Ministry of Transport

Vietnam Expressway Corporation

Project Management Unit No. 85

THE WORLD BANK

IDA Credit No. : 4779-VN
Project ID No. : P106235

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

Project Completion Report (Final Revision) / BáocáoHoànthànhdựán (Bảncuốicùng)

30/12/2014

The Joint Venture of

NIPPON KOEI CO.,LTD.
NIPPON ENGINEERING CONSULTANTS CO.,LTD.
CHODAI CO.,LTD.
THAI ENGINEERING CONSULTANTS CO., LTD.

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Abbreviations

AC	:	Appraisal Consultant
AIDS	:	Acquired Immune Deficiency Syndrome
AM	:	Ante Meridiem
AP	:	Affected Person
B/D	:	Basic Design
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
DDC	:	Detailed Design Consultant
D/D	:	Detailed Engineering Design
DE	:	Deep Excavation
DEG	:	Design Group
DMS	:	Detailed Measurement Survey
DN	:	Danang city
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
EOI	:	Expression of Interest
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, FS	:	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	:	PostMeridiem
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
QN	:	Quang Nam province
QNg	:	QuangNgai province
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

Part A: General

1. BACKGROUND

1. 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.

2. 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.

3. 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/BQl-KHDA2 dated June 13, 2009.

4. In response to the supplemental study, WB engaged an international consultant, CPCS[1] of Canada, 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.

5. 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.

6. 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.

7. In April 2014, after issuance of several times of Addendums to the original contract which are mainly for extension of the period of the consulting services, the Consultant has completed his duties, except the social environmental, as shown in this report.

8. This report summarizes the results of the consulting services for the detailed design forDanang–QuangNgai Expressway Development Project (DQEDP).

[1]http://www.cpcs.ca/en/

2. PROJECT OUTLINE

2.1 Project Location

9. 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 QuangNgai 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 QuangNgai 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 QuangNgai 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.

10. Project location map is shown in cover page.

2.2 Objectives of the Project

11. The objective of the Project is to meet increasing traffic demand, to reduce travel time and uncertainly for passenger users and freight, and to enhance travel safety for road users, by constructing an expressway from Da Nang to QuangNgai – a top priority section of the North-South Expressway, thereby contributing to economic growth and international competitiveness of Da Nang City and Central Vietnam.

2.3 Scopes of the Project

12. Major features and facilities of the expressway is summarized in Table 2.1.

13. Major features and facilities of the expressway of each package is shown in Appendix-1

14. Contract packages of the Project were divided into 13 civil works contract packages, ITS/O&M packages and Traffic Safety/Lighting packages as shown in Table 2.2.

15. Sub-division of PKG13 into PKG13A/13B/13C is still under discussion as of December 2014.

Table 2.1 Major Features and Facilities of Expressway

No.	Items	Main Features
1	Road Length	139.204 km By Road Class: Expressway section: 131.500 km, Linking road section: 7.704 km By Jurisdiction: Danang city: 8.0 km, Quang Nam province: 91.3 km, QuangNgai province: 39.904 km Beginning Point (BP): Intersection of the existing Danang bypass and NH14B in Danang city Ending Point (EP): Connecting point with the planned city ring road at the existing NH1A (KM1063+700) in QuangNgai province
2	Road Classification	Expressway: Type A, Class 120, Linking Road: Class III, Delta
3	Design Speed	Expressway: 120 km/h, Linking Road: 80 km/h
4	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
5	Road Width	Expressway: Road section: 25.5m, Bridge sections: 25.5m (PC-Box: 26.0m), Tunnel section: 2@12.75 m, Linking Road: 12.0 m
6	Design Frequency	DHWL (Design High Water Level): Expressway: 1 %, Linking Road: 4 %
		Pavement Drainage: 4%
		Bridge Deck Drainage: 4%
7	Bridge	104 bridges (L=9,226.81 m) Large River Bridge (LRB, L>100 m):13 bridges (L=2,137 m), Other River Bridge (ORB, L<100 m):27 bridges (L=1,482.0 m), Canal Bridge (CB): 12 bridges (L=539.1 m), Viaduct (VD):13 bridges (L=2,780 m), Overpass (OP): 23 bridges (L=1,156.41 m), Interchange Rampway Bridge (IRB):5 bridges (L=427.6 m), Flyover (FO): 11 bridges (L=704.7 m)
8	Major River Bridge	4 bridges (L=2,724.90 m) Thu Bong River (KM017+503): Ky Lam Bridge (L=1,044.80 m), Ba Ren River (KM020+209): Chiem Son Bridge (L=451.10 m), Tra Bong River (KM109+001): Tra Bong Bridge (L=454.50 m), TraKhuc River (KM125+367): TraKhuc Bridge (L=774.50 m)
9	Tunnel	1 tunnel (KM022+900, North Bound L=556m & South Bound L=551 m)
10	Culvert	561 culverts Culvert Box: 320 culvert boxes (125 roadway culverts and 195 waterway culverts), Culvert Pipe: 241 culvert pipes
11	Softground	24.206 km (FS: 4.190km)
12	Interchange	8 interchanges (KM0+000:Tuy Loan IC, KM13+260:My Son IC, KM40+880:Ha Lam IC, KM64+510:Tam Ky IC, KM82+990:Chu Lai IC, KM101+740:Dung Quat IC, KM123+700:Quang Ngai North IC, KM130+502:Quang Ngai IC)
13	Frontage Road	Approximately 59.7km
14	Earth Works	Soil excavation: 5,161,829 m^3, Rock excavation: 4,655,367 m^3, Filling: 9,817,196m3
15	Electrical Facilities	Power supply, road lighting, tunnel ventilation and safety facilities
16	ITS	Traffic management, toll collection and communication systems
17	O&M Building	26 locations Main Management Center (MMC): 1 location, Management Office (MO):2 locations, Toll Office (TO):9 locations, Toll Barrier (TB): 2 locations, Toll Gate (TG): 7 (initial stage) locations, Service Area (SA):1 location, Parking Area (PA): 4 locations
18	O&M Equipment	O&M vehicles, spare parts, maintenance equipment and consumables

Table 2.2Contract Packaging of the Project

Work	Jurisdiction	No.	Section	Length (km)	Fund	
					JICA	WB
Civil	Danang	PKG1	KM000+000 - KM008+000	8.000	X	
	Quang Nam	PKG2	KM008+000 - KM016+880	8.880	X	
		PKG3A	KM016+880 - KM018+100	1.220	X	
		PKG3B	KM018+100 - KM021+500	3.400	X	
		PKG4	KM021+500 - KM032+600	11.100	X	
		PKG5	KM032+600 - KM042+000	9.400	X	
		PKG6	KM042+000 - KM052+000	10.000	X	
		PKG7	KM052+000 - KM065+000	13.000	X	
		PKG A1	KM065+000 - KM081+150	16.150		X
		PKG A2	KM081+150 - KM099+500	18.350		X
	QuangNgai	PKG A3	KM099+500 - KM110+100	10.600		X
		PKG A4	KM110+100 - KM124+700	14.600		X
		PKG A5	KM124+700 - KM131+500	6.800		X
			KM131+500 - KM139+204	7.704		X
ITS/O&M	Building Works	PKG 13A	KM000+000 - KM139+204	139.204	X	
	Equipment	PKG 13B				
	ITS Works	PKG 13C				
Traffic Safety/ Lighting	DN-Tam Ky	PKG 14A	KM000+000 - KM065+000	65.000	X	
	Tam Ky-QNg	PKG 14B	KM065+000 - KM139+204	74.204		X
Consulting Services	Danang– QuangNgai		KM000+000 - KM139+204	139.204		X

2.4 Project Structure

16. Vietnam Expressway Corporation (VEC) is executing agency (EA), and Project Management Unit No.85 (PMU85) is implementation agency (IA) for the project.Overall project structure is shown in Figure 2.1.

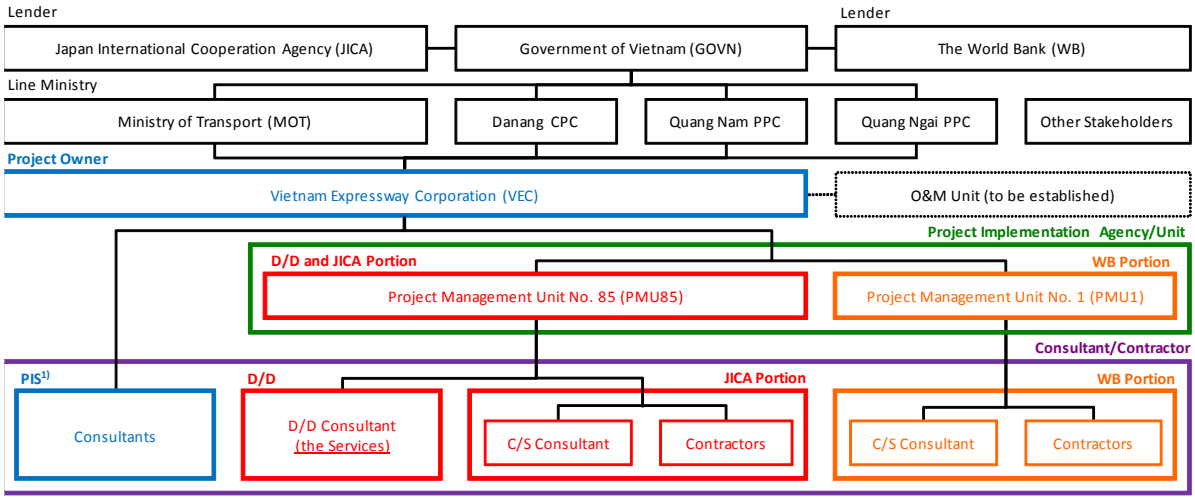


Figure 2.1Overall Project Structure

17. Figure 2.2 shows organization of VEC.
18. Figure 2.3 shows project organization of PMU85.

ORGNIZATION CHART OF VEC (subject to Business Law)

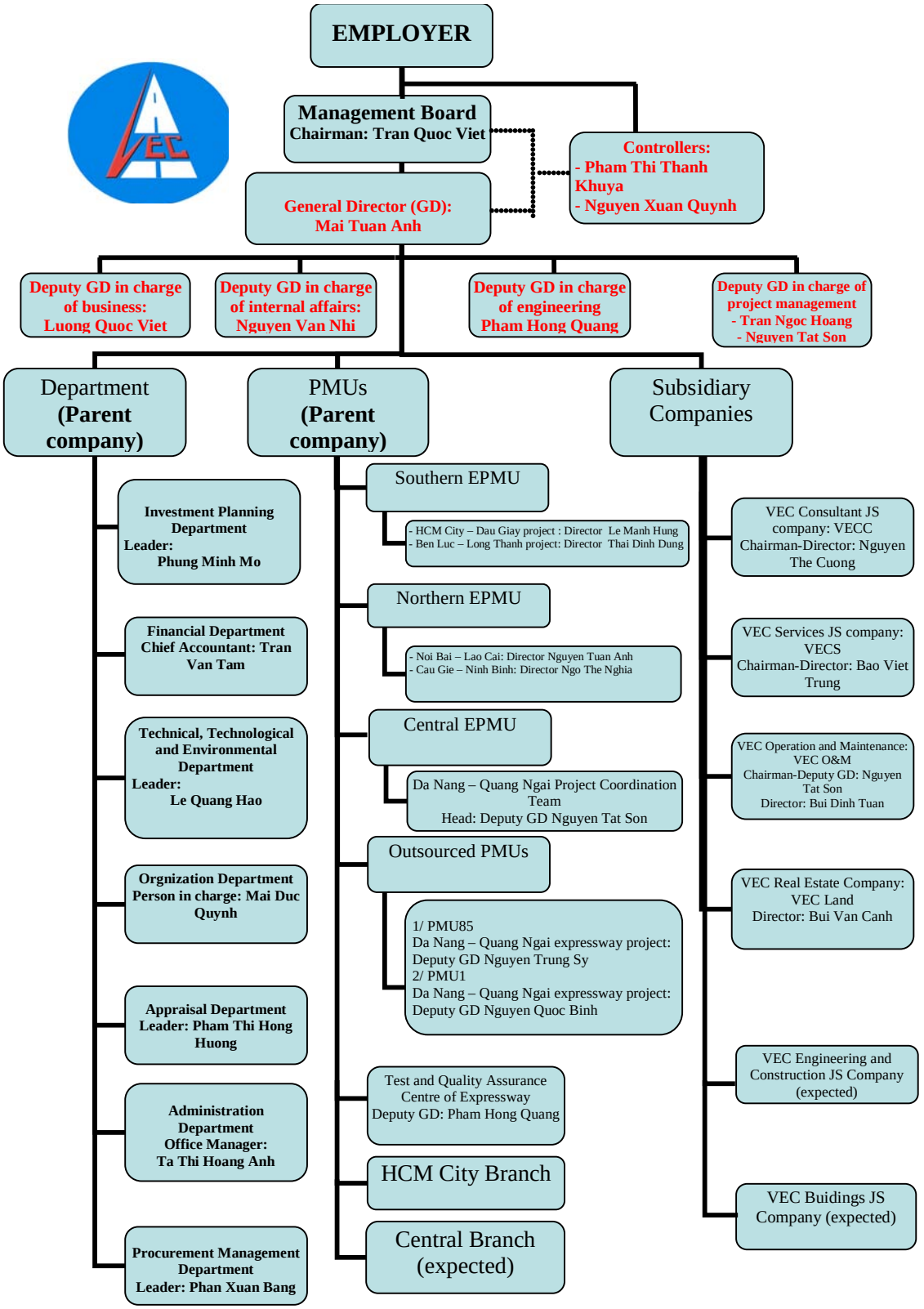
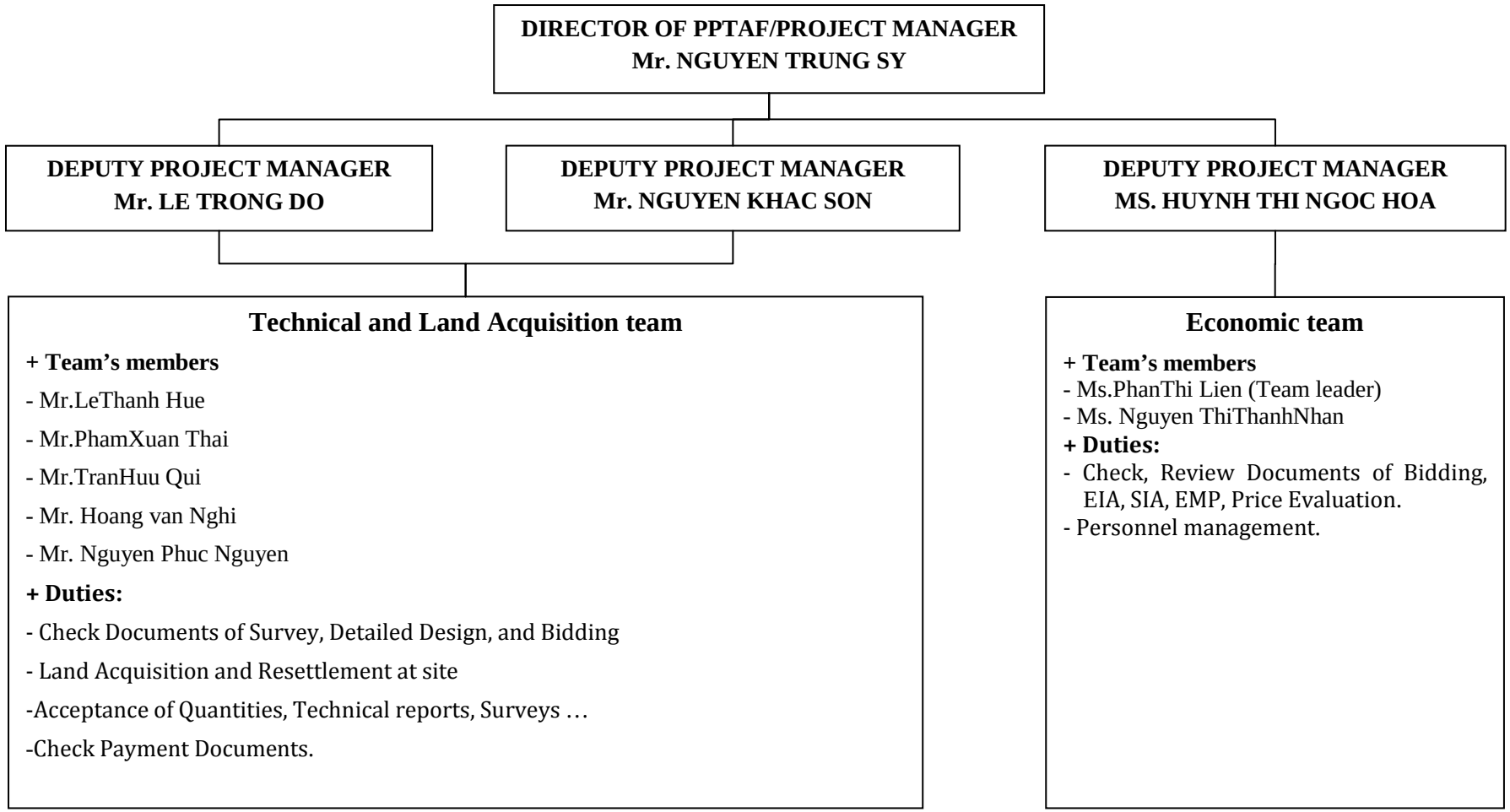


Figure 2.2VEC Organization



Source: Letter No.129-BQL-DNQN dated 30 May 2012 from PMU85 &1777/TB-BQL dated 13 November 2012

Figure 2.3PMU85 Project Organization

2.5 Implementation Program

19. The construction and construction supervision will be carried out under JICA and WB loan separately.The first package of the construction is Package 3A and commenced the construction work on 19 May 2013. Other packages have been commenced time to time as shown in Figure 2.4.

No.	Items			Months	2011	2012	2013	2014	2015	2016	2017	2018
1	**Common**											
11	Loan Sign/	JICA		-----								
12	Effectiveness	WB		-----								
2	**D/D (Whole Sections, the Services)**											
21	Design Works	Basic Design Works	Original (Inception Report)	7								
22			Actual	19								
23		Detailed Design Works	Original (Inception Report)	11								
24			Actual (Civil Works)	22								
25			Actual (ITS/Safety/Lighting Works)	23								
26	Land Acquisition and Resettlement		Original	10								
27			Actual (Civil Works)									
3	**Procurement**											
31	Bidding (JICA)	Civil Work (PKG1~7)	Original (Inception Report)	10 for each 18 for total								
			Actual	28								
32		ITS Work (PKG 13A: Building) / ITS Work (PKG 13B: Vehicles&Equipment) / ITS Work (PKG 13C: ITS Works) / Traffic Safety&Street Lighting (PKG14)	To be carried out during construction stage.									
33	Bidding (WB)	Civil Work (PKGA1~A5)	Original (Inception Report)	10 for each 18 for total								
			Actual	25								
34		Traffic Safety&Street Lighting (PKG14)	To be carried out during construction stage.									
4	**Construction (JICA Portion)**			58								
41	Procurement	C/S Consultant (ICB)	Original (Inception Report)	6								
			Actual	15								
42	Construction Supervision by Consultant	Civil Work PKGs(PKG1-7)	Original (Inception Report)	52								
			Actual	52								
43		Elec./O&M/ITS PKGs (PKG13A/13B/13C)	B/D Review	Original (Inception Report)	6							
				Actual								
44			Procurement (ICB)	Original (Inception Report)	7.5							
				Actual								
45			C/S	Original (Inception Report)	30							
				Actual								
46	Construction Works	Civil Work PKGs	1st Priority: PKG3a	Original (Inception Report)	42							
				Actual								
47			2nd Priority	Original (Inception Report)	42							
				Actual								
48			Non-priority	Original (Inception Report)	36							
				Actual								
49		O&M Buildings/O&M Vehicles/ ITS Works (PKG13A/13B/13C)		Original (Inception Report)	30							
				Actual								
49A		Traffic Safety/Street Lighting (PKG14A)		Actual								
5	**Construction (WB Portion)**			50								
51	Procurement	C/S Consultant (ICB)	Original (Inception Report)	6								
			Actual									
52	C/S by Consultant	Civil Work PKGs	PKGA1-A5	Original (Inception Report)	44							
				Actual								
53		Traffic Safety/Street Lighting (PKG14B)		Actual								
54	Construction Works	Civil Work PKGs	2nd Priority: PKGA4	Original (Inception Report)	42							
				Actual								
55			Non-priority: PKGA1-A3, A5	Original (Inception Report)	36							
				Actual								
56		Traffic Safety/Street Lighting (PKG14B)		Actual								

Figure 2.4Implementation Schedule

3. OUTLINE OF THE CONSULTING SERVICES

3.1 Chronicle of Procurement of the Design Consultant

20. Chronicle of the procurement of the design consultant can be summarized as shown in Table 3.1.

21. It should be noted that early commencement of the topographic survey works was agreed during the first contract negotiation in order to finalize the site work of the survey works before rainy season which usually starts late September every year.

Table 3.1Chronicle of Procurement of Design Consultant

No.	Date	Event
1	25.03.2009	Announcement of EOI by PMU85
2	20.04.2009	Deadline of Submission of EOI
3	06.02.2010	Issuance of RFP
4	26.02.2010	Pre-proposal Conference
5	19.04.2010	Issuance of Revised RFP (Addendum No.1)
6	28.05.2010	Issuance of Revised RFP (Addendum No.2)
7	01.06.2010	Deadline of Submission of Proposal
8	20.04.2011	WB issued NOL to VEC
9	16-26.05.2011	Contract Negotiation (1st)
10	15.07.2011	Commencement of Survey Works
11	20.09.2011	Contract Negotiation (2nd)
12	15.10.2011	Contract Negotiation (3rd)
13	15. 11.2011	Contract Sign
14	18.11.2011	Issuance of NTP
15	01.12.2011	Commencement of Services

3.2 Objectives of the Consulting Services

22. The consulting services for detailed design for Da Nang – QuangNgai (DNQN) expressway development project comprises of the following three (3) objectives:

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

II. 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

III. 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.

3.3 Scope of the Consulting Services

23. Expressway Design and Procurement is designed to assist Vietnam Expressway Corporation (VEC), said executing agency (EA), and Project Management Unit No.85 (PMU85), for DNQN expressway construction project, said implementation agency (IA) to implement pre-construction activities for the project.

24. The scope of the consulting services broadly consists of the following works:

I. Review of previous studies.

II. Detailed engineering design including cost estimation and preparation of tender documents and other supporting documentation.

III. Assistance with calling and assessing tenders for works and for contract negotiations.

3.4 Consulting Service Contract

25. Contract No. 01/DD-EDDQP/2011 is made on 15th November 2011 (the Original Contract) for Consulting Services for Detailed Design for Expressway Development (Da Nang –QuangNgai)

Project between PMU85 and a joint venture of Nippon Koei Co., Ltd. – Nippon Engineering Consultants Co., Ltd. –Chodai Co., Ltd. – Thai Engineering Consultants Co., Ltd. (the Consultant) as shown in Table 3.2.

Table 3.2Consulting Service Contract

Item	Description
Contract Title	Consulting Services Contract for Detailed Design (No.01/DD-EDDQP/2011)
Employer Name	Project Management Unit No. 85 (PMU85)
Consultant Name	The Joint Venture of Nippon Koei Co., Ltd. – Nippon Engineering Consultants Co., Ltd. –Chodai Co., Ltd. – Thai Engineering Consultants Co., Ltd.
Contracted Date	15 November 2011
Contract Period	1 December 2011 – 30 June 2014 (by Addendum No.6)
Notice to Proceed	PMU85 letter No. 1622/PMU85-PP2 datedNovember 18, 2011
Commencement of Services	1 December 2011

3.5 Terms of Reference (TOR)

26. Terms of reference (TOR) in the consulting service contract consists of the contents shown in Table 3.3.

Table 3.3 Scope stipulated in TOR

TOR Clause	Item			Title
3.1				General
3.2				Review of Previous Studies and Establishing the Detailed Design Framework
		(1)		Review Previous Studies
		(2)		Establish Detailed Engineering Design Framework
3.3				Detailed Engineering Design and Procurement Planning
	3.3.1			Packaging
	3.3.2			Surveys and Investigations
		(1)		Data collection
		(2)		Surveys
			(i)	Topographic survey
			(ii)	Survey of hydrographical data
			(iii)	Engineering geological survey
			(iv)	Material Source Survey
			(v)	Survey of other relevant structures
			(vi)	Additional Traffic Surveys
			(vii)	Independent Land Valuation Survey
			(viii)	Environmental and Social Surveys
	3.3.3			Detailed Design of Road, Bridges and Other Structures
		(1)		Comparative Analysis
		(2)		Review of Previous studies with Survey Results
		(3)		Maintain Records of Changes in Features of the Project
		(4)		Detailed Engineering Designs
		(5)		Drafting of Engineering Drawings
		(6)		Work Quantities with Agreed Form and Content of Bill of Quantities (BOQ)
		(7)		Road Safety Audit
		(8)		Detailed Design of Service Areas
		(9)		Detailed Design and Construction Supervision of Resettlement Area

TOR Clause	Item			Title
		(10)		Documentation for Land Acquisition Staking
	3.3.4			Study and Design of ITS and Toll Collection System
		(1)		Concept Design
			a	Identification of potential data and information needs
			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
		(2)		Basic Design and Cost Estimate
			a	Central Control and Operation Center and Branch Offices (Building)
			b	ITS facilities other than Toll Collection Facilities
			c	Toll Collection Facilities
			d	Communication Facilities
	3.3.5			Expressway Operations and Maintenance (O&M)
			a	Expressway Management Unit (EMU)
			b	Office and Facilities for EMU
			c	Bidding Documents for O&M Facilities
	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)
	3.3.7			Construction Method and Schedule
	3.3.8			Cost Estimate
			a	Bills of Quantities (BOQ)
			b	Cost Estimate (Each Package)
			c	Total Project Cost
			d	Annual Disbursement Schedule
	3.3.9			Pre-qualification, Bidding and Contract Documents
	3.3.10			Preparation of Implementation Program
3.4				Procurement Assistance
		(1)		Procurement Plan
		(2)		Pre-Qualification and Bidding Documents
		(3)		Assistance to Pre-Qualification
		(4)		Assistance to Bidding
		(5)		Assistance to Contract Negotiation
3.5				Staking forLand Acquisition
3.6				Training and Technology Transfer
				Reports and Documents
		(1)		Inception Report
		(2)		Review and Detailed Design Framework Report
		(3)		Monthly Progress Reports
		(4)		EIA, EMP, EMDP, RAP Reports
		(5)		
			(i)	Design Reports
			(ii)	Pre-Qualification Documents
			(iii)	Bidding Documents
		(6)		Road Safety Audit Reports

TOR Clause	Item			Title
				Consultant Personnel
5.1				Key Consultant Personnel
5.2				Key Local Personnel
				Undertakings of PMU85 - MOT
		(1)		Arrange for Necessary Meetings with Local Authorities
		(2)		Assist in Procedures with Other Relevant Authorities
		(3)		Assist the Consultant to Collect Data from Relevant Authorities
				Obligations of the Consultants
				Updating the Environmental Impact Assessment and Management Plan for the Proposed Danang to QuangNgai Expressway Project Detail Design Stage
				Resettlement Study Methodology Preparation of an Updated Resettlement Plan

3.6 Additional Scope to TOR

27. At the initial stage of the services, it was confirmed that some scope, which were not clearly required in the TOR of the consulting service contract. The consultant proposed to carry out scope shown in Table 3.4, and the client agreed.

Table 3.4 Additional Scope to TOR

No.	Additional Scope	Description
1	Inundation Analysis	- Some sections of the expressway located flood areas and inundated almost every rainy season. - The Consultant carried out inundation analysis and studied the impact of building the expressway crossing such areas. - A long viaduct (L=780m) was allocated at DienQuang commune, Dien Ban district, Quang Nam province, in order to minimize the negative impact of expressway during rainy seasons.
2	Basic Design (Updating F/S)	- The feasibility study reportwas finalized by TEDI in April 2010 and approved by MOT in Decision No. 2656/QD-BGTVT dated September 10, 2010. - The Consultant identified several critical design controls, during the "Review of Previous Studies" stage, which were missing in TEDI F/S (April 2010). - The Consultant thoroughly revised the TEDI F/S and submitted "Basic Design Report" including modifications of the alignment, location and type of interchanges, typical cross section, and bridge types.
3	Electrical Design	- Electrical engineer is nominated in the TOR, however, no work description stipulated in the TOR. - The Consultant carried out necessary electrical design including relocation of HVL and street lighting.

28. During the implementation of the services, many additional works had been carried out in accordance with the instruction by the client.

29. The consultant made 27 contractual claims for the additional works and nine (9) items were approved by MOT as shown in Table 3.5.

30. Those additional works had been carried out through whole of the service period, and made negative impact on the progress of the design works, as shown in Figure 3.1

Table 3.5List of All Additional Works

No.	Additional Work Item	Survey	Design	RAP	MOT Approved
01	Modification of Alignment	Yes	Yes	Yes	Yes
02	Detailed Design of Ky Lam Bridge	---	Yes	--	---
03	Basic Design of Road Cross Structures	---	Yes	--	---
04	Basic Design of Other Bridges	---	Yes	--	---
05	Additional Study on Tuy Loan IC	Yes	Yes	Yes	---
06	Study on Temporary Access Roads	Yes	Yes	---	---
07	Additional Depth of Bearing Layer of Ky Lam Bridge	Yes	---	---	---
08	Additional O&M Buildings	Yes	Yes	--	---
09	Additional Topographic and Environmental Survey at Populous Residential Areas	Yes	Yes	---	Yes
10	Supplemental Socio-Economic Survey	---	---	Yes	---
11	Detailed Hydrological Analysis with Additional Elevation Survey	Yes	Yes	---	---
12	Additional Length of Softground Sections	Yes	Yes	--	Yes
13	Chu Lai IC (New Location)	Yes	Yes	---	---
14	Detailed Design of Chiem Son Bridge and TraKhuc Bridge	---	Yes	---	---
15	Additional Boring at ORB00a	Yes	---	---	---
16	Binh Son IC (Diamond Type)	---	Yes	---	---
17	Re-alignment at Major Cemeteries	Yes	Yes	Yes	Yes
18	Detailed Design of Type of Other Bridges	---	Yes	--	---
19	Relocation of QuangNgai North IC	Yes	Yes	---	Yes
20	Handbook for Income Restoration Program	---	---	Yes	---
21	Existence of Underground Void Space	Yes	---	--	---
22	Avoidance of High Voltage Lines (HVLs)	Yes	Yes	--	---
23	Preliminary Design of Dung Quat 2 IC	Yes	Yes	---	Yes
24	Change of Pavement Structure, Application of ATB/CTB	Yes	Yes	--	Yes
25	Shift of Parking Area at Package A2	Yes	Yes		---
26	Preliminary Study on Connecting Plan between DQE and PR620	---	Yes	---	---
27	Additional Office Operation Cost	---	---	---	Yes

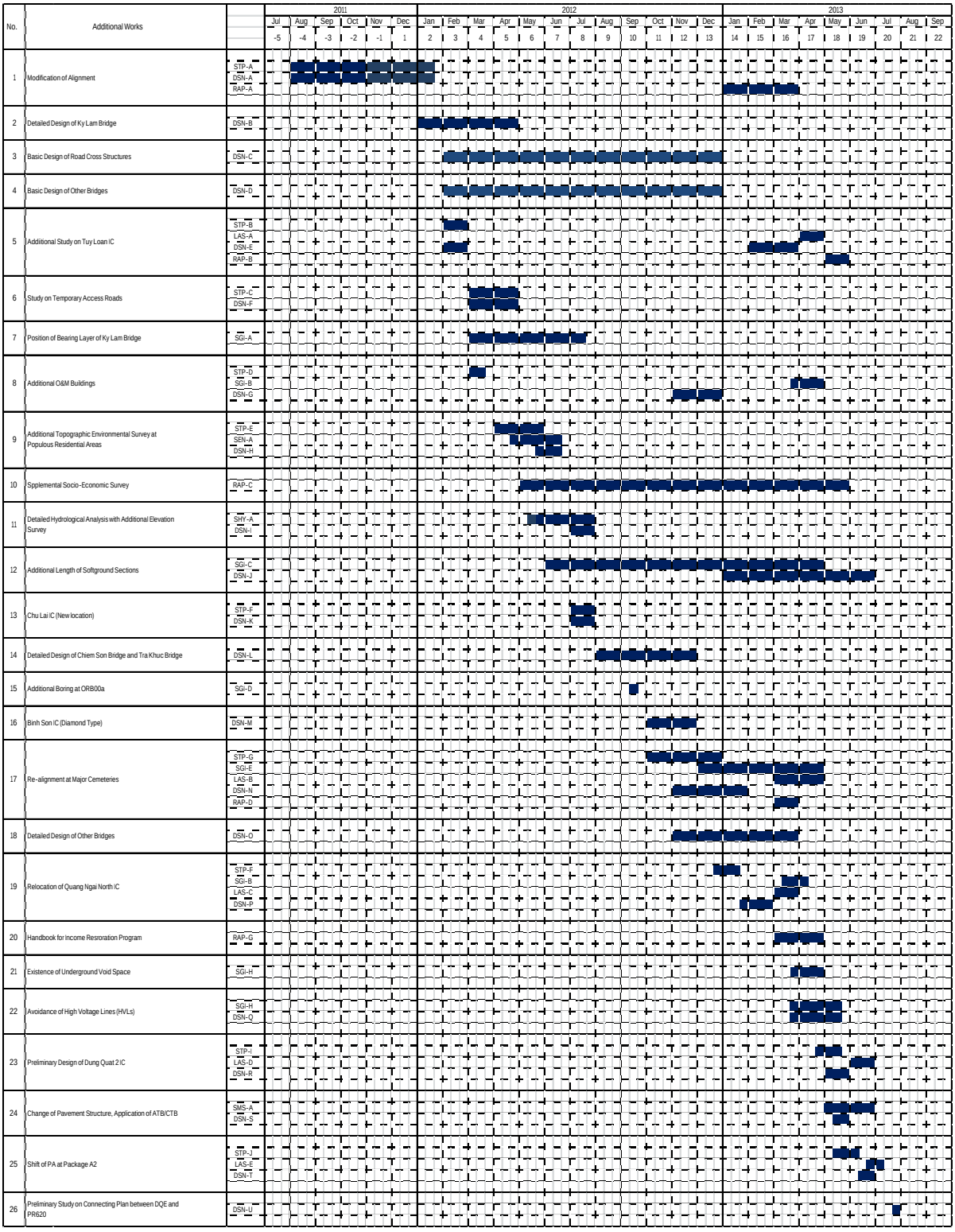


Figure 3.1 Work Period of Additional Works

3.7 Addendum to Original Contract

31. There were eight (8)addendums to the Original Contract. Contract Addendum No.1 dated 27th December 2011; Contract Addendum No.2 dated 29th November 2012; Contract Addendum No.3 dated 30 January 2013, Contract Addendum No.4 dated 26th April 2013; Contract Addendum No.5 dated 31stJuly 2013, Contract Addendum No.6 dated 9th January 2014,

Contract Addendum No.7 dated 29th December 2014 and Addendum No.8 dated 31st December 2014.

