JKR Registered Project Manager
Professional Status Certification

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Complex Project Management Division

Written summary of the level of application of project management through the project life cycle for

JKR Level 5
Registered Project Manager

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Written Summary Of The Level Of Application Of Project Management Through The Project Life Cycle For JKR Level 5 – Registered Project Manager

Demonstrate management capability for the 9 key functions through the five project phases.

The following text is intended to highlight the approach taken in Project Management in the **East Coast Highway Phase II Project (also known as LPT2 Project)** of Public Works Department (JKR) where I was a general manager (structures) from Oct 1st 2004 to November 15th 2007 and my current position as Project Manager for Establishment of Scheduling Office, Earned Value Milestone Payment and Crisis Management products in Cawangan Pengurusan Projek Kompleks (PROKOM) JKR.

Where specific areas are not part of my normal tasks, I have identified previous position where I had responsibility and my approach in those instances.

This position was **Senior Assistant Director** in Bridge Unit, Roads Branch, JKR form 1st January 2003 to 30th September 2004.

The project cycle in JKR is defined in five generic phases. Each Phase has defined Activities leading to handover to the next Phase, or eventual handover. The methodology has a Procedure for each Phase, and Work Instructions against Activities and Tasks. Techniques and Toolsets are thereby defined at Activity or Task levels. Where appropriate JKR Business Systems, Quality Management System, Environmental Management System, Occupational Health & Safety Standards and Toolsets are employed to integrate project management with corporate requirements/legislation.

As a Project Manager, I manage these aspects by taking a structured approach to each phase in accordance with JKR Project Management System:

- **Planning**. Activities/techniques and toolsets are employed to develop the concept and obtain authorisation to proceed with further detailed development.
- **Design**. This phase outlines the compilation of the preliminary and detailed design of the project
- **Procurement**. Activities ensure clarity of scope; manage, monitor, assess & control of procurement documentation; identify issues requiring contract management intervention; calling of tender, evaluation & award
- **Construction.** Monitoring and control mechanisms assess progress, identify issues requiring management intervention, and identify next steps at regular reviews through the project implementation.
- **Handover**. Activities confirm successful completion of project objectives to relevant quality criteria, assessment of outcomes, and assess project process effectiveness as a tool for process and personal improvement.

Copies of typical documentation are detailed in JKR Project Management System.

A summary of my past and current projects that I intend to use as evidence follows:

- Project 1 - Program of 16 Packages under the LPT2 Project which comprise of the following Packages:-
  - Package 1A
  - Package 1B
  - Package 1C
  - Package 2
  - Package 3
  - Package 4
  - Package 5A
  - Package 5B

  - Package 6
  - Package 7
  - Package 8
  - Package 9A
  - Package 9B
  - Package 9C
  - Package 11
  - Package 12
- Project 2 - Development of Earned Value for JKR Projects
- Project 3 - Development of Crisis Management System in JKR
- Project 4 - Development of Establishment of Scheduling Office

My role in the implementation of these projects was:-

- Managing the implementations of the structures (such as bridges, elevated structures and culverts) in the LPT2 projects during planning, design, procurement and constructions
- Project manager to the three projects in PROKOM
- Managing competency and training requirement for all the staff of LPT2 project in 2007.

Summary Of Attainment Of Program Management Performance Units Of Competence And Elements

The following criteria are based on the JKR Competency Standards for Project Management Level 5: Registered Project Manager. Each Element of performance is matched with a short description of how performance is met in the work environment and context.

UNIT 1 : PLAN AND MANAGE SCOPE

1.1 Establish Project Authorisation

East Coast Highway Phase 2 Project or also known as LPT2 project was announced by the Malaysian Government in 2004 as a catalyst to the development of the states in the East Coast of Malaysia, particularly the state of Terengganu where the whole alignment of this project is located. JKR was given the responsibility to manage 70 percent of the project which is about 130 km length of expressway. JKR set up **LPT2 project team** in October 2004 to manage the project and I was one of the engineers appointed. (Refer to **Evidence 1.1a** for appointment letter.)

LPT2 Project Team is responsible to manage the planning, design, procurement, construction and handing over of the whole of the 130 km of the LPT2 expressway. The set up of the initial project team is as shown in **Evidence 1.1b.** The team was lead by Ir Adanan bin Mohamed Hussein as the Construction Director.

During my attachment in the LPT2 Project Team, I was appointed the General Manager (Structures) and was responsible for managing all structures work in the project. On technical issues I would reported directly to Dr Abdul Aziz Arshad who is the HOPT as well as the HODT for structures. On the management of the structures I normally reported direct to the Construction Director. As the project progress into construction my role changed to i) the HODT for structures and ii) competency and training manager. (See **Evidence 1.1c** on organization chart and appointment letter as HODT during construction stage)

For LPT2 project team, authorisation was established when the project is handed to JKR and we received the appointment letter (**Evidence** 1.1a above). The role of the initial 12 officers appointed on 1st October 2004 was decided by the then Director for Roads Dato' Razali. As for my role as the structures general manager the authorisation to manage the works for structures were established at the set up and also formalised in the meetings that followed later (see Evidence **1.1d** on minutes of meeting)

The construction of LPT2 project was divided into 16 packages for ease of management

For the purpose of this report I shall consider LPT2 Project as a program while each of the 16 packages becomes project. I may also refer to the design of the structure components of the expressway as my sub-project.

For projects undertaken while in PROKOM, project authorisation was established by the Program Manager. I was appointed as the Project Manager for Earned Value, Establishment of Scheduling Office and Crisis Management and prepared scope definition for approval by the PROKOM Director who is the Program Manager.(See **Evidence 1.1e** on scope definition for Earned Value and Establishment of Scheduling Office)

1.2 Define Project Scope

Structures General Manager, LPT2 Project

Scope of the whole LPT2 alignment (Program)

For roads and highway projects in Malaysia, the client Ministry is the Ministry of Works. The scope of projects is usually based on feasibility and traffic studies done by Highway Planning Unit.

However there are many cases where the scope of projects are determined by JKR (through Cawangan Jalan or JKR State) and consortiums proposing expressway.

