

**Consulting Services for Detailed Design for
Danang Quang Ngai Expressway Development Project
IDA Credit No. 3843-VN**

Project Location Map

Project Location Map

Project Route Map

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Abbreviations

ACEC	: American Council of Engineering Companies
AP	: Affected People
ARTBA	: American Road & Transportation Builders Association
BOT	: Build-Operate-Transfer
BP	: Beginning Point
B/Q	: Bill of Quantities
CAD	: Computer Aided Design
CARB	: Compensation, Assistance and Resettlement Boards
CBR	: California Bearing Ratio
CPC	: City People's Committee
CPCSR	: Comprehensive Plan on Compensation, Support and Resettlement
C/S	: Construction Supervision
DARD	: Department of Agriculture and Rural Development
DOFPP	: Department of Fire Prevention and Protection
DOLA	: Department of Land Administration
DONRE	: Department of Natural Resources and Environment
DOT	: Department of Taxation
DOTP	: Department of Traffic Office
D/D	: Detailed Engineering Design
DMS	: Detailed Measurement Survey
DPC	: District People's Committee
DRC	: District Resettlement Committee
ED	: Evaluation Department
EIA	: Environmental Impact Assessment
EMP	: Environmental Management Plan
EOO	: Expressway Operation Office
EP	: Ending Point
ESCRD	: Environmental and Social Considerations Review Division
ETC	: Electric Toll Collection
F/S	: Feasibility Study
GDEM	: Global Digital Elevation Model
GOVN	: Government of the Socialist Republic of Vietnam
HCMC	: Ho Chi Minh City
HEC-RAS	: Hydrologic Engineering Centers River Analysis System, US Army Corps of Engineers
HIDO	: Highway Industry Development Organization, Japan
IBRD	: International Bank for Reconstruction and Development
IC	: Interchange
IDA	: International Development Association
I/P	: Implementation Program
ISO	: International Organization for Standardization
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
KEX	: Korean Expressway Corporation

L/A	: Loan Agreement
LAN	: Local Area Network
LOS	: Level of Services
MEX	: Metropolitan Expressway Co., Ltd., Japan
MLIT	: Ministry of Land, Infrastructure, Transport and Tourism, Japan
M/M	: Man-Months
MOF	: Ministry of Finance
MONRE	: Ministry of Natural Resources and Environment
MOPS	: Ministry of Public Security
MOT	: Ministry of Transport
MS	: Microsoft
NE	: Nippon Engineering Consultants Co., Ltd., Japan
NEXCO	: Nippon Expressway Company Limited, Japan
NH	: National Highway
NK	: Nippon Koei Co., Ltd., Japan
ODA	: Official Development Assistance
OED	: Operations Evaluation Department
O&M	: Operation and Maintenance
OP	: Operational Policies
ORSE	: Organization for Road System Enhancement, Japan
PA	: Parking Area
PAP	: Project Affected People
PC	: Personnel Computer
PIARC	: Permanent International Association of Road Congresses
PTC2	: Power Transmission Company No. 2
P/A	: Procurement Assistance
PMBOK	: Project Management Body of Knowledge
PMI	: Project Management Institute
PMU85	: Project Management Unit No. 85
PPC	: Provincial People's Committee
P/Q	: Pre-qualification
P3	: Primavera Project Planner
QACU	: Quality Assurance and Compliance
QA/QC	: Quality Assurance and Quality Control
QCBS	: Quality and Cost Based Selection
RAP	: Resettlement Action Plan
RFP	: Request for Proposals
RMP	: Resettlement Monitoring Plan
RNIP	: Road Network Improvement Project
ROW	: Right of Way
SA	: Service Area
SES	: Socio-economic Survey
SPT	: Standard Penetration Test
SSS	: Single Source Selection
TB	: Toll Barrier
TDF	: Transportation Development Foundation
TEC	: Thai Engineering Consultants Company Limited
TEDI	: Transport Engineering Design Incorporated

TFT	: Task Force Team
TG	: Toll Gate
TMC	: Traffic Management Center
TOR	: Terms of Reference
TPO	: Toll Plaza Office
TV	: Television
UPS	: Uninterruptible Power Supply
USD	: United States Dollar
VEC	: Vietnam Expressway Corporation
VICS	: Vehicle Information and Communication System
VITRANSS2	: The Comprehensive Study on the Sustainable Development of Transport System in Vietnam
VITTEL	: Vietnam Military Electronic and Telecommunications Corporation
VND	: Vietnamese Dong
VNPT	: Vietnam Posts and Telecommunications Group
VST	: Vane Shear Test
WB	: World Bank

C.1 Appreciation of the Terms of Reference

The Terms of Reference (TOR) for Consulting Services for Detailed Design for Danang Quang Ngai Expressway Development Project (hereafter called the Project) dated February 12, 2010 and Addendum No.1 and revised RFP dated April 9, 2010, prepared by Project Management Unit No. 85 (PMU85), on behalf of Vietnam Expressway Corporation (VEC) have described very specific terms of requirements of PMU85 for the Consulting Services (the Services). It clearly presents the background of the Project, the objectives and scope of the Services, the requirements of reports and documents, the requirements of the Consultant personnel, the undertaking of PMU85-Ministry of Transport (MOT) and the obligation of the Consultant.

We have carried out the past studies (JETRO (Japan External Trade Organization) study in 2007 and the World Bank (WB) supplemental study in 2008-2009) and fully acquainted the details of the Project. On the basis of our experience of the above studies and other similar expressway projects, we have carefully appreciated TOR and found that this TOR is very clear and precise, in which all required services are comprehensively and adequately described.

Followings are our comments and suggestions which we have considered necessary during the preparation of this Proposal and have included into the objectives and tasks of the Services.

C.2 Comments and Suggestions on TOR

Our detailed comments and suggestions on TOR are summarized in correlation with the relevant Sections of TOR as follows:

- Project Components (TOR 1)
- Contract Packaging and Project Implementation Program (TOR 3.3.1)
- Scope of Services (TOR 3)
- Reports and Documents (TOR 4)
- Consultant Personnel (TOR 5)

(1) Project Components

Our comments and suggestions for the Project components are summarized in Table C.1.

Table C.1 Comments and Suggestions on TOR (Project Components)

No.	Comments	Suggestions
1	<p>Project Components (TOR 1)</p> <p>TOR 1 mentions as follows for the Project components:</p> <p>(1) <u>Component A: Civil Works</u> Construction of four-lane dual carriageway road (with capacity for eventual widening to six lanes) and 131 km in total length.</p> <p>(2) <u>Component B: ITS (Intelligent Transport Systems) Works</u> Provision of traffic management and toll collection facilities.</p> <p>(3) <u>Component C: Expressway Operations and Maintenance</u> Planning an institution to operate and maintain the expressway and identifying facilities and equipment that it will need.</p> <p>We confirmed main Project features from the distributed final report of the TEDI F/S (April 2010) as shown in Table C.2.</p> <p>In addition to the linking road above, the following 3 other linking roads were listed in the WB supplemental study (May 2009) to improve the transport linkage between the interchanges and existing NH1A (see locations in Figure D.1).</p> <ul style="list-style-type: none"> ➤ NH14E (KM041+121) ➤ District Road 616 (KM064+200) ➤ Provincial Road 623 (KM124+400) 	<p>1) We prepare this Proposal based on the fundamental data shown in Table C.2 to secure same bidding conditions among the short-listed firms.</p> <p>2) We understand that the improvement of 3 other linking roads is necessary to ensure the effectiveness of the Project. We confirm during the contract negotiation whether those linking roads are included as additional scope of works in the Services.</p> <p>3) Any other additional scope of works, of course, shall be subject to consent with VEC/PMU85.</p>

Table C.2 Main Project Features in the TEDI F/S (April 2010)

No.	Item	Main Project Features
1	Road Length	131.5 km (Danang: 8.0 km, Quang Nam: 91.5 km, Quang Ngai: 32.0 km) (BP: NH14B in Danang city, EP: connection to planned city ring road in Quang Ngai province)
2	Road Classification	Type A, class 120
3	Design Speed	120km/hr
4	Numbers of Lane	4 lanes (widened to 6 lanes in the ultimate stage)
5	Road Width	Road: 26.0m, bridge: 26.0m, tunnel section: 2@12.75 m = 25.5 m
6	Bridges	130 bridges (4 major river bridges, 21 viaducts, 52 other river bridges, 34 overpasses, 19 flyovers)
7	Tunnel	1 tunnel (2@540 m)
8	Culverts	361 culverts (expressway: 107 underpass, 211 drainage culverts, Linking road: 43 drainage culverts)
9	Softground Section	Approximately 3.6 km
10	Interchanges	9 interchanges
11	Linking Road ¹⁾	Approximately 8.0 km (EP of the expressway to existing NH1A in Quang Ngai province)
12	Frontage Roads	Approximately 59.7 km
13	Earthworks	Soil excavation: 10,000,000 m ³ , rock excavation: 1,000,000 m ³ , Filling: 24,000,000m ³
14	Electrical Facilities	Power supply, road lighting, and tunnel ventilation and safety facilities
15	ITS	Traffic management, toll collection ²⁾ and communication systems
16	O&M Buildings	1 traffic management center, 1 expressway operation office, 9 toll plaza offices, 2 toll barriers, 7 toll gates, 2 service areas, 4 parking areas
17	O&M Equipment	O&M vehicles, spare parts, maintenance equipment and consumables
18	Total Investment Cost	29,204 Bil.VND (1,537 Mil.USD)

1): Note that 3 other linking roads were included in the WB supplemental study (May 2009)

2): Including ETC systems in accordance with MOT Notice No.94/TB-BGTVT dated March 10, 2009

(2) Contract Packaging and Project Implementation Program

In the Pre-proposal Conference held on February 26, 2010, it was emphasized the necessity of commencement of construction works within 2010, and we were requested to propose the appropriate arrangement to realize it. Considering the Project implementation program (I/P) with this special requirement, in accordance with the requirements in TOR 3.3.1, we propose those in D.1.3(1)(a).

Our comments and suggestions for the contract packaging and I/P are summarized in Table C.3.

Table C.3 Comments and Suggestions on TOR (Contract Packaging and I/P)

No.	Comments	Suggestions
1	<p>Contract Packaging and Project I/P (TOR 3.3.1)</p> <p><u>Contract Packaging and Project I/P (TOR 3.3.1)</u> The requirements for the contract packaging and Project I/P in TOR 3.3.1 are summarized as follows:</p> <p>a. <u>Single City/Province</u> Arrange individual packages confined to a single city/province.</p> <p>b. <u>Single Financier</u> Arrange individual packages to be financed by only a single financier.</p> <p>c. <u>Value of Package</u> Arrange value of a package from 70 to 100 Mil.USD.</p> <p>d. <u>Commencement of Construction</u> Commence construction works within 2010.</p> <p>We understand that the construction work(s) can not be commenced in 2010 under the WB/JICA procurement guidelines and their L/A schedules.</p> <p><u>Procedure for finalization (not mentioned in TOR)</u> There is no clear procedure to finalize the demarcation of each funding source. We understand that the delay of determination of the demarcation would disable the commencement of construction works within 2010.</p>	<ol style="list-style-type: none"> 1) We recommend mobilizing state budget for one (1) package in each city/province (GOVN packages) to enable them to commence the construction works within 2010. 2) We recommend adopting Single Source Selection (SSS) procedure for the GOVN packages according to Decree No. 85/2009/ND-CP dated October 15, 2009 to shorten the procurement period. 3) It is strongly recommended that a tripartite meeting among GOVN, WB and JICA shall be held to finalize the funding demarcation as early as possible. 4) We propose early commencement of the Services for the GOVN packages one month in advance from the official commencement for ensuring commencement of the construction works within 2010. 5) We discuss the issues above, as the first priority, during the contract negotiation. Only strong initiative of GOVN, and well organized design and procurement by the Consultant, the construction works can be commenced within 2010.

(3) Scope of Services

We thoroughly examined the documents related to the required scope of Services as follows:

- Original RFP issued on February 12, 2010;
- Minutes of Pre-proposal Conference issued on February 26, 2010;
- Clarifications on RFP issued on March 22, 2010;
- Revised RFP issued on April 9, 2010;
- Clarifications on RFP issued on April 22, 2010;
- Clarifications on RFP issued on April 29, 2010.

The scope of Services is very clearly and specifically described in TOR 3, and it is sufficient to deliver the required outputs in the Services. In consideration of our examination of the scope of Services, we propose some revision and addition for improving TOR.

Our comments and suggestions for the scope of Services are summarized in Table C.4.

Table C.4 Comments and Suggestions on TOR (Scope of Services) (1/3)

No.	Comments	Suggestions
1	Project Management (not mentioned in TOR) The Services are large-scale and extend to the various technical fields and organizations. Therefore, it is important to perform an appropriate project management for smooth execution of the Services.	1) We perform a well structured project management as the specific task in the Services. 2) Our proposed methodology is shown in Task 1.1.
2	Surveys (TOR 3.3.2(2)) TOR does not mention about the survey quantities. This bidding is the Quality and Cost Based Selection (QCBS) including the survey cost; therefore, survey quantities should be mentioned for fair evaluation of the survey cost in the bid price.	1) Based on the distributed final report of the TEDI F/S (April 2010), overall survey quantities should be prepared for fair comparison among the bidders. 2) We have developed major survey quantities for the cost estimate as shown in Tables C.5 to 7.
3	Topographic Survey (TOR 3.3.2(2)(i)) <u>Existing Control Points (1st to 4th para)</u> We understand that the control points established in the TEDI F/S (April 2010) can be used in the Services. <u>Detailed Stakeout Works (6th para)</u> TOR requires detailed stake out works. We understand that the works are included in the cross section survey in accordance with 22 TCN 263-2000. <u>Interval of Cross-section Survey (8th para)</u> TOR does not mention the required interval of the cross-section survey. We understand that the interval of the cross-section survey is 20 m in accordance with 22 TCN 263-2000. <u>Planimetric Survey of Culverts (9th and 13th para)</u> TOR requires planimetric surveys of the residential underpass and drainage culvert. We understand that the planimetric surveys of road can be used for those structures. <u>Survey of Intersection Points (10th para)</u> TOR requires survey of the intersection points with existing facilities. We understand that the works are included in the planimetric surveys of road in accordance with 22 TCN 263-2000. <u>Survey of Canals and Dykes (14th para)</u> TOR requires surveys of the canals and dykes. We understand that the surveys of the road and existing data of canal system can be used for those structures.	1) We utilize the existing control points established in the TEDI F/S in the following sections: ➤ BP to KM016 ➤ KM060 to KM073 ➤ KM109 to EP and whole linking road We check the control points above in the Services. If there is any problem, we newly establish control points in the above section as additional works. 2) We conduct detailed stakeout works in accordance with TOR. The quantity for the works is included in the cross section survey. 3) We update the survey specifications in TOR with 20 m interval of the cross section survey. 4) We utilize the planimetric surveys of the road instead of the planimetric surveys of the drainage culvert and residential underpass. 5) We conduct the survey of intersection points with existing facilities in accordance with TOR. The quantity for the works is included in the planimetric surveys of the road. 6) We utilize the surveys of road and existing data of canal system instead of the surveys of the canal and dyke.

Table C.4 Comments and Suggestions on TOR (Scope of Services) (2/3)

No.	Comments	Suggestions
	<p><u>River Survey (not mentioned in TOR)</u> River survey is not included in TOR and should be added to the survey items.</p> <p><u>Planimetric Survey of Tunnel (not mentioned in TOR)</u> Topographic survey of the tunnel portals is not included in TOR and should be added to the survey items.</p>	<p>7) We update the survey specifications in TOR with the river surveys of river as follows:</p> <ul style="list-style-type: none"> ➤ Profile: 30 m pith with 200 m length ➤ Cross-section: 2 cross-sections per river bridge <p>8) We update the survey specifications in TOR with the planimetric survey of the tunnel portals.</p>
4	<p>Survey of Hydrographical Data (TOR 3.3.2(2)(ii))</p> <p><u>Flow Rate and Velocity of Rivers (1st and 6th para)</u> TOR requires data collection of water level and velocity of rivers from meteorological stations. We understand that sufficient data can not collect from the stations.</p> <p><u>Inundation Analysis (not mentioned in TOR)</u> Some sections on the Project road are on inundation plains. We understand that the inundation analysis is essential to establish the hydrological requirements for the viaducts, drainage culverts and embankments. Furthermore, cost benefit analysis is also recommended to optimize the viaduct construction in consideration of the socio-economic damage. However, those analyses are not mentioned in TOR.</p>	<p>1) We survey the water level and velocity of the large rivers in the Services. The specifications of the survey are as follows:</p> <ul style="list-style-type: none"> ➤ Water level: 2 locations*3 sections per bridge ➤ Velocity: 2 locations*3 sections per bridge <p>2) We conduct the inundation and cost benefit analyses in the Services. Our proposed methodology is shown in Task 3.2.3.</p>
5	<p>Engineering Geological Survey (TOR 3.3.2(2)(iii))</p> <p><u>Mechanical Boring for Soutground (2nd para)</u> TOR mentions “Drill one hole at expressway centerline per 75 m; drill geological cross-sections with two holes for two sides per 150 m”. We understand that the above requirements of cross-section boring are excessive. VST can be sufficiently supplementing the cross-sectional geotechnical data.</p> <p><u>Mechanical Boring for Deep Excavation (2nd para)</u> TOR mentions “Drill one hole at expressway centerline per 75 m; drill geological cross-sections with two holes for two sides per 150 m”. We understand that boring for deep excavation is necessary at the section where the slope height is more than 20 m and the length is more than 200 m. However, 75 m interval at centerline is excessive, and 200 m interval is appropriate. As for the cross-section boring, it is also necessary at the section where the slope height is more than 30 m.</p> <p><u>Mechanical Boring for Bridge (3rd para)</u> TOR mentions “Each abutment and bridge pier have one drilled hole; the hole is 3 to 5 m deeper than pile foundation”. We understand that the depth of the drilled hole is 3 to 10 m deeper than pile foundation in accordance with Vietnamese standards. Furthermore, depth of the drilled hole depends on the type of the bearing layer; it is not mentioned in final report of the TEDI F/S.</p> <p><u>Mechanical Boring for Tunnel (4th para)</u> TOR mentions “Drill one hole at the expressway center line per 50 m”. However, 50 m interval is excessive. We understand that 1 hole at each portal, 2 holes between the portals, and horizontal drilling with 100 m long at each portal are appropriate in accordance with survey guideline of Japanese Expressway Corporation (NEXCO).</p> <p><u>Geotechnical Test for Tunnel (4th para)</u> TOR mentions “Testing 17 undisturbed soil samples/ each boring and 8 disturbed samples/each boring”. However, the specifications are not clear what standards are referred.</p>	<p>1) We update the survey specifications in TOR with deleting the cross-section borings for softground.</p> <p>2) We update the survey specifications in TOR with boring at expressway centerline per 150 m in the section where the slope height is more than 20 m and the length is more than 200 m. The list of deep excavation sections are as follows:</p> <ul style="list-style-type: none"> ➤ KM031+600-KM031+900 ➤ KM034+500-KM034+800 ➤ KM091+900-KM092+100 ➤ KM093+900-KM094+100 ➤ KM104+100-KM104+300 ➤ KM111+600-KM112+000 ➤ KM114+300-KM114+500 <p>3) We estimate the depth of the mechanical boring for bridges with 15 m (shallow foundation) and 7 m deeper than pile foundation (pile foundation).</p> <p>4) We update the survey specifications in TOR with tunnel boring, 1 hole at each portal, 2 holes between the portals, and horizontal drilling with 100 m long at each portal.</p> <p>5) We update the survey specifications in TOR with geotechnical test for tunnel in accordance with Japanese standards. The item and quantity are shown in Table C.7.</p>

Table C.4 Comments and Suggestions on TOR (Scope of Services) (3/3)

No.	Comments	Suggestions
	<p><u>Seismic Measurement for Tunnel (4th para)</u> TOR mentions “Seismic measurement at 4 points at the depth of 50 m and 8 points at the depth of 100 m is carried out to identify strata structure”. However, this description is not clear. We understand that along the centerline and 632 m long (tunnel length+100 m) at each tunnel are sufficient.</p> <p><u>Mechanical Boring for Residential Culvert (5th para)</u> TOR mentions “Drill two staggered holes at each location of residential underpass”. We understand that this number is excessive, and 1 bore hole at each residential underpass is appropriate.</p> <p><u>Mechanical Boring for Building (6th para)</u> TOR mentions “each location has at least 4 holes”. However, some small buildings such as toll gates are unnecessary 4 bore holes.</p>	<p>6) We update the seismic measurement specifications in TOR with along the centerline and 632 m long at each tunnel.</p> <p>7) We update the survey specifications in TOR with 1 bore hole per each residential underpass.</p> <p>8) We update the survey specifications in TOR with 1 to 4 bore holes per buildings.</p>
6	<p>Detailed Design of Road, Bridges and Other Structures (TOR 3.3.3)</p> <p>TOR 3.3.3(5)c. mentions “Cross sections: 1:50” for the scale of cross section drawings.</p> <p>However, TOR 3.3.2(2)(i) 8th para mentions “Survey of cross-section at scale of 1/200”.</p> <p>We understand that the standard scale of drawings for cross section is 1:200.</p>	<p>1) We update the specifications of the scale of cross section drawing in TOR to 1:200.</p>
7	<p>Review and Update, as Necessary an EIA, EMP, EMDP and RAP (TOR 3.3.6)</p> <p><u>Detailed Measurement Survey (Annex B (2))</u> TOR mentions “a detailed measurement survey (DMS) of all lost assets is conducted, and the AP database is finalized”. We confirmed that DMS was conducted of all lost assets based on the F/S alignment in RAP. Therefore, DMS is necessary to conduct only the sections where alignment will be changed from the F/S.</p> <p><u>Socio-economic Survey (Annex B (3))</u> TOR mentions “If resettlement plan (RP) updating does not occur for at least two years after socio-economic survey (SES) which was undertaken during the Feasibility Study, another SES will be carried out. It will cover 20% of severely affected peoples (APs) and at least 10% of all other APs, disaggregated by gender, ethnicity, and type of impact”. We confirmed that SES was conducted within the past 2 years in RAP, and covered the requirements above.</p>	<p>1) The quantity of DMS is unknown in this stage. We confirm the survey quantity when the alignment will be fixed in basic design, and negotiate and agree the survey cost with VEC/PMU85 as additional works.</p> <p>2) We propose that we do not conduct SES in the Services.</p>
8	<p>Procurement Assistance (TOR 3.4)</p> <p>TOR mentions that the Consultant shall assist VEC/PMU85 in all of the tendering procedures.</p> <p>However, Special Condition of Contract 1.7 mentions that the Services period is only 14 months, and the procurement period can not be secured in consideration of the L/A schedules of WB and JICA (see D.1.3(1)(c)).</p>	<p>1) We propose to provide the procurement assistance flexibly to meet the L/A schedules.</p> <p>2) We discuss and confirm in the contract negotiation that the cost for procurement assistance after 14th months is allowed as additional works.</p>
9	<p>Technology Transfer (TOR 3.6)</p> <p>TOR mentions “The Consultant shall undertake training and technology transfer for the Client and PMU85”; however, participants of the program should be open to other than the VEC/PMU85.</p>	<p>1) We recommend that the program provide to four (4) types of participants; 1) VEC/PMU85, 2) key local professional staff, 3) relevant authorities i.e. traffic police, and 4) ordinal people as road users.</p> <p>2) We discuss the basic policy in the contract negotiation.</p>

We have developed major survey quantities for the cost estimate in this Proposal based on the distributed final report of TEDI F/S (April 2010) as follows:

- Topographic Survey;
- Hydrological Survey;
- Engineering Geological Survey.