Table 3.6 Addendum to Original Contract

Amendment	Signed Date	Contents/Scope
No.1	27.12.2011	- Modification of Clause 6.4 in the Special Conditions of the Original Contract regarding bank accounts
No.2	29.11.2012	- Modification of Clause 2.6.1 in the General Conditions of the Original Contract regarding the applicable guidelines for the selection of the Consultant. - Modification of Clause 6.4 in the Special Conditions of the Original Contract regarding the Consultant's bank account for local currency. - Modification of Clause 6.6 in the Special Conditions of the Original Contract regarding setting of the exchange rates.
No.3	30.01.2013	- Extension of the contract period until 30 April 2013.
No.4	26.04.2013	- Extension of the contract period until 31 July 2013
No.5	31.07.2013	- Extension of the contract period until 31 December 2013.
No.6	09.01.2014	- Extension of the contract period until 30 June 2014.
No.7	29.12.2014	- Extension of the contract period until 31 December 2014.
No.8	31.12.2014	- Payment for additional works.

3.8 Organization of the Consultant

32. Organization of the Consultant is given in Figure 3.2.

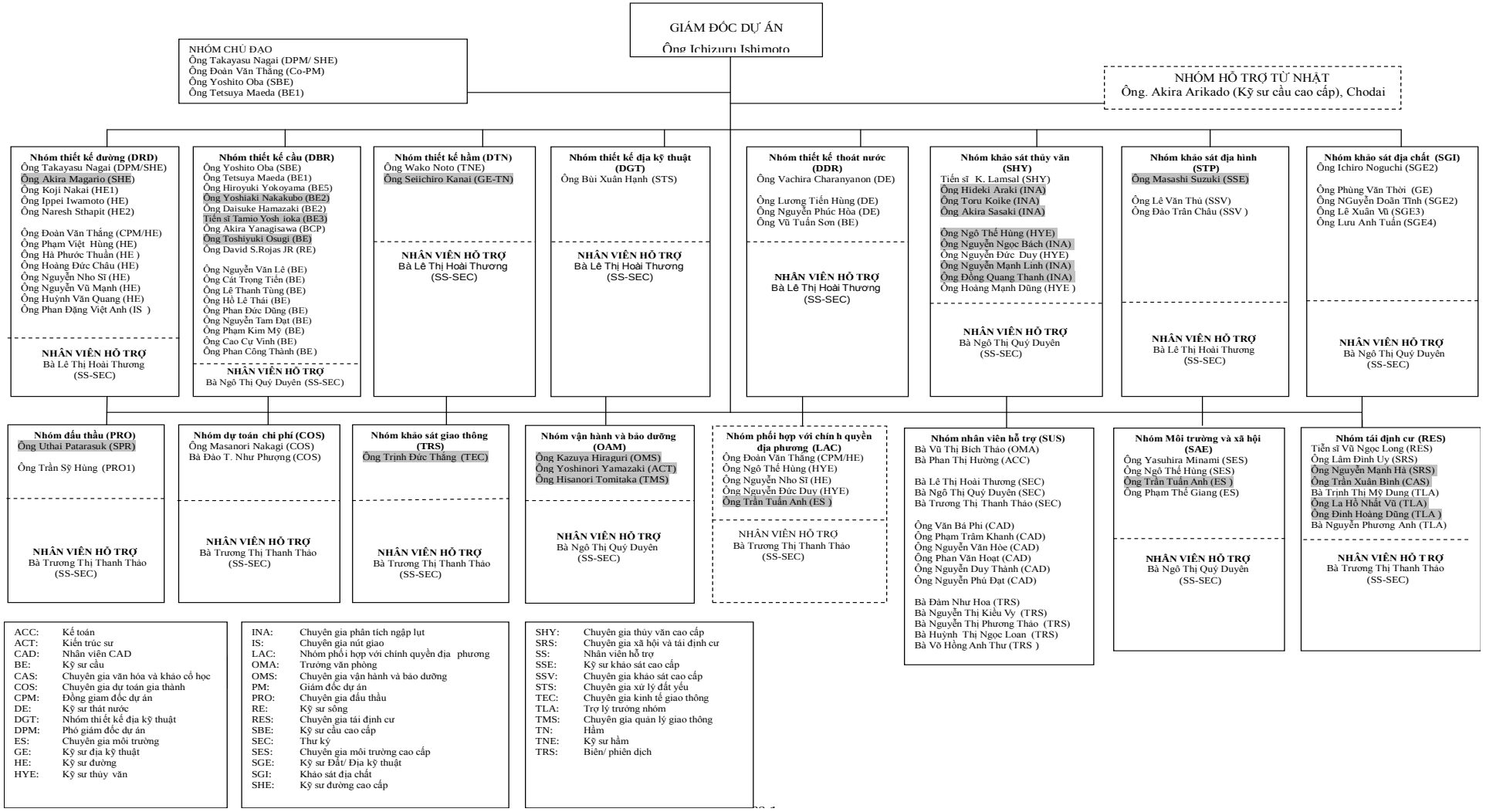


Figure 3.2Organization of the Consultant

3.9 Mobilization Status

33. Staff mobilization status as of 31/12/2013 is summarized in Table 3.7.As shown in the table, considerable amount of additional staff had been mobilized in order to cover the extended time by delay of approval and additional works.

Table 3.7 Staff Mobilization Record (As of 31/12/2013)

			Staff-months (MM)			
			Contract	Actual (31/12/2013)	Total	Variance
			a	b	c=b+c	d=c-a
1	Staff Approved					
	11	International Staff	239	293(123%)	295(123%)	56 (23%)
	12	National Staff	357	607(170%)	616(173%)	259 (73%)
	13	Supporting Staff	250	414(166%)	424(170%)	174 (70%)
2	Staff Not Approved					
	21	International Staff		42		
	22	National Staff		159		
	23	Supporting Staff		27		

34. 38approvedinternational staff for expressway design servicewere mobilized as shown in Table 3.8.

Table 3.8Mobilization Status (International Staff, Approved)

No.	Position	Name	Staff-months		
			Contract	Actual	Variance
I1	Project Manager/Team Leader	Ichizuru Ishimoto	14	20.87	6.87
I2	Senior Highway Engineer	Takayasu Nagai	13	23.17	10.17
I3	Road Safety Audit Specialist	Maurice Frederick Burley	3	3.01	0.01
I4	Senior Bridge Engineer	Yoshito Oba	13	15.34	2.34
I5	Highway Engineer 1	Koji Nakai	12	16.74	4.74
I6	Bridge/Structural Engineer 1	Tetsuya Maeda	12	21.21	9.21
I7	Bridge/Structural Engineer 2	Yoshiaki Nakakubo	4	6.07	2.07
I8	Highway Engineer 2	NareshSthapit	12	15.37	3.37
I9	Bridge/Structural Engineer 3	Takeyuki Takada	12	14.63	2.63
I10	Bridge/Structural Engineer 4	KentaroOkuno	4	1	-3
I11	Senior Interchange Specialist	Akira Magario	7	4.1	-2.9
I12	Bridge/Structural Engineer 5	Hiroyuki Yokoyama	11	14.6	3.6
I13	Tunnel Engineer	Wako Noto	4	6.14	2.14
I14	Soil/Geotechnical Engineer 1 (Slope)	Fumio Nakamura	2	0.2	1.8
I15	Soft Ground Treatment Specialist	Yasuhiro Nozue	3	1.13	1.87
I16	Drainage Engineer	VachiraCharanyanon	7	12.05	5.05
I17	River Engineer	David Rojaz	2	1.67	-0.33
I18	Bridge/Structural Engineer 6	Akira Yanagisawa	7	7.26	0.26
I19	Pavement/Material Engineer	Keishi Ihara	4	0.97	-3.03
I20	Survey Engineer	Masashi Suzuki	6	8.27	2.27
I21	Soil/Geotechnical Engineer 2	Ichiro Noguchi	5	12.83	7.83
I22	Geological Engineer (Tunnel)	Seichiro Kanai	2	0.87	-1.13
I23	Senior Hydrologist	KhadanandaLamsal	3	4.9	1.9
I24	Inundation Analyst	YukishiTomida	3	0.43	-2.57
I25	Operation&Maintenance Specialist	Kazuya Hiraguri	4	4.03	0.03
I26	Expressway Management Unit Specialist	Yuichi Tsujimoto	2	2.0	0
I27	Traffic Management Specialist	HisanoriTomitaka	2	1.6	-0.4
I28	Asset Management Specialist	Kyoichi Takeuchi	2	0.3	-1.7

No.	Position	Name	Staff-months		
			Contract	Actual	Variance
I29	Architect	Yoshinori Yamazaki	3	3.1	0.1
I30	ITS Specialist	Koichi Nishimura	5	5.29	0.29
I31	Communication System Engineer	Masahiro Sakagami	3	1.47	-1.53
I32	Senior Electrical Engineer	Shinichi Ando	7	3.47	-3.53
I33	Toll Collection System Specialist	Masashi Iwamoto	4	4.1	0.1
I34	Construction Planner/Cost Estimator	Masanori Nakagi	11	23.94	12.94
I35	Senior Procurement/Contract Specialist	William John Davy	12	8.87	-3.13
I36	Social and Environmental Specialist	Yasuhira Minami	5	4.73	-0.27
I37	Resettlement Specialist	Vu Ngoc Long	10	18.73	8.73
I38	Training Specialist	NoppongUnhabhokha	4	0	-4
		Total	239	294.5	55.5

35. 12 non-approved international staff for expressway design service were mobilized as shown in Table 3.9.

Table 3.9Mobilization Status (International Staff, Not-Approved)

No.	Position	Name	Mobilized	Demobilized	MM
I2-2	Senior Highway Engineer	Ippei Iwamoto	15/07/2011	05/5/2013	15.22
I7-2	Bridge/Structural Engineer 2	Yoshinori Uchiumi	19/8/2012	31/3/2013	9.56
I9-2	Bridge/Structural Engineer 3	Toshiyuki Osugi	18/4/2012	25/10/2012	2.99
I10	Bridge/Structural Engineer 4	Atsushi Kawamura	15/02/2012	16/5/2012	2.93
I14	Soil/Geotechnical Engineer 1 (Slope)	MotohiroUra	15/02/2012	05/9/2012	0.60
I14	Soil/Geotechnical Engineer 1 (Slope)	Yutaka Inagaki	06/9/2012	26/9/2012	0.70
I18-2	Bridge/Structural Engineer 6	Kyung Duk Kim	07/01/2013	31/3/2013	2.83
I21	Soil/Geotechnical Engineer 2	SuthamSattayakom	25/3/2012	12/5/2012	1.63
I24-2	Inundation Analyst	Toru Koike	06/12/2011	23/12/2011	0.60
I24-3	Inundation Analyst	Akira Sasaki	15/11/2011	25/12/2011	1.36
I35	Senior Procurement/Contract Specialist	UthaiPatarasuk	25/3/2012	31/5/2012	2.23
I35-2	Senior Procurement/Contract Specialist	Kenji Nomoto John	15/6/2012	13/7/2012	0.96
		Total			41.61

36. 57 approved Vietnamese domestic staff for expressway design service were mobilized as shown in Table 3.10.

Table 3.10 Mobilization Status (Vietnamese Staff, Approved)

No.	Position	Name	Staff-months		
			Contract	Actual	Variance
L1	Co-Project Manager	Nguyễn Lam Hồng	14	15.57	1.57
L2	Highway Engineer 1 (Geometric)	PhạmViệtHùng	13	18.80	5.80
L3	Highway Engineer 2 (Road Structure)	HàPhướcThuần	13	23.00	10.00
L4	Road Safety Audit Specialist	NguyễnAnhPhương	3	3.10	0.10
L5	Bridge/Structural Engineer 1 (Superstructure)	NguyễnVănLê	13	26.40	13.40
L6	Bridge/Structural Engineer 2 (Substruct/Foundation)	CátTrọngTiến	13	19.00	6.00
L7	Highway Engineer 3 (Geometric)	HoàngĐứcChâu	12	25.00	13.00
L8	Highway Engineer 4 (Road Structure)	NguyễnNhoSĩ	12	23.33	11.33
L9	Bridge/Structural Engineer 3	PhanĐứcDũng	4	13.83	9.83
L10	Bridge/Structural Engineer 4	NguyễnTâmĐạt	4	17.83	13.83
L11	Highway Engineer 5 (Geometric)	NguyễnVũMạnh	12	23.50	11.50
L12	Highway Engineer 6 (Road Structure)	HuỳnhVănQuang	12	17.9	5.90
L13	Bridge/Structural Engineer 5	HồLêThái	4	16.90	12.90
L14	Bridge/Structural Engineer 6	LêThanhTùng	4	19.83	15.83
L15	Interchange Specialist	PhanĐặngViệtAnh	2	5.79	3.79
L16	Bridge/Structural Engineer 7	PhanCôngThành	3	11.00	8.0

No.	Position	Name	Staff-months		
			Contract	Actual	Variance
L17	Tunnel Engineer	NguyễnQuangToàn	4	1.4	-2.6
L18	Soil/Geotechnical Engineer 1 (Slope)	QuachThi Thu	2	0	-2
L19	Soft Ground Treatment Specialist	BùiXuânHạnh	3	18.66	15.66
L20	Drainage Engineer 1	LươngTiếnHùng	7	19.16	12.16
L21	Drainage Engineer 2	NguyễnPhúcHòa	6	9.00	3.00
L22	River Engineer	NguyễnSơn	2	0	-2
L23	Pavement/Material Engineer 1	TrầnTrọngNghĩa	4	7.0	3.0
L24	Pavement/Material Engineer 2	NguyễnViệtHải	4	5.00	1.0
L25	Senior Surveyor 1	LêVănThủ	6	21.87	15.87
L26	Senior Surveyor 2	ĐàoTrânChâu	5	9.14	4.14
L27	Senior Surveyor 3	NguyễnAnhTuấn	5	0	-5
L28	Soil/Geotechnical Engineer 2	NguyễnDoãnTĩnh	5	9.73	4.73
L29	Soil/Geotechnical Engineer 3	LêXuânVũ	4	15.23	11.23
L30	Soil/Geotechnical Engineer 4	TrầnDuyKhiêm	4	15.23	11.23
L31	Geological Engineer (Tunnel)	PhùngVănThời	2	6.47	2.47
L32	Hydraulic Engineer 1	Nguyễn Minh Lương	3	10.62	7.62
L33	Hydraulic Engineer 2	NguyễnĐứcDuy	3	16.90	13.90
L34	Inundation Analyst	NguyễnNgọcBách	3	1.63	-1.37
L35	Transport Economist	TRịnhĐứcThắng	3	3.67	0.67
L36	Operating & Maintenance Specialist	Ha QuocHieu	4	0	-4
L37	Expressway Management Unit Specialist	Le Tung Lam	2	0	-2
L38	Traffic Management Specialist	Phan Minh Tuan	3	0	-3
L39	Asset Management Specialist	Trinh Ngoc HaiThang	2	0	-2
L40	Architect 1	NguyễnVănHòa	3	4.8	1.8
L41	Architect 2	Ngo Vu QuangKhoa	3	0	-3
L42	ITS Specialist	Nguyen HuuTinh	5	0	-5
L43	Communication System Engineer	Man Thành Nam	3	6	3
L44	Electrical Engineer 1	Trinh DinhKhiem	7	0	-7
L45	Electrical Engineer 2	VõHồng	5	16.29	11.29
L46	Toll Collection System Specialist	Bui PhuHuy	4	0	-4
L47	Cost Estimator 1 (Civil Work Packages)	VănHồngLiên	11	19.93	8.93
L48	Cost Estimator 2 (Civil Work Packages)	HoàngThanh Minh	8	12.53	4.53
L49	Cost Estimator 3 (Other Packages)	Nguyen ThiSinh	2	0	-2
L50	Procurement/Contract Specialist 1	TrầnSỹHùng	12	27.87	15.87
L51	Procurement/Contract Specialist 2	Ha Ngoc Anh Minh	8	0	-8
L52	Senior Environmental Specialist	NgôThếHùng	8	20	12
L53	Environmental Specialist	Pham The Giang	8	7.9	-0.1
L54	Senior Resettlement Specialist	NguyễnMạnhHà	14	13	-1
L55	Social and Resettlement Specialist	LâmĐìnhUy	14	23.50	9.50
L56	Cultural and Archaeological Specialist	TrầnVănBình	14	13	-1
L57	Training Specialist	To be named	4	0	-4
		Total	357	616.34	259.34

37. 15 non-approved Vietnamese domestic staff for expressway design service were mobilized as shown in Table 3.11.

Table 3.11 Mobilization Status (Vietnamese Staff, Not Approved)

No.	Position	Name	Mobilized	Demobilized	MM
L12-2	Highway Engineer 7 (Road Structure)	Mai XuânNgọc	01/8/2012	31/5/2013	10.00
L12-3	Highway Engineer 8 (Road Structure)	VũAnhTuấn	01/8/2012	31/5/2013	10.00
L16-2	Bridge/Structural Engineer 8	Phạm Kim Mỹ	01/12/2011	28/02/2013	15.00
L16-3	Bridge/Structural Engineer 9	Cao CựVinh	01/12/2011	31/10/2013	22.00
L16-4	Bridge/Structural Engineer 10	LêKiênCường	15/7/2012	31/8/2013	13.57
L19-2	Soft Ground Treatment Specialist 2	NguyễnTrầnHải	01/10/2012	31/8/2013	11.00
L21-2	Drainage Engineer 3	VũTrầnSơn	01/6/2012	20/5/2013	11.67
L21-3	Drainage Engineer 4	NguyễnXuânĐạt	15/11/2012	31/8/2013	9.53

No.	Position	Name	Mobilized	Demobilized	MM
L21-4	Drainage Engineer 5	VươngHồngThắng	15/11/2012	31/8/2013	6.63
L21-5	Drainage Engineer 6	PhạmVănQuân	15/11/2012	31/8/2013	9.00
L30-2	Soil/Geotechnical Engineer 5	NguyễnAnhNgọc	01/8/2012	31/7/2013	12.00
L30-3	Soil/Geotechnical Engineer 6	ĐàoQuangHuy	01/8/2012	15/01/2013	5.50
L30-4	Soil/Geotechnical Engineer 7	Mai HuyĐạo	01/8/2012	15/01/2013	5.50
	KCS/ road	NguyễnMạnh Chung	01/12/2012	14/9/2013	9.47
	KCS/bridge	NguyễnĐăngHoàng	18/12/2012	30/9/2013	9.47
		Total			160.33

38. Totaling 97.11 MM of international and 419.67 MM of Vietnamese staff were mobilized for the expressway design as shown in Table 3.12. This is mainly because of the following reasons:

- Quality of the feasibility study was poor and the DD consultant spent much time for "updating F/S" including additional topographic survey and discussion with local authorities.
- Approval process of the client is poor. Even PMU85 approved, VEC changed, Even VEC approved, MOT changed during the detailed design process, and such poor decision making caused much un-necessary works which the consultant needed to input more staff for recovering the delay of the services.
- Delays of appraisal comments also caused much delays, and therefore the Consultant was forced to keep our staff in order to wait those delayed comments from the client.

Table 3.12Total Additional Input of Staffing

No.	Position	As contract	Mobilized	Variance
1	International staffs	239	294.5 + 41.61 = 336.11	97.11
2	Domestic staffs	357	616.34+ 160.33 = 776.67	419.67

3.10 Planned vs. Actual Implementation Schedules

39. During the first contract negotiation completed on 26th May 2011, VEC(EA) agreed with early commencement of GPS Survey, topographic survey and hydrological survey in order to complete those site works before rainy seasons. Accordingly, the Consultant mobilized to Danang city on 15th July 2011 and commenced the survey works.

40. Upon the signing of the Original Contract on 15th November 2011, PMU85(IA) issued Notice to Proceed (NPT) with his letter No. 1622/PMU85-PP2 dated 18th November 2011 and the consulting service contract was commenced on 1st December 2011 for 14 months period which ends 31st January 2013.

41. Because of mainly the following reasons, the services has been delayed more than one year:

- Many additional works was required to correct the design in feasibility study which was in poor and not acceptable quality as shown in Table 5.1 below.
- Delay of appraisal comments and approval as shown in Table 6.14 for civil works. For the electrical works, the comments were issued on 7/3/2014, and for the ITS works, the MOT comments were issued on 21/5/2014.
- Many changes instructed even once those final outcomes were already submitted to the client.

42. Actual implementation against the milestones stipulated in the contract is tabulated in Table 3.13.

Table 3.13 Achievement of Contractual Milestones

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
01	Contract signing	----	15/11/2011	Contract
02	Issuance of Notice to Proceed	----	18/11/2011	PMU85 letter No. 1622/PMU85-PP2 dated November 18, 2011
03	Commencement of Consulting services	----	1/12/2011	Consultant letter No. DQEDD-PMU85-52-11 dated November 18, 2011.
04	Submission and approval of Bank Guarantee for 20% of the Contract Price.	30/01//2012	---	Item 6.4 of Special Conditions of Contract, Condition of 1st Payment (20%)
05	Submission of draft design report for the first contract package	13/02/2012	31/12/2011	Item I.3.6 of Minutes of Discussion dated 15/10/2011
06	Inception Report	27/12/2011	31/12/2011	Item (1), Appendix B: Reporting Requirements
07	Submission of 1st Interim Payment for Inception Report	21/02/2012	31/12/2011	Item 6.4 of Special Conditions of Contract, Condition of 2nd Payment (10%)
08	Inception report of Replacement Cost Survey	13/03/2012	31/12/2011	Item IV, TOR of RCS, Annex B, TOR, Item (9), Appendix B: Reporting Requirements
09	Submission of a brief report on the appropriateness of the proposed alignment	13/03/2012	15/1/2012	Item 7, Annex A, TOR, Item (8), Appendix B: Reporting Requirements
10	Review and Detailed Design Framework Report	27/02/2012	31/1/2012	Item (2), Appendix B: Reporting Requirements
11	Completion of detailed design for the first contract package	30/6/2012.	15/2/2012	Item I.3.6 of Minutes of Discussion dated 15/10/2011
12	Submission and approval of Interim Report (ITR), Basic Design Report (BDR) and Prequalification Documents (PQD).		31/3/2012	Item 6.4 of Special Conditions of Contract, Condition of 3rd Payment (25%)
12-1	Interim Report (ITR)	5/4/2012		
12-2	Basic Design Report (BDR)	4/7/2012		
12-3	Prequalification Documents (PQD).	29/03/2012		
13	Release of bank guarantee when the total payments reach 55%	15/1/2013	31/3/2012	Item 6.4 of Special Conditions of Contract Condition of Release of Bank Guarantee
14	Submission of overall implementation plan of the project	14/06/2012	31/3/2012	Item B.2 of Minutes of Contract Negotiation dated 26/05/2011
15	Submission of updated draft EIA and EMP reports		15/4/2012	Item 7, Annex A, TOR, Item (8), Appendix B: Reporting Requirements
15-1	EIA	14/06/2012		
15-2	EMP	30/07/2012		
16	Submission of RCS reports		15/5/2012	Item IV, TOR of RCS, Annex B, TOR, Item (9), Appendix B: Reporting Requirements
16-1	HoaVang	12/01/2013		
16-2	Dien Ban	27/6/2012		
16-3	DuyXuyen	15/01/2013		
16-4	Que Son	14/01/2013		
16-5	ThangBinh	19/03/2013		
16-6	PhuNinh	29/03/2013		
16-7	TP.TamKy	20/06/2012		
16-8	Nui Thanh	21/01/2013		
16-9	Binh Son	07/06/2012		

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
16-10	Son Tinh	07/06/2012		
16-11	TP.QuangNgai	N/A		
16-12	TuNghia	03/01/2013		
16-13	NghiaHanh	03/01/2013		
17	Submission of 3 sets of draft design report (DDR), prequalification (PQ) and tender documents (TB) for the first three contract packages		31/5/2012	Appendix B: Reporting Requirements
17-1	PKG3A			
17-1-1	draft design report (DDR)	30/06/2012		
17-1-2	prequalification (PQ)	19/11/2011		
17-1-3	tender documents (TB)	26/07/2012		
17-2	PKGA4:			
17-2-1	draft design report (DDR)	15/10/2012		
17-2-2	prequalification (PQ)	17/01/2012		
17-2-3	tender documents (TB)	29/11/2012		
17-3	PKG6			
17-3-1	draft design report (DDR)	11/05/2012		
17-3-2	prequalification (PQ)	18/12/2013		
17-3-3	tender documents (TB)	1/3/2013		
18	Submission of updated draft final EIA and EMP reports		15/7/2012	Item 7, Annex A, TOR, Item (8), Appendix B: Reporting Requirements
18-1	draft final EIA report	EIA: 05/10/2012		
18-2	draft final EMP report	EMP: 3/11/2012		
19	Completion of design works and preparation of bidding documents of the first 3 packages		31/8/2012	Item B.2 of Minutes of Contract Negotiation dated 26/05/2011
19-1	PKG3A			
19-1-1	Draft Detailed Design Report	5/11/2012		
19-1-2	Draft Bidding Documents	5/11/2012		
19-2	PKGA4			
19-2-1	Draft Detailed Design Report	15/10/2012		
19-2-2	Draft Bidding Documents	29/11/2012		
19-3	PKG6			
19-3-1	Draft Detailed Design Report	18/12/2013		
19-3-2	Draft Bidding Documents	1/3/2013		
20	Submission and approval of Monthly Progress Report No.9, Detailed Design Report and Bidding Documents of the first 3 packages.		15/9/2012	Item 6.4 of Special Conditions of Contract, Condition of 4th Payment (20%)
20-1	MPR No.9	05/09/2012		
20-2	PKG3A			
20-2-1	Approval of Detailed Design Report	5/11/2012		
20-2-2	Approval of Bidding Documents	5/11/2012		
20-3	PKGA4			
20-3-1	Approval of Detailed Design Report	15/10/2012		
20-3-2	Approval of Bidding Documents	29/11/2012		
20-4	PKG6			

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
20-4-1	Approval of Detailed Design Report	18/12/2013		
20-4-2	Approval of Bidding Documents	1/3/2013		
21	Commencement of the first package	19/5/2013	30/9/2012	Item I.1 of Minutes of Discussion dated 15/10/2011, Item 3.3.1 of TOR
22	Submission of full sets of design reports, prequalification and tender documents for the whole project		30/11/2012	Appendix B: Reporting Requirements
22-1	PKG1			
22-1-1	Submission of full sets of design reports	14/06/2013		
22-1-2	Prequalification documents	02/05/2012		
22-1-3	Tender documents	05/9/2013		
22-2	PKG2			
22-2-1	Submission of full sets of design reports	13/06/2013		
22-2-2	Prequalification documents	02/05/2012		
22-2-3	Tender documents	26/8/2013		
22-3	PKG3A			
22-3-1	Submission of full sets of design reports	30/06/2012		
22-3-2	Prequalification documents	19/11/2012		
22-3-3	Tender documents	26/07/2012		
22-4	PKG3B			
22-4-1	Submission of full sets of design reports	22/04/2013		
22-4-2	Prequalification documents	02/05/2012		
22-4-3	Tender documents	12/7/2013		
22-5	PKG4			
22-5-1	Submission of full sets of design reports	25/06/2013		
22-5-2	Prequalification documents	12/05/2012		
22-5-3	Tender documents	25/11/2013		
22-6	PKG5			
22-6-1	Submission of full sets of design reports	20/03/2013		
22-6-2	Prequalification documents	11/05/2012		
22-6-3	Tender documents	5/8/2013		
22-7	PKG6			
22-7-1	Submission of full sets of design reports	18/12/2012		
22-7-2	Prequalification documents	11/05/2012		
22-7-3	Tender documents	01/03/2013		
22-8	PKG7			
22-8-1	Submission of full sets of design reports	07/02/2013		
22-8-2	Prequalification documents	12/05/2012		
22-8-3	Tender documents	17/7/2013		
22-9	PKGA1			
22-9-1	Submission of full sets of design reports	24/04/2013		
22-9-2	Prequalification documents	04/04/2012		

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
22-9-3	Tender documents	9/10/2013	30/11/2012	Appendix B: Reporting Requirements
22-10	PKGA2			
22-10-1	Submission of full sets of design reports	21/03/2012		
22-10-2	Prequalification documents	06/04/2012		
22-10-3	Tender documents	30/09/2013		
22-11	PKGA3			
22-11-1	Submission of full sets of design reports	24/5/2013		
22-11-2	Prequalification documents	13/04/2012		
22-11-3	Tender documents	11/10/2013		
22-12	PKGA4			
22-12-1	Submission of full sets of design reports	15/10/2012		
22-12-2	Prequalification documents	17/01/2012		
22-12-3	Tender documents	25/6/2013		
22-13	PKGA5			
22-13-1	Submission of full sets of design reports	28/12/2013		
22-13-2	Prequalification documents	13/04/2012		
22-13-3	Tender documents	21/11/2013		
22-14	PKG13			
22-14-1	Submission of full sets of design reports	9/5/2013		
22-14-2	Prequalification documents	N/A		
22-14-3	Tender documents	N/A		
22-15	PKG14A-1			
22-15-1	Submission of full sets of design reports	06/11/2013		
22-15-2	Prequalification documents	19/11/2013		
22-15-3	Tender documents	Under preparation		
22-16	PKG14A-2			
22-16-1	Submission of full sets of design reports	21/11/2013		
22-16-2	Prequalification documents	N/A		
22-16-3	Tender documents	Under preparation		
23	Submission and approval of Detailed Design Report and Bidding Documents of the remaining packages, Draft Final Project Completion Report and satisfactory completion of the following works: • Review and update EIA, EMP, EMDP, RAP • Construction method and schedule • Preparation of implementation program • Study and design of ITS and toll		30/11/2012	Item 6.4 of Special Conditions of Contract Condition of 5th Payment (15%)

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
	collection system • Cost Estimate • Expressway operation and maintenance			
23-1	Approval of Detailed Design Report			
23-1-1	PKG 1	21/08/2013		
23-1-2	PKG 2	15/08/2013		
23-1-3	PKG 3A	23/11/2012		
23-1-4	PKG 3B	05/06/2013		
23-1-5	PKG 4	25/10/2013		
23-1-6	PKG 5	14/06/2013		
23-1-7	PKG 6	09/07/2013		
23-1-8	PKG 7	09/07/2013	30/11/2012	
23-1-9	PKG A1	20/08/2013		
23-1-10	PKG A2	09/07/2013		
23-1-11	PKG A3	20/08/2013		
23-1-12	PKG A4	08/03/2013		
23-1-13	PKG A5	20/08/2013		
23-1-14	PKG 13 A/B/C			
23-1-15	PKG 14 A	16/06/2014		
23-1-16	PKG 14 B	16/06/2014		
23-2	Approval of Bidding Documents			
23-2-1	PKG 1	06/09/2013		
23-2-2	PKG 2	28/08/2013		
23-2-3	PKG 3A	08/01/2013		
23-2-4	PKG 3B	25/07/2013	30/11/2012	
23-2-5	PKG 4	13/12/2013		
23-2-6	PKG 5	27/09/2013		
23-2-7	PKG 6	27/09/2013		
23-2-8	PKG 7	27/09/2013		
23-2-9	PKG A1	N/A		
23-2-10	PKG A2			
23-2-11	PKG A3			
23-2-12	PKG A4	24/06/2013	30/11/2012	
23-2-13	PKG A5	26/03/2014		

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
23-2-14	PKG A1-A2-A3	31/12/2013	30/11/2012	
23-2-15	PKG 13 A/B/C	To be prepared by Supervision Consultant		
23-2-16	PKG 14 A		30/11/2012	
23-2-17	PKG 14 B			
23-3	Draft Final Project Completion Report	15/12/2014	30/11/2012	
23-4	Approval of Update EIA	10/07/2013	30/11/2012	
23-5	Approval of Update EMP	10/07/2013	30/11/2012	
23-6	Method Statement		30/11/2012	
23-6-1	PKG 1	25/10/2013		
23-6-2	PKG 2	21/10/2013		
23-6-3	PKG 3A	11/3/2013		
23-6-4	PKG 3B	12/9/2013		
23-6-5	PKG 4	8/2/2014		
23-6-6	PKG 5	2/11/2013		
23-6-7	PKG 6	14/11/2013		
23-6-8	PKG 7	7/11/2013		
23-6-9	PKG A1	29/10/2013		
23-6-10	PKG A2	3/9/2013		
23-6-11	PKG A3	9/1/2014		
23-6-12	PKG A4	11/5/2013		
23-6-13	PKG A5	18/4/2013		
23-7	Implementation Program	4/12/2012	Time to time	
23-8	Design of ITS and toll collection system	12/02/2014	30/11/2012	
23-9	Cost Estimate		30/11/2012	
23-9-1	PKG 1	25/10/2013		
23-9-2	PKG 2	29/10/2013		
23-9-3	PKG 3A	28/2/2013		
23-9-4	PKG 3B	27/9/2013		
23-9-5	PKG 4	24/1/2014		
23-9-6	PKG 5	8/11/2013		
23-9-7	PKG 6	14/11/2013		
23-9-8	PKG 7	7/11/2013		
23-9-9	PKG A1	24/1/2014		

No.	Milestone	Actual	Schedule in Contract	Clause in Contract
23-9-10	PKG A2	20/1/2014	30/11/2012	
23-9-11	PKG A3	2/1/2014		
23-9-12	PKG A4	27/8/2013		
23-9-13	PKG A5	15/4/2013		
23-9-14	PKG 13 A/B/C			
23-9-15	PKG 14 A	07/07/2014		
23-9-16	PKG 14 B	07/07/2014		
23-10	Expressway Operation & Maintenance	12/02/2014		
24	Commencement of 2nd to 5th package	A4:24/22/2013	Every 2 month	Item I.1 of Minutes of Discussion dated 15/10/2011
25	Commencement of 6th package to the last one	Not yet.	Every one month	
26	Submission and approval of Project Completion Report.	Under preparation	31/1/2013	Item 6.4 of Special Conditions of Contract Condition of Final Payment (10%)

Part B: Performed Services against the TOR

4. REVIEW OF PREVIOUS STUDIES AND ENSBLISHING THE DETAILED DESIGN FRAMEWORK (TOR 3.2)

4.1 Review of Previous Studies

43. The Consultant submitted the review reports shown in Table 4.1. The results of review and concerned discussion were carried to subsequent"Basic Design Stage".

