

### 2-2-3 Basic Design Drawings

The basic design drawings for the 43 objective bridges listed in Table 2.2.3.1 are shown starting from the next page.

**Table 2.2.3.1 List of 43 Objective Bridges**

Province	Br. No.	Bridge Name	Province	Br. No.	Bridge Name
<b>Son La</b>	2	Ban Sai	<b>Tuyen Quang</b>	30	Ban Nghien
	3	Ban Tum		31	Trinh
	4	Na Do		32	Na Nham
	5	Na Tra		33	Sung
	6	Ban Pang	<b>Ha Giang</b>	36	Na Lan
<b>Dien Bien</b>	7	Na Phat		37	Ta Lang
	8	Pa Bat		38	Suoi Dau
	9	Su Lu		39	Diec
	10	Ban Bung		40	Lien Hiep
	11	Pac Nam (DB)	<b>Bac Can</b>	42	Pac Nam (BC)
<b>Lai Chau</b>	12	San Thang		43	Khuoi Nung
	14	Nam Puc		44	Nga Ba
	15	Huoi Dit		46	Don Phong
	16	Nam Ham		47	Quang Chu
	17	Nam Cum	<b>Cao Bang</b>	48	Dong May
<b>Yen Bai</b>	18	Ngoi Thap		49	Binh Long
	20	Lao Chai		50	Ban Sac
	21	Pu Trang		52	Keo Ai
	22	Ta Tiu			
	23	Ben Cao			
<b>Lao Cai</b>	25	Thanh Phu			
	26	Ban Xeo			
	27	Muong Hum 2			
	28	Den Sang			
	29	Soi Chat			

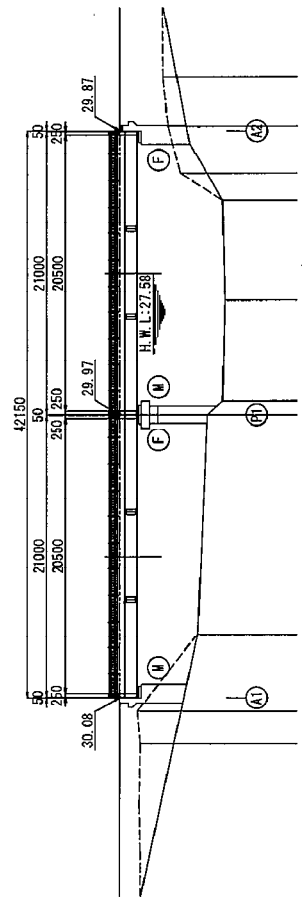
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECT MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT  
 PROJECT: THE PAVEMENT AND BRIDGE REPAIRS  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 2 BAN SAI BRIDGE

(General View of the Bridge)

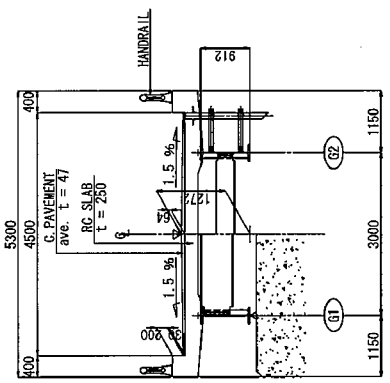
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100	67-	of
DRAWING	DATE	DESCRIPTION	SIGNATURE

PROFILE  
 SCALE = 1/400

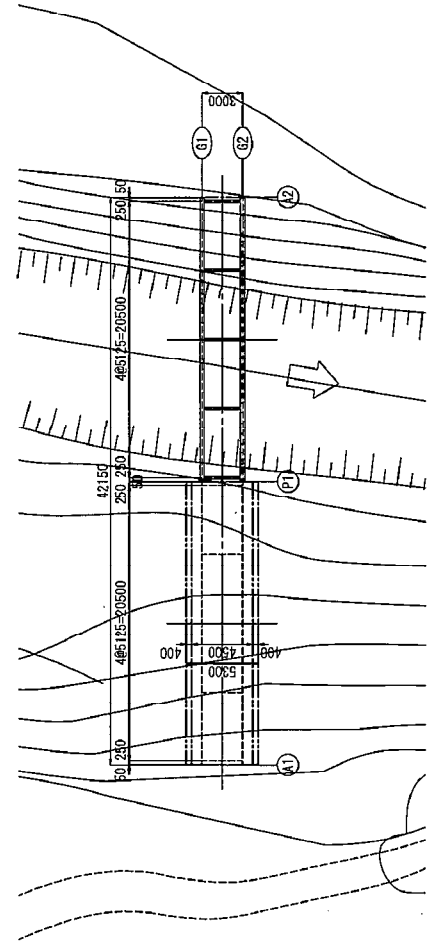


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
30.08	28.56	28.79	0+0.0	A1
29.97	22.48	23.61	0+0.0	P1
29.92	22.32	29.92	0+0.0	20L
29.87	26.53	29.87	0+0.0	A2
29.87	26.62	22.48		
29.87	26.99	26.99		

SECTION  
 SCALE = 1/100



PLAN  
 SCALE = 1/400



DESIGN CRITERIA

General	Condition
Design Speed	V = 35 km/h
Bridge Length (Spa Length)	42.15m (20.5m + 20.5m)
Clear Width	4.5m
Longitudinal Gradient	0.5%
Cross-slope of Carriageway	1.5%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Pier
Material	Concrete
Strength	σ <sub>a</sub> = 210 N/mm <sup>2</sup>
Super Structure Type	Girder
σ <sub>a</sub>	σ <sub>a</sub> = 140 N/mm <sup>2</sup>
Slab	σ <sub>a</sub> = 30 N/mm <sup>2</sup>
C. Pavement	ave. t = 4.7 cm
Surface	σ <sub>a</sub> = 30 N/mm <sup>2</sup>
Sub Structure Type	σ <sub>a</sub> = 25 N/mm <sup>2</sup>
Reinforcing Steel	S0235 (σ <sub>y</sub> = 300 N/mm <sup>2</sup> )

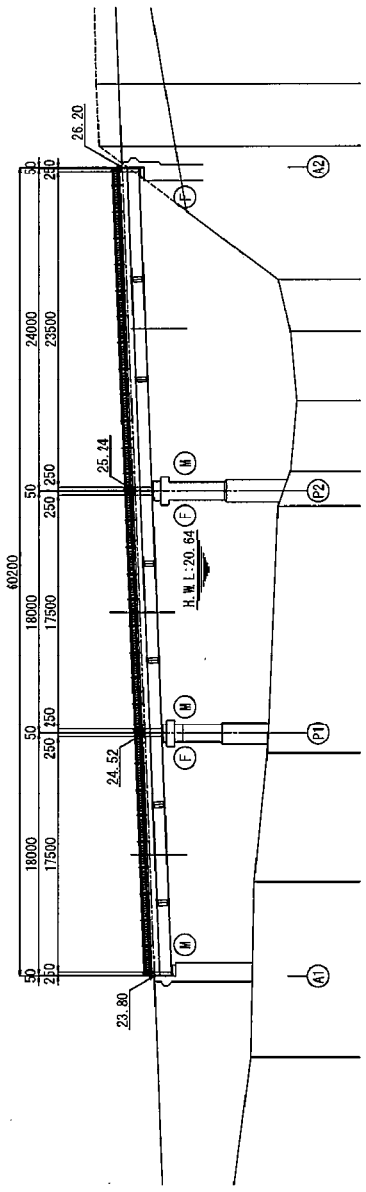
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING ROAD BRIDGE IN WATKIN (NORTH-WEST PROVINCES)  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 3 BAN TUM BRIDGE

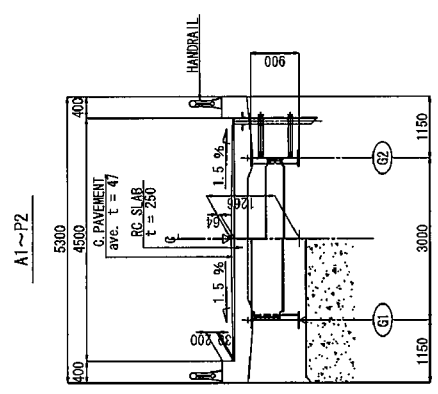
(General View of the Bridge)

SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWING TITLE	Br. No. 3 BAN TUM BRIDGE (Son La Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**PROFILE**  
SCALE = 1/400

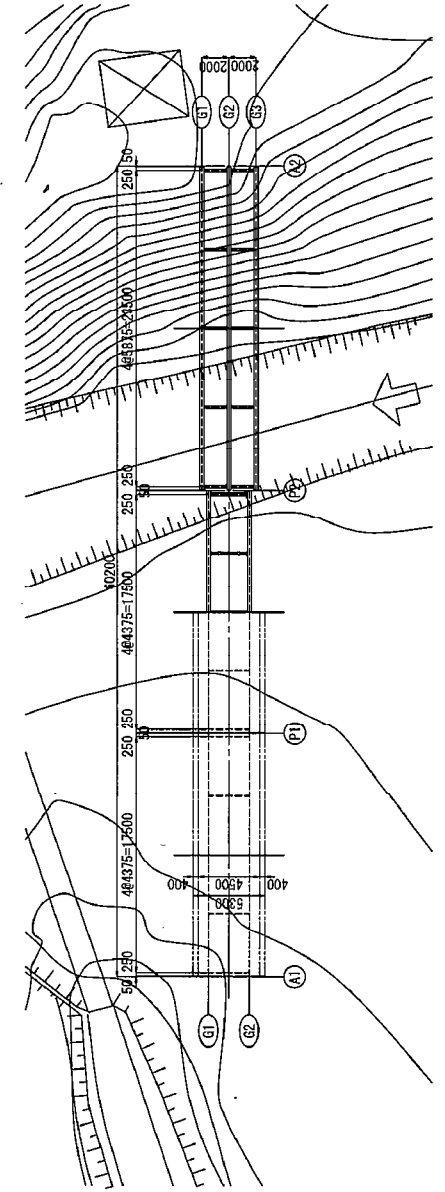


**SECTION**  
SCALE = 1/100



GRADE	PROPOSED RIGHT	GROUND RIGHT	DISTANCE	MARKER
23.80	23.80	23.80	0+0.0	A1
16.67	24.16	24.16	0+0.0	1C1
15.47	24.52	24.52	0+0.0	P1
14.67	25.24	25.24	0+0.0	P2
13.76	25.72	25.72	0+0.0	3C1
14.65	26.20	26.20	0+0.0	A2

**PLAN**  
SCALE = 1/400



**DESIGN CRITERIA**

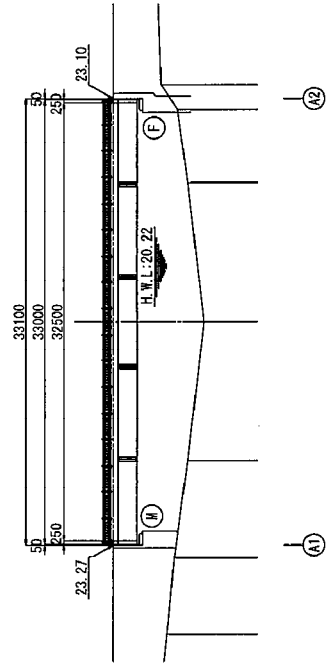
General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	60.2m (17.5m+17.5m+7.3.5m)
Clear Width	4.5 m
Longitudinal Gradient	4.0 %
Cross-fall of Carriageway	1.50 %
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Steel	$\sigma_s = 210 \text{ N/mm}^2$
Concrete	$\sigma_c = 140 \text{ N/mm}^2$
Super Structure Type	Concrete
Sub Structure Type	Concrete
Surface	Concrete
Sub Structure Type	Concrete
Reinforcing Steel	SB2507-300(HP)

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECT MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT	
PROJECT: BRIDGE FOR IMPROVEMENT OF ROAD BRIDGE IN WYKHAN DISTRICT, PHU THO	
CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.	
DESIGNED BY	CHECKED BY
APPROVED BY	DATE

# Br. No. 4 NA D0 BRIDGE

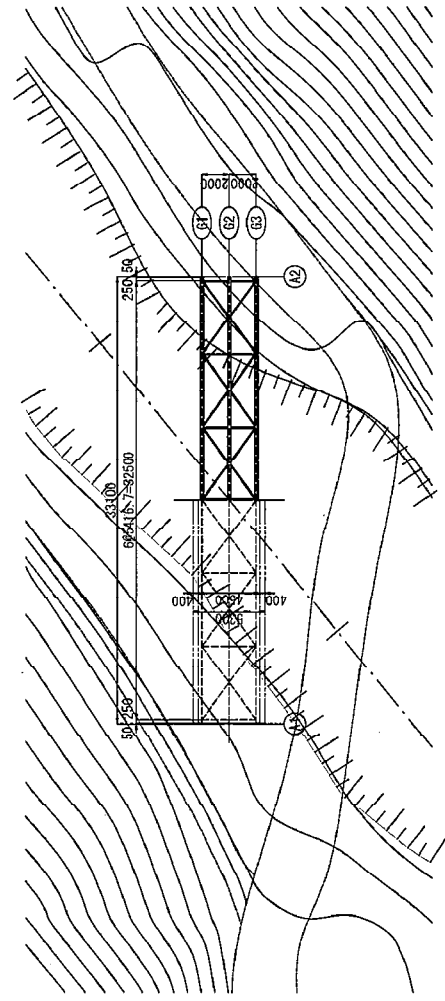
(General View of the Bridge)

PROFILE  
SCALE = 1/400



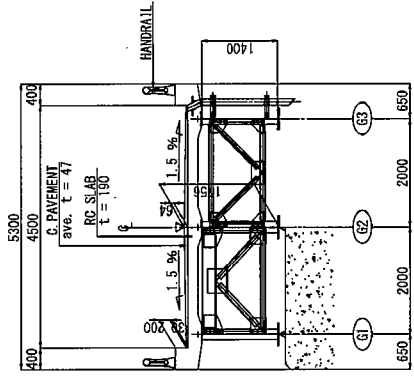
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
23.10	0+0.0	19.75	0+0.0	A2
23.10	0+0.0	18.55	17.80	
23.27	0+0.0	16.57	17.80	A1
23.27	0+0.0	23.19	18.70	
23.10	0+0.0	17.80	19.32	

PLAN  
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	C-1	OF
DRAWING TITLE	Br. No. 4 NA D0 BRIDGE ( Son La Province )		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

SECTION  
SCALE = 1/100



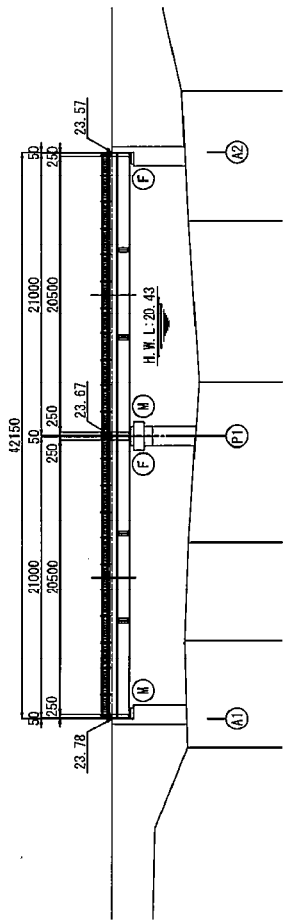
DESIGN CRITERIA	
General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	33.1m (32.5m)
Clear Width	4.5m
Longitudinal Gradient	0.5%
Gross-Ill of Carriageway	1.50%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Concrete	$\sigma_c = 140 \text{ N/mm}^2$
Steel	$\sigma_s = 210 \text{ N/mm}^2$
Cross Beam	$\sigma_c = 140 \text{ N/mm}^2$
Slab	$\sigma_c = 140 \text{ N/mm}^2$
C. Pavement	$\sigma_c = 140 \text{ N/mm}^2$
Surface	$\sigma_c = 140 \text{ N/mm}^2$
Sub Structure Type	$\sigma_c = 140 \text{ N/mm}^2$
Reinforcing Steel	R235 (fy=235N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT  
 PROJECT: THE BRIDGE ON IMPROVED ROAD BRIDGE IN WATSON BANGKONG PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 5 NA TRA BRIDGE

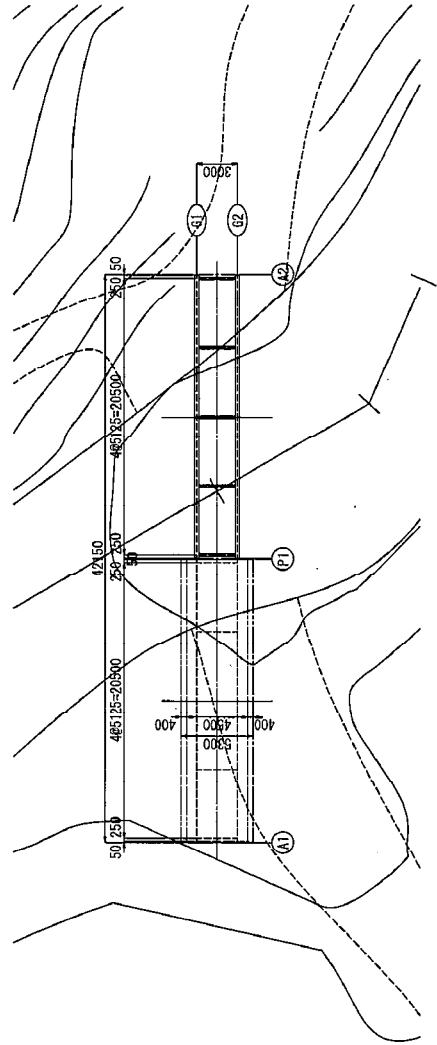
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

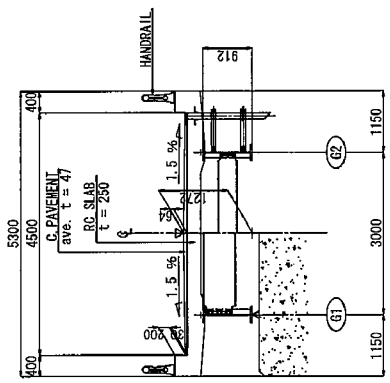


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
23.57	18.66	18.17	0+0.0	A2
23.57	23.57	18.17	0+0.0	P1
23.62	18.17	17.35	0+0.0	20L
23.73	18.43	18.17	0+0.0	10L
23.78	23.67	18.17	0+0.0	A1
23.78	23.57	18.17	0+0.0	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

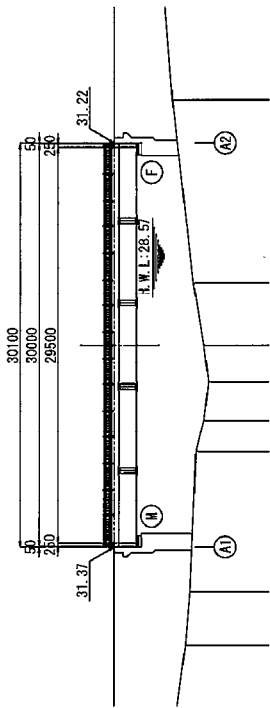
General Condition	
Design Speed	V = 35 km/h
Bridge Length (Span Length)	42.15m (20.5m+20.5m)
Clear Width	4.0m
Longitudinal Gradient	0.5%
Cross-Fall of Pavement	1.5%
Sub Structure Type	Steel
Abutment	Reinforced Concrete
Pier	Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Girder
Cross Beam	$\sigma_a = 210 \text{ N/mm}^2$
Slab	$\sigma_a = 160 \text{ N/mm}^2$
C. Pavement	$\sigma_{bb} = 30 \text{ N/mm}^2$
Surface	ave. L = 4.7cm
Sub Structure Type	$\sigma_{bb} = 30 \text{ N/mm}^2$
Reinforcing Steel	$\sigma_{bb} = 25 \text{ N/mm}^2$

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PLAN FOR IMPROVING & MAINTAINING BRIDGES IN WATSON INTERNATIONAL PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 6 BAN PANG BRIDGE

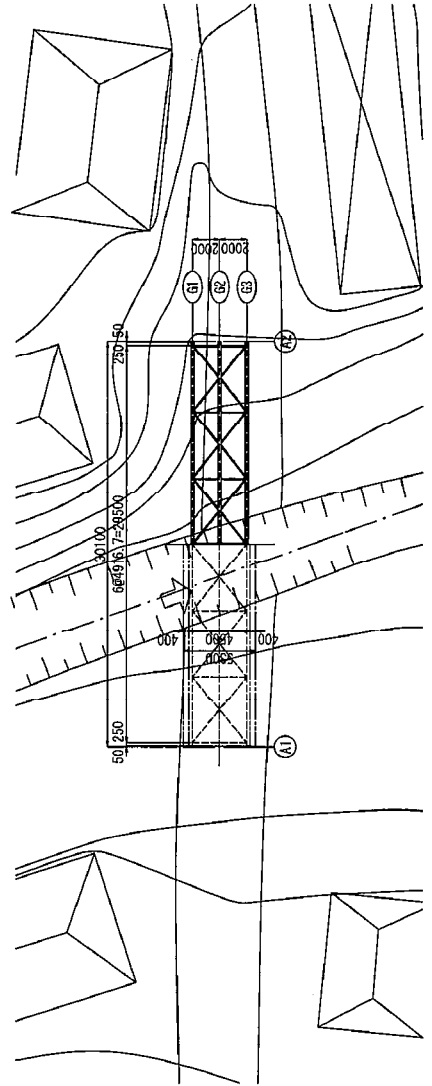
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

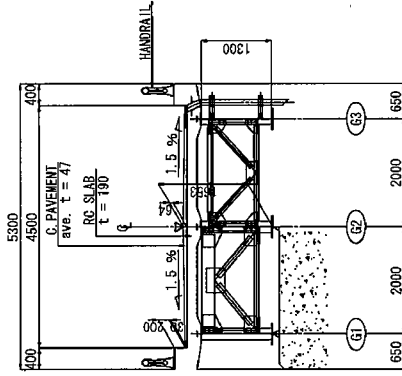


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
	31.22	31.22	0+0.0	A2
	31.37	31.37	0+0.0	A1
	26.11	26.79	0+0.0	
	24.41	24.76	0+0.0	
	24.76	24.76	0+0.0	
	28.35	28.55	0+0.0	
	27.09	27.09	0+0.0	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

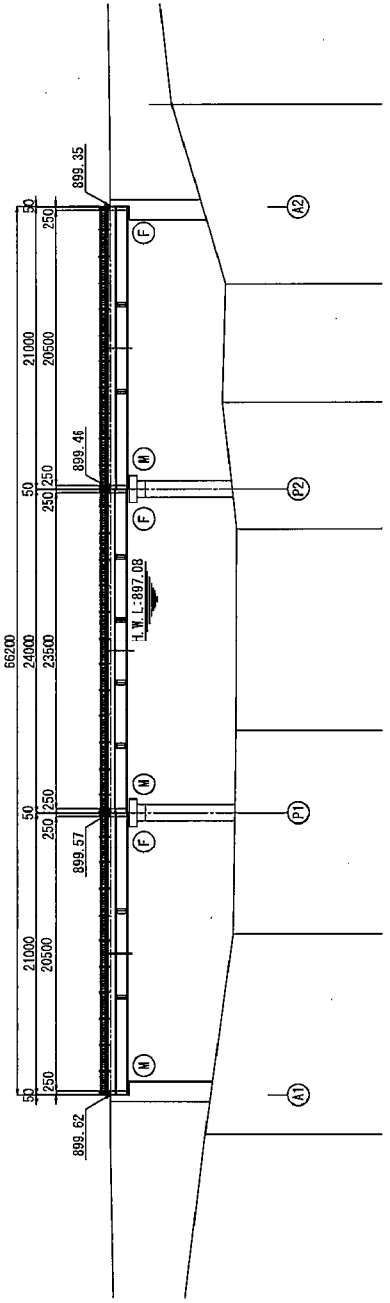
Design Item	General Condition
Design Speed	V = 25 km/h
Bridge Length (Span Length)	30.1m (29.5m)
Clear Width	4.0m
Longitudinal Gradient	0.0%
Cross-Fall at Carriageway	1.5%
Super Structure Type	Steel
Sub Structure Type	Abutment: Reinforced Concrete Pier: Reinforced Concrete
Foundation Type	
<b>Material Strength</b>	
Super Structure Type	Girder
Surface	C. Pavement
Reinforcing Steel	
	σ <sub>a</sub> = 210 N/mm <sup>2</sup> σ <sub>s</sub> = 140 N/mm <sup>2</sup> σ <sub>cs</sub> = 30 N/mm <sup>2</sup> avg. L = 4.7cm σ <sub>cs</sub> = 30 N/mm <sup>2</sup> σ <sub>cs</sub> = 25 N/mm <sup>2</sup> S295 (σ <sub>y</sub> = 300 N/mm <sup>2</sup> )

THE GOVERNMENT OF SINGAPORE  
 PROJECTS MANAGEMENT UNIT NO. 11, MINISTRY OF TRANSPORT  
 PROJECT: THE IMPACT OF IMPROVING ROAD WIDTHS IN URBAN INDIGENOUS VILLAGES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 NAME: \_\_\_\_\_  
 STRAITS: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 DESIGNED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_

# Br. No. 7 NA PHAT BRIDGE

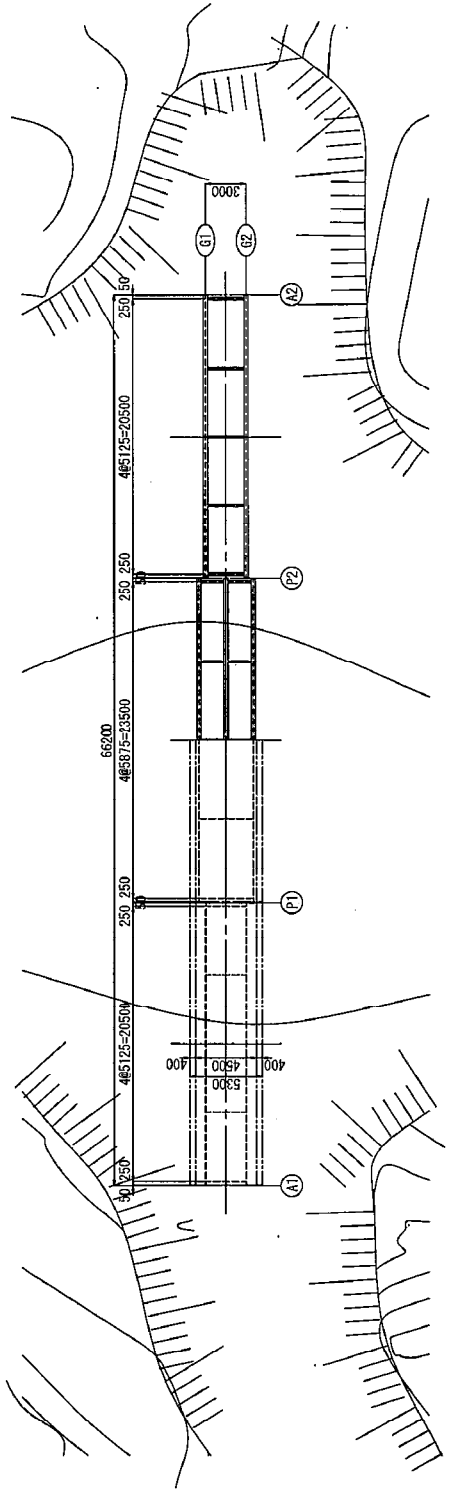
(General View of the Bridge)

PROFILE  
 SCALE = 1/400



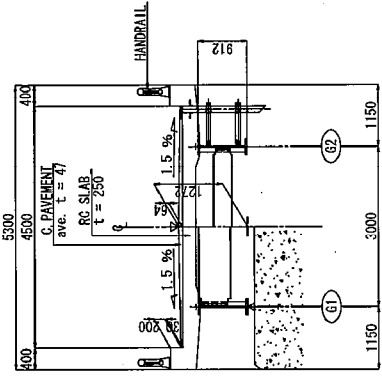
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
899.62	899.62	892.69	0+0.0	A1
899.63	899.63	890.63	0+0.0	1C1
899.57	899.57	899.57	0+0.0	P1
899.52	899.52	890.42	0+0.0	2C1
899.46	899.46	899.46	0+0.0	P2
899.40	899.40	891.42	0+0.0	3C1
899.35	899.35	891.18	0+0.0	A2
899.35	899.35	899.35	0+0.0	3C2

PLAN  
 SCALE = 1/400

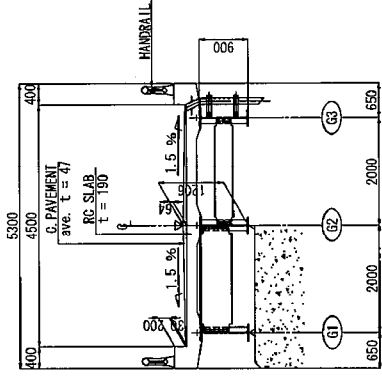


SECTION  
 SCALE = 1/100

A1~P1, P2~A2



P1~P2



### DESIGN CRITERIA

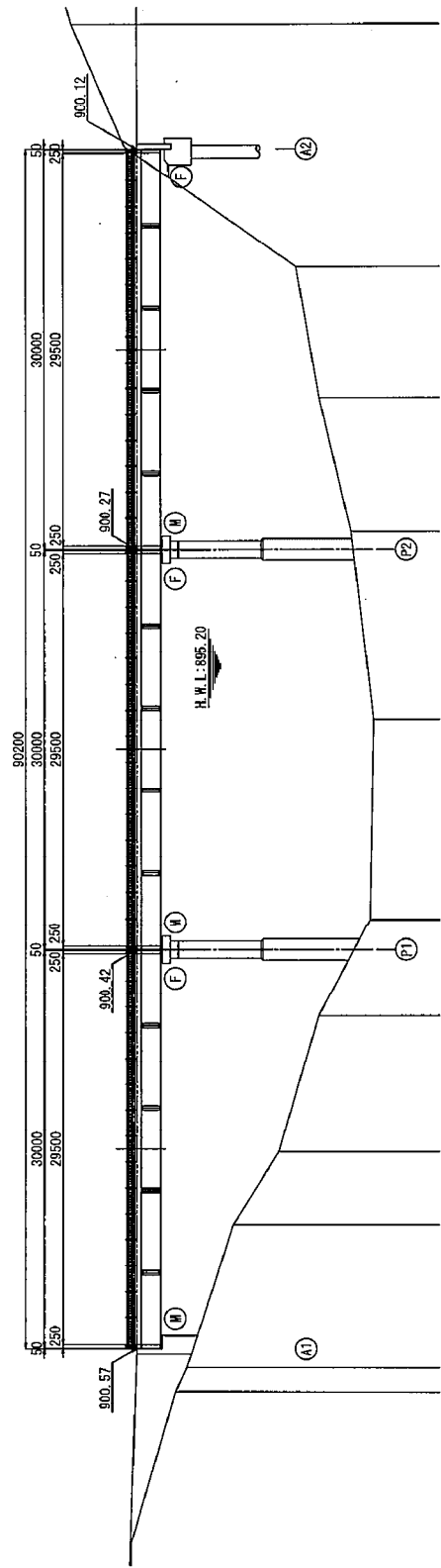
General Condition	
Design Speed	V = 25 km/h
Slurry Shield (See Int'l)	66.2m (20.5m x 2.5m x 20.5m)
Clear Width	4.0m
Longitudinal Gradient	0.5%
Cross-fall at Curbsides	1.30%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Pier
Material Strength	
Super Structure Type	Girder
Cross Beam	$\sigma_a = 210 \text{ N/mm}^2$
Slab	$\sigma_a = 140 \text{ N/mm}^2$
C. Pavement	$\sigma_a = 30 \text{ N/mm}^2$
Surface	avg. L = 4.7cm
Sub Structure Type	Concrete
Reinforcing Steel	$\sigma_a = 25 \text{ N/mm}^2$
	S275 (p=300N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT  
 PROJECT: THE PLAN FOR IMPROVING ROAD BRIDGES IN MOUNTAIN REGIONS PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 8 PA BAT BRIDGE

