



Ministry of Transport



Vietnam Expressway Corporation



Project Management Unit No. 85

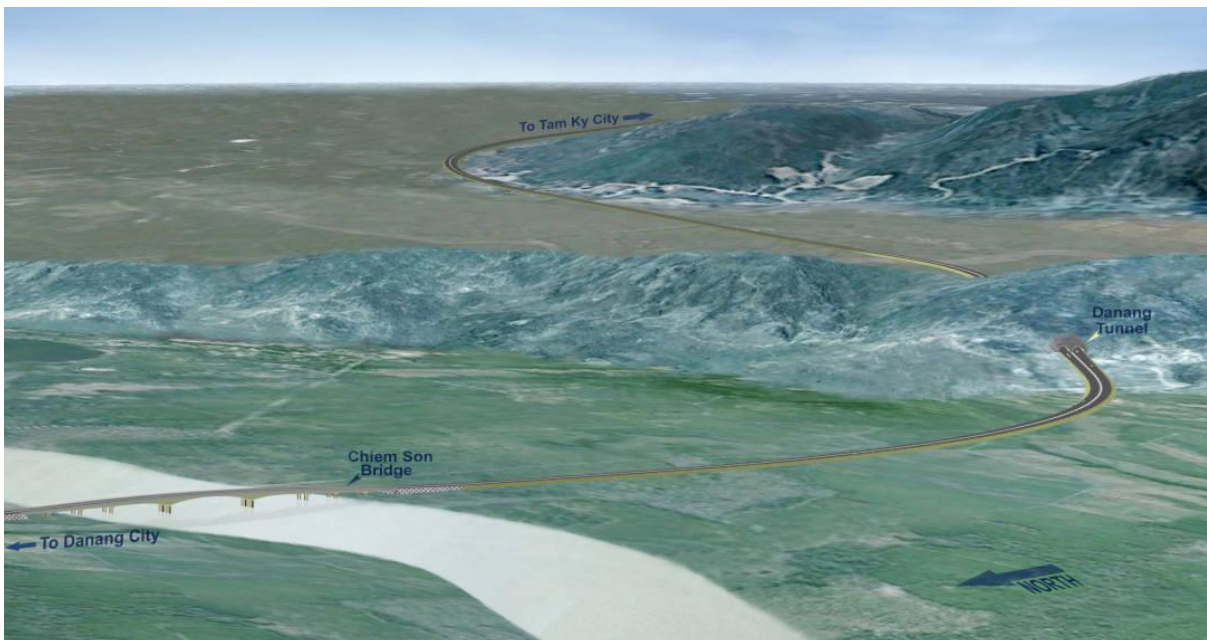


THE WORLD BANK

IDA Credit No. : 3843-VN

Project ID No. : P106235

**Consulting Services
for
Detailed Design for Danang - Quang Ngai Expressway Development Project**



Inception Report

December 26, 2011

The Joint Venture of



NIPPON KOEI CO.,LTD.



NIPPON ENGINEERING CONSULTANTS CO.,LTD.



CHODAI CO.,LTD.



THAI ENGINEERING CONSULTANTS CO., LTD.

Consulting Services for

Detailed Design for Danang - Quang Ngai Expressway Development Project (DQEDP-DD)

IDA Credit No. : 3843-VN

Project ID No. : P106235

Project Office

Unit 2, 11th floor, PVFC Danang Building

Lot A2.1, April 30 Street, Hai Chau District, Danang City, Vietnam

Tel. : +84-(0)511-379796

Fax. : +84-(0)511-379796

Ref. No.: DQEDD-PMU-94-11

Date : December 26, 2011

Mr. Nguyen Tien Ha

Project Manager

Project Management Unit No. 85 (PMU85)

Fax No. : +84-(38)3834705

Subject: Submission of Inception Report (IC/R) (English Version)

Dear Sir,

Since the official commencement of Services on December 1, 2011, we have mobilized our professional staff and established our project office at the captioned address.

In accordance with Appendix B - Reporting Requirements in the Contract for Consulting Services, we would like to submit fifteen (15) copies of the Inception Report (IC/R) in English. Vietnamese versions will be submitted soon.

This report is the baseline of our Services at the initial stage, and will be continuously updating in accordance with the progress of our services, time to time, work item by item.

Your review and comments will be highly appreciated.

Sincerely yours,

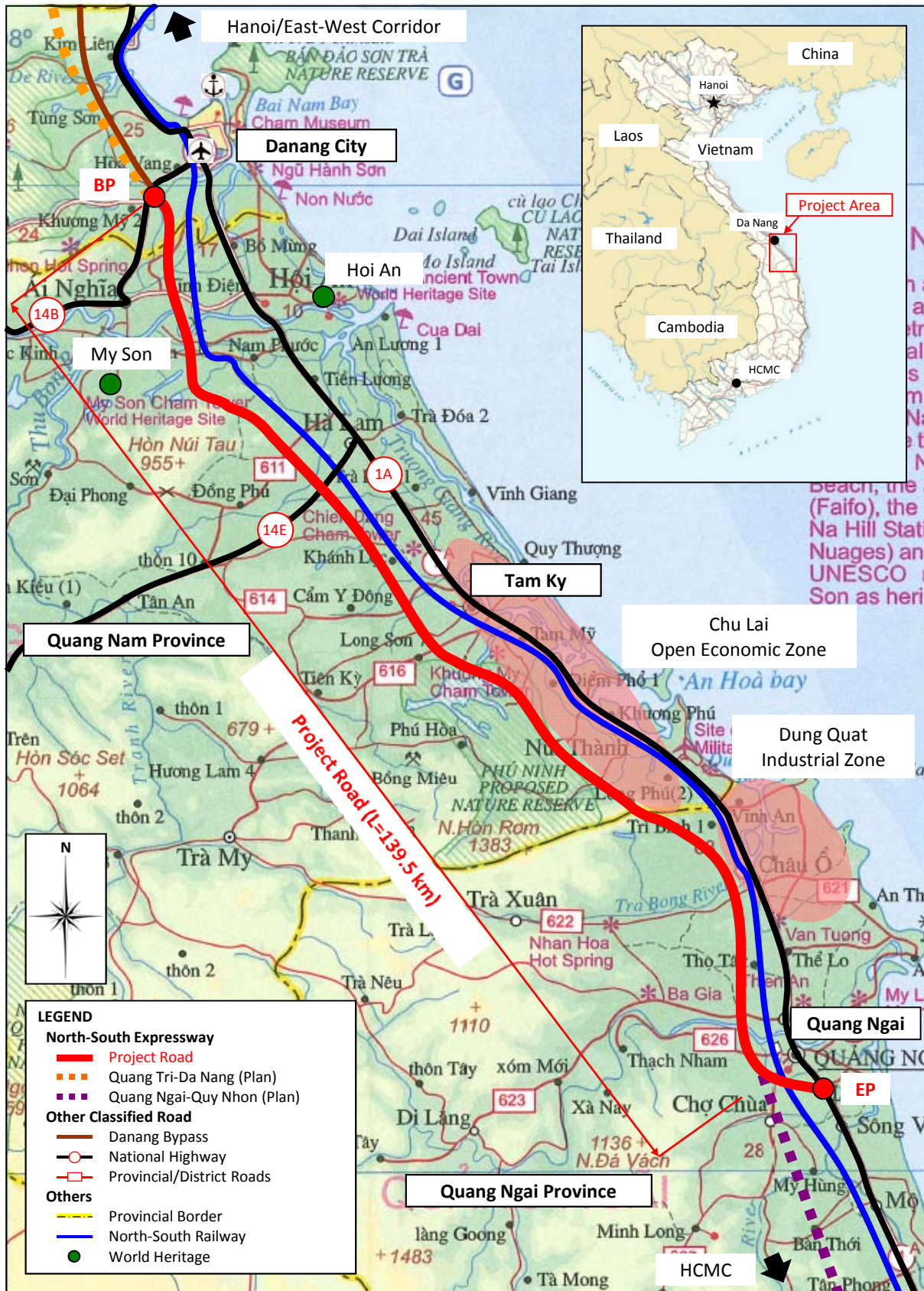


Ichizuru ISHIMOTO

Project Manager/Team Leader

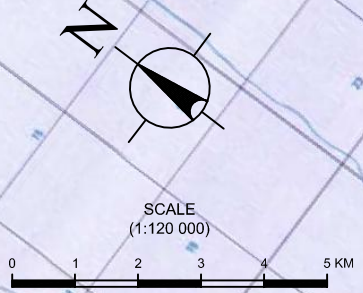
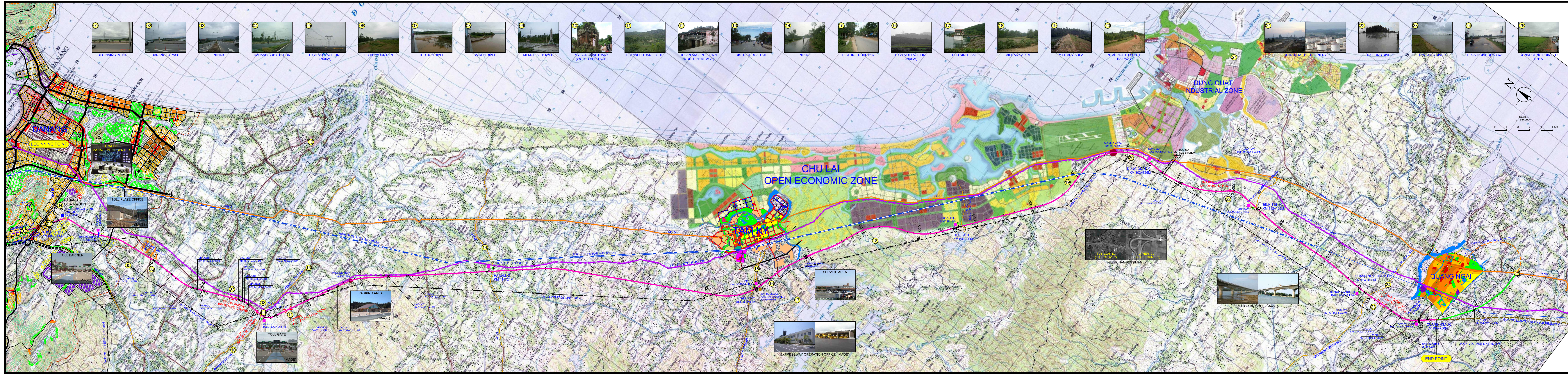
Encl.: Inception Report (English: 15 copies)

- c.c. : 1) PMU85 Head Office, Vinh city (Cover only)
2) NK Hanoi (Cover only)
3) Office Copy



Consulting Services for Detailed Design for
 Danang Quang Ngai Expressway Development Project
 (DQEDP-DD)

Project Location Map



PROJECT ROUTE MAP

- ROADS
- SOUTH EXPRESSWAY
- PROJECT ROAD
- QUANG TRI - DANANG (PLAN)
- QUANG NGAI - QUANG BINH (PLAN)
- OTHER CLASSIFIED ROAD
- DANANG BYPASS
- NATIONAL HIGHWAY
- PROVINCIAL / DISTRICT / CITY ROAD
- PROVINCIAL / DISTRICT / CITY ROAD (PLAN)
- RAILWAY
- HIGH-SPEED RAILWAY (PLAN)
- NORTH - SOUTH RAILWAY
- PROJECT FACILITIES
- TOLL PLAZA OFFICE (NEW CONSTRUCTION)
- TOLL PLAZA OFFICE (EXISTING)
- TOLL BARRIER (NEW CONSTRUCTION)
- TOLL BARRIER (EXISTING)
- TOLL GATE (NEW CONSTRUCTION)
- TOLL GATE (EXISTING)
- TOLL PLAZA OFFICE (PRO)

Letter of Submission
Project Location Map
Project Route Map

Table of Contents

Abbreviations

Main Part

Part A	General	1
	A.1 Project Features	1
	A.1.1 Background	1
	A.1.2 Recent Major Updates	2
	A.1.3 Location	3
	A.1.4 Objectives	3
	A.1.5 Project Components	4
	A.1.6 Safeguards	8
	A.1.7 Project Cost	9
	A.1.8 Funding Arrangement	9
	A.1.9 Contract Packaging	10
	A.1.10 Project Implementation Structure	11
	A.1.11 Project Implementation Program	12
	A.2 Outline of the Services	14
	A.2.1 General	14
	A.2.2 Objectives	14
	A.2.3 Scope in TOR	14
	A.2.4 Additional Scope to TOR	15
	A.2.5 Work Items in the Services	15
	A.2.6 Work Schedule	16
	A.2.7 Reporting Schedule	19
	A.2.8 Organization	25
	A.2.9 Staffing	27
	A.2.10 Terms of Payment	28
Part B	Project Management	33
	B.1 Basic Policy	33
	B.2 General Phasing in Project Management	33
Part C	Previous Studies Review and Establishing Detailed Engineering Design Framework	36
	C.1 Review Previous Studies	36
	C.2 Establish Detailed Engineering Design Framework	37
Part D	Detailed Engineering Design and Procurement Planning	39
	D.1 Contract Packaging	39
	D.1.1 Propose Contract Packaging	39
	D.2 Surveys and Investigations	39
	D.2.1 Data Collection	39
	D.2.2 Conduct Topographic Survey	41
	D.2.3 Conduct Hydrological Survey and Analysis	44
	D.2.4 Inundation Analysis	46

D.2.5 Conduct Geotechnical and Geological Investigations	47
D.2.6 Conduct Material Source Survey	50
D.2.7 Conduct Relevant Facilities Survey	51
D.2.8 Conduct Additional Traffic Surveys	52
D.2.9 Conduct Independent Land Valuation Survey	53
D.2.10 Conduct Environmental and Social Surveys	53
D.3 Civil Engineering Design	54
D.4 O&M Plan and Design	59
D.5 ITS Plan and Design	61
D.6 Electrical Facilities Design	62
D.7 Public Utilities Relocation Plan	63
D.8 Safeguards	64
D.8.1 Assist in Updating EIA and EMP	64
D.8.2 Review and update Resettlement Action Plan (RAP)	64
D.9 Construction Planning	77
D.9.1 Prepare Construction Plan	77
D.10 Project Cost Estimate	78
D.10.1 Estimate Project Cost	78
D.11 Procurement Documents	79
D.11.1 Prepare Procurement Documents	79
D.12 Project Implementation Program	80
D.12.1 Prepare Project Implementation Program	80
Part E Procurement Assistance	81
E.1 Assist in Tendering Procedures	81
Part F Land Acquisition Staking	83
Part G Technology Transfer	84
G.1 Provide Training to VEC, PMU85 and Relevant Organizations	84
G.2 Provide Training to the Key Local Professional Staff	85

Appendix

- Appendix 1 : Terms of Reference (Appendix A in the Contract)
- Appendix 2 : List of Bridges (As of December 2011)
- Appendix 3 : List of Culverts (As of December 2011)
- Appendix 4 : List of Communes along the expressway
- Appendix 5 : List of Crossing of Electrical Lines

Abbreviations

AIDS	: Acquired Immune Deficiency Syndrome
AM	: Ante Meridiem
AP	: Affected Person
B/D	: Basic Design
BL	: Building
BOT	: Build-Operate-Transfer
BP	: Beginning Point
B/Q	: Bill of Quantities
BR	: Bridge
CARB	: Compensation, Assistance and Resettlement Boards
CB	: Culvert Box
CDM	: Civil Design Management
CID	: Civil Design Team
COD	: Cost and Document Team
COR	: Core Team
COS	: Cost Estimate
CP	: Culvert Pipe
CPC	: City People's Committee
CPCSR	: Comprehensive Plan on Compensation, Support and Resettlement
C/S	: Construction Supervision
CSC	: Construction Supervision Consultant
CU	: Triaxial Compression Test
Cv	: Consolidation Test
DARD	: Department of Agriculture and Rural Development
DC	: Design Consultant
D/D	: Detailed Engineering Design
DE	: Deep Excavation
DEG	: Design Group
DMS	: Detailed Measurement Survey
DOC	: Document
DOFPP	: Department of Fire Prevention and Protection
DOLA	: Department of Land Administration
DONRE	: Department of Natural Resources and Environment
DOT	: Department of Transport
DOTP	: Department of Traffic Office
DP	: Displaced Person
DPC	: District People's Committee
DRC	: District Resettlement Committee
DRD	: Drainage Design
ED	: Evaluation Department
EIA	: Environmental Impact Assessment
EID	: Electrical Facility and Intelligent Transport Systems Design
EMP	: Environmental Management Plan
ENV	: Environmental Team
EOO	: Expressway Operation Office

EP	: Ending Point
ER	: Existing Road
ESCRD	: Environmental and Social Considerations Review Division
ETC	: Electric Toll Collection
EVN	: Electricity of Vietnam
FIDIC	: International Federation of Consulting Engineers
FO	: Flyover
F/S	: Feasibility Study
GOVN	: Government of Vietnam
GPS	: Global Positioning System
GTD	: Geotechnical Design
GTS	: Geotechnical Survey
HCMC	: Ho Chi Minh City
HDS	: Hydrological Survey
HE	: High-embankment
HEC-RAS	: Hydrologic Engineering Centers River Analysis System, US Army Corps of Engineer
HIDO	: Highway Industry Development Organization, Japan
HIV	: Human Immunodeficiency Virus
HVL	: High-voltage Line
IBRD	: International Bank for Reconstruction and Development
IC	: Interchange
ICB	: International Competitive Bidding
ICD	: Interchange Design
ICR	: Inception Report
ID	: Identification
IDA	: International Development Association
IMO	: Independent Monitoring Organization
IOL	: Inventory of Losses
I/P	: Implementation Program
IRB	: Interchange Rampway Bridge
IS	: Intersection
ITS	: Intelligent Transport Systems
JBIC	: Japan Bank for International Cooperation
JEHDRA	: Japan Expressway Holding and Debt Repayment Agency
JETRO	: Japan External Trade Organization
JICA	: Japan International Cooperation Agency
JV	: Joint Venture
L/A	: Loan Agreement
LOS	: Level of Services
LRB	: Large River Bridge
MBD	: Major Bridges Design
M/D	: Minutes of Discussion
MEX	: Metropolitan Expressway Co., Ltd., Japan
MGT	: Management Team
ML	: Main Line
MLIT	: Ministry of Land, Infrastructure, Transport and Tourism, Japan
MLS	: Material Source Survey
MOF	: Ministry of Finance

MOND	: Ministry of National Defense
MONRE	: Ministry of Natural Resources and Environment
MOPS	: Ministry of Public Security
MOT	: Ministry of Transport
MRB	: Major River Bridge
MS	: Milestone
MS	: Microsoft
NE	: Nippon Engineering Consultants Co., Ltd., Japan
NEE	: Normal Embankment and Excavation
NEXCO	: Nippon Expressway Company Limited, Japan
NH	: National Highway
NK	: Nippon Koei Co., Ltd., Japan
NTP	: Notice to Proceed
OAM	: Operation and Maintenance
OED	: Operations Evaluation Department
O&M	: Operation and Maintenance
OMI	: Operation and Intelligent Transport Systems Team
OP	: Overpass
ORB	: Other River Bridge
ORSE	: Organization for Road System Enhancement, Japan
PA	: Parking Area
PAP	: Project Affected People
PC	: People's Committee
PIARC	: Permanent International Association of Road Congresses
PIS	: Project Implementation Support for Vietnam Expressway Corporation
PKG	: Package
PM	: Prime Minister
PM	: Post Meridien
PMBOK	: Project Management Body of Knowledge
PMU	: Project Management Unit
PPC	: Provincial People's Committee
P/Q	: Pre-qualification
PSMD	: Project Site Management Department
PTC2	: Power Transmission Company No. 2
PVD	: Pavement Design
QACU	: Quality Assurance and Compliance Unit
QA/QC	: Quality Assurance and Quality Control
RAP	: Resettlement Action Plan
RB	: River Bridge
RC	: Resettlement Committee
RCS	: Replacement Cost Survey
RD	: Roadway
RDD	: Road Design
RES	: Resettlement
RFP	: Request for Proposals
RMP	: Resettlement Monitoring Plan
RNIP	: Road Network Improvement Program
ROW	: Right of Way

RP	: Resettlement Plan
RRD	: Revetment and River Bed Protection Design
SA	: Service Area
SAE	: Social and Environmental
SB	: Stream Bridge
SED	: Section Design
SES	: Socio-economic Survey
SG	: Softground
SPG	: Supporting Group
SPT	: Standard Penetration Test
T/A	: Technical Assistance
TB	: Toll Barrier
TEC	: Thai Engineering Consultants Co., Ltd., Thailand
TEDI	: Transport Engineering Design Incorporated
TFD	: Bridge Temporary Facility Design
TG	: Toll Gate
TMC	: Traffic Management Center
TN	: Tunnel
TND	: Tunnel Design
TOR	: Terms of reference
TPO	: Toll Plaza Office
TPS	: Topographic Survey
TRG	: Training Team
TRS	: Traffic Survey
USD	: United States Dollars
UU	: Triaxial Compression Test
VAT	: Value Added Tax
VEC	: Vietnam Expressway Corporation
VD	: Viaduct
VICS	: Vehicle Information and Communication System
VIETTEL	: Vietnam Military Electronic and Telecommunications Corporation
VND	: Vietnamese Dong
VNPT	: Vietnam Posts and Telecommunications Group
VNR	: Vietnam National Railway
VST	: Vane Shear Test
WB	: The World Bank
WT	: Waterway

Main Part

Part A General

A.1 Project Features

A.1.1 Background

The preparation of Pre-F/S for the Project under BOT scheme was approved by MOT in Decision No. 2654/QD-BGTVT dated September 11, 2000. The Pre-F/S report was prepared by PMU85 and approved by the Prime Minister in his letter No. 493/CP-CN dated April 21, 2003. Continually, the preparation of F/S was approved by MOT in Decision No. 134/QD-BGTVT dated January 14, 2004. The F/S report was also prepared by PMU85 and submitted to MOT in his letter No. 514/BQL-KHDA2 dated May 11, 2005. However, this BOT scheme Project did not materialize because of funding sources were not identified at that time.

Two (2) years later, the Project was approved as one (1) of the top priority projects in transport sector by GOVN in Decision No. 412/QD-TTg dated April 11, 2007. For carrying forward the Project, GOVN requested JETRO to assist a further study expecting materialization of the Project by a JBIC (currently JICA) loan scheme in June 2007. JETRO conducted the study and submitted the study report to MOT on April 28, 2008.

In parallel with the JETRO study, WB declared GOVN to be eligible for the IBRD loan in November, 2007 and the Project was identified as the top priority use for the loan. After submission of the JETRO study report, WB undertook the identification missions in April and June, 2008 and confirmed necessity of updating the JETRO study to meet his requirements and decided to allocate the fund from on-going RNIP (IDA Credit No.: 3843-VN) to conduct the WB supplemental study. The study report was prepared by PMU85 and submitted to MOT in his letter No. 551/BQ1-KHDA2 dated June 13, 2009.

In response to the supplemental study, WB engaged an international consultant and undertook the WB appraisal study. In the appraisal study, WB modified the alignment at three (3) sections by taking into consideration social and environmental issues. Based on the modified alignment, TEDI updated the supplemental study and submitted as the draft F/S report to MOT in April, 2010. The draft F/S report was also finalized by TEDI in accordance with the MOT appraisal report No. 6188/BGTVT-KHDT dated September 8, 2011 and submitted by VEC as the F/S report to MOT in September 2010. The F/S report was approved by MOT in Decision No. 2656/QD-BGTVT dated September 10, 2010.

In parallel with the F/S approval, WB agreed to allocate the fund from RNIP for D/D and the Prime Minister allowed commencing the procurement of D/D consultant. Through the procurement procedures, NK-NE-Chodai-TEC JV (the Consultant) was selected and signed the contract with PMU85 on November 15, 2011. Subsequently, PMU85 issued NTP in his letter No. 1622/PMU85-PP2 dated November 18, 2011 and the consulting service was officially commenced from December 1, 2011.

Outline of the Project background is shown in Figure A.1.

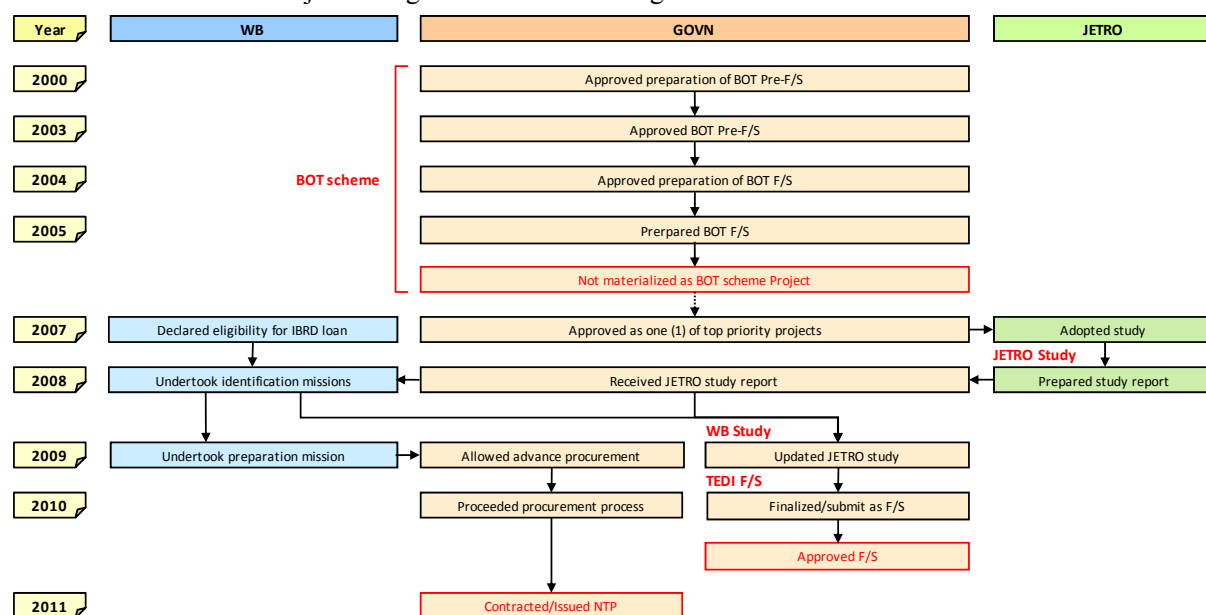


Figure A.1 Project Chronicle

A.1.2 Recent Major Updates

(1) Main Updates after Proposals Submission

The Consultant submitted the proposals for Consulting Services for Detailed Design for Danang - Quang Ngai Expressway Development Project (the Services) on June 1, 2010 based on the draft F/S report distributed by VEC/PMU85 in the procurement stage (see A.1.1). Since that time, various documents for the Project have been issued and updated by the relevant organizations.

Major updates after the proposals submission are shown in Table A.1.

Table A.1 Major Updates after Proposals Submission

No.	Items		Issued by	Subject (Summary)	Ref. No.	Date Issued	
01	F/S	Approval	MOT	F/S Approval	Decision No. 2656/QD-BGTVT	10 Sep., 2010	
02			GOVN Office	Investment Approval and Assigning MOT for F/S Approval	Document No. 4684/VPCP-KTN	7 Jul., 2010	
03		Appraisal	MOT	F/S Appraisal Report	Document No. 6188/BGTVT-KHDT	8 Sep., 2010	
04		Submission	VEC	Submission of F/S Report	Letter No. 384/TTr-VEC	7 Sep., 2010	
05					Letter No. 160/TTr-VEC	30 Jul., 2010	
06	Safeguards	EIA	MONRE	Approval for Supplemental EIA	Decision No. 2046/QD-BTNMT	29 Oct., 2010	
07		RAP	PM	Approval for RAP (Based on F/S Alignment)	Decision No. 442/TTg-KTN	23 Mar., 2011	
08	Funding	JICA Loan	GOVN-JICA	L/A	-----	15 Jun., 2011	
09				M/D (L/A)	-----	17 Jan., 2011	
10				M/D (Appraisal Mission)	-----	21 Oct., 2010	
11		WB Loan	GOVN-WB	M/D (Appraisal Mission)	-----	21 Apr., 2011	
12		GOVN	MOT	Approval for Adjustment of Project Investment Structure	Decision No. 666/QD-BGTVT	6 Apr., 2011	
13				GOVN Office	VEC's Responsibilities (Borrowing/Paying Loan)	Document No. 4684/VPCP-KTN	7 Jul., 2010
14				MOF		Document No. 695/BTC-QLN	13 Aug., 2010
15	Procurement			JICA Portion	MOT	Approval for Procurement Plan (JICA Portion)	Decision No. 1688/QD-BGTVT
16	WB Portion	MOT	Approval for Procurement Plan (WB Portion)	Decision No. 1423/QD-BGTVT	30 Jun., 2011		
17	GOVN	MOND	Executing Plan (Searching and De-mining Bombs)	Decision No. 1286/QD-BQP	20 Apr., 2011		
18	Project Implementation Structure	MOT	Assigning PMU85 for Implementation Agency in D/D	Decision No. 2149/QD-BGTVT	19 Sep., 2011		
19	Project Implementation Program	PMU85	Commencement of Const. Works in 3rd Quarter, 2012	Letter No. 1816/PMU85-PP2	22 Sep., 2011		
20	Request from Quang Nam PPC (Additional IC and Re-alignment)	Quang Nam	Agreement for Re-alignment/Request for Additional IC	Circular No. 346/TBUBND	13 Sep., 2011		
21			Request for Additional IC and Re-alignment Study	Document No. 2107/UBND-KTN	17 Jun., 2011		
22		MOT	F/S Approval (including No.23 and 24 below)	Decision No. 2656/QD-BGTVT	10 Sep., 2010		
23			Notice (for No.24 below)	Notice No. 325	6 Aug., 2010		
24	Quang Nam	Comments on Additional IC and Re-alignment	Document No. 1732/UBND-KTN	31 May, 2010			

(2) Issues carried over to D/D Stage

The MOT Appraisal Report, Document No. 6188/BGTVT-KHDT dated September 8, 2010 mentioned that MOT/VEC received the comments on the draft F/S report from relevant organizations and basically modified those items according to their opinions in the F/S report. However, in Paragraph IV.7, it was also mentioned that some technical issues were unsolved in the F/S stage and those issues were carried over to the subsequent D/D stage.

Issues carried over to D/D stage are shown in Table A.2.

Table A.2 Issues carried over to D/D Stage

No.	Items	Issues carried over to D/D Stage
01	Alternative Route	Study and adjust the section passing Duc Bo Shooting field (KM070 – KM080) in Quang Nam Province according to Notice No. 325 dated August 6, 2010 issued by MOT
02	Inundation Analysis	Study more carefully and define exactly where to construct viaducts and drainage culverts to ensure the flood discharge
03	Requirement for River Bridges	Discuss and agree with localities on hydrological and navigational requirement for river bridges other than four (4) major river bridges which already agreed with the localities in the F/S stage
04	Clearance with HVL (500kV)	Discuss and agree with EVN on countermeasures for insufficient vertical clearance between the expressway and existing HVL (500kV) at two (2) locations (KM004+431 and KM065+959)
05	Additional Overpass	Discuss and agree with VNR on intersecting mode (at grade or grade separation) at the intersection between the expressway and existing North-South Railway at KM135+270 (finally, an overpass with 492 m length was approved in the MOT F/S Approval)
06	ITS	Check in term of technical approach and standards, appropriate investment cost and suitable with current conditions of Vietnam

Source: MOT Appraisal Report, Document No. 6188/BGTVT-KHDT dated September 8, 2010

A.1.3 Location

The expressway is a part of the North-South Expressway located in parallel with the existing NH1A and North-South Railway and passing through Danang city, Quang Nam and Quang Ngai provinces in the central region. The road starts at the intersection of the Danang Bypass and NH14B in Danang city and ends at the connecting point with the planned City Ring Road at existing NH1A in Quang Ngai province. The major socio-economic developments along the expressway are Chu Lai Open Economic Zone in Quang Nam province and Dung Quat Industrial Zone in Quang Ngai province. As for the cultural properties, Hoi An Ancient Town and My Son Sanctuary, registered as the world heritage (cultural heritage), are existed along the expressway.

Project location map is shown in Figure A.2.

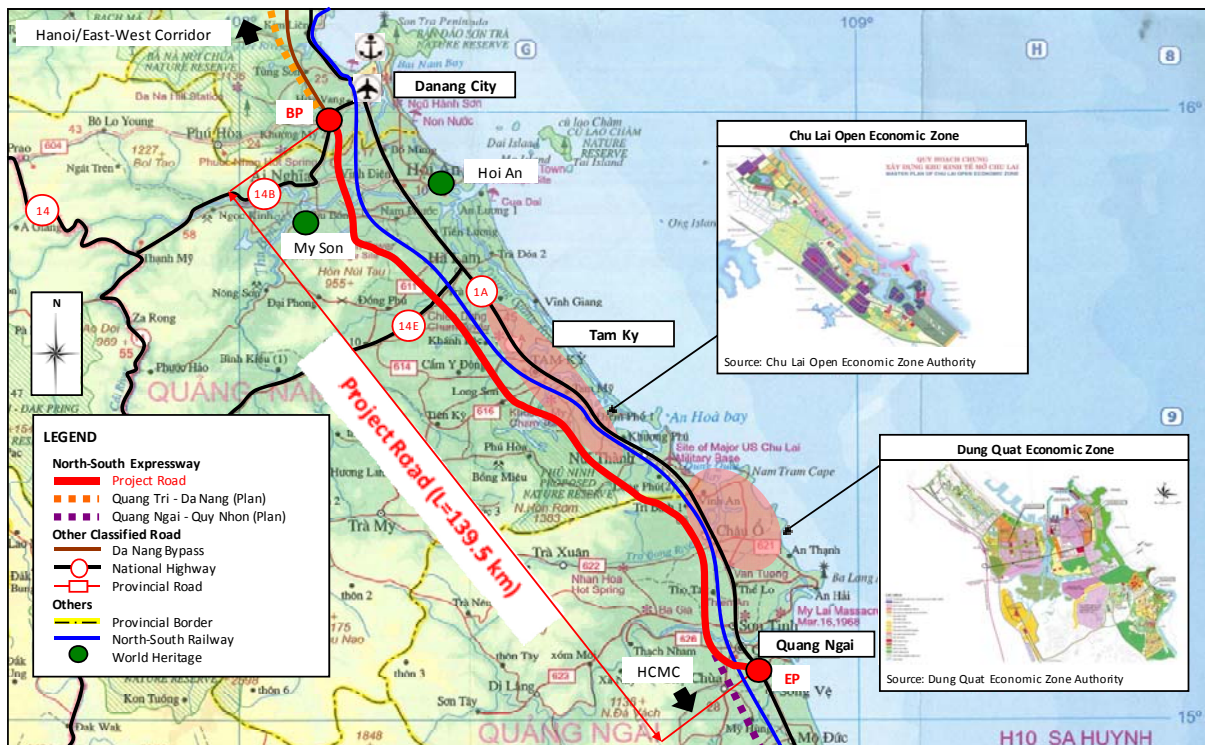


Figure A.2 Project Location Map

A.1.4 Objectives

The main objectives of the Project are to enhance travel efficiency and safety by constructing an expressway from Danang to Quang Ngai, and contributing to economic growth in the central region.

Outline of the Project framework and operating effectiveness indicators established by WB and VEC are shown in Figure A.3 and Table A.3, respectively.

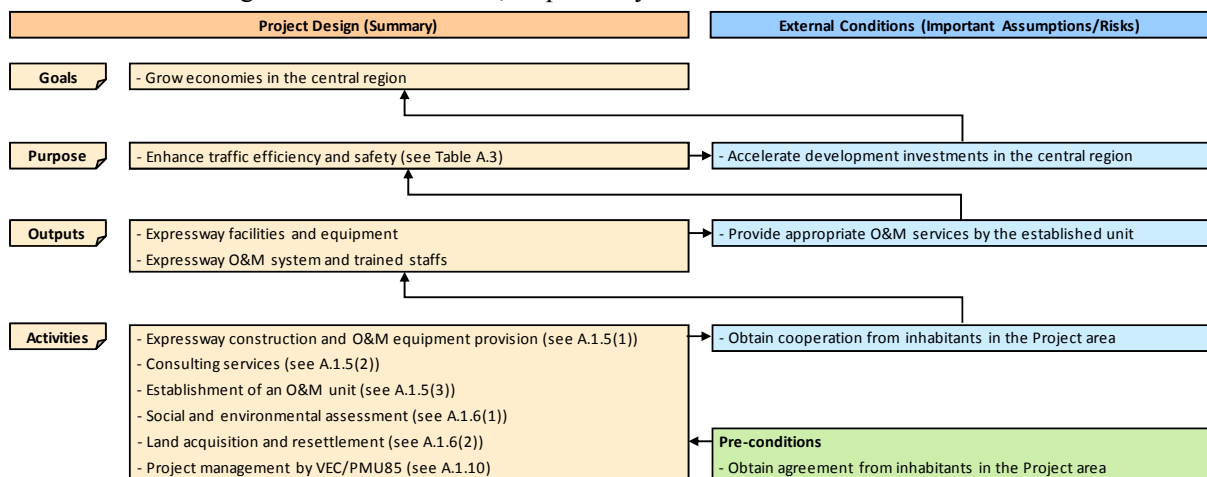


Figure A.3 Outline of Project Framework

Table A.3 Operating Effectiveness Indicators established by WB and VEC

No.	Area/Sections	Quantitative Indicators		Baseline	Target
01	Between Danang and Quang Ngai	Travel time	10 ton freight vehicles	233 minutes	20 % reduction
02			Passenger vehicles	158 minutes	20 % reduction
03		Coefficient of variation (travel time)	10 ton freight vehicles	0.19	10 % reduction
04			Passenger vehicles	0.08	10 % reduction
05		Traffic accidents (no. of fatalities)		185 nos./year	10 % reduction

Source: M/D (WB Appraisal Mission) dated April 21, 2011

Note: JICA also agreed to establish the indicators in line with WB in M/D (JICA Appraisal Mission) dated October 21, 2010

A.1.5 Project Components

(1) Three Project Components

The Project consists of the following three (3) components;

Table A.4 Three Project Components

No.	Component	Description
01	Component A Civil Works	Construction of four-lane dual carriageway road (with capacity for eventual widening to six lanes) and 131 km in total length
02	Component B ITS (Intelligent Transport Systems)	Provision of traffic management and toll collection facilities
03	Component C Expressway Operation and Maintenance (O&M)	Planning an institution to operate and maintain the expressway and identifying facilities and equipment that it will need.

Source: TOR 1

It is currently expected that the Project will be implemented with financial support from the World Bank and the Japan International Cooperation Agency (JICA). Funds from these agencies would be used to finance separate sections of the Project.

(2) Expressway Construction and O&M Provision

Main features of expressway construction and O&M provision indicated in the F/S are shown in Table A.5, and Project facilities plan is shown in Figure A.4, respectively.

As of the end-December 2011, based on our preliminary review, the followings are identified and to be updated from the F/S:

- 1) Alignment of Expressway
- 2) Typical Cross Sections
- 3) Location of Bridges
- 4) Type of Bridges
- 5) Locations of Cross Structures
- 6) Type of Cross Structures
- 7) Location of My Son Interchange
- 8) Type of Interchanges

Location of My Son Interchange was studied in accordance with PMU85 instruction, and the Consultant proposed new location in our letter No. DQEDD-PMU85-38-11 dated October 25, 2011.

Table A.5 Main Features of Expressway Construction and O&M Provision

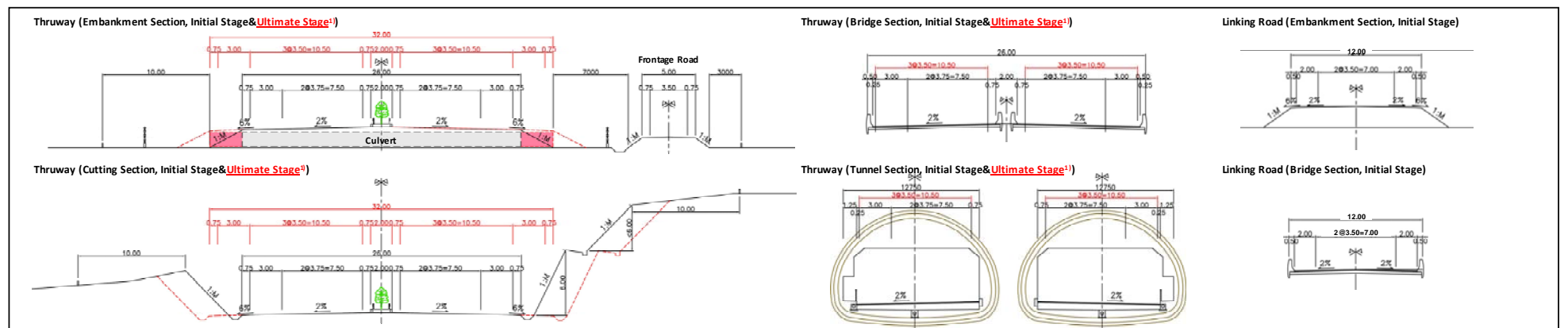
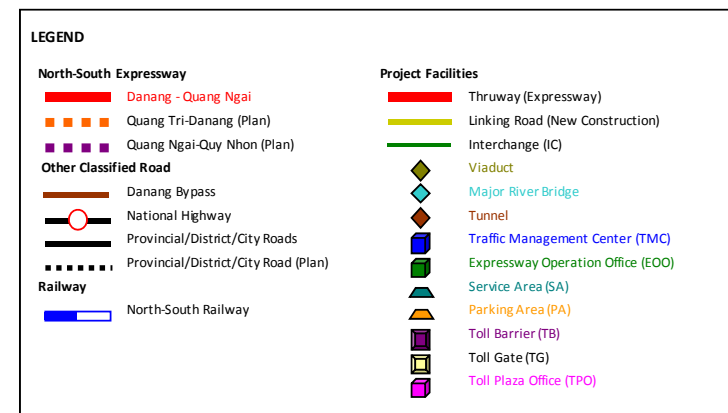
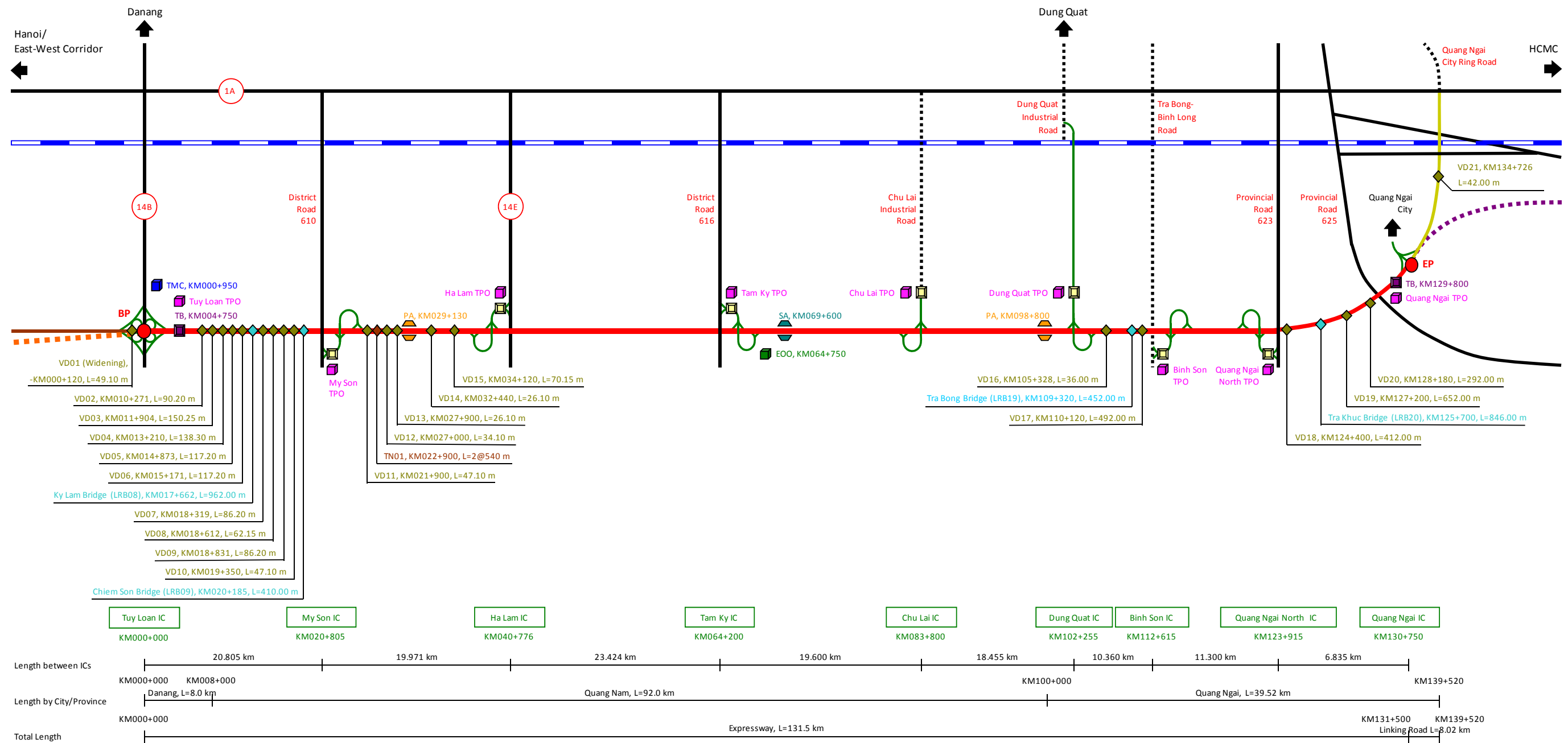
No.	Items	Main Features	Ref. in TOR
01	Road Length	139.52 km <u>By Road Class</u> : Expressway section: 131.5 km, Linking road section: 8.02 km <u>By Jurisdiction</u> : Danang city: 8.0 km, Quang Nam province: 92.0 km, Quang Ngai province: 39.52 km <u>Beginning Point (BP)</u> : Intersection of the existing Danang bypass and NH14B in Danang city <u>Ending Point (EP)</u> : Connecting point with the planned city ring road at the existing NH1A (KM1063+700) in Quang Ngai province	Component A (TOR 1(1))
02	Road Classification	Expressway: Type A, Class 120, Linking Road: Class III, Delta	
03	Design Speed	Expressway: 120 km/hr (Tunnel section: 100 km/hr), Linking Road: 80 km/hr	
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes (see Figure A.4))	
05	Road With	Expressway: Road and Bridge sections: 26.0 m, Tunnel section: 2@12.75 m=25.5 m, Linking Road: 12.0 m	
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 %	
07	Bridge	131 bridges (L=15,486.85 m) ¹⁾ <u>Large River Bridge (LRB, L>100 m)</u> : 20 bridges (L=5,687.55 m) ²⁾ , <u>Other River Bridge (ORB, L<100 m)</u> : 10 bridges (L=603.85 m), <u>Stream Bridge (SB)</u> : 8 bridges (L=354.90 m), <u>Canal Bridge (CB)</u> : 18 bridges (L=666.00 m), <u>Viaduct (VD)</u> : 21 bridges (L=3,073.45 m), <u>Overpass (OP)</u> : 23 bridges (L=1,186.80 m) ¹⁾ , <u>Interchange Rampway Bridge (IRB)</u> : 12 bridges (L=1,662.30 m), Flyover (FO): 19 bridges (L=2,252.00 m)	
08	Major River Bridge	4 bridges (L=2,670.00 m) <u>Thu Bong River (KM017+662)</u> : Ky Lam Bridge (L=962.00 m), <u>Ba Ren River (KM020+185)</u> : Chiem Son Bridge (L=410.00 m), <u>Tra Bong River (KM109+320)</u> : Tra Bong Bridge (L=452.00 m), <u>Tra Khuc River (KM125+700)</u> : Tra Khuc Bridge (L=846.00 m)	
09	Tunnel	1 tunnel (KM022+900, L=2@540 m)	
10	Culvert	375 culverts <u>Culvert Box</u> : 188 culvert boxes (106 roadway culverts and 82 waterway culverts), <u>Culvert Pipe</u> : 187 culvert pipes	
11	Softground	Approximately 3.6 km	
12	Interchange	9 interchanges	
13	Frontage Road	Approximately 59.7 km	
14	Earth Works	Soil excavation: 10,000,000 m ³ , Rock excavation: 1,000,000 m ³ , Filling: 24,000,000m ³	
15	Electrical Facilities	Power supply, road lighting, tunnel ventilation and safety facilities	Component B
16	ITS	Traffic management, toll collection ³⁾ and communication systems	(TOR 1(2))
17	O&M Building	26 locations (see Figure A.4) <u>Traffic Management Center (TMC)</u> : 1 location, <u>Expressway Operation Office (EOO)</u> : 1 location, <u>Toll Plaza Office (TPO)</u> : 9 locations, <u>Toll Barrier (TB)</u> : 2 locations, <u>Toll Gate (TG)</u> : 7 locations, <u>Service Area (SA)</u> : 2 locations, <u>Parking Area (PA)</u> : 4 locations	Component C (TOR 1(3))
18	O&M Equipment	O&M vehicles, spare parts, maintenance equipment and consumables	

Source: MOT F/S Approval, Decision No. 2656/QD-BGTVT dated September 10, 2010 (modified discrepancies with the F/S report by the Consultant)

Note: 1) Including the additional overpass with 492 m at KM135+270 (see No.5, Table A.2)

2) Including 4 major river bridges (see No.8)

3) Including electric toll collection system in accordance with MOT Notice No.94/TB-BGTVT dated March 10, 2009



Source: MOT F/S Approval, Decision No. 2656/QĐ-BGTVT dated September 10, 2010 (modified discrepancies with the F/S report by the Consultant)
 Note: 1) Confirmed with the F/S Consultant (not mentioned in the MOT F/S Approval, Decision No. 2656/QĐ-BGTVT dated September 10, 2010)

Figure A.4 Project Facilities Plan

(3) Extent of the Consulting Services

The overall consulting services for the Project consists of Detailed Engineering Design (D/D), Construction Supervision (C/S) and Project implementation support for PMU85/VEC. The consulting services in this contract (the Services) cover D/D only, without C/S and Project implementation support.