Table 4.1 Review Reports

No.	Report Title	Submission Date	Update	Approval
1	Previous Studies Review Reports (Civil)	27/2/2012	R1 (23/3/2012)	---
2	Brief Report on Environmental Considerations	13/3/2012	R1 (25/3/2012)	---
3	Previous Studies Review Reports (ITS)	31/10/2012	---	---
4	Previous Studies Review Reports (O&M)	1/11/2012	---	--
5	Finalization of Expressway Alignment	19/5/2012	---	--

4.2 Establish Detailed Engineering Design Framework

44. The Consultant submitted the following detailed engineering design framework, and those were used for the subsequent design stages:

Table 4.2 Detailed Engineering Design Framework

No.	Report Title	Submission Date	Update	Approval
1	List of Technical Standards (Civil)	29/11/2011	---	---
2	List of Technical Standards (ITS) - Planning Standard Report	2/11/2012	---	---
3	List of Technical Standards (O&M) - Planning Standards Report	23/10/2012	---	---
4	Geometric Design Criteria	27/2/2012	27/3/2012	20/3/2012
5	Bridge Design Criteria	18/1/2012	---	--
6	Typical Cross Sections	18/4/2012	---	---
7	Sample PQ Document, BOQ, Cost Estimate	19/3/2012	---	---

4.3 Technical Standards

4.3.1 Civil Work

45. Technical standards to be applied for the design of civil works in the project had been approved several times:

- Decision No. 362/QD-BGTVT dated on 20 February 2009,
- Decision No. 727/QD-BGTVT dated 6 April 2012,

46. Finally, Decision No. 994/QD-BGTVT dated 16 April 2013, updated the previous approval as shown in Table 4.3.

Table 4.3 Design Standards for Civil Work

No	Technical Standard	Standards approved in Decision No.362/QD-BGTVT dated 20/2/2009 and No. 727/QD-BGTVT dated 6/4/2013	Updated/Approved Standards In No. 994/QD-BGTVT dated 16/4/2013
1	Asphalt Concrete Pavement – Specification for Construction and Acceptance	22TCN 249-1998	TCVN 8819:2011
2	Graded Aggregate Base and Subbase Pavement - Specification for Construction and Acceptance	22TCN 334-2006	TCVN 8859:2011
3	Bituminous Surface Treatment – Specification for Construction and Acceptance	22TCN 271-2001	TCVN 8863:2011
4	Standard Test Method for Measuring Road Pavement Surface Roughness Using a 3m Straight Edge	22TCN 16-1979	TCVN 8864:2011
5	Method for Measuring and Assessment Roughness by International Roughness Index (IRI)	22TCN 277-2001	TCVN 8865:2011
6	Standard Test Method for Measuring Pavement	22TCN 278-2001	TCVN 8866:2011

No	Technical Standard	Standards approved in Decision No.362/QD-BGTVT dated 20/2/2009 and No. 727/QD-BGTVT dated 6/4/2013	Updated/Approved Standards In No. 994/QD-BGTVT dated 16/4/2013
	MacrotextureDepth Using a Volumetric Technique		
7	Flexible Pavement – Standard Test Method for Determination of Elastic Modulus of Pavement Structure Using Benkelman beam	22TCN 251-1998	TCVN 8867:2011
8	National Technical Regulation on Road Signs and Signals	22TCN 237-2001	QCVN 41:2012/BGTVT
9	Soil - Methods laboratory of determination of specific weight	TCVN4195:1995	TCVN4195:2012
10	Soil - Methods laboratory of determination of volume weight	TCVN4202:1995	TCVN4202:2012
11	Soils - Sampling, packing, transportation and curing of samples	TCVN2683:1991	TCVN2683:2012
12	Bored Piles- Construction, check and acceptance	TCXDVN 326:2004	TCVN 9395:2012
13	Bored piles – Determination of homogeneity of concrete - sonic pulse method	TCXDVN 358:2005	TCVN 9396:2012
14	Piles - standard test method in situ for piles under axial compressive load	TCXDVN 269:2002	TCVN 9393:2012
15	Cement Treated Aggregate Base for Road Pavement – Specification for Construction and Acceptance	22TCN 245-1998	TCVN 8858:2011
16	Painting Traffic signal – Road marking by thermoplastic reflective material – Specification, testing method, construction and acceptance.	22TCN 283-2002	TCVN 8791:2011
17	Painting for protection of steel structure – Specification and testing method	22TCN 235-97	TCVN8789:2011
18	Painting for protection of steel structure – Construction and acceptance	22TCN 253-98	TCVN8790:2011
19	Paint and metal covering – Testing method in natural conditions	22TCN 300-02	TCVN8785-1:2011 TCVN8785-14:2011
20	Concrete structure and precast reinforced concrete	TCXDVN 390:2007	TCVN 9115:2012
21	Drainage reinforced concrete culvert pipe	TCXDVN 372:2006	TCVN 9113:2012
22	Reinforced concrete box culvert	TCXDVN 392:2007	TCVN 9116:2012
23	Product of pre-stressed concrete – Technical specification and acceptance	TCXDVN 389:2007	TCVN 9114:2012
24	Bored pile – Specification for construction and acceptance	TCXDVN 326:2004	TCVN 9395:2012
25	Bored pile – Ultrasonic impulse method for determining the uniform of concrete	TCXDVN 358:2005	TCVN 9396:2012
26	Cement – Testing method – Determination of durability	TCVN 6016:1995	TCVN 6016:2001
27	Portland cements – Specifications	TCVN 2682 – 1999	TCVN 2682 - 2009
28	Portland blended cements – Specifications.	TCVN 2660 – 1987	TCVN 6260 - 2009
29	Water for mixing concrete and mortar – Technical Specification	TCVN 4506:1987	TCXDVN 4506:2012
30	Heavy concrete – Nondestructive method by using both ultrasonic counter and rebound hammer for determining compressive strength	TCXD 171-1989	TCVN 9335:2012
31	The finalization works in construction – Construction and acceptance	TCXD 303-2006	TCVN 9397-2:2012 TCVN 9397-3:2012
32	Mass concrete – Specification for construction and acceptance	TCXDVN 305-2004	TCVN 9395-2012
33	Bitumen – Testing method for physico-mechanical characteristic	22TCN 279-01	TCVN 7493:2005 ÷TCVN 7405:2005
34	Bitumen –Method for sampling	22TCN 231-96	TCVN 7494:2005
35	Installation of conduct line in house and public works – Design specification	TCXD25:1991	TCVN 9207:2012
36	Installation of electric facilities in house and public works – Design specification	TCXD27:1991	TCVN 9206:2012
37	Anti-lightning for civil works – Instruction of design, inspection and maintenance for its system	TCXDVN 46:2007	TCVN 9385:2012
38	Chemical admixture for concrete	TCXDVN 325-2004	TCVN 8826:2011
39	Concrete – Requirements on natural moisture curing	TCXDVN 391:2007	TCVN 8828:2011
40	Structure of concrete and reinforced concrete – Technical instruction on preventing cracks under impact of hot- moist climate	TCXDVN 313:2004	TCVN 9345:2012
41	Structure of concrete and reinforced concrete – Instruction on maintenance works.	TCXDVN 318:2004	TCVN 9343

4.3.2 ITS Work

47. Decision No.270/QD-BGTVT dated 29 January 2013 shown design standards to be applied for the design or ITS Work.

Table 4.4 Design Standards for ITS Work

No.	Standards to be applied	Reference
I	TO BE APPLIED FOR TRAFFICE MANAGEMENT SYSTEM	
1	Reference model architecture for the ITS sector	ISO 14813
2	Transport information and control systems – Requirements for ITS/TICS central data registry and ITS/TICS data dictionaries	ISO 14817:2002
3	Transport information and control systems – Data interfaces between centers for transport information and control system – Part1: message definition requirements	ISO 14827-1:2005
4	Transport information and control systems – Data interfaces between centers for transport information and control systems – Part 2: DATEX-ASN	ISO 14827-2:2005
5	Intelligent transport systems (ITS) – Data exchange involving roadside modules communication Part1: General principles and documentation framework of application profiles	ISO 15784-1:2008
6	Intelligent transport systems (ITS) – Data exchange involving roadside modules communication Part2:Application Profile-SNMP	ISO 15784-2:2008
7	Intelligent transport systems (ITS) – Data exchange involving roadside modules communication --- Part3: Application profile-data exchange (AP-DATEX)	ISO 15784-3:2008
II	TO BE APPLIED FOR TOLL COLLECTION SYSTEM	
1	Information technology – specification and standardization of data elements	ISO/IEC 11179
2	ITS – Dedicated Short Range Communication (DSRC) at 5.8GHz	ITU-R M.1453-2
3	Road transport and traffic telematics – Dedicated Short Range Communication (DSRC) – Application Layer	ISO 15628
4	DSRC System	ARIB STD-T75
5	Road transport and traffic telematics – Electronic fee collection Application Interface Definition for DSRC	ISO 14906
6	Electronic fee collection -- Interface Definition for on-board account using integrated circuit card (ICC)	ISO/TS 25110
7	Road transport and traffic telematics – Electronic fee collection (EFC) – systems architecture for vehicle related transport services	ISO 17573
8	Identification cards – Contactless integrated circuit cards – Proximity cards – Part 1: Physical characteristics	ISO/IEC 14443-1
9	Identification cards – Contactless integrated circuit cards – Proximity cards – Part 2: Radio frequency power and signal interface	ISO/IEC 14443-2
10	Identification cards – Contactless integrated circuit cards – Proximity cards – Part 3: Initialization and anti-collision	ISO/IEC 14443-3
11	Identification cards – Contactless integrated circuit cards – Proximity cards – Part 4: Transmission protocol	ISO/IEC 14443-4
12	Identification cards – Integrated circuit cards – Part 4: Organization, security and commands for interchange	ISO/IEC 7816-4
13	Information technology – Telecommunication and information exchange between systems – Near Field Communication – Interface and Protocol (NFCIP-1)	ISO/IEC 18092
14	Classification of environment conditions – Part 3 : Classification of groups of environmental parameters and their severities – Section 4: Stationary use at non-weather-protected locations	IEC 60721-3-4
15	Classification of environment conditions – Part 3 : Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations	IEC 60721-3-5
16	Road transport and traffic telematics – Automatic vehicle and equipment identification – System specifications	ISO 14815
17	Environmental testing. Part 1: General and guidance	IEC 60068-1
18	Road transport and traffic telematics – Electronic fee collection – Test procedures for user and fixed equipment – Part 1: Description of test procedures	ISO/TS 14907-1
19	Road transport and traffic telematics – Electronic fee collection – Test procedures for user and fixed equipment – Part 2: Conformance test for the onboard unit application interface	ISO/TS 14907-2
III	TO BE APPLIED FOR COMMUNICATION SYSTEM	
1	• 8802-3: 2000 (ISO/IEC) (ANSI/IEEE Std 802.3 2000 Edition): Information Technology – Telecommunications and information exchange between systems – Local	Ethernet

No.	Standards to be applied	Reference
	and Metropolitan area networks – Specific equipment -- Part3: Carrier sence multiple access with collision detection (CAMA/CD) access method and physical layer specifications.	
2	• IEEE 802.3u-1995 IEEE Standards for Local and metropolitan area networks: Supplement to Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications: Media access control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100Mb/s Operation, Type 100BaseT (Clauses 21-30) (ANSI) • EIA/TIA568B (AT and T-258A) Commercial Building Telecommunications Wiring Standard, 1991	Fast Ethernet
3	• IEEE 802.3ab : Physical coding sublayer (PCS), physical medium attachment (PMA) sublayer and baseband medium, type 1000BASE-T • IEEE 802.3z : Media Access Control(MAC) Parameters, Physical Layer, Repeater and Management Parameters for 1000 Mb/s Operation	Gigabit Ethernet
4	• RFC 959 File Transfer Protocol, J. Postel, J.K. Reynolds, Oct-01-1985 • RFC 1350 The TFTP Protocol (Revision 2), K. Sollins, July 1992 (TFTP)	FTP
5	• RFC 1945 Hypertext Transfer Protocol -- HTTP/1.0. R. Fielding, H. Frystyk, T. Berners-Lee • RFC 2068 Hypertext Transfer Protocol -- HTTP/1.1. R. Fielding, J. Gettys, J. Mogul, H. Frystyk, T. Berners-Lee, January 1997 (Status: PROPOSED STANDARD) • RFC 2616 Hypertext Transfer Protocol /1.1 June 1999 • RFC 2617 HTTP Authentication: Basic and Digest Access Authentication, June 1999	HTTP
6	• RFC 791 Internet Protocol. J. Postel. Sep-01-1981	IP
7	• RFC 1661 The Point-to-Point Protocol (PPP), W. Simpson, July 1994	PPP
8	• RFC 1157 Simple Network Management Protocol (SNMP), J.D. Case, M. Fedor, M.L.Schoffstall, C. Davin, May-01-1990	SNMP
9	• RFC 793 Transmission Control Protocol. J. Postel. Sep-01-1981	TCP
10	• RFC 768 User Datagram Protocol. J. Postel. Aug-28-1980	UDP
11	• ISO/IEC 144916-1:1999 Information technology -- Coding of audio visual objects -- Part 1: Systems • ISO/IEC 144916-2:1999 Information technology -- Coding of audio-visual objects -- Part 2: Visual • ISO/IEC 144916-2:1999 Information technology -- Coding of audio-visual objects -- Part 3: Audio • ISO/IEC 14496-10:2003: Information technology -- Coding of audio-visual objects -- Part 10: Advanced Video Coding	MPEG4
12	• ITU-T G 652: Characteristics of a single-mode optical fiber and cable • ITU-T G 655: Characteristic of a non-zero dispersion-shifted single-mode optical fiber and cable	FOC
13	Telecom Peripheral Construction – Technical regulations	TCN 68-254:2006
14	Cable duct and cable connected box - Technical requirements	TCN 68-153:1995
15	Rigid PVC pipes for underground cables - Technical standards	TCN 68-144:1995
16	Rigid PVC pipes for underground cables - Technical standards	TC.VNPT-06:2003
17	Code of practice for the construction for optical fiber communication system	TCN 68-178:1999

4.3.3 Additional Standards

48. Other than the above, the following additional standards, shown in Table 4.5, are applied in the design.

Table 4.5 Additional Design Standards

No	Technical Standard	Code
1	Standard test method for CBR (California Bearing Ratio) of soils and unbound roadbase in place	TCVN 8821-2011
2	Steel for the reinforcement of concrete – Threaded coupler splice	TCVN 8163:2009
3	Water-stop membrane used in construction joints - Requires in using	TCXDVN 290:2002

4	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)	ASTM C1107
5	Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets - Evaluation of Rubber for Bridge bearing.	ASTM D3182÷D3190; D3192
6	Reflective membrane for road signaling	TCVN 7887:2008
7	Temporary regulation on normal cement concrete formation with joint in construction of traffic works.	Decision No.3230/QD-BGTVT dated 14/12/2012.
8	Temporary regulation on construction engineering and acceptance for cement concrete pavement in construction of traffic works.	Decision No.1951/QD-BGTVT dated 17/08/2012.
9	Flexible pavement – Determination of elastic modul of ground base and pavement structure courses by using hard steel plates	TCVN 8861:2001
10	Water supply – Network of pipe and structures – Specification for design	TCXDVN 33:2006
11	National technical codes on safety for fire for house and structures	QCVN 06:2010/BXD
12	Regulations on earthen connection and neutral connection for electric facilities	TCVN 4756:1989
13	Geotextile fabric – Testing method	TCVN 8871-1:2011- TCVN 8871-6:2011
14	Painting for traffic signal	TCVN 8786:2011 TCVN 8788:2011
15	Structure of stone brick – Regulations on construction and acceptance	TCVN 4085:2011
16	Asphalt concrete – Testing method	TCVN 8860-1:2011- TCVN 8860-12:2011
17	Hot asphalt concrete mixing plant – Specification and checking method	22TCN 255-99
18	Pavement for highway – Construction and acceptance	TCVN 9436-2012
19	Polymer Modified Cationic Emulsified Asphalt	TCVN 8816:2011
20	Cationic Emulsified Asphalt	TCVN 8817-1:2011 - TCVN 8817-15:2011
21	Cut-back asphalt	TCVN 8818-1:2011 - TCVN 8818-5:2011

5. BASIC DESIGN (ADDITIONAL TO TOR)

5.1 Design Modified

49. As described in Para 19 above, the Consultant carried out "Basic Design", said "Updating the F/S", after identification of several critical design controls, during the "Review of Previous Studies" stage, which were missing in TEDI F/S (April 2010).The Consultant thoroughly revised the TEDI F/S (2010) and submitted "Basic Design Report" including modifications of the alignment, location and type of interchanges, typical cross section, and bridge types.

50. There are 12 major design modifications from TEDI F/S (2010),during the basic design phase,as shown in Table 5.1

Table 5.1 Major Modifications from TEDI F/S (2010)

No.	Design Area	Modifications
1	Alignment	- 11 sections of the alignment were modified in accordance with design controls newly identified. Total length of the expressway was updated as 131.2km which is 300m shorter than that in the F/S.
2	Cross sections	- Typical cross sections were fully studied and necessary typical cross sections for i) Throughway, ii) Linking Road, iii) interchange's rampways and iv)crossing roads were defined.
3	Pavement Structures	- Application of ATB (10cm) is decided for whole of the expressway.
4	Design High Water Level (DHWL)	- Design High Water Level (DHWL) was determined for each hydrological sections in the whole of the expressway included alignment shifted sections. Revised DHWLs are lower than that of F/S for some sections and higher for some sections.
5	Profile	- In accordance with the approved technical standards, the vertical design controls are duly studied including DHWL, required clearance for each crossing roads and waterways, and so on. Cost minimized profile is developed after alternative studies for several sections.
6	Interchanges	- Design criteria for the interchange design was modified. Basically the scale of interchanges are downsized by lowering the design speed of rampways and reducing the radius of loops. Stage construction method is applied for Tuy Loan IC and Binh Son IC.
7	Bridges/Viaducts	- All site conditions and requirements are updated by site reconnaissance, hydrological and hydraulic study, geotechnical investigation, clearance requirements and so on. As the result, more than 20 bridges, which is reduction of more than 3,500m of bridge, are

<table>
<tr><td></td><td></td><td>cancelled or replaced by underpass or box culverts.</td></tr>
<tr><td>8</td><td>Tunnel</td><td>- Location of the tunnel alignment was shifted 200m westward avoiding school, temple and pagoda. Tunnel elevation was lowered from FS approximately 3m, with grade-separation of the alignment, avoiding high embankment at the approach sections. As the results, tunnel length is 556m for East and 515m for West line. In the F/S, 540m for both lines.
- Tunnel inner width is changed to 13.05m from 12.75m in order to secure lane arrangement for 120km/hr travel speed.</td></tr>
<tr><td>9</td><td>Softground Treatment</td><td>- Softground sections are newly identified and some additional countermeasures are required.
Table 5.2Confirmed Softground Section in B/D
<table>
<tr><th>PKG</th><th>F/S</th><th>B/D</th></tr>
<tr><td>1</td><td>3.14 km</td><td>5.62 km</td></tr>
<tr><td>2</td><td>1.05 km</td><td>5.61 km</td></tr>
<tr><td>A2</td><td>-</td><td>4.46 km</td></tr>
<tr><td>A3</td><td>-</td><td>2.50 km</td></tr>
<tr><td>Total</td><td>4.19 km</td><td>18.19 km
(+14.00 km)</td></tr>
</table>
- Note that the total length of the softground section became longer than the above during the detailed design.</td></tr>
<tr><td>10</td><td>Slope Protection at Deep Cut Sections</td><td>- 29 deep cut excavation (H>12m, L>100m) sections are identified and slope protection method for each section is studied.</td></tr>
<tr><td>11</td><td>Road Crossing Structures</td><td>- All crossing structures are examined and updated, not only road but also waterways:
Underpass (Vehicles and Pedestrian): 126
Flyover: 11
Waterways: 186</td></tr>
<tr><td>12</td><td>O&M</td><td>- Locations of O&M buildings are revised in order to avoid design controls newly identified by the detailed topographic survey.</td></tr>
</table>

5.2 Updated Work Quantities

51. The work quantities are updated after design modification above.

- Earthwork volume is reduced by narrowing the median and improving the vertical alignment.
- Many bridges are replaced by underpass boxes or waterway boxes.

Table 5.3Updated Work Quantities

No.	Work Item	Increase/Decrease
1	Earthworks Excavation: Embankment:	 - 3,700,000m3 (30%) - 3,000,000m3 (13%)
2	Pavement	
3	Softground Treatment	+ 14 km (334%)
4	Underpass Box	+ 5 nos. (4%)
5	Bridge Major River Bridges Other Bridges	 + 58m (2%) - 3,740m (29%)
6	Waterway Box	+ 76 nos. (93%)
7	Tunnel	- 9m (1%)

5.3 Cost Change by Major Design Modification

52. Cost change made by major design modifications is summarized in Table 5.4. In total, the design modification contributes the cost saving with the amount of 560 Billion VND which is equivalent to 27 Million US Dollar.

Table 5.4Cost Change by Major Design Modifications

No.	Design Area	Cost Change (Billion VND)
1	Alignment	-100
2	Cross sections	-200
3	Pavement Structures	+600
4	Design High Water Level (DHWL)	-
5	Profile	-
6	Interchanges	-220
7	Bridges/Viaducts	-1200
8	Tunnel	-
9	Softground Treatment	+200
10	Slope Protection at Deep Cut Sections	+200
11	Road Crossing Structures	+160
12	O&M	-
	Total	**-560**

(By FS unit cost)

6. DETAILED ENGINEERING DESIGN AND PROCUREMENT PLANNING (TOR 3.3)

6.1 Packaging (TOR 3.3.1)

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

54. In December 2011, the Consultant submitted our procurement plan several times. After several times of discussion withPMU85/VEC, the contract packaging is finalized as shown in Table 2.2 above which was submitted by the Consultant's letter No.DQEDD-PMU85-77-11 dated December 15, 2011.

6.2 Surveys and Investigations (TOR 3.3.2)

6.2.1 Data Collection (TOR 3.3.2 (1))

55. In accordance with the requirements stipulated in TOR 3.3.2 (1), the Consultant carried out the data collection as shown in Tables 6.1– 6.4.

Table 6.1Data Collection (TOR 3.3.2 (1))

No.	Item	Data Collected
1	Cost estimate	- See Table 6.2
2	Transportation cost of construction materials	
3	Other project plan	- See Table 6.3 and 6.4
4	Minutes of Acceptance	- See Table 6.5

Table 6.2Data Collection for Cost Estimate

No.	Document Code	Issue Date	Document Title
1	04/2010/TT-BXD	26 May2010	Guideline of project cost establishment and management (MOC)
2	No. 16/2003/QH11	26 Nov 2003	Construction law (NA)
3	No.13/2003/QH11	26Nov 2003	Law on Land (NA)
4	No. 13/2008/QH12	03 Jun 2008	Law of Value Added Tax (NA)
5	Decree no.12/2009/NĐ-CP	12 Feb 2009	Management of project construction investment cost (Government)
6	Decree no.85/2009/NĐ-CP	15 Oct 2009	Law on Bidding (Government)
7	Decision No. 957/QĐ-BXD	29 Sep 2009	Management and consultancy cost of construction investment project (MOC)
8	letter No. 1776/2007/BXD-	16 Aug 2007	Capital construction norms for work construction part (MOC)

No.	Document Code	Issue Date	Document Title
	VP		
9	letter No. 1777/2007/BXD-VP	16 Aug 2007	Capital construction norms for installation part (MOC)
10	No. 2274/BXD-VP	10 Nov 2008	The norm on maintenance of public lighting system (MOC)
11	No. 2565/BXD-KTCL	29 Nov 2006	Application of traffic safety cost (MOC)
12	Letter No. 1784/BXD-VP	16 Aug 2007	The norms for materials (MOC)
13	DecisionNo. 131/2007/QD-TTg	08 Sep 2007	Publishing regulationof foreign consultant choosy cost in construction activities in Viet Nam (Prime Minister)
14	Decision No. 33/2004/QD-BTC	12 Apr 2004	Insurance fee (MOF)
15	Decree No. 123/2008/ND-CP	08 Dec 2008	VAT law (Government)
16	CircularNo. 194/2010/TT-BTC	6 Dec 2010	Guiding customs procedures (MOF)
17	Decree no.209/2004/NĐ-CP	16 Dec 2004	Quality control of construction Project (Government)
18	Decree no.112/2009/NĐ-CP	14 Dec 2009	Management of project construction investment cost (Government)
19	Decree no.205/2004/NĐ-CP	14 Dec 2009	Regulates the salary and allowances system in the state company (Government)
20	Decree no.70/2011/NĐ-CP	22 Aug 2011	Regulates the minimum, zone salary level of the labor working in companies, enterprises, co-operatives, cooperative groups, farms, households, individual and other organizations of Vietnam employ labor. (Government)
21	Decision No. 38/2005/QĐ-BXD	2 Nov 2005	Cost estimate norm of urban drainages maintenance and public lighting (MOC)
22	Decision No.18/2007/QĐ-UBND	19 Jul 2007	Construction unit price-installation part in QuangNgai Province
23	Decision No.19/2007/QĐ-UBND	19 Jul 2007	Construction survey unit price in QuangNgai Province
24	Decision No.20/2007/QĐ-UBND	19 Jul 2007	Construction unit price-Construction part in QuangNgai Province
25	Decision No.70/2006/QĐ-UBND	28 Nov 2006	Estimated price list of machine shift and construction work in QuangNgai Province
26	No. 1138/SXD-KTKHXD&HT	05 Dec 2011	Declaration on material price: Material price of QuangNgai Province
27	No. 1254/CB-LS	07 oct 2011	Declaration on material price: Material price of Quang Nam Province
28	No. 3911/CB-LS	21 Nov 2011	Declaration on material price: Material price of Danang City
29	Letter 324/2008/UBND-QLĐT	16 Jan 2008	Construction unit price-Construction part in Da Nang City
30	Letter 325/2008/UBND-QLĐT	16 Jan 2008	Estimated price list of machine shift in Da Nang City
31	Decision No.28/2007/QĐ-UBND	28 May 2007	Highway transport Fee in Da Nang City
32	Decision No 2236/2006/QĐ-UBND	01 Aug 2006	Estimated price list of machine shift in Quang Nam Province
33	Decision No 3075/2006/QĐ-UBND	30 Oct 2006	Estimated price list of machine shift in Quang Nam Province
34	Decision No.2637/2008/QĐ-UBND	12 Aug 2008	Highway transport Fee in Quang Nam Province
35	Decision No.13/2011/QĐ-UBND	17 June 2011	Highway transport Fee in QuangNgai Province

Table 6.3 Regional Development Plan along the Expressway

No.	Document No.	Issued on	Issued by	Subject
1	1734/QD-TTg	01/12/2008	Prime minister	The planning of Vietnam expressway network up to 2020 and vision to 2030
2	35/2009/QD-TTg	03/03/2009	Prime minister	The Vietnam transportation development strategy up to 2020 and vision 2030
3	1327/QD-TTg	24/08/2009	Prime minister	The Vietnam highway development planup to 2020 and vision to 2030
4	136/QD-TTg	10/09/2009	Prime minister	The Vietnam railway transportation development strategy to 2020 and vision to 2030

5	1601/QD-TTg	15/10/2009	Prime minister	The Vietnam maritime transportation development plan up to 2020 and vision to 2030
6	2190/QD-TTg	24/12/2009	Prime minister	The Vietnam seaport system development plan up to 2020, vision to 2030
7	140/QD-TTg	21/01/2010	Prime minister	The detailed planning of North – South expressway
8	07/2011/QĐ-TTg	25/01/ 2011	Prime minister	The master transportation plan of the key economic zone of the central up to 2020 and orientation to 2030

Table 6.4 Relevant Projects along the Expressway

No	Name of Industrial Zone	Area (ha)	Location/Description
1	Chu Lai Open Economic Zone	3,100	North Chu Lai (630ha), Truong Hai Automobile Mechanic EZ (243ha), Tam Anh EZ (1.915ha)…; construct and develop Tam Thang high technology zone (300 ha).
2	Dung Quat Economic Zone	46,000	
3	HoaKhuong IZ	400	HoaKhuong, HoaVang, Da Nang
4	Hoa Minh IZ	200	Hoa Minh, HoaVang, Da Nang
5	6 Industrial Groups at some districts of Da Nang	316	Districts of Hoa Van, NguHanh Son, ThanhKhe, Lien Chieu, Son Tra - Da Nang
6	Dien Nam - Dien Ngoc IZ	418	Dien Ban District – Quang Nam
7	Thuan Yen IZ	130	Tam Ky Town – Quang Nam
8	Tam Hiep IZ	120	Nui Thanh district – Quang Nam
9	Bac Chu Lai IZ	120	Nui Thanh district – Quang Nam
10	Tam Thang IZ	292	ThangBinh district - Quang Nam
11	Dong Que Son IZ	381	Que Son district - Quang Nam
12	An Hoa - Dong Son Iz	300	DuyXuyen District – Quang Nam
13	Phu My Xuan IZ	550	PhuNinh district – Quang Nam
14	Phu My Xuan IZ (Phase 1)	350	HuyệnPhúNinh – Quang Nam
15	157 Industrial Groups located in Quang Nam province	3,096	Districts of TayGiang, Dong Giang, Nam Giang, Dai Loc, Que Son, Phuoc Son, Nam Tra My, HiepDuc, TienPhuoc, Dien Ban, QuyXuyen, Hoi An, ThangBinh, Tam Ky, PhuNinh, Nui Thanh – Quang Nam
16	IZ at the East (Dung Quat EZ)	5,054	Dung Quat EZ – QuangNgai
17	IZ at the West (Dung Quat EZ)	2,100	Dung Quat EZ – QuangNgai
18	TinhPhong IZ	350	QuangNgai
19	QuangPhu IZ	147	At the west of QuangNgai town
20	Pho Phong IZ	138	Duc Pho – QuangNgai
21	IZ at the West of Son Tinh	80	QuangNgai
22	Industrial Groups at some districts of QuangNgai	25	QuangNgai town, NghiaHanhdist

6.2.2 Topographic Survey (TOR 3.3.2 (2) (i))

56. In accordance with the requirements stipulated in TOR 3.3.2 (2) (i), the Consultant carried out the topographic survey as shown in Table 6.5.

Table 6.5Topographic Survey

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
1	Control Point Survey	19/12/2012	20/12/2012
2	Topographic Survey of PKG1	16/5/2013	24/5/2013
3	Topographic Survey of PKG2	10/5/2013	24/5/2013
4	Topographic Survey of PKG3A	9/10/2012	2210/2012
5	Topographic Survey of PKG3B	2/4/2013	18/4/2013
6	Topographic Survey of PKG4	5/6/2013	31/5/2013
7	Topographic Survey of PKG5	13/5/2013	18/4/2013

8	Topographic Survey of PKG6	5/2/3013	19/4/2013
9	Topographic Survey of PKG7	15/3/2013	22/4/2013
10	Topographic Survey of PKGA1	6/5/2013	27/5/2013
11	Topographic Survey of PKGA2	8/3/2013	11/4/2013
12	Topographic Survey of PKGA3	24/4/2013	28/5/2013
13	Topographic Survey of PKGA4	31/5/2013	29/4/2013
14	Topographic Survey of PKGA5	21/5/2013	28/4/2013

57. After completion of the procurement of the civil contractor for each contract package, the design consultant handed-over the GPS monuments, at the site, to the contractors as shown in Table 6.6.

Table 6.6List of Site Handover of GPS Monuments

No.	Package	Site handover Date
1	PKG1	19/02/2014
2	PKG2	03/01/2014
3	PKG3A	26/06/2013
4	PKG3B	11/12/2013
5	PKG4	07/05/2014
6	PKG5	07/04/2014
7	PKG6	17/03/2014
8	PKG7	04/2014
9	PKGA1	25/06/2014
10	PKGA2	25/06/2014
11	PKGA3	02/07/2014
12	PKGA4	16/12/2013
13	PKGA5	17/07/2014

6.2.3 Survey of Hydrographical Data (TOR 3.3.2 (2) (ii))

58. In accordance with the requirements stipulated in TOR 3.3.2 (2) (ii), the Consultant carried out the hydrological survey and analysis as shown in Table 6.7.

Table 6.7Hydrological Survey and Analysis

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
	1. Hydrological Survey Reports		
1	V 1 Hydro-Metrological Data Report	25/12/2012	
2	V 2.1 Report on water level survey along the Expressway centerline		
3	V 2.2 Drawing of water level survey along the Expressway centerline		
4	V 3.1 Report on additional survey for flood inundation analysis	27/3/2013	
5	V 3.2 Drawing of additional survey for flood inundation analysis		
6	V 4.1 Water level survey and velocity of flow survey for Ky Lam bridge	25/12/2012	
7	V 4.2 Water level survey and velocity of flow survey for Chiem Son bridge		
8	V 4.3 Water level survey and velocity of flow survey for Tra Bong bridge		
9	V 4.4 Water level survey and velocity of flow survey for TraKhuc bridge		
-	2. Hydraulic and Hydrological Calculation Reports		
10	2.1 Hydrological Study Report	22/10/2012	
11	2.2 Supporting Document for Hydrological Study	17/11/2012	
12	2.3 Flood Inundation Analysis Report	3/12/2012	

6.2.4 Engineering Geological Survey (TOR 3.3.2 (2) (iii))

59. In accordance with the requirements stipulated in TOR 3.3.2 (2) (iii), the Consultant carried out the engineering geological survey as shown in Table 6.8.