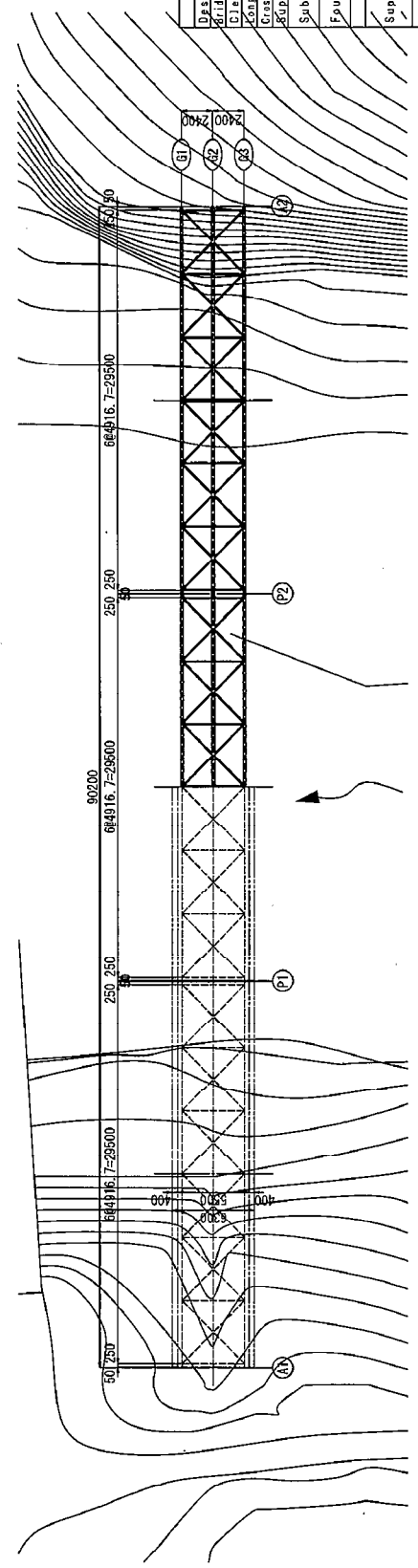
(General View of the Bridge)

PROFILE  
 SCALE = 1/400



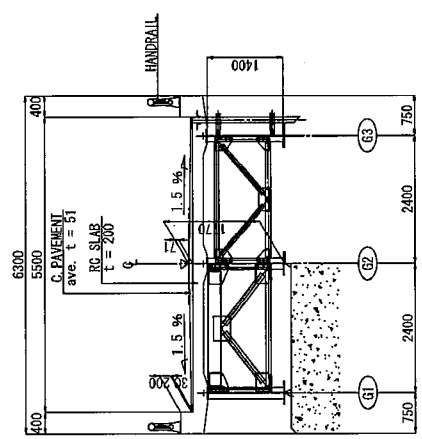
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
900.57	0+0.0	900.57		A1
900.42	0+0.0	900.42		P1
900.35	0+0.0	900.35		20L
900.27	0+0.0	900.27		P2
900.20	0+0.0	900.20		30L
900.12	0+0.0	900.12		A2
900.48		900.48		

PLAN  
 SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWING TITLE	Br. No. 8 PA BAT BRIDGE (Don Ban Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

SECTION  
 SCALE = 1/100



DESIGN CRITERIA

General Condition	Design Speed	V = 75 km/h
	Bridge Length (Span Length)	80.2m (29.5m+29.5m+29.5m)
	Clear Width	5.5m
	Longitudinal Gradient	0.5%
	Vertical Curvature	1.80m
Super Structure Type	Material	Reinforced Concrete
Sub Structure Type	Pier	Reinforced Concrete
Foundation Type		
Material Strength		
Girder	$\sigma_s = 210 \text{ N/mm}^2$	
Cross Beam	$\sigma_s = 110 \text{ N/mm}^2$	
Slab	$\sigma_s = 30 \text{ N/mm}^2$	
C. Pavement	$\sigma_c = 50 \text{ N/mm}^2$	
Surface	$\sigma_c = 50 \text{ N/mm}^2$	
Sub Structure Type	$\sigma_c = 75 \text{ N/mm}^2$	
Reinforcing Steel	$\sigma_s = 300 \text{ N/mm}^2$	

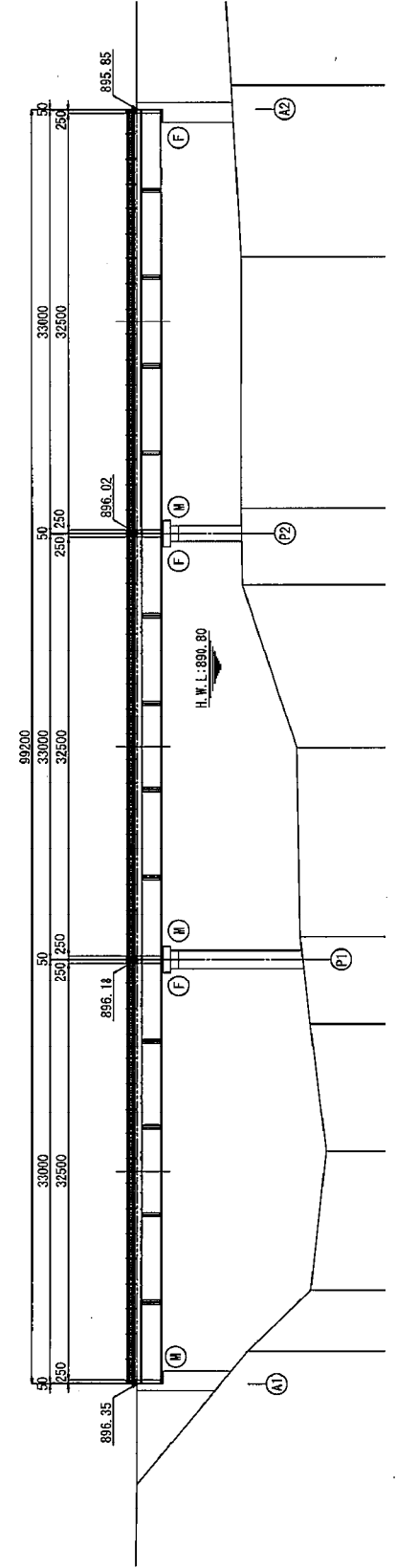


THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT  
 PROJECT: THE BRIDGE FOR IMPROVEMENT OF SUK LU BRIDGE IN NHERN PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No.9 SU LU BRIDGE

(General View of the Bridge)

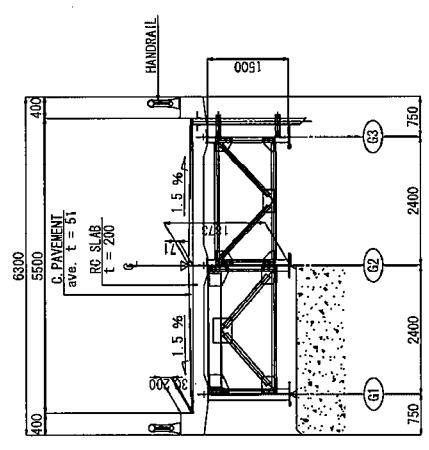
**PROFILE**  
 SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
896.35	896.85	896.85	0+0.0	A1
887.81	896.81	887.81	0+0.0	
882.93	896.72	882.93	0+0.0	
881.72	896.27	881.72	0+0.0	10L
883.75	896.18	883.75	0+0.0	P1
882.98	896.98	882.98	0+0.0	
883.22	896.02	883.22	0+0.0	P2
888.22	896.02	888.22	0+0.0	
888.32	895.93	888.32	0+0.0	
888.31	895.93	888.31	0+0.0	
895.06	895.85	895.06	0+0.0	A2

SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/120, 1/400	ET-	OF
REVISION			
NO.	DATE	DESCRIPTION	SIGNATURE
1		BR. No.9 SU LU BRIDGE (Dien Bien Province)	

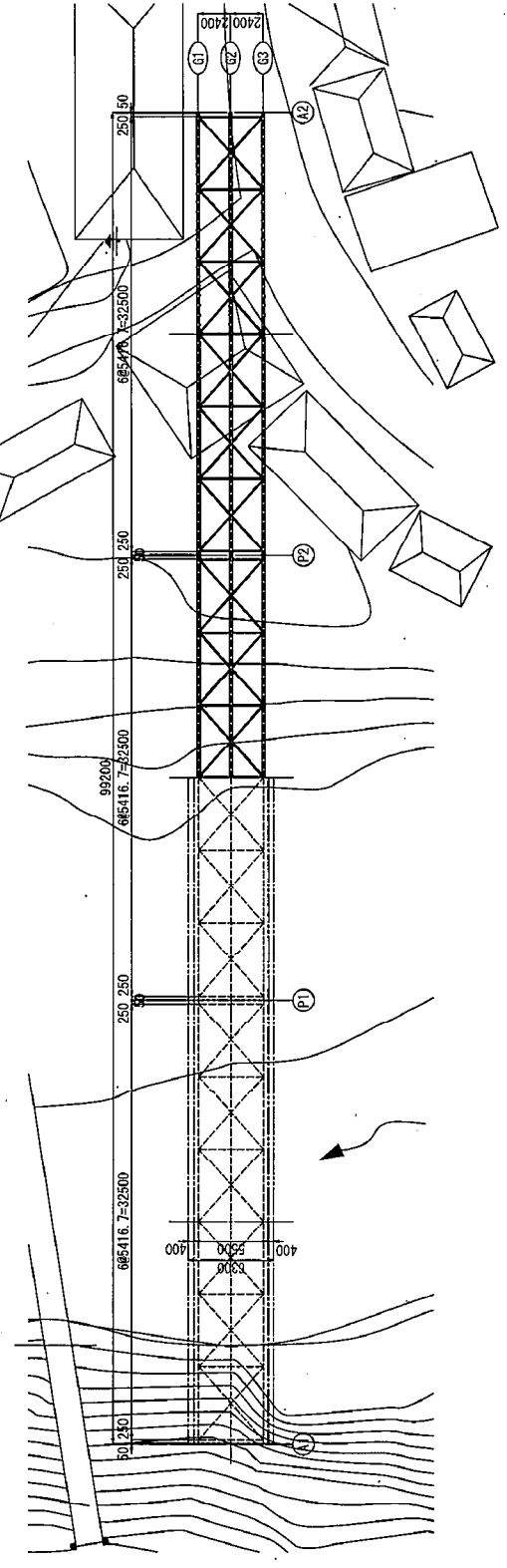
**SECTION**  
 SCALE = 1/100



**DESIGN CRITERIA**

General	Condition
Design Speed	V = 30 km/h
Bridge Length (Span length)	99.2m (32 Spans x 30.5m + 42.5m)
Clear Width	6.5m
Longitudinal Gradient	0.5%
Construction of Carriageway	1.50%
Super Structure Type	Steel
Sub Structure Type	Abutment Reinforced Concrete
Foundation Type	Pier Reinforced Concrete
Material Strength	
Super Structure Type	Girder
	σ <sub>b</sub> = 210 N/mm <sup>2</sup>
	σ <sub>s</sub> = 140 N/mm <sup>2</sup>
Surface	C. Pavement
	σ <sub>b</sub> = 30 N/mm <sup>2</sup>
	σ <sub>s</sub> = 30 N/mm <sup>2</sup>
Sub Structure Type	Reinforcing Steel
	S225 (fy = 225 N/mm <sup>2</sup> )

**PLAN**  
 SCALE = 1/400

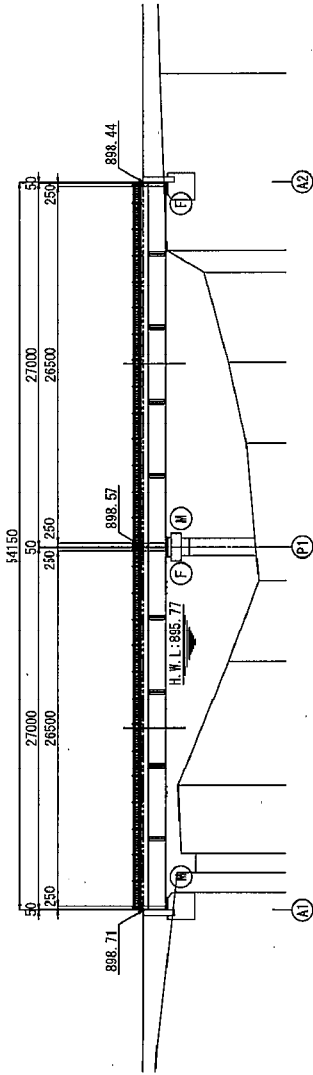


THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECT'S MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE BRIDGE ON IMPROVED BAN BUNG RIVER IN BIEN HIEP PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 10 BAN BUNG BRIDGE

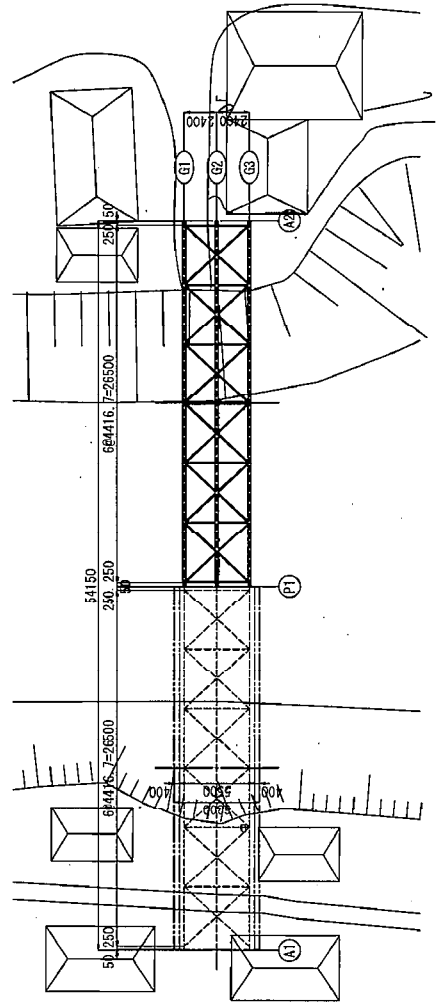
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400



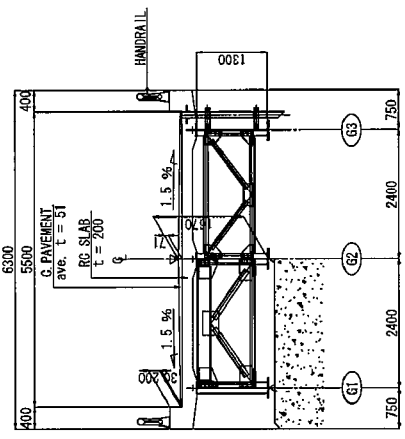
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
		898.71	0+0.0	A1
		898.37	0+0.0	
		898.20	0+0.0	
		898.85	0+0.0	
		898.94	0+0.0	
		898.17	0+0.0	
		898.64	0+0.0	
		892.44	0+0.0	
		890.20	0+0.0	
		898.57	0+0.0	P1
		892.44	0+0.0	
		898.81	0+0.0	
		892.44	0+0.0	
		894.26	0+0.0	
		896.99	0+0.0	
		898.44	0+0.0	A2

**PLAN**  
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/100	BT-	OF
DRAWING TITLE	BR. No. 10 BAN BUNG BRIDGE ( Bien Hiep Province )		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

General	Condition
Design Speed	V = 25 km/h
Design Wind Speed (km/h)	54.15m (16.5m x 26.5m)
Clear Width	3.0 m
Longitudinal Gradient	0.0 %
Cross-fall at Carriageway	1.50 %
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Pier

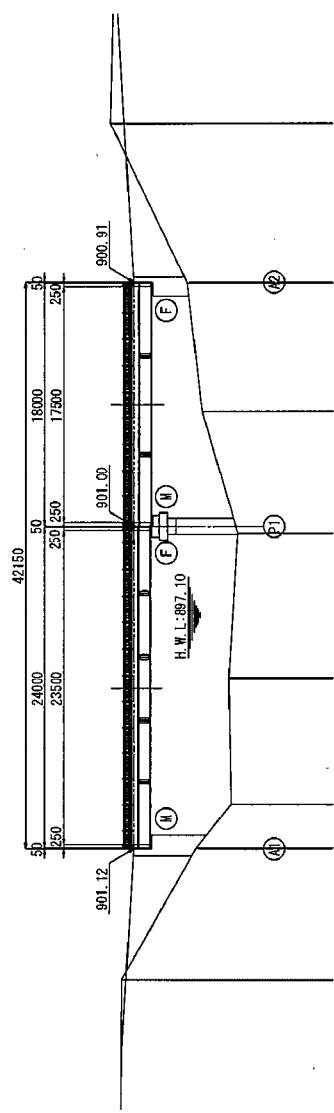
Material	Strength
Super Structure Type	Girder
	Cross Beam
	Slab
Surface	C. Pavement
	Curb
Sub Structure Type	
Reinforcing Steel	

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECT MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT	
PROJECT THE FUND FOR IMPROVING OF ROAD BRIDGE IN MOUNTAIN PROVINCES	
CONSULTANT	ORIENTAL CONSULTANTS CO., LTD
DESIGNED BY	CHECKED BY
APPROVED BY	
NAME	
SIGNATURE	
DATE	

# Br. No.11 PAC NAM ( DB ) BRIDGE

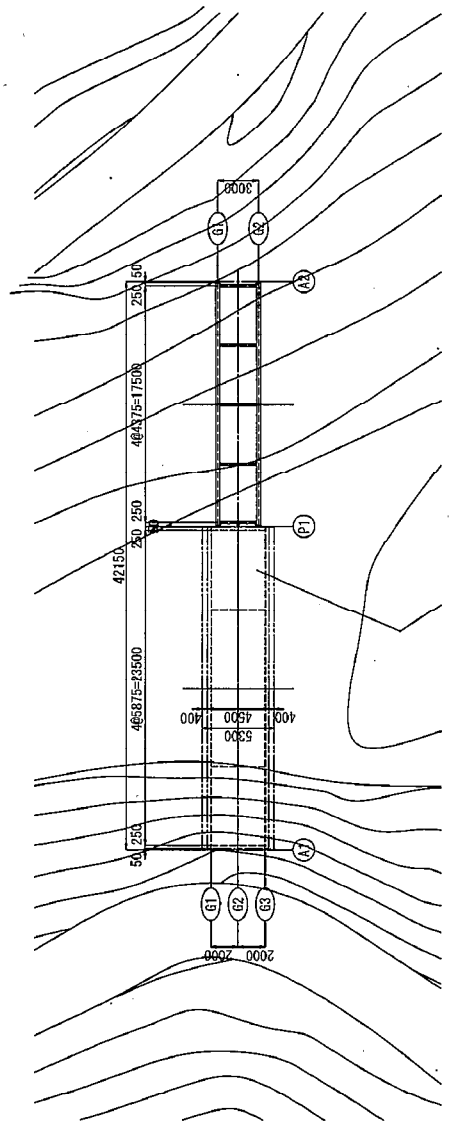
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400



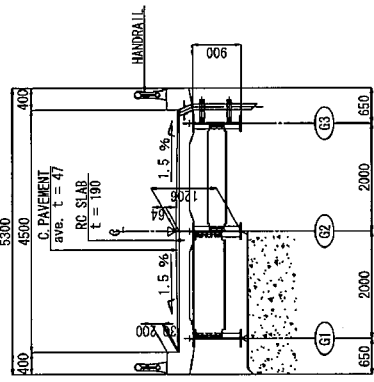
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
	902.85	902.85	0+0.0	A2
	902.20	900.91	0+0.0	A2
	902.08	900.96	0+0.0	2C1
	901.46	901.00	0+0.0	P1
	901.13	901.06	0+0.0	1C1
	901.96	901.12	0+0.0	A1
	901.54	901.12	0+0.0	A1
	901.12	901.12	0+0.0	A1

**PLAN**  
SCALE = 1/400

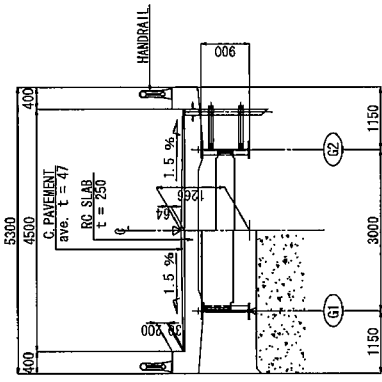


**SECTION**  
SCALE = 1/100

A1~P1



P1~A2



**DESIGN CRITERIA**

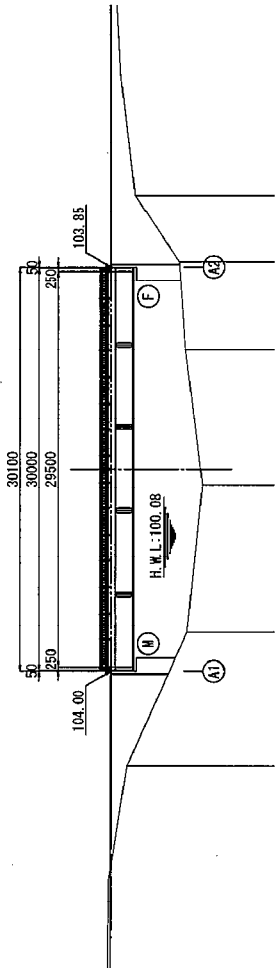
General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	42.15m (23.5m+17.5m)
Clear Width	4.5 m
Longitudinal Gradient	0.5 %
Clearance of Curvature	1.90 %
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Reinforced Concrete
Cross Beam	$\sigma_s = 210 \text{ N/mm}^2$
Slab	$\sigma_s = 140 \text{ N/mm}^2$
C. Pavement	$\sigma_s = 30 \text{ N/mm}^2$
Surface	$\sigma_s = 30 \text{ N/mm}^2$
Sub Structure Type	$\sigma_s = 25 \text{ N/mm}^2$
Reinforcing Steel	$\sigma_s = 30250 \text{ (N/mm}^2)$

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE IMPACT OF IMPROVING ROAD BRIDGES IN NORTH HANOI PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 12 SAN THANG BRIDGE

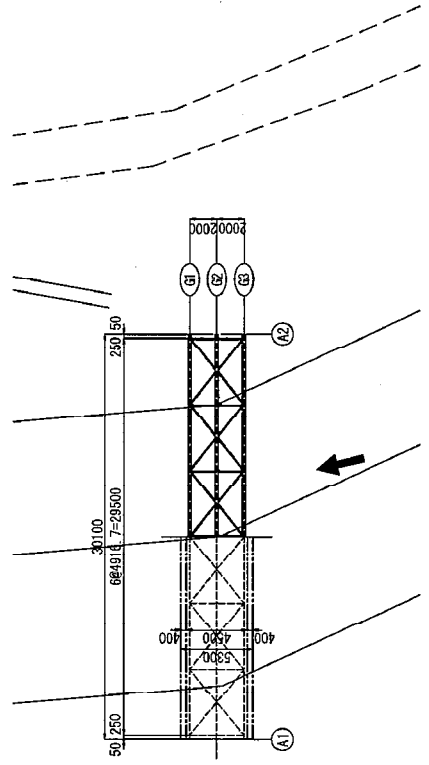
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

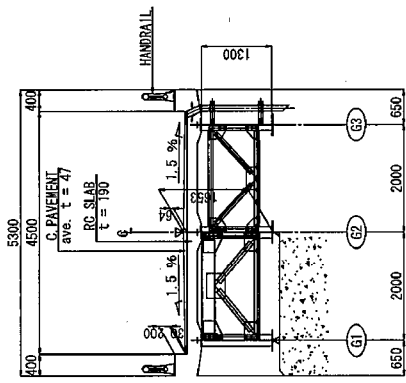


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
104.00	0+0.00	104.00	0+0.00	A1
98.97	0+0.00	98.97	0+0.00	A2
102.21	0+0.00	102.21	0+0.00	A3

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

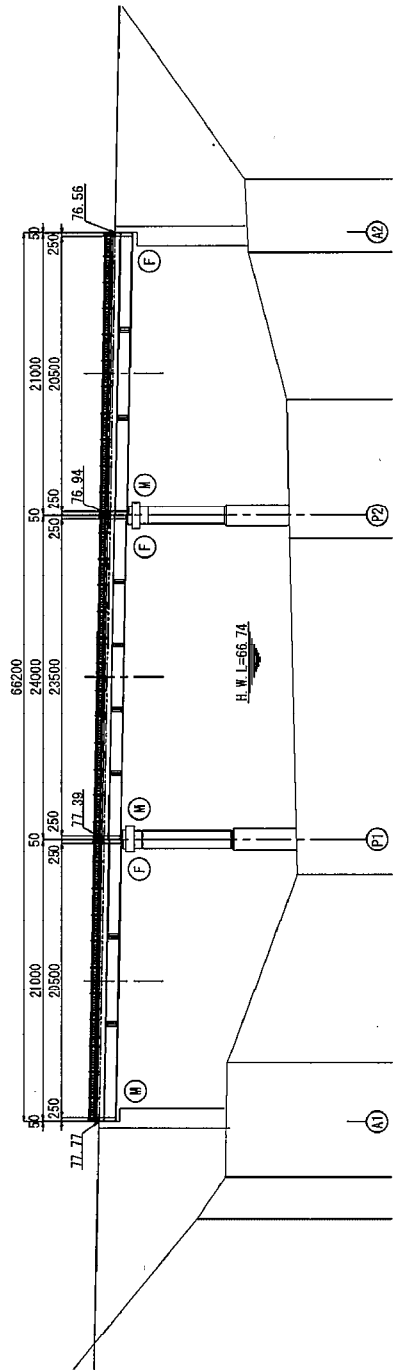
General Condition	
Design Speed	V = 75 Km/h
Strip Length (between piers)	30.0m (20.5m)
Girder Width	4.0m
Longitudinal Gradient	0.0%
Cross-fall of Girders (m)	1.50%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Girder
	σ <sub>s</sub> = 210 N/mm <sup>2</sup>
	σ <sub>b</sub> = 100 N/mm <sup>2</sup>
Surface	Slab
	σ <sub>s</sub> = 30 N/mm <sup>2</sup>
	ave. L = 4.7cm
Sub Structure Type	Curb
	σ <sub>s</sub> = 30 N/mm <sup>2</sup>
	σ <sub>b</sub> = 25 N/mm <sup>2</sup>
	Reinforcing Steel
	S245 (R <sub>yk</sub> = 300N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM
PROJECTS MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT
PROJECT THE BRIDGE FOR IMPROVING ROAD BRIDGES IN NORTHERN MOUNTAIN PROVINCES
CONSULTANT ORIENTAL CONSULTANTS CO., LTD.
DESIGNED BY
CHECKED BY
APPROVED BY
NAME
SIGNATURE
DATE

# Br. No. 14 NAM PUC BRIDGE

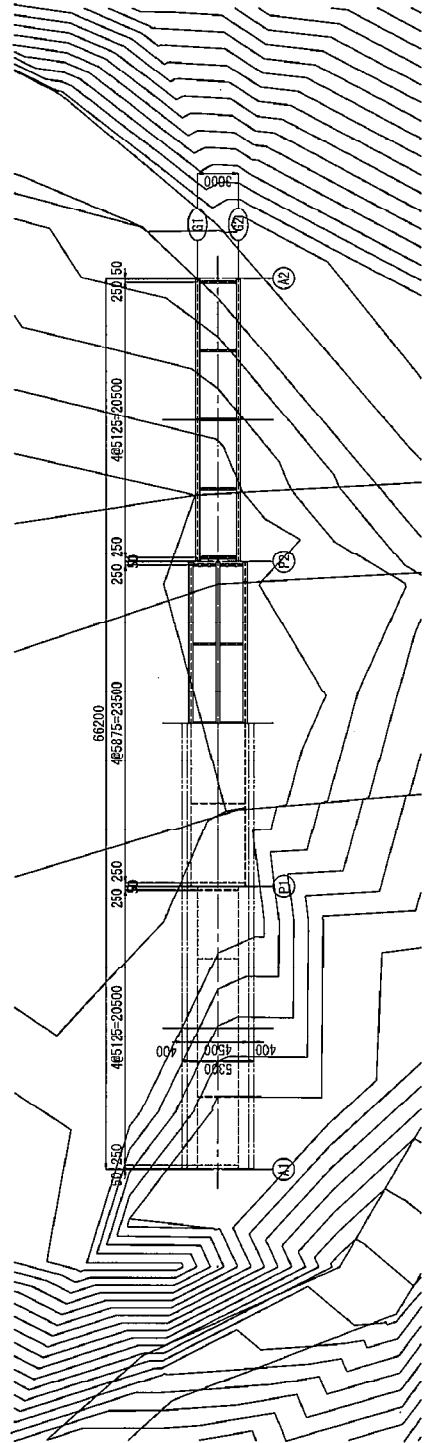
(General View of the Bridge)

PROFILE  
SCALE = 1/400



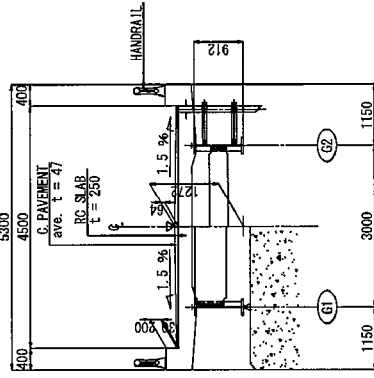
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
76.56	76.56	77.77	0+0.0	A1
76.56	76.56	77.39	0+0.0	P1
76.56	76.56	77.16	0+0.0	20L
76.56	76.56	76.94	0+0.0	P2
76.56	76.56	76.75	0+0.0	30L
76.56	76.56	68.44	0+0.0	
76.56	76.56	68.32	0+0.0	
76.56	76.56	77.58	0+0.0	10L
76.56	76.56	63.12	0+0.0	
76.56	76.56	63.72	0+0.0	
76.56	76.56	66.74	0+0.0	
76.56	76.56	67.02	0+0.0	A2

PLAN  
SCALE = 1/400

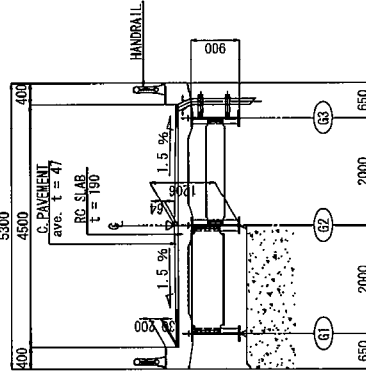


SECTION  
SCALE = 1/100

A1~P1, P2~A2



P1~P2



### DESIGN CRITERIA

General Condition	Design Speed	V = 30 km/h
	Bridge Length (Span Length)	66.2m (20.5m+23.5m+20.5m)
	Clear Width (Span Length)	4.5m
	Longitudinal Gradient	1.84%
	Cross-slope of Concrete	1.50%
	Super Structure Type	Steel Reinforced Concrete
	Foundation Type	Pier Reinforced Concrete
		Abutment Reinforced Concrete
		Foundation Type
		Material Strength
		Steel
		σ <sub>s</sub> = 210 N/mm <sup>2</sup>
		Concrete
		σ <sub>c</sub> = 30 N/mm <sup>2</sup>
		Surface
		σ <sub>s</sub> = 30 N/mm <sup>2</sup>
		σ <sub>c</sub> = 25 N/mm <sup>2</sup>
		Sub Structure Type
		Reinforcing Steel
		S225 (σ <sub>s</sub> = 225 N/mm <sup>2</sup> )

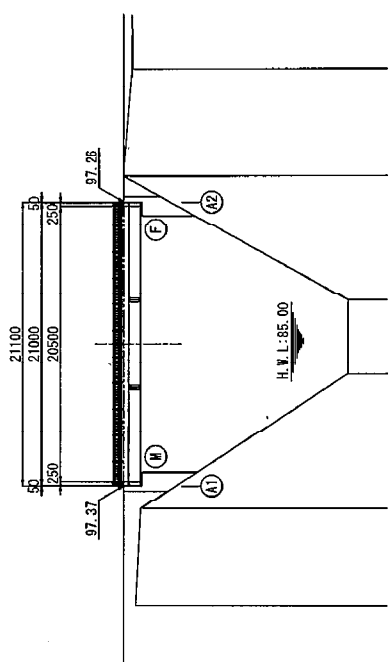
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: BRIDGE FOR IMPROVING ROAD BRIDGE IN MOUNTAINOUS PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 15 HUOI DIT BRIDGE

