

- G = 9.81 m/sec²
- R = normalized rock response;
- S = soil amplification spectral ratio;
- Z = reduction for ductility and risk assessment.

In the absence of data indicated above, EQ may be determined by this formula:

$$\begin{array}{ll} \text{EQ} = 0.10 (W + L/2) & \text{for superstructure} \\ \text{EQ} = 0.1 W & \text{for substructure} \end{array}$$

Where:

L = total live load on the structure.

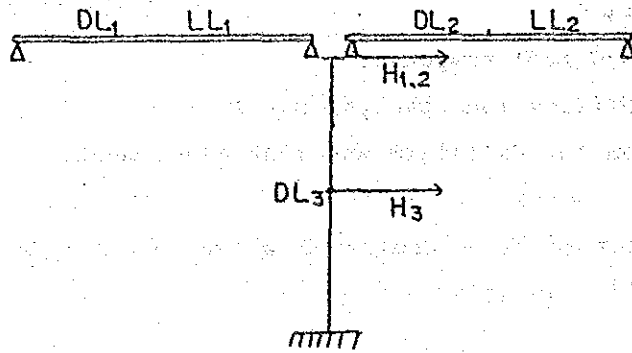
Formula (1) above cannot be applied in this feasibility study because of the absence of Maximum Expected Rock Acceleration Map and inadequate data of soils. Consequently, formula (2) is adopted since the absence of data is allowed in the NSCP.

3.2 Application of Earthquake Design (Study Team)

In case of new construction, the earthquakes design is considered for all new bridges.

In case of repair, the earthquake design is considered for the large scale rehabilitation works, reinforcing high piers and/or for long span and not considered for the minor rehabilitation works.

The earthquakes force, equivalent static horizontal force, is estimated in accordance with the NSCP and applied in the following manner.



Horizontal Seismic Forces:

Derived from superstructure is:

$H_{1.2} = 0.1x(1/2DL_1 + 1/2DL_2 + 0.5LL)$, and action point is at top of bearing

Derived from substructure is:

$H_3 = 0.1x(DL_3)$, and action point is at gravity center.

Where:

- DL: Deal Load
- LL: Live Load
- H_i : Horizontal Seismic Force

The prescription concerning earthquake design is taken from the NSCP.

8.3 Minimum Support Length (NSCP, Appendix E and Japanese Spec-V)

Bearing seats supporting the expansion ends of girder shall be designed to provide a minimum support length N (mm).

The comparison of specification on the minimum support length between NSCP and Japanese standard is discussed as follows:

- (1) NSCP, Philippines; The minimum support length N (mm) is measured, normal to the face of an abutment or pier, not less than that or specified below:

$$N = 305 + 2.5 L + 10 H$$

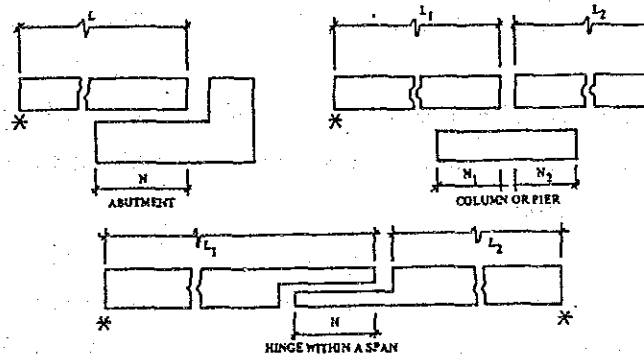
where L = length, in metres, of the bridge deck to the adjacent expansion joint, or to the end of the bridge deck. For hinges within a span, L shall be the sum of L_1 and L_2 the distances to either edge of the hinge. For single span bridges L equals the length of the bridge deck.

For abutments

H = average height, in metres, of columns supporting the bridge deck to the next expansion joint. $H = 0$ for single span bridges.

For columns and/or piers

H = average height of the adjacent two columns or piers in metres.



NOTE: EXPANSION JOINT OR END OF BRIDGE DECK ARE DENOTED BY ASTERISK. (*)

(2) Japanese Specification

The minimum support length N (mm) is specified in the following formula.

$$N = 70 + 0.5L, L \leq 100 \text{ m}$$

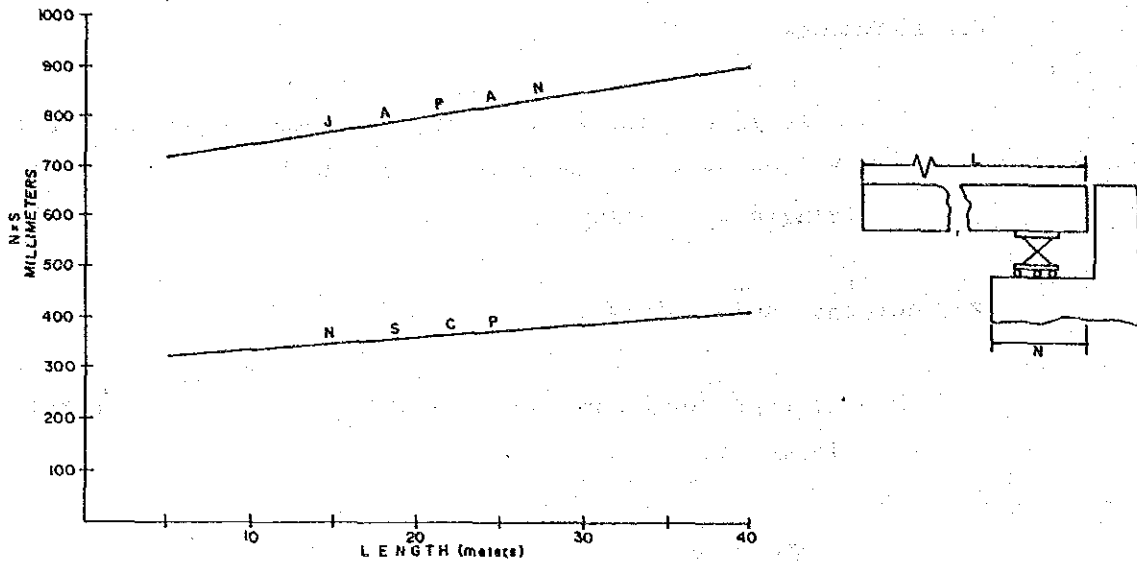
$$N = 80 + 0.4L, L > 100 \text{ m}$$

where:

N = minimum support length (mm)

L = length of bridge deck (m)

(3) Comparison of Minimum Support Length



As a results of the comparison study above, it was realized that the support length of Japanese standards are considerably greater than that of the Philippines.

The support length at the top of the substructure is an important factor of earthquake design. Recently, earthquake design is specially considered for bridge design in the Philippines. Thus the support length of Japanese Standard is recommendable to be applied on the preliminary design of bridges.

9. Selection of Design Method

The two kinds of design methods of bridge structures are discussed in NSCP Vol. II, i.e., SERVICE DESIGN (Allowable Stress Design) and STRENGTH DESIGN (Load Factor Design), where SERVICE LOAD DESIGN (Allowable Stress Design) is principally applied to the preliminary design while STRENGTH DESIGN (Load Factor Design) is treated as

verification of the structural durability, as necessary. The following provisions are taken from the NSCP, Vol. II.

For the Reinforced Concrete Bridges; (NSCP, 8.14.1)

- The design of reinforced concrete members shall be made either with reference to service loads and allowable stresses as provided in SERVICE LOAD DESIGN or, alternatively, with reference to load factors and strengths as provided in STRENGTH DESIGN.

- The strength and serviceability requirements of STRENGTH DESIGN may be assumed to satisfy the SERVICE LOAD DESIGN if the service load stresses are limited to the values given in Article 8.15.2.

For the Steel Bridges; (NSCP, 10.31)

- Allowable stress design is the standard design method for all structure types. It is a method for proportioning structural members using design loads and forces, allowable stresses and design limitations for the appropriate material under service conditions.

10. Superstructure Design

The design methods and manners of the superstructures such as Reinforced Concrete, Prestressed Concrete and Steel Structure shall be based on the provisions prescribed in the NSCP. The design method shall be basically SERVICE DESIGN (Allowable Stress Design) in accordance with the result of the design method previously studied (Refer to 10.4.10)

11. Substructure Design

11.1 Pier Spacing, Orientation and Type (NSCP, 7.1)

Pier shall be located to meet navigational clearance requirements and to give a minimum interference to flood flow. In general, piers should be placed parallel with the direction of the stream current at flood stage. Adequate provisions should be made for drift increasing

span lengths and vertical clearances, proper selection of pier types and by using debris deflectors. Special precautions against scour are required when large cofferdams are placed in unstable stream beds.

11.2 Piers (NSCP, 7.2)

The general requirements governing the depths of foundations given in Section 4 shall apply in the case of tubular steel piers except that steel tubes resting upon gravel foundation without piling shall be carried to a depth greater than 2.44 m below the permanent bed of the stream and to such additional depth as may be necessary to eliminate all danger of undetermined nature.

Piles supporting tubular piers shall thoroughly brace the tubes by extending into the concrete filling a sufficient distance, which in general shall not be less than 1.83 to 2.44 m.

11.3 Abutment (NSCP, 7.4)

Abutments shall be designed to withstand earth pressure as specified in Article 3.20, the weight of the abutment and bridge superstructure, live load on the superstructure or approach fill, wind forces and longitudinal forces when the bearings are fixed, and longitudinal forces due to friction or shear resistance of bearings. The design shall be investigated for any combination of these forces which may produce the most severe condition of loading.

11.4 Foundations (NSCP, 4)

Foundation bearing capacity of foundation soil shall be based on the following.

(1) Theoretical Estimation (NSCP, 4.2.1)

The bearing capacity of the foundation soil may be estimated using accepted theories. Such theories are based on the measurement of soil parameters such as cohesion and angle of friction or on the results of field tests such as the standard

penetration test or the shear vane test.

(2) Approximate Values (NSCP, 4.2.3)

Where testing is not carried out, the bearing capacity and angle of friction of broad basic groups of materials given in Tables 10-8 and 10-9 may be used. These values should be used conservatively; for example, in determining lateral pressures, the minimum angle of friction shall be taken.

Material	Safe Bearing Capacity KN per square meter	
	Minimum	Maximum
Alluvial soils	48	96
Clays	96	383
Sand, refined	96	383
Gravel	192	383
Cemented sand and gravel	479	958
Rock	479	

Angle of Friction					
Earth. Loam	----	30° to 45°	Gravel	-----	30° to 40°
Dry Sand	-----	25° to 35°	Cinders	-----	25° to 40°
Moist Sand	-----	30° to 45°	Coke	-----	30° to 45°
Wet Sand	-----	15° to 30°	Coal	-----	25° to 25°
Compact Earth	--	35° to 40°			

(3) Piles (NSCP, 4.3.1)

In general, the penetration for any pile shall not be less than 3.05 m into hard cohesive or dense granular material nor less than 6.10 m into soft cohesive or loose granular material. Piles for trestle or pile bents shall meet these requirements and, in addition, unless refusal is encountered, shall penetrate not less than 1/3 the length of the pile.

(4) Maximum Design Loads for Piles (NSCP, 4.3.4.5)

In those cases where it is not feasible to make the required subsurface investigations or test loads, the maximum assumed design load for piles shall be as given in the tables below. These values may increase for certain combinations of loads as specified in Article 3.22.

The assumed pile loads shall be substantiated by using a pile driving formula to determine the allowable load when the piles are driven, as provided in Article 3.6.2 — Division II.

Size or Diameter at Butt ^a	Types of Piles			
	Timber (Kn)	Concrete (Kn)	Steel (Friction) (Kn)	Steel Point-Bearing
mm				
200	-	-	142	62 MPa.
250	178	178	178	of point area,
300	214	214	214	not including.
350	249	249	249	the area of
400	285	285	-	any pile tip
500	-	356	-	reinforcement.
600	-	445	-	

* Timber piles diameter to be measured 0.91 m from butt.

(5) Footing (NSCP, 4.4)
Depth (NSCP, 4.4.2)

The depth of footings shall be determined with respect to the character of the foundation materials and the possibility of undermining. Except where solid rock is encountered or in other special cases, footings of all structures, other than culverts, which are exposed to the erosive action of stream currents shall be founded at a depth preferably not less than 1.22 m below the permanent stream bed. Stream piers and arch abutments shall be founded at a depth preferably not less than 1.83 m below stream

bed. The above preferred minimum depth shall be increased as conditions may require.

(6) Caisson is a hollow foundation structure which is prefabricated off-site and transported to location, or built at the site and lowered into place as a single unit. The stability of a caisson is calculated as rigid body supported by spring at its bottom and sides. The fundamental consideration for design of caisson are as follows:

- At the bottom of caisson, maximum reaction due to vertical loading shall not be greater than the allowed vertical soil bearing capacity.
- In front of the side-wall of the caisson, maximum horizontal reaction due to horizontal force shall not be greater than the allowed horizontal soil bearing capacity.
- At the bottom of caisson, resistance shear force shall not be greater than the allowed shear bearing capacity between bottom of caisson and ground.
- Displacement of caisson shall not exceed the allowed displacement.

12. Material and Allowable Stress

12.1 Concrete (NSCP, 8.15.2.1)

Stresses in concrete shall not exceed the following.

(1) Flexure

Extreme fiber stress in compression, f_c	-----	$0.40 f_c'$
Extreme fiber stress in tension for plain concrete, f_t	-----	$0.21 f_r$

Modulus of rupture, f_r , from tests, or, if data are not available:

Normal weight concrete	-----	0.62 $\sqrt{f_c}$
"Sand-lightweight" concrete	-----	0.52 $\sqrt{f_c}$
"All lightweight" concrete	-----	0.46 $\sqrt{f_c}$

(2) Shear

For detailed summary of allowable shear stress, v_c , see Article 8.15.5.2. Shear Stress Carried by Concrete

(3) Bearing Stress

The bearing stress, f_b , on loaded area shall not exceed $0.30 f_c'$.

When the supporting surface is wider on all sides than the loaded area, the allowable bearing stress on the loaded area may be increased by $\sqrt{A_2/A_1}$, but not more than 2.

12.2 Reinforcing Steel

The tensile stress in the Reinforcing Steel f_s shall not exceed the following:

Grade 40 reinforcement	-----	138 MPa
Grade 60 reinforcement	-----	166 MPa

12.3 Structural Steel (NSCP, 10.32.1)

Structural steel shall conform to the materials designated in Table 10.5. (The stresses in this table are in pounds per square inch). The modulus of elasticity of all grades of structural steel shall be assumed to be 200 000 Mpa and the coefficient of linear expansion is 11×10^{-6} per degree Centigrade.

12.4 Pre-stressed Concrete (NSCP, 9.15)

(1) Pre-stressed Steel

- Temporary stress before loss due to creep and shrinkage ----- 0.70 f_s'
- Stress at service load after losses ----- 0.80 f_y^*

(2) Concrete

- Temporary Stresses Before Losses Due to Creep and Shrinkage:

- Compression

Pretensioned members ----- 0.60 f_{ci}

Post-tensioned members ----- 0.55 f_{ci}

- Tension

Precompressed tensile zone ----- No temporary allowable stresses are specified. See Article for allowable stresses after losses.

Other Areas

In tension areas with

no bonded reinforcement ----- 1.40 Mpa or 0.25 $\sqrt{f_{ci}}$

The maximum tensile stress shall

not exceed ----- 0.62 $\sqrt{f_{ci}}$

- Stress at Service Load After Losses Have Occurred:

Compression ----- 0.40 $\sqrt{f_c}$

Tension in the precompressed tensile zone

(a) For members with bonded reinforcement ----- 0.50 $\sqrt{f_c}$

For severe corrosive exposure conditions,

as coastal areas ----- 0.25 $\sqrt{f_c}$

(b) For members without bonded reinforcement -- 0

Tension in other areas is limited by the allowable temporary stresses specified in Article 9.15.2.1.

- Cracking Stress*

Modulus of rupture from tests or if not available.

For normal weight concrete -----	0.62 $\sqrt{f_c}$
For sand-lightweight concrete -----	0.52 $\sqrt{f_c}$
For all other lightweight concrete -----	0.46 $\sqrt{f_c}$

- Anchorage Bearing Stress

Post-tensioned anchorage at service load ----- 20.70 MPa
(but not to exceed 0.9 f'_c)

- Prestressing Steel

Wire, strands, or bars shall conform to anyone of the following specifications.

"Uncoated Stress-Relieved Wire for Prestressed Concrete," AASHTO M 204.

"Uncoated Seven-Wire Stress-Relieved Strand for Prestressed Concrete," AASHTO M 203.

"Uncoated High-Strength Steel Bar for Prestressing Concrete," ASTM A 722.

Wire, strands, and bars not specifically listed in AASHTO M 204, AASHTO M 203, or ASTM A 722 may be used provided they conform to the minimum requirements of these specifications.

Notations:

- f_c' = specified compressive strength of concrete, MPa
- f_r = modulus of rupture of concrete, MPa
- f_c = extreme fiber compressive stress in concrete at service loads
- A_1 = loaded area

A_2 = maximum area of the portion of the supporting surface that is geometrically similar to and concentric with the loaded area.

MPa = mega pascal

f_s' = ultimate strength of prestressing steel

f_y^* = yield point stress of prestressing steel

f_{ci} = compressive strength of concrete at 28 days.

(Refer to Tables 10.5, 10.6 and 10.7)

Table 10.5 MINIMUM MATERIAL PROPERTIES (STRUCTURAL STEEL)

Type	Minimum Material Properties: Structural Steel			
	Structural Steel	High-Strength Low-Alloy Steel		High Yield Strength, Quenched and Tempered Alloy Steel
AASHTO Designation ²	M 183	M 223	M 222	M244
Equivalent ASTM Designation	A 36	A 572 Grade 50	A 588	A 514 ^b A 517 ^{b-c}
Thickness of Plates	Up to 200mm incl. ^g	Up to 50mm incl.	Up to 100mm incl.	Up to 63 1/2mm incl. Over 63 1/2 mm 100 mm incl.
Shapes ^d	All Groups ^e	Shapes thru 635 kg/m	All Groups	Not Applicable Not Applicable
Minimum Tensile Strength, F _u (MPa)	400	448	483	758 689
Minimum Yield Point or Minimum Yield Strength, F _y (MPa)	248	345	345	689 620

^aExcept for the mandatory notch toughness and weldability requirements, the ASTM designations are similar to the AASHTO designations. Steels meeting the AASHTO requirements are prequalified for use in welded bridges.

^bQuenched and tempered alloy steel structural shapes and seamless mechanical tubing meeting all mechanical and chemical requirements of ASTM A 514/A 517, except that the specified maximum tensile strength may be 965, Mpa for structural shapes and 1000 Mpa for seamless mechanical tubing, shall be considered as ASTM A 514/A517 steel.

^cMaterials ordered to ASTM A 517 specifications shall comply with toughness requirements of AASHTO M 244.

^dGroups 1 and 2 include all shapes except those in Groups 3, 4 and 5. Group 3 includes L-shapes over 19 mm in thickness. HP shapes over 152 kilograms/m and the following W shapes:

Designation:

- W36 x 230 to 300 incl.
- W33 x 200 to 240 incl.
- W14 x 142 to 211 incl.
- W12 x 120 to 190 incl.

Group 4 includes the following W shapes: W14 x 219 to 550 incl.

Group 5 includes the following W shapes: W14 x 605 to 730 incl.

For breakdown of Groups 1 and 2 see ASTM A 6.

^eLimited to 100 mm thickness for structural members other than bearing assembly components.

Table 10.6 MINIMUM MATERIAL PROPERTIES (PINS, ROLLERS AND ROCKERS)

	Minimum Material Properties Pins, Rollers, and Rockers				
	Expansion rollers shall be not less than 100 mm in diameter				
AASHTO Designation ² with Size Limitations	M 169 100 mm in dia. or less	M 102 To 500 mm in dia.	M 102 To 500 mm in dia.	M 102 To 250 mm in dia.	M 102 To 500 mm in dia.
ASTM Designation Grade or class	A 108 Grades 1016 to 1030 incl.	A 668 class C	A 668 Class D	A 668 Class F	A 668 ^b Class G
Minimum Yield Point, mpa F _y	248 ^a	228	258	345	345

^aFor design purpose only. Not a part of the A 108 specifications. Supplementary material requirements should provide guarantee that material will meet these values.

^bMay substitute rolled material of the same properties.

