</sup>	4.080
	Outlet Head Wall	2.600			1.500	2	m <sup>2</sup>	7.800
	Leveling Concrete1	3.300			0.100	2	m <sup>2</sup>	0.660
	Leveling Concrete2	27.810			0.100	1	m <sup>2</sup>	2.781
6	Riprap for Bedding Stone	10.300	2.000	0.300		1	m <sup>3</sup>	6.180

# DRAINAGE OUTLET TYPE-B (4) BAR ARRANGEMENT OF BOX CULVERT S=1:50

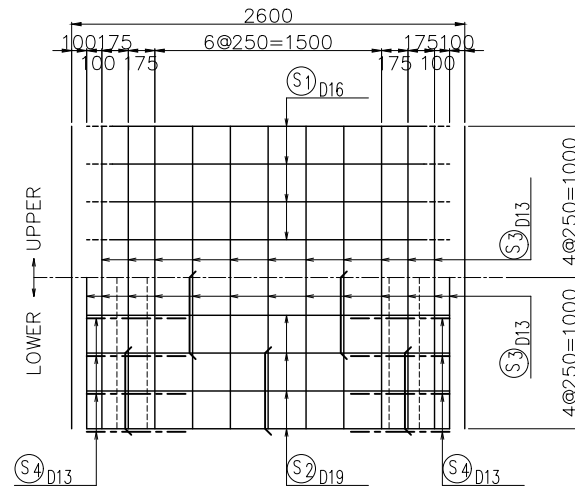
GENERAL DRAWING S=1:50



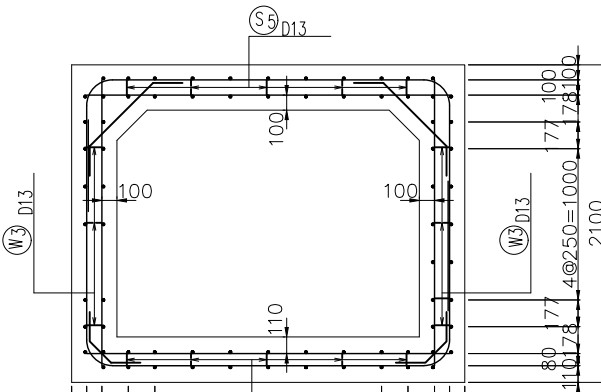
ERECTION DIAGRAM OF MAIN REINFORCEMENT



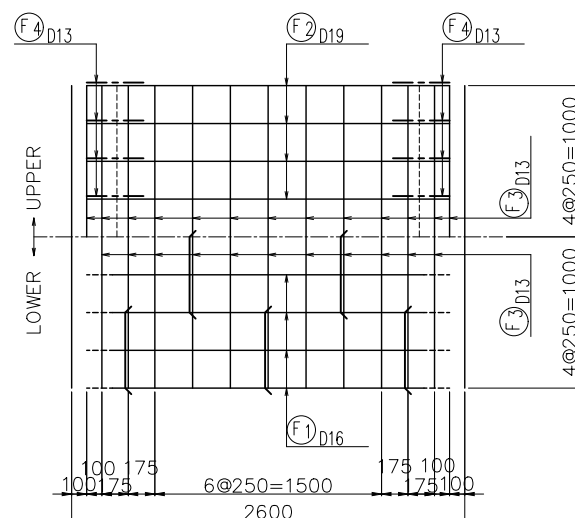
TOP SLAB



SECTION S=1:50



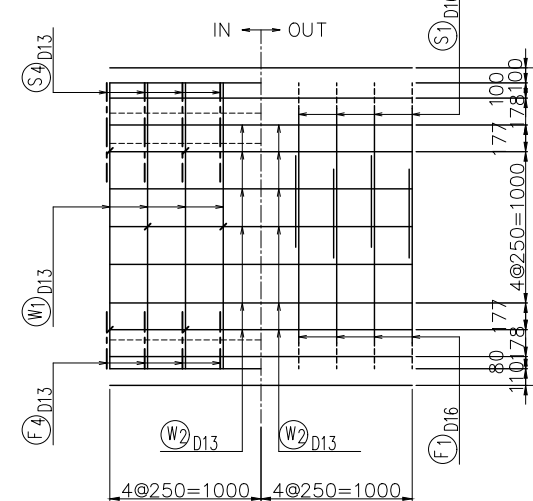
BOTTOM SLAB



DESIGN CRITERIA

INSIDE DIMENSION	WIDTH	2.00 m
	HEIGHT	1.50 m
LIVE LOAD		T-TYPE LIVE LOAD
UNIT WEIGHT	REINFORCED CONCRETE	24.5 kN/m <sup>3</sup>
	SOIL	18 kN/m <sup>3</sup>
CONCRETE DESIGN STRENGTH		24 N/mm <sup>2</sup>
ALLOWABLE STRESS		
	COMPRESSIVE STRESS DUE TO BENDING	8 N/mm <sup>2</sup>
	SHEARING STRESS	0.39 N/mm <sup>2</sup>
	TENSILE STRESS (SD345)	160 N/mm <sup>2</sup>
COEFFICIENT OF EARTH PRESSURE		0.5
IMPACT COEFFICIENT		-
SEISMIC COEFFICIENT		-
ANGLE OF SKEW		90°00'00"
RADIUS OF CURVATURE		R=∞
GRADIENT OF BOX CULVERT		i=0.100%

SIDE SLAB



MATERIALS

KIND		UNIT	QUANTITY
CONCRETE	TOP	m <sup>3</sup>	0.780
	SIDE	m <sup>3</sup>	0.940
	BOTTOM	m <sup>3</sup>	0.780
	TOTAL	m <sup>3</sup>	2.500
FORM		m <sup>2</sup>	8.966
REINFORCING BAR	D19	kg	44
	D16	kg	59
	D13	kg	118
	TOTAL	kg	221
LEVELING CONCRETE (E) t=100		m <sup>2</sup>	0.280
FOUNDATION t=200		m <sup>2</sup>	0.560