Main scope of overall consulting services is summarized in Table A.6. See Table A.9 for reference.

Table A.6 Main Scope of Overall Consulting Services

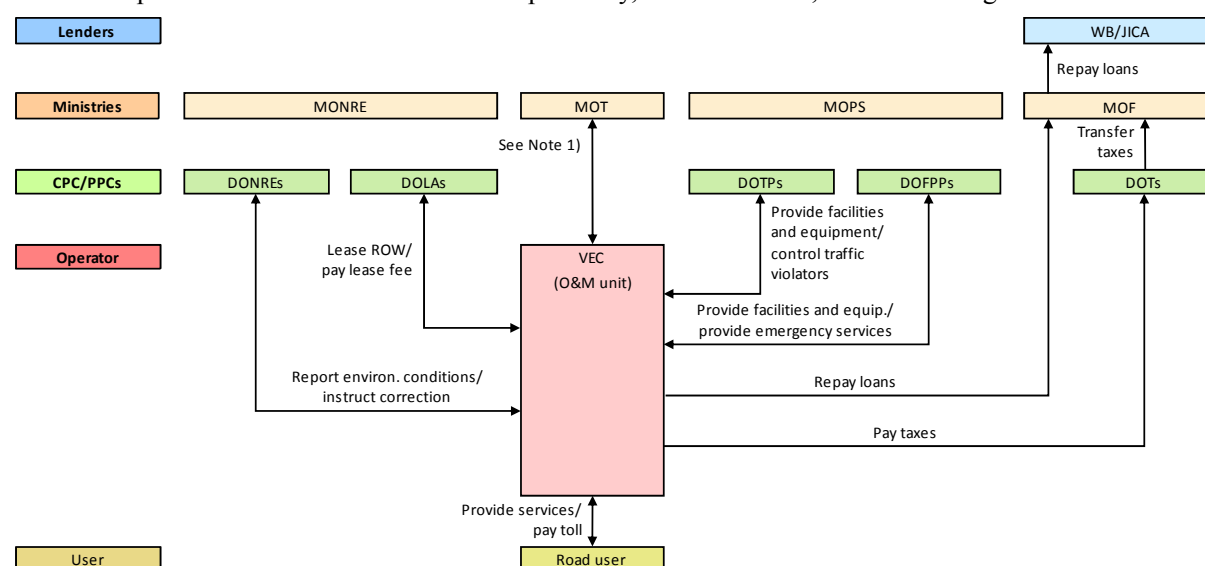
No.	Items	Main Scope
01	Detailed Engineering Design (D/D)	- Previous studies review and establishing D/D framework
		- D/D and procurement planning (incl. B/D of O&M/ITS package)
		- Procurement assistance (civil work packages)
02	Construction Supervision (C/S)	- B/D and procurement documents review (O&M/ITS package)
		- Procurement assistance (O&M/ITS package)
		- D/D review (civil work packages)
		- C/S (incl. internal social, environmental and resettlement monitoring)
		- Assisting in establishment of an O&M unit (incl. capacity development)
		- Assisting in defect liability inspections
03	Project Implementation Support for PMU85/VEC	Integrated Project Review and Monitoring Services
		- D/D appraisal
		- Traffic safety audit
		- Construction quality inspection
		- Social and environmental external monitoring
		- Resettlement external monitoring
		- Overall project monitoring and evaluation
	- Expressway user information and HIV/AIDS campaign	
Financial Audit	- Annual project financial external audit	
Financial Capacity Development	- Financial capacity development for VEC	

Source: Decision No. 1423/QĐ-BGTVT dated June 30, 2011, Decision No. 1688/QĐ-BGTVT dated July 28, 2011
M/D (JICA Appraisal Mission) dated October 21, 2010, M/D (WB Appraisal Mission) dated April 21, 2011

(4) Establishment of an O&M Unit

The O&M framework of the expressway section will be proposed in the Service. Based on the F/S report, the estimated financial return by operating the expressway is low in the early stage because of the forecasted traffic volume is small. Therefore, O&M concessions are not attractive for private investors, and the expressway is expected to be operated by an O&M unit under VEC in the early stage.

Expected O&M framework for the expressway, at this moment, is shown in Figure A.5.



Note: 1) Various administrative arrangements such as level of services and its inspection system, accounting and auditing systems, toll rate setting and subsidies

Figure A.5 Expected O&M Framework for Expressway

A.1.6 Safeguards

(1) Social and Environmental Assessment

The original EIA report based on the JETRO study was prepared by PMU85, and approved by MONRE in Decision No. 2378/QD-BTNMT dated November 12, 2008. The supplemental EIA report based on the F/S alignment was also prepared by PMU85 and approved by MONRE in Decision No. 2046/QD-BTNMT dated October 29, 2010.

Social and environmental assessment framework for the expressway is shown in Figure A.6.

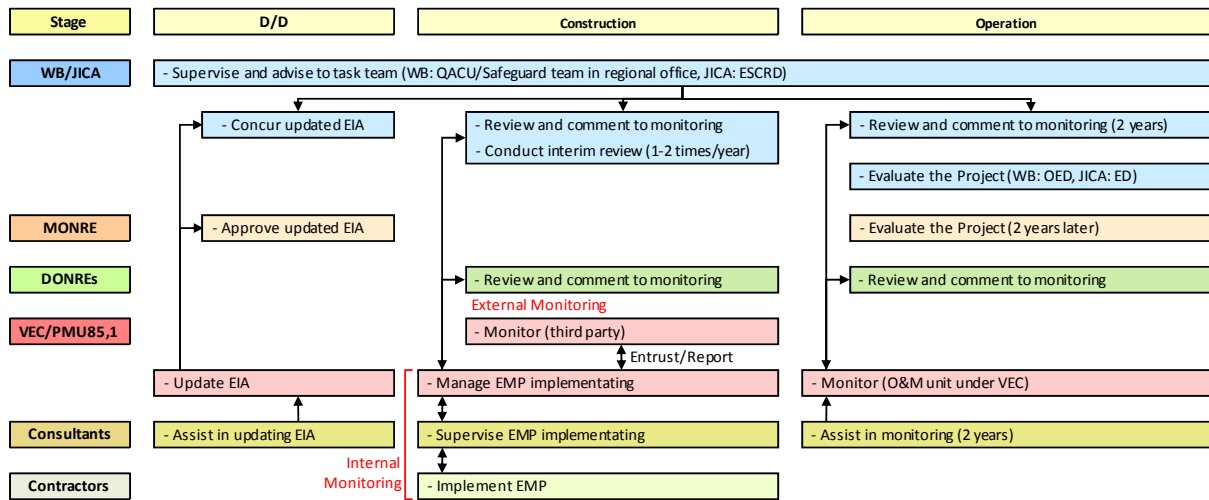


Figure A.6 Social and Environmental Assessment Framework for the Expressway

(2) Land Acquisition and Resettlement

RAP based on the F/S alignment was prepared by PMU85 and approved by the Prime Minister in Decision No. 442/TTg-KTN dated March 23, 2011.

Land acquisition area and no. of resettlement households for the expressway is shown in Table A.7, and CPCS framework for the expressway is shown in Figure A.7.

Table A.7 Land Acquisition Area and Nos. of Resettlement Households for the Expressway

No.	Item	Unit	Danang	Quang Nam	Quang Ngai	Total
01	Land Acquisition Area	sq.m	506,014 (5%)	6,425,285 (67%)	2,658,838 (28%)	9,590,137 (100%)
02	Resettlement Households	nos.	85 (7%)	771 (60%)	430 (33%)	1,286 (100%)

Source: Decision No. 442/TTg-KTN dated March 23, 2011

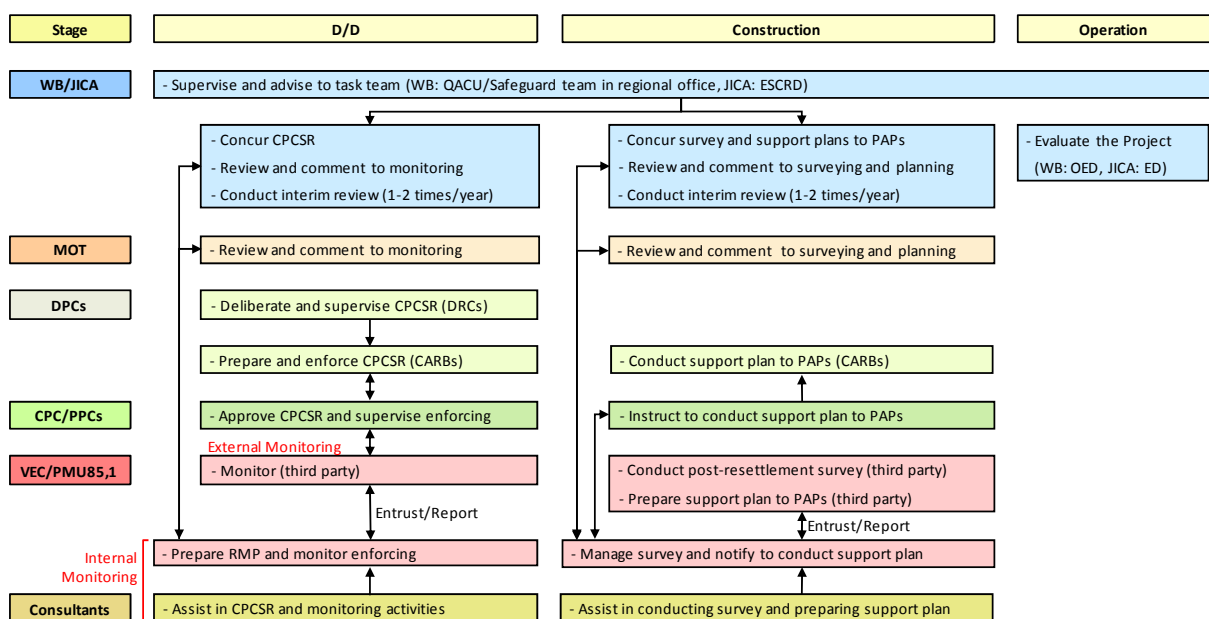


Figure A.7 CPCS Framework for the Expressway

A.1.7 Project Cost

The total investment cost was approved by MOT in Decision No. 2656/QD-BGTVT dated September 10, 2010, and it amounts to 27,968 Bil.VND (equivalent to 1,472 Mil.USD).

Total investment cost is shown in Table A.8.

Table A.8 Total Investment Cost

No.	Items	Foreign Loans (Mil.USD)	State Budget (Bil.VND)	Total ¹⁾	
				(Equiv. to Bil.VND)	(Equiv. to Mil.USD)
01	Construction Cost	904		17,179	904
02	Equipment Cost	31		580	31
03	Consulting Services Cost	53		1,003	53
04	Project Management Cost		68	68	4
05	Other Cost	32		606	32
06	Land Acquisition and Compensation Cost		1,074	1,074	56
07	Contingency	200	114	3,927	206
08	VAT		1,943	1,943	102
09	Loan Interest and Financial Fees ²⁾	84		1,588	84
Total		1,304	3,199	27,968	1,472

Source: Decision No. 2656/QD-BGTVT dated September 10, 2010

Note: 1) Exchange rate: 1USD = 19,000VND

2) Interest during construction, front-end fees, commitment charge and service charges

A.1.8 Funding Arrangement

The investment cost is financed by JICA, WB and counterpart fund and it was approved by MOT in Decision No. 2656/QD-BGTVT dated September 10, 2010. VEC is responsible for borrowing and re-paying the loans and it was decided by GOVN Office and MOF in Document No. 4684/VPCP-KTN dated July 7, 2010 and Document No. 695/BTC-QLN dated August 13, 2010.

JICA signed L/A on June 15, 2011 and finances the civil works section between Danang to Tam Ky, electrical works, O&M building works and O&M/ITS equipment procurement for the whole section, C/S, other cost, contingency and loan interest and financial fees for JICA portion.

WB finances the D/D cost for the whole section through on-going RNIP (IDA Credit No.: 3843-VN). In addition, WB approved to provide a loan and two (2) credits by the Executive Directors on May 24, 2011 and finances the civil works section between Tam Ky and Quang Ngai, C/S, other cost, contingency and loan interest and financial fees for WB portion, and project implementation support for VEC. Funding arrangement among WB, JICA and GOVN is shown in Table A.9.

Table A.9 Funding Demarcation among WB, JICA and GOVN

No.	Item		Section	Funding Demarcation			
				JICA ¹⁾	WB ¹⁾	GOVN	
01	Construction (Civil Works)		Danang to Tam Ky	●			
			Tam Ky to Quang Ngai		●		
02	Electrical, ITS Facilities and O&M Building Works, and O&M Equipment Provision		Whole Section	●			
03	Consulting Services	D/D	Whole Section		●		
		C/S	Civil Works	Danang to Tam Ky	●		
				Tam Ky to Quang Ngai		●	
				Electrical/O&M/ITS Works and Equipment Provision	Whole Section	●	
		Project Implementation Support for VEC	Integrated Project Review and Monitoring Services	Whole Section		●	
			Financial Audit	Whole Section		●	
Financial Capacity Development	Whole Section			●			
04	Project Management, Land Acquisition and Compensation, Contingency and VAT		Whole Section			●	

Source: Decision No. 2656/QD-BGTVT dated September 10, 2010

M/D (JICA Appraisal Mission) dated October 21, 2010, M/D (WB Appraisal Mission) dated April 21, 2011

Note: 1) Including other cost, contingency and loan interest and financial fees in each portion

A.1.9 Contract Packaging

The procurement plan for JICA portion including construction contract packaging was approved by MOT in Decision No. 1688/QD-BGTVT dated July 28, 2011. As for the WB portion, it was also approved by MOT in Decision No. 1423/QD-BGTVT dated June 30, 2011.

As of December 2011, the Consultant submitted our procurement plan with our letter No. DQEDD-PMU85-77-11 dated December 15, 2011 in accordance with several times of discussion with PMU85/VEC.

- Re-defining the package boundaries based on the modified alignment (see D.3.1(4))
- Dividing PKG3 into Ky Lam Bridge (PKG3A) and remaining section (PKG3B) (see A.1.11).
- Propose separation of “Traffic Safety and Street Lighting” as PKG14.

Bing Proposed construction contract packaging is shown in Table A.10.

Table A.10 Proposed Construction Contract Packaging (December 15, 2011)

Contract Packaging					Lenders	
Items	Jurisdiction	No.	Station ¹⁾	Length ¹⁾	JICA	WB
Civil Works	Danang	PKG1	KM000+000 - KM008+000	8.00 km	●	
	Quang Nam	PKG2	KM008+000 - KM016+880	8.88 km	●	
		PKG3a	KM016+880 - KM018+100	1.22 km	●	
		PKG3b	KM018+100 - KM021+500	3.40 km	●	
		PKG4	KM021+500 - KM032+600	11.10 km	●	
		PKG5	KM032+600 - KM042+000	9.40 km	●	
		PKG6	KM042+000 - KM052+000	10.00 km	●	
		PKG7	KM052+000 - KM065+000	13.00 km	●	
		PKGA1	KM065+000 - KM081+150	16.15 km		●
		PKGA2	KM081+150 - KM099+500	18.35 km		●
	Quang Ngai	PKGA3	KM099+500 - KM110+100	10.60 km		●
		PKGA4	KM110+100 - KM124+700	14.60 km		●
		PKGA5	KM124+700 - KM131+500	6.80 km		●
	Total				131.50 km	
Electrical/O&M Building/ITS Works and Equipment Provision	All	PKG13	KM000+000 - KM131+150	131.50 km	●	
Traffic Safety and Street Lighting	All	PKG14	KM000+000 - KM131+150	131.50 km	●	

Source: Consultant proposal by DQEDD-PMU85-11 dated December 15, 2011

Note: 1) Based on the modified alignment in D.3.1 Work Item (4) (station and section length are not based on F/S alignment)

On the basis of the above proposed packaging, the contract amount of each package in the approved bidding plan is revised as shown in Table A.11.

Table A.11 Updated Contract Amount by Proposed Contract Package (December 15, 2011)

Jurisdiction	Contract Packaging				Rate	Traffic/Lighting	Contract (Bill. VND)				
	No.	Section		Length (m)			JICA		WB		
							Amount wo Traffic/Lighting	Unit Cost (/km)	Amount	Amount wo Traffic/Lighting	
Danang	PKG1	KM000+000	-	KM008+000	8,000	5.75%	36.44	1,354.16	169		
Quang Nam	PKG2	KM008+000		KM016+880	8,880	6.38%	40.44	1,377.69	155		
	PKG3A	KM016+880		KM017+000	120	0.09%	0.55	810.44	664		
		KM017+000		KM018+100	1,100	0.79%	5.01				
	PK3B	KM018+100		KM021+500	3,400	2.44%	15.49	733.07	216		
	PKG4	KM021+500		KM022+000	500	0.36%	2.28	1,332.48	120		
		KM022+000		KM032+000	10,000	7.18%	45.54				
		KM032+000		KM032+600	600	0.43%	2.73				
	PKG5	KM032+600		KM042+000	9,400	6.75%	42.81	1,160.76	123		
	PKG6	KM042+000		KM052+000	10,000	7.18%	45.54	1,209.56	121		
	PKG7	KM052+000		KM065+000	13,000	9.34%	59.21	1,602.59	123		
PKG A1	KM65+000		KM081+150	16,150	11.60%	73.55			1,607.13	100	
PKG A2	KM081+150		KM081+500	350	0.25%	1.59			1,699.04	93	
	KM081+500		KM099+500	18,000	12.93%	81.98					
Quang Ngai	PKG A3	KM099+500		KM100+000	500	0.36%	2.28			1,447.38	137
		KM100+000		KM110+100	10,100	7.26%	46.00				
	PKG A4	KM110+100		KM111+000	900	0.65%	4.10			1,724.17	118
		KM111+000		KM124+700	13,700	9.84%	62.40				
	PKG A5	KM124+700		KM125+000	300	0.22%	1.37			1,742.14	120.1
		KM125+000		KM131+500	6,500	4.67%	29.60				
		KM131+500		KM139+204	7,704	5.53%	35.09	(linking road)			
Expressway Length					131,500	100.00%					
Linking Road Length					7,704						
All	PKG13	KM000+000	-	KM131+500	131,500			580.00	4		
All	PKG14	KM000+000	-	KM131+500	131,500			634.00	5		
Total							634	9,580.76		8,219.86	18,434.6

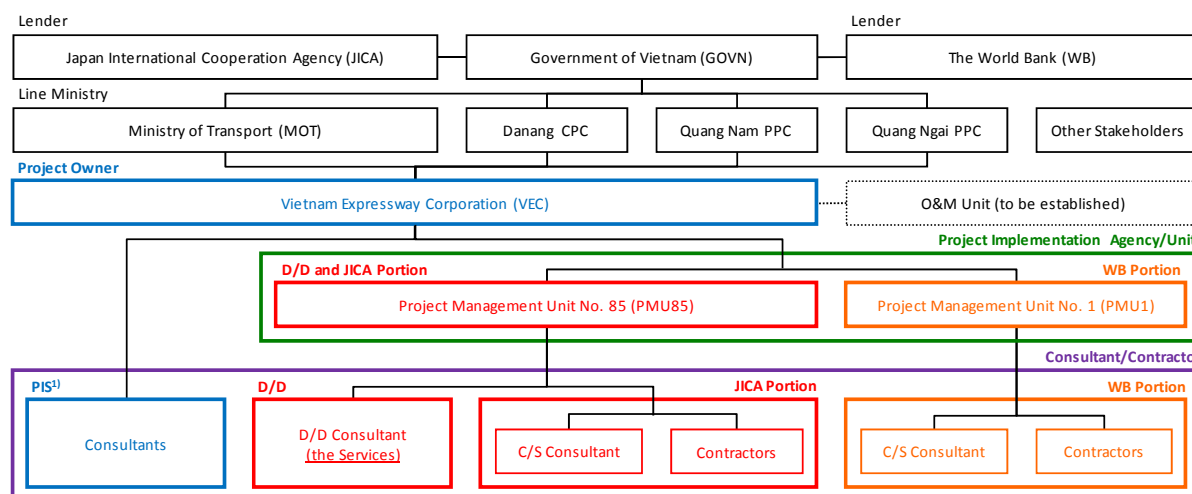
Source: Consultant proposal by DQEDD-PMU85-11 dated December 15, 2011

A.1.10 Project Implementation Structure

MOT designated VEC as the Project Owner in Decision No. 220/QD-BGTVT dated January 22, 2010 and also appointed PMU85 as the Project Implementation Agency for the D/D stage in Decision No. 2149/QD-BGTVT dated September 19, 2011.

As for the construction stage, MOT approved that PMU85 for JICA financed portion and PMU1 for WB financed portion are Project Implementation Agencies, by signing the principle contracts with VEC in Decision No. 2656/QD-BGTVT dated September 10, 2011.

Project implementation structure is shown in Figure A.8.



Note: 1) Project Implementation Support for VEC (see Table A.6)

Figure A.8 Project Implementation Structure

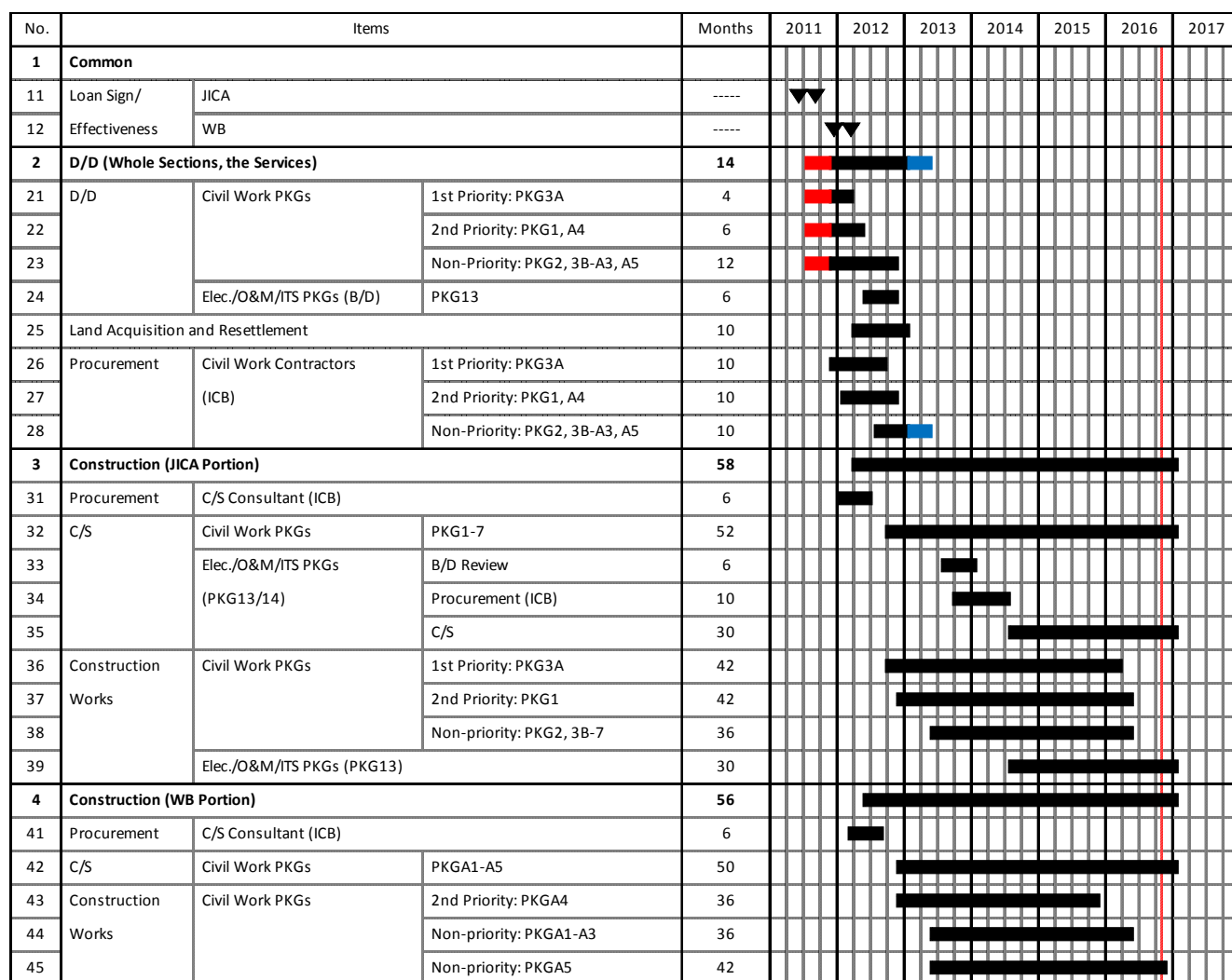
A.1.11 Project Implementation Program

The Project Implementation Program (I/P) was agreed among JICA, WB and GOVN during the JICA Appraisal in October, 2010. However, this program is delayed approximately 15 months. i.e. the commencement of the detailed design was intended August 10, 2010 in Clause 7.2 of Data Sheet of the RFP issued on February 12, 2010, and now this Service was commenced on December 1, 2012.

Main considerations in updating Project I/P are shown in Table A.12, and proposed Project I/P is shown in Figure A.9.

Table A.12 Main Considerations in Updating Project I/P

No.	Items	Contents
01	Commencement of Construction Works (1st Priority, within September 2012)	The realization for commencing construction works within September 2012 is required by the Minutes of Contract Negotiation for the Services dated October 15, 2011. Based on the Consultant’s study, Ky Lam Bridge was selected as the priority package by design and land acquisition ease; then, PKG3 was divided into Ky Lam Bridge (PKG3A) and remaining sections (PKG3B).
02	Construction Period (Civil Work Packages)	The construction period of all civil work packages were defined 36 months in the following Decisions: - MOT Decision No. 1688/QD-BGTVT dated July 28, 2011 (Procurement Plan, JICA Portion) - MOT Decision No. 1423/QD-BGTVT dated June 30, 2011 (Procurement Plan, WB Portion) Based on the Consultant’s preliminary estimate, the construction period for PKG1 (Softground Section), PKG3A (Ky Lam Bridge) and PKGA5 (incl. Tra Khuc Bridge) were extended to 42 months.
03	Completion of D/D of Three (3) Packages (2nd Priority, within 6th month)	Draft D/D of first three (3) packages is required to complete within 6th month by the Minutes of Contract Negotiation for the Services dated October 15, 2011. In consideration of land acquisition, design ease and fairness among provinces, PKG1 and PKGA4 were selected as the priority packages.



■ Prior Works
 ■ Posterior Works (Intermittent Assignment)

Figure A.9 Updated Project Implementation Program

A.2 Outline of the Services

A.2.1 General

This Inception Report (IC/R) is for Consulting Services for Detailed Design for Danang - Quang Ngai Expressway Development Project (the Services) in accordance with the Consulting Services Contract (the Contract) between PMU85 and Joint Venture of Nippon Koei Co., Ltd. (NK), Nippon Engineering Co., Ltd. (NE), Chodai Co., Ltd. and Thai Engineering Consultant Co., Ltd. (TEC) (the Consultant) signed on November 15, 2011.

The Services is officially commenced on December 1, 2011 in accordance with Notice to Proceed (NTP) issued PMU85 letter No. 1622/PMU85-PP2 dated November 18, 2011 and the Consultant letter No. DQEDD-PMU85-52-11 dated November 18, 2011.

A.2.2 Objectives

The objectives of the Services are, as stipulated in the TOR of the Contract:

- To undertake the efficient and proper preparation of the detailed engineering design;
- To prepare an implementation program that can ensure delivery of the project in an efficient and timely manner infrastructure in accordance with the implementation program; and
- To promote technology transfer by employing suitably qualified Vietnamese professionals for the detailed design and implementation planning for the Project and by providing appropriate training for staff of the related agencies who will be at various times responsible for the Project.

A.2.3 Scope in TOR

(1) Two Modes in the Consulting Services

The Services are carried out by two (2) modes as shown in Table A.13.

Table A.13 Mode of the Services

No.	Mode	Contents
1	Primary Tasks	Arrangement for managing the Services by the Consultant, who is fully responsible to VEC/PMU85, for adequacy and quality of the end outputs of the Services assuring duly compliance of the Services assuring duly compliance of the scope of the Services specified in the Contract.
2	Assistance Tasks	The Consultant provides technical advice and assistance in carrying out the works to be accomplished by VEC/PMU85 through the Consultant's professional ability; however, the Consultant is not responsible for the end outputs.

(2) Contents of the Consulting Service Contract

The scope of service is stipulated in the Contract consists of the following contents as shown in Table A.14.

Table A.14 Contents of the Consulting Service Contract

No.	Content	Issue Date
01	Contract	15 November 2011
02	Minutes of Discussion Meeting for Contract Finalization.	15 October 2011
03	The second Minutes of Contract Negotiation.	20 September 2011
04	Minutes of Contract Negotiation.	26 May 2011
05	The General Conditions of Contract.	15 November 2011
06	The Special Conditions of Contract;	
07	Appendix A: Description of the Services	
08	Appendix B: Reporting Requirements	
09	Appendix C: Key Personnel and Sub-consultants	
10	Appendix D: Cost Estimates	
11	Appendix E: Services and Facilities Provided by the Client	
12	Appendix F: Form of Advanced Payment Guarantee	

(3) TOR in the Contract

As shown in Table A.14, the Terms of Reference (TOR) is provided in Appendix A: Description of the Services of the contract.

The Consultant reviewed the TOR carefully and prepare our work plan to satisfy the requirements in the most efficient and effective manner as shown in this Inception Report.

A.2.4 Additional Scope to TOR

On the basis of the Consultant's understanding of the Project, with natural and social conditions of the region, the following additional work items were proposed in our Technical Proposals, in order to implement the Project smoothly and successfully.

Those work items and necessary professional staff input were agreed with the Client and stipulated in the Contract.

Table A.15 Additional Scope to TOR

No.	Category	Scope
01	Inundation Analysis	The Consultant consulted with JICA to utilize the results of "Project for Building Disaster Resilient Societies in Central Region in Vietnam (DRSC)" for the expressway design, and it was agreed by JICA. Supported by JICA's agreement, the Consultant will carry out the inundation analysis to assess flood inundation conditions along and around the expressway, and compare the inundation phenomena "Before Project" and "After Project".
02	Electrical Facilities Design	There are many electrical facilities that crossing the expressway and/or locating nearby. Those electrical facilities should be relocated and appropriate design should be provided. Not only that there are several electrical facilities to be provided as integral part of the expressway. The Consultant will carry out the detailed design of those electrical facilities.
03	Public Utilities Relocation Plan	Public utilities such as electrical lines, telecommunication lines, water supply pipes, drainage pipes, should be carefully and timely relocated during the construction. The Consultant identifies all public utilities to be relocated in the project, in consultation with the local authorities, and prepare necessary drawings and place the cost in the cost estimate.

A.2.5 Work Items in the Services

The Consultant established the work items for the Services in accordance to the requirement of "Item 3. Scope of Services" in Appendix A: Description of Services in the Contract, with the above additional, as shown in Table A.16.

The work items in Table A.16 are further break down into appropriate scale of work units which are good for monitoring and control. Detailed work items and the work method of each item are described later in Parts B to F in this report.

Table A.16 Summary of Work Items

Work Items		Clause No. in TOR
Part B	Project Management	Additional Task
B.1	Establish and control practical management system	Additional Task
Part C	Previous Studies Review and Establishing Detailed Engineering Design Framework	3.1, 3.2
C.1	Review previous studies	3.2(1)
C.2	Establish detailed engineering design framework	3.2(2)
Part D	Detailed Engineering Design and Procurement Planning	3.3
D.1	Contract Packaging	3.3.1
D.1.1	Propose contract packaging	3.3.1
D.2	Surveys and Investigations	3.3.2
D.2.1	Collect relevant data and documents	3.3.2(1)
D.2.2	Conduct topographic survey	3.3.2(2)(i), 3.5
D.2.3	Conduct hydrological survey and analysis	3.3.2(2)(ii)
D.2.4	Inundation analysis	Additional Task
D.2.5	Conduct geotechnical and geological investigations	3.3.2(2)(iii)
D.2.6	Conduct material source survey	3.3.2(2)(iv)
D.2.7	Conduct relevant facilities survey	3.3.2(2)(v)
D.2.8	Review traffic forecasting and conduct baseline surveys	3.3.2(2)(vi)
D.2.9	Conduct independent land valuation survey	3.3.2(2)(vii)
D.2.10	Conduct environmental and social surveys	3.3.2(2)(viii)
D.3	Civil Engineering Design	3.3.3
D.3.1	Prepare basic design of civil structures	3.3.3
D.3.2	Prepare detailed engineering design of civil structures	3.3.3
D.4	O&M Plan and Design	3.3.5
D.4.1	Prepare institutional and administrative arrangement plan	3.3.5
D.4.2	Prepare O&M plan	3.3.5
D.4.3	Prepare basic design of O&M buildings	3.3.5
D.5	ITS Plan and Design	3.3.4
D.5.1	Prepare ITS plan	3.3.4(1)
D.5.2	Prepare basic design of ITS facilities	3.3.4(2)
D.6	Electrical Facilities Design	Additional Task
D.6.1	Prepare detailed engineering design of electrical facilities	Additional Task
D.7	Public Utilities Relocation Plan	Additional Task
D.7.1	Prepare relocation plan of public utilities	Additional Task
D.8	Safeguards	3.3.6, Annex A, Annex B
D.8.1	Review and update EIA, EMDP and EMP	3.3.6, Annex A
D.8.2	Review and update RAP	3.3.6, Annex B
D.9	Construction Planning	3.3.7
D.9.1	Prepare construction plan	3.3.7
D.10	Project Cost Estimate	3.3.8
D.10.1	Estimate Project cost	3.3.8
D.11	Procurement Documents	3.3.9
D.11.1	Prepare procurement documents	3.3.9
D.12	Project Implementation Program	3.3.10
D.12.1	Prepare Project I/P	3.3.10
Part E	Procurement Assistance	3.4
E.1	Assist in tendering procedures	3.4
Part F	Land Acquisition Staking	3.5
F.1	Stake land acquisition to handover to local authorities	3.5
Part G	Technology Transfer	3.6
G.1	Provide training to VEC, PMU85 and relevant organizations	3.6
G.2	Provide training to key local professional staff	3.6

A.2.6 Work Schedule

(1) Milestones in the Contract

Milestones are mentioned in the Contract as summarized in Table A.17.

The Consultant prepared the work schedule in order to satisfy the required milestones.

Table A.17 Milestones in the Contract (December 2011)

No.	Milestone (MS)	Date/Deadline	Clause in Contract
01	Contract signing	November 15, 2011	Contract
02	Issuance of Notice to Proceed	November 18, 2011	PMU85 letter No. 1622/PMU85-PP2 dated November 18, 2011
03	Commencement of Consulting services	December 1st, 2011	Consultant letter No. DQEDD-PMU85-52-11 dated November 18, 2011.
04	Submission of draft design report for the first contract package	Late December 2011	Item I.3.6 of Minutes of Discussion dated 15/10/2011
05	Inception Report	December 31, 2011	Item (1), Appendix B: Reporting Requirements
06	Inception report of Replacement Cost Survey	December 31, 2011	Item IV, TOR of RCS, Annex B, TOR Item (9), Appendix B: Reporting Requirements
07	Submission of a brief report on the appropriateness of the proposed alignment	January 15, 2012	Item 7, Annex A, TOR Item (8), Appendix B: Reporting Requirements
08	Review and Detailed Design Framework Report	January 31, 2012	Item (2), Appendix B: Reporting Requirements
09	Completion of detailed design for the first contract package	February 15, 2012	Item I.3.6 of Minutes of Discussion dated 15/10/2011
10	Submission of updated draft EIA and EMP reports	April 15, 2012	Item 7, Annex A, TOR Item (8), Appendix B: Reporting Requirements
11	Submission of overall implementation plan of the project	March 31, 2012	Item B.2 of Minutes of Contract Negotiation dated 26/05/2011
12	Submission of RCS reports	May 15, 2012	Item IV, TOR of RCS, Annex B, TOR Item (9), Appendix B: Reporting Requirements
13	Submission of 3 sets of draft design report, prequalification and tender documents for the first three contract packages	May 31, 2012	Appendix B: Reporting Requirements
14	Submission of updated draft final EIA and EMP reports	July 15, 2012	Item 7, Annex A, TOR Item (8), Appendix B: Reporting Requirements
15	Completion of design works and preparation of bidding documents of the first 3 packages	August 31, 2012	Item B.2 of Minutes of Contract Negotiation dated 26/05/2011
16	Commencement of the first package	September 2012	Item I.1 of Minutes of Discussion dated 15/10/2011 Item 3.3.1 of TOR
17	Submission of full sets of design reports, prequalification and tender documents for the whole project	November 30, 2012	Appendix B: Reporting Requirements
18	Commencement of 2nd to 5th package	Every 2 month	Item I.1 of Minutes of Discussion dated 15/10/2011
19	Commencement of 6th to last package	Every one month	

(2) Priority Packages

Taking the above mentioned requirement of the milestones (MS) into consideration, the D/D work schedule is divided into the following three (3) priorities to meet the requirements in the Project I/P (see A.1.11).

- **1st Priority Package** : Complete D/D not later than February 15, 2012 (MS09)
- **2nd Priority Packages** : Complete D/D not later than May 31, 2012 (MS13)
- **Non-priority Packages** : Complete D/D not later than November 30, 2012 (MS17)

(3) General Work Schedule

The Services was officially commenced from December 1, 2011 although the topographic survey work items were commenced from July 15, 2011 in accordance with the Minutes of Contract Negotiation dated May 26, 2011.

Service period is 14 months and end in January 2013. The procurement assistance will be continued after that time as agreed in the Minutes of Discussion Meeting dated October 15, 2011.

General work schedule is shown in Figure A.10.

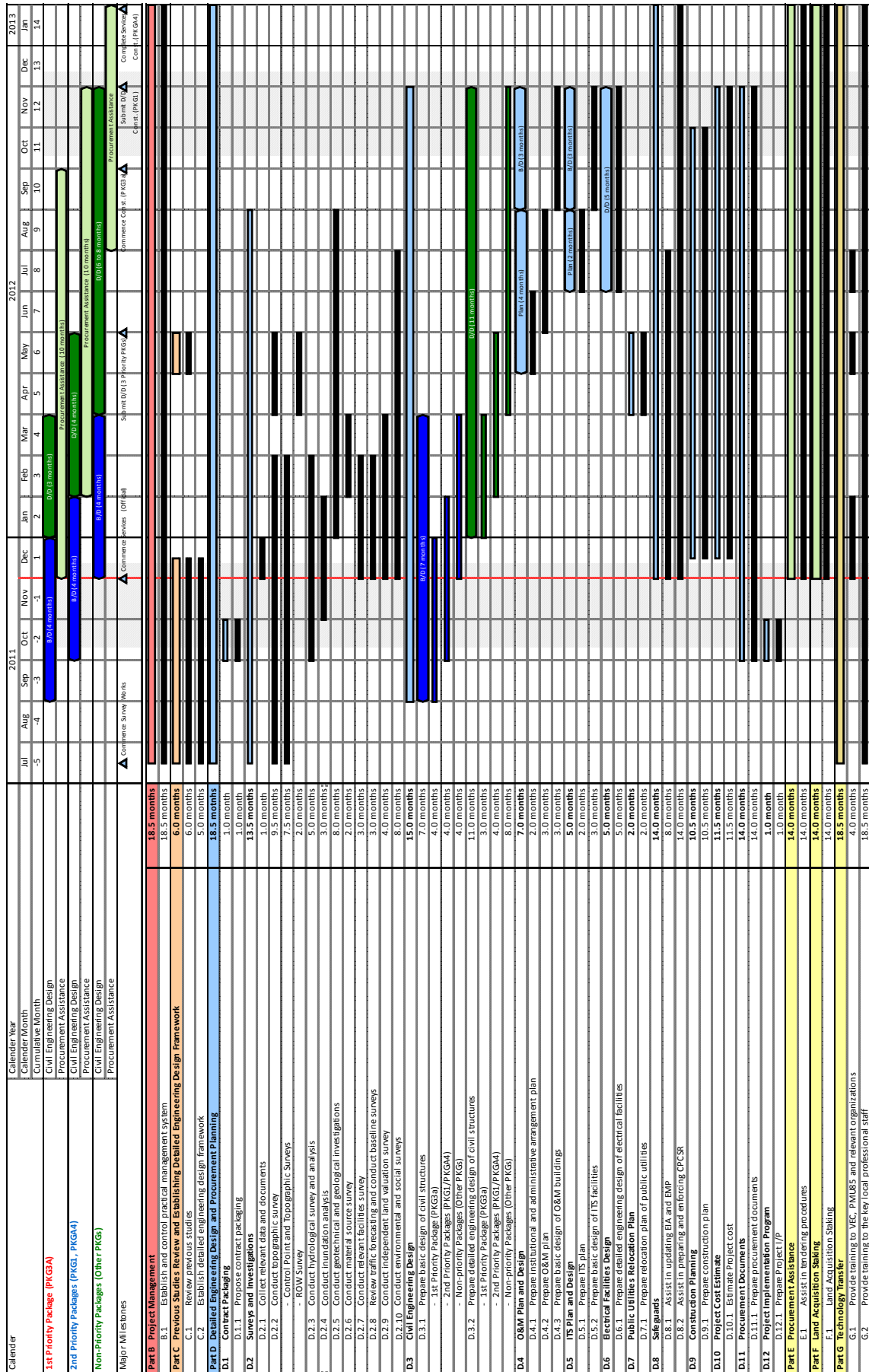


Figure A.10 General Work Schedule

A.2.7 Reporting Schedule

(1) Reporting Structure

Considering the requirements in Appendix B: Reporting Requirement in the Contract, the Consultant established the following six (6) categories, as reporting structure in the Services as shown in Table A.18.

Table A.18 Reporting Structure

No.	Sub No.	Category
01		General Reports
02		Technical Reports
	01	Survey Reports
	02	Basic Design Reports (Civil)
	03	Detailed Engineering Design Reports (Civil)
	04	Electrical Design Reports
	05	Public Utilities Relocation Plan Reports
	06	ITS Plan and Design Reports
	07	O&M Plan and Design Reports
03		Cost Estimate Reports
	01	Method Statements
	02	Quantity Reports
	03	Cost Estimate Reports
04		Procurement Reports
	01	Procurement Plan Reports
	02	PQ Documents
	03	Tender Documents
05		Safeguard Documents
06		Discussion Papers

(2) List of Reports (Tentative)

As of the end- December 2011, the following reports are identified as shown in Table A.19. The list of reports will be continuously updated.

(3) Submission Schedule (Tentative)

Tentative submission schedule of each report is shown in Figure A.11.

Table A.19 List of Reports (Tentative)

Category	No.	Report Title (Tentative)
General Reports	01	Inception Report
	02	Monthly Progress Reports
	03	Interim Reports
	04	Draft Project Completion Report
	05	Project Completion Report
	06	Review Reports
	07	Detailed Engineering Design Framework
	08	Contract Packaging
	09	Project I/P
	10	Technology Transfer Reports
Technical Reports	11	Relevant Data and Documents
	12	Topographic Survey Reports
	13	ROW Survey Reports
	14	Hydrological/Inundation Analyses Reports
	15	Geotechnical and Geological Investigations Report
	16	Material Source Survey Report
	17	Relevant Facilities Survey Report
	18	Traffic Forecasting Review Report
	19	Baseline Survey Reports (Additional Traffic Survey)
	20	Independent Land Valuation Survey Reports
	21	Environmental and Social Survey Report (Site Survey)
	22	Working Design Reports
	23	Basic Design Reports (Civil)
	24	Working Design Reports
	25	Detailed Engineering Design Reports (Civil)
	26	Quantity Reports (Civil)
	27	Road Safety Audit Report
	28	Electrical/O&M/ITS Plan
	29	Draft Basic Design Reports (Electrical/O&M/ITS)
	30	Quantity Report (Electrical/O&M/ITS)
	31	Public Utilities Relocation Plan
Cost Estimate Reports	32	Cost Estimate Conditions
	33	Cost Estimate Reports
Procurement Reports	34	Procurement Plan
	35	Pre-qualification Documents (by PKG)
	36	Bidding Documents (by PKG)
	37	P/Q Evaluation Reports (Civil, by PKG)
	38	Bid Evaluation Reports (Civil, by PKG)
	39	Draft Contract Documents (Civil, by PKG)
Safeguard Documents	40	Brief Report on Appropriateness of F/S Alignment
	41	Updated Draft EIA and EMP
	42	Draft Final Updated Draft EIA and EMP
	43	Draft TOR (External Environmental Monitoring)
	44	Inception Report (Resettlement Monitoring Plan)
	45	CPCSR (by Province)
	46	Draft TOR (External Resettlement Monitoring)
	47	Internal Monitoring Reports (CPCSR)
Discussion Papers	48	Alternative Alignment Study Reports
	49	Cross Structure Plan (by PKG)
	50	Alternative Study Reports

Calendar	2011												2012					2013			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Calendar Year	Cumulative Month																				
Technical Reports																					
e) Frontage Road Plan (by PKG)	78 copies (English: 3, Vietnamese: 3)*13																				
f) Culvert Plan (Thruway, by PKG)	78 copies (English: 3, Vietnamese: 3)*13																				
g) Bridge Plan (Thruway Bridges, by PKG)	78 copies (English: 3, Vietnamese: 3)*13																				
h) Standard Design (Bridge Works)	6 copies (English: 3, Vietnamese: 3)*1																				
i) Revetment/River Bed Protection Design	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Revetment/River Bed Protection Design (PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
iii) Revetment/River Bed Protection Design (PKG1/PKG4)	6 copies (English: 3, Vietnamese: 3)*1																				
iv) Revetment/River Bed Protection Design	6 copies (English: 3, Vietnamese: 3)*1																				
j) Standard Design (Revetment/River Bed Protection Works)	6 copies (English: 3, Vietnamese: 3)*1																				
k) Tunnel Plan	6 copies (English: 3, Vietnamese: 3)*1																				
23) Basic Design Reports (CIV)																					
a) Basic Design Report (Civ. PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
b) Basic Design Report (Civ. PKG1/PKG4)	6 copies (English: 3, Vietnamese: 3)*1																				
c) Basic Design Report (Civ)	6 copies (English: 3, Vietnamese: 3)*1																				
Detailed Engineering Design Reports (Civil)																					
24) Working Design Reports																					
a) Design Criteria and Conditions	6 copies (English: 3, Vietnamese: 3)*1																				
b) Highway Design																					
i) Geometric Design (Others, by PKG, excl. PKG3a)	12 copies (English: 3, Vietnamese: 3)*2																				
ii) Geometric Design (Others, PKG1/PKG4)	60 copies (English: 3, Vietnamese: 3)*10																				
c) Standard Design (Culvert Works)	6 copies (English: 3, Vietnamese: 3)*1																				
Bridge Design																					
d) Bridge Plan (Other Bridges, by PKG, excl. PKG3a)	12 copies (English: 3, Vietnamese: 3)*2																				
i) Bridge Plan (Others, Other PKGs)	60 copies (English: 3, Vietnamese: 3)*10																				
e) Bridge Temporary Facility Design (by PKG)																					
i) Bridge Temporary Facility Design (PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Bridge Temporary Facility Design (PKG1/PKG4)	12 copies (English: 3, Vietnamese: 3)*2																				
iii) Bridge Temporary Facility Design (Other PKGs)	60 copies (English: 3, Vietnamese: 3)*10																				
f) Standard Design (Bridge Temporary Facility Works)	6 copies (English: 3, Vietnamese: 3)*1																				
Other Design																					
B) Road Accessory Plan (by PKG)																					
i) Road Accessory Plan (PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Road Accessory Plan (PKG1/PKG4)	12 copies (English: 3, Vietnamese: 3)*2																				
iii) Road Accessory Plan (Other PKGs)	60 copies (English: 3, Vietnamese: 3)*10																				
h) Standard Design (Road Accessory)	6 copies (English: 3, Vietnamese: 3)*1																				
i) Slope Protection Design (by PKG)																					
i) Slope Protection Design (PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Slope Protection Design (PKG1/PKG4)	12 copies (English: 3, Vietnamese: 3)*2																				
iii) Slope Protection Design (Other PKGs)	60 copies (English: 3, Vietnamese: 3)*10																				
j) Standard Design (Slope Protection Works)	6 copies (English: 3, Vietnamese: 3)*1																				
k) Retaining Wall Plan (by PKG)																					
i) Retaining Wall Plan (PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Retaining Wall Plan (PKG1/PKG4)	12 copies (English: 3, Vietnamese: 3)*2																				
iii) Retaining Wall Plan (Other PKGs)	60 copies (English: 3, Vietnamese: 3)*10																				
l) Standard Design (Retaining Wall Works)	6 copies (English: 3, Vietnamese: 3)*1																				
m) Softground Treatment Design (by PKG, PKG1/PKG2)																					
i) Softground Treatment Design (PKG1)	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Softground Treatment Design (PKG2)	6 copies (English: 3, Vietnamese: 3)*1																				
n) Standard Design (Softground Treatment Works)	6 copies (English: 3, Vietnamese: 3)*1																				
o) Pavement Design (by PKG)																					
i) Pavement Design (PKG3a)	6 copies (English: 3, Vietnamese: 3)*1																				
ii) Pavement Design (PKG1/PKG4)	12 copies (English: 3, Vietnamese: 3)*2																				
iii) Pavement Design (Other PKGs)	60 copies (English: 3, Vietnamese: 3)*10																				
p) Standard Design (Pavement Works)	6 copies (English: 3, Vietnamese: 3)*1																				

Figure A.11 Reports Submission Schedule (Tentative) (2/4)

: Heavy Rainy Season

Calendar	2011												2012					2013				
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
Procurement Reports	Tender Assistance Reports																					
	37) P/Q Evaluation Reports (Civil, by PKG)																					
	a) P/Q Evaluation Report (Civil, PKG3a)																					
	12 copies (English: 3, Vietnamese: 3)* 2																					
	b) P/Q Evaluation Reports (Civil, PKG1/PKG4)																					
	60 copies (English: 3, Vietnamese: 3)*10																					
	38) Bid Evaluation Reports (Civil, by PKG)																					
	a) Bid Evaluation Report (Civil, PKG3a)																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	b) Bid Evaluation Reports (Civil, PKG1/PKG4)																					
	60 copies (English: 3, Vietnamese: 3)*10																					
	39) Draft Contract Documents (Civil, by PKG)																					
a) Draft Contract Documents (Civil, PKG3a)																						
6 copies (English: 3, Vietnamese: 3)* 1																						
b) Draft Contract Documents (Civil, PKG1/PKG4)																						
12 copies (English: 3, Vietnamese: 3)* 2																						
c) Draft Contract Documents (Civil, Other PKGs)																						
60 copies (English: 3, Vietnamese: 3)*10																						
Safeguard Documents	Social and Environmental Assessment																					
	40) Brief Report on Appropriateness of F/S Alignment																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	41) Updated Draft EIA and EMP																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	42) Draft Final Updated Draft EIA and EMP																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	43) Draft TOR (External Environmental Monitoring)																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	Comprehensive Plan on Compensation, Support and Resettlement (CPCS)																					
	44) Inception Report (Resettlement Monitoring Plan)																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
45) CPCS (by Province)																						
18 copies (English: 3, Vietnamese: 3)* 3																						
46) Draft TOR (External Resettlement Monitoring)																						
6 copies (English: 3, Vietnamese: 3)* 1																						
47) Internal Monitoring Reports (CPCS)																						
84 copies (English: 3, Vietnamese: 3)*14																						
Discussion Papers	48) Alternative Alignment Study Reports																					
	a) Alternative Alignment Study Report (KM070 - KM080)																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	b) Alternative Alignment Study Report																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	49) Cross Structure Plan (by PKG)																					
	78 copies (English: 3, Vietnamese: 3)*13																					
	50) Alternative Study Reports																					
	a) Alternative Study Reports (Major River Bridge)																					
	i) Alternative Study Report (Ky Lam Bridge)																					
	6 copies (English: 3, Vietnamese: 3)* 1																					
	ii) Alternative Study Report (Other Bridges)																					
6 copies (English: 3, Vietnamese: 3)* 1																						
b) Alternative Study Report (Location of My Son Interchange)																						
6 copies (English: 3, Vietnamese: 3)* 1																						
c) Alternative Study Report (Interchange Type)																						
6 copies (English: 3, Vietnamese: 3)* 1																						

Figure A.11 Reports Submission Schedule (Tentative) (4/4)

A.2.8 Organization

(1) Joint Venture

The Consultant Team is Joint Venture (JV) of Nippon Koei Co., Ltd. (NK), Nippon Engineering Co., Ltd. (NE), Chodai Co., Ltd. and Thai Engineering Consultant Co., Ltd. (TEC), and jointly and severally responsible for the Services among the JV firms.