When LPT2 was given to JKR to manage, the preliminary alignment had already been designed by MTD under the authorisation of Malaysian Highway Authority (LLM). At the initial stage, the whole alignment was to be managed by MTD under design and build contract. When the Government of Malaysia decided to hand over 70% of the alignment to JKR, MTD sent a copy of the preliminary design report and drawing to JKR for further development. (See **Evidence 1.2a** on minutes of meeting with LLM)

At that stage what was handed over was two discontinue alignment, i) the alignment between Jabor and Bukit Besi and ii) alignment between Bukit Payong and Telemong (in Kuala Terengganu). MTD is to retain the alignment between Bukit Besi and Bukit Payong. **Evidence 1.2b** shows the map of the proposed alignment. The scope also includes the design of five interchanges, two rest areas, a set of lay-bye and allocation for weighbridges. (See **Evidence 1.2a** on minutes of meeting with LLM and MTD)

The program scope was developed further by the LPT2 project team through studying the preliminary alignment, topography maps, walking through the proposed alignment and meetings with the consultant firm who design the preliminary alignment.(See **Evidence 1.2c** on report of site visits)

We also carried out desk studies of the alignment based on topography maps and geotechnical maps. This was to ensure that the alignment chosen is feasible. Flood records were collected from the Drainage and Irrigation Department since Terengganu is prone to flood during every monsoon season. Based on history of recorded flood level we need to establish that the proposed alignment would be passable during major flood. (**Evidence 1.2d** on letter to JPS Terengganu and the meeting with JPS and DOE Terengganu)

My role is determining the scope of structures for the whole alignment such as bridges and culverts. This is done by studying the alignment and results of site visits and looking for locations of possible crossings such as river crossings, road crossings, interchanges and swampy areas. (See **Evidence 1.2e** list of structures in LPT2 projects)

Scope of packages (projects)

Government of Malaysia through Treasury has decided that the whole of the program were to be tendered to Bumiputera contractors with half of the total of the packages tendered only to local Bumiputera Contractors. Local means contractors who are registered in the state of Terengganu. As such it was decided to split LPT2 projects into 16 packages for construction.

The scope for each package was decided based on the following criteria:-

i) Manageable sizes with cost to be less than RM100 million for packages to be tendered to Bumiputera Terengganu contractors and not more than RM200 million for other Bumiputera contractors.

ii) Project implementation must be completed by the end of RMK9.

iii) Simpler scope and construction methodology for Bumiputera Trerengganu contractors since there are not many established road contractors based there. Examples of such scope are relatively shorter alignments (2 to 5 km), no major bridge required to be constructed (other than culverts and drainage), and soil condition does not require complicated treatment method.

During planning and design stage the topography map and site survey of the alignment would be the basis to determine the number of structures required in a package. Chainage numbers are used to demarcate the beginnings and endings of packages. The Need Statement and preliminary alignment design would be the basis for scope of work on the detail design of each structure (See **Evidence 1.2f** on the Need Statement and **Evidence 1.2g** on minutes of package meeting)

As the General Manager of Structures, it was my duty to manage the scope and requirement of bridge or structure for each design packages. Basically the scope covers the number of locations where there are of river or road crossings.

Each package scope is documented for reference. (**Evidence 1.2h** Tables on scope of each packages)

Project manager, PROKOM

In PROKOM I am the project manager for Earned Value Milestone Payment, Crisis Management and the Establishment of Scheduling Office in JKR. The scope was based on the initial needs as defined by JKR Strategic Framework, business case or through brainstorming. (**Evidence 1.2i** on business case for Establishment of Scheduling Office)

The scope was defined and documented as in the Scope Definition with endorsement obtained from the program manager. See **Evidence 1.1d on the scope definition of Earned Value and Establishment of Scheduling Office.**

1.3 Implement Scope Controls.

In line with JKR SPK there are a few mechanisms to ensure the project scope is under control. Design review is carried out at the end of both preliminary and detail design stage. At the same time during design stage regular technical meetings were carried out to ensure the design was carried out according to the required scope. The meetings are usually chaired by the senior general managers and would involve the package manager, structures general manager, geotechnical manager and the designer (either in-house or consultants).

Structures General manager, LPT2 Project

Design Stage

The appointed consultant firms had to propose at least three options of preliminary bridge design to be presented to the team to ensure that all possibilities had been explored and design is optimised. (See **Evidence 1.3a** for letter instructing consultant to prepare three design options and minutes of meeting.) The options should look at the technical aspect such as safety, constructability, ease of maintenance, aesthetics and optimum cost. In some of the packages the options may involve comparing shorter bridge with approach on high embankment against longer bridge without high embankment.

Once the most optimum option was chosen and agreed upon the detail design was carried out. Before the design could be finalised into tender documentation, a design review would be carried out. (See **Evidence 1.3 b** for minutes of meeting of design review and design verification.)

Construction Stage

The tender documents which comprised of Tender Drawings, Bill of Quantities and Specification is the basis for scope of work during the construction phase. Any changes would need to go through proper procedure as spelled out in the Contract and also JKR SPK.

It was anticipated that some changes would occur during construction stage due to unforeseen circumstances such as soil profile being different from the soil data acquired earlier. At construction stage any change is scope would have to be approved by the S.O or his representative. At the same time any change in scope which involves design change has to be referred to the technical general manager.

During the construction phase I would review any request on structure design changes. This is to ensure the changes are really needed and all technical requirements are still fulfilled. Before approving the changes I have to review the new design and check it against the original scope. The designer has to provide design calculations and drawings for approval. If the proposal came from the contractor then he has to engage a professional engineer to carry out the design. The

original designer would have to check the proposal and gave his comment for me to make a decision. (See **Evidence 1.3c** on correspondence regarding design change /scope change)

All changes have to be documented for records and future reference. The forms to be used are as detailed out in JKR SPK. See **Evidence 1.3d** on design change request form. I only commented on the changes based on the scope and quality requirement. Changes that involved additional or reduction in cost is to be decided by the Construction Director as the SO.