Table 6.8Engineering Geological Survey

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
1	Geotechnical Investigation of PKG1	10/5/2013	15/7/2013
2	Geotechnical Investigation of PKG1 (Tuy Loan IC)	27/6/2013	10/7/ 2013
3	Geotechnical Investigation of PKG1 (Realignment section)	8/8/2013	30/7/2013
4	Geotechnical Investigation of PKG1 (LRB02)	04/06/2013	16/7/2013
5	Geotechnical Investigation of PKG2 (Embankment)	29/1/2013	27/2/2013
6	Geotechnical Investigation of PKG2 (Bridge)	1/7/2013	8/7/2013
7	Geotechnical Investigation of PKG2 (My Son IC)	11/5/2013	4/6/2013
8	Geotechnical Investigation of PKG2 (Geologic Profile)	5/7/2013	6/7/2013
9	Geotechnical Investigation of PKG3A (Ky Lam Bridge)	17/10/2012	27/3/2013
10	Geotechnical Investigation of PKG3B	22/6/2013	26/6/2013
11	Geotechnical Investigation of PKG3B (Chiem Son Bridge)	4/4/2013	28/5/2013
12	Geotechnical Investigation of PKG4-1	7/8/2013	3/7/2013
13	Geotechnical Investigation of PKG4-2	7/8/2013	10/8/2013
14	Geotechnical Investigation of PKG 4- Tunnel Section	15/4/2013	29/5/2013
15	Geotechnical Investigation of PKG5	11/4/2013	23/5/2013
16	Geotechnical Investigation of PKG5 (Ha Lam IC)	25/5/2013	4/6/2013
17	Geotechnical Investigation of PKG6	5/2/2013	24/6/2013
18	Geotechnical Investigation of PKG6 (ORB-13)	24/6/2013	25/6/2013
19	Geotechnical Investigation of PKG7	22/3/2013	24/5/2013
20	Geotechnical Investigation of PKG7 (Tam Ky IC)	25/5/2013	4/6/2013
21	Geotechnical Investigation of PKGA1	5/7/2013	12/7/2013
22	Geotechnical Investigation of PKGA1 (FO06a, ORB17a)	5/7/2013	12/7/2013
23	Geotechnical Investigation of PKGA2-1	9/4/2013	3/6/2013
24	Geotechnical Investigation of PKGA2-1 (CB23, OP19)	24/6/2013	25/6/2013
25	Geotechnical Investigation of PKGA2-1 (Chu Lai IC)	25/5/2013	4/6/2013
26	Geotechnical Investigation of PKGA2-2	2/4/2013	31/5/2013
27	Geotechnical Investigation of PKGA2-2 (CB25)	24/6/2013	25/6/2013
28	Geotechnical Investigation of PKGA3	5/7/2013	11/7/2013
29	Geotechnical Investigation of PKGA3 (Dung Quat IC)	25/5/2013	4/6/2013
30	Geotechnical Investigation of PKGA3 (Tra Bong Bridge)	4/4/2013	5/6/2013
31	Geotechnical Investigation of PKGA4	9/4/2013	…Jan 2013
32	Geotechnical Investigation of PKGA4 (Box culvert)	24/6/2013	25/6/2013
33	Geotechnical Investigation of PKGA4 (QuangNgai North IC)	25/6/2013	4/6/2013
34	Geotechnical Investigation of PKGA5	19/6/2013	20/6/2013
35	Geotechnical Investigation of PKGA5 (Box culvert)	24/6/2013	25/6/2013
36	Geotechnical Investigation of PKGA5 (TraKhuc Bridge)	4/4/2013	27/6/2013
37	Geotechnical Investigation of PKG13 (O&M Building)	13/6/2013	31/7/2013

6.2.5 Material Source Survey (TOR 3.3.2 (2) (iv))

60. In accordance with the requirements stipulated in TOR 3.3.2 (2) (iv), the Consultant carried out the material source survey as shown in Table 6.9.

61. Material survey for ATB was additionally instructed during MOT meeting on 13/3/2013.

Table 6.9Material Source Survey

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
1	Construction Material Survey Report (Whole)	24/7/2013	
2	Construction Material Survey Report (Each Package)	9/8/2013	
3	Construction Material Survey Report (ATB)	16/9/2013	

6.2.6 Survey of Other Relevant Structures (TOR 3.3.2 (2) (v))

62. In accordance with the requirements stipulated in TOR 3.3.2 (2) (v), the Consultant carried out the other relevant surveys as shown in Table 6.10.

63. List of Electrical crossing is shown in Appendix-2.

Table 6.10Other Relevant Surveys

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
1	Topographic Survey of Populous Residential Areas	4/5/2013	16/5/2013
2	Topographic Survey of Temporary Access Road	9/5/2013	
3	Topographic Survey of Public Utility	17/5/2013	16/5/2013
4	High Voltage Lines (HVL)	24/10/2012	
5	Medium and Low Voltage Lines (MVL-LVL)	20/6/2012	

6.2.7 Additional Traffic Survey (TOR 3.3.2 (2) (vi))

64. In accordance with the requirements stipulated in TOR 3.3.2 (2) (vi), the Consultant carried out the additional traffic survey as shown in Table 6.11.

Table 6.11Additional Traffic Survey

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
1	Additional Traffic Survey Report	9/1/2013	

6.2.8 Independent Land Valuation Survey (TOR 3.3.2 (2) (vii))

65. In accordance with the requirements stipulated in TOR 3.3.2 (2) (vii), the Consultant carried out the independent land valuation survey as shown in Table 6.12.

Table 6.12Independent Land Valuation Survey

No.	Package/ Item	Outcome Submission Date	Acceptance Minutes Date
1	HòaVang (Km0+000 – Km7+965)	12/01/2013	
2	ĐiệnBàn (Km7+965 – Km21+115)	27/6/2012	
3	DuyXuyên (Km21+115 – Km29+465)	15/01/2013	
4	QuếSơn (Km29+465 – Km39+650)	14/01/2013	
5	ThăngBình (Km39+650 – Km52+350)	19/03/2013	
6	PhúNinh (Km52+350 – Km66+480)	29/03/2013	
7	Tam Kỳ (Km66+480 – Km68+425)	20/06/2012	
8	NúiThành (Km68+425 – Km99+200)	21/01/2013	
9	BìnhSơn (Km99+200 – Km111+512)	07/06/2012	
10	SơnTịnh (Km111+512 – Km125+200)	07/06/2012	
11	TưNghĩa (Km125+200 – Km139+263)	03/01/2013	
12	NghĩaHành (Km132+600 – Km134+640)	03/01/2013	

6.2.9 Environmental and Social Surveys (TOR 3.3.2 (2) (viii))

66. Please refer to Sub-clause 6.7 which covers the scope of TOR 3.3.6.

6.3 Detailed Design of Road, Bridges and Other Structures (TOR 3.3.3)

6.3.1 Approval date of Design Documents (Civil Works) by Package

67. In accordance with the requirements stipulated in TOR 3.3.3, the Consultant carried out the detailed design of road, bridges and other structures.

68. After receiving the AC comments and Approval Decision, each report were finalized, time to time, as shown in Table 6.13.

Table 6.13Approval date of Design Documents (Civil Works) by Package

No.	PKG	Submission			Appraisal Comment (1)	Answer to Comment (1)	Appraisal Comment (2)	Answer to Comment (2)	Approval
		Draft	D Final	Final					
1	3A	30/6/2012		28/12/2012					23/11/2012
2	A4	27/9/2012	3/4/2013	4/6/2013	1/3/2013	3/3/2013	23/4/2013	9/5/2013	8/3/2013
3	3B	22/4/2013		24/6/2013	3/6/2013	6/6/2013			5/6/2013
4	6	5/2/2013		15/7/2013	26/3/2013	12/4/2013	8/5/2013		9/7/2013
5	5	24/4/2013		8/7/2013	6/5/2013	25/5/2013			14/6/2013
6	7	24/4/2013		29/7/2013	6/5/2013	25/5/2013			9/7/2013
7	A2	24/4/2013		29/7/2013	6/5/2013	25/5/2013			9/7/2013
8	A1	22/4/2013		11/9/2013	1/7/2013	12/7/2013			20/8/2013
9	A3	27/5/2013		23/9/2013	1/7/2013	12/7/2013			20/8/2013
10	A5	4/4/2013		2/10/2013	26/3/2013	24/4/2013	8/5/2013		20/8/2013
11	1	29/5/2013		4/9/2013	9/7/2013	17/7/2013			21/8/2013
12	2	30/5/2013		26/8/2013	24/6/2013	4/7/2013			15/8/2013
13	4	25/6/2013		20/11/2013	17/7/2013	23/7/2013			25/10/2013
14	14A-1	2/7/2013					24/9/2013	11/10/2013	16/06/2014
15	14B-1	2/7/2013					24/9/2013	11/10/2013	16/06/2014

6.3.2 Submitted Design Documents for Civil Works

69. Table 6.14 summarizes all design documents for the civil works submitted for each contract package.

Table 6.14Submitted Design Documents by Package (Civil Works)

No.	PKG	Category	Report Title	Rev	Submission Date
1	PKG1	Road	Detailed Design Reports	1	03/09/2013
2			Drawings		
3			Structural Calculation Report	1	03/09/2013
4			Work Qty Report	1	03/09/2013
5		Geotechnical	Detailed Design Reports	2	06/12/2013
6			Drawings	2	06/12/2013
7			Structural Calculation Report	2	06/12/2013
8			Work Qty Report	2	06/12/2013
9		Bridge	Detailed Design Reports	1	03/09/2013
10			Drawings		
11			Structural Calculation Report		
12			Work Qty Report		
13		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	27/04/2013

No.	PKG	Category	Report Title	Rev	Submission Date
14			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	10/05/2013
15	PKG2	Road	Detailed Design Reports	1	30/08/2013
16			Drawings		
17			Structural Calculation Report	1	30/08/2013
18			Work Qty Report	1	30/08/2013
19		Geotechnical	Detailed Design Reports	1	27/11/2013
20			Drawings	3	30/12/2013
21			Structural Calculation Report		
22			Work Qty Report		
23		Bridge	Detailed Design Reports	1	30/08/2013
24			Drawings		
25			Structural Calculation Report		
26			Work Qty Report		
27		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	27/04/2013
28			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	10/05/2013
29	PKG3A	Road Ky Lam Bridge	Detailed Design Reports	2	28/12/2012
30			Drawings		
31			Structural Calculation Report		
32			Work Qty Report		
33	PKG3B	Road	Detailed Design Reports	1	16/08/2013
34			Drawings		
35			Structural Calculation Report		
36			Work Qty Report		
37		Bridge	Detailed Design Reports	1	16/08/2013
38			Drawings		
39			Structural Calculation Report		
40			Work Qty Report		
41		Chiem Son Bridge	Detailed Design Reports	1	16/08/2013
42			Drawings		
43			Structural Calculation Report		
44			Work Qty Report		
45		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	10/04/2013
46			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	05/04/2013
47	PKG4	Road	Detailed Design Reports	1	20/11/2013
48			Drawings		
49			Structural Calculation Report		
50			Work Qty Report	1	20/11/2013
51		Geotechnical	Detailed Design Reports	1	20/11/2013
52			Drawings		
53			Structural Calculation Report		
54			Work Qty Report		
55		Bridge	Detailed Design Reports	1	20/11/2013
56			Drawings		
57			Structural Calculation Report		
58			Work Qty Report		
59		Tunnel	Detailed Design Reports	2	20/11/2013

No.	PKG	Category	Report Title	Rev	Submission Date
60			Drawings		
61			Work Qty Report		
62		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	27/04/2013
63			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	24/05/2013
64			Hydrological and Hydraulic Calculation Report (3) Cross Drainage	3	27/04/2013
65	PKG5	Road	Detailed Design Reports	1	08/07/2013
66			Drawings		
67			Structural Calculation Report		
68			Work Qty Report		
69		Geotechnical	Detailed Design Reports	1	08/07/2013
70			Drawings		
71			Structural Calculation Report		
72			Work Qty Report		
73		Bridge	Detailed Design Reports	1	08/07/2013
74			Drawings		
75			Structural Calculation Report		
76			Work Qty Report		
77		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	26/03/2013
78			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	25/03/2013
79	PKG6	Road	Detailed Design Reports	1	15/7/2013
80			Drawings		
81			Structural Calculation Report		
82			Work Qty Report		
83		Geotechnical	Detailed Design Report s	1	15/7/2013
84			Drawings		
85			Structural Calculation Report		
86			Work Qty Report		
87		Bridge	Detailed Design Reports	1	15/7/2013
88			Drawings		
89			Structural Calculation Report		
90			Work Qty Report		
91		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	10/04/2013
92			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	25/03/2013
93	PKG7	Road	Detailed Design Reports	1	30/07/2013
94			Drawings		
95			Structural Calculation Report		
96			Work Qty Report		
97		Geotechnical	Detailed Design Reports	1	30/07/2013
98			Drawings		
99			Structural Calculation Report		
100			Work Qty Report		
101		Bridge	Detailed Design Reports	1	30/07/2013
102			Drawings		
103			Structural Calculation Report		

No.	PKG	Category	Report Title	Rev	Submission Date
104			Work Qty Report		
105		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	10/04/2013
106			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	25/03/2013
107			Hydrological and Hydraulic Calculation Report (3) Relocation of Rivers and Streams	0	10/04/2013
108	PKGA1	Road	Detailed Design Reports	1	11/9/2013
109			Drawings		
110			Structural Calculation Report		
111			Work Qty Report		
112		Geotechnical	Detailed Design Reports	1	11/9/2013
113			Drawings		
114			Structural Calculation Report		
115			Work Qty Report		
116		Bridge	Detailed Design Reports	1	11/9/2013
117			Drawings		
118			Structural Calculation Report		
119			Work Qty Report		
120		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	22/04/2013
121			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	16/4/2013
122			Hydrological and Hydraulic Calculation Report (3) Relocation of Rivers and Streams	0	22/04/2013
123	PKGA2	Road	Detailed Design Reports	1	30/07/2013
124			Drawings		
125			Structural Calculation Report		
126			Work Qty Report		
127		Geotechnical	Detailed Design Reports	3	15/01/2014
128			Drawings		
129			Structural Calculation Report		
130			Work Qty Report		
131		Bridge	Detailed Design Reports	1	30/07/2013
132			Drawings		
133			Structural Calculation Report		
134			Work Qty Report		
135		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	26/03/2013
136			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	25/03/2013
137	PKGA3	Road	Detailed Design Reports	1	23/9/2013
138			Drawings		
139			Structural Calculation Report		
140			Work Qty Report		
141		Geotechnical	Detailed Design Reports	3	11/01/2014
142			Drawings		
143			Structural Calculation Report		
144			Work Qty Report		

No.	PKG	Category	Report Title	Rev	Submission Date
145		Bridge	Detailed Design Reports	1	23/9/2013
146			Drawings		
147			Structural Calculation Report		
148			Work Qty Report		
149		Tra Bong Bridge	Detailed Design Reports	1	23/9/2013
150			Drawings		
151			Structural Calculation Report		
152			Work Qty Report		
153		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	18/04/2013
154			Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	26/04/2013
155	PKGA4	Road	Detailed Design Reports	3	04/06/2013
156			Drawings		
157			Structural Calculation Report	1	04/06/2013
158			Work Qty Report	4	21/08/2013
159		Bridge	Detailed Design Reports	4	04/06/2013
160			Drawings		
161			Structural Calculation Report		
162			Work Qty Report		
163		Drainage	Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	1	25/03/2013
164			Topographic Survey Reports and Drawings	1	02/04/2013
165	A5	Road	Detailed Design Reports	1	2/10/2013
166			Drawings		
167			Structural Calculation Report		
168			Work Qty Report		
169		Geotechnical	Detailed Design Reports	3	16/01/2014
170			Drawings		
171			Structural Calculation Report		
172			Work Qty Report		
173		Bridge	Detailed Design Reports	1	2/10/2013
174			Drawings		
175			Structural Calculation Report		
176			Work Qty Report		
177		TraKhuc Bridge	Detailed Design Reports	1	10/10/2013
178			Drawings		
179			Structural Calculation Report		
180			Work Qty Report		
181		Drainage	Hydrological and Hydraulic Calculation Report (1) Cross Drainage	3	10/04/2013
182	PKG14A-1	Traffic Safety	Hydrological and Hydraulic Calculation Report (2) Longitudinal Drainage	0	25/03/2013
183			Traffic Safety, Report	1	06/11/2013
184			Traffic Safety, Drawings	3	12/05/2014
185	PKG14B-1	Traffic Safety	Traffic Safety, Work Qty Report	3	12/05/2014
186			Traffic Safety, Report	1	21/11/2013
187			Traffic Safety, Drawings	3	12/05/2014
			Traffic Safety, Work Qty Report	3	12/05/2014

6.3.3 List of Bridges

70. List of bridge is shown in Appendix-3.

6.3.4 List of Cross Structures

71. List of cross structure is shown in Appendix-4.

6.4 Detailed Design of Electrical Works (Additional to TOR)

6.4.1 Approval date of Design Documents (Electrical Works) by Package

72. Design of the electrical works was not included in the TOR, however, the Consultant designed necessary electrical works.

73. After receiving the AC comments and Approval Decision, each report were finalized, time to time, as shown in Table 6.15.

Table 6.15Approval date of Design Documents (Electrical Works) by Package

No.	PKG	Submission			Appraisal Comment (1)	Answer to Comment (1)	Appraisal Comment (2)	Answer to Comment (2)	Approval
		Draft	D Final	Final					
1	14A-2	23/5/2013		2/7/2014	18/7/2013	25/7/2013	24/9/2013	11/10/2013	16/06/2014
2	14B-2								16/06/2014

6.4.2 Submitted Design Documents for Electrical Works

74. Table 6.16 summarizes all design documents for the electrical works submitted for each contract package.

Table 6.16Submitted Design Documents by Package (Electrical Works)

No.	PKG	Category	Report Title	Rev	Submission Date
1	PKG14A-2	Electrical	Detailed Design Reports	2	02/07/2014
2			Drawings		
3	PKG14B-2	Electrical	Detailed Design Reports	2	02/07/2014
4			Drawings		

6.5 Study and Design of ITS and Toll Collection System (TOR 3.3.4)

75. In accordance with the requirements stipulated in TOR 3.3.4, the Consultant carried out the detailed design of ITS works.

76. After receiving the AC comments and Approval Decision, each report were finalized, time to time, as shown in Table 6.17.

Table 6.17Approval date of Design Documents (ITS Works) by Package

No.	PKG	Submission			Appraisal Comment (1)	Answer to Comment (1)	Appraisal Comment (2)	Answer to Comment (2)	Approval
		Draft	D Final	Final					
1	13C	10/5/2013	12/2/2014				24/9/2013	28/10/2013	

77. Table 6.18summarizes all design documents for the ITS works submitted for each contract package.

Table 6.18Submitted Design Documents by Package (ITS Works)

No.	PKG	Category	Report Title	Rev	Submission Date
1	PKG13C	ITS	Detailed Design Reports	0	27/01/2013
2			Drawings		

6.6 Expressway Operation and Maintenance (TOR 3.3.5)

78. In accordance with the requirements stipulated in TOR 3.3.5, the Consultant carried out the operation and maintenance (O&M) plan and detailed design of O&M building works.

79. After receiving the AC comments and Approval Decision, each report were finalized, time to time, as shown in Table 6.19.

Table 6.19Approval date of Design Documents (O&M Works) by Package

No.	PKG	Submission			Appraisal Comment (1)	Answer to Comment (1)	Appraisal Comment (2)	Answer to Comment (2)	Approval
		Draft	D Final	Final					
1	13A	10/5/2013	12/2/2014				24/9/2013	28/10/2013	
2	13B								

80. Table 6.20 summarizes all design documents for the O&M works submitted for each contract package.

Table 6.20Submitted Design Documents by Package (O&M Works)

No.	PKG	Category	Report Title	Rev	Submission Date
1	---	O&M Plan	O&M Plan Report	2	03/05/2013
2			Traffic Management Plan Report	1	03/05/2013
3			Heavy Vehicle Control System Report	1	03/05/2013
4			O&M Building Plan Report	3	03/05/2013
5	PKG13A	O&M Building	Detailed Design Reports	0	27/01/2013
6			Drawings		
7			Work Qty Report		
8			Specifications		
9	PKG13B	O&M Vehicles	Specifications	0	27/01/2013

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

6.7.1 Update of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)

81. In accordance with the requirements stipulated in TOR 3.3.6, the Consultant carried out the update of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports.

Table 6.21Work Progress of Update of EIA and EMP Reports

Task	Required Tasks	Time	Contents
1	Review the latest EIA Report, the EMP, and the World Bank comments.	Mar 2012	The latest version of EIA Report and the EMP (which were submitted to WB in October 2010) had been reviewed, and inadequacy/shortcomings of these reports had been identified. Results of review are summarized and described in the Brief Report. The Brief Report had been submitted to PMU85 on March 13, 2012.
2	Carry out the field survey to confirm the appropriateness and adequacy of road alignment planning and impact mitigation measures.	Jul 2012	A list of environmentally-sensitive spots/structures, including all populous residential areas along the proposed alignment, was made. Carried out field surveys at these environmentally-sensitive spots/structures to identify environmental issues, potential impacts that may cause by the proposed alignment, and examined proper measures to avoid/mitigate these impacts if necessary.

Task	Required Tasks	Time	Contents
3	Co-work with the Resettlement Team in organizing the public consultation meetings at the project-affected communes and districts.	Jul 2012	With aim to diffuse information on the Project to local residents, promote local residents' understanding about the Project, and collect local residents' comments/opinions on the project design and impact mitigation measures, Co-working with the Resettlement Team in organizing the public consultation meetings at the project-affected communes. Information such as project outlines, impacts that may cause by the project to the commune, proposed impact mitigation measures, etc. are explained to local people during those public consultation meetings. It is also an opportunity for local residents to raise questions, comments, opinions, etc. on the Project, and for collecting information on the environmentally-sensitive spots/structures which could not identified on topographic maps. Comments and opinions raised by participants in the public consultation meetings are also useful and contributable to plan the impact mitigation measures that match with the actual natural and socio-economic conditions of the localities.
4	Review the comparison of the alternatives and the selection of the options.	Mar 2012	The process of alignment planning for the Da Nang – QuangNgai Expressway since 2003, including the comparison of alignment alternatives and the selection of optimum alternative had been reviewed and summarized in the Brief Report. The Brief Report had been submitted to PMU85 on March 13, 2012.
5	Review, comment on the adequacy of impacts assessment and discuss any potential environmental impacts or issues not raised in the EIA Report.	Mar 2012	The impact assessment described in the EIA reports had been reviewed. Result of the review was summarized in the Brief Report. The Brief Report had been submitted to PMU85 on March 13, 2012. It can conclude that all potential impacts had been described to some extent in these EIA reports except for the following impacts: • Impact caused by the excavation and transportation of construction materials • Impact caused by the transportation and disposal of waste soils generated from construction works of road, bridges, and tunnels.
6	Review the environmental mitigation measures proposed for the design, construction and operation phases, and confirm the appropriateness and adequacy of the proposed mitigation measures.	Mar 2012	The impact mitigation measures described in the EIA reports had been reviewed. Result of the review was summarized in the Brief Report. All impact mitigation measures had been described to some extent in these EIA reports. However, the following impact mitigation measures should be examined further in detail during D/D stage: • Mitigation measures for impact of noise and vibration (during design phase, construction phase and operation phase) • Mitigation measures for impact of air pollution (during construction phase and operation phase) • Mitigation measures for impact of waste water (during construction phase and operation phase) and polluted runoff water from road surface of large bridges (during design phase and operation phase) • Mitigation measures for impacts caused by the transportation and disposal of waste soils and construction wastes (during design phase and construction phase) • Mitigation measures for impact of inundation (during design phase and operation phase) • Mitigation measures for impacts caused by the exploitation and transportation of construction materials (during design phase and construction phase) • Mitigation measures for impact of split of communities, impedance of movements, etc.
7	Recommend supplemental impact mitigation measures as needed.	Mar 2012	Necessary supplemental to the impact mitigation measures (which has not been described appropriately in the existing EIA reports) are being examined, those were be described in the Draft Updated EIA Report.

Task	Required Tasks	Time	Contents
8	Confirm the appropriateness of the road alignment planning.	Mar 2012	Process of alignment planning (comparison of alignment alternatives, selection of optimum alternative, appropriateness of topographic maps and information used for alignment planning, etc.) was reviewed. Validity of the alignment planning was assessed and summarized in the Brief Report on Environmental Considerations. In addition, identified 25 sections of the alignment where is relatively high population density and where there is the need to collect more detailed information for assessing the validity of the proposed alignment. Additional topographic Survey for 250m from the centerline at these 25 sections was carried out for confirmation on the validity of the proposed alignment.
9	Prepare a brief report on the comparison and selection of the alternatives and the final alignment	Mar 2012	The Brief Report on Environmental Considerations was submitted to PMU85 on March 13, 2012 (Letter Ref No. DQEDD-PMU85-75-12)
10	Confirm the appropriateness of the mitigation measures and ensure that the mitigation measures are included in the design, technical specifications and contract documents	Jul 2012	Working close with the design teams in incorporating the impact mitigation measures into design of road, bridges and tunnel. The following measures are considered important and should be discussed carefully with the design teams in D/D stage: • Mitigation measures for impact of noise and vibration in operation phase: co-work with the road design team; • Mitigation measures for impact of polluted runoff water from road surface of large bridges in operation phase: co-work with the bridge design team; • Mitigation measures for impacts caused by the transportation and disposal of waste soils and construction wastes during construction phase: co-work with the cost team; • Mitigation measures for impact of inundation in operation phase: co-work with the road design team; • Mitigation measures for impacts caused by the exploitation and transportation of construction materials during construction phase: co-work with the cost and procurement Team; • Mitigation measures for impact of split of communities, impedance of movements, etc. in operation phase: co-work with the road design Team.
11	Prepare the Draft Updated EIA Report	Jun 2012	The following parts of the EIA Report are likely to be revised and updated greatly: • Vietnam legal framework on EIA • Project descriptions (including changes in project design between F/S and D/D) • Anticipated impact and mitigation measures • Public consultation and information disclosure • The Draft Updated EIA Report had been submitted to PMU85 on June 14, 2012.
12	Prepare the Draft Updated EMP	Jul 2012	Since there are 13 proposed contract packages for civil work, it will be better to make a common part of EMP for all packages (general regulations, standards, policy, etc.), and the separate parts for 13 packages (which will concentrate into impacts, mitigation measures, responsibilities of contractor, etc. for each package). Depending on the geographical and socio-environmental conditions of each road section, the contract packages can be categorized into each. Doing like this, the separate parts of EMP can describe concretely in detail the measures to avoid/mitigate impacts specialized for the each package in concern.
13	Make the Draft Final Updated EIA Report	Aug 2012	The Draft Updated EIA Report described in the previous Section 11 was revised based on comments from PMU85 and WB to make the Draft Final EIA Report in August 2012.
14	Make the Draft Final Updated EMP	Sep 2012	The Draft Updated EMP described in the previous Section 12 was revised based on comments from PMU85 and WB to make the Draft Final EMP in September 2012.

Task	Required Tasks	Time	Contents
15	Prepare TOR for independent environmental monitoring and supervision during construction phase	Sep 2012	TOR for independent environmental monitoring and supervision during construction phase was prepared and included in the Updated EIA Report and EMP.

82. After receiving the World Bank specialist's comments the report was finalized as shown in Table 6.22.

Table 6.22 Submitted EIA and EMP Reports

No.	PKG	Category	Report Title	Rev	Submission Date	Approval Date
1	----	EIA	Updated draft EIA Report	-	2012/6/13	10/07/2014
2			Draft final Updated EIA Report	-	2012/12/10	
3			Final Updated EIA Report	-	2013/7/22	
4	----	EMP	Updated draft EMP Report	-	2012/7/30	27/03/2014
5			Draft final Updated EMP Report	-	2013/3/20	
6			Final Updated EMP Report	-	2013/7/22	

6.7.2 Preparation of Ethnic Minority Development Plan (EMDP)

83. It was confirmed that there is no ethnic minority in the project site, and therefore, this report was not required.

6.7.3 Update of Resettlement Action Plan (RAP)

84. In accordance with the requirements stipulated in TOR 3.3.6, the Consultant carried out the preparation of Resettlement Action Plan (RAP) report.

85. There are 42 communes along the expressway and public consultation meetings were carried out for those communes along the expressway, and the expressway alignment were agreed by each local community as shown in Table 6.23.

86. To facilitate RAP updating and implementation of priority sections, at the request of VEC, WB, JICA agreed that the updated RAPs were prepared separately for affected districts and divided into several stages. Four(4) updated RAPs were found acceptable by VEC and WB and compensation payment is ongoing.

87. Pegging out works completed and handed over to provincial authorities. However, updating of RAPs are being delayed and will unlikely be completed before the LCD due to delays in carrying out the detailed measurement survey (DMS). Therefore, implementation monitoring of resettlement activities, which are carried by Project Supervision Consultants (PSCs), need to be extended and continued for the entire section after the LCD. External monitoring of resettlement activities will be handed over to PSC to ensure the independence from the implementation monitoring

88. Consultant has designed an Income Restoration Guideline and handed over to VEC. In addition, feasibility study for Income Restoration Program (IRP) were also completed in all project's districts.

89. As of December 2014, progress of the preparing S-RAP report is still in progress as shown in Table 6.24-6.26. It was agreed to transfer the remaining works to Construction Supervision Concusltant (CSC) under WB portion.

Table 6.23List of Communes along the Expressway

No.	Province	Contract Package	District	Commune			
				Name	From	To	Length (m)
1	Danang	PKG01 (Km0 - Km8)	HòaVang	HòaNhơn	Km0+000	Km1+615	1,615
2				HòaPhong	Km1+615	Km2+515	900
3				HòaTiến	Km2+515	Km7+965	5,450
4	Quang Nam		ĐiệnBàn	ĐiệnTiến	Km7+965	Km8+000	35
5		PKG02 (Km8 - Km16+880)			Km8+000	Km9+580	1,580
6				ĐiệnThọ	Km9+580	Km16+880	7,300
7		PKG03A (16+880 - Km18+100)			Km16+880	Km17+700	820
8				ĐiệnQuang	Km17+700	Km18+100	400
9		PKG03B (18+100 - Km21+500)			Km18+100	Km20+200	2,100
10			DuyXuyên	Duy Trinh	Km20+200	Km21+500	1,300
11		PKG04 (Km21+500 - Km32+600)			Km21+500	Km22+840	1,340
12				DuySơn	Km22+840	Km26+460	3,620
13				DuyTrung	Km26+460	Km29+465	3,005
14			QuếSơn	QuếXuân	Km29+465	Km32+600	3,135
15		PKG05 (Km32+600 - Km42)			Km32+600	Km34+190	1,590
16				PhúcThọ	Km34+190	Km39+650	5,460
17			ThăngBình	BìnhQuý	Km39+650	Km42+000	2,350
18		PKG06 (Km42 - Km52)			Km42+000	Km45+433	3,433
19				BìnhChánh	Km45+433	Km48+393	2,960
20				BìnhQuế	Km48+393	Km49+513	1,120
21				Bình An	Km49+513	Km50+817	1,304
22				BìnhQuế	Km50+817	Km51+650	833
23				Bình An	Km51+650	Km52+000	350
24		PKG07 (Km52 - Km65)			Km52+000	Km52+350	350
25			PhúNinh	Tam Thành	Km52+350	Km55+296	2,946
26				Tam Phước	Km55+296	Km58+250	2,954
27				Tam Đàn	Km58+250	Km60+820	2,570
28				Tam Thái	Km60+820	Km65+025	4,205
29		PKGA1 (Km65 - Km81+150)		Tam Đại	Km65+025	Km66+465	1,440
30			Tam Kỳ	Tam Ngọc	Km66+465	Km68+412	1,947
31			NúiThành	Tam Xuân 1	Km68+412	Km70+404	1,992
32				Tam Xuân 2	Km70+404	Km75+187	4,783
33				Tam AnhBắc	Km75+187	Km76+800	1,613
34		PKGA2 (Km81+150 - Km99+500)		Tam Anh Nam	Km76+800	Km82+395	5,595
35				Tam Hiệp	Km82+395	Km85+625	3,230
36				Tam MỹTây	Km85+625	Km87+980	2,355
37				Tam MỹĐông	Km87+980	Km92+100	4,120
38				Tam Nghĩa	Km92+100	Km99+200	7,100
39	QuangNgai		BìnhSơn	BìnhChánh	Km99+200	Km99+500	300
40		PKGA3 (Km99+500 - Km110+100)			Km99+500	Km100+285	785
41				BìnhNguyên	Km100+285	Km105+800	5,515
42				BìnhTrung	Km105+800	Km109+100	3,300
43				BìnhChương	Km109+100	Km109+600	500
44				Bình Long	Km109+600	Km110+100	500
45		PKGA4 (Km110+100 - Km124+700)			Km110+100	Km111+512	1,412
46			SơnTịnh	TịnhThọ	Km111+512	Km121+000	9,488
47				TịnhHà	Km121+000	Km124+700	3,700
48		PKGA5 (Km124+700 - Km131+500)			Km124+700	Km125+200	500
49			TưNghĩa	NghĩaKỳ	Km125+200	Km129+905	4,705
50			TP QuảngNgãi	QuảngPhú	Km129+905	Km130+175	270
51			TưNghĩa	NghĩaĐiền	Km130+175	Km131+500	1,325
52		PKGA5 (Km131+500 - Km139+263)			Km131+500	Km132+620	1,120
53			NghĩaHành	HànhThuận	Km132+620	Km133+100	480
54			TưNghĩa	NghĩaĐiền	Km133+100	Km133+375	275
55			NghĩaHành	HànhThuận	Km133+375	Km134+640	1,265
56			TưNghĩa	NghĩaTrung	Km134+640	Km138+365	3,725
57				NghĩaThương	Km138+365	Km139+263	898
	3		13	42			139,263

Table 6.24 List of Consultation Meeting

No	Location			Meeting date
	Province/ City	District	Commune	
1	Da Nang	HoaVang	HoaNhon	14/06/2013
2			HoaPhong	12/4/2012
3			HoaTien	13/4/2012
4	Quang Nam	Dien Ban	DienTien	13/01/2012
5			DienTho	11/01/2012
6			DienQuang	12/01/2012
7		DuyXuyen	Duy Trinh	09/10/2012
8			DuySơn	09/10/2012
9			DuyTrung	10/10/2012
10		Que Son	QueXuan 2	08/04/2013
11			PhuTho	09/11/2012
12		ThangBinh	BinhQuy	26/11/2012
13			BinhChanh	26/11/2012
14			BinhQue	27/11/2012
15			Binh An	27/11/2012
16		PhuNinh	Tam Thanh	21/11/2012
17			Tam Phuoc	21/11/2012
18			Tam Đan	22/11/2012
19			Tam Thai	23/4/2012
20			Tam Đai	23/4/2012
21		Tam Ky City	Tam Ngoc	19/4/2012
22		Nui Thanh	Tam Xuan 1	20/4/2012
23			Tam Xuan 2	21/4/2012
24			Tam AnhBac	04/01/2013
25			Tam Anh Nam	08/01/2013
26			Tam Hiep	04/01/2013
27			Tam My Tay	09/01/2013
28			Tam My Dong	08/01/2013
29			Tam Nghia	09/01/2013
30	QuangNgai	BinhSơn	BinhChanh	07/11/2012
31			Binh Nguyen	10/11/2012
32			BinhTrung	07/11/2012
33			BinhChuong	10/11/2012
34			Binh Long	14/3/2012
35		Son Tinh	TinhTho	15/3/2012
36			Tinh Ha	16/3/2012
37		TuNghia	NghiaKy	23/3/2012
38			NghiaĐien	19/3/2012
39			NghiaTrung	20/3/2012
40			NghiaThuong	21/3/2012
41		NghiaHành	HanhThuan	22/3/2912

Table 6.25 Agreements with Relevant Authorities

No.	Document	Date	Local government
1	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	February 8, 2012	Dien Ban district, Quang Nam province
2	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	February 20, 2012	HoaVang district, Da Nang city
3	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	March 7, 2012	Tam Ky city, Quang Nam province
4	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	March 16, 2012	Binh Son district, QuangNgai province
5	The Letterregarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	March 19, 2012	Son Tinh district, QuangNgai province
6	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	March 24, 2012	Nui Thanh district, Quang Nam province
7	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	March 29, 2012	PhuNinh district, Quang Nam province
8	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	April 5, 2012	ThangBinh district, Quang Nam province
9	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	April 11, 2012	Que Son district, Quang Nam province
10	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	April 18, 2012	TuNghia district, QuangNgai province
11	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	April 18, 2012	NghiaHanh district, QuangNgai province
12	Minutes of meeting regarding alignment of expressway, road crossing structures, drainage culverts, realigned canals	April, 2012	DuyXuyen district, Quang Nam province

Table 6.26Update of Resettlement Action Plan (RAP)

SURAP No.	PKG	Province	District	Scale of completion (%)					
				DMS	RCS	IRP	SES	RS	Completion of SURAP
1	1	Da Nang	HòaVang	70	100	0	100	45	75
2	1, 2	Quang Nam	ĐiệnBàn	80	100	100	100	100	95
	3A			100	100	100	100	100	100
3	3B, 4		DuyXuyên	50	100	100	100	60	80
4	4, 5		QuếSơn	50	100	100	100	30	60
5	5, 6, 7		ThăngBình	50	100	100	100	30	60
6	7, A1		PhúNinh	50	100	100	100	55	65
7	A1		Tam Kỳ City	100	100	100	100	100	100
8	A1, A2		NúiThành	50	100	100	100	60	70
9	A2, A3	QuangNgai	BìnhSơn	50	100	100	100	55	65
	A4			100	100	100	100	100	100
10			SơnTịnh	100	100	100	100	100	100
	A5			90	100	100	100	100	95
11			TưNghĩa,	95	100	100	100	100	88
12			QuangNgai city	70	100	0	100	100	0
13			NghĩaHành	95	100	100	100	100	94
Responsible/involved parties				District authorities, PMU85, PMU1, Consultant	Consultant, PPCs, PMU85, PMU1	Consultant, VEC, District authorities	Consultant	Province/District authorities, VEC, Consultant	Consultant

RCS = Replacement Cost Survey (conducted by sub-consultants)
DMS = Detailed Measurement Survey (conducted by district authorities)
RS = Relocation Strategy
SES = Supplementary Socio-economic Survey
IRP = Income Restoration Program

6.8 Construction Method and Schedule (TOR 3.3.7)

90. In accordance with the requirements stipulated in TOR 3.3.7, the Consultant carried out the preparation of the construction method and schedule and submitted as "Method Statement" for each package.