(2) Consultant Team

The Consultant Team divides into six (6) teams and four (4) supporting teams as described below.

Organization structure of the Consultant Team is shown in Figure A.12.

(a) Management Team (MGT)

The Management Team is responsible for managing the Services, and all communications in the Services are exchanged through the team. In the team, the Consultant organizes core team which consists of the representative of each team and secures the consistent communication among the teams.

(b) Civil Team (CVT)

The Civil Team, consisting of Road Design Team, Bridge Design Team and Survey Group, is responsible for survey, planning and designing the civil structures.

In addition, LACT (Local Authority Coordination Team) is a virtual team for coordination with all level of local authorities. The Consultant understood that it required considerable time until reaching agreement with the local people for road structure design, especially cross structures.

(c) O&M and ITS Team

The O&M and ITS team is responsible for preparing the O&M and ITS plan, basic design of the O&M buildings and ITS facilities, and detailed engineering design of the electrical facilities including the preparation of the technical specifications in the bidding documents.

(d) Cost and Procurement Team

The Cost and Procurement Team is responsible for preparing the construction plan, engineer's cost estimate, procurement plan, PQ documents and bidding documents, and assisting the tendering procedures.

(e) Environmental Team

The Environmental Team consists of Social and Environmental Team (SAE) and Resettlement Team (RES).

SAE works with the relevant organizations for review and update of EIA and EMP.

RES works with the relevant organizations for review and update of RAP, conducting both the land valuation and Replacement Cost Survey (RCS) and monitoring the progress of the land acquisition.

(f) Training Team

The Training Team is responsible for identifying the training needs with VEC, PMU85 and relevant organizations, and preparing and coordinating the training materials in cooperation with the engineers/specialists of the respective fields assign in other teams.

(g) Supporting Group

The Supporting Group assists to the Key Professional Staff in daily works. The Group consists of four (4) teams, and those are allocated three (3) teams in Danang Main Office and one (1) in Hanoi Sub-office (see A.2.5(1)(d)).

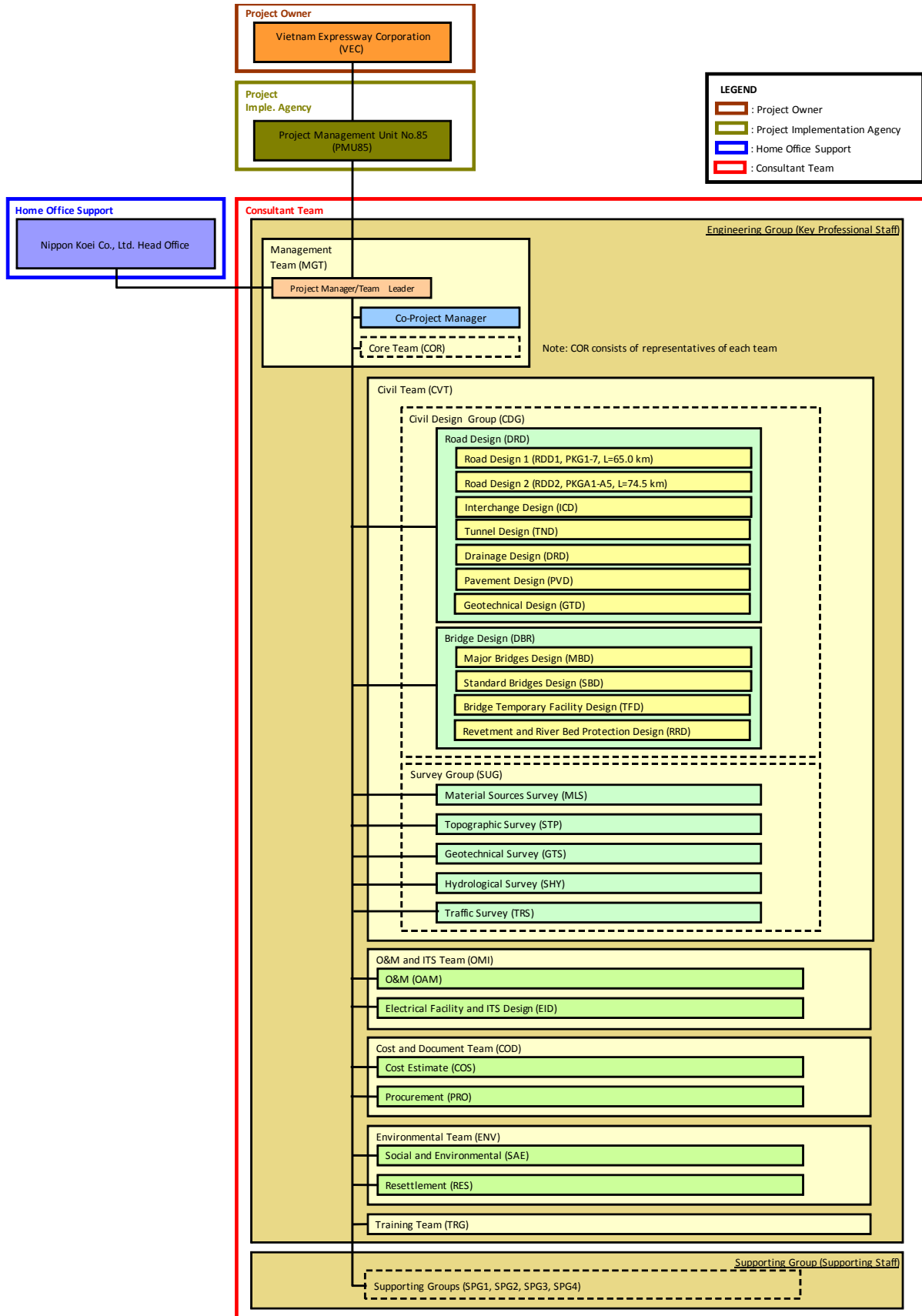


Figure A.12 Organization Structure of the Consultant Team

(3) Home Office Support

NK, the prime consultant of JV firms has the home office support system and utilizes the technical, managerial and operational support including the review and verification of design in the Services.

Conceptual image of NK's home office support system is shown in Figure A.13

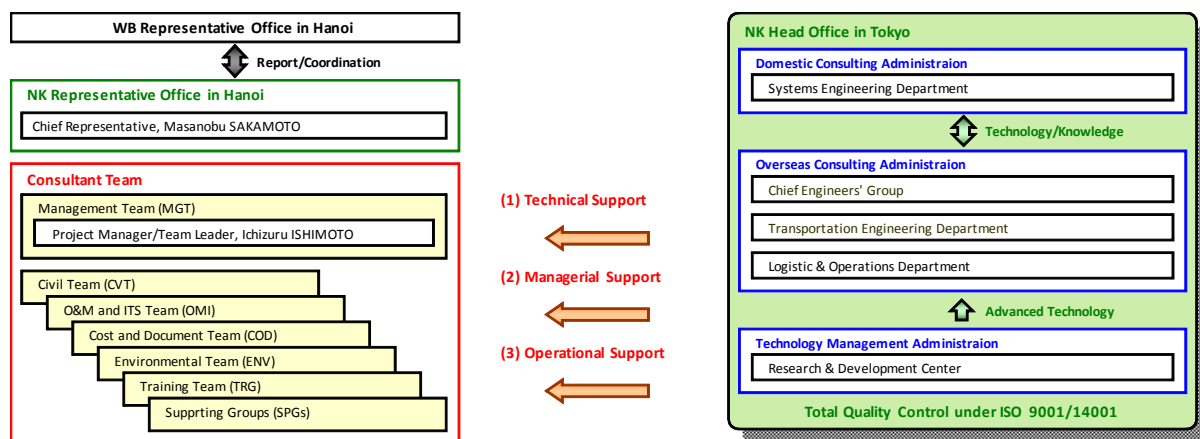


Figure A.13 Conceptual Image of NK's Home Office Support System

(4) Office Arrangement

PMU85 organized the Project Site Management Department (PSMD) in his Danang office, and Danang CPC, Quang Nam and Quang Ngai PPCs and the Project site are also located in/near Danang city. Therefore, the Consultant set up the Main Office in Danang city.

On the other hand, the Consultant outsources the D/D of all interchanges and bridges (excluding Ky Lam Bridge, 1st Priority Package) to the Vietnamese sub-consultants in Hanoi city (see A.2.5(2)(a)). For supervising the outsourcing works, the Consultant set up the Sub-office in Hanoi city.

Office arrangement for Consultant team is shown in Table A.20.

Table A.20 Office Arrangement for Consultant Team

No.	Office	Period	Address	Tel	Fax
1	Danang Main Office	14 months (Dec. 2011 to Jan. 2013)	Unit 2, 11th floor, PVFC Danang Building, Lot A2.1, April 30 Street, Hai Chau District, Danang City, Vietnam	+84-(0)511-3797961	+84-(0)511-3797962
2	Hanoi Sub-office	8 months (Apr. 2011 to Nov. 2012)	To be established		

A.2.9 Staffing

(1) Staffing and Task Assignment

The Consultant established the staffing and task assignment in consistent with the work schedule and reporting plan described in A.2.6 and A.2.7.

It is noted that the Consultant outsources the D/D of all interchanges and bridges (excluding Ky Lam Bridge, 1st Priority Package) to the Vietnamese sub-consultants in Hanoi city to minimize the personnel inputs and shorten the design period.

Staffing and task assignment matrix for key professional staff are shown in Table A.21.

(2) Staffing Schedule

The Consultant takes into account the staffing for the key professional staff as follows:

- Arrange the staff who worked with VEC/PMU85 in the past studies;
- Arrange the staff who worked together with other team members in the past;

(3) Replacement of Professional Staff

Because of the delay of the commencement of the Services, the Consultant replaced several positions in both international professional staff and Vietnamese professional staff provided that substitute personnel possesses equivalent or higher qualification to the previous ones.

The Consultant submitted his proposal of the replacement with supporting documents by his letter No. DQEDD-PMU85-72-11 dated December 09, 2011, and PMU85 approve most of replacement by his replacement by his letter No. 1834/PMU85-PP2 dated December 21, 2011.

(4) Updated Assignment Schedule

Time schedule for key international professional staff, key local professional staff and supporting staff are shown in Tables A.22 to A.24, respectively.

A.2.10 Terms of Payment

Table A.25 summarizes the terms of payment stipulated in Clause 6.4 of the Special Conditions of Contract (SCC).

Table A.25 Teams of Payment

No.	Amount	Requirements
1	<ul style="list-style-type: none"> · Twenty (20) percent of the Contract Price · 92,667,705 JPY · 1,234,820 USD 	<ul style="list-style-type: none"> · Submission of a bank guarantee for the same amount.
	<ul style="list-style-type: none"> · Ten (10) percent of the contract price · 46,333,853 JPY · 617,410 USD 	<ul style="list-style-type: none"> · Submission of Inception Report (ICR).
	<ul style="list-style-type: none"> · Twenty Five (25) percent of the contract price · 115,834,632 JPY · 1,543,525 USD 	<ul style="list-style-type: none"> · Submission of Interim Report, Basic Design Report (BDR) and Prequalification Documents.
	<ul style="list-style-type: none"> · Twenty (20) percent of the contract price · 92,667,705 JPY · 1,234,820USD 	<ul style="list-style-type: none"> · Submission of Monthly Progress Report No.9 · Detailed Design Reports and Bidding Documents of the first 3 packages.
	<ul style="list-style-type: none"> · Fifteen (15) percent of the contract price · 69,500,779 JPY · 929,115 USD 	<ul style="list-style-type: none"> · Approval of Detailed Design Reports and Bidding Documents of the remaining packages · Draft Final Project Completion Report and satisfactory completion of the following works: <ul style="list-style-type: none"> · Review and update EIA, EMP, EMDP, RAP; · Construction method and schedule; · Preparation of implementation program; · Study and design of ITS and toll collection system; · Cost Estimate; · Expressway operation and maintenance.
	<ul style="list-style-type: none"> · Ten (10) percent of the contract price · 46,333,853 JPY · 926,115 USD 	<ul style="list-style-type: none"> · Approval of Final Project Completion Report.

Table A.22 Time Schedule for Key International Professional Staff

Calendar		Calendar Year		2011					2012					'13	Duration									
		Calendar Month		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J		
		Cumulative Month		-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1st Priority Package (PKG3A)	Civil Engineering Design																						7	
	Procurement Assistance																							10
2nd Priority Packages (PKG1, PKGA4)	Civil Engineering Design																							8
	Procurement Assistance																							10
Non-priority Packages (Other PKGs)	Civil Engineering Design																							12
	Procurement Assistance																							

No.	TOR 5.1	Position	Name	Firm	Home/Field	2011					2012					'13	Staff-Months							
						J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J
						-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Management Team (MGT)																								
11	1	Project Manager/Team Leader	Ichizuru Ishimoto	NK	[Field]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	14
Civil Design Team (CID)																								
Civil Design Management (CDM)																								
12	2	Senior Highway Engineer	Takayasu Nagai	NK	[Field]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	14
13	21	Road Safety Audit Specialist	Takehiko Tsuji	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	3
14	5	Senior Bridge Engineer	Yoshito Oba	Chodai	[Field]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	13
Section Design (SED)																								
Road Design 1 (RDD1, PKG1-7, JICA Section)																								
15	3	Highway Engineer 1	Koji Nakai	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	12
16	6	Bridge/Structural Engineer 1	Tetsuya Maeda	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	12
17	6	Bridge/Structural Engineer 2	Yoshiaki Nakakubo	Chodai	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Road Design 2 (RDD2, PKGA1-A5, WB Section)																								
18	3	Highway Engineer 2	Decha Sa-nguanprasith	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	12
19	6	Bridge/Structural Engineer 3	Tamio Yoshioka	NE	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	12
110	6	Bridge/Structural Engineer 4	Kentaro Okuno	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Interchange Design (ICD)																								
111	4	Senior Interchange Specialist	Chanchai Techashongs	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	7
Major Bridges Design (MBD)																								
112	6	Bridge/Structural Engineer 5	Hiroyuki Yokoyama	Chodai	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	11
Tunnel Design (TND)																								
113	11	Tunnel Engineer	Wako Noto	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Geotechnical Design (GTD)																								
114	7	Soil/Geotechnical Engineer 1 (Slope)	Manoon Arayasiri	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
115	8	Soft Ground Treatment Specialist	Suvichai Methpreechakul	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
Drainage Design (DRD)																								
116	23	Drainage Engineer	Suntichai Horpaopan	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	7
Revetment and River Bed Protection Design (RRD)																								
117	23	River Engineer	Aristeo B. Rabajante	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	3
Bridge Temporary Facility Design (TFD)																								
118	6	Bridge/Structural Engineer 6	Akira Yanagisawa	Chodai	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	7
Pavement Design (PVD)/Material Sources Survey (MLS)																								
119	9	Pavement/Material Engineer	Bundit Kitsuwannarut	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Topographic Survey (TPS)																								
120	22	Survey Engineer	Masashi Suzuki	NK	[Field]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	7
Geotechnical Survey (GTS)																								
121	7	Soil/Geotechnical Engineer 2	Jirarat Piyapompong	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	5
122	23	Geological Engineer (Tunnel)	Seichiro Kanai	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
Hydrological Survey (HDS)																								
123	10	Senior Hydrologist	Khadananda Lamsal	NK	[Field]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	3
124	23	Inundation Analyst	Yukishi Tomida Toru Koike Akira Sasaki	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
O&M and ITS Team (OMI)																								
O&M (OAM)																								
125	18	Operating&Maintenance Specialist	Shigeki Takahashi	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
126	19	Expressway Management Unit Specialist	Yuichi Tsujimoto	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
127	23	Traffic Management Specialist	Hisanori Tomitaka	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
128	23	Asset Management Specialist	Kyoichi Takeuchi	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	2
129	23	Architect	Yoshinori Yamazaki	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	3
Electrical Facility and ITS Design (EID)																								
130	15	ITS Specialist	Koichi Nishimura	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	5
131	16	Communication System Engineer	Masahiro Sakagami	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	3
132	12	Senior Electrical Engineer	Eiji Matsuda	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	7
133	17	Toll Collection System Specialist	Masashi Iwamoto	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Cost and Document (COD)																								
Cost Estimate (COS)																								
134	23	Construction Planner/Cost Estimator	Masanori Nakagi	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	12
Document (DOC)																								
135	14	Senior Procurement/Contract Specialist	Anothai Boonthikul	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	13
Environmental (ENV)																								
Social and Environmental (SAE)																								
136	13	Social and Environmental Specialist	Yasuhiro Minami	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Resettlement (RES)																								
137	13	Resettlement Specialist	Vu Ngoc Long	NK	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	8
Training (TRG)																								
138	20	Training Specialist	Noppong Unhabokha	TEC	[Field]							■	■	■	■	■	■	■	■	■	■	■	■	4
Total					[Field]																			239

■ Work in Danang Main Office
 ■ Work in Hanoi Sub-office

Table A.23 Time Schedule for Key Local Professional Staff (1/2)

Calendar		Calendar Year		2011					2012					'13	Duration							
Calendar Month		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J		
Cumulative Month		-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1st Priority Package (PKG3a)	Civil Engineering Design																				7	
	Procurement Assistance																					10
2nd Priority Packages (PKG1, PKGA4)	Civil Engineering Design																					8
	Procurement Assistance																					10
Non-priority Packages (Other PKGs)	Civil Engineering Design																					12
	Procurement Assistance																					

No.	TOR 5.2	Position	Name	Firm	Home/Field	2011					2012					'13	Duration								
						J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	
						-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Management Team (MGT)																									
L1	1	Co-Project Manager	Doan Van Thang	NK	[Field]																			14	
Civil Design Team (CID)																									
Civil Design Management (CDM)																									
L2	2	Highway Engineer 1 (Geometric)	Pham Viet Hung	NK	[Field]																			14	
L3	2	Highway Engineer 2 (Road Structure)	Ha Phuoc Thuan	NK	[Field]																			14	
L4	22	Road Safety Audit Specialist	Tran Quang Huy	NK	[Field]																			3	
L5	3	Bridge/Structural Engineer 1 (Superstructure)	Cat Trong Tien	NK	[Field]																			14	
L6	3	Bridge/Structural Engineer 2 (Subst/Foundation)	Nguyen Van Le	NK	[Field]																			14	
Section Design (SED)																									
Road Design 1 (RDD1, PKG1-7, JICA Section)																									
L7	2	Highway Engineer 3 (Geometric)	Hoang Duc Chau	NK	[Field]																			12	
L8	2	Highway Engineer 4 (Road Structure)	Nguyen Nho Si	NK	[Field]																			12	
L9	3	Bridge/Structural Engineer 3	Phan Duc Dung	NK	[Field]																			4	
L10	3	Bridge/Structural Engineer 4	Nguyen Tam Dat	NK	[Field]																			4	
Road Design 2 (RDD2, PKGA1-A5, WB Section)																									
L11	2	Highway Engineer 5 (Geometric)	Nguyen Vu Manh	NK	[Field]																			12	
L12	2	Highway Engineer 6 (Road Structure)	Huynh Van Quang	NK	[Field]																			12	
L13	3	Bridge/Structural Engineer 5	Ho Le Thai	NK	[Field]																			4	
L14	3	Bridge/Structural Engineer 6	Le Thanh Tung	NK	[Field]																			4	
Interchange Design (ICD)																									
L15	22	Interchange Specialist	Le Thanh Hung	NK	[Field]																			3	
Major Bridges Design (MBD)																									
L16	3	Bridge/Structural Engineer 7	Phan Cong Thanh	NK	[Field]																			4	
Tunnel Design (TND)																									
L17	22	Tunnel Engineer	Nguyen Duc Toan	NK	[Field]																			4	
Geotechnical Design (GTD)																									
L18	4	Soil/Geotechnical Engineer 1 (Slope)	Quach Thi Thu	NK	[Field]																			2	
L19	22	Soft Ground Treatment Specialist	Trinh Viet Linh	NK	[Field]																			2	
Drainage Design (DRD)																									
L20	22	Drainage Engineer 1	Nguyen Minh Ngoc	NK	[Field]																			7	
L21	22	Drainage Engineer 2	Nguyen Phuc Hoa	NK	[Field]																			6	
Revetment and River Bed Protection Design (RRD)																									
L22	22	River Engineer	Nguyen Son	NK	[Field]																			3	
Pavement Design (PVD)/Material Sources Survey (MLS)																									
L23	5	Pavement/Material Engineer 1	Tran Trong Nghia	NK	[Field]																			4	
L24	5	Pavement/Material Engineer 2	Nguyen Viet Hai	NK	[Field]																			3	
Topographic Survey (TPS)																									
L25	8	Senior Surveyor 1	Le Van Thu	NK	[Field]																			1.5	
L26	8	Senior Surveyor 2	Dao Tran Chau	NK	[Field]																			9.5	
L27	8	Senior Surveyor 3	Nguyen Anh Tuan	NK	[Field]																			5	
Geotechnical Survey (GTS)																									
L28	4	Soil/Geotechnical Engineer 2	Nguyen Doan Tinh	NK	[Field]																			8	
L29	4	Soil/Geotechnical Engineer 3	Nguyen Manh Tuan	NK	[Field]																			3	
L30	4	Soil/Geotechnical Engineer 4	Trinh Minh Khiem	NK	[Field]																			2	
L31	22	Geological Engineer (Tunnel)	Tran Ngoc Nhan	NK	[Field]																			2	
Hydrological Survey (HDS)																									
L32	7	Hydraulic Engineer 1	Ngo The Hung	NK	[Field]																			2	
L33	7	Hydraulic Engineer 2	Nguyen Duc Duy	NK	[Field]																			2	
L34	22	Inundation Analyst	Nguyen Ngoc Bach	NK	[Field]																			2	
Traffic Survey (TRS)																									
L35	14	Transport Economist	Trinh Duc Thang	NK	[Field]																			3	
O&M and ITS Team (OMI)																									
O&M (OAM)																									
L36	18	Operating & Maintenance Specialist	Ha Quoc Hieu	NK	[Field]																			4	
L37	19	Expressway Management Unit Specialist	Le Tung Lam	NK	[Field]																			2	
L38	22	Traffic Management Specialist	Phan Minh Tuan	NK	[Field]																			2	
L39	22	Asset Management Specialist	Trinh Ngoc Hai Thang	NK	[Field]																			2	
L40	15	Architect 1	Pham Quang Minh	NK	[Field]																			3	
L41	15	Architect 2	Ngo Vu Quang Khoa	NK	[Field]																			2	
Electrical Facility and ITS Design (EID)																									
L42	17	ITS Specialist	Nguyen Huu Tinh	NK	[Field]																			5	
L43	17	Communication System Engineer	To Minh Tri	NK	[Field]																			3	
L44	13	Electrical Engineer 1	Trinh Dinh Khiem	NK	[Field]																			7	
L45	13	Electrical Engineer 2	Vo Hong	NK	[Field]																			4	
L46	22	Toll Collection System Specialist	Bui Phu Huy	NK	[Field]																			4	

■ Work in Danang Main Office

Part B Project Management

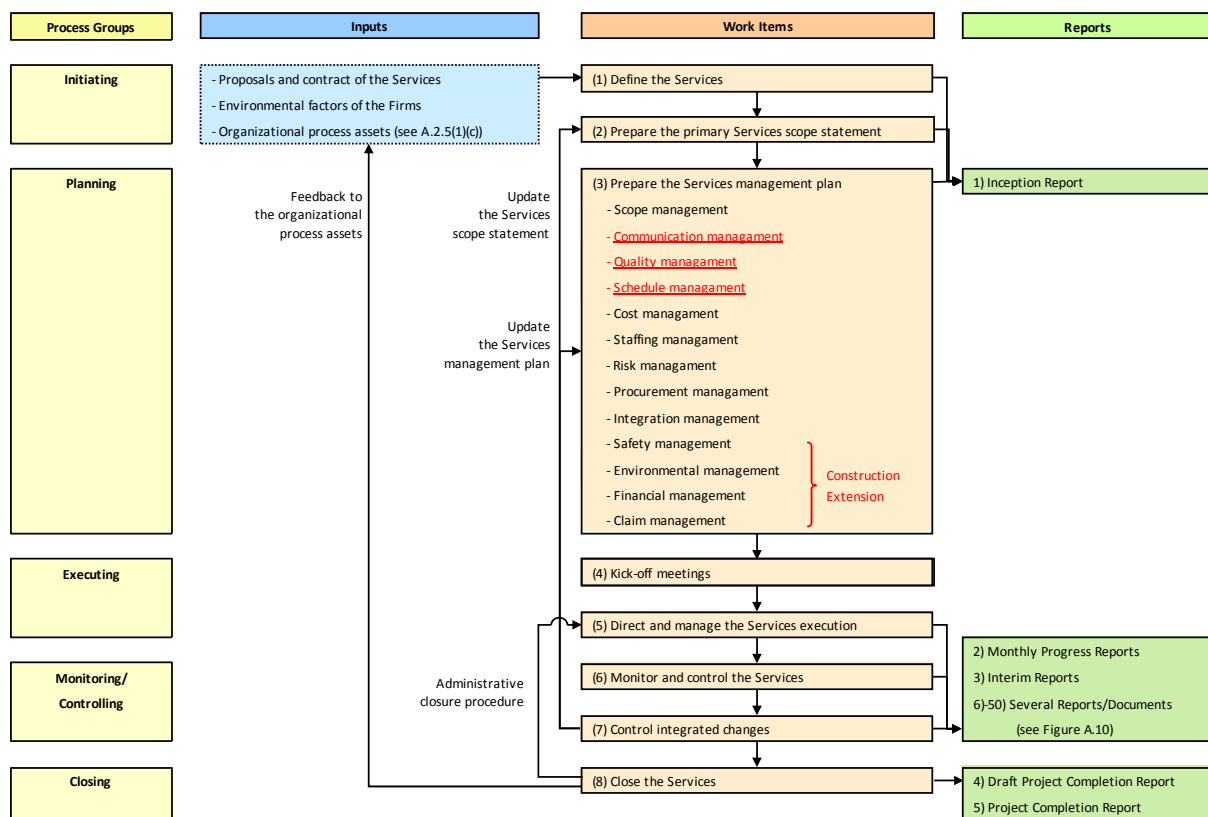
B.1 Basic Policy

The Consultant established the practical Project management system by utilizing PMBOK and its construction extension and customized it to the characteristics of the Services.

This project management system consists of 13 management areas, and the integration management which is one of the management areas consisting of the processes and activities needed to identify, define, combine, unify and coordinate the various processes and activities within the management process groups, is useful for understanding of overall project management system.

In consideration of the large-scale and complex assignment, the Consultant prioritizes the communication, quality and schedule managements in the Services. Especially, it is understood that the communication management is the most important management area, and the Consultant pay our best efforts and attention to this for successful implementation of the Project.

Work diagram of project management based on integration management is shown in Figure B.1, and describes the methodology of work items subsequently.



Note: Not all process interactions and data flow among the inputs, work items and reports are shown in the figure

Figure B.1 Work Diagram of Project Management based on Integration Management

B.2 General Phasing in Project Management

As shown in Figure B.1, the project management consists of five (5) phases, i.e. Initiating, Planning, Executing, Monitoring/Controlling, and Closing.

As of the end-December 2011, it is transition period between planning and executing. This Inception Report (ICR) is a product of the result of our project management planning.

(1) Define the Services

The consulting contract defines the required Services to be performed by the Consultant.

(2) Prepare the Primary Services Scope Statement

The Consultant reconfirmed the requirements stipulated in the contract and defines the Service in this Inception Report (ICR). The ICR will function as baseline of the project management of the consulting services for all stakeholders to develop a common understanding of the Service scope.

(3) Prepare the Services Management Plan

In the ICR, the Consultant explains how the Services is executed, monitored and controlled with addressing the communication, quality and schedule managements.

Main contents of three (3) major management areas are shown in Table B.1.

Table B.1 Main Contents of Three (3) Major Management Areas

No.	Management Areas	Main Items	Contents
1	Communication	Communication requirements	- Among the relevant organizations and inside the consultant team
		Communication item	- Including format, contents, level of detail, frequency, conveyor and receiver
		Medium and technologies	- Meetings, letters, reports, workshops, etc.
		Escalation process	- Identifying time frames and channel for escalation of issues
		Method for updating	- Required conditions and process for updating
		Common terminology	- Definitions for minimizing communication errors
2	Quality	Quality metrics	- Operational definition for quality control item, process and measurement
		Quality checklists	- Structured tool for verifying QA/QC performance
		Process improvement	- Process boundaries, configuration and metrics, and performance targets
		Quality baseline	- Records for quality objectives
		Method for updating	- Required conditions and process for updating
3	Schedule	Activity definition	- Activity list and attributes, and milestone list
		Baseline schedule	- Baseline for progress monitoring and reporting
		Monitoring and reporting	- Method for monitoring and reporting including format, contents and frequency
		Method for updating	- Required conditions and process for updating

(4) Kick-off Meeting

Based on the Inception Report, the Consultant holds the kick-off meeting with not only the Project executing agency but also other relevant organizations for publicizing, gaining the consensus and smooth implementation of the Services.

In the past, there were two (2) kick-off meetings:

On 15 July 2011: A Kick-off meeting for commencement of the topographic survey was carried out with reference to the Work Plan of Topographic Survey.

On 25 November 2011: A Kick-off meeting for the commencement of the detailed design was carried out with reference to draft Inception Report.

This ICR is submitted at the end of December 2011, meeting the requirement of the milestone MS05 in Table A.17.

(5) Direct and Manage the Services Execution

The Consultant directs and manages the Services execution in accordance with the process of executing the Services defined in the ICR in order to achieve the requirements stipulated in the contract. Information on the status of the management activities being performed to accomplish the Services is routinely collected, and the Consultant compiles and submits the status as the monthly progress report.

The Consultant already established internal weekly meeting for information share and tackling difficulties in execution of the Services. This communication tool is the baseline of direct and management of the Service execution.

(6) Monitor and Control the Services

The Consultant monitors and controls the processes used to initiate, plan, execute and close the Services to meet the performance objectives defined in this ICR. Status of the activity is also compiled and submitted as the monthly progress report.

In order to help the monitoring and control, the Consultant will develop the work schedule by scheduling software, Microsoft Project, and the task(s) running on the critical path will be intensively

monitored and necessary reallocation of resources, manpower and/or equipment, will be efficiently and effectively carried out.

(7) Control Integrated Change

The Consultant controls integrated change which is the process of reviewing all change requests and approving and controlling changes to deliverables and organizational process assets. The approved changes are reflected to update the ICR. Status in the activity is also compiled and submitted as the monthly progress report.

It is understood that there would be considerable amount of changes required when the Consultant hold discussion with the local authorities. In this regards, the change management is the most critical management area, and the Consultant pay the most care to maintain good communication among the stakeholders.

(8) Close the Services

The Consultant finalizes all of the activities across the process groups to formally close the Services. It is understand that there will be two (2) closure in the Services:

Closure 1: Completion of the detailed engineering design.

Closure 2: Completion of the procurement assistance.

Administrative closing procedure is prepared timely when the above two (2) services are near to the completion. All of documents of the management activities are compiled and submitted as the Project completion report.

Part C Previous Studies Review and Establishing Detailed Engineering Design Framework

C.1 Review Previous Studies

(1) TOR Requirements

Requirements in the TOR is summarized as shown in Table C.1

Table C.1 TOR Requirements for Previous Studies Review

No.	TOR Requirements	Check
1	<ul style="list-style-type: none"> - The Consultant shall review the previous studies to acquaint themselves with the evolution of the Project and its current features, and to identify matters that may materially affect the work of the current contract. - Key issues will be identified for discussion and agreement with PMU85. - The review shall cover, among others, the following subjects: 	
2	a. Review of horizontal and vertical alignment and proposed structures.	
	b. Review site-specific social and environmental impacts identified in the Environmental Impact Assessment (EIA) prepared by PMU85 and the mitigation measures proposed in the associated Environmental Management Plan (EMP).	
	c. Review construction phasing and management of traffic during construction.	
	d. Review toll operation and control facilities, operation and maintenance facilities and services, service areas, parking areas, etc.	

Source: TOR 3.2 (1)

(2) Methodology

The Consultant reviews the previous studies, especially the F/S report and safeguard documents, to take cognizance of the current arrangements of the Project and extracts the key issues which materially affect to the Services for discussing and obtaining the agreement with VEC/PMU85 and relevant organizations.

Work diagram of previous studies review is shown in Figure C.1, and main contents of previous studies review are shown in Table C.2, respectively.

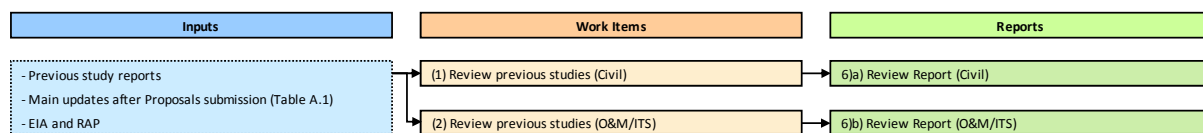


Figure C.1 Work Diagram of Previous Studies Review

Table C.2 Main Contents of Previous Studies Review

No.	Category	Main Contents
1	Civil	- Topography, geology and hydrology of the Project area
		- Technical standards ¹⁾ , and design criteria and conditions
		- Route alignment, geometric design and typical cross sections
		- Preliminary design of civil structures
		- Construction planning and preliminary Project cost estimates
		- Environmental impacts and its mitigation measures and RAP
2	O&M/ITS	- Existing legal and administrative arrangements
		- O&M/ITS standards and plan
		- O&M unit establishment plan
		- Tariff rate and toll collection system
		- Electrical/O&M/ITS facilities and equipment plan

Note: 1) Applicable technical standards for the Project were approved by MOT in Decision No. 362/QĐ-BGTVT dated February 20, 2009

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Horizontal alignment: Submitted technical report for finalization of expressway alignment by our letter No. DQEDD-PMU85-85-11 dated December 21, 2011.

- Vertical alignment: Finished preliminary alignment considering the all crossing structures.
- Structures (1), Bridges: In progress
- Structure (2), Road Structures: Finished preliminary planning.
- EIA and EMP: In progress.
- Construction Phasing: In progress
- Traffic Management during Construction: Not started.
- Toll Operation and Control Facilities: Not started.
- Operation and Maintenance facilities and Services: Not started.
- Service Areas and Packing Areas: Not started.

C.2 Establish Detailed Engineering Design Framework

(1) TOR Requirements

Requirements in the TOR is summarized as shown in Table C.3

Table C.3 TOR Requirements for Establish Detailed Engineering Design Framework

No.	TOR Requirements	Check
1	a. Establish design criteria and design standards to be applied for the Project.	
	b. Recommend and agree with PMU85 the format and content for the Bills of Quantities, cost estimates and prequalification and bidding documents.	
	c. Recommend and agree with PMU85/VEC the time schedule for preparation of the detailed design, the Bills of Quantities, cost estimates, prequalification documents and bidding documents to allow the tendering of works and construction for each contract package to commence immediately after the completion of necessary design and documentation work and the gaining of necessary approvals.	

Source: TOR 3.2 (2)

(2) Methodology

The Consultant establishes the detailed engineering design framework which consists of the primary matters for execution of the Services based on C.1 and obtains the approval from VEC/PMU85 and relevant organizations.

Work diagram of detailed engineering framework is shown in Figure C.2, and main contents of the detailed engineering design framework are shown in Table C.4, respectively.

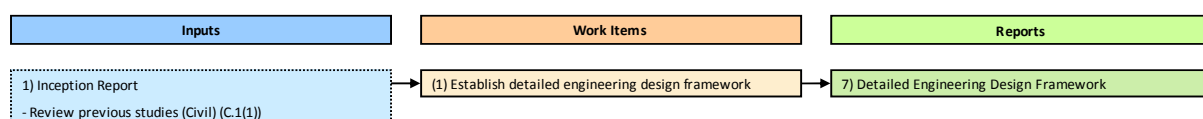


Figure C.2 Work Diagram of Detailed Engineering Design Framework

Table C.2 Main Contents of Detailed Engineering Design Framework

No.	Item	Main Contents
1	Detailed Engineering Design Framework	<ul style="list-style-type: none"> - Updated applicable technical standards for the Project - Format and content of the B/Q items, cost estimate and procurement documents - Updated work schedule of the Services

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Design Standards: Updated list of technical standards was submitted by our letter No. DQEDD-PMU85-79-11 dated December 16, 2011.
- Design Criteria: In progress.
- Format and Contents of BOQ and Cost Estimate: In progress
- Format and Contents of PQ Documents: A draft PQ Documents for PKG3A was submitted by

our letter No. DQEDD-PMU85-53-11 dated November 18, 2011.

- Format and Contents of Bidding Documents: Not started.
- Recommendation of Time Schedule of Detailed Design: In progress.

Part D Detailed Engineering Design and Procurement Planning

D.1 Contract Packaging

D.1.1 Propose Contract Packaging

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.1

Table D.1 TOR Requirements for Contract Packaging

No.	TOR Requirements	Check
1	- The Consultant shall identify a recommended packaging for the project and get agreement with the Client before commencing detailed design. Packaging shall satisfy the following conditions:	
2	a. Individual packages should be confined to a single province.	
	b. Individual package shall be financed by only a single financier.	
	c. The value of a package should generally be from about 70 million to 100 million USD, i.e. neither too big nor too small.	
	d. During preparation of the detailed design, the Consultant shall study, initiate the solutions and design a contract package with reasonable scopes of works beforehand so that its construction can be commenced in September, 2012.	

Source: TOR 3.3.2

(2) Methodology

Work diagram of contract packaging is shown in Figure D.1,

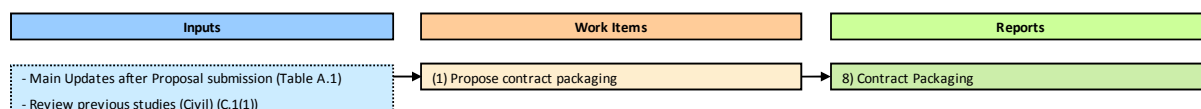


Figure D.1 Work Diagram of Contract Packaging

(3) Work Progress to Date

As described in A.1.9, the Consultant proposed the contract packaging plan as shown in Table A.11 and waiting further discussion.

In case further modification is requested by VEC/PMU85, the Consultant studies it taking into account the impact to the D/D works and overall project implementation, and update it timely.

D.2 Surveys and Investigations

D.2.1 Data Collection

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.2.

**TABLE D.2 TOR REQUIREMENTS FOR DATA
COLLECTION**

No.	Items	Main Contents
1	General cost estimate	<ul style="list-style-type: none"> - Production costs related to local transportation activities - depreciation regulations related to traffic vehicles - haulage tables for transportation services - charges for travel, bridges and roads, and insurance - costs for traffic accidents - inflation and exchange rate in the previous years - local unit price for calculation of general cost estimate - consult unit prices of projects under implementation in the region - investigate sources of materials and energies for construction - cooperate with local governments to identify disposal areas for soil and waste materials (including liquid waste)
2	Survey for construction material transportation	-
3	Investigate and collect planning data related to the project and work with relevant authorities	<ul style="list-style-type: none"> - Collect planning maps of highways, railways, waterways and maritime - plan of industrial and urban zones along the route - plan of systems of hydraulic works , irrigation, canals, dykes, and pumping stations, etc - plan of underground works and system of underground and overhead lines - Plan of water supply and drainage system - plan of electricity supply and lighting - plan of communication system and other relevant plans along the route, etc (the plans must be granted with official approval of relevant authorities)
4	Collect project documents and design document of the relevant projects	-
5	Work and agree in writing with relevant authorities of Danang city, Quang Nam and Quang Ngai provinces, 5th military zone under Ministry of Defense, EVN, VNPT, PMU of industrial zones and other relevant managing agencies about the following contents	<ul style="list-style-type: none"> - Alignments - alternative design of interchange - scale and location of toll plazas, control center, service stations - elevation of detailed plans of urban zones and industrial zones - location, span or width, and elevation of culvert and frontage road - navigational clearance, railway clearance - documents related to hydraulic works, irrigation, water sources and sewage system for urban zones, clearance of large canals and dykes - areas within military structures, military barracks - and the other relevant documents, etc

Source: TOR 3.3.2 (1)

(2) Methodology

The Consultant collects the relevant data and documents for basis of execution of the Services.

Work diagram of relevant data and documents is shown in Figure D.2, and main contents of relevant data and documents should refer to Table D.2 above.

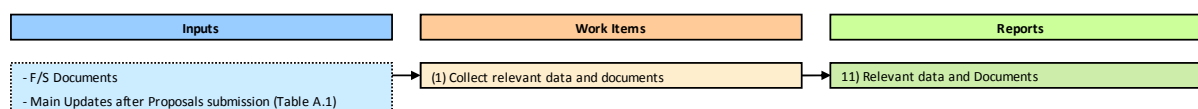


Figure D.2 Work Diagram of Relevant Data and Documents

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Data collection is not progressed well.
- Data collection should be started immediately with support by PMU85 and local authorities.

D.2.2 Conduct Topographic Survey

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

The Consultant conducts the topographic and ROW surveys for preparation of engineering design, quantity take-off and CPCS. In consideration of the huge survey volumes, the Consultant outsources the site survey works to Vietnamese sub-consultant(s) and supervises their performance by the Survey Engineer. The selection of sub-consultant(s) and work plan including survey specifications were approved by VEC/PMU85.

In consideration of the rainy season, short-period and work procedure of basic design, the Consultant conducted the site survey works in accordance with the following priorities:

- **1st Priority** : Control point survey and leveling network (whole section)
- **2nd Priority** : Planimetric survey (thruway, sections for survey centerline study)
- **3rd Priority** : Remaining surveys for basic design
- **Non-priority** : Surveys for detailed engineering design

Work diagram of topographic survey is shown in **Figure D.3**, and work quantities for topographic survey are shown in **Table D.3**, respectively

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant submitted the revised work plan for the control point survey by our letter No. DQEDD-VEC-05-11 dated July 20, 2011. VEC approved the work plan by his letter No. 1391/VEC-KTCNMT dated August 3, 2011.
- The Consultant submitted the revised work plan for the topographic survey by our letter DQEDD-PMU85-48-11 dated November 14, 2011.
- All field works except the survey for rampways of the interchanges are completed, including some additional survey areas.
- Digital files of plan, profile and cross-section of the throughway were already handed over to the design team.

Reporting and drawings are being finalized and to be completed in January as the final products of the survey works..

