

## **Appendix 5. Technical Memorandum**

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TECHNICAL MEMORANDUM  
ON THE PREPARATORY STUDY  
ON THE PROJECT FOR RECONSTRUCTION OF BRIDGES  
IN THE CENTRAL DISTRICT (PHASE II)  
IN THE SOCIALIST REPUBLIC OF VIETNAM

In November 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Study Team on the Preparatory Study (hereinafter referred to as "the Study") on the Project for Reconstruction of Bridges in the Central District (Phase II) (hereinafter referred to as "the Project") the Socialist Republic of Vietnam (hereinafter referred to as "the Vietnam")

The major objectives of the Study are to re-formulate the Project based on a review of the detailed design study outcome of 2006 due to changes on site conditions and/or to the socio economy around the bridge sites, as well as to meet the conditions of Japan's Grant Aid scheme.

In the course of discussions with relevant organizations and field survey, the Study Team confirmed requests to the design output from the Vietnamese side, which should be considered in the Study for the Project. The Study Team promised to convey them to the Japanese side, and examine their appropriateness from the viewpoint of both engineering and Japan's Grant Aid scheme (see Attachment 1).

Further, the Vietnamese side confirmed and basically accepted major undertakings to be done by the Vietnamese side at each bridge site, which are mainly associated with construction work at site (see Attachment 2).

Hanoi, 15<sup>th</sup> December 2009

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## ATTACHMENT 1

### REQUESTS FROM VIETNAMESE SIDE

The following items are requested from the Vietnamese side. The Vietnamese side promised to provide supporting documents for their requests to the Study Team, such as traffic data and relevant area/transport development plan.

#### 1. No.36 Da Dung Bridge, Binh Thuan Province

##### (1) Widening of Bridge Width

It should be widened to 12.0m comprising 2-lane carriageway of 7m with 1m shoulder and 1.5m walkway (including railing) at both sides, according to the Provincial Transport Development Plan, 2004.

##### (2) Application of Higher Live Load for Bridge Design

It should be considered HL-93 live load for bridge design since the Provincial Road 719 will be upgraded from Class IV to Class III.

##### (3) Pavement

It should be paved with asphalt concrete based on the Provincial Transport Development Plan, 2004.

##### (4) Consideration of Water Supply Pipe Load for Bridge Design

Water supply pipe load (Dia. 320mm, 160kg/m) should be considered in the bridge design.

#### 2. No.37 Tran Bridge, Binh Thuan Province

##### (1) Widening of Bridge Width

It should be widened to 12.0m comprising 2-lane carriageway of 7m with 1m shoulder and 1.5m walkway (including railing) at both sides, according to the Provincial Transport Development Plan, 2004.

##### (2) Application of Higher Live Load for Bridge Design

It should be considered HL-93 live load for bridge design since the Sara-Tam Hung Route will be upgraded from Class IV to Class III.

##### (3) Pavement

It should be paved with asphalt concrete based on the Provincial Transport Development Plan, 2004.

##### (4) Replacement of Irrigation Box Culvert

An irrigation channel crossing the new approach road on the left bank side should be replaced with a box culvert with the following design conditions

confirmed in previous study in 2005;

- Designed canal bank level: 20.97m
- Designed canal bed level: 19.47m
- Designed irrigation output: 5.65m<sup>3</sup>/s
- Designed canal bed width: 3.00m
- Area to be replaced: Within the embankment area of the approach road

### **3. No.43 Tam Ngan Bridge, Ninh Thuan Province**

#### **(1) Widening of Bridge Width**

It should be widened to 8.0m comprising 2-lane carriageway of 7m with 0.5m shoulder at both sides since this bridge will connect with Lam Son – Phuoc Hoa route which has been upgrading so far.

#### **(2) Application of Higher Live Load for Bridge Design**

It should be considered HL-93 live load for bridge design since this bridge will connect with Lam Son – Phuoc Hoa route which has been upgrading so far.

#### **(3) Consideration of Function of the Existing Irrigation Channel**

The existing open channel for irrigation (WxH: 0.6mx0.5m), which crosses the new approach road on the right bank side, should be restored its present function, and consider the easiness of maintenance.

### **4. No.52 Ea Soup Bridge, Dak Lak Province**

#### **(1) Widening of Bridge Width**

It should be widened to 7.0m comprising 2-lane carriageway since this bridge locates in the centre of Ea Soup district with high traffic volume and it serves transportation demand for whole northern area of Ea Soup district.

#### **(2) Application of Higher Live Load for Bridge Design**

A higher live load level of H-30 or HL-93 should be applied to this new bridge because all other bridges on the provincial road No.1 have been constructed as permanent RC bridge with design load of H-30 or HL-93.

### **5. No.56 Krong K'mar Bridge, Dak Lak Province**

#### **(1) Widening of Bridge Width**

It should be widened to 7.0m comprising 2-lane carriageway since this bridge locates in the centre of Krong Bong district with high traffic volume and it serves transportation demand for whole eastern area of Krong Bon district.

#### **(2) Application of Higher Live Load for Bridge Design**

A higher live load level of H-30 or HL-93 should be applied to this new bridge because all other bridges on the provincial road No.12 have been constructed as

permanent RC bridge with design load of H-30 or HL-93.