(General View of the Bridge)

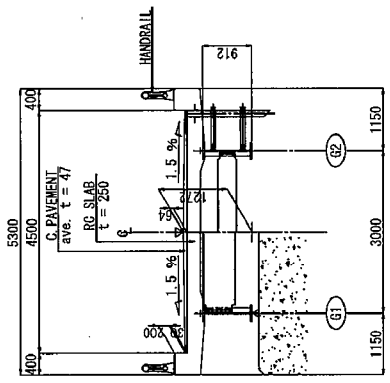
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
TITLE	Br. No. 15 HUOI DIT BRIDGE (Lai Chau Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**PROFILE**  
SCALE = 1/400

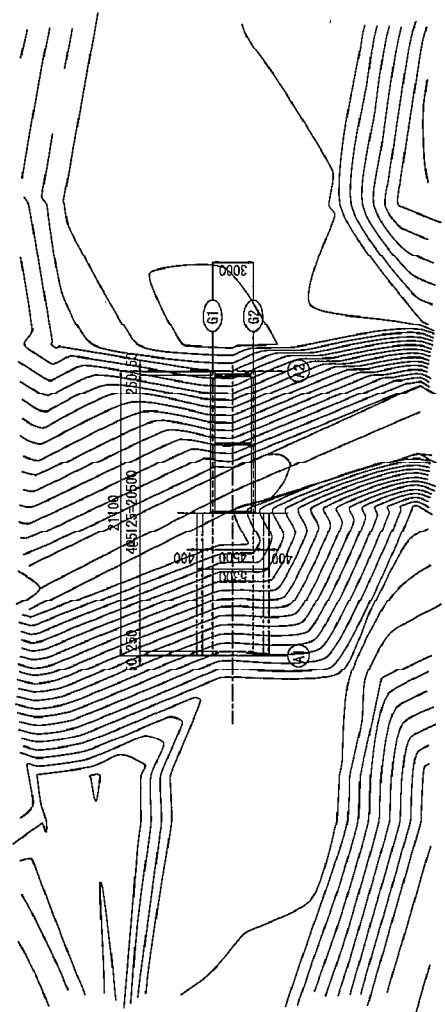


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
	97.37	97.37	0+0.0	A1
	97.32	97.32	80.80	CL
	97.41	97.41	80.80	CL
	97.26	97.26	0+0.0	A2

**SECTION**  
SCALE = 1/100



**PLAN**  
SCALE = 1/400



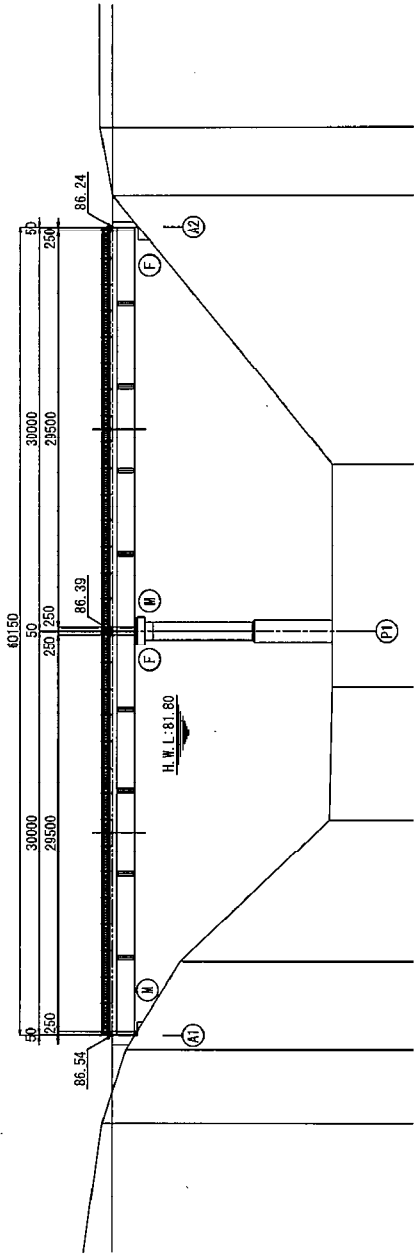
DESIGN CRITERIA	
Design Speed	General Condition V = 75 Km/h
Bridge Length (Span length)	21.1m (20.5m)
Clear Width	4.5
Longitudinal Gradient	0.5 %
Cross-Fill at Girders nos	0.8 %
Sub Structure Type	Steel
Abutment	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Girder $\sigma_s = 210 \text{ N/mm}^2$
	Cross Beam $\sigma_s = 150 \text{ N/mm}^2$
	Slab $\sigma_s = 30 \text{ N/mm}^2$
Surface	C. Pavement ave. L = 4.7cm
	Curb $\sigma_s = 30 \text{ N/mm}^2$
Sub Structure Type	Reinforced Concrete $\sigma_s = 25 \text{ N/mm}^2$
Reinforcing Steel	S225 (fy=235N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR INVESTMENT IN BRIDGE IN NORTHERN PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 DRAWN BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 16 NAM HAM BRIDGE

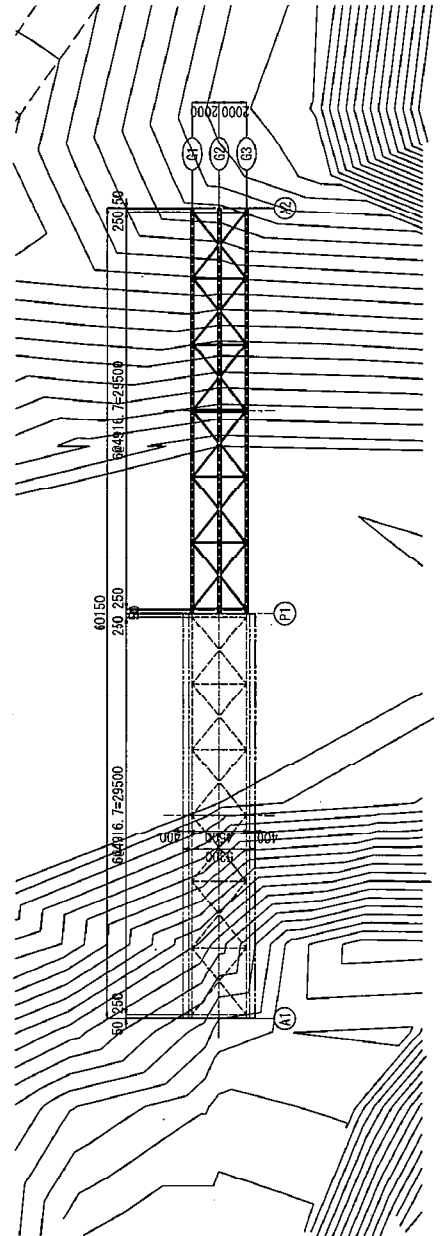
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

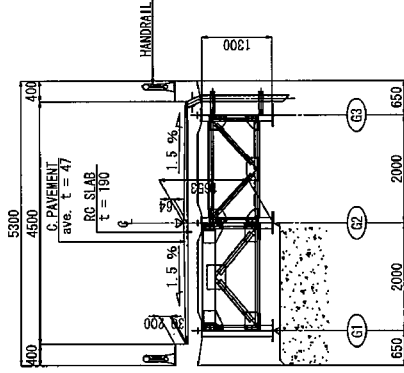


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
86.54	0+0.0	87.29	0+0.0	A1
86.54	0+0.0	81.55	10L	
86.54	0+0.0	70.31	20L	
86.54	0+0.0	88.39	P1	
86.54	0+0.0	70.31	A2	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

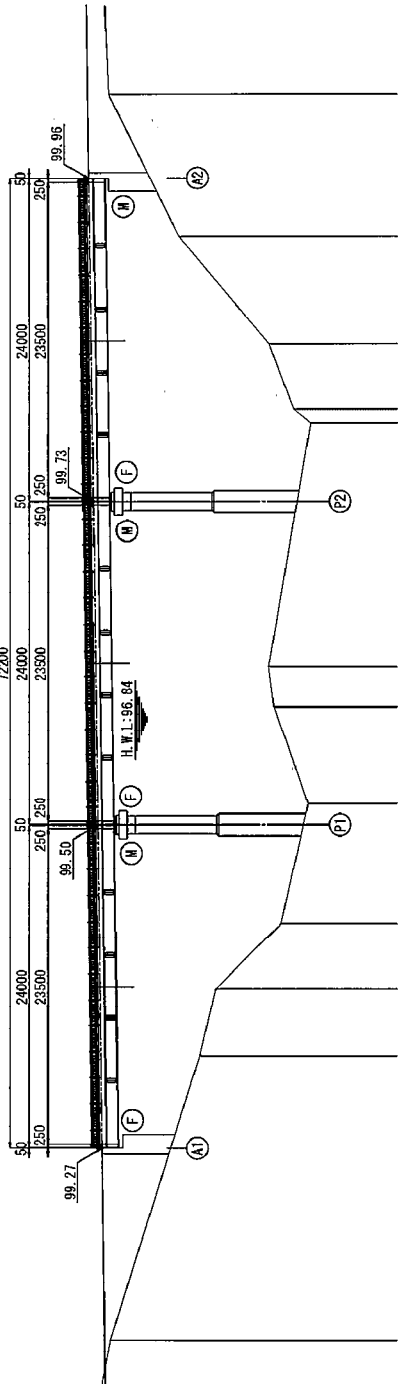
Design Speed	General Condition	V = 25 km/h
Bridge Length (Span Unit)		60.15m (20.5m x 3)
Clear Width		4.5m
Longitudinal Gradient		0.5%
Cross-sill of Chassis		1.50%
Super Structure Type	Abutment	Reinforced Concrete
	Pier	Reinforced Concrete
Foundation Type		
<b>Material Strength</b>		
Super Structure Type	Girder	$\sigma_a = 210 \text{ N/mm}^2$
	Cross Beam	$\sigma_a = 140 \text{ N/mm}^2$
	Slab	$\sigma_a = 30 \text{ N/mm}^2$
Surface	C. Pavement	ave. t = 4.7cm
	Carb	$\sigma_a = 30 \text{ N/mm}^2$
Sub Structure Type		$\sigma_a = 25 \text{ N/mm}^2$
Reinforcing Steel		S295 (fy = 300 N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: BRIDGE FOR IMPROVEMENT OF ROAD BRIDGE II IN SON BINH PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: [ ] CHECKED BY: [ ] APPROVED BY: [ ]  
 NAME: [ ] SIGNATURE: [ ] DATE: [ ]

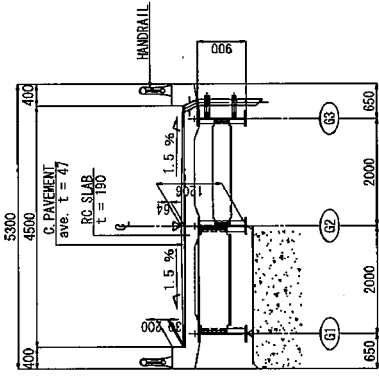
# Br. No. 17 NAM CUM BRIDGE

(General View of the Bridge)

PROFILE  
 SCALE = 1/400



SECTION  
 SCALE = 1/100

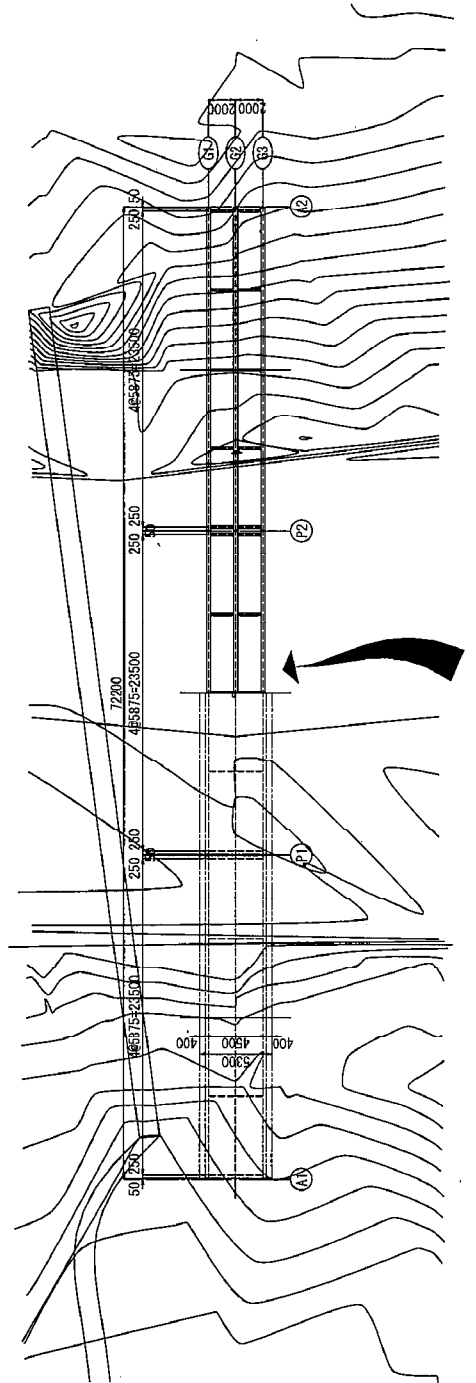


## DESIGN CRITERIA

Design Speed	General Condition	V = 75 Km/h
Bridge width (Clear width)		72.2m (23.5m x 2.5m x 2.5m)
Clear Width		4.7m
Longitudinal Gradient		0.95 %
Cross-fall of Carriageway		1.50 %
Super. Structure Type	Abutment	Steel
Sub Structure Type	Reinforced Concrete	Pier
Foundation Type		Reinforced Concrete
Material Strength		
Super Structure Type	Girder	$\sigma_a = 210 \text{ N/mm}^2$
	Cross Beam	$\sigma_a = 160 \text{ N/mm}^2$
	Slab	$\sigma_a = 30 \text{ N/mm}^2$
Surface	C. Pavement	ave. L = 4.7 cm
Sub Structure Type	Curb	$\sigma_a = 30 \text{ N/mm}^2$
Reinforcing Steel		$\sigma_a = 25 \text{ N/mm}^2$
		S202S (fy = 300N/mm <sup>2</sup> )

GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
99.27	99.27	99.27	0+0.0	A1
98.66	98.66	98.66	0+0.0	
99.96	99.96	99.96	0+0.0	A2
99.50	99.50	99.50	0+0.0	P1
99.73	99.73	99.73	0+0.0	P2
98.85	98.85	98.85	0+0.0	3CL
98.62	98.62	98.62	0+0.0	3CL
99.50	99.50	99.50	0+0.0	
98.10	98.10	98.10	0+0.0	
99.91	99.91	99.91	0+0.0	1CL
98.68	98.68	98.68	0+0.0	
99.63	99.63	99.63	0+0.0	
98.97	98.97	98.97	0+0.0	3CL
98.81	98.81	98.81	0+0.0	

PLAN  
 SCALE = 1/400







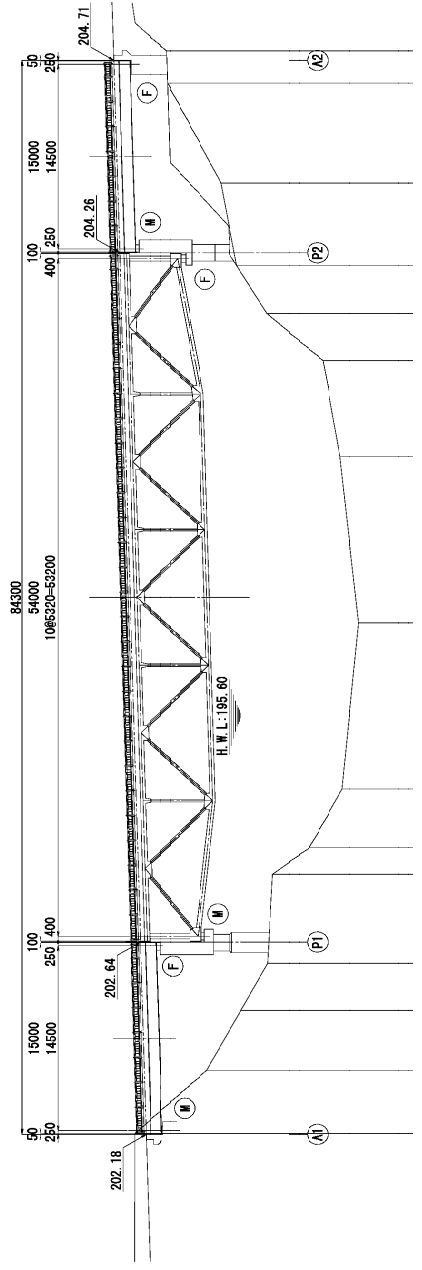
THIS DOCUMENT IS THE PROPERTY OF VIETNAM PROJECTS MANAGEMENT CONSULTANTS CO., LTD. THE PROJECT FOR IMPROVING OF ROAD BRIDGE IN BORDER AREAS PHU HOI PROVINCE. CONSULTANT: ORIENTAL CONSULTANTS CO., LTD. APPROVED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ DRAWN BY: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 20 LAO CHAI BRIDGE

(General View of the Bridge)

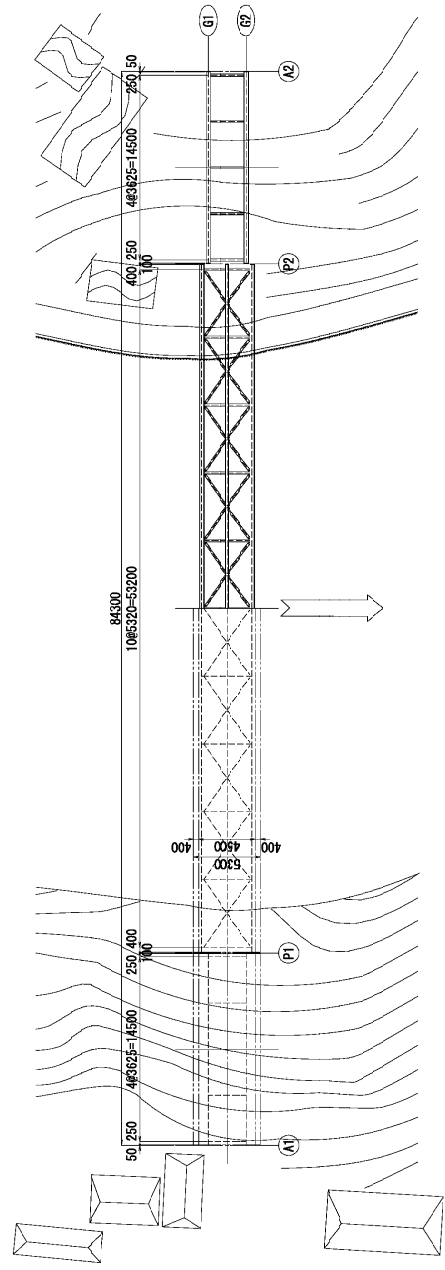
SECTION	SCALE	DRAWING NO.	SHEET NO.
1/100, 1/400	GT-		01
PROJECT TITLE	Br. No. 20 LAO CHAI BRIDGE (Yon Bai Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**PROFILE**  
SCALE = 1/400



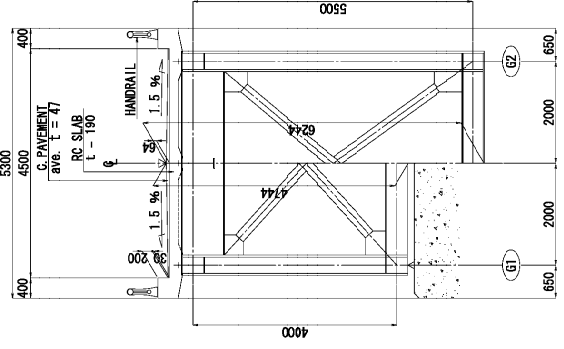
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
A1	20-957.850	201.75	202.18	202.18
CL1	20-966.400	197.41	202.41	
P1	20-972.950	192.65	202.64	
CL2	21- 0.000	185.50	203.45	
P2	21- 27.050	195.64	204.26	
CL3	21- 34.600	195.70	204.49	
A2	21- 42.150	200.35	204.71	204.71

**PLAN**  
SCALE = 1/400

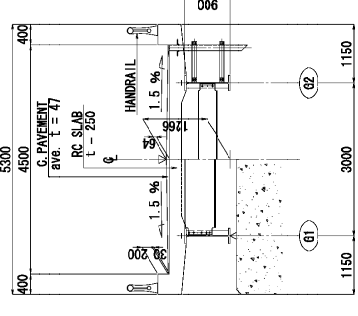


**SECTION**  
SCALE = 1/100

PT~P2



A1~P1, P2~A2



**DESIGN CRITERIA**

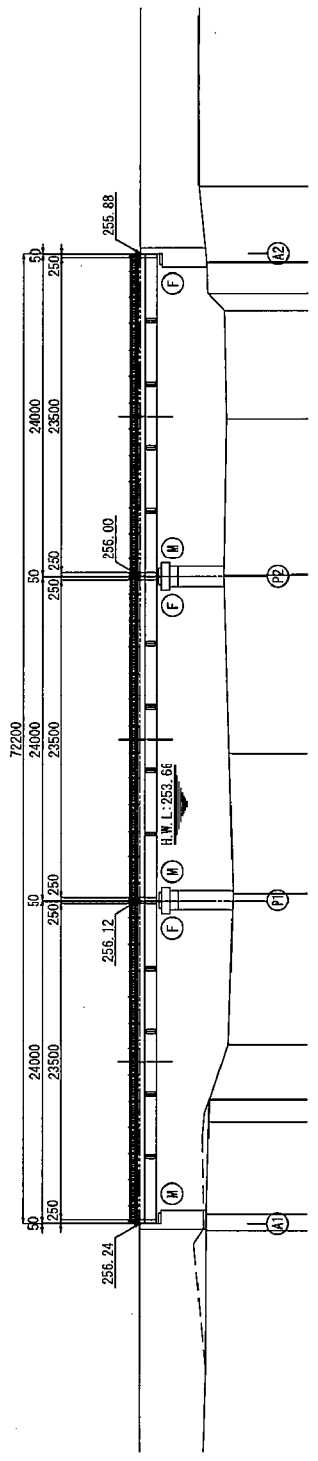
Design Speed	General Condition	V = 25 km/h
Bridge Length (Span length)		84.2m (4.5m+3.2m+14.5m)
Clear Width		4.5 m
Longitudinal Gradient		3.0 %
Cross-fall of Carriage way		1.50 %
Super Structure Type		Steel
Sub Structure Type		Reinforced Concrete
Foundation Type		Reinforced Concrete Square 40x40cm
Material Strength		Steel: $f_{yk} = 460, f_{yk} = 460$
	Super Structure Type	Girder
	Cross Beam	$\sigma_a = 210 \text{ N/mm}^2$
	Slab	$\sigma_a = 210 \text{ N/mm}^2$
Surface		C. Pavement
		600 T = 4.7 cm
		620 T = 30.0 mm
Sub Structure Type		Curb Wall
		620 T = 30.0 mm
		Sub. Structure Type
		300x300 (300x300 mm)

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE BRIDGE FOR IMPROVING ROAD IN THE MOUNTAIN PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 21 PU TRANG BRIDGE

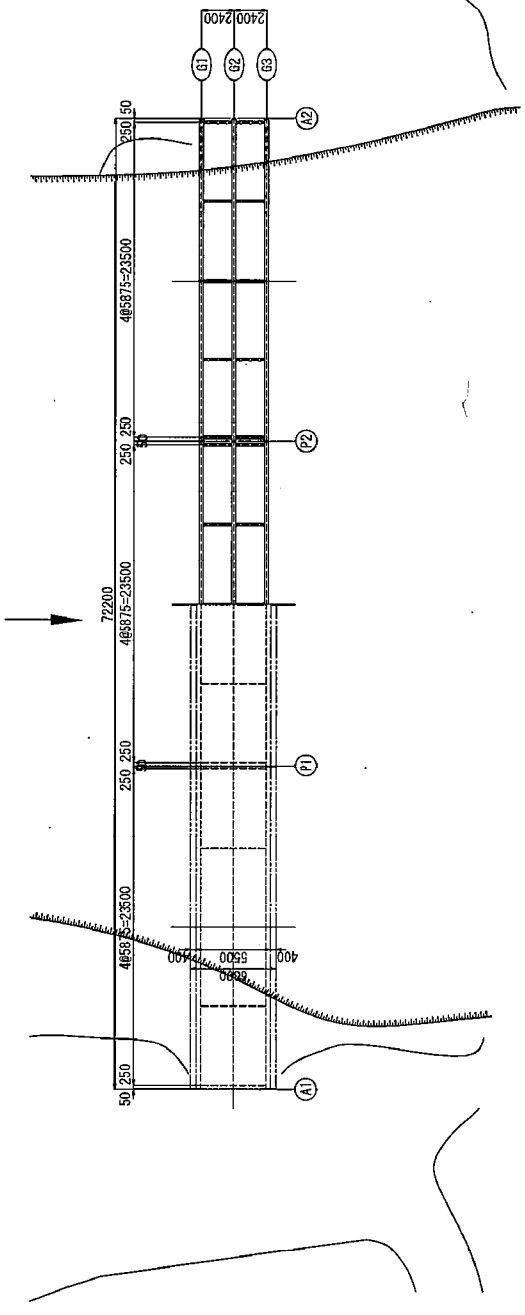
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

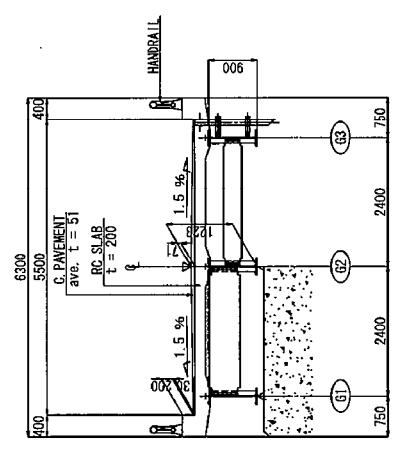


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
256.24	251.35	250.72	1+263.900	A1
256.24	251.35	250.72	1+263.900	
256.18	248.81	250.54	1+276.950	I.C1.
256.12	248.44	250.12	1+287.975	P1
256.08	248.76	250.00	1+300.000	2.C1.
256.00	249.16	250.00	1+312.025	P2
255.94	248.95	250.94	1+324.050	3.C1.
255.88	251.29	249.13	1+336.100	A2

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	72.2m (23.5m+23.5m+23.5m)
Clear Width	5.5 m
Longitudinal Gradient	0.5 %
Cross-fall of Carriageway	1.50 %
Super Structure Type	Steel
Sub Structure Type	Abutment: Reinforced Concrete Pier: Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Reinforced Concrete
Reinforcing Steel	σ <sub>s</sub> = 210 N/mm <sup>2</sup>
Concrete	σ <sub>c</sub> = 140 N/mm <sup>2</sup>
Surface	σ <sub>c</sub> = 30 N/mm <sup>2</sup>
Sub Structure Type	σ <sub>c</sub> = 10 N/mm <sup>2</sup>
Reinforcing Steel	σ <sub>s</sub> = 25 N/mm <sup>2</sup>
	σ <sub>c</sub> = 30 N/mm <sup>2</sup>

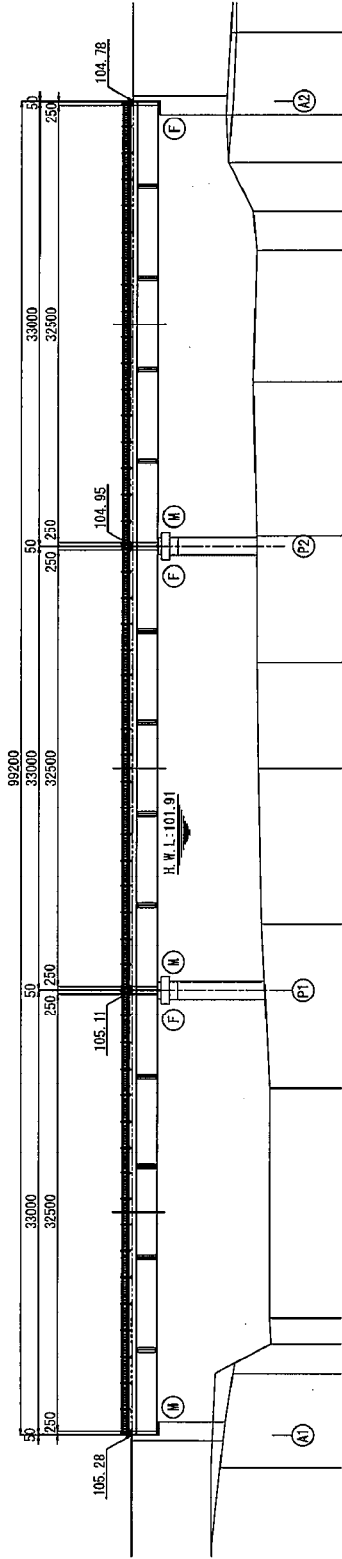
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWING TITLE: Br. No. 21 PU TRANG BRIDGE (General View of the Bridge)			
REV. NO.	DATE	DESCRIPTION	SIGNATURE

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM
PROJECTS MANAGEMENT UNIT NO. 11, MINISTRY OF TRANSPORT
PROJECT: THE PROJECT FOR IMPROVING ROAD BRIDGES IN NORTHERN HANOI PROVINCES
CONSULTANT: ORIENTAL CONSULTANTS CO., LTD
DESIGNED BY
CHECKED BY
APPROVED BY
NAME
SIGNATURE
DATE

# Br. No. 22 TA TIU BRIDGE

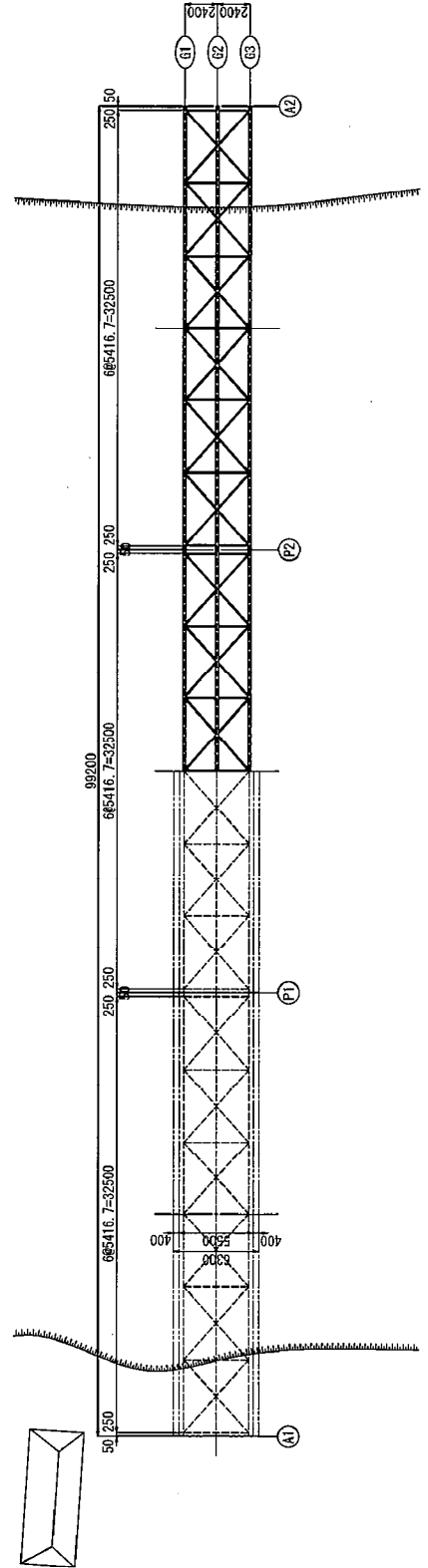
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