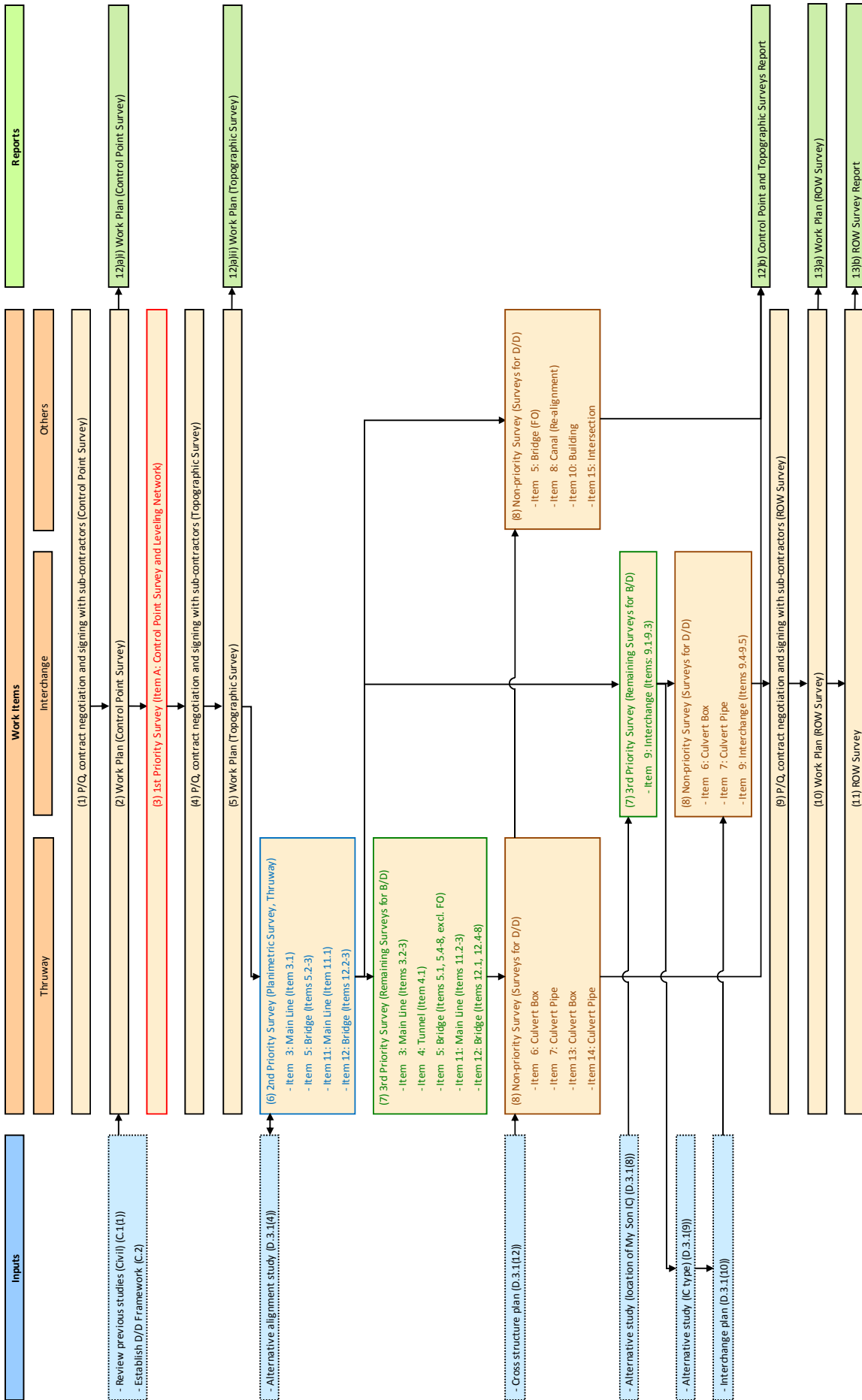


Figure D.3 Work Diagram of Topographic Survey

Table D.3 Work Quantities for Topographic Survey

No.	Items	Specifications	Unit	Quantities	Remark
A	Control Point and Leveling Network				
1	Primary Control Point (GPS)				
1.1	Primary Control Point (GPS)	Class IV, VN2000	nos.	66	
1.2	Primary Leveling Network (GPS Network)		km	279.6	
2	Secondary Control Point				
2.1	Secondary Control Point	Class II	nos.	705	
2.2	Secondary Leveling Network		km	181.9	
B	Expressway				
3	Main Line (ML, Road Section)				
3.1	Planimetric	1/1,000	ha	1,533.1	
3.2	Profile	1/1,000; 1/100	km	109.5	
3.3	Cross-section	1/200	km	800.8	
4	Tunnel (TN)				
4.1	Planimetric	1/500	ha	4.5	
5	Bridge (BR)				
5.1	Secondary Control Point	Class II	nos.	314	
5.2	Planimetric (On Shore)	1/500	ha	268.1	
5.3	Planimetric (Off Shore)	1/500	ha	44.8	
5.4	Profile (On Shore)	1/500	km	18.4	
5.5	Profile (Off Shore)	1/500	km	3.2	
5.6	Cross-section (Approach Road)	1/200	km	76.4	
5.7	River Profile	1/1,000; 1/100	km	16.0	
5.8	River Cross-section	1/200	km	21.2	
6	Culvert Box (CB)				
6.1	Planimetric	1/500	ha	105.7	
6.2	Profile	1/200	km	2.8	
6.3	Cross-section	1/200	km	3.4	
7	Culvert Pipe (CP)				
7.1	Profile	1/200	km	14.2	
7.2	Cross-section	1/200	km	17.0	
8	Canal (Re-alignment)				
8.1	Planimetric	1/500	ha	1.4	
8.2	Profile	1/500	km	0.2	
8.3	Cross-section	1/200	km	0.4	
9	Interchange (IC)				
9.1	Secondary Control Point	Class II	nos.	72	
9.2	Secondary Leveling Network		km	18.0	
9.3	Planimetric	1/500	ha	406.6	
9.4	Profile (Rampway)	1/1,000; 1/100	km	19.4	
9.5	Cross-section (Rampway)	1/200	km	102.0	
10	Building (BL)				
10.1	Planimetric	1/500	ha	20.5	
C	Linking Road				
11	Main Line (ML, Road Section)				
11.1	Planimetric	1/1,000	ha	68.8	
11.2	Profile	1/1,000; 1/100	km	6.9	
11.3	Cross-section	1/200	km	21.2	
12	Bridge (BR)				
12.1	Secondary Control Point	Class II	nos.	6	
12.2	Planimetric (On Shore)	1/500	ha	12.1	
12.3	Planimetric (Off Shore)	1/500	ha	0.3	
12.4	Profile (On Shore)	1/500	km	1.1	
12.5	Profile (Off Shore)	1/500	km	0.3	
12.6	Cross-section (Approach Road)	1/200	km	1.9	
12.7	River Profile	1/1,000; 1/100	km	0.8	
12.8	River Cross-section	1/200	km	0.5	
13	Culvert Box (CB)				
13.1	Planimetric	1/500	ha	7.4	
13.2	Profile	1/200	km	2.3	
13.3	Cross-section	1/200	km	2.8	
14	Culvert Pipe (CP)				
14.1	Profile	1/200	km	1.7	
14.2	Cross-section	1/200	km	2.0	
15	Intersection (IS, NH1A)				
15.1	Planimetric	1/500	ha	23.7	
15.2	Profile	1/1,000; 1/100	km	4.4	
15.3	Cross-section	1/200	km	12.6	

Source: Estimated quantities by the Consultant (as of end of November, 2011)

D.2.3 Conduct Hydrological Survey and Analysis

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

“National Strategy for Natural Disasters Prevention, Response and Mitigation to 2020” and “Provincial Integrated Disaster Risk Management Plan to 2020” have stressed for building flood resistant roads and widening the openings of bridges and culverts along the roads and railways to facilitate drainage. Therefore, width of bridges, viaducts and culverts in the expressway is required to design with enough openings that flood conditions in river and on floodplain is not alter from the existing situations.

The expressway passes through floodplains of large rivers; therefore, some sections have severe problems. The Consultant conducts hydrological and inundation analyses performed as follows:

- Identify the sections of the expressway where inundation occurs
- Determine design high water level in river and on floodplain along the expressway
- Check width of bridges and culverts in F/S are enough or not
- Optimize the length of bridges and culverts for cost-effectiveness

Work diagram of hydrological survey and analysis is shown in Figure D.4, and describes the methodology of work items subsequently.

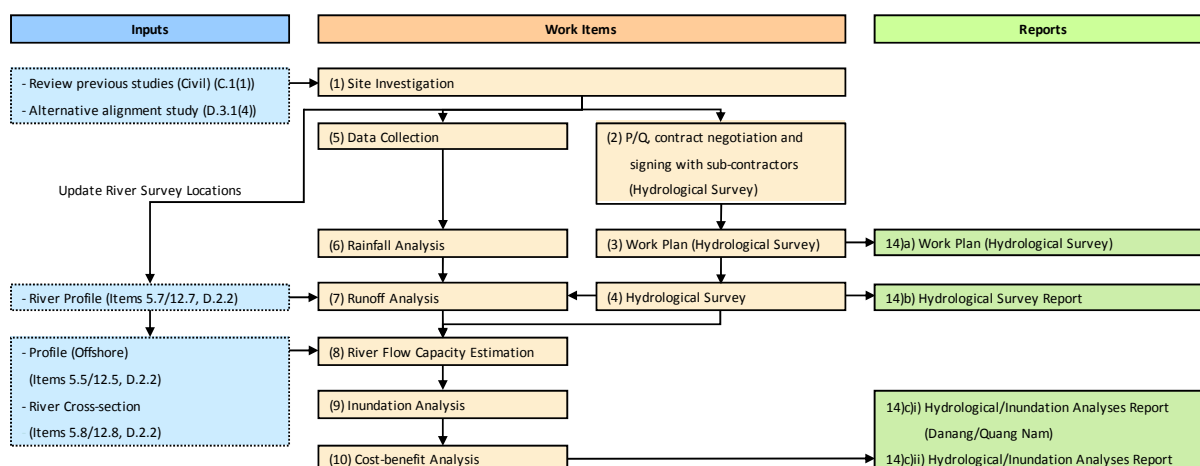


Figure D.4 Work Diagram of Hydrological Survey and Analysis

(a) Site Investigation

The Consultant conducts site investigations to acquire the river locations, channels and crossing points with the expressway and updates the specifications for hydrological survey including the river profile and cross-section survey points in the topographic survey (D.2.2).

(b) Hydrological Survey

The Consultant outsources the hydrological survey works to Vietnamese sub-consultant(s) and supervises their performance by the Senior Hydrologist. The selection of sub-consultant(s) and work plan including survey specifications shall be approved by VEC/PMU85.

Work quantities for hydrological survey are shown in Table D.4.

Table D.4 Work Quantities for Hydrological Survey

No.	Items	Locations and Quantities
1	Historical Water Level	A group of highest one, frequent one, average one and lowest one along the thruway centerline at 1.0 km interval where existing ground level is less than 25 m from mean sea level and at all planned positions of bridge and culvert.
2	Water Level	Thrice a day in November and December 2011 at 6:00, 12:00 and 18:00 hours at three (3) positions (one (1) position at river center, two (2) positions near banks) in four (4) major river bridges.
3	Water Flow Velocity	Once during high flood in November and December 2011 at three (3) positions (one (1) position at river center, two (2) positions near banks) in four (4) major river bridges.

Source: Estimated quantities by the Consultant (based on F/S)

(c) Data Collection

The Consultant collects hydro-meteorological data which is necessary for hydrological analysis. Those data can be obtained from Hydro-meteorological Data Center in Hanoi.

Hydro-meteorological data collection plan is shown in Table D.5.

Table D.5 Hydro-meteorological Data Collection Plan

No.	Items	Stations and Periods
1	Annual Maximum Daily Rainfall	Danang (1964 - 2010), Cau Lau (1977 - 2010), Tam Ky (1977 - 2010), Tra My (1979 - 2010), Tra Bong (1976 - 2010), Quang Ngai (1964 - 2010), Gia Vuc (1981 - 2010)
2	Annual Maximum Rainfall	Danang (amounts of 5, 15, 30, 45 and 60 minutes duration during 1986 - 2010 or rainfall intensity duration frequency (IDF) curve with equation and constants)
3	Meteorological Data	Danang (mean monthly air temperature, wind speed, evaporation and relative humidity during 2001 - 2010)
4	Annual Maximum River Discharge (with Catchment Areas)	Nong Son (Thu Bon River, 1977 - 2010), Thanh My (Vu Gia River, 1977 - 2010), Son Giang (Tra Khuc River, 1979 - 2010)
5	Annual Maximum and Minimum River Water Levels	Giao Thuy (Thu Bon River, 1976 - 2010), Ai Nghia (Vu Gia River, 1976 - 2010), Son Giang and Tra Khuc (Tra Khuc River, 1977 - 2010), Cam Le (Other River, 1976 - 2010)
6	Hourly Water Levels and Rainfalls (one (1) week, the highest in 2009)	<u>Hourly Water Level (7 days)</u> : Giao Thuy and Cau Lau (Thu Bong River), Ai Nghia (Vu Gia River), Son Giang and Tra Khuc (Tra Khuc River), Cam Le (Other River) <u>Hourly Rainfall 7 days</u> : Danang, Tra My, Tam Ky and Quang Ngai

Source: Estimated quantities by the Consultant (based on F/S)

(d) Rainfall Analysis

The Consultant conducts frequency analysis of annual maximum daily rainfall of stations in the Project area performed to determine 1 % (linking road: 4 %), 5 % and 50 % exceeding probability rainfalls at the stations. Most commonly used log normal distribution function is employed for the frequency analysis. As for the coverage of river basin area by a particular rainfall station, it is determined by using Thiessen's Polygon Method. Basin rainfalls of 1 % (linking road: 4 %), 5 % and 50 % exceeding probability levels are computed based on the point rainfalls, and hourly distribution pattern of basin rainfall is designed for runoff analysis.

(e) Runoff Analysis

The Consultant conducts runoff analysis by using empirical methods (specific discharge method or rational method) or lumped sub-basin model. The information such as catchment area, rainfall amount and intensities, and sub-basin parameters is collected for runoff analysis. The lumped sub-basin model is calibrated by observed flood levels in river and on floodplain during high flood in 2009. The river flow of 1 % (linking road: 4 %), 5 % and 50 % exceeding probabilities is estimated for determining design high water levels in river and on floodplain.

(f) River Flow Capacity Estimation

The Consultant checks river flow capacity by employing river flow simulation model. In case of 1 % (linking road: 4 %) exceeding probability flow is within the flow capacity of river, the design high water level in the river is estimated by unsteady river flow simulation by using HEC-RAS. In case of 1 % (linking road: 4 %) exceeding probability flow overflows from river bank, inundation analysis is adopted for determining the design high water level in river and on floodplain.

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant submitted the revised work plan by our letter No. DQEDD-PMU85-50-11 dated November 18, 2011.
- Regarding the out-sourced hydrological survey:
 - Historical Water Level Survey: Field work completed.
 - Water Level Survey: Complete the field survey on December 29, 2011.
 - Water Flow Velocity Survey: Field work completed.
- Data collection is completed.
- Rainfall analysis is almost completed.
- Runoff analysis is 50% completed.
- River flow capacity analysis is just started.

D.2.4 Inundation Analysis

(1) TOR Requirements

This scope is proposed by the Consultant as additional scope, not included in the Appendix 1: Terms of Reference (TOR).

(2) Methodology

The Consultant conducts inundation analysis with input of 1 % (linking road section: 4 %) and 5 % exceeding probabilities basin rainfalls. The scenarios of inundation analysis are as follows:

- 1 % (linking road: 4 %) exceeding probability basin rainfall and existing physical conditions of basin
- 1 % (linking road: 4 %) and 5 % exceeding probability basin rainfall, existing physical conditions of basin, and planned designs (dimensions) and arrangements of thruway bridge, viaduct and culvert
- Other scenarios as needed to determine the design high water level in river and on floodplain

The Consultant utilizes MIKE-11 and ArcGIS for inundation analysis and flood maps preparations. The data used in flood management model developed by JICA's Disaster Protection Study in Quang Nam and WB's Flood Risk Management Plan Study in Quang Ngai.

Image of MIKE-11 and ArcGIS is shown in Figure D.5.

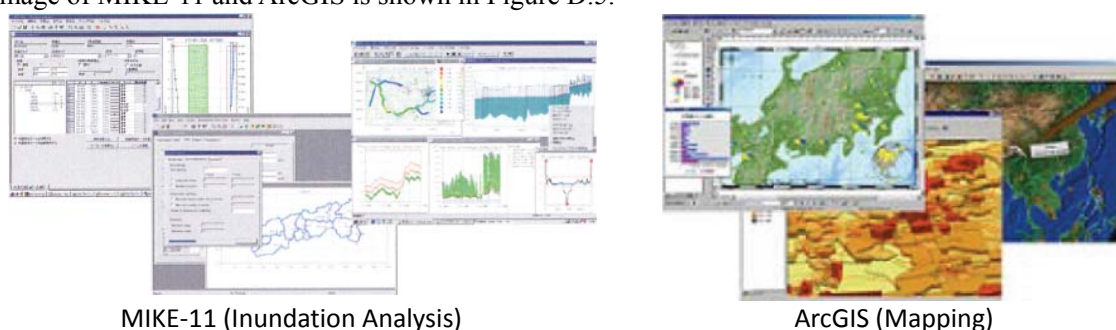


Figure D.5 Image of MIKE-11 and ArcGIS

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant submitted the first work plan report by our letter No. DQEDD-PMU85-74-11 dated December 10, 2011.
- Two working teams are mobilized, one for Danang-Quang Nam section, the other is for

Quang Ngai section.

- Both analyses will be completed in January 2012.

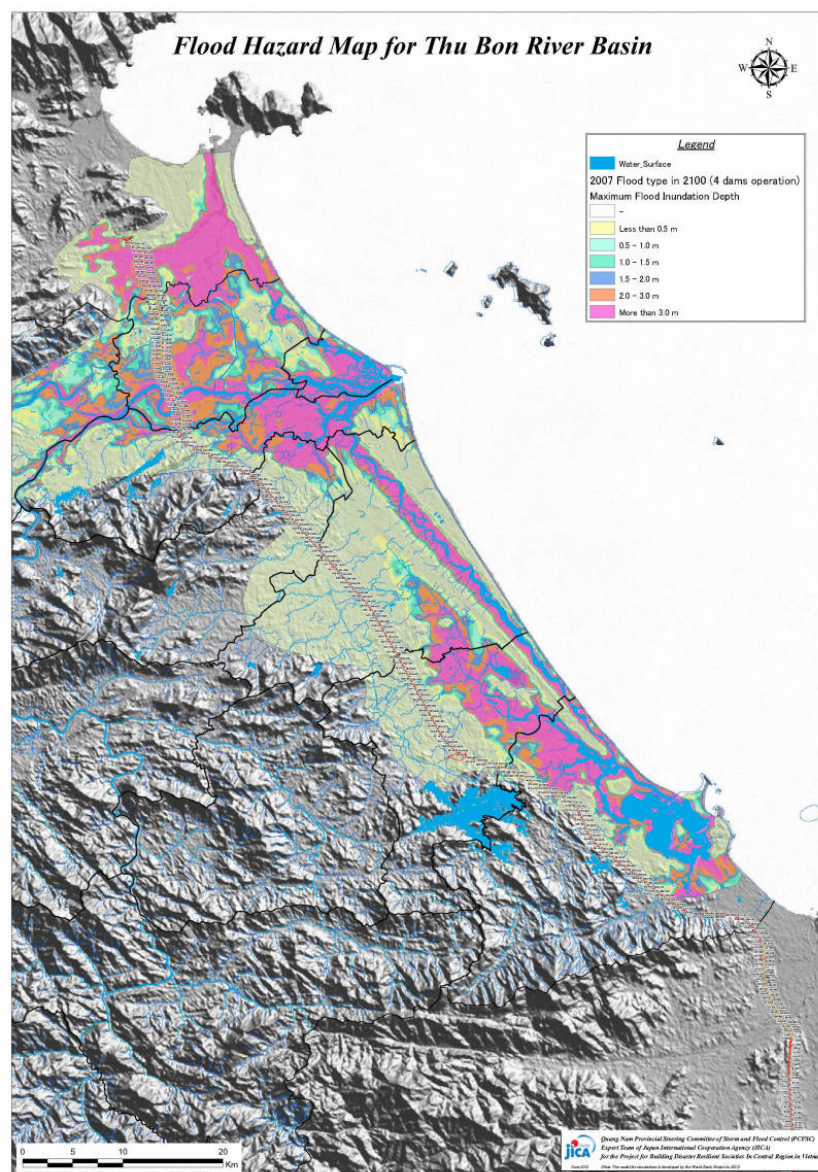


Figure D.6 Image of Inundation Analysis

D.2.5 Conduct Geotechnical and Geological Investigations

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

The Consultant conducts the geotechnical and geological investigations for engineering design. In consideration of huge investigation volumes, the Consultant outsources the site investigation works to Vietnamese sub-consultant(s) and supervises their performance by the Soil/Geotechnical Engineer 2 and Geological Engineer (Tunnel). The selection of sub-consultant(s) and work plan including investigation specifications shall be approved by VEC/PMU85.

The Consultant conducts the site investigation works in accordance with the following priorities:

- **1st Priority Investigations** : PKG3a (1st Priority Package)
- **2nd Priority Investigations** : PKG1 and PKGA4 (2nd Priority Packages)
- **3rd Priority Investigations** : Other Civil Work Packages (Non-priority Packages)
- **Non-priority Investigations**: PKG13 (O&M Package)

The structural plan including bridge plan may be modified from F/S in accordance with the results of several surveys and analyses, especially hydrological and inundation analyses (D.2.3). Therefore, the commencement of geotechnical and geological investigations shall be taken into account the maturity of the structure plan for avoiding re-investigations.

Work diagram of geotechnical and geological investigations is shown in Figure D.7, and tentative work quantities for geotechnical and geological investigations are shown in Table D.6, respectively.

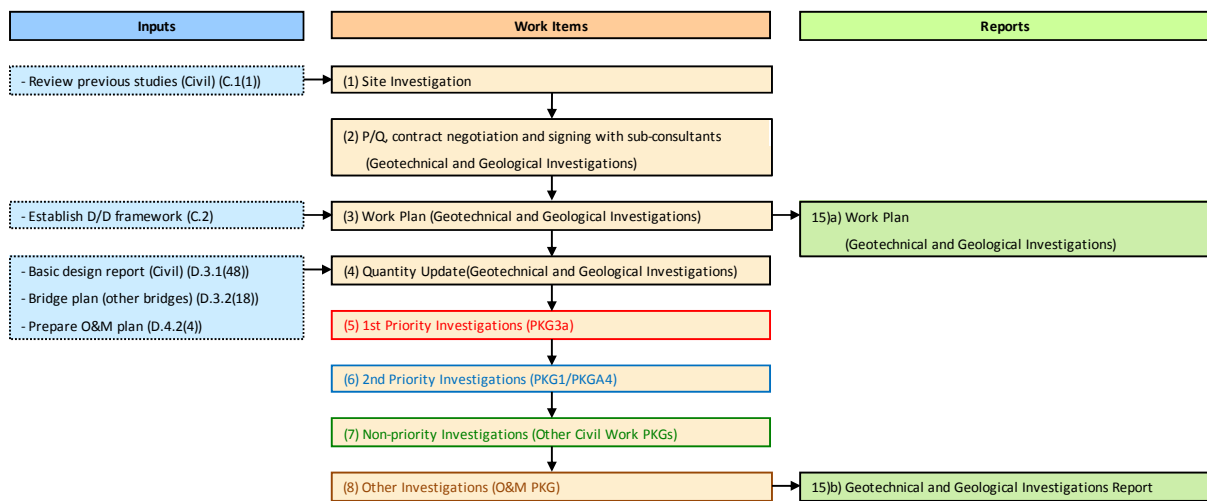


Figure D.7 Work Diagram of Geotechnical and Geological Investigations

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

Table D.6 Tentative Work Quantities for Geotechnical and Geological Investigations

No.	Item	Soil Class	Unit	Quantities	Remarks
A	Expressway				
1	Main Line (ML, Normal Embankment and Excavation Sections (NEE))				
1.1	Mechanical Boring	I-III (100%)	l.m.	336	
1.2	Sampling		nos.	192	
1.3	Undisturbed Sample Test		nos.	48	
1.4	Disturbed Sample Test		nos.	48	
2	Tunnel (TN)				
2.1	Mechanical Boring (Vertical)	I-III (50%), IV-VI (50%)	l.m.	210	
2.2	Mechanical Boring (Horizontal)	I-III (50%), IV-VI (50%)	l.m.	200	
2.3	Sampling		l.m.	410	
2.4	Standard Penetration Test (SPT)		points	105	
2.5	Disturbed Sample Test		nos.	62	
2.6	Unconfined Compression Test		nos.	31	
2.7	Permeability Test		nos.	8	
2.8	Profile Survey		l.m.	1,280	
2.9	Seismic Measurement		l.m.	1,280	
3	Bridge (BR)				
3.1	Mechanical Boring (On Shore)	I-III (50%), IV-VI (50%)	l.m.	9,369	
3.2	Mechanical Boring (Off Shore)	I-III (70%), IV-VI (30%)	l.m.	3,410	
3.3	Sampling		nos.	6,550	
3.4	Standard Penetration Test (SPT)		points	6,550	
3.5	Floating Equipment		nos.	32	
3.6	Undisturbed Sample Test		nos.	1,737	
3.7	Disturbed Sample Test		nos.	1,737	
3.8	Unconfined Compression Test		nos.	1,036	
3.9	Consolidation Test (Cv)		nos.	24	
4	Interchange (IC)				
4.1	Mechanical Boring	I-III (100%)	l.m.	210	
4.2	Sampling		nos.	112	
4.3	Standard Penetration Test (SPT)		points	112	
4.4	Undisturbed Sample Test		nos.	28	
4.5	Disturbed Sample Test		nos.	28	
5	Building (BL)				
5.1	Mechanical Boring	I-III (100%)	l.m.	300	
5.2	Sampling		nos.	160	
5.3	Standard Penetration Test (SPT)		points	144	
5.4	Vane Shear Test (VST)		nos.	8	
5.5	Undisturbed Sample Test		nos.	40	
5.6	Disturbed Sample Test		nos.	40	
5.7	Consolidation Test (Cv)		nos.	4	
5.8	Triaxial Compression Test (UU)		nos.	2	
5.9	Triaxial Compression Test (CU)		nos.	2	
6	Main Line (ML, Softground Section (SG))				
6.1	Mechanical Boring	I-III (100%)	l.m.	1,785	
6.2	Sampling		nos.	952	
6.3	Standard Penetration Test (SPT)		points	952	
6.4	Vane Shear Test (VST)		nos.	440	
6.5	Undisturbed Sample Test		nos.	238	
6.6	Disturbed Sample Test		nos.	238	
6.7	Consolidation Test (Cv)		nos.	238	
6.8	Triaxial Compression Test (UU)		nos.	119	
6.9	Triaxial Compression Test (CU)		nos.	119	
7	Main Line (ML, Deep Excavation Section (DE))				
7.1	Mechanical Boring	I-III (50%), IV-VI (50%)	l.m.	2,280	
7.2	Sampling		l.m.	2,280	
8	Main Line (ML, High-embankment Section (HE))				
8.1	Mechanical Boring	I-III (100%)	l.m.	465	
8.2	Sampling		nos.	248	
8.3	Undisturbed Sample Test		nos.	62	
8.4	Disturbed Sample Test		nos.	62	
9	Existing Road (ER)				
9.1	Belkenman Test		nos.	239	
B	Linking Road				
10	Main Line (ML, Normal Embankment and Excavation Sections (NEE))				
10.1	Mechanical Boring	I-III (100%)	l.m.	35	
10.2	Sampling		nos.	20	
10.3	Undisturbed Sample Test		nos.	5	
10.4	Disturbed Sample Test		nos.	5	
11	Bridge (BR)				
11.1	Mechanical Boring (On Shore)	I-III (50%), IV-VI (50%)	l.m.	150	
11.2	Mechanical Boring (Off Shore)	I-III (70%), IV-VI (30%)	l.m.		
11.3	Sampling		nos.	78	
11.4	Standard Penetration Test (SPT)		points	78	
11.5	Floating Equipment		nos.		
11.6	Vane Shear Test (VST)		nos.	20	
11.7	Undisturbed Sample Test		nos.	20	
11.8	Disturbed Sample Test		nos.	12	
11.9	Unconfined Compression Test		nos.		
12	Existing Road (ER)				
12.1	Belkenman Test		nos.	16	

Source: Estimated quantities by the Consultant (based on F/S-2010)

D.2.6 Conduct Material Source Survey

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.7.

Table D.7 TOR Requirements for Material Source Survey

No.	TOR Requirements	Check
1	- This task must be ensured to collect all data of locations of material sources which meet the requirements of the Project, are practical and feasible during construction. - Back filling materials (borrow pits) and sand for soft ground treatment:	
2	a. identify exploitable soil and sand quarries; b. work with local governments to gain agreement in writing and then, map out them on plan at scale of 1/50,000. c. Collect data related to capacity and quality of each quarry; d. take testing sample to identify necessary parameters of back filling materials and others for soft ground treatment.	
3	- Survey and evaluation of general situation, capacity and transportation length of the routes for exploitation and transportation to the construction site.	
4	- For borrow pits and quarry sites which are exploited or being exploited, collect data related to their capacity and quality, exploitability, and transporting conditions to the construction site. - For new borrow pits and quarry sites, carry out procedures for survey and testing necessary characteristics of each material.	

Source: TOR 3.3.2 (2).(iv)

(2) Methodology

The Consultant conducts material source survey by outsourcing to Vietnamese sub-consultant(s) at locations identified with the local PCs to confirm quality and volume of borrow, sand and rock materials for detailed engineering design and construction planning. The selection of sub-consultant(s) and work plan including survey specifications shall be approved by VEC/PMU85.

Work diagram of material source survey is shown in Figure D.8, and tentative work quantities for material source survey are shown in Table D.8, respectively.

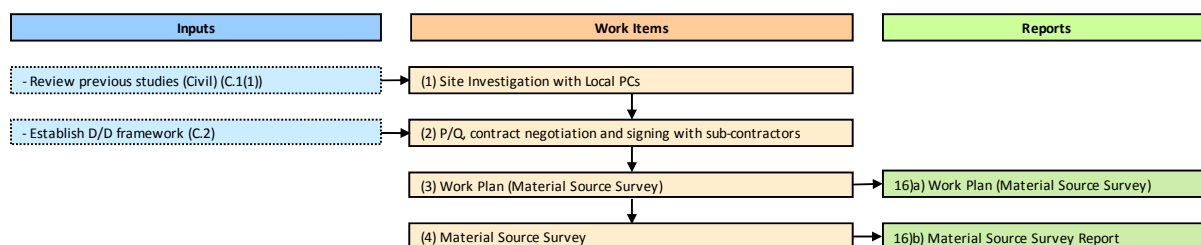


Figure D.8 Work Diagram of Material Source Survey

Table D.8 Tentative Work Quantities for Material Source Survey

No.	Item	Unit	Quantities	Remark
A	Sampling and Laboratory Test			
1	Borrow Material			1 location/20 km*140 km = 8 locations
1.1	Undisturbed Sample Test	nos.	24	3 samples/location*8 locations
1.2	Standard Compaction Test	nos.	24	3 samples/location*8 locations
1.3	CBR Test	nos.	24	3 samples/location*8 locations
2	Rock			
2.1	Rock Sample Test	nos.	15	3 samples/location*5 locations
3	Fine Sand			
3.1	Sand Sample Test	nos.	24	3 samples/location*8 locations
3.2	Standard Compaction Test	nos.	24	3 samples/location*8 locations
4	Coarse Sand			
4.1	Sand Sample Test	nos.	6	3 samples/location*2 locations

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

D.2.7 Conduct Relevant Facilities Survey

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.9.

Table D.9 TOR Requirements for Relevant Facility Survey

No.	TOR Requirements	Check
1	- Survey current situations of traffic works in the area to evaluate usage capacity and level that shall be upgraded to construct service roads for construction of the expressway.	
2	- Survey old bridges and culverts on the cross lines: - Identify location, survey profile, main cross-section, and elevation of components of existing works;	
3	- review construction materials; - evaluate loading capacity of the works; - evaluate fault degrees, suitability and utilizing capacity.	
4	- Survey current situations of irrigation works within study area.	
5	- Survey underground structures, public works: - optical cables, underground cables, pipeline, oil and petrol pipeline, etc.	
6	- Survey existing power supply in the route, and request for supplying capacity and starting points. - For transformer stations, request was made to identify their location, scale, capacity, specifications, and works which is supplied with power, etc. - Survey additional locations of transformer stations; - identify clearly locations of the station by coordinate and full description in maps including topographic, geologic and ground object data, and agreeing with the local governments in writing on these issues, etc.	
7	- Survey cultural buildings, temples, pagodas, and relevant legal religious buildings.	

Source: TOR 3.3.2 (2).(v)

(2) Methodology

The Consultant conducts the relevant facilities survey in the Project area to identify the obstacles and cultural properties for extracting the design controls, and evaluates the level of capacity of existing roads and structures for construction planning.

Work diagram of relevant facilities survey is shown in Figure D.9, and main contents of relevant facilities survey is shown in Table D.10, respectively.

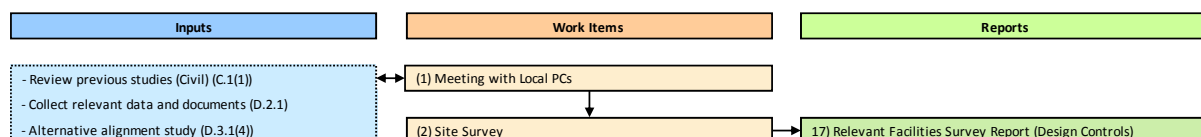


Figure D.9 Work Diagram of Relevant Facilities Survey

Table D.10 Main Contents of Relevant Facilities Survey

No.	Items	Contents
1	Design Controls	- Identify the location, capacity and specification of the obstacles in the Project area - Identify the cultural buildings, temples, pagodas and relevant legal religious buildings
2	Construction Planning	- Evaluate current traffic conditions of the existing roads in the Project area - Identify and evaluate loading capacity of bridges/culverts on potential construction roads

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

D.2.8 Conduct Additional Traffic Surveys

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.11.

Table D.11 TOR Requirements for Additional Traffic Surveys

No.	TOR Requirements	Check
1	- The Consultant shall review available traffic data on the existing road and conduct additional surveys as necessary to:	
2	- Collect data needed for the detailed design of foundations, pavements, interchanges, and toll stations, etc; and	
3	- Collect base line data that can be used for monitoring performance of the completed Project, where this data shall include the quantity and composition of traffic using the current national highway, total travel time and the variability of the travel time for, separately, cars and trucks, and the number and type of traffic accidents per annum along the current corridor.	
4	- This data will be collected separately for at least the segments Danang to Tam Ky and Tam Ky to Quang Ngai.	

Source: TOR 3.3.2 (2).(vi)

(2) Methodology

The Consultant reviews the traffic demand forecasting in F/S to establish the requirements for the engineering design from the traffic aspects. In addition, the Consultant reviews the traffic survey data above and other relevant studies around the Project area to collect the available baseline data for the performance indicators in the Project framework (A.1.4).

In case of the appropriate data is not identified, the Consultant conducts the additional traffic survey by outsourcing to the Vietnamese sub-consultant(s). The selection of sub-consultant(s) and work plan including survey specifications shall be approved by VEC/PMU85.

Work diagram of traffic forecasting review and baseline surveys is shown in Figure D.10, and tentative work quantities for baseline survey is shown in Table D.12, respectively.

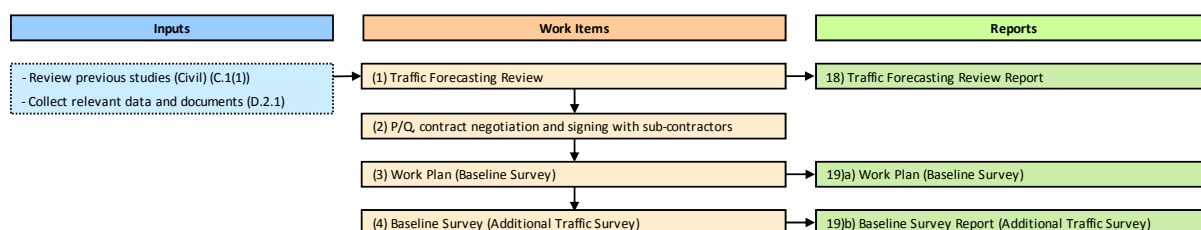


Figure D.10 Work Diagram of Traffic Forecasting Review and Baseline Surveys

Table D.12 Tentative Work Quantities for Baseline Survey

No.	Surveys	Contents	
1	Traffic Count	Day and Time	1 weekday and 1 holiday, 24 hours in each day
		Location	On the existing NH1A (2 segments Danang to Tam Ky and Tam Ky to Quang Ngai)
		Survey Item	Traffic volume and composition on the both directions
2	Travel Time	Day and Time	1 weekday and 1 holiday, peak traffic hour identified in the traffic count survey
		Location	On the existing NH1A (2 segments Danang to Tam Ky and Tam Ky to Quang Ngai)
		Survey Item	Travel time by each vehicle classification on the both directions
3	Traffic Accident	Period	Annual (the last 3 years)
		Location	On the existing NH1A (2 segments Danang to Tam Ky and Tam Ky to Quang Ngai)
		Survey Item	Nos. and type of traffic accident

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Vietnamese Transport Economist was mobilized on December 12, 2011.
- Started the preparation of the work plan.

D.2.9 Conduct Independent Land Valuation Survey

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.13.

Table D.13 TOR Requirements for Land Valuation Survey

No.	TOR Requirements	Check
1	- As part of the work on updating the Resettlement Action Plan (RAP) the consultant will engage as a sub-consultant a qualified Land Valuation Consultant (LVC).	
2	- The LVC must be licensed by the Ministry of Finance to undertake land valuation in Viet Nam and be independent of all project stakeholders.	
3	- As part of the updating work the LVC will undertake a survey to establish current market values for all types of land, by location and use, sufficient to confirm the budget under the updated RAP.	

Source: TOR 3.3.2 (2).(vii)

(2) Methodology

The Consultant conducts the independent land valuation survey by outsourcing to the qualified land valuation consultant who is licensed by MOF and independent of all Project stakeholders to confirm the current market prices of land by location and use in each commune in the Project area. The selection of sub-consultant and work plan including survey specifications shall be approved by VEC/PMU85.

Work diagram of independent land valuation survey is shown in Figure D.11, and potential land valuation consultants in the Project area is shown in Table D.14, respectively.

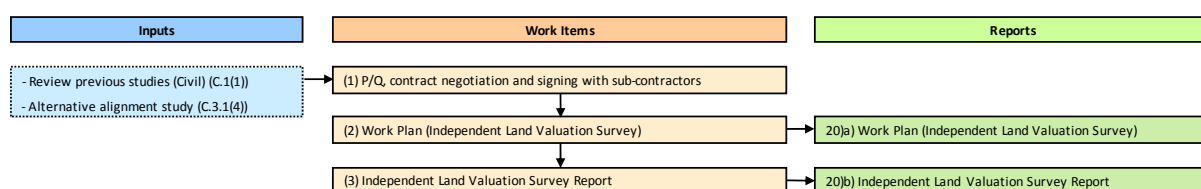


Figure D.11 Work Diagram of Independent Land Valuation Survey

Table D.14 Potential Land Valuation Consultants in the Project Area

No.	City/Province	Name of Consultant	Tel	Fax	e-mail
1	Danang	Danang Valuation & Financial Services Limited Company	0511-3887628	0511-3887532	divc@vnn.vn
2	Quang Nam	Quang Nam Financial & Price Consultancy Joint-stock Company	0510-3811657	---	mylangbd@yahoo.com.vn
3	Quang Ngai	Central Information & Valuation of Cost Joint-stock Company	055-3818348	---	---

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- During October 2011, several candidate companies visited the Consultant office.
- Since then, evaluation of those candidates has been processed.
- Finally, the Consultant selected Joint Venture of Danang – Quang Nam – Quang Ngai Independent Price Evaluation Company, and informed the selection result to PMU85 by our letter No. DQEDD-PMU85-92-11 dated December 23, 2011.

D.2.10 Conduct Environmental and Social Surveys

(1) TOR Requirements

Undertake surveys as necessary to update the EIA and EMP.

(2) Methodology

The Consultant conducts the site surveys for updating the existing EIA and EMP to confirm the environmental and social conditions in the Project area in accordance with the JICA Guidelines for

Environmental and Social Considerations and WB safeguard policies and, if necessary.

Work diagram of environmental and social surveys is shown in Figure D.12.

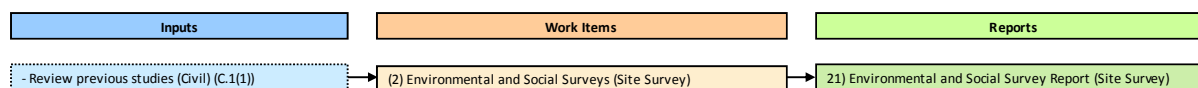


Figure D.12 Work Diagram of Environmental and Social Surveys

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Collected Decision of Ministry of natural Resources and Environment (MONRE) issued recently.
- Review EIA report.
- Study the expressway corridor for identification of the location where noise sensitive receptors are exists.

D.3 Civil Engineering Design

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

The Consultant divides the civil engineering design into the basic design (B/D) and detailed engineering design (D/D) stages to proceed the design works efficiently. The numbers of structure are huge; therefore, the Consultant prepares and utilizes the standard designs to assure the design quality.

Work items and demarcation between B/D and D/D stages is shown in Table D.10.

(a) Prepare Basic Design of Civil Structures

In the B/D stage, the Consultant establishes the fundamental conditions and obtains the approval from VEC/PMU85 and other relevant organizations to avoid the re-design in the D/D stage.

Main contents of B/D stage are summarized below:

- Establish design criteria and conditions;
- Define typical cross sections;
- Define thruway geometric design;
- Prepare general view of all thruway bridges;
- Prepare thruway culverts, tunnel and interchanges plan.

Work diagram of basic design of civil structures is shown in Figure D.13.

(b) Prepare Detailed Design of Civil Structures

In the D/D stage, the Consultant conducts the remaining plan and design works in accordance with the B/D and outsources all of bridges (excluding Ky Lam Bridge, 1st Priority Package) and interchanges design to Vietnamese sub-consultants who have abundant experiences and resources for minimize the personnel inputs and shorten the design period.

Work diagram of detailed design of civil structures is shown in Figure D.14, and main contents of road safety audit are shown in Table D.15, respectively.

Table D.15 Main Contents of the Road Safety Audit (PIARC Road Safety Manual 2004)

No.	Classification	Category			Indicators
1	All Roads	Horizontal alignment			Curve radius, speed differentials, surface conditions, overturning, super-elevation, road width, shoulders, roadside sight distance/forgiving road, passing in curve warning signs and devices, combination of features
2		Vertical alignment	Grade	Downhill	Generalities (stopping distance, brake temperature, compound grades, etc.), location of road sign, drainage capacity and structure, brake check area, arrester beds
				Uphill	Generalities (deceleration rate, speed reduction, etc.), climbing lanes, drainages
		Curves		Generalities (sight distance, etc.), passing (pavement marking), drainages	
3		Human factors (driver)			Strain, workload, perception, lane tracking, choice of speed, orientation, anticipation
4	Non-access Control Roads	Sight distance	At grade intersections		Stopping, maneuvering, passing sight and decision sight distances, sight triangles
			Two-way, two lane roads		Stopping, decision, passing and meeting sight distances
5		At grade intersections			Generalities (intersection type, access control, sight distance, distance between intersections, conflict points at intersections, etc.)

Note: Sight distance and at grade intersection are astride the plural categories in the table

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The basic design work has been progressed well and the following reports were submitted for the discussion:
- <List of report submitted>
- The centerline of the alignment is finalized on December 19, 2011.
- Based on this alignment, road plan drawings are being prepared for “commune meeting” with indication of all cross structures.
- Updated list of bridges is shown in Appendix 2.
- Updated list of culverts is shown in Appendix 3.
- Updated list of communes along the expressway is shown in Appendix 4. It is identified that there are 58 borders of communes passing through 39 communities.

Table D.15 Work Items and Demarcation between B/D and D/D Stages

Category	No.	Work Items	No.	Reports	Team In-charge	Facilities																							
						Expressway																		Linking Road					
						Main Line						Interchange						Crossing Road		Frontage Road		Main Line			Intersection				
						RD	TN	BR	CB	CP	BL ⁴⁾	RD	BR	CB	CP	BL ⁵⁾	RD	BR	RD	CP	RD	BR	CB	CP	RD	BR	CB	CP	RD
1 Design Criteria and Conditions	(1)	Design Criteria and Conditions (Civil 1)	22)a)	Design Criteria and Conditions (Civil 1)	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	(2)	Design Criteria and Conditions (Civil 2, Others)	24)a)	Design Criteria and Conditions (Civil 2, Others)	GTD/DRD/TFD/PVD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
3 Highway	(3)	Typical Cross Sections	22)b)	Typical Cross Sections	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	3.1 Alignment/ Geometric	(4)	Alternative Alignment Study	48)	Alternative Alignment Study Reports	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(5)	Geometric Design (Thruway, Horizontal)			CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(6)	Geometric Design (Thruway, Vertical)			CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(7)	Geometric Design (Others)	24)b)	Geometric Design (Others)	SED																							
	3.2 Interchange	(8)	Alternative Study (Location of My Son Interchange)	50)b)	Alternative Study Report (Location of My Son Interchange)	CDM																							
		(9)	Alternative Study (Interchange Type)	50)c)	Alternative Study Report (Interchange Type)	ICD																							
		(10)	Interchange Plan	22)d)	Interchange Plan	ICD																							
		(11)	Geometric Design (Interchange)			ICD																							
	3.3 Cross Structure	(12)	Cross Structure Plan	49)	Cross Structure Plan	CDM																							
	3.4 Frontage Road	(13)	Frontage Road Plan	22)e)	Frontage Road Plan	CDM																							
3.5 Culvert	(14)	Culvert Plan (Thruway)	22)f)	Culvert Plan (Thruway)	CDM																								
	(15)	Standard Design (Culvert Works)	24)c)	Standard Design (Culvert Works)	CDM																								
4 Bridge	4.1 Bridge Structure	(16)	Alternative Study (Major River Bridges)	50)a)	Alternative Study Reports (Major River Bridges)	MBD																							
		(17)	Bridge Plan (Thruway Bridges)	22)g)	Bridge Plan (Thruway Bridges)	CDM																							
		(18)	Bridge Plan (Other Bridges)	24)d)	Bridge Plan (Other Bridges)	CDM																							
		(19)	Standard Design (Bridge Works)	22)h)	Standard Design (Bridge Works)	CDM																							
		(20)	Structural Design (Bridge)			SED/MBD																							
	4.2 Temporary Facility	(21)	Bridge Temporary Facility Plan	24)e)	Bridge Temporary Facility Plan	MBD/TFD																							
		(22)	Standard Design (Bridge Temporary Facility Works)	24)f)	Standard Design (Bridge Temporary Facility Works)	MBD/TFD																							
	4.3 River Bed/ Bank Protection	(23)	Scoring Analysis	22)i)	Revetment/River Bed Protection Design	RRD																							
		(24)	Revetment/River Bed Protection Plan			RRD																							
		(25)	Standard Design (Revetment/River Bed Protection Works)	22)j)	Standard Design (Revetment/River Bed Protection Works)	RRD																							
5 Tunnel	(26)	Tunnel Portal Location Plan	22)k)	Tunnel Plan	TND																								
	(27)	Tunnel Cross Section			TND																								
	(28)	Tunnel Supporting Design			TND																								
6 Others	6.1 Revision (B/D)	(29)	Revision (B/D)	22)l)	Geometric Design (Thruway)	SED/MBD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	6.2 Road Accessory	(30)	Road Accessory Plan	24)g)	Road Accessory Plan	SED	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
		(31)	Standard Design (Road Accessory)	24)h)	Standard Design (Road Accessory)	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	6.3 Slope Protection	(32)	Slope Stability Analysis	24)i)	Slope Protection Design	GTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(33)	Slope Protection Plan			GTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(34)	Standard Design (Slope Protection Works)	24)j)	Standard Design (Slope Protection Works)	GTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	6.4 Retaining Wall	(35)	Retaining Wall Plan	24)k)	Retaining Wall Plan	SED	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(36)	Standard Design (Retaining Wall Works)	24)l)	Standard Design (Retaining Wall Works)	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	6.5 Softground Treatment	(37)	Consolidation/Stability Analyses	24)m)	Softground Treatment Design	GTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(38)	Softground Treatment Plan			GTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(39)	Standard Design (Softground Treatment Works)	24)n)	Standard Design (Softground Treatment Works)	GTD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	6.6 Pavement	(40)	Pavement Design	24)o)	Pavement Design	PVD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(41)	Standard Design (Pavement Works)	24)p)	Standard Design (Pavement Works)	PVD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	6.7 Drainage	(42)	Drainage Analysis	24)q)	Drainage Design	DRD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(43)	Drainage Plan			DRD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
		(44)	Standard Design (Drainage Works)	24)r)	Standard Design (Drainage Works)	DRD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	6.8 Drawings	(45)	Design Drawings (B/D)			SED/MBD	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾	● ⁷⁾					
(46)		Design Drawings (D/D)			SED/ICD/MBD/TND/GTD/DRD/TFD/PVD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
6.9 Quantity	(47)	Quantity Taking-off	26)	Quantity Reports (Civil)	SED/ICD/MBD/TND/GTD/DRD/TFD/PVD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
6.10 Report	(48)	Basic Design Reports (Civil)	23)	Basic Design Reports (Civil)	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	(49)	Detailed Engineering Design Reports (Civil)	25)	Detailed Engineering Design Reports (Civil)	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
6.11 Road Safety Audit	(50)	Road Safety Audit	27)	Road Safety Audit Report	CDM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					

Legend: ● (B/D), ● (D/D)
 Code: RD(Road), TN(Tunnel), BR(Bridge), RB(River Bridge), LRB(Large River Bridge), ORB(Other River Bridge), MRB(Major River Bridge), CB(Culvert Box), WT(Waterway), CP(Culvert Pipe), BL(Building), IRB(Interchange Rampway Bridge), FO(Flyover)
 Note: 1) LRB(L>100 m), ORB(L<100 m), Other LRB (100 m<L<300 m)
 2) 4 Bridges (Ky Lam Bridge (LRB08, KM017+662), Chiem Son Bridge (LRB09, KM020+185), Tra Bong Bridge (LRB19, KM109+320), Tra Khuc Bridge (LRB20, KM125+700))
 3) Stream Bridge (SB), Canal Bridge (CB), Viaduct (VD), Overpass (OP)
 4) Toll Barrier (TB) and Toll Plaza Office (TPO), Service Area (SA), Parking Area (PA), Traffic Management Center (TMC), Expressway Operation Office (EOO)
 5) Toll Gate (TG) and Toll Plaza Office (TPO)
 6) Civil Works Only
 7) Plan and Profile and General View (Bridge)

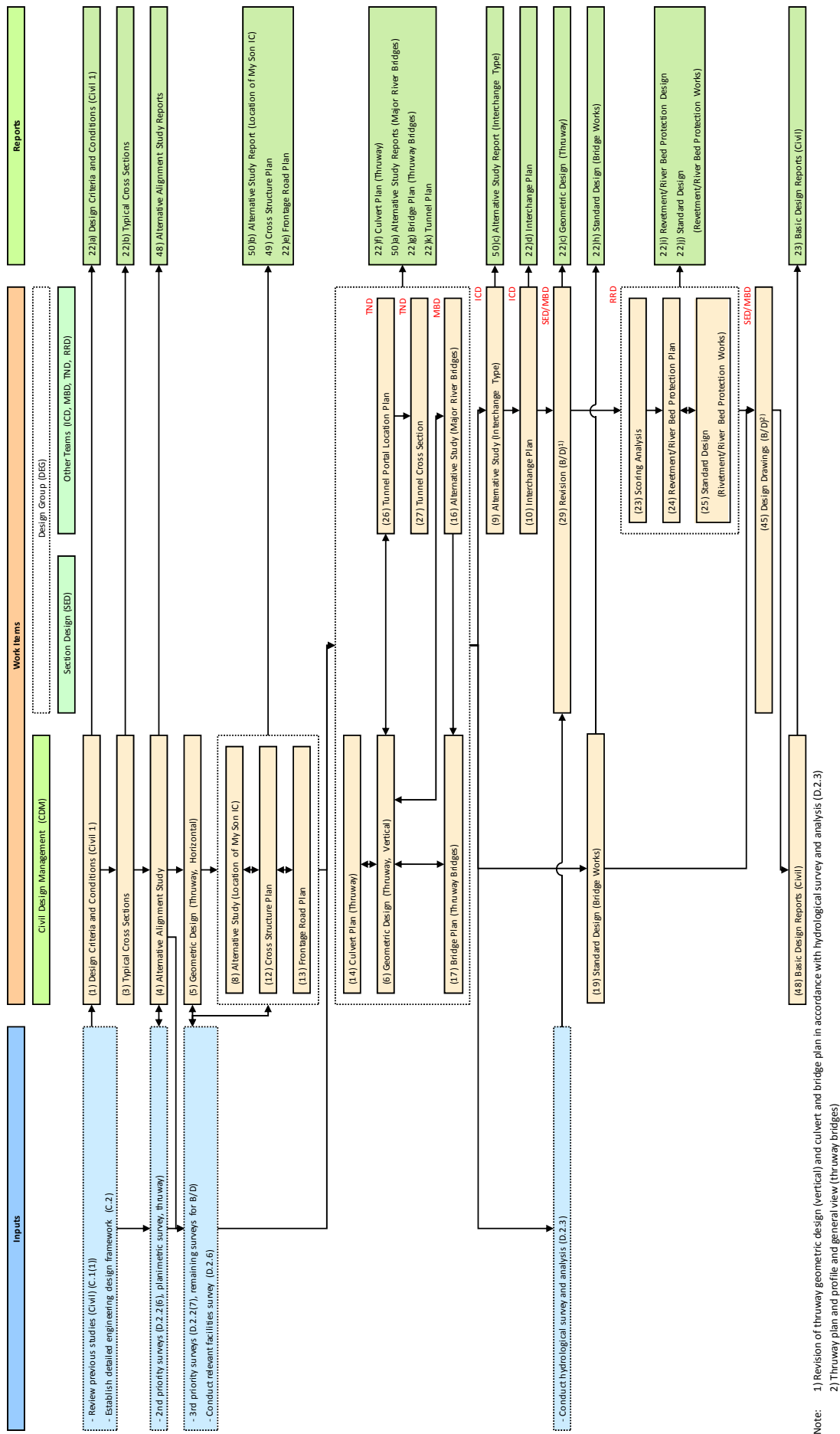


Figure D.13 Work Diagram of Basic Design of Civil Structures

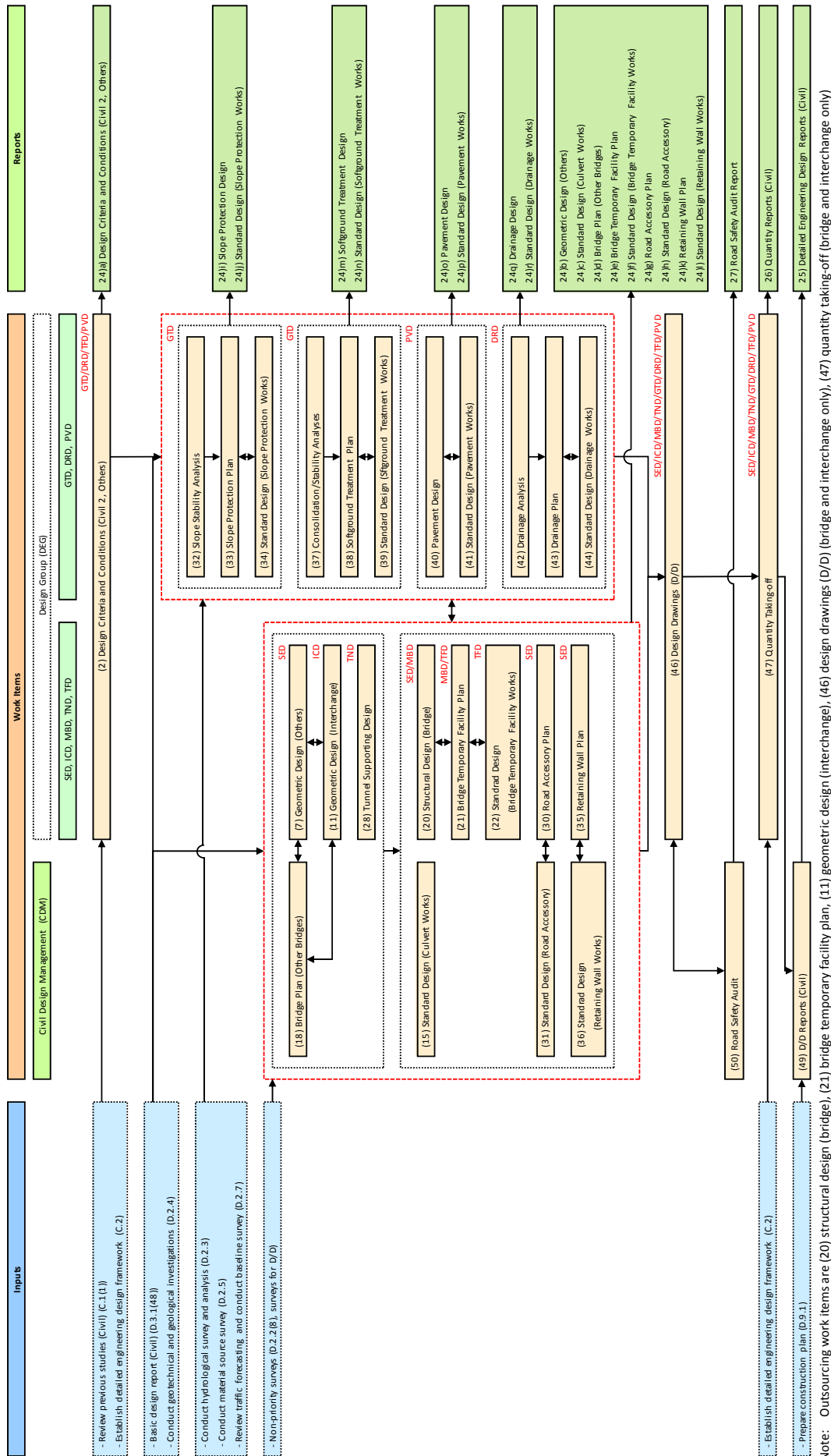


Figure D.14 Work Diagram of Detailed Design of Civil Structures

D.4 O&M Plan and Design

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

(a) Prepare Institutional and Administrative Arrangement Plan

The Consultant confirms the existing legal and regulatory framework for expressway O&M in Vietnam and studies the necessary institutional and administrative arrangement plan for O&M of the expressway. Based on the plan, the Consultant holds workshops with the relevant organizations and gains the consensus for work sequence, schedule and organizations in-charge of the arrangement works.