The estimated quantities are shown in Tables C.5 to 7.

Table C.5 Estimated Quantities of the Topographic Survey

No.	Item	Class/Scale	Unit	Quantity	Remarks
A	Expressway				
1	Control Points and Leveling Network				
11	Primary control points (GPS)	Class IV, VN2000	point	29	
12	Primary leveling network (GPS network)		km	128	
13	Secondary control points	Class II	point	340	
14	Secondary leveling network		km	94	
2	Thruway				
21	Planimetric survey	1/1,000	ha	1,419	
22	Profile survey	1/1,000; 1/100	km	101	
23	Cross-section survey	1/200	km	840	
3	Interchange (including Rampway Bridge)				
31	Secondary control points	Class II	point	16	
32	Secondary leveling network		km	6	
33	Planimetric survey	1/500	ha	259	
34	Profile survey (rampway)	1/1,000; 1/100	km	18	
35	Cross-section survey (rampway)	1/200	km	21	
4	Viaduct and River Bridge				
41	Secondary control points (centerline stakeout)	Class II	point	204	
42	Planimetric survey (on shore)	1/500	ha	351	70 % of planimetric survey
43	Planimetric survey (off shore)	1/500	ha	150	30 % of planimetric survey
44	Profile survey (on shore)	1/500	km	18	70 % of profile survey
45	Profile survey (off shore)	1/500	km	8	30 % of profile survey
46	River profile survey	1/1,000; 1/100	km	31	
47	River cross-section survey	1/200	km	12	
5	Overpass				
51	Secondary control points (centerline stakeout)	Class II	point	44	
52	Planimetric survey	1/500	ha	102	
53	Profile survey	1/500	km	5	
6	Flyover				
61	Secondary control points (centerline stakeout)	Class II	point	66	
62	Planimetric survey	1/500	ha	99	
63	Profile survey	1/500	km	10	
64	Cross-section survey (approach road)	1/200	km	49	
7	Tunnel				
71	Planimetric survey (tunnel portal)	1/500	ha	1	
8	Drainage Culvert				
81	Profile survey	1/500	km	21	
82	Cross-section survey (canal)	1/200	km	2	
9	Underpass				
91	Profile survey	1/500	km	43	
92	Cross-section survey	1/200	km	32	
10	O&M Building				
101	Planimetric survey	1/500	ha	19	
B	Linking Road				
1	Road				
11	Planimetric survey	1/1,000	ha	80	
12	Profile survey	1/1,000; 1/100	km	9	
13	Cross-section survey	1/200	km	30	
2	Intersection				
21	Profile survey (crossing road)	1/1,000; 1/100	km	1	
22	Cross-section survey (crossing road)	1/200	km	1	
3	Viaduct and River Bridge				
31	Secondary control points (centerline stakeout)	Class II	point	6	
32	Planimetric survey (on shore)	1/500	ha	10	70 % of planimetric survey
33	Planimetric survey (off shore)	1/500	ha	4	30 % of planimetric survey
34	Profile survey (on shore)	1/500	km	0.5	70 % of profile survey
35	Profile survey (off shore)	1/500	km	0.2	30 % of profile survey
36	River profile survey	1/1,000; 1/100	km	0.3	
37	River cross-section survey	1/200	km	0.2	
4	Drainage Culvert				
41	Profile survey	1/200	km	3	
42	Cross-section survey	1/200	km	0.4	
C	ROW survey		ha	1,013	Provisional sum

Table C.6 Estimated Quantities of the Hydrological Survey

No.	Item	Unit	Quantity	Remark
A	Flood Record Survey			
1	Expressway			
11	Thruway	point	393	3 points/location*131 locations
12	Viaduct and river bridge	point	222	3 points/location*74 locations
13	Drainage culvert	point	633	3 points/location*211 locations
2	Linking Road			
21	Road	point	24	3 points/location*8 locations
22	Viaduct and river bridge	point	9	3 points/location*3 locations
23	Drainage culvert	point	129	3 points/location*43 locations
B	Water level and Velocity (Large Rivers)			
1	Thu Bong River			
11	Water level	section	6	3 sections/location*2 locations
12	Velocity	section	6	3 sections/location*2 locations
2	Ba Ren River			
21	Water level	section	6	3 sections/location*2 locations
22	Velocity	section	6	3 sections/location*2 locations
3	Tam Ky River			
31	Water level	section	6	3 sections/location*2 locations
32	Velocity	section	6	3 sections/location*2 locations
4	Tra Bong River			
41	Water level	section	6	3 sections/location*2 locations
42	Velocity	section	6	3 sections/location*2 locations
5	Tra Khuc River			
51	Water level	section	6	3 sections/location*2 locations
52	Velocity	section	6	3 sections/location*2 locations

Table C.7 Estimated Quantities of the Engineering Geological Survey (1/2)

No.	Item	Unit	Quantity	Remark
A	Expressway			
1	Normal Embankment			
11	Mechanical boring	l.m.	35	5 nos., soil class: I-III (100%)
12	Sampling	nos.	18	2 m pitch
13	Undisturbed sample test	nos.	5	25 % of sampling
14	Disturbed sample test	nos.	5	25 % of sampling
2	Deep Excavation Section			
21	Mechanical boring	l.m	710	20 nos., soil class: I-III (50%), IV-VI (50 %)
22	Sampling	nos.	355	2 m pitch
23	Disturbed sampling test	nos.	89	25 % of sampling
3	Softground Section			
31	Mechanical boring	l.m	805	45 nos., soil class: I-III (100 %)
32	Standard Penetration test (SPT)	point	403	2 m pitch
33	Sampling	nos.	403	2 m pitch
34	Vane shear test (VST)	nos.	386	8 to 10 nos./cross section
35	Undisturbed sampling test	nos.	141	35 % of sampling
36	Disturbed sampling test	nos.	60	15 % of sampling
37	Consolidation test (Cv)	nos.	103	2 to 3 nos./bore hole
38	Triaxial compression test (UU)	nos.	45	1 to 2 nos./bore hole
39	Triaxial compression test (CU)	nos.	58	1 nos./bore hole
4	Viaduct and River Bridge			
41a	Mechanical boring (on shore)	l.m	7,376	285 nos., soil class: I-III (50%), IV-VI (50 %)
41b	Mechanical boring (off shore)	l.m	1,240	51 nos., soil class: I-III (70%), IV-VI (30 %)
42	Standard Penetration test (SPT)	point	4,308	2 m pitch
43	Sampling	nos.	4,308	2 m pitch
44	Vane shear test (VST)	nos.	60	Softground section
45	Undisturbed sampling test	nos.	1,077	25 % of sampling
46	Disturbed sampling test	nos.	1,077	25 % of sampling
47	Unconfined compression test	nos.	672	2 nos./bore hole
48	Consolidation test (Cv)	nos.	12	Softground section
49	Triaxial compression test (UU)	nos.	6	Softground section
50	Triaxial compression test (CU)	nos.	6	Softground section
5	Overpass			
51	Mechanical boring	l.m	1,000	50 nos., soil class: I-III (50%), IV-VI (50 %)
52	Standard Penetration test (SPT)	point	500	2 m pitch
53	Sampling	nos.	500	2 m pitch
54	Undisturbed sampling test	nos.	125	25 % of sampling
55	Disturbed sampling test	nos.	125	25 % of sampling
56	Unconfined compression test	nos.	100	2 nos./bore hole

Table C.7 Estimated Quantities of the Engineering Geological Survey (2/2)

No.	Item	Unit	Quantity	Remark
6	IC Rampway Bridge			
61	Mechanical boring	l.m	1,361	56 nos., soil class: I-III (50%), IV-VI (50 %)
62	Standard Penetration test (SPT)	point	681	2 m pitch
63	Sampling	nos.	681	2 m pitch
64	Undisturbed sampling test	nos.	170	25 % of sampling
65	Disturbed sampling test	nos.	170	25 % of sampling
66	Unconfined compression test	nos.	112	2 nos./bore hole
7	Flyover			
71	Mechanical boring	l.m	1,831	77 nos., soil class: I-III (50%), IV-VI (50 %)
72	Standard Penetration test (SPT)	point	916	2 m pitch
73	Sampling	nos.	916	2 m pitch
74	Undisturbed sampling test	nos.	229	25 % of sampling
75	Disturbed sampling test	nos.	229	25 % of sampling
76	Unconfined compression test	nos.	154	2 nos./bore hole
8	Tunnel			
81a	Mechanical boring (vertical)	l.m	200	4 nos., soil class: I-III (50%), IV-VI (50 %)
81b	Mechanical boring (horizontal)	l.m	200	2 nos., soil class: I-III (50%), IV-VI (50 %)
82	Standard Penetration test (SPT)	point	100	2 m pitch (vertical boring)
83	Sampling	nos.	200	2 m pitch
84	Disturbed sampling test	nos.	50	25 % of sampling
85	Unconfined compression test	nos.	16	4 nos./bore hole (vertical boring)
86	Seismic measurement	l.m.	1,264	632 m/tunnel*2 tunnels
9	Drainage Culvert			
91	Mechanical boring	l.m	831	65 nos., soil class: I-III (100%)
92	Standard Penetration test (SPT)	point	353	2 m pitch (box culvert)
93	Sampling	nos.	416	2 m pitch
94	Vane shear test (VST)	nos.	24	Softground section
95	Undisturbed sampling test	nos.	104	25 % of sampling
96	Disturbed sampling test	nos.	104	25 % of sampling
97	Unconfined compression test	nos.	94	2 nos./bore hole (box culvert)
98	Consolidation test (Cv)	nos.	6	Softground section
99	Triaxial compression test (UU)	nos.	3	Softground section
100	Triaxial compression test (CU)	nos.	3	Softground section
10	Underpass			
101	Mechanical boring	l.m	2,020	101 nos., soil class: I-III (100%)
102	Standard Penetration test (SPT)	point	1,010	2 m pitch
103	Sampling	nos.	1,010	2 m pitch
104	Vane shear test (VST)	nos.	40	Softground section
105	Undisturbed sampling test	nos.	253	25 % of sampling
106	Disturbed sampling test	nos.	253	25 % of sampling
107	Unconfined compression test	nos.	202	2 nos./bore hole
108	Consolidation test (Cv)	nos.	12	Softground section
109	Triaxial compression test (UU)	nos.	4	Softground section
110	Triaxial compression test (CU)	nos.	8	Softground section
11	O&M Building			
111	Mechanical boring	l.m	485	31 nos., soil class: I-III (100%)
112	Standard Penetration test (SPT)	point	243	2 m pitch
113	Sampling	nos.	243	2 m pitch
114	Undisturbed sampling test	nos.	61	25 % of sampling
115	Disturbed sampling test	nos.	61	25 % of sampling
B	Linking Road			
1	Drainage Culvert			
11	Mechanical boring	l.m	337	23 nos., soil class: I-III (100%)
12	Standard Penetration test (SPT)	point	165	2 m pitch (box culvert)
13	Sampling	nos.	169	2 m pitch
14	Undisturbed sampling test	nos.	42	25 % of sampling
15	Disturbed sampling test	nos.	42	25 % of sampling
16	Unconfined compression test	nos.	44	2 nos./bore hole (box culvert)
2	Viaduct and River Bridge			
21	Mechanical boring (on shore)	l.m	150	6 nos., soil class: I-III (50%), IV-VI (50 %)
22	Standard Penetration test (SPT)	point	75	2 m pitch
23	Sampling	nos.	75	2 m pitch
24	Undisturbed sampling test	nos.	19	25 % of sampling
25	Disturbed sampling test	nos.	19	25 % of sampling
26	Unconfined compression test	nos.	12	2 nos./bore hole

(4) Reports and Documents

Our comments and suggestions for the reports and documents are summarized in Table C.8.

Table C.8 Comments and Suggestions on TOR (Reports and Documents)

No.	Comments	Suggestions
1	Reports and Documents (TOR 4)	
	<p>TOR 4 mentions the required reports and documents with submission time.</p> <p>However, there are more reports and documents which are required to complete the Services.</p> <p>In addition, we propose the Project I/P with the GOVN packages and the submission time of the reports and documents for the GOVN packages is not matched with TOR and the WB/JICA packages.</p>	<ol style="list-style-type: none"> 1) We propose to add the Services completion report as required reports and documents. 2) In addition to the required reports and documents, we propose to prepare the several technical reports for discussion whenever appropriate. 3) Regarding the GOVN packages, we submit some of the reports and documents separately from the WB/JICA packages 4) We translate all of reports, documents and technical reports to Vietnamese for speedy processing of reviewing/approving by the relevant organizations. 5) Our proposed reports, documents and technical reports are listed in Table H.1.

(5) Consultant Personnel

Our comments and suggestions for the Consultant personnel are summarized in Table C.9.

Table C.9 Comments and Suggestions on TOR (Consultant Personnel)

No.	Comments	Suggestions
1	Key International Professional Staff (TOR 5.1)	
	<p>TOR 5.1 mentions the required positions of the key international professional staff with 23 positions and total in 247 man-months (M/M).</p> <p>In line with our Proposal, some positions are necessary to addition and rearrangement from TOR.</p>	<ol style="list-style-type: none"> 1) We propose 38 key international professional staff in total 239 M/M as shown in Table G.1 2) Our proposed alteration for the positions in TOR is shown in Table C.10.
2	Key Local Professional Staff (TOR 5.2)	
	<p>TOR 5.2 mentions the required positions of the key local professional staff with 22 positions and total in 600 man-months.</p> <p>In line with our Proposal, some positions are necessary to addition and rearrangement from TOR.</p>	<ol style="list-style-type: none"> 1) We outsource the detailed engineering design of all bridges/interchanges to Vietnamese sub-consultants to minimize the personnel inputs and shorten the design period. 2) We propose 57 key local professional staff in total 357 M/M as shown in Table G.2. 3) Our proposed alteration for the positions in TOR is shown in Table C.11.
3	Local Supporting Staff (TOR 5.2)	
	<p>TOR 5.2 mentions only the max. M/M total in 266 M/M for the local supporting staff.</p>	<ol style="list-style-type: none"> 1) We propose 21 supporting staff in total 250 M/M as shown in Table G.3.

Table C.10 Proposed Alteration for the Positions in TOR (Key International Professional Staff)

TOR 5.1		Our Proposals	
No.	Position	No.	Position
13	Social, Environmental & Resettlement Specialist	I36	Social and Environmental Specialist
		I37	Resettlement Specialist
23	Other Positions	I16	Drainage Engineer
		I17	River Engineer
		I22	Geological Engineer (Tunnel)
		I24	Inundation Analyst
		I27	Traffic Management Specialist
		I28	Asset Management Specialist
		I29	Architect
		I34	Construction Planner/Cost Estimator

Table C.11 Proposed Alteration for the Positions in TOR (Key Local Professional Staff)

TOR 5.1		Our Proposals	
No.	Position	No.	Position
17	Communications & ITS Specialist	L42	ITS Specialist
		L43	Communication System Engineer
22	Other Positions	L4	Road Safety Audit Specialist
		L15	Interchange Specialist
		L17	Tunnel Engineer
		L19	Soft Ground Treatment Specialist
		L20	Drainage Engineer 1
		L21	Drainage Engineer 2
		L22	River Engineer
		L31	Geological Engineer (Tunnel)
		L34	Inundation Analyst
		L38	Traffic Management Specialist
		L39	Asset Management Specialist
		L46	Toll Collection System Specialist

C.3 Comments and Suggestions on Data, Services, and Facilities to be Provided by the Client

The undertakings of PMU85-MOT and the obligation of the Consultant is described in TOR 6 and 7. In consideration of examination of TOR, we propose some specific provisions which are necessary to execution of the Services below and to be confirmed during the contract negotiation.

(1) Undertakings of PMU85-MOT

PMU85 has much experience, and we were/are working together with PMU85-MOT as project executing agency. Although, this Project requires many coordination and discussions because large scale, multiple funding, crossing several municipalities and crossing high-voltage lines, we believe PMU85-MOT can complete the design smoothly and successfully with close communication with the Consultant.

(2) Obligations of the Consultant

The obligations of the Consultant are described in TOR 7. We have been prepared this Project from 2007 and acquainted every detail of the works. Mobilizing our best knowledge and efforts; we are sure to complete the Services timely in quality.

(3) Equipment and Facilities Required

In accordance with TOR 7, we responsible for equipment and software required for carrying out the Services. In consideration of examination of TOR, we propose some specific provisions which are necessary to execution of the Services below and to be confirmed during the contract negotiation.

(a) Office Space, Equipment and Furniture

The office space, and numbers of the equipment and facilities, we estimate the demand at the time of the maximum number of the assigned staff in the office.

(i) Office Space

We propose to set up 2 offices “Danang main office” and “Hanoi branch office” as explained in D.3.1(5). Based on the proposed work program in Figure D.12, the period and space required for each office is estimated as shown in Table C.12.

Table C.12 Required Office Space

No.	Office	Period	Max. nos. of staff	Office space	Remarks
1	Danang main office	14 months	79 (77 ¹⁾)	400 m ²	77 staff*4m ² /staff + meeting room, etc.
2	Hanoi branch office	8 months	7	100 m ²	7 staff*4m ² /staff+meeting room, etc.

Note 1): except guards

(ii) Office Equipment and Furniture

The required office equipment and furniture for the Services are shown in Table C.13.

Table C.13 Required Office Equipment and Furniture

No.	Category	Item	Description	Unit	Quantity		Purchase/ Lease	Remarks
					Danang	Hanoi		
1	Furniture	Working desk	with chair and lamp	set	77		Purchase	All staff except guards
2		Bookshelf		nos.	20		Purchase	
3		Meeting table	with chair	set	1		Purchase	1 set/office
4		White board		nos.	1		Purchase	1 nos./office
5		Sofa set		set	1		Purchase	1 set/office
6		Air conditioner		L.S.	1		Purchase	
7		Curtain/blind		L.S.	1		Purchase	
8	Electronic Office Equipment	Desktop PC	with MS office	nos.	17	2	Purchase	All supporting staff except guards
9		Printer	Plotter, A0	nos.	1		Purchase	1 nos./main office
10			Color laser, A3	nos.	1		Purchase	1 nos./office
11			Monochrome, A4	nos.	2		Purchase	2 nos./office
12		Photocopy machine	Monochrome, A3	nos.	1		Purchase	1 nos./office
13		TV/video deck		set	1		Purchase	1 nos./office
14		Video camera		nos.	1		Purchase	1 nos./office
15		Digital camera		nos.	7		Purchase	1 nos./team
16		Projector	with screen	nos.	1		Purchase	1 nos./office
17		Scanner	A3	nos.	1		Purchase	1 nos./office
18		Others	UPS, transformer, etc.	L.S.	1		Purchase	
19	Communication Equipment	Telephone		nos.	2		Purchase	1 nos./office
20		Fax machine	A4	nos.	1		Purchase	1 nos./office
21		Others	LAN, internet, etc.	L.S.	1		Purchase	
22	Stationary	Binding machine		nos.	1		Purchase	1 nos./office
23		Consumables		L.S.	1		Purchase	
24	Other Equipment	Aqua Dispenser		nos.	1		Purchase	1 nos./office
25		Refrigerator		nos.	1		Purchase	1 nos./office

Note: Furniture and equipment in Hanoi branch office is fully furnished except PCs.

(b) Vehicles

The required vehicles for the Services are shown in Table C.14.

We procure all vehicles on lease basis and provide to the staff who are not locals.

Table C.14 Required Vehicles

No.	Item	Description	Unit	Quantity		Purchase/ Lease	Remarks
				Danang	Hanoi		
1	Sedan	Sedan	vehicle-months	14		Lease	1 vehicle*14 months
2	Multi Pleasure Vehicle	Innova	vehicle-months		8	Lease	1 vehicle*8 months
3	Microbus	Hiace (15 sheets)	vehicle-months	37		Lease	2 vehicles*12 months, 1 vehicle* 13 months

(c) Technical Software

The required technical software for the Services is shown in Table C.15.

Other technical software not listed below is provided ourselves.

Table C.15 Required Technical Software

No.	Item	Description	Unit	Quantity		Purchase/ Lease	Remarks
				Danang	Hanoi		
1	MIKE-11		nos.	1		Purchase	Inundation analysis

(d) Survey Equipment

We outsource all of survey works to the Vietnamese sub-consultants and the required equipment shall be provided themselves.

D.1 Technical Approach and Methodology

In this section, we describe our understanding of the features of the Project, the objectives and scope of the assignment, the approach being addressed and their importance, and outline the methodology for the proposed detail tasks.

D.1.1 Project Features

In this subsection, we describe the features of the Project which are necessary to prepare this Technical Proposal for the detailed engineering design required in RFP.

(1) Background

The preparation of the 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 the F/S was approved by MOT in Decision No. 134/QD-BGTVT dated January 14, 2004. The F/S report was also prepared by PMU85 and submitted to MOT in his letter No. 514/BQL-KHDA2 dated May 11, 2005. However, this BOT scheme Project did not materialize because of funding sources were not identified at that time.

Two (2) years later, the Project was approved as one 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 in April 28, 2008.

In parallel with the JETRO study, WB declared GOVN to be eligible for the IBRD loan in November, 2007 and the Project was identified as the top priority use for the loan. After submission of the JETRO study report, WB undertook the identification missions in April and June, 2008 and confirmed necessity of updating the JETRO study to meet his requirements and decided to allocate the fund from ongoing 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/BQI-KHDA2 dated June 13, 2009.

In response to the supplemental study, WB has engaged an international consultant and undertaken the WB appraisal study. In the appraisal study, WB modified the alignment at 3 sections by taking into consideration environmental and social issues. Based on the modified alignment, TEDI updated the WB supplemental study and submitted as the draft final F/S report to MOT in March, 2010. This report is being updated for the approval by the Prime Minister.