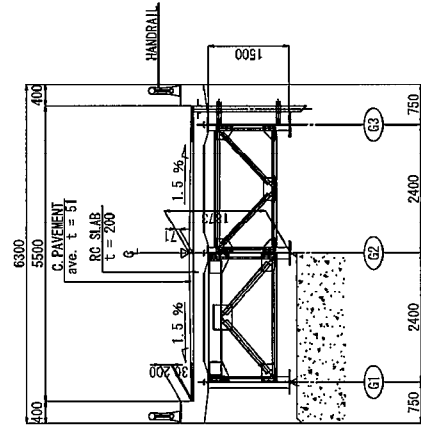


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
105.28	99.44	105.28	0+0.0	A1
105.19	95.10	105.19	0+0.0	I.C1
105.11	95.72	105.11	0+0.0	P1
104.57	95.97	104.57	0+0.0	2.C1
104.93	96.10	104.93	0+0.0	P2
104.86	96.37	104.86	0+0.0	3.C1
104.78	97.55	104.78	0+0.0	A2
104.78	97.44	104.78	0+0.0	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



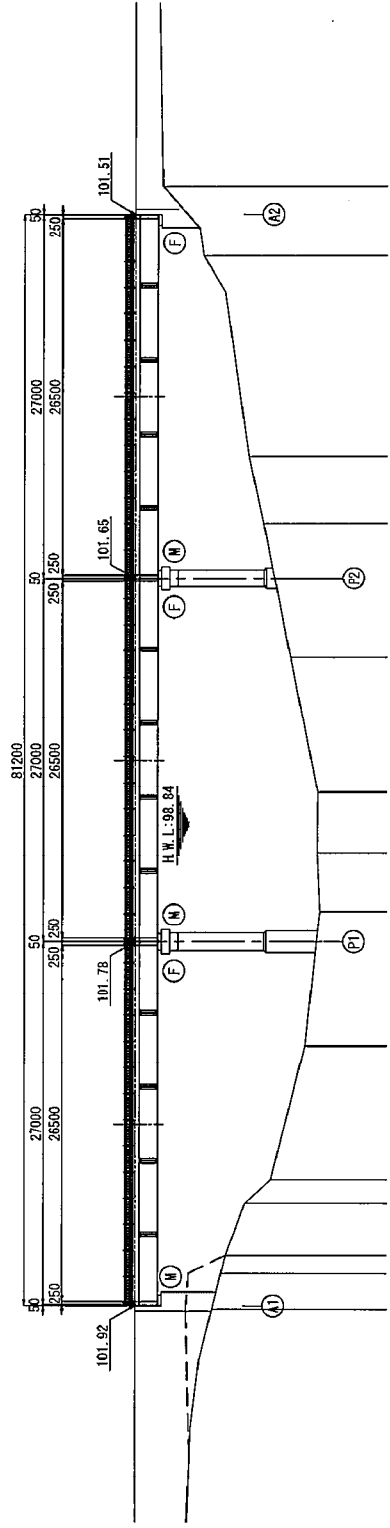
DESIGN CRITERIA	
General Condition	Design Speed
General Condition	Y = 25 km/h
Bridge Length (Span Length)	99.2m (32.5m+32.5m+32.5m)
Clear Width	5.5m
Longitudinal Gradient	0.5%
Cross-fall of Carriageway	1.50%
Sub Structure Type	Abutment
Foundation Type	Pier
Material Strength	Reinforced Concrete
Super Structure Type	Reinforced Concrete
Surface	Steel
Sub Structure Type	Reinforced Concrete
Reinforcing Steel	SP252 (σ <sub>s</sub> = 300 N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING ROAD INFRASTRUCTURE IN HONAI PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 23 BEN CAO BRIDGE

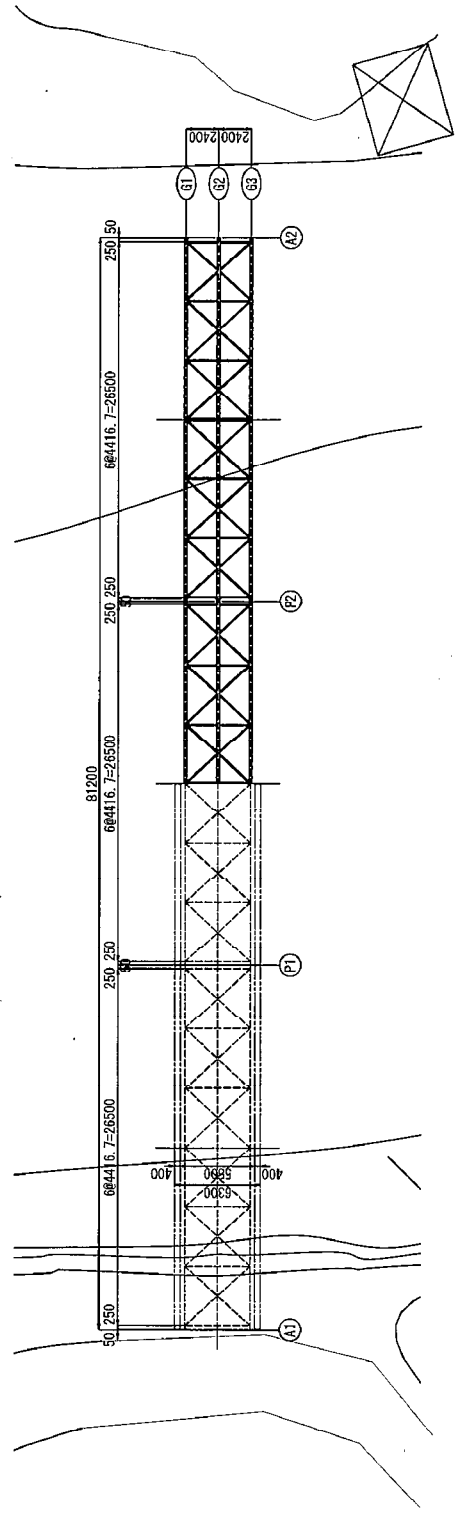
(General View of the Bridge)

**PROFILE**  
 SCALE = 1/400

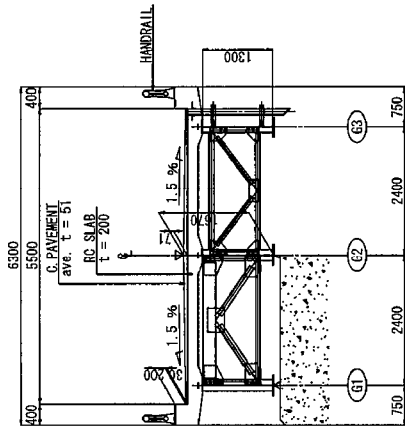


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
A1	98.17	101.92	6+938.400	(101.92)
ICL	98.81	101.99	6+972.950	
P1	89.35	101.78	6+986.475	
2CL	88.40	101.72	7+ 0.000	
P2	90.44	101.65	7+ 13.525	
3CL	92.44	101.58	7+ 27.025	
A2	94.71	101.51	7+ 40.600	(101.51)

**PLAN**  
 SCALE = 1/400



**SECTION**  
 SCALE = 1/100



**DESIGN CRITERIA**

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	81.2m (26.5m+26.5m+26.5m)
Clear Width	5.5 m
Longitudinal Gradient	0.5 %
Cross-fall of Carriageway	1.5 %
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Girders	$\sigma_s = 210 \text{ N/mm}^2$
Super Structure Types	$\sigma_s = 140 \text{ N/mm}^2$
Concrete	$\sigma_c = 30 \text{ N/mm}^2$
Surface	$\sigma_c = 5 \text{ N/mm}^2$
Sub Structure Types	$\sigma_c = 25 \text{ N/mm}^2$
Reinforcing Steel	SP25 (Fy=300N/mm <sup>2</sup> )

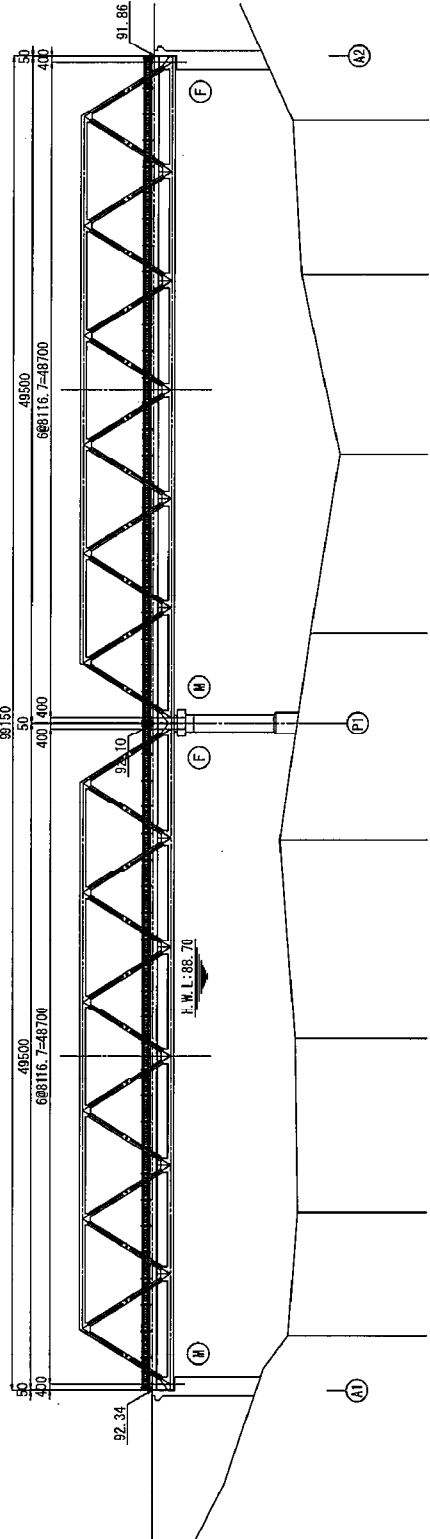
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	C-1	OF
DRAWING TITLE	Br. No. 23 BEN CAO BRIDGE (General View)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE BRIDGE FOR IMPROVEMENT OF ROAD BRIDGE IN NINH THUAN PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_

# Br. No. 25 THANH PHU BRIDGE

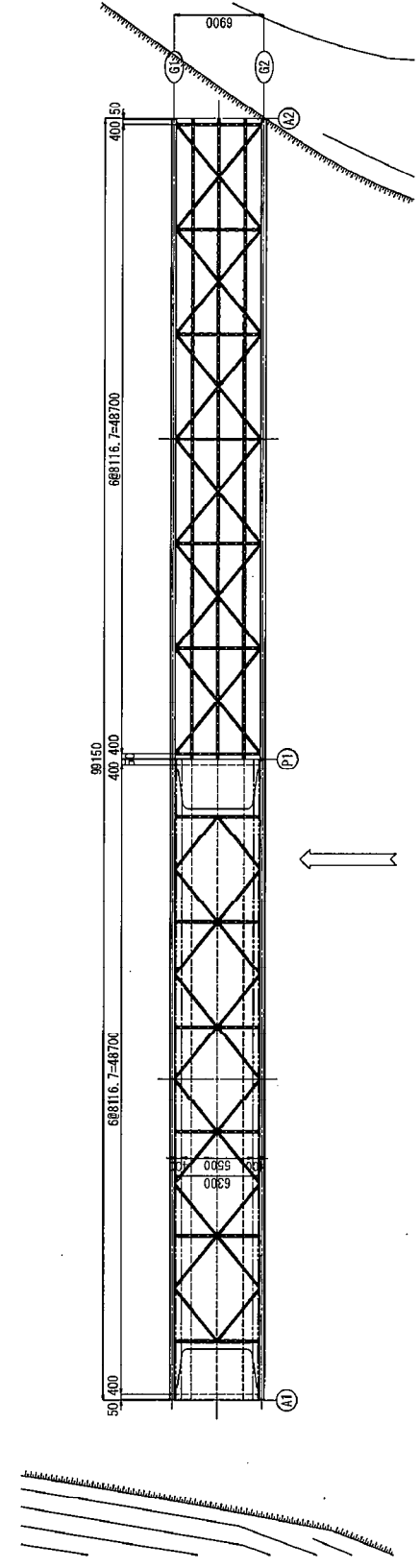
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

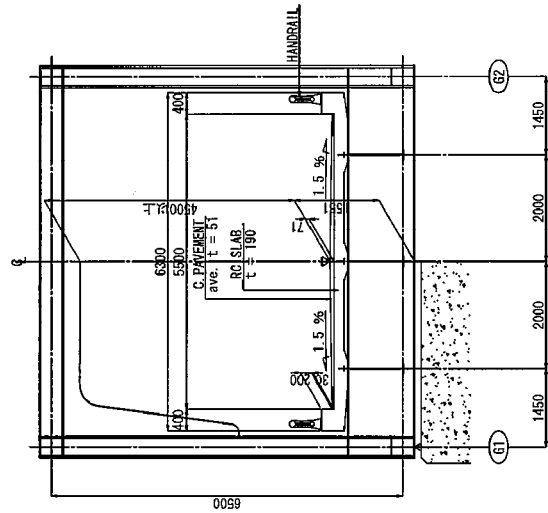


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
92.34	92.34	92.34	20+90.428	A1
91.86	91.86	91.86	24+00.000	P1
91.60	91.60	91.60	24+49.575	A2
91.98	91.98	91.98	24+24.775	Q2
81.12	81.12	81.12	23+975.226	Q1
82.47	82.47	82.47	24+00.000	P1
80.21	80.21	80.21	24+24.775	Q2
80.92	80.92	80.92	24+49.575	A2
91.86	91.86	91.86	24+00.000	P1

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	99.15m (48.7m+48.7m)
Clear Width	5.5m
Longitudinal Gradient	0.5%
Cross-fall of Carriageway	1.5%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete Swayer 40x40cm
Material Strength	
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Slab	28 = 30 N/mm <sup>2</sup>
C. Pavement	28 = 30 N/mm <sup>2</sup>
Surface	28 = 30 N/mm <sup>2</sup>
Sub Structure Type	28 = 30 N/mm <sup>2</sup>
Reinforcing Steel	SU235 (F304/300N/mm <sup>2</sup> )

SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	ET-	OF
<b>DRAWING TITLE</b> Br. No. 25 THANH PHU BRIDGE (Luo Cai Province)			
<b>REV. NO.</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>SIGNATURE</b>

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVEMENT OF BRIDGE IN WATKIN PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

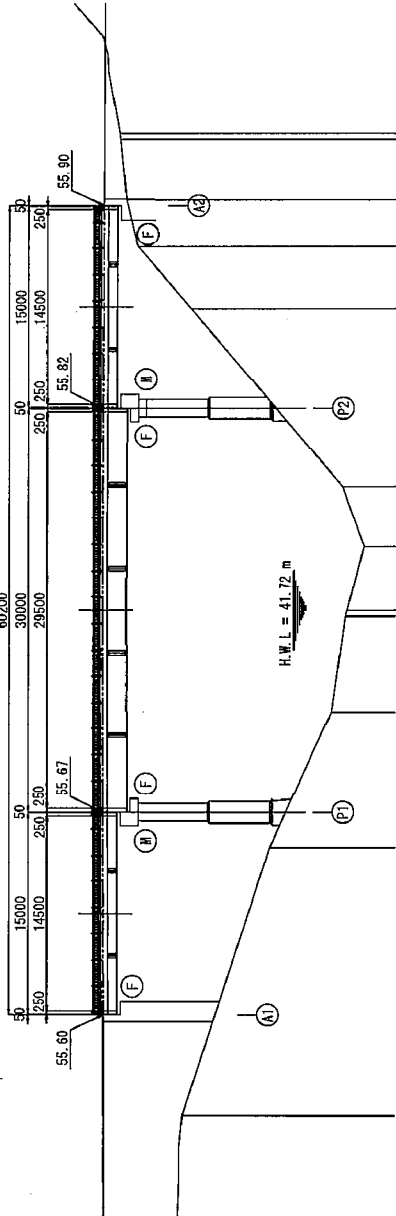
# Br. No. 26 BAN XEO BRIDGE

(General View of the Bridge)

SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
TITLE			
DATE			
DESCRIPTION			
SIGNATURE			

## PROFILE

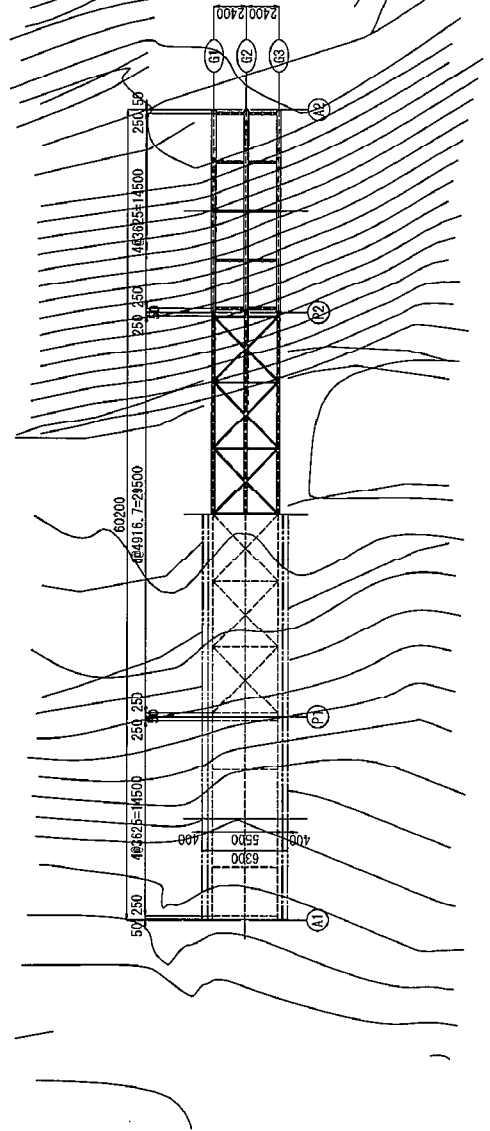
SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
55.60	49.67	55.60	0+0.0	A1
55.64	43.21	55.67	0+0.0	P1
37.50	37.50	55.75	0+0.0	20L
36.25	36.25	55.82	0+0.0	P2
49.05	49.05	55.86	0+0.0	30L
53.00	53.00	55.90	0+0.0	A2
53.84	53.84	55.90	0+0.0	50
54.52	54.52	55.90	0+0.0	55

## PLAN

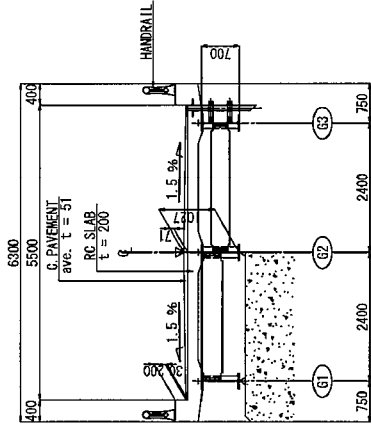
SCALE = 1/400



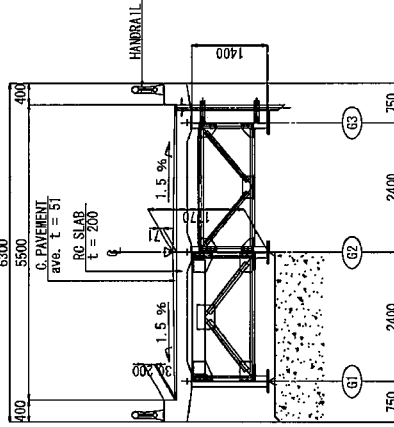
## SECTION

SCALE = 1/100

A1~P1, P2~A2



## P1~P2



## DESIGN CRITERIA

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	60.2m (14.5m+29.5m+14.5m)
Clear Width	5.5m
Longitudinal Gradient	0.5%
Crossfall of Carriageway	1.5%
Sub Structure Type	Steel
Foundation Type	Reinforced Concrete
Material Strength	
Girder	$\sigma_c = 210 \text{ N/mm}^2$
Cross Beam	$\sigma_c = 140 \text{ N/mm}^2$
Slab	$\sigma_c = 30 \text{ N/mm}^2$
C. Pavement	$\sigma_c = 5 \text{ N/mm}^2$
Curb	$\sigma_c = 30 \text{ N/mm}^2$
Reinforcing Steel	$\sigma_s = 300 \text{ N/mm}^2$

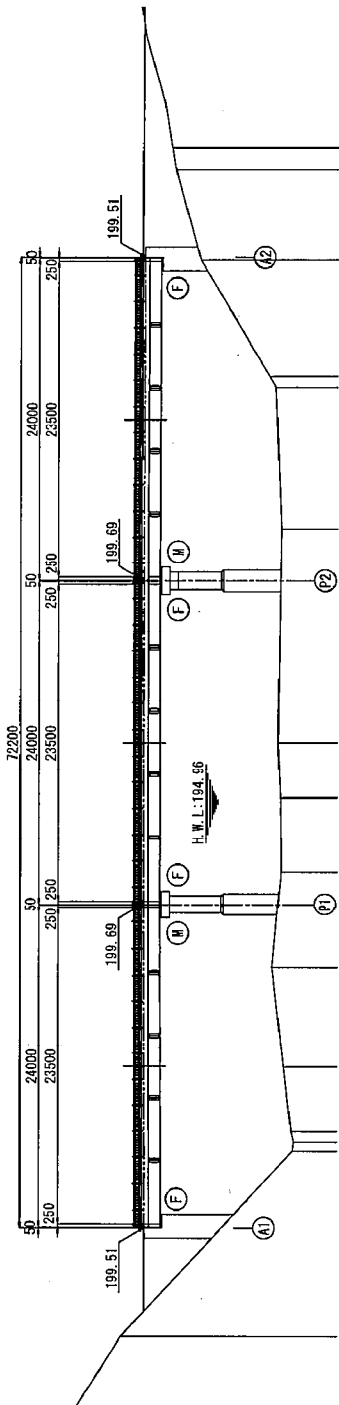
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING OF ROAD BRIDGES IN MOUNTAIN PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 27 MUONG HUM2 BRIDGE

(General View of the Bridge)

## PROFILE

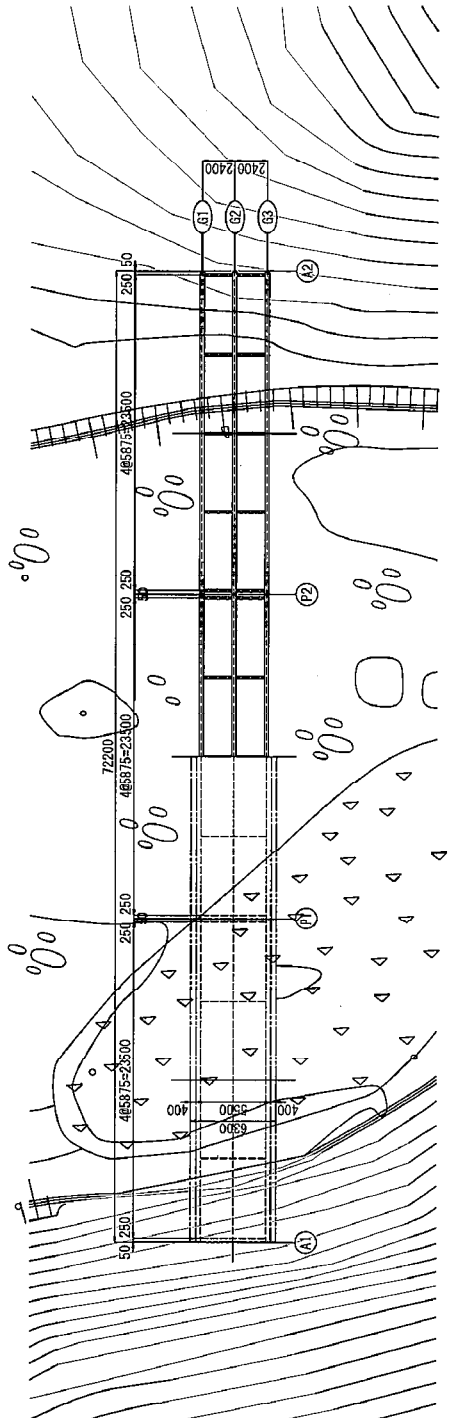
SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
199.51	201.21	199.51	23+963.880	A1
199.51	189.21	199.60	23+975.930	TCL
199.69	190.08	199.69	23+987.956	P1
199.69	189.46	199.69	23+999.980	2CL
199.69	189.40	199.69	24+008.030	P2
199.69	189.83	199.69	24+020.080	3CL
199.51	197.47	199.51	24+032.130	A2

## PLAN

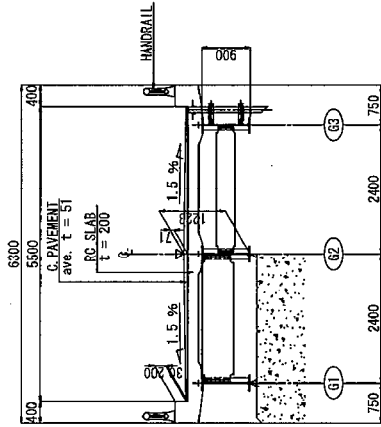
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
1/100, 1/400	CT		OF
WORKING TITLE	Br. No. 27 MUONG HUM2 BRIDGE (Lap Set Provision)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

## SECTION

SCALE = 1/100



## DESIGN CRITERIA

General	Condition
Design Speed	V = 25 km/h
Bridge Length (Span Length)	72.2m (23.5m+23.5m+23.5m)
Clear Width	5.5m
Longitudinal Gradient	0.75% ~ LEVEL ~ 0.75%
Cross-sill of Curbside	L 50%
Sub Structure Type	Abutment Reinforced Concrete Pier Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Slab $\sigma_s = 210 \text{ N/mm}^2$ Cross Beam $\sigma_s = 140 \text{ N/mm}^2$ Slab $\sigma_s = 30 \text{ N/mm}^2$
Surface	C. Pavement Curb $\sigma_s = 5 \text{ t/cm}^2$ Sub Structure Type $\sigma_s = 25 \text{ N/mm}^2$ Reinforcing Steel $\sigma_s = 500 \text{ N/mm}^2$

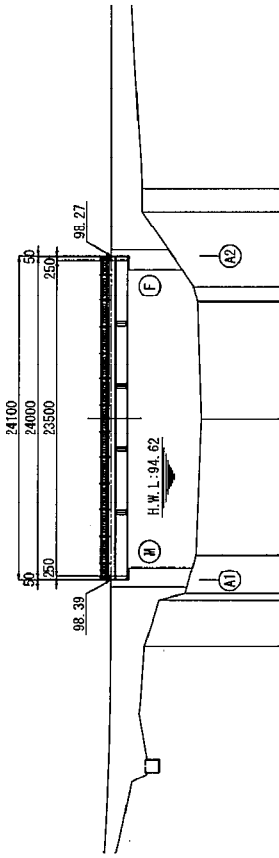


THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECTS MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT	
PROJECT: THE PROJECT FOR IMPROVEMENT OF DEN SANG BRIDGE IN NGUYEN BINH KHUONG PROVINCE	
CONSULTANT: ORIENTAL CONSULTANTS CO., LTD	
DESIGNED BY	APPROVED BY
CHECKED BY	
NAME	
SIGNATURE	
DATE	

# Br. No. 28 DEN SANG BRIDGE

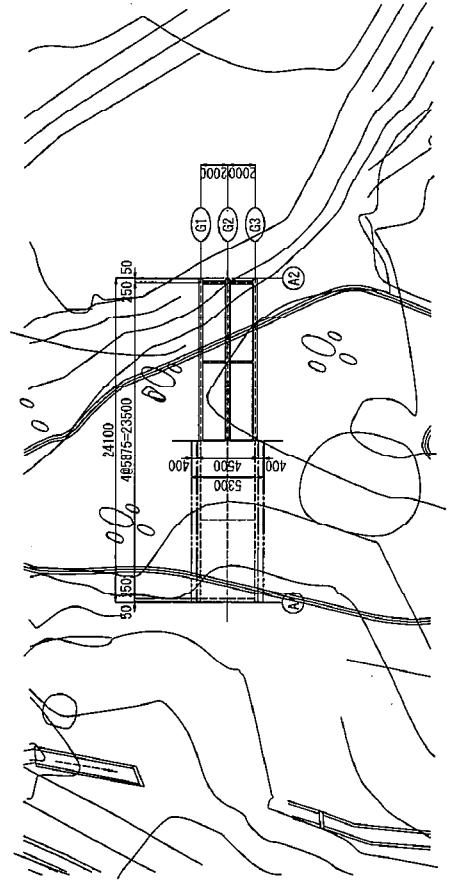
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

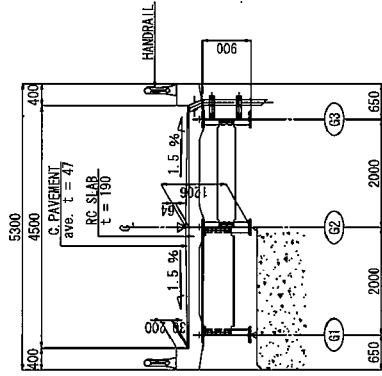


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
98.39	98.39	98.39	0	A1
98.90	98.90	98.90	33+987.950	
99.10	99.10	99.10	34+0.000	CL
98.33	98.33	98.33	34+12.050	A2
98.27	98.27	98.27	98.27	
92.30	92.30	92.30	92.30	
92.20	92.20	92.20	92.20	
96.30	96.30	96.30	96.30	
96.30	96.30	96.30	96.30	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	24 m (23.5m)
Clear Width	4.5 m
Longitudinal Gradient	0.5 %
Crossfall of Curbside	1.5 %
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Surface	C. Pavement
Sub Structure Type	Reinforcing Steel

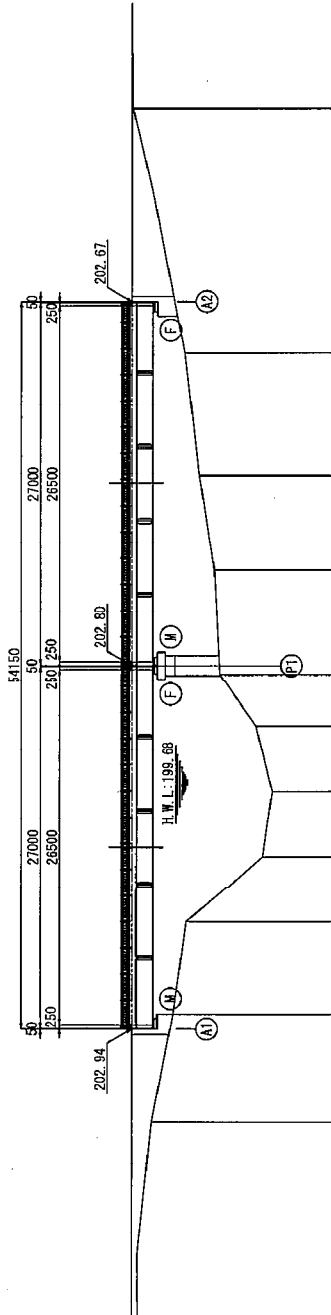
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	01-	01-
DRAWING TITLE	Br. No. 28 DEN SANG BRIDGE (Lao Cai Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECT MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT	
PROJECT: THE PROJECT FOR IMPROVEMENT OF ROAD BRIDGES IN BORDER PROVINCES	
CONSULTANT	ORIENTAL CONSULTANTS CO., LTD
DESIGNED BY	CHECKED BY
APPROVED BY	
NAME	
SIGNATURE	
DATE	