91. After receiving the AC comments and Approval Decision, each report were finalized, time to time, as shown in Table 6.27.

Table 6.27Submitted Method Statement by Package

No.	PKG	Category	Report Title	Rev	Submission Date	Approval Date
1	1	Method Statement	Method Statement	1	25/10/2013	
2	2			1	21/10/2013	
3	3A			2	11/3/2013	
4	3B			2	12/9/2013	
5	4			1	8/2/2014	
6	5			1	2/11/2013	
7	6			3	14/11/2013	
8	7			1	7/11/2013	
9	A1			0	29/10/2013	
10	A2			0	3/9/2013	
11	A3			0	9/1/2014	
12	A4			2	11/5/2013	
13	A5			0	18/4/2013	

6.9 Cost Estimate (TOR 3.3.8)

92. In accordance with the requirements stipulated in TOR 3.3.8, the Consultant carried out the preparation of the cost estimate reports for each package.

93. After receiving the AC comments and Approval Decision, each report were finalized, time to time, as shown in Table 6.28.

Table 6.28Submitted Cost Estimate Report by Package

No.	PKG	Category	Report Title	Rev	Submission Date	Approval Date
1	1	Cost Estimate	Cost Estimate Report	1	25/10/2013	28/10/2013
2	2			2	29/10/2013	30/10/2013
3	3A			4	28/2/2013	01/03/2013
4	3B			3	27/9/2013	13/09/2013
5	4			1	24/1/2014	13/02/2014
6	5			1	8/11/2013	18/11/2013
7	6			3	14/11/2013	28/11/2013
8	7			1	7/11/2013	25/11/2013
9	A1			1	24/1/2014	13/03/2014
10	A2			1	20/1/2014	13/03/2014
11	A3			0	2/1/2014	13/03/2014
12	A4			4	27/8/2013	30/08/2013
13	A5			0	15/4/2013	07/05/2014
14	13A					
15	13B					
16	13C					
17	14A			2	07/07/2014	
18	14B			3	07/07/2014	

6.10 Pre-qualification, Bidding and Contract Documents (TOR 3.3.9)

6.10.1 Pre-qualification (PQ) Documents

94. In accordance with the requirements stipulated in TOR 3.3.9, the Consultant carried out the preparation of the Pre-qualification (PQ) Documents for each package.

95. After receiving the AC/VEC comments, each report were finalized, time to time, as shown in Table 6.29.

Table 6.29Pre-qualification (PQ) Documentsby Package

No.	PKG	Category	Report Title	Rev	Submission Date	Approval Date
1	1	PQ Documents	PQ Documents	3	5/11/2012	
2	2			3	5/11/2012	
3	3A			2	12/02/2012	
4	3B			3	5/11/2012	
5	4			3	12/11/2012	
6	5			3	12/11/2012	
7	6			3	12/11/2012	
8	7			3	12/11/2012	
9	A1			4	05/07/2012	
10	A2			4	05/07/2012	
11	A3			3	05/07/2012	
12	A4			1	17/01/2012	
13	A5			3	05/07/2012	
14	13A			1	06/06/2014	
15	13B				N/A	
16	13C			1	16/06/2014	
17	14A			2	19/11/2013	
18	14B				N/A	

6.10.2 Bidding and Documents

96. In accordance with the requirements stipulated in TOR 3.3.9, the Consultant carried out the preparation of the Pre-qualification (PQ) Documents for each package.

97. After receiving the AC/VEC comments, each report were finalized, time to time, as shown in Table 6.30.

Table 6.30Bidding Documentsby Package

No.	PKG	Category	Report Title	Rev	Submission Date	Approval Date
1	1	Bidding Documents	Parts 1&3	0	12/04/2013	06/09/2013
2			V2.1 Technical Specifications	0	5/9/2013	
3			V2.3 BOQ	0	5/9/2013	
4	2		Parts 1&3	0	12/04/2013	28/08/2013
5			V2.1 Technical Specifications	0	26/08/2013	
6			V2.3 BOQ	0	26/08/2013	
7	3A		Parts 1&3	0	22/03/2012	08/01/2013
8			V2.1 Technical Specifications	3	09/01/2013	
9			V2.3 BOQ	3	09/01/2013	
10	3B		Parts 1&3	0	12/04/2013	25/07/2013
11			V2.1 Technical Specifications	1	12/07/2013	
12			V2.3 BOQ	1	12/07/2013	
13	4		Parts 1&3	0	31/05/2013	13/12/2013
14			V2.1 Technical Specifications	1	14/12/2013	
15			V2.3 BOQ	1	14/12/2013	
16	5		Parts 1&3	0	31/05/2013	27/09/2013
17			V2.1 Technical Specifications	1	17/9/2013	
18			V2.3 BOQ	1	17/9/2013	
19	6		Parts 1&3	0	22/03/2013	27/09/2013
20			V2.1 Technical Specifications	1	19/09/2013	
21			V2.3 BOQ	0	19/9/2013	
22	7		Parts 1&3	0	31/05/2013	27/09/2013
23			V2.1 Technical Specifications	1	23/09/2012	
24			V2.3 BOQ	1	17/07/2012	
25	A1		Parts 1&3	0	26/6/2013	N/A
26			V2.1 Technical Specifications	0	09/10/2013	
27			V2.3 BOQ	0	09/10/2013	
28	A2		Parts 1&3	0	26/7/2013	
29			V2.1 Technical Specifications	0	30/9/2013	
30			V2.3 BOQ	0	30/9/2013	
31	A3		Parts 1&3	0	26/7/2013	
32			V2.1 Technical Specifications	0	11/10/2013	
33			V2.3 BOQ	0	11/10/2013	
34	A4		Parts 1&3	0	19/04/2012	24/06/2013
35			V2.1 Technical Specifications	6	29/07/2013	
35			V2.3 BOQ	7	20/08/2013	
37	A5		Parts 1&3	0	26/7/2013	26/03/2014
38			V2.1 Technical Specifications	0	16/01/2014	
39			V2.3 BOQ	0	16/01/2014	
40	A1-A2-A3		V2.1 Technical Specifications	1	30/12/2013	31/12/2013
41			V2.3 BOQ	1	30/12/2013	
---	13A		To be prepared by CSC under JICA portion.			
---	13B					

No.	PKG	Category	Report Title	Rev	Submission Date	Approval Date
---	13C					
42	14A-1		Parts 1&3			12/12/2014
43			Traffic Safety, Specifications			
44			Traffic Safety, BOQ			
45	14A-2		Parts 1&3			
46			Street Lighting, Specifications			
47			Street Lighting, BOQ			
48	14B-1		Parts 1&3			
49			Traffic Safety, Specifications			
50			Traffic Safety, BOQ			
51	14B-2		Parts 1&3			
52			Street Lighting, Specifications			
53			Street Lighting, BOQ			

6.10.3 Contract Documents

98. Preparation of the contract documents were carried out by VEC.

6.11 Preparation of Implementation Program (TOR 3.3.10)

99. Implementation program has been prepared time to time in accordance with actual progress of design work, procurement work.

100. Updated implementation program is shown in Figure 2.1 above.

7. PROCUREMENT ASSISTANCE (TOR 3.4)

101. Most of the procurement processes have been carried out by VEC.

102. Updated procurement plan is shown in Table 7.1.

103. The Consultant has supported whenever requested by VEC, i.e. answer to the bidders for “Request of Clarifications” during the bidding period.

Table 7.1Updated Procurement Plan (As of May 2014)

Ref. No	Contract Description	Estimated Cost (USD million)	Procurement method	Contract Mode	Contract Duration (month)	Date of issuance of PQ documents	Date of issuance of bidding documents/RFP	Pre-qualification/EOI required	Prior Review	Funding Sources
1	Civil Works Contract Package 1 (KM000+000 - KM008+000)	71.43	ICB	unit price	36	20/12/2012-20/02/2013	9/9/2013	Yes	Yes	JICA
2	Civil Works Contract Package 2 (KM008+000 - KM016+880)	72.69	ICB	unit price	36	20/12/2012-20/02/2013	30/8/2013	Yes	Yes	JICA
3	Civil Works Contract Package 3A (KM016+880 - KM018+100)	42.68	ICB	unit price	36	15/8/2012-10/10/2012	16/1/2013	Yes	Yes	JICA
4	Civil Works Contract Package 3B (KM018+100 - KM021+500)	38.65	ICB	unit price	36	20/12/2012-20/02/2013	26/7/2013	Yes	Yes	JICA
5	Civil Works Contract Package 4 (KM021+500 - KM032+600)	70.36	ICB	unit price	36	04/3/2013-3/5/2013	16/9/2013	Yes	Yes	JICA
6	Civil Works Contract Package 5 (KM032+600 - KM042+000)	61.28	ICB	unit price	36	04/3/2013-3/5/2013	30/9/2013	Yes	Yes	JICA
7	Civil Works Contract Package 6 (KM042+000 - KM052+000)	63.86	ICB	unit price	36	04/3/2013-3/5/2013	30/9/2013	Yes	Yes	JICA
8	Civil Works Contract Package 7 (KM052+000 - KM065+000)	84.61	ICB	unit price	36	04/3/2013-3/5/2013	30/9/2013	Yes	Yes	JICA
9	Civil Works Contract Package A1 (KM065+000 - KM081+150)	84.54	ICB	unit price	36	15/3/2013-10/5/2013	3/1/2014	Yes	Yes	WB
10	Civil Works Contract Package A2 (KM081+150 - KM099+500)	89.37	ICB	unit price	36	15/3/2013-10/5/2013		Yes	Yes	WB
11	Civil Works Contract Package A3 (KM099+500 - KM110+100)	76.14	ICB	unit price	36	15/3/2013-10/5/2013		Yes	Yes	WB
12	Civil Works Contract Package A4 (KM110+100 - KM124+700)	90.70	ICB	unit price	36	23/4/2012-18/6/2012	25/6/2013	Yes	Yes	WB
13	Civil Works Contract Package A5 (KM124+700 - KM131+500; & KM131+500 - KM139+204)	91.65	ICB	unit price	36	15/3/2013-10/5/2013	**27/3/2014**	Yes	Yes	WB
14	Contract Package 13 (Electrical/O&M Building/ITS Works and Equipment Provision)	60.28	ICB	unit price (EPC)	24	Under supervision service		Yes	Yes	JICA
15	Contract Package 14A (Traffic safety/Lighting)	14.27	ICB	unit price	12	-	Under supervision service	Yes	Yes	JICA
16	Contract Package 14B (Traffic safety/Lighting)	18.02	ICB	unit price	12	Not Applicable		No	Yes	WB
Exchange rate: 1USD=19000 VND										

8. LAND ACQUISITION STAKING (TOR 3.5)

104. In accordance with the requirements stipulated in TOR 3.5, the Consultant carried out the land acquisition staking.

105. Firstly, prepare and submit the "ROW Report". After receiving approval by PMU85, the staking works have been carried out at the site as shown in Table 8.1.

Table 8.1 Right of Way and Land Acquisition Staking

District	Item	From	To	ROW Report	Minutes of Hnading-over	Approval
HòaVang	Tuy Loan IC	00-800	00+900	No. 9	6/11/12	
				No. 14	21/05/13	226/QĐ-VEC, 20/5/2013
	TMC/PA	03+400	05+934	No. 9	6/11/12	
	Re-Aligned	00+518	02+601	No. 11	11/1/13	40/QĐ-VEC, 24/01/2013
ĐiệnBàn	My Son IC	12+840	13+820	No. 12	10/4/13	41/QĐ-VEC, 24/01/2013
	Thruway	17+850	20+100	No. 1	17/8/12	
DuyXuyên	Thruway	20+400	24+700	No. 6	17/8/12	
	Thruway	24+700	29+465	No. 5	17/8/12	
	PA (29+130)	Chuyển sang gói 5				
	Re-Aligned	20+657	22+080	No. 11	1/2/13	40/QĐ-VEC, 24/01/2013
	Re-Aligned	25+210	30+100	No. 11	1/2/13	40/QĐ-VEC, 24/01/2013
QuếSơn	Thruway	29+465	39+650	No. 2	27/9/12	
	Re-Aligned	30+100	32+600	No. 11	1/2/13	40/QĐ-VEC, 24/01/2013
	Re-Aligned	34+298	35+100	No.15	**7/08/13**	
	PA (36+000)	35+501	36+641	No. 15	**7/08/13**	
ThăngBình	Thruway	39+650	52+350	No. 3	29/9/12	
	Ha Lam IC	40+300	41+400	No. 12	10/4/13	41/QĐ-VEC, 24/01/2013
PhúNinh	Thruway	52+350	60+140	No. 4	1/10/12	
	Tam Ky IC	63+900	64+950	No. 12	11/4/13	41/QĐ-VEC, 24/01/2013
	SA (66+460)	66+409	67+785	No. 15	8/8/13	
NúiThành	Thruway	71+100	99+200	No. 8*	1/11/12	
					28/11/12	Stakes were restored
	Chu Lai IC	82+430	83+500	No. 12	11/4/13	41/QĐ-VEC, 24/01/2013
	PA (96+300)	95+810	96+800	No. 16	17/12/13	477/QĐ-VEC, 27/9/2013
BìnhSơn	Thruway	99+200	109+300	No. 7	5/10/12	
					28/11/12	Stakes were restored
	Dung Quat IC	101+190	102+240	No. 12	12/4/13	41/QĐ-VEC, 24/01/2013
	Revised (Frontage Rd)	110+100	111+600	No. 13	24/7/13	166/QĐ-VEC, 18/4/2013
SơnTịnh	Revised (Frontage Rd)	111+600	124+700	No. 13	24/7/13	
	DungQuat 2 IC	116+685	117+485	No. 15	24/7/13	
	PA	120+300	121+700	No. 10		Suspended
	QuangNgai North IC	123+000	124+450	No. 13	23/7/13	166/QĐ-VEC, 18/4/2013
	GPMB bổ sung	123+989	124+072	No. 18	10/2013	543/QĐ-VEC, 14/10/2013
TưNghĩa	TB (129+500)	129+321	131+550	No. 15	24/7/13	
	Additional Land	127+878	129+078	No.15	23/7/13	
	Additional Land	134+646	135+326	No.15	23/7/13	
	NH1 Intersection	138+891	139+204	No.15	24/7/13	
TP QuảngNgãi	QuangNgai IC	130+050	130+870	No.15	24/7/13	
Whole Section				No. 17	19/12/13	477/QĐ-VEC, 27/9/2013

Table 8.2Acceptance Minutes of Land Acquisition Staking

No.	Description	Sign- date
1	Land acquisition & ROW staking works	01 June 2014

9. TECHNOLOGY TRANSFER (TOR 3.6)

106. Technology transfer had been carried out by i) on the job training (OJT) and ii) off the job training (OffJT).

107. OJT type technology transfer had been carried out through day-to-day discussion on both technical and project management.

108. OffJT type technology transfer wascarried out the following technical seminar. The Consultant proposed to hold a technical proposal with the program shown in Table9.2 by his letter No. DQEDD-PMU85-294-13 dated 21/5/2013, however unfortunately, it did not realized by some reason.

Table 9.1Technology Transfer Work Shop

Workshop No.	Workshop Title	Date	Venue	Attendance	Trainee no.	Remarks
1	ITS/O&M Workshop	16/10/2012	VEC Hanoi	MOT, VEC, PMU85	15	

Table 9.2Proposed Training Program (June 2013)

No.	Title	Presenter	Position
1	Highway Design utilizing Google Earth	DrNareshSthapit	Highway Engineer 2
2	ITS Plan and Design	Mr Koichi Nishimura	ITS Specialist
3	Preparation of SURAP Report	Dr Vu Ngoc Long	Resettlement Specialist
4	Preparation of Bidding Documents	Mr William John Davy	Sr Procurement/Contract Specialist
5	Project Management of D/D Project	MrIchizuru Ishimoto	Project Manager

Part C: List of Submitted Documents

10. LIST OF SUBMITTED DOCUMENTS

109. List of submitted documents is summarized in Table 10.1.

Table 10.1List of Submitted Documents

No.	Title of Report	Required quantity in the contract (set)	Submitted quantity (set)	Cover Letter (Date)
1	Inception Report	15	15	27/12/2011
2	Review Study reports and design framework	15	14	27/02/2012
3	Monthly Reports	15	8 set- English 8 set-Vietnamese	Every month
4	EIA Report	15	15	22/07/2013
5	EMP Report	15	15	22/07/2013
6	Brief report on the appropriateness of proposed alignment (Study report – Finalization of Expressway Alignment)	Not specific mentioned	3 sets	19/05/2012
7	Updated Sub-RAP	15	0	
	Survey report			
8	Topographic Survey:	Not specific mentioned		
	Package No. 1	14	14	16/5/2013
	Package No. 2	14	14	10/5/2013
	Package No. 3A	15	15	9/10/2012
	Package No. 3B	14	14	2/4/2013
	Package No. 4	14	14	5/6/2013
	Package No. 5	14	14	13/5/2013
	Package No. 6	14	14	5/2/3013
	Package No. 7	14	14	15/3/2013
	Package No. A1	14	14	6/5/2013
	Package No. A2	14	14	8/3/2013
	Package No. A3	14	14	24/4/2013
	Package No. A4	14	14	31/5/2013
	Package No. A5	14	14	21/5/2013
9	Survey hydrological data	Not specific mentioned	14	22/08/2013
10	Engineering geological survey	Not specific mentioned		
	Geotechnical Investigation of PKG1	14	14	10/5/2013
	Geotechnical Investigation of PKG1 (Tuy Loan IC)	14	14	27/6/2013
	Geotechnical Investigation of PKG1 (Realignment section)	14	14	8/8/2013
	Geotechnical Investigation of PKG1 (LRB02)	14	14	04/06/2013
	Geotechnical Investigation of PKG2 (Embankment)	14	14	29/1/2013
	Geotechnical Investigation of PKG2 (Bridge)	14	14	1/7/2013
	Geotechnical Investigation of PKG2 (My Son IC)	14	14	11/5/2013
	Geotechnical Investigation of PKG2 (Geologic Profile)	14	14	5/7/2013
	Geotechnical Investigation of PKG3A (Ky Lam Bridge)	14	14	17/10/2012
	Geotechnical Investigation of PKG3B	14	14	22/6/2013

No.	Title of Report	Required quantity in the contract (set)	Submitted quantity (set)	Cover Letter (Date)
	Geotechnical Investigation of PKG3B (Chiem Son Bridge)	14	14	4/4/2013
	Geotechnical Investigation of PKG4-1	14	14	7/8/2013
	Geotechnical Investigation of PKG4-2	14	14	7/8/2013
	Geotechnical Investigation of PKG 4- Tunnel Section	14	14	15/4/2013
	Geotechnical Investigation of PKG5	14	14	11/4/2013
	Geotechnical Investigation of PKG5 (Ha Lam IC)	14	14	25/5/2013
	Geotechnical Investigation of PKG6	14	14	5/2/2013
	Geotechnical Investigation of PKG6 (ORB-13)	14	14	24/6/2013
	Geotechnical Investigation of PKG7	14	14	22/3/2013
	Geotechnical Investigation of PKG7 (Tam Ky IC)	14	14	25/5/2013
	Geotechnical Investigation of PKGA1	14	14	5/7/2013
	Geotechnical Investigation of PKGA1 (FO06a, ORB17a)	14	14	5/7/2013
	Geotechnical Investigation of PKGA2-1	14	14	9/4/2013
	Geotechnical Investigation of PKGA2-1 (CB23, OP19)	14	14	24/6/2013
	Geotechnical Investigation of PKGA2-1 (Chu Lai IC)	14	14	25/5/2013
	Geotechnical Investigation of PKGA2-2	14	14	2/4/2013
	Geotechnical Investigation of PKGA2-2 (CB25)	14	14	24/6/2013
	Geotechnical Investigation of PKGA3	14	14	5/7/2013
	Geotechnical Investigation of PKGA3 (Dung Quat IC)	14	14	25/5/2013
	Geotechnical Investigation of PKGA3 (Tra Bong Bridge)	14	14	4/4/2013
	Geotechnical Investigation of PKGA4	14	14	9/4/2013
	Geotechnical Investigation of PKGA4 (Box culvert)	14	14	24/6/2013
	Geotechnical Investigation of PKGA4 (QuangNgai North IC)	14	14	25/6/2013
	Geotechnical Investigation of PKGA5	14	14	19/6/2013
	Geotechnical Investigation of PKGA5 (Box culvert)	14	14	24/6/2013
	Geotechnical Investigation of PKGA5 (TraKhuc Bridge)	14	14	4/4/2013
	Geotechnical Investigation of PKG13 (O&M Building)	14	14	13/6/2013
11	Material Source Survey	Not specific mentioned	1 set/1 package	09/8/2013
12	Relevant structures survey	Not specific mentioned	14	
	Topographic Survey of Populous Residential Areas		14	4/5/2013
	Topographic Survey of Temporary Access Road		14	9/5/2013
	Topographic Survey of Public Utility		14	17/5/2013
	High Voltage Lines (HVL)		14	24/10/2012
	Medium and Low Voltage Lines (MVL-LVL)		14	20/6/2012
13	Additional Traffic Surveys	Not specific mentioned	03	09/01/2013

No.	Title of Report	Required quantity in the contract (set)	Submitted quantity (set)	Cover Letter (Date)
14	Detailed Design, reports	3 set (draft) for each submission		
	Package No. 1	14	14	03/09/2013
	Package No. 2	14	14	30/08/2013
	Package No. 3A	14	14	28/12/2012
	Package No. 3B	14	14	16/08/2013
	Package No. 4	14	14	20/11/2013
	Package No. 5	14	14	08/07/2013
	Package No. 6	14	14	15/07/2013
	Package No. 7	14	14	30/07/2013
	Package No. A1	14	14	11/09/2013
	Package No. A2	14	14	30/07/2013
	Package No. A3	14	14	23/09/2013
	Package No. A4	14	14	04/06/2013
	Package No. A5	14	14	02/10/2013
	Package No. 13	14	14	???
	Package No. 14A	14	14	12/05/2014
	Package No. 14B	14	14	12/05/2014
15	Cost Estimate Report	Not specific mentioned		
	Package No. 1		03	25/10/2013
	Package No. 2		03	29/10/2013
	Package No. 3A		03	28/2/2013
	Package No. 3B		03	27/9/2013
	Package No. 4		03	24/1/2014
	Package No. 5		03	8/11/2013
	Package No. 6		03	14/11/2013
	Package No. 7		03	7/11/2013
	Package No. A1		03	24/1/2014
	Package No. A2		03	20/1/2014
	Package No. A3		03	2/1/2014
	Package No. A4		03	27/8/2013
	Package No. A5		03	15/4/2013
	Package No. 13		03	included in B/D report
	Package No. 14A		04	07/07/2014
	Package No. 14B		04	07/07/2014
16	PQ Documents	3 set (draft) for each submission		
	Package No. 1	10	10	5/11/2012
	Package No. 2	10	10	5/11/2012
	Package No. 3A	10	10	12/02/2012
	Package No. 3B	10	10	5/11/2012
	Package No. 4	10	10	12/11/2012
	Package No. 5	10	10	12/11/2012
	Package No. 6	10	10	12/11/2012
	Package No. 7	10	10	12/11/2012
	Package No. A1	10	10	05/07/2012
	Package No. A2	10	10	05/07/2012
	Package No. A3	10	10	05/07/2012

No.	Title of Report	Required quantity in the contract (set)	Submitted quantity (set)	Cover Letter (Date)
	Package No. A4	10	10	17/01/2012
	Package No. A5	10	10	05/07/2012
	Package No. 13A	10	10	06/06/2014
	Package No. 13B	10	10	N/A
	Package No. 13C	10	10	16/06/2014
	Package No. 14A	10	10	19/11/2013
	Package No. 14B	10	10	N/A
17	Bidding Documents	3 set (draft) for each submission		
	Package No. 1	14	14	5/09/2013
	Package No. 2	14	14	26/08/2013
	Package No. 3A	14	14	09/01/2013
	Package No. 3B	14	14	12/07/2013
	Package No. 4	14	14	14/12/2013
	Package No. 5	14	14	17/09/2013
	Package No. 6	14	14	19/09/2013
	Package No. 7	14	14	23/09/2013
	Package No. A1	14	14	09/10/2013
	Package No. A2	14	14	30/09/2013
	Package No. A3	14	14	11/10/2013
	Package No. A4	14	14	29/07/2013
	Package No. A5	14	14	16/01/2014
	Package No. A1-A2-A3	14	14	30/12/2013
	Package No. 13 A	14	14	prepared by the C.SC
	Package No. 13 B	14	14	
	Package No. 13 C	14	14	
	Package No. 14A	14	14	19/08/2014
	Package No. 14B	14	14	04/09/2014
18	Safety Audit Report	15	15	27/11/2013
Independent Land Valuation Survey				
19	Inception Report	6	6	15/06/2012
20	Replacement Cost Survey	6	6	
	HoaVang			12/01/2013
	Dien Ban			25/09/2012
	DuyXuyen			15/01/2013
	Que Son			14/01/2013
	ThangBinh			19/03/2013
	PhuNinh			29/03/2013
	Tam Ky			25/09/2012
	Nui Thanh			21/01/2013
	TuNghia			03/01/2013
	NghiaHanh			03/01/2013
	Binh Son			07/06/2012
	Son Tinh			07/06/2012
21	ROW No.	Not specific mentioned		
	Report No. 1		3	15/05/2012
	Report No. 2		3	15/05/2012
	Report No. 3		3	15/05/2012
	Report No. 4		4	15/05/2012
	Report No. 5		3	15/05/2012

No.	Title of Report	Required quantity in the contract (set)	Submitted quantity (set)	Cover Letter (Date)
	Report No. 6		2	05/06/2012
	ReportNo. 7		3	15/06/2012
	ROW for Km17+900 – Km109+300		12	05/07/2012
	Report No. 9 and No. 10		3	03/10/2012
	Report No. 11		3	20/12/2012
	Report No. 12		3	08/01/2013
	Report No. 13		3	03/04/2013
	Report No. 14		3	10/05/2013
	Report No. 15		3	29/05/2013
	Report No. 16		3	13/08/2013
	Report No. 17		3	01/10/2013
	Report No. 18		3	8/10/2013

Appendix -1

Major Features and Facilities of Expressway (by Package)

Appendix 1: Major Features and Facilities of Expressway (by Package)

Package 1: KM000+000 - KM008+000, 8.000km

No.	Items	Main Features
01	Road Length	Danang city: 8.0km Beginning Point: Km0+000, HoaNhon Commune, HoaVang District, Da Nang City. Ending Point: Km8+000, DienTien Commune, Dien Ban District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road Width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	8 bridges (L=803.0m) Large River Bridge (L>100m): 2 bridges (L=445.6m) Other River Bridge (L<100m): 2 bridges (L=120.9m) Overpass: 3 bridges (L=165.9m) Cross Road Flyover: 1 bridge (L=70.6m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	8Cross roads (Thruway: 8Rampway: 0)
11	Culvert	Culvert Box: 15 (Thruway: 9, Rampway: 6) Culvert Pipe: 24 (Thruway: 20, Rampway: 4)
12	Softground	Approximately 5.6km
13	Interchange	KM0+000, Tuy Loan IC, NH14B
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 182,295 m3 Rock excavation: 45m3 Embankment: 2,288,281m3
16	Rough Cost	F/S (Sep 2010): 71.43 Million USD Updated (Mar 2013): 84.09 Million USD

Package 2: KM008+000 - KM016+880, 8.880km

No.	Items	Main Features
01	Road Length	Quang Nam province: 8.880km Beginning Point: Km8+000, DienTien Commune, Dien Ban District, Quang Nam Province. Ending Point: Km16+880, DienTho Commune, Dien Ban District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	15 bridges (L=1,518.8m) Large River Bridge (L>100m): 5 bridges (L=608.9m) Canal Bridge: 2 bridges (L=78.2m) Viaduct: 5 bridges (L=588.7m) Overpass: 1 bridge (L=40.7m) Interchange Rampway Bridge: 1 bridge (L=142.0m) Cross Road Flyover: 1 bridge (L=60.3m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	5 cross roads (Thruway: 5 Rampway: 0)
11	Culvert	Culvert Box: 6 (Thruway: 5, Rampway: 1) Culvert Pipe: 16 (Thruway: 10, Rampway: 6)
12	Softground	Approximately 5.6km
13	Interchange	KM13+260, My Son IC, PR609
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 16,221m3 Rock excavation: 15,084m3 Embankment: 1,947,854m3
16	Rough Cost	F/S (Sep 2010): 72.69 Million USD Updated (Mar 2013): 86.10 Million USD

Package 3A: KM016+880 - KM018+100, 1.220km

No.	Items	Main Features
01	Road Length	Quang Nam province: 1.220km Beginning Point: Km16+880, DienTho Commune, Dien Ban District, Quang Nam Province. Ending Point: Km18+100, DienQuang Commune, Dien Ban District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	None
08	Major River Bridge	KM017+503, Ky Lam Bridge, L=1,044.80m, Thu Bon River
09	Tunnel	None
10	Underpass	None
11	Culvert	None
12	Softground	None
13	Interchange	None
14	Frontage Road	110m
15	Earthworks	Soil excavation: 5,579m3 Rock excavation: 0m3 Embankment: 65,128m3
16	Rough Cost	F/S (Sep 2010): 42.68 Million USD Updated (Mar 2013): 70.18 Million USD

Package 3B: KM018+100 - KM021+500, 3.400km

No.	Items	Main Features
01	Road Length	Quang Nam province: 3.400km Beginning Point: Km18+100, DienQuang Commune, Dien Ban District, Quang Nam Province. Ending Point: Km21+500, Duy Trinh Commune, DuyXuyen District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	4 bridges (L=1,051.1m) Viaduct: 3 bridges (L=995.9m) Cross Road Flyover: 1 bridges (L=55.2m)
08	Major River Bridge	KM20+209, Chiem Son Bridge, L=451.10m, Ba Ren River
09	Tunnel	None
10	Underpass	None
11	Culvert	Culvert Box: 2 (Thruway: 2) Culvert Pipe: 1 (Thruway:1)
12	Softground	None
13	Interchange	None
14	Frontage Road	1,788 m
15	Earthworks	Soil excavation: 101,857m3 Rock excavation: 101,547m3 Embankment: 568,191m3
16	Rough Cost	F/S (Sep 2010): 38.65 Million USD Updated (Mar 2013): 59.26 Million USD

Package 4: KM021+500 - KM032+600, 11.100km

No.	Items	Main Features
01	Road Length	Quang Nam province: 11.100km Beginning Point: Km21+500, Duy Trinh Commune, DuyXuyen Commune, Dien Ban District, Quang Nam Province. Ending Point: Km32+600, QueXuan Commune, Que Son District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 100 - 120, Linking Road: Class III, Delta
03	Design Speed	Expressway: 100 - 120 km/hr, Linking Road: 80 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road Width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	5 bridges (L=302.9m) Other River Bridge (L<100m): 3 bridges (L=204.9m) Overpass: 1bridge (L=35.7m) Cross Road Flyover: 1 bridge (L=62.3m)
08	Major River Bridge	None
09	Tunnel	1 tunnel (KM022+900, North bound : 556m; South bound: 515m)
10	Underpass	12 cross roads (Thruway: 12Rampway: 0)
11	Culvert	Culvert Box: 19 (Thruway: 19, Rampway: 0) Culvert Pipe: 21 (Thruway: 21, Rampway: 0)
12	Softground	None
13	Interchange	None
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 301,039m3 Rock excavation: 290,659m3 Embankment: 1,638,682m3
16	Rough Cost	F/S (Sep 2010): 70.36 Million USD Updated (Mar 2013): 122.59 Million USD

Package 5: KM032+600 - KM042+000, 9.400km

No.	Items	Main Features
01	Road Length	Quang Nam province: 9.400km Beginning Point: Km32+600, QueXuan Commune, Que Son District, Quang Nam Province. Ending Point: Km42+000, BinhQuy Commune, ThangBinh District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 100 - 120, Linking Road: Class III, Delta
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	8 bridges (L=581.3m) Large River Bridge (L>100m): 1 bridge (L=222.1m) Other River Bridge (L<100m): 3 bridges (L=184.3m) Canal Bridge: 1 bridge (L=51.0m) Overpass: 3 bridges (L=123.9m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	4 cross roads (Thruway: 3Rampway: 1)
11	Culvert	Culvert Box: 7 (Thruway: 6, Rampway: 1) Culvert Pipe: 21 (Thruway: 16, Rampway: 5)
12	Softground	None
13	Interchange	KM40+880, Ha Lam IC, NH14E
14	Frontage Road	374m
15	Earthworks	Soil excavation: 435,079m3 Rock excavation: 214,556m3 Embankment: 2,880,820m3
16	Rough Cost	F/S (Sep 2010): 61.28 Million USD Updated (Mar 2013): 84.75 Million USD