Evidence:

- 1.1a - Appointment Letters (pink form)
- 1.1b –Organization Chart of LPT2 Project Team (Initial set-up)
- 1.1c – organization chart and appointment letter as HODT during construction stage
- 1.1d – Minutes of meeting – in charge of structures
- 1.1e - Scope definition for Earned Value and Establishment of Scheduling Office
- 1.2a – Minutes of meeting with LLM and MTD
- 1.2b- Map of proposed Alignment
- 1.2c – Reports of site visits
- 1.2d –Letter to JPS Terengganu and meeting with JPS and DOE Terengganu
- 1.2e – List of structures for LPT2 Projects
- 1.2f – Need Statement (Refer to Memorandum of Agreement with GEA – Package 5B)
- 1.2g – Minutes of Package Meeting
- 1.2h – Table on scope of project (can be taken from Progress Report)
- 1.2i – Business Case (Establishment of Scheduling Office)
- 1.3a – Instruction to consultants to prepare 3 design options
- 1.3b - Minutes of Meetings With Client and Project Team on Design Review
- 1.3c – Corresponding regarding scope change
- 1.3d – Design Change Request Form (Pkg 12)

UNIT 2 : PLAN AND MANAGE TIME

2.1 Determine Project Schedule

General Manager (Structures) LPT2 Project

In LPT2 Project, a Master Program was prepared for the implementation of the whole alignment as a program. The dateline given for the whole alignment to be completed is by the end of 2010 (based on RMKe 9). The Project Team had to schedule all packages taking view of a few criteria such as:-

i) optimising manpower within the team since we could not get more resources from JKR especially from the support group (technicians and technical assistants).

ii) avoiding peak activities of all packages implemented concurrently to prevent shortage of materials and machineries.

iii) implementing confirmed routes first.

Taking these into consideration the main program was drawn up and becomes the basis of scheduling for each package. For the Master Program, the work breakdown is divided into the packages, preliminary works such as surveys and soil investigations works, design work and land acquisition process.

Based on the confirmed route, Package 11 and 12 were implemented first. The design and supervision is to be done departmentally with the project manager of the design package continues as the supervision manager (he is the SO representative). The other packages follow later with the last package being timed so that construction can be completed before the end of 2010. See **Evidence 2.1a** for Master Work Program for LPT2 Project.

Each package has to prepare its own detail schedule to fit into the main program, beginning with the design phase to the completion of construction. The packages with the least cumbersome or problems were tendered earlier followed by the ones with alignment problem or land acquisition problem.

As the structures general manager I have to ensure the planning for the design work of all the structures fit into the main program and time frame given is reasonable. The schedule for structures depends on the number of structures to design and its complexities. Other input such as soil investigation results and survey data are also crucial, therefore the schedule has to take into account those requirements.

At the start of the design stage the consultants of each package are instructed to prepare their work programs. For structure design I made sure the program is broken down to include reasonable components for each structure. The program has to be complete with resource loaded and fit with the master program See **Evidence 2.1b** and **Evidence 2.1c** for minutes of meeting discussing on work program for package.

Project Manager, PROKOM

As the project manager in PROKOM I would plan the schedule of the implementation of the project by a few brainstorming sessions. The first schedule planned would be during the scope definition stage where the major items are identified together with the approximate schedules. See **Evidence 1.1e** of schedule in Scope Definition of Earned Value and Establishment of Scheduling Office earlier.

The schedule is detailed further by breaking down the items into WBS and preparing schedule using Microsoft Project program. (See **Evidence 2.1d** on WBS of Establishment of Scheduling Office)The time taken for each activity are estimated based on duration of similar projects, our experience as well as current workload. (See **Evidence 2.1e** - Work Program for Establishment of Scheduling Office) The WBS and Work Program are still being developed and improved as discussed in project meetings. (See **Evidence 2.1f** on minutes of meeting Project Establishment of Scheduling Office)

2.2 Implement Project Schedule

General Manager (Structures) LPT2 Project

The program and each package schedule is monitored and controlled regularly by the Construction Director through the use of SKALA and monthly management meeting. During the design stage the package manager and function manager in turn will monitor the progress of each package or functional scope (such as geotechnical and structure) through regular meetings and discussion with the consultants.

I would monitor the progress of all structure works against the schedule set by the Package Manager. In cases where there are delays, consultant was asked to find solutions to recover the progress. See **Evidence 2.2a** for minutes of progress meeting on package and **Evidence 2.2b** on Progress Report submitted by the design consultant. See **Evidence 2.2c** on letter instructing consultant to stick to original schedule of delivering construction drawings.

Project Manager, PROKOM

For the implementation of the Establishment of Scheduling Office, original schedule is done by the IMS. However PROKOM was asked to take over the project and we revised the scope and schedule (See E**vidence 2.2d** – email to IMS from Ir Nazari). When PROKOM took over the project an initial implementation schedule was based on appointment of IKRAM as the consultant. The proposed schedule is as in **Evidence 2.2e** (submission by IKRAM and updated schedule). The project includes the training of expert scheduler and is supposed to complete within 2008 assuming the approval of the technical and financial proposal by the consultant by the procurement committee can be obtained early. Based on the early proposal the scope definition was proposed and approved as shown by the earlier evidence. The progress is monitored against the schedule and reported to the program manager monthly. See **Evidence 2.2f** on Status Report of Establishment of Scheduling Office Project.

2.3 Assess Time Management Outcomes

General Manager (Structures) LPT2 Project

At the design stage I review the progress of the design for each package through regular meetings and also discussion with the designer. Progress reports are also prepared monthly by the consulting firms. See earlier **Evidence 2.2b** for a copy of the progress report.

When there is evident showing the design cannot be completed on time the consultant were asked to submit application on extension of time with valid and acceptable reason. See **Evidence 2.3a** on letter to consultant asking them to apply for extension of time.

As a project team we have to monitor our own progress against the master work program. Overall progress is reported to the top management of JKR in monthly progress report. See Evidence **2.3b** on one of the Project Team Progress Report.