# Br. No. 29 SOI CHAT BRIDGE

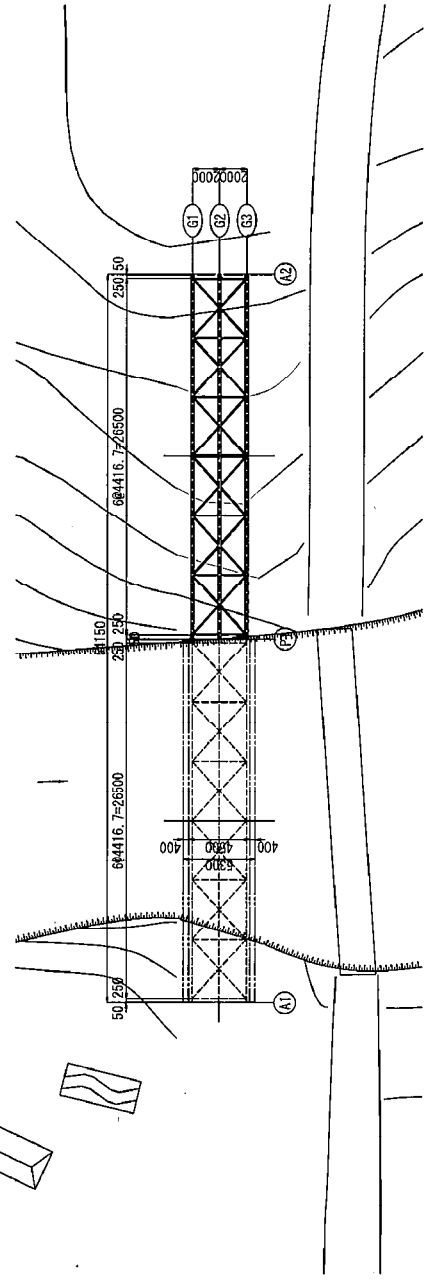
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

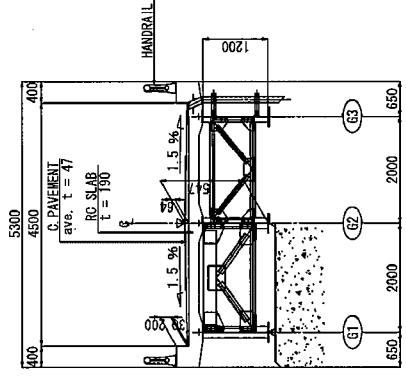


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
	202.87	199.93	0+0.0	A1
	202.87	199.91	0+0.0	
	202.87	198.24	0+0.0	
	202.87	191.72	0+0.0	
	202.87	191.00	0+0.0	
	202.87	192.20	0+0.0	
	202.87	194.99	0+0.0	P1
	202.87	196.39	0+0.0	
	202.87	202.74	0+0.0	
	202.87	197.47	0+0.0	A2
	202.87	201.30	0+0.0	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



DESIGN CRITERIA	
General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	54.15m (26.5m+26.5m)
Clear Width	4.5m
Longitudinal Gradient	0.5%
Cross-fall of Gutterline	1.50%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Concrete
Cross Beam	Concrete
Slab	Concrete
C. Pavement	Concrete
Surface	Concrete
Sub Structure Type	Concrete
Reinforcing Steel	Steel

SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	07-	07
DRAWING TITLE	Br. No. 29 SOI CHAT BRIDGE (Lab. Cui Printing)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

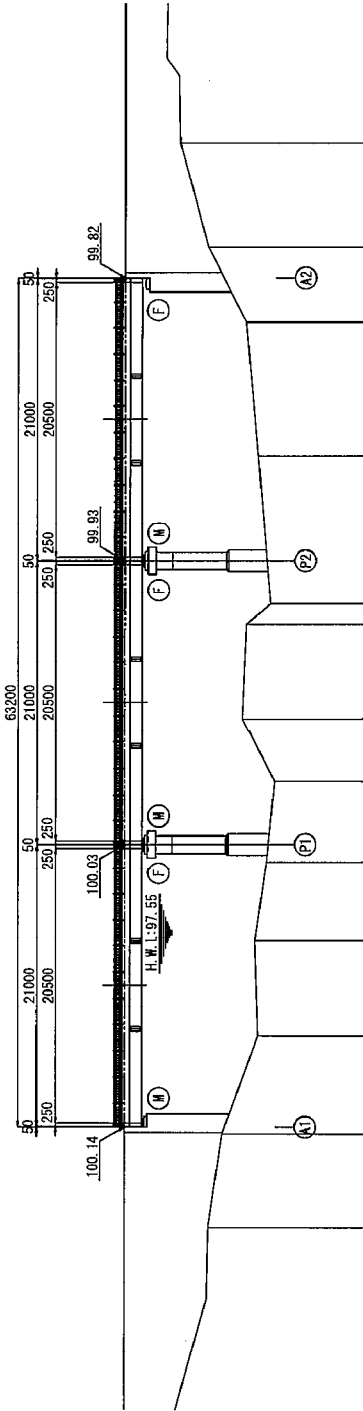
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECTS MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT	
PROJECT: THE PROJECT FOR IMPROVING OF ROAD BRIDGES IN NORTHERN BORDER PROVINCES	
CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.	
DESIGNED BY	CHECKED BY
APPROVED BY	
NAME	
SIGNATURE	
DATE	

# Br. No. 30 BAN NGHIEU BRIDGE

(General View of the Bridge)

## PROFILE

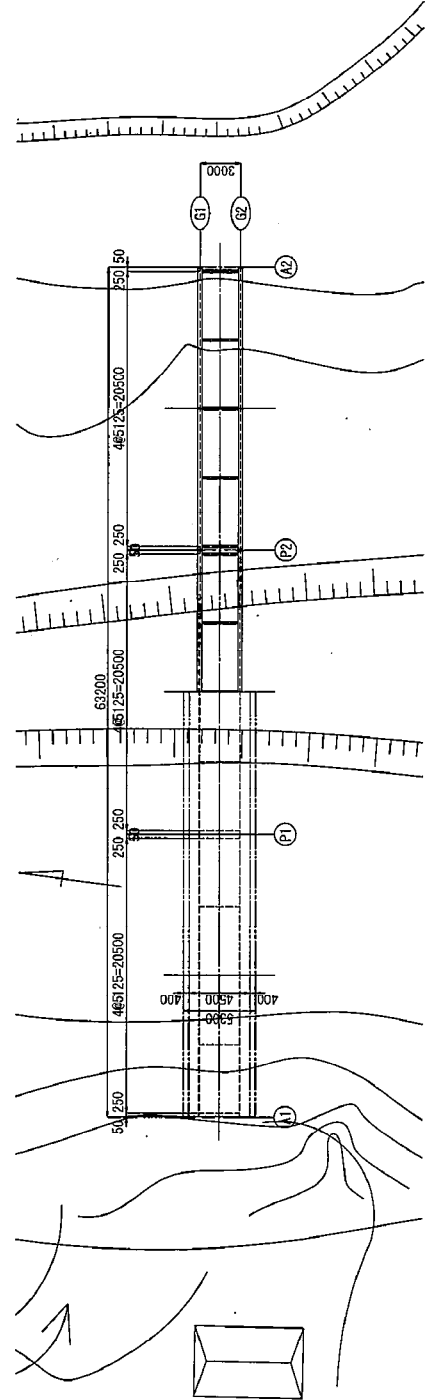
SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
100.14	93.99	92.96	0+0.0	A1
100.03	90.31	100.09	0+0.0	P1
99.87	90.54	89.97	0+0.0	
99.98	91.48	99.98	0+0.0	2C1
99.93	91.16	89.37	0+0.0	P2
99.82	90.31	99.87	0+0.0	3C1
99.82	91.20	99.82	0+0.0	A2
99.82	94.00	94.00	0+0.0	
99.82	96.09	96.09	0+0.0	

## PLAN

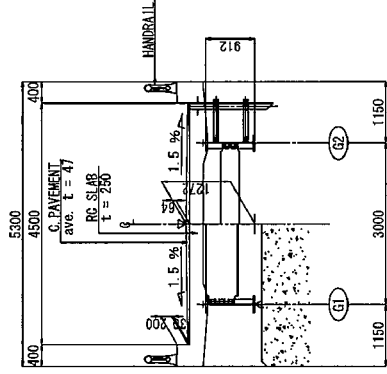
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
NAME	Br. No. 30 BAN NGHIEU BRIDGE (Open Change Province)		
FILE NO.	DESCRIPTION		
REV. NO.	DATE		

## SECTION

SCALE = 1/100



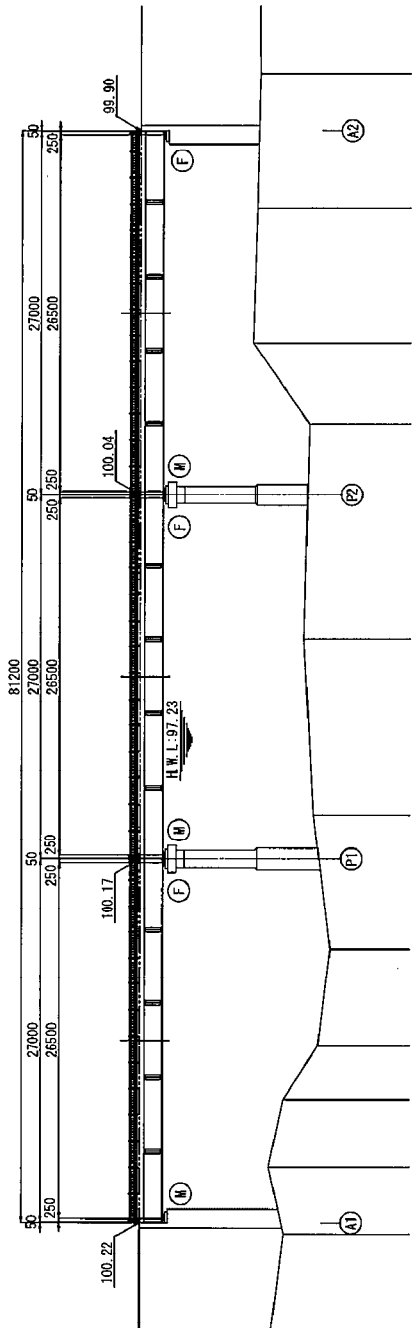
DESIGN CRITERIA	
Design Speed	General Condition
Bridge Length (Span Length)	V = 25 km/h
Clear Width	63.2m (20.5m+20.5m+2.0m)
Longitudinal Gradient	4.5%
Cross-fall of Carriageway	0.5%
Sub Structure Type	Steel
Foundation Type	Reinforced Concrete
Foundation Type	Pier
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Grid
Cross Beam	$\sigma_b = 210 \text{ N/mm}^2$
Slab	$\sigma_b = 140 \text{ N/mm}^2$
C. Pavement	$\sigma_b = 30 \text{ N/mm}^2$
Surface	avg. t = 8.7cm
Sub Structure Type	$\sigma_b = 30 \text{ N/mm}^2$
Reinforcing Steel	$\sigma_b = 25 \text{ N/mm}^2$
	S225 (fy=235N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM PROJECTS MANAGEMENT UNIT NO. 11, MINISTRY OF TRANSPORT
PROJECT: THE PROJECT FOR IMPROVING 11 RAIL BRIDGES IN NORTHERN HIGHLAND PROVINCES
CONSULTANT: ORIENTAL CONSULTANTS CO., LTD
DESIGNED BY: _____
CHECKED BY: _____
APPROVED BY: _____
DATE: _____

# Br. No.31 TRINH BRIDGE

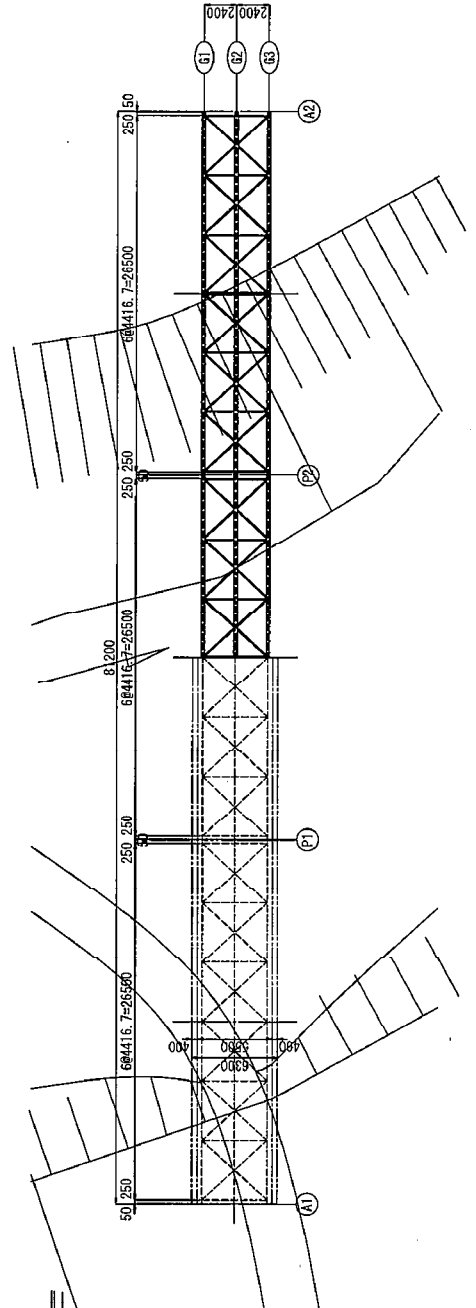
(General View of the Bridge)

PROFILE  
SCALE = 1/400



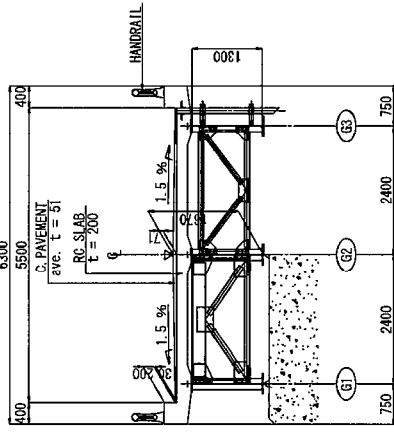
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
100.22	89.58	90.71	100.22	A1
100.15	87.08	89.60	100.15	1CL
100.17	86.14	87.40	100.17	P1
100.11	88.12	87.72	100.11	2CL
100.04	88.88	87.72	100.04	P2
99.97	91.90	87.72	99.97	3CL
99.90	91.59	91.37	99.90	A2

PLAN  
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100	1/400	OF
DRAWING TITLE	Br. No.31 TRINH BRIDGE (Tuyen Quang Province)		
REV. NO	DATE	DESCRIPTION	SIGNATURE

SECTION  
SCALE = 1/100

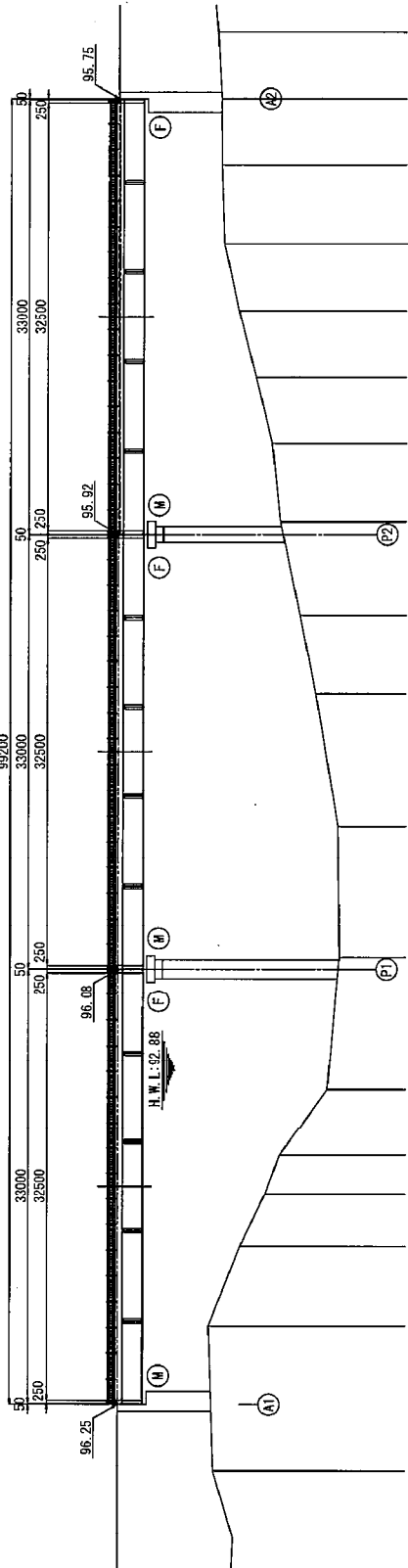


DESIGN CRITERIA	
General Condition	
Design Speed	v = 25 km/h
Stiffness (Span Length)	81.2m (265m x 26.5m x 26.5m)
Clear Width (Span Length)	51.5
Longitudinal Gradient	0.5%
Cross-slopes of Carriageway	1.5%
Super Structure Type	Steel
Sub Structure Type	Abutment: Reinforced Concrete Pier: Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Girder: $\sigma_s = 210 \text{ N/mm}^2$
	Cross Beam: $\sigma_s = 140 \text{ N/mm}^2$
Surface	Slab: $\sigma_s = 30 \text{ N/mm}^2$
	C. Pavement: $\sigma_s = 5.1 \text{ cm}$
Sub Structure Type	Curb: $\sigma_s = 25 \text{ N/mm}^2$
Reinforcing Steel	$\sigma_{yk} = 300 \text{ N/mm}^2$

# Br. No. 32 NA NHAM BRIDGE

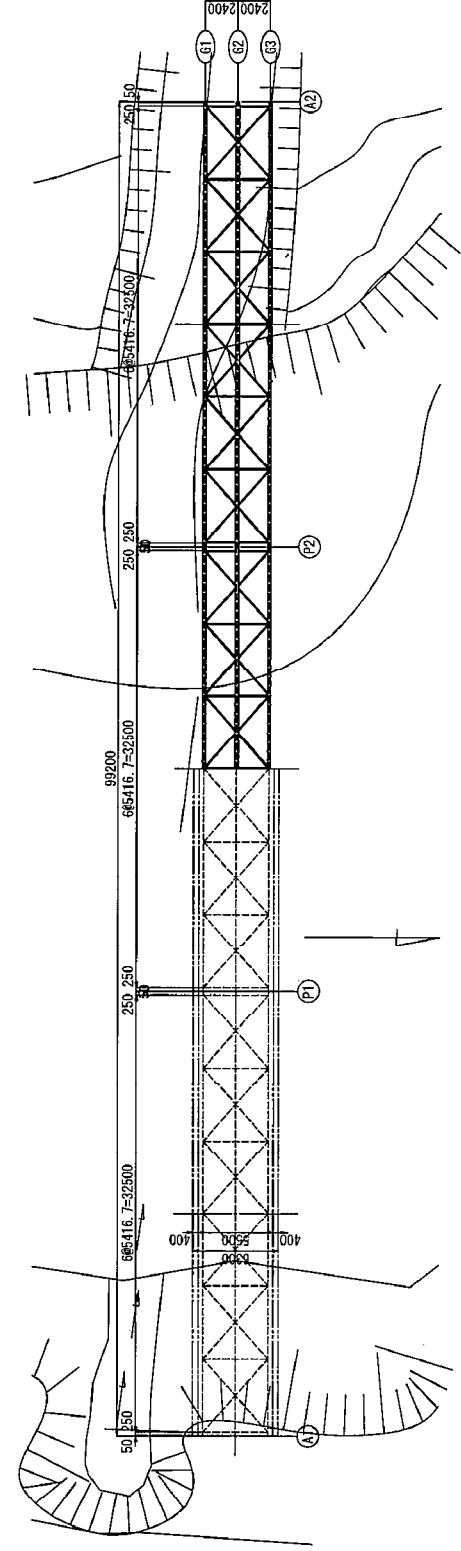
(General View of the Bridge)

PROFILE  
 SCALE = 1/400

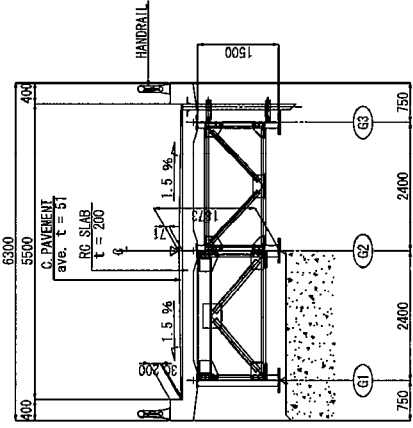


GRADE	PROPOSED HIGHT	GROUND HIGHT	DISTANCE	MARKER
96.25	89.07	96.25	0+204.960	A1
96.17	87.03	96.17	0+221.510	1C1
89.44	80.44	89.44	0+238.035	P1
79.54	79.54	79.54	0+250	
96.00	81.34	96.00	0+284.569	2C1
84.04	84.04	84.04	0+271.035	P2
87.18	85.89	87.18	0+287.610	3C1
88.31	84.68	88.31		
88.51	84.88	88.51		
88.52	84.88	88.52		
95.75	88.79	95.75	0+304.160	A2

PLAN  
 SCALE = 1/400



SECTION  
 SCALE = 1/100



DESIGN CRITERIA

Design Speed	General Condition	$V = 25 \text{ km/h}$
Bridge Length (Span length)		99.2m (32.5m+32.5m+32.5m)
Clear Width		6.5m
Longitudinal Gradient		0.5%
Cross-fall of Carriageway		1.5%
Sub Structure Type	Abutment	Reinforced Concrete
	Pier	Reinforced Concrete
Foundation Type		
Material Strength		
Super Structure Type	Girder	$\sigma_a = 210 \text{ N/mm}^2$
	Cross Beam	$\sigma_a = 140 \text{ N/mm}^2$
	Slab	$\sigma_a = 30 \text{ N/mm}^2$
Surface	C. Pavement	$\sigma_{a0.1} = 5.1 \text{ cm}$
Sub Structure Type	Curb	$\sigma_a = 30 \text{ N/mm}^2$
	Reinforcing Steel	$\sigma_{235} (\sigma_s) = 300 \text{ N/mm}^2$

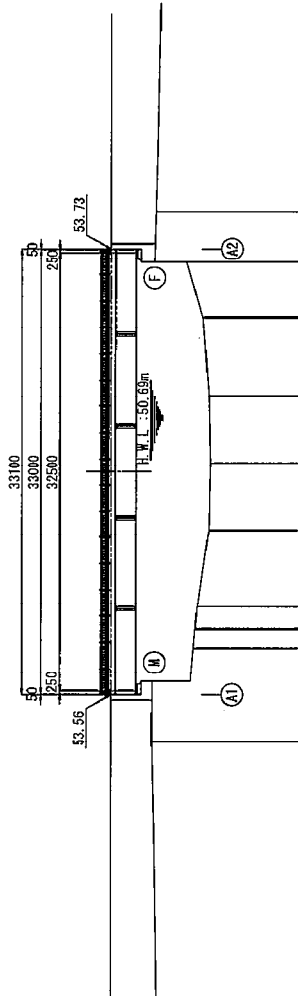
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT  
 PROJECT: THE PLAN FOR IMPROVING OF BRIDGE IN BACH HOANG PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 33 SUNG BRIDGE

(General View of the Bridge)

## PROFILE

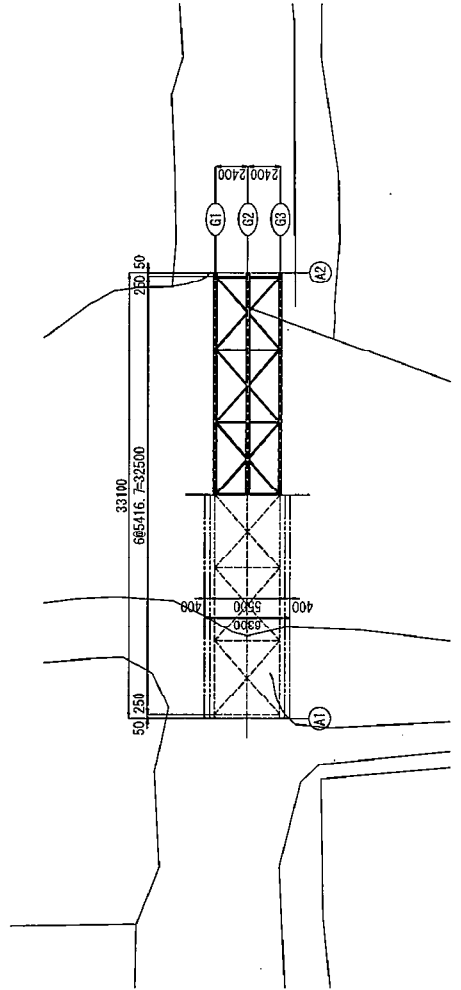
SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
53.56	53.73	53.56	0-130.850	A1
50.49	47.28	50.05	60.08	
46.72	46.72	46.72	46.72	
45.85	45.85	45.85	45.85	
45.74	45.74	45.74	45.74	
53.54	53.54	53.54	53.54	
49.90	49.90	49.90	49.90	
48.88	48.88	48.88	48.88	
49.76	49.76	49.76	49.76	
53.73	53.73	53.73	0-163.950	A2

## PLAN

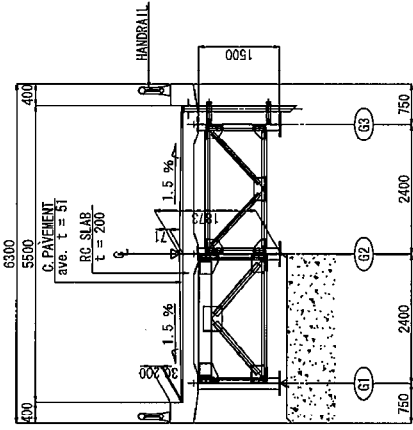
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
NAME	Br. No. 33 SUNG BRIDGE (Tuyen Quang Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

## SECTION

SCALE = 1/100



## DESIGN CRITERIA

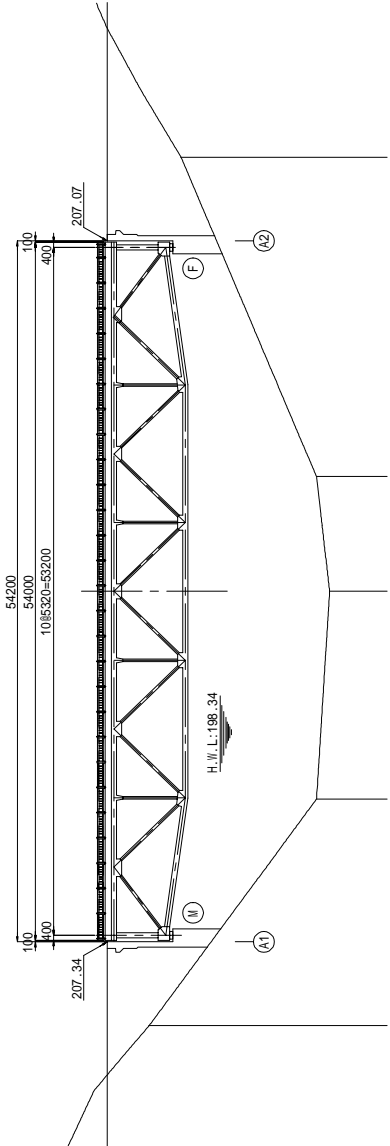
General	Condition
Design Speed	V = 70 km/h
Bridge Length (Span Length)	33.1m (32.5m)
Clear Width	E. S.W.
Longitudinal Gradient	0.5 %
Cross-slopes of Carriageway	1.5 %
Sub Structure Type	Steel Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Slab
Cross Beam	σ <sub>b</sub> = 210 N/mm <sup>2</sup>
Slab	σ <sub>b</sub> = 140 N/mm <sup>2</sup>
C. Pavement	σ <sub>b</sub> = 30 N/mm <sup>2</sup>
Surface	avg. t = 5.1cm
Sub Structure Type	σ <sub>b</sub> = 30 N/mm <sup>2</sup>
Reinforcing Steel	σ <sub>b</sub> = 25 N/mm <sup>2</sup>
	σ <sub>b</sub> = 500 N/mm <sup>2</sup>

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECT MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT	
PROJECT: THE PROJECT FOR IMPROVEMENT OF ROAD BRIDGES IN BACH GIANG PROVINCE	
CONSULTANT	ORIENTAL CONSULTANTS CO., LTD
DESIGNED BY	CHECKED BY
DRAWN BY	DATE
APPROVED BY	

# Br.No.36 NA LAN BRIDGE

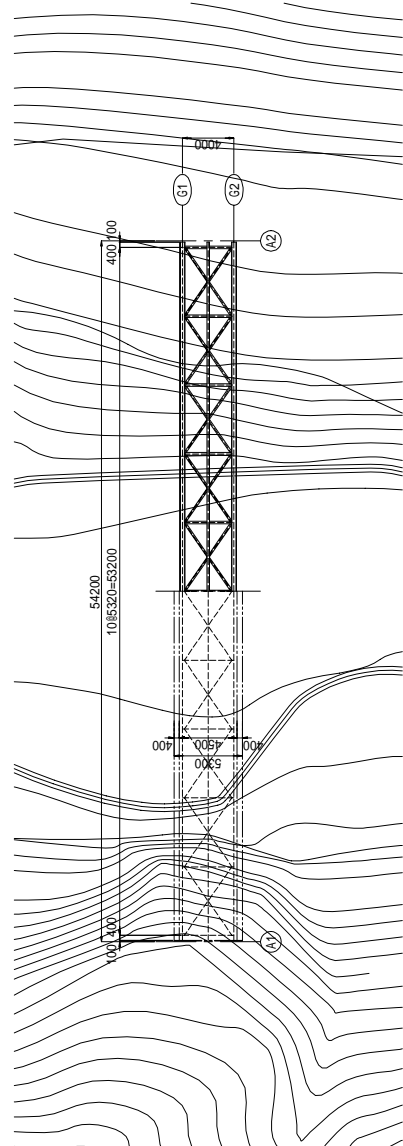
(General View of the Bridge)

PROFILE  
SCALE = 1 / 400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
207.07	207.07	207.34	0+398.905	A1
207.07	207.07	207.21	0+426.005	C
207.07	207.07	190.88	0+453.105	A2
207.36	207.36	190.88		

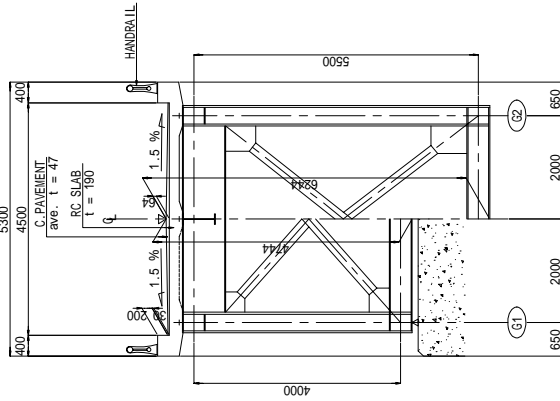
PLAN  
SCALE = 1 / 400



## DESIGN CRITERIA

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	54.2m (GS, 2m)
Clear Width	4.5m
Longitudinal Gradient	0.5%
Cross-Fall of Carriage Way	0.5%
Super Structure Type	Steel
Sub Structure Type	Abutment Reinforced Concrete Pier Reinforced Concrete
Foundation Type	Reinforced Concrete, 40x40cm Steel, 140x140x4mm
Material Strength	
Concrete	C <sub>20</sub> = 210 N/mm <sup>2</sup>
Steel	S <sub>275</sub> (S275) = 275 N/mm <sup>2</sup>
Super Structure Type	
Cross Beam	C <sub>20</sub> = 210 N/mm <sup>2</sup>
Slab	C <sub>20</sub> = 210 N/mm <sup>2</sup>
Surface	
C. Pavement	ava.t = 4.7 cm
Sub Structure Type	C <sub>20</sub> = 210 N/mm <sup>2</sup>
Reinforcing Steel	R235 (S235) = 235 N/mm <sup>2</sup>

SECTION  
SCALE = 1 / 100



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWN BY	BR.No.36 NA LAN BRIDGE (Ba Giang Province)		
CHECKED BY	DATE	DESCRIPTION	SIGNATURE

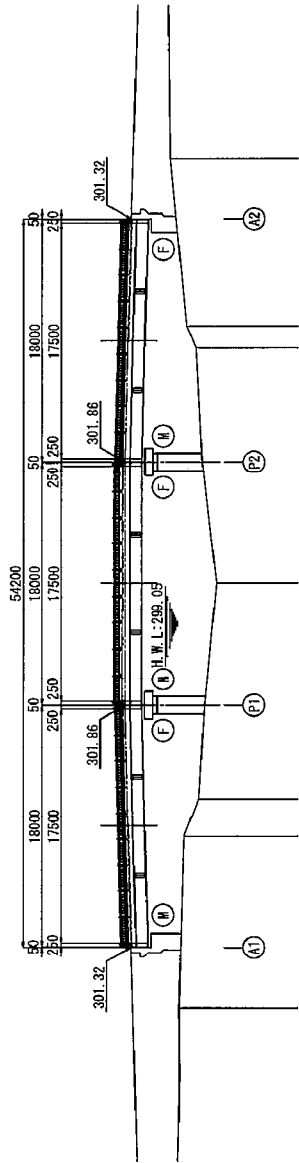
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 14, MINISTRY OF TRANSPORT  
 PROJECT THE PROJECT FOR IMPROVEMENT OF BRIDGE IN BACH BINH PROVINCE  
 CONSULTANT ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY \_\_\_\_\_ CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_  
 NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