Following the maturity of the Project, WB agreed to allocate the fund from RNIP for the detailed engineering design (D/D) of the Project and the Prime Minister allowed commencing the procurement of the consultant ahead of the F/S approval. Through the procedure for the expressions of interest, PMU85 issued RFP to the short-listed firms on February 12, 2010 and has requested them to submit the Proposals on June 1, 2010.

(2) Location

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

The Project location map is shown in the beginning of this Technical Proposal.

(3) Objectives

The main purpose of the Project is contributing to the socio-economic growth in the central region through improving the transport linkages by construction of the Project road. The performance indicators, targets and monitoring mechanisms have designed in the WB appraisal study (see D.1.1(1)) to measure the socio-economic impacts of the Project during the operation phase.

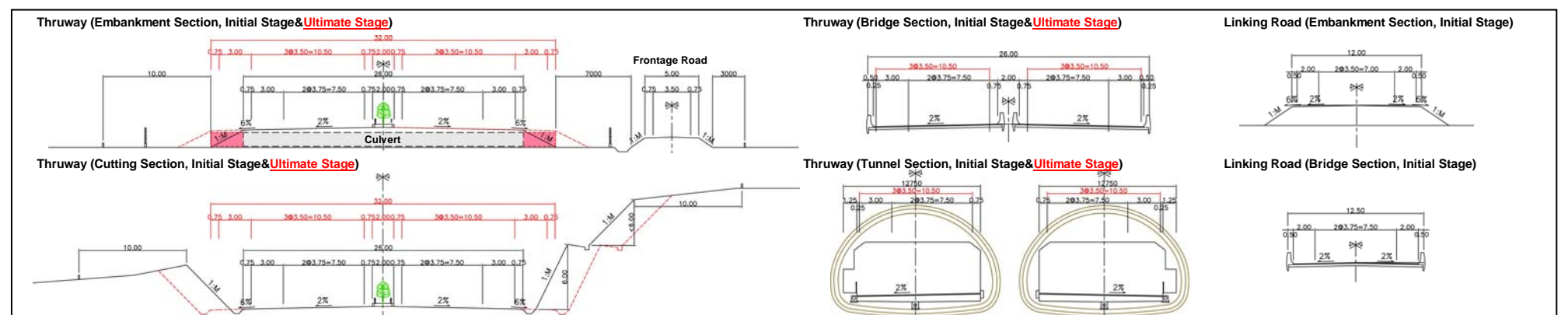
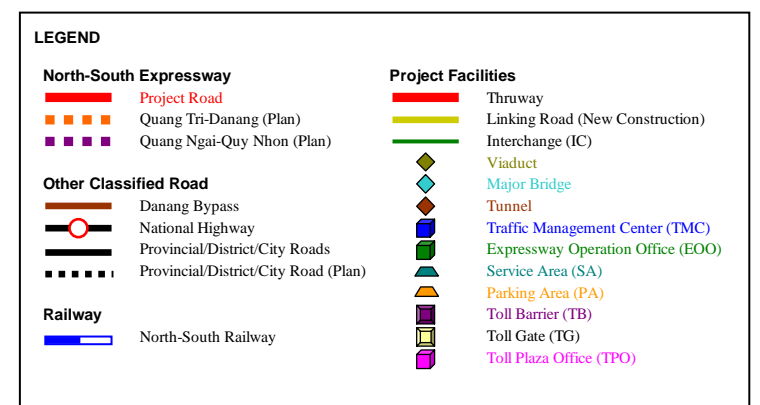
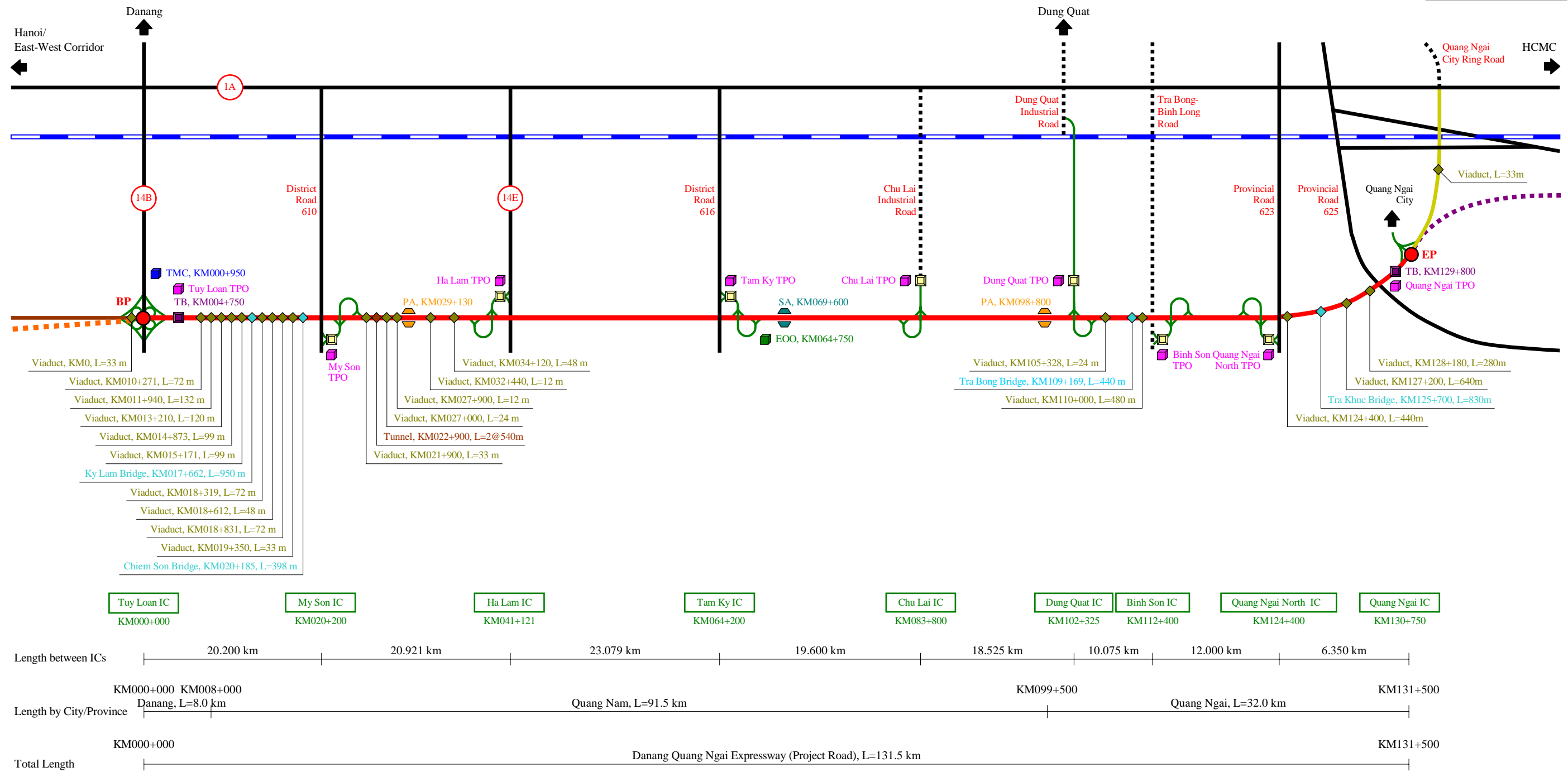


Figure D.1 Project Facilities Plan

(5) Safeguards

(a) Environmental Assessment

The original EIA based on the JETRO study was prepared by PMU85 and approved by MONRE in Decision No. 2378/QD-BTNMT dated November 12, 2008. The supplemental EIA based on the F/S alignment is under preparation by PMU85.

(b) Land Acquisition and Resettlement

The RAP based on the F/S alignment is under preparation by PMU85.

The land acquisition area and nos. of resettlement households in the draft RAP is shown in Table D.2

Table D.2 Land Acquisition Area and Nos. of Resettlement Households (Draft RAP)

No.	Item	Unit	Danang	Quang Nam	Quang Ngai	Total
1	Land Acquisition Area	sq.m	564,520 (6%)	6,695,975 (66%)	2,870,615 (28%)	10,131,110 (100%)
2	Resettlement Households	nos.	29 (4%)	559 (66%)	254 (30%)	842 (100%)

(6) Project Cost

The estimated total Project cost amounts to 29,204 Bil.VND (1,537 Mil.USD) in the F/S.

The summary of the estimated Project cost is shown in Table D.3.

Table D.3 Summary of the Estimated Project Cost

No.	Item	Cost (Bil.VND)	Equiv. in USD ¹⁾ (Mil.USD)
1	Construction Works and O&M Equipment Provision	20,693	1,089
	Civil Works	19,163	1,009
	Elec./ITS and O&M Build. Works, and O&M Equip. Provision	1,530	80
2	Other Expenses (Project Management, Consulting Services and Others)	2,483	131
3	Land Acquisition and Compensation Cost	1,160	61
4	Contingency	4,868	256
Total Project Cost		29,204	1,537

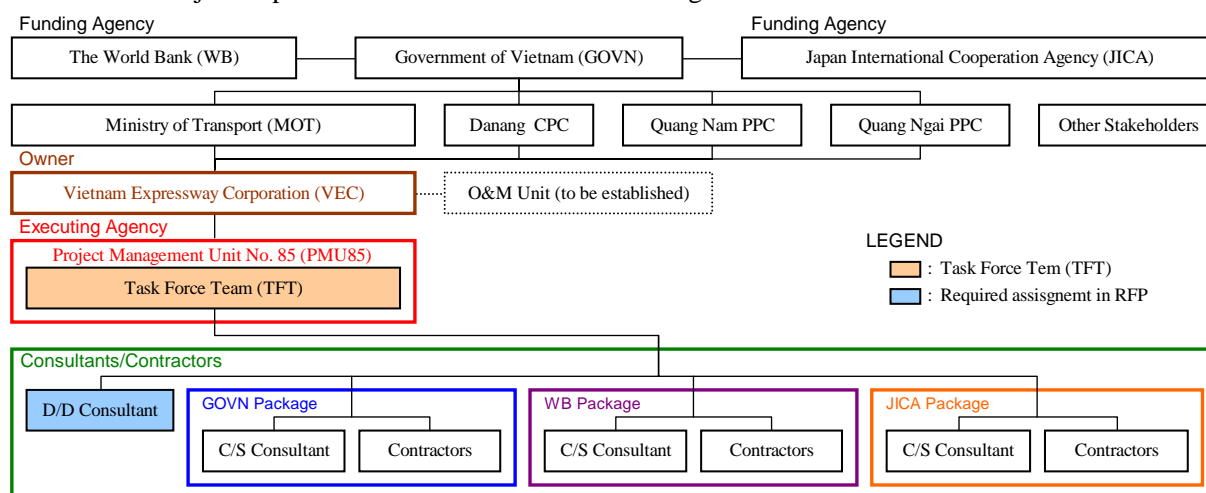
Note 1): 1USD = 19,000VND (exchange rate applied in the F/S)

(7) Project Implementation Structure

Decree No. 131/2006/ND-CP dated November 9, 2006 requires that a Project owner receiving ODA fund shall be a permanent organization who is responsible for operation and maintenance of infrastructure built by ODA funding. In this regard, VEC has been designated as the Project Owner by MOT in Decision No. 220/QD-BGTVT dated January 22, 2010.

On the other hand, PMU85 proceeded the Project preparation and well acquired the characteristics of the Project. Therefore, VEC has appointed PMU85 as the Project Executing Agency in the implementation stage and signed principle contract on January 31, 2010. PMU85 has organized the Task Force Team to manage the Project in his letter No. 889/QD0BQL dated July 23, 2008.

The Project implementation structure is shown in Figure D.3.



Note: GOVN packages are proposed in this Technical Proposal (see D.1.3(1)(a))

Figure D.3 Project Implementation Structure

D.1.2 Objectives and Scope of the Services

This Technical Proposal is for the Services which are required in RFP. In this subsection, we describe our understanding of the objectives and scope of the Services.

(1) Objectives

We understand that the objectives of the Services are to ensure the preparation of the D/D and assist VEC/PMU85 in tendering procedures with the most efficient and timely manner to deliver the required outputs in accordance with the Project implementation program (I/P).

Furthermore, appropriate technology transfers for VEC/PMU85 and key local professional staff are also required as a specific component in the Services to ensure smooth execution of the Project and sustainable development of the expressway network in Vietnam.

(2) Scope of the Services

The required scope of the Services is clearly instructed in Section 5 TOR. In consideration of our examination of TOR, we propose the scope of the Services below.

(a) Mode of the Services

We understand that the Services are carried out by the 2 modes as shown in Table D.4.

Table D.4 Mode of the Services

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

(b) Task Series

We thoroughly examined the documents related to the required scope of the Services as follows:

- Original RFP issued on February 12, 2010;
- Minutes of Pre-proposal Conference issued on February 26, 2010;
- Clarifications on RFP issued on March 22, 2010;
- Revised RFP issued on April 9, 2010;
- Clarifications on RFP issued on April 22, 2010;
- Clarifications on RFP issued on April 29, 2010.

Those are comprehensive and form by the sufficient scope to deliver the required outputs in the Services. Therefore, our proposed task series are covered all of requirements in RFP. We propose some revision and addition for improving TOR and those are explained in C.2.

The proposed task series in the Services are shown in Table D.5.

Table D.5 Proposed Task Series in the Services

No.	Task Series	Mode	Ref. in TOR
1	Project Management	Primary	Proposed
2	Previous Studies Review and Establishing Detailed Engineering Design Framework	Primary	3.2
3	Detailed Engineering Design and Procurement Planning	Primary	3.3, 3.5
4	Procurement Assistance	Assistance	3.4
5	Technology Transfer	Assistance	3.6

D.1.3 Approach to the Services

We carried out the JETRO study in 2007 and the WB supplemental study in 2008-2009 (see D.1.1(1)), and continuously paid attention to the subsequent arrangements among WB, JICA and GOVN. Therefore, we are well acquainted the characteristics of the Project. In this subsection, we explain our approaches being addressed in the Services.

(1) Project Management Approach**(a) Contract Packaging/Project Implementation Program: Propose Practical Packaging and I/P**

We are requested to propose the contract packaging and Project I/P according to TOR 3.3.1.

The proposed conditions for the contract packaging and Project I/P, the proposed contract packaging, the proposed Project I/P are shown in Tables D.6-D.7, and Figure D.4 respectively.

Table D.6 Proposed Conditions for the Contract Packaging and Project I/P

No.	Item	Proposed Conditions
1	Requirements (TOR 3.3.1)	The requirements for the contract packaging and Project I/P in TOR 3.3.1 are as follows: 1) Single City/Province: Arrange individual packages confined to a single city/province 2) Single Financier: Arrange individual packages to be financed by only a single financier 3) Value of Package: Arrange value of a package from 70 to 100 Mil.USD 4) Commencement of Construction: Commence construction works within 2010
2	Demarcation (WB/JICA)	We propose the demarcation between WB and JICA in accordance with their intentions in the past meetings as follows: <ul style="list-style-type: none"> ➤ Financing Amounts: Arrange financing amounts by WB and JICA in equivalent ➤ Demarcation (Civil) : Allocate northern section to JICA and southern section to WB ➤ Demarcation (Others): Allocate the works and provisions other than civil works to JICA
3	GOVN Packages	The construction works can not commence within 2010 in the WB/JICA packages by their L/A schedule (see Figure D.4). We propose to arrange the GOVN packages as follows: <ul style="list-style-type: none"> ➤ GOVN Packages: Arrange one (1) GOVN package in each city/province ➤ Value of Package : Arrange value of a GOVN package less than 150 Bil.VND (see No. 4)) ➤ Location: Arrange non-flood areas for the GOVN packages to shorten the design period
4	Project I/P	We propose the measures for commencing the construction works within 2010 as follows: <ul style="list-style-type: none"> ➤ D/D: Complete the D/D for the GOVN packages within 3 months ➤ Procurement: Apply single source selection (SSS) method for the GOVN packages SSS method is allowed with GOVN approval by Decree No. 85/2009/ND-CP dated October 15, 2009 in case of contract amount is less than 150 Bil.VND (8 Mil.USD) for the contractors. As for the WB/JICA packages , we propose the schedule as follows: <ul style="list-style-type: none"> ➤ D/D and Procurement: Follow the required D/D schedule in RFP ➤ Construction Periods: Follow the periods studied in the WB supplemental study and expecting the expressway open to the public in March 2015

(b) The Services Schedule: Arrange to realize early commencement of GOVN packages

The period to the commencement of construction works in the GOVN packages is less than 4 months. In the contract negotiation, we propose and negotiate the early commencement of the Services in the GOVN packages one (1) month in advance from the official commencement date for ensuring the commencement of the construction works in the GOVN packages within 2010.

(c) Procurement Schedule: Provide flexible time management for procurement process

We propose the Project I/P which satisfies the required time schedule in RFP (see D.1.3(1)(a)). However, the standard procurement period in the WB packages is 18 months (JICA: 11 months), and the procurement process is allowed to commence after the loan effective day (JICA: pledged day of the loan) in accordance with their procurement guidelines. However, the period of the Services is only 14 months, and the procurement period can not be secured in consideration of the L/A schedule (see Figure D.4). For meeting their L/A schedules, we provide the procurement assistance flexibly in the Services.

(d) Project Management: Utilize state-of-arts project management technique

The Services are large-scale and extend to the various technical fields and organizations. For ensuring the smooth execution of the Services, we establish and control the practical project management system by utilizing PMBOK. In consideration of the large-scale and complex assignment of the Services, we prioritize and address to the communications, quality and schedule managements.

Table D.7 Proposed Contract Packaging

Category	Contract Packaging				Construction Cost (Mil.USD)		
	Jurisdiction	No.	Station	Section Length	GOVN	WB	JICA
Civil Works	Danang	01	KM000+000 - KM007+000	7.0km			77
		02	KM007+000 - KM008+000	1.0km	4		
	Quang Nam	03	KM008+000 - KM017+000	9.0km			70
		04	KM017+000 - KM021+000	4.0km			80
		05	KM021+000 - KM030+000	9.0km			80
		06	KM030+000 - KM042+000	12.0km			75
		07	KM042+000 - KM055+000	13.0km			75
		08	KM055+000 - KM066+300	11.3km		70	
		09	KM066+300 - KM067+300	1.0km		4	
		10	KM067+300 - KM083+000	15.7km			90
		11	KM083+000 - KM099+500	16.5km			85
	Quang Ngai	12	KM099+500 - KM109+500	10.0km			75
		13	KM109+500 - KM119+500	10.0km			70
		14	KM119+500 - KM120+500	1.0km		4	
		15	KM120+500 - KM126+500	6.0km			80
		16	KM126+500 - KM131+500	5.0km			70
Elec. and ITS/O&M Build. Works	All	17	KM000+000 - KM131+500	131.5km			70
O&M Equipment Provision	All	18	KM000+000 - KM131+500	131.5km			10
Total			KM000+000 - KM131+500	131.5km	12	540	537
							1,089

Note: The features of the structure, facility and equipment in each package are shown in "Task 3.1.1 Propose contract packaging"

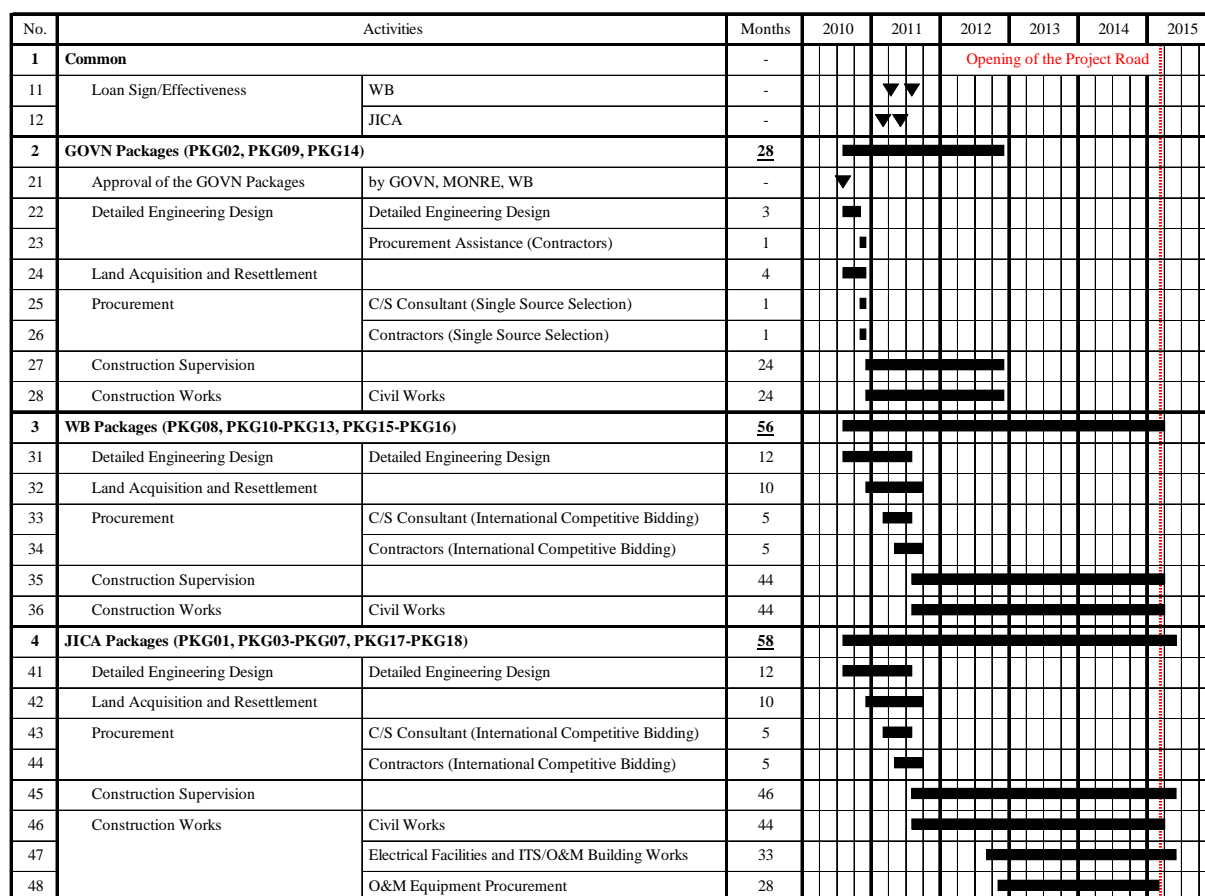


Figure D.4 Proposed Project I/P

(2) Technical Approach**(a) Topographic Survey: Shorten topographic survey period**

The volume of the topographic survey work is huge and its work progress is critical in the Service. For ensuring the Services on the schedule, we outsource the topographic survey work to the Vietnamese sub-consultants who have abundant experiences and resources to shorten the survey period. In addition, from 4th month in the Services is rainy season; therefore, we prioritize the survey items and complete all of items for the GOVN packages and the basic design for the WB/JICA packages before the rainy season.