(PER 1m)

MARK	No.	SEC.	EACH	LENGTH (mm)	L 1 (mm)	L 2 (mm)	L 3 (mm)	L 4 (mm)	H (mm)	R (mm)
S 1	4	D16	4	4500	900	267	2060	1006		170
S 2	1	D19	4	2400	2400					
S 3	1	D13	24	1000	1000					
S 4	5	D13	8	1040	195	649			459	
S 5	3	D13	5	1000	—	131	—			
W 1	1	D13	8	1890	1890					
W 2	1	D13	28	1000	1000					
W 3	2	D13	12	360	—	154				
F 1	4	D16	4	5000	1150	267	2060	1256		170
F 2	1	D19	4	2400	2400					
F 3	1	D13	24	1000	1000					
F 4	5	D13	8	650	195	255			180	
F 5	3	D13	5	960	—	111	—			

LIST OF REINFORCEMENT

(PER 1m)

MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
S 1	D16	4500	4	1.56	7.020	28.080	□
S 2	D19	2400	4	2.25	5.400	21.600	—
S 3	D13	1000	24	0.995	0.995	23.880	—
S 4	D13	1040	8	0.995	0.995	8.280	□
S 5	D13	1000	5	0.995	0.995	4.975	—
W 1	D13	1890	8	0.995	1.881	15.048	—
W 2	D13	1000	28	0.995	0.995	27.860	—
W 3	D13	360	12	0.995	0.358	4.296	—
F 1	D16	5000	4	1.56	7.800	31.200	□
F 2	D19	2400	4	2.25	5.400	21.600	—
F 3	D13	1000	24	0.995	0.995	23.880	—
F 4	D13	650	8	0.995	0.647	5.176	□
F 5	D13	960	5	0.995	0.955	5.000	□

	D	a (mm)	b (mm)	c (mm)	R (mm)	L (mm)
D13	66	164	230	42	410	
D16	75	195	270	48	500	
D19	94	236	330	60	600	
D22	104	266	370	66	690	
D25	122	308	430	78	790	
D29	141	349	490	90	910	
D32	151	389	540	96	1000	

Note1: Size of Box Culvert and Bar Arrangement are based on Standard Drawing of Ministry of Land, Infrastructure, Transport and Tourism of Japan

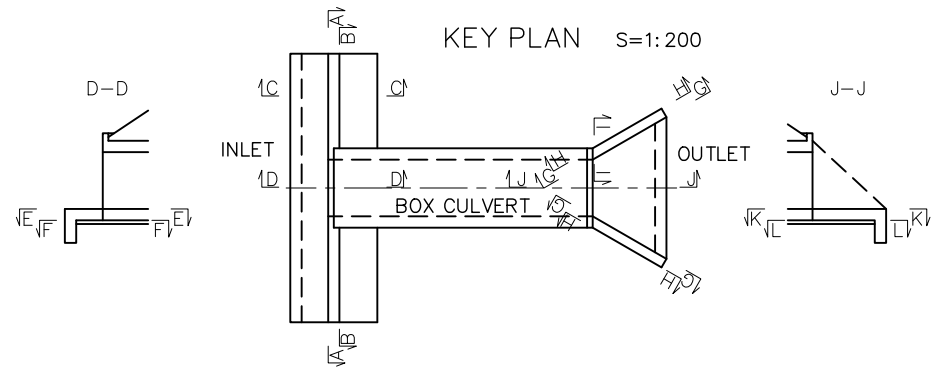
Note2: Specification of Steel Reinforcement Bar shall comply with SD345 (JIS G3112) or equivalent

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 DRAINAGE OUTLET TYPE-B (4) BAR ARRANGEMENT OF BOX CULVERT	PACKAGE 2 DWG No. P2-RD-3073
				PREPARED BY	M. TORIU	15 Jun. 2017		
				CHECKED BY	T. HAYAKAWA	20 Jun. 2017		
				APPROVED BY	Y. SANO	21 Jun. 2017		

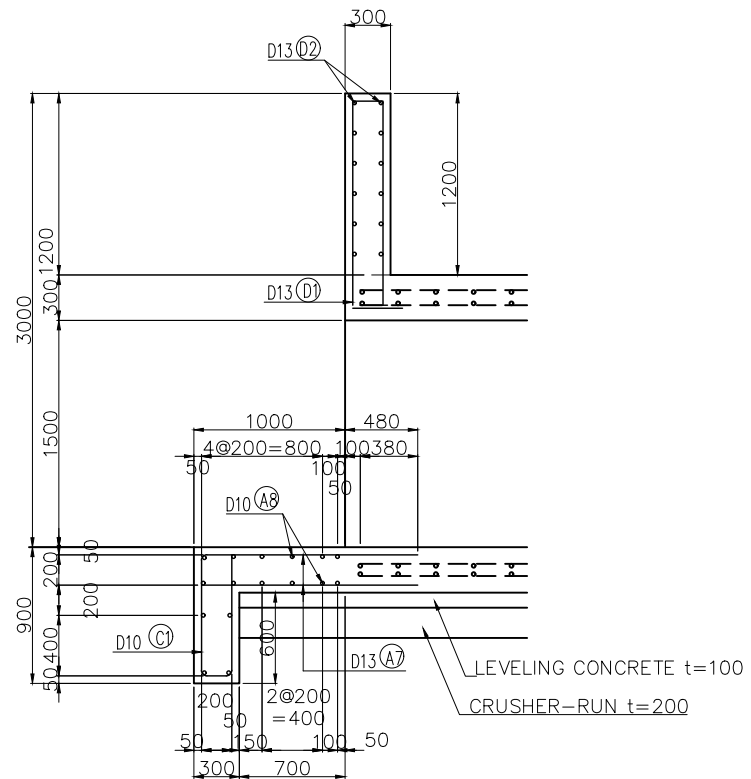
# DRAINAGE OUTLET TYPE-B (5)

## BAR ARRANGEMENT OF INLET S=1:50

(2000x1500)