# Br. No. 37 TA LANG BRIDGE

(General View of the Bridge)

## PROFILE

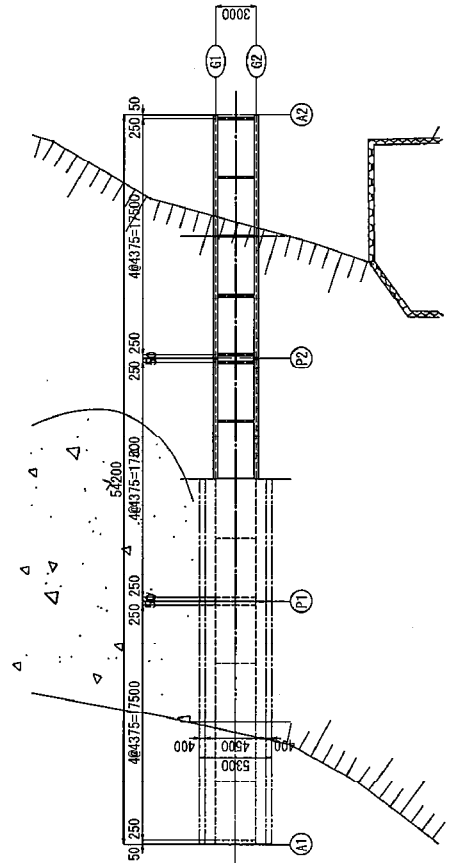
SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
301.32	298.05	301.32	0+0.0	A1
301.59	297.70	301.59	0+0.0	1Q.L
301.86	296.59	301.86	0+0.0	P1
301.86	296.17	301.86	0+0.0	P1
301.86	296.35	301.86	0+0.0	P2
301.59	296.80	301.59	0+0.0	3Q.L
301.59	296.80	301.59	0+0.0	3Q.L
301.32	298.74	301.32	0+0.0	A2

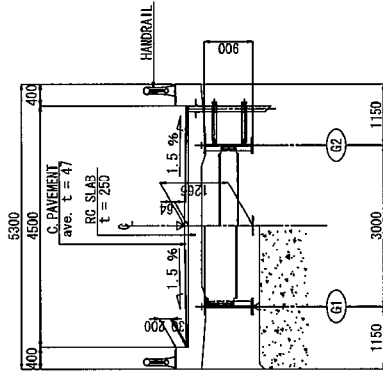
## PLAN

SCALE = 1/400



## SECTION

SCALE = 1/100



## DESIGN CRITERIA

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	54.2m (17.5m+17.5m+17.5m)
Clear Width	4.5m
Longitudinal Gradient	3.0% ~ LEVEL
Construction Material	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Pier
Material Strength	
Super Structure Type	Cross Beam
Surface	C. Pavement
Sub Structure Type	Reinforcing Steel

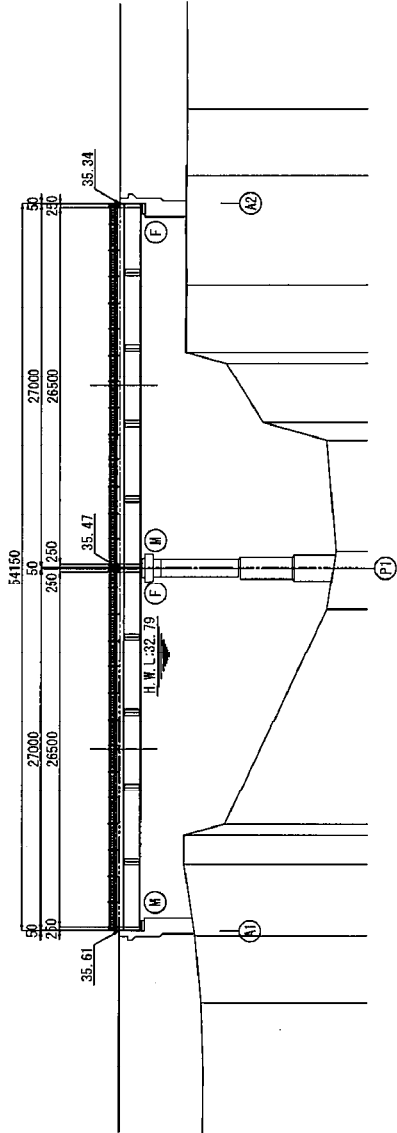


THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECTS MANAGEMENT UNIT NO. 14, MINISTRY OF TRANSPORT	
PROJECT: THE PROJECT FOR IMPROVING MAIN BRIDGE IN WATKON PROVINCE	
CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.	
DESIGNED BY	CHECKED BY
APPROVED BY	DATE

# Br. No. 38 SUOI DAU BRIDGE

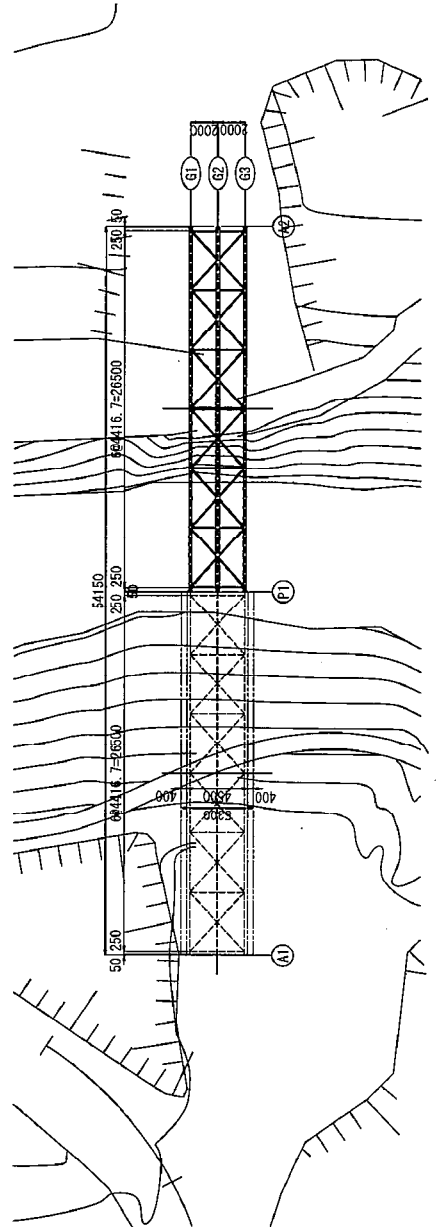
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

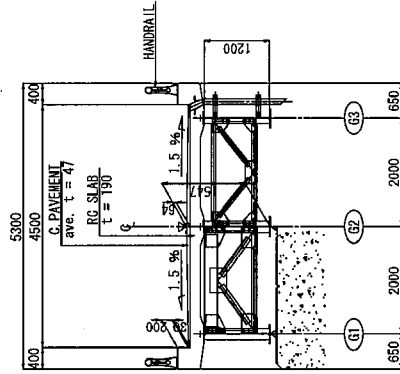


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
35.61	35.61	30.02	0+224.825	A1
35.61	35.61	30.84	30.84	
35.61	35.61	30.84	30.84	
35.54	35.54	19.98	0+238.175	1C1
35.41	35.41	20.27	0+251.700	P1
35.41	35.41	24.98	0+265.225	2C1
35.34	35.34	30.72	0+278.775	A2
35.34	35.34	30.72	30.72	

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



DESIGN CRITERIA	
General Condition	General Condition
Design Speed	45 km/h
Clear Width (Span Length)	54.15m (26.5m+26.5m)
Longitudinal Gradient	0.4%
Vertical Curve Type	S+V
Super Structure Type	Abutment Reinforced Concrete
Pier	Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Girder
Cross Beam	$\sigma_b = 140 \text{ N/mm}^2$
Slab	$\sigma_b = 30 \text{ N/mm}^2$
C. Pavement	ave. t = 4.7cm
Surface	$\sigma_b = 30 \text{ N/mm}^2$
Sub Structure Type	$\sigma_b = 25 \text{ N/mm}^2$
Reinforcing Steel	SP235 (or 300N/mm <sup>2</sup> )

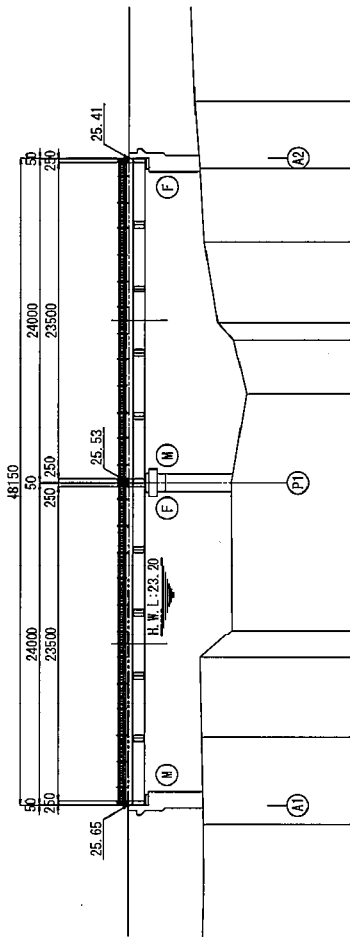
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	05
DRAWING TITLE	Br. No. 38 SUOI DAU BRIDGE ( Ho Giang Province )		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECTS MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT	
PROJECT THE BRIDGE FOR IMPROVING OF ROAD BRIDGE IN WATSON WINDHAM PROVINCE	
CONSULTANT	ORIENTAL CONSULTANTS CO., LTD.
DESIGNED BY	CHECKED BY
APPROVED BY	
NAME	
SIGNATURE	
DATE	

# Br. No. 39 DIEC BRIDGE

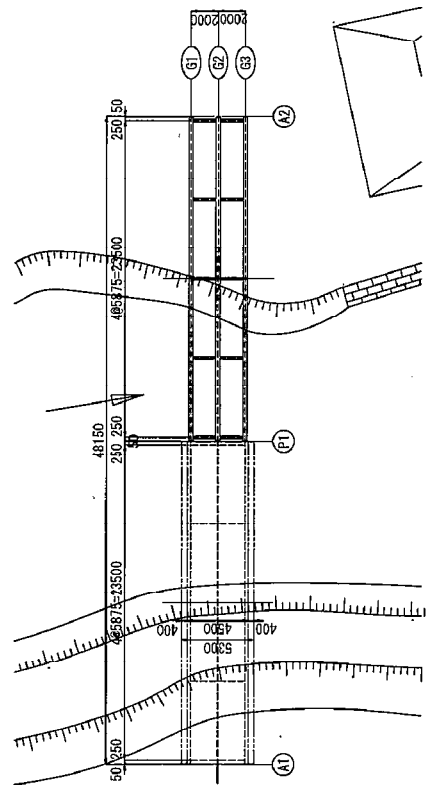
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

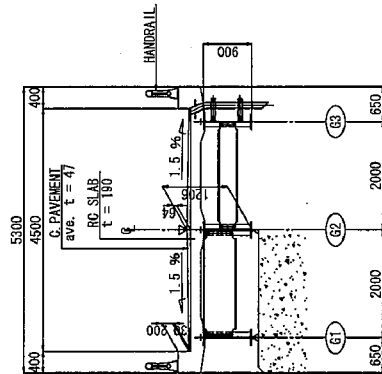


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
25.65	25.41	20.09	0+155.735	A1
25.59	25.47	18.00	0+167.785	1CL
25.53	25.47	18.07	0+179.810	P1
25.41	25.47	17.91	0+191.835	2CL
25.40	25.47	16.91	0+203.885	A2
25.41	25.47	20.08		
25.41	25.47	20.80		

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



DESIGN CRITERIA	
General	Condition
Design Speed	V = 25 km/h
Bridge Width (Span Unit)	48.15m (23.5m+23.5m)
Clear Width	20.0m
Longitudinal Gradient	0.5%
Cross-sill Sl. Carriage way	1.50%
Sub Structure Type	Abutment Reinforced Concrete Pier Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Girder $\sigma_s = 210 \text{ N/mm}^2$
	Cross Beam $\sigma_s = 140 \text{ N/mm}^2$
	Slab $\sigma_s = 30 \text{ N/mm}^2$
Surface	C. Pavement $\text{ave. } t = 4.7 \text{ cm}$
Sub Structure Type	Curb $\sigma_s = 30 \text{ N/mm}^2$
Reinforcing Steel	$\sigma_s = 500 \text{ N/mm}^2$

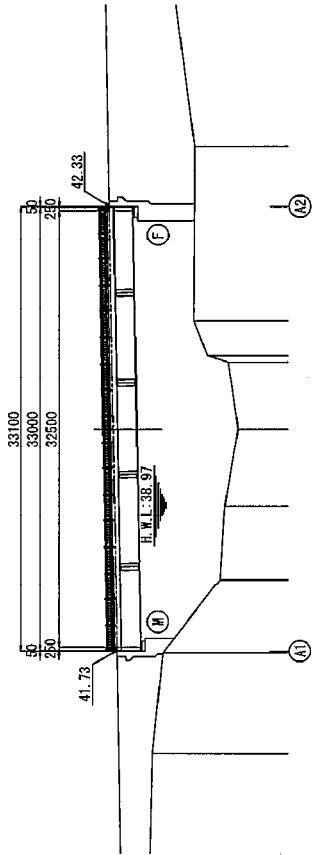
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	21-	OF
DRAWING TITLE	Br. No. 39 DIEC BRIDGE (In Giang Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	PROJECT'S MANAGEMENT UNIT NO. 12, MINISTRY OF TRANSPORT
CONSULTANT	ORIENTAL CONSULTANTS CO., LTD.
DESIGNED BY	CHECKED BY
APPROVED BY	
SIGNATURE	
DATE	

# Br. No. 40 LIEN HIEP BRIDGE

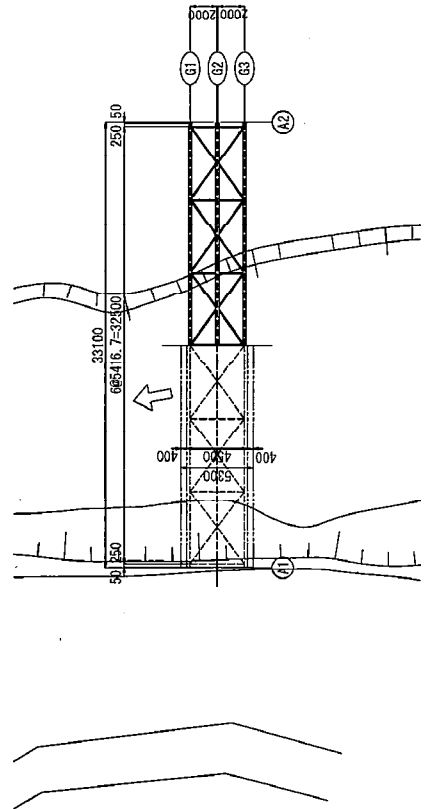
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400

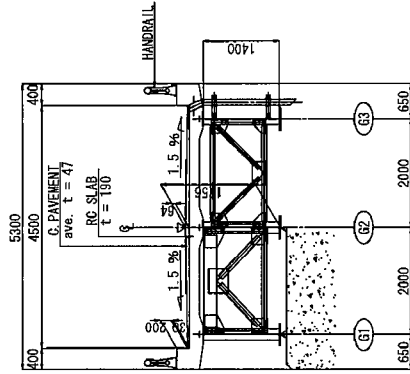


GRADE	PROPOSED HIGHT	GROUND HIGHT	DISTANCE	MARKER
				(A1)
				(A2)
				(B1)
				(B2)
				(B3)

**PLAN**  
SCALE = 1/400



**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

General	Condition
Design Speed	V = 25 km/h
Bridge Length (Span length)	33.1m (32.5m)
Clearer Width	4.5m
Longitudinal Gradient	1.8%
Cross-Fall Gradient	1.5%
Super Structure Type	Steel Reinforced Concrete
Sub Structure Type	Pier Reinforced Concrete
Foundation Type	
<b>Material Strength</b>	
Super Structure Type	Concrete
Sub Structure Type	Concrete
Reinforcing Steel	3025 (σ <sub>y</sub> = 300 N/mm <sup>2</sup> )

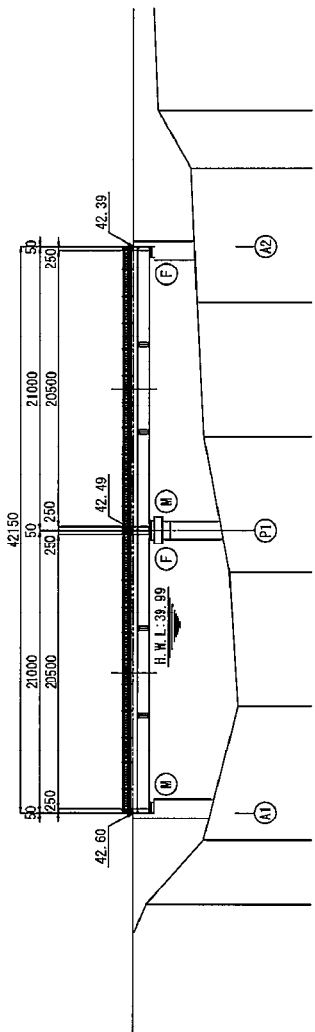
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT--	06
REVISION	DATE	DESCRIPTION	SIGNATURE

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM	
PROJECTS MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT	
PROJECT: THE PROJECT FOR IMPROVING ROAD BRIDGES IN MEGHON PROVINCES	
CONSULTANT:	ORIENTAL CONSULTANTS CO., LTD.
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
NAME:	
SIGNATURE:	
DATE:	

## Br. No. 42 PAC NAM ( BC ) BRIDGE

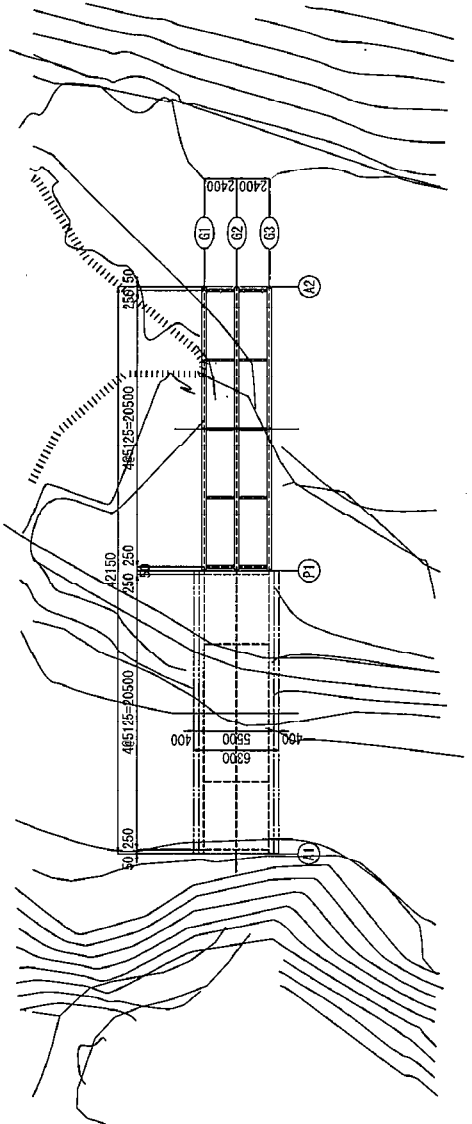
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400



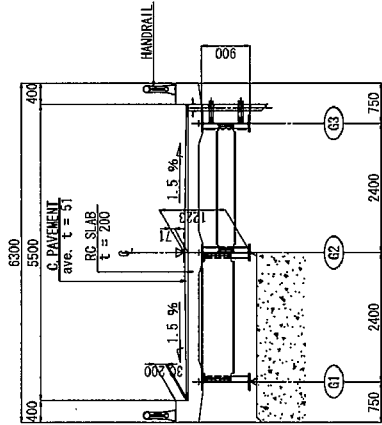
GRADE	PROPOSED HIGHT	GROUND HIGHT	DISTANCE	MARKER
42.60	42.39	42.55	0-112.030	A1
42.49	42.44	42.55	0-112.580	1CL
42.49	42.44	42.55	0-112.105	P1
42.39	42.44	42.55	0-143.650	2CL
42.39	42.35	42.35	37.90	
42.77	42.35	42.35	38.35	A2

**PLAN**  
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	01-	01
DRAWING TITLE	Br. No. 42 PAC NAM ( BC ) BRIDGE ( See On Previous )		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**SECTION**  
SCALE = 1/100



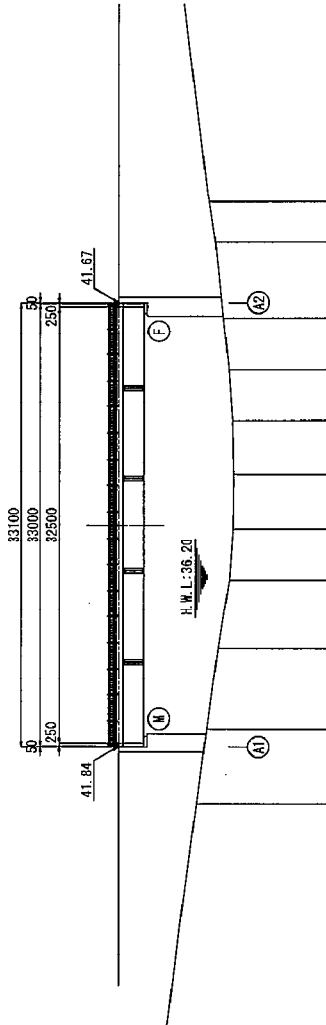
DESIGN CRITERIA	
General Condition	
Design Speed	V = 35 km/h
Bridge Length (Span Unit)	42.15m (20.5m+20.5m)
Clear Width	6.5
Longitudinal Gradient	0.5 %
Cross-sloped Gradient	1.5 %
Sub Structure Type	Steel Reinforced Concrete
Foundation Type	Pier
Material Strength	
Super Structure Type	Girder
	$\sigma_s = 210 \text{ N/mm}^2$
Slab	Cross Beam
	$\sigma_s = 180 \text{ N/mm}^2$
Surface	C. Pavement
	ave. t = 5.1 cm
Sub Structure Type	C. Pavement
	ave. t = 5.1 cm
Reinforcing Steel	$\sigma_{235} (\sigma_s = 300 \text{ N/mm}^2)$

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 15, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVEMENT OF ROAD BRIDGES IN MESSON PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 43 KHUOI NUNG BRIDGE

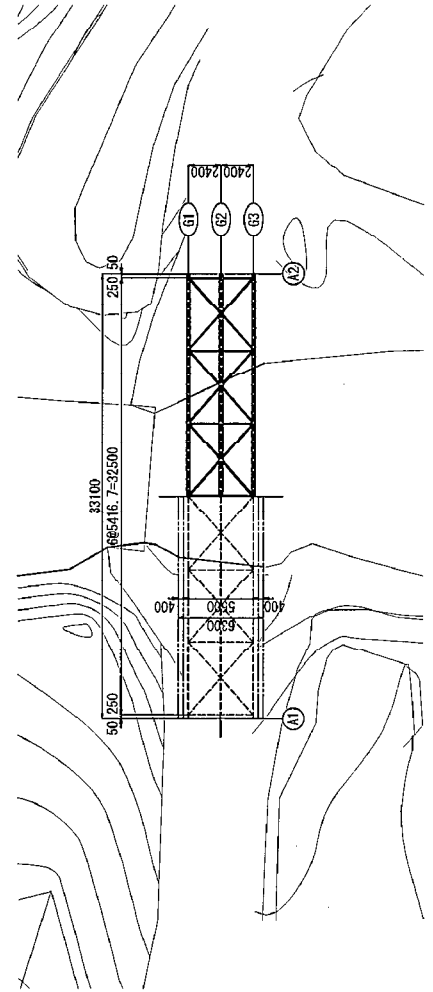
(General View of the Bridge)

**PROFILE**  
 SCALE = 1/400

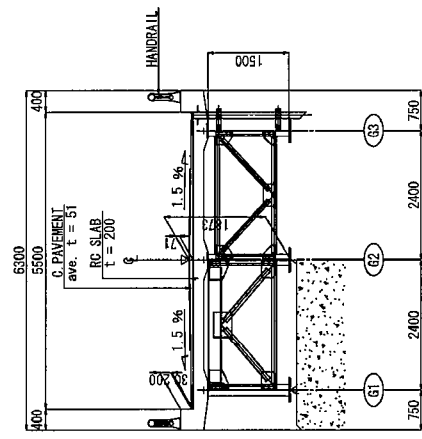


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
			36.10	A1
		41.84	0+102.550	A1
		35.34	34.51	
		33.87	33.87	
		33.98	33.98	
		41.76	0+119.100	CL
		33.35	33.35	
		33.43	33.43	
		33.70	33.70	
		34.11	34.11	
		41.67	0+135.650	A2
		34.71	34.71	
		35.13	35.13	

**PLAN**  
 SCALE = 1/400



**SECTION**  
 SCALE = 1/100



**DESIGN CRITERIA**

General	Condition
Design Speed	V = 25 km/h
Bridge Length (Span Length)	33.1m (32.5m)
Clearance Width	5.5m
Longitudinal Gradient	0.5%
Cross-slopes of Carriageway	1.5%
Sub Structure Type	Steel
Abutment	Reinforced Concrete
Pier	Reinforced Concrete
Foundation Type	
Material Strength	
Girder	$\sigma_s = 210 \text{ N/mm}^2$
Super Structure Type	Cross Beam
Slab	$\sigma_s = 140 \text{ N/mm}^2$
C. Pavement	$\sigma_s = 30 \text{ N/mm}^2$
Surface	avg. t = 5.1cm
Sub Structure Type	avg. t = 30 N/mm <sup>2</sup>
Reinforcing Steel	avg. t = 25 N/mm <sup>2</sup>
	S925 (fy = 500 N/mm <sup>2</sup> )

SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWING STYLE	Br. No. 43 KHUOI NUNG BRIDGE ( Soc Con Province )		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

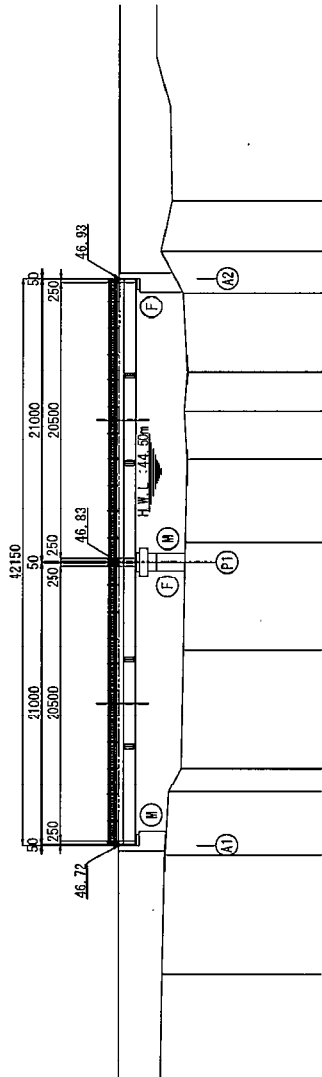
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING ROAD BRIDGES IN WETLANDS (WATERWAYS) PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 REVIEWED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 44 NGA BA BRIDGE

(General View of the Bridge)

## PROFILE

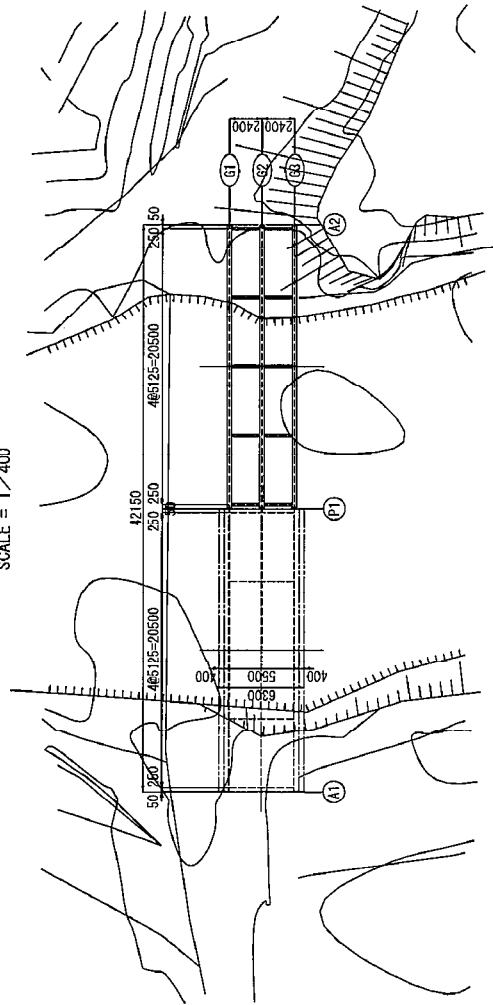
SCALE = 1/400



GRADE	PROPOSED HIGHT	GROUND HIGHT	DISTANCE	MARKER
44.04	43.85	43.85	0+117.100	A1
42.84	42.64	42.64	0+121.650	TCL
42.48	42.35	42.35	0+138.175	P1
42.21	42.21	42.21	0+148.700	ZCL
42.20	42.20	42.20	0+159.250	A2
42.53	42.53	42.53	0+169.250	
44.17	44.17	44.17		
43.35	43.35	43.35		

## PLAN

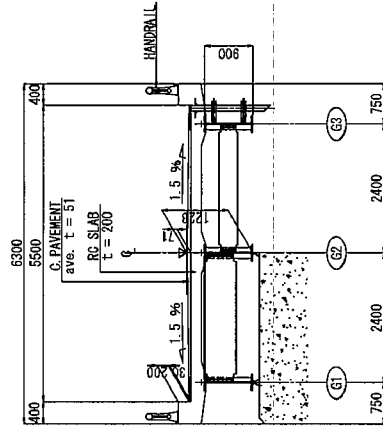
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	BT-	OF
DRAWING TITLE	Br. No. 44 NGA BA BRIDGE ( Bat Chi Province )		
REV. NO.	DESCRIPTION	SIGNATURE	

## SECTION

SCALE = 1/100



## DESIGN CRITERIA

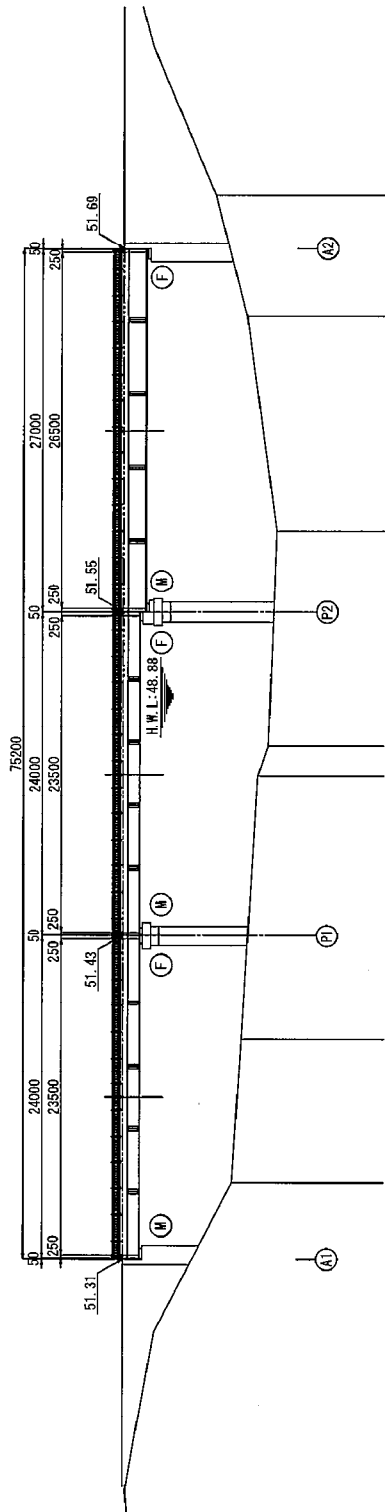
Design Speed	General Condition
35 km/h	42.15m (20.5m+20.5m)
Clear Width (Span Length)	0.5%
Clear Width	1.50%
Longitudinal Gradient	Reinforced Concrete
Sub-Structure Type	Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	
Surface	
Sub Structure Type	