(b) Viaduct: Optimize viaduct plan on inundation plains

The Project road is on inundation plains and 21 viaducts are planned in the F/S; however, quantitative analyses were not carried out. We conduct inundation and cost-benefit analyses to optimize the viaduct construction by utilizing the manual for economic analysis of flood control project published MLIT, Japan which provides the damage rate of crops by inundation depths and days.

(c) Civil Engineering Design: Organize productive civil engineering design system

The number of civil structures is large, particularly, the bridges amount to 130. Therefore, we divide the civil engineering design into the basic design and detailed engineering design stages to proceed the design works efficiently. In the basic design, we establish the basic conditions including the standard designs. In the detailed engineering design, we prepare the design in accordance with the basic design, and outsource all of bridges and interchanges design to the Vietnamese sub-consultants who have abundant experiences and resources for minimize the personnel inputs and shorten the design period.

(d) High-voltage Line: Study relocation plan of 500 kV lines

The Project road is across the 500 kV lines at 6 locations. Therefore, we study the relocation plan in cooperation with PTC2 who has managed the power supply system in the Project area. We already confirmed with him in the past studies that 2 routes of the 500 kV lines are existed in the Project area and it is possible to relocate/raise the lines without cutting off the transmission and damaging to users.

(e) O&M Framework: Propose O&M framework for the Project road

WB schedules to provide the advisory services for establishing the legal/regulatory frameworks for the development of the expressway network in Vietnam. We follow the advisory services and update the O&M framework (see D.1.1(4)(c)) to ensure the unification in the network.

(f) O&M Plan and Design: Utilize O&M experiences in Japan

MOT prepared the provisional expressway O&M standards for HCMC-Trung Luong section which is a part of the North-South Expressway. We utilize these standards to prepare the O&M plan and design. However, the standards are still provisional, and need to establish or customize the requirements which are not specified or not satisfied the level of services. In this regards, we assign an international professional staff from NEXCO who is an expressway operator in Japan to utilize their practices.

(g) ITS: Prepare expandable ITS plan and design

GOVN has proceeded to develop the expressway network nationwide with support from several donors and been introduced different type of ITS by projects without securing connectivity to the whole network. In response to the request by GOVN, JICA has undertaken the technical assistance to establish the ITS standard design and specifications. For ensuring the connectivity and compatibility to the future expansion, we prepare the ITS plan and design in accordance with the standards above.

(h) Land Acquisition and Resettlement: Assist in preparing and enforcing CPCR

CARB in each DPC prepares and enforces the CPCR and PMU85 monitors their activities. These activities are required to satisfy not only the Vietnamese law and regulations but also the WB/JICA safeguards policy; however, the Project is the first WB financing project for PMU85. For ensuring the smooth completion of the activities, we assign a Vietnamese international professional staff who has abundant experiences in the WB/JICA financing projects and well acquired the Project area.

(i) Project Cost Estimate: Study proper hauling distance

The Project road is long and the hauling cost holds the large portion of the construction cost. Therefore, we carefully study the procurement of all materials, equipment and construction machines, and estimate the proper hauling distances to minimize the construction cost.

(j) Technology Transfer: Provide sufficient training program

The Project is the first expressway development project for PMU85 and the components include peculiar technologies of expressway. In addition, this is the first IBRD financing project in Vietnam. For ensuring the smooth execution of the Project and sustainable development of the expressway network, we provide sufficient training program to VEC/PMU85.

D.1.4 Methodology

In this subsection, we propose the detail tasks and outline those methodologies.

(1) Proposed Tasks

We propose the detail tasks those cover all of requirements in TOR. In addition, we propose some revision and addition for improving TOR and those are explained in C.2.

The proposed detail tasks are shown in Table D.8.

Table D.8 Proposed Detailed Tasks

Proposed Detailed Tasks		Ref. in TOR
Task Series 1 Project Management		Proposed Task Series
Task 1.1	Establish and control practical management system	Proposed Task
Task Series 2 Previous Studies Review and Establishing Detailed Engineering Design Framework		3.2
Task 2.1	Review previous studies	3.2(1)
Task 2.2	Establish detailed engineering design framework	3.2(2)
Task Series 3 Detailed Engineering Design and Procurement Planning		3.3
Task Series 3.1 Contract Packaging		3.3.1
Task 3.1.1	Propose contract packaging	3.3.1
Task Series 3.2 Surveys and Investigations		3.3.2
Task 3.2.1	Collect relevant data and documents	3.3.2(1)
Task 3.2.2	Conduct topographic survey	3.3.2(2)(i), 3.5
Task 3.2.3	Conduct hydrological survey and analysis	3.3.2(2)(ii)
Task 3.2.4	Conduct geotechnical and geological investigations	3.3.2(2)(iii)
Task 3.2.5	Conduct material source survey	3.3.2(2)(iv)
Task 3.2.6	Conduct relevant facilities survey	3.3.2(2)(v)
Task 3.2.7	Review traffic forecasting and conduct baseline surveys	3.3.2(2)(vi)
Task 3.2.8	Conduct independent land valuation survey	3.3.2(2)(vii)
Task 3.2.9	Conduct environmental and social surveys	3.3.2(2)(viii)
Task Series 3.3 Civil Engineering Design		3.3.3
Task 3.3.1	Prepare basic design of civil structures	3.3.3
Task 3.3.2	Prepare detailed engineering design of civil structures	3.3.3
Task Series 3.4 O&M Plan and Design		3.3.5
Task 3.4.1	Prepare institutional and administrative arrangement plan	3.3.5
Task 3.4.2	Prepare O&M plan	3.3.5
Task 3.4.3	Prepare basic design of O&M buildings	3.3.5
Task Series 3.5 ITS Plan and Design		3.3.4
Task 3.5.1	Prepare ITS plan	3.3.4(1)
Task 3.5.2	Prepare basic design of ITS facilities	3.3.4(2)
Task Series 3.6 Electrical Facilities Design		Proposed Task Series
Task 3.6.1	Prepare detailed engineering design of electrical facilities	Proposed Task
Task Series 3.7 Public Utilities Relocation Plan		Proposed Task Series
Task 3.7.1	Prepare relocation plan of public utilities	Proposed Task
Task Series 3.8 Safeguards		3.3.6, Annex A, Annex B
Task 3.8.1	Assist in updating EIA and EMP	3.3.6, Annex A
Task 3.8.2	Assist in preparing and enforcing CPCS	3.3.6, Annex B
Task Series 3.9 Construction Planning		3.3.7
Task 3.9.1	Prepare construction plan	3.3.7
Task Series 3.10 Project Cost Estimate		3.3.8
Task 3.10.1	Estimate Project cost	3.3.8
Task Series 3.11 Procurement Documents		3.3.9
Task 3.11.1	Prepare procurement documents	3.3.9
Task Series 3.12 Project Implementation Program		3.3.10
Task 3.12.1	Prepare Project I/P	3.3.10
Task Series 4 Procurement Assistance		3.4
Task 4.1	Assist in tendering procedures	3.4
Task Series 5 Technology Transfer		3.6
Task 5.1	Provide training to VEC/PMU85	3.6
Task 5.2	Provide training to the key local professional staff	Proposed Task

(2) Methodology

We outline the methodologies of the proposed detail tasks below.

Task 1.1 Establish and control practical project management system

We establish the practical project management system by utilizing PMBOK and its construction extension, and customize it to the characteristic of the Services. In consideration of the large-scale and complex Services, we prioritize the communication, quality and schedule managements. We compile the system as a part of the inception report and explain it during the kick-off meeting to not only VEC/PMU85 but also other relevant organizations for publicizing, gaining the consensus and smooth execution of the Services. During the Services, we monitor and control the activities according to the system.

The outline of the project management procedure is shown in Figure D.5, and the contents of the prioritized project management areas are shown in Table D.9.

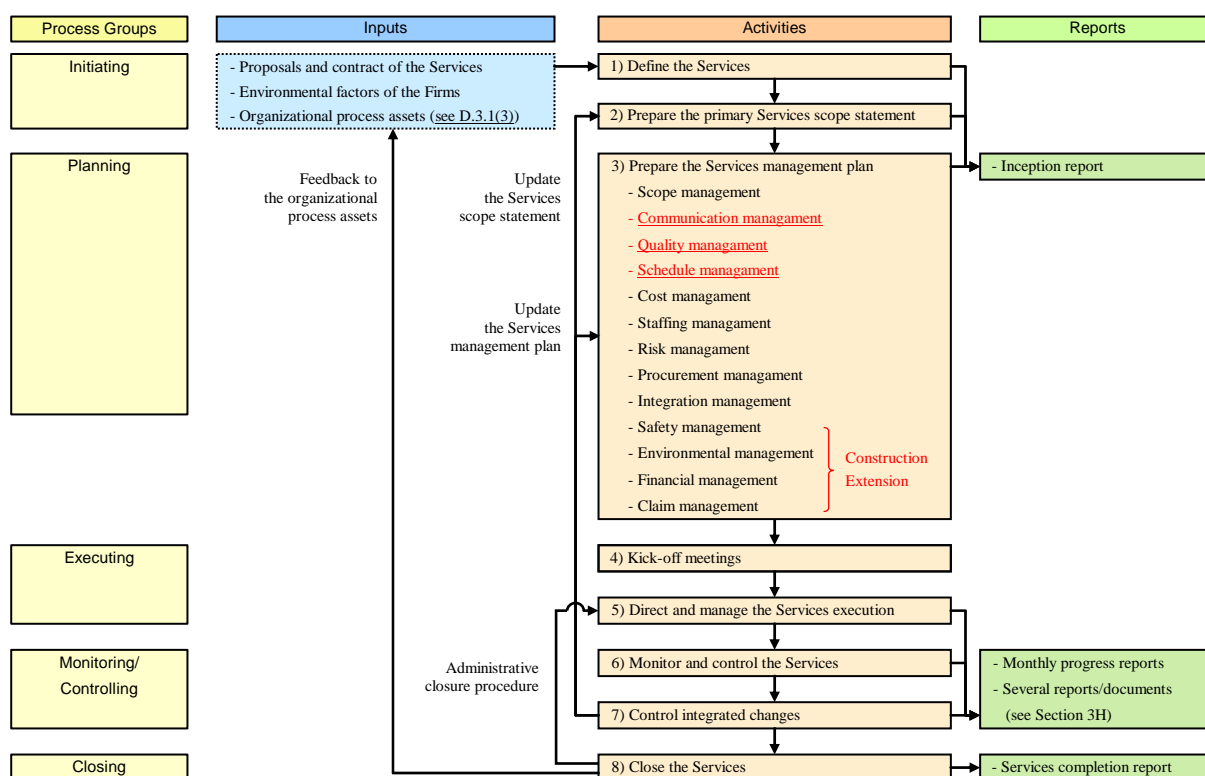


Figure D.5 Outline of the Project Management Procedure

Table D.9 Contents of the Prioritized Project Management Areas

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

Task 2.1 Review previous studies

We review the previous studies especially the F/S and safeguard documents to take cognizance of the current arrangements of the Project, and extract the key issues which materially affect to the Services for discussing and obtaining the agreement with the relevant organizations.

The main subjects of reviewing the previous studies are as follows:

- Topography, geology and hydrology of the Project area;
- Technical standards¹⁾, and design criteria and conditions;
- Route alignment, geometric design and typical cross sections;
- Preliminary design of civil structures;
- Construction plan and preliminary Project cost estimates;
- Environmental impacts and its mitigation measures and RAP;
- O&M and ITS plan and those preliminary facilities design.

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

Task 2.2 Establish detailed engineering design framework

We establish the detailed engineering design framework which consists of the primary matters for execution of the Services based on Task 2.1 and obtain the approval from the relevant organizations.

The main contents of the detailed engineering design framework are as follows:

- Updated applicable technical standards for the Project;
- Format and content of the B/Q items, cost estimate and procurement documents;
- Updated work schedule¹⁾ of the Services.

Note 1): In TOR 3.3, it is instructed to commence the procurement of each contract package immediately after completion of the D/D. The updated work schedule is required to take into account the contract packaging (Task 3.1.1) and Project I/P (Task 3.12.1).

Task 3.1.1 Propose contract packaging

We propose the contract packaging in D.1.3(1)(a) with the GOVN packages for commencing the construction works within 2010. We confirm the possibility of the GOVN packages and the intentions of WB/JICA in the beginning of the Services, and propose the updated contract packaging for obtaining the approval from the relevant organizations.

The proposed contract packaging is shown in Table D.10 in the next page.

Task 3.2.1 Collect relevant data and documents

We collect the relevant data and documents around the Project area as follows:

- Data related to the construction planning and cost estimate proper to the Project area;
- Relevant developing plan and existing facilities data in the Project area;
- Report and design document of the relevant projects.

Through our past studies, the JETRO study and the WB supplemental study, we can complete this task efficiently in short time, and can move to the detailed engineering design without difficulties.

Task 3.2.2 Conduct topographic survey

As required in TOR, we conduct the topographic survey for the engineering design, quantity take-off and CPCSR. In consideration of the huge volumes, we outsource the survey works to the Vietnamese sub-consultants and supervise their work performance by our specialist.

In consideration of the work program (see D.2(2)), the detailed work schedule for the survey was already prepared and prioritized as follows:

- **High priority:** Survey for the control points and the GOVN packages (within 2 months);
- **Priority:** Survey for the basic design of the WB/JICA packages (within 3 months);
- **Non-priority:** Survey for the D/D of the WB/JICA packages (within 6 months).

The summary of our prioritization of the topographic survey works are shown in Table D.11.

Table D.11 Summary of Our Prioritization of the Topographic Survey Works

Priority No.	Survey Item		Class/Scale	GOVN	WB/JICA			Quantity
				Thruway/Linking Road	IC	Building		
1	Control Points	Primary control points	Class IV, VN2000	●	●	---	---	29 nos.
2		Secondary control points	Class II	●	●	●	●	676 nos.
3	Interchange	Planimetric	1/500	---	---	■	---	259 ha
4	Bridge	Planimetric	1/500	---	▲	---	---	716 Ha
5		Profile	1/500	---	▲	■	---	42 km
6		River profile	1/1,000; 1/100	---	▲	---	---	31 km
7		River cross-section	1/200	---	▲	---	---	12 km
8	Tunnel	Planimetric	1/500	---	▲	---	---	1 ha
9	Road/IC Rampway	Profile	1/1,000; 1/100	●	▲	■	---	129 km
10		Cross-section	1/200	●	■	■	---	941 km
11		Planimetric (Road only)	1/1,000	●	■	---	---	1,499 ha
12	Culverts (Drainage)	Profile	1/500	●	■	■	---	24 km
13		Cross-section	1/200	●	■	■	---	2 km
14	Culverts (Underpass)	Profile	1/500	●	■	---	---	43 km
15		Cross-section	1/200	●	■	---	---	32 km
16	O&M Buildings	Planimetric	1/500	---	---	---	■	19 ha
17	ROW	Stake-out		●	■	■	■	1,013 ha

●: High priority (within 2 months) ▲: Priority (within 3 months) ■: Non-priority (within 6 months)

Task 3.2.3 Conduct hydrological survey and analysis

We conduct the hydrological survey and analysis to establish the appropriate drainage system, to determine the design formation height and required opening spaces for the bridges and drainage culverts, to estimate scouring depth at piers and to provide appropriate bank protection where needed.

The main work items for the hydrological survey and analysis are as follows:

- Hydrological survey (outsource to the Vietnamese sub-consultants);
- Site investigation, and collection and analysis of the meteorological and hydrographical data;
- Hydrological analysis (unsteady analysis by HEC-RAS).

The Project road is on inundation plains; therefore, we conduct the inundation analysis to establish the hydrological requirements for the viaducts, drainage culverts and embankments.

The main work items for the inundation analysis are as follows:

- Inundation analysis (software: MIKE-11, geographical map: Aster GDEM);
- Cost-benefit analysis (manual for economic analysis of flood control project, MLIT, Japan).

We can mobilize the most updated technical information from ongoing flood management studies, WB’s Flood Risk Management Plan Study and JICA’s Disaster Protection Study.

The image of Aster GDEM and inundation analysis is shown in Figure D.6.



Aster GDEM



Inundation Analysis (MIKE-11)

Figure D.6 Image of Aster GDEM and Inundation Analysis

Task 3.2.4 Conduct geotechnical and geological investigations

As required in TOR, we conduct the geotechnical/geological investigations for the engineering design of the slope, pavement, culverts, softground treatment, bridge, tunnel and O&M buildings. In consideration of the huge volumes, we outsource the investigation work to the Vietnamese sub-consultants and supervise their work performance by our specialist. The work supported by the topographic survey (Task 3.2.1) which stakes out the investigation points.

The summary of the geotechnical and geological investigations are shown in Table D.12.

Table D.12 Summary of the Geotechnical and Geological Investigations

No.	Investigation Items		Quantity	Remarks
1	Mechanical	Road	Normal embankment 35 l.m.	1 km pitch, 1 hole/point, 2 m pitch (sampling)
2	Boring	Road	Deep excavation section 710 l.m.	150 m pitch (H>20 m, L>200 m, 1 hole/point (H>30 m: +cross-section), 2 m pitch (sampling)
3			Softground section 805 l.m.	75 m pitch, 1 hole/point, 2 m pitch (sampling)
4			Bridge	On shore 11,718 l.m.
5		Off shore 1,240 l.m.		pile foundation+7 m depth (shallow foundation: 15 m depth)
6		Tunnel	Vertical 200 l.m.	1 hole/portal, 2 holes between portals, planned level+5 m depth, 2 m pitch (sampling)
7			Horizontal 200 l.m.	1 hole/portal, 100 m depth, 2 m pitch (sampling)
8		Culvert	Drainage 1,168 l.m.	1 hole/culvert, 7 m depth (box culvert: 15 m depth), 2 m pitch (sampling)
9			Underpass 2,020 l.m.	1 hole/culvert, 20 m depth, 2 m pitch (sampling)
10			Building	O&M building 485 l.m.
11		VST	Road	Softground section 510 nos.
12	Geology	Tunnel	Seismic measurement 1,264 l.m.	2 tunnels*632 m (tunnel length (532 m)+100 m)
13	Testing	Site	Standard penetration test (SPT) 8,754 point	2 m pitch (borehole for softground, bridges, tunnel, box culverts and buildings)
14		Laboratory	Undisturbed sample test 2,226 nos.	25 % of sampling (softground: 35% of sampling)
15			Disturbed sample test 2,284 nos.	25 % of sampling (softground: 15% of sampling)
16			Unconfined compression test 1,406 nos.	2-3 tests/hole (borehole for box culverts, bridges and tunnels)
17			Consolidation test (Cv) 133 nos.	2-4 tests/hole (borehole for softground section)
18		Triaxial compression test (UU) 58 nos.	1-2 tests/hole (borehole for softground section)	
19		Triaxial compression test (CU) 75 nos.	1-2 tests/hole (borehole for softground section)	

Task 3.2.5 Conduct material source survey

We conduct the material source survey to locations identified in the F/S to confirm quality and volume of borrow, sand and rock materials for the engineering design and construction planning.

The main work items for the material source survey are as follows:

- Identify the location and potential volume of the material sources to minimize the hauling distance in consultation with PPCs;
- Collect and evaluate the testing results of the existing borrow pits and quarry plants;
- Conduct the sampling and laboratory tests of the potential sites. (outsource to the Vietnamese sub-consultant)

The tentative quantity of the sampling and laboratory tests are shown in Table D.13.

Table D.13 Tentative Quantity of the Sampling and Laboratory Tests

No.	Item	Unit	Quantity					
			Borrow	Rock	Fine sand	Coarse sand	Total	
1	Site	each	8	5	8	2	23	
2	Sampling (3 samples/site)	each	24	15	24	6	69	
3	Testing	Undisturbed sample test	each	24				24
		Rock sample test	each		15			15
		Sand sample test	each			24	6	30
		Standard compaction test	each	24		24		48
		CBR test	each	24				24

Task 3.2.6 Conduct relevant facilities survey

We conduct relevant facilities survey in the Project area to evaluate level of capacity of existing roads for temporary construction roads during the construction stage.

The main work items for the relevant facilities survey are as follows:

- Evaluate current traffic conditions of the existing roads in the Project area;
- Identify and evaluate loading capacity of bridges/culverts on potential construction roads;
- Identify the location, capacity and specification of the obstacles in the Project area;
- Identify the cultural buildings, temples, pagodas and relevant legal religious buildings.

Task 3.2.7 Review traffic forecasting and conduct baseline surveys

We review the traffic forecasting in the WB appraisal study to establish the requirements for the engineering design from the traffic aspects. In addition, we review the traffic survey data above and other relevant studies around the Project area to collect the available baseline data of the performance indicators in the Project framework (see D.1.1(3)). In case of the appropriate data is not identified, we conduct the additional traffic survey by outsourcing to the Vietnamese sub-consultant.

The requirements for the engineering design from traffic aspects are shown in Table D.14, and the contents of the baseline surveys are shown in Table D.15.

Table D.14 Requirements for the Engineering Design from Traffic Aspects

No.	Item	Requirements
1	Pavement Structures	Forecasted traffic volume and composition in each IC section
		Forecasted directional traffic volume and composition in each IC
2	IC Rampways and TBs/TGs	Forecasted directional traffic volume and composition in each IC
3	SAs/PAs	Expected nos. of user in each SA/PA

Table D.15 Contents of the Baseline Surveys

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

Task 3.2.8 Conduct independent land valuation survey

We conduct the independent land valuation survey to confirm the current market prices of land by location and use in each commune in the Project area. We outsource the survey works to the qualified land valuation consultant who is licensed by the MOF and independent of all project stakeholders.

The potential land valuation consultants are shown in Table D.16.

Table D.16 Potential Land Valuation Consultants

No.	City/Province	Name of Consultant	Tel	Fax	E-mail
1	Danang	Da Nang Valuation & Financial Services Limited Company	0511-3887628	05113-887532	divc@.vnn.vn
2	Quang Nam	Quang Nam Finance & Price Consultancy Joint-stock Company	0510-3811657	---	mylangbd@yahoo.com.vn
3	Quang Ngai	Central Information & Valuation of Cost Joint-stock Company	055-3818348	---	---

Task 3.2.9 Conduct environmental and social surveys

We conduct the necessary site surveys for updating the EIA and EMP (see Task 3.8.1) to confirm the environmental and social conditions in the Project area in accordance with the WB safeguard policies such as OP4.01 and OP4.12.