Table 10.7 ALLOWABLE STRESSES OF MATERIALS

I T E M	D E S C R I P T I O N	CLASSIFICATION OF MATERIALS		ALLOWABLE STRENGTH (σ)		REMARKS	
		CLASS	SPECIFIED STRENGTH MPa	FORMULA	σ (MPa)		
● SUPERSTRUCTURE	1. Structural Steel	Axial tension and tension in extreme tension members subject to bending. Compression in extreme fibers of member subject to bending when (A) Compression flange is supported laterally by embedment in concrete (B) Partially supported with l/b not greater than 3b	F _y = 248	0.55 f _y	136.4	1390	
			F _y = 345	0.55 f _y	189.8	1935	
	2. Reinforcing Steel			137.888 - 0.004 (l/b)	136.4	1390	
					138.0	1407	
	3. Prestressing Steel	Temporary stress before loss due to creep and shrinkage Stress at service load after losses		0.70 f' _s			
				0.80 f _y			
	4. Concrete	Extreme fiber stress in compression (f _c) Extreme fiber stress in tension for plain concrete (f _t)	CLASS "A"	f' _c = 20.68	0.40 f' _c	8.272	84
					0.21 f _t		
	5. Prestressed Concrete	(1.) Temporary stresses before losses due to creep and shrinkage A. Post-tensioned members (Compression) B. Pre-tensioned members (Compression) Tension in precompressed tensile zone In tension areas with no bonded reinforcement (2.) Stresses at service load after losses have occurred Compression Tension in the precompressed tensile zone A.) For members with bonded reinforcement For severe corrosive exposure conditions, such as coastal areas For members without bonded reinforcement (3.) Cracking stress For normal weight concrete (4.) Anchorage bearing stress		f' _{ci} = 34.5	0.55 f' _{ci}	18.9	193
				f' _{ci} = 34.5	0.60 f' _{ci}	20.7	211
				f' _{ci} = 34.5	0		
				f' _{ci} = 34.5	1.40 MPa or 0.25√f' _{ci}	1.47	15
				f' _c = 34.5	0.40 f' _c	13.8	141
f' _c = 34.5				0.50√f' _c	2.94	30	
f' _c = 34.5				0.25√f' _c	1.47	15	
f' _c = 34.5							
f' _c = 34.5				0.62√f' _c	3.64	37	
f' _c = 34.5				20.70 MPa	20.70	211	
● SUBSTRUCTURE	1. Structural Steel	See No. 1 Superstructure					
	2. Reinforcing Steel						
	3. Steel H-Pile						
	4. Prestressing Steel	See No. 3, Superstructure					
	5. Concrete	Normal Weight Concrete					
	6. Precast Concrete Pile	Normal Weight Concrete					
	7. Prestressed Concrete for Pile	Normal Weight Concrete					
8. Cast-in-Place Concrete Pile	Normal Weight Concrete						

13. Design Standards

In studying and determining the design criteria, the NSCP is the primary source. However, the following standards were also considered in addition to the NSCP.

- (1) AASHTO, STANDARD SPECIFICATION for Highway Bridges, THIRTEENTH EDITION, 1983
- (2) A policy on Geometric Design of Highway and Streets, AASHTO, 1984
- (3) HIGHWAY DESIGN GUIDELINES, D.P.W.H.
- (4) BRIDGE DESIGN GUIDELINES (PART - IV), D.P.W.H.
- (5) SPECIFICATION FOR HIGHWAY BRIDGES, JAPAN ROAD ASSOCIATION, 1978

10.4.14 Unit Conversion

The unit being utilized in the preliminary design is based on the following relationships between Metric and Systems International Unit.

$$1 \text{ Pa} = 1 \text{ N/m}^2$$

$$1 \text{ kgf} = 9.80665 \text{ N}$$

$$1 \text{ N/cm}^2 = 10 \text{ KPa} = 10,000 \text{ Pa}$$

$$1 \text{ KN/cm}^2 = 10 \text{ MPa} = 10,000,000 \text{ Pa}$$

$$1.0 \text{ kgf/cm}^2 = 9.80665 \text{ N/cm}^2 = 98066.5 \text{ Pa}$$

$$1,000 \text{ kgf/cm}^2 = 9.80665 \text{ KN/cm}^2 = 98,066,500 \text{ Pa}$$

$$70 \text{ kgf/cm}^2 = 6.865 \text{ MPa}$$

$$1,200 \text{ kgt/cm}^2 = 117.68 \text{ MPa}$$

$$1,400 \text{ kgg/cm}^2 = 137.3 \text{ MPa}$$

APPENDIX 10.3

STANDARD BRIDGE WIDTH OF PREVIOUS PROJECTS

AP 10.2 STANDARD BRIDGE WIDTH OF PREVIOUS PROJECTS

DESCRIPTIONS	YEAR PREPARED	ISSUED BY	BRIDGE WIDTH
1. LAOAG - ALLACAPAN ROAD (PHASE II)	-	DPWH	0.76 + 7.32 + 0.76
2. BAUANG BRIDGE (MNR) PONY	-	DPWH	0 + 6.10 + 0
3. PLARIDÉL BRIDGE truss (PANGASINAN)	-	DPWH	0.76 + 7.32 + 0.76
4. TYPICAL COMPOSITE I-BEAM BRIDGE	May 1970	DPWH	0.46 + 7.32 + 0.46
5. MAG-AMPON BRIDGE	July 1982	DPWH	0.76 + 7.32 + 0.76
6. TYPICAL ABUTMENT FOR 100 FT. SPAN AASHO	Sept. 1982	DPWH	0.76 + 7.32 + 0.76
7. STANDARD 20,30,40, 50, AND 60 FT. BAILEY BRIDGE	June 1981	DPWH	3.937
8. STD. 100 FT. SPAN AASHO PSC-I-BEAM (POST TENSIONED)	June 1982	DPWH	0.46 + 7.32 + 0.46
9. STANDARD 100 FT. PRESTRESSED CONCRETE GIRDER BRIDGE SPAN	Aug. 1978	DPWH	0.46 + 7.32 + 0.46
10. RC-TEE BEAM	Sept. 1971	DPWH	0.76 + 7.32 + 0.76
11. STANDARD STEEL BRIDGE FOR 45 M SPAN (JUMBO)	Jan. 1984	DPWH	0.76 + 7.32 + 0.76
12. STANDARD 23.0 M SPAN R.C. BOX	May 1966	DPWH	0.76 + 7.32 + 0.76
13. STANDARD 100 FT. PRESTRESSED CONCRETE GIRDER BRIDGE	Aug. 1978	DPWH	0.46 + 7.32 + 0.46
14. STD. 15.0 M RCDG	-	DPWH	0.76 + 7.32 + 0.46
15. STD. 10 M RCDG	Oct. 1975	DPWH	0.46 + 7.32 + 0.46
16. STD. RCDG BRIDGE (8.0 M)	Sept. 1977	DPWH	0.76 + 7.32 + 0.76
17. STD. STEEL I BEAM BRIDGE (25 M)	Aug. 1, 1981	NIPPON KOKAN K.K.	0.76 + 7.32 + 0.76
18. STD. 12 M SPAN RCDG	-	RC GAITE	0.75 + 7.32 + 0.75
19. STD. 12 M RCDG SPAN	Jan. 1976	DPWH	0.76 + 7.32 + 0.76
20. STD. 12 M RCDG SPAN	-	DPWH	0.46 + 7.32 + 0.46
21. STD. RCDG 14 M SPAN	-	DPWH	0.76 + 7.32 + 0.76

APPENDIX 10.4

COMPARATIVE DESIGN

1. Comparative Design
2. Labangan Bridge
 - 2.1 Foundation
 - 2.2 Superstructure and Substructure
3. Tagamusing Bridge
4. Bued Bridge
5. Bauang Bridge
6. Indiana Bridge
7. Pinacanauan Bridge
8. Pared Bridge
9. Jiabong Bridge

1. Comparative Design

Preliminary design is carried out based on its planning conditions and design criteria, however, the actual bridge site conditions must also be considered to determine the practical way of preliminary design. Thus, a comparative design to select the most suitable rehabilitation method is important before the major preliminary design. The comparative design is concerned with the fundamental studies such as alignment, types of superstructure, substructure and foundation. The comparative design was carried out for the following bridges.

Bridge Name	Comparative Design
- Labangan	Type and Span Arrangement of Bridge structures and Type of Foundation
- Tagamusing	Type and Span Arrangement of Bridge Structures
- Bued	Type and Span Arrangement of Bridge Structures and Alternative alignment
- Bauang I	Type and Span Arrangement of Bridge Structures
- Indiana	Type and Span Arrangement of Bridge Structures
- Pinacanauan	Type of Rehabilitation Method
- Pared	Type and Span Arrangement of Bridge Structures
- Jiabong	Type and Span Arrangement of Bridge Structures

Table of Comparative Design

Bridge Name Cases	Span length (m)	Total Length	Superstructure Type	Remarks
1. <u>LABANGAN</u>				
CASE I	3 @ 26.0=78.0		S-I-B	
	1 @ 35.0		Continuous Steel Box	
	1 @ 60.0	260.0m	Continuous Steel Box	
	1 @ 35.0		Continuous Steel Box	
	2 @ 26.0=52.0		S-I-B	

(Continued)

Bridge Name Cases	Span length (m)	Total Length	Superstructure Type	Remarks
CASE II	3 @ 26.0=78.0	260.0m	PC-I	
	1 @ 35.0		Continuous PC Box	
	1 @ 60.0		Continuous PC Box	
	1 @ 35.0		Continuous PC Box	
	2 @ 26.0=52.0		PC-I	
CASE III	8 @ 32.50=260.0	260.0m	Simple PC-I	
CASE IV	8 @ 32.50=260.0	260.0m	Simple S-I-B	Recommended
2. <u>TAGAMUSING</u>				
CASE I	1 @ 15.0	50.0m	PC-I	Recommended
	1 @ 20.0		PC-I	
	1 @ 15.0		PC-I	
CASE II	2 @ 25.0=50.0m	50.0m	PC-I	
3. <u>BUED</u>				
CASE I	1 @ 25.0	500.5m	PC-I	
	4 @ 50.0=200.0		Continuous PC Box	
	1 @ 32.50		PC-T	
	3 @ 50.0=150.0		Continuous PC Box	
	3 @ 31.0=93.0		PC-T	
CASE II	1 @ 25	500.5m	S-I-B	
	4 @ 50.0=200.0		Continuous Steel Box	
	1 @ 32.5		S-I-B	
	3 @ 50.0=150.0		Continuous Steel Box	
	3 @ 31.0=93.0		S-I-B	
CASE III	3 @ 25.0=75.0	500.5m	PCI	
	3 @ 50.0=150.0		Concrete PC Box	
	1 @ 32.5		PC-T	
	6 @ 25.0=150.0		PC-I	
	3 @ 31.0=93.0		PC-T	

(Continued)

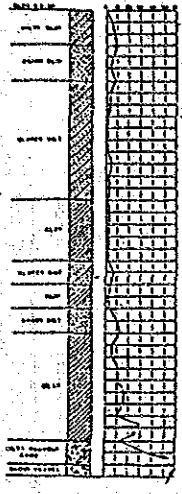
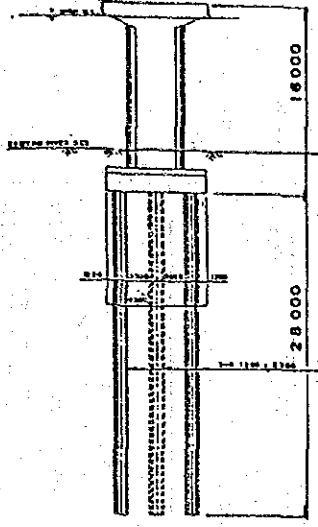
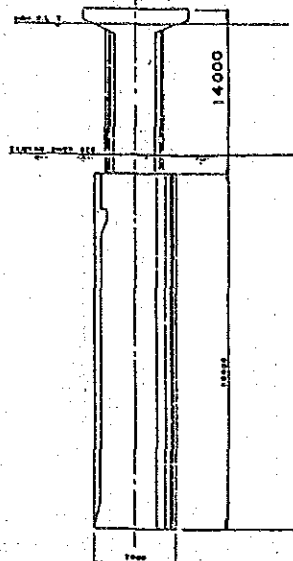
Bridge Name Cases	Span length (m)	Total Length	Superstructure Type	Remarks
CASE IV	3 @ 25.0-75.0	500.5m	PC-I	Recommended
	6 @ 25.0-150.0		PC-I	
	1 @ 32.5		PC-T	
	6 @ 25.0-150.0		PC-I	
	3 @ 31-93.0		PC-T	
4. <u>BAUANG I</u>				
CASE I	9 @ 25.0-225.0	225m	PC-I	Recommended
CASE II	9 @ 25.0-225.0	225m	PC-I	
CASE III	9 @ 25.0-225.0	225m	PC-I	
5. <u>INDIANA</u>				
CASE I	1 @ 19.50	110.0m	S-I-B	Recommended
	3 @ 25.0-75.0		S-I-B	
	1 @ 15.50		S-I-B	
CASE II	1 @ 19.50	110.0m	PC-I	
	3 @ 25.0-75.0		PC-I	
	1 @ 15.50		PC-I	
CASE III	1 @ 17.50	110.0m	PC-I	
	3 @ 25.0-75.0		PC-I	
	1 @ 17.50		S-I-B	
6. <u>PINACANAUAN</u>				
CASE I	1 @ 15.9	383.40m	S-I-B	Recommended
	3 @ 60.0-180.0		Truss	
	15 @ 12.50-187.5		S-I-B	
CASE II	1 @ 15.9	383.40m	S-I-B	
	3 @ 60.0-180.0		Truss	
	2 @ 25.0-50.0		PC-I	
	11 @ 12.50-137.5		S-I-B	

(continued)

Bridge Name Cases	Span length (m)	Total Length	Superstructure Type	Remarks
7. <u>PARED</u>				
CASE I	1 @ 10.00	203.10m	RCDG	
	1 @ 37.50		PC-T	
	1 @ 8.00		RCDG	
	3 @ 49.20=147.60		Truss	
CASE II	2 @ 23.75=47.5	203.10m	PC-I	Recommended
	1 @ 8.00		RCDG	
	3 @ 49.20=147.6		Truss	
8. <u>JLABONG</u>				
CASE I	11 @ 6.82=75.0	75.0m	RC-Slab	
CASE II	2 @ 37.5=75.0	75.0m	PC-T Beam	
CASE III	3 @ 25.0=75.0	75.0m	PC-I Beam	Recommended
CASE IV	6 @ 12.5=75.0	75.0m	Pre-cast PC-T Beam	

2. Labangan Bridge

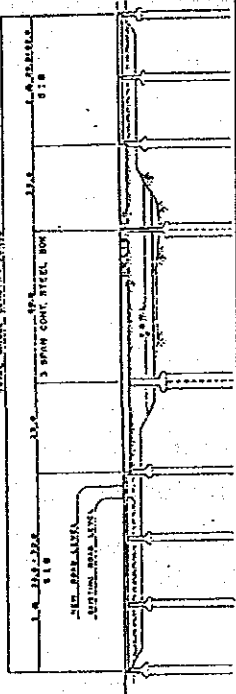
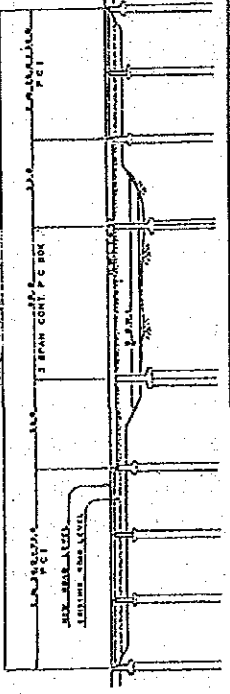
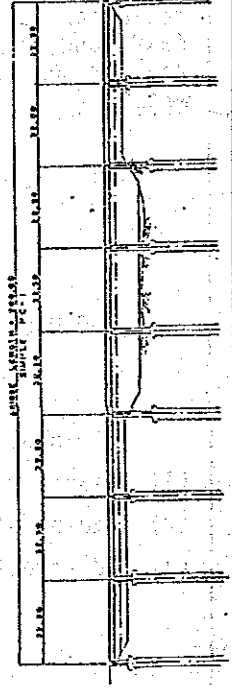
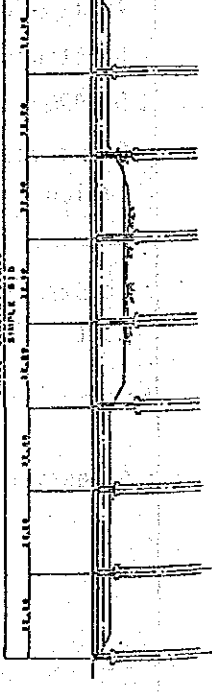
SUMMARY OF COMPARATIVE DESIGN FOR LABANGAN BRIDGE (1/2)
(FOUNDATION)

N - Blows	Cast in Pile	Open Caisson
		
Soil Conditions for Application	Clay and silt are suitable Sand are not suitable	Gravel size less than 10 cm is suitable, but from 10 to 50 cm is slightly difficult.
Applicable Depth	60 m	50 m
Equipment/Construction method	Equipment preparation and installation is comparatively easy, and construction is suited for construction above water	Keeping amending inclination and accurate sinking of open caisson is difficult.
Construction Period	-	-
Construction Cost	1,000,000 pesos	* 2,600,000 pesos
Assessment	Cast in place pile is recommended for the following reasons: (1) Clay and silt soil are suitable for execution drills. (2) Equipment is suitable for the construction above water. (3) Construction cost is cheaper than that of caisson.	
Results	Recommended	-

* Minimum size for construction is considered.

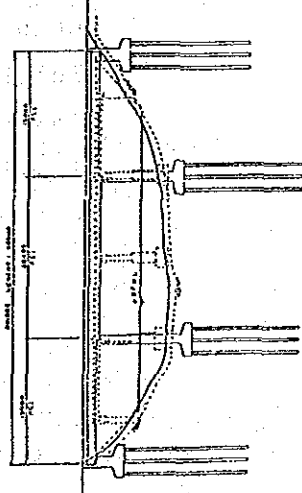
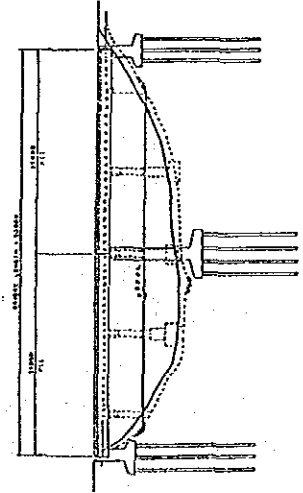
2.2 Superstructure and Substructure

SUMMARY OF COMPARATIVE DESIGN FOR LABAGAN BRIDGE (2/2) (SUPERSTRUCTURE AND SUBSTRUCTURE)