Work diagram of institutional and administrative arrangement plan is shown in Figure D.15, and main items for institutional and administrative arrangement plan are shown in Table D.16, respectively.

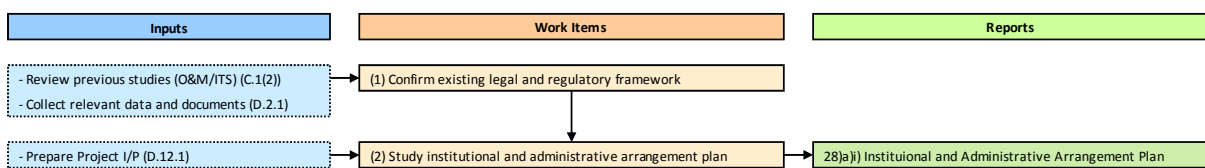


Figure D.15 Work Diagram of Institutional and Administrative Arrangement Plan

Table D.16 Main Items for Institutional and Administrative Arrangement Plan

No.	Items	Contents
1	Institutions	The necessary institutions shall be set up in order to clarify and delineate responsibilities among relevant organizations involved in O&M.
2	Standards	O&M works on expressways mainly consists of traffic operation, road maintenance and toll collection. The establishment of standards for each work is essential in the effective and efficient implementation of works.
3	Enforcement and Regulation	In order to properly implement expressway operation by the road administrator, administrative demarcation of responsibilities for traffic enforcement and regulation between the administrator and concerned regular authority shall be clarified.

(b) Prepare O&M Plan

The Consultant prepares the O&M plan for the Expressway in accordance with the existing legal and regulatory framework confirmed in D.4.1. As for the items which are not existed and scheduled in the institutional and administrative arrangement plan in D.4.1, the Consultant establishes the assumptions based on overseas practices.

Work diagram of O&M plan is shown in Figure D.16, and describes the methodology of work items subsequently.

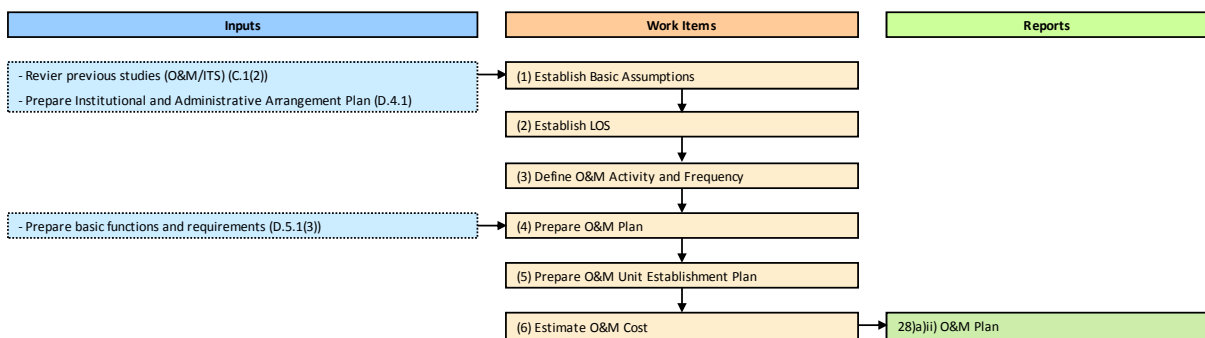


Figure D.16 Work Diagram of O&M Plan

(i) Establish Basic Assumptions

The Consultant establishes basic assumptions for preparing O&M plan in accordance with the existing legal and regulatory framework confirmed in D.4.1. As for the items which are not existed and scheduled in the institutional and administrative arrangement plan in D.4.1, the Consultant establishes the assumptions based on overseas practices.

(ii) Establish LOS

The Consultant establishes LOS by extracting the requirements in MOT Circular on Expressway O&M and utilizing overseas experiences for definition of O&M activity and frequency.

Possible performance indicators for LOS are shown in Table D.17.

Table D.17 Possible Performance Indicators for LOS

No.	Category	Indicators
1	Availability	Frequency of road closures, transaction time of traffic accidents, duration and work area of maintenance works
2	Mobility	Average covering speed, traffic density
3	Accessibility	Capacity of toll gates, transaction system and time of toll gates
4	Safety	Traffic safety facilities, lighting, enforcement of traffic regulation, traffic accident rate, visibility
5	Comfortability	Facilities and activity level of SAs/PAs
6	Emergency Response	Covering time of rescue cars arrival (ambulance and fire fighting cars)
7	Surface Conditions	Coarseness, roughness and pot holes of road surface
8	Traffic Information	Traffic congestion/delay, regulation and disaster
9	Environment Aspect	Noise, air pollution

(iii) Define O&M Activity and Frequency

The Consultant defines the O&M activity and frequency in case of regular, traffic regulation and emergency to satisfy LOS established in (2) above in accordance with MOT Circular on Expressway O&M or by utilizing the overseas experiences. The activity and frequency is taken into account stage-wised strengthening for ensuring LOS in the future traffic growth.

(iv) Prepare O&M Plan

The Consultant prepares the O&M plan based on (1) to (3) above. As for the item related to ITS, the Consultant utilizes ITS Standards prepared by JICA T/A to define the basic requirements and system. Based on this basic requirements and system, the Consultant prepares the functions and specifications for ITS facility and system configuration in D.5.1(3).

Main contents of O&M plan are shown in Table D.18.

Table D.18 Contents of O&M Plan

No.	Item	Contents
1	O&M Charter	Name, legal status, objectives, policies, responsibilities, targets, budgets, management, organization, staffing
2	Traffic Management	Traffic surveillance and control system, organization and staffing
3	Toll Collection	Location of toll plaza, numbers of toll barrier/gate, toll collection system, organization and staffing
4	SA/PA Services	Location of SAs/PAs, contents of the services, organization and staffing
5	Maintenance	Maintenance system (including road asset management), organization and staffing
6	Administration	Organization, personnel, reports and financial management system
7	O&M Buildings	Layout plan of toll plaza, O&M building and SAs/PAs
8	O&M Equipment	Procurement, management and maintenance plan of O&M equipment

(v) Prepare O&M Unit Establishment Plan

The Consultant prepares the O&M unit establishment plan including the training program in consideration of the required arrangements and enhancements extracted in (4) above.

(vi) Estimate O&M Cost

The Consultant estimates the O&M cost both of the Project implementation and operation stages based on (4) to (5) above. However, the cost in the Project implementation stage is used for the reference, and the detailed cost is estimated in D.10.1.

Based on (1) to (6) above, the Consultant compiles the O&M plan and holds workshops with VEC/PMU85 and relevant organizations.

(c) Prepare Basic Design of O&M Buildings

The Consultants prepares the basic design of O&M buildings based on the O&M plan in D.4.2. The design covers all of facilities in toll plaza, O&M buildings and SA/PA except communications and electrical facilities which are designed in D.5.2 and D.6.1, respectively.

Work diagram of basic design of O&M buildings is shown in Figure D.17.

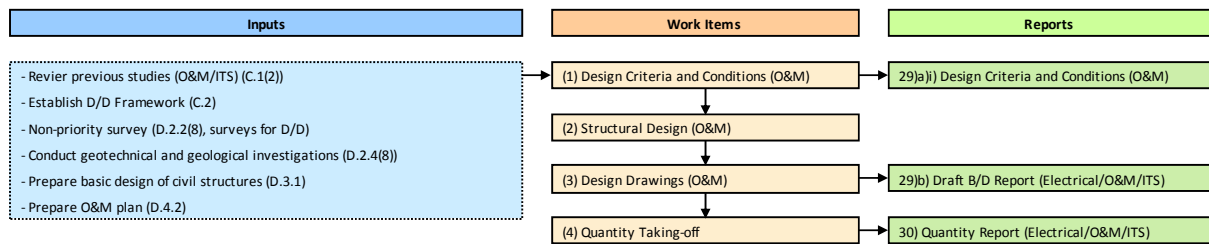


Figure D.17 Work Diagram of Basic Design of O&M Buildings

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

D.5 ITS Plan and Design

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

(a) Prepare ITS Plan

Based on the ITS basic requirements and system in D.4.2(4), the Consultant prepares the ITS development plan which is composed of planning concept, stage development, location of facilities, equipment procurement and implementation plans. Based on the development plan, the Consultant prepares the basic functions and specifications of ITS facility and system in accordance with ITS Standards prepared by JICA T/A.

Work diagram of ITS plan is shown in Figure D.18, and main contents of ITS basic requirements and system are shown in Table D.19, respectively.

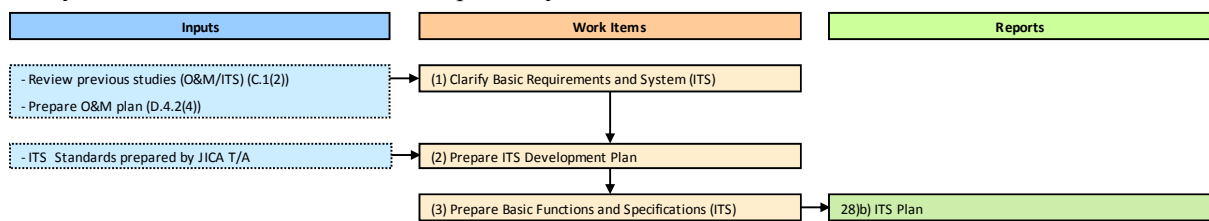


Figure D.18 Work Diagram of ITS Plan

Table D.19 Main Contents of ITS Basic Requirements and System

No.	Items	Contents
1	Organization	Organization of maintenance, traffic management and toll collection
2	Traffic Control	Operation system for traffic control including emergency site management
3	Road Traffic Information (Collection)	Item, contents, frequencies, information flow and operation plan to be collected by ITS (traffic volume, congestion and accident, over-weight, weathers, disaster, structural conditions)
4	Road Traffic Information (Provision)	Required road traffic information providing to road users and stakeholders
5	Toll Collection	Toll collection method and transaction flow

(b) Prepare Basic Design of ITS Facilities

The Consultant prepares the basic design of ITS facilities, communication system, toll collection facilities and system and obtains the approval from VEC/PNU85.

Work diagram of basic design of ITS facilities is shown in Figure D.19.

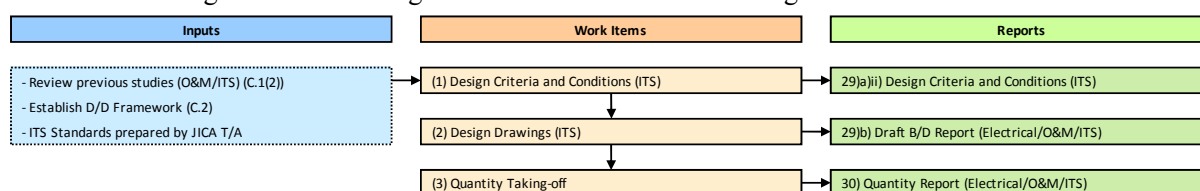


Figure D.19 Work Diagram of Basic Design of ITS Facilities

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

D.6 Electrical Facilities Design

(1) TOR Requirements

This scope is proposed by the Consultant as additional scope, not included in the Appendix 1: Terms of Reference (TOR).

(2) Methodology

(a) Prepare Detailed Engineering Design of Electrical Facilities

The Consultant prepares the detailed engineering design of electrical facilities in relation with the basic design of civil structures (D.3.1), O&M buildings (D.4.3) and ITS facilities (D.5.2). The works are included to coordinate and agree the power receiving plan with the power suppliers in the Project area.

Work diagram of detailed engineering design of electrical facilities is shown in Figure D.20, and electrical facilities plan in F/S is shown in Table D.20, respectively.

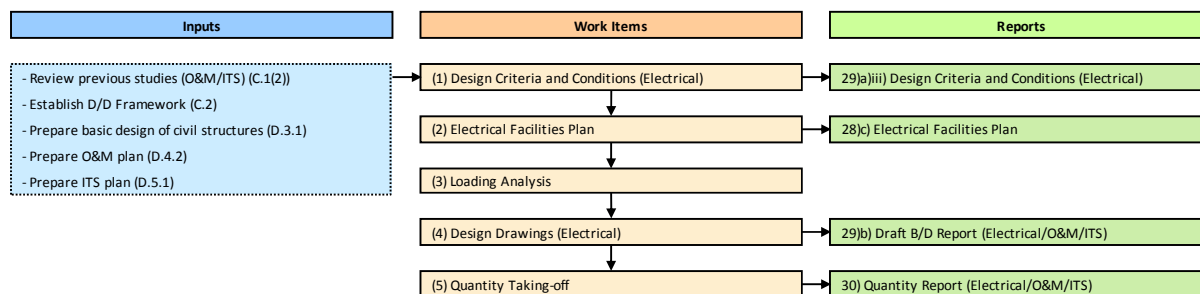


Figure D.20 Work Diagram of Electrical Facilities Design

Table D.20 Electrical Facilities Plan in F/S

No.	Items	Facilities
1	Power Supply	Power receiving points, receiving power voltages and capacities, and back-up power supply facilities
2	Road Lighting	Lighting source and output power, height, interval and location of lighting poles, and lighting calculation
3	Tunnel Ventilation and Safety	Reporting system, information system, fire-fighting facilities, and ventilation facilities, etc.

Source: Decision No. 2656/QD-BGTVT dated September 10, 2010

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

D.7 Public Utilities Relocation Plan

(1) TOR Requirements

This scope is proposed by the Consultant as additional scope, not included in the Appendix 1: Terms of Reference (TOR).

(2) Methodology

(a) Prepare Relocation Plan of Public Utilities

The Consultant confirms the public utilities which are necessary to relocate by the implementation of the Project based on the topographic survey (D.2.2), relevant facilities survey (D.2.6) and basic design of civil structures (D.3.1). The Consultant prepares and agrees the relocation plan and cost estimate in cooperation with the relevant agencies.

Work diagram of public utilities relocation plan is shown in Figure D.21, and probable public utilities to be relocated by the Project are shown in Table D.21, respectively.

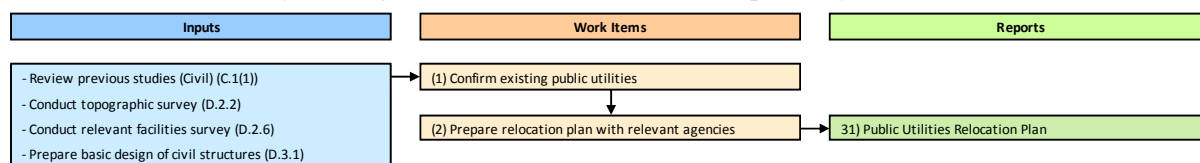


Figure D.21 Work Diagram of Public Utilities Relocation Plan

Table D.21 Probable Public Utilities to be relocated by the Project

No.	Public utilities	Owners
1	Electrical Line	Power Transmission Company No.2 (PTC2)
2	Telecommunication Line	Vietnam Posts and Telecommunications Group (VNPT) or Vietnam Military Electronic and Telecommunications Corporation (VIETTEL)
3	Water Supply Pipe	Water Supply Company in each City/Province
4	Sewerage Pipe	Transport Works Management Company or Drainage Company
5	Irrigation Canal	Department of Agriculture and Rural Development (DARD)

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Vietnamese Electrical Engineer started to visit electrical companies in order to discuss the method of the relocation works.
- Identified crossing of the electrical lines are more than 200 places as shown in Appendix 5.

D.8 Safeguards

D.8.1 Assist in Updating EIA and EMP

(1) TOR Requirements

Please refer to Appendix 1: Terms of Reference (TOR).

(2) Methodology

The Consultant assists PMU85 in updating EIA and EMP. The environmental assessment for the Project is required to satisfy not only the Vietnamese law/regulations but also JICA/WB safeguard policies.

The F/S alignment was finalized through the appraisal process to the draft F/S. However, the used map of existing EIA is too small scale (1/50,000) and not suitable for confirmation of appropriateness of the road alignment. Therefore, the Consultant reviews and confirms the appropriateness of the F/S alignment with the alternative study based on the adequate scale maps and design details.

In relation with the engineering design, the Consultant analyzes the environmental impacts by the Project and incorporates the environmental requirements to the engineering design. Based on above, the Consultant develops the mitigation measures and updates the existing EIA and EMP including the preparation of draft TOR for external monitoring by the third party during the construction stage.

Work diagram of updating EIA and EMP is shown in Figure D.22.

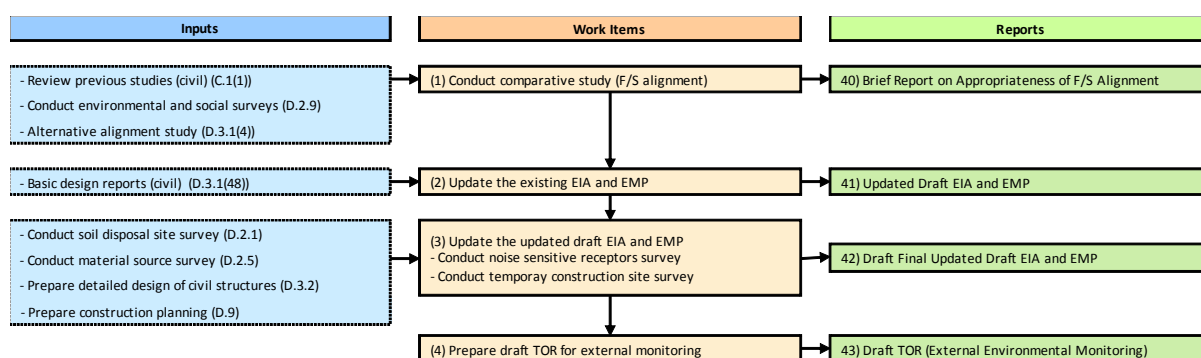


Figure D.22 Work Diagram of Updating EIA and EMP

(3) Work Progress to Date

Please refer to D.2.10 in the above.

D.8.2 Review and update Resettlement Action Plan (RAP)

(1) Scope of Works

Scope of the works is stipulated in Appendix 1: Terms of Reference (TOR) of the Contract and can be summarized as follows:

- To prepare an updated the Comprehensive Plan on Compensation, Supports and Resettlement (CPCSR) in accordance with World Bank guidelines based on the Resettlement Plan prepared by PMU85 and the detailed designs. World Bank guidelines have been applied in this project including the Bank's Resettlement Policy OP 4.12, includes safeguards to address and mitigate the economic, social, and environmental risks arising from involuntary resettlement; the OP 4.11 on Cultural Property and the OP 4.10 on Indigenous Peoples.
- To carry out a social, poverty and gender analysis (social impact assessment) in accordance with the Work Bank guidelines and Viet Nam requirements.
- The above objectives also cover the impact of the project on ethnic minorities and vulnerable groups, socio-economic profiles and poverty reduction effects of affected communities.

(2) Approach

The general flow of works is presented in Figure D.23.

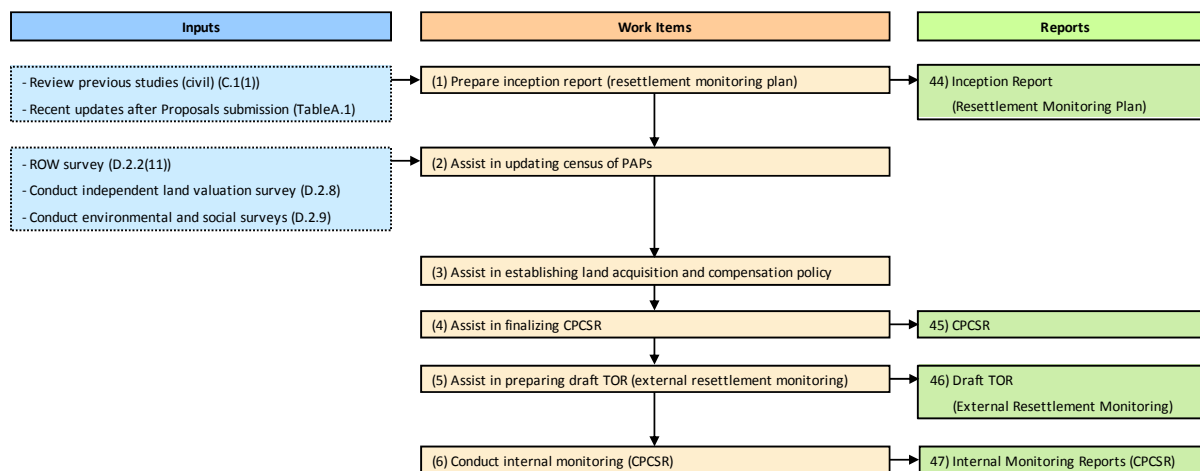


Figure D.23 Work Diagram of Preparing and Enforcing CPCR

(3) Major Tasks and Methods

Summary of the main tasks harmony with stakeholders and the methods will be used to fulfill the tasks are presented in Table D.22.

Proposed major methods will be applied are described below. These may be supplemented by Participatory Rapid Appraisal (PRA) methods.

(a) Semi-structured interviews

Interviews to key persons will be conducted using semi-structured interviews based on a checklist of information need to be collected. Key informants and stakeholders will be selected from local leaders, residents or persons with special knowledge or experience about resettlement activities and implementation. They are should be chairman of People committee of affected communes/wards, leader of women unions, heads of affected hamlets/quarters and head of DCC of project-affected districts.

For key informants and stakeholders, semi-structured interviews will be carried out with a view of obtaining background information that can not be obtained from reports or surveys. Some of this information relates to the conditions vulnerable groups such as old and disabled, ethnic minorities etc., and includes program for training as well as other specific measures and services that may be provided, as part of the development of the project.

Besides interviewing the key persons, project affected persons also will be interviewed randomly about compensation, relocation and the satisfaction of APs. Persons belonging to vulnerable group also will be taken into account of these interviews.

(b) Collecting secondary/available documents

For general background information on the affected communities, the reports and development plans of the respective districts and communes/wards will be acquired and studied. This also includes eventual specific information from line organizations at district and provincial levels, such as Department of Natural Resources (DONRE), Department of Agriculture and Rural development (DARD), Department of Industry (DOI), Department of Labor, Invalid and Social Affairs (DOLISA) etc.

The team members also will be responsible for collecting reports, data relating to resettlement issues from various sources such as job service offices, training centers, health stations, schools, pagodas, churches, etc.

Table D.21 Major Works, Methods and Supports Needed from Related Agencies

No	Works item	Purposes	Methods	Need support from PMU 85	Need support from DCSCCs	Need support from other
1	Review of existing reports and policies	Find out the GAPS between WB policies and Vietnamese policies	Gap analysis	Project documents as RAPs reports. EIA, EMP, maps	Social and Economic development Reports.	-
2	Collect secondary data and information	-Update progress of compensation, resettlement and livelihood activities -Finding livelihood options in project areas -Collect current decisions, legal documents relating to resettlement issues of the DQEP project.	Meeting with District Compensation Councils (DCCs) and PMU-85 Key informant interviews based on check lists of necessary information	-Arrange PMU-85's Coordinators to cooperate with RES team -Introduce RES Team to DPC and DCSCC and local authorities	DPCs of affected Communes provide Social economic reports including the resettlement situation and updated process land acquisition report.	PCs of affected districts provide Social economic reports including the resettlement situation and updated process land acquisition report.
3	Consultation meetings	-Public meeting: (i) Inform affected persons (APs) of the progress of project; progress of compensation and resettlement program, and project's policies; (ii) Affected persons express their request on resettlement and income restoration supports -Stakeholder meeting: To consult with participants on the	Focus group discussion: separate with consultation different topics and groups of APs	PMU 85 assist to get permits from local authorities. Cooperate with Consultants for introducing the DQEP project to PAs as well as Local authority	Official of DCSCCs take part the meetings and explain to affected people on regulations and policies related to compensation, supports and resettlement.	PC of affected districts provide the permits to conduct the meetings

No	Works item	Purposes	Methods	Need support from PMU 85	Need support from DCSCCs	Need support from other
		draft RP	Prepare meeting notes as well as comments from participants	invitation letters to participants.		
4	Replacement cost survey	Determine the replacement cost in the affected area to apply for the project	Involve with the external valuers	Leading meetings to approve survey's results	DCSCCs to discuss/comments on the survey's results	
5	Detailed measurement surveys-DMS (conducted by DCSCCs)	-Obtain full database of APs and their loss assets to prepare land compensation award papers. -Assess incomes, identify productive activities, target groups and plan for income restoration -evaluation relocation options and social development program for vulnerable groups	Supervising DMS Conduct supplement interview household Questionnaire	Supervisor to the DMS process and Data. Support to RES team receive database of APs.	DCSCCs to provide the full database of APs and their loss assets as soon as possible.	DD consultants to provide detail maps of ROW and underpass, overpass, interchanges

No	Works item	Purposes	Methods	Need support from PMU 85	Need support from DCSCCs	Need support from other
6	Supplement social survey	<p>-Identify and update the economic and social conditions of affected persons, disaggregated by gender, ethnicity, and type of impact (i.e. loss of residential land and house, loss of agricultural land, loss of income from business or employment, etc.)</p> <p>-conduct quick evaluation to APs groups which are not consider in the list of APs comment by DPC, or PPC.</p> <p>-Identify income restoration options and severely affected groups</p>	<p>-Collect annual social economic reports of Commune People Committees</p> <p>-Interview using questionnaire</p> <p>-Observations</p>	PMU 85 assist to get permits from local authorities	DCSCCs to provide the full list of APs . DPC of affected Commune to provide the permits RES team to conduct the surveys as necessary.	PC of affected districts to provide the permits to conduct the surveys
7	Resettlement site survey	Carry out feasibility study of the final sites identified; confirm available resources and facilities and identify requirements to improve replacement sites.	<p>Meeting with relating agencies, design and construction companies.</p> <p>Interview key informants based on a check list</p> <p>Observations</p> <p>Desk study</p>	PMU 85 assist to get permits from local authorities	DCCs to provide information of resettlement sites, including maps	PC of host districts to provide the permits to conduct the surveys
8	Prepare the draft	Integrating and analyzing data,		Provide advices on how to narrow	Provide solutions on how to narrow the	

No	Works item	Purposes	Methods	Need support from PMU 85	Need support from DCSCCs	Need support from other
	updated resettlement plans	information, results of field studies to prepare the draft updated RP, including a livelihood restoration program		the gaps with WB's requirements	gaps with WB's requirements	
9	Finalize the Updated RP	To complete the Updated Resettlement plan according to suggestions recorded at the stakeholder meeting	Desk study	PMU 85: to provide consultations on how to deal with WB's requirements		

(c) Structured direct observations

Another PRA tool will be used is a structured direct observation. Field observations on status of resettlement implementation, plus individual or group interviews for cross-checking purposes will be conducted every time the team going to the field. In-depth case studies of APs and host populations from various social classes will be carried out to assess impact of resettlement.

(d) Consultation meetings

The team will assist the affected districts in organizing the public consultation meetings. The public consultation meetings shall be organized when the draft updated RP has been finished. The main technique to be used in the consultation meetings is focus group discussion. Specific topics such as land compensation payments, services at resettlement sites, income restoration, and gender issues will be discussed in open-ended group sessions. These group will be divided according to their categories, which will be revealed thank to social survey.

(e) Stakeholder Meetings:

Stakeholder meeting will be held with provincial, district and commune leaders and representatives of their key departments.

(f) Survey using questionnaire

The DMS is carried out by DCCs, acting on the request of the project management in order to identify extent and effects of land loss, assess entitlements and to prepare land compensation award papers. It is based on project planning documents, land-use maps and land records. The DMS only includes persons with title for compensation.

Besides, resettlement consultants conduct a supplement survey for severely affected HHs and 126 HHs identified recently as affected HHs. This survey use household questionnaire that covers all APs irrespective of entitlement or ownership. It provides a complete inventory of all APs and their assets. It will be used to assess incomes, identify productive activities, and plan for income restoration, to develop relocation options and social preparation phase for vulnerable groups. The survey questionnaires will be briefed fully on the requirements of the survey and policy needs, including eligibility and entitlement categories, if they have already been defined prior to the survey. The core team for the survey will be interdisciplinary, comprising a range of skills (for example, ecological, legal, economic, socio-cultural, environmental, land use, planning, regional and settlement).

(4) Resettlement Team and Staff Assignments**(a) Responsibility Assignment**

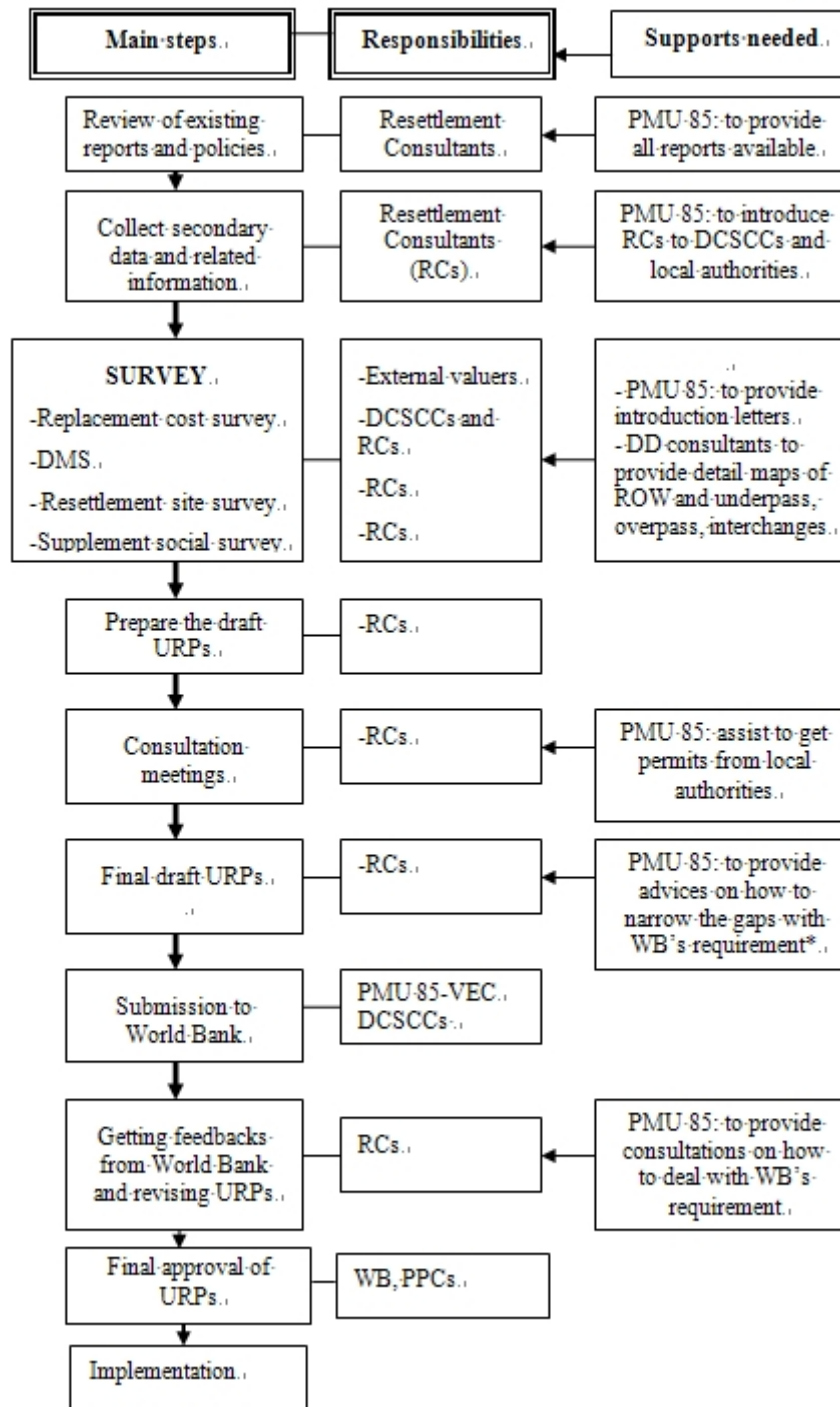
Resettlement consultants (RCs) team composition and tasks assigned are presented in Table D.22

Table D.22 Responsibility Assignment in Resettlement Team

No.	Name	Position	Task assigned
1	Vu Ngoc Long, PhD	International Resettlement Specialist	<ul style="list-style-type: none"> ▪ Responsible for overall resettlement activities and reporting works. ▪ To build plan and coordinate all activities of the project in order to complete the planned tasks successfully. ▪ To ensure the progress of the project, evaluate quality of resettlement activities. ▪ To prepare the draft URP and finalize it after getting feedbacks
2	Nguyen Manh Ha, Msc	Senior Resettlement specialist	<ul style="list-style-type: none"> ▪ Detailed Measurement Survey ▪ Replacement cost survey (with external valuers) ▪ Income restoration program ▪ Review and update policies, grievance mechanism, institutional arrangements and other sections of the URP ▪ Conduct consultation workshop
3	Lam Dinh Uy	Social and resettlement specialist	<ul style="list-style-type: none"> ▪ Collect secondary data and information ▪ Detailed Measurement Survey ▪ Review the SES baseline, analysis and carry out supplementary work ▪ Review and finalize the relocation strategy, including the Resettlement site survey ▪ Conduct consultation workshop
4	Tran Van Binh, PhD	Cultural and Archaeological specialist	<ul style="list-style-type: none"> ▪ Review the impacts on sites having archaeological, paleontological, historical, religious and unique natural values. Propose the mitigation measures to avoid the elimination ▪ Review the impacts on indigenous peoples, and to prepare an Indigenous Peoples Plan that will ensure these people to receive social and economic benefits that are culturally appropriate and gender and "inter-generationally" inclusive.

(b) Working Steps and Implementation Arrangement

The working steps and the implementation arrangement is shown in Figure D.24



* Possible issues are: (i) Differences between replacement cost and PPC's cost; (ii) For the priority package, project has to make compensation payment before WB's approvals to ensure the progress of civil construction works; (iii) Livelihood measures for severely affected households.

Figure D.24 Working Steps and Implementation Arrangement

(5) Division of Updated Resettlement Plan (URPs) Reports

To ensure the project's progress, Updated RPs will be prepared on district basic because all resettlement and land acquisition activities are conducted at district level by the District Compensation Councils. Therefore, all data and information (especially the DMS data) will be collected district by district. One URP will cover one or more district and therefore cover several packages. For the priority package, it

should be included in a URP which covers one district only. Division of URPs is proposed as shown in Table D.23

Table D.23 Division of Updated Resettlement Plan (URPs) Reports

Locality	Contract Packaging			District and commune	Remarks	Updated RP
	No.	Section	Length (m)			
Danang	PKG1	KM000+000 - KM008+000	8,000	Hoa Nhon, Hoa Phong, Hoa Tien Comm (Hoa Vang Dist)	Unchanged	URP 1
Quang Nam	PKG2	KM008+000 - KM016+880	8,880	Dien Tien, Dien Tho Comm. (Dien Ban Dist.)	Km17+00 is on the approach road of Ky Lam bridge	URP 2 (Dien Ban District)
	PKG3A	KM016+880 - Km18+100	1,220	Dien Tho, Dien Quang Comm.(Dien Ban Dist.)	Package of Ky Lam bridge	
	PKG3B	KM018+100 - KM021+500	3,400	Dien Quang, Duy Trinh Comm. (Duy Xuyen Dist.)	To avoid large steep at Km22+00	URP 3 (Duy Xuyen, Que Son districts)
	PKG4	KM021+500 - KM032+600	11,100	Duy Trinh, Duy Son, Duy Trung Comm.(Duy Xuyen Dist.); Que Xuan Comm. (Que Son Dist.)	To avoid large steep and deep excavation at Km32+00	
	PKG5	KM032+600 - KM042+000	9,400	Que Xuan, Phu Tho Comm. (Que Son Dist.); Binh Quy Comm. (Thang Binh Dist.)	Unchanged	
	PKG6	KM042+000 - KM052+000	10,000	Binh Quy, Binh Chanh, Binh Que Comm. (Thang Binh Dist.)	Unchanged	
	PKG7	KM052+000 - KM065+000	13,000	Binh Que Comm. (Thang Binh Dist.); Tam Thanh, Tam Phuoc, Tam Dan, Tam Thai Comm. (Phu Ninh Dist.)	Unchanged	URP 4 (Thang Binh, Phu Ninh and Nui Thanh Districts)
	PKG A1	KM065+000 - KM081+150	16,150	Tam Thai, Tam Dai, (Phu Ninh Dist); Tam Ngoc (Tam Ky City) Tam Xuan, Tam Anh Comm. (Nui Thanh Dist.)	Km81+500 is at the location of overpass culvert and nearby the approach road of a bridge L=55m	
	PKG A2	KM081+150 - KM099+500	18,350	Tam Anh, Tam My, Tam Nghia Comm. (Nui Thanh Dist.)	Station KM099+500 is the boundary between QN-QNg	
	Quang Ngai	PKG A3	KM099+500 - KM110+100	10,600	Binh Nguyen, Binh Trung, Binh Long Comm. (Binh Son Dist.)	To avoid deep excavation at Km111+00 and high

Locality	Contract Packaging			District and commune	Remarks	Updated RP
	No.	Section	Length (m)			
					embankment nearby	URP 6 (Son Tinh, Tu Nghia and Quang Ngai City)
	PKG A4	KM110+100 - KM124+700	14,600	Binh Long Comm. (Binh Son Dist); Tinh Tho, Tinh Ha Comm. (Son Tinh Dist.)	Km124+500 is on the approach road of Tra Khuc bridge	
	PKG A5	KM124+700 - KM131+150	6,450	Tinh Ha Comm. (Son Tinh Dist.); Nghia Ky, Nghia Dien Comm. (Tu Nghia Dist.); Quang Phu Ward (Quang Ngai City)		

(6) Work Schedule

(a) Overall

Based on the division of URPs above, the overall work schedule of the update resettlement plan is proposed as shown in D.25.

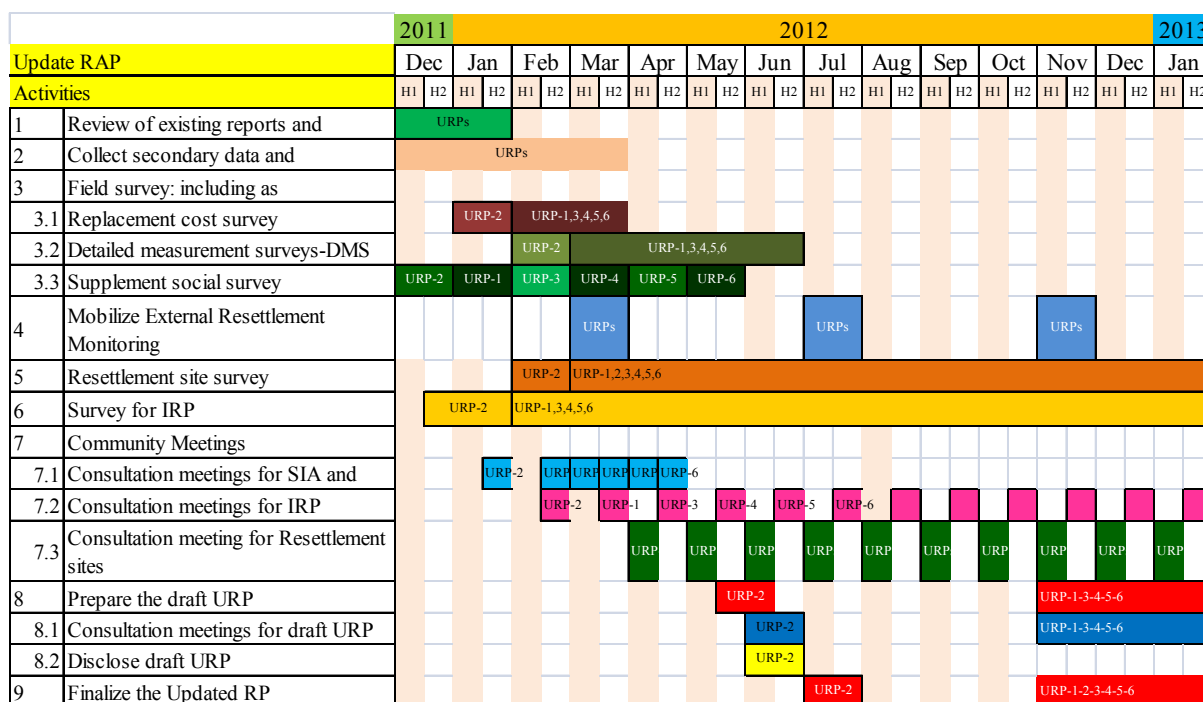


Figure D.25 Overall Work Schedule for Update Resettlement Plan

(b) Priority Section

The URP 2 covering Dien Ban district, Quang Nam province, include the priority package PKG3A, will be finished in the end of July 2012. This will give sufficient time to implement the URP, ensure that cleared land will be available for commencing the construction of the package 3A in September 2012.

The detailed work schedule of the URP 2 is shown in Table D.24.

Table D.24 Detail Work Schedule for Updated RP No 02 – Dien Ban district, Quang Nam Province.

No.	Activities	Person in charge	Proposed timing		PMU 85 supports
			Start	Finish	
1	Review of existing reports and policies Detail working plan.	Long, Ha, Uy, Binh	1/12/2011	30/12/2011	Project documents
2	Collect secondary data and updated Social economic situation of PAPs in 03 communes, <u>Dien Ban district , Quang Nam pro.</u>	Long, Ha, Binh, Uy	06/12/2011	15/1/2012	-Arrangement meeting with DPC, DCSCC and introduce RES Team. - Introduction Letter to Local authority and Departments -Indicate coordinator-PMU85.
2.1	Meeting with relevant stakeholders, DARD, DONRE, Provincial Departments, NGOs. PRC,	Long, Uy			
2.2	Meeting with local authority: CPC	Binh, Uy, Ha			
2.3	Meeting with MASS Organization	Binh, Uy			
3	Detailed measurement surveys (DMS) (1059 HH)	Ha, Binh	05/2/2012	30/3/2012	Prepare contract with DCSCCs to provide the full database of APs and their loss assets.
3.1	- Dien Tien commune (131HH)				
3.2	- Dien Tho commune (887HH)				
3.3	- Dien Quang Commune (40HH)?				
4	Replacement cost survey	Long, Uy	15/12/2011	05/2/2012	Comment and approve the External Land Valuers
	Selection the external land valuers Company and Prepare the contracts		12/12/2011		
5	Supplement social survey				Introduce RES Team to DCP, CPC, for cooperation working in the field.
5.1	Study on updated the situation of project sites	Ha, Binh	06/12/2011	30/12/2011	
5.2	The second detail Supplement Social Survey for <u>126</u> HH in Dien Quang commune and other Vulnerable groups.	Uy	06/12/2011	30/12/2011	
6	Resettlement site survey: <u>04 sites</u>	Long, Ha, Uy, Binh	01/3/2012	30/3/3012	-Introduce RES Team to DCSCCs, to Provincial Resettlement Committee.
6.1	- Thai Son site , Dien Tien commune				
6.2	- Dong Hoa site , Dien tho Commune				
6.4	- Phong thu 01, Dien tho, Dien Quang commune				
7	Survey for Income Restoration Programme (IRP)	Binh	06/12/2011	06/2/2012	-Introduce RES Team to MASS organizations, CPC, DCSCCs, and departments.
7.1	- Dien Tien commune				
7.2	- Dien Tho commune				
7.3	- Dien Quang Commune				
8	Community Meetings	Long			Co-Chair the meeting together DPC, CPC. Coordinate with EIA consultant to present project design and EIA reports as well
8.1	Consultation meetings for SIA and EIA	Long, Uy , Ha	02/1/2012	14/1/2012	
8.1.1	Dien Tien commune		09/1/2012		
8.1.2	Dien Tho commune		10/1/2012		
8.1.3	Dien Quang Commune		11/1/2012		

No.	Activities	Person in charge	Proposed timing		PMU 85 supports
			Start	Finish	
					EMP.
8.2	Consultation meetings for IRP	Long, Binh	01/3/2012	15/3/2012	Co-Chair the meeting together CPC.
8.2.1	<i>Dien Tien commune</i>		8/3/2012		
8.2.2	<i>Dien Tho commune</i>		9/3/2012		
8.2.3	<i>Dien Quang Commune</i>		10/3/2012		
8.3	Consultation meeting for Resettlement sites	Long, Ha, Uy	15/4/2012	30/4/2012	Co-Chair the meeting together DPC, CPC. Coordinate with DCSCC to present resettlement sites as well as moving planning.
8.3.1	- <i>Thai Son site , Dien Tien commune</i>		20/4/2012		
8.3.2	- <i>Dong Hoa site , Dien tho Commune</i>		21/4/2012		
8.3.3	- <i>Ky Lam site , Dien tho commune</i>		22/4/2012		
8.3.4	- <i>Phong thu 01, Dien tho, Dien Quang commune</i>		23/4/2012		
9	Prepare the draft URP 02 – Dien Ban district	Long , Uy	01/5/2012	30/5/2012	
9.1	Consultation meeting for draft URPs	Long, Uy, Ha, Binh	15/5/2012		Co-Chair the meeting together DPC, CPC.
9.2	Discloser URPs	Long, Uy	20/5/2012		
10	Finalize the final draft Updated RP	Long, Uy	30/6/2012		

(7) Land Acquisition Impact as of December 2011

As of December 2011, land acquisition impact is estimated as shown in Table D.25.