Package 6: KM042+000 - KM052+000, 10.000km

No.	Items	Main Features
01	Road Length	Quang Nam province: 10.000km Beginning Point: Km42+000, BinhQuy Commune, ThangBinh District, Quang Nam Province. Ending Point: Km52+000, Binh An Commune, ThangBinh District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	9 bridges (L=480.0m) Large River Bridge (L>100m): 1 bridge (L=112.2m) Other River Bridge (L<100m): 3 bridges (L=176.7m) Canal Bridge: 3 bridges (L=123.1m) Overpass: 2 bridges (L=68.0m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	11 cross roads (Thruway: 11)
11	Culvert	Culvert Box: 10 (Thruway: 10) Culvert Pipe: 18 (Thruway: 18)
12	Softground	None
13	Interchange	None
14	Frontage Road	7,767m
15	Earthworks	Soil excavation: 66,564m3 Rock excavation: 66,564m3 Embankment: 1,718,654m3
16	Rough Cost	F/S (Sep 2010): 63.86 Million USD Updated (Mar 2013): 63.92 Million USD

Package 7: KM052+000 - KM065+000, 13.000km

No.	Items	Main Features
01	Road Length	Quang Nam province: 13.000km Beginning Point: Km52+000, Binh An Commune, ThangBinh District, Quang Nam Province. Ending Point: Km65+000, Tam Thai Commune, PhuNinh District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	10 bridges (L=668.6m) Large River Bridge (L>100m): 2 bridges (L=294.8m) Other River Bridge (L<100m): 3 bridges (L=156.0m) Overpass: 4 bridges (L=149.8m) Interchange Rampway Bridge: 1 bridges (L=68.0m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	17 cross roads (Thruway: 15, Rampway: 2)
11	Culvert	Culvert Box: 31 (Thruway: 25, Rampway: 6) Culvert Pipe: 21 (Thruway: 15, Rampway: 6)
12	Softground	None
13	Interchange	KM64+510, Tam Ky IC, PR616
14	Frontage Road	3,619m
15	Earthworks	Soil excavation: 52,431m3 Rock excavation: 46,927m3 Embankment: 2,781,573m3
16	Rough Cost	F/S (Sep 2010): 84.61 Million USD Updated (Mar 2013): 79.84 Million USD

Package A1: KM065+000 - KM081+150, 16.150km

No.	Items	Main Features
01	Road Length	Quang Nam province: 16.150km Beginning Point: Km65+000, Tam Thai Commune, PhuNinh District, Quang Nam Province. Ending Point: Km81+150, Tam Anh Nam Commune, Nui Thanh District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	5bridges (L=585.5m) Large River Bridge (L>100m): 1 bridge (L=306.3m) Other River Bridge (L<100m): 2 bridges (L=118.3m) Cross Road Flyover: 2 bridges (L=160.9m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	18 cross roads (Thruway: 18, Rampway: 0)
11	Culvert	Culvert Box: 27 (Thruway: 27, Rampway: 0) Culvert Pipe: 24 (Thruway: 24, Rampway: 0)
12	Softground	None
13	Interchange	None
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 560,325 m3 Rock excavation: 549,437m3 Embankment: 2,451,666m3
16	Rough Cost	F/S (Sep 2010): 84.54 Million USD Updated (Mar 2013): 98.04 Million USD

Package A2: KM081+150 - KM099+500, 18.350km

No.	Items	Main Features
01	Road Length	Quang Nam province: 18.150km, QuangNgai province: 0.200km Beginning Point: Km81+150, Tam Anh Nam Commune, Nui Thanh District, Quang Nam Province. Ending Point: Km99+500, BinhChanh Commune, Binh Son District, QuangNgai Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	9 bridges (L=539.1m) Large River Bridge (L>100m): 1 bridge (L=147.1m) Other River Bridge (L<100m): 3 bridges (L=152.5m) Canal Bridge (CB): 2 bridges (L=98.8m) Overpass: 2 bridges (L=84.2m) Cross Road Flyover: 1 bridge (L=56.5m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	23 cross roads (Thruway: 22, Rampway: 1)
11	Culvert	Culvert Box: 24 (Thruway: 20, Rampway: 4) Culvert Pipe: 35 (Thruway: 29, Rampway: 6)
12	Softground	Approximately 3.36km
13	Interchange	KM82+990, Chu Lai IC, Planned Road
14	Frontage Road	3,229m
15	Earthworks	Soil excavation: 1,653,116m3 Rock excavation: 1,646,860m3 Embankment: 2,323,333m3
16	Rough Cost	F/S (Sep 2010): 89.37 Million USD Updated (Mar 2013): 114.19Million USD

Package A3: KM099+500 - KM110+100, 10.600km

No.	Items	Main Features
01	Road Length	QuangNgai province: 10.600km Beginning Point: Km99+500, BinhChanh Commune, Binh Son District, QuangNgai Province. Ending Point: Km101+100, Binh Nguyen Commune, BinhSoin District, Quang Nam Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	12 bridges (L=579.0m) Other River Bridge (L<100m): 4 bridges (L=158.6m) Canal Bridge: 1 bridge (L=31.5m) Viaduct: 2 bridges (L=92.2m) Overpass: 1 bridges (L=24.8m) Interchange Rampway Bridges: 3 bridges (L=217.6m) Cross Road Flyover: 1 bridge (L=54.3m)
08	Major River Bridge	KM109+001, Tra Bong Bridge, L=454.5m, Tra Bong River
09	Tunnel	None
10	Underpass	15 cross roads (Thruway: 14, Rampway: 1)
11	Culvert	Culvert Box: 11 (Thruway: 11, Rampway: 0) Culvert Pipe: 12 (Thruway: 10, Rampway: 2)
12	Softground	Approximately 2.46km
13	Interchange	KM101+740, Dung Quat IC, Planed Road
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 722,598m3 Rock excavation: 722,598m3 Embankment: 992,250m3
16	Rough Cost	F/S (Sep 2010): 76.14 Million USD Updated (Mar 2013): 74.58 Million USD

Package A4: KM110+100 - KM124+700, 14.600km

No.	Items	Main Features
01	Road Length	QuangNgai province: 14.600km Beginning Point: Km110+100, Binh Long Commune, Binh Son District, QuangNgai Province. Ending Point: Km124+700, Tinh Ha Commune, Son Tinh District, QuangNgai Province.
02	Road Classification	Expressway: Type A, Class 100 - 120
03	Design Speed	Expressway: 100-120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5 (33.0)m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	8 bridges (L=500.8m) Other River Bridge (L<100m): 1 bridge (L=61.9m) Canal Bridge: 1 bridges (L=46.1m) Viaduct: 1 bridge (L=116.4m) Overpass: 2 bridges (L=91.8m) Cross Road Flyover: 3 bridges (L=184.6m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	7 cross roads (Thruway: 7)
11	Culvert	Culvert Box: 24 (Thruway: 23, Rampway: 1) Culvert Pipe: 15 (Thruway: 15)
12	Softground	None
13	Interchange	KM123+700, QuangNgai North IC, NH24B
14	Frontage Road	2,753m
15	Earthworks	Soil excavation: 1,064,725m3 Rock excavation: 1,001,090m3 Embankment: 1,559,038m3
16	Rough Cost	F/S (Sep 2010): 90.7 Million USD Updated (Mar 2013): 93.63 Million USD

Package A5 (1/2): KM124+700 - KM131+500, 6.800km (Expressway)

No.	Items	Main Features
01	Road Length	QuangNgai province: 6.800km Beginning Point: Km124+700, NghiaKy Commune, TuNghia District, QuangNgai Province. Ending Point: Km131+500, NghiaDien Commune, TuNghia District, QuangNgai Province.
02	Road Classification	Expressway: Type A, Class 120
03	Design Speed	Expressway: 120 km/hr
04	Nos. of Lane	4 lanes (Ultimate stage: Widened to 6 lanes)
05	Road width	Expressway: Road 25.5m, Large River Bridge: 26.0m, Other Bridges: 25.5m, Tunnel section: 2@13.05m=26.1m, Linking Road: 12.0m
06	Design Hydrological Frequency	Expressway: 1 %, Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	8 bridges (L=1,369.8m) Other River Bridge (L<100m): 2 bridge (L=99.2m) Canal Bridge: 1 bridge (L=55.9m) Viaduct: 2 bridges (L=986.8m) Overpass: 3 bridges (L=227.9m)
08	Major River Bridge	KM125+367, TraKhuc Bridge, L=774.50m, TraKhuc River
09	Tunnel	None
10	Underpass	4 cross roads (Thruway: 4)
11	Culvert	Culvert Box: 5 (Thruway: 5) Culvert Pipe:9 (Thruway: 9)
12	Softground	None
13	Interchange	KM130+502, QuangNgai IC, Planned Road
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 0m3 Rock excavation: 0m3 Embankment: 1,214,650m3
16	Rough Cost (incl/ Linking Road)	F/S (Sep 2010): 91.65 Million USD Updated (Mar 2013): 74.01 Million USD

Package A5 (2/2): KM131+500 - KM139+204, 7.704km (Linking Road)

No.	Items	Main Features
01	Road Length	QuangNgai province: 7.704km Beginning Point: Km131+500, NghiaDien Commune, TuNghia District, QuangNgai Province. Ending Point: Km139+204, NghiaThuong Commune, TuNghia District, QuangNgai Province.
02	Road Classification	Linking Road: Class III, Delta
03	Design Speed	Linking Road: 80 km/hr
04	Nos. of Lane	2 lanes
05	Road width	Linking Road: 12.0m
06	Design Hydrological Frequency	Linking Road: 4 % Pavement Drainage: 4% Bridge Deck Drainage: 4%
07	Other Bridge	3 bridges (L=246.906m) Other River Bridge (L<100m): 1 bridge (L=48.7m) Canal Bridge: 1 bridges (L=54.5m) Overpass: 1 bridge (L=143.71m)
08	Major River Bridge	None
09	Tunnel	None
10	Underpass	1 cross road
11	Culvert	Culvert Box: 14 Culvert Pipe: 24
12	Softground	None
13	Interchange	None
14	Frontage Road	(Under design)
15	Earthworks	Soil excavation: 0m3 Rock excavation: 0m3 Embankment: 124,659m3

Package 13:Electrical/O&M Building/ITS Works and Equipment Provision

No.	Items	Main Features
01	Electrical Facilities	Power supply, road lighting, tunnel ventilation and safety facilities
02	ITS	Traffic management, toll collection and communication systems
03	O&M Building	26 locations KM4+100, Traffic Management Center KM4+100, KM123+900, ManagementOffices KM66+800, Service Area KM36+000, KM96+000, Parking Area KM4+100, KM 129+500, Toll Barriers, Interchange Toll Gate and Office: 6locations
04	O&M Equipment	O&M vehicles, spare parts, maintenance equipment and consumables

Package 14A/14B: Traffic Safety/Lighting

No.	Items	Main Features
1	Electrical facilities	Road lighting and tunnel ventilation
2	Traffic Safety Facilities	Guard rail (except crossing & frontage roads), Fence, Traffic signs (except crossing & frontage roads), Road Marking (except crossing & frontage roads), Anti-glare screen

Appendix -2

List of Electrical Crossing

Appendix 2: List of Crossing of Electrical Lines

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	36º15'00"	220KV	7.123	8	8	12.78	15.55	15.53	4 legged steel				152.52	113.34
2	Km0+24.3	76º12'00"	35KV	8.882	3	2	7.8	9.67	9.68	Steel reinforced concrete			0.35	26.91	49.97
3	Km0+24.3	76º12'00"	TT	8.882	1	0	4.9	5.23	5.25	Steel reinforced concrete	0.25	0.2		26.91	49.97
4	Km0+37.8	77º47'00"	TT	1.973	1	0	4.3	5.23	5.25	Steel reinforced concrete	0.25	0.20		32.07	17.35
5	Km0+583.8	141º39'00"	220V	21.959	3	2	5.7	6.55	6.53	Steel reinforced concrete			0.30	52.96	25.39
6	Km0+592.2	148º42"00	35KV	21.645	3	2	9.05	9.67	9.68	Steel reinforced concrete			0.35	24.28	33.12
7	Km0+597.7	142º39'00"	TT	21.773	1	0	5.0	5.23	5.25	Steel reinforced concrete	0.25	0.20		24.27	33.12
8	Km0+800	77º23'00"	220KV	6.336	8	8	17.4			4 legged steel				128.11	433.95
9	Km1+570.35	45º05'00"	35KV	1.364	3	2	9.85	10.07	10.08	Steel reinforced concrete			0.35	15.64	129.37
10	Km1+596.59	36º15'00"	110KV	-1.76	8	8	13.2	12.55	12.53	4 legged steel				71.56	113.05
11	Km3+050.509	90º33'00"	35KV	3.187	3	2	8.90	9.67	9.68	Steel reinforced concrete			0.35	19.23	29.56
12	Km4+434	69º02'00"	220KV	3.406	8	8	12.7	14.55	14.53	4 legged steel				222.28	190.34
13	Km5+518.75	52º33'00"	220V	4.115	3	2	5.9	10.55	10.53	Steel reinforced concrete			0.30	24.96	22.16
14	Km5+745.8	125º43'00"	35KV	4.935	3	2	8.95	9.67	9.68	Steel reinforced concrete			0.35	24.14	28.09
15	Km5+745.8	109º03'00"	TT	4.935	1	0	4.3	5.23	5.25	Steel reinforced concrete	0.25	0.20		6.81	36.36
16	Km7+369.65	88º41'00"	35KV	5.167	3	2	9.7	10.07	10.08	Steel reinforced concrete			0.35	8.709	43.799

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
17	Km7+923	109º03'00"	TT	4.41	1	0	3.5	5.23	5.25	Steel reinforced concrete	0.25	0.20		55.28	25.59
18	Km7+957.70	86º54'00	220V	3.76	3	2	6.8	10.55	10.53	Steel reinforced concrete			0.30	52.32	10.46
19	Km8+038.00	105º04'48"	15KV	2.971	3	1	11.05	10.49	10.65	Steel reinforced concrete			0.30	58.3	53.55
20	Km8+470.50	92º41'	220V	4.906	2	1	5.06	5.22	4.74	Steel reinforced concrete	0.25	0.20		32.03	4.55
21	Km8+980.00	35º09'	6KV	5.485	3	1	7.08	8.89	8.98	Steel reinforced concrete	0.40	0.20		50.16	29.27
22	Km9+27.00	79º00'	TT	5.515	3	0	4.87	5.30	4.90	Steel reinforced concrete	0.25	0.20		3.70	25.89
23	Km9+43.00	79º02'	220V	5.525	4	1	5.00	6.1	5.93	Steel reinforced concrete	0.30	0.25		37.35	31.07
24	Km9+381.30	113º15'47"	6KV	6.859	3	1	9.42	10.61	8.93	Steel reinforced concrete			0.30	73.42	3.73
25	Km9+464.00	29º03'37"	220KV	7.249	8	4	9.87	39.18	40.83	Steel	7.00	7.00		101.10	181.80
26	Km10+330	163º41'	220KV	5.704	8	4	7.56	40.90	40.83	Steel	4.00	4.00		166.14	176.28
27	Km10+554.0	92º12'45"	220V	5.207	3	1	7.73	8.98	9.30	Steel reinforced concrete			0.30	16.80	79.03
28	Km10+764.5	89º89'	220V	6.521	4	1	5.17	7.28	7.02	Steel reinforced concrete			0.30	28.67	16.14
29	Km10+770	90º20'01"	TT	6.426	1	0	4.07	4.64	4.81	Steel reinforced concrete	0.20	0.15		10.17	25.93
30	Km13+87.0	103º34'	6KV	5.755	3	1	8.15	8.76	8.97	Steel reinforced concrete			0.30	90.61	8.88
31	Km13+307	18º43'36"	220KV	4.91	8	4	12.96	40.76	45.89	Steel	4.00	4.00		194.67	176.01
32	Km13+620	94º57'	TT	5.91	1	0	4.90	5.21	5.08	Steel reinforced concrete	0.25	0.20		2.17	36.36
33	Km13+637	104º49'	220V	7.063	4	1	8.82	9.37	6.95	Steel reinforced concrete			0.30	5.46	25.73
34	Km13+820	40º06'	220V	6.259	4	1	6.78	7.05	7.00	Steel reinforced concrete			0.30	49.50	48.35
35	Km13+909.5	140º43'	15KV	6.004	3	1	9.44	12.31	10.30	Steel reinforced concrete			0.50	63.56	62.19
36	Km14+112	44º37'	6KV	6.894	7	2	4.99	8.84	8.74	Steel reinforced concrete	0.35	0.25		37.59	23.57

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
37	Km14+243.5	30º45'	TT	6.672	1	0	4.30	4.57	4.66	Steel reinforced concrete	0.25	0.20		5.25	30.68
38	Km14+276.2	115º57'	220V	6.674	4	1	6.31	7.25	7.31	Steel reinforced concrete			0.30	24.37	21.14
39	Km14+471.5	111º26'30"	220V	6.054	4	1	6.81	5.60	7.46	Steel reinforced concrete			0.30	3.15	2.50
40	Km16+200	102º32'	TT	5.216	1	0	4.30	4.91	4.95	Steel reinforced concrete	0.25	0.20		33.55	4.96
41	Km16+205.6	106º58'	220V	4.651	4	1	6.83	7.29	7.39	Steel reinforced concrete			0.30	9.80	44.12
42	Km16+426	54º01'	220V	5.134	2	1	5.77	6.15	6.07	Steel reinforced concrete			0.30	34.65	10.40
43	Km16+631.5	136º41'	220V	5.435	4	1	5.60	6.15	6.19	Steel reinforced concrete			0.30	10.43	33.75
44	Km16+785.5	56º41'	220V	5.831	4	1	6.35	5.71	7.11	Steel reinforced concrete			0.30	20.43	32.90
45	Km16+853.5	150º00'	220V	5.803	4	1	3.62	7.37	7.48	Steel reinforced concrete			0.30	24.70	22.47
46	Km16+863.5	152º46'	TT	5.648	1	0	3.88	4.47	4.32	Steel reinforced concrete	0.20	0.15		28.40	4.43
47	Km16+880	66º33'	220V	5.443	4	1	4.38	7.41	7.21	Steel reinforced concrete			0.30	12.60	34.40
48	Km18+077.90	87º06'36"	220V	5.01	4	1	7.01	7.21	7.22	Steel reinforced concrete			0.25	39.10	1.30
49	Km18+109.50	75º04'59"	6KV	5.27	3	1	8.42	8.70	8.75	Steel reinforced concrete			0.35	31.96	56.70
50	Km18+214.60	16º10'06"	TT	5.50	4	1	6.5	6.70	6.70	Steel reinforced concrete	0.2	0.2		7.61	2.32
51	Km19+208.20	94º54'40"	220V	6.44	4	1	6.95	7.16	7.22	Steel reinforced concrete			0.25	6.03	2.62
52	Km19+423.20	75º04'59"	250KV	5.29	4	2	14.8	46.3	46.3	Iron	6.5	6.5		42.4	28.55
53	Km19+491.00	90º10'49"	220V	6.16	4	1	5.25	5.43	5.45	Steel reinforced concrete			0.25	7.61	2.32
54	Km19+569.37	95º32'32"	220V	6.34	4	1	6.0	6.3	6.3	Steel reinforced concrete			0.25	18.03	5.57
55	Km20+482.60	70º10'52"	6KV	13.5	3	1	6.3	6.6	6.6	Steel reinforced concrete			0.35	12.72	63.27

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
56	Km21+471.36	46º15'46"	220V	12.8	4	1	4.09	4.35	4.35	Steel reinforced concrete			0.25	0.68	34.84
57	Km21+536.9	56º58'	220V	12.58	4	1	4.5	5	5	Steel reinforced concrete	0.25	0.2		19.18	25.74
58	Km23+284.4	39º53'	220V	6.46	4	1	4.2	5	5	Steel reinforced concrete	0.25	0.2		23.45	25.81
59	Km23+537														
60	Km23+942.2	134º35	220V	6.48	4	2	8.3	9	9	Steel reinforced concrete			0.35	12.59	22.46
61	Km23+944.5														
62	Km24+220.0	80º52'	220V	11.37	3	2	9	9	9	Steel reinforced concrete			0.35	0.2	38.16
63	Km24+222														
64	Km24+793.9	109º20'	220V	11.54	4	1	4.8	5	5	Steel reinforced concrete			0.35	6.08	22.70
65	Km25+221.6	76º33'42"	35KV	8.56	3	2	8.5	9	9	Steel reinforced concrete			0.35	23.01	48.60
66	Km27+428.6	165º12'41"	220V	11.80	4	1	5.3	6.3	6.3	Steel reinforced concrete			0.35	7.62	9.86
67	Km27+572	110º56'00"	35KV	15.22	3	2	8.3	9	9	Steel reinforced concrete			0.35	1.58	41.67
68	Km28+915	47º53'00"	35KV	14.18	3	2	7.5	9	9	Steel reinforced concrete			0.35	36.11	0.7
69	Km30+323	120º30'12"	220V	17.50	2	1	3.5	4.5	4.5	Steel reinforced concrete	0.25	0.2		37.04	15.85
70	Km32+074.96	58º55'53"	220V	19.76	4	1	7.3	7.58	7.6	Steel reinforced concrete			0.25	25.49	9.39
71	Km34+990.37	15º07'29"	6KV	27.91	3	1	11.5	12.4	13.8	Steel reinforced concrete			0.35	10.79	24.7
72	Km35+432.40	83º06'46"	TEL	28.71	5	1	4.18	5.21	5.19	Steel reinforced concrete	0.20	0.17		35.04	1.79
73	Km35+498.34	82º10'06"	6KV	26.70	4	1	7.72	9.38	8.74	Steel reinforced concrete			0.48	52.36	42.19
74	Km35+687.74	107º52'07"	6KV	28.50	4	1	7.93	8.89	9.21	Steel reinforced concrete			0.45	46.17	6.17
75	Km36+588.36	123º26'11"	220V	21.25	4	1	5.88	6.25	6.38	Steel reinforced concrete			0.45	23.64	19.80

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
76	Km37+641.26	98º38'27"	220V	14.27	4	1	6.96	6.81	7.04	Steel reinforced concrete			0.37	46.17	6.17
77	Km40+130.28	81º42'42"	220V	16.01	3	1	8.35	9.47	9.53	Steel reinforced concrete			0.45	46.45	24.39
78	Km41+219.70	108º00'31"	6KV	15.82	5	1	5.69	8.90	9.36	Steel reinforced concrete			0.45	3.35	70.02
79	Km41+242.28	106º50'59"	TEL	15.40	1	1	3.51	6.30	6.17	Steel reinforced concrete	0.15	0.20		3.02	90.85
80	Km41+247.09	106º36'52"	TEL	14.88	5	1	4.58	5.43	5.39	Steel reinforced concrete	0.15	0.20		0.66	23.47
81	Km41+839.20	42º26'30"	6KV	14.66	4	2	7.29	8.85	9.12	Steel reinforced concrete			0.45	47.06	16.93
82	Km41+854.68	42º07'06"	6KV	14.54	1	2	5.88	9.10	9.11	Steel reinforced concrete			0.45	18.82	43.53
83	Km42+020.09	132º15'26"	6KV	14.56	4	2	10.85	10.81	8.87	Steel reinforced concrete			0.45	11.27	74.82
84	Km42+718.33	39º15'18"	TEL	14.56	1	1	6.67	6.60	6.67	Steel reinforced concrete			0.35	43.88	15.85
85	Km42+728.08	51º53'14"	TEL	14.67	3	1	4.57	5.04	6.08	Steel reinforced concrete	0.15	0.20		5.03	30.71
86	Km42+928.35	102º12'18"	220V	14.49	4	1	6.09	6.17	6.39	Steel reinforced concrete				0.85	30.33
87	Km43+669.69	98º35'45"	6KV	13.39	4	2	6.73	9.96	9.14	Steel reinforced concrete			0.48	42.64	37.82
88	Km46+218.01	93º45'31"	TEL	12.08	3	1	4.93	5.17	5.63	Steel reinforced concrete	0.15	0.20		6.42	40.97
89	Km46+218.29	93º45'31"	6KV	12.08	3	1	7.90	8.38	8.59	Steel reinforced concrete	0.40	0.43		60.56	17.83
90	Km47+139.38	104º22'35"	TEL	11.46	2	1	5.00	5.59	5.59	Steel reinforced concrete	0.15	0.20		41.93	22.02
91	Km47+142.54	100º2'51"	220V	11.38	4	1	6.34	6.33	6.00	Steel reinforced concrete			0.35	71.12	43.92
92	Km48+385.85	101º24'45"	TEL	13.52	1	1	3.70	5.55	5.49	Steel reinforced concrete	0.15	0.20		30.01	53.11
93	Km49+027.05	111º9'38"	220V	12.85	4	1	7.80	7.43	7.53	Steel reinforced concrete	0.15	0.20		4.01	42.49
94	Km51+098.97	54º35'56"	220V	14.50	3	1	5.42	6.58	6.41				0.45	63.37	30.24

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
95	Km51+276.06	114°0'20"	TEL	11.77	1	1	5.21	6.80	6.66	Steel reinforced concrete			0.35	59.63	35.59
96	Km51+287.47	118°20'11"	220V	11.73	6	1	3.84	5.00	5.04	Steel reinforced concrete	0.15	0.20		19.77	15.08
97	Km53+7.40	127°23'26"	220V	11.86	4	1	7.15	7.38	7.65	Concrete			0.20	2.30	44.70
98	Km53+358.00	92°03'50"	220V	12.39	4	1	7.25	7.30	7.45	Concrete			0.20	17.30	10.70
99	Km53+751.80	83°13'15"	220V	9.74	4	1	6.74	7.31	7.04	Concrete			0.30	4.90	39.87
100	Km54+072.00	147°52'22"	220V	9.53	4	1	7.37	7.43	6.92	Concrete			0.20	5.60	20.54
101	Km54+216.00	82°41'12"	TEL	8.11	1	0	4.55	5.24	5.35	Concrete	0.20	0.20		37.10	12.90
102	Km54+216.90	82°41'12"	35KV	8.11	3	1	9.00	9.25	9.26	Concrete			0.30	61.40	2.37
103	Km54+216.90	82°41'12"	220V	8.11	4	1	6.64	9.25	9.26	Concrete			0.30	61.40	2.37
104	Km54+515.70	119°54'17"	220V	8.47	4	1	6.39	7.33	7.21	Concrete			0.20	13.33	45.60
105	Km56+040.00	140°42'55"	220V	6.32	1	0	6.05	6.43	0.00	Concrete			0.20	6.09	
106	Km56+501.20	87°07'00"	35KV	7.57	3	1	7.01	9.14	9.13	Concrete			0.30	31.14	19.65
107	Km56+501.20	87°07'00"	220V	7.57	4	1	4.93	9.14	9.13	Concrete			0.30	31.14	19.65
108	Km56+504.00	87°14'05"	220V	7.92	4	1	6.15	6.21	6.5	Concrete	0.25	0.30		30.80	17.00
109	Km56+505.31	87°14'05"	TEL	7.92	3	1	3	3.50	3.5	Concrete	0.20	0.20		30.80	17.00
110	Km57+495.82	102°31'14"	TEL	7.95	3	0	4.35	4.78	4.95	Concrete	0.15	0.20		33.71	2.49
111	Km57+512.85	102°31'14"	220V	8.73	4	1	6.75	7.11	7.16	Concrete	0.25	0.30		27.50	12.30
112	Km59+980.00		220V	15.11	4	1			7.06	Concrete			0.20		12.30
113	Km60+000.00	123°33'39"	35KV	15.35	3	1	9.75	10.88	10.13	Concrete			0.30	7.34	33.50
114	Km60+000.00	123°33'39"	220V	15.35	4	1	6.25	10.88	10.13	Concrete			0.30	7.34	33.50
115	Km60+040.00	111°13'58"	TEL	15.82	3	0	3.91	5.61	4.62	Concrete	0.15	0.20		25.70	11.00
116	Km60+050.00	111°13'58"	CS	15.52	2	0	4.62	6.05	7.92	Concrete			0.20	12.09	30.38
117	Km60+690.00	50°43'09"	500KV	20.53	14	2	14.89	36.08	28.21	Steel	6.00	6.00		86.60	80.00
118	Km61+780.00	133°14'09"	220V	14.40	4	1	5.75	6.85	6.19	Concrete			0.25	7.70	22.10
119	Km61+958.00	24°1'16"	TEL	12.20	1	0	4.35	4.94	4.89	Concrete			0.20	8.69	11.38
120	Km62+150.00	93°51'50"	220KV	11.14	8	4	22.87	47.26	40.66	Steel	4.00	4.00		60.00	103.00
121	Km63+33.12	58°52'12"	220V	9.80	1	0	6.01	7.45	7.08	Concrete			0.20	10.00	24.00
122	Km63+680.00	54°24'35"	35KV	14.28	3	1	7.71	9.45	9.29	Concrete			0.30	50.00	56.00
123	Km63+694.50	54°50'49"	35KV	14.34	3	1	8.45	9.35	9.79	Concrete			0.30	24.00	35.80
124	Km63+795.00	46°07'17"	TEL	15.88	2	0	3.00			Concrete				51.70	10.80
125	Km63+795.00	46°07'17"	220V	15.88	3	1	3.45	4.31	5.65	Concrete	0.15	0.20		51.70	10.80
126	Km64+213.00	137°19'14"	220V	12.04	1	0	4.85	7.31	7.07	Concrete			0.20	18.80	16.00
127	Km64+637.00	96°44'42"	TEL	11.95	1	0	4.86	4.97	5.00	Concrete			0.20	24.50	7.50
128	Km64+660.00	104°52'58"	35KV	11.90	3	1	8.67	8.95	9.04	Concrete			0.30	45.30	69.00
129	Km64+670.00	82°37'00"	110KV	11.86	3	1	12.86	18.50	18.52	Concrete			0.30	77.00	74.70
130	Km66+14.75	78°52'00"	220V	4.99	3	1	5.00	5.60	5.60	Steel reinforced concrete	0.20	0.20		36.58	43.97
131	Km66+118.00	25°25'00"	500KV	4.97	6	2	14.60	34.00	34.00	Iron	8.76	7.32		111.56	100.19
132	Km66+446.90	53°24'00"	TT	4.34	1	0	6.00	6.45	6.50	Steel reinforced concrete	0.20	0.20		15.72	25.87
133	Km66+446.90	53°24'00"	10KV	4.34	3	1	10.00	10.50	10.80	Steel reinforced concrete			0.25	10.79	37.60
134	Km66+452.00	52°04'14"	220V	4.92	3	1	6.00	6.20	6.20	Steel reinforced concrete	0.20	0.20		47.69	0.37
135	Km67+508.00	76°52'53"	220V	2.03	3	1	6.00	6.30	6.35	Steel reinforced concrete	0.20	0.20		14.30	10.16

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
136	Km67+509.12	77°44'09"	10KV	2.03	3	1	10.00	11.10	10.80	Steel reinforced concrete			0.25	38.80	9.66
137	Km67+599.40	70°38'41"	TT	3.43	1	0	5.00	5.40	5.37	Steel reinforced concrete	0.20	0.20		23.36	13.91
138	Km67+711.00	122°59'37"	220V	3.05	3	1	6.00	6.20	6.21	Steel reinforced concrete	0.20	0.20		11.06	14.70
139	Km69+308.91	74°40'32"	TT	5.30	1	0	5.00	5.40	5.35	Steel reinforced concrete	0.20	0.20		27.51	11.18
140	Km69+308.98	61°33'55"	220V	5.66	3	1	5.00	5.60	5.55	Steel reinforced concrete	0.20	0.20		18.44	14.47
141	Km69+384.85	84°29'00"	10KV	3.85	3	1	10.00	10.70	10.80	Steel reinforced concrete			0.25	77.57	43.64
142	Km71+759.00	105°43'00"	10KV	7.51	3	1	10.00	10.50	10.80	Steel reinforced concrete			0.25	59.98	6.68
143	Km73+318.80	56°37'00"	220V	6.05	3	1	6.00	6.55	6.60	Steel reinforced concrete	0.20	0.20		13.20	18.31
144	Km81+325.60	34º53'44"	6KV	13.70	3	1	6.79	7.50	7.50	Steel reinforced concrete			0.30	35.78	5.91
145	Km81+329.00	31º23'34"	TEL	13.00	1	0	6.50	7.10	7.10	Steel reinforced concrete			0.20	15.20	3.70
146	Km81+366.00	50º01'40"	220V	11.65	4	1	5.59	7.25	7.25	Steel reinforced concrete			0.20	24.87	1.43
147	Km81+904.5	130º08'23"	220V	14.43	2	1	5.11	6.50	6.50	Steel reinforced concrete	0.20	0.20		6.14	20.00
148	Km82+158.00	115º43'31"	TEL	11.20	2	1	5.60	6.00	6.00	Steel reinforced concrete			0.20	52.90	9.60
149	Km83+118.00	57º10'05"	220V	8.14	2	1	5.45	7.50	7.50	Steel reinforced concrete			0.20	5.48	33.43
150	Km86+831.30	162º53'47"	TEL	3.31	2	1	6.50	7.50	7.50	Steel reinforced concrete			0.20	22.91	2.00
151	Km87+340														
152	Km87+577.30	54º30'52"	220V	1.85	2	1	6.48	7.00	7.00	Steel reinforced concrete	0.20	0.20		22.06	30.00
153	Km87+600														
154	Km87+615.40	96º35'27"	220KV	3.52	2	1	5.98	6.90	6.90	Steel reinforced concrete			0.25	28.81	20.00
155	Km87+764.30	118º55'32"	35KV	1.88	3	1	6.65	8.57	8.57	Steel reinforced concrete	0.20	0.35		75.38	8.46
156	Km89+146.09	64º26'46"	6KV	15.77	3	1	8.50	8.80	8.80	Steel reinforced concrete			0.30	19.80	25.00