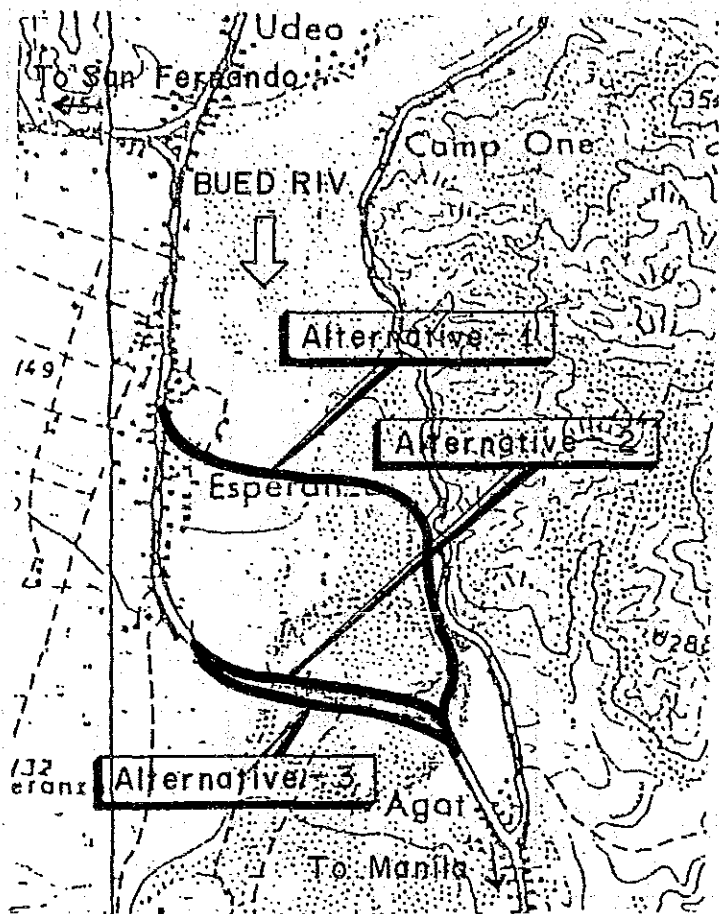
ALTERNATIVES	FEATURES OF ALTERNATIVES	CONSTRUCTION COST (x10 ⁶ Pesos)	ASSESSMENT/RECOMMENDATION
<p>CASE-1</p> 	<ul style="list-style-type: none"> Continuous long span bridge is provided at the low water channel. The steel bridges are considered to minimize the superstructure's effect to the substructure. Web height of box girder is 2.10 m. Imported steel is required. 	<ul style="list-style-type: none"> Superstructure 38,700 Substructure 21,465 Others 6,724 Total 66,889 	<ul style="list-style-type: none"> Lowest construction cost is concrete PC-I bridge, however, steel bridge (CASE-4) is recommendable by reason of that It is required to make the proposed height of the bridge lower.
<p>CASE-2</p> 	<ul style="list-style-type: none"> Continuous long span bridge is provided at the low water channel. The concrete PC bridges are considered to minimize the construction cost. Web height of box girder is 2.50m Local procurement of materials is possible. 	<ul style="list-style-type: none"> Superstructure 29,117 Substructure 23,850 Others 6,724 Total 59,691 	<ul style="list-style-type: none"> A steel bridge is advantageous at places where the bearing stratum layer is very deep, likely more than 30 m. Rapid construction is expected.
<p>CASE-3</p> 	<ul style="list-style-type: none"> Simple span of PC-I bridges are provided to minimize web height. Short span arrangement will give smaller construction costs than longer span arrangements. Web height of girder is 2.03 m. Local procurement of materials is possible. 	<ul style="list-style-type: none"> Superstructure 22,730 Substructure 17,100 Others 6,724 Total 46,554 	
<p>CASE-4</p> 	<ul style="list-style-type: none"> Simple span of steel bridges are provided to minimize web height. The light superstructure is effective for reducing its reaction to substructure. Web height of girder is 2.91 m. Imported steel is required. 	<ul style="list-style-type: none"> Superstructure 27,730 Substructure 13,680 Others 6,724 Total 48,134 	

3. Tagamusing Bridge

SUMMARY OF COMPARATIVE DESIGN FOR TAGAMUSING BRIDGE

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x 10 ⁷ Pesos)	ASSESSMENT / RECOMMENDATION
<p>CASE-1</p> 	<ul style="list-style-type: none"> The existing RCDDG's are replaced by new concrete PG-I bridge. Both side spans are extended from 10 m to 15 m. Center pier P₂ is demolished and the remained two piers were reinforced. 	<ul style="list-style-type: none"> Superstructure 2,992 Substructure 4,110 Others (River Facilities, etc.) 2,060 <p>Total 9,162</p>	<p>CASE-1 is recommended by reason that:</p> <ul style="list-style-type: none"> The pier at the center of bridge (CASE-2) is disadvantageous because the river is considerably steep slope flow and local scouring is severe around pier foundation.
<p>CASE-2</p> 	<ul style="list-style-type: none"> The existing RCDDG's are replaced by new concrete PG-I bridge. The both side spans are extended from 10 m to 15 m. P₁ and P₂ piers are demolished. 	<ul style="list-style-type: none"> Superstructure 3,712 Substructure 4,404 Others (River Facilities, etc.) 2,060 <p>Total 10,176</p>	

4. Bued Bridge



To determine the rehabilitation method of Bued Bridge, the following three (3) alternative alignments are considered for comparison and examination with the technical and economical aspects. These alternative alignments are outlined as follows:

(1) Alternative - 1:

Realignment at the upstream side of the existing bridge is planned and approach roads and new construction of superstructure and substructure are considered: Bridge Length = 369.0 m, Approach Road Length = 1,300 m, Total Length = 1,669.0 m.

(2) Alternative - 2:

Raising of the existing bridges on the existing alignment is planned at the girder bridge portion and reconstruction of superstructure is considered at the RCDG and truss bridge portion including pony truss: Bridge Length = 500.38 m, Approach Road Length =

236.0 m, Total Length = 736.4 m.

(3) Alternative - 3:

Alignment is shifted to the downstream side of adjacent existing bridge and approach roads and new construction of superstructure and substructure are considered: Bridge Length = 500.5 m, Approach Road Length = 280.0 m, Total Length = 780.5 m.

Comparison of Construction Cost
on Alignment Comparison for Bued Bridge

Unit: $\times 10^3$ Pesos

	Alternative-1	Alternative-2	Alternative-3
- Superstructure	41,326	46,901	54,712
- Substructure	22,039	18,264	19,952
- Others (River Facilities, etc.)	26,981	20,228	17,838
Total	89,346	85,393	92,502

The alignment of alternative-3 is recommendable because of the following:

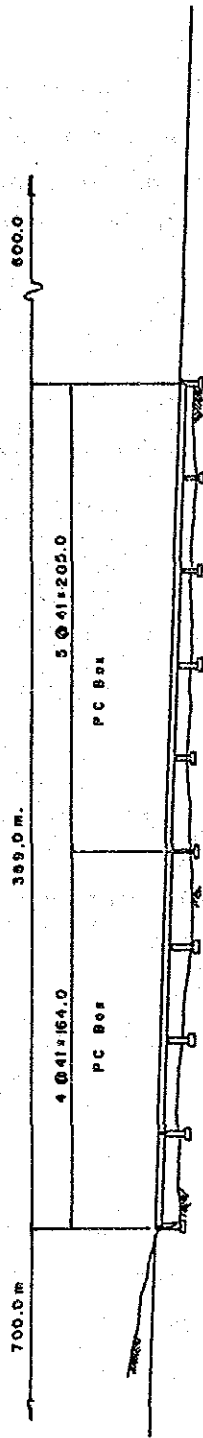
- The alignment of alternative-1 on the steep slope of the left bank of Bued river requires the costly work of cutting slope and embankment.

- although the construction cost of alternative-2 is rather cheap in comparison with other alternatives, Sophisticated construction methods are required for raising the existing girders. Furthermore, a long and costly temporary bridge is necessary during the construction.

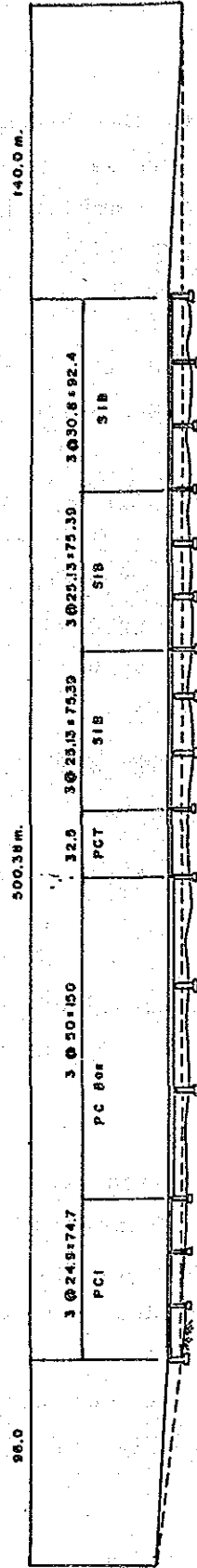
- Alternative-3 can be constructed without long and costly temporary bridge. (Refer to Fig. 10.8)

ALIGNMENT COMPARATIVE DESIGN

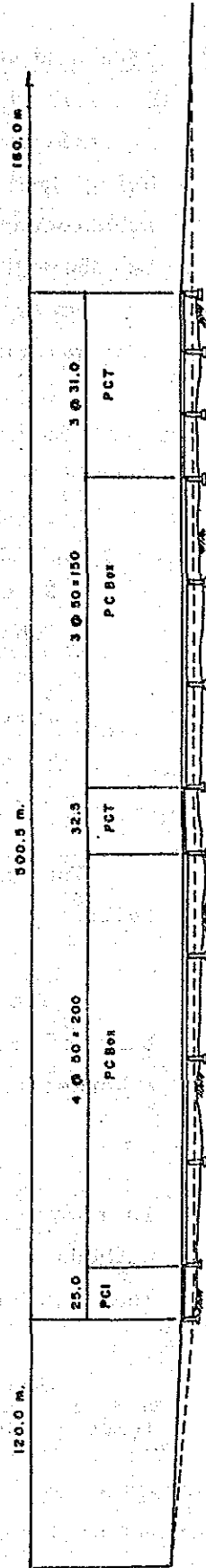
ALTERNATIVE 1



ALTERNATIVE 2

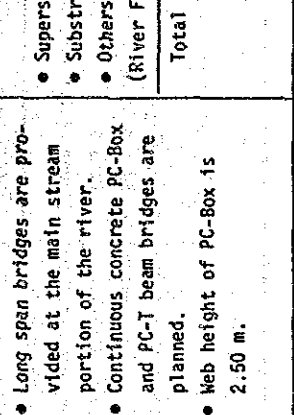
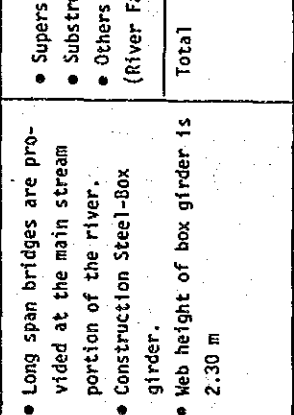
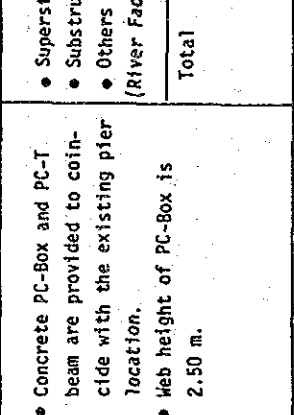
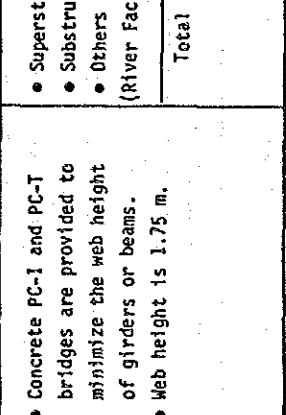


ALTERNATIVE 3



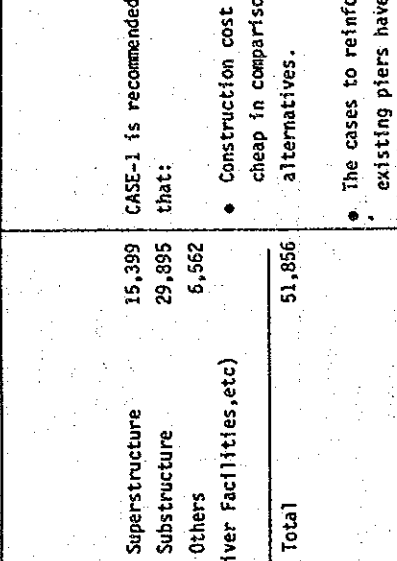
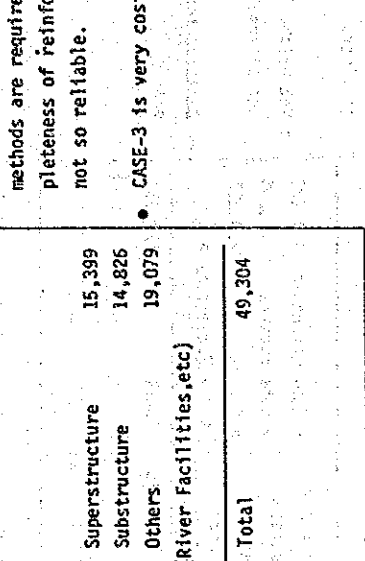
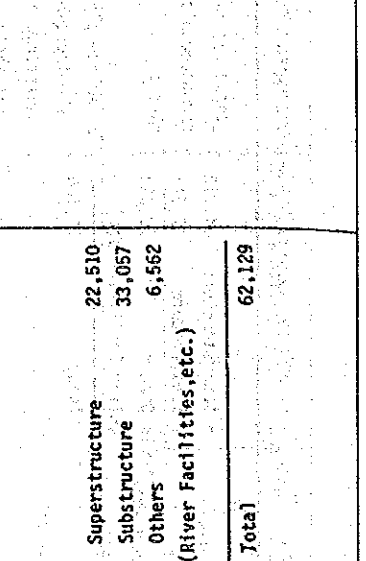
SUMMARY OF COMPARATIVE DESIGN FOR BUED BRIDGE

4. Comparative Result

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x10 ⁶ Pesos)	ASSESSMENT/RECOMMENDATION
<p>CASE - 1</p> 	<ul style="list-style-type: none"> Long span bridges are provided at the main stream portion of the river. Continuous concrete PC-Box and PC-T beam bridges are planned. Web height of PC-Box is 2.50 m. 	<ul style="list-style-type: none"> Superstructure 54,712 Substructure 17,245 Others 19,223 (River Facilities, etc) Total 91,180 	<p>CASE-4 of alternatives is recommendable by reason that :</p> <ul style="list-style-type: none"> As new piers coincide with the location of that of existing, the new piers do not obstruct the current of river. Web height is lowest among the alternatives. Construction cost is cheapest.
<p>CASE - 2</p> 	<ul style="list-style-type: none"> Long span bridges are provided at the main stream portion of the river. Construction Steel-Box girder. Web height of box girder is 2.30 m 	<ul style="list-style-type: none"> Superstructure 141,483 Substructure 17,245 Others 19,223 (River Facilities, etc) Total 177,951 	
<p>CASE - 3</p> 	<ul style="list-style-type: none"> Concrete PC-Box and PC-T beam are provided to coincide with the existing pier location. Web height of PC-Box is 2.50 m. 	<ul style="list-style-type: none"> Superstructure 41,634 Substructure 21,752 Others 19,223 (River Facilities, etc) Total 82,609 	
<p>CASE - 4</p> 	<ul style="list-style-type: none"> Concrete PC-I and PC-T bridges are provided to minimize the web height of girders or beams. Web height is 1.75 m. 	<ul style="list-style-type: none"> Superstructure 35,102 Substructure 24,967 Others 19,223 (River Facilities, etc) Total 79,292 	

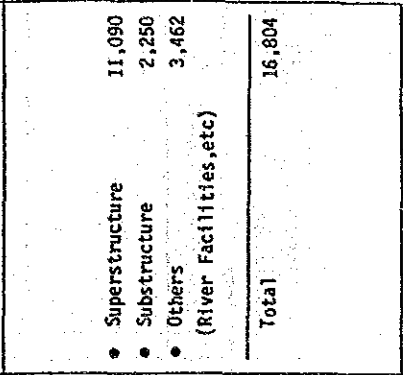
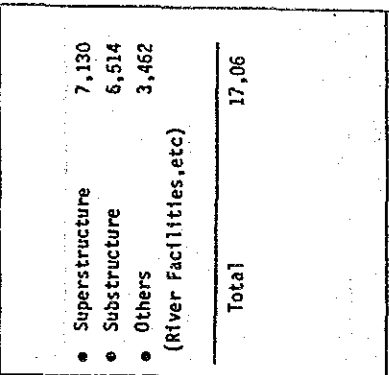
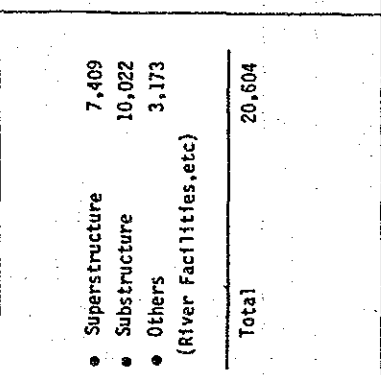
5. Bauang Bridge

SUMMARY OF COMPARATIVE DESIGN FOR BAUANG BRIDGE

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x10 ³ Pesos)	ASSESSMENT / RECOMMENDATION
<p>CASE-1</p> 	<ul style="list-style-type: none"> • New construction of concrete PC-1 bridge (2-lanes) is constructed in parallel with the existing bridge at upstream. • The existing bridge will be demolished after completion of new bridge 	<ul style="list-style-type: none"> • Superstructure 15,399 • Substructure 29,895 • Others (River Facilities, etc) 6,562 <hr/> <p>Total 51,856</p>	<p>CASE-1 is recommended by reason that:</p> <ul style="list-style-type: none"> • Construction cost is relatively cheap in comparison with other alternatives. • The cases to reinforce the existing piers have problems that sophisticated construction methods are required and completeness of reinforcement is not so reliable. • CASE-3 is very costly.
<p>CASE-2</p> 	<ul style="list-style-type: none"> • The existing pony trusses are replaced by new concrete PC-1 bridge. • Substructure and foundation are reinforced to sustain the new superstructure. 	<ul style="list-style-type: none"> • Superstructure 15,399 • Substructure 14,826 • Others (River Facilities, etc) 19,079 <hr/> <p>Total 49,304</p>	
<p>CASE-3</p> 	<ul style="list-style-type: none"> • In initial stage, the new concrete PC-1 bridge (1-lane) is constructed as the same location of CASE-1. • Finally, the existing pony trusses are removed and a new superstructure is reconstructed on the existing substructure which is reinforced. 	<ul style="list-style-type: none"> • Superstructure 22,510 • Substructure 33,057 • Others (River Facilities, etc.) 6,562 <hr/> <p>Total 62,129</p>	

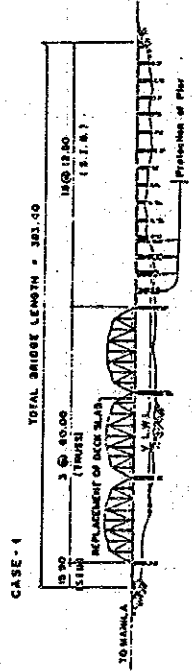
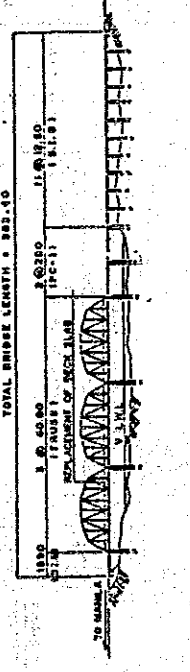
6. Indiana Bridge

SUMMARY OF COMPARATIVE DESIGN FOR INDIANA BRIDGE

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x10 ⁶ Pesos)	ASSESSMENT/RECOMMENDATION
<p>CASE - 1</p> 	<ul style="list-style-type: none"> The existing pony truss bridges are replaced by new S-I-B bridges. Manila side span is additionally replaced by S-I-B bridge. The existing piers including foundations are reinforced to sustain the new superstructures. 	<ul style="list-style-type: none"> Superstructure 11,090 Substructure 2,250 Others (River Facilities, etc) 3,462 <hr/> <p>Total 16,804</p>	<p>CASE-1 is recommended because:</p> <ul style="list-style-type: none"> Construction cost is the cheapest among alternatives. CASE-1 is more resistant to earthquakes than other concrete type bridges. Rapid construction is expected.
<p>CASE - 2</p> 	<ul style="list-style-type: none"> The existing pony truss bridges are replaced by new concrete PC-I bridges. Manila side span is additionally replaced by concrete PC-I bridge. The existing piers including foundations are reinforced to sustain the new superstructures. 	<ul style="list-style-type: none"> Superstructure 7,130 Substructure 6,514 Others (River Facilities, etc) 3,462 <hr/> <p>Total 17,06</p>	
<p>CASE - 3</p> 	<ul style="list-style-type: none"> Concrete PC-I bridges will be newly constructed beside the existing bridges. The substructures including foundations of new construction bridge are also planned. 	<ul style="list-style-type: none"> Superstructure 7,409 Substructure 10,022 Others (River Facilities, etc) 3,173 <hr/> <p>Total 20,604</p>	

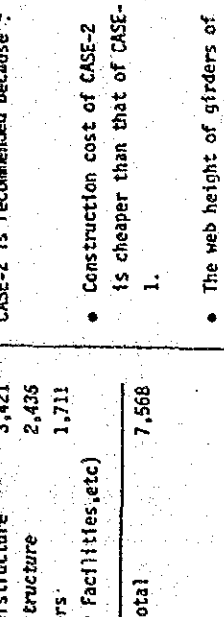
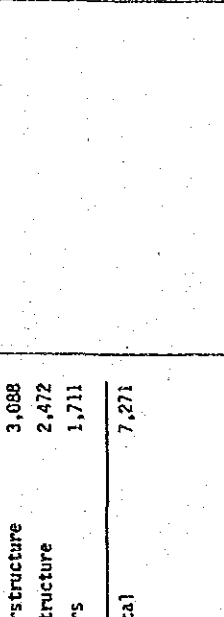
7. Pinacanauan Bridge