Table D.25 Land Acquisition Impact as of December 2011

Items	Unit	Danang	Quang Nam	Quang Ngai	Total
PAPs	HH	424	4,486	1,896	6,898
Affected Districts		1	7	4	12
Affected Communes		3	24	11	38
Resident land	HH	62	878	648	1,588
	m2	38,498	347,138	340,749	726,385
Agricultural land	HH	295	2473	1,369	4,137
	m2	370,374	2,686,623	1,281,653	4,338,650
Public land	m2	88,067	1,923,858	908,021	2,919,946
Forest land	m2	9,075	1,700,726	128,415	1,838,216
Houses	HH	59	763	589	1,411
	m2	?	37,594	26,059	63,653?
Resettle	HH	85	771	430	1,286
Affected Gov. offices			2	2	4

(8) Work Progress to Date

The Consultant submitted the work plan of updating resettlement plan, and it was approved by PMU85. Accordingly, the Consultant is preparing the first consultation meeting in Dien Ban District in Quang Nam Province.

D.9 Construction Planning

D.9.1 Prepare Construction Plan

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.26.

Table D.26 TOR Requirements for Construction Method and Schedule

No.	TOR Requirements	Check
1	- The Consultant shall carry out the study of construction execution and propose the most suitable and practical construction method and schedule of the Project.	

Source: TOR 3.3.7.

(2) Methodology

The Consultant prepares the construction methods, schedule, temporary facilities and procurement plan of labors, materials and construction machines to estimate the proper Project cost. Especially, the volume of borrow materials are huge; therefore, the Consultant prepares the mass curve to estimate the proper hauling cost.

Work diagram of construction planning is shown in Figure D.26, and image of construction scheduling and mass curve is shown in Figure D.27, respectively.

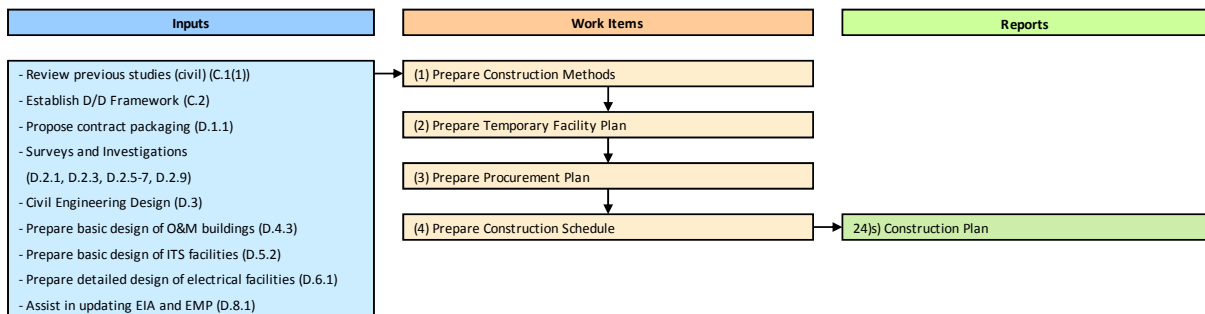
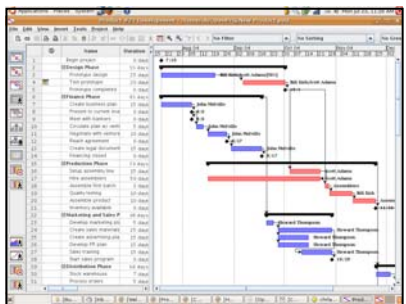
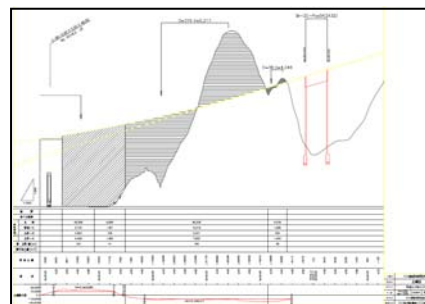


Figure D.26 Image of Construction Scheduling and Mass Curve



Construction Scheduling (MS Project)



Mass Curve

Figure D.27 Image of Construction Scheduling and Mass Curve

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- Temporary construction roads were identified for whole section.
- Necessary topographic survey areas are identified.
- Rough estimate of the construction cost was carried out.

D.10 Project Cost Estimate

D.10.1 Estimate Project Cost

(1) TOR Requirements

Requirements in the TOR is summarized as shown in Table D.27.

Table D.27 TOR Requirements for Cost Estimate

No.	TOR Requirements	Check
1	- The Consultant shall prepare the detailed cost estimate for the construction of the Project, including:	
2	a. Bills of Quantities for the construction works of every contract package and the whole project.	
	b. The cost estimate for every contract package based on a detailed unit price analysis.	
	c. Prepare the total cost estimate for every contract package and the whole project based on the Bills of Quantities and taking account of project management and other costs, and showing a breakdown of foreign and local currency portions.	
	d. Prepare annual financing schedules for every contract package and the whole project based on the construction schedule and showing total costs and a breakdown of foreign and local currently portions.	

Source: TOR 3.3.8

(2) Methodology

The Consultant estimates the Project cost and annual fund requirements by contract packages in relation with the construction plan (D.9.1). The cost estimate conditions are severely affected to the outputs; therefore, the Consultant proposes those conditions in advance and obtains the approval from VEC/PMU85 and other relevant organizations.

Work diagram of Project cost estimate is shown in Figure D.28, and main contents of cost estimate conditions are shown in Table D.28, respectively.

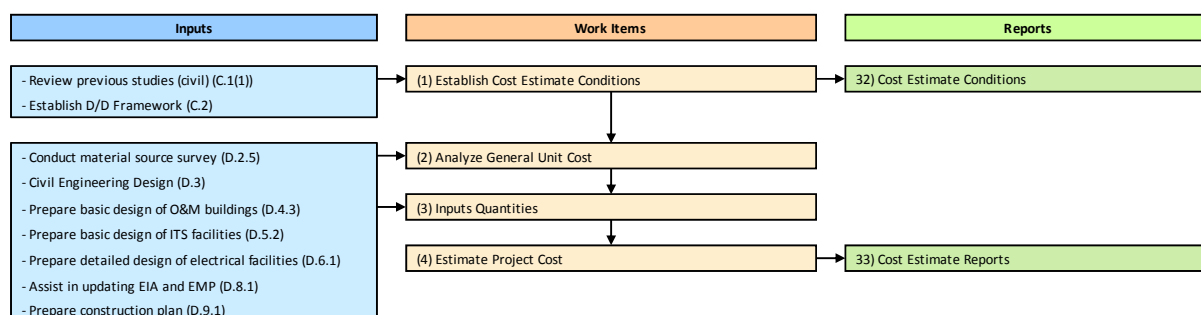


Figure D.28 Work Diagram of Project Cost Estimate

Table D.28 Main Contents of Cost Estimate Conditions

No.	Item	Contents
1	Time of Cost Estimate	Time applied in the cost estimate (quarter)
2	Currency	Foreign currency applied in the cost estimate
3	Exchange Rate	Exchange rate for the foreign currency applied in the cost estimate
4	Classification Condition of Currency	Classification conditions of foreign and local currencies applied in the cost estimate
5	Tax Exemption	Items of the tax exemption applied in the cost estimate
6	Cost Estimate Standards	Cost estimate standards applied in the cost estimate (productivity, and unit cost of materials, labors, construction machine operation and hauling)
7	Price Fluctuation Rate	Price fluctuation rate of the foreign and local currencies applied in the cost estimate
8	Physical Contingency Rate	Physical contingency rate applied in the cost estimate

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant reviewed the cost estimate in the F/S.
- The Consultant proposed revision of procurement plan as shown in Table A.11.

D.11 Procurement Documents

D.11.1 Prepare Procurement Documents

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.29.

Table D.29 TOR Requirements for Preparation of Procurement Documents

No.	TOR Requirements	Check
1	<ul style="list-style-type: none"> - For sections of the Project to be funded with assistance from the World Bank, the Consultant shall prepare procurement documents in accordance with the World Bank's Procurement Guidelines, Standard Pre-Qualification Documents and Standard Bidding Documents for Procurement of Works. - For sections to be funded with assistance from the Government of Japan, the documents will be prepared in accordance with the most recent version of the Handbook for Procurement under ODA Loans. - These standard documents will be provided to the Consultant. 	
	<ul style="list-style-type: none"> - The procurement documents to be prepared by the Consultant will include those needed for pre-qualification, bidding and contracting each contract package. - The documents shall be prepared and completed in a timely manner so that prequalification of packages for which design has been completed and approvals gained can be undertaken in parallel with detailed design for other packages and the bidding can be started immediately after completing the detailed design for the concerned contract package. 	
	<ul style="list-style-type: none"> - Pre-qualification, bidding and contract documents shall be in English. - The documents shall be translated into Vietnamese by the Consultant and submitted to VEC for approval. - Where there is discrepancy between the English and Vietnamese versions, the English version will prevail. 	

Source: TOR 3.3.9

(2) Methodology

The Consultant prepares the procurement plan, P/Q and bidding documents including those evaluation criteria in accordance with the current WB/JICA procurement guidelines and standard forms.

The conditions of contract in the bidding documents are applied the appropriate series of FIDIC, and the technical specifications including EMP with supervision of engineers/specialists in every technical field for ensuring the quality.

Work diagram of procurement documents preparation is shown in Figure D.29.

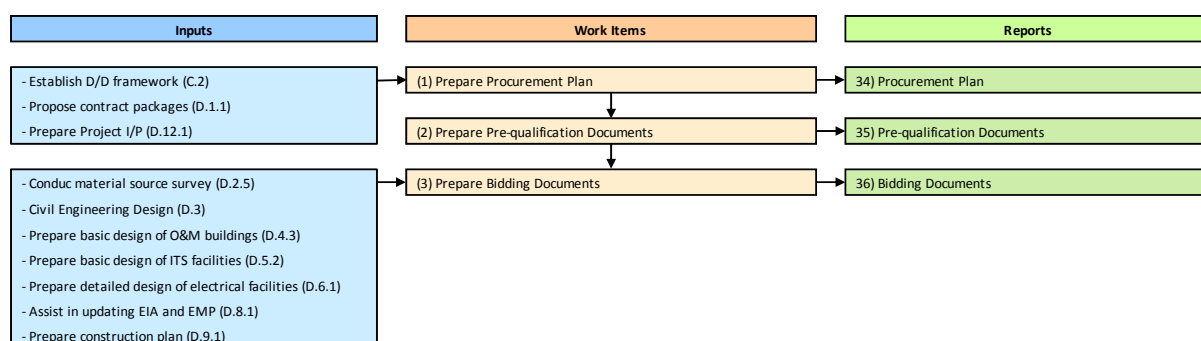


Figure D.29 Work Diagram of Procurement Documents Preparation

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant submitted the revised procurement plan on December 15,2011.
- The Consultant submitted the first draft of the pre-qualification documents of PKG3A: Ky Lam Bridge.

D.12 Project Implementation Program

D.12.1 Prepare Project Implementation Program

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table D.30.

Table D.30 TOR Requirements for Preparation of Implementation Program

No.	TOR Requirements	Check
1	- The Consultant shall prepare the implementation program in accordance with the final scope of works.	

Source: TOR 3.3.10

(2) Methodology

The current Project I/P is shown in Figure A.9.

During the Services, the Consultant studies the construction period in each contract package and updates the Project I/P in accordance with the results of construction planning (D.9), if required.

Work diagram of Project implementation program is shown in Figure D.27.

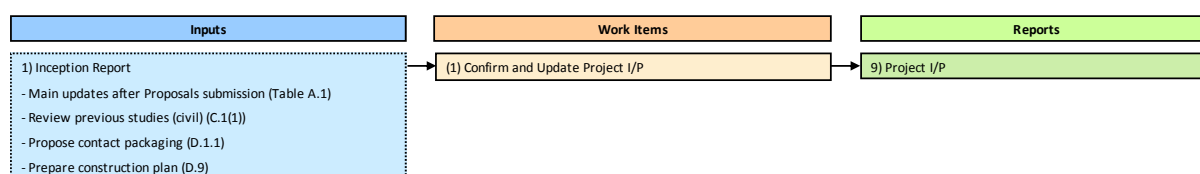


Figure D.27 Work Diagram of Project Implementation Program

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant updated the Project I/P and proposing in the revised procurement plan submitted on December 15, 2011.
- As requested in Appendix B, the overall I/P will be submitted within four (4) months from the commencement date of the Services.

Part E Procurement Assistance

E.1 Assist in Tendering Procedures

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table E.1.

Table E.1 TOR Requirements for Procurement Assistance

No.	TOR Requirements	Check
1	- The Consultant shall provide necessary technical assistance to PMU85/VEC in all aspects of the procurement process in accordance with the procurement regulations of GOVN and World Bank guidelines. - The technical assistance shall include, but not limited to, the following:	
2	- Preparation of the Procurement Plan covering all major work contracts.	
3	- Preparation of pre-qualification and bidding documents for each contract package.	
4	- Providing necessary assistance on invitation of pre-qualification, evaluation of pre-qualification applications and preparation of pre-qualification evaluation reports for submission for review by concerned agencies including PMU85, VEC, MOT and the World Bank.	
5	- Providing necessary assistance on invitation for bids, bid opening, pre-bid conference, pre-bid site visits for the pre-qualified interested bidders, preparation of clarification answers and addendum to bidding documents, evaluation of bids, preparation of bid evaluation report in accordance with the World Bank's standard bid evaluation form and the MOT's form for submission for review by concerned agencies including PMU85, VEC, MOT and the World Bank.	
6	- Assist PMU85/VEC in contract negotiation, preparation and finalization of contracts submission for review by concerned agencies including VEC, MOT and the World Bank.	

Source: TOR 3.4

(2) Methodology

The Consultant assists VEC/PMU85 in tendering procedures of all civil contract packages in accordance with the JICA/WB procurement guidelines. In the assistance, the Consultant conducts the independent P/Q and bid evaluations to advise VEC/PMU85 on issues related to contract negotiations.

Work diagram of procurement assistance is shown in Figure E.1.

(3) Work Progress to Date

Please refer to D.11.

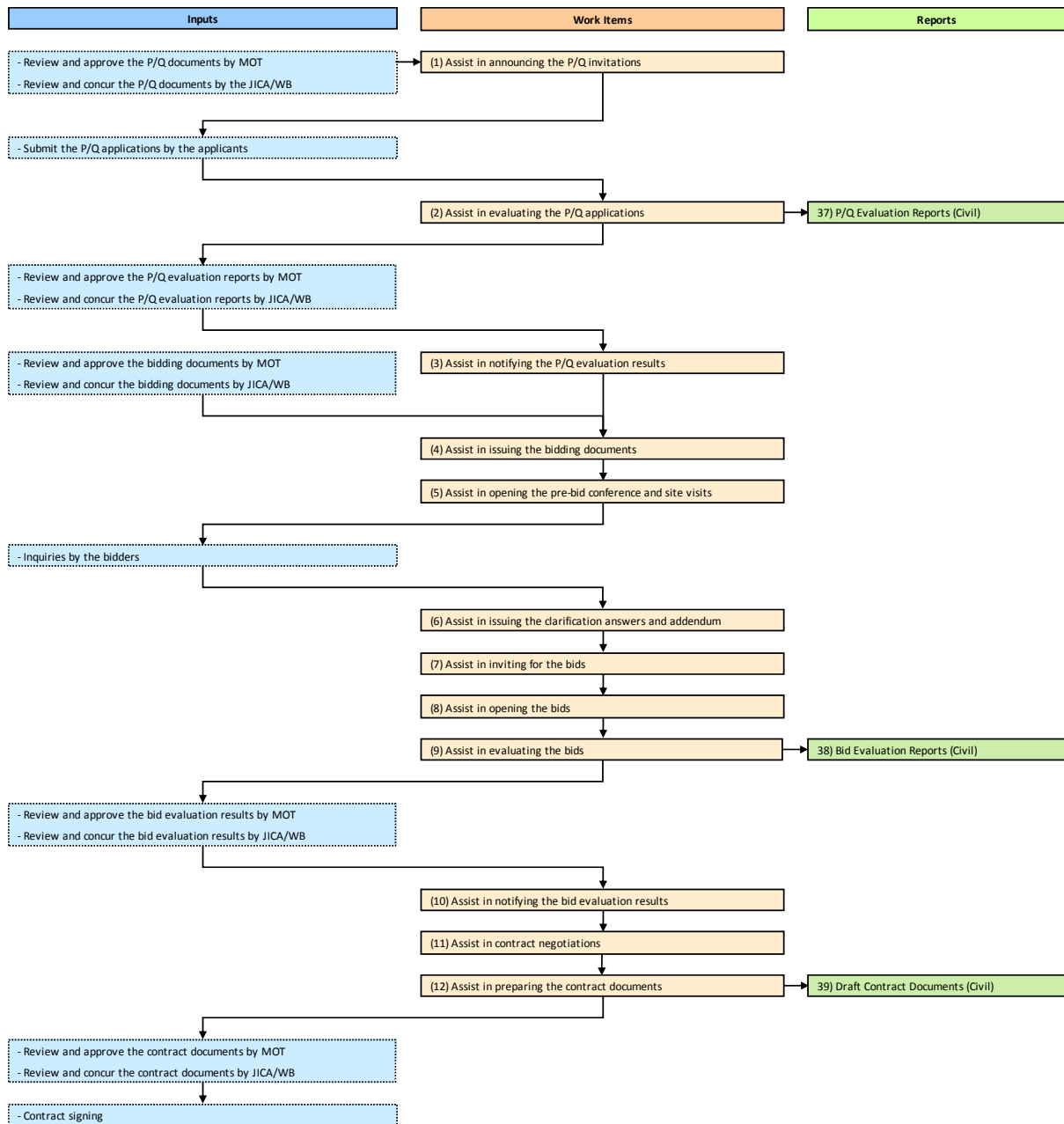


Figure E.1 Work Diagram of Procurement Assistance

Part F Land Acquisition Staking

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table F.1.

Table E.1 TOR Requirements for Procurement Assistance

No.	TOR Requirements	Check
1	- The Consultant shall stake land acquisition to hand over to local authorities who undertake compensation for land acquisition and resettlement.	

Source: TOR 3.5

(2) Methodology

General work flow of the land acquisition staking is as follows as shown in Figure F.1.

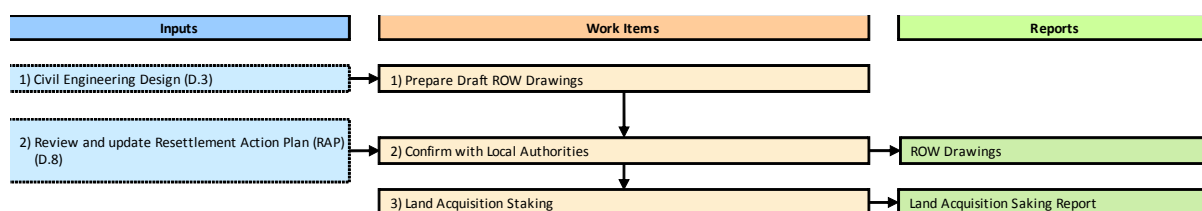


Figure F.1 Work Diagram of Land Acquisition Staking

(a) Prepare ROW Drawings

The Consultant prepares ROW (Right-Of-Way) drawings on the basis of the civil engineering design, commune by commune.

(b) Confirm with Local Authorities

The Consultant confirms the ROW drawings with the local authorities. Updating the RAP should be carried out with the discussion.

The drawings shall be finalized after agreement with relative authorities.

(c) Land Acquisition Staking

The Consultant stakes the land acquisition boundaries. This work will be out-sources in order to carry out in efficient and effective manner.

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant identified the extent of all communes as shown in Appendix 4.
- The Consultant provided some draft ROW drawings to our resettlement team for consultation meeting, especially for the priority package of PKG3A: Ky Lam Bridge.

Part G Technology Transfer

G.1 Provide Training to VEC, PMU85 and Relevant Organizations

(1) TOR Requirements

Requirements in the TOR is summarized as shown in Table G.1

Table G.1 TOR Requirements for Technology Transfer

No.	TOR Requirements	Check
1	- The Consultant shall undertake training and technology transfer for PMU85, VEC, local consultant and relevant authorities.	

Source: TOR 3.6

(2) Methodology

The Consultant provides the appropriate technology transfer to VEC, PMU85 and relevant organizations for enhancing the necessary knowledge and capacity to ensure the smooth execution of the Project and sustainable development of the expressway network in Vietnam.

The objectives of the training are that VEC, PMU85 and relevant organizations acquire the knowledge and capacity which are necessary to manage and control the Project smoothly and to make decisions with sufficient technical backgrounds for the important issues and peculiar matters of expressway in the Project. Based on the knowledge and capacity acquired by the training program, VEC, PMU85 and relevant organizations are able to manage and control the expressway development projects by themselves.

The Consultant assigns the key professional staff as the Training Specialists and identifies the training needs with VEC, PMU85 and relevant organizations in the beginning of the Services. Based on the needs above, the Consultant prepares the training plan which consists of the training themes, program, trainees and implementation schedule. The training schedule is taken into account the work schedule of the Services to provide the workshops at appropriate timing in advance of the execution of the Services.

In corporation with each engineer/specialist in the respective fields, the training specialists prepare the appropriate training materials and hold the workshops to VEC, PMU85 and relevant organizations.

Tentative training themes are as follows:

- Project management of all project phases (PMBOK);
- Safeguards (WB/JICA safeguards policy);
- Expressway road safety and auditing system (PIARC road safety manual);
- Expressway administration, O&M, ITS and ETC systems (including overseas study tour).

Work program of technology transfer to VEC, PMU85 and relevant organizations is shown in Figure G.1, and tentative training program of the overseas study tour is shown in Table G.2, respectively.

In case, VEC/PMU85 agree to carry out the program, the Consultant arrange necessary procedures timely.

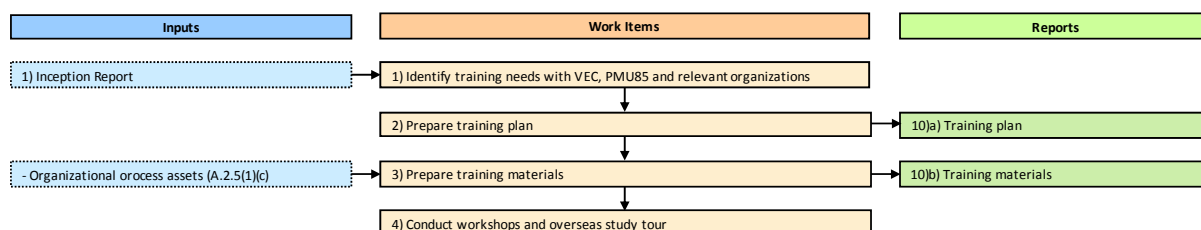


Figure G.1 Work Diagram of Technology Transfer to VEC, PMU85 and Relevant Organizations

Table G.2 Training Program of Overseas Study Tour (Tentative)

Day	Time	Program	Contents	Stay at
1	Night	Move to Narita	- Move from Hanoi to Narita by airplane	Flying overnight
2	AM	Move to Tokyo	- Move from Narita to Tokyo by car	Tokyo
	PM	Visit to MLIT	- Introduce expressway administrative policy	
3	AM	Visit to JEHDRRA	- Introduce expressway business and implementation scheme	Tokyo
		Visit to ORSE	- Introduce ETC technology and standardized system	
	PM	Visit to HIDO	- Introduce advanced ITS technology	
		Visit to VICS center	- Introduce traffic information and VICS system	
4	AM	Visit to MEX	- Introduce traffic management and O&M system for <u>intra</u> -urban expressway	Tokyo
	PM	Visit to NEXCO	- Introduce traffic management and O&M system for <u>inter</u> -urban expressway	
5	AM	Move to Narita	- Move from Tokyo to Narita by car	Hanoi
		Move to Hanoi	- Move to Narita to Hanoi by airplane	

(3) Work Progress to Date

As of the end-December 2011, this work does not start yet.

G.2 Provide Training to the Key Local Professional Staff

(1) TOR Requirements

Requirements in the TOR are summarized as shown in Table G.1 above.

(2) Methodology

During the Services, the Consultant provides person-to-person technology transfer to key local professional staff by co-working style in the respective fields. It is expected that the key local professional staff are acquired day-to-day knowledge and skills necessary for the execution of the Services.

Work diagram of technology transfer to key local professional staff is shown in Figure G.2.

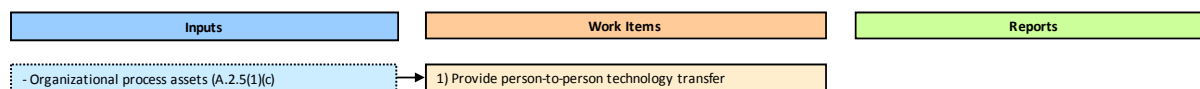


Figure G.2 Work Diagram of Technology Transfer to Key Local Professional Staff

(3) Work Progress to Date

As of the end-December 2011, the following progress is performed.

- The Consultant starts the training to the key local professional from the commencement of the topographic survey on July 15, 2011, day-to-day basis, person-to-person basis.
- Especially, the Consultant is paying much attention in providing communication management in the project management, i.e. participation to the general meeting, issuance of Inter-Office-Memo.

Appendix

Appendix 1: (Extraction from the Contract)

Appendix A: Description of the Services (Terms of Reference)

Appendix B: Reporting Requirements

Appendix C: Key Personnel and Sub-Consultants

Appendix A: Description of the Services

Handwritten initials/signatures

IV. Appendices

APPENDIX A - DESCRIPTION OF THE SERVICES

Terms of Reference

1. Background

The Government of the Socialist Republic of Vietnam (GOVN) represented by Ministry of Transport (MOT) is planning to implement Expressway Development (Da Nang - Quang Ngai) Project (hereafter called the Project). Vietnamese MOT is the line agency who makes investment decision for the Project. Vietnam Expressway Corporation (VEC) is the project owner and Project Management Unit No. 85 (PMU85) is the project management consultant at project preparation and implementation phases until the works is handed over and put into operation. PMU85 is authorized by MOT to manage the implementation of Detailed Design Consulting Services Contract and is also the implementing agency who actively works with relevant authorities to solve all the issues related to the Project. The purpose of the Expressway is to improve the inter-regional transport networks to support the socio-economic development in the Central region and in the whole country and promote traffic safety.

In preparation for the Project, the GOVN commissioned a Feasibility Study (FS) in 2003 which was subsequently revised and completed in March 2008 by JETRO Consultants. In order to meet the requirements of the guidelines and loan procedure of the World Bank and other international financial donors, the FS was updated by Nippon Koei Co., Ltd., being completed in May 2009 and completed by Transport Engineering Design Incorporated (TEDI) in 2010. This updated FS is being reviewed and further refined by CPCS Transcom Limited.

The Project consists of the following three components;

- (1) Component A: Civil Works
Construction of four-lane dual carriageway road (with capacity for eventual widening to six lanes) and 131 km in total length.
- (2) Component B: ITS (Intelligent Transport System) Works
Provision of traffic management and toll collection facilities
- (3) Component C: Expressway Operations and Maintenance
Planning an institution to operate and maintain the expressway and identifying facilities and equipment that it will need.

It is currently expected that the project will be implemented with financial support from the World Bank and the Japan International Cooperation Agency (JICA). Funds from these agencies would be used to finance separate sections of the Project. The current Terms of Reference pertain to the entire Project.

2. Objectives of the Consulting Services

The objectives of the consulting services are:

- To undertake the efficient and proper preparation of the detailed engineering design;



- To prepare an implementation program that can ensure delivery of the project in an efficient and timely manner infrastructure in accordance with the implementation program; and
- To promote technology transfer by employing suitably qualified Vietnamese professionals for the detailed design and implementation planning for the Project and by providing appropriate training for staff of the related agencies who will be at various times responsible for the Project.

3. Scope of Services

3.1 General

In executing the services, the Consultant shall follow the current relevant Guidelines and regulation/procedures of GOVN and the Bank based on the FIDIC Conditions of Contracts. The Consultant shall assist PMU85 in all aspects of the work including the review of previous studies, detailed design and tender assistance required for implementation of the Project. The scope of the consulting services broadly consists of, but not limited to, the following works:

1. Review of previous studies.
2. Detailed engineering design including cost estimation and preparation of tender documents and other supporting documentation.
3. Assistance with calling and assessing tenders for works and for contract negotiations.

Special attention is drawn to the requirement that the Consultant conduct independent bid evaluations and give the Client advice on issues related to contract negotiations for the Client's reference.

The Consultant shall perform the tasks listed below:

3.2 Review of Previous Studies and Establishing the Detailed Design Framework

The Consultant shall:

(1) Review Previous Studies

The Consultant shall review the previous studies to acquaint themselves with the evolution of the Project and its current features, and to identify matters that may materially affect the work of the current contract. Key issues will be identified for discussion and agreement with PMU85. The review shall cover, among others, the following subjects:

- a. Review of horizontal and vertical alignment and proposed structures.
- b. Review site-specific social and environmental impacts identified in the Environmental Impact Assessment (EIA) prepared by PMU85 and the mitigation measures proposed in the associated Environmental Management Plan (EMP).
- c. Review construction phasing and management of traffic during construction.
- d. Review toll operation and control facilities, operation and maintenance facilities and services, service areas, parking areas, etc.

(2) Establish Detailed Engineering Design Framework

The Consultant shall:

- a. Establish design criteria and design standards to be applied for the Project.
- b. Recommend and agree with PMU85 the format and content for the Bills of Quantities, cost estimates and prequalification and bidding documents.

- c. Recommend and agree with PMU85/VEC the time schedule for preparation of the detailed design, the Bills of Quantities, cost estimates, prequalification documents and bidding documents to allow the tendering of works and construction for each contract package to commence immediately after the completion of necessary design and documentation work and the gaining of necessary approvals.

3.3 Detailed Engineering Design and Procurement Planning

Tasks to be undertaken by the Consultant to prepare the detailed engineering design and the planning of procurement will include:

1. Identify project packaging.
2. Conduct surveys and investigations.
3. Prepare detailed design for roads, bridges and other structures.
4. Design of intelligent transport systems and toll facilities.
5. Establish an operation and maintenance system for the project.
6. Prepare an Environmental Impact Assessment, Environmental Management Plan, Ethnic Minority Development Plan (if needed) and Resettlement Action Plan.
7. Recommend construction methods and prepare a construction schedule.
8. Prepare a cost estimate for the Project.
9. Prepare pre-qualification, tender and contract documents.
10. Prepare an implementation program.

In undertaking the detailed engineering design, the Consultant shall:

- a. Use the reference documents of previous studies approved by GOVN and the World Bank as the basis for detailed design.
- b. Use engineering standards approved by GOVN. Where current standards are not available or are unsuitable, the Consultants shall make recommendations for appropriate standards and gain approval from PMU85 for their use.
- c. Undertake the work in a phased manner so that pre-qualification of contractors can occur for packages for which detailed design and documentation is completed while detailed design and documentation continues for other packages.

3.3.1 Packaging

The Consultant shall identify a recommended packaging for the project and get agreement with the Client before commencing detailed design. Packaging shall satisfy the following conditions:

- a. Individual packages should be confined to a single province;
- b. Individual package shall be financed by only a single financier;
- c. The value of a package should generally be from about 70 million to 100 million USD, i.e. neither too big nor too small.
- d. During preparation of the detailed design, the Consultant shall study, initiate the solutions and design a contract package with reasonable scopes of works beforehand so that its construction can be commenced in September, 2012.

3.3.2 Surveys and Investigations

(1) Data collection

- Investigate and collect the following data for cost estimate and general cost

[Handwritten signatures and initials]

estimate: Production costs related to local transportation activities; depreciation regulations related to traffic vehicles; haulage tables for transportation services; charges for travel, bridges and roads, and insurance; costs for traffic accidents; inflation and exchange rate in the previous years; local unit price for calculation of general cost estimate; consult unit prices of projects under implementation in the region; investigate sources of materials and energies for construction; cooperate with local governments to identify disposal areas for soil and waste materials (including liquid waste)

- Survey for construction material transportation
- Investigate and collect planning data related to the project and work with relevant authorities: Collect planning maps of highways, railways, waterways and maritime; plan of industrial and urban zones along the route; plan of systems of hydraulic works, irrigation, canals, dykes, and pumping stations, etc; plan of underground works and system of underground and overhead lines; Plan of water supply and drainage system; plan of electricity supply and lighting; plan of communication system and other relevant plans along the route, etc (the plans must be granted with official approval of relevant authorities)
- Collect project documents and design document of the relevant projects
- Work and agree in writing with relevant authorities of Da nang city, Quang Nam and Quang Ngai provinces, 5th military zone under Ministry of Defense, EVN, VNPT, PMU of industrial zones and other relevant managing agencies about the following contents: Alignments; alternative design of interchange; scale and location of toll plazas, control center, service stations; elevation of detailed plans of urban zones and industrial zones; location, span or width, and elevation of culvert and frontage road; navigational clearance, railway clearance; documents related to hydraulic works, irrigation, water sources and sewage system for urban zones, clearance of large canals and dykes; areas within military structures, military barracks; and the other relevant documents, etc.

(2) Surveys

Implement detailed surveys served for engineering designs of all work items under the project including: surveys of topography, hydrology, geology and testing, material sources, traffic issues, electricity, land acquisition and resettlement, surveys of relevant underground and overhead structures and staking land acquisition, etc ..., and additional survey quantities (if any) during the design. The surveys must comply with current Vietnamese specifications and standards, and supply sufficient data for documentation of detail engineering designs. Before implementation of surveys, the Consultant must carry out thorough studies on existing documents and data in the previous stages (FS, JETRO). Based on the findings from the studies, the Consultant makes and submits detailed plans for PMU85's approval to implement. Scope of the work are mainly, but not limited, as follows:

(i) Topographic survey

- Class IV primary control points (national coordinate system VN2000): Installed with GPS technology, mark specification is in accordance with standard 22 TCN 263-2000. Each mark's distance is about 3-4 km along the expressway route, and at least 4 marks/ point at points of intersection and large bridges such as Ky Lam, Tam Ky.... and at least 2 marks/ point for the other interchanges and bridges. The marks along the route and at the large bridges and interchanges should be arranged reasonably to avoid overlapping.
- Class IV leveling network: Installed with highly accurate geometric leveling equipment. Marks of IV class leveling network share same positions with those of IV

class primary control points. Its errors are varied within standard 22 TCN 263-2000.

- Secondary control point (traverse net): measured with electronic tachometer which has accuracy and errors according to standard 22 TC 263-2000. Each mark's distance is about 150m-200 m/1 point along the expressway route, and at least 8 marks/ point for points of interchange and large bridges and at least 4 marks/ point for the other interchanges and bridges. The marks along the route and at the large bridges, interchanges should be arranged reasonably to avoid overlapping.
- Technical leveling network: Marks of technical leveling networks share same positions with those of secondary control point. It is measured with highly accurate geometric leveling equipment. Its accuracy and error is in line with standard 22 TCN 263-2000.
- Site planning: According to the alignment determined in FS, a site plan at scale of 1/1000 is made along the route, with measurement range in the expressway from center line to sides of 70 m and that in level crossing (traverse) from center line to sides of 50 m. The site plan is required to have full description of topography, ground objects, underground and surface structures, high voltage and low voltage lines, ground communication lines, railway signals, location of lakes and ponds, system of irrigation and canals, special ground objects, historical site, temples, pagodas, feretories, cemeteries, and administrative land boundary, etc as well as GPS marks, and secondary control points.
- Detailed stakeout works: According to the above site plan at scale of 1/1000, alignment design must comply with the specification and is agreed with relevant authorities (locality, military, etc). Based on system of secondary control points, official setting out in the field includes: top marking, marking in the curve, main stakeout in TS, TC, P, ST, CT; and detailed stake arrangement with max. distance of lower than 20m/ stake, and main stakes in the curve and in changed terrains and stakes of ground objects, culverts, control stakes, locations in planned industrial and urban zones (focusing on starting points and ending points) boundary of communes and districts, etc. Main stakes at top of curves, in TS, TC, P, ST, CT, Km, culverts, bridges, intersection, etc must be concreted according to standard 22 TCN 263-2000.
- Survey of longitudinal section at horizontal scale of 1/1000, and vertical scale of 1/100.
- Survey of cross-section at scale of 1/200. Surveying range is 70 m from center line to both sides of the expressway.
- Survey of culverts for drainage: Planimetric survey of the culverts with span (width) of more than 1.5m is at scale of 1/500 at the culverts, and axial measurement range of 100 m and horizontal one of 100 m for each side. The axial survey of dyke's center line, horizontal survey of dyke, and road crossing at all points of dyke's center line are at scale of 1/200. Surveying range includes range of planimetric survey of the culverts. Intersection angle is surveyed between road and culvert center lines. It is necessary to agree in writing with the relevant agencies on irrigation culverts.
- Survey of intersection points with the other works such as railways, high-voltage and low-voltage lines, communication lines including phone lines, electricity and lighting structures, post and communication cables and underground structures in the expressway routes consists of the following works: measurement of height of rail top at the intersection points with the existing routes; investigation of planned elevation of crossroad, if any; survey of elevation and locating alignment and electrical poles (by coordinate), survey of at least two adjacent poles, intersection angle between lines and perpendicular lines, distance from the center line to the poles, height of the poles,

[Handwritten signatures and initials]

clearance between the lowest lines and natural surface; and survey of kinds of poles, electricity, cables, pipeline, electric transmission grid, managing agencies.

- Survey of interchanges: Identify crossroad intersecting with designed route (coordinate, station); identify the intersection angle, width of road base, kind of pavement, existing structure, kinds of vehicle, etc in the interchanges; stake out concrete/ iron piles at centerlines, starting points, ending points, top points, and basic points in the curve; make site plan with scale of 1/500 with measurement range within designed interchange range; survey longitudinal section of interchanges and its branches with length scale of 1/1000 and height scale of 1/100; survey cross-section of interchange at scale of 1/200 and distance from centerline to each side of 50m, and survey range is equal to site plan one.
- Survey of bridge: Make elevation plan at construction place of bridge at scale of 1/500; survey profile of bridge at scale of 1/500 at center line of the expressway; stake center line of the bridge with accuracy equivalent to that of secondary control points (it is noted to collect hydrographic and hydraulic data, and the documents agreed with local authorities on plan of rivers, dykes and hydraulic works. It is necessary to survey meteorological data such as: temperature, wind, rainfall, humidity, earthquake, and figures of flow rate, velocity and water level.
- Survey of residential underpass culverts: Make plan at scale of 1/500 with distance from center line to two sides of 200m and 100m respectively along the main route; survey the intersection angle between the interchange and the main route; survey kinds of intersection (district ones, commune ones, and ward ones), scale and plans (if any). Survey profile of intersection at scale of 1/500, at distance from the expressway's centerline to each side of 200m, and survey cross section of intersection at scale of 1/200 from the intersection's centerline to each side of 30m.
- Survey of canals and dykes: Identify location and boundary of canals and dykes; set plan at scale of 1/500 in boundary of canals and dykes; survey longitudinal section of canals and dykes at scale of 1/1000, and their height at scale of 1/100; survey their cross section at scale of 1/100, at distance from their centerline to each side of 20m.
- Survey of toll plazas, control centers, service station, expressway management offices, bus station, communication stations: Establish area control points equivalent to secondary control points; survey topographic plan at scale of 1/500.
- Survey and investigation of land acquisition and resettlement.
- Survey of tunnel portals: The Consultant shall submit detailed applicable specifications (survey specifications related to tunnel have not been available in Vietnam) to the Client for approval or to authorities for approval.
- Survey of frontage roads: Frontage roads are located inside survey areas (70m from center line to both sides). Thus, there is no additional works of frontage road survey.

(ii) Survey of hydrographical data

- Collect meteorological and hydrographical data related to rainfall, wind, and temperature, humidity from meteorological stations, and flow rate and water level at hydrographical stations in rivers in the project area.
- Collect relevant documents and work with Ministry and provincial departments of agriculture and rural development to agree with bridge designs. In terms of the culverts over irrigation systems, it is necessary to work with relevant authorities and local governments to gain agreement on culvert location, width, and required elevation

from its bottom.

- Survey water level along each 1 km distance of the expressway, forming 1 water level group (each water level includes: highest one, frequent one, average one, and lowest one in 3 consecutive years; survey causes and period of flood....For drainage culverts, survey water level groups (each water level includes: highest one, frequent one, average one, and lowest one in 3 consecutive years). Survey year and causes of flood. Illustrate surveyed water level groups in the site plan.
- Survey situation of existing drainage works, irrigational system along and through the route, identify existing cross-section of canals and dykes, their top width, bottom width, depth, bottom elevation, functions, flow direction and longitudinal slope, and mark at their side.
- Survey fully existing situation of drainage, utility purposes and managing agencies of irrigation systems along and through the route.
- Hydrologic survey of bridge: Measure cross-section of flow; survey the water level in form of 3 groups at each location of bridge including: highest one, frequent one, average one, and lowest one in 3 consecutive years, causes and duration of flood.
- Hydraulic and hydrologic calculation: Based on survey data, carry out hydrologic calculation for the engineering design such as designed water level along the route, and hydraulic and hydrologic calculation of bridges and culverts (flow rate, velocity, and water level, general and local scour).

(iii) Engineering geological survey:

The Consultant is required to study thoroughly geological data in FS stage to arrange the holes drilled at stage of the engineering designs, avoiding to quantity overlapping. Requirements of geological drill are as follows:

- Engineering geological survey of normal foundation: Drill both normal foundation and culverts with two holes at the depth of 7 m per 1 km.
- Survey at special sections such as the ones which need deep excavation, embankment or soft ground ones: Drill one hole at the expressway centerline per 75 m; drill geological cross-sections with two holes for two sides and one hole at the centerline per 150 m and these cross-sections should be combined the locations of drilled culverts. Depth of borings must be enough to meet the requirements of detailed design. Carry out Vane shear test (VST) at drilled holes of the centerline at cross-section location. Distance of vane shear is 2 m to bottom of the holes..
- Engineering geological survey of bridge: Each abutment and bridge pier have one the drilled hole (location of abutment and bridge pier is identified after completion of the plan and profile of bridge's center line); the hole is 3-5 m deeper than pile foundation with the completing conditions equivalent to standard of 22 TCN 263-2000; one sample/ 2m is taken. SPT piercing in the holes is carried out with distance of 2m/ point. Test physico-mechanical properties of ground, especially in case of soft ground, test the additional parameters such as Cv, K, organic content, and compress 3 axes in form of UU and CU to provide sufficient data for soft ground treatment.
- Engineering geological survey of tunnel: The Consultant is required to submit tunnel survey specifications. In case of the survey specifications of the Consultant is approved and suit with Consultant's proposal so PMU85 will agree with the Consultant's proposal. Engineering geological survey of tunnel: Drill at least one hole at the tunnel plaza, two holes at expressway centerline and horizontal drills with at least 50m at each tunnel portals. Depth of borings must be enough to meet the requirements of detailed design. Testing 17 undisturbed soil samples/ each boring and

[Handwritten signatures and initials]

8 disturbed samples/each boring. Seismic measurement at 4 points at the depth of 50m and 8 points at the depth of 100m is carried out to identify strata structure. The consultant shall prepare and submit PMU85 tunnel survey specifications for their review and approval.

- Engineering geological survey of residential underpass culvert: Drill two staggered holes at each location of the residential underpass culvert, one hole at right lane of the expressway, and another at left one; Take one sample/ 2m; carry out SPT piercing in the holes with distance of 2m/ point.
- Engineering geological survey of toll plazas, control centers, service station, expressway management offices: each location has at 2- 4 holes with full depth to provide sufficient data for the design and the specific alternative shall be submitted to PMU85 before implementation.
- Sampling and testing works is carried out in accordance with the standards of 22 TCN 259-2000, 22 TCN 263-2000, 22TCN262-2000 and enough data is required to collect to serve for detailed engineering design. For the embankments on the soft ground, it necessary to test the parameters such as Cv, K, organic content, and compress 3 axes in form of UU and CU to provide sufficient data for soft ground treatment. The Consultant shall collect and store samples, especially the ones at large bridges. These samples shall be handed over to the client upon the Project completion.

(iv) Material Source Survey

This task must be ensured to collect all data of locations of material sources which meet the requirements of the Project, are practical and feasible during construction.

- Back filling materials (borrow pits) and sand for soft ground treatment: identify exploitable soil and sand quarries; work with local governments to gain agreement in writing and then, map out them on plan at scale of 1/50,000. Collect data related to capacity and quality of each quarry; take testing sample to identify necessary parameters of back filling materials and others for soft ground treatment.
- Survey and evaluation of general situation, capacity and transportation length of the routes for exploitation and transportation to the construction site.
- Borrow pits and quarry sites for construction of bridge and culverts, pavement: For borrow pits and quarry sites which are exploited or being exploited, collect data related to their capacity and quality, exploitability, and transporting conditions to the construction site. For new borrow pits and quarry sites, carry out procedures for survey and testing necessary characteristics of each material.

(v) Survey of other relevant structures

- Survey current situations of traffic works in the area to evaluate usage capacity and level that shall be upgraded to construct service roads for construction of the expressway.
- Survey old bridges and culverts on the cross lines: Identify location, survey profile, main cross-section, and elevation of components of existing works; review construction materials; evaluate loading capacity of the works; evaluate fault degrees, suitability and utilizing capacity.
- Survey current situations of irrigation works within study area.
- Survey underground structures, public works: optical cables, underground cables, pipeline, oil and petrol pipeline, etc.
- Survey existing power supply in the route, and request for supplying capacity and

starting points. For transformer stations, request was made to identify their location, scale, capacity, specifications, and works which is supplied with power, etc. Survey additional locations of transformer stations; identify clearly locations of the station by coordinate and full description in maps including topographic, geologic and ground object data, and agreeing with the local governments in writing on these issues, etc.

- Survey cultural buildings, temples, pagodas, and relevant legal religious buildings.

(vi) Additional Traffic Surveys

- The Consultant shall review available traffic data on the existing road and conduct additional surveys as necessary to:
- Collect data needed for the detailed design of foundations, pavements, interchanges, and toll stations, etc; and
- Collect base line data that can be used for monitoring performance of the completed Project, where this data shall include the quantity and composition of traffic using the current national highway, total travel time and the variability of the travel time for, separately, cars and trucks, and the number and type of traffic accidents per annum along the current corridor. This data will be collected separately for at least the segments Danang to Tam Ky and Tam Ky to Quang Ngai.

(vii) Independent Land Valuation Survey

As part of the work on updating the Resettlement Action Plan (RAP) the consultant will engage as a sub-consultant a qualified Land Valuation Consultant (LVC). The LVC must be licensed by the Ministry of Finance to undertake land valuation in Viet Nam and be independent of all project stakeholders. As part of the updating work the LVC will undertake a survey to establish current market values for all types of land, by location and use, sufficient to confirm the budget under the updated RAP.

(viii) Environmental and Social Surveys

Undertake surveys as necessary to update the EIA and EMP.