For structures work under construction the schedule and progress can be tracked through SKALA. See **Evidence 2.3c** on list of SKALA users for LPT2 Project. Again the progress is monitored against the CPM prepared by the contractor (See **Evidence 2.3d** on CPM submitted by contractor). I also attend site meeting and take the opportunity to visit the construction site during after the meeting.

Construction at site can delay due to unforeseen circumstances or inadequate information given the designer. As the HODT, I would ensure that any technical support required on structure is given on time so as not to delay the progress of the construction. See **Evidence 2.3e** on memo to designer.

Project Manager, PROKOM

As a project manager I have to inform the program manager if there is any delay in the implementation of any project so that further action can be taken either to overcome it or to change the project schedule. Due to the delay in the appointment of consultant for Establishment of Scheduling Office project, (as was reported in the status report) it was decided that we started with the training program first. Training Budget was proposed to be used instead of development budget meant for consultancy program. See **Evidence 2.3f** on e-mail from Pengarah PROKOM and **Evidence 2.3g** on training program after discussion with the identified trainer.

It was proposed to develop the practice standard as in-house project, and dateline for it to be carried out is based on revised implementation schedule. See **Evidence 2.1f** on minutes of meeting and **2.1e** on Microsoft Office Work Program earlier.

As a way of capturing lesson learned on the time management of the project, any observations or lesson learned are recorded in the Project Completion Report progressively. See **Evidence 2.3h** on format of Project Completion Report.

Evidence:

- 2.1a – Master Work Programme in MS Project - LPT2 (print out)
- 2.1b – Minutes of Meeting – overall program LPT2
- 2.1c – Minutes of meeting package Work Programme LPT2
- 2.1d – WBS – Scheduling Office
- 2.1e- Work Program Scheduling Office
- 2.1f – Minutes of Meeting – Scheduling Office
- 2.2a - Minutes of Progress Meeting LPT2
- 2.2b – Progress Report Package 3, 5B
- 2.2c - Letter to consultant on package schedule LPT2
- 2.2d – e-mail to IMS regarding Scheduling Office
- 2.2e – schedule submitted by IKRAM – Scheduling Office
- 2.2f – Status Report – Scheduling Office
- 2.3a – Consultants Progress Report LPT2/ Minutes of Meeting Status Report Pkg 1
- 2.3b – Project Team Progress Report LPT2
- 2.3c - List of SKALA users in LPT2 Project
- 2.3d- Work Program submitted by consultant for construction stage LPT2
- 2.3e - Memo to bridge designer LPT2
- 2.3f – e-mail from Pengarah PROKOM – Scheduling Office
- 2.3g – rescheduled training program – Scheduling Office
- 2.3h – Project Completion Report Establishment of Scheduling Office

UNIT 3 : PLAN AND MANAGE COSTS

3.1 Determine Project Costs

General Manager (Structures) LPT2 Project

At the planning stage of LPT2 project, cost estimates were made in order to apply for funds from the Government. Throughout the life span of the project, annual budget requirement is planned based on the overall work program prepared.

Initially, overall cost estimate of the program is based on per km length of the expressway. The estimation was done based on the cost of phase 1 of LPT with some factors added for increase in materials and labour cost. LPT Phase 1 was a negotiated tender at a cost of about RM7.5 million per km and constructed in Pahang where they are more hilly terrain. Due to nature of soil in Terengganu where the proposed alignment is; the project team estimated the initial cost of LPT2 to be about RM11.5 million per km including the cost of soil treatment, land acquisition and design fees. See **Evidence 3.1a** for tables on cost breakdown for whole program.

At the planning stage we prepare an initial construction cost estimates of structures for each package by cost of the deck plan area of the proposed structures depending on the type of structures (bridge, elevated structures or culverts). Bridges cost higher than elevated structures and culverts per metre square of deck area. This estimating method relies on our previous experience and is known as top down method. This estimate is used by the team to plan for budget including the estimated design consultancy fees. A bridge using prestressed reinforced concrete beams cost usually RM3000 to RM4000 per metre square of plan area, while elevated structure costs around RM1000 to RM2000 per metre square. However overall cost per package is still estimated to per km of road length.

The more accurate construction cost is based on the works costs as described in the Bill of Quantities for each bridge. As the design progress detail bill of quantities for each bridge are prepared. For JKR road projects, standard format for Bill of Quantities are used to ensure uniformity. As such we can ensure items are not missed out and the cost estimated would not be far off from actual construction cost. Methods of measurement (MOM) against the bill of quantities are also part of the tender document. The MOM serves as a guide to contractors to quote their price. At the starting of the projects all the designers and consultants are provided with the standard Bill of Quantities to ensure standardised submissions. The soft copies of the standard BQ is available from Cawangan Jalan and Projek LPT2 Office (kept in server L)

To optimise cost of structures, at the design stage the consultants were asked to propose three alternatives where the criteria for selecting the best design include construction cost. See earlier **Evidence 1.3a** on the instruction to the consultants. Once the project is tendered and awarded to the successful tenderer then the exact cost is tabulated into the As-Tendered Detailed Abstract (ATDA) See **Evidence 3.1b** for ATDA of Package 11. This is the cost that will be recorded in the Q-Plan and SKALA.

Project Manager PROKOM

For the non-physical projects in PROKOM the cost of project would be estimated to cover the cost of the followings:-

- consultant fees if consultant is to be appointed
- emolument or salary of staff involved – if it involves additional staff
- the cost of conducting workshops and seminars
- other miscellaneous cost such as producing of reports, travelling expenses etc.

Refer to **Evidence 1.1d** earlier for cost estimation in Project Scope Definition. See also **Evidence 3.1c** for Cost estimates for running training program for Establishment of Scheduling Office.

3.2 Monitor And Control Project Costs

General Manager (Structures) LPT2 Project

LPT2 was implemented as a program and the budget approved was for the whole alignment. Changes in cost in any one of the package will affect the overall budget so it was very crucial to monitor the cost of each package. Besides the construction or tendered cost of each package there are also cost incurred for design fees and land acquisition and this cost need to be monitored too.