SUMMARY OF COMPARATIVE DESIGN FOR PINACANAUAN BRIDGE

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x10 ⁶ Pesos)	ASSESSMENT / RECOMMENDATION
<p>CASE - 1</p>  <p>TOTAL BRIDGE LENGTH = 303.00 40.00 (TRUSS) REPLACEMENT OF EXISTING TRUSS 160.00 (P.I.E.R.) PROTECTION OF PIER TO MANILA ZAMBOANGA</p>	<ul style="list-style-type: none"> The existing piers are reinforced with additional structure to increase rigidity of piers. The river training works such as river bed protection and slope protection at high water channel are also provided. 	<ul style="list-style-type: none"> Superstructure - Substructure 2,866 Others 800 (River Facilities, etc) Total 3,666 	<p>CASE-1 is recommended because:</p> <ul style="list-style-type: none"> Reinforcing works of piers can be done even with the passing vehicular traffic. In case of the construction of a new bridge, considerable temporary works are necessary Cost of reinforcing works of piers is cheaper than new construction of 2-span-bridge.
<p>CASE - 2</p>  <p>TOTAL BRIDGE LENGTH = 303.00 40.00 (TRUSS) REPLACEMENT OF EXISTING TRUSS 160.00 (P.I.E.R.) PROTECTION OF PIER TO MANILA ZAMBOANGA</p>	<ul style="list-style-type: none"> The two (2) span concrete PC-1 bridge is newly constructed with removing the existing piers which become useless. The river training works such as river bed protection and slope protection at high water channel are also provided. 	<ul style="list-style-type: none"> Superstructure 2,833 Substructure 1,236 Others 800 (River Facilities, etc) Total 4,869 	

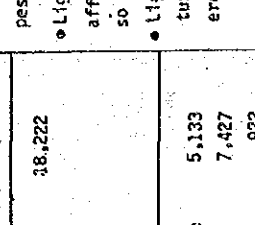
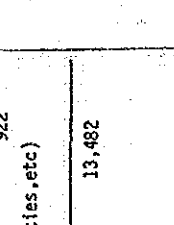
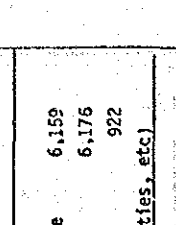
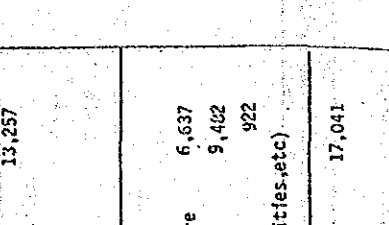
SUMMARY OF COMPARATIVE DESIGN FOR PARED BRIDGE

8. Pared Bridge

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x10 ³ Pesos)	ASSESSMENT / RECOMMENDATION
<p>CASE - 1</p> 	<ul style="list-style-type: none"> The existing temporary bailey bridge behind the existing abutment is replaced by RONG and Pony Truss located on adjacent span also is replaced by PC-T. The cap portion of piers to sustain these superstructure is widened and reinforced. Manila side abutment is reconstructed. 	<ul style="list-style-type: none"> Superstructure 3,421 Substructure 2,436 Others (River Facilities, etc) 1,711 <hr/> <p>Total 7,568</p>	<p>CASE-2 is recommended because:</p> <ul style="list-style-type: none"> Construction cost of CASE-2 is cheaper than that of CASE-1. The web height of girders of PC-I (2.14 m) is higher than that of PC-I (1.50 m). PC-I bridge is advantageous when replacing the existing pony truss with a floor height of 1.20 m.
<p>CASE - 2</p> 	<ul style="list-style-type: none"> The existing temporary bailey bridge and pony truss are replaced by 2-span PC-I bridge. Piers and abutment are newly constructed. 	<ul style="list-style-type: none"> Superstructure 3,088 Substructure 2,472 Others 1,711 <hr/> <p>Total 7,271</p>	

9. Jiabong Bridge

SUMMARY OF COMPARATIVE DESIGN FOR JIABONG BRIDGE

ALTERNATIVES	FEATURE OF ALTERNATIVES	CONSTRUCTION COST (x10 ³ Pesos)	ASSESSMENT / RECOMMENDATION
<p>CASE-1</p> 	<ul style="list-style-type: none"> Span Arrangement: 11 75.0 = 75.0 m Superstructure Type: RC-Slab New RC-Slab bridge is constructed taking into consideration the identical span length of the existing bridge. 	<ul style="list-style-type: none"> Superstructure 1,700 Substructure 25,600 Others 922 (River Facilities, etc.) Total 28,222 	<p>CASE-4 is recommended because:</p> <ul style="list-style-type: none"> Construction cost is the cheapest alternatives Lighter superstructure do not affect the foundation of piers so much. Lighter weight of superstructure is convenient for its erection.
<p>CASE-2</p> 	<ul style="list-style-type: none"> Span Arrangement: 3 25.0 = 75.0 m Superstructure Type: PC-I beam Medium span length is planned for optimization of construction cost. 	<ul style="list-style-type: none"> Superstructure 5,133 Substructure 7,427 Others 922 (River Facilities, etc.) Total 13,482 	
<p>CASE-3</p> 	<ul style="list-style-type: none"> Span Arrangement: 2 37.5 = 75.0 m Superstructure Type: PC-T beam Longer span length is planned to reduce the number of piers 	<ul style="list-style-type: none"> Superstructure 6,159 Substructure 6,175 Others 922 (River Facilities, etc.) Total 13,257 	
<p>CASE-4</p> 	<ul style="list-style-type: none"> Span Arrangement: 6 12.5 = 75.0 m Superstructure Type: Precast PC-T beam Shorter span length is planned for optimization of construction cost. 	<ul style="list-style-type: none"> Superstructure 6,637 Substructure 9,402 Other 922 (River Facilities, etc.) Total 17,041 	

APPENDIX 11.1

DETAILED CONSTRUCTION COST FOR BRIDGES

ADOPTED PRICE

Item No.	Description	Unit	Price						Component (%)		Taxes
			Region 1	Region 2	Region 3	Region 4	Region 5	Region 8	Foreign	Local	
(I) EARTHWORK AND ROAD WORKS											
100	Clearing and Grubbing	Sq.m	2.16	2.16	2.12	2.12	2.16	2.18	7	83	10
102	Common excavation	Cu.m	43.8	43.8	42.9	42.9	43.8	44.2	67	23	10
103(2)	Ridge excavation above low water level	Cu.m	58.5	58.5	57.3	57.3	58.5	59.0	63	27	10
103(2)S	Bridge excavation below low water level	Cu.m	111	111	109	109	111	112	61	29	10
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	1	1	1	1	1	72	18	10
104(1)	Embankment	Cu.m	69.0	69.0	67.7	67.7	69.0	69.7	73	17	10
104(S)	Selected borrow for backfill	Cu.m	120	120	118	118	120	122	36	54	10
200	Aggregate subbase course	Cu.m	193	195	191	189	195	195	72	18	10
311(2)	FCC Pavement (Reinforced)	Sq.m	457	474	457	423	465	474	62	28	10
(II) SUPERSTRUCTURE WORKS											
101(S)	Removal concrete structure	Cu.m	912	912	894	894	912	921	43	47	10
101(1)	Removal steel structure (bridge)	LS	1	1	1	1	1	1	67	23	10
401	Railing	m	760	803	760	717	789	803	56	34	10
402	Timber structure (Detour bridge)	span	55700	55700	54500	61900	45200	43300	31	59	10
403(S)	Structural steel (Detour bridge)	Sq.m	5180	5380	5080	4980	5180	5430	75	15	10
404	Reinforcing steel	kg	17.4	18.7	18.4	16.3	17.9	18.5	72	18	10
405(1)	Structural concrete, Class A	Cu.m	2700	2860	2700	2600	2760	2760	55	35	10
407	Prestressed concrete bridge	Cu.m	15600	15800	15600	14400	15800	16100	68	22	10
408	Steel bridge(I-beam)	ton	61400	61400	60200	60200	61400	62000	81	9	10
411	Paint	Sq.m	68.4	71.1	67.1	65.8	68.4	71.7	13	77	10
(III) SUBSTRUCTURE WORKS											
101(S)	Removal of concrete structure	Cu.m	912	912	894	894	912	921	43	47	10
101(1)	Removal of steel structure	LS	1	1	1	1	1	1	67	23	10
400(3)	Steel H-piles	m	3260	3380	3190	3130	3260	3410	75	15	10
400(4)	Precast concrete pile (400X400mm)	m	787	831	801	742	801	815	70	20	10
400(6)	Steel sheet pile	m	3290	3410	3220	3160	3290	3440	75	15	10
400(7)	Precast concrete sheet pile	m	569	601	580	537	580	587	69	21	10
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	7540	7270	6730	7270	7400	70	20	10
404	Reinforcement steel	kg	15.1	16.2	15.9	14.1	15.5	16.2	72	18	10
405(1)	Structural concrete, Class A	Cu.m	1890	2000	1890	1820	1930	1930	61	29	10
405(5)	Seal concrete	Cu.m	1710	1800	1710	1640	1740	1740	63	27	10
501	Grouted riprap	Cu.m	936	989	962	883	945	883	43	47	10
505	Stone masonry	Cu.m	845	893	869	797	853	797	48	42	10
509	Gabion	Cu.m	663	663	688	625	663	600	62	28	10
(IV) RIVER TRAINING WORKS											
400(1)	Untreated timber pile	m	134	134	131	149	109	104	49	41	10
400(4)	Precast concrete pile (400X400mm)	m	787	831	801	742	801	816	70	20	10
400(6)	Steel sheet pile	m	3290	3410	3220	3160	3290	3440	75	15	10
404	Reinforcement steel	kg	15.1	16.2	15.9	14.1	15.5	16.2	72	18	10
405(1)	Structural concrete, Class A	Cu.m	1890	2000	1890	1820	1930	1930	61	29	10
405(5)	Seal concrete	Cu.m	1710	1800	1710	1640	1740	1740	63	27	10
504	Grouted riprap	Cu.m	936	989	962	883	945	883	43	47	10
505	Stone masonry	Cu.m	845	893	869	797	853	797	48	42	10
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	300	311	283	300	272	28	62	10
509	Gabion	Cu.m	663	663	688	625	663	600	62	28	10
(V) SPECIAL WORKS FOR REHABILITATION											
800	Additional stringer	ton	41300	42900	40500	39700	41300	43300	76	14	10
801	Additional sidewalk	Sq.m	6880	7150	6750	6880	6690	7220	73	17	10
802	Reinforcing beam of RCOG	Cu.m	5850	6180	5960	5520	5960	6070	56	34	10
803	Widening of pier coping	Cu.m	8520	9000	8680	8040	8680	8840	53	37	10
(VI) TEMPORARY WORKS											
900	Scaffolding	Sq.m	156	156	153	153	156	158	70	20	10
901	Staging	Cu.m	220	220	216	216	220	222	62	28	10
902	Temporary bridge	Sq.m	5180	5380	5080	4980	5180	5430	75	15	10
903	Preparation works	LS									

SUMMARY OF CONSTRUCTION COST ESTIMATE (1/2)

Unit : Peso

Reg- ion No.	Bridge No.	Bridge Name	Classification	Construction Cost		Component		Totals
					Foreign	Local		
1	4	48 PLARIDEL	Repair	27430243.02	18448071.69	6239147.03	2743024.30	
1	5	54 TAGAHUSING	Reconstruction	11406055.06	7593823.01	2671626.54	1140605.51	
1	6	58 BUED	Reconstruction	89967667.15	61799860.70	19171039.74	8996766.71	
1	7	65 LOMBOY	Replacement of Superstructure	727816.95	423830.77	231204.48	72781.70	
1	8	77 BAUANG I	Reconstruction	54344695.10	37334857.77	11575367.81	5434469.51	
1	9	77-1 BAUANG II	Reconstruction	33512812.91	22469123.20	7692408.42	3351281.29	
1	10	104 STA CRUZ I	Reconstruction for Extension span	14009919.61	9824619.78	2784307.87	1400991.96	
1	11	113 LANGLANGKA I	Replacement of Superstructure	1949666.36	1145944.64	608755.09	194966.64	
1	12	120 STA MARIA	Reconstruction for Extension span	25175444.47	17258342.34	5399557.68	2517544.45	
1	13	148 TIPICAL	Replacement of Superstructure	2634141.57	1701682.54	669044.87	263414.16	
3	1	3 MARILAO	Replacement of Superstructure	889215.27	524765.92	275527.83	88921.53	
3	2	14 LABANGAN I	Reconstruction	55712209.06	40391523.86	9748464.29	5571220.91	
3	3	22 SULIPAN	Reconstruction	92133556.67	68408313.11	14511887.89	9213355.67	
		Sub-total		409893443.20 (100.0 %)	287324759.33 (70.1 %)	81579339.54 (19.9 %)	40989344.34 (10.0 %)	
2	17	71 INDIANA	Reconstruction for Extension span	19714998.19	13224013.60	4519484.77	1971499.82	
2	18	73 BATU	Repair	23567370.57	15646269.90	5564363.61	2356737.06	
2	19	86 NAMANPARAN I	Replacement of Superstructure	3668474.49	1890752.26	1410874.78	366847.45	
2	20	89 SAN LUIS	Repair	230225.60	124385.27	82817.77	23022.56	
2	21	109 NAGUILAN	Repair	22321970.69	14660026.94	5429746.68	2232197.07	
2	22	113 MALALAN	Repair	6767872.09	3927329.45	2163755.43	676787.21	
2	23	126 BALASIG	Repair	3000923.02	1738254.83	962575.90	300092.30	
2	24	129 SAN PABLO	Repair	10960469.17	7346386.69	2518035.56	1096046.92	
2	25	139 PINACANAUAN	Repair	11015591.78	6944414.88	2969617.72	1101559.18	
2	26	154 PARED	Reconstruction	16592853.29	11025191.21	3908376.75	1659285.33	
3	14	3 PLARIDEL-PULILAN	Repair	21170126.42	15220493.81	3832619.98	2117012.64	
3	15	14 SAN ROQUE	Repair	545320.11	316563.45	174224.64	54532.01	
3	16	43 SICSIKAN	Repair	2994489.65	1853907.57	841133.11	299448.96	
		Sub-total		142550685.07 (100.0 %)	93917989.86 (65.8 %)	34377626.70 (24.1 %)	14255068.51 (10.0 %)	
5	27	19 SUJE(RIZAL)	Replacement of Superstructure	2352451.07	1470754.46	646451.50	235245.11	
5	28	43 GUINOBATAN	Repair	660203.22	381351.34	212891.56	66020.32	
5	29	75 SAN FERNANDO	Repair	1264748.64	704835.13	433438.64	126474.86	
5	30	76 PAMUKID	Repair	823762.07	422533.43	318852.43	82376.21	
5	31	77 SAN ISIDRO	Repair	1259921.24	710636.26	423292.85	125992.12	
5	32	78 SAN GABRIEL	Replacement of Superstructure	1243849.22	637929.86	481534.43	124384.92	
5	33	79 PAHOHO	Repair	202781.25	111091.95	71411.18	20278.12	
5	34	80 TINIGUIBAN	Replacement of Superstructure	1254652.00	673329.97	455856.83	125465.20	
5	35	82 SGT. MATIAS	Repair	148878.26	89475.03	44515.41	14887.83	
5	36	86 NAUBOD I	Repair	713091.87	334385.71	307396.97	71309.19	
5	37	99 SOOK	Repair	667039.54	424708.85	176626.73	66703.95	
5	38	143 KANAPAWAN	Repair	1163000.09	642734.15	403985.93	116300.01	
5	39	154 BASTAD	Repair	2048324.85	1356943.98	486548.38	204832.48	
		Sub-total		13802703.32 (100.0 %)	7960710.12 (57.6 %)	4461722.84 (32.3 %)	1380270.32 (10.0 %)	
4	40	173 GUMACA	Replacement of Superstructure	1916937.84	1205135.04	520109.01	191693.78	
4	41	181 TALABA	Replacement of Superstructure	1984034.93	1049107.62	736523.81	198403.49	
4	42	188 BINAHAAN	Replacement of Superstructure	3044253.58	1795745.47	944082.75	304425.36	
4	43	190 PALSABANGON	Replacement of Superstructure	3213256.29	1526736.97	1365193.69	321325.63	
4	44	206 LAGNAS II	Repair	147430.08	89773.73	42913.34	14743.01	
4	45	208 STO CRISTO	Replacement of Superstructure	2201455.65	1145153.40	836150.68	220145.56	
4	46	220 HAGAPONG	Replacement of Superstructure	2253899.17	1465773.64	562735.61	225389.92	
4	47	223 BIGA	Repair	723830.03	439570.93	211876.10	72383.00	
4	48	227 SAN CRISTOBAL	Repair	4477706.85	3171483.12	858473.04	447770.68	
		Sub-total		19962804.42 (100.0 %)	11888465.92 (59.5 %)	6078058.03 (30.4 %)	1996280.43 (10.0 %)	
8	49	109 JIABONG	Reconstruction	14485412.54	9841303.57	3195567.72	1448541.25	
8	50	120 HINGOBONGAN	Repair	1541911.03	997181.34	390558.58	154191.10	
8	51	160 JUBASAN II	Replacement of Superstructure	7249198.46	4728667.80	1795610.81	724919.85	
8	52	161 JUBASAN I	Reconstruction	14558244.89	9746043.60	3356376.80	1455824.49	
		Sub-total		37834766.92 (100.0 %)	25313176.31 (66.9 %)	8738113.91 (23.1 %)	3783476.69 (10.0 %)	
Grand Total				624044402.93 (100.0 %)	426405101.54 (68.3 %)	135234861.02 (21.5 %)	62404440.29 (10.0 %)	

SUMMARY OF CONSTRUCTION COST ESTIMATE (2/2)