3.3.3 *Detailed Design of Road, Bridges and Other Structures*

The Consultant shall:

- (1) Prepare a comparative analysis to aid the selection of the most appropriate types of interchange bridge structures and other important structures taking into account the site conditions, construction method as well as economic conditions.
- (2) Review the preliminary design in the previous studies taking account of the results of updated topographic survey, materials survey, geotechnical survey and soil investigation, hydrological survey and other available data.
- (3) Take account of site-specific social and environmental impacts identified in the EIA prepared by PMU85/VEC and the mitigation measures proposed in the associated EMP, and any other matters identified through work described in Section 3.3.6, in the detailed engineering design. Maintain records of changes in features of the Project to facilitate updating the EIA and EMP.
- (4) Prepare detailed engineering designs for roads, interchanges, bridges and other structures, soft ground treatment and pavement structure, including structural analysis, design calculation, drawings, etc. taking into account the most appropriate construction method.
- (5) Prepare engineering drawing that include site plans, interchange plans, general views and structural drawings. Unless agreed, scales for drawings shall be not

less than:

- | | |
|-------------------|----------------|
| a. Plan | 1:1000 |
| b. Elevation | 1:100 |
| c. Cross sections | 1:200 |
| d. Structures | 1:200 |
| e. Other | as appropriate |
- (6) Calculate quantities for each item of work based on the detailed design and the agreed form and content of the bill of quantities.
 - (7) Undertake a road safety audit of the expressway design and revise the design, if appropriate, to address any safety issues identified in the design. A report will be prepared by an experienced Road Safety Audit Expert and submitted for review by the appropriate authority to confirm that appropriate measures have been taken to address road safety issues.
 - (8) The Consultant shall prepare detailed design of service areas in the alignment
 - (9) Using a participatory approach, identify the impact of the expressway construction on local infrastructure, which will include consideration of pedestrian and vehicle accesses, and disruption to irrigation and other agricultural or community facilities. Based on consultations with local communities prepare plans and procedures for minimizing impacts on local communities both during and after construction of expressways. To the extent possible existing accesses should be reinstated through use of over and under passes. Where an access cannot be reinstated alternative routes must be provided.
 - (10) The Consultant shall prepare the documents of land acquisition staking for the Project.

3.3.4 Study and Design of ITS and Toll Collection System

- (1) The Consultant shall conduct an investigation into intelligent transport systems (ITS) and the toll collection system needed for the Project. The systems will include vehicle and incident detection, CCTV, information systems, data transmission, etc. The work shall draw on technical standards that it is expected will be established by the GOVN with support from JICA, and will cover:
 - a. Identification of potential data and information needs, traffic management issues and emergency support such as police, fire and ambulance services.
 - b. Conceptual design of ITS and toll collection systems.
 - c. Setting of design standards for each system component and configuration of each item of equipment.
 - d. Conceptual plan for institutional arrangements and staffing needed to manage the ITS and toll collection systems, including branch offices.
- (2) Following this investigation and approval of proposals by VEC, detailed design and cost estimates shall be prepared for the following facilities:
 - a. Central control and operation center and branch offices.
 - b. Agreed vehicle and incident detection, CCTV, information systems, data transmission and other systems.

[Handwritten signatures and initials]

- c. Toll collection facilities including toll gate equipment and its operation system.
- d. Communication and other facilities needed for emergency support such as police, fire and ambulance services.

3.3.5 *Expressway Operations and Maintenance*

The Consultant shall review the operation and maintenance systems for existing and proposed expressway in Vietnam and recommend the most appropriate system for the Project. In doing so, the Consultant will also take account of work described in Section 3.3.4, and also the work of a separate planned investigation of legal and regulatory frameworks, policies, and institutional and administrative arrangements for expressways in Vietnam to be undertaken by the GOVN with support from the World Bank. The work to be undertaken by the Consultant shall include the following:

- a. Plan a Management Unit to undertake operations and maintenance of the expressway, including goals and objectives, organization structure, and staffing needs for the proposed Unit. This work should be undertaken to a sufficient level of detail to allow work described in the next item to be undertaken.
- b. Determine the buildings, facilities and equipment needed by the Unit, including its central and branch offices, submit the plans to VEC for review.
- c. Following approval, prepared the detailed design and cost estimates for buildings and facilities for the Management Unit and prepared specifications and cost estimates for all equipment, vehicles, materials and supplies, including stock, that will need to be procured to allow the Unit to undertake operations and maintenance of the expressway.

3.3.6 *Review and update, as necessary, an Environmental Impact Assessment (EIA), Environmental Management Plan (EMP), Ethnic Minority Development Plan (EMDP) and Resettlement Action Plan (RAP)*

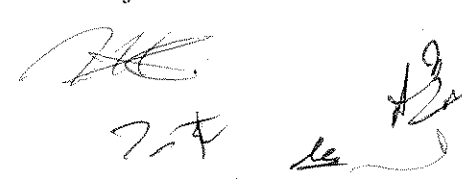
The Consultant shall review the EIA for the Project and submit an updated EIA and an associated EMP with recommendations for mitigation measures in response to the environmental impacts, if any. An EMDP will be prepared if needed. The Consultant shall review and update the Resettlement Action Plan (RAP) prepared by PMU85/VEC. The EIA, EMP, EMDP and RAP will be prepared in accordance with World Bank guidelines including the *Environmental Assessment Guidebook* and *Involuntary Resettlement in Development Projects: Policy Guidelines in World Bank-Financed Projects*.

A more detailed outline of activities to be undertaken with regard to the EIA and EMP is presented in Annex A. Information on the work to be undertaken in updating the RAP is given in Annex B. The work on the RAP will draw on the independent land valuation survey described in Section 3.3.2(6). The work of the Consultant on resettlement will support the relevant Resettlement Committees, which have the principal responsibility for planning and implementing resettlement activities.

Note: The EIA, EMP, EMDP (if needed) and RAP shall be translated into Vietnamese by the Consultant and submitted PMU85/VEC. In case, there is discrepancy between English version and Vietnamese one, the English version will prevail.

3.3.7 *Construction Method and Schedule*

The Consultant shall carry out the study of construction execution and propose the most suitable and practical construction method and schedule of the Project.



3.3.8 *Cost Estimate*

The Consultant shall prepare the detailed cost estimate for the construction of the Project, including:

- a. Bills of Quantities for the construction works of every contract package and the whole project.
- b. The cost estimate for every contract package based on a detailed unit price analysis.
- c. Prepare the total cost estimate for every contract package and the whole project based on the Bills of Quantities and taking account of project management and other costs, and showing a breakdown of foreign and local currency portions.
- d. Prepare annual financing schedules for every contract package and the whole project based on the construction schedule and showing total costs and a breakdown of foreign and local currently portions.

3.3.9 *Pre-qualification, Bidding and Contract Documents*

For sections of the Project to be funded with assistance from the World Bank, the Consultant shall prepare procurement documents in accordance with the World Bank's *Procurement Guidelines, Standard Pre-Qualification Documents* and *Standard Bidding Documents for Procurement of Works*. For sections to be funded with assistance from the Government of Japan, the documents will be prepared in accordance with the most recent version of the *Handbook for Procurement under ODA Loans*. These standard documents will be provided to the Consultant.

The procurement documents to be prepared by the Consultant will include those needed for pre-qualification, bidding and contracting each contract package. The documents shall be prepared and completed in a timely manner so that prequalification of packages for which design has been completed and approvals gained can be undertaken in parallel with detailed design for other packages and the bidding can be started immediately after completing the detailed design for the concerned contract package.

Pre-qualification, bidding and contract documents shall be in English. The documents shall be translated into Vietnamese by the Consultant and submitted to VEC for approval. Where there is discrepancy between the English and Vietnamese versions, the English version will prevail.

3.3.10 *Preparation of Implementation Program*

The Consultant shall prepare the implementation program in accordance with the final scope of works.

3.4 *Procurement Assistance*

The Consultant shall provide necessary technical assistance to PMU85/VEC in all aspects of the procurement process in accordance with the procurement regulations of GOVN and World Bank guidelines.

The technical assistance shall include, but not limited to, the following:

- (1) Preparation of the Procurement Plan covering all major work contracts.
- (2) Preparation of pre-qualification and bidding documents for each contract package.
- (3) Providing necessary assistance on invitation of pre-qualification, evaluation of pre-qualification applications and preparation of pre-qualification evaluation reports for submission for review by concerned agencies including PMU85, VEC,

MOT and the World Bank.

- (4) Providing necessary assistance on invitation for bids, bid opening, pre-bid conference, pre-bid site visits for the pre-qualified interested bidders, preparation of clarification answers and addendum to bidding documents, evaluation of bids, preparation of bid evaluation report in accordance with the World Bank's standard bid evaluation form and the MOT's form for submission for review by concerned agencies including PMU85, VEC, MOT and the World Bank.
 - (5) Assist PMU85/VEC in contract negotiation, preparation and finalization of contracts submission for review by concerned agencies including VEC, MOT and the World Bank.
- 3.5. The Consultant shall stake land acquisition to hand over to local authorities who undertake compensation for land acquisition and resettlement.
- 3.6. The Consultant shall undertake training and technology transfer for PMU85, VEC, local consultant and relevant authorities.

4. Obligations of the Consultants

The Consultants shall commit to complete well all the works stipulated in the TOR and the Contract Agreement. All members of the Consultants shall comply with Vietnamese law and regulations and World Bank requirements during the undertaking of the consulting services in Vietnam.

The Consultants shall be responsible for equipments and software required for carrying out their work.



Annex A

**Updating the Environmental Impact Assessment and Management Plan
for the Proposed Da Nang to Quang Ngai Expressway Project
Detail Design Stage**

1. **Background:** In 2008-2010, PMU85 and its environmental consultants prepared and updated the Environmental Impact Assessment (EIA) and developed the Environmental Management Plan (EMP) based on the updated Feasibility Study published in October 2010. At that time, the entire alignment was re examined and the alignment segments were selected based not only on the technical, cost and geotechnical criteria but also taking into consideration environmental and social issues. Thus the current EIA/EMP reports are based on the alignment which was selected using environmental, technical and social criteria. However, the comparison and selection of the alignment is based on the feasibility level design, with inadequate maps and design details. Also, the current review of the feasibility study and the detailed engineering design could lead to some further revisions to the features of the project that could have environmental and other consequences.
2. **Objective:** The main objectives of the proposed assignment are to: (a) confirm that the selected alignment and the corresponding mitigation measures in presented in the EA reports are based on sound engineering design carried out using appropriate scale maps and drawings; (b) confirm that the project specific environmental, social and cultural issues are properly integrated in the analysis and selection of the final alignment, design, construction and operation of the proposed Da Nang to Quang Ngai Expressway; (c) confirm that the proposed mitigation measures are appropriate, feasible, and cost effective and are incorporated in the detail design, technical specs and contract documents; and (d) update the EIA and EMP reports highlighting the changes and modifications.
3. In reviewing and updating the EA reports, the Consultant will use the latest version of the preliminary design/feasibility report and any updates to it. PMU85 will share with the Consultants the latest version of the EIA/EMP reports and World Bank comments on the EIA/EMP reports.
4. **Scope of Work:** The scope of work comprises of the following main tasks divided into two phases.
5. **Phase 1: Confirm the appropriateness of the selected alignment and the adequacy of the proposed mitigation measures**
 - Review the latest EIA/EMP reports and the World Bank comments. Review the comparison of the alternatives and the selection of the options and confirm that the preferred alternatives and the final alignment are based on the engineering design using appropriate scale maps and drawings and takes into consideration environmental and social issues.
 - Based on detail field survey carried out during detail engineering design phase, review, comment on the adequacy of impacts assessment and discuss any potential environmental impacts or issues not raised in the EIA provided.




- Review the environmental mitigation measures proposed for the design, construction and operational phases. Confirm the appropriateness and adequacy of the proposed mitigation measures and recommend supplement mitigation measures as needed.
- Prepare a brief report on the comparison and selection of the alternatives and the final alignment. The report should: (a) include evaluation of the adequacy/-shortcomings in the choice of the alignment and whether the alternatives and the alignment were evaluated and selected with adequate detail engineering design, appropriate scale topographical maps and other information; (b) include an assessment of the best way to finalize the comparative options for selecting the remaining short segments of the alignment, the adequacy of the proposed mitigation measures and how best to incorporate the mitigation measures in the EA reports, the engineering design and the contract documents; and (c) review this TOR and if necessary, propose modifications of the TOR and resources (time and manpower) allocated to remediate/modify the above deficiencies and how best to proceed with updating the final EAs.
- In undertaking this work, collection of baseline environmental and social data is not envisaged. In the event that some data collection or confirmation is necessary, the Design Consultant should discuss the issue with PMU85, VEC and the EA Consultants responsible for compiling the original EA reports to confirm the need for additional data to supplement the information already collected. Allowance should be made in the budget for collection of some additional data in case it should be necessary.

6. **Phase 2: Update the EA reports, Engineering Design and Contract documents**

- Following consensus on the revised scope of work and budget, the Design Consultant will: (a) for the alignments segments for which previous work may be considered insufficient, strengthen the analysis using detail design and appropriate scale maps and information; (b) for the short segment alignment which require comparative analysis, obtain the necessary social and environmental information to supplement the technical and cost information for an in-depth analysis and selection of the alignment; (c) for the newly selected segments of the alignment, develop mitigation measures in consultation with PMU85/VEC and the environmental and social groups; (d) for the whole alignment, confirm the appropriateness of the mitigation measures and ensure that the mitigation measures are included in the design, technical specifications and contract documents; and (e) update the EIA/EMP reports. The Design Consultant should ensure that the mitigation measures proposed to remediate the impacts are practical, feasible and cost effective and that the measures should reduce/remediate the adverse environmental impacts to acceptable levels. The proposed mitigation measures should be practical and implementable and should be costed for capital and recurrent operating and monitoring costs.
- Prepare Terms of Reference for independent environmental monitoring and supervision during construction of the Project.

7. **Reporting.** The Design Consultant is required to deliver interim reports to VEC and the



World Bank for review and comments. The interim schedule is as follows:

- 2 months after signing the Contract: A brief report on the appropriateness of the proposed alignment, adequacy of socio-environmental impacts assessment and the corresponding mitigation measures.
- 5 months after signing the Contract: Updated draft EIA and EMP reports
- 8 months after signing the Contract: Draft final updated EIA and EMP reports, subject to no final updated EIA and EMP reports for any individual segment being submitted no less than 2 months in advance of completion of detailed engineering design for any individual section or component of the project.

Handwritten signatures and initials:
AHL
704
llc
J

Annex B

Resettlement Study Methodology
Preparation of an Updated Resettlement Plan

Following detailed design and together with the PMU85 and VEC staff and concerned resettlement committees (RCs), the scope of work to be undertaken by the Consultant will include, but not necessarily be limited to, the following:

- (1) Discuss with the PMU85 and VEC staff and implementing agencies (People's Committees and Resettlement Committees) on the cut-off-date of eligibility.
- (2) Updated Census of Affected Persons (APs) and Detailed Measurement Survey: Review the AP and IOL database survey prepared during the Feasibility Study. Work with RCs to ensure an updated census is prepared, a detailed measurement survey (DMS) of all lost assets is conducted, and the AP database is finalized. The updated information in the DMS baseline survey for each AP household will include the following:
 - a. Number of household members, gender of head of household, and ethnicity of family
 - b. Primary and secondary sources of income and levels of income for each, and location of income source (i.e., whether on site or off site)
 - c. Loss of potential work days due to loss of business by roadside shop owners or employment in roadside industries/businesses due to dislocation and/or disruption of normal economic activities
 - d. Number, type and area of the houses to be affected, and whether totally affected and must relocate or partially affected and can repair on same site
 - e. Number and area of all residential plots to be affected, and whether have sufficient remaining land or must relocate
 - f. Number, category and area of agricultural land to be affected; area of total agricultural landholding; area of remaining unaffected agricultural landholding
 - g. Quantity and types of crops and trees to be affected
 - h. Businesses to be affected including structures, land and other fixed assets
 - i. Quantity and category of other fixed assets affected by the Project
 - j. Temporary damage to productive assets
 - k. Legal status of affected land and structure assets, and duration of tenure and ownership
 - l. Resettlement needs, choices/preferences for resettlement and income restoration activities
- (3) Work with RCs to review the SES baseline and analysis and carry out supplementary work to improve the updated RP as necessary. If RP updating

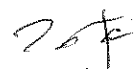


does not occur for at least two years after SES which was undertaken during the Feasibility Study, another SES will be carried out. It will cover 20% of severely affected APs and at least 10% of all other APs, disaggregated by gender, ethnicity, and type of impact (i.e. loss of residential land and house, loss of agricultural land, loss of income from business or employment, etc.). Data to be collected should include, among others the following:

- a. Household head: name, sex, age, livelihood or occupation, income, education and ethnicity
 - b. Household members: number, livelihood or occupation, income, school age, children and school attendance, and literacy
 - c. Living conditions: access to water, sanitation and energy for cooking and lighting; ownership of durable goods; and
 - d. Access to basic services and facilities
 - e. Expenditures and Poverty Levels
 - f. Residential history of family and of community
 - g. Main agricultural practices of the family and community, if an agricultural area
 - h. Main non-agricultural employment opportunities
- (4) Ensure that an updated replacement cost is estimated for each affected commune based on the current market prices for different types of land and non-land assets including transaction costs such as administrative charges, taxes, registration. Analyze and compare results with current rates issued by the Provincial People's Committees and establish project rates. Further details of the requirements of the replacement cost survey are given below.
 - (5) Review and assess the consultation and disclosure program carried out during the Feasibility Study. Design and facilitate implementation of a consultation and disclosure program to ensure all key stakeholders have been identified and consulted closely on their views about the project and resettlement effects, including poor and vulnerable APs (for example, the very poor, those without formal land title, female-headed households, ethnic minority groups, isolated groups, and the elderly) who might require special assistance are identified and consulted. Review and revise, as necessary, the gender strategy. Document the consultation and disclosure activities. Attach minutes of meetings, photos, attendance sheets in the updated RP.
 - (6) Review and finalize the relocation strategy. Identify risks of loss of income/livelihood due to relocation, record discussions with APs in terms of final options for compensation and relocation. Review discussions held with local officials in terms of availability of replacement land, location of potential replacement land/resettlement sites (i.e., name of commune and distance from existing site) confirmed during the Feasibility Study and carry out feasibility study of the final sites identified. Confirm available resources and facilities and identify requirements to improve replacement land. Discuss land title issues and

process to acquire land with title. Identify environmental risks and arrangements for environmental management and monitoring.

- (7) Where incomes must be restored, review and assess list of severely affected APs and also APs most vulnerable to risk; carry out feasibility studies for income restoration programs and prepare a good monitoring program to see how APs are able to rehabilitate themselves, if not improve their socio-economic conditions, any problems faced and how to fine tune the programs introduced to make it workable/implementable based on current conditions/feedback from APs.
- (8) Review the Bank's relevant policies and guidelines and Government relevant laws and regulations. Review and revise gaps between Bank and Government policies and key strategies to reconcile differences to meet Bank's policies.
- (9) Review project policies and finalize entitlements for all types and level of impacts. Finalize options for locally acceptable replacements for land and non-land assets, lost services, cultural sites, common property or access to traditional resources for subsistence, income or cultural activities.
- (10) Review grievance mechanism and an appeal procedure. Finalize responsibilities, reporting requirements, and budget allocation to support the committee's functions.
- (11) Review and assess institutional arrangements. Focus on staffing, capacity, and logistical arrangements. Assess trainings and capacity buildings undertaken during Feasibility Study and include skills and training required during RP updating and implementation. Update key milestones for establishing units at the central and field level.
- (12) Work with RCs to establish an appropriate implementation schedule for land acquisition, compensation and resettlement and income restoration, in conjunction with the proposed implementation schedule for civil works, showing how affected people will be properly compensated and relocated before the site is required to be handed over to the contractor.
- (13) Review and revise as necessary a monitoring and evaluation plan with clear reporting requirements, an updated RP budget covering all land acquisition and resettlement activities with a clear description of flow of funds.
- (14) Review and assess grievance redress committees established and ensure that the responsibilities, reporting requirements, and budget allocation to support the committee's functions are in place.
- (15) Prepare updated RP. Prior to submission of updated RP to the Bank for review and approval, pertinent resettlement information in the updated RP should be disclosed to APs in a form and manner understood by them. This may be in a form of an Information Brochure to be distributed to the APs. The Information Brochure should contain a brief description of the Project, the types of impacts, basic compensation policy and entitlements, implementation schedule, implementing organizations, public consultation mechanisms and grievance procedures, and timing for compensation payments and schedule for clearing



the land required for the Project.

- (16) Coordinate with the independent monitoring organization. Ensure that findings and recommendations made by the IMO are discussed with PMU85 and RCs for appropriate action to ensure that resettlement updating and implementation are undertaken properly and effectively.

DETAILED TERMS OF REFERENCE FOR REPLACEMENT COST SURVEY

I. Objectives of the Assignment

Under the Replacement Cost Survey (RCS) the team shall verify and establish compensation rates for land, crops, trees, structures, and other non-land based income (e.g. fishponds) to ensure that Displaced Persons (DPs) are compensated at replacement costs.

II. Scope of Works

Approach. The establishment of replacement costs will be carried out based on information collected from both Desk research and Direct interviews with people in affected area, both those persons who are affected and those not affected. Desk research will focus on relevant publications, materials of Government authorities, both at central and local levels. However, these materials will play the supporting role only. As the work is aimed at obtaining reasonable replacement costs for different types of affected assets, market evidences are the factors which most strongly base the formulation of these costs. Direct interviews with people in the affected area, both those, whose assets are affected by the Project and those, whose assets are not, will produce reliable data for establishment.

Basis for Valuation. The basis for valuation assessment of both land and real estate should be (i) research and market investigations carried out by the RCS team, (ii) accumulated market evidence already held by the valuation organization, (iii) the results of any valuation surveys carried out by any other organization that is available and (iv) survey maps of the land to be valued and surrounding land. Valuation of land must be undertaken by a licensed Land Valuer.

Data collection. The interviews will be conducted based on a pre-developed interview guide. Sample size will be determined by the RCS team for land, structures and other fixed assets.

Structures: (a) Interviews with owners of structures (main materials they used for their current structures; type of shops where they bought construction materials; distance of transport; origin of the materials (local or overseas); costs of various materials; labor cost); and (b) interviews with construction contractors (main materials which are most used by the local people to build their structures; costs of those main materials; cost of labor; average construction cost (cost per sq.m floor) for different types of houses according to different categories; and (c) validation of provincial construction prices (cost per sq.m floor for each category). Proposed compensation rates for structures will be based on sample of houses in each class to ensure that the rates established cover the whole range of houses in that class.

Land. Price of land will be differentiated based on the use of land, including:

[Handwritten signatures and initials]

Residential land; Garden land; Agricultural land; Land with water surface for fishery cultivation; and Forest land.

The objective of this establishment is to determine whether the provincial prices are sufficient or not to purchase the same quality and quantity of land. The establishment of compensation for the loss of land is based on its market value. The best way to obtain this market value is to gather data of some sales of land, which have just taken place. However, the transfer of land use right does not always go along with such sales, which makes details of such sales not recorded. The team will make their best effort to collect sales evidence to support the verification of provincial prices. In addition, information to base the establishment will be collected from direct interviews with owners of land in Project affected area, including those, whose land is affected and those whose land is not. The interviews will cover the following issues: (i) recent land use rights transfer in the area and (ii) price, at which owners (affected and not affected persons) are willing to sell their land.

Apart from determining the rates for various types of land. The Land Valuer also need to determine the transaction costs involved such as administrative charges, taxes, registration and titling costs. The Land Valuer should bear in mind that when establishing replacement cost for each type of assets, transaction costs should be clearly specified and should be shouldered by the Project.

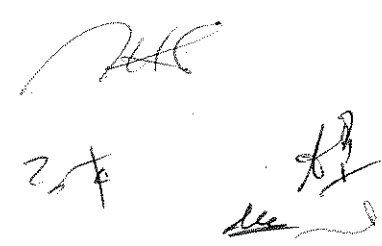
Crops and Trees. The objective of this establishment is to determine whether the provincial prices paid to DPs are equivalent, lower or higher than the average market price. The basis of the establishment is to determine the average market price for each type of crops and trees. The information to base the establishment will be collected from:

- Secondary sources: (a) publications of respective ministries (environment, agriculture, forestry and (b) publications of Price Committee (if available)
- Primary source: (a) interviews with people who own the same crops and trees in the locality. The interviews will cover price, at which owners are willing to sell each type of their crops and trees. The prices for perennial trees will be differentiated by the age of the trees and (b) market, team will investigate the sales price of outputs of different types of crops and trees in the market.

Replacement Cost = Current Market Value + Transaction Cost. Apart from determining the rates for land and non-land assets indicated above. The RCS team also needs to determine the transaction costs involved such as administrative charges, taxes, registration and building permit costs. The RCS team should bear in mind that when establishing replacement cost for each type of assets, transaction costs should be clearly specified to ensure that these expenses or costs are shouldered by the Project and should not be deducted from the compensation payment that each AP will receive. A separate section in the report should present how transaction costs are calculated.

III. Formal Outputs

Based on the activities carried out, the consultant team should (i) present the methodology used and (ii) prepare a table and discuss among the team the unit rates to be applied for the project.



IV. Working Schedule

The tasks for the Replacement Cost Survey will be a critical input to the Detailed Measurement Survey (DMS) to be undertaken to prepare the detailed Resettlement Action Plan. To ensure that the results of the Replacement Cost Survey are available to be incorporated in the DMS it is expected that this work will be undertaken between December 2011 – May 2012 with the following inputs submission schedule:

No.	Output	Hard copies		Date
		Vietnamese	English	
1	Inception report	6	6	1 month after beginning of the assignment
2	Replacement cost survey	6	6	06 month after signing of contract

V. Qualification and Experience Requirements

The team will be composed of one senior social development consultant, at least 2 resettlement consultants and a team of enumerators, statistician and encoders. A licensed Land Valuer must be engaged as part of the team to prepare land valuations that are (i) prepared using internationally accepted methodologies, (ii) reflect market values and clear transaction costs and (iii) are independent.

Each member of the RCS team will have the following minimum qualifications and experience:

- (a) The consultants must hold a university degree with a minimum of Bachelor preferably with a major in social sciences;
- (b) The Land Valuer must hold all required licenses and registrations to practice as a land valuer in Vietnam;
- (c) The consultant must have at least 2 years working in similar field and that have experience in RCS for projects funded by WB or other international sponsors such as ADB;
- (d) Preferably RCS consultants should have experience in the management of projects;
- (e) Consultant must be fluent in written and spoken English.

VI. Client's Inputs

The consultant shall report to the PMU85 and VEC, who will provide, free of charge, the RAPs, and available related documents of the project.

PMU85/VEC will assist in arranging access to, and coordination with relevant departments, local authorities and organizations in the three project provinces of Da Nang, Quang Nam, and Quang Ngai.

Appendix B: Reporting Requirements

Handwritten marks:
A large scribble resembling the letters "AR" is located in the upper right of the footer area.
Below it, the letters "201" are written.
To the right of "201", there is a vertical scribble that appears to be the number "10" with a horizontal line underneath it.

APPENDIX B - REPORTING REQUIREMENTS

The Consultant shall prepare and submit the following reports and documents in English and Vietnamese to Client:

(1) Inception Report

Within one (1) month after commencement of the services of the project, the Consultant shall submit the fifteen (15) copies of an Inception Report for guiding all the consulting services to be undertaken by the Consultant.

(2) Review of Previous Studies and Establishing the Detailed Design Framework

Within two (2) months after commencement of the services, the Consultant shall submit fifteen (15) copies of Review and Detailed Design Framework.

(3) Monthly Progress Reports

The Consultant shall submit fifteen (15) copies of a Monthly Progress Report in the accepted form describing briefly and concisely all activities and progress in the previous month. Problems encountered or problems anticipated shall be clearly stated, together with measures taken or recommendations for their correction. It will also indicate the works to be performed during the coming month.

(4) Environmental and Social Reports

The Consultant shall submit 15 copies of the Environmental Impact Statement, Environmental Management Plan, Ethnic Minority Development Plan (if required) and Resettlement Action Plan.

(5) Land Acquisition Staking Report

The Consultant shall submit 15 copies of Land Acquisition Staking Report to PMU85.

(6) Survey Reports, Design Reports and Prequalification, Tender and Contract Documents

It is expected that the bidding process for each contract package will be started right after the completion of its detailed design and bidding documents.

Continuous detailed design for each contract package until its completion is carried out and the Consultant shall submit design reports, prequalification and tender documents for each contract package. The schedule of document submission is as follows: Within 6 months since the commencement date, the Consultant shall submit 3 sets of draft design report, prequalification and tender documents for the first three contract packages. Until the 12th month since the commencement date, the Consultant shall submit full sets of design reports, prequalification and tender documents for the whole project.

Survey reports, detailed design reports, prequalification and bidding documents prepared by the Consultant shall be submitted to PMU85 who will review the documents and arrange for review of the documents by appropriate authorities. In the review process, the Consultant shall be responsible for making clarifications of the documents to the

authorities. Based on their comments and recommendations, the Consultant shall update, revise and finalize the documents until these documents are approved by relevant authorities.

(7) Road Safety Audit

The Consultant shall submit 15 copies of a Road Safety Audit report setting out (i) issues identified during an safety audit of the expressway design, and (ii) measures taken to address the above issues.

(8) Updating the Environmental Impact Assessment and Management Plan

The Design Consultant is required to deliver interim reports to PMU85/VEC and the World Bank for review and comments. The interim schedule is as follows:

- 2 months after signing the Contract: A brief report on the appropriateness of the proposed alignment, adequacy of socio-environmental impacts assessment and the corresponding mitigation measures.
- 5 months after signing the Contract: Updated draft EIA and EMP reports
- 8 months after signing the Contract: Draft final updated EIA and EMP reports, subject to no final updated EIA and EMP reports for any individual segment being submitted no less than 2 months in advance of completion of detailed engineering design for any individual section or component of the project.

(9) The replacement cost survey

To ensure that the results of the Replacement Cost Survey are available to be incorporated in the Detailed Measurement Survey it is expected that this work will be undertaken between December 2011 – May 2012 with the following inputs submission schedule:

No.	Output	Hard copies		Date
		Vietnamese	English	
1	Inception report	6	6	1 month after beginning of the assignment
2	Replacement cost survey	6	6	06 month after signing of contract

[Handwritten signatures and initials]

Appendix C: Key Personnel and Sub-consultants

Handwritten signature

Time Schedule for Professional Personnel (Key International Professional Staff)

Calendar		2011												2012				Duration	
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Jul	Aug	Staff- Months	
Calendar Year		Basic Design (4)												Detailed Engineering Design and Procurement Planning (10)				14	
Calendar Month																			
Cumulative Month																			
No	TOR	Position	Name	Firm	Home/ Field														
Management Team (MGT)																			
11	1	Project Manager/Team Leader	Ichizuru Ishimoto	NK	[Field]														
Civil Design Team (CID)																			
Civil Design Management (CDM)																			
12	2	Senior Highway Engineer	Akira Magario	NK	[Field]														
13	21	Road Safety Audit Specialist	Takehiko Tsuji	NK	[Field]														
14	5	Senior Bridge Engineer	Yoshinori Abe	Chodai	[Field]														
Section Design (SED)																			
Road Design 1 (RDD1, PKG01,03-08, L=62.3 km)																			
15	3	Highway Engineer 1	Koji Nakai	NK	[Field]														
16	6	Bridge/Structural Engineer 1	Tetsuya Maeda	NK	[Field]														
17	6	Bridge/Structural Engineer 2	Yoshiaki Nakakubo	Chodai	[Field]														
Road Design 2 (RDD2, PKG10-14,16-17, L=66.2 km)																			
18	3	Highway Engineer 2	Decha Sa-ngaunprasith	TEC	[Field]														
19	6	Bridge/Structural Engineer 3	Hiroo Jin	NE	[Field]														
110	6	Bridge/Structural Engineer 4	Yuichi Sano	NK	[Field]														
Interchange Design (ICD)																			
111	4	Senior Interchange Specialist	Chanchai Techashongs	TEC	[Field]														
Major Bridges Design (MBD)																			
112	6	Bridge/Structural Engineer 5	Hiroyuki Yokoyama	Chodai	[Field]														
Tunnel Design (TND)																			
113	11	Tunnel Engineer	Wako Noto	NK	[Field]														
Geotechnical Design (GTD)																			
114	7	Soil/Geotechnical Engineer 1 (Slope)	Manoon Arayasiri	TEC	[Field]														
115	8	Soft Ground Treatment Specialist	Suvichai Methpreechakul	TEC	[Field]														
Drainage Design (DRD)																			
116	23	Drainage Engineer	Suntichai Horpaopan	TEC	[Field]														
Revetment and River Bed Protection Design (RRD)																			
117	23	River Engineer	Arristeeo B. Rabajante	NK	[Field]														
Bridge Temporary Facility Design (TFD)																			
118	6	Bridge/Structural Engineer 6	Akira Yanagisawa	Chodai	[Field]														
Pavement Design (PVD)/Material Sources Survey (MLS)																			
119	9	Pavement/Material Engineer	Bundit Kitsuwanarut	IEC	[Field]														
Topographic Survey (TPS)																			
120	22	Survey Engineer	Kazuhiro Ishizuka	NK	[Field]														
Geotechnical Survey (GTS)																			
121	7	Soil/Geotechnical Engineer 2	Jirarote Piyapompong	IEC	[Field]														
122	23	Geological Engineer (Tunnel)	Seichiro Kanai	NK	[Field]														

AR 2014 43

Time Schedule for Professional Personnel (Key Local Professional Staff)

Calendar	Calendar Year												Duration	
	2012													
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun		Jul
Basic Design/Detailed Engineering Design and Procurement Planning													14	
Basic Design (4)														
Detailed Engineering Design and Procurement Planning (10)														
No	TOR	Position	Name	Firm	Home/Field	2011	2012	2011	2012	2011	2012	2011	2012	Staff-Months
Management Team (MGT)														
L1	1	Co-Project Manager	Le Kim An	NK	[Field]									14
Civil Design Team (CID)														
Civil Design Management (CDM)														
L2	2	Highway Engineer 1 (Geometric)	Tran Dinh Van	NK	[Field]									13
L3	2	Highway Engineer 2 (Road Structure)	Phan Dang Viet Anh	NK	[Field]									13
L4	22	Road Safety Audit Specialist	Tran Quang Huy	NK	[Field]									3
L5	3	Bridge/Structural Engineer 1 (Superstructure)	Le Toan Thang	NK	[Field]									13
L6	3	Bridge/Structural Engineer 2 (Substructure/Foundation)	Dao Ngoc Vinh	NK	[Field]									13
Section Design (SED)														
Road Design 1 (RDD1, PKG01,03-08, L=62.3 km)														
L7	2	Highway Engineer 3 (Geometric)	Le Thi Thanh Thuy	NK	[Field]									12
L8	2	Highway Engineer 4 (Road Structure)	Vu Gia Hung	NK	[Field]									12
L9	3	Bridge/Structural Engineer 3	Do Hong Phuc	NK	[Field]									4
L10	3	Bridge/Structural Engineer 4	Pham Anh Kiet	NK	[Field]									4
Road Design 2 (RDD2, PKG10-14,16-17, L=66.2 km)														
L11	2	Highway Engineer 5 (Geometric)	Nguyen Dinh Trung	NK	[Field]									12
L12	2	Highway Engineer 6 (Road Structure)	Dao Manh Son	NK	[Field]									12
L13	3	Bridge/Structural Engineer 5	Le Kien Cuong	NK	[Field]									4
L14	3	Bridge/Structural Engineer 6	Tran Anh Tuan	NK	[Field]									4
Interchange Design (ICD)														
L15	22	Interchange Specialist	Le Thanh Hung	NK	[Field]									2
Major Bridges Design (MBD)														
L16	3	Bridge/Structural Engineer 7	Pham Ngoc Tuan	NK	[Field]									3
Tunnel Design (TND)														
L17	22	Tunnel Engineer	Tran Phong Nha	NK	[Field]									4
Geotechnical Design (GTD)														
L18	4	Soil/Geotechnical Engineer 1 (Slope)	Quach Thi Thu	NK	[Field]									2
L19	22	Soft Ground Treatment Specialist	Trinh Viet Linh	NK	[Field]									3
Drainage Design (DRD)														
L20	22	Drainage Engineer 1	Nguyen Minh Ngoc	NK	[Field]									7
L21	22	Drainage Engineer 2	Nguyen Phuc Hoa	NK	[Field]									6
Revetment and River Bed Protection Design (RRD)														
L22	22	River Engineer	Nguyen Son	NK	[Field]									2
Pavement Design (PVD)/Material Sources Survey (MLS)														
L23	5	Pavement/Material Engineer 1	Tran Trong Nghia	NK	[Field]									4
L24	5	Pavement/Material Engineer 2	Nguyen Viet Hai	NK	[Field]									4
Topographic Survey (TPS)														
L25	8	Senior Surveyor 1	Vo Thanh Binh	NK	[Field]									6
L26	8	Senior Surveyor 2	Le Van Thu	NK	[Field]									5
L27	8	Senior Surveyor 3	Nguyen Anh Tuan	NK	[Field]									5

Handwritten notes and signatures in the top right corner, including a signature and the number '1'.

No	TOR	Position	Name	Firm	Home/Field	2011												Staff-Months
						Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Geotechnical Survey (GTS)																		
L28	4	Soil/Geotechnical Engineer 2	Nguyen Doan Tinh	NK	[Field]													
L29	4	Soil/Geotechnical Engineer 3	Nguyen Manh Tuan	NK	[Field]													
L30	4	Soil/Geotechnical Engineer 4	Trinh Minh Khiem	NK	[Field]													
L31	22	Geological Engineer (Tunnel)	Tran Ngoc Nhan	NK	[Field]													
Hydrological Survey (HDS)																		
L32	7	Hydraulic Engineer 1	Ngo The Hung	NK	[Field]													
L33	7	Hydraulic Engineer 2	Pham Huu Nhu	NK	[Field]													
L34	22	Inundation Analyst	Nguyen Huy Phuong	NK	[Field]													
Traffic Survey (TRS)																		
L35	14	Transport Economist	Vo Hoang Anh	NK	[Field]													
O&M and ITS Team (OMI)																		
O&M (OAM)																		
L36	18	Operating & Maintenance Specialist	Ha Quoc Hieu	NK	[Field]													
L37	19	Expressway Management Unit Specialist	Le Tung Lañ	NK	[Field]													
L38	22	Traffic Management Specialist	Phan Minh Tuan	NK	[Field]													
L39	22	Asset Management Specialist	Trinh Ngoc Hai Thang	NK	[Field]													
L40	15	Architect 1	Pham Quang Minh	NK	[Field]													
L41	15	Architect 2	Ngo Vu Quang Khoa	NK	[Field]													
Electrical Facility and ITS Design (EID)																		
L42	17	ITS Specialist	Nguyen Huu Tinh	NK	[Field]													
L43	17	Communication System Engineer	To Minh Tri	NK	[Field]													
L44	13	Electrical Engineer 1	Trinh Dinh Khiem	NK	[Field]													
L45	13	Electrical Engineer 2	Vo Hong	NK	[Field]													
L46	22	Toll Collection System Specialist	Bui Phu Huy	NK	[Field]													
Cost and Document Team (COD)																		
Cost Estimate (COS)																		
L47	16	Cost Estimator 1 (Civil Work Packages)	Nguyen Thi Bich Thuy	NK	[Field]													
L48	16	Cost Estimator 2 (Civil Work Packages)	Phan Thi Thuy Trinh	NK	[Field]													
L49	16	Cost Estimator 3 (Other Packages)	Nguyen Thi Sinh	NK	[Field]													
Document (DOC)																		
L50	6	Procurement/Contract Specialist 1	Nguyen The Truong	NK	[Field]													
L51	6	Procurement/Contract Specialist 2	Ha Ngoc Anh Minh	NK	[Field]													
Environmental Team (ENV)																		
Social and Environmental (SAE)																		
L52	9	Senior Environmental Specialist	Pham Van Xuan	NK	[Field]													
L53	21	Environmental Specialist	Pham The Giang	NK	[Field]													
Resettlement (RES)																		
L54	10	Senior Resettlement Specialist	To be named	NK	[Field]													
L55	11	Social and Resettlement Specialist	Ho Thi Thu Thuy	NK	[Field]													
L56	12	Cultural and Archaeological Specialist	Le Duy Son	NK	[Field]													
Training (TRG)																		
L57	20	Training Specialist	To be named	NK	[Field]													
Total															357			

■ : Work in Danang office

■ : Work in Hanoi office

Handwritten signature and date: 2/2/11

Appendix 2: List of Bridges (As of December 2011)

List of Thruway Bridges (As of December 2011)

Jurisdiction	Package	Bridge No.	Km	Bridge Length (include wing)	Bridge Type	Girder Type	
Danang	PKG 1 KM000+000 KM008+000	1	KM001+173	39.9	OP	PC I girder	
		2	KM001+619	737.6	LRB	PC I girder	
		3	KM002+510	175.1	LRB	PC I girder	
		4	KM005+623	109.0	LRB	PC I girder	
		5	KM007+929	18.9	OP	PC Slab beam	
Quang Nam	PKG 2 KM008+000 KM016+880	6	KM009+361	24.9	CB	PC Slab beam	
		7	KM009+852	175.1	LRB	PC I girder	
		8	KM010+271	82.0	VD	PC I girder	
		9	KM010+882	109.0	LRB	PC I girder	
		10	KM011+904	142.1	VD	PC I girder	
		11	KM012+639	82.0	ORB	PC I girder	
		12	KM013+031	30.9	CB	PC Slab beam	
		13	KM013+205	130.1	VD	PC I girder	
		14	KM013+626	33.9	OP	PC Slab beam	
		15	KM014+054	109.0	LRB	PC I girder	
		16	KM014+120	27.9	OP	PC Slab beam	
		17	KM014+710	21.9	OP	PC Slab beam	
		18	KM015+171	109.0	VD	PC I girder	
		19	KM016+549	109.0	LRB	PC I girder	
		20	PKG 3A KM016+880 KM018+100	KM017+662	960.3	MRB	Box
		PKG 3B KM018+100 KM021+500	21	KM018+319	82.0	VD	PC I girder
			22	KM018+608	58.0	VD	PC I girder
			23	KM018+857	82.0	VD	PC I girder
			24	KM019+217	21.9	OP	PC Slab beam
	25		KM019+330	42.9	VD	PC I girder	
	26		KM020+198	100.2	MRB	Box/I girder	
	PKG 4 KM021+500 KM032+600	27	KM021+800	129.9	ORB	PC I girder	
		28	KM023+395	60.2	ORB	PC I girder	
		29	KM023+935	39.9	OP	PC I girder	
		30	KM024+875	79.8	ORB	PC I girder	
		31	KM025+373	28.8	OP	PC I girder	
		32	KM028+015	21.9	VD	PC Slab beam	
		33	KM028+909	24.9	OP	PC Slab beam	
		34	KM029+555	76.0	SB	PC I girder	
		35	KM032+070	21.9	VD	PC Slab beam	
		36	KM032+511	30.9	OP	PC I girder	
	PKG 5 KM032+600 KM042+000	37	KM034+157	76.0	VD	PC I girder	
		38	KM035+488	27.9	OP	PC Slab beam	
		39	KM036+421	58.0	ORB	PC I girder	
		40	KM036+888	33.9	SB	PC I girder	
		41	KM038+347	142.1	LRB	PC I girder	

List of Thruway Bridges (As of December 2011)

Jurisdiction	Package	Bridge No.	Km	Bridge Length (include wing)	Bridge Type	Girder Type
		42	KM039+645	175.1	LRB	PC I girder
		43	KM040+104	36.9	CB	PC I girder
		44	KM041+234	21.9	OP	PC Slab beam
	PKG 6	45	KM042+189	58.0	CB	PC I girder
	KM042+000	46	KM042+463	18.9	OP	PC Slab beam
	KM052+000	47	KM042+723	30.9	OP	PC Slab beam
		48	KM043+656	33.9	CB	PC Slab beam
		49	KM044+435	58.0	ORB	PC I girder
		50	KM045+434	36.9	SB	PC I girder
		51	KM045+599	55.0	CB	PC Slab beam
		52	KM045+892	33.9	LRB	PC I girder
		53	KM047+920	142.1	LRB	PC I girder
		54	KM048+393	33.9	CB	PC Slab beam
		55	KM048+834	21.9	OP	PC Slab beam
		56	KM049+037	21.9	OP	PC Slab beam
		57	KM051+268	21.9	OP	PC Slab beam
	PKG 7	58	KM054+114	42.9	CB	PC I girder
	KM052+000	59	KM054+352	24.9	OP	PC Slab beam
	KM065+000	60	KM054+932	76.0	ORB	PC I girder
		61	KM055+615	142.1	LRB	PC I girder
		62	KM057+091	33.9	ORB	PC I girder
		63	KM057+496	49.9	OP	Super tee
		64	KM058+255	139.9	LRB	PC I girder
		65	KM059+296	22.9	OP	PC Slab beam
		66	KM061+773	49.9	OP	PC I girder
		67	KM062+470	29.9	ORB	PC I girder
		68	KM063+673	21.9	CB	PC Slab beam
		69	KM063+786	42.9	CB	PC I girder
		70	KM064+377	31.9	ORB	PC I girder
	PKG A1	71	KM065+907	82.0	ORB	PC Slab beam
	KM065+000	72	KM066+285	24.9	SB	PC Slab beam
	KM081+150	73	KM066+483	27.9	OP	PC Slab beam
		74	KM067+316	76.0	ORB	PC I girder
		75	KM067+535	30.9	SB	PC I girder
		76	KM068+155	44.9	ORB	PC I girder
		77	KM068+440	307.3	LRB	PC I girder
		78	KM070+385	70.0	CB	PC I girder
		79	KM071+023	27.9	CB	PC Slab beam
		80	KM074+170	30.9	SB	PC I girder
		81	KM074+264	27.9	CB	PC Slab beam
		82	KM075+185	44.9	ORB	PC I girder
	PKG A2	83	KM081+367	39.9	OP	PC I girder
	KM081+150	84	KM082+158	58.0	OP	PC Slab beam

List of Thruway Bridges (As of December 2011)

Jurisdiction	Package	Bridge No.	Km	Bridge Length (include wing)	Bridge Type	Girder Type
	KM099+500	85	KM082+333	82.0	ORB	PC I girder
		86	KM085+743	30.9	OP	PC Slab beam
		87	KM087+710	39.9	CB	PC I girder
		88	KM087+996	106.1	LRB	PC I girder
		89	KM090+466	226.5	CB	PC I girder
Quang Ngai	PKG A3 KM099+500	90	KM099+543	21.9	OP	PC Slab beam
		91	KM101+826	24.9	CB	PC Slab beam
	KM110+100	92	KM104+889	42.9	CB	PC I girder
		93	KM106+578	44.9	CB	PC I girder
		94	KM109+002	408.0	MRB	Super tee
	PKG A4 KM110+100 KM124+700	95	KM109+810	21.9	OP	PC Slab beam
		96	KM110+253	27.9	CB	PC Slab beam
		97	KM110+790	650.7	VD	Super tee
		98	KM112+078	39.9	OP	PC I girder
		99	KM115+980	30.9	SB	PC I girder
		100	KM116+497	27.9	OP	PC Slab beam
		101	KM118+050	42.9	CB	PC I girder
		102	KM119+163	27.9	OP	PC Slab beam
		103	KM120+828	650.7	CB	Super tee
		104	KM121+011	39.9	CB	PC I girder
	PKG A5 KM124+700 KM131+500	105	KM122+778	150.9	CB	Super tee
		106	KM124+090	33.9	OP	PC Slab beam
		107	KM125+385	710.2	MRB	Box girder
108		KM127+070	30.9	CB	PC Slab beam	
109		KM127+192	27.9	ORB	PC Slab beam	
110		KM128+614	30.9	OP	PC Slab beam	
111		KM129+020	33.9	OP	PC I girder	
112		KM129+727	33.9	OP	PC I girder	
113		KM130+294	33.9	CB	PC I girder	

Appendix 3: List of Culverts (As of December 2011)

List of Crossing Structures (As of December 2011)

Jurisdiction	Package	SLNo.	Station	Structure No.		Size
				Road	Water	(m)
Danang	PKG1 Km000+000 Km008+000	1	KM003+053.0	PKG1-RD 01		4.0x3.0
		2	KM003+624.0	PKG1-RD 02		8.0x4.0
		3	KM004+272.0	PKG1-RD 03		4.0x3.5
		4	KM005+243.5	PKG1-RD 04		3.0x2.5
		5	KM005+752.5	PKG1-RD 05		4.5x3.5
		6	KM006+006.0	PKG1-RD 06		3.0x2.5
		7	KM006+302.5	PKG1-RD 07		3.0x2.5
		8	KM007+129.0		PKG1-WT 01	1.5x1.5
		9	KM007+367.0	PKG1-RD 08		4.0x3.0
		10	KM007+380.0		PKG1-WT 02	1.5x1.5
Quang Nam	PKG2 Km008+000 Km017+000	11	KM008+210.0		PKG2-WT 01	2.0x2.0
		12	KM008+741.0	PKG2-RD 01		3.5x3.5
		13	KM009+030.0	PKG2-RD 02		4.0x3.0
		14	KM010+773.0	PKG2-RD 03		3.0x2.5
		15	KM011+280.0	PKG2-RD 04		3.5x3.5
		16	KM011+521.5	PKG2-RD 05		5.0x3.5
		17	KM012+255.0	PKG2-RD 06		3.5x3.5
		18	KM015+782.0	PKG2-RD 07		3.5x3.5
		19	KM016+200.0	PKG2-RD 08		4.0x3.5
		20	KM016+801.0	PKG2-RD 09		5.0x3.5
	PKG3 Km017+000 Km022+000	21	KM019+565.5	PKG3-RD 01		4.0x4.0
		22	KM019+734.0	PKG3-RD 02		2.5x2.5
		23	KM021+100.0	PKG3-RD 03		4.0x3.2
		24	KM021+617.0	PKG3-RD 04		4.0x3.2
	PKG4 Km022+000 Km032+000	25	KM022+252.0	PKG4-RD 01		4.0x3.2
		26	KM023+243.0	PKG4-RD 02		4.0x2.5
		27	KM023+547.0	PKG4-RD 03		3.0x2.5
		28	KM024+228.5	PKG4-RD 04		3.0x4.0
		29	KM024+790.0	PKG4-RD 05		4.0x4.0
		30	KM025+716.5	PKG4-RD 06		4.0x3.0
		31	KM026+003.0	PKG4-RD 07		3.0x2.5
		32	KM026+159.0		PKG4-WT 01	3.0x2.5
		33	KM026+463.5	PKG4-RD 08		4.0x3.5
		34	KM028+330.0		PKG4-WT 02	2.0x2.0
		35	KM029+200.0		PKG4-WT 03	2.0x2.0
		36	KM030+300.0	PKG4-RD 09		3.0x2.5
		37	KM031+282.0	PKG4-RD 10		3.0x2.5
	PKG5 Km032+000 Km042+000	38	KM035+094.0	PKG5-RD 01		4.0x3.0
		39	KM036+605.0	PKG5-RD 02		4.0x3.0
		40	KM037+619.0	PKG5-RD 03		4.0x3.0
		41	KM038+920.0	PKG5-RD 04		5.0x3.5
		42	KM039+145.0	PKG5-RD 05		3.0x2.5