Task 3.3.1 Prepare basic design of civil structures

We prepare the basic design of the civil structures to establish the basic conditions of the detailed engineering design and obtain the approval from the relevant organizations. The numbers of the culvert and bridge are large; therefore, we prepare the standard design to assure the design quality.

The main work items for the basic design are as follows:

- Establish design criteria and conditions (including typical cross sections);
- Prepare geometric design (thruway and linking road);
- Prepare standard design (culvert works, bridge works, revetment and river bed protection works);
- Prepare culverts and bridges plan;
- Conduct comparative study (major bridges, interchanges);
- Prepare basic design (general view: bridge works, tunnel works);
- Confirm location of O&M buildings;
- Prepare basic design report (draft design report) for discussion and approval.

The outline of the basic design procedure is shown in Figure D.7.

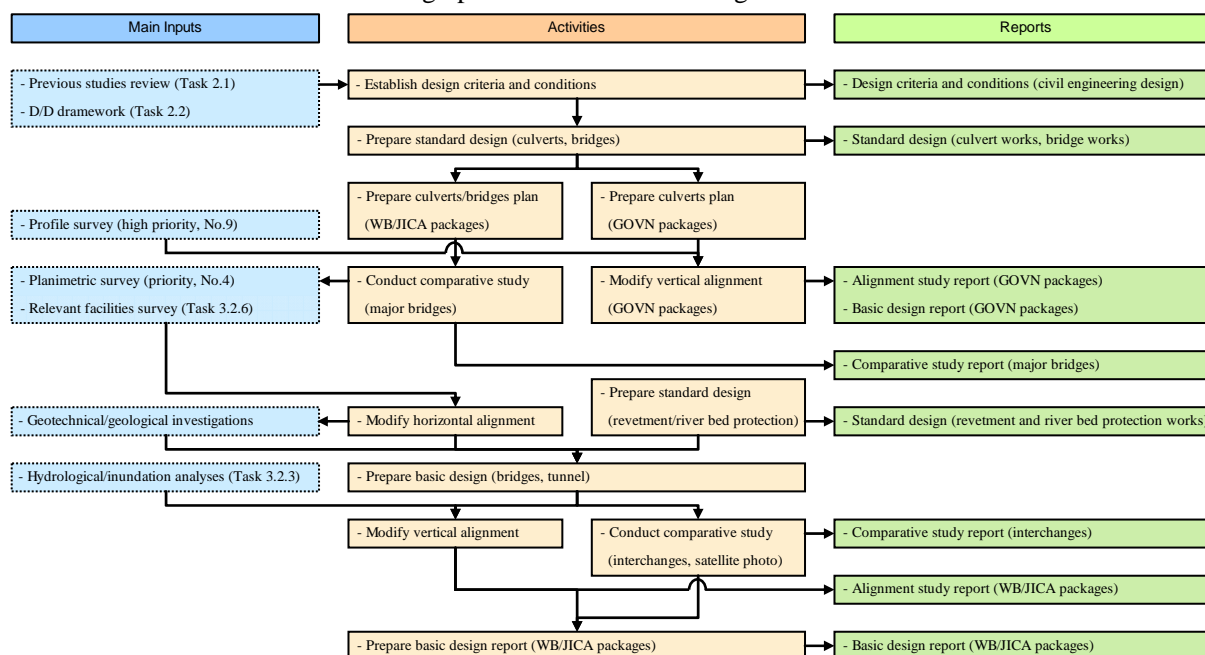


Figure D.7 Outline of the Basic Design Procedure

Task 3.3.2 Prepare detailed engineering design of civil structures

Based on the basic design (Task 3.3.1), we prepare the detailed engineering design of the civil structures and obtain the approval from the relevant organizations.

The main points of the detailed engineering design are as follows:

Standard Design (GOVN Packages)

The schedule for the detailed engineering design in the GOVN packages is separated from the WB/JICA packages (see D.1.3(1)(a)). We prepare the provisional standard design for the GOVN packages. If any discrepancy would occur with the standard design for the WB/JICA packages, appropriate addendum could be issued to the contractors during the early time of their construction works.

Design Reports

The schedule for the detailed engineering design is different package by package (see Task 2.2). Therefore, we prepare and submit the working design reports package by package, and final design report compile all of them into one for each technical field, i.e. highways, bridges, drainages, pavements.

Outsourcing

We outsource the detailed engineering design of all bridges and interchanges to the Vietnamese sub-consultant who has abundant experiences and resources for minimizing the personnel inputs and shorten the design period. We assign appropriate international specialists to supervise their work and ensure the design quality.

The main work items in the detailed engineering design are as follows:

- Prepare provisional standard design (GOVN packages);
- Prepare standard design (road accessory);
- Prepare standard design (pavement works);
- Prepare standard design (slope protection works);
- Prepare standard design (softground treatment);
- Prepare standard design (drainage works);
- Prepare standard design (bridge temporary facility works);
- Prepare detailed engineering design;
- Conduct road safety audit (based on PIARC road safety manual 2004);
- Prepare working design reports (each package);
- Prepare overall design report (all packages)
- Prepare quantity reports (each package).

The main contents of the road safety audit (PIARC road safety manual) are shown in Table D.17.

Table D.17 Main Contents of the Road Safety Audit (PIARC Road Safety Manual 2004)

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

Note: The sight distance and at grade intersection are astride the plural categories in the table.

Task 3.4.1 Prepare institutional and administrative arrangement plan

We update the O&M framework shown in Figure D.2 in accordance with the legal and regulatory frameworks for the expressway network in Vietnam to be established in the WB advisory services (see D.1.3(2)(e)), and prepare the necessary institutional and administrative arrangement plan for the Project road. As for the level of services (LOS), we establish a LOS by extracting the requirements from the provisional expressway O&M standards (see D.1.3(2)(f)) with utilizing the Japanese practices.

The main work items for the institutional and administrative arrangement are as follows:

- Identify legal and regulatory frameworks established in the WB advisory services;
- Update O&M framework, and prepare institutional and administrative arrangement plan;
- Hold the workshops with the relevant organizations.

The possible performance indicators of the LOS for the Project road are shown in Table D.18.

Table D.18 Possible Performance Indicators of the LOS for the Project Road

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

Task 3.4.2 Prepare O&M plan

We define O&M activities and frequencies for both case of normal traffic and emergency response with traffic regulations by extracting the requirements from the provisional expressway O&M standards (see D.1.3(2)(f)). In case of the activities and frequencies are not specified or not enough to satisfy the LOS, we establish or customize those by utilizing the Japanese practices. The activities and frequencies are taken into account the stage-wised strengthening for ensuring the LOS in the future traffic growth.

The main work items for the O&M plan are as follows:

- Define O&M activities and frequencies;
- Prepare O&M plan and O&M unit establishment plan;
- Hold workshops with the relevant organizations.

The contents of the O&M plan are shown in Table D.19. We had studied all items below in the previous studies so that our update can be carried out efficiently.

Table D.19 Contents of the O&M Plan

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

Task 3.4.3 Prepare basic design of O&M buildings

Based on the layout plan (see Task 3.4.2), we prepare the basic design of the O&M buildings and obtain the approval from the relevant organizations.

Task 3.5.1 Prepare ITS plan

We extract the ITS basic requirements and system from the O&M plan (see Task 3.4.2) to prepare the ITS development plan which is composed of the planning concept, stage development plan, facility location plan, equipment procurement plan, and implementation plan. Based on the development plan, we prepare the basic function and specifications of the ITS facilities and system in accordance with the ITS standard design and specifications under establishing in the JICA technical assistance (see D.1.3(2)(g)).

The main work items for the ITS plan are as follows:

- Extract ITS basic requirements and system;
- Prepare ITS development plan;
- Prepare basic function and specifications of ITS facilities and system;
- Hold workshops with the relevant organizations.

The contents of the ITS basic requirements and system are shown in Table D.20. We had studied all items below in the previous studies so that our update can be carried out efficiently.

Table D.20 Contents of the ITS Basic Requirements and System

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

Task 3.5.2 Prepare basic design of ITS facilities

Based on the ITS plan (Task 3.5.1), we prepare the basic design of ITS facilities, communication system, and toll collection facilities and system, and obtain the approval from the relevant organizations.

Task 3.6.1 Prepare detailed engineering design of electrical facilities

In relation with the civil engineering design (Task 3.3.2), O&M building design (Task 3.4.3) and ITS facilities design (Task 3.5.2), we prepare the detailed engineering design of electrical facilities, and obtain the approval from the relevant organizations. The works are included to coordinate and agree the power receiving plan with the power suppliers in the Project area.

The electrical facilities plan in the F/S is shown in Table D.21.

Table D.21 Electrical Facilities Plan

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

Task 3.7.1 Prepare relocation plan of public utilities

We confirm the public utilities which are necessary to relocate by the implementation of the Project based on the basic design of the civil structures (Task 3.3.1), and agree with the relevant agencies. We prepare the relocation plan and cost estimate in cooperation with the relevant agencies.

The probable public utilities to be relocated by the Project are shown in Table D.22.

Table D.22 Probable Public Utilities to be Relocated by the Project

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

Task 3.8.1 Update EIA and EMP

We assist PMU85 in updating the EIA and EMP. The environmental assessment for the Project is required to satisfy not only the Vietnamese law and regulations but also the WB/JICA safeguards policy.

The environmental assessment framework for the Project road is shown in Figure D.8.

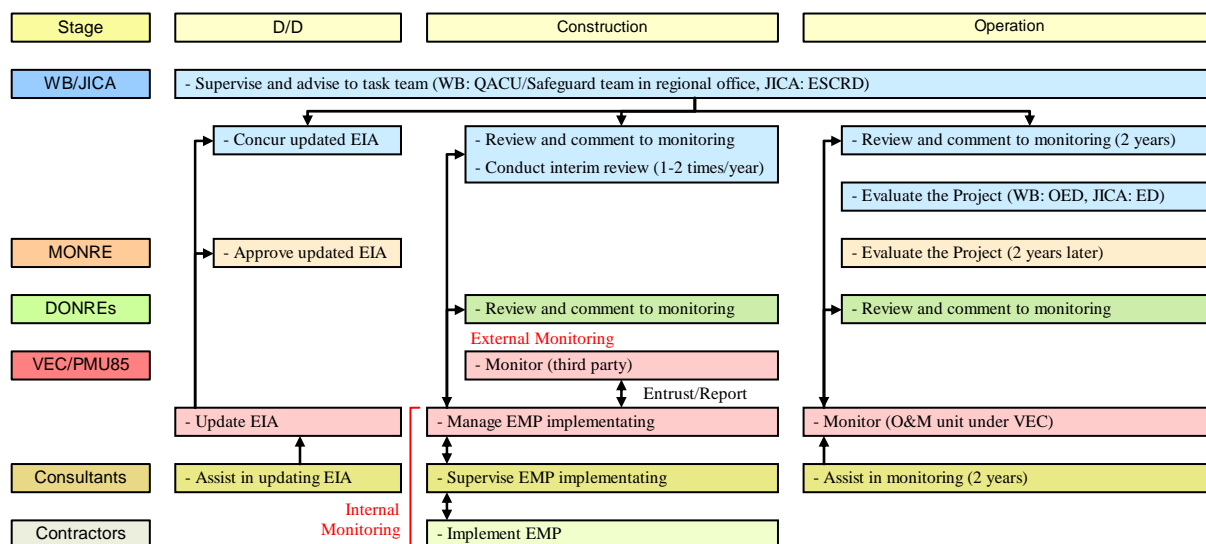


Figure D.8 Environmental Assessment Framework for the Project Road

The F/S alignment was finalized through the appraisal process of the previous F/S. However, existing EIA report describes that the used map of the F/S is too small scale (1/50,000) and not suitable for confirmation of appropriateness of the alignment. Therefore, we review and confirm the appropriateness of the F/S alignment with the alternative study based on the adequate scale maps and design details.

In relation with the engineering design, we analyze the environmental impacts by the Project and incorporate the environmental requirements to the engineering design. Based on above, we develop the mitigation measures and update the existing EIA and EMP including the preparation of draft TOR for the external monitoring by the third party during the construction stage.

The main work items for the EIA and EMP updating are as follows:

- Confirm appropriateness of the F/S alignment;
- Prepare updated draft EIA and EMP; (based on the basic design of civil structures)
- Prepare draft final updated EIA and EMP. (based on the detailed engineering design of civil structures)

Task 3.8.2 Assist in preparing and enforcing CPCS

We assist CARB in each DPC in preparing and enforcing CPCS. In the kick-off meeting with CARBs, we confirm the activities, procedures and schedule and obtain the consensus including the measurement for the gaps between the WB/JICA safeguards policy and the GOVN laws and regulations.

We prepare the resettlement monitoring plan for the CPCS activities and report the internal monitoring results every month to assist the monitoring by PMU85. As for the external monitoring by the independent organizations, we assist PMU85 to prepare the draft TOR.

The CPCS framework for the Project road is shown in Figure D.9 in the next page.

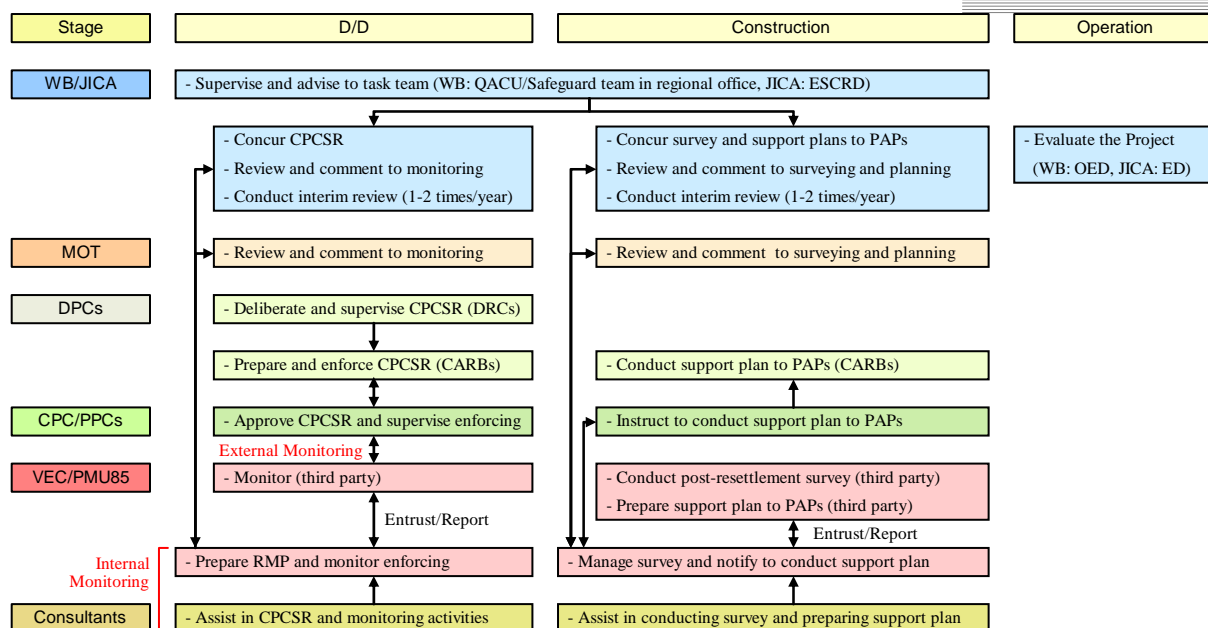


Figure D.9 CPCS Framework for the Project Road

We update the list of PAPs based on the ROW survey (see Task 3.2.2) and the cadastral maps, and conduct the detailed measurement survey of all lost assets which are newly identified from the RAP. As for the socio-economic survey indicated in Annex B (3) of TOR, we do not conduct it in the Service because of the survey was conducted within the past 2 years in the RAP preparation, and it was covered 10 % of the severely affected people's and 10 % of all other peoples.

The contents of the detailed measurement survey are shown in Table D.23.

Table D.23 Contents of the Detailed Measurement Survey

No.	Category	Contents
1	Land/Properties	Number/type/area of the houses to be affected and whether totally affected and must relocate or partially affected
		Number/area of residential plots to be affected and whether sufficient remaining land or must relocate agricultural landholding
		Number/category/area of agricultural land to be affected; area of total agricultural landholding; area of remaining unaffected
		Quantity/types of crops and trees to be affected, quantity/category of other fixed assets affected by the Project
		Temporary damage to productive assets, legal status of affected land and structure assets, and duration of tenure and ownership
2	Household Socio-economic Condition	Number of household members, gender of head of household and ethic of family
		Primary and secondary sources of income and level of income for each and location of income source
		Resettlement needs, choices/preferences for resettlement and income restoration activities
3	Business	Loss of potential work days due to loss of business by road side shop owners or employment in roadside industries/businesses
		Businesses to be affected including structures, land and other fixed assets

Through the consultations and disclosure program to all of key stakeholders, we establish the land acquisition and compensation policy in cooperation with CARBs as follows:

- Options for compensation and resettlement;
- Proposed resettlement sites, infrastructures, amenities and environmental management;
- Assistance for generation of income, and restoration of livelihood and quality of life;
- Special assistance program for poor and vulnerable PAPs;
- Consideration for cultural sites, common properties and traditional resources;
- Public consultation and disclosure mechanisms;
- Entitlements and grievance procedures;
- Unit price for compensation and resettlement;
- Institutional, organizational and budgeting arrangements;
- Implementation schedule.

Based on above, we finalize CPSCR and obtain the approval from the relevant organizations. In addition, following addendum No.1 to RFP dated April 9, 2010, we carry out the works in TOR 3.3.3(9) and TOR 3.5.

Task 3.9.1 Prepare construction plan

We plan the construction methods and schedule, temporary facilities, and procurement plan of labors, materials and construction machines to estimate the proper Project cost. Particularly, the volume of the borrow materials are huge, therefore, we prepare the mass curve to estimate the proper hauling cost.

The image of the construction scheduling and mass curve is shown in Figure D.10.

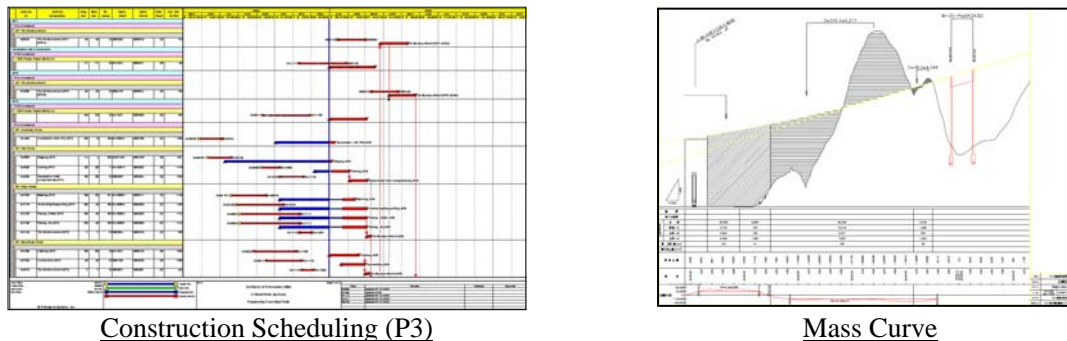


Figure D.10 Image of the Mass Curve and Construction Scheduling

Task 3.10.1 Estimate Project cost

We estimate the Project cost and annual funding requirements every packaging in relation with the construction plan (Task 3.9.1). The cost estimate conditions are severely affected to the outputs; therefore, we propose those conditions in advance and obtain the approval from the relevant organizations.

The contents of the cost estimate conditions are shown in Table D.24.

Table D.24 Contents of the Cost Estimate Conditions

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

Task 3.11.1 Prepare procurement documents

We prepare the procurement documents in accordance with the requirements of each financier. For the WB/JICA packages, we prepare the procurement plan, and P/Q and bidding documents including those evaluation criteria according to the current version of their guidelines and standard forms. For the GOVN packages, we prepare the procurement documents according to the GOVN regulations in which single source selection method can be applied. We prepare the technical specifications including EMP with supervision of engineers/specialists in every technical field for ensuring the quality.

Task 3.12.1 Prepare Project I/P

In this Technical Proposal, we propose the Project I/P in D.1.3(1)(a). We confirm and update this Project I/P with VEC/PMU85 in the beginning of the Services. During the Services, we study the construction period in each contact package; therefore, we update the Project I/P in accordance with the results of the construction planning (Task 3.9.1).

Task 4.1 Assist in tendering procedures

We assist VEC/PMU85 in tendering procedures of all contract packages in accordance with the WB/JICA procurement guidelines and the GOVN laws and regulations. In the assistance, we conduct the independent P/Q and bid evaluations to advise VEC/PMU85 on issues related to contract negotiations.

The outline of the procurement assistance procedure is shown in Figure D.11.

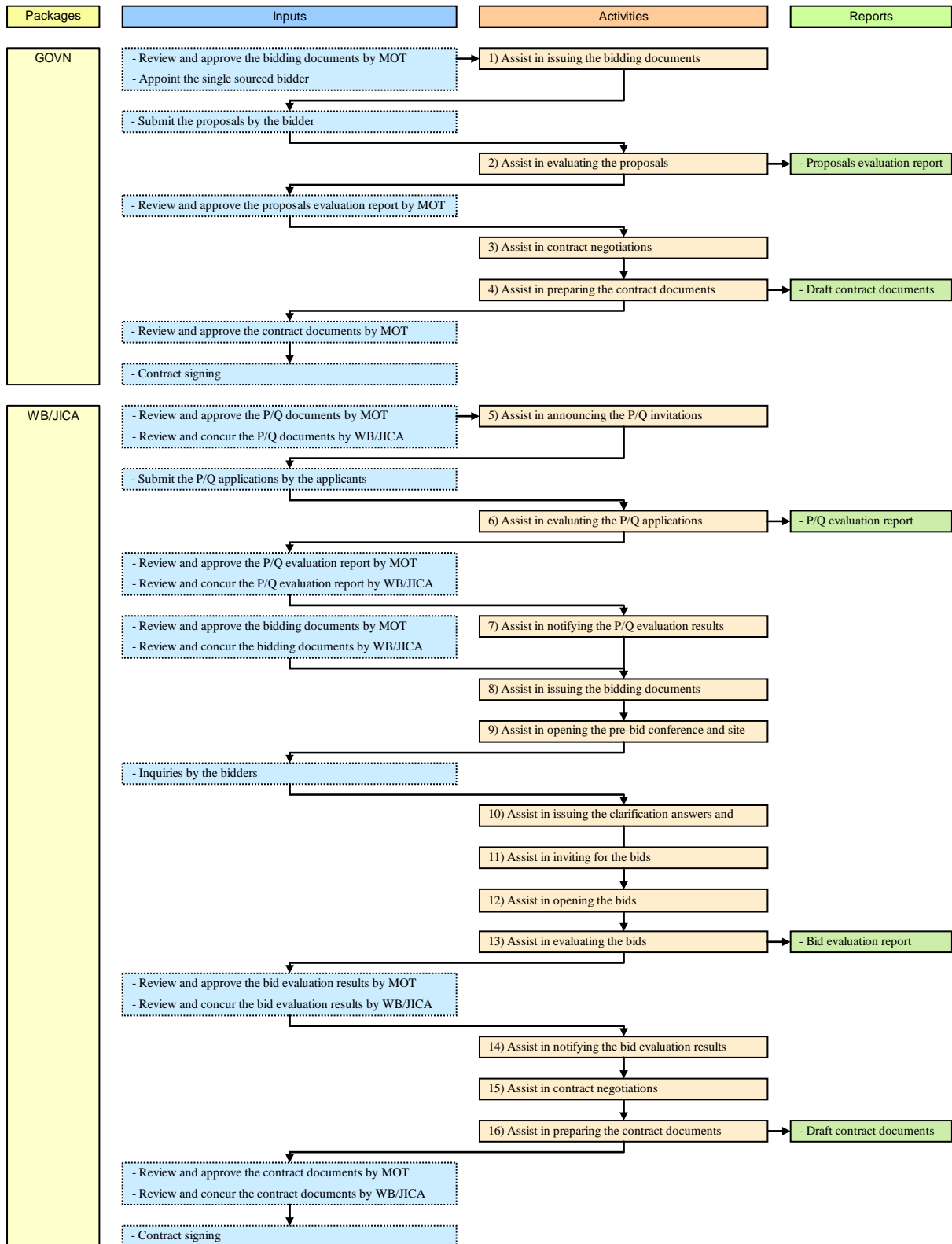


Figure D.11 Outline of the Procurement Assistance Procedure

Task 5.1 Provide training to VEC/PMU85

We provide the appropriate technology transfer to VEC/PMU85 for enhancing the necessary knowledge and capacity to ensure the smooth execution of the Project and sustainable development of the expressway network.