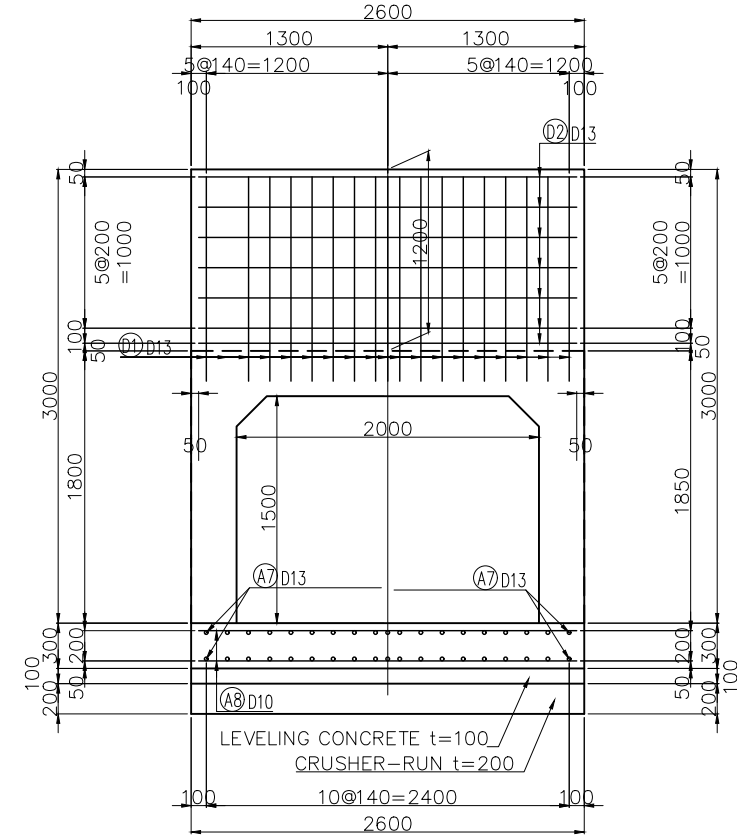


D-D



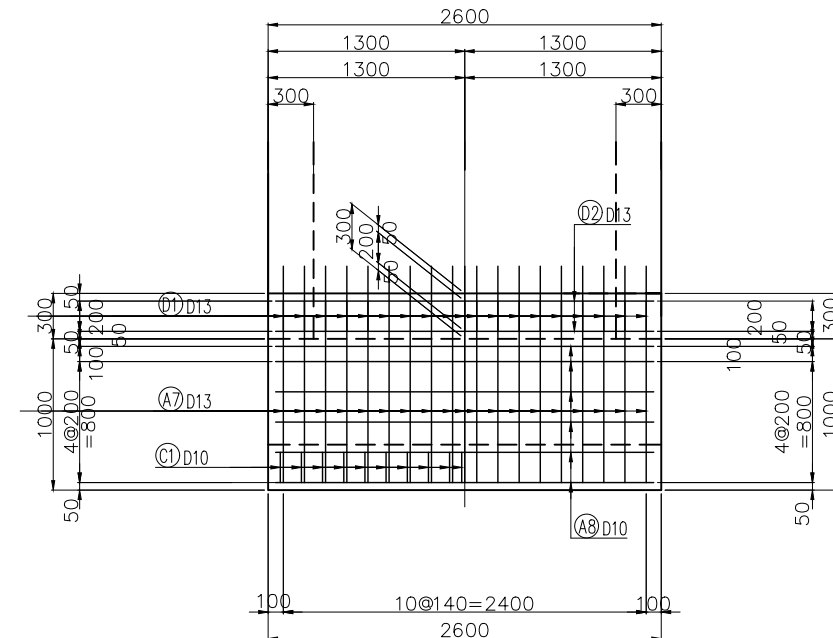
A-A

B-B



E-E

F-F

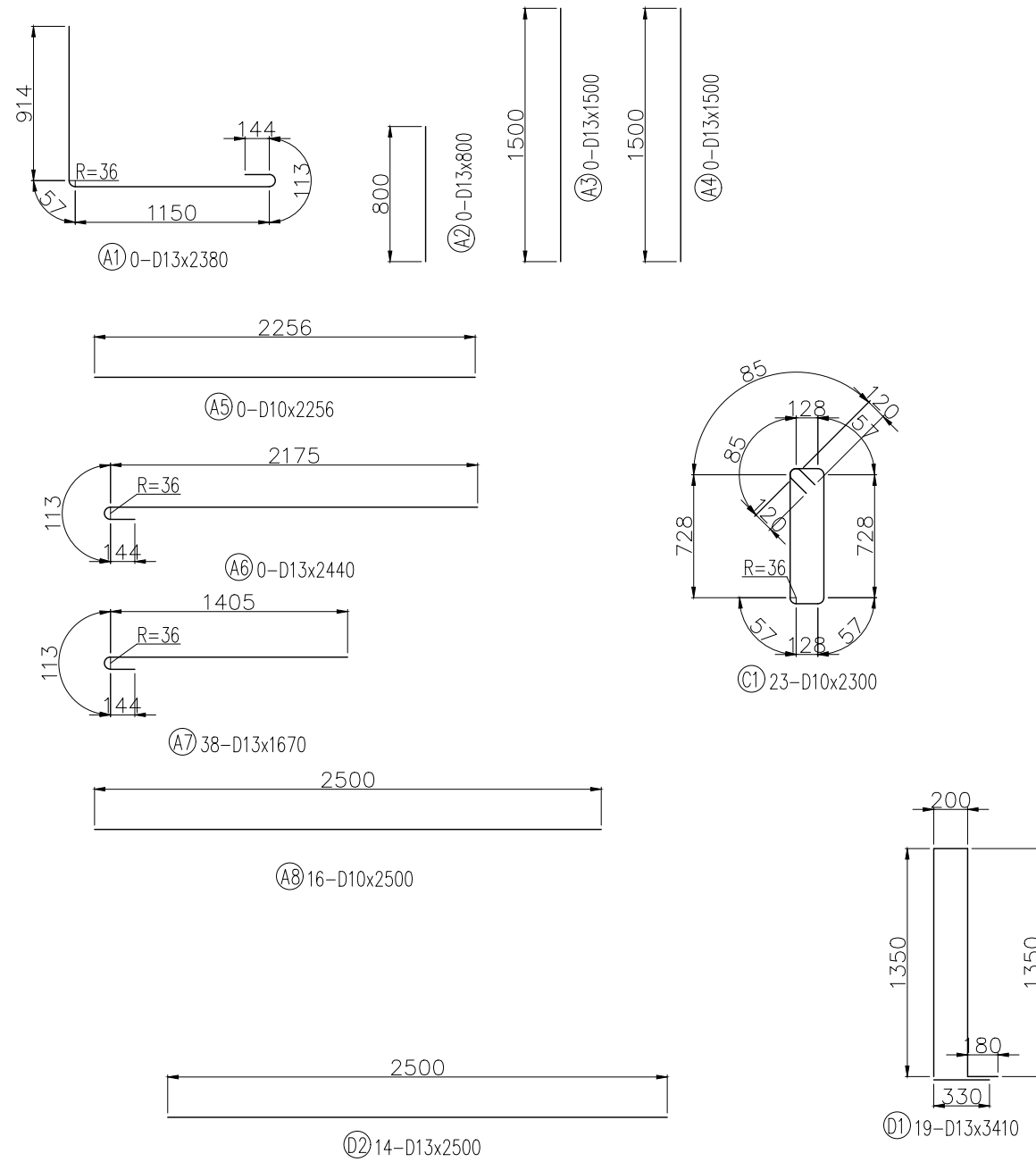


<b>PROJECT NAME</b>	<b>FINANCED BY</b>	<b>COUNTERPART</b>	<b>JICA STUDY TEAM</b>	<b>NAME</b>	<b>SIGNATURE</b>	<b>DATE</b>	<b>DRAWING TITLE</b>	<b>PACKAGE</b>
DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	REPUBLIC OF THE UNION OF MYANMAR MINISTRY 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.	M. TORIU		15 Jun. 2017	<b>DRAINAGE OUTLET TYPE-B (5)</b>	2
				T. HAYAKAWA		20 Jun. 2017		DWG No.
				Y. SANO		21 Jun. 2017		P2-RD-3074