Unit : Peso

Reg- ion	Bridge No.	Bridge Name	Classification	Construction Cost	Foreign	Component Local	Taxes
1	48	PLARIDEL	Repair	27430243.02	18448071.69	6239147.03	2743024.30
1	54	TAGAMUSING	Reconstruction	11406055.06	7593823.01	2671626.54	1140605.51
1	58	BUED	Reconstruction	89967667.15	61799860.70	19171039.74	8996766.71
1	65	LCHBOY	Replacement of Superstructure	727816.95	423830.77	231204.48	72781.70
1	77	BAUANG I	Reconstruction	54344695.10	37334857.77	11575367.81	5434469.51
1	77-1	BAUANG II	Reconstruction	33512812.91	22469123.20	7692408.42	3351281.29
1	104	STA CRUZ I	Reconstruction for Extension span	14009919.61	9824619.78	2784307.87	1400991.96
1	113	LANGLANGKA I	Replacement of Superstructure	1949666.36	1145944.64	608753.09	191966.64
1	120	STA MARIA	Reconstruction for Extension span	25175444.47	17258342.34	5399557.68	2517544.45
1	148	TIPCAL	Replacement of Superstructure	2634141.57	1701682.54	669044.87	263414.16
		Sub-total		261158462.20 (100.0 %)	178000156.44 (68.1 %)	57042459.53 (21.8 %)	26115846.23 (10.0 %)
2	71	INDIANA	Reconstruction for Extension span	19714998.19	13224013.60	4519484.77	1971499.82
2	73	BATU	Repair	23567370.57	15646269.90	5564363.61	2356737.06
2	86	NAMANPARAN I	Replacement of Superstructure	3668474.49	1890752.26	1410874.78	366847.45
2	89	SAN LUIS	Repair	230225.60	124385.27	82817.77	23022.56
2	109	NAGUILAN	Repair	22321970.69	14660026.94	5429746.68	2232197.07
2	113	MALALAN	Repair	6767872.09	3927329.45	2163755.43	676787.21
2	126	BALASIG	Repair	3000923.02	1738254.83	962575.90	300092.30
2	129	SAN PABLO	Repair	10960469.17	7346386.69	2518035.56	1096046.92
2	139	PINACANAUAN	Repair	11015591.78	6944414.88	2969617.72	1101559.18
2	154	PARED	Reconstruction	16592853.29	11025191.21	3908376.75	1659285.33
		Sub-total		117840748.89 (100.0 %)	76527025.03 (64.9 %)	29529648.97 (25.0 %)	11784074.90 (10.0 %)
3	3	MARILAO	Replacement of Superstructure	889215.27	524765.92	275527.83	88921.53
3	14	LABANGAN I	Reconstruction	55712209.06	40391523.86	9749464.29	5571220.91
3	22	SULIPAN	Reconstruction	92133556.67	68408313.11	14511887.89	9213355.67
3	3	PLARIDEL-PULILAN	Repair	21170126.42	15220493.81	3832619.98	2117012.64
3	14	SAN ROGUE	Repair	545320.11	316563.45	174224.64	54532.01
3	43	SICSICAN	Repair	2994489.65	1853907.57	841133.11	299448.96
		Sub-total		173444917.18 (100.0 %)	126715567.72 (73.0 %)	29384857.74 (16.9 %)	17344491.72 (10.0 %)
4	173	GUMACA	Replacement of Superstructure	1916937.84	1205135.04	520109.01	191693.78
4	181	TALABA	Replacement of Superstructure	1984034.93	1049107.62	736523.81	198403.49
4	188	BINAHAAN	Replacement of Superstructure	3044253.58	1795745.47	944082.75	304425.36
4	190	PALSABANGON	Replacement of Superstructure	3213256.29	1526736.97	1365193.69	321325.63
4	206	LAGNAS II	Repair	147430.08	89773.73	42913.34	14743.01
4	208	STO CRISTO	Replacement of Superstructure	2201455.65	1145159.40	836150.68	220145.56
4	220	HAGAPONG	Replacement of Superstructure	2253899.17	1465773.64	562735.61	225389.92
4	223	BIGA	Repair	723830.03	439570.93	211876.10	72383.00
4	227	SAN CRISTOBAL	Repair	4477706.85	3171463.12	858473.04	447770.68
		Sub-total		19962804.42 (100.0 %)	11888465.92 (59.5 %)	6078058.03 (30.4 %)	1996280.43 (10.0 %)
5	19	SUJE(RIZAL)	Replacement of Superstructure	2352451.07	1470754.46	646451.50	235245.11
5	43	GUINOBATAN	Repair	660203.22	381351.34	212831.56	66020.32
5	75	SAN FERNANDO	Repair	1264748.64	704835.13	433438.64	126474.86
5	76	PAMUKID	Repair	823762.07	422533.43	318852.43	82376.21
5	77	SAN ISIDRO	Repair	1259921.24	710636.26	423292.85	125992.12
5	78	SAN GABRIEL	Replacement of Superstructure	1243849.22	637929.86	481534.43	124384.92
5	79	PAKHO	Repair	202781.25	111091.95	71411.18	20278.12
5	80	TINIGUIBAN	Replacement of Superstructure	1254652.00	673329.97	455856.83	125465.20
5	82	SGT. MATIAS	Repair	148878.26	89475.03	14515.41	14887.83
5	86	NAUBOD I	Repair	713091.87	334385.71	307396.97	71309.19
5	99	SOOK	Repair	667039.54	424708.85	175626.73	66703.95
5	143	KANAPAWAN	Repair	1163000.09	642734.15	403965.93	116300.01
5	154	BASIAD	Repair	2048324.85	1356943.98	486548.38	204832.48
		Sub-total		13802703.32 (100.0 %)	7960710.12 (57.6 %)	4461722.84 (32.3 %)	1380270.32 (10.0 %)
8	109	JIADONG	Reconstruction	14485412.54	9841303.57	3195567.72	1448541.25
8	120	HINOGBONGAN	Repair	1541911.03	997161.34	390558.58	154191.10
8	160	JUBASAN II	Replacement of Superstructure	7249198.46	4728667.80	1795610.81	724919.85
8	161	JUBASAN I	Reconstruction	14558244.89	9746043.60	3350376.80	1455824.49
		Sub-total		37834766.92 (100.0 %)	25313176.31 (66.9 %)	8738113.91 (23.1 %)	3783476.69 (10.0 %)
		Grand Total		624044402.93 (100.0 %)	426405101.54 (68.3 %)	135234861.02 (21.6 %)	62404440.29 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (1/52)

1 Name of Bridge : MARILAO
 Classification : Replacement of Superstructure

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.12	-	-	-	-	-
102	Common excavation	Cu.m	42.9	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	57.3	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	109	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	87.7	-	-	-	-	-
104(5)	Selected borrow for backfill	Cu.m	118	-	-	-	-	-
200	Aggregate subbase course	Cu.m	191	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	457	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	894	54	48276.00	20758.68	22689.72	4827.60
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	26	19760.00	11065.60	6718.40	1976.00
402	Timber structure (Detour bridge)	span	54600	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5080	-	-	-	-	-
404	Reinforcing steel	kg	18.4	6732	123868.80	89185.54	22296.38	12386.88
405(1)	Structural concrete, Class A	Cu.m	2700	67	180900.00	99495.00	63315.00	18090.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	60200	-	-	-	-	-
411	Paint	Sq.m	67.1	-	-	-	-	-
* Sub-total					372804.80	220504.82	115019.50	37280.48
					(100.0 %)	(59.1 %)	(30.8 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	894	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3190	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	131	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
404	Reinforcement steel	kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	311	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	40500	-	-	-	-	-
801	Additional sidewalk	Sq.m	6750	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	23	199640.00	105809.20	73866.80	19964.00
* Sub-total					199640.00	105809.20	73866.80	19964.00
					(100.0 %)	(53.0 %)	(37.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	153	231	35343.00	24740.10	7068.60	3534.30
901	Staging	Cu.m	216	1183	255528.00	158427.36	71547.84	25552.80
902	Temporary bridge	Sq.m	5080	-	-	-	-	-
903	Preparation works	LS	1	1	25899.47	15284.44	8025.08	2589.95
* Sub-total					316770.47	198451.90	86641.52	31677.05
					(100.0 %)	(62.6 %)	(27.3 %)	(10.0 %)
** Grand Total					889215.27	624765.92	275527.83	88921.53
					(100.0 %)	(59.0 %)	(30.9 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (2/52)

2 Name of Bridge : LABANGAN I
 Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.12	6958	14750.96	1032.57	12243.30	1475.10
102	Common excavation	Cu.m	42.9	4737	203217.30	136155.59	46739.98	20321.73
103(2)	Bridge excavation above low water level	Cu.m	57.3	3566	204331.80	128729.03	55169.59	20433.18
103(2)S	Bridge excavation below low water level	Cu.m	109	1913	208517.00	127195.37	60469.93	20851.70
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	2155472	2155472.00	1551939.84	387984.96	215547.20
104(1)	Embankment	Cu.m	67.7	7866	532528.20	388745.59	90529.79	53252.82
104(5)	Selected borrow for backfill	Cu.m	118	4013	473534.00	170472.24	255708.36	47353.40
200	Aggregate subbase course	Cu.m	191	1062	202842.00	146046.24	36511.66	20284.20
311(2)	PCC Pavement (Reinforced)	Sq.m	457	1843	842251.00	522195.62	235830.28	84225.10
* Sub-total					4837444.26	3172512.09	1181187.75	483744.43
					(100.0 %)	(65.5 %)	(24.4 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	894	305	272670.00	117248.10	128154.90	27267.00
101(1)	Removal steel structure (bridge)	LS	1	106590	106590.00	71415.30	24515.70	10659.00
401	Railing	m	760	572	434720.00	243443.20	147804.80	43472.00
402	Timber structure (Detour bridge)	span	54500	-	-	-	-	-
403(5)	Structural steel (Detour bridge)	Sq.m	5080	-	-	-	-	-
404	Reinforcing steel	kg	18.4	102102	1878676.80	1352647.30	338161.82	187867.68
405(1)	Structural concrete, Class A	Cu.m	2700	851	2297700.00	1263735.00	804195.00	229770.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	60200	365	21973000.00	17798130.00	1977570.00	2197300.00
411	Paint	Sq.m	67.1	7293	489360.30	63616.84	376807.43	48936.03
* Sub-total					27452717.10	20910235.74	3797209.66	2745271.71
					(100.0 %)	(76.1 %)	(13.8 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	894	204	182376.00	78421.68	85716.72	18237.60
101(1)	Removal of steel structure	LS	1	410025	410025.00	274716.75	94305.75	41002.50
400(3)	Steel H-piles	m	3190	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	1407	10228890.00	7160223.00	2045778.00	1022889.00
404	Reinforcement steel	kg	15.9	128700	2046330.00	1473357.60	368339.40	204633.00
405(1)	Structural concrete, Class A	Cu.m	1890	1613	3048570.00	1859627.70	884085.30	304857.00
405(5)	Seal concrete	Cu.m	1710	48	82080.00	51710.40	22161.60	8208.00
501	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					15998271.00	10898057.13	3500386.77	1599827.10
					(100.0 %)	(68.1 %)	(21.8 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	131	66	8646.00	4236.54	3544.86	864.60
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
404	Reinforcement steel	kg	15.9	110	1749.00	1259.28	314.82	174.90
405(1)	Structural concrete, Class A	Cu.m	1890	6	11340.00	6917.40	3288.60	1134.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	962	149	143338.00	61635.34	67368.86	14333.80
505	Stone masonry	Cu.m	869	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	311	-	-	-	-	-
509	Gabion	Cu.m	688	198	136224.00	84458.89	38142.72	13622.40
* Sub-total					301297.00	158507.44	112659.86	30129.70
					(100.0 %)	(52.6 %)	(37.3 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	40500	-	-	-	-	-
801	Additional sidewalk	Sq.m	6760	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	153	3146	481338.00	336936.60	96267.60	48133.80
901	Staging	Cu.m	216	891	192456.00	119322.72	53887.68	19245.60
902	Temporary bridge	Sq.m	5080	950	4826000.00	3619500.00	723900.00	482600.00
903	Preparation works	LS	1	1622685.70	1176462.15	283964.98	162268.57	
* Sub-total					7122479.70	5252211.47	1158020.26	712247.97
					(100.0 %)	(73.7 %)	(16.2 %)	(10.0 %)
** Grand Total					55712209.06	40391523.86	9749464.29	5571220.91
					(100.0 %)	(72.5 %)	(17.5 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (3/52)

3 Name of Bridge : SULIPAN
Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.12	7821	16580.52	1160.64	13761.83	1658.05
102	Common excavation	Cu.m	42.9	255	10939.50	7329.47	2516.09	1093.95
103(2)	Bridge excavation above low water level	Cu.m	57.3	1593	91278.90	57505.71	24645.30	9127.89
103(2)S	Bridge excavation below low water level	Cu.m	109	2576	280784.00	171278.24	81427.36	28078.40
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	2155472	2155472.00	1551939.84	387984.96	215547.20
104(1)	Embankment	Cu.m	67.7	7531	509848.70	372189.56	86674.28	50984.87
104(S)	Selected borrow for backfill	Cu.m	118	2453	289454.00	104203.44	156305.16	28945.40
200	Aggregate subbase course	Cu.m	191	1274	243334.00	175200.48	43800.12	24333.40
311(2)	PCC Pavement (Reinforced)	Sq.m	457	2211	1010427.00	628464.74	282919.56	101042.70
* Sub-total					4608118.62	3087272.10	1080034.66	460811.85
					(100.0 %)	(66.5 %)	(23.4 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	894	-	-	-	-	-
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	723	549480.00	307708.80	186823.20	54948.00
402	Timber structure (Detour bridge)	span	54500	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5080	-	-	-	-	-
404	Reinforcing steel	kg	18.4	126852	2334076.80	1680535.90	420133.82	233407.68
405(1)	Structural concrete, Class A	Cu.m	2700	1012	2732400.00	1502820.00	956340.00	273240.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	68600	667	45756200.00	37062522.00	4118058.00	4575620.00
411	Paint	Sq.m	67.1	12406	832442.60	108217.54	640980.80	83244.26
* Sub-total					52204599.40	40661803.63	6322335.83	5220459.94
					(100.0 %)	(77.8 %)	(12.1 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	894	809	723246.00	310995.78	339925.62	72324.60
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3190	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	2310	16793700.00	11755590.00	3358740.00	1679370.00
404	Reinforcement steel	kg	15.9	147400	2343660.00	1687435.20	421858.80	234366.00
405(1)	Structural concrete, Class A	Cu.m	1890	1846	3488940.00	2128253.40	1011792.60	348894.00
405(5)	Seal concrete	Cu.m	1710	264	451440.00	284407.20	121868.80	45144.00
501	Grouted riprap	Cu.m	962	132	126984.00	54603.12	89682.48	12698.40
505	Stone masonry	Cu.m	869	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					23927970.00	16221284.70	5313888.30	2392797.00
					(100.0 %)	(67.7 %)	(22.2 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	131	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
404	Reinforcement steel	kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	311	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	40500	-	-	-	-	-
801	Additional sidewalk	Sq.m	6750	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	153	3975	608175.00	425722.50	121635.00	60817.50
901	Staking	Cu.m	216	1287	277992.00	172355.04	77837.76	27799.20
902	Temporary bridge	Sq.m	5080	1540	7823200.00	5867400.00	1173480.00	782320.00
903	Preparation works	LS	1	2683501.65	1992475.14	422676.35	268350.17	
* Sub-total					11392868.65	8467952.68	1796629.11	1139286.87
					(100.0 %)	(74.2 %)	(15.7 %)	(10.0 %)
** Grand Total					92133556.67	68408313.11	14511887.89	9213355.67
					(100.0 %)	(74.2 %)	(15.7 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (4/52)

4 Name of Bridge : PLARIDRL
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(5)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	193	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	457	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	455	424080.00	182354.40	199317.60	42408.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	699	531240.00	297494.40	180621.60	53124.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.4	84018	1461913.20	1052577.50	263144.38	146191.32
405(1)	Structural concrete, Class A	Cu.m	2700	646	1744200.00	959310.00	610470.00	174420.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	21971	1502816.40	195366.13	1157168.63	150281.64
Sub-total					5564249.60	2587102.44	2410722.20	566424.96
					(100.0 %)	(47.4 %)	(42.5 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	330	300960.00	129412.80	141451.20	30096.00
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(15)	Cast-in-Place concrete pile(1200mm)	m	24000	198	4752000.00	3326400.00	950400.00	475200.00
404	Reinforcement steel	kg	15.1	52833	797778.30	574400.38	143600.09	79777.83
405(1)	Structural concrete, Class A	Cu.m	1890	372	703080.00	428878.80	203893.20	70308.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					6553818.30	4459091.98	1439344.40	655381.83
					(100.0 %)	(68.0 %)	(21.9 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	129	5327700.00	4049052.00	745878.00	532770.00
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
Sub-total					5327700.00	4049052.00	745878.00	532770.00
					(100.0 %)	(76.0 %)	(14.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	6986	1089816.00	762871.20	217963.20	108981.60
901	Staging	Cu.m	220	1544	339680.00	210601.60	95110.40	33968.00
902	Temporary bridge	Sq.m	5180	1478	7656040.00	5742030.00	1148406.00	765604.00
903	Preparation works	LS	1	798939.12	537322.48	537322.48	181722.73	79893.91
Sub-total					9884475.12	7252825.28	1643202.33	988447.51
					(100.0 %)	(73.3 %)	(16.6 %)	(10.0 %)
Grand Total					27430243.02	18448071.69	6239147.03	2743024.30
					(100.0 %)	(67.2 %)	(22.7 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (5/52)

5 Name of Bridge : TAGANUSING
 Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I)	EARTHWORK AND ROAD WORKS							
100	Clearing and Grubbing	Sq.m	2.16	931	2010.96	140.77	1869.19	201.10
102	Common excavation	Cu.m	43.8	657	28776.60	19280.32	8618.62	2877.66
103(2)	Bridge excavation above low water level	Cu.m	58.5	6529	381946.50	240626.30	103125.56	38194.65
103(2)S	Bridge excavation below low water level	Cu.m	111	1540	170940.00	104273.40	49572.60	17094.00
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	384	26496.00	19342.08	4804.32	2649.60
104(5)	Selected borrow for backfill	Cu.m	120	1597	191640.00	68990.40	103485.60	19164.00
200	Aggregate subbase course	Cu.m	193	255	49215.00	35434.80	8858.70	4921.50
311(2)	PCC Pavement (Reinforced)	Sq.m	457	442	201994.00	125236.28	56558.32	20199.40
*	Sub-total				1053019.06 (100.0 %)	613324.34 (58.2 %)	334392.81 (31.7 %)	105301.91 (10.0 %)
(II)	SUPERSTRUCTURE WORKS							
101(S)	Removal concrete structure	Cu.m	912	140	127680.00	54902.40	50009.60	12768.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	110	83600.00	46816.00	28424.00	8360.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	Kg	17.4	14960	260304.00	187418.88	46854.72	26030.40
405(1)	Structural concrete, Class A	Cu.m	2700	150	405000.00	222750.00	141750.00	40500.00
407	Prestressed concrete bridge	Cu.m	15600	163	2542800.00	1729104.00	569416.00	254280.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
*	Sub-total				3419384.00 (100.0 %)	2240991.28 (65.5 %)	836454.32 (24.4 %)	341938.40 (10.0 %)
(III)	SUBSTRUCTURE WORKS							
101(S)	Removal of concrete structure	Cu.m	912	116	105792.00	45490.56	49722.24	10579.20
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3280	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	1480	1164760.00	815332.00	232952.00	116476.00
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	Kg	15.1	35750	539625.00	398674.00	97168.50	53962.50
405(1)	Structural concrete, Class A	Cu.m	1890	353	667170.00	406973.70	193479.30	66717.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
*	Sub-total				2477547.00 (100.0 %)	1656470.26 (66.8 %)	573322.04 (23.1 %)	247754.70 (10.0 %)
(IV)	RIVER TRAINING WORKS							
400(1)	Untreated timber pile	m	134	176	23584.00	11556.16	9669.44	2358.40
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	Kg	15.1	308	4650.80	3348.58	837.14	465.08
405(1)	Structural concrete, Class A	Cu.m	1890	15	28350.00	17293.50	8221.50	2835.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	473	442728.00	190373.04	208082.16	44272.80
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	759	503217.00	311994.54	140900.76	50321.70
*	Sub-total				1002529.80 (100.0 %)	534665.82 (53.3 %)	367711.00 (36.6 %)	100252.98 (10.0 %)
(V)	SPECIAL WORKS FOR REHABILITATION							
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
*	Sub-total				(-)	(-)	(-)	(-)
(VI)	TEMPORARY WORKS							
900	Scaffolding	Sq.m	156	550	85800.00	60060.00	17160.00	8580.00
901	Staging	Cu.m	220	330	72600.00	45012.00	20328.00	7260.00
902	Temporary bridge	Sq.m	5180	572	2962960.00	2222220.00	444444.00	296296.00
903	Preparation works	LS	1	1	33215.20	221179.31	77814.37	33215.22
*	Sub-total				3453575.20 (100.0 %)	2548471.31 (73.7 %)	569746.37 (16.2 %)	345357.52 (10.0 %)
**	Grand Total				11406055.06 (100.0 %)	7593823.01 (66.5 %)	2671626.54 (23.4 %)	1140605.51 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (6/52)

6 Name of Bridge : BUED
 Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	3256	7032.96	492.31	5837.36	703.30
102	Common excavation	Cu.m	43.8	191	8365.80	5605.09	1924.13	836.58
103(2)	Bridge excavation above low water level	Cu.m	58.5	10915	638527.50	402272.33	172402.43	63852.75
103(2)S	Bridge excavation below low water level	Cu.m	111	3770	418470.00	255266.70	121356.30	41847.00
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	2524500	2524500.00	1817640.00	454410.00	252450.00
104(1)	Embankment	Cu.m	69.0	2377	164013.00	119729.49	27882.21	16401.30
104(S)	Selected borrow for backfill	Cu.m	120	13772	1652640.00	594950.40	892425.60	165264.00
200	Aggregate subbase course	Cu.m	193	637	122941.00	88517.52	22129.38	12294.10
311(2)	PCC Pavement (Reinforced)	Sq.m	457	1106	505442.00	313374.04	141523.76	50544.20
* Sub-total					6041932.26	3597847.87	1839891.17	604193.23
					(100.0 %)	(59.5 %)	(30.4 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	784	715008.00	307453.44	336053.76	71500.80
101(1)	Removal steel structure (bridge)	LS	1	3045042	3045042.00	2040178.14	700359.56	304504.20
401	Railing	m	760	1101	836760.00	468585.60	284498.40	83676.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.4	152526	2653952.40	1910845.73	477711.43	265395.24
405(1)	Structural concrete, Class A	Cu.m	2700	1526	4120200.00	2266110.00	1442070.00	412020.00
407	Prestressed concrete bridge	Cu.m	15600	1729	26972400.00	18341232.00	5933928.00	2697240.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
* Sub-total					38343362.40	25334404.91	9174621.25	3834336.24
					(100.0 %)	(66.0 %)	(23.9 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	666	607392.00	261178.55	285474.24	60739.20
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3920	6085	23853200.00	17889900.00	3577980.00	2385320.00
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	kg	15.1	214390	3237289.00	2330848.08	582712.02	323728.90
405(1)	Structural concrete, Class A	Cu.m	1890	2680	5065200.00	3089772.00	1468908.00	506520.00
405(5)	Seal concrete	Cu.m	1710	95	162450.00	102343.50	43861.50	16245.00
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	563	-	-	-	-	-
* Sub-total					32925531.00	23674042.14	5958935.76	3292553.10
					(100.0 %)	(71.9 %)	(18.1 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	133	124488.00	53529.84	58509.36	12448.80
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					124488.00	53529.84	58509.36	12448.80
					(100.0 %)	(43.0 %)	(47.0 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	5506	858936.00	601255.20	171787.20	85893.60
901	Staging	Cu.m	220	1782	392040.00	243064.80	109771.20	39204.00
902	Temporary bridge	Sq.m	5180	1672	8660960.00	6495720.00	1299144.00	866096.00
903	Preparation works	LS	1	2620417.49	2620417.49	1799995.94	558379.80	262041.75
* Sub-total					12532353.49	9140035.94	2139082.20	1253235.35
					(100.0 %)	(72.9 %)	(17.0 %)	(10.0 %)
** Grand Total					89967667.16	61799860.70	19171039.74	8996766.71
					(100.0 %)	(68.6 %)	(21.3 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (7/52)