Objectives

The objectives of the training are that VEC/PMU85 acquires the knowledge and capacity which are necessary to manage and control the Project smoothly and to make decisions with sufficient technical backgrounds for the important issues and peculiar matters of expressways in the Project.

Goals

Based on the knowledge and capacity acquired by the training program, VEC/PMU85 is able to manage and control the expressway development projects by themselves.

Methodology

We assign the key professional staff as the training specialists and identify the training needs with VEC/PMU85 in the beginning of the Services. Based on the identification above, we prepare the training plan which consists of the training themes, program, trainees and implementation schedule. The training schedule is taken into account the work schedule of the Services to provide the workshops at appropriate timing in advance of the execution of the Services.

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

The proposed training themes are as follows:

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

The tentative program of the overseas study tour is shown in Table D.25.

Table D.25 Tentative Program of the Overseas Study Tour

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

Task 5.2 Provide training to the key local professional staff

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

D.2 Work Plan

In this section, we propose the work program which is composed of the main tasks, duration and major milestones in consideration of the interrelation, reports and major meetings to prepare the work schedule in Section 3H with all of proposed detail tasks.

(1) Major Consideration Points for Preparation of Work Plan

We confirm the major constraints for the work program below.

(a) Requirements in RFP

The main requirements for the work program in RFP are shown in Table D.26.

Table D.26 Main Requirements for the Work Program in RFP

No.	Item	Requirements in RFP	Ref. in RFP
1	Commencement of the Services	August 10, 2010	Data Sheet 7.2, Section 2
2	Period of the Services	14 months	Special Conditions of Contract 1.7, Section 6
3	Draft design report	Submit within 6 months after commencement of the Services	TOR 4 (5), Section 5
4	Design report, procurement documents	Submit within 12 months after commencement of the Services	TOR 4 (5), Section 5
5	Draft final updated EIA and EMP	Submit within 8 months after commencement of the Services	Annex A 7, Section 5
6	Procurement schedule	Commence after preparation of bidding documents by packages	TOR 4 (5), Section 5
7	Construction schedule	Commence construction works within 2010	TOR 3.3.1 d, Section 5

(b) GOVN Packages

We propose the GOVN packages in the civil works for commencing the construction works within 2010 (see D.1.3(1)(a)). Therefore, we selected the most appropriate work section in each city/province and prioritize the works for the GOVN packages and complete the D/D within 3 months.

(c) Civil Engineering Design

In order to complete huge design works, a 130 km long expressway, within 14 months, we divide the civil engineering design into the basic design stage and the detailed engineering design stage (see D.1.3(2)(c)). Based on our examination, we allocate 4 months for the basic design stage and 8 months for the detailed engineering design in the WB/JICA packages.

(d) Topographic Survey

From 4th month in the Services is rainy season at the Project site. Therefore, we prioritize the survey items and complete all of items for the GOVN packages and the basic design for the WB/JICA packages before the rainy season (see Task 3.2.2).

(e) Hydrological Survey and Analysis

The Project road is in inundation plains; therefore, we conduct the inundation analysis. The thruway vertical alignment depends on the results of the hydrological survey and analysis (see Task 3.3.1); therefore, we complete the survey and analysis one (1) month in advance of the completion of the basic design of civil structures.

(f) Safeguards

We commence to assist CARBs in preparing and enforcing CPCSRs immediately after completion of the basic design of civil structures. We also provide design and supervision of resettlement area (TOR 3.3.3(9)).

(g) Procurement Assistance

We commence the P/Q procedure one (1) month in advance from the preparation for completion of the bidding documents to shorten the procurement period.

(2) Work Program

The proposed work program is shown in Figure D.12.

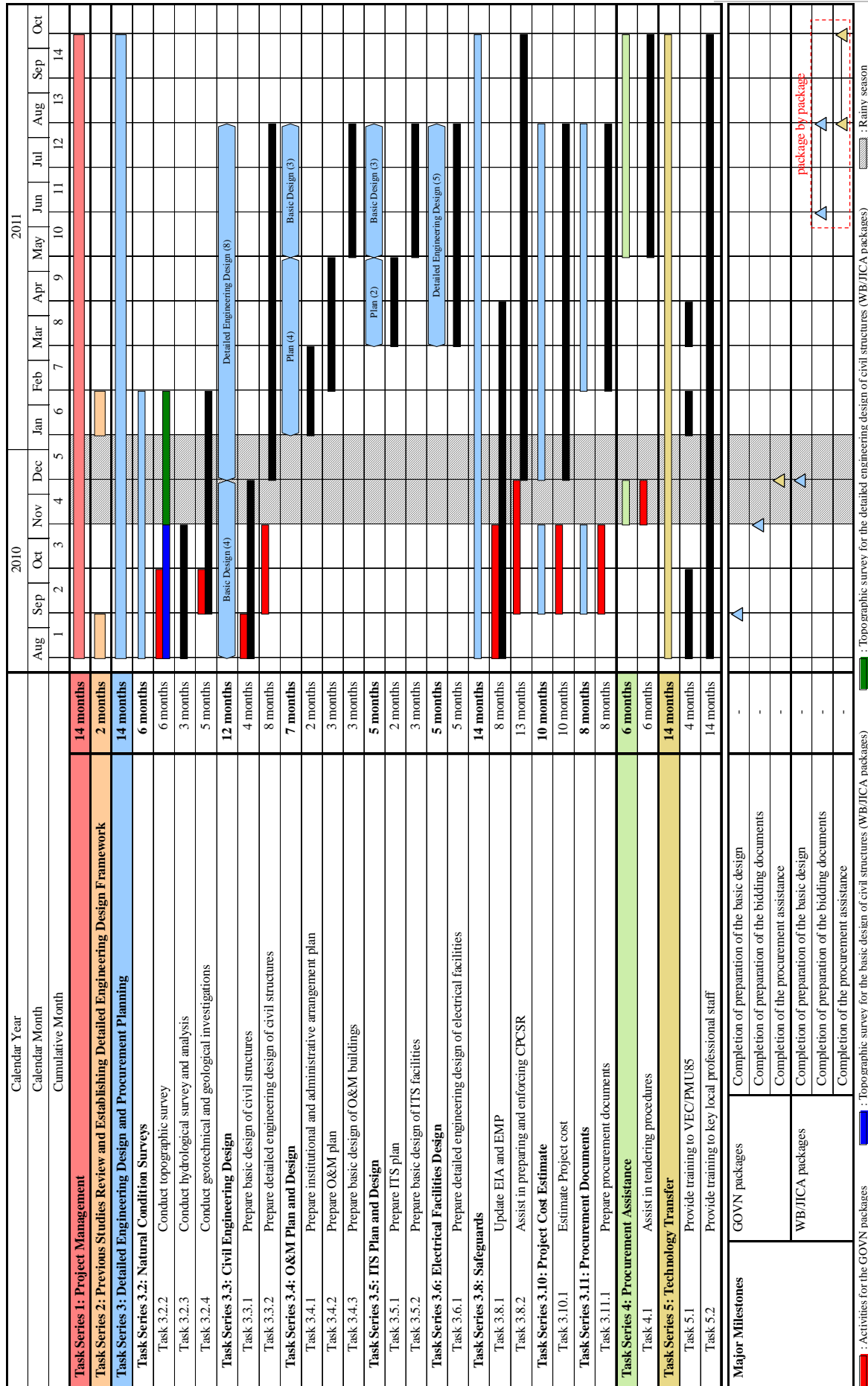


Figure D.12 Proposed Work Program

D.3 Organization and Staffing

In this section, we propose the organization and team composition of the Services, and list the task assignments and proposed key professional and supporting staff in compatibility with the approach, methodology and work plan proposed in the previous sections.

D.3.1 Consultant's Organization

In this subsection, we describe the duties and responsibilities shared among the joint venture, the organization of the Consultant Team, and home office support in the Services.

(1) Joint Venture

Our Consultant Team consists of the joint venture of NK, NE, Chodai and TEC, and jointly and severally responsible for the Services among the joint venture firms.

(2) Consultant Team

We propose to divide the Consultant Team into 7 teams as explained below. The organization structure of the Consultant Team is shown in Figure D.13 in the next page.

(a) Management Team

The management team is responsible for managing the Services, and all communications in the Services are exchanged through the team. In the team, we organize the core team which consists of the representatives of each team and secure the consistent communication among the teams.

(b) Civil Design Team

The civil design team is responsible for planning and designing the civil structures and consists of the civil design management, design group and the survey group.

The civil design management is responsible for establishing the design criteria and conditions, standard design of road accessories, culverts and bridges, and supervising the works of the design and survey groups, preparing the technical specifications and assisting the tendering procedures.

The design group is responsible for preparing the basic design and detailed engineering design, and consists of two (2) sections and each structural design.

(c) O&M and ITS Team

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

(d) Cost and Document Team

The cost and document team is responsible for preparing the construction plan, engineer's cost estimate, procurement plan and documents, and assisting the tendering procedures.

(e) Environmental Team

The environmental team works with the relevant organizations for updating EIA and EMP, preparing and enforcing CPCR, and preparing the requirements for EMP in the bidding documents.

(f) Training Team

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

(g) GOVN Packages Team

The GOVN packages team is responsible for preparing the basic design and detailed engineering design of civil structures, and assisting the tendering procedures of the GOVN packages. The management team, civil design management, cost and document team, and environmental team hold the GOVN packages team.

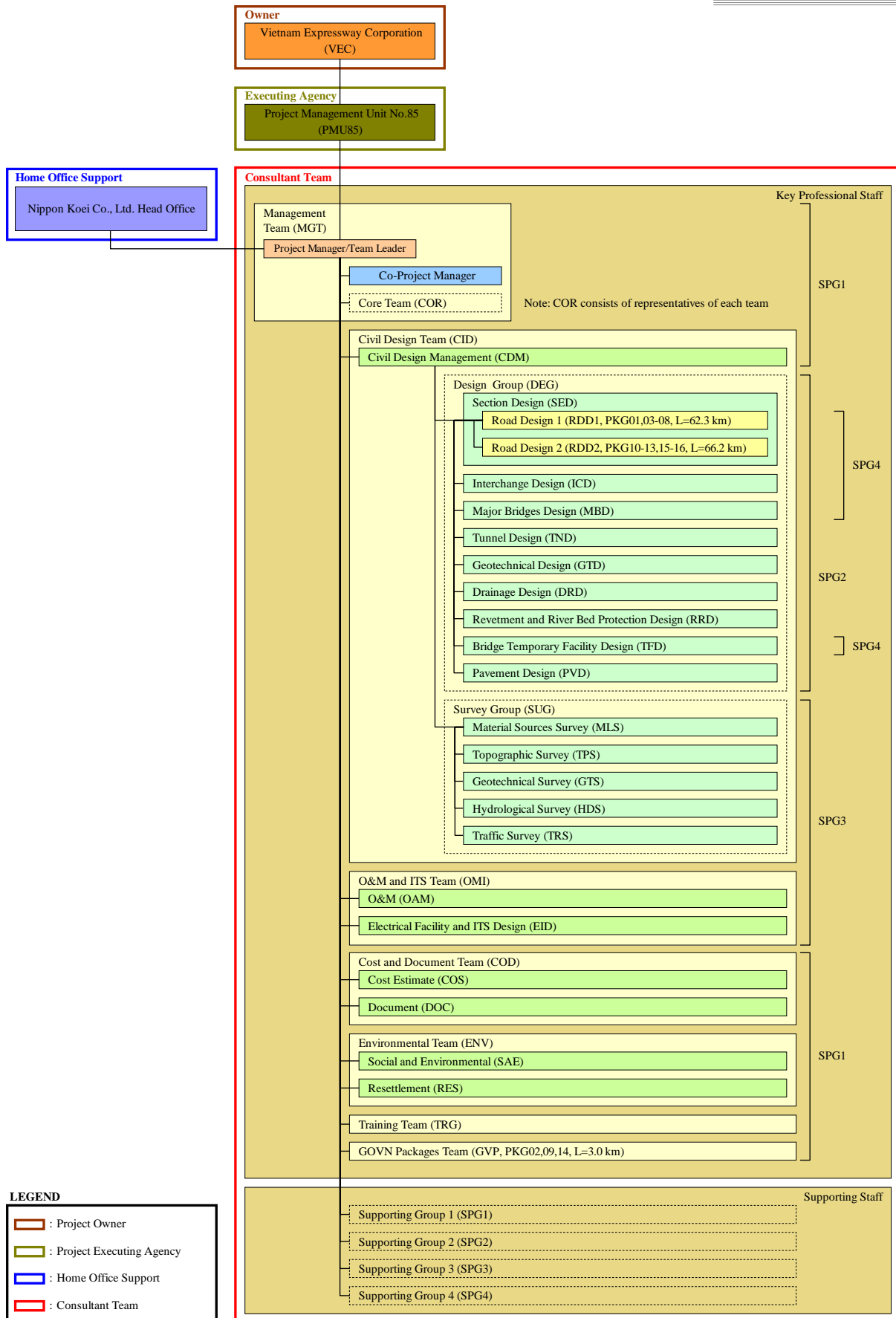


Figure D.13 Organization Structure of the Consultant Team

(3) Home Office Support

NK has the home office support system and utilize the technical, managerial and operational support including the review and verification of the design in the Services.

The conceptual image of NK’s home office support is shown in Figure D.14.

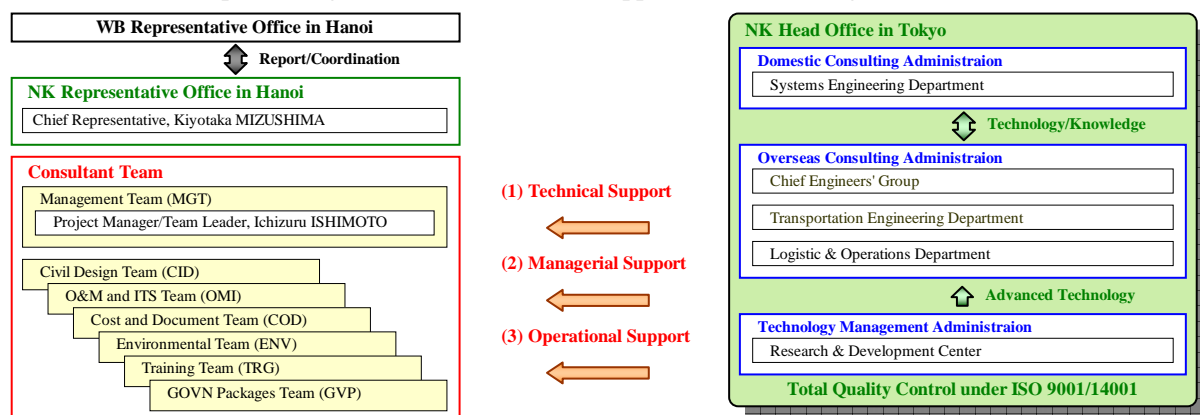


Figure D.14 Conceptual Image of NK’s Home Office Support

(4) Supporting Staff

We propose to organize the 4 supporting groups (SPGs) and procure all of the supporting staff in the local places for utilizing their familiarization with the local conditions and saving the cost.

The proposed arrangement of the supporting groups is shown in Table D.27.

Table D.27 Proposed Composition of the Supporting Groups

No.	Supporting Staff	Danang								Hanoi
		SPG1			SPG2		SPG3		SPG4	
		B/D	D/D	P/A	B/D	D/D	B/D	D/D	D/D	
1	Office Manager	1	1	1						
2	Bilingual Secretary	1	1	1	1	1	1	1	1	
3	Accountant	1	1	1						
4	Translator	5	5	1						
5	CAD Operator	2	1		4	4	1	1	1	
6	Guard	2	2	2						

B/D: Basic Design, D/D: Detailed Engineering Design, P/A: Procurement Assistance

(5) Office Arrangement

PMU85 organize TFT in Danang, and CPC/PPCs and the Project site are also located in/near Danang. Therefore, we propose to set up the main office for the Consultant Team in Danang. On the Other hand, we outsource the D/D of all bridges and ICs to the Vietnamese sub-consultant in Hanoi. For supervising the works, we set up the branch office in Hanoi during the D/D.

The proposed office arrangement is shown in Table D.28.

Table D.28 Proposed Office Arrangement

No.	Office	Period	Max. nos. of staff
1	Danang main office	14 months	79 (77 ¹⁾)
2	Hanoi branch office	8 months	7

Note 1): except guards

D.3.2 Staffing

In this subsection, we propose the staffing and schedule in consistent with the work plan and the task assignments proposed in the previous sections.

(1) Staffing

We take into account the staffing for the key professional staff as follows:

- Arrange the staff who worked with VEC/PMU85 in the past studies;
- Arrange the staff who worked together with other team members in the past;
- Assign some Thai key professional staff for saving the cost.

The Curriculum Vitae for proposed key professional staff are shown in Section 3F.

(2) Key Professional Staff

We understand that the Project Manager/Team Leader and the Co-Project Manager are important to ensure the smooth execution of the Services. We introduce our proposed staff for the positions below.

(a) Project Manager/Team Leader

Mr. Ishimoto started his work in Vietnam, with his assignment as Sr. Highway Engineer/Contract Engineer, on the D/D of National Highway No.10 Improvement Project (NH10), from December 1998. After NH10 assignment, Mr. Ishimoto moved to Danang for construction supervision of the Hai Van Pass Tunnel Construction Project. The Project was awarded “Globe Award” of ARTBA-TDF (American Road & Transportation Builders Association Transportation Development Foundation) in 2003 and “Engineering Excellence Awards” of ACEC (American Council of Engineering Companies) in 2006 for its high level of construction quality control and project management. Individually, Mr. Ishimoto was awarded “Prime Minister Award” in 2003 and “President Award” in 2006. PMI (Project Management Institute) provided him “Project Management Champion in 2006” during PMI Global Congress Asia Pacific, Singapore in 2005. Through the above two prestigious projects, Mr. Ishimoto has mastered all design standards, construction quality standards and procurement regulations in Vietnam and built strong human relations not only in the central Vietnam but also MOT and concerned central government people in Hanoi.

In addition, Mr. Ishimoto has been project director for Hanoi-Thai Nguyen Expressway (New National Highway No.3) Construction Project and Ho Chi Minh City-Long Thanh-Dau Giay Expressway. Those two projects are now under construction after smooth progress of the detailed design by his good coordination and support to the project operations. Moreover, Mr. Ishimoto has recently completed his assignment on VITRANSS2 (The Comprehensive Study on the Sustainable Development of Transport System in Vietnam) as Sub-Team Leader in charge of Road Development Plan. During his assignment, he reviewed comprehensively existing law, regulation and standards related to road and road transport and developed road development strategy and expressway development master plan in the study.

Regarding the Danang Quang Ngai Expressway Development Project, Mr. Ishimoto had been Team Leader to “Updating and Finalizing the Feasibility Study Report for Da Nang-Quang Ngai Expressway Construction Project” under WB from 2008 to 2009 and “The Study on Da Nang-Quang Ngai Expressway Construction Project” under JETRO from 2007 to 2008. As the result of above assignments, he understands every details of the expressway facilitation with their background, and also acquainted most of all stakeholders among Danang city, and Quang Nam and Quang Ngai provinces through several times of meetings in those studies. We believe Mr. Ishimoto is the best project manager for the Service considering his broad, deep and practical knowledge of project management, his past performances in Vietnam and his personality highly appreciated in Vietnam, and his 3 years of studies in depth of the Project in particular.

(b) Co-Project Manager

Mr. Le Kim An has started his career as highway engineer when Japanese ODA (Official Development Assistance) to Vietnam resumed in 1992. Since then, he has been at position of project manager for domestic projects and co-project manager for international projects for many times. From 1998 and 2000, Mr. An was assigned to the detailed engineering design of NH10 under direction of Mr. Ishimoto for 18 months. During this assignment, he mastered highway design by CAD and design of interchange. He designed Quan Toan Interchange, located at Hai Phong city, which is the first grade-separated intersection, said interchange, in northern region of Vietnam.

Since then, Mr. An has experienced several international fund projects and familiarized with D/D and subsequent procurement processes. Especially, Mr. An has been co-project manager of Hanoi-Hai Phong Expressway which is 105 km long with 6-lane carriageways, working together with KEX (Korean Expressway Corporation). The design work was completed successfully and the construction was commenced in May 2008. Hanoi-Hai Phong Expressway has very similar nature with Danang-Quang Ngai Expressway in its scale and requirement of softground treatment.

Mr. An is the best competent engineer for D/D of expressway in Vietnam, not only for the expressway design standards but also team building and lead the design team for actual expressway design works. Now, we will move his design team, who performed the D/D works of the Hanoi-Hai Phong Expressway, to Danang for carrying out of the Services. We believe that Mr. An and Mr. Ishimoto is the most practical partner available for the D/D of Danang Quang Ngai Expressway Development Project.