As the client for LPT2 project is the Ministry of Works we are required to report to Ministry on the expenditure regularly. See **Evidence 3.2a** on letter calling for budget examination meeting and breakdown of financial resources. We also prepare cost projection for each year to get the allocations from the Ministry. When there are elements outside our control such as the rising cost of material due to the increase in global cost of crude oil then the project team had to go back to Treasury through Ministry of Works for an increase in overall cost of project. See Evidence **3.2b** on newspaper cutting on the project cost increase.

The project cost is controlled and monitored through SKALA where the ATDA cost is the baseline cost. The supervision team would update the progress cost in SKALA as well as reporting it monthly. (See **Evidence 3.2c** on minutes of monthly meeting reporting on financial progress.

As the structural general manager, I have to monitor and control the cost of structures at design stage. At design review stage I ensure that the cost of structures designed are reasonable (based on my experienced as a designer) through the top down method.

This is done through regular progress meeting and verification meeting where the consultant has to present his design including the cost estimate. See **Evidence 3.2d** on consultant's proposal with some cost reduction as instructed for the design verification process. If the cost is not reasonable then a thorough check of the design and Bill of Quantities are done (bottom-up method). In the event that we are still not satisfied the consultant has to submit the detail taking off calculations. See **Evidence 3.2e** where a consultant submitted taking off and design calculations to prove his design is reasonable.

During construction, if there are any changes required changes to structures, I have to monitor the changes that may affect the cost of the project. The consultants fee is tagged as a percentage to the cost of the package, so it would also change if cost of package change. Besides monitoring any cost change I have to monitor the progress of structures design work because it is related to expenditures budgeted for in a year. (See **Evidence 3.2f** for e-mail correspondence on cost saving measures for Package 11).

Where there are proposed design changes that may affect the overall cost of the project, I would highlight it to the S.O representatives for his decision. (See **Evidence 3.2g** on memo regarding changes to design that would incur extra cost.).

3.3 Conduct Financial Completion Activities

General Manager (Structures) LPT2 Project

For all projects in JKR the Project Manager undertakes financial closeout and reconciliation of the account. Financial analysis of the project is undertaken with the Program Manager as an integral part of the project review process. Where variation has occurred, this is documented and any lessons learned are communicated to management by means of the completion report.

As for LPT2 the project is still under construction and the first package to be completed is expected only in 2009. Once a package is completed the closing process has to follow the procedure spelled out in SPK and As Completed Detailed Abstract (ACDA) need to be prepared, verified and endorsed. The closing out report on the project would also be prepared for record.

As for my role as design manager, the cost of the tendered project would mark the end of cost management under design activities. The tendered cost would become the contract cost and becomes the baseline cost for the construction phase. The contract cost together with other documents such as the construction drawings and the agreed Bill of Quantities would be the basis of the SO or his representatives to monitor the cost till the completion of construction. See **Evidence 3.3a** for the Letter of Acceptance of Package which stated the contract cost.

Due to the staggered tendering process of LPT2 packages, any lesson learned on cost from the previously completed and tendered package is documented and used to improve on the next package. See earlier **Evidence 3.2e** where under estimate in quantity has occurred requiring us to take more cautious in checking quantity of similar structure for the next package. Feedback received during tendering stage (from contractors and others) are also used to improve the tender documents. See **Evidence 3.3b** on minutes of meeting to improve tender document during tender and **Evidence 3.3c** on improvement of document post tender.

Evidence:

- 3.1a – Breakdown cost of LPT2 Project
- 3.1b – ATDA for Package 11 LPT2
- 3.1c – Cost Estimation in Establishment of Scheduling Office
- 3.2a – Letter calling for budget examination meeting with Ministry of Works LPT2
- 3.2b- Newspaper cutting on cost increase LPT2
- 3.2c - Minutes of meeting with financial reporting LPT2
- 3.2d – Consultants presentation at design verification LPT2
- 3.2e - BQ and taking off Package 7
- 3.2f – e-mail on cost reduction exercise for Package 11 LPT2.
- 3.2g – memo on design change that would involve extra cost
- 3.3a – Package Letter of Acceptance with contract cost
- 3.3b – Minutes of Meeting to Improve Tender Document LPT2
- 3.3c – Letter on Post Tender Meeting LPT2

UNIT 4 : PLAN AND MANAGE QUALITY

4.1 Determine quality requirements

General Manager (Structures) LPT2 Project

LPT2 project has to be implemented in conformance to quality standard as specified in JKR SPK. At the same time quality reference are also made to international standard such as AASHTO and British Standard. Reference to LLM standards as also made since LLM is the authority that has been managing expressway.

As for bridge structures, quality have always been based on British Standards and it was spelled out in the Need Statement (see **Evidence 4.1a).** The consultants responsible for designer structures were reminded about the requirement during coordination meetings held with them (See earlier **Evidence 2.1b** on minutes of meeting). The requirement is also spelled out in the Design Plan. **(See Evidence 4.1b)**

Project Manager PROKOM

In PROKOM, the quality for non-physical projects is usually based on international best practice. For Establishment of Scheduling Office copies of PMI's the Practice Standard for Scheduling and Practice Standard for Work Breakdown Structures is referred to.

4.2 Implement quality management

General Manager (Structures) LPT2 Project

At design stage the quality of the design is managed through regular progress meeting or discussion with the designer or consultant. Site visits are also a way of checking that the proposed design is meeting the required needs and standards.(See **Evidence 4.2a** on minutes of technical meeting discussing requirements and informing a review of road alignment due to bridge design issue.)

All design will go through design review/verification and design validation process as spelled out in the SPK. Before the design verification is carried out I would review the quality of the design and see that the requirement specified in the Need Statement and relevant code is satisfied. See **Evidence 4.2b** for letter calling for a meeting to streamline structural drawings. See also **Evidence 4.2c** on discussion on bridges for package 7B.

At the design review stage, a meeting is held normally chaired by the Construction Director or the Head of Project Team for Roads. The design of structures would be given go/no go by the Senior Structures General Manager, Dr. Abdul Aziz Arshad, normally on the overall concept. The structures consultant or designer would then detailed out the drawings, bill of quantities and specifications and submit to my office. I would carry out audit on the documentation to ensure the requirement has been made. The next stage is the design verification and validation See **Evidence 4.2d** on minutes of design validation meeting.