## DRAINAGE OUTLET TYPE-B (6)

### BAR ARRANGEMENT OF INLET S=1:40

INLET



LIST OF REINFORCEMENT(INLET)

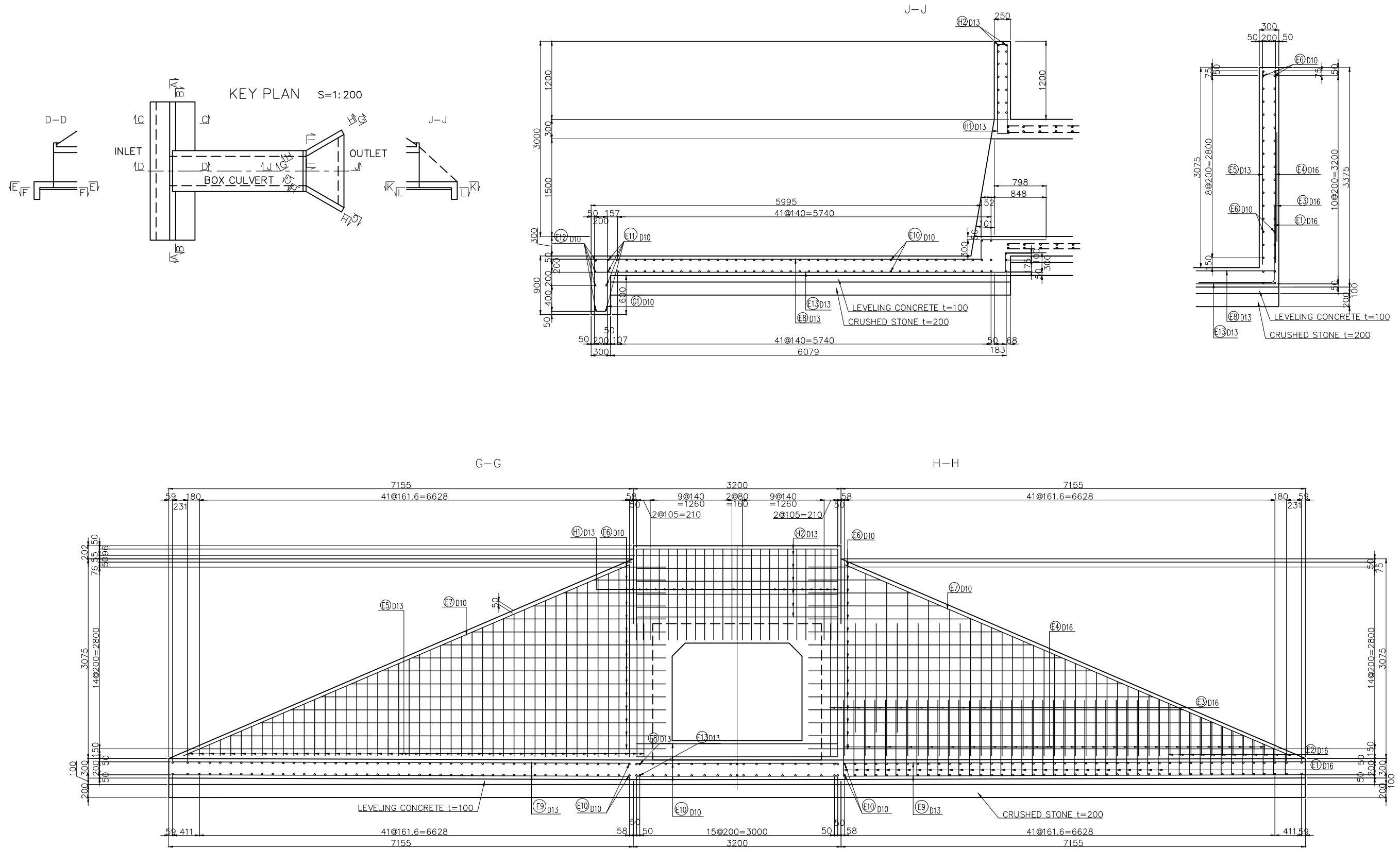
MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
A 1	D13	2 380	0	0.995	2.368	0	L
A 2	"	800	0	"	0.796	0	
A 3	"	1 500	0	"	1.493	0	
A 4	"	1 500	0	"	1.493	0	
A 5	D10	2 256	0	0.560	1.263	0	—
A 6	D13	2 440	0	0.995	2.428	0	—
A 7	"	1 670	38	"	1.662	63	—
A 8	D10	2 500	16	0.560	1.400	22	—
C 1	"	2 300	23	"	1.288	30	⊔
D 1	D13	3 410	19	0.995	3.393	64	⊔
D 2	"	2 500	14	"	2.488	35	—
SUB TOTAL						214	kg
D10						52	kg
D13						162	kg
Total						214	kg