(3) Staffing Schedule

We propose the time schedule for professional personnel as shown in Section 3G.

Table E.1 Team Composition and Task Assignments (1/11)

No.	Name	Position	Task	
11	Ichizuru Ishimoto	Project Manager/Team Leader	Task Series 1 Project Management	
			Task 1.1 Establish and control practical management system	●
			Task Series 2 Previous Studies Review and Establishing D/D Framework	
			Task 2.1 Review previous studies	◎
			Task 2.2 Establish detailed engineering design framework	●
			Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.1 Contract Packaging	
			Task 3.1.1 Propose contract packaging	●
			Task Series 3.2 Surveys and Investigations	
			Task 3.2.1 Collect relevant data and documents	◎
			Task 3.2.2 Conduct topographic survey	◎
			Task 3.2.3 Conduct hydrological survey and analysis	◎
			Task 3.2.4 Conduct geotechnical and geological investigations	◎
			Task 3.2.5 Conduct material source survey	◎
			Task 3.2.6 Conduct relevant facilities survey	◎
			Task 3.2.7 Review traffic forecasting and conduct baseline surveys	◎
			Task 3.2.8 Conduct independent land valuation survey	◎
			Task 3.2.9 Conduct environmental and social surveys	◎
			Task Series 3.3 Civil Engineering Design	
			Task 3.3.1 Prepare basic design of civil structures	◎
			Task 3.3.2 Prepare detailed engineering design of civil structures	◎
			Task Series 3.4 O&M Plan and Design	
			Task 3.4.1 Prepare institutional and administrative arrangement plan	◎
			Task 3.4.2 Prepare O&M plan	◎
			Task 3.4.3 Prepare basic design of O&M buildings	◎
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.1 Prepare ITS plan	◎
			Task 3.5.2 Prepare basic design of ITS facilities	◎
			Task Series 3.6 Electrical Facilities Design	
			Task 3.6.1 Prepare detailed engineering design of electrical facilities	◎
			Task Series 3.7 Public Utilities Relocation Plan	
			Task 3.7.1 Prepare relocation plan of public utilities	◎
			Task Series 3.8 Safeguards	
			Task 3.8.1 Assist in updating EIA and EMP	◎
			Task 3.8.2 Assist in preparing and enforcing CPCS	◎
			Task Series 3.9 Construction Planning	
			Task 3.9.1 Prepare construction plan	◎
			Task Series 3.10 Project Cost Estimate	
			Task 3.10.1 Estimate Project cost	◎
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	◎
Task Series 3.12 Project Implementation Program				
Task 3.12.1 Prepare Project I/P	●			
Task Series 4 Procurement Assistance				
Task 4.1 Assist in tendering procedures	●			
Task Series 5 Technology Transfer				
Task 5.1 Provide training to VEC/PMU85	●			
Task 5.2 Provide training to the key local professional staff	●			
12	Akira Magario	Senior Highway Engineer	Task Series 2 Previous Studies Review and Establishing D/D Framework	
			Task 2.1 Review previous studies	●
			Task 2.2 Establish detailed engineering design framework	●
			Task Series 3 Detailed Engineering Design and Procurement Planning	
Task Series 3.2 Surveys and Investigations				
Task 3.2.1 Collect relevant data and documents	●			
Task 3.2.6 Conduct relevant facilities survey	●			

◎: Management and Guidance, ●: In-charge, Red: Accountability for the Services, Blue: Responsibility for the Team

Table E.1 Team Composition and Task Assignments (2/11)

No.	Name	Position	Task			
12	Akira Magario	Senior Highway Engineer	Task 3.2.7	Review traffic forecasting and conduct baseline surveys	●	
			Task Series 3.3 Civil Engineering Design			
			Task 3.3.1	Prepare basic design of civil structures	●	
			Task 3.3.2	Prepare detailed engineering design of civil structures	●	
			Task Series 3.7 Public Utilities Relocation Plan			
			Task 3.7.1	Prepare relocation plan of public utilities	●	
			Task Series 3.11 Procurement Documents			
			Task 3.11.1	Prepare procurement documents	●	
			Task Series 4 Procurement Assistance			
			Task 4.1	Assist in tendering procedures	●	
13	Takehiko Tsuji	Road Safety Audit Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning			
			Task Series 3.3 Civil Engineering Design			
			Task 3.3.2	Prepare detailed engineering design of civil structures	●	
			Task Series 5 Technology Transfer			
			Task 5.1	Provide training to VEC/PMU85	●	
Task 5.2	Provide training to the key local professional staff	●				
14	Yoshinori Abe	Senior Bridge Engineer	Task Series 2 Previous Studies Review and Establishing D/D Framework			
			Task 2.1	Review previous studies	●	
			Task 2.2	Establish detailed engineering design framework	●	
			Task Series 3 Detailed Engineering Design and Procurement Planning			
			Task Series 3.2 Surveys and Investigations			
			Task 3.2.6	Conduct relevant facilities survey	●	
			Task Series 3.3 Civil Engineering Design			
			Task 3.3.1	Prepare basic design of civil structures	●	
			Task 3.3.2	Prepare detailed engineering design of civil structures	●	
			Task Series 3.9 Construction Planning			
			Task 3.9.1	Prepare construction plan	●	
			Task Series 3.11 Procurement Documents			
			Task 3.11.1	Prepare procurement documents	●	
			Task Series 4 Procurement Assistance			
			Task 4.1	Assist in tendering procedures	●	
15	Koji Nakai	Highway Engineer 1	Task Series 3 Detailed Engineering Design and Procurement Planning			
			Task Series 3.2 Surveys and Investigations			
			Task 3.2.6	Conduct relevant facilities survey	●	
18	Decha Sa-ngunprasith	Highway Engineer 2	Task Series 3.3 Civil Engineering Design			
			Task 3.3.1	Prepare basic design of civil structures	●	
			Task 3.3.2	Prepare detailed engineering design of civil structures	●	
Task Series 5 Technology Transfer						
Task 5.2	Provide training to the key local professional staff	●				
16	Tetsuya Maeda	Bridge/Structural Engineer 1	Task Series 3 Detailed Engineering Design and Procurement Planning			
			Task Series 3.3 Civil Engineering Design			
			Task 3.3.1	Prepare basic design of civil structures	●	
			Task 3.3.2	Prepare detailed engineering design of civil structures	●	
19	Hiroo Jin	Bridge/Structural Engineer 3	Task Series 5 Technology Transfer			
			Task 5.2	Provide training to the key local professional staff	●	
			Task Series 3 Detailed Engineering Design and Procurement Planning			
			Task Series 3.3 Civil Engineering Design			
Task 3.3.1	Prepare basic design of civil structures	●				
Task 3.3.2	Prepare detailed engineering design of civil structures	●				
Task Series 5 Technology Transfer						
Task 5.2	Provide training to the key local professional staff	●				
17	Yoshiaki Nakakubo	Bridge/Structural Engineer 2	Task Series 3 Detailed Engineering Design and Procurement Planning			
			Task Series 3.3 Civil Engineering Design			
			Task 3.3.1	Prepare basic design of civil structures	●	
110	Yuichi Sano	Bridge/Structural Engineer 4	Task Series 5 Technology Transfer			
			Task 5.2	Provide training to the key local professional staff	●	

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Table E.1 Team Composition and Task Assignments (3/11)

No.	Name	Position	Task
I11	Chanchai Techashongs	Senior Interchange Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I12	Hiroyuki Yokoyama	Bridge/Structural Engineer 5	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I13	Wako Noto	Tunnel Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.4 Conduct geotechnical and geological investigations ●
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I14	Manoon Arayasiri	Soil/Geotechnical Engineer 1 (Slope)	Task Series 3 Detailed Engineering Design and Procurement Planning
I15	Suvichai Methpreechakul	Soft Ground Treatment Specialist	Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I16	Suntichai Horpaopan	Drainage Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I17	Arristeo B. Rabajante	River Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I18	Akira Yanagisawa	Bridge/Structural Engineer 6	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 3.9 Construction Planning
			Task 3.9.1 Prepare construction plan ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I19	Bundit Kitsuwannarut	Pavement/Material Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.5 Conduct material source survey ●
			Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I20	Kazuhiro Ishizuka	Survey Engineer	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.2 Conduct topographic survey ●

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Table E.1 Team Composition and Task Assignments (4/11)

No.	Name	Position	Task
I20	Kazuhiro Ishizuka	Survey Engineer	Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I21	Jirarote Piyapompong	Soil/Geotechnical Engineer 2	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.4 Conduct geotechnical and geological investigations ●
			Task 3.2.5 Conduct material source survey ●
I22	Seichiro Kanai	Geological Engineer (Tunnel)	Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I23	Khadananda Lamsal	Senior Hydrologist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.4 Conduct geotechnical and geological investigations ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
			Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
I24	Silver Yance	Inundation Analyst	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.3 Conduct hydrological survey and analysis ●
			Task 3.2.6 Conduct relevant facilities survey ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
			Task Series 2 Previous Studies Review and Establishing D/D Framework
I25	Shigeki Takahashi	Operating & Maintenance Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.1 Prepare institutional and administrative arrangement plan ●
			Task 3.4.2 Prepare O&M plan ●
			Task Series 5 Technology Transfer
			Task 5.1 Provide training to VEC/PMU85 ●
			Task 5.2 Provide training to the key local professional staff ●
I26	Yuichi Tsujimoto	Expressway Management Unit Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.1 Prepare institutional and administrative arrangement plan ●
			Task 3.4.2 Prepare O&M plan ●
			Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
			Task Series 2 Previous Studies Review and Establishing D/D Framework
I27	Hisanori Tomitaka	Traffic Management Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.2 Prepare O&M plan ●
I28	Kyoichi Takeuchi	Asset Management Specialist	Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●

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Table E.1 Team Composition and Task Assignments (5/11)

No.	Name	Position	Task	
I29	Yoshinori Yamazaki	Architect	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.4 O&M Plan and Design	
			Task 3.4.3 Prepare basic design of O&M buildings	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
			Task Series 5 Technology Transfer	
Task 5.2 Provide training to the key local professional staff	●			
I30	Koichi Nishimura	ITS Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.1 Prepare ITS plan	●
			Task 3.5.2 Prepare basic design of ITS facilities	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
			Task Series 5 Technology Transfer	
Task 5.1 Provide training to VEC/PMU85	●			
Task 5.2 Provide training to the key local professional staff	●			
I31	Masahiro Sakagami	Communication System Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.2 Prepare basic design of ITS facilities	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
Task Series 5 Technology Transfer				
Task 5.2 Provide training to the key local professional staff	●			
I32	Eiji Matsuda	Senior Electrical Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.6 Electrical Facilities Design	
			Task 3.6.1 Prepare detailed engineering design of electrical facilities	●
			Task Series 3.7 Public Utilities Relocation Plan	
			Task 3.7.1 Prepare relocation plan of public utilities	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
Task Series 5 Technology Transfer				
Task 5.2 Provide training to the key local professional staff	●			
I33	Masashi Iwamoto	Toll Collection System Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.1 Prepare ITS plan	●
			Task 3.5.2 Prepare basic design of ITS facilities	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
Task Series 5 Technology Transfer				
Task 5.2 Provide training to the key local professional staff	●			
I34	Masayuki Iwashita	Construction Planner/Cost Estimator	Task Series 2 Previous Studies Review and Establishing D/D Framework	
			Task 2.1 Review previous studies	●
			Task 2.2 Establish detailed engineering design framework	●
			Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.1 Contract Packaging	
			Task 3.1.1 Propose contract packaging	●
			Task Series 3.2 Surveys and Investigations	
			Task 3.2.1 Collect relevant data and documents	●
			Task 3.2.6 Conduct relevant facilities survey	●
			Task Series 3.9 Construction Planning	
			Task 3.9.1 Prepare construction plan	●
			Task Series 3.10 Project Cost Estimate	
			Task 3.10.1 Estimate Project cost	●
			Task Series 3.12 Project Implementation Program	
Task 3.12.1 Prepare Project I/P	●			

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Table E.1 Team Composition and Task Assignments (6/11)

No.	Name	Position	Task
I34	Masayuki Iwashita	Construction Planner/Cost Estimator	Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I35	Anothai Boonthikul	Senior Procurement/Contract Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.1 Contract Packaging
			Task 3.1.1 Propose contract packaging ●
			Task Series 3.2 Surveys and Investigations
			Task 3.2.1 Collect relevant data and documents ●
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●
			Task Series 3.12 Project Implementation Program
			Task 3.12.1 Prepare Project I/P ●
			Task Series 4 Procurement Assistance
			Task 4.1 Assist in tendering procedures ●
I36	Yasuhira Minami	Social and Environmental Specialist	Task Series 5 Technology Transfer
			Task 5.2 Provide training to the key local professional staff ●
I37	Vu Ngoc Long	Resettlement Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.6 Conduct relevant facilities survey ●
			Task 3.2.9 Conduct environmental and social surveys ●
			Task Series 3.8 Safeguards
			Task 3.8.1 Assist in updating EIA and EMP ●
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●
			Task Series 5 Technology Transfer
Task 5.1 Provide training to VEC/PMU85 ●			
Task 5.2 Provide training to the key local professional staff ●			
I38	Noppong Unhabhokha	Training Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.8 Conduct independent land valuation survey ●
			Task Series 3.8 Safeguards
			Task 3.8.2 Assist in preparing and enforcing CPCR ●
Task Series 5 Technology Transfer			
Task 5.1 Provide training to VEC/PMU85 ●			
Task 5.2 Provide training to the key local professional staff ●			
L1	Le Kim An	Co-Project Manager	Task Series 5 Technology Transfer
			Task 5.1 Provide training to VEC/PMU85 ●
			Task 5.2 Provide training to the key local professional staff ●
			Task Series 1 Project Management
			Task 1.1 Establish and control practical management system ●
			Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ◎
			Task 2.2 Establish detailed engineering design framework ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.1 Contract Packaging
			Task 3.1.1 Propose contract packaging ●
Task Series 3.2 Surveys and Investigations			
Task 3.2.1 Collect relevant data and documents ◎			
Task 3.2.2 Conduct topographic survey ◎			
Task 3.2.3 Conduct hydrological survey and analysis ◎			
Task 3.2.4 Conduct geotechnical and geological investigations ◎			
Task 3.2.5 Conduct material source survey ◎			

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Table E.1 Team Composition and Task Assignments (7/11)

No.	Name	Position	Task				
L1	Le Kim An	Co-Project Manager	Task 3.2.6	Conduct relevant facilities survey	◎		
			Task 3.2.7	Review traffic forecasting and conduct baseline surveys	◎		
			Task 3.2.8	Conduct independent land valuation survey	◎		
			Task 3.2.9	Conduct environmental and social surveys	◎		
			Task Series 3.3 Civil Engineering Design				
			Task 3.3.1	Prepare basic design of civil structures	◎		
			Task 3.3.2	Prepare detailed engineering design of civil structures	◎		
			Task Series 3.4 O&M Plan and Design				
			Task 3.4.1	Prepare institutional and administrative arrangement plan	◎		
			Task 3.4.2	Prepare O&M plan	◎		
			Task 3.4.3	Prepare basic design of O&M buildings	◎		
			Task Series 3.5 ITS Plan and Design				
			Task 3.5.1	Prepare ITS plan	◎		
			Task 3.5.2	Prepare basic design of ITS facilities	◎		
			Task Series 3.6 Electrical Facilities Design				
			Task 3.6.1	Prepare detailed engineering design of electrical facilities	◎		
			Task Series 3.7 Public Utilities Relocation Plan				
			Task 3.7.1	Prepare relocation plan of public utilities	◎		
			Task Series 3.8 Safeguards				
			Task 3.8.1	Assist in updating EIA and EMP	◎		
			Task 3.8.2	Assist in preparing and enforcing CPCR	◎		
			Task Series 3.9 Construction Planning				
			Task 3.9.1	Prepare construction plan	◎		
			Task Series 3.10 Project Cost Estimate				
			Task 3.10.1	Estimate Project cost	◎		
			Task Series 3.11 Procurement Documents				
			Task 3.11.1	Prepare procurement documents	◎		
			Task Series 3.12 Project Implementation Program				
			Task 3.12.1	Prepare Project I/P	●		
			Task Series 4 Procurement Assistance				
			Task 4.1	Assist in tendering procedures	●		
Task Series 5 Technology Transfer							
Task 5.1	Provide training to VEC/PMU85	●					
Task 5.2	Provide training to the key local professional staff						
L2	Tran Dinh Van	Highway Engineer 1 (Geometric)	Task Series 2 Previous Studies Review and Establishing D/D Framework				
L3	Phan Dang Viet Anh	Highway Engineer 2 (Road Structure)	Task 2.1	Review previous studies	●		
			Task 2.2	Establish detailed engineering design framework	●		
Task Series 3 Detailed Engineering Design and Procurement Planning							
Task Series 3.2 Surveys and Investigations							
Task 3.2.1	Collect relevant data and documents	●					
Task 3.2.6	Conduct relevant facilities survey	●					
Task Series 3.3 Civil Engineering Design							
Task 3.3.1	Prepare basic design of civil structures	●					
Task 3.3.2	Prepare detailed engineering design of civil structures	●					
Task Series 3.7 Public Utilities Relocation Plan							
Task 3.7.1	Prepare relocation plan of public utilities	●					
Task Series 3.11 Procurement Documents							
Task 3.11.1	Prepare procurement documents	●					
Task Series 4 Procurement Assistance							
Task 4.1	Assist in tendering procedures	●					
L4	Tran Quang Huy	Road Safety Audit Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning				
Task Series 3.3 Civil Engineering Design							
Task 3.3.2	Prepare detailed engineering design of civil structures	●					
Task Series 5 Technology Transfer							
Task 5.1	Provide training to VEC/PMU85	●					

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Table E.1 Team Composition and Task Assignments (8/11)

No.	Name	Position	Task
L5	Le Toan Thang	Bridge/Structural Engineer 1 (Superstructure)	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
L6	Dao Ngoc Vinh	Bridge/Structural Engineer 2 (Substructure/Foundation)	Task 2.2 Establish detailed engineering design framework ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.6 Conduct relevant facilities survey ●
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●
			Task Series 4 Procurement Assistance
Task 4.1 Assist in tendering procedures ●			
L7	Le Thi Thanh Thuy	Highway Engineer 3 (Geometric)	Task Series 3 Detailed Engineering Design and Procurement Planning
L8	Vu Gia Hung	Highway Engineer 4 (Road Structure)	Task Series 3.2 Surveys and Investigations
L11	Nguyen Dinh Trung	Highway Engineer 5 (Geometric)	Task 3.2.6 Conduct relevant facilities survey ●
L12	Dao Manh Son	Highway Engineer 6 (Road Structure)	Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
L9	Do Hong Phuc	Bridge/Structural Engineer 3	Task Series 3 Detailed Engineering Design and Procurement Planning
L10	Pham Anh Kiet	Bridge/Structural Engineer 4	Task Series 3.3 Civil Engineering Design
L13	Le Kien Cuong	Bridge/Structural Engineer 5	Task 3.3.1 Prepare basic design of civil structures ●
L14	Tran Anh Tuan	Bridge/Structural Engineer 6	
L15	Le Thanh Hung	Interchange Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
L16	Pham Ngoc Tuan	Bridge/Structural Engineer 7	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
L17	Tran Phong Nha	Tunnel Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.4 Conduct geotechnical and geological investigations ●
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
L18	Quach Thi Thu	Soil/Geotechnical Engineer 1 (Slope)	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
L19	Trinh Viet Linh	Soft Ground Treatment Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
L20	Nguyen Minh Ngoc	Drainage Engineer 1	Task Series 3 Detailed Engineering Design and Procurement Planning
L21	Nguyen Phuc Hoa	Drainage Engineer 2	Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●
L22	Nguyen Son	River Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.3 Civil Engineering Design
			Task 3.3.1 Prepare basic design of civil structures ●
L23	Tran Trong Nghia	Pavement/Material Engineer 1	Task Series 3 Detailed Engineering Design and Procurement Planning
L24	Nguyen Viet Hai	Pavement/Material Engineer 2	Task Series 3.2 Surveys and Investigations
			Task 3.2.5 Conduct material source survey ●
			Task Series 3.3 Civil Engineering Design
			Task 3.3.2 Prepare detailed engineering design of civil structures ●

◎: Management and Guidance, ●: In-charge, Red: Accountability for the Services, Blue: Responsibility for the Team

Table E.1 Team Composition and Task Assignments (9/11)

No.	Name	Position	Task
L25	Vo Thanh Binh	Senior Surveyor 1	Task Series 2 Previous Studies Review and Establishing D/D Framework
L26	Le Van Thu	Senior Surveyor 2	Task 2.1 Review previous studies ●
L27	Nguyen Anh Tuan	Senior Surveyor 3	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.2 Conduct topographic survey ●
L28	Nguyen Doan Tinh	Soil/Geotechnical Engineer 2	Task Series 3 Detailed Engineering Design and Procurement Planning
L29	Nguyen Manh Tuan	Soil/Geotechnical Engineer 3	Task Series 3.2 Surveys and Investigations
L30	Trinh Minh Khiem	Soil/Geotechnical Engineer 4	Task 3.2.4 Conduct geotechnical and geological investigations ●
			Task 3.2.5 Conduct material source survey ●
L31	Tran Ngoc Nhan	Geological Engineer (Tunnel)	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.4 Conduct geotechnical and geological investigations ●
L32	Ngo The Hung	Hydraulic Engineer 1	Task Series 2 Previous Studies Review and Establishing D/D Framework
L33	Pham Huu Nhu	Hydraulic Engineer 2	Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.3 Conduct hydrological survey and analysis ●
			Task 3.2.6 Conduct relevant facilities survey ●
L34	Nguyen Huy Phuong	Inundation Analyst	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.3 Conduct hydrological survey and analysis ●
L35	Vo Hoang Anh	Transport Economist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.6 Conduct relevant facilities survey ●
			Task 3.2.7 Review traffic forecasting and conduct baseline surveys ●
L36	Ha Quoc Hieu	Operating & Maintenance Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.1 Prepare institutional and administrative arrangement plan ●
			Task 3.4.2 Prepare O&M plan ●
			Task Series 5 Technology Transfer
			Task 5.1 Provide training to VEC/PMU85 ●
L37	Le Tung Lam	Expressway Management Unit Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.1 Prepare institutional and administrative arrangement plan ●
			Task 3.4.2 Prepare O&M plan ●
L38	Phan Minh Tuan	Traffic Management Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.2 Prepare O&M plan ●
L39	Trinh Ngoc Hai Thang	Asset Management Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.4 O&M Plan and Design
			Task 3.4.2 Prepare O&M plan ●
L40	Pham Quang Minh	Architect 1	Task Series 3 Detailed Engineering Design and Procurement Planning
L41	Ngo Vu Quang Khoa	Architect 2	Task Series 3.4 O&M Plan and Design
			Task 3.4.3 Prepare basic design of O&M buildings ●
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●