**6. No.83 Ngoi Ngan Bridge, Khanh Hoa Province**

**(1) Widening of Bridge Width**

It should be widen to 9.0m comprising 2-lane carriageway of 7m with 1.0m shoulder at both sides since this bridge locates on Nguyen Hue road which is planed as plain Class III road in Master Plan until year 2020.

**(2) Application of Higher Live Load for Bridge Design**

It should be considered higher live load for bridge design since this bridge locates on Nguyen Hue road which is planed as plain Class III road in Master Plan until year 2020.



## ATTACHMENT 2

### Confirmation of Major Undertakings to be Done by Vietnamese Side

#### 1. Resettlement and Land Acquisition

- The Study Team confirmed that land acquisition and resettlement activity at six bridge sites have been well proceeding including for the construction yard.
- The DOTs of all provinces agreed to complete all resettlement and land acquisition work at least by the end of May 2010, and to provide agreements with the affected people to the Japanese side.

#### 2. Specific Undertakings to be done by Vietnamese Side at Each Bridge Site.

##### (1) No.36 Da Dung Bridge, Binh Thuan Province

- Removal of the existing bridge after completion of a new bridge

##### (2) No.37 Tran Bridge, Binh Thuan Province

- Resettlement of temporary store on approach road of left bank side

##### (3) No.43 Tam Ngan Bridge, Ninh Thuan Province

- Removal of the existing bridge after completion of a new bridge
- Resettlement one house and land acquisition a part of church land

##### (4) No.52 Ea Soup Bridge, Dak Lak Province

- Removal of the existing bridge after completion of a new bridge
- Resettlement of temporary store on approach road of right bank side

##### (5) No.56 Krong K'mar Bridge, Dak Lak Province

- Removal of the existing bridge and a part of the existing approach road which will affect the river flow after completion of a new bridge
- Resettlement of temporary house on approach road of right bank side
- Relocation of telephone and electric lines at the upstream side of the existing bridge before commencement of construction

##### (6) No.83 Ngoi Ngan Bridge, Khanh Hoa Province

- Relocation of electric lines and electric poles on both approach road of downstream side



## **Appendix 6. Necessity of Soft Ground Treatment**

## Appendix 6. Necessity of Soft Soil Treatment

### 3-2-2 Results of Analysis

Representative Embankment Height of approach Road for Bridges, its Safety Factor and when  $F_s=1.2$ , Limited Embankment Height are shown as below.

The Bridge to be required soft ground treatment by PBD method are four bridges of BNO.18, 26, 35 and 56.

Table 3-4 Safety Factor of Embankment on soft ground  
And Limited Embankment Height

Bridge NO.	Safety Factor ( $F_s$ )	Embankment Height (m)	When $F_s=1.2$ , Limited Embankment Height (m)	Thickness of Soft Soil (m)	Note
BNO. 6 A-1 (BH-1)	1.456	2.31	2.80	7.0	
BNO. 6 A-2 (BH-2)	1.302	2.55	2.80	5.8	
BNO. 18 A-1 (BH-1)	0.707	5.10	2.75	8.9	Need treatment
BNO. 26 A-1 (BH-1)	0.934	3.47	2.40	7.5	"
BNO. 26 A-2 (BH-2)	1.009	3.04	2.40	8.5	"
BNO. 35 A-1 (BH-1)	1.146	3.74	3.10	21.8	"
BNO. 35 A-2 (BH-2)	1.064	3.61	3.10	23.5	"
BNO. 56 A-1 (BH-2)	0.640	5.80	2.80	7.0	"
BNO. 56 A-2 (BH-1)	0.737	5.30	2.95	5.5	"

Results of Analysis for Soft ground treatment by Plastic Board Drain method are shown  
Table 3-5

Table 3-5 Results of Analysis for Soft ground treatment by PBD method

Bridge NO.	Planning Embankment Height	Necessary Embankment Height	Settle. Value Sc	S.Factor* <sup>1</sup> ( $F_s$ ) imm. after completion	S.Factor* <sup>2</sup> ( $F_s$ ) After com.30 days	Remain* <sup>3</sup> ing Settle. Value Sr	PBD* <sup>4</sup> Interval x Length (m)
BNO.18 A-1 (BH-1)	5.10 m	5.65 m	55.4 cm	1.281	1.352	9.0 cm	1.2 x 9.0
BNO.26 A-1 (BH-1)	3.47 m	3.80 m	35.3 cm	1.205	1.291	5.7 cm	1.3 x 7.5
BNO.26 A-2 (BH-2)	3.04 m	3.40 m	31.9 cm	1.264	1.333	8.4 cm	1.6 x 8.5
BNO.35 A-1 (BH-1)	3.74 m	4.30 m	51.6 cm	1.393	1.483	8.2 cm	1.2 x 22
BNO.35 A-2 (BH-2)	3.61m	4.15m	53.3 cm	1.423	1.532	9.8 cm	1.2 x 24
BNO.56 A-1 (BH-2)	5.80m	6.34m	52.3 cm	1.157	1.211	6.6 cm	1.2 x 7
BNO.56 A-2 (BH-1)	5.30m	5.73m	41.8 cm	1.157	1.223	5.5 cm	1.2 x 6