7 Name of Bridge : LONBOY
 Classification : Replacement of Superstructure

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	193	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	457	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	62	56544.00	24313.92	26575.68	5654.40
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	33	25080.00	14044.80	8527.20	2508.00
402	Timber structure (Detour bridge)	span	56700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.4	3806	66224.40	47681.57	11920.39	6622.44
405(1)	Structural concrete, Class A	Cu.m	2700	74	199800.00	109890.00	89930.00	19980.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
* Sub-total					347648.40 (100.0 %)	195930.29 (56.3 %)	116953.27 (33.6 %)	34764.84 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	kg	15.1	2200	33220.00	23918.40	6979.60	3322.00
405(1)	Structural concrete, Class A	Cu.m	1890	19	35910.00	21905.10	10413.90	3591.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					69130.00 (100.0 %)	45823.50 (66.2 %)	16393.50 (23.7 %)	6913.00 (10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	13	110760.00	58702.80	40981.20	11076.00
* Sub-total					110760.00 (100.0 %)	58702.80 (53.0 %)	40981.20 (37.0 %)	11076.00 (10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	-	-	-	-	-
901	Staging	Cu.m	220	814	179080.00	111029.60	50142.40	17908.00
902	Temporary bridge	Sq.m	5180	-	-	-	-	-
903	Preparation works	LS	1	1	21198.55	12344.69	6734.11	2119.86
* Sub-total					200278.55 (100.0 %)	123374.19 (61.6 %)	56876.51 (28.4 %)	20027.86 (10.0 %)
** Grand Total					727816.95 (100.0 %)	423830.77 (58.2 %)	231204.48 (31.7 %)	72781.70 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (8/52)

8 Name of Bridge : BAUANG I
Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	4875	10530.00		8739.90	1053.00
102	Common excavation	Cu.m	43.8	316	13840.80	9273.34	3183.38	1384.08
103(2)	Bridge excavation above low water level	Cu.m	58.6	3705	216742.50	136547.77	58520.48	21674.25
103(2)S	Bridge excavation below low water level	Cu.m	111	3180	352980.00	215317.80	102364.20	35298.00
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	2860853	2860853.00	2059814.16	514953.54	286085.30
104(1)	Embankment	Cu.m	69.0	4025	277725.00	202739.25	47213.25	27772.50
104(5)	Selected borrow for backfill	Cu.m	120	4705	564600.00	203256.00	304884.00	56460.00
200	Aggregate subbase course	Cu.m	193	252	48636.00	35017.92	8754.48	4863.60
311(2)	PCP Pavement (Reinforced)	Sq.m	457	1658	757706.00	469777.72	212157.68	75770.60
Sub-total					5103613.30	3332481.06	1260770.91	510361.33
					(100.0 %)	(65.3 %)	(24.7 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	267	243504.00	104706.72	114446.88	24350.40
101(1)	Removal steel structure (bridge)	LS	1	1506348	1506348.00	1009253.16	346460.04	150634.80
401	Railing	m	760	517	392920.00	220035.20	133592.80	39292.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.4	62249	1083132.60	779855.47	194963.87	108313.26
405(1)	Structural concrete, Class A	Cu.m	2700	623	1682100.00	925155.00	588735.00	168210.00
407	Prestressed concrete bridge	Cu.m	15600	703	10966800.00	7457424.00	2412696.00	1096680.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
Sub-total					15874804.60	10496429.55	3790894.59	1587480.46
					(100.0 %)	(66.1 %)	(23.8 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	174	158688.00	68235.84	74583.36	15868.80
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	1874	13361620.00	9353134.00	2672324.00	1336162.00
404	Reinforcement steel	kg	15.1	132000	1993200.00	1436104.00	358776.00	199320.00
405(1)	Structural concrete, Class A	Cu.m	1890	1648	3114720.00	1899979.20	905268.80	311472.00
405(5)	Seal concrete	Cu.m	1710	67	114570.00	72179.10	30933.90	11457.00
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					18742798.00	12828632.14	4039886.05	1874279.80
					(100.0 %)	(68.4 %)	(21.5 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	462	61908.00	30334.92	25382.28	6190.80
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	220	3322.00	2391.84	597.96	332.20
405(1)	Structural concrete, Class A	Cu.m	1890	11	20790.00	12681.90	6029.10	2079.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	264	247104.00	106254.72	116138.88	24710.40
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	191	57300.00	16044.00	35526.00	5730.00
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					390424.00	167707.38	183674.22	39042.40
					(100.0 %)	(42.9 %)	(47.0 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	8880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	2585	403260.00	282282.00	80652.00	40326.00
901	Staging	Cu.m	220	1584	348480.00	216057.60	97574.40	34848.00
902	Temporary bridge	Sq.m	5180	2297	11898460.00	8923845.00	1784769.00	1189846.00
903	Preparation works	LS	1	1582855.20	1582855.20	1087423.04	337146.64	158285.52
Sub-total					14233055.20	10509607.64	2300142.04	1423305.52
					(100.0 %)	(73.8 %)	(16.1 %)	(10.0 %)
Grand Total					54344695.10	37334857.77	11575367.81	5434469.51
					(100.0 %)	(68.7 %)	(21.3 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (9/52)

9 Name of Bridge : BAUANG II
Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	5511	11903.76	833.26	9880.12	1190.38
102	Common excavation	Cu.m	43.8	306	13402.80	8979.88	3082.64	1340.28
103(2)	Bridge excavation above low water level	Cu.m	58.5	3692	215982.00	136088.66	58315.14	21598.20
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	6248	431112.00	314711.76	73289.04	43111.20
104(S)	Selected borrow for backfill	Cu.m	120	3022	362640.00	130550.40	195825.60	36264.00
200	Aggregate subbase course	Cu.m	193	1274	245882.00	177035.04	44258.76	24588.20
311(2)	PCC Pavement (Reinforced)	Sq.m	457	2211	1010427.00	626464.74	282919.56	101042.70
*	Sub-total				2291349.56 (100.0 %)	1394643.74 (60.8 %)	667570.86 (29.1 %)	229134.96 (10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	228	207936.00	89412.48	97729.92	20793.60
101(1)	Removal steel structure (bridge)	LS	1	1284382	1284382.00	860535.94	295407.86	128438.20
401	Railing	m	760	412	313120.00	175347.20	106460.80	31312.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	Kg	17.4	51260	891924.00	642185.28	160646.32	89192.40
405(1)	Structural concrete, Class A	Cu.m	2700	513	1385100.00	761805.00	484785.00	138510.00
407	Prestressed concrete bridge	Cu.m	15600	558	8704800.00	5919264.00	1915056.00	870480.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
*	Sub-total				12787262.00 (100.0 %)	8448549.90 (66.0 %)	3059985.90 (23.9 %)	1278726.20 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	152	138624.00	59608.32	65153.28	13862.40
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	1448	10324240.00	7226968.00	2064848.00	1032424.00
404	Reinforcement steel	Kg	15.1	125400	1893540.00	1363348.80	340837.20	189354.00
405(1)	Structural concrete, Class A	Cu.m	1890	1563	2954070.00	1801982.70	856680.30	295407.00
405(5)	Seal concrete	Cu.m	1710	55	94050.00	59251.50	25393.50	9405.00
501	Grouted riprap	Cu.m	936	92	86112.00	37028.16	40472.64	8611.20
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gablon	Cu.m	663	-	-	-	-	-
*	Sub-total				15490636.00 (100.0 %)	10548187.48 (68.0 %)	3393384.92 (21.9 %)	1549063.60 (10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	Kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gablon	Cu.m	663	-	-	-	-	-
*	Sub-total				(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
*	Sub-total				(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	2059	321204.00	224842.80	64240.80	32120.40
901	Staging	Cu.m	220	1267	278740.00	172818.80	78047.20	27874.00
902	Temporary bridge	Sq.m	5180	264	1367520.00	1025640.00	205128.00	136752.00
903	Preparation works	LS	1	976101.35	976101.35	654440.48	224056.73	97610.13
*	Sub-total				2943556.35 (100.0 %)	2077742.08 (70.5 %)	671466.73 (19.4 %)	294356.53 (10.0 %)
**	Grand Total				33512812.91 (100.0 %)	22469123.20 (67.0 %)	7692408.42 (22.9 %)	3351281.29 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (10/52)

10 Name of Bridge : STA CRUZ I
 Classification : Reconstruction for Extension span

Item No.	Description	Unit	Price	Quantity	Amount	Forlexn Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	345	745.20	52.16	618.52	74.52
102	Common excavation	Cu.m	43.8	2880	126144.00	84516.48	29013.12	12614.40
103(2)	Bridge excavation above low water level	Cu.m	58.5	3687	215689.50	135884.39	58236.17	21568.95
103(2)S	Bridge excavation below low water level	Cu.m	111	4523	502053.00	308252.33	145595.37	50205.30
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	2639	182091.00	132926.43	30955.47	18209.10
104(5)	Selected borrow for backfill	Cu.m	120	2077	249240.00	89726.40	134589.60	24924.00
200	Aggregate subbase course	Cu.m	193	85	16405.00	11811.60	2952.90	1640.50
311(2)	PCC Pavement (Reinforced)	Sq.m	457	147	67179.00	41650.98	18810.12	6717.90
Sub-total					1359546.70	802820.77	420771.26	135954.67
					(100.0 %)	(59.0 %)	(30.9 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	4	3648.00	1668.64	1714.56	364.80
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	90	68400.00	38304.00	23256.00	6840.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	592	3066560.00	2299920.00	459984.00	306656.00
404	Reinforcing steel	kg	17.4	12023	209200.20	150624.14	37656.04	20920.02
405(1)	Structural concrete, Class A	Cu.m	2700	100	270000.00	148500.00	94500.00	27000.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	43	2640200.00	2138562.00	237618.00	264020.00
411	Paint	Sq.m	68.4	3480	238032.00	30944.16	183284.64	23803.20
Sub-total					6496040.20	4808422.94	1038013.24	649604.02
					(100.0 %)	(74.0 %)	(15.9 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	7	6384.00	2745.12	3000.48	638.40
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	2024	1592888.00	1115021.60	318577.60	159288.80
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	kg	15.1	31900	481690.00	346816.80	86704.20	48169.00
405(1)	Structural concrete, Class A	Cu.m	1890	405	765450.00	466924.50	221980.50	76545.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	846	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					2846412.00	1931508.02	630262.78	284641.20
					(100.0 %)	(67.8 %)	(22.1 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	352	47168.00	23112.32	19338.88	4716.80
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	308	4650.80	3348.58	837.14	465.08
405(1)	Structural concrete, Class A	Cu.m	1890	15	28350.00	17293.50	8221.50	2835.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	396	370656.00	159382.08	174208.32	37065.60
505	Stone masonry	Cu.m	846	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	264	79200.00	22176.00	49104.00	7920.00
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					530024.80	225312.48	251709.84	53002.48
					(100.0 %)	(42.5 %)	(47.4 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	385	60060.00	42042.00	12012.00	6006.00
901	Staging	Cu.m	220	139	30580.00	18959.60	8562.40	3058.00
902	Temporary bridge	Sq.m	5180	440	2279200.00	1709400.00	341880.00	227920.00
903	Preparation works	LS	1	1	408055.91	286153.97	81096.35	40805.59
Sub-total					2777895.91	2056555.57	443550.75	277789.59
					(100.0 %)	(74.0 %)	(15.9 %)	(10.0 %)
** Grand Total					14009919.61	9824619.78	2784307.87	1400991.96
					(100.0 %)	(70.1 %)	(19.8 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (11/52)

11 Name of Bridge : LANGLANGKA I
 Classification : Replacement of Superstructure

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I)	EARTHWORK AND ROAD WORKS							
100	Clearing and Grubbing	Sq.m	2.16	931	2010.96	140.77	1669.10	201.10
102	Common excavation	Cu.m	43.8	255	11169.00	7483.23	2568.87	1116.90
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	793	54717.00	39943.41	9301.89	5471.70
104(5)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	193	255	49215.00	35434.80	8858.70	4921.50
311(2)	PCC Pavement (Reinforced)	Sq.m	457	442	201994.00	125236.28	55558.32	20199.40
*	Sub-total				319105.96 (100.0 %)	208238.49 (65.2 %)	78956.88 (24.7 %)	31910.60 (10.0 %)
(II)	SUPERSTRUCTURE WORKS							
101(S)	Removal concrete structure	Cu.m	912	69	62928.00	27059.04	29576.18	6292.80
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	31	23560.00	13193.60	8010.40	2356.00
402	Timber structure (Detour bridge)	span	55700	4	222800.00	69068.00	131452.00	22280.00
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.4	7370	128238.00	92331.36	23082.84	12823.80
405(1)	Structural concrete, Class A	Cu.m	2700	38	102600.00	56430.00	35910.00	10260.00
407	Prestressed concrete bridge	Cu.m	15600	42	655200.00	445536.00	144144.00	65520.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
*	Sub-total				1195326.00 (100.0 %)	703618.00 (58.8 %)	372175.40 (31.1 %)	119532.60 (10.0 %)
(III)	SUBSTRUCTURE WORKS							
101(S)	Removal of concrete structure	Cu.m	912	52	47424.00	20392.32	22289.28	4742.40
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	563	-	-	-	-	-
*	Sub-total				47424.00 (100.0 %)	20392.32 (43.0 %)	22289.28 (47.0 %)	4742.40 (10.0 %)
(IV)	RIVER TRAINING WORKS							
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	563	-	-	-	-	-
*	Sub-total				(-)	(-)	(-)	(-)
(V)	SPECIAL WORKS FOR REHABILITATION							
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	35	298200.00	158046.00	110334.00	29820.00
*	Sub-total				298200.00 (100.0 %)	158046.00 (53.0 %)	110334.00 (37.0 %)	29820.00 (10.0 %)
(VI)	TEMPORARY WORKS							
900	Scaffolding	Sq.m	156	154	24024.00	16816.80	4804.80	2402.40
901	Staging	Cu.m	220	40	8800.00	5456.00	2464.00	880.00
902	Temporary bridge	Sq.m	5180	-	-	-	-	-
903	Preparation works	LS	1	1	56786.40	33377.03	17730.73	5678.64
*	Sub-total				89610.40 (100.0 %)	55649.83 (62.1 %)	24999.53 (27.9 %)	8961.04 (10.0 %)
**	Grand Total				1949666.36 (100.0 %)	1145944.64 (58.7 %)	608755.09 (31.2 %)	194966.64 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (12/52)

12 Name of Bridge : STA MARIA
 Classification : Reconstruction for Extension span

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
101	Clearing and Grubbing	Sq.m	2.16	345	745.20	52.16	618.52	74.52
102	Common excavation	Cu.m	43.8	674	29521.20	19779.20	6789.88	2952.12
103(2)	Bridge excavation above low water level	Cu.m	58.5	5711	334093.50	210478.90	90205.25	33409.35
103(2)S	Bridge excavation below low water level	Cu.m	111	1746	193806.00	118221.66	56203.74	19380.60
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	6353	438357.00	320000.61	74520.69	43835.70
104(5)	Selected borrow for backfill	Cu.m	120	922	110640.00	39830.40	59745.60	11064.00
200	Aggregate subbase course	Cu.m	193	85	16405.00	11811.60	2952.90	1640.50
311(2)	PCC Pavement (Reinforced)	Sq.m	457	147	67179.00	41650.98	18810.12	6717.90
Sub-total					1190746.90	761825.52	309846.69	119074.69
					(100.0 %)	(63.9 %)	(26.0 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	497	453264.00	194903.52	213034.08	45326.40
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Balling	m	760	755	573800.00	321328.00	195092.00	57380.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	1043	5402740.00	4052055.00	810411.00	540274.00
404	Reinforcing steel	kg	17.4	78012	1357408.80	977334.34	244333.58	135740.88
405(1)	Structural concrete, Class A	Cu.m	2700	625	1687500.00	928125.00	590625.00	168750.00
407	Prestressed concrete bridge	Cu.m	15600	116	1809600.00	1230528.00	398112.00	180960.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	5283	361357.20	46976.44	278245.04	36135.72
Sub-total					11645670.00	7751250.29	2729852.71	1164567.00
					(100.0 %)	(66.5 %)	(23.4 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	1672	1315864.00	921104.80	263172.80	131586.40
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	kg	15.1	22000	332200.00	239184.00	59796.00	33220.00
405(1)	Structural concrete, Class A	Cu.m	1890	278	525420.00	320506.20	152371.80	52542.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	935	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					2173484.00	1480795.00	475340.60	217348.40
					(100.0 %)	(68.1 %)	(21.8 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	528	70752.00	34668.48	29008.32	7075.20
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	462	6976.20	5022.86	1255.72	697.62
405(1)	Structural concrete, Class A	Cu.m	1890	23	43470.00	26516.70	12606.30	4347.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	935	594	555984.00	239073.12	261312.48	55598.40
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	695	208500.00	58380.00	129270.00	20850.00
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					885682.20	363661.16	433452.82	88568.22
					(100.0 %)	(41.0 %)	(48.9 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	104	4295200.00	3264352.00	601328.00	429520.00
801	Additional sidewalk	Sq.m	6880	142	976960.00	713180.80	166083.20	97696.00
802	Reinforcing beam of RCDB	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
Sub-total					5272160.00	3977532.80	767411.20	527216.00
					(100.0 %)	(75.4 %)	(14.5 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	3606	562536.00	393775.20	112507.20	56253.60
901	Staging	Sq.m	220	248	54560.00	33827.20	15276.80	5456.00
902	Temporary bridge	Sq.m	5180	513	2557340.00	1993005.00	398601.00	255734.00
903	Preparation works	LS	1	1	733265.37	502670.17	157268.67	73326.54
Sub-total					4007701.37	2923277.57	683653.67	400770.14
					(100.0 %)	(72.9 %)	(17.0 %)	(10.0 %)
Grand Total					25175444.47	17258342.34	5395567.68	2517544.45
					(100.0 %)	(68.5 %)	(21.4 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (13/52)

13 Name of Bridge : TIPCAL
 Classification : Replacement of Superstructure

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	336	19656.00	12383.28	5307.12	1965.60
103(2)S	Bridge excavation below low water level	Cu.m	111	75	8325.00	5078.25	2414.25	832.50
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	120	735	88200.00	31752.00	47628.00	8820.00
200	Aggregate subbase course	Cu.m	193	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	467	-	-	-	-	-
* Sub-total					116181.00	49213.53	55349.37	11618.10
					(100.0 %)	(42.3 %)	(47.6 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	130	118560.00	50980.80	55723.20	11856.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	77	58520.00	32771.20	19896.80	5852.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.4	2255	39237.00	28250.64	7062.66	3923.70
405(1)	Structural concrete, Class A	Cu.m	2700	23	62100.00	34155.00	21735.00	6210.00
407	Prestressed concrete bridge	Cu.m	15600	113	1762800.00	1198704.00	387816.00	176280.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
* Sub-total					2041217.00	1344861.64	492233.66	204121.70
					(100.0 %)	(65.8 %)	(24.1 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	198	155826.00	109078.20	31165.20	15582.60
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	569	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7130	-	-	-	-	-
404	Reinforcement steel	kg	15.1	3850	58135.00	41857.20	10464.30	5813.50
405(1)	Structural concrete, Class A	Cu.m	1890	32	60480.00	36892.80	17539.20	6048.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	936	70	65520.00	28173.60	30794.40	6552.00
505	Stone masonry	Cu.m	845	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					339961.00	216001.80	89963.10	33996.10
					(100.0 %)	(63.5 %)	(26.4 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	787	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.1	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	936	-	-	-	-	-
505	Stone masonry	Cu.m	845	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6880	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5850	-	-	-	-	-
803	Widening of pier coping	Cu.m	8520	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	385	60060.00	42042.00	12012.00	6006.00
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5180	-	-	-	-	-
903	Preparation works	LS	1	1	76722.57	49663.67	19486.74	7672.26
* Sub-total					136782.57	91605.67	31498.74	13678.26
					(100.0 %)	(66.9 %)	(23.0 %)	(10.0 %)
** Grand Total					2634141.57	1701682.54	669044.87	263414.16
					(100.0 %)	(64.6 %)	(25.4 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (14/52)