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVEMENT OF ROAD BRIDGES IN NORTHERN PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 46 DON PHONG BRIDGE

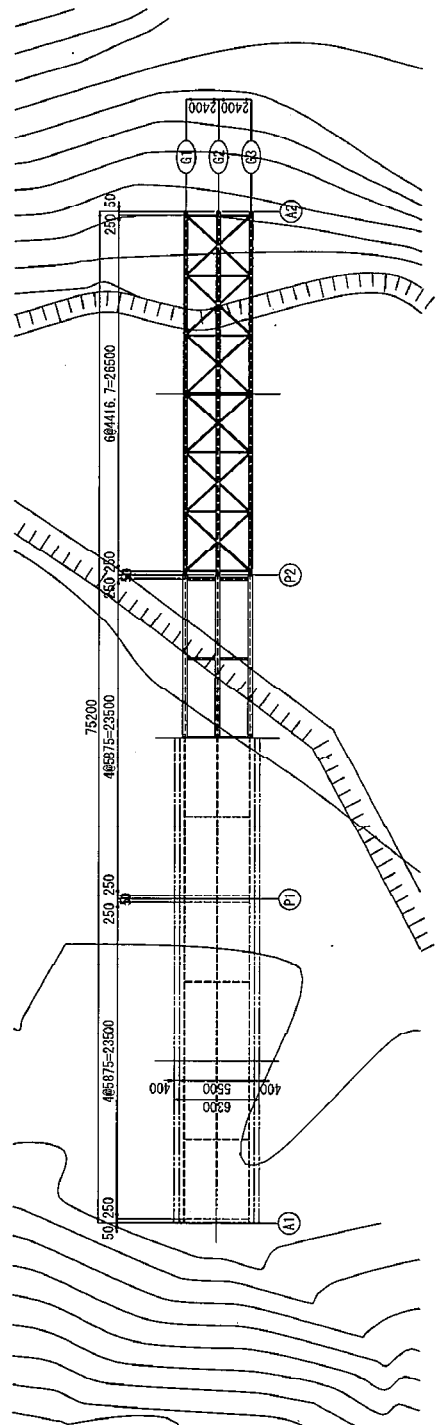
(General View of the Bridge)

PROFILE  
 SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
51.31	0-79.480	43.91	51.37	A1
51.43	0-103.555	43.20	51.37	P1
51.49	0-115.580	41.22	41.99	2C1
51.55	0-121.665	41.22	51.55	P2
51.62	0-141.130	42.81	51.62	3C1
51.69	0-154.680	45.16	42.81	A2

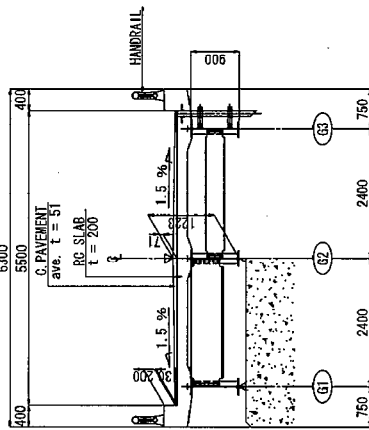
PLAN  
 SCALE = 1/400



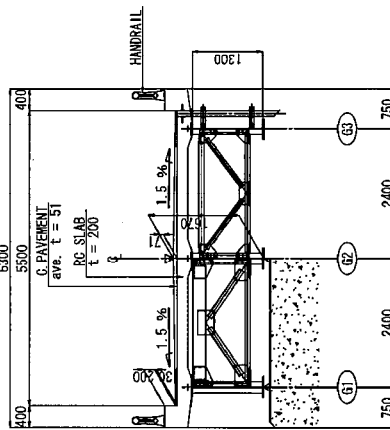
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400		51-
DRAWING TITLE	Br. No. 46 DON PHONG BRIDGE (Bao Can Province)		OF
REV. NO.	DATE	DESCRIPTION	SIGNATURE

SECTION  
 SCALE = 1/100

A1~P2



P2~A2



DESIGN CRITERIA	
Design Speed	General Condition
Bridge Length (Spac. Lan(1))	75.2m (23.5m x 3.5m + 26.5m)
Clear Width	6.30m
Longitudinal Gradient	0.5%
Cross-sill of Giraffe way	0.30%
Sub Structure Type	Abutment: Reinforced Concrete Pier: Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Girder: $\sigma_a = 210 \text{ N/cm}^2$
Cross Beam	$\sigma_a = 140 \text{ N/cm}^2$
Slab	$\sigma_a = 30 \text{ N/cm}^2$
Surface	C. Pavement: $\text{ave } t = 5.1 \text{ cm}$
Sub Structure Type	$\sigma_a = 75 \text{ N/cm}^2$
Reinforcing Steel	S1025 ( $\sigma_p = 300 \text{ N/cm}^2$ )

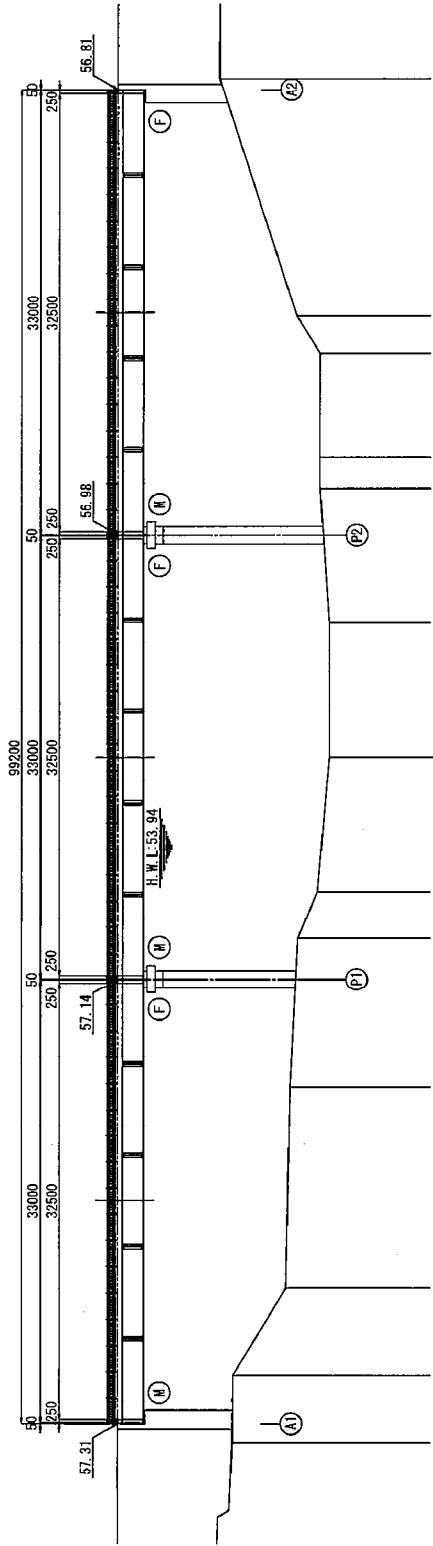
THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING OF BRIDGE IN HAI PHONG PROVINCE  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 47 QUANG CHU BRIDGE

(General View of the Bridge)

## PROFILE

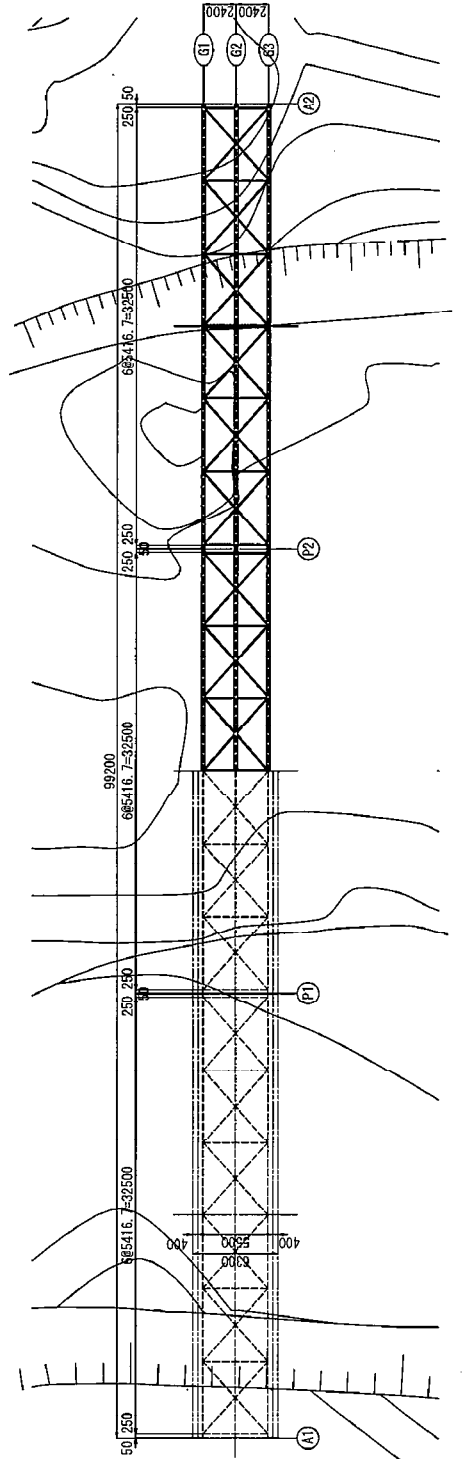
SCALE = 1/400



GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
57.31	57.31	48.82	0+327.710	A1
57.31	57.31	48.59	48.59	
57.31	57.31	44.65	44.65	
57.23	57.23	44.34	44.34	
51.14	51.14	43.76	43.76	P1
51.43	51.43	42.33	42.33	
56.98	56.98	42.13	42.13	P2
43.87	43.87	42.13	42.13	
56.89	56.89	43.87	43.87	3CL
56.91	56.91	49.88	0+426.910	A2

## PLAN

SCALE = 1/400

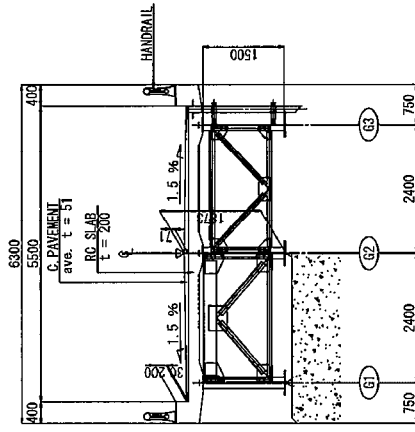


## DESIGN CRITERIA

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	99.2m (32.5m+32.5m+32.5m)
Clear Width	5.5m
Longitudinal Gradient	0.5%
Cross-sill of Abutments	1.50%
Sub Structure Type	Abutment: Reinforced Concrete Pier: Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Concrete
Super Structure Type	Cross Beam: $\sigma_s = 210 \text{ N/mm}^2$
Super Structure Type	Slab: $\sigma_s = 140 \text{ N/mm}^2$
Super Structure Type	C. Pavement: $\sigma_s = 30 \text{ N/mm}^2$
Super Structure Type	Surface: $\sigma_s = 5.1 \text{ cm}$
Super Structure Type	Sub Structure Type: $\sigma_s = 30 \text{ N/mm}^2$
Super Structure Type	Reinforcing Steel: $\sigma_s = 392.5 \text{ (or } 500 \text{ N/mm}^2)$

## SECTION

SCALE = 1/100



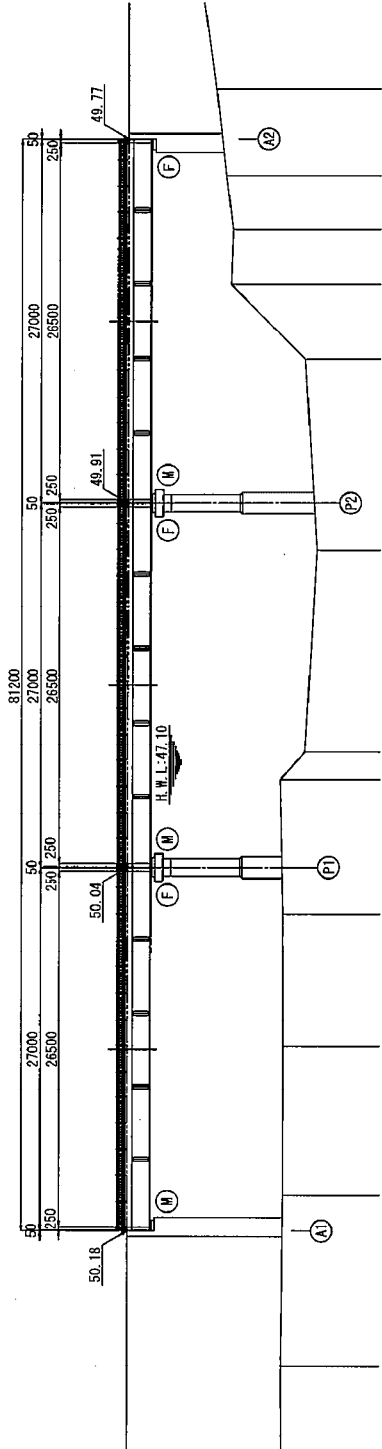
SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400		51-
DRAWING TITLE	Br. No. 47 QUANG CHU BRIDGE (Bac Can Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE



THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 18, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVEMENT OF ROAD BRIDGES IN NORTH PROVINCES PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

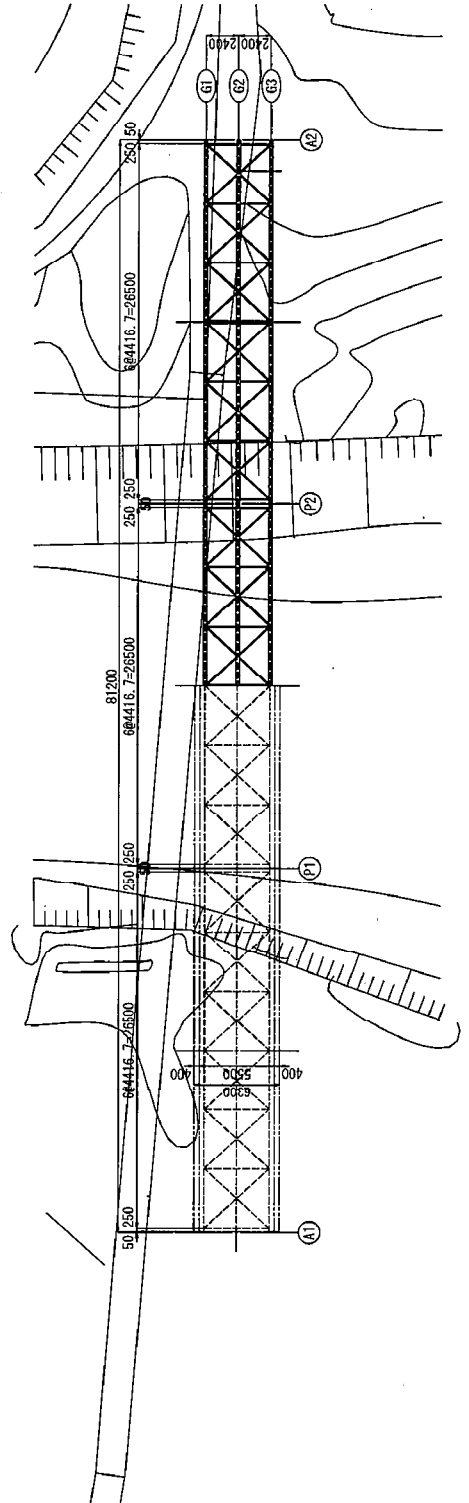
**Br. No. 48 DONG MAY BRIDGE**  
 (General View of the Bridge)

**PROFILE**  
 SCALE = 1/400



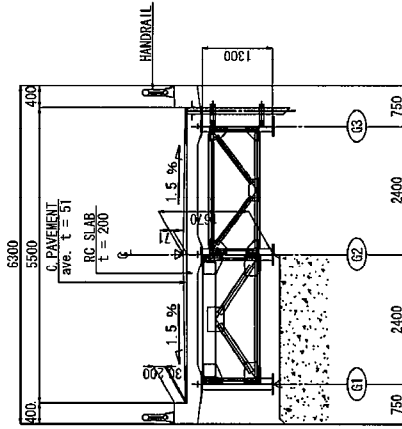
MARKER	DISTANCE	GROUND HEIGHT	PROPOSED HEIGHT	GRADE
A1	0+188.210	38.84	50.18	(B)
P1	0+213.285	38.72	50.04	(F)
P2	0+240.336	36.21	49.91	(F)
P3	0+253.880	37.11	49.84	(F)
A2	0+267.410	42.97	49.77	(F)
		38.92	37.11	
		49.98	49.98	
		38.89	38.89	
		50.11	50.11	
		38.69	38.69	
		43.70	43.70	

**PLAN**  
 SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	ST-	OF
DRAWING TITLE	Br. No. 48 DONG MAY BRIDGE (On Bong Province)		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**SECTION**  
 SCALE = 1/100



**DESIGN CRITERIA**

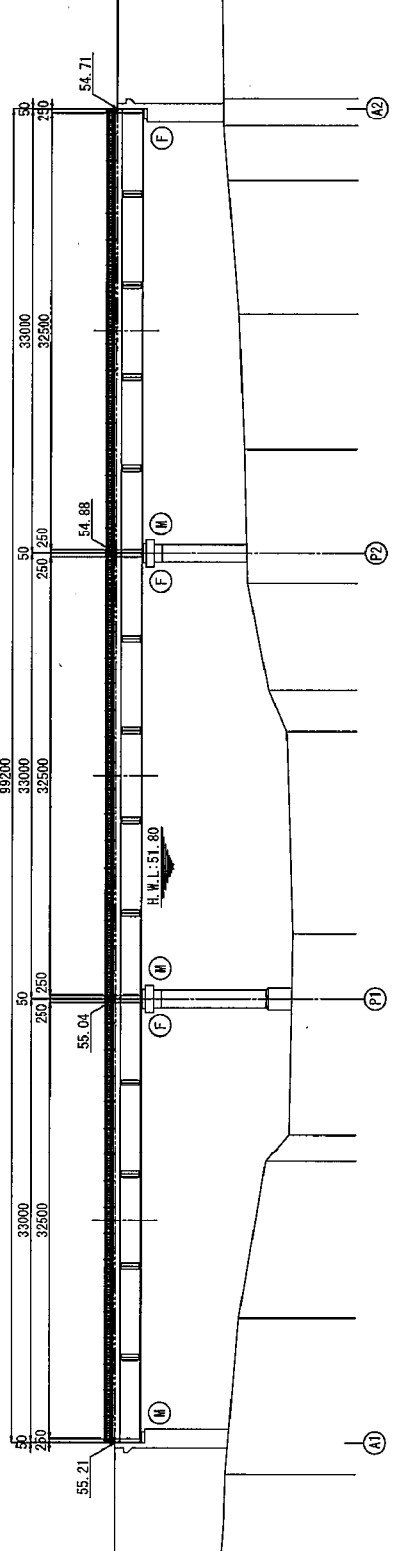
General	Condition
Design Speed	$V = 75$ km/h
Bridge Width (Span Unit)	81.2m (26.5m x 26.5m x 26.5m)
Clear Width	57.5
Longitudinal Gradient	0.5 %
Constructional Carriage Wt	1.50 %
Super Structure Type	Abutment Reinforced Concrete
Sub Structure Type	Pier Reinforced Concrete
Foundation Type	
<b>Material Strength</b>	
Super Structure Type	Girder $\sigma_a = 210$ N/mm <sup>2</sup>
	Cross Beam $\sigma_a = 140$ N/mm <sup>2</sup>
	Slab $\sigma_a = 30$ N/mm <sup>2</sup>
Surface	C. Pavement $\sigma_a = 5$ t/cm <sup>2</sup>
Sub Structure Type	Curb $\sigma_a = 30$ N/mm <sup>2</sup>
	Sub $\sigma_a = 25$ N/mm <sup>2</sup>
Reinforcing Steel	SP235 ( $\sigma_s = 300$ N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING OF ROAD BRIDGES IN VIETNAM (WORLD BANK FINANCE)  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_  
 DATE: \_\_\_\_\_

# Br. No. 49 BINH LONG BRIDGE

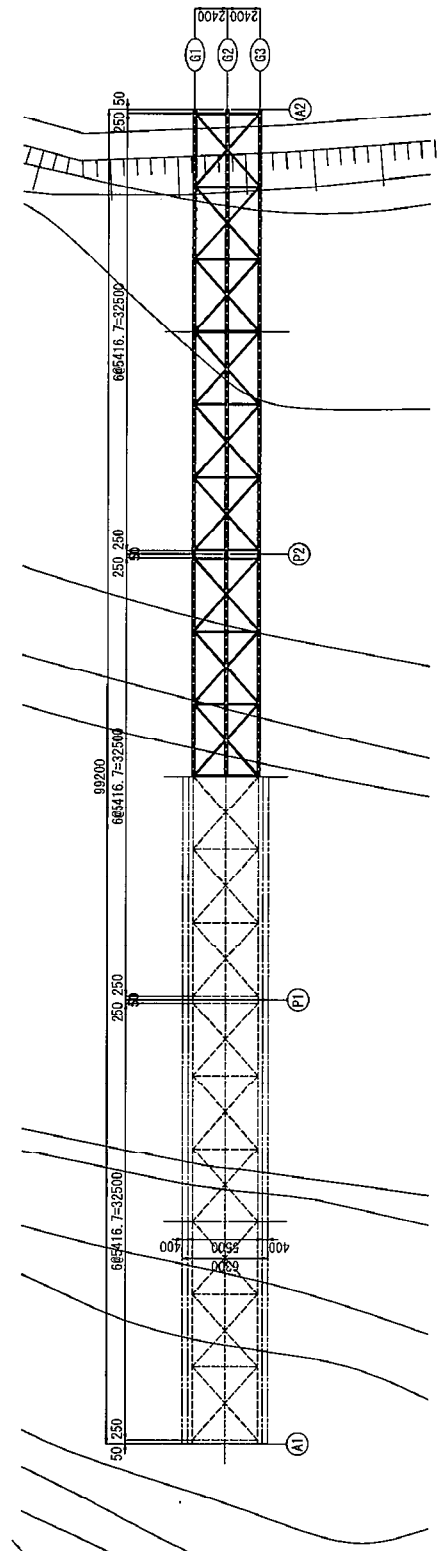
(General View of the Bridge)

**PROFILE**  
 SCALE = 1/400



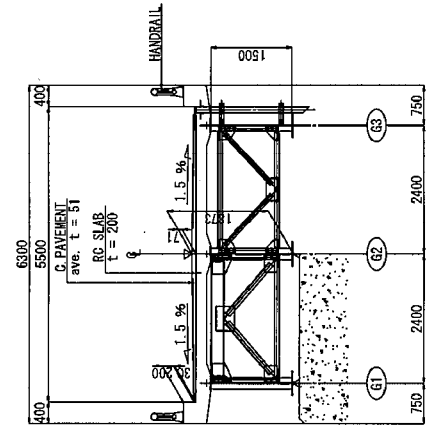
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
A1	0+345.720	55.21	0	55.21 (54.71)
ICL	0+362.270	55.13	0	
P1	0+378.795	55.04	0	
2CL	0+395.320	54.96	0	
P2	0+411.845	54.88	0	
3CL	0+428.370	55.78	0	
A2	0+444.920	54.71	0	54.71

**PLAN**  
 SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWING TITLE: Br. No. 49 BINH LONG BRIDGE (Cao Bang Province)			
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**SECTION**  
 SCALE = 1/100



**DESIGN CRITERIA**

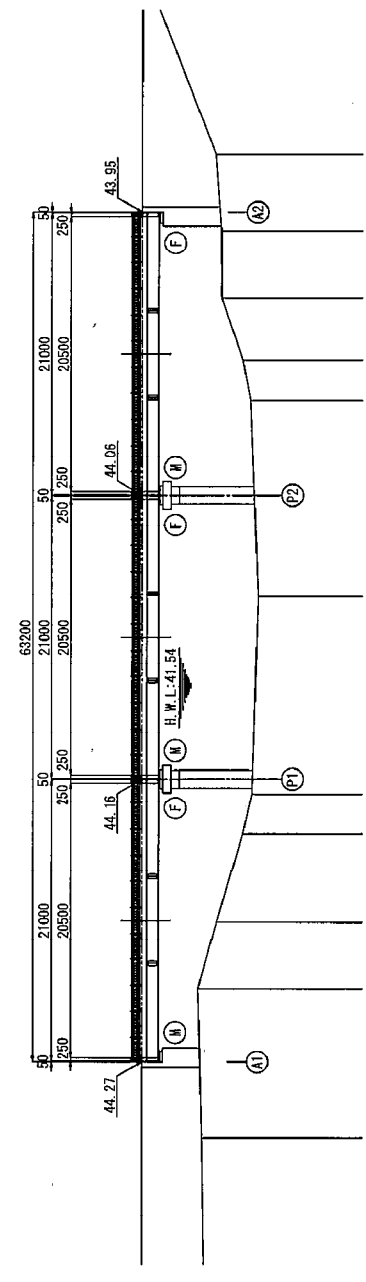
General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	99.2m (32.5m+32.5m+32.5m)
Clear Width	7.0m
Longitudinal Gradient	0.5%
Cross-fall of Carriageway	1.5%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Grids $\sigma_s = 210 \text{ N/mm}^2$
	Cross Beam $\sigma_s = 140 \text{ N/mm}^2$
	Slab $\sigma_s = 20 \text{ N/mm}^2$
Surface	C. Pavement $\sigma_s = 15 \text{ N/mm}^2$
	Curb $\sigma_s = 30 \text{ N/mm}^2$
Sub Structure Type	$\sigma_s = 25 \text{ N/mm}^2$
Reinforcing Steel	SU250 (F-500/MPa)

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 13, MINISTRY OF TRANSPORT  
 PROJECT: THE PROJECT FOR IMPROVING OF BAN SAC BRIDGE IN NORTHERN PROVINCES  
 CONSULTANT: ORIENTAL CONSULTANTS CO., LTD  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_  
 NAME: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

# Br. No. 50 BAN SAC BRIDGE

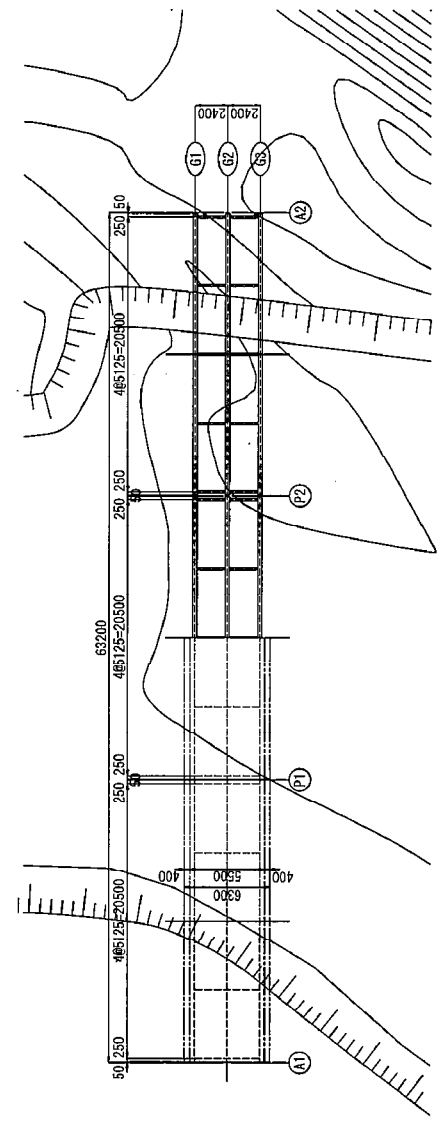
(General View of the Bridge)

PROFILE  
SCALE = 1/400

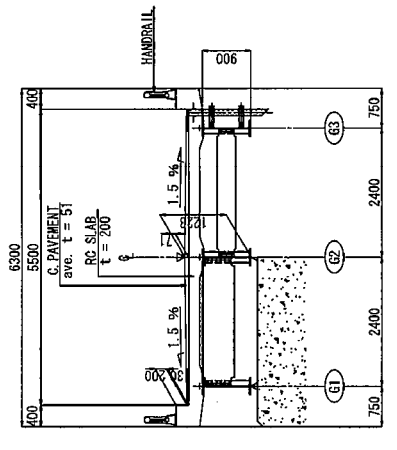


GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
44.27	44.27	39.98	63+38.270	A1
44.13	44.22	40.13	63+34.820	1CL
44.16	36.13	36.83	63+37.345	P1
44.11	35.69	35.69	63+37.870	2CL
44.06	44.06	38.378	63+378.395	P2
44.00	36.27	36.93	63+388.920	3CL
38.43	38.43	38.43	63+398.470	A2
43.95	43.95	38.43	63+399.470	A2

PLAN  
SCALE = 1/400



SECTION  
SCALE = 1/100



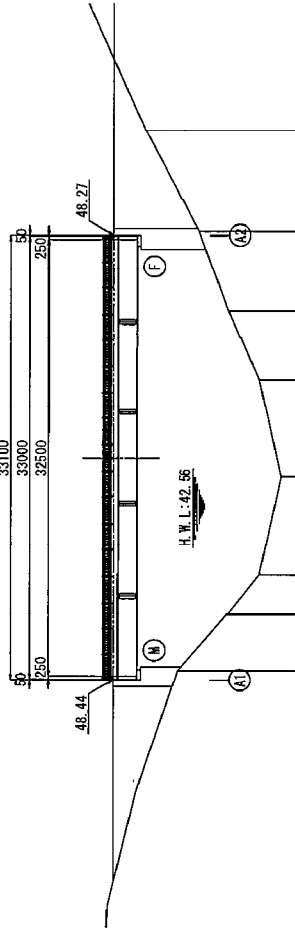
DESIGN CRITERIA	
Design Speed	General Condition
63 km/h	
Bridge Length (Span Length)	63.2m (20.5m+20.5m+2.0.5m)
Clear Width	7.0m
Longitudinal Gradient	0.5%
Gross-kill of Carriage way	1.5%
Sub Structure Type	Abutment: Reinforced Concrete
Sub Structure Type	Pier: Reinforced Concrete
Foundation Type	
Material Strength	
Super Structure Type	Slab: $\sigma_b = 210 \text{ N/mm}^2$
Cross Beam	$\sigma_b = 140 \text{ N/mm}^2$
Slab	$\sigma_b = 30 \text{ N/mm}^2$
C. Pavement	$\sigma_b = 1.5 \text{ N/mm}^2$
Surface	$\sigma_b = 30 \text{ N/mm}^2$
Sub Structure Type	$\sigma_b = 2.8 \text{ N/mm}^2$
Reinforcing Steel	SU285 (F <sub>y</sub> = 300 N/mm <sup>2</sup> )

THE GOVERNMENT OF SOCIALIST REPUBLIC OF VIETNAM  
 PROJECTS MANAGEMENT UNIT NO. 15, MINISTRY OF TRANSPORT  
 PROJECT THE FINANCING AND IMPROVEMENT OF ROAD BRIDGES IN NORTHERN PROVINCES  
 CONSULTANT ORIENTAL CONSULTANTS CO., LTD.  
 DESIGNED BY \_\_\_\_\_ CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_  
 NAME \_\_\_\_\_ SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