D	a (mm)	b (mm)	c (mm)	R (mm)	L (mm)
D10	47	120	167	30	320
D13	57	144	201	36	380
D16	75	195	270	48	500
D19	94	240	334	60	630
L AND OVER					



# DRAINAGE OUTLET TYPE-B (7)

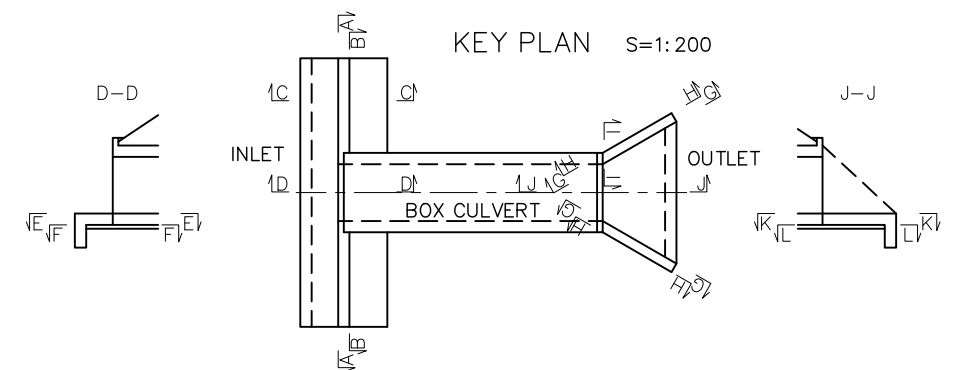
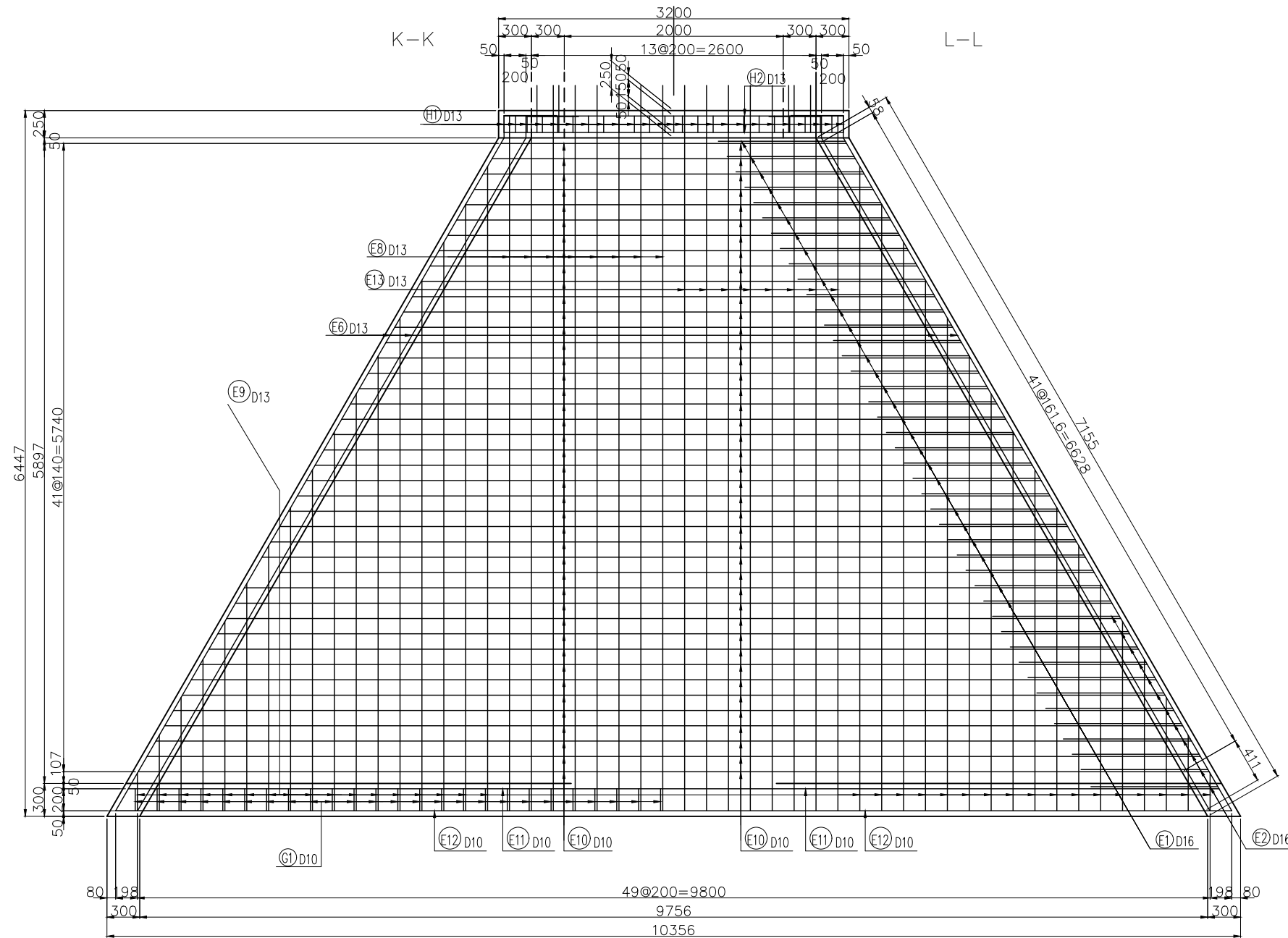
## BAR ARRANGEMENT OF OUTLET S=1:60