14 Name of Bridge : FLARIDEL-PULILAN
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.12	-	-	-	-	-
102	Common excavation	Cu.m	42.9	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	57.3	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	109	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	57.7	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	118	-	-	-	-	-
200	Aggregate subbase course	Cu.m	191	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	457	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	894	473	422862.00	181830.66	198745.14	42286.20
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	377	286520.00	160451.20	97416.80	28652.00
402	Timber structure (Detour bridge)	Span	54500	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5080	-	-	-	-	-
404	Reinforcing steel	Kg	18.4	63404	1166533.60	839976.19	209994.05	116663.36
405(1)	Structural concrete, Class A	Cu.m	2700	488	1317600.00	724680.00	461160.00	131760.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	60200	-	-	-	-	-
411	Paint	Sq.m	67.1	6967	467485.70	60773.14	359963.99	46748.57
Sub-total					3661101.30	1967711.19	1327279.98	366110.13
					(100.0 %)	(53.7 %)	(36.2 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	894	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3190	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	Kg	15.9	3795	60340.80	43445.16	10861.29	6034.05
405(1)	Structural concrete, Class A	Cu.m	1890	32	60480.00	36892.80	17539.20	6048.00
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
Sub-total					120820.50	80337.96	28400.49	12082.05
					(100.0 %)	(66.4 %)	(23.5 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	131	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
404	Reinforcement steel	Kg	16.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	311	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	40500	407	16483500.00	12527460.00	2307690.00	1648350.00
801	Additional sidewalk	Sq.m	6750	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	-	-	-	-	-
Sub-total					16483500.00	12527460.00	2307690.00	1648350.00
					(100.0 %)	(76.0 %)	(14.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	153	1883	288099.00	201669.30	57619.80	28809.90
901	Staging	Cu.m	216	-	-	-	-	-
902	Temporary bridge	Sq.m	5080	-	-	-	-	-
903	Preparation works	LS	1	1	616605.62	443315.35	111629.71	61660.56
Sub-total					904704.62	644984.65	169249.51	90470.46
					(100.0 %)	(71.2 %)	(18.7 %)	(10.0 %)
** Grand Total					21170126.42	15220493.81	3832619.98	2117012.64
					(100.0 %)	(71.9 %)	(18.1 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (15/52)

15 Name of Bridge : SAN ROQUE
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.12	-	-	-	-	-
102	Common excavation	Cu.m	42.9	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	57.3	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	109	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	87.7	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	118	-	-	-	-	-
200	Aggregate subbase course	Cu.m	191	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	457	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	894	23	20562.00	8841.66	9664.14	2056.20
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	760	-	-	-	-	-
402	Timber structure (Detour bridge)	span	54600	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5080	-	-	-	-	-
404	Reinforcing steel	Kg	18.4	2280	41952.00	30205.44	7551.36	4195.20
405(1)	Structural concrete, Class A	Cu.m	2700	23	62100.00	34155.00	21735.00	8210.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge (I-beam)	ton	60200	-	-	-	-	-
411	Paint	Sq.m	67.1	-	-	-	-	-
* Sub-total					124614.00 (100.0 %)	73202.10 (58.7 %)	38950.50 (31.2 %)	12461.40 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	894	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3190	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-In-Place concrete pile (1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	Kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	131	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
404	Reinforcement steel	Kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	311	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	40500	-	-	-	-	-
801	Additional sidewalk	Sq.m	6750	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	16	95360.00	53401.60	32422.40	9536.00
803	Widening of pier coping	Cu.m	8680	22	190960.00	101208.80	70655.20	19096.00
* Sub-total					286320.00 (100.0 %)	154610.40 (54.0 %)	103077.60 (36.0 %)	28632.00 (10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	153	495	75735.00	53014.50	15147.00	7573.50
901	Staging	Cu.m	216	198	42768.00	26516.16	11975.04	4276.80
902	Temporary bridge	Sq.m	5080	-	-	-	-	-
903	Preparation works	LS	-	1	15883.11	9220.29	5074.50	1588.31
* Sub-total					134386.11 (100.0 %)	88750.95 (66.0 %)	32196.54 (23.9 %)	13438.61 (10.0 %)
** Grand Total					545320.11 (100.0 %)	316563.45 (58.0 %)	174224.64 (31.9 %)	54532.01 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (16/52)

16 Name of Bridge : SICSICAN
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.12	-	-	-	-	-
102	Common excavation	Cu.m	42.9	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	57.3	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	109	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	67.7	-	-	-	-	-
104(5)	Selected borrow for backfill	Cu.m	118	-	-	-	-	-
200	Aggregate subbase course	Cu.m	191	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	457	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(5)	Removal concrete structure	Cu.m	894	165	147510.00	63429.30	69329.70	14751.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railink	m	760	165	125400.00	70224.00	42636.00	12540.00
402	Timber structure (Detour bridge)	span	54500	-	-	-	-	-
403(5)	Structural steel (Detour bridge)	Sq.m	5080	-	-	-	-	-
404	Reinforcing steel	kg	18.4	19844	365129.60	262893.31	65723.33	36512.96
405(1)	Structural concrete, Class A	Cu.m	2700	153	413100.00	227205.00	144585.00	41310.00
407	Prestressed concrete bridge	Cu.m	15600	-	-	-	-	-
408	Steel bridge(I-beam)	ton	60200	-	-	-	-	-
411	Paint	Sq.m	67.1	5189	348181.90	45263.65	268100.06	34818.19
Sub-total					1399321.60 (100.0 %)	669016.26 (47.8 %)	590374.09 (42.1 %)	139932.15 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(5)	Removal of concrete structure	Cu.m	894	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3190	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
501	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	131	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3220	-	-	-	-	-
404	Reinforcement steel	kg	15.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1890	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1710	-	-	-	-	-
504	Grouted riprap	Cu.m	962	-	-	-	-	-
505	Stone masonry	Cu.m	869	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	311	-	-	-	-	-
509	Gabion	Cu.m	688	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	40500	31	1255500.00	954180.00	175770.00	125550.00
801	Additional sidewalk	Sq.m	6750	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	-	-	-	-	-
Sub-total					1255500.00 (100.0 %)	954180.00 (76.0 %)	175770.00 (14.0 %)	125550.00 (10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	153	1650	252450.00	176715.00	50490.00	25245.00
901	Staging	Cu.m	216	-	-	-	-	-
902	Temporary bridge	Sq.m	5080	-	-	-	-	-
903	Preparation works	LS	1	1	87218.14	53997.31	24499.02	8721.81
Sub-total					339668.15 (100.0 %)	230712.31 (67.9 %)	74989.02 (22.0 %)	33966.81 (10.0 %)
** Grand Total					2994489.65 (100.0 %)	1853907.57 (61.9 %)	841133.11 (28.0 %)	299448.96 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (17/52)

17 Name of Bridge : INDIANA
 Classification : Reconstruction for Extension span

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	904	1952.64	136.68	1620.69	195.26
102	Common excavation	Cu.m	43.8	1209	52954.20	35479.31	12179.47	5295.42
103(2)	Bridge excavation above low water level	Cu.m	58.5	7781	455188.50	286768.76	122900.90	45518.85
103(2)S	Bridge excavation below low water level	Cu.m	111	1122	124542.00	75970.62	36117.18	12454.20
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	6264	432216.00	315517.68	73476.72	43221.60
104(S)	Selected borrow for backfill	Cu.m	120	2510	301200.00	108432.00	162648.00	30120.00
200	Aggregate subbase course	Cu.m	195	255	49725.00	35802.00	8950.50	4972.50
311(2)	PCC Pavement (Reinforced)	Sq.m	474	442	209508.00	129894.96	58652.24	20950.80
* Sub-total					1627286.34	988002.01	476555.69	162728.63
					(100.0 %)	(60.7 %)	(29.2 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	115	104880.00	45098.40	49293.60	10488.00
101(1)	Removal steel structure (bridge)	LS	1	597718	597718.00	400471.06	137475.14	59771.80
401	Railing	m	803	242	194326.00	108822.56	66070.84	19432.60
402	Timber structure (Detour bridge)	span	56700	28	1559600.00	483476.00	920164.00	155960.00
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	Kg	18.7	34040	636548.00	458314.56	114578.64	53654.80
405(1)	Structural concrete, Class A	Cu.m	2860	284	812240.00	446732.00	284284.00	81224.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	114	6999600.00	5669676.00	629964.00	699960.00
411	Paint	Sq.m	71.1	2600	184860.00	24031.80	142342.20	18486.00
* Sub-total					11089772.00	7636622.38	2344172.42	1108977.20
					(100.0 %)	(68.8 %)	(21.1 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	7	6384.00	2745.12	3000.48	638.40
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	920	764520.00	535164.00	152904.00	76452.00
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	Kg	16.2	64900	1051380.00	756993.60	189248.40	105138.00
405(1)	Structural concrete, Class A	Cu.m	2000	810	1620000.00	988200.00	469800.00	162000.00
405(5)	Seal concrete	Cu.m	1800	132	237600.00	149688.00	64152.00	23760.00
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					3679884.00	2432790.72	879104.88	367988.40
					(100.0 %)	(66.1 %)	(23.8 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	264	35376.00	17334.24	14504.16	3537.60
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	Kg	16.2	308	4989.60	3592.51	898.13	498.96
405(1)	Structural concrete, Class A	Cu.m	2000	15	30000.00	18300.00	8700.00	3000.00
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	475	469775.00	202003.25	220794.25	46977.50
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	884	586092.00	363377.04	164105.76	58609.20
* Sub-total					1126232.60	604607.04	409002.30	112623.26
					(100.0 %)	(53.6 %)	(36.3 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	1	42900.00	32604.00	6006.00	4290.00
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
* Sub-total					42900.00	32604.00	6006.00	4290.00
					(100.0 %)	(76.0 %)	(14.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	1125	175500.00	122860.00	35100.00	17550.00
901	Staging	Cu.m	220	960	215600.00	133872.00	60368.00	21560.00
902	Temporary bridge	Sq.m	5380	220	1183600.00	887700.00	177540.00	118360.00
903	Preparation works	LS	1	1	574223.25	385165.44	131635.48	57422.32
* Sub-total					2148923.25	1529367.44	404643.48	214892.32
					(100.0 %)	(71.1 %)	(18.8 %)	(10.0 %)
** Grand Total					19714998.19	13224013.60	4519464.77	1971499.82
					(100.0 %)	(67.0 %)	(22.9 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (18/52)

18 Name of Bridge : BATU
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Forlezn Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	3036	177606.00	111891.78	47953.62	17760.60
103(2)S	Bridge excavation below low water level	Cu.m	111	9658	1072038.00	653943.18	310891.02	107203.80
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	4510	311190.00	227168.70	52902.30	31119.00
104(3)	Selected borrow for backfill	Cu.m	120	794	95280.00	34300.80	51451.20	9528.00
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
* Sub-total					1656114.00	1027304.46	463198.14	165611.40
					(100.0 %)	(62.0 %)	(27.9 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	267	243504.00	104706.72	114446.88	24350.40
101(I)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railink	m	803	385	309155.00	173126.80	105112.70	30915.50
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	1738	9350440.00	7012830.00	1402566.00	935044.00
404	Reinforcing steel	Kg	18.7	45650	853655.00	614631.60	153657.90	85365.50
405(1)	Structural concrete, Class A	Cu.m	2860	351	1003860.00	552123.00	351351.00	100386.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	10063	715479.30	93012.31	550919.06	71547.93
* Sub-total					12476093.30	8550430.43	2678053.54	1247609.33
					(100.0 %)	(68.5 %)	(21.4 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(I)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	Kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	348	344172.00	147993.96	161760.84	34417.20
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					344172.00	147993.96	161760.84	34417.20
					(100.0 %)	(43.0 %)	(47.0 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	220	29480.00	14445.20	12086.80	2948.00
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	Kg	16.2	4950	80190.00	57736.80	14434.20	8019.00
405(1)	Structural concrete, Class A	Cu.m	2000	248	496000.00	302560.00	143840.00	49600.00
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	1181	1168009.00	502243.87	548964.23	116800.90
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	3218	2133534.00	1322791.08	597389.52	213353.40
* Sub-total					3907213.00	2199776.95	1316714.75	390721.30
					(100.0 %)	(56.3 %)	(33.7 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	545	3896750.00	2844627.50	662447.50	389675.00
802	Reinforcing beam of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
* Sub-total					3896750.00	2844627.50	662447.50	389675.00
					(100.0 %)	(73.0 %)	(17.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	3850	600600.00	420420.00	120120.00	60060.00
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5380	-	-	-	-	-
903	Preparation works	LS	1	1	686428.27	456716.60	162068.84	68642.83
* Sub-total					1287028.27	876136.60	282188.84	128702.83
					(100.0 %)	(68.0 %)	(21.9 %)	(10.0 %)
** Grand Total					23567370.57	15646269.90	5564363.61	2356737.06
					(100.0 %)	(66.3 %)	(23.6 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (19/52)

19 Name of Bridge : NAMANPARAN I
 Classification : Replacement of Superstructure

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	732	1581.12	110.68	1312.33	158.11
102	Common excavation	Cu.m	43.8	23	1007.40	674.96	231.70	100.74
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	479	33051.00	24127.23	5618.67	3305.10
104(5)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	195	212	41340.00	29764.80	7441.20	4134.00
311(2)	PCG Pavement (Reinforced)	Sq.m	474	369	174906.00	108441.72	48973.68	17490.60
* Sub-total					251885.52 (100.0 %)	163119.39 (64.7 %)	63577.58 (25.2 %)	25188.55 (10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	180	164160.00	70588.80	77155.20	16416.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	803	99	79497.00	44518.32	27028.98	7949.70
402	Timber structure (Detour bridge)	span	55700	17	946900.00	393539.00	558671.00	94690.00
403(5)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	KK	18.7	21736	406463.20	292653.50	73163.38	40646.32
405(1)	Structural concrete, Class A	Cu.m	2860	218	623480.00	342914.00	218218.00	62348.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	-	-	-	-	-
* Sub-total					2220500.20 (100.0 %)	1044213.62 (47.0 %)	954236.66 (42.9 %)	222050.02 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-In-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	KK	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gablon	Cu.m	663	100	66300.00	41106.00	18564.00	6630.00
* Sub-total					66300.00 (100.0 %)	41106.00 (62.0 %)	18564.00 (28.0 %)	6630.00 (10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	KK	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gablon	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RCDDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	58	522000.00	276660.00	193140.00	52200.00
* Sub-total					522000.00 (100.0 %)	276660.00 (53.0 %)	193140.00 (37.0 %)	52200.00 (10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	-	-	-	-	-
901	Staging	Cu.m	220	2277	500940.00	310582.80	140263.20	50094.00
902	Temporary bridge	Sq.m	5380	-	-	-	-	-
903	Preparation works	LS	1	1	106848.77	55070.46	41093.44	10684.88
* Sub-total					607788.77 (100.0 %)	365553.25 (60.1 %)	181356.64 (29.8 %)	60778.88 (10.0 %)
** Grand Total					3668474.49 (100.0 %)	1890752.26 (51.5 %)	1410874.78 (38.4 %)	366847.45 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (20/52)

20 Name of Bridge : SAN LUIS
 Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	803	-	-	-	-	-
402	Timber structure (Detour bridge)	span	58700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	kg	18.7	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2860	-	-	-	-	-
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	22	198000.00	104940.00	73260.00	19800.00
* Sub-total					198000.00	104940.00	73260.00	19800.00
					(100.0 %)	(53.0 %)	(37.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	-	-	-	-	-
901	Staging	Cu.m	220	116	25520.00	15822.40	7145.60	2552.00
902	Temporary bridge	Sq.m	5380	-	-	-	-	-
903	Preparation works	LS		1	6705.60	3622.87	2412.17	670.56
* Sub-total					32225.60	19445.27	9557.77	3222.56
					(100.0 %)	(60.3 %)	(29.6 %)	(10.0 %)
** Grand Total					230225.60	124365.27	82817.77	23022.56
					(100.0 %)	(54.0 %)	(35.9 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (21/52)

21 Name of Bridge : NAGUILAN
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	1035	943920.00	405885.60	443642.40	94392.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	803	1320	1059960.00	593577.60	360386.40	105996.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	kg	18.7	131923	2466960.10	1776211.27	444052.82	246696.01
405(1)	Structural concrete, Class A	Cu.m	2860	1015	2902900.00	1596696.00	1016015.00	290290.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	17251	1226546.10	159450.99	944440.50	122654.61
* Sub-total					8600286.20	4531720.46	3208537.12	860028.62
					(100.0 %)	(52.6 %)	(37.3 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	1690	1120470.00	694691.40	313731.60	112047.00
* Sub-total					1120470.00	694691.40	313731.60	112047.00
					(100.0 %)	(62.0 %)	(28.0 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	203	8708700.00	6618612.00	1219218.00	870870.00
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RC DG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
* Sub-total					8708700.00	6618612.00	1219218.00	870870.00
					(100.0 %)	(76.0 %)	(14.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	5610	875160.00	612612.00	175032.00	87516.00
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5380	440	2367200.00	1775400.00	365080.00	236720.00
903	Preparation works	LS	1	1	650154.49	426991.08	158147.96	65015.45
* Sub-total					3892514.49	2816003.08	688259.96	389251.45
					(100.0 %)	(72.3 %)	(17.6 %)	(10.0 %)
** Grand Total					22321970.69	14560026.94	5429746.68	2232197.07
					(100.0 %)	(65.6 %)	(24.3 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (22/52)

22 Name of Bridge : MALALAN
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(6)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(5)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	377	343824.00	147844.32	161597.28	34382.40
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	803	488	391864.00	219443.84	133233.76	39186.40
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	kg	18.7	48807	912690.90	657137.45	164284.36	91269.09
405(1)	Structural concrete, Class A	Cu.m	2860	376	1075360.00	591448.00	376376.00	107536.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge (I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	12767	907733.70	118005.38	698954.95	90773.37
Sub-total					3631472.60	1733878.99	1534446.35	363147.26
					(100.0 %)	(47.7 %)	(42.2 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile (1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	1267	840021.00	520813.02	235205.88	84002.10
Sub-total					840021.00	520813.02	235205.88	84002.10
					(100.0 %)	(62.0 %)	(28.0 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RC DG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9600	-	-	-	-	-
Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	2076	323856.00	226699.20	64771.20	32385.60
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5380	330	1775400.00	1331550.00	266310.00	177540.00
903	Preparation works	LS	1	1	197122.49	114388.24	63022.00	19712.25
Sub-total					2296378.49	1672637.44	394103.20	229637.85
					(100.0 %)	(72.8 %)	(17.1 %)	(10.0 %)
** Grand Total					6767872.09	3927329.45	2163755.43	676787.21
					(100.0 %)	(58.0 %)	(31.9 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (23/52)