List of Crossing Structures (As of December 2011)

Jurisdiction	Package	SLNo.	Station	Structure No.		Size
				Road	Water	(m)
		43	KM039+864.0	PKG5-RD 06		4.0x3.0
		44	KM041+484.0	PKG5-RD 07		4.0x3.0
	PKG6 Km042+000 Km052+000	45	KM042+400.0	PKG6-RD 01		4.0x3.0
		46	KM043+312.0	PKG6-RD 02		3.0x2.5
		47	KM044+175.0	PKG6-RD 03		3.0x2.5
		48	KM044+740.0	PKG6-RD 04		4.0x3.5
		49	KM045+260.0	PKG6-RD 05		5.0x3.5
		50	KM045+746.0		PKG6-WT 01	2.0x2.0
		51	KM046+174.0	PKG6-RD 06		5.0x4.0
		52	KM046+500.0	PKG6-RD 07		4.0x3.0
		53	KM046+832.0	PKG6-RD 08		3.0x2.5
		54	KM046+832.0		PKG6-WT 01a	2.0x2.0
		55	KM046+872.0		PKG6-WT 02	2.0x2.0
		56	KM047+135.5	PKG6-RD 09		5.0x4.0
		57	KM047+586.0	PKG6-RD 10		5.0x3.5
		58	KM048+767.0		PKG6-WT 03	3.0x2.0
		59	KM049+398.5	PKG6-RD 11		4.0x3.0
		60	KM049+490.0		PKG6-WT 04	2.0x2.0
		61	KM050+413.0	PKG6-RD 12		4.0x3.5
		62	KM050+718.0	PKG6-RD 13		4.0x3.5
		63	KM051+121.0	PKG6-RD 14		4.0x3.0
		64	KM051+134.0		PKG6-WT 05	2.0x2.0
		65	KM051+577.0	PKG6-RD 15		5.0x3.5
	PKG7 Km052+000 Km065+000	66	KM052+077.0	PKG7-RD 01		4.0x3.0
		67	KM052+610.0	PKG7-RD 02		4.0x3.0
		68	KM052+771.0	PKG7-RD 03		3.0x2.5
		69	KM052+990.0	PKG7-RD 04		3.0x2.5
		70	KM053+337.0	PKG7-RD 05		4.0x3.0
		71	KM053+742.0	PKG7-RD 06		4.0x3.0
		72	KM054+791.0	PKG7-RD 07		4.0x3.0
		73	KM055+054.0	PKG7-RD 08		4.0x3.5
		74	KM055+489.0	PKG7-RD 09		4.0x3.5
		75	KM055+839.0	PKG7-RD 10		4.0x3.0
		76	KM055+980.0	PKG7-RD 11		4.0x3.0
		77	KM056+514.0	PKG7-RD 12		5.0x4.0
		78	KM057+296.0	PKG7-RD 13		4.0x3.5
		79	KM057+866.0	PKG7-RD 14		4.0x3.2
		80	KM058+080.0	PKG7-RD 15		4.0x3.2
		81	KM058+747.0	PKG7-RD 16		3.0x3.2
		82	KM060+043.0	PKG7-RD 17		4.0x3.0
		83	KM060+608.0	PKG7-RD 18		4.5x3.5
		84	KM062+735.0	PKG7-RD 19		3.0x2.5

List of Crossing Structures (As of December 2011)

Jurisdiction	Package	SLNo.	Station	Structure No.		Size	
				Road	Water	(m)	
PKGA1 Km065+000 Km081+150		85	KM062+959.0	PKG7-RD 20		4.0x3.5	
		86	KM064+234.0	PKG7-RD 21		3.0x2.5	
		87	KM064+620.0	PKG7-RD 22		4.5x3.5	
			88	KM065+107.0		PKGA1-WT 01	3.0x2.5
			89	KM065+493.0	PKGA1-RD 01		5.0x3.5
			90	KM065+621.0		PKGA1-WT 02	3.0x2.0
			91	KM066+812.0	PKGA1-RD 02		5.0x3.5
			92	KM067+596.0	PKGA1-RD 03		5.0x3.5
			93	KM067+731.0	PKGA1-RD 04		5.0x3.5
			94	KM068+071.5	PKGA1-RD 05		5.0x3.5
			95	KM068+684.0	PKGA1-RD 06		5.0x3.5
			96	KM069+114.0	PKGA1-RD 07		5.0x3.5
			97	KM069+308.0	PKGA1-RD 08		5.0x3.5
			98	KM069+614.0	PKGA1-RD 09		5.0x3.5
			99	KM070+757.0	PKGA1-RD 10		5.0x3.5
			100	KM071+228.0	PKGA1-RD 11		5.0x3.5
			101	KM072+027.0	PKGA1-RD 12		3.0x2.5
			102	KM072+803.0	PKGA1-RD 13		4.0x3.5
			103	KM073+336.0	PKGA1-RD 14		4.0x3.5
			104	KM074+057.0	PKGA1-RD 15		5.0x3.5
			105	KM074+834.0		PKGA1-WT 03	3.0x3.0
			106	KM075+460.0	PKGA1-RD 16		3.0x2.5
			107	KM076+000.0		PKGA1-WT 04	2.0x2.0
			108	KM077+000.0	PKGA1-RD 17		3.0x2.5
	109	KM077+203.0		PKGA1-WT 05	3.0x3.0		
	110	KM077+460.0		PKGA1-WT 06	2.0x2.0		
111	KM078+041.0	PKGA1-RD 18		3.0x2.5			
112	KM079+180.0		PKGA1-WT 07	2.0x2.0			
113	KM079+703.0		PKGA1-WT 08	3.0x2.5			
114	KM080+090.0	PKGA1-RD 19		3.0x2.5			
PKGA2 Km081+150 Km099+500		115	KM081+200.0	PKGA2-RD 01		5.0x3.5	
		116	KM081+503.0	PKGA2-RD 02		3.0x2.5	
		117	KM081+892.0	PKGA2-RD 03		5.0x3.5	
		118	KM082+047.0		PKGA2-WT 01	2.0x2.0	
		119	KM082+489.0		PKGA2-WT 02	5.0x3.5	
		120	KM082+856.0	PKGA2-RD 04		4.0x3.5	
		121	KM084+340.0	PKGA2-RD 05		5.0x3.5	
		122	KM085+136.0	PKGA2-RD 06		4.0x3.5	
		123	KM085+390.0	PKGA2-RD 07		3.0x2.5	
		124	KM086+240.0	PKGA2-RD 08		5.0x3.5	
		125	KM086+808.0	PKGA2-RD 09		7.0x5.0	
		126	KM087+616.0	PKGA2-RD 10		5.0x3.5	

List of Crossing Structures (As of December 2011)

Jurisdiction	Package	SLNo.	Station	Structure No.		Size
				Road	Water	(m)
		127	KM088+377.0	PKGA2-RD 11		5.0x3.5
		128	KM088+520.0	PKGA2-RD 12		5.0x3.5
		129	KM089+501.0	PKGA2-RD 13		5.0x3.5
		130	KM090+045.0	PKGA2-RD 14		3.0x2.5
		131	KM090+287.0	PKGA2-RD 15		6.0x4.5
		132	KM090+830.0	PKGA2-RD 16		4.0x3.5
		133	KM091+002.0	PKGA2-RD 17		3.0x2.5
		134	KM091+394.0	PKGA2-RD 18		5.0x3.5
		135	KM092+078.0	PKGA2-RD 19		5.0x3.5
		136	KM092+208.0	PKGA2-RD 20		6.0x4.5
		137	KM092+360.0		PKGA2-WT 03	7.0x4.0
		138	KM092+615.0	PKGA2-RD 21		3.0x2.5
		139	KM093+041.0	PKGA2-RD 22		3.0x2.5
		140	KM093+364.0	PKGA2-RD 23		5.0x3.5
		141	KM093+591.0	PKGA2-RD 24		5.0x3.5
		142	KM093+900.0	PKGA2-RD 25		3.0x2.5
		143	KM094+118.0		PKGA2-WT 04	5.0x3.5
		144	KM094+617.0	PKGA2-RD 26		5.0x3.5
		145	KM094+961.0		PKGA2-WT 05	3.0x2.5
		146	KM095+413.0	PKGA2-RD 27		3.0x2.5
		147	KM095+516.0		PKGA2-WT 06	3.0x2.5
		148	KM095+827.0	PKGA2-RD 28		5.0x3.5
		149	KM097+238.0		PKGA2-WT 07	2.0x2.0
		150	KM097+450.0	PKGA2-RD 29		5.0x4.5
		151	KM097+849.5	PKGA2-RD 30		5.0x3.5
		152	KM098+622.0	PKGA2-RD 31		4.0x3.5
		153	KM098+712.0		PKGA2-WT 08	3.0x2.0
		154	KM099+224.0	PKGA2-RD 32		5.0x3.5
Quang Ngai	PKGA3 Km099+500 Km110+100	155	KM100+183.0	PKGA3-RD 01		3.0x2.5
		156	KM100+510.0	PKGA3-RD 02		4.0x3.0
		157	KM100+850.0	PKGA3-RD 03		5.0x3.5
		158	KM101+393.0	PKGA3-RD 04		4.0x3.0
		159	KM101+984.5	PKGA3-RD 05		3.0x3.0
		160	KM102+035.0		PKGA3-WT 01a	5.0x4.0
		161	KM102+327.0		PKGA3-WT 01	5.0x4.0
		162	KM102+617.0	PKGA3-RD 06		5.0x3.5
		163	KM102+894.0	PKGA3-RD 07		5.0x3.5
		164	KM103+090.0		PKGA3-WT 02	5.0x4.0
		165	KM103+218.0	PKGA3-RD 08		3.0x2.5
		166	KM103+950.0	PKGA3-RD 09		5.0x3.5
		167	KM104+523.0	PKGA3-RD 10		4.0x3.5
		168	KM105+412.0	PKGA3-RD 11		3.0x2.5

List of Crossing Structures (As of December 2011)

Jurisdiction	Package	SLNo.	Station	Structure No.		Size
				Road	Water	(m)
		169	KM105+640.0	PKGA3-RD 12		5.0x3.5
		170	KM105+867.0	PKGA3-RD 13		3.0x2.5
		171	KM106+075.0	PKGA3-RD 14		3.0x2.5
		172	KM106+176.0	PKGA3-RD 15		4.0x3.5
		173	KM106+368.0	PKGA3-RD 16		5.0x3.5
		174	KM106+695.0	PKGA3-RD 17		5.0x3.5
		175	KM107+600.0	PKGA3-RD 18		3.0x2.5
		176	KM107+829.0	PKGA3-RD 19		5.0x3.5
		177	KM108+102.0	PKGA3-RD 20		5.0x3.5
		178	KM108+269.0	PKGA3-RD 21		4.0x3.5
		179	KM108+622.0	PKGA3-RD 22		5.0x3.5
		180	KM108+846.0	PKGA3-RD 23		3.0x2.5
		181	KM109+479.0	PKGA3-RD 24		5.0x3.5
		182	KM110+070.0	PKGA3-RD 25		4.0x3.0
	PKGA4	183	KM113+152.0		PKGA4-WT 01	3.0x2.5
	Km110+100	184	KM113+860.0		PKGA4-WT 02	2.0x2.0
	Km124+700	185	KM114+407.0	PKGA4-RD 01		4.0x3.5
		186	KM114+652.0	PKGA4-RD 02		3.0x2.5
		187	KM114+933.0	PKGA4-RD 03		4.0x3.5
		188	KM115+338.0	PKGA4-RD 04		3.0x2.5
		189	KM116+227.0		PKGA4-WT 03	3.0x2.0
		190	KM116+566.0	PKGA4-RD 05		5.0x4.0
		191	KM117+766.0	PKGA4-RD 06		4.0x3.0
		192	KM118+325.0	PKGA4-RD 07		3.0x2.5
		193	KM118+925.0		PKGA4-WT 04	2.0x2.0
		194	KM119+551.0	PKGA4-RD 08		3.0x2.5
		195	KM120+003.0	PKGA4-RD 09		4.0x3.0
		196	KM120+538.5	PKGA4-RD 10		5.0x4.0
		197	KM120+664.0		PKGA4-WT 05	3.0x2.0
		198	KM121+241.0		PKGA4-WT 06	3.0x2.0
		199	KM121+548.0	PKGA4-RD 11		5.5x4.5
		200	KM122+231.0	PKGA4-RD 12		5.0x4.0
		201	KM122+453.0	PKGA4-RD 13		3.0x2.5
		202	KM124+260.0		PKGA4-WT 07	2.0x2.0
	PKGA5	203	KM126+045.0	PKGA5-RD 01		5.5x4.5
	Km124+700	204	KM126+634.0	PKGA5-RD 02		5.0x4.5
	Km139+200	205	KM127+534.0	PKGA5-RD 03		3.0x3.0
		206	KM127+911.0	PKGA5-RD 04		3.0x3.0
		207	KM128+167.5	PKGA5-RD 05		4.0x4.0
		208	KM128+780.0	PKGA5-RD 06		4.0x3.5
		209	KM129+894.0		PKGA5-WT 01	3.0x2.0
		210	KM130+763.0		PKGA5-WT 02	3.0x2.5

Appendix 4: List of Communes along the Expressway

List of Communes along the Expressway (As of December 2011)

No.	Province	Contract Package	District	Commune					
				Name	From	To	Length (m)		
1	Danang	PKG01 (Km0 - Km8)	Hòa Vang	Hòa Nhơn	Km0+000	Km1+615	1,615		
2				Hòa Phong	Km1+615	Km2+515	900		
3				Hòa Tiến	Km2+515	Km7+965	5,450		
4	Quang Nam	PKG02 (Km8 - Km16+880)	Điện Bàn	Điện Tiến	Km7+965	Km8+000	35		
5					Km8+000	Km9+574	1,574		
6				Điện Thọ	Km9+574	Km16+880	7,306		
7		PKG03A (16+880 - Km18+100)	Điện Quang		Km16+880	Km17+700	820		
8				Km17+700	Km18+100	400			
9		PKG03B (18+100 - Km21+500)	Duy Xuyên		Km18+100	Km21+115	3,015		
10				Duy Trinh	Km21+115	Km21+500	385		
11					Km21+500	Km22+840	1,340		
12		PKG04 (Km21+500 - Km32+600)	Duy Xuyên	Duy Sơn	Km22+840	Km26+468	3,628		
13					Km26+468	Km29+465	2,997		
14				Quế Xuân	Km29+465	Km32+600	3,135		
15		PKG05 (Km32+600 - Km42)	Quế Sơn		Km32+600	Km34+190	1,590		
16				Phúc Thọ	Km34+190	Km39+650	5,460		
17		PKG06 (Km42 - Km52)	Thăng Bình	Bình Quý	Km39+650	Km42+000	2,350		
18					Km42+000	Km45+420	3,420		
19				Bình Chánh	Km45+420	Km48+416	2,996		
20				Bình Quế	Km48+416	Km49+513	1,097		
21				Bình An	Km49+513	Km50+817	1,304		
22					Bình Quế	Km50+817	Km51+650	833	
23				Bình An	Km51+650	Km52+000	350		
24					Km52+000	Km52+350	350		
25				PKG07 (Km52 - Km65)	Phú Ninh	Tam Thanh	Km52+350	Km55+215	2,865
26						Tam Phước	Km55+215	Km58+270	3,055
27		Tam Vinh	Km58+270			Km60+620	2,350		
28		Tam Thái	Km60+620			Km65+000	4,380		
29			Km65+000			Km66+480	1,480		
30		PKGA1 (Km65 - Km81+150)	Tam Kỳ	Tam Ngọc	Km66+480	Km68+425	1,945		
31	Núi Thành		Tam Xuân 1	Km68+425	Km70+420	1,995			
32			Tam Xuân 2	Km70+420	Km74+835	4,415			
33	Tam Anh		Km74+835	Km81+150	6,315				
34			Km81+150	Km82+395	1,245				
35	Tam Hiệp		Km82+395	Km85+625	3,230				
36	Tam Mỹ		Km85+625	Km92+258	6,633				
37	Tam Nghĩa		Km92+258	Km99+200	6,942				
38	PKGA2 (Km81+150 - Km99+500)		Núi Thành		Km99+200	Km99+500	300		
39				Bình Sơn	Bình Chánh	Km99+500	Km100+285	785	
40		Bình			Km100+285	Km105+800	5,515		
39	Quang Ngãi	PKGA3 (Km99+500 - Km110+100)	Bình Sơn	Bình Chánh	Km99+500	Km100+285	785		
40				Bình	Km100+285	Km105+800	5,515		

List of Communes along the Expressway (As of December 2011)

No.	Province	Contract Package	District	Commune				
				Name	From	To	Length (m)	
				Nguyễn				
41				Bình Trung	Km105+800	Km109+100	3,300	
42				Bình Chương	Km109+100	Km109+600	500	
43				Bình Long	Km109+600	Km110+100	500	
44		PKGA4 (Km110+100 - Km124+700)			Km110+100	Km111+512	1,412	
45			Sơn Tịnh	Tịnh Thọ	Km111+512	Km121+000	9,488	
46				Tịnh Hà	Km121+000	Km124+700	3,700	
47		PKGA5 (Km124+700 - Km131+500)			Km124+700	Km125+200	500	
48			Tư Nghĩa	Nghĩa Kỳ	Km125+200	Km129+905	4,705	
49		PKGA5 (Km124+700 - Km131+500)	TP Quảng Ngãi	Quảng Phú	Km129+905	Km130+175	270	
50			Tư Nghĩa	Nghĩa Điền		Km130+175	Km131+500	1,325
51							Km131+500	Km132+600
52		PKGA5 (Km131+500 - Km139+263)	Nghĩa Hành	Hành Thuận	Km132+600	Km133+100	500	
53			Tư Nghĩa	Nghĩa Điền	Km133+100	Km133+400	300	
54			Nghĩa Hành	Hành Thuận	Km133+400	Km134+640	1,240	
55			Tư Nghĩa	Nghĩa Trung		Km134+640	Km138+365	3,725
56						Nghĩa Thương	Km138+365	Km139+263
	3			13	39			139,263

Appendix 5: List of Crossing of Electrical Lines

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
1	Km0+527.96	36°15'00"	220V	7.123	8	8	12.78	10.55	10.53	4 legged steel				152.52	113.34
2	Km0+24.3	76°12'00"	35KV	8.882	3	2	7.8	9.67	9.68	BTCT			0.35	26.91	49.97
3	Km0+24.3	76°12'00"	TT	8.882	1	0	4.9	5.23	5.25	BTCT	0.25	0.2		26.91	49.97
4	Km0+24.3	77°47'00"	TT	1.973	1	0	4.9	5.23	5.25	BTCT	0.25	0.20		32.07	17.35
5	Km0+583.8	141°39'00"	220V	21.959	3	2	5.7	10.55	10.53	BTCT			0.30	52.96	25.39
6	Km0+592.2	148°42'00"	35KV	21.645	3	2	9.05	9.67	9.68	BTCT			0.35	24.28	33.12
7	Km0+597.7	142°39'00"	TT	21.773	1	0	5.0	5.23	5.25	BTCT	0.25	0.20		24.27	33.12
8	Km0+800	77°23'00"	220KV	6.336	8	8	17.4			4 legged steel				128.11	433.95
9	Km1+570.35	45°05'00"	35KV	1.364	3	2	8.90	9.67	9.68	BTCT			0.35	15.64	129.37
10	Km1+596.59	36°15'00"	110KV	-1.89	8	8		10.55	10.53	4 legged steel				71.56	113.05
11	Km3+050.509	90°33'00"	35KV	3.187	3	2	8.90	9.67	9.68	BTCT			0.35	19.23	29.56
12	Km4+434	69°02'00"	220KV	3.406	8	8	12.7	10.55	10.53	4 legged steel				222.28	190.34
13	Km5+518.75	52°33'00"	220V	4.115	3	2	5.9	10.55	10.53	BTCT			0.30	24.96	22.16
14	Km5+745.8	125°43'00"	35KV	4.935	3	2	8.95	9.67	9.68	BTCT			0.35	24.14	28.09
15	Km7+923	109°03'00"	TT	4.935	1	0	4.3	5.23	5.25	BTCT	0.25	0.20		6.81	36.36
16	Km7+369.65	88°41'00"	35KV	5.167	3	2	9.7	9.67	9.68	BTCT			0.35	8.709	43.799
17	Km7+923	109°03'00"	TT	4.41	1	0	3.5	5.23	5.25	BTCT	0.25	0.20		55.28	25.59
18	Km7+957.70	86°54'00"	220V	3.76	3	2	6.8	10.55	10.53	BTCT			0.30	52.32	10.46
19	Km8+038.00	105°04'48"	15KV	2.971	3	1	11.05	10.49	10.65	BTCT			0.30	58.3	53.55
20	Km8+470.50	92°41'	220V	4.906	2	1	5.06	5.22	4.74	BTCT	0.25	0.20		32.03	4.55
21	Km8+980.00	35°09'	6KV	5.485	3	1	7.08	8.89	8.98	BTCT	0.40	0.20		50.16	29.27
22	Km9+27.00	79°00'	TT	5.515	3	0	4.87	5.30	4.90	BTCT	0.25	0.20		3.70	25.89
23	Km9+43.00	79°02'	220V	5.525	4	1	5.00	6.1	5.93	BTCT	0.30	0.25		37.35	31.07

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
24	Km9+381.30	113°15'47"	6KV	6.859	3	1	9.42	10.61	8.93	BTCT			0.30	73.42	3.73
25	Km9+464.00	29°03'37"	220KV	7.249	8	4	9.87	39.18	40.83	Steel	7.00	7.00		101.10	181.80
26	Km10+330	163°41'	220KV	5.704	8	4	7.56	40.90	40.83	Steel	4.00	4.00		166.14	176.28
27	Km10+554.0	92°12'45"	220KV	5.207	3	1	7.73	8.98	9.30	BTCT			0.30	16.80	79.03
28	Km10+764.5	89°89'	220KV	6.521	4	1	5.17	7.28	7.02	BTCT			0.30	28.67	16.14
29	Km10+770	90°20'01"	TT	6.426	1	0	4.07	4.64	4.81	BTCT	0.20	0.15		10.17	25.93
30	Km13+87.0	103°34'	6KV	5.755	3	1	8.15	8.76	8.97	BTCT			0.30	90.61	8.88
31	Km13+307	18°43'36"	220KV	4.91	8	4	12.96	40.76	45.89	Steel	4.00	4.00		194.67	176.01
32	Km13+620	94°57'	TT	5.91	1	0	4.90	5.21	5.08	BTCT	0.25	0.20		2.17	36.36
33	Km13+637	104°49'	220V	7.063	4	1	8.82	9.37	6.95	BTCT			0.30	5.46	25.73
34	Km13+820	40°06'	220V	6.259	4	1	6.78	7.05	7.00	BTCT			0.30	49.50	48.35
35	Km13+909.5	140°43'	15KV	6.004	3	1	9.44	12.31	10.30	BTCT			0.50	63.56	62.19
36	Km14+112	44°37'	6KV	6.894	7	2	4.99	8.84	8.74	BTCT	0.35	0.25		37.59	23.57
37	Km14+243.5	30°45'	TT	6.672	1	0	4.30	4.57	4.66	BTCT	0.25	0.20		5.25	30.68
38	Km14+276.2	115°57'	220KV	6.674	4	1	6.31	7.25	7.31	BTCT			0.30	24.37	21.14
39	Km14+471.5	111°26'30"	220KV	6.054	4	1	6.81	5.60	7.46	BTCT			0.30	3.15	2.50
40	Km16+200	102°32'	TT	5.216	1	0	4.30	4.91	4.95	BTCT	0.25	0.20		33.55	4.96
41	Km16+205.6	106°58'	220V	4.651	4	1	6.83	7.29	7.39	BTCT			0.30	9.80	44.12
42	Km16+426	54°01'	220V	5.134	2	1	5.77	6.15	6.07	BTCT			0.30	34.65	10.40
43	Km16+631.5	136°41'	220V	5.435	4	1	5.60	6.15	6.19	BTCT			0.30	10.43	33.75
44	Km16+785.5	56°41'	220V	5.831	4	1	6.35	5.71	7.11	BTCT			0.30	20.43	32.90
45	Km16+853.5	150°00'	220V	5.803	4	1	3.62	7.37	7.48	BTCT			0.30	24.70	22.47
46	Km16+863.5	152°46'	TT	5.648	1	0	3.88	4.47	4.32	BTCT	0.20	0		28.40	4.43
47	Km16+880	66°33'	220V	5.443	4	1	4.38	7.41	7.21	BTCT			0.30	12.60	34.40
48	Km18+077.90	87°06'36"	220V	5.01	4	1	7.01	7.21	7.22	BTCT			0.25	39.10	1.30
49	Km18+109.50	75°04'59"	6KV	5.27	3	1	8.42	8.70	8.75	BTCT			0.35	31.96	56.70
50	Km18+214.60	16°10'06"	TT	5.50	4	1	6.5	6.70	6.70	BTCT	0.2	0.2		7.61	2.32

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
51	Km19+208.20	94°54'40"	220KV	6.44	4	1	6.95	7.16	7.22	BTCT			0.25	6.03	2.62
52	Km19+423.20	75°04'59"	250KV	5.29	4	2	14.8	46.3	46.3	Iron	6.5	6.5		42.4	28.55
53	Km19+491.00	90°10'49"	220V	6.16	4	1	5.25	5.43	5.45	BTCT			0.25	7.61	2.32
54	Km19+569.37	95°32'32"	220V	6.34	4	1	6.0	6.3	6.3	BTCT			0.25	18.03	5.57
55	Km20+482.60	70°10'52"	6KV	13.5	3	1	6.3	6.6	6.6	BTCT			0.35	12.72	63.27
56	Km21+471.36	46°15'46"	220V	12.8	4	1	4.09	4.35	4.35	BTCT			0.25	0.68	34.84
57	Km23+229.6	112°00'20"	220V	10.9	4	1	5.7	6	6	BTCT			0.30	0.2	24.48
58	Km23+614.9	95°42'38"	220V	6.70	3	1	5.2	6	6	BTCT	0.25	0.20		19.28	30.10
59	Km23+970	136°11'05"	220V	8.52	4	2	8.30	9	9	BTCT			0.35	7.12	18.96
60	Km24+165.5	80°00'25"	220V	10.57	3	2	9	9	9	BTCT			0.35	30.05	20.37
61	Km24+748	107°00'46"	TT	11.32	4	0	4.8	5	5	BTCT	0.25	0.20		16.59	8.20
62	Km25+221.6	76°33'42"	35KV	8.56	3	2	8.5	9	9	BTCT			0.35	23.01	48.60
63	Km27+428.6	165°12'41"	220V	11.80	4	1	5.3	6.3	6.3	BTCT			0.35	7.62	9.86
64	Km27+572	110°56'00"	35KV	15.22	3	2	8.3	9	9	BTCT			0.35	1.58	41.67
65	Km28+915	47°53'00"	35KV	14.18	3	2	7.5	9	9	BTCT			0.35	36.11	0.7
66	Km30+323	120°30'12"	220V	17.50	2	1	3.5	4.5	4.5	BTCT	0.25	0.2		37.04	15.85
67	Km32+074.96	58°55'53"	220V	19.76	4	1	7.3	7.58	7.6	BTCT			0.25	25.49	9.39
68	Km34+990.37	15°07'29"	6KV	27.91	3	1	11.5	12.4	13.8	BTCT			0.35	10.79	24.7
69	Km35+451.20	83°06'46"	TEL	28.71	5	1	4.18	5.21	5.19	BTCT	0.20	0.17		35.04	1.79
70	Km35+498.34	82°10'06"	6KV	26.70	4	1	7.72	9.38	8.74	BTCT			0.48	52.36	42.19
71	Km37+654.60	98°38'27"	220V	14.27	4	1	6.96	6.81	7.04	BTCT			0.37	46.17	6.17
72	Km40+130.28	81°42'42"	220V	16.01	3	1	8.35	9.47	9.53	BTCT			0.45	46.45	24.39
73	Km41+219.70	108°00'31"	6KV	15.82	5	1	5.69	8.90	9.36	BTCT			0.45	3.35	70.02
74	Km41+242.28	106°50'59"	TEL	15.40	1	1	3.51	6.30	6.17	BTCT	0.15	0.20		3.02	90.85
75	Km41+247.09	106°36'52"	TEL	14.88	5	1	4.58	5.43	5.39	BTCT	0.15	0.20		0.66	23.47
76	Km41+839.20	42°26'30"	6KV	14.66	4	2	7.29	8.85	9.12	BTCT			0.45	47.06	16.93
77	Km41+854.68	42°07'06"	6KV	14.54	1	2	5.88	9.10	9.11	BTCT			0.45	18.82	43.53
78	Km42+020.09	132°15'26"	6KV	14.56	4	2	10.85	10.81	8.87	BTCT			0.45	11.27	74.82
79	Km42+718.33	39°15'18"	TEL	14.56	1	1	6.67	6.60	6.67	BTCT			0.35	43.88	15.85
80	Km42+728.08	51°53'14"	TEL	14.67	3	1	4.57	5.04	6.08	BTCT	0.15	0.20		5.03	30.71
81	Km43+669.69	98°35'45"	6KV	13.39	4	2	6.73	9.96	9.14	BTCT			0.48	42.64	37.82

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
82	Km46+218.01	93°45'31"	TEL	12.08	3	1	4.93	5.17	5.63	BTCT	0.15	0.20		6.42	40.97
83	Km46+218.29	93°45'31"	6KV	12.08	3	1	7.90	8.38	8.59	BTCT	0.40	0.43		60.56	17.83
84	Km47+139.38	104°22'35"	TEL	11.46	2	1	5.00	5.59	5.59	BTCT	0.15	0.20		41.93	22.02
85	Km47+142.54	100°25'1"	220V	11.38	4	1	6.34	6.33	6.00	BTCT			0.35	71.12	43.92
86	Km48+385.85	101°24'45"	TEL	13.52	1	1	3.70	5.55	5.49	BTCT	0.15	0.20		30.01	53.11
87	Km49+027.05	111°9'38"	220V	12.85	4	1	7.80	7.43	7.53	BTCT	0.15	0.20		4.01	42.49
88	Km51+276.06	114°0'20"	TEL	11.77	1	1	5.21	6.80	6.66	BTCT			0.35	59.63	35.59
89	Km51+287.47	118°20'11"	220V	11.73	6	1	3.84	5.00	5.04	BTCT	0.15	0.20		19.77	15.08
90	Km53+7.40	127°23'26"	220V	11.86	4	1	7.15	7.38	7.65	BT			0.20	2.30	44.70
91	Km53+360.00	92°03'50"	220V	12.39	4	1	7.14	7.20	7.45	BT			0.20	17.30	10.70
92	Km53+751.80	83°13'15"	220V	9.74	4	1	7.74	7.20	7.04	BT			0.30	4.90	39.87
93	Km54+072.00	147°52'22"	220V	9.53	4	1	7.37	7.43	6.92	BT			0.20	5.60	20.54
94	Km54+200.00	82°41'12"	DT	8.11	2	0	4.55	5.24	5.35	BT	0.20	0.20		37.10	12.90
95	Km54+216.90	82°41'12"	35KV	8.11	3	1	9.00	9.25	9.26	BT			0.30	61.40	2.37
96	Km54+216.90	82°41'12"	220V	8.11	4	1	6.64	9.25	9.26	BT			0.30	61.40	2.37
97	Km54+515.70	119°54'17"	220V	8.47	4	1	6.39	7.33	7.21	BT			0.20	13.33	45.60
98	Km56+040.00	140°42'55"	220V	6.32	1	0	6.05	6.43	0.00	BT			0.20	6.09	
99	Km56+501.20	87°07'00"	35KV	7.57	3	1	7.01	9.14	9.13	BT			0.30	31.14	19.65
100	Km56+501.20	87°07'00"	220V	7.57	4	1	4.93	6.73	6.81	BT			0.30	31.14	19.65
101	Km56+504.00	87°14'05"	220V	7.92	4	1	6.15	6.21	6.5	BT	0.25	0.30		30.80	17.00
102	Km56+504.00	87°14'05"	DT	7.92	3	1	3.00	6.21	5.08	BT	0.25	0.30		30.80	17.00
103	Km57+495.82	102°31'14"	DT	7.95	3	0	3.00	4.78	4.95	BT	0.15	0.20		33.71	2.49
104	Km57+512.85	102°31'14"	220V	8.73	4	1	6.75	7.11	7.16	BT	0.25	0.30		27.50	12.30
105	Km60+000.00	123°33'39"	35KV	15.35	3	2	9.66	10.88	10.13	BT			0.30	7.34	33.50
106	Km60+000.00	123°33'39"	35KV	15.35	4	2	9.66	10.88	10.13	BT			0.30	7.34	33.50
107	Km60+040.00	111°13'58"	DT	15.82	3	0	3.91	5.61	4.62	BT	0.15	0.20		25.70	11.00
108	Km60+690.00	50°43'09"	500KV	20.53	14	2	14.89	36.08	28.21	Steel				86.60	80.00
109	Km61+780.00	133°14'09"	220v	14.40	4	1	5.74	6.85	6.19	BT			0.25	7.70	22.10
110	Km61+958.00	93°51'50"	DT	12.20	1	0	5.62	4.94	4.89	BT			0.20	8.69	11.38
111	Km62+150.00	93°51'50"	220KV	11.14	8	4	21.22	41.90	47.61	Steel				60.00	103.00
112	Km63+33.12	58°52'12"	220V	9.80	1	0	15.81	7.45	7.08	BT			0.20	10.00	24.00
113	Km63+680.00	54°24'35"	35KV	14.28	3	1	22.73	9.45	9.29	BT			0.30	50.00	56.00
114	Km63+694.50	54°50'49"	35KV	14.34	3	1	7.71	9.35	9.79	BT			0.30	24.00	35.80
115	Km63+795.00	46°07'17"	DT	15.88	5	0	3.35	4.31	5.65	BT	0.15	0.20		51.70	10.80
116	Km64+213.00	137°19'14"	220V	12.04	1	0	4.85	7.31	7.07	BT			0.20	18.80	16.00
117	Km64+637.00	96°44'42"	DT	11.95	1	0	4.86	4.86	4.77	BT			0.20	24.50	7.50
118	Km64+660.00	104°52'58"	35KV	11.90	3	2	8.67	8.95	9.04	BT			0.30	45.30	69.00
119	Km64+660.00	104°52'58"	35KV	11.90	4	2	8.67	8.95	9.04	BT			0.30	45.30	69.00

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
120	Km64+670.00	82°37'00"	110KV	11.86	3	1	12.86	18.50	15.82	BT			2X0.4	77.00	74.70
121	Km66+14.75	78°52'00"	220V	3.99	3	1	5.00	5.60	5.60	BTCT	0.20	0.20		36.58	43.97
122	Km66+118.00	25°25'00"	500KV	4.97	6	2	13.84	34.00	34.00	Iron	8.76	7.32		111.56	100.19
123	Km66+446.90	53°24'00"	TT	4.34	1	0	6.00	6.45	6.50	BTCT	0.20	0.20		15.72	25.87
124	Km66+446.90	53°24'00"	10KV	4.34	3	1	10.00	10.50	10.80	BTCT			0.25	10.79	37.60
125	Km66+452.00	52°04'14"	220V	4.92	3	1	6.00	6.20	6.20	BTCT	0.20	0.20		47.69	0.37
126	Km67+508.00	76°52'53"	220V	2.03	3	1	6.00	6.30	6.35	BTCT	0.20	0.20		14.30	10.16
127	Km67+509.12	77°44'09"	10KV	2.03	3	1	10.00	11.10	10.80	BTCT			0.25	38.80	9.66
128	Km67+599.40	70°38'41"	TT	3.43	1	0	5.00	5.40	5.37	BTCT	0.20	0.20		23.36	13.91
129	Km69+308.91	74°40'32"	TT	5.30	1	0	5.00	5.40	5.35	BTCT	0.20	0.20		27.51	11.18
130	Km69+308.98	61°33'55"	220V	5.66	3	1	5.00	5.60	5.55	BTCT	0.20	0.20		18.44	14.47
131	Km69+384.85	84°29'00"	10KV	3.85	3	1	10.00	10.70	10.70	BTCT			0.25	77.57	43.64
132	Km71+759.00	105°43'00"	10KV	7.51	3	1	10.00	10.50	10.80	BTCT			0.25	59.98	6.68
133	Km73+318.80	56°37'00"	220V	6.05	3	1	6.00	6.55	6.60	BTCT	0.20	0.20		13.20	18.31
134	Km81+325.00	34°34'00"	6KV	13.70	3	1	6.90	8.00	8.80	BTCT			0.25	5.90	35.93
135	Km81+329.00	31°39'00"	TT	13.62	1	0	5.00	5.40	5.35	BTCT	0.20	0.20		15.24	3.76
136	Km81+365.50	51°50'00"	220V	11.65	3	1	7.00	7.30	7.00	BTCT	0.20	0.20		24.80	1.28
137	Km81+325.60	34°53'44"	6KV	13.71	3	1	20.5	7.50	7.50	BTCT			0.30	35.78	5.91
138	Km81+366.00	50°01'40"	220V	11.60	4	1	17.19	7.25	7.25	BTCT			0.20	24.87	1.43
139	Km81+904.5	130°08'23"	220KV	14.43	2	1	19.54	6.50	6.50	BTCT	0.20	0.20		6.14	20.00
140	Km83+118.00	57°10'05"	220V	8.14	2	1	13.59	7.50	7.50	BTCT			0.20	5.48	33.43
141	Km87+577.30	54°30'52"	220V	1.85	2	1	8.33	7.00	7.00	BTCT	0.20	0.20		22.06	30.00
142	Km87+615.40	96°35'27"	220KV	3.52	2	1	9.50	6.90	6.90	BTCT			0.25	28.81	20.00
143	Km87+764.30	118°55'32"	35KV	1.88	3	1	8.53	8.57	8.57	BTCT	0.20	0.35		75.38	8.46
144	Km89+146.09	64°26'46"	6KV	15.77	3	1	24.27	8.80	8.80	BTCT			0.30	19.80	25.00
145	Km89+498.8	70°33'22"	220V	4.06	2	1	11.00	7.50	7.50	BTCT			0.20	39.60	3.70
146	Km91+069.90	160°22'54"	500KV	0.51	4	4	18.48	31.69	31.70	SAT	6.50	6.50		52.78	75.54
147	Km92+315.00	25°59'50"	500KV	1.89	4	4	17.19	31.76	31.70	SAT	5.00	5.00		69.80	81.00
148	Km93+593.50	49°24'46"	220V	7.64	4	1	5.77	6.58	7.22	BT			0.30	18.71	12.95
149	Km93+655.00	165°41'42"	220V	7.47	4	1	6.60	6.87	7.13	BT			0.30	2.53	5.38
150	Km93+869.00	45°18'08"	220KV	12.78	3	2	29.62	31.60	45.56	SAT	5.00	5.00		135.00	85.00
151	Km93+928.00	43°55'58"	110KV	7.29	4	4	35.30	31.60	42.29	SAT	5.00	5.00		136.00	54.10
152	Km95+641.00	100°06'35"	6KV	7.45	3	1	8.19	8.23	8.40	BT			0.35	11.62	37.11
153	Km95+641.00	68°29'11"	6KV	6.22	3	1	6.83	10.29	11.21	BT			0.35	35.46	53.24
154	Km96+308.00	80°05'48"	6KV	8.20	3	1	6.83	7.86	7.86	BT			0.35	16.83	9.11
155	Km97+138.70	102°58'59"	6KV	9.33	3	1	11.24	8.28	7.82	BT			0.35	57.56	34.98
156	Km97+440.00	91°15'09"	6KV	6.41	3	1	8.42	8.60	9.53	BT			0.35	33.83	28.92
157	Km97+814.90	94°08'37"	6KV	15.95	3	1	7.56	8.68	8.73	BT			0.35	1.16	28.29
158	Km97+860.00	13°16'29"	6KV	10.97	3	1	7.45	9.25	9.33	BT			0.35	12.29	3.02

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
159	Km98+840.00	9°36'53"	110KV	13.03	3	2	7.46	17.06	17.43	BT			0.40	19.30	1.55
160	Km99+617.00	91°43'48"	15KV	7.20	3	1	7.73	10.64	8.50	BT			0.35	39.89	25.76
161	Km100+060.00	170°19'27"	110KV	5.26	3	1	16.90	17.93	17.08	BT			0.40	0.19	26.08
162	Km100+000.00	112°33'22"	110KV	2.02	3	2	12.63	30.74	29.43	SAT	6.43	6.43		37.42	204.00
163	Km101+373.70	96°07'50"	15KV	8.77	3	1	7.73	9.00	8.98	BT			0.35	9.28	57.17
164	Km102+683.00	81°31'31"	35KV	2.67	3	1	7.90	8.50	8.50	BT			0.35	24.00	52.13
165	Km103+099.83	93°29'13"	110KV	6.35	3	3	19.15	41.50	41.50	SAT	3.50	3.50		269.04	151.02
166	Km103+257.03	91°11'14"	500KV	18.90	12	1	27.50	32.20	33.00	SAT	9.00	9.00		124.57	287.13
167	Km103+302.70	91°33'10"	500KV	18.81	12	1	29.75	30.00	33.00	SAT	9.00	9.00		172.68	228.07
168	Km104+737.70	47°39'00"	110KV	1.14	3	3	15.33	35.60	35.71	SAT	3.50	3.50		159.61	47.97
169	Km105+694.00	140°37'17"	220V	4.75	4	1	7.10	7.30	7.30	BT			0.25	6.10	19.90
170	Km106+104.93	118°02'22"	220V	1.78	4	1	7.05	7.30	7.30	BT			0.25	10.50	31.30
171	Km106+702.09	128°08'25"	220V	4.61	4	1	7.10	7.30	7.30	BT			0.25	31.30	4.70
172	Km106+759.64	120°37'50"	6KV	4.61	3	1	7.57	8.72	8.72	BT			0.35	25.60	50.40
173	Km107+491.37	20°01'32"	6KV	1.04	3	1	6.39	8.50	8.50	BT			0.35	32.50	2.10
174	Km107+660.42	30°14'43"	220V	5.09	4	1	4.75	5.17	5.17	BT			0.25	0.50	22.20
175	Km107+838.43	105°56'02"	220V	2.52	4	1	6.13	7.07	7.07	BT			0.25	18.90	24.80
176	Km108+097.41	81°21'21"	220V	5.61	4	1	6.06	7.16	7.16	BT			0.25	0.70	39.50
177	Km108+160.40	83°32'27"	6KV	5.80	3	1	7.28	8.50	8.50	BT			0.35	42.70	57.30
178	Km108+262.23	76°30'48"	220V	5.93	4	1	5.59	7.00	7.00	BT			0.25	19.90	27.80
179	Km108+616.11	80°00'36"	220V	3.67	4	1	5.60	7.15	7.15	BT			0.25	0.70	41.19
180	Km109+746.23	105°57'49"	220V	8.67	4	1	5.50	7.00	7.00	BT			0.25	41.60	14.90
181	Km109+853.26	82°27'55"	35KV	3.87	3	1	6.50	7.50	7.50	BT			0.35	78.00	7.90
182	Km114+938.49	73°05'18"	220V	20.18	4	2	6.50	7.02	7.03	BTCT			0.33	33.44	11.09
183	Km119+123.90	116°56'38"	6KV	12.84	3	2	6.50	7.32	7.13	BTCT			0.33	33.13	69.63
184	Km119+740.00	109°42'19"	6KV	19.50	3	2	6.56	7.22	7.33	BTCT			0.33	39.73	60.27
185	Km120+164.30	96°55'24"	220V	14.70	4	1	6.65	7.12	7.16	BTCT			0.33	0.12	45.54
186	Km121+448.46	11°30'33"	220V	16.95	4	1	6.47	7.02	7.03	BTCT			0.33	41.14	8.55
187	Km122+270.30	121°27'18"	220V	15.94	4	1	6.10	7.04	7.03	BTCT			0.33	17.33	31.06
188	Km123+327.84	170°38'13"	6KV	10.72	3	2	6.10	7.24	7.35	BTCT			0.33	79.85	25.16
189	Km124+142.20	30°21'10"	6KV	7.09	3	2	10.50	7.54	7.32	BTCT			0.33	0.54	95.80
190	Km124+376.00	116°16'02"	6KV	6.78	3	2	9.15	7.38	7.21	BTCT			0.33	42.32	29.36
191	Km126+029.00	110°35'28"	220V	8.79	4	1	5.32	5.22	5.44	BTCT			0.29	20.20	20.20
192	Km126+256.80	72°30'27"	6KV	8.14	3		7.81	8.10	8.17	BTCT			0.30	60.00	37.20
193	Km126+339.00	86°25'29"	220V	9.33	4	1	4.80	5.27	5.40	BTCT			0.30	23.50	25.25
194	Km126+611.00	38°35'26"	TT	8.30	1		4.50	5.35	5.44	BTCT	0.27	0.28		6.40	23.00
195	Km127+766.50	48°58'30"	220V	7.07	4	1	6.90	7.03	7.10	BTCT			0.30	7.40	34.30
196	Km127+961.50	86°27'53"	220V	11.88	3		5.22	5.80	5.87	BTCT			0.30	20.00	31.00
197	Km128+207.00	23°50'54"	TT BC	14.32	4	1	6.87	7.10	7.20	BTCT	0.28	0.28		26.17	8.50

ELECTRIC INTERSECTION STATISTICS (As of December 2011)

DANANG - QUANG NGAI EXPRESSWAY DEVELOPMENT PROJECT (Detailed Design Stage)

No.	Station	Intersection angle	Type	I.P Elev.	Wires	Bars	Space Clearance	Pillar high		Type Of pillar	Pillar's dimension			Perpendicular distance	
								Left	Right		Side 1	Side 2	Φ	Left	Right
198	Km128+212.50	23°50'54"	220V	14.06	2		4.92	5.81	5.87	BTCT			0.30	8.50	1.80
199	Km128+412.00	90°00'00"	6KV	12.66	3		9.10	10.60	10.71	BTCT			0.31	15.60	
200	Km129+452.50	61°21'00"	15KV	8.54	3		4.70	6.25	6.33	BTCT			0.31	60.70	20.20
201	Km129+740.30	51°00'00"	35KV	6.83	3		8.80	10.90	11.03	BTCT			0.31	8.70	46.50
202	Km129+874.00	19°52'16"	35KV	6.66	3		7.42	8.01	8.14	BTCT			0.31	7.00	5.65
203	Km130+532.40	58°46'50"	35KV	6.80	3		9.32	9.87	10.02	BTCT			0.32		6.16
204	Km131+794.14	158°00'00"	220V	7.73	4	1	6.80	6.93	7.01	BTCT			0.29	7.85	1.00
205	Km131+896.00	19°32'12"	220V	8.97	4	1	7.60	7.70	7.81	BTCT			0.29	5.30	1.90
206	Km132+043.70	171°49'06"	220V	7.78	4	1	6.60	6.65	6.72	BTCT			0.29	0.90	3.90
207	Km133+323.70	144°40'38"	15KV	5.16	3		8.50	8.55	8.67	BTCT			0.31	45.87	13.38
208	Km133+908.30	68°00'00"	TTBC	5.97	2		5.40	6.10	6.00	BTCT	0.28	0.30		35.35	35.00
209	Km133+912.00	68°00'00"	220V	6.02	4	1	6.70	6.95	7.00	BTCT			0.30	15.86	14.50
210	Km134+934.00	33°05'00"	TT	5.58	12	2	5.60	6.30	6.35	BTCT	0.27	0.28		15.90	A.1.113.70
211	Km135+103.30	93°20'00"	220V	6.31	4	1	7.30	7.45	7.47	BTCT			0.29	4.00	52.00
212	Km135+552.00	115°25'45"	220V	5.59	4	1	5.95	6.11	6.07	BTCT			0.29	7.40	50.20
213	Km136+894.00	117°21'08"	220V	7.73	4	1	4.10	6.35	6.24	BTCT			0.29	48.00	12.00
214	Km137+692.33	91°50'29"	15KV	4.24	3		8.95	9.30	9.25	BTCT			0.31	51.30	0.90
215	Km138+361.30	125°24'00"	15KV	4.08	3		9.00	10.10	10.15	BTCT			0.30	39.50	33.00
216	Km139+118.20	146°24'23"	220V	3.29	4	1	6.00	6.13	6.00	BTCT	0.27	0.26		3.00	21.00
217	Km139+156.55	60°00'00"	220V	3.18	4	1	6.45	7.04	6.95	BTCT			0.28	19.00	23.00
218	Km139+166.57	60°00'00"	35KV	3.23	3		7.30	8.32	8.47	BTCT			0.30	25.00	48.24