At the construction stage, the quality of construction is managed by the SO representative. However matters regarding structures are still referred to me as HODT especially if there is any discrepancy or inadequacy in the construction stage that may affect the quality of the structure. See **Evidence 4.2e** on correspondence for structures under construction.

Project Manager PROKOM

The nature of work in PROKOM requires most projects to be done as team work. This involves a lot of discussion where qualities are also discussed. As project manager I also referred to colleagues and superior as a way of checking the quality of deliverables is meeting requirement. See **Evidence 4.2f.**

4.3 Implement project quality improvements

General Manager (Structures) LPT2 Project

At the early planning stage the Structure Group within the project team had a few discussions where based on our previous experience we decided on some criteria for design that would improve the quality of the bridges to be built. See **Evidence 4.3a** on notes of the discussion. These become the input to the need statement and developed further with the consultants once the design process started.

Due to fast track nature of the projects, there are still discrepancies or inadequacies on the tendered design. The consultant firms were asked to review and improve the design and produce an improved construction drawing. See **Evidence 4.3b** on the letter / minutes of meeting for improvement of tender drawings.

4.4 JKR Specific – Environmental Quality Plan for a Project

General Manager (Structures) LPT2 Project

For projects in LPT the overall EIA report was carried out by an EIA consultant. Based on that report each package consultant or designer has to prepare a detail environmental plan which usually looks at the aspects of air, water and noise pollution. The EMP proposed should ensure the air, water and noise quality is maintained according to the DOE requirement.

Being located in the East Cost, the proposed LPT2 expressway is subjected to flood at least during the monsoon season. One of the main issues discussed during planning stage was the proposed level of the expressway and the bridge structure. For bridge, it was already stated in the Need Statement adequate opening under the bridge must be designed for. Reference to Jabatan Pengairan dan Saliran was done at planning stage.

As for construction of bridge structure crossings river, water quality must be maintained during and after construction. The bridges are usually designed avoiding piers in the water so that piling and concreting works are done only on the banks. At the same time slope of the bank is to be protected by providing gabion mattress and gabion blocks. As the design manager I have to ensure that the consultant or bridge designer provide all these details on the drawings. See **Evidence 4.4a** for bridge general layout drawing and correspondence with Jabatan Pengairan dan Saliran.

4.5 JKR Specific – Implementation of Environmental Management Plan

General Manager (Structures) LPT2 Project

To ensure the EMP is implemented during construction the contractor is required to appoint an experienced environmental officer on site. This officer is asked to report environmental work status at every site meeting. See **Evidence 4.5a** for agenda of site meeting.

Evidence:

- 4.1a – Need Statement LPT2
- 4.1b – Design Plan of Package LPT2
- 4.2a – Minutes of Technical Meeting LPT2
- 4.2b- Letter calling for meeting to streamline structural drawings LPT2
- 4.2c – Discussion on Bridge LPT2
- 4.2d – Minutes of Design Validation Meeting LPT2
- 4.2e – Correspondence on Structures under construction LPT2
- 4.2f – e-mail to Ir Nazari
- 4.3a – notes on discussion
- 4.3b - Letter calling for meeting to improve tender drawings
- 4.4a – correspondence with JPS
- 4.5a – Agenda of Site Meeting

UNIT 5 : PLAN AND MANAGE HUMAN RESOURCES

5.1 Implement HRM Planning Activities

In JKR, the overall human resource planning is done by the Cawangan Pengurusan Korporat or Corporate Management Division. However, within a program the human resource planning is the responsibility of the program manager. When the LPT2 Project Team was formed in October 2004 there were only twelve of us to start with. Clearly this number is far from adequate for a RM2.0 billion expressway project.

Once the team is appointed we planned on the human resource requirement based on the job function. See **Evidence 5.1a** on Functional Organisation Chart. The team planned on the overall human resource requirement but knew that the resource had to be from the consultant firms.

Based on my experience as a bridge engineer I was assigned the task of planning the job function for structural engineer within the team. See **Evidence 5.1b** on job description for structural engineers from J41 to J54. Approval was later obtained from Treasury to appoint civil & structural, EIA and RSA consultant firms.

General Manager (Structures) LPT2 Project

In LPT2 projects team the number of structural designers are limited, therefore only structures in Package 11, 12 and 4 are done departmentally while other packages are assigned to consultant firms. Refer to **Evidence 5.1c** on correspondence to Treasury regarding the proposal of appointing consultant firms. See also **Evidence 5.1d** on letter to some consultant firms inviting them to submit proposal.

My role at the human resource planning activity is determining the required number and experience of bridge designer and draftsmen for the design works of each package. See **Evidence 5.1e** on minutes of negotiation meeting with the consultant firm. The consultant firm must name the proposed person together with the relevant CVs. Once appointed, the consultant firm are required to resource loaded the work program to show the distribution of resources in delivering the design. (See earlier Evidence on package meeting discussing on resource requirement in Unit 2 earlier.

There are occasions where some of the consultant staff needs to be placed at the project team office to assist us. See **Evidence 5.1f** on correspondence regarding the service of draftsman.

Project Manager, PROKOM

At PROKOM, the staffs are not uniquely assigned to one unit. Instead we are required to work in teams in any project assigned to us. As such, as a project manager I have to identify officers to be assigned to my project based on his or her current work load and also his / her interest. The human resource required to carry out a project is based on the scope definition of the project.

Due to the non-physical nature of the projects in PROKOM the experience on the identified subject matter may not be readily available internally. In that case the service of consultant firm would be proposed. For Establishment of Scheduling Office, it was proposed to appoint IKRAM as the consultant to carry out the project. See earlier **Evidence 1.1e** on Scope Definition of Establishment of Scheduling Office. Internally there are team members made out of PROKOM offices who expressed their interest in becoming expert scheduler. See **Evidence 5.1g** on e-mail with team members. The responsibility of each team members are assigned based on the scope as detailed out in the WBS of the project. See Responsibility Assignment Matrix as in **Evidence 5.1h** and minutes of meeting in earlier **Evidence 2.1f**.