23 Name of Bridge : BALASIG
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.18	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	792	46332.00	29189.16	12509.64	4633.20
103(2)S	Bridge excavation below low water level	Cu.m	111	968	107448.00	65543.28	31159.92	10744.80
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	120	333	39960.00	14385.60	21578.40	3996.00
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
* Sub-total					193740.00 (100.0 %)	109118.04 (56.3 %)	65247.96 (33.6 %)	19374.00 (10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	102	93024.00	40000.32	43721.28	9302.40
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	803	165	132495.00	74197.20	45048.30	13249.50
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	kg	18.7	16632	311018.40	223933.25	55983.31	31101.84
405(1)	Structural concrete, Class A	Cu.m	2860	128	366080.00	201344.00	128128.00	36608.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	2175	154642.50	20103.53	119074.73	15464.25
* Sub-total					1057259.90 (100.0 %)	559578.29 (52.9 %)	391965.62 (37.0 %)	105725.99 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	123	16482.00	8076.18	6767.62	1648.20
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	kg	16.2	308	4989.60	3592.51	898.13	498.96
405(1)	Structural concrete, Class A	Cu.m	2000	15	30000.00	18300.00	8700.00	3000.00
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	554	547906.00	235599.58	257515.82	54790.60
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	264	175032.00	108519.84	49008.96	17503.20
* Sub-total					774409.60 (100.0 %)	374088.11 (48.3 %)	322880.53 (41.6 %)	77440.96 (10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	108	772200.00	563706.00	131274.00	77220.00
802	Reinforcing beam of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
* Sub-total					772200.00 (100.0 %)	563706.00 (73.0 %)	131274.00 (17.0 %)	77220.00 (10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	743	115908.00	81135.60	23181.60	11590.80
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5380	-	-	-	-	-
903	Preparation works	LS	1	1	87405.53	50628.78	28036.19	8740.55
* Sub-total					203313.53 (100.0 %)	131764.38 (64.8 %)	51217.79 (25.1 %)	20331.35 (10.0 %)
** Grand Total					3000923.03 (100.0 %)	1738254.83 (57.9 %)	952576.90 (32.0 %)	300092.30 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (24/52)

24 Name of Bridge : SAN PABLO
 Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(5)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
209	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	455	414960.00	178432.80	195031.20	41496.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Hallink	m	803	510	409530.00	229336.80	139240.20	40953.00
402	Timber structure (Detour bridge)	span	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	kg	18.7	59719	1116745.30	804066.62	201014.15	111674.53
405(1)	Structural concrete, Class A	Cu.m	2860	459	1312740.00	722007.00	459459.00	131274.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	7809	555219.90	72178.59	427519.32	55521.99
* Sub-total					3809195.20	2006011.80	1422263.88	380919.52
					(100.0 %)	(52.6 %)	(37.3 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	211	139893.00	86733.56	39170.04	13989.30
* Sub-total					139893.00	86733.56	39170.04	13989.30
					(100.0 %)	(62.0 %)	(28.0 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	92	3946800.00	2999568.00	552552.00	394680.00
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
* Sub-total					3946800.00	2999568.00	552552.00	394680.00
					(100.0 %)	(76.0 %)	(14.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	2424	378144.00	264700.80	75628.80	37814.40
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5380	440	2367200.00	1775400.00	355080.00	236720.00
903	Preparation works	LS	1	1	319236.97	213972.43	73340.84	31923.70
* Sub-total					3064580.97	2254073.23	504049.64	306458.10
					(100.0 %)	(73.5 %)	(16.4 %)	(10.0 %)
** Grand Total					10980469.17	7346386.69	2518035.56	1096046.92
					(100.0 %)	(67.0 %)	(22.9 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (25/52)

25 Name of Bridge : PINACANAUAN
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I)	EARTHWORK AND ROAD WORKS							
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	1287	75289.50	47432.39	20328.17	7528.95
103(2)S	Bridge excavation below low water level	Cu.m	111	3493	387723.00	236511.03	112439.67	38772.30
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	-	-	-	-	-
104(S)	Selected borrow for backfill	Cu.m	120	297	35640.00	12830.40	19245.60	3564.00
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
*	Sub-total				498652.50 (100.0 %)	296773.82 (59.5 %)	152013.43 (30.4 %)	49865.25 (10.0 %)
(II)	SUPERSTRUCTURE WORKS							
101(S)	Removal concrete structure	Cu.m	912	151	137712.00	59216.16	64724.64	13771.20
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Ralling	m	803	198	158994.00	89036.64	54057.96	15899.40
402	Timber structure (Detour bridge)	SP&N	55700	-	-	-	-	-
403(S)	Structural steel (Detour bridge)	Sq.m	5380	-	-	-	-	-
404	Reinforcing steel	KK	18.7	19660	367642.00	264702.24	66175.56	36764.20
405(1)	Structural concrete, Class A	Cu.m	2860	164	469040.00	257972.00	164164.00	46904.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	5090	361899.00	47046.87	278662.23	36189.90
*	Sub-total				1495287.00 (100.0 %)	717973.91 (48.0 %)	627784.39 (41.9 %)	149528.70 (10.0 %)
(III)	SUBSTRUCTURE WORKS							
101(S)	Removal of concrete structure	Cu.m	912	76	68400.00	29412.00	32148.00	6840.00
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	KK	16.2	46200	748440.00	538876.80	134719.20	74844.00
405(1)	Structural concrete, Class A	Cu.m	2000	471	942000.00	574620.00	273180.00	94200.00
405(5)	Seal concrete	Cu.m	1800	174	313200.00	197316.00	84564.00	31320.00
501	Grouted riprap	Cu.m	989	-	-	-	-	-
506	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
*	Sub-total				2072040.00 (100.0 %)	1340224.80 (64.6 %)	524611.20 (25.3 %)	207204.00 (10.0 %)
(IV)	RIVER TRAINING WORKS							
400(1)	Untreated timber pile	m	134	154	20636.00	10111.64	8460.76	2063.60
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	KK	16.2	374	6058.80	4362.34	1090.58	605.88
405(1)	Structural concrete, Class A	Cu.m	2000	19	38000.00	23180.00	11020.00	3800.00
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	1169	1156141.00	497140.63	643386.27	115614.10
506	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	2034	1348542.00	836096.04	377591.76	134854.20
*	Sub-total				2569377.80 (100.0 %)	1370890.65 (53.3 %)	941549.37 (36.6 %)	256937.78 (10.0 %)
(V)	SPECIAL WORKS FOR REHABILITATION							
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
*	Sub-total				(-)	(-)	(-)	(-)
(VI)	TEMPORARY WORKS							
900	Scaffolding	Sq.m	156	792	123552.00	86486.40	24710.40	12355.20
901	Staging	Cu.m	220	772	169840.00	105300.80	47555.20	16984.00
902	Temporary bridge	Sq.m	5380	700	3766000.00	2824500.00	564900.00	376600.00
903	Preparation works	LS		1	320842.48	202264.51	86493.72	32084.25
*	Sub-total				4380234.48 (100.0 %)	3218551.71 (73.4 %)	723659.32 (16.5 %)	438023.45 (10.0 %)
**	Grand Total				11015591.78 (100.0 %)	6944414.88 (63.0 %)	2969617.72 (26.9 %)	1101559.18 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (26/52)

26 Name of Bridge : PARED
 Classification : Reconstruction

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	2424	141804.00	89336.52	38287.08	14180.40
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	2553	176157.00	128594.61	29946.69	17615.70
104(5)	Selected borrow for backfill	Cu.m	120	2020	242400.00	87264.00	130896.00	24240.00
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	474	-	-	-	-	-
Sub-total					560361.00	305195.13	199129.77	56036.10
					(100.0 %)	(54.4 %)	(35.5 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(5)	Removal concrete structure	Cu.m	912	339	309168.00	132942.24	145308.96	30916.80
101(1)	Removal steel structure (bridge)	LS	1	318447	318447.00	213359.49	73242.81	31844.70
401	Railing	m	803	435	349305.00	195610.80	118763.70	34930.50
402	Timber structure (Detour bridge)	span	56700	-	-	-	-	-
403(5)	Structural steel (Detour bridge)	Sq.m	5380	361	1942180.00	1456635.00	291327.00	194218.00
404	Reinforcing steel	kg	18.7	45210	845427.00	608707.44	152176.86	84542.70
405(1)	Structural concrete, Class A	Cu.m	2860	398	1138280.00	626054.00	398398.00	113828.00
407	Prestressed concrete bridge	Cu.m	15800	136	2148800.00	1461184.00	472736.00	214880.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	71.1	4243	301677.30	39218.05	232291.52	30167.73
Sub-total					7353284.30	4733711.02	1884244.85	735328.43
					(100.0 %)	(64.3 %)	(25.6 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(5)	Removal of concrete structure	Cu.m	912	128	116736.00	50196.48	54865.92	11673.60
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3380	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	908	754548.00	528183.60	150909.60	75454.80
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	601	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7540	-	-	-	-	-
404	Reinforcement steel	kg	16.2	40920	662904.00	477290.88	119322.72	66290.40
405(1)	Structural concrete, Class A	Cu.m	2000	477	954000.00	581940.00	276650.00	95400.00
405(5)	Seal concrete	Cu.m	1800	9	16200.00	10206.00	4374.00	1620.00
501	Grouted riprap	Cu.m	989	-	-	-	-	-
505	Stone masonry	Cu.m	893	-	-	-	-	-
509	Gablon	Cu.m	663	-	-	-	-	-
Sub-total					2504388.00	1647816.96	606132.24	250438.80
					(100.0 %)	(65.8 %)	(24.2 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	134	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	831	-	-	-	-	-
400(6)	Steel sheet pile	m	3410	-	-	-	-	-
404	Reinforcement steel	kg	16.2	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2000	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1800	-	-	-	-	-
504	Grouted riprap	Cu.m	989	311	307579.00	132258.97	144562.13	30757.90
505	Stone masonry	Cu.m	893	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gablon	Cu.m	663	496	328848.00	203885.76	92077.44	32884.80
Sub-total					636427.00	336144.73	236639.57	63642.70
					(100.0 %)	(52.8 %)	(37.1 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	42900	-	-	-	-	-
801	Additional sidewalk	Sq.m	7150	471	3367650.00	2458384.50	572500.50	336765.00
802	Reinforcing beams of RCDG	Cu.m	6180	-	-	-	-	-
803	Widening of pier coping	Cu.m	9000	-	-	-	-	-
Sub-total					3367650.00	2458384.50	572500.50	336765.00
					(100.0 %)	(73.0 %)	(17.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	1821	284076.00	198853.20	56815.20	28407.60
901	Slaging	Cu.m	220	999	219780.00	136263.60	61538.40	21978.00
902	Temporary bridge	Sq.m	5380	220	1183600.00	887700.00	177540.00	118360.00
903	Preparation works	LS	1	1	483286.99	321122.07	113836.22	48328.70
Sub-total					2170742.99	1543938.87	409729.82	217074.30
					(100.0 %)	(71.1 %)	(18.8 %)	(10.0 %)
Grand Total					16592863.29	11025191.21	3908376.76	1659286.33
					(100.0 %)	(66.4 %)	(23.5 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (27/52)

27 Name of Bridge : SUJE(RIZAL)
 Classification : Replacement of Superstructure

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	588	1226.88	85.88	1018.31	122.69
102	Common excavation	Cu.m	43.8	94	4117.20	2758.62	946.96	411.72
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	479	33051.00	24127.23	5618.67	3306.10
104(5)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
200	Aggregate subbase course	Cu.m	195	170	33150.00	23866.00	5967.00	3315.00
311(2)	PCC Pavement (Reinforced)	Sq.m	465	295	137175.00	85048.50	38409.00	13717.50
*	Sub-total				208720.08 (100.0 %)	135888.14 (65.1 %)	51959.94 (24.8 %)	20872.01 (10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	55	50160.00	21568.80	23575.20	5016.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Nailing	m	789	26	20514.00	11487.84	6974.76	2051.40
402	Timber structure (Detour bridge)	span	45200	4	180800.00	56048.00	106672.00	18080.00
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	Kg	17.9	770	13783.00	9923.76	2480.94	1378.30
405(1)	Structural concrete, Class A	Cu.m	2760	8	22080.00	12144.00	7728.00	2208.00
407	Prestressed concrete bridge	Cu.m	15800	39	616200.00	419016.00	135564.00	61620.00
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
*	Sub-total				903537.00 (100.0 %)	530188.40 (58.6 %)	282994.90 (31.3 %)	90353.70 (10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	32	29184.00	12549.12	13716.48	2918.40
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	132	430320.00	322740.00	64548.00	43032.00
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	Kg	15.5	11660	180730.00	130125.60	32531.40	18073.00
405(1)	Structural concrete, Class A	Cu.m	1930	117	225810.00	137744.10	65484.90	22581.00
405(5)	Seal concrete	Cu.m	1740	-	-	-	-	-
501	Grouted riprap	Cu.m	945	72	68040.00	29257.20	31978.80	6804.00
505	Stone masonry	Cu.m	853	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
*	Sub-total				934084.00 (100.0 %)	632416.02 (67.7 %)	208259.58 (22.3 %)	93408.40 (10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	109	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	Kg	15.5	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1930	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1740	-	-	-	-	-
504	Grouted riprap	Cu.m	945	-	-	-	-	-
505	Stone masonry	Cu.m	853	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
*	Sub-total				(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6690	-	-	-	-	-
802	Reinforcing beam of RCBG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	25	217000.00	115010.00	80290.00	21700.00
*	Sub-total				217000.00 (100.0 %)	115010.00 (53.0 %)	80290.00 (37.0 %)	21700.00 (10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	132	20592.00	14414.40	4118.40	2059.20
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5180	-	-	-	-	-
903	Preparation works	LS	1	1	68517.99	42837.51	18828.68	6851.80
*	Sub-total				89109.99 (100.0 %)	57251.91 (64.2 %)	22947.08 (25.7 %)	8911.00 (10.0 %)
**	Grand Total				2352451.07 (100.0 %)	1470754.46 (62.5 %)	646451.50 (27.4 %)	235245.11 (10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (28/52)

28 Name of Bridge : GUINOBATAN
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.18	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	474	27729.00	17469.27	7486.83	2772.90
103(2)S	Bridge excavation below low water level	Cu.m	111	312	34632.00	21125.52	10043.28	3463.20
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	286	19734.00	14405.82	3354.78	1973.40
104(5)	Selected borrow for backfill	Cu.m	120	773	92760.00	33393.60	50090.40	9276.00
200	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	465	-	-	-	-	-
* Sub-total					174855.00	86394.21	70975.29	17485.50
					(100.0 %)	(49.4 %)	(40.5 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(5)	Removal concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Railing	m	789	-	-	-	-	-
402	Timber structure (Detour bridge)	span	45200	-	-	-	-	-
403(5)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kz	17.9	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	2760	-	-	-	-	-
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(III) SUBSTRUCTURE WORKS								
101(5)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	kz	15.5	9680	150040.00	108028.80	27007.20	15004.00
405(1)	Structural concrete, Class A	Cu.m	1930	97	187210.00	114198.10	54290.90	18721.00
405(5)	Seal concrete	Cu.m	1740	-	-	-	-	-
501	Grouted riprap	Cu.m	945	-	-	-	-	-
505	Stone masonry	Cu.m	853	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					337250.00	222226.90	81298.10	33725.00
					(100.0 %)	(65.8 %)	(24.1 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	109	66	7194.00	3525.06	2949.54	719.40
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kz	15.5	110	1705.00	1227.60	305.90	170.50
405(1)	Structural concrete, Class A	Cu.m	1930	6	11580.00	7063.80	3358.20	1158.00
405(5)	Seal concrete	Cu.m	1740	-	-	-	-	-
504	Grouted riprap	Cu.m	945	47	44415.00	19098.45	20875.05	4441.50
505	Stone masonry	Cu.m	853	75	63975.00	30708.00	26869.50	6397.50
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					128869.00	61622.91	54359.19	12886.90
					(100.0 %)	(47.8 %)	(42.1 %)	(10.0 %)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	-	-	-	-	-
801	Additional sidewalk	Sq.m	6690	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	-	-	-	-	-
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5180	-	-	-	-	-
903	Preparation works	LS	1	1	19229.22	11107.32	6198.98	1922.92
* Sub-total					19229.22	11107.32	6198.98	1922.92
					(100.0 %)	(57.7 %)	(32.2 %)	(10.0 %)
** Grand Total					660203.22	381351.34	212831.56	66020.32
					(100.0 %)	(57.7 %)	(32.2 %)	(10.0 %)

DETAILED CONSTRUCTION COST ESTIMATE (29/52)

29 Name of Bridge : SAN FERNANDO
Classification : Repair

Item No.	Description	Unit	Price	Quantity	Amount	Foreign Component	Local Component	Taxes
(I) EARTHWORK AND ROAD WORKS								
100	Clearing and Grubbing	Sq.m	2.16	-	-	-	-	-
102	Common excavation	Cu.m	43.8	-	-	-	-	-
103(2)	Bridge excavation above low water level	Cu.m	58.5	-	-	-	-	-
103(2)S	Bridge excavation below low water level	Cu.m	111	-	-	-	-	-
103(5)	Shoring, cribbing, cofferdam and related work	LS	1	-	-	-	-	-
104(1)	Embankment	Cu.m	69.0	479	33051.00	24127.23	5618.67	3305.10
104(S)	Selected borrow for backfill	Cu.m	120	-	-	-	-	-
290	Aggregate subbase course	Cu.m	195	-	-	-	-	-
311(2)	PCC Pavement (Reinforced)	Sq.m	465	-	-	-	-	-
* Sub-total					33051.00	24127.23	5618.67	3305.10
					(100.0 %)	(73.0 %)	(17.0 %)	(10.0 %)
(II) SUPERSTRUCTURE WORKS								
101(S)	Removal concrete structure	Cu.m	912	60	54720.00	23529.60	25718.40	5472.00
101(1)	Removal steel structure (bridge)	LS	1	-	-	-	-	-
401	Halling	m	789	-	-	-	-	-
402	Timber structure (Detour bridge)	span	45200	7	316400.00	98084.00	186676.00	31640.00
403(S)	Structural steel (Detour bridge)	Sq.m	5180	-	-	-	-	-
404	Reinforcing steel	kg	17.9	8085	144721.50	104199.48	26049.87	14472.15
405(1)	Structural concrete, Class A	Cu.m	2760	62	171120.00	94116.00	59892.00	17112.00
407	Prestressed concrete bridge	Cu.m	15800	-	-	-	-	-
408	Steel bridge(I-beam)	ton	61400	-	-	-	-	-
411	Paint	Sq.m	68.4	532	36388.80	4730.54	28019.38	3638.88
* Sub-total					723350.30	324659.62	326355.65	72335.03
					(100.0 %)	(44.8 %)	(45.1 %)	(10.0 %)
(III) SUBSTRUCTURE WORKS								
101(S)	Removal of concrete structure	Cu.m	912	-	-	-	-	-
101(1)	Removal of steel structure	LS	1	-	-	-	-	-
400(3)	Steel H-piles	m	3260	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
400(7)	Precast concrete sheet pile	m	580	-	-	-	-	-
400(16)	Cast-in-Place concrete pile(1200mm)	m	7270	-	-	-	-	-
404	Reinforcement steel	kg	15.5	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1930	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1740	-	-	-	-	-
501	Grouted riprap	Cu.m	945	66	62370.00	26819.10	29313.90	6237.00
505	Stone masonry	Cu.m	853	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					62370.00	26819.10	29313.90	6237.00
					(100.0 %)	(43.0 %)	(47.0 %)	(10.0 %)
(IV) RIVER TRAINING WORKS								
400(1)	Untreated timber pile	m	109	-	-	-	-	-
400(4)	Precast concrete pile (400X400mm)	m	801	-	-	-	-	-
400(6)	Steel sheet pile	m	3290	-	-	-	-	-
404	Reinforcement steel	kg	15.5	-	-	-	-	-
405(1)	Structural concrete, Class A	Cu.m	1930	-	-	-	-	-
405(5)	Seal concrete	Cu.m	1740	-	-	-	-	-
504	Grouted riprap	Cu.m	945	-	-	-	-	-
505	Stone masonry	Cu.m	853	-	-	-	-	-
506	Stone pitching (Hand-laid rock embankment)	Cu.m	300	-	-	-	-	-
509	Gabion	Cu.m	663	-	-	-	-	-
* Sub-total					(-)	(-)	(-)	(-)
(V) SPECIAL WORKS FOR REHABILITATION								
800	Additional stringer	ton	41300	9	371700.00	282492.00	52038.00	37170.00
801	Additional sidewalk	Sq.m	6690	-	-	-	-	-
802	Reinforcing beam of RCDG	Cu.m	5960	-	-	-	-	-
803	Widening of pier coping	Cu.m	8680	-	-	-	-	-
* Sub-total					371700.00	282492.00	52038.00	37170.00
					(100.0 %)	(76.0 %)	(14.0 %)	(10.0 %)
(VI) TEMPORARY WORKS								
900	Scaffolding	Sq.m	156	240	37440.00	26208.00	7488.00	3744.00
901	Staging	Cu.m	220	-	-	-	-	-
902	Temporary bridge	Sq.m	5180	-	-	-	-	-
903	Preparation works	LS	1	1	36837.34	20529.18	12624.43	3683.73
* Sub-total					74277.34	46737.18	20112.43	7427.73
					(100.0 %)	(62.9 %)	(27.0 %)	(10.0 %)
** Grand Total					1264748.64	704835.13	433438.64	126474.86
					(100.0 %)	(55.7 %)	(34.2 %)	(10.0 %)