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157	Km89+498.8	70º33'22"	220V	4.06	2	1	6.94	7.50	7.50	Steel reinforced concrete			0.20	39.60	3.70
158	Km91+069.90	160º22'54"	500KV	0.51	4	4	17.97	31.69	31.70	Iron	6.50	6.50		52.78	75.54
159	Km92+315.00	25º59'50"	500KV	1.89	4	4	15.30	31.76	31.70	Iron	5.00	5.00		69.80	81.00
160	Km93+380														
161	Km93+593.50	49º24'46"	220V	7.64	4	1	5.77	6.58	7.22	Concrete			0.30	18.71	12.95
162	Km93+655.00	165º41'42"	220V	7.47	4	1	6.60	6.87	7.13	Concrete			0.30	2.53	5.38
163	Km93+869.00	45º18'08"	220KV	12.78	3	2	29.62	31.60	45.56	Iron	5.00	5.00		135.00	85.00
164	Km93+928.00	43º55'58"	110KV	7.29	4	4	35.30	31.60	42.29	Iron	5.00	5.00		136.00	54.10
165	Km95+610														
166	Km95+641.63	100º06'35"	6KV	7.45	3	1	8.19	8.23	8.40	Concrete			0.35	11.62	37.11
167	Km95+641.00	68º29'11"	6KV	6.22	3	1	6.83	10.29	11.21	Concrete			0.35	35.46	53.24
168	Km95+915														
169	Km96+308.12	80º05'48"	6KV	8.20	3	1	6.83	7.86	7.86	Concrete			0.35	16.83	9.11
170	Km97+138.70	102º58'59"	6KV	9.33	3	1	11.24	8.28	7.82	Concrete			0.35	57.56	34.98
171	Km97+440.00	91º15'09"	6KV	6.41	3	1	8.42	8.60	9.53	Concrete			0.35	33.83	28.92
172	Km97+569		220V												
173	Km97+569.88	116º05'29"	220V	9.55	2	1	6.55	7.10	7.10	Concrete			0.20	21.56	4.67
174	Km97+814.90	94º08'37"	220V	15.95	3	1	7.56	8.68	8.73	Concrete			0.35	1.16	28.29
175	Km97+860.00	13º16'29"	6KV	10.97	3	1	7.45	9.25	9.33	Concrete			0.35	12.29	3.02
176	Km98+840.00	9º36'53"	110KV	13.03	3	2	7.46	17.06	17.43	Concrete			0.40	19.30	1.55
177	Km99+548		220V												
178	Km99+617.00	91º43'48"	15KV	7.20	3	1	7.73	10.64	8.50	Concrete			0.35	39.89	25.76
179	Km100+060.00	170º19'27"	110KV	5.26	3	1	16.90	17.93	17.08	Concrete			0.40	0.19	26.08
180	Km100+507.63	100º28'02"	220V	2.52	2	1	6.81	7.37	7.37	Concrete			0.20	20.37	19.95
181	Km101+000	112º33'22"	110KV	2.02	3	2	12.63	30.74	29.43	Iron	6.43	6.43		37.42	204.00
182	Km101+373.70	96º07'50"	15KV	1.91	3	1	7.73	9.00	8.98	Concrete			0.35	9.28	57.17
183	Km101+389.20	92º05'58"	TEL	2.53	2	1	6.05	6.50	6.05	Concrete			0.20	6.32	35.13
184	Km102+611.12	78º00'	TT	3.33	1		4.5	4.7	4.7	Concrete	0.20	0.20		11.11	24.40
185	Km102+682.53	81º31'31"	35KV	2.67	3	1	7.9	8.5	8.5	Concrete			0.35	24	52.13
186	Km102+887.58	75º00'	TT	4.01	1		4.3	4.5	4.5	Concrete	0.20	0.20		37.10	3.92
187	Km103+099.83	93º29'13"	110KV	6.35	3	3	19.15	41.5	41.5	Iron	3.5	3.5		269.04	151.02
188	Km103+257.03	91º11'14"	500KV	18.9	12	1	27.5	32.2	33.00	Iron	9.00	9.00		124.57	287.13
189	Km103+302.70	91º33'10"	500KV	18.81	12	1	29.75	30.00	33.00	Iron	9.00	9.00		172.68	228.07
190	Km104+737.70	47º39'00"	110KV	1.14	3	3	15.33	35.60	35.71	Iron	3.5	3.5		159.61	47.97
191	Km105+660														
192	Km105+694.00	140º37'17"	220V	4.75	4	1	7.10	7.3	7.3	Concrete			0.25	6.1	19.9
193	Km106+104.93	118º02'22"	220V	1.78	4	1	7.05	7.3	7.3	Concrete			0.25	10.5	31.3
194	Km106+103.93						6.11								
195	Km106+300	132º00'	TT	3.86	1		4.3	4.5	4.5	Concrete	0.20	0.20		16.70	24.10
196	Km106+600														
197	Km106+701.90	52º02'	220V	4.58	4	1	7.05	7.3	7.3	Concrete			0.25	31.10	4.76
198	Km106+759.64	120º37'50"	6KV	4.61	3	1	7.57	8.72	8.72	Concrete			0.35	25.6	50.4
199	Km107+491.37	20º01'32"	6KV	1.04	3	1	6.39	8.5	8.5	Concrete			0.35	32.5	2.1
200	Km107+660.42	30º14'43"	220V	5.09	4	1	4.75	5.17	5.17	Concrete			0.25	0.5	22.2
201	Km107+834.77	109º00'	TT	3.93	1		4.7	4.9	4.5	Concrete	0.20	0.20		13.25	62.00
202	Km107+838.43	105º56'02"	220V	2.52	4	1	6.13	7.07	7.07	Concrete			0.25	18.9	24.8
203	Km108+097.41	81º21'21"	220V	5.61	4	1	6.06	7.16	7.16	Concrete			0.25	0.7	39.5
204	Km108+157.66	83º00'	TT	5.70	1		4.4	4.6	4.6	Concrete	0.20	0.20		11.70	41.20
205	Km108+160.40	83º32'27"	6KV	5.80	3	1	7.28	8.5	8.5	Concrete			0.35	42.7	57.3
206	Km108+262.23	76º30'48"	220V	5.93	4	1	5.59	7.00	7.00	Concrete			0.25	19.9	27.8
207	Km108+616.11	80º00'36"	220V	3.67	4	1	5.6	7.15	7.15	Concrete			0.25	0.7	41.19
208	Km109+467.80	135º00'	TT	3.64	1		4.5	4.7	4.7	Concrete	0.20	0.20		3.21	30.58
209	Km109+746.23	105º57'49"	220V	8.67	4	1	5.5	7.00	7.00	Concrete			0.25	41.6	14.9

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								Left	Right		Side 1	Side 2	Φ	Left	Right
210	Km109+818.16	91°00'	TT	4.30	1		4.5	4.7	4.7	Concrete	0.20	0.20		17.00	30.92
211	Km109+853.26	82°27'55"	35KV	3.87	3	1	6.5	7.5	7.5	Concrete			0.35	78	7.9
212	Km114+938.49	73°05'18"	220V	20.18	4	2	6.50	7.02	7.03	Steel reinforced concrete			0.33	33.44	11.28
213	Km116+494.44	51°32'14"	TT	13.46	1	0	4.80	5.00	5.00	Steel reinforced concrete	0.25	0.30		9.27	37.84
214	Km116+562.25	72°32'12"	TT	14.33	1	0	4.65	5.00	5.00	Steel reinforced concrete	0.25	0.30		28.66	10.19
215	Km119+123.90	116°56'38"	6KV	12.84	3	2	6.50	7.32	7.13	Steel reinforced concrete			0.33	28.23	62.02
216	Km119+740.00	109°42'19"	6KV	19.50	3	2	6.56	7.22	7.33	Steel reinforced concrete			0.33	37.48	56.99
217	Km120+164.30	96°55'24"	220V	14.70	4	1	6.65	7.12	7.16	Steel reinforced concrete			0.33	0.12	45.10
218	Km119+165.20	109°18'56"	TT	12.21	1	0	3.56	4.50	4.45	Steel reinforced concrete	0.15	0.20		8.91	18.75
219	Km119+994.30	64°19'46"	TT	15.27	1	0	3.62	4.35	4.42	Steel reinforced concrete	0.15	0.20		13.19	50.00
220	Km122+260.00	119°54'36"	TT	16.80	1	0	3.68	4.46	4.48	Steel reinforced concrete	0.15	0.20		19.29	11.42
221	Km121+448.46	11°30'33"	220V	16.95	4	1	6.47	7.02	7.03	Steel reinforced concrete			0.33	8.54	1.92
222	Km122+270.30	121°27'18"	220V	15.94	4	1	6.10	7.04	7.03	Steel reinforced concrete			0.33	14.78	26.33
223	Km123+327.84	170°38'13"	6KV	10.72	3	2	6.10	7.24	7.35	Steel reinforced concrete			0.33	14.35	4.77
224	Km124+142.20	30°21'10"	6KV	7.09	3	2	10.50	11.34	7.32	Steel reinforced concrete			0.33	0.37	49.96
225	Km124+376.00	116°16'02"	6KV	6.78	3	2	9.15	11.08	7.21	Steel reinforced concrete			0.33	37.63	25.93
226	Km124+540.00	103°41'04"	220V	10.39	3	2	6.15	7.24	7.21	Steel reinforced concrete			0.33	10.39	38.18
227	Km126+029.00	110°35'28"	220V	8.79	4	1	14.11	5.22	5.44	Steel reinforced concrete			0.29	20.20	20.20
228	Km126+256.80	72°30'27"	6KV	8.14	3		15.95	8.10	8.17	Steel reinforced concrete			0.30	60.00	37.20
229	Km126+339.00	86°25'29"	220V	9.33	4	1	14.13	5.27	5.40	Steel reinforced concrete			0.30	23.50	25.25

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
230	Km126+611.00	38º35'26"	TT	8.30	1		12.80	5.35	5.44	Steel reinforced concrete	0.27	0.28		6.40	23.00
231	Km127+766.50	48º58'30"	220V	7.07	4	1	13.97	7.03	7.10	Steel reinforced concrete			0.30	7.40	34.30
232	Km127+961.50	86º27'53"	220V	11.88	3		17.10	5.80	5.87	Steel reinforced concrete			0.30	20.00	31.00
233	Km128+207.00	23º50'54"	TT BC	14.32	4	1	21.19	7.10	7.20	Steel reinforced concrete	0.28	0.28		26.17	8.50
234	Km128+212.50	23º50'54"	220V	14.06	2		18.98	5.81	5.87	Steel reinforced concrete			0.30	8.50	1.80
235	Km128+412.00	90º00'00"	6KV	12.66	3		21.76	10.60	10.71	Steel reinforced concrete			0.31	15.60	
236	Km129+452.50	61º21'00"	15KV	8.54	3		14.24	6.25	6.33	Steel reinforced concrete			0.31	60.70	20.20
237	Km129+740.30	51º00'00"	35KV	6.83	3		15.63	10.90	11.03	Steel reinforced concrete			0.31	8.70	46.50
238	Km129+874.00	19º52'16"	35KV	6.66	3		14.08	8.01	8.14	Steel reinforced concrete			0.31	7.00	5.65
239	Km130+532.40	58º46'50"	35KV	6.80	3		16.12	9.87	10.02	Steel reinforced concrete			0.32		6.16
240	Km131+794.14	158º00'00"	220V	7.73	4	1	14.53	6.93	7.01	Steel reinforced concrete			0.29	7.85	1.00
241	Km131+896.00	19º32'12"	220V	8.97	4	1	16.57	7.70	7.81	Steel reinforced concrete			0.29	5.30	1.90
242	Km132+043.70	171º49'06"	220V	7.78	4	1	14.38	6.65	6.72	Steel reinforced concrete			0.29	0.90	3.90
243	Km133+323.70	144º40'38"	15KV	5.16	3		14.11	8.55	8.67	Steel reinforced concrete			0.31	45.87	13.38
244	Km133+908.30	68º00'00"	TTBC	5.97	2		11.37	6.10	6.00	Steel reinforced concrete	0.28	0.30		35.35	35.00
245	Km133+912.00	68º00'00"	220V	6.02	4	1	12.72	6.95	7.00	Steel reinforced concrete			0.30	15.86	14.50
246	Km134+934.00	33º05'00"	TT	5.58	12	2	11.18	6.30	6.35	Steel reinforced concrete	0.27	0.28		15.90	13.70
247	Km135+103.30	93º20'00"	220V	6.31	4	1	13.61	7.45	7.47	Steel reinforced concrete			0.29	4.00	52.00

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
248	Km135+552.00	115º25'45"	220V	5.59	4	1	11.54	6.11	6.07	Steel reinforced concrete			0.29	7.40	50.20
249	Km136+894.00	117º21'08"	220V	7.73	4	1	11.83	6.35	6.24	Steel reinforced concrete			0.29	48.00	12.00
250	Km137+692.33	91º50'29"	15KV	4.24	3		13.19	9.30	9.25	Steel reinforced concrete			0.31	51.30	0.90
251	Km138+361.30	125º24'00"	15KV	4.08	3		13.08	10.10	10.15	Steel reinforced concrete			0.30	39.50	33.00
252	Km139+118.20	146º24'23"	220V	3.29	4	1	9.49	6.13	6.00	Steel reinforced concrete	0.27	0.26		3.00	21.00
253	Km139+156.55	60º00'00"	220V	3.18	4	1	9.63	7.04	6.95	Steel reinforced concrete			0.28	19.00	23.00
254	Km139+166.57	60º00'00"	35KV	3.23	3		10.53	8.32	8.47	Steel reinforced concrete			0.30	25.00	48.24

Appendix -3

List of Bridges

Appendix 3: List of Bridges

City/ Province	Section	PKG	Station	Bridge Location: EXP./Linking Rd. Thruway	Bridge Location: IC Section Thruway	Bridge Location: IC Section Rampway	Bridge Location: Cross Road	Bridge Nos. [1]	No.	Bridge Code	I/O Lines	Bridge Station	Current Bridge Plan: Proposed Bridge Plan: Bridge Length [1] (m)	Bridge Width (m)	Bridge Skew Angle	Superstructure: Girder Type	Superstructure: Girder Arrange.	Substructure: Abutment Type	Abutment Height (m)	Substructure: Pier Type	Pier Height (m)	Foundation: Type	Foundation: Dia. (m)	Foundation: Length (m)
Danang	Expressway	1	KM000+000 - KM008+000					7	---	ORB00a	I/O	-KM000+124	Existing Bridge											
							•		1	FO01	I/O	KM000+578	69.2	6.5	90°	Void Slab	2@30m	T	7.322	Wall	9.171	Spread	-----	-----
				•					2	OP00a	I/O	KM001+154	50.1	25.5	90°	I Girder	1@30m	T	13.616	-----	-----	Bored Pile	1.2	33.0
				•					3	LRB01	I/O	KM001+595	223.5	25.5	80°,90°	I Girder	6@33m	T	14.241	Wall	20.330	Bored Pile	1.2	45.0
				•					4	LRB02	I/O	KM002+461	221.2	25.5	80°	I Girder	6@33m	T	12.077	Wall	21.549	Bored Pile	1.2	47.0
				•					5	OP00b	I/O	KM002+823	57.2	25.5	71°	I Girder	2@21m	T	10.903	Wall	10.788	Bored Pile	1.2	27.0
				•					6	OP01	I/O	KM003+656	60.1	25.5	70°	I Girder	1@40m	T	12.708	-----	-----	Bored Pile	1.2	63.0
				•					7	ORB00b	I/O	KM005+632	82.8	25.5	80°	I Girder	3@21m	T	10.872	Wall	13.627	Bored Pile	1.2	25.0
Quang Nam		2	KM008+000 - KM016+880	•				15	8	CB02	I/O	KM009+373	39.1	25.5	70°	I Girder	1@27m	T	9.162	-----	-----	Bored Pile	1.0	33.0
							•		9	FO02	I/O	KM009+619	58.6	12.0	70°	Void Slab	2@24m	T	9.975	Wall	10.109	Bored Pile	1.0	27.0
				•					10	LRB04	I/O	KM009+855	149.6	25.5	80°	I Girder	4@33m	T	9.432	Wall	17.589	Bored Pile/Spread	1.0	44.0
				•					11	VD02	I/O	KM010+271	78.6	25.5	90°	I Girder	2@33m	T	8.561	Wall	8.459	Bored Pile	1.0	45.0
				•					12	LRB05	I/O	KM010+887	103.0	25.5	70°	I Girder	3@30m	T	9.360	Wall	12.206	Bored Pile	1.0	42.0
				•					13	LRB05a	I/O	KM011+924	151.8	25.5	90°	I Girder	4@33m	T	10.229	Wall	12.386	Bored Pile	1.0	59.0
				•					14	LRB05b	I/O	KM012+644	107.5	25.5	90°	I Girder	3@30m	T	9.634	Wall	11.726	Bored Pile	1.0	60.0
					•				15	VD02a	I/O	KM013+259	156.6	33.0	90°	I Girder	4@33m	T	12.554	Wall	14.528	Bored Pile	1.2	58.0
					•				16	OP03	I/O	KM013+626	40.6	42.036	80°	I Girder	1@24m	T	11.976	-----	-----	Bored Pile	1.2	54.0
						•			17	IRB00d	O	RW-D,KM000+396	144.1	8.5	90°	Void Slab	23+3@28+23m	T	9.806	Wall	11.798	Bored Pile	1.0	64.0
				•					18	LRB06	I/O	KM014+027	105.5	25.5	90°	I Girder	3@30m	T	9.592	Wall	15.354	Bored Pile	1.0	52.0
				•					19	CB05	I/O	KM014+270	31.1	25.5	70°	I Girder	1@21m	T	7.531	-----	-----	Bored Pile	1.0	52.0
				•					20	VD03	I/O	KM014+880	108.5	25.5	90°	I Girder	3@30m	T	9.978	Wall	11.386	Bored Pile	1.0	56.0
				•					21	VD03a	I/O	KM015+340	137.2	25.5	90°	I Girder	4@30m	T	9.571	Wall	9.478	Bored Pile	1.0	54.0
				•					22	VD04	I/O	KM016+558	117.9	25.5	90°	I Girder	3@33m	T	10.081	Wall	11.175	Bored Pile	1.0	52.0
		3a	KM016+880 - KM018+100	•					23	MRB01	I/O	KM017+502	1,044.8	26.0	90°	Super Tee + Box Girder	10@40m + m+5@100m+65m	T	12.000	Round	19.000	Bored Pile	1.5	64.0
		3b	KM018+100 - KM021+500	•				5	24	VD05	I/O	KM018+319	107.3	25.5	90°	I Girder	3@30m	T	10.243	Wall	10.150	Bored Pile	1.0	59.0
				•					25	VD06	I/O	KM018+606	76.8	25.5	90°	I Girder	2@30m	T	11.558	Wall	11.965	Bored Pile	1.2	57.0
				•					26	VD07	I/O	KM019+252	811.8	25.5	90°	I Girder	19@40m	T	12.530	Wall	14.799	Bored Pile	1.2	67.0
				•					27	MRB02	I/O	KM020+215	451.5	25.5	90°	Super Tee	11@40m	T	7.850	Wall	13.500	Bored Pile	1.2	23.0
							•		28	FO03	I/O	KM020+700	57.1	6.5	70°	Void Slab	2@24m	T	9.523	Wall	9.988	Bored Pile	1.0	10.0
		4	KM021+500 - KM032+600	•				5	29	ORB04	I	KM023+377	75.1	13.0	70°	I Girder	2@27m	T	12.109	Wall	15.020	Bored Pile	1.2	16.0
											O	KM023+390	75.1	13.0	70°	I Girder	2@27m	T	11.587	Wall	14.998	Bored Pile	1.2	16.0
				•					30	OP06	I	KM023+940	36.3	13.0	70°	I Girder	1@21m	T	10.862	-----	-----	Bored Pile	1.0	9.0
											O	KM023+931	35.1	13.0	70°	I Girder	1@21m	T	9.908	-----	-----	Bored Pile	1.0	9.0
							•		31	FO05	I/O	KM024+790	61.5	5.0	70°	Void Slab	2@24m	T	10.028	Wall	9.512	Bored Pile	1.0	19.0
				•					32	ORB05	I/O	KM024+918	60.0	25.5	70°	I Girder	2@24m	T	8.281	Wall	10.694	Bored Pile	1.0	12.0
				•					33	ORB06	I/O	KM029+505	70.8	25.5	90°	I Girder	2@30m	T	7.582	Wall	11.742	Bored Pile	1.0	27.0
		5	KM032+600 - KM042+000	•				8	34	ORB07	I/O	KM034+151	52.1	25.5	90°	I Girder	1@33m	T	12.543	-----	-----	Bored Pile	1.2	22.0
				•					35	OP09	I/O	KM035+497	34.7	33.0	90°	I Girder	1@21m	T	10.607	-----	-----	Bored Pile	1.0	13.0
				•					36	ORB08	I/O	KM036+431	43.9	33.0	70°	I Girder	1@33m	T	8.921	-----	-----	Bored Pile	1.0	28.0
				•					37	ORB09a	I/O	KM038+378	88.3	25.5	70°	I Girder	3@24m	T	10.582	Wall	14.386	Bored Pile	1.0	20.5
				•					38	LRB08	I/O	KM039+652	222.1	25.5	90°	I Girder	6@33m	T	11.859	Round	16.233	Bored Pile/Spread	1.2	22.5
				•					39	CB09	I/O	KM040+110	51.0	25.5	80°	I Girder	1@33m	T	10.968	-----	-----	Bored Pile	1.2	10.0
					•				40	OP09a	I/O	KM040+880	47.1	35.850	90°	I Girder	1@27m	T	12.281	-----	-----	Bored Pile	1.2	6.0
					•				41	OP10	I/O	KM041+235	42.1	33.140	70°	I Girder	1@24m	T	12.270	-----	-----	Spread	-----	-----
		6	KM042+000 - KM052+000	•				9	42	OP11	I/O	KM042+723	34.1	25.5	70°	I Girder	1@21m	T	9.916	-----	-----	Bored Pile	1.2	8.0
				•					43	CB11	I/O	KM043+655	39.1	25.5	80°	I Girder	1@27m	T	9.462	-----	-----	Bored Pile	1.0	17.5
				•					44	ORB11	I/O	KM044+440	57.8	25.5	90°	I Girder	2@24m	T	7.196	Wall	14.596	Bored Pile/Spread	1.0	10.0
				•					45	ORB12	I/O	KM045+438	44.1	25.5	90°	I Girder	1@30m	T	9.722	-----	-----	Bored Pile	1.0	9.0
				•					46	CB12	I/O	KM045+540	39.1	25.5	70°	I Girder	1@27m	T	9.978	-----	-----	Bored Pile	1.0	11.0
				•					47	ORB13	I/O	KM045+885	74.8	25.5	90°	I Girder	2@27m	T	11.018	Wall	16.016	Bored Pile/Spread	1.2	9.5
				•					48	OP11a	I/O	KM047+136	33.9	25.5	70°	I Girder	1@21m	T	9.692	-----	-----	Bored Pile	1.0	9.0
				•					49	LRB09	I/O	KM047+911	112.2	25.5	70°	I Girder	3@33m	T	8.949	Wall	14.385	Bored Pile/Spread	1.0	10.0
				•					50	CB13	I/O	KM048+390	44.9	25.5	80°	I Girder	1@27m	T	10.091	-----	-----	Bored Pile	1.0	11.5
		7	KM052+000 - KM065+000	•				10	51	ORB14	I/O	KM054+985	43.5	25.5	80°	I Girder	1@33m	T	9.170	-----	-----	Bored Pile/Spread	1.0	6.0
				•					52	LRB10	I/O	KM055+615	148.3	25.5	90°	I Girder	4@33m	T	9.213	Round	15.470	Bored Pile/Spread	1.0	14.5
				•					53	ORB15	I/O	KM057+095	40.0	25.5	70°	I Girder	1@30m	T	9.274	-----	-----	Bored Pile/Spread	1.0	6.0
				•					54	OP16	I/O	KM057+508	34.7	25.5	90°	I Girder	1@21m	T	10.328	-----	-----	Bored Pile	1.0	15.0
				•					55	LRB11	I/O	KM058+244	146.5	25.5	70°	I Girder	4@33m	T	7.729	Wall	13.523	Bored Pile/Spread	1.0	8.0
				•					56	OP17a	I/O	KM060+043	34.1	25.5	80°	I Girder	1@21m	T	10.217	-----	-----	Bored Pile	1.0	18.0
				•					57	OP17b	I/O	KM060+966	33.7	25.5	90°	I Girder	1@21m	T	9.621	-----	-----	Bored Pile	1.0	6.0
				•					58	ORB16	I/O	KM062+456	72.5	25.5	90°	I Girder	2@30m	T	9.231	Wall	12.107	Bored Pile/Spread	1.0	6.0
				•					59	OP17c	I/O	KM063+786	47.3	25.5	70°	I Girder	1@33m	T	10.264	-----	-----	Bored Pile	1.0	6.0
						•			60	IRB01	I/O	RW-C1,KM000+455	68.0	15.5	90°	Void Slab	2@27m	T	9.942	Wall	9.642	Bored Pile	1.0	6.0
		A1	KM065+000 - KM081+150				•	5	61	FO06a	I/O	KM066+455	103.1	12.0	70°	Void Slab	3@30m	T	11.862	Wall	16.512	Bored Pile	1.2	TBD
				•					62	ORB17a	I/O	KM066+615	37.5	36.110	70°	I Girder	1@24m	T	9.719	-----	-----	Bored Pile	1.0	TBD
				•					63	LRB12	I/O	KM068+456	306.3	25.5	90°	I Girder	7@40m	T	12.400	Round	23.753	Bored Pile/Spread	1.2	24.0
				•					64	ORB21	I/O	KM075+182	79.8	25.5	90°	I Girder	2@33m	T	10.463	Wall	12.932	Bored Pile	1.0	8.0
							•		65	FO07	I/O	KM076+970	55.8	4.0	90°	K-frame	12.4+31+12.4m	-----	-----	-----	-----	-----	-----	-----
		A2	KM081+150 - KM099+500	•				9	66	CB23	I/O	KM081+364	56.7	25.5	70°	I Girder	1@40m	T	10.581	-----	-----	Bored Pile	1.2	14.5
				•					67	ORB22	I/O	KM082+348	78.7	25.5	90°	I Girder	3@21m	T	10.068	Wall	15.815	Bored Pile/Spread	1.0	10.0
					•				68	OP18a	I/O	KM082+986	43.1	35.830	80°	I Girder	1@27m	T	11.270	-----	-----	Bored Pile	1.2	13.5
				•					69	OP19	I/O	KM085+751	41.1	25.5	90°	I Girder	1@27m	T	10.341	-----	-----	Bored Pile	1.0	15.0
				•					70	ORB23	I/O	KM087+710	42.9	25.5	90°	I Girder	1@33m	T	8.879	-----	-----	Bored Pile	1.0	16.0
				•					71	LRB12a	I/O	KM087+970	147.1	25.5	90°	I Girder	4@33m	T	8.367	Round	11.162	Bored Pile	1.0	14.0
							•		72	FO09	I/O	KM089+158	56.5	7.5	70°	Void Slab	2@24m	T	8.218	Wall	9.389	Bored Pile	1.0	27.0
				•					73	ORB25a	I/O	KM091+140	30.9	25.5	90°	I Girder	1@21m	T	8.434	-----	-----	Bored Pile	1.0	21.5
				•					74	CB25	I/O	KM092+538	42.1	25.5	90°	I Girder	1@33m	T	7.771	-----	-----	Bored Pile	1.0	11.0
Quang Ngai		A3	KM099+500 - KM110+100	•				13	75	OP20a	I/O	KM100+846	24.8	25.5	90°	Portal	1@14m	T	8.308	-----	-----	Bored Pile	1.0	22.5
					•				76	ORB26	I/O	KM101+445	34.1	45.530	90°	I Girder	1@24m	T	8.513	-----	-----	Bored Pile	1.0	17.5
					•				77	CB27	I/O	KM101+827	31.5	34.160	90°	I Girder	1@21m	T	8.001	-----	-----	Bored Pile	1.0	13.0
					•				78	ORB26a	I/O	KM102+055	35.9	35.700	90°	I Girder	1@27m	T	7.899	-----	-----	Bored Pile	1.0	17.0
						•			79	IRB02	I	RW-B,KM000+408	44.1	8.5	90°	I Girder	1@30m	T	10.392	-----	-----	Bored Pile	1.2	21.0
						•			80	IRB03	I/O	RW-C1,KM000+981	98.3	15.5	80°	I Girder	2@40m	T	13.854	Wall	14.788	Bored Pile	1.5	20.5
						•			81	IRB04	I/O	RW-C1,KM001+254	75.2	15.5	90°	Void Slab	2@30m	T	12.943	Wall	9.844	Bored Pile	1.2	47.0
				•					82	ORB26b	I/O	KM102+327	43.9	25.5	90°	I Girder	1@33m	T	8.224	-----	-----	Bored Pile	1.0	16.0
							•		83	FO10	I/O	KM103+560	54.3	3.0	90°	Void Slab	2@24m	T	8.667	Round	9.027	Spread	-----	-----
				•					84	ORB27	I/O	KM104+887	44.7	25.5	90°	I Girder	1@33m	T	9.322	-----	-----	Bored Pile	1.0	14.0
				•					85	VD09a	I/O	KM107+307	47.7	25.5	90°	I Girder	1@30m	T	11.436	-----	-----	Bored Pile	1.2	17.0
				•					86	VD09b	I/O	KM107+829	44.5	25.5	90°	I Girder	1@30m	T	10.291	-----	-----	Bored Pile	1.0	17.5
				•					87	MRB03	I/O	KM109+001	454.5	25.5	90°	Super Tee	11@40m	T	10.800	Wall	14.500	Bored Pile	1.2	25.0
		A4	KM110+100 - KM124+700				•	8	88	FO10a	I/O	KM111+720	51.9	4.0	90°	Void Slab	2@24m	T	5.318	Round	8.384	Spread	-----	-----
					•				89	OP22a	I/O	KM112+120	50.7	29.250	90°	I Girder	1@40m	T	6.344	-----	-----	Spread	-----	-----
				•					90	ORB28	I/O	KM115+999	61.9	25.5	70°	I Girder	2@24m	T	8.091	Wall	11.090	Bored Pile/Spread	1.0	9.0
							•		91	FO14	I/O	KM116+570	65.6	7.5	90°	Void Slab	2@27m	T	9.363	Wall	8.736	Bored Pile	1.0	18.5
				•					92	CB30	I/O	KM118+050	46.1	25.5	90°	I Girder	1@33m	T	8.979	-----	-----	Bored Pile	1.0	8.0
							•		93	FO16	I/O	KM119+170	67.1	9.0	70°	Void Slab	2@27m	T	10.410	Wall	9.102	Bored Pile	1.0	15.5
					•				94	OP23c	I/O	KM123+700	41.1	34.060	70°	I Girder	1@27m	T	10.082	-----	-----	Bored Pile	1.0	10.0
					•				95	VD10a	I/O	KM124+117	116.4	25.500	70°	I Girder	3@33m	T	10.643	Wall	12.922	Bored Pile	1.2	10.5
		A5	KM124+700 - KM139+263	•				9	96	OP24a	I/O	KM124+899	47.1	25.5	80°	I Girder	1@27m	T	11.724	-----	-----	Bored Pile	1.2	29.5
				•					97	MRB04	I/O	KM125+367	774.5	25.5	90°	Super Tee	19@40m	T	10.500	Wall	13.500	Bored Pile	1.2	28.0
				•					98	VD12	I/O	KM126+882	692.4	25.5	90°	Super Tee	17@40m	T	10.050	Wall	13.351	Bored Pile	1.2	27.0
				•					99	VD13	I/O	KM127+761	294.4	25.5	90°	Super Tee	7@40m	T	12.748	Wall	12.552	Bored Pile	1.2	23.0
				•					100	OP25	I/O	KM128+615	42.7	25.5	70°	I Girder	1@27m	T	10.243	-----	-----	Bored Pile	1.2	15.0
					•				101	ORB28a	I/O	KM130+174	45.1	25.5	90°	I Girder	1@33m	T	9.420	-----	-----	Bored Pile	1.0	23.5
	Linking Road			•					102	ORB29	I/O	KM132+620	54.1	12.0	90°	I Girder	1@40m	T	9.972	-----	-----	Bored Pile	1.2	16.0
				•					103	OP27	I/O	KM134+953	138.1	12.0	70°	I Girder	3@40m	T	12.737	Wall	15.505	Bored Pile	1.5	35.5
				•					104	CB38	I/O	KM138+284	55.9	12.0	70°	I Girder	1@40m	T	11.180	-----	-----	Bored Pile	1.2	15.0
Total				**76**	**12**	**5**	**11**	**103**					**11,676.3**											

1) Counted average bridge length of bridges in independent alignment sections as one bridge