# Br. No. 52 KE0 A1 BRIDGE

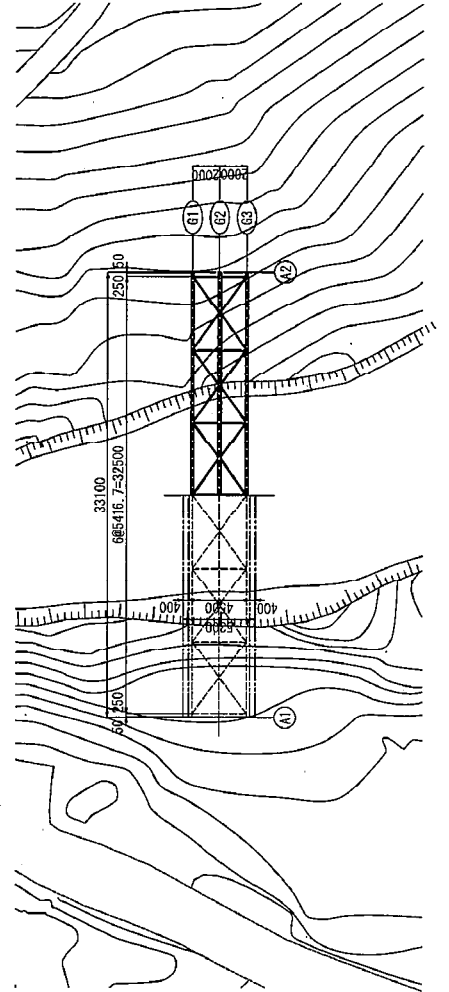
(General View of the Bridge)

**PROFILE**  
SCALE = 1/400



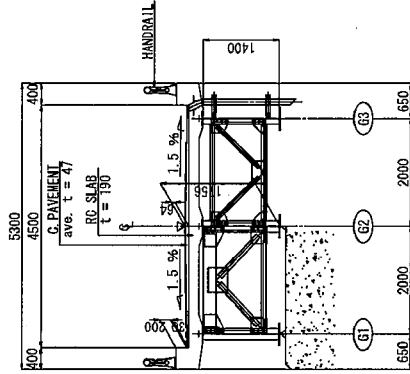
GRADE	PROPOSED HEIGHT	GROUND HEIGHT	DISTANCE	MARKER
48.47	48.44	48.44	0+28.670	A1
48.36	48.36	48.36	36.05	P
48.27	48.27	48.27	37.69	
48.27	48.27	48.27	39.97	
48.07	42.15	42.15	0+681.770	A2

**PLAN**  
SCALE = 1/400



SECTION	SCALE	DRAWING NO.	SHEET NO.
	1/100, 1/400	CT-	OF
DRAWING TITLE	Br. No. 52 KE0 A1 BRIDGE ( Cho Bang Province )		
REV. NO.	DATE	DESCRIPTION	SIGNATURE

**SECTION**  
SCALE = 1/100



**DESIGN CRITERIA**

General Condition	
Design Speed	V = 25 km/h
Bridge Length (Span Length)	33.1m (32.5m)
Clear Width	4.5m
Longitudinal Gradient	0.5%
Cross-fall of Carriageway	1.50%
Super Structure Type	Steel
Sub Structure Type	Reinforced Concrete
Foundation Type	Reinforced Concrete
Material Strength	
Super Structure Type	Girder
Cross Beam	$\sigma_b = 210 \text{ N/mm}^2$
Slab	$\sigma_b = 140 \text{ N/mm}^2$
C. Pavement	$\sigma_b = 30 \text{ N/mm}^2$
Sub Structure Type	Concrete
Reinforcing Steel	$\sigma_b = 28 \text{ N/mm}^2$
	$\sigma_{28} = 25 \text{ N/mm}^2$
	$\sigma_{28} = 20 \text{ N/mm}^2$
	$\sigma_{28} = 15 \text{ N/mm}^2$
	$\sigma_{28} = 10 \text{ N/mm}^2$
	$\sigma_{28} = 5 \text{ N/mm}^2$
	$\sigma_{28} = 0 \text{ N/mm}^2$

## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

This Project is to procure superstructure materials for 43 small to medium sized bridges dispersed in nine northern provinces of Vietnam. Policies for both the construction and procurement of the Project, which is a Japanese Grant Aid scheme, are as follows:

- Erection via truck crane will be adopted for 40 of the 43 bridges, as it possible to use the riverbeds of the proposed bridge sites during the dry season. For these 40 bridges, the GOV is responsible for implementing all of the bridge works, except for girder procurement, since Vietnamese contractors have sufficient experience with similar projects.
- The three remaining bridges are truss bridges and are to be constructed by the GOV with Japanese technical support, as Vietnamese contractors have little experience with this type of structure.
- Erection via cable crane will be adopted for two of the three truss bridges, as a truck crane cannot use the riverbeds of these bridge sites. Since Vietnamese contractors usually do not own a cable crane, which is often utilized for girder erection in mountainous areas in Japan, it should be included as equipment to be procured by the Project.
- Although there are a few fabricators of steel girders in Vietnam at present, their production capacity is limited. Consequently, it is assumed that only the three truss bridges, with a total weight of 350 tons, will be procured from the domestic market. The remaining 2000 tons of steel for I-shaped girders will be procured from the Japanese market and transported by ship to Vietnam.

### **2-2-4-2 Implementation Conditions**

#### **(1) Sea Transport from Japan**

Hai Phong International Port shall be utilized for unloading Project materials and equipment from Japan, because it is the closest port to the Project area and is capable of handling large amounts of freight. Presently, there are both container and conventional ships traveling between Japan and Hai Phong Port, with the former making a few trips per week and the latter one or two trips per month. Note that a conventional ship should be utilized for transporting steel girders due to their long length and the inconvenience of both loading and unloading long steel girders from a container ship. In a previous project implemented in 2002 (Project

for Reconstruction of Bridges in the Central Area (Phase I)), a conventional ship was utilized for this purpose. Note that it will take 7 to 20 days to transport girders from Japan to Hai Phong, and once arriving little time will be required for unloading as there are a sufficient numbers of berths (11).

**(2) Customs Clearance**

A letter for tax exemption and an import certificate have to be provided for customs clearance, as the Project is to be implemented with a Japanese Grant. These documents will be prepared on the basis of shipping documents, which are obtained after the loading of materials in Japan. It usually takes two weeks to prepare these documents. Since Vietnamese Customs at Hai Phong Port has much experience in dealing with materials imported under Japan’s Grant Aid Scheme, it should be possible to clear customs in 3 to 5 days.

**(3) Land Transport in Vietnam**

Table 2.2.4.1 shows the transportation distances to the unloading points of each province from Hai Phong Port. The materials procured for the Project are to be transported to stockyards located in the provincial centers, which are designated by the Provincial People’s Committees.

**Table 2.2.4.1 Transport Distances from Hai Phong Port**

Province	Unloading Points (Provincial Center)	Transportation Route from Hai Phong Port	Distance (km)
Son La	Son La	NR5-NR6	387
Dien Bien	Dien Bren	NR5-NR6-PR279	537
Lai Chau	Lai Chau	NR5-NR6-NR12-NR4D	645
Yen Bai	Yen Bai	NR5-NR3-NR2-NR70-NR37	281
Lao Cai	Lao Cai	NR5-NR3-NR2-NR70	432
Tuyen Quang	Tuyen Quang	NR5-NR3-NR2	262
Ha Giang	Ha Giang	NR5-NR3-NR2	423
Bac Can	Bac Can	NR5-NR3	258
Cao Bang	Cao Bang	NR5-NR3	371

As shown in Table 2.2.4.1, all transportation will be on routes utilizing national roads. However, these national roads have not been maintained well enough for heavy trailers, as they are located in mountainous areas. For instance, some routes have bridges with weight restrictions (e.g., 8 tons), or sharp curves less than 15m in diameter, or steep gradients of more than 10%. Taking these constraints into account, appropriate loading will be determined. Note that a truck with a capacity of 10 tons can carry 4 to 6 girders of about 7 to 8 tons, and medium size trucks with a capacity of about 5 tons could be utilized for sever road conditions.

After leaving Hai Phong Port, it takes a few days (including loading time ) to transport the girders to each province.

### **2-2-4-3 Scope of Works**

The responsibilities of the GOJ and GOV regarding procurement, construction, etc for the Project bridges, which are being financed with Japanese Grant Aid, are described below.

#### **(1) Responsibilities of GOJ**

##### **1) Procurement of Superstructure and Miscellaneous Equipment for Bridges**

The following materials and equipment shall be procured by GOJ.

Procurement of Steel Girders for Plate Girder Bridges and H-shaped Girder Bridges, and Steel Members for Truss Bridges

These members are to be fabricated with weathering steel and shall be procured together with splice plates, TC bolts, nuts, etc.

Miscellaneous

Bearings, expansion joints, drainage devices, painting materials necessary at site shall be procured by the GOJ. Handrail materials will be procured by the GOV.

Erection Equipment

- Special equipment necessary for steel girders, member erection, or maintenance (axial force meter, clamping device for TC bolts, impact wrenches, etc.), excluding common equipment such as jacks and lever blocks.
- Cable crane equipment for erection of truss bridges including winches with double drums, pylons, erectors, carriers, wire, and saddles. However, common equipment that can be obtained in Vietnam shall not be included (e.g., anchor devices, generators, bents)

Others

Bridge inscription plates, ODA stickers

##### **2) Transport to Designated Provincial Store Yards**

The materials and equipment described in 1) shall be transported to the designated store yards for each province and handed over to the Vietnamese side.

##### **3) Dispatch of Experts for Girder Erection of Truss Bridges**

Two experts, one for procurement management and the other for girder erection, will be sent to site to assist with the erection of the three truss bridges, starting from the preparation for

erection work to completion of erection work.

#### 4) Detailed Design Review & Procurement Supervision

The Japanese Consultant will execute the detailed design review for the superstructure (excluding handrail) of the bridges, prepare draft tender documents, and support the GOV in conducting tendering. In addition, the Consultant will supervise the procurement and erection process on site for truss bridges, from the handing over of materials and equipment to the completion of truss bridge erection.

### **(2) Responsibilities of GOV**

#### 1) Erection of Bridge Superstructure

The GOV shall erect the superstructure of bridges procured by the GOJ. This work includes installation of bearings, expansion joints, drainage pipes, and inscription plates.

#### 2) Design, Construction and Supervision of Construction

The GOV shall design the substructure, slab, pavement, handrail, approach roads and revetment work, as well as supervise the construction work.

#### 3) Tax Exemption & Customs Clearance

Tax exemption and timely customs clearance of the materials and equipment procured by the Japanese side will be provided by the GOV.

#### 4) Land Acquisition & Compensation for Resettlement

Land acquisition for both permanent and temporary facilities and compensation for resettlement shall be carried out by the GOV.

#### 5) Removal or Relocation of Public Facilities

The GOV shall remove or relocate public facilities that adversely affect the construction activities of the proposed bridges. This includes demolition of existing bridges and the provision of temporary detour roads, if necessary.

#### 6) Tax Exemption for Japanese Experts

The GOV shall exempt the Japanese experts engaged in the Project from taxes.

### **2-2-4-4 Consultant Supervision**

The Japanese Consultant will appoint a procurement supervisor in order to witness the handover of materials and equipment procured by the GOJ as well as to monitor truss bridge erection work. Whereas the Vietnamese procurement supervisor will manage the whole process of procurement, the Japanese procurement supervisor will only be present for

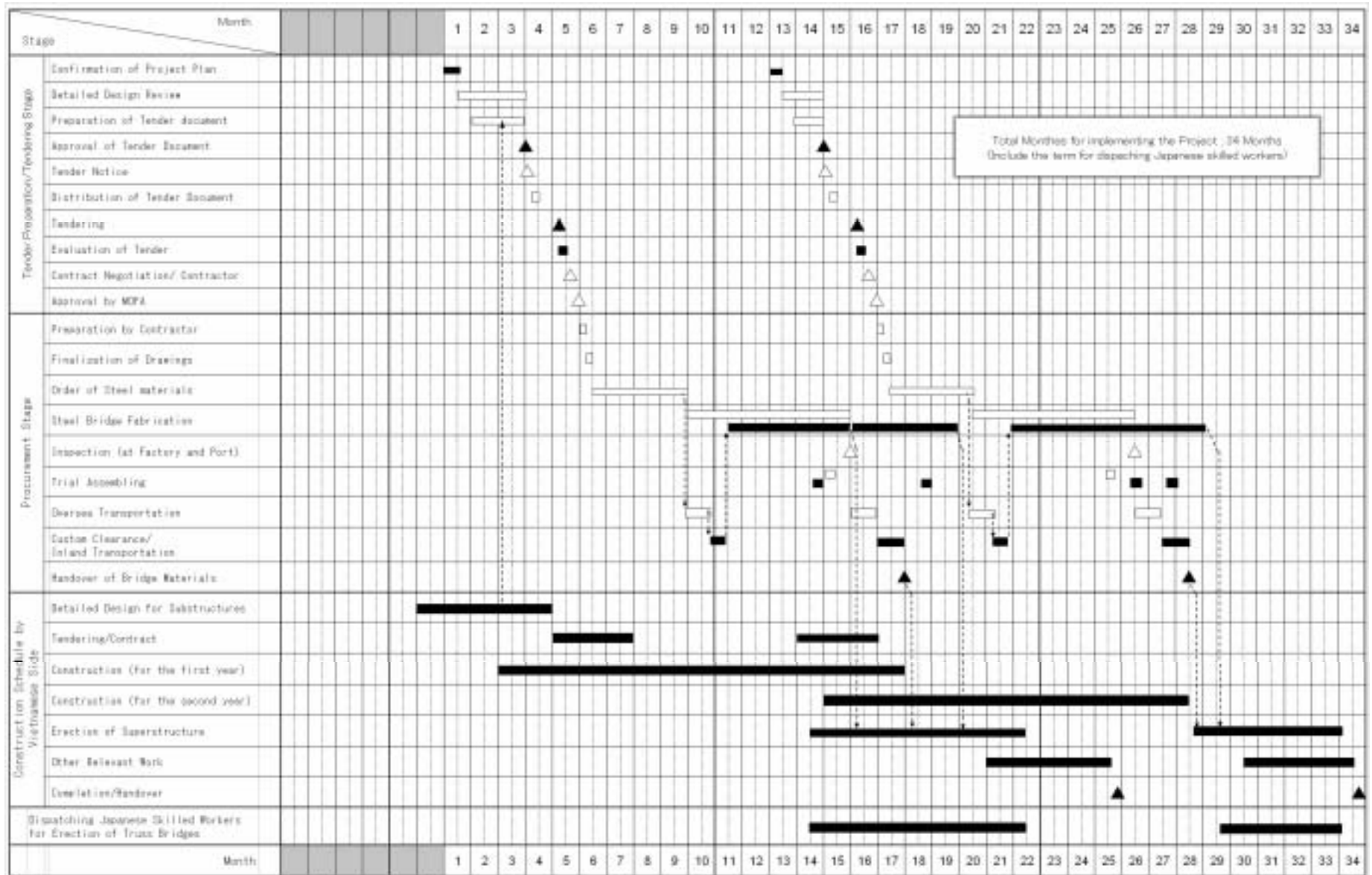


important milestones, including material handover, the preparation process for truss bridge erection, and the completion of erection work for the truss bridges.

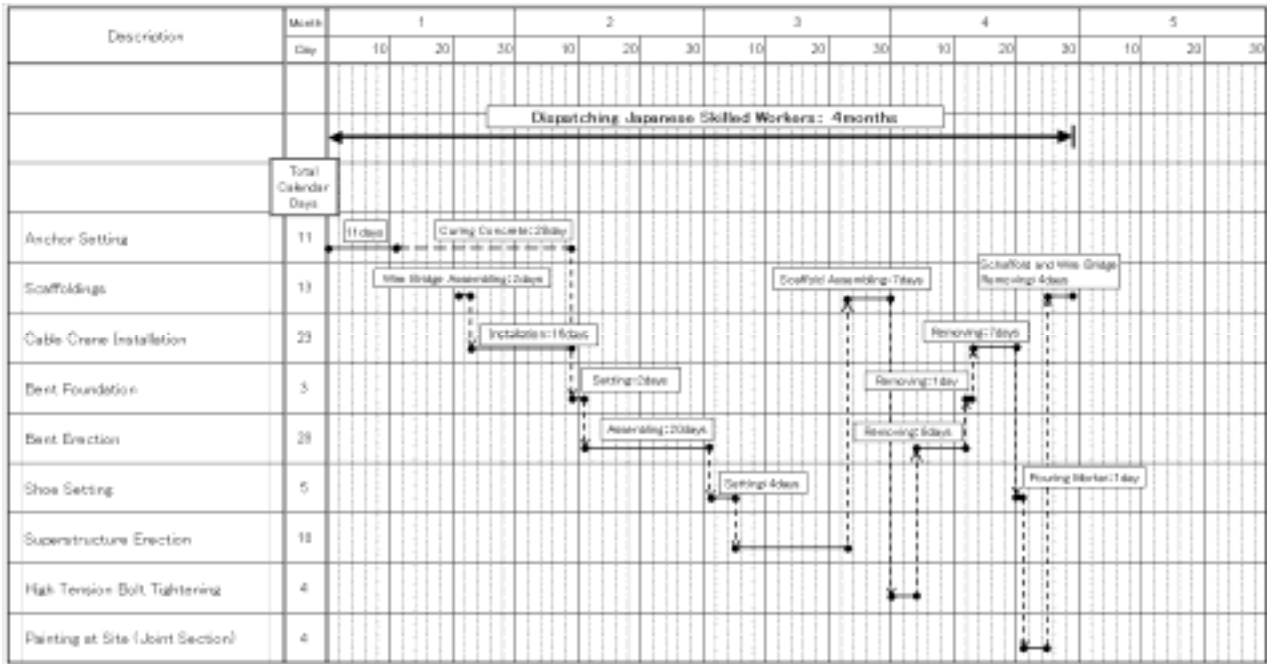
#### **2-2-4-5 Implementation Schedule**

A draft implementation plan, which includes the basic design period, is shown in Table 2.2.4.2. For the successful completion of the Project, it is important that the Japanese and Vietnamese sides cooperate with each other throughout the whole process (i.e., from the design stage to the completion of construction). Table 2.2.4.3 shows the bridge erection work plan for the three truss bridges and the assignment periods of the Japanese experts.

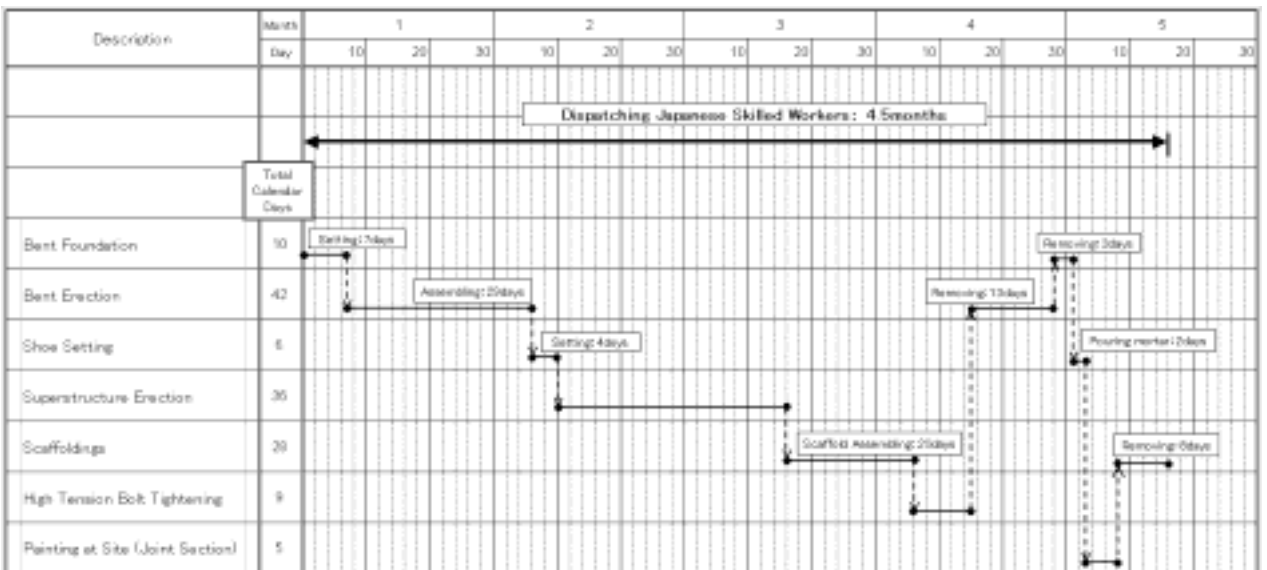
**Table 2.2.4.2 Implementation Schedule for Project (Draft)**



**Table 2.2.4.3 Implementation Schedule for Truss Bridges (Draft)**  
**(First Year: Bridge No.20 & No.36)**



**(Second Year: Bridge No.25)**



## **2-3 Obligations of Recipient Country**

The obligations of the GOV for the Project are listed below.

### **(1) General**

- ① Banking arrangements
- ② Notice and payment fees for Authorization to Pay (A/P)

### **(2) Project Implementation**

- ① Acquisition of construction sites and lands necessary to perform temporary work, and compensation for relocation of houses from construction sites
- ② Removal or relocation of public utilities
- ③ Removal of existing bridges and construction of detour roads, if necessary
- ④ Design and construction of substructures, slabs, pavements and handrails for the objective bridges, approach roads, protection works and supervision of the construction activities
- ⑤ Exemption of tax on materials and equipment for the superstructures of the proposed bridges and prompt customs clearance
- ⑥ Provision of storage yards for materials and equipment for the superstructures of the proposed bridges procured by the GOJ in the each province center by the time of unloading them
- ⑦ Transportation of materials and equipment procured by the GOJ from storage yards to the proposed bridge sites
- ⑧ For the proposed truss bridges, completion of substructure works by the time of arrival of the materials and equipment procured by the GOJ and prompt implementation of superstructure works
- ⑨ Installation of bridge inscription plates procured by the GOJ
- ⑩ Completion of all bridge works within one year from procurement completion.

### **(3) Others**

- ① Ensuring a sufficient budget for work to be undertaken by the GOV, including land acquisition and compensation for relocation of houses
- ② Conclusion of a contract with the Japanese Consultant recommended by the GOJ for the detailed design review and procurement supervision
- ③ Execution of the tender to select a Japanese Contractor, who will procure the materials and equipment for the proposed bridges, and the conclusion of a contract with said Contractor in the tender process
- ④ Conclusion of contracts with Vietnamese contractors to implement the bridge works

the GOV is responsible for

- ⑤ Exemption from custom fees and taxation for Japanese entering Vietnam to work on the Project, as well as exemption from any other financial obligations
- ⑥ Coordination of the procurement supervisor designated by the Consultant and the experts for truss bridge erection dispatched by the Contractor.
- ⑦ Execution of the proper operation and maintenance of the bridges constructed by the Project and ensuring a continuous budget sufficient for this purpose

## **2-4 Project Operation Plan**

### **2-4-1 Operation & Maintenance System**

The Provincial Department of Transport (DOT) will take responsibility for the operation and maintenance of the proposed bridges after the completion of the Project, while the MOT is responsible for implementing the Project. There are few maintenance requirements for the proposed bridges, unlike a normal steel bridge that needs re-painting every 20 to 30 years. Although the operation and maintenance cost for the proposed bridges is expected to be small, the following “full-scale maintenance” activities are needed at the proper intervention levels: (1) replacement of expansion joints approximately every 15 years, (2) replacement of bearings approximately every 30 years, (3) re-painting of girder edges with epoxy resin approximately every 30 years, and (4) replacement of deck slabs on superstructure approximately every 50 years. As shown in Table 2.2.1.1, the financial burden of these “full-scale maintenance” activities amounts to only 0.5-2.0% of the maintenance budget of a provincial DOT, meaning that it is possible for provincial DOTs to execute the necessary “full-scale maintenance” activities for the upkeep of the bridges.

### **2-4-2 Inspection & Maintenance Method**

#### **(1) Periodic Inspection & Maintenance**

Note that the “full-scale maintenance” cost described in 2.4.1 is only achievable if regular inspections and minor repair works for the proposed bridges are properly executed in accordance with Table 2.4.2.1. Therefore, it is suggested that the Japanese side occasionally encourage the Vietnamese side to carry out this work as intended. It is also important that the Japanese side advise each provincial DOT about the establishment of a system for keeping records on periodic inspections, which would indicate the date, inspection items, inspection results, and the name of the inspector, in order to assess the repair works that might be needed.

#### **(2) Maintenance of Approach Roads**

Although minor maintenance activities, including patching and leveling, shall be executed periodically, an overlay shall be required approximately every 10 years given the life span in case of the DBST (Double Bituminous Surface Treatment).

**Table 2.4.2.1 Regular Inspection & Maintenance Items**

	Items	Maintenance & Repair Works	Intervention Level
Bridge	Drainage pipe	Clearing of sediment	3 months
	Expansion joint	Tightening of loose devices & repair of seal rubber	3 months
	Railing	Repair of damage from collisions	3 months
	Bearing	Removal of soil deposits	6 months
	Deck slab & curb	Repair of cracks & minor damages	1 year
	Pavement	Inspection of surface condition & repair of minor damages	1 year
	Structural members	Monitoring of generation of stable rust layer & minor repairs	1 year
	Abutment & Piers	Repair of cracks & minor damages	1 year
	Revetment	Inspection of scouring & minor repairs	1 year
Approach Road	Pavement	Inspection of surface condition & minor repairs	1 month
	Shoulder & slope	Surface treatment, planting, repair of embankments	1 month
	Side ditch	Removal of soil deposits	1 month
	Marking	Re-painting	1 month
	Guard rail	Re-painting & replacement	6 months
	Retaining wall	Repair of cracks & minor damages	1 year

## 2-5 Project Cost Estimation

### 2-5-1 Initial Cost Estimation

The total implementation cost of the Project under Japan's Grant Aid Scheme is estimated at 4,044 million Japanese Yen. This cost shall be divided between the GOJ and GOV in the manner described below.

#### (1) Project Costs borne by GOJ

Approximate Project Cost (Japanese side): 1,368 Million JPY(Japanese Yen)

This cost estimate is provisional and will be further refined by the GOJ when approving the Grant. In addition, this implementation cost does not represent the maximum amount of Japan's Grand Aid to be contained in the Exchange of Notes.

**Table 2.5.1.1 Approximate Project Implementation Cost Borne by GOJ**

Phase 1: 28 Bridges in 6 Provinces (total bridge length: 1,677m)

Items			Project Cost ( Million JPY )
Materials & Equipment	Bridge main structure	Main girder and structural members, etc	846
	Bridge accessories	Bearing, expansion joints, bolts, etc	
	Erection tools	Wrenches, winches, etc	
	Dispatch of expert	Advice on erection to Vietnamese contractors	
Detailed Design & Procurement Supervision			37

(Sub-total) 883 Million JPY

Phase 2: 15 Bridges in 3 Provinces (total bridge length: 909m)

Items			Project Cost ( Million JPY )
Materials & Equipment	Bridge main structure	Main girder and structural members, etc	462
	Bridge accessories	Bearings, expansion joints, bolts, etc	
	Erection tools	Wrenches, winches, etc	
	Dispatch of experts	Advice on erection to Vietnamese contractors	
Detailed Design & Procurement Supervision			23

(Sub-total) 485 Million JPY

#### (2) Premises of Estimation

- ① Time of estimate : July 2006
- ② Exchange rate : 1US\$ = JPY116.79, 1US\$ = VND15,933  
(at above-mentioned time)



- ③ Implementation period : Tendering process and construction period are shown in Table 2.2.4.2 (17 months for each phase excluding tendering).
- ④ Others : The Project is implemented under the conditions of Japan's Grant Aid Scheme. Note that the above-mentioned exchange rate is to be reviewed by the GOJ.

### (3) Project Cost borne by GOV

Approximate Project Cost (Vietnamese side): 365,121 Million VND (2,676 Million JPY)

**Table 2.5.1.2 Approximate Implementation Cost Borne by GOV**

Phase 1: 28 Bridges in 6 Provinces (total bridge length: 1,677m)

Items	Cost: Million VND ( Million JPY )	
Land acquisition Resettlement Removal/relocation of public facilities	10,853	(80)
Detailed design	4,638	(34)
Bridge construction	203,582	(1,492)
Removal/relocation of existing bridges	1,022	(7)
Total amount	220,095	(1,613)

Phase 2: 15 Bridges in 3 Provinces (total bridge length: 909m)

Items	Cost: Million VND ( Million JPY )	
Land acquisition Resettlement Removal/relocation of public facilities	10,226	(75)
Detailed design	2,309	(17)
Bridge construction	132,115	(968)
Removal/relocation of existing bridges	377	(3)
Total amount	145,026	(1,063)

Note: \*The above-mentioned costs are estimates subject to review

### 2-5-2 Operation & Maintenance Cost

Inspection and maintenance costs (light maintenance cost) are estimated below for the post-construction period.

#### (1) Inspection & Maintenance Activities

Periodic inspection and minor repair/maintenance works shall be executed by the provincial

DOTs. The cost for annual inspection and minor repair/maintenance works per province is estimated as shown below.

Personal expenses	:	40 Mil VND	=	40 Mil VND
Materials	:	50% of above	=	20 Mil VND
Equipment including vehicles	:	25 Mil VND	=	25 Mil VND
Total		85 Mil VND ( US\$ 5300 )		

## (2) Periodic Maintenance for Pavement

Approach roads will be paved with DBST, as there is no asphalt mixing plant in the northern mountainous area of Vietnam, with an overlay to be carried out by a local maintenance company approximately every 10 years. The cost of an overlay per bridge is shown below.

200m × 5.5m × 1Bridge × 90 Thousand VND	=	99 Mil. VND
(Assumed approach road length; 100m for both side)		
Total 99Mil.VND ( 0.73 Mil. JPY )		

## (3) Annual Operation & Maintenance Cost

The average annual operation and maintenance cost by province is summarized in Table 2.5.1.3.

**Table 2.5.1.3 Approximate Annual Maintenance Costs to be Borne by GOV**

Unit ( Mil.VND )

Province	Son La	Dien Bien	Lai Chau	Yen Bai	Lao Cai	Tuyen Quang	Ha Gian	Bac Can	Cao Bang
Full-scale Maintenance Cost/Year	144	241	162	239	215	193	154	224	253
Light Maintenance Cost/Year	135	135	135	135	135	125	135	135	125
Total Maintenance Cost/Year	279	376	297	374	350	318	289	359	378
Provincial Budget for Road Maintenance (Year)	30,055 (2005)	18,200 (2005)	11,196 (2005)	24,174 (2005)	18,200 (2006)	17,250 (2006)	28,000 (2006)	17,222 (2005)	14,237 (2006)
Ratio (%)	0.93	2.06	2.65	1.55	1.92	1.84	1.03	2.08	2.66

The total operation and maintenance cost per province ranges from VND 278 million to VND 378 million, and accounts at a maximum for approximately 2.7% of the maintenance budget, which can be easily covered by the maintenance budget of any province.

## 2-6 Other Relevant Issues

There will be little problem with the GOV implementing the Project, as it has much experience and knowledge of the Japanese Grant Aid System and the issues that need to be addressed, which include land acquisition, resettlement, relocation of public utilities, etc. However, there are some issues that should be raised with the GOV before commencement of the Project based on the experience of the Japanese previous projects in Vietnam and they are as follows:

- There were cases in previous projects where the necessary storage yards had not been provided by the relevant provinces by the designated unloading dates. The implementation agency PMU18 should coordinate the Contractor and the provinces to ensure that this does not occur.
- Some provincial officers in the past have misunderstood that maintenance was unnecessary for bridges built with weathering steel. Although there is no need for re-painting, which accounts for a major portion of the maintenance requirements for a steel bridge, it is essential that each province's DOT periodically replace the expansion joints and bearings and execute routine inspection and minor repair/maintenance works for bridges built with weathering steel as well. This should be made clear to each province at the outset of the Project.

In the project for Reconstruction of Bridges in the Central District (Phase 1), the Japanese side provided work manuals regarding steel girder transportation, erection of girders, deck slab construction, painting on site, and maintenance through "Soft Component" scheme. PMU 18 should be requested to make maximum use of those manuals to smooth execution of its work.