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 	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 20%;">NAME</th> <th style="width: 20%;">SIGNATURE</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	DRAWING TITLE <b>DRAINAGE OUTLET TYPE-B (7)</b>	PACKAGE 2 DWG No. P2-RD-3076
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			

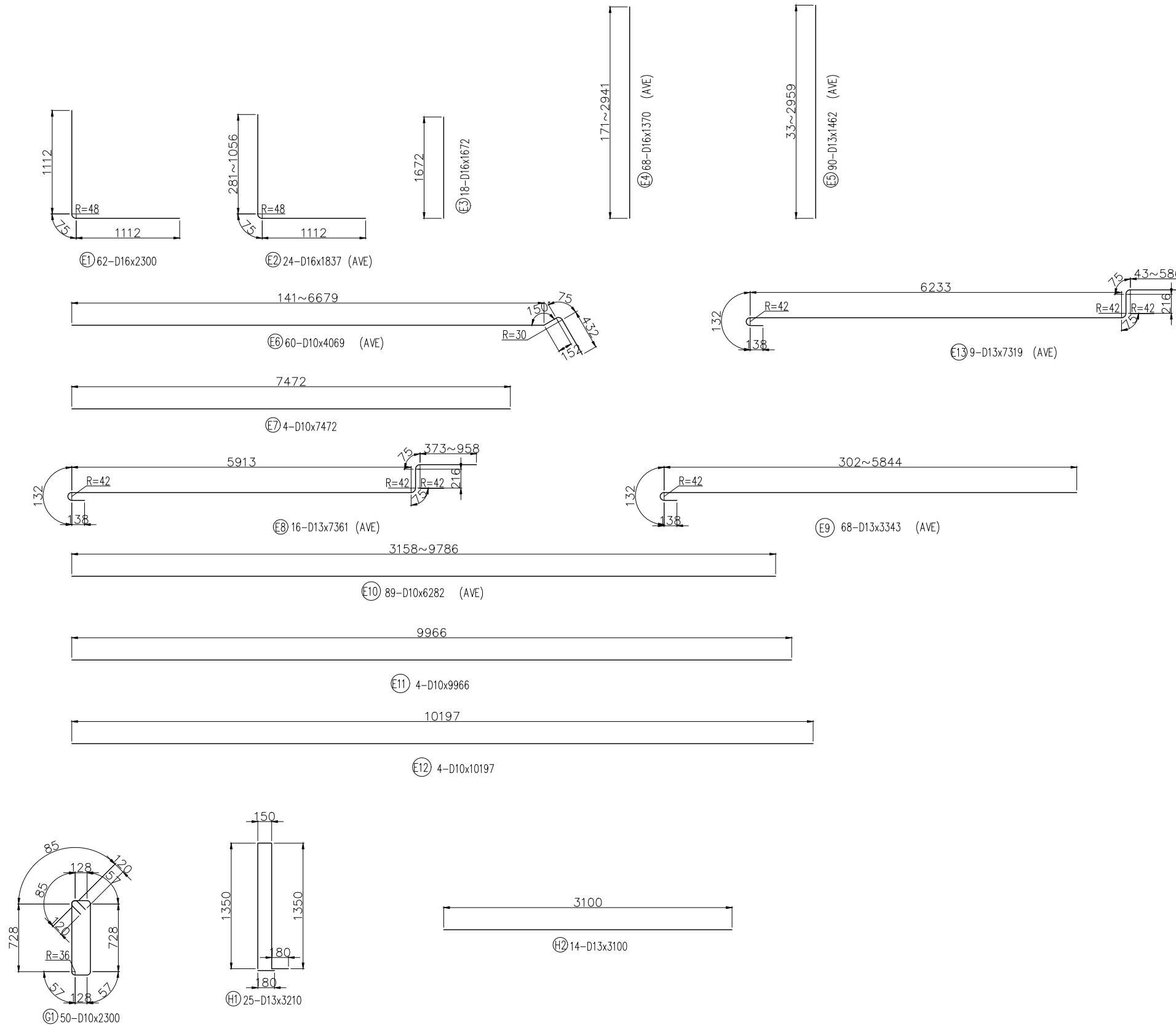
# DRAINAGE OUTLET TYPE-B (8)