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Table E.1 Team Composition and Task Assignments (10/11)

No.	Name	Position	Task	
L42	Nguyen Huu Tinh	ITS Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.1 Prepare ITS plan	●
			Task 3.5.2 Prepare basic design of ITS facilities	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
			Task Series 5 Technology Transfer	
Task 5.1 Provide training to VEC/PMU85	●			
L43	To Minh Tri	Communication System Engineer	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.2 Prepare basic design of ITS facilities	●
			Task Series 3.11 Procurement Documents	
Task 3.11.1 Prepare procurement documents	●			
L44 L45	Trinh Dinh Khiem Vo Hong	Electrical Engineer 1 Electrical Engineer 2	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.6 Electrical Facilities Design	
			Task 3.6.1 Prepare detailed engineering design of electrical facilities	●
			Task Series 3.7 Public Utilities Relocation Plan	
			Task 3.7.1 Prepare relocation plan of public utilities	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
L46	Bui Phu Huy	Toll Collection System Specialist	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.5 ITS Plan and Design	
			Task 3.5.1 Prepare ITS plan	●
			Task 3.5.2 Prepare basic design of ITS facilities	●
			Task Series 3.11 Procurement Documents	
Task 3.11.1 Prepare procurement documents	●			
L47	Nguyen Thi Bich Thuy	Cost Estimator 1 (Civil Work Packages)	Task Series 2 Previous Studies Review and Establishing D/D Framework	
			Task 2.1 Review previous studies	●
			Task 2.2 Establish detailed engineering design framework	●
			Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.1 Contract Packaging	
			Task 3.1.1 Propose contract packaging	●
			Task Series 3.2 Surveys and Investigations	
			Task 3.2.1 Collect relevant data and documents	●
			Task Series 3.10 Project Cost Estimate	
			Task 3.10.1 Estimate Project cost	●
			Task Series 3.12 Project Implementation Program	
Task 3.12.1 Prepare Project I/P	●			
L48 L49	Phan Thi Thuy Trinh Nguyen Thi Sinh	Cost Estimator 2 (Civil Work Packages) Cost Estimator 3 (Other Packages)	Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.10 Project Cost Estimate	
Task 3.10.1 Estimate Project cost	●			
L50	Nguyen The Truong	Procurement/Contract Specialist 1	Task Series 2 Previous Studies Review and Establishing D/D Framework	
			Task 2.2 Establish detailed engineering design framework	●
			Task Series 3 Detailed Engineering Design and Procurement Planning	
			Task Series 3.1 Contract Packaging	
			Task 3.1.1 Propose contract packaging	●
			Task Series 3.2 Surveys and Investigations	
			Task 3.2.1 Collect relevant data and documents	●
			Task Series 3.11 Procurement Documents	
			Task 3.11.1 Prepare procurement documents	●
			Task Series 3.12 Project Implementation Program	
			Task 3.12.1 Prepare Project I/P	●
Task Series 4 Procurement Assistance				
Task 4.1 Assist in tendering procedures	●			

◎: Management and Guidance, ●: In-charge, Red: Accountability for the Services, Blue: Responsibility for the Team

Table E.1 Team Composition and Task Assignments (11/11)

No.	Name	Position	Task
L51	Ha Ngoc Anh Minh	Procurement/Contract Specialist 2	Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●
			Task Series 4 Procurement Assistance
L52	Pham Van Xuan	Senior Environmental Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.6 Conduct relevant facilities survey ●
			Task 3.2.9 Conduct environmental and social surveys ●
			Task Series 3.8 Safeguards
			Task 3.8.1 Assist in updating EIA and EMP ●
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●
			Task Series 5 Technology Transfer
			Task 5.1 Provide training to VEC/PMU85 ●
L53	Pham The Giang	Environmental Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.6 Conduct relevant facilities survey ●
			Task 3.2.9 Conduct environmental and social surveys ●
			Task Series 3.8 Safeguards
			Task 3.8.1 Assist in updating EIA and EMP ●
			Task Series 3.11 Procurement Documents
			Task 3.11.1 Prepare procurement documents ●
L54	Le Dang Giang	Senior Resettlement Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.8 Conduct independent land valuation survey ●
			Task Series 3.8 Safeguards
			Task 3.8.2 Assist in preparing and enforcing CPCR ●
Task Series 5 Technology Transfer			
Task 5.1 Provide training to VEC/PMU85 ●			
L55	Ho Thi Thu Thuy	Social and Resettlement Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
			Task Series 3.2 Surveys and Investigations
			Task 3.2.8 Conduct independent land valuation survey ●
L56	Le Duy Son	Cultural and Archaeological Specialist	Task Series 2 Previous Studies Review and Establishing D/D Framework
			Task 2.1 Review previous studies ●
			Task Series 3 Detailed Engineering Design and Procurement Planning
L57	Bach The Dung	Training Specialist	Task Series 3.8 Safeguards
			Task 3.8.2 Assist in preparing and enforcing CPCR ●
L57	Bach The Dung	Training Specialist	Task Series 5 Technology Transfer
			Task 5.1 Provide training to VEC/PMU85 ●

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Table G.1 Time Schedule for Professional Personnel (Key International Professional Staff)

Calendar	Calendar Year												Staff- Months									
	2011																					
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		Aug	Sep	Oct						
GOVN Packages	Cumulative Month												Duration									
	Detailed Engineering Design and Procurement Planning																					
	Procurement Assistance																					
WB/JICA Packages	Detailed Engineering Design and Procurement Planning												Duration									
	Procurement Assistance																					
	P/A (5)																					
No	TOR	Note	Position	Name	Firm	Home/ Field	2010												Staff- Months			
11			Project Manager/Team Leader	Ichizuru Ishimoto	NK	[Field]	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	14
Civil Design Team (CID)																						
Civil Design Management (CDM)																						
12			Senior Highway Engineer	Akira Magario	NK	[Field]															13	
13			Road Safety Audit Specialist	Takehiko Tsuji	NK	[Field]																3
14			Senior Bridge Engineer	Yoshinori Abe	Chodai	[Field]																13
Section Design (SED)																						
Road Design 1 (RDD1, PKG01.03-08, L=62.3 km)																						
15			Highway Engineer 1	Koji Nakai	NK	[Field]																12
16			Bridge/Structural Engineer 1	Tetsuya Maeda	NK	[Field]																12
17			Bridge/Structural Engineer 2	Yoshiaki Nakakubo	Chodai	[Field]																4
Road Design 2 (RDD2, PKG10.13,15-16, L=66.2 km)																						
18			Highway Engineer 2	Decha Sa-nguamprasith	TEC	[Field]																12
19			Bridge/Structural Engineer 3	Hiroo Jin	NE	[Field]																12
110			Bridge/Structural Engineer 4	Yuichi Sano	NK	[Field]																4
Interchange Design (ICD)																						
111			Senior Interchange Specialist	Chanchai Techashongs	TEC	[Field]																7
Major Bridges Design (MBD)																						
112			Bridge/Structural Engineer 5	Hiroyuki Yokoyama	Chodai	[Field]																11
Tunnel Design (TND)																						
113			Tunnel Engineer	Wako Noto	NK	[Field]																4
Geotechnical Design (GTD)																						
114			Soil/Geotechnical Engineer 1 (Slope)	Manoon Arayasri	TEC	[Field]																2
115			Soft Ground Treatment Specialist	Suvichai Methprechakul	TEC	[Field]																3
Drainage Design (DRD)																						
116		*	Drainage Engineer	Suntichai Horpaopan	TEC	[Field]																7
Retevment and River Bed Protection Design (RRD)																						
117		*	River Engineer	Arristee B. Rabajante	NK	[Field]																2
Bridge Temporary Facility Design (TFD)																						
118			Bridge/Structural Engineer 6	Akira Yamagisawa	Chodai	[Field]																7
Pavement Design (PVD)/Material Sources Survey (MLS)																						
119			Pavement/Material Engineer	Bundit Kitsuwanarut	TEC	[Field]																4
Topographic Survey (TPS)																						
120			Survey Engineer	Kazuhiko Ishizuka	NK	[Field]																6
Geotechnical Survey (GTS)																						
121			Soil/Geotechnical Engineer 2	Jirarote Piyapompong	TEC	[Field]																5
122		*	Geological Engineer (Tunnel)	Seichiro Kanai	NK	[Field]																2
Hydrological Survey (HDS)																						
123			Senior Hydrologist	Khadananda Lamisal	NK	[Field]																3
124		*	Inundation Analyst	Silver Yance	NK	[Field]																3
O&M and ITS Team (OMI)																						
O&M (OAM)																						
125			Operating&Maintenance Specialist	Shigeaki Takahashi	NK	[Field]																4
126			Expressway Management Unit Specialist	Yuichi Tsujimoto	NK	[Field]																2
127		*	Traffic Management Specialist	Hisanori Tomitaka	NK	[Field]																2
128		*	Asset Management Specialist	Kyoichi Takeuchi	NK	[Field]																2
129		*	Architect	Yoshinori Yamazaki	NK	[Field]																3
Electrical Facility and ITS Design (EID)																						
130			ITS Specialist	Koichi Nishimura	NK	[Field]																5
131			Communication System Engineer	Masahiro Sakagami	NK	[Field]																3
132			Senior Electrical Engineer	Eiji Matsuda	NK	[Field]																7
133			Toll Collection System Specialist	Masashi Iwamoto	NK	[Field]																4
Cost and Document (COD)																						
Cost Estimate (COS)																						
134		*	Construction Planner/Cost Estimator	Masayuki Iwashita	NK	[Field]																9
Document (DOC)																						
135			Senior Procurement/Contract Specialist	Anothai Boonthikul	TEC	[Field]																9
Environmental (ENV)																						
Social and Environmental (SAE)																						
136		*	Social and Environmental Specialist	Yasuhira Mianami	NK	[Field]																5
Resettlement (RES)																						
137		*	Resettlement Specialist	Vu Ngoc Long	NK	[Field]																10
Training (TRG)																						
138			Training Specialist	Noppong Unhubbokha	TEC	[Field]																4
GOVN Packages (GVP, PKG02,09,14, L=3.0 km)																						
11			Project Manager/Team Leader	Ichizuru Ishimoto	NK	[Field]																(0)
12			Senior Highway Engineer	Akira Magario	NK	[Field]																(0)
134		*	Construction Planner/Cost Estimator	Masayuki Iwashita	NK	[Field]																2
135			Senior Procurement/Contract Specialist	Anothai Boonthikul	TEC	[Field]																3
136		*	Social and Environmental Specialist	Yasuhira Mianami	NK	[Field]																(0)
137		*	Resettlement Specialist	Vu Ngoc Long	NK	[Field]																(0)
Total																						
239																						

■ : Work in Danang office

■ : Work in Hanoi office

■ : Work in Danang office (GOVN Packages)

* : Proposed positions (see C.2(5))

* : Rearranged positions (see C.2(5))

Table G.3 Time Schedule for Supporting Staff

Calendar			Calendar Year		2010					2011					Duration			
Calendar Month			Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		Aug	Sep	Oct
Cumulative Month			1	2	3	4	5	6	7	8	9	10	11	12		13	14	
GOVN Packages			Detailed Engineering Design and Procurement Planning															3
			Procurement Assistance															1
WB/JICA Packages			Detailed Engineering Design and Procurement Planning															12
			Procurement Assistance															5

No	TOR 5.2	Note	Position	Name	Firm	Home/Field	2010					2011					Staff-Months
							Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
Supporting Group 1 (SPG1)																	
S1			Office Manager	To be named	NK	[Field]											14
S2			Bilingual Secretary 1	To be named	NK	[Field]											14
S3			Accountant	To be named	NK	[Field]											14
S4			Translator 1	To be named	NK	[Field]											14
S5			Translator 2	To be named	NK	[Field]											12
S6			Translator 3	To be named	NK	[Field]											12
S7			Translator 4	To be named	NK	[Field]											12
S8			Translator 5	To be named	NK	[Field]											12
S9			CAD Operator 1	To be named	NK	[Field]											14
S10			CAD Operator 2	To be named	NK	[Field]											4
S11			Guard 1	To be named	NK	[Field]											14
S12			Guard 2	To be named	NK	[Field]											14
Supporting Group 2 (SPG2)																	
S13			Bilingual Secretary 2	To be named	NK	[Field]											12
S14			CAD Operator 3	To be named	NK	[Field]											12
S15			CAD Operator 4	To be named	NK	[Field]											12
S16			CAD Operator 5	To be named	NK	[Field]											12
S17			CAD Operator 6	To be named	NK	[Field]											12
Supporting Group 3 (SPG3)																	
S18			Bilingual Secretary 3	To be named	NK	[Field]											12
S19			CAD Operator 7	To be named	NK	[Field]											12
Supporting Group 4 (SPG4)																	
S20			Bilingual Secretary 4	To be named	NK	[Field]											8
S21			CAD Operator 8	To be named	NK	[Field]											8
Total						[Field]											250

■ : Work in Danang office
■ : Work in Hanoi office

Table H.1 Activity (Work) Schedule (1/2)

Calendar	Calendar Year	2010												2011					
		Calendar Month												Calendar Month					
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
Cumulative Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14				
GOVN Packages	Detailed Engineering Design and Procurement Planning		B/D (1)	D/D (2)															
	Procurement Assistance				P/A (1)														
WB/JICA Packages	Detailed Engineering Design and Procurement Planning			Basic Design (4)															
	Procurement Assistance														Procurement Assistance (5)				
Task Series 1 Project Management		14 months																	
Task 1.1	Establish and control practical project management system	14 months																	
Task Series 2 Previous Studies Review and Establishing Detailed Engineering Design Framework		2 months																	
Task 2.1	Review previous studies	2 months																	
Task 2.2	Establish detailed engineering design framework	1 months																	
Task Series 3 Detailed Engineering Design and Procurement Planning		14 months																	
Task Series 3.1 Contract Packaging		1 months																	
Task 3.1.1	Propose contract packaging	1 months																	
Task Series 3.2 Surveys and Investigations		8 months																	
Task 3.2.1	Collect relevant data and documents	1 months																	
Task 3.2.2	Conduct topographic survey	6 months																	
Task 3.2.3	Conduct hydrological survey and analysis	3 months																	
Task 3.2.4	Conduct geotechnical and geological investigations	5 months																	
Task 3.2.5	Conduct material source survey	2 months																	
Task 3.2.6	Conduct relevant facilities survey	3 months																	
Task 3.2.7	Review traffic forecasting and conduct baseline surveys	3 months																	
Task 3.2.8	Conduct independent land valuation survey	3 months																	
Task 3.2.9	Conduct environmental and social surveys	8 months																	
Task Series 3.3 Civil Engineering Design		12 months																	
Task 3.3.1	Prepare basic design of civil structures	4 months																	
Task 3.3.2	Prepare detailed engineering design of civil structures	8 months																	
Task Series 3.4 O&M Plan and Design		7 months																	
Task 3.4.1	Prepare institutional and administrative arrangement plan	2 months																	
Task 3.4.2	Prepare O&M plan	3 months																	
Task 3.4.3	Prepare basic design of O&M buildings	3 months																	
Task Series 3.5 ITS Plan and Design		5 months																	
Task 3.5.1	Prepare ITS plan	2 months																	
Task 3.5.2	Prepare basic design of ITS facilities	3 months																	
Task Series 3.6 Electrical Facilities Design		5 months																	
Task 3.6.1	Prepare detailed engineering design of electrical facilities	5 months																	
Task Series 3.7 Public Utilities Relocation Plan		2 months																	
Task 3.7.1	Prepare relocation plan of public utilities	2 months																	
Task Series 3.8 Safeguards		14 months																	
Task 3.8.1	Assist in updating EIA and EMP	8 months																	
Task 3.8.2	Assist in preparing and enforcing CPCR	13 months																	
Task Series 3.9 Construction Planning		6 months																	
Task 3.9.1	Prepare construction plan	6 months																	
Task Series 3.10 Project Cost Estimate		10 months																	
Task 3.10.1	Estimate Project cost	10 months																	
Task Series 3.11 Procurement Documents		8 months																	
Task 3.11.1	Prepare procurement documents	8 months																	
Task Series 3.12 Project Implementation Program		2 months																	
Task 3.12.1	Prepare Project I/P	2 months																	
Task Series 4 Procurement Assistance		6 months																	
Task 4.1	Assist in tendering procedures	6 months																	
Task Series 5 Technology Transfer		14 months																	
Task 5.1	Provide training to VEC/PMU85	4 months																	
Task 5.2	Provide training to the key local professional staff	14 months																	
Major Milestones	GOVN Packages (PKG 02,09,14)	Completion of preparation of the basic design																	
		Completion of preparation of the bidding documents																	
	WB/JICA Packages (PKG 01,03-08,10-13,15-18)	Completion of the procurement assistance																	
		Completion of preparation of the basic design																	
		Completion of preparation of the bidding documents																	
		Completion of the procurement assistance																	

■ : Activities for the GOVN packages
 ■ : Topographic survey for the basic design of civil structures (the WB/JICA packages)
 ■ : Topographic survey for the detailed engineering design of civil structures (the WB/JICA packages)
 ■ : Rainy season

Table H.1 Activity (Work) Schedule (2/2)

Calendar		Calendar Year		2010												2011																	
				Aug		Sep		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
GOVN Packages		Detailed Engineering Design and Procurement Planning		B/D (1)		D/D (2)																											
WB/JICA Packages		Detailed Engineering Design and Procurement Planning				Basic Design (4)				Detailed Engineering Design (8)																							
		Procurement Assistance						P/A (1)																									
		Procurement Assistance																															
Reports/ Documents	Inception Report	30 copies	(English: 15, Vietnamese: 15)	▲																													
	Previous Studies Review Report	60 copies	(English: 15, Vietnamese: 15)*2		▲																												
	Detailed Engineering Design Framework	30 copies	(English: 15, Vietnamese: 15)		▲																												
	Monthly Progress Report	420 copies	(English: 15, Vietnamese: 15)*14		▲																												
	Brief Report on Appropriateness of the F/S Alignment	30 copies	(English: 15, Vietnamese: 15)			▲																											
	Updated draft EIA and EMP	60 copies	(English: 15, Vietnamese: 15)*2				▲																										
	Draft Final Updated EIA and EMP	60 copies	(English: 15, Vietnamese: 15)*2					▲																									
	Comprehensive Plan on Compensation, Support and Resettlement	180 copies	(English: 15, Vietnamese: 15)*2*3						▲																								
	Basic Design Report (Civil, Draft Design Report)	12 copies	(English: 3, Vietnamese: 3)*2							▲																							
	Design Report	6 copies	(English: 3, Vietnamese: 3)								▲																						
	Pre-qualification Document	90 copies	(English: 3, Vietnamese: 3)*15																														
	Bidding Documents	108 copies	(English: 3, Vietnamese: 3)*18																														
	Road Safety Audit Report	30 copies	(English: 15, Vietnamese: 15)																														
	The Services Completion Report	30 copies	(English: 15, Vietnamese: 15)																														
Technical Reports	Contract Packaging	6 copies	(English: 3, Vietnamese: 3)																														
	Relevant Data and Documents	6 copies	(English: 3, Vietnamese: 3)																														
	Topographic Survey Report	6 copies	(English: 3, Vietnamese: 3)																														
	ROW Survey Report	12 copies	(English: 3, Vietnamese: 3)*2																														
	Flood Record Survey Report	6 copies	(English: 3, Vietnamese: 3)																														
	Hydrological Survey and Analysis Report	6 copies	(English: 3, Vietnamese: 3)																														
	Geotechnical Investigation Report	6 copies	(English: 3, Vietnamese: 3)																														
	Geological Profile Map (Tunnel Section)	6 copies	(English: 3, Vietnamese: 3)																														
	Material Source Survey Report	6 copies	(English: 3, Vietnamese: 3)																														
	Relevant Facilities Survey Report (Design Controls)	12 copies	(English: 3, Vietnamese: 3)*2																														
	Traffic Forecasting Review Report	6 copies	(English: 3, Vietnamese: 3)																														
	Baseline Survey Report (Additional Traffic Survey)	6 copies	(English: 3, Vietnamese: 3)																														
	Independent Land Valuation Survey Report	12 copies	(English: 3, Vietnamese: 3)*2																														
	Environmental and Social Survey Report (Site Investigation)	12 copies	(English: 3, Vietnamese: 3)*2																														
	Design Criteria and Conditions (Civil Engineering Design)	6 copies	(English: 3, Vietnamese: 3)																														
	Provisional Standard Design (GOVN Packages)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Culvert Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Bridge Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Revetment and River Bank Protection Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Road Accessory)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Pavement Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Slope Protection Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Softground Treatment)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Drainage Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Standard Design (Bridge Temporary Facility Works)	6 copies	(English: 3, Vietnamese: 3)																														
	Alignment Study Report	12 copies	(English: 3, Vietnamese: 3)*2																														
	Comparative Study Report (Major Bridges)	6 copies	(English: 3, Vietnamese: 3)																														
	Comparative Study Report (Interchanges)	6 copies	(English: 3, Vietnamese: 3)																														
	Working Design Reports	108 copies	(English: 3, Vietnamese: 3)*18																														
	Quantity Reports	108 copies	(English: 3, Vietnamese: 3)*18																														
	Institutional and Administrative Arrangement Plan	6 copies	(English: 3, Vietnamese: 3)																														
	O&M Plan	6 copies	(English: 3, Vietnamese: 3)																														
	ITS Plan	6 copies	(English: 3, Vietnamese: 3)																														
	Public Utilities Relocation Plan	6 copies	(English: 3, Vietnamese: 3)																														
	Draft TOR (External Environmental Monitoring)	6 copies	(English: 3, Vietnamese: 3)																														
	Resettlement Monitoring Plan	6 copies	(English: 3, Vietnamese: 3)																														
	Draft TOR (External Resettlement Monitoring)	6 copies	(English: 3, Vietnamese: 3)																														
	Construction Plan	102 copies	(English: 3, Vietnamese: 3)*17																														
	Cost Estimate Conditions	6 copies	(English: 3, Vietnamese: 3)																														
	Cost Estimate Report	108 copies	(English: 3, Vietnamese: 3)*18																														
Procurement Plan	6 copies	(English: 3, Vietnamese: 3)																															
Pre-qualification Evaluation Report	90 copies	(English: 3, Vietnamese: 3)*15																															
Proposals Evaluation Report	18 copies	(English: 3, Vietnamese: 3)*3																															
Bid Evaluation Report	90 copies	(English: 3, Vietnamese: 3)*15																															
Draft Contract Documents	108 copies	(English: 3, Vietnamese: 3)*18																															
Training Plan	6 copies	(English: 3, Vietnamese: 3)																															