5.2 Implement Staff Training And Development

General Manager (Structures & Competency and Training) LPT2 Project

At LPT, the numbers of officers directly reporting to me keep on changing but the most number was when I have two engineers assigned to me. I train my designer by supervising their design closely. The officers are assessed on their performance continually and reported in the assessment forms at the end of the year.

In May 2007 I was appointed as the new training officer for LPT2 and my responsibility was to plan training program for all the staff. See **Evidence 5.2a** for letter of appointment as training officer. My role as a training officer is to determine the staff training needs and ensuring staff is given a chance to attend training on the areas needed and everyone get an opportunity to attend training annually. Training requirements and process within JKR is guided by **JKR SPK** and the **Government Circulars**. To determine the training requirement a training need analysis is carried out based on standard forms filled by all staffs. See **Evidence 5.2b** on memos and standard format for training need analysis, and some copies of forms filled up by the project team.

The officer who has attended any course or training has to evaluate the effectiveness of the course. I must ensure all training program follows the procedure spelled out in JKR SPK. See Evidence **5.2c** on evaluation forms submitted by the project team.

Based on the training requirement for LPT2, a list of all courses and budget needs are submitted to Cawangan Pengurusan Korporat for their approval. See **Evidence 5.2d** on letter to Cawangan Pengurusan Korporat.

5.3 Guide The Project Team

General Manager (Structures) LPT2 Project

As the Structures Project manager at LPT2, it was my duty to ensure the designers are properly guided through regular discussion and meetings. One way of guiding the project team is through assigning task to them and guides them through. See E**vidence 5.3a** on assigning tasks to staff as a way of guiding them. At the end of the year I was responsible to prepare confidential evaluation report for my engineers and they would be informed verbally of where they ought to improve. Staffs that need training are sent for the required training if it is available. See **Evidence 5.3b** on list of staffs with records of training they attended.

Project Manager, PROKOM

In Establishment of the Scheduling Office, the team are guided through monthly discussions and also by asking them to search for reference materials online. See earlier **Evidence 2.1f** on minutes of meeting where team members are assigned to senior officers as mentor.

5.4 Identify Opportunities For Improvement In HR Planning And Management

General Manager (Structures) LPT2 Project

In LPT2, the staff placement is constantly updated based on the current requirement. As Package 11 and 12 were the first two packages to be constructed the team learned from those packages on the human resource requirement especially for supervision works. Hence all other packages followed were outsourced to consultant for supervision.

The job function and ratio of professional to lower staff from Package 11 and 12 is used as a guide for the other packages.

LPT2 project team also need additional staff as the work progressed as indicated on the organisation chart. Based on history and the long procedures of government human resource recruitment, it was

decided to engage additional consultant staffs on contract basis to serve the team. See minutes of meeting discussion on human resource as in **Evidence 5.4a**

Besides lesson learned from previous package, observations, feedback or report from audit done on human resource management and competency is also used to improve on the management of human resource within the project team. See **Evidence 5.4b** on the NCR and Observations as reported by JKR SPK Internal Auditors.

Improvement in the training is based on feed back forms filled up by officers once they attended the course. See Evidence **5.2c** earlier on evaluation forms submitted by the project team. Improvement in the competency of the officer has to be evaluated by the superior six month after attending the course. This feedback will help the training officer to plan for future courses of the same nature.

5.5 Establish and Implement Health and Safety Plan

General Manager (Structures) LPT2 Project

Besides managing the training and competency of all staff, the health and safety is also a main concerned as mandated by regulations such as OSHA. In LPT2 project, Health and Safety is managed at the program level (for all staff) as well as at Package level (which includes all construction workers). The management at program level is under the Support Service Unit while at package level it is managed by the Construction Manager or S.O Representative.

All staffs in LPT2 attended the green card training as a means of preparing for site work. See **Evidence 5.3b** earlier on list of course attended and also the item on green card discussed for new staff as in minutes of meeting in **Evidence 5.4a** earlier. Safety of staff in office building is also maintained as discussed in minutes of meeting in **Evidence 5.4a**.

Health and safety is also a permanent item discussed in all monthly site meeting. See **Evidence 4.5a** on minutes of site meeting earlier.

I played my role by observing all health and safety rule especially during any site visit, such as wearing hard hat and safety boots and ensuring everyone else under my care doing the same.

Evidence:

- 5.1a – LPT2 Organization Charts
- 5.1b – Job Description for Structural Engineers LPT2
- 5.1c – Letter to Treasury on Appointment of Consultant Firms LPT2
- 5.1d – Invitation Letter to Consultant Firms LPT2
- 5.1e – Minutes of Negotiation Meeting with Consultant Firms LPT2
- 5.1f – Letter to Consultant Firm on Draftsmen Service LPT2
- 5.1g – e-mail to Scheduling Office Team Member
- 5.1h - Responsibility Assignment Matrix – Scheduling Office PROKOM
- 5.2a - Appointment Letter as Training and Competency Officer LPT2
- 5.2b – Memos and Standard Format for Training Needs Analysis LPT2
- 5.2c – Letter to Cawangan Pengurusan Korporat on Budget for Training LPT2
- 5.3a – Discussion and Assignment of Tasks LPT2
- 5.3b – Records of Staff Training LPT2
- 5.4a – Minutes of Management Meeting LPT2
- 5.4b – NCR and Observations Report by SPK Internal Audit LPT2
- 5.4c - Training Evaluation Forms LPT2
- 5.4d – e-mail regarding Competency Workshop for PROKOM

UNIT 6 : PLAN AND MANAGE COMMUNICATIONS

6.1 Implement Communications Planning Processes

General Manager (Structures) LPT2 Project

There are many forms of Project Communications in LPT2 such as regular or ad hocks meetings, letters, memos, e-mail, circulars and communication through the phone.

Within the project team communication is planned by setting management meeting every month. The meeting is to be chaired by the Construction Director and attended by all Senior General Managers and General Managers. Twice a year there will be a staff meeting which would include all supporting staff.

See earlier **evidence 5.4a** on monthly management meeting and **Evidence 6.1a** on internal memo.