Appendix 3:List of Bridges

City/ Province	Section	PKG	Station	Bridge Location				Bridge Nos. [1]	No.	Bridge Code	I/O Lines	Current Bridge Plan												
				EXP./Linking Rd.			Cross Road					Bridge Station	Proposed Bridge Plan											
				Thruway	IC Section								Bridge Length [1] (m)	Bridge Width (m)	Bridge Skew Angle	Superstructure		Substructure				Foundation		
					Thruway	Rampway										Girder Type	Girder Arrange.	Abutment		Pier		Type	Dia. (m)	Length (m)
																		Type	Height (m)	Type	Height (m)			
Danang	Expressway	1	KM000+000 - KM008+000				•	7	---	DRB00a	I/O	-KM000+124	Existing Bridge											
									1	FO01	I/O	KM000+578	69.2	6.5	90°	Void Slab	2@30m	T	7.322	Wall	9.171	Spread	-----	-----
				•					2	OP00a	I/O	KM001+154	50.1	25.5	90°	I Girder	1@30m	T	13.616	-----	-----	Bored Pile	1.2	33.0
				•					3	LRB01	I/O	KM001+595	223.5	25.5	80°,90°	I Girder	6@33m	T	14.241	Wall	20.330	Bored Pile	1.2	45.0
				•					4	LRB02	I/O	KM002+461	221.2	25.5	80°	I Girder	6@33m	T	12.077	Wall	21.549	Bored Pile	1.2	47.0
				•					5	OP00b	I/O	KM002+823	57.2	25.5	71°	I Girder	2@21m	T	10.903	Wall	10.788	Bored Pile	1.2	27.0
				•					6	OP01	I/O	KM003+656	60.1	25.5	70°	I Girder	1@40m	T	12.708	-----	-----	Bored Pile	1.2	63.0
				•					7	DRB00b	I/O	KM005+632	82.8	25.5	80°	I Girder	3@21m	T	10.872	Wall	13.627	Bored Pile	1.2	25.0
Quang Nam		2	KM008+000 - KM016+880	•				15	8	CB02	I/O	KM009+373	39.1	25.5	70°	I Girder	1@27m	T	9.162	-----	-----	Bored Pile	1.0	33.0
							•		9	FO02	I/O	KM009+619	58.6	12.0	70°	Void Slab	2@24m	T	9.975	Wall	10.109	Bored Pile	1.0	27.0
				•					10	LRB04	I/O	KM009+855	149.6	25.5	80°	I Girder	4@33m	T	9.432	Wall	17.589	Bored Pile/Spread	1.0	44.0
				•					11	VD02	I/O	KM010+271	78.6	25.5	90°	I Girder	2@33m	T	8.561	Wall	8.459	Bored Pile	1.0	45.0
				•					12	LRB05	I/O	KM010+887	103.0	25.5	70°	I Girder	3@30m	T	9.360	Wall	12.206	Bored Pile	1.0	42.0
				•					13	LRB05a	I/O	KM011+924	151.8	25.5	90°	I Girder	4@33m	T	10.229	Wall	12.386	Bored Pile	1.0	59.0
				•					14	LRB05b	I/O	KM012+644	107.5	25.5	90°	I Girder	3@30m	T	9.634	Wall	11.726	Bored Pile	1.0	60.0
					•				15	VD02a	I/O	KM013+259	156.6	33.0	90°	I Girder	4@33m	T	12.554	Wall	14.528	Bored Pile	1.2	58.0
					•				16	OP03	I/O	KM013+626	40.6	42.036	80°	I Girder	1@24m	T	11.976	-----	-----	Bored Pile	1.2	54.0
						•			17	IRB00d	O	RW-D,KM000+396	144.1	8.5	90°	Void Slab	23+3@28+23m	T	9.806	Wall	11.798	Bored Pile	1.0	64.0
				•					18	LRB06	I/O	KM014+027	105.5	25.5	90°	I Girder	3@30m	T	9.592	Wall	15.354	Bored Pile	1.0	52.0
				•					19	CB05	I/O	KM014+270	31.1	25.5	70°	I Girder	1@21m	T	7.531	-----	-----	Bored Pile	1.0	52.0
				•					20	VD03	I/O	KM014+880	108.5	25.5	90°	I Girder	3@30m	T	9.978	Wall	11.386	Bored Pile	1.0	56.0
				•					21	VD03a	I/O	KM015+340	137.2	25.5	90°	I Girder	4@30m	T	9.571	Wall	9.478	Bored Pile	1.0	54.0
				•					22	VD04	I/O	KM016+558	117.9	25.5	90°	I Girder	3@33m	T	10.081	Wall	11.175	Bored Pile	1.0	52.0
		3a	KM016+880 - KM018+100	•					23	MRB01	I/O	KM017+502	1,044.8	26.0	90°	Super Tee + Box Girder	10@40m + m+5@100m+65m	T	12.000	Round	19.000	Bored Pile	1.5	64.0
		3b	KM018+100 - KM021+500	•				5	24	VD05	I/O	KM018+319	107.3	25.5	90°	I Girder	3@30m	T	10.243	Wall	10.150	Bored Pile	1.0	59.0
				•					25	VD06	I/O	KM018+606	76.8	25.5	90°	I Girder	2@30m	T	11.558	Wall	11.965	Bored Pile	1.2	57.0
				•					26	VD07	I/O	KM019+252	811.8	25.5	90°	I Girder	19@40m	T	12.530	Wall	14.799	Bored Pile	1.2	67.0
				•					27	MRB02	I/O	KM020+215	451.5	25.5	90°	Super Tee	11@40m	T	7.850	Wall	13.500	Bored Pile	1.2	23.0
							•		28	FO03	I/O	KM020+700	57.1	6.5	70°	Void Slab	2@24m	T	9.523	Wall	9.988	Bored Pile	1.0	10.0
		4	KM021+500 - KM032+600	•				5	29	ORB04	I	KM023+377	75.1	13.0	70°	I Girder	2@27m	T	12.109	Wall	15.020	Bored Pile	1.2	16.0
											O	KM023+390	75.1	13.0	70°	I Girder	2@27m	T	11.587	Wall	14.998	Bored Pile	1.2	16.0
				•					30	OP06	I	KM023+940	36.3	13.0	70°	I Girder	1@21m	T	10.862	-----	-----	Bored Pile	1.0	9.0
											O	KM023+931	35.1	13.0	70°	I Girder	1@21m	T	9.908	-----	-----	Bored Pile	1.0	9.0
							•		31	FO05	I/O	KM024+790	61.5	5.0	70°	Void Slab	2@24m	T	10.028	Wall	9.512	Bored Pile	1.0	19.0
				•					32	ORB05	I/O	KM024+918	60.0	25.5	70°	I Girder	2@24m	T	8.281	Wall	10.694	Bored Pile	1.0	12.0
				•					33	ORB06	I/O	KM029+505	70.8	25.5	90°	I Girder	2@30m	T	7.582	Wall	11.742	Bored Pile	1.0	27.0
		5	KM032+600 - KM042+000	•				8	34	ORB07	I/O	KM034+151	52.1	25.5	90°	I Girder	1@33m	T	12.543	-----	-----	Bored Pile	1.2	22.0
				•					35	OP09	I/O	KM035+497	34.7	33.0	90°	I Girder	1@21m	T	10.607	-----	-----	Bored Pile	1.0	13.0
				•					36	ORB08	I/O	KM036+431	43.9	33.0	70°	I Girder	1@33m	T	8.921	-----	-----	Bored Pile	1.0	28.0
				•					37	DRB09a	I/O	KM038+378	88.3	25.5	70°	I Girder	3@24m	T	10.582	Wall	14.386	Bored Pile	1.0	20.5
				•					38	LRB08	I/O	KM039+652	222.1	25.5	90°	I Girder	6@33m	T	11.859	Round	16.233	Bored Pile/Spread	1.2	22.5
				•					39	CB09	I/O	KM040+110	51.0	25.5	80°	I Girder	1@33m	T	10.968	-----	-----	Bored Pile	1.2	10.0
					•				40	OP09a	I/O	KM040+880	47.1	35.850	90°	I Girder	1@27m	T	12.281	-----	-----	Bored Pile	1.2	6.0
					•				41	OP10	I/O	KM041+235	42.1	33.140	70°	I Girder	1@24m	T	12.270	-----	-----	Spread	-----	-----
		6	KM042+000 - KM052+000	•				9	42	OP11	I/O	KM042+723	34.1	25.5	70°	I Girder	1@21m	T	9.916	-----	-----	Bored Pile	1.2	8.0
				•					43	CB11	I/O	KM043+655	39.1	25.5	80°	I Girder	1@27m	T	9.462	-----	-----	Bored Pile	1.0	17.5
				•					44	ORB11	I/O	KM044+440	57.8	25.5	90°	I Girder	2@24m	T	7.196	Wall	14.596	Bored Pile/Spread	1.0	10.0
				•					45	ORB12	I/O	KM045+438	44.1	25.5	90°	I Girder	1@30m	T	9.722	-----	-----	Bored Pile	1.0	9.0
				•					46	CB12	I/O	KM045+540	39.1	25.5	70°	I Girder	1@27m	T	9.978	-----	-----	Bored Pile	1.0	11.0
				•					47	ORB13	I/O	KM045+885	74.8	25.5	90°	I Girder	2@27m	T	11.018	Wall	16.016	Bored Pile/Spread	1.2	9.5
				•					48	OP11a	I/O	KM047+136	33.9	25.5	70°	I Girder	1@21m	T	9.692	-----	-----	Bored Pile	1.0	9.0
				•					49	LRB09	I/O	KM047+911	112.2	25.5	70°	I Girder	3@33m	T	8.949	Wall	14.385	Bored Pile/Spread	1.0	10.0
				•					50	CB13	I/O	KM048+390	44.9	25.5	80°	I Girder	1@27m	T	10.091	-----	-----	Bored Pile	1.0	11.5
		7	KM052+000 - KM065+000	•				10	51	ORB14	I/O	KM054+985	43.5	25.5	80°	I Girder	1@33m	T	9.170	-----	-----	Bored Pile/Spread	1.0	6.0
				•					52	LRB10	I/O	KM055+615	148.3	25.5	90°	I Girder	4@33m	T	9.213	Round	15.470	Bored Pile/Spread	1.0	14.5
				•					53	ORB15	I/O	KM057+095	40.0	25.5	70°	I Girder	1@30m	T	9.274	-----	-----	Bored Pile/Spread	1.0	6.0
				•					54	OP16	I/O	KM057+508	34.7	25.5	90°	I Girder	1@21m	T	10.328	-----	-----	Bored Pile	1.0	15.0
				•					55	LRB11	I/O	KM058+244	146.5	25.5	70°	I Girder	4@33m	T	7.729	Wall	13.523	Bored Pile/Spread	1.0	8.0
				•					56	OP17a	I/O	KM060+043	34.1	25.5	80°	I Girder	1@21m	T	10.217	-----	-----	Bored Pile	1.0	18.0
				•					57	OP17b	I/O	KM060+966	33.7	25.5	90°	I Girder	1@21m	T	9.621	-----	-----	Bored Pile	1.0	6.0
				•					58	ORB16	I/O	KM062+456	72.5	25.5	90°	I Girder	2@30m	T	9.231	Wall	12.107	Bored Pile/Spread	1.0	6.0
				•					59	OP17c	I/O	KM063+786	47.3	25.5	70°	I Girder	1@33m	T	10.264	-----	-----	Bored Pile	1.0	6.0
						•			60	IRB01	I/O	RW-C1,KM000+455	68.0	15.5	90°	Void Slab	2@27m	T	9.942	Wall	9.642	Bored Pile	1.0	6.0
		A1	KM065+000 - KM081+150				•	5	61	FO06a	I/O	KM066+455	103.1	12.0	70°	Void Slab	3@30m	T	11.862	Wall	16.512	Bored Pile	1.2	TBD
				•					62	ORB17a	I/O	KM066+615	37.5	36.110	70°	I Girder	1@24m	T	9.719	-----	-----	Bored Pile	1.0	TBD
				•					63	LRB12	I/O	KM068+456	306.3	25.5	90°	I Girder	7@40m	T	12.400	Round	23.753	Bored Pile/Spread	1.2	24.0
				•					64	ORB21	I/O	KM075+182	79.8	25.5	90°	I Girder	2@33m	T	10.463	Wall	12.932	Bored Pile	1.0	8.0
							•		65	FO07	I/O	KM076+970	55.8	4.0	90°	K-frame	12.4+31+12.4m	-----	-----	-----	-----	-----	-----	-----
		A2	KM081+150 - KM099+500	•				9	66	CB23	I/O	KM081+364	56.7	25.5	70°	I Girder	1@40m	T	10.581	-----	-----	Bored Pile	1.2	14.5
				•					67	ORB22	I/O	KM082+348	78.7	25.5	90°	I Girder	3@21m	T	10.068	Wall	15.815	Bored Pile/Spread	1.0	10.0
					•				68	OP18a	I/O	KM082+986	43.1	35.830	80°	I Girder	1@27m	T	11.270	-----	-----	Bored Pile	1.2	13.5
				•					69	OP19	I/O	KM085+751	41.1	25.5	90°	I Girder	1@27m	T	10.341	-----	-----	Bored Pile	1.0	15.0
				•					70	ORB23	I/O	KM087+710	42.9	25.5	90°	I Girder	1@33m	T	8.879	-----	-----	Bored Pile	1.0	16.0
				•					71	LRB12a	I/O	KM087+970	147.1	25.5	90°	I Girder	4@33m	T	8.367	Round	11.162	Bored Pile	1.0	14.0
							•		72	FO09	I/O	KM089+158	56.5	7.5	70°	Void Slab	2@24m	T	8.218	Wall	9.389	Bored Pile	1.0	27.0
				•					73	ORB25a	I/O	KM091+140	30.9	25.5	90°	I Girder	1@21m	T	8.434	-----	-----	Bored Pile	1.0	21.5
				•					74	CB25	I/O	KM092+538	42.1	25.5	90°	I Girder	1@33m	T	7.771	-----	-----	Bored Pile	1.0	11.0
Quang Ngai		A3	KM099+500 - KM110+100	•				13	75	OP20a	I/O	KM100+846	24.8	25.5	90°	Portal	1@14m	T	8.308	-----	-----	Bored Pile	1.0	22.5
					•				76	ORB26	I/O	KM101+445	34.1	45.530	90°	I Girder	1@24m	T	8.513	-----	-----	Bored Pile	1.0	17.5
					•				77	CB27	I/O	KM101+827	31.5	34.160	90°	I Girder	1@21m	T	8.001	-----	-----	Bored Pile	1.0	13.0
					•				78	ORB26a	I/O	KM102+055	35.9	35.700	90°	I Girder	1@27m	T	7.899	-----	-----	Bored Pile	1.0	17.0
						•			79	IRB02	I	RW-B,KM000+408	44.1	8.5	90°	I Girder	1@30m	T	10.392	-----	-----	Bored Pile	1.2	21.0
						•			80	IRB03	I/O	RW-C1,KM000+981	98.3	15.5	80°	I Girder	2@40m	T	13.854	Wall	14.788	Bored Pile	1.5	20.5
						•			81	IRB04	I/O	RW-C1,KM001+254	75.2	15.5	90°	Void Slab	2@30m	T	12.943	Wall	9.844	Bored Pile	1.2	47.0
				•					82	DRB26b	I/O	KM102+327	43.9	25.5	90°	I Girder	1@33m	T	8.224	-----	-----	Bored Pile	1.0	16.0
							•		83	FO10	I/O	KM103+560	54.3	3.0	90°	Void Slab	2@24m	T	8.667	Round	9.027	Spread	-----	-----
				•					84	ORB27	I/O	KM104+887	44.7	25.5	90°	I Girder	1@33m	T	9.322	-----	-----	Bored Pile	1.0	14.0
				•					85	VD09a	I/O	KM107+307	47.7	25.5	90°	I Girder	1@30m	T	11.436	-----	-----	Bored Pile	1.2	17.0
				•					86	VD09b	I/O	KM107+829	44.5	25.5	90°	I Girder	1@30m	T	10.291	-----	-----	Bored Pile	1.0	17.5
				•					87	MRB03	I/O	KM109+001	454.5	25.5	90°	Super Tee	11@40m	T	10.800	Wall	14.500	Bored Pile	1.2	25.0
		A4	KM110+100 - KM124+700				•	8	88	FO10a	I/O	KM111+720	51.9	4.0	90°	Void Slab	2@24m	T	5.318	Round	8.384	Spread	-----	-----
					•				89	OP22a	I/O	KM112+120	50.7	29.250	90°	I Girder	1@40m	T	6.344	-----	-----	Spread	-----	-----
				•					90	ORB28	I/O	KM115+999	61.9	25.5	70°	I Girder	2@24m	T	8.091	Wall	11.090	Bored Pile/Spread	1.0	9.0
							•		91	FO14	I/O	KM116+570	65.6	7.5	90°	Void Slab	2@27m	T	9.363	Wall	8.736	Bored Pile	1.0	18.5
				•					92	CB30	I/O	KM118+050	46.1	25.5	90°	I Girder	1@33m	T	8.979	-----	-----	Bored Pile	1.0	8.0
							•		93	FO16	I/O	KM119+170	67.1	9.0	70°	Void Slab	2@27m	T	10.410	Wall	9.102	Bored Pile	1.0	15.5
					•				94	OP23c	I/O	KM123+700	41.1	34.060	70°	I Girder	1@27m	T	10.082	-----	-----	Bored Pile	1.0	10.0
					•				95	VD10a	I/O	KM124+117	116.4	25.500	70°	I Girder	3@33m	T	10.643	Wall	12.922	Bored Pile	1.2	10.5
		A5	KM124+700 - KM139+263	•				9	96	OP24a	I/O	KM124+899	47.1	25.5	80°	I Girder	1@27m	T	11.724	------	-----	Bored Pile	1.2	29.5
				•					97	MRB04	I/O	KM125+367	774.5	25.5	90°	Super Tee	19@40m	T	10.500	Wall	13.500	Bored Pile	1.2	28.0
				•					98	VD12	I/O	KM126+882	692.4	25.5	90°	Super Tee	17@40m	T	10.050	Wall	13.351	Bored Pile	1.2	27.0
				•					99	VD13	I/O	KM127+761	294.4	25.5	90°	Super Tee	7@40m	T	12.748	Wall	12.552	Bored Pile	1.2	23.0
				•					100	OP25	I/O	KM128+615	42.7	25.5	70°	I Girder	1@27m	T	10.243	-----	-----	Bored Pile	1.2	15.0
					•				101	ORB28a	I/O	KM130+174	45.1	25.5	90°	I Girder	1@33m	T	9.420	-----	-----	Bored Pile	1.0	23.5
	Linking Road			•					102	ORB29	I/O	KM132+620	54.1	12.0	90°	I Girder	1@40m	T	9.972	-----	-----	Bored Pile	1.2	16.0
				•					103	OP27	I/O	KM134+953	138.1	12.0	70°	I Girder	3@40m	T	12.737	Wall	15.505	Bored Pile	1.5	35.5
				•					104	CB38	I/O	KM138+284	55.9	12.0	70°	I Girder	1@40m	T	11.180	-----	-----	Bored Pile	1.2	15.0
Total				**76**	**12**	**5**	**11**	**103**					**11,676.3**											

1) Counted average bridge length of bridges in independent alignment sections as one bridge

Appendix -4

List of Cross Structures

Appendix 4: List of Cross structures

Jurisdiction	Package	No.	Road		Water Way	Size	Remarks
			CB	FO			
Danang	PKG-1	1	PKG-1RD1			3X3	
	Km000+000	2			PKG-1-WT1	2X2	Change form CP
	Km008+000	3	PKG-1-RD2			5X3.5	
		4			PKG-1-WT2	2*(2.0*1.5)	Check Discharge Q'ty
		5			PKG-1-WT3	2X2	Check the Drainage System
		6	PKG-1-RD3			5X3.5	
		7			PKG-1-WT4	2*(1.5*1.5)	
		8			PKG-1-WT5	2X2	
		9	PKG-1-RD4			4X3	
		10			PKG-1-WT6	2X1.5	
		11	PKG-1-RD5			4X3	
		12	PKG-1-RD6			4X3	
		13			PKG-1-WT7	2X2	Check Discharge Q'ty
		14			PKG-1-WT8	2X2	Check Discharge Q'ty
		15	PKG-1-RD7			5X3.5	
		16			PKG-1-WT9	2X2	Check the Drainage System
		17	PKG-1-RD8			6.5X4.5	
Quang	PKG-2	18			PKG-2-WT1	3*(3.0*3.0)	
Nam	Km008+000	19			PKG-2-WT2	2X2	
	Km016+880	20			PKG-2-WT3	1.5X1.5	
		21	PKG-2-RD1			5X3.5	
		22		PKG-2-FO1		12X0	
		23			PKG-2-WT4	1.5X1.5	Chang from CB-Rd
		24			PKG-2-WT5	2X1.5	
		25	PKG-2-RD2			5X3.5	
		26	PKG-2-RD3			2*(4.5*4.5)	
		27	PKG-2-RD4			5.8X4.5	
		28	PKG-2-RD5			4X3	
	PKG-3A						
	Km016+880						
	Km018+100						
	PKG-3B	29		PKG-3B-FO1		6.5X0	
	Km018+100	30			PKG-3B-WT1	3*(3.0*3.0)	
	Km021+500	31			PKG-3B-WT2	3X3	
	PKG-4	32	PKG-4-RD1			5X3.5	
	Km021+500	33			PKG-4-WT1	2*(3.0*3.0)	
	Km032+600	34			PKG-4-WT2	2*(4.5*4.5)	
		35	PKG-4-RD2			5X3.5	
		36			PKG-4-WT3	2X2	
		37			PKG-4-WT4	2*(3.0x3.0)	
		38	PKG-4-RD3			5X3.5	
		39		PKG-4-FO1		5X0	
		40	PKG-4-RD4			2*(4.5*4.5)	
		41			PKG-4-WT5	2*(2.5*2.5)	
		42	PKG-4-RD5			4X3	
		43			PKG-4-WT6	2.5X2.5	
		44			PKG-4-WT7	2*(2.5*2.5)	
		45	PKG-4-RD6			5X3.5	
		46			PKG-4-WT8	2*(2.5*2.5)	
		47			PKG-4-WT9	2*(2.0*1.5)	
		48	PKG-4-RD7			3X3	
		49			PKG-4-WT10	3X3	
		50			PKG-4-WT11	2X2	
		51			PKG-4-WT12	2.5X2.5	
		52	PKG-4-RD8			6.5X4.5	
		53			PKG-4-WT13	1.5X1.5	Change from CP
		54			PKG-4-WT14	2X2	
		55			PKG-4-WT15	2*(3.0*3.0)	
		56	PKG-4-RD9			5X3.5	W/Side Ditch
		57			PKG-4-WT16	2X2	
		58	PKG-4-RD10			3X3	
		59			PKG-4-WT17	2X2	Check Discharge Q'ty
		60	PKG-4-RD11			5X3.5	
		61			PKG-4-WT18	2X2	
		62	PKG-4-RD12			6.5X4.5	Check Discharge Q'ty
		63			PKG-4-WT19	3*(3.0*3.0)	

Jurisdictior	Package	No.	Road		Water Way	Size	Remarks
			CB	FO			
	PKG-5	64			PKG-5-WT1	2*(2.5*2.5)	
	Km032+600	65	PKG-5-RD1			3X3	
	Km042+000	66			PKG-5-WT2	2*(3.0*3.0)	
		67			PKG-5-WT3	2.5X2.5	
		68	PKG-5-RD2			5X3.5	
		69	PKG-5-RD3			6.5X4.5	
		70			PKG-5-WT4	2X2	Change from CP
		71			PKG-5-WT5	2.5X2.5	
		72			PKG-5-WT6	2.5X2.5	
	PKG-6	73			PKG-6-WT1	2*(1.5*1.5)	
	Km042+000	74	PKG-6-RD1			4X3	Change from Br.
	Km052+000	75			PKG-6-WT2	3*(3.0*3.0)	
		76	PKG-6-RD2			3X3	
		77			PKG-6-WT3	2X2	
		78	PKG-6-RD3			3X3	
		79	PKG-6-RD4			4X3	
		80			PKG-6-WT4	2X2	
		81	PKG-6-RD5			2*(4.5*4.5)	
		82			PKG-6-WT5	3X3	
		83			PKG-6-WT6	1.5X1.5	
		84			PKG-6-WT7	2.5X2.5	
		85	PKG-6-RD6			4X3	
		86	PKG-6-RD7			5.5X4	
		87	PKG-6-RD8			5X3.5	
		88			PKG-6-WT8	2*(3.0*3.0)	
		89	PKG-6-RD9			5X3.5	
		90	PKG-6-RD10			4X3	
		91			PKG-6-WT9	2X2	
		92	PKG-6-RD11			2*(4.5*4.5)	
		93			PKG-6-WT10	2*(2.5*2.5)	
	PKG-7	94	PKG-7-RD1			5X3.5	
	Km052+000	95			PKG-7-WT1	2X1.5	
	Km065+000	96			PKG-7-WT2	2X2	Check Discharge Q'ty
		97	PKG-7-RD2			5X3.5	Check Discharge Q'ty
		98	PKG-7-RD3			5X3.5	
		99			PKG-7-WT3	2X2	
		100	PKG-7-RD4			5X3.5	
		101			PKG-7-WT4	2X2	
		102			PKG-7-WT5	2*(2.0x1.5)	
		103	PKG-7-RD5			6.5X4.5	
		104			PKG-7-WT6	2X2	
		105	PKG-7-RD6			4X3	Change from CP
		106	PKG-7-RD7			5X3.5	
		107			PKG-7-WT7	2.5X2.5	
		108	PKG-7-RD8			6.5X4.5	
		109	PKG-7-RD9			5X3.5	
		110			PKG-7-WT8	2*(2.0*1.5)	
		111	PKG-7-RD10			4X3	
		112	PKG-7-RD11			4X3	
		113	PKG-7-RD12			6.5X4.5	
		114			PKG-7-WT9	2*(2.0*2.0)	
		115	PKG-7-RD13			3X3	Change from Br.
		116			PKG-7-WT10	2*(2.5*2.5)	
		117	PKG-7-RD14			3X3	
		118			PKG-7-WT11	2X2	
		119	PKG-7-RD15			5X3.5	
		120			PKG-7-WT12	2X2	
		121			PKG-7-WT13	2*(1.5*1.5)	

Jurisdiction	Package	No.	Road		Water Way	Size	Remarks
			CB	FO			
	PKG-A1	122	PKG-A1-RD1			3X3	
	Km065+000	123			PKG-A1-WT1	2*(3.0*3.0)	
	Km081+000	124			PKG-A1-WT2	2*(3.0*3.0)	
		125	PKG-A1-RD2			3X3	
		126			PKG-A1-WT3	2*(2.0*2.0)	
		127			PKG-A1-WT4	2.5X2.5	
		128	PKG-A1-RD3			4X3	
		129			PKG-A1-WT5	3X3	
		130			PKG-A1-WT6	3X3	
		131	PKG-A1-RD4			5X3.5	
		132	PKG-A1-RD5			5X3.5	
		133	PKG-A1-RD6			3X3	
		134	PKG-A1-RD7			5X3.5	
		135			PKG-A1-WT7	2*(2.5*2.5)	
		136	PKG-A1-RD8			3X3	
		137			PKG-A1-WT8	3X2.5	
		138	PKG-A1-RD9			6.5X4.5	
		139	PKG-A1-RD10			5X4.5	
		140			PKG-A1-WT9	2X2	
		141			PKG-A1-WT10	2*(2.0*2.0)	
		142	PKG-A1-RD11			3X3	Change from Br.
		143			PKG-A1-WT11	2X2	
		144			PKG-A1-WT12	3X3	
		145			PKG-A1-WT13	2X2	
		146	PKG-A1-RD12			3X3	
		147			PKG-A1-WT14	2X2	
		148			PKG-A1-WT15	2X2	
		149	PKG-A1-RD13			4X3.5	
		150			PKG-A1-WT16	2X2	
		151	PKG-A1-RD14			5X3.5	
		152			PKG-A1-WT17	2X2	
		153	PKG-A1-RD15			4X3.5	
		154			PKG-A1-WT18	3*(4.0*4.0)	
		155			PKG-A1-WT19	2*(2.0*2.0)	Change from Br.
		156	PKG-A1-RD16			3X3	Change from Br.
		157			PKG-A1-WT20	2*(2.5*2.5)	
		158			PKG-A1-WT21	2*(2.5*2.5)	
		159		PKG-A1-FO1		4X0	
		160			PKG-A1-WT22	2X2	
		161	PKG-A1-RD17			4X3.5	
		162			PKG-A1-WT23	2.5X2.5	
		163		PKG-A1-FO2		4X0	
		164			PKG-A1-WT24	3X3	
		165			PKG-A1-WT25	2X2	
		166			PKG-A1-WT26	2X2	
		167	PKG-A1-RD18			4X3.5	
		168			PKG-A1-WT27	2.5X2.5	
	PKG-A2	169			PKG-A2-WT1	2.5X2.5	
	Km081+000	170	PKG-A2-RD1			4X3	
	Km099+500	171			PKG-A2-WT2	2.5X2.5	
		172			PKG-A2-WT3	2*(2.0*2.0)	
		173			PKG-A2-WT4	2X2	
		174			PKG-A2-WT5	2X2	
		175	PKG-A2-RD2			4X3	
		176	PKG-A2-RD3			3X3	
		177	PKG-A2-RD4			4X3	
		178	PKG-A2-RD5			6.5X4.5	
		179	PKG-A2-RD6			4X3	
		180		PKG-A2-FO3		7.5X0	
		181	PKG-A2-RD7			5X3.5	
		182			PKG-A2-WT6	2.5X2.5	
		183	PKG-A2-RD8			5X3.5	
		184			PKG-A2-WT7	2*(3.0*3.0)	
		185	PKG-A2-RD9			3X3	

Jurisdiction	Package	No.	Road		Water Way	Size	Remarks
			CB	FO			
	PKG-A2	186	PKG-A2-RD10			3X3	
	Km081+000	187			PKG-A2-WT8	2*(2.5*2.5)	
	Km099+500	188	PKG-A2-RD11			4X3.5	
		189	PKG-A2-RD12			3X3	
		190	PKG-A2-RD13			3X3	
		191	PKG-A2-RD14			5X3.5	
		192			PKG-A2-WT9	2X2	
		193	PKG-A2-RD15			4X3.5	
		194			PKG-A2-WT10	2X2	
		195			PKG-A2-WT11	2X2	
		196	PKG-A2-RD16			3X3	
		197			PKG-A2-WT12	3*(3.0*3.0)	
		198	PKG-A2-RD17			5X3.5	
		199			PKG-A2-WT13	2.5X2.5	
		200			PKG-A2-WT14	2X2	
		201	PKG-A2-RD18			5X3.5	
		202			PKG-A2-WT15	2X2	
		203	PKG-A2-RD19			5X3.5	
		204			PKG-A2-WT16	2X2	
		205	PKG-A2-RD20			4X3	
		206	PKG-A2-RD21			5X3.5	
		207			PKG-A2-WT17	2*(3.0*2.5)	
		208	PKG-A2-RD22			4X3	
Quang	PKG-A3	209			PKG-A3-WT1	3*(3.0*3.0)	
Ngai	Km099+500	210	PKG-A3-RD1			3X3	
	Km110+100	211			PKG-A3-WT2	3X3	
		212	PKG-A3-RD2			5.5X4	
		213			PKG-A3-WT3	2X2	
		214	PKG-A3-RD3			6.5X4.5	
		215			PKG-A3-WT4	3X3	
		216			PKG-A3-WT5	2X2	
		217		PKG-A3-FO1		3X	
		218	PKG-A3-RD4			4X3	
		219	PKG-A3-RD5			3X3	
		220	PKG-A3-RD6			5X3.5	
		221	PKG-A3-RD7			4X3	
		222			PKG-A3-WT6	2*(3.0*3.0)	
		223	PKG-A3-RD8			2*(4.5*4.5)	
		224			PKG-A3-WT7	2*(3.0*2.0)	
		225	PKG-A3-RD9			5X3.5	
		226			PKG-A3-WT8	2.5X2.5	
		227	PKG-A3-RD10			2*(4.5*4.5)	
		228			PKG-A3-WT9	2.5X2.5	
		229	PKG-A3-RD11			5X3.5	
		230			PKG-A3-WT10	2*(2.0*2.0)	
		231	PKG-A3-RD12			5X3.5	
		232	PKG-A3-RD13			2*(4.5*4.5)	
		233			PKG-A3-WT11	2*(3.0*3.0)	
		234	PKG-A3-RD14			4X3	
	PKG-A4	235			PKG-A4-WT1	2X2	
	Km110+100	236			PKG-A4-WT2	2*(1.5*1.5)	
	Km124+700	237			PKG-A4-WT3	2.5X2.5	
		238			PKG-A4-WT4	3X3	
		239		PKG-A4-FO1		4X	
		240			PKG-A4-WT5	2X2	
		241			PKG-A4-WT6	2X2	
		242	PKG-A4-RD1			4X3	
		243			PKG-A4-WT7	2*(3.0*3.0)	
		244		PKG-A4-FO2		7.5X0	
		245	PKG-A4-RD2			3X3	
		246	PKG-A4-RD3			5X3.5	
		247			PKG-A4-WT8	3*(3.0*3.0)	
		248			PKG-A4-WT9	2X1.5	
		249			PKG-A4-WT10	3*(3.0*2.0)	
		250		PKG-A4-FO3		9X	

Jurisdiction	Package	No.	Road		Water Way	Size	Remarks
			CB	FO			
		251			PKG-A4-WT11	2*(2.0*2.0)	
		252			PKG-A4-WT12	2*(2.0*2.0)	
		253	PKG-A4-RD4			5X3.5	
		254			PKG-A4-WT13	2*(2.0*2.0)	
		255	PKG-A4-RD5			4X3	
		256			PKG-A4-WT14	2.5X2.5	
		257			PKG-A4-WT15	2X2	
		258			PKG-A4-WT16	3X2	
		259			PKG-A4-WT17	2X2	
		260	PKG-A4-RD6			5X4	
		261	PKG-A4-RD7			5X3.5	
		262			PKG-A4-WT18	2.5X2.5	
		263			PKG-A4-WT19	2*(3.0*2.0)	
	PKG-A5	264	PKG-A5-RD1			4X3	
	Km124+700	265	PKG-A5-RD2			4X3	
	Km139+204	266			PKG-A5-WT1	1.5X1.5	
		267			PKG-A5-WT2	2X1.5	
		268			PKG-A5-WT3	2.5X2.5	
		269	PKG-A5-RD3			6.5X4.5	
		270			PKG-A5-WT4	2X2	
		271			PKG-A5-WT5	2*(2.5*2.5)	
		272			PKG-A5-WT6	2X2	
		273			PKG-A5-WT7	3X2	
		274			PKG-A5-WT8	1.5X1.5	
		275			PKG-A5-WT9	1.5X1.5	
		276			PKG-A5-WT10	1.5X1.5	
		277			PKG-A5-WT11	2*(2.5*2.5)	
		278			PKG-A5-WT12	2*(2.5*2.5)	
		279	PKG-A5-RD4			2*(4.5*4.5)	
		280			PKG-A5-WT13	1X1	
		281			PKG-A5-WT14	2.5X2.5	
		282			PKG-A5-WT15	1X1	
		283			PKG-A5-WT16	2.5X2.5	
		284			PKG-A5-WT17	2X2	
		285			PKG-A5-WT18	2X2	
		286			PKG-A5-WT19	2*(3.0*3.0)	
		287			PKG-A5-WT20	1.5X1.5	

Appendix 4: List of Cross structures in Interchange

Jurisdiction	Package	IC Name	No.	Road		Water Way	Size	Remarks
				CB	FO			
Danang	PKG-1	Tuy Loan	1		PKG1-FO1		6.5X4.75	
		(Phase 1)	2			PKG1-WT1	2X2	
			3			PKG1-WT2	2X2	
			4			PKG1-WT3	6X4X4	
			5			PKG1-WT4	2X2	
			6			PKG1-WT5	2X2	
			7			PKG1-WT6	6X4X4	
Quang Nam	PKG-2	My Son	8			PKG2-WT1	2X1.5	
	PKG-5	Ha Lam	9	PKG5-RD1			3X3	
			10			PKG5-WT1	2X2	
			11			PKG5-WT2	2X2X2	
	PKG-7	Tam Ky	12	PKG7-RD1			3X3	
			13	PKG7-RD2			4X3	
			14			PKG7-WT1	2X3X3	
			15			PKG7-WT2	2X2	
			16			PKG7-WT3	2X3X3	
			17			PKG7-WT4	1X1	
			18			PKG7-WT5	0.75X0.75	
			19			PKG7-WT6	2X3X3	
			20			PKG7-WT7	2X0.75X0.75	
			21			PKG7-WT8	2X0.75X0.75	
	PKG-A2	Chu Lai	22	PKGA2-RD1			5X3.5	
			23	PKGA2-RD2			5X3.5	
			24			PKGA2-WT1	2X3X3	
			25			PKGA2-WT2	2X2	
			26			PKGA2-WT3	2X2X1.5	
			27			PKGA2-WT4	0.75X0.75	
			28			PKGA2-WT5	0.75X0.75	
			29			PKGA2-WT6	2X1.5X1.5	
Quang Ngai	PKG-A3	Dung Quat	30	PKGA3-RD1			5X3.5	
	PKG-A4	Q.N. North	31			PKGA4-WT1	2X3X3	
			32			PKGA4-WT2	3X2X2	
			33			PKGA4-WT3	1.5X1.5	
	PKG-A5	Q.N.	34	PKGA5-RD1			4.5X3.5	
		(Initial)	35			PKGA5-WT1	3X2X1.5	