## BAR ARRANGEMENT OF OUTLET S=1:50

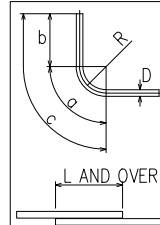


<small>PROJECT NAME</small> DETAILED DESIGN ON BAGO RIVER BRIDGE CONSTRUCTION PROJECT	<small>FINANCED BY</small> JAPAN INTERNATIONAL COOPERATION AGENCY	<small>COUNTERPART</small> REPUBLIC OF THE UNION OF MYANMAR MINISTRY OF CONSTRUCTION DEPARTMENT OF BRIDGE	<small>JICA STUDY TEAM</small> NIPPON KOEI CO., LTD. ORIENTAL CONSULTANTS GLOBAL CO., LTD. METROPOLITAN EXPRESSWAY COMPANY LIMITED CHODAI CO., LTD. NIPPON ENGINEERING CONSULTANTS CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 20%;">NAME</th> <th style="width: 20%;">SIGNATURE</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td>PREPARED BY</td> <td>M. TORIU</td> <td></td> <td>15 Jun. 2017</td> </tr> <tr> <td>CHECKED BY</td> <td>T. HAYAKAWA</td> <td></td> <td>20 Jun. 2017</td> </tr> <tr> <td>APPROVED BY</td> <td>Y. SANO</td> <td></td> <td>21 Jun. 2017</td> </tr> </tbody> </table>		NAME	SIGNATURE	DATE	PREPARED BY	M. TORIU		15 Jun. 2017	CHECKED BY	T. HAYAKAWA		20 Jun. 2017	APPROVED BY	Y. SANO		21 Jun. 2017	<small>DRAWING TITLE</small> <b>DRAINAGE OUTLET TYPE-B (8)</b>	<small>PACKAGE</small> 2 <small>DWG No.</small> P2-RD-3077
	NAME	SIGNATURE	DATE																			
PREPARED BY	M. TORIU		15 Jun. 2017																			
CHECKED BY	T. HAYAKAWA		20 Jun. 2017																			
APPROVED BY	Y. SANO		21 Jun. 2017																			

## DRAINAGE OUTLET TYPE-B (9) BAR ARRANGEMENT OF OUTLET S=1:50



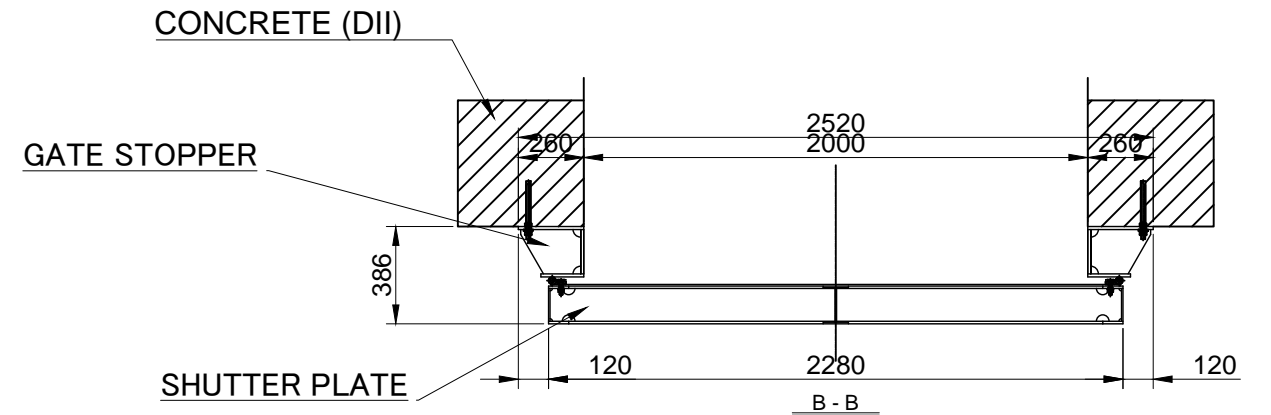
MARK	SEC.	LENGTH (mm)	EACH	WEIGHT (kg/m)	WEIGHT/one (kg)	WEIGHT (kg)	REMARKS
E 1	D16	2 300	62	1.560	3.588	222	L
E 2	"	1 837	24	"	2.866	69	L (AVE)
E 3	"	1 672	18	"	2.608	47	
E 4	"	1 370	68	"	2.137	145	(AVE)
E 5	D13	1 462	90	0.995	1.455	131	(AVE)
E 6	D10	4 069	60	0.560	2.279	137	— (AVE)
E 7	"	7 472	4	"	4.184	17	—
E 8	D13	4 880	16	0.995	4.856	78	—
E 9	"	3 363	68	"	3.346	228	— (AVE)
E 10	D10	6 282	89	0.560	3.518	313	— (AVE)
E 11	"	9 966	4	"	5.581	22	—
E 12	"	10 197	4	"	5.710	23	—
E 13	D13	7 319	16	0.995	7.282	117	—
G 1	"	2 300	50	"	2.289	114	—
H 1	D13	3 210	25	0.995	3.194	80	—
H 2	"	3 100	14	"	3.085	43	—
SUB TOTAL						1 786	kg
					D10	512	kg
					D13	791	kg
					D16	483	kg
					Total	1 786	kg



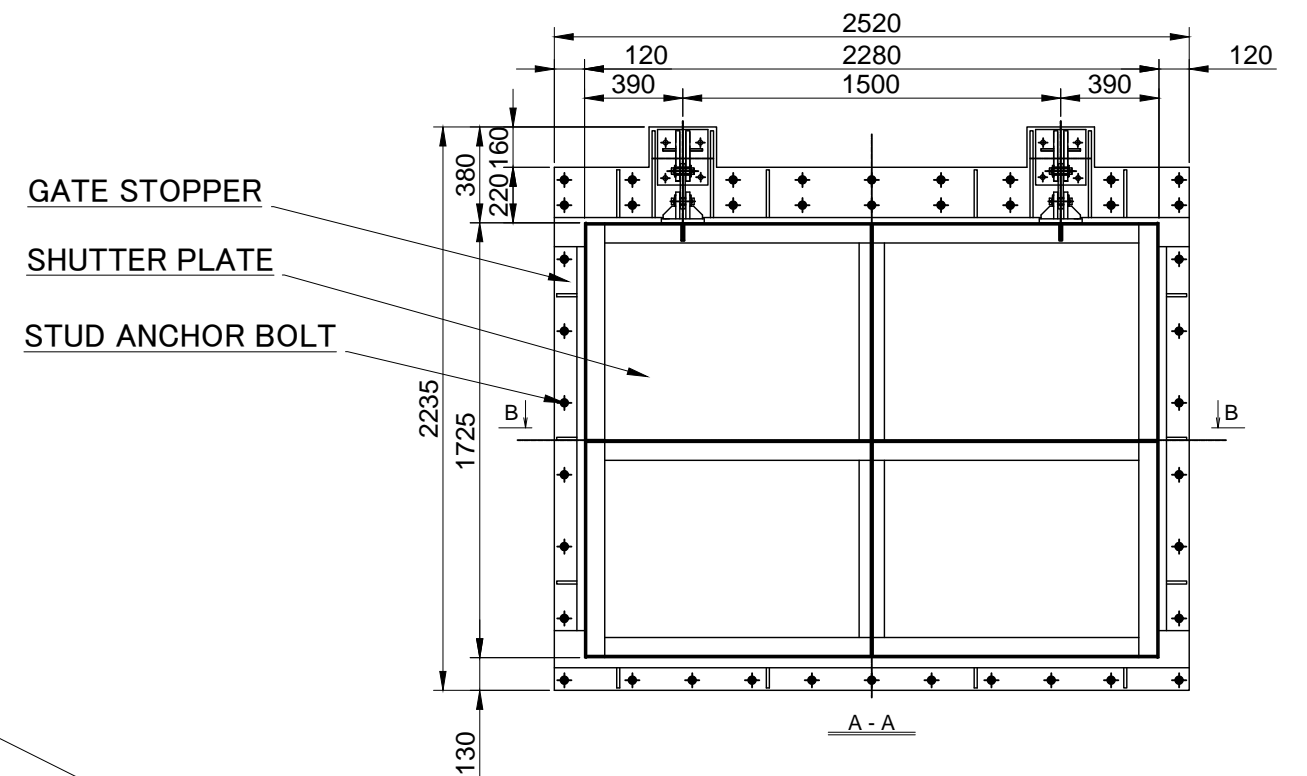
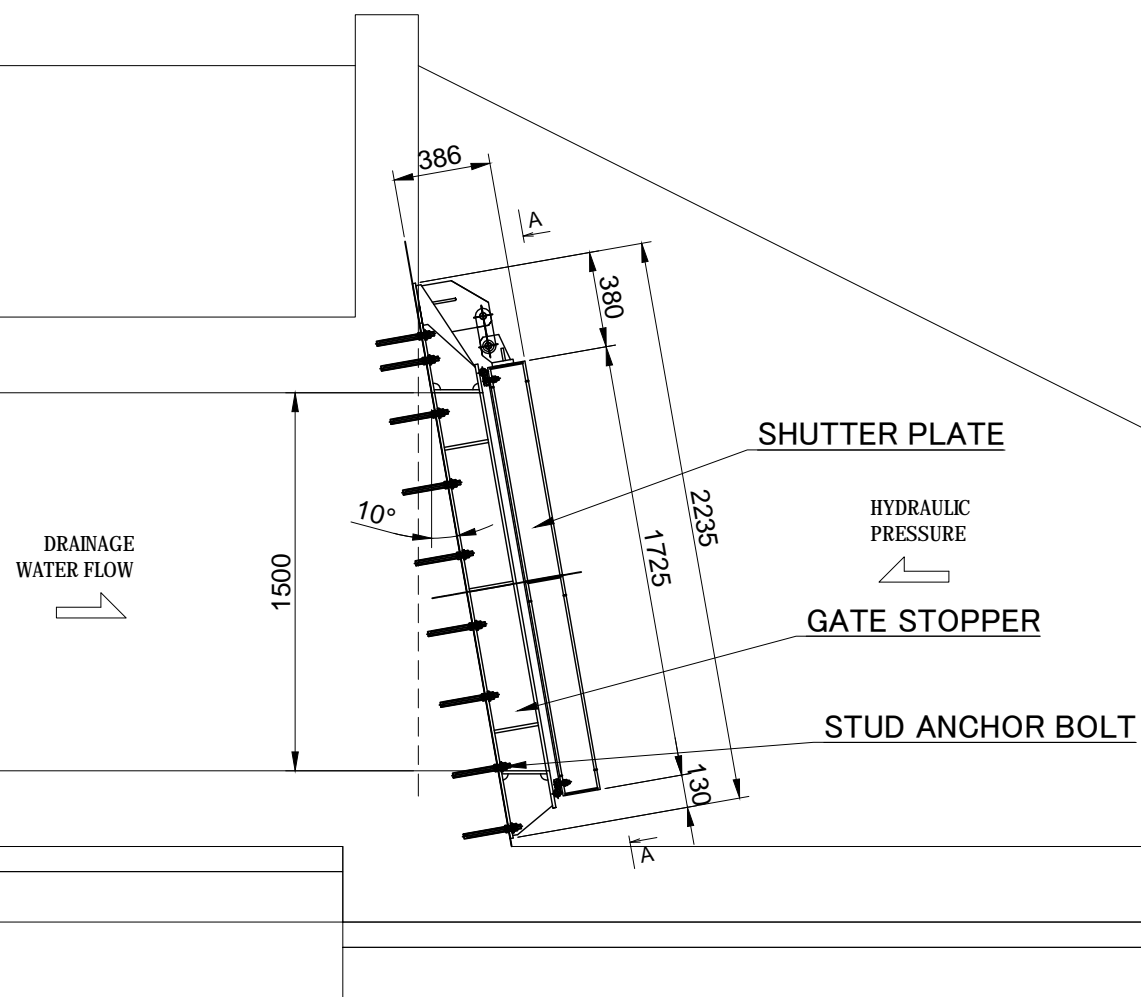
D	a (mm)	b (mm)	c (mm)	R (mm)	L (mm)
D10	47	120	167	30	320
D13	66	164	230	42	410
D16	75	195	270	48	500
D19	94	236	330	60	600

# DRAINAGE OUTLET TYPE-B (10)

DETAIL OF FLAP GATE S=1/30



SIDE VIEW



RIP RAP

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 DRAINAGE OUTLET TYPE-B (10)	PACKAGE	
				PREPARED BY	M. TORIU			15 Jun. 2017	2
				CHECKED BY	T. HAYAKAWA			20 Jun. 2017	DWG No.
				APPROVED BY	Y. SANO			21 Jun. 2017	P2-RD-3079