Communication with the consultants is planned through regular package meeting and also the progress report they have to submit as instructed in the Term of Reference as in earlier evidence. The meetings are planned during the preparation of the Project Design Plan. Communication with other stakeholders is managed by the Package Manager. For communication with the Government of Terengganu, En Kamalaldin from the team is named as the representative to attend Terengganu EXCO meeting when the need arises.

For construction stage, communication is managed through the site meeting and other meetings as indicated in the Construction Plan. See **Evidence 6.1b** on Construction Plan.

My communication plan with the consultants is mostly through the package meeting together with the package manager and also verbally or by e-mail when required. See **Evidence 6.1c** on contact list of the consultants and earlier minutes of meeting with consultant. Within the project team it can be in the monthly meeting as indicated earlier or discussion as in **Evidence 5.3a** earlier.

Communication internally and externally is also planned by setting a website. See **evidence 6.1d** on minutes of meeting regarding the website.

Project Manager, PROKOM

Communication within a project is planned early during the preparation of Project Management Plan. Stakeholders are identified during scope definition and contact list prepared. See **Evidence 6.1e**. Communication network or matrix is also prepared to illustrate how communication is done.

Within the project team communication can be in the form of report, discussion or regular meeting. This is documented in the Scheduled Reports and Meeting as in **Evidence 6.1f**.

6.2 Plan And Manage Information Management

General Manager (Structures) LPT2 Project

Within LPT2 project team e-mail was the main medium of communications or direct conversation since we were situated within the same office. At the same time a special server (server L- Network drive L:\\VKRACAD1\CAD1\JLN\LPT) was dedicated to us for keeping information that can be used by all. Access rights are controlled by the Construction Director who is also the Program Manager.

A proper file keeping system was developed (based on Roads Branch filing system since we are in the same nature of business). See **Evidence 6.2a** for list of files in LPT2. To ensure easier sharing of information within the team, a document management system was installed (Fingertips). All incoming letters and memos are scanned and the soft copies are kept according to preset categories. Easier search can be done using this system. This system is set in the project team office in Terengganu and the site offices. See **Evidence 6.2b** on e-mail from Construction Director regarding document management in Fingertips

Communications externally with the other players such as the consultants and contractors are plan through regular coordination meetings, letters e-mail and also telephones. See earlier **evidence** on progress meeting with the consultant and **evidence 6.2c** on letters to consultants.

For the Terengganu contractors a special forum was conducted in 2005 as shown in the photo below. In that forum we discussed on the project implementation strategy especially on matters pertaining the allocation of contracts to local contractors.

Communications with the public is done through website (see earlier evidence in minutes of meeting) and taking part in exhibition at JKR senior officer conference or other similar occasions. See **Evidence 6.2d** on duty list for exhibition. Brochures (**Evidence 6.2e**) are distributed during the exhibitions. Brochure for the project is also updated to communicate the latest information on the project. See minutes of meeting in **Evidence 5.4a** earlier discussing on the preparation of brochures.

Photos during exhibition are kept at server **L\JLN\LPT\Images\Photo Gallery**.

The Project Team also gave a special presentation to the Yang Pertuan Agong when he visited the Ministry of Works as shown in the two photos above.

For communication within the project team monthly meeting is carried out for each package. Rather than holding separate meeting for each work component such as road works structures and geotechnical works, monthly project meetings conducted are meant for all components. As the project manager for structures I would be managing all issues on structures in the meeting and ensure any action to be taken is communicated to the designer. See earlier **evidence** on minutes of management meeting.

6.3 Implement Project Reporting Processes

General Manager (Structures) LPT2 Project

The progress of design in LPT2 is reported monthly by the consultant as in the earlier evidence. The Project Manager would report directly to the Program manager during the monthly management meeting as in earlier evidence of minutes of meeting. The Project Manager is responsible for planning all reports and scheduling formal meetings for the project.

Reports and documents on projects are also kept in project files which can be assessed by all staff. Project files are kept according to packages and other standardised subheadings.

From the team an overall LPT2 Project Progress Report is prepared monthly and sent to Top Management in JKR as described in earlier **Evidence 2.3b**. One general manager is managing the preparation of he report while the rest of the general manager feed the relevant information. Copies of the monthly progress report are also kept L\JLN\LPT\Progress Report.

Project Manager, PROKOM

For the implementation of Establishment of Scheduling Office, project reporting is done by monthly status report as shown in earlier **Evidence 2.2f**. Reporting on the progress is also discussed during management meeting.

6.4 Assess Communications Management Outcomes

General Manager (Structures) LPT2 Project

Reviews and the final post critique are used to determine the effectiveness of project communications management. Where improvements can be identified these are actioned by the Project Managers and

communicated to the Program Manager to achieve business wide improvement. Follow-up briefings with clients are essential and are noted in the project completion report.

In LPT2, the tender documents are one form of communication with the tenderers / contractors. We manage improvement of that documentation in post tender meetings where matters raised by contractors or others are discussed, improved and documented. See earlier **Evidence 3.3b and 3.3c**.

Project Manager, PROKOM

An assessment on the effectiveness of communication should be carried out as the project progress. Any lesson learned should be documented in the completion report progressively as shown in earlier **evidence 2.3h**.

6.5 JKR Specific – Dispute Management : Avoid From Letting Issues Develop Into Disputes

General Manager (Structures) LPT2 Project

Based on JKR previous experience, there is a tendency for contractors to propose alternative design on structures once his tender is successful. This is causing unnecessary delay to the project because JKR needs to evaluate the new proposal and the process would take valuable time from the construction period. Furthermore if the design was carried out by a consultant firm the fees are still paid in full to the consultant.

To avoid that dispute in LPT2, we inserted a clause in the tender document saying that no alternative design is allowed. See **Evidence 7.1b**. However we still received a proposal by Package 2 contractor on alternative design for the bridges. See **Evidence 7.2b**. The contractor insisted the clause on No Alternative Design Allowed was valid only for tender purpose and does not apply to the successful contractor. The matter was brought to the top management where the contractor was allowed to propose. We accepted this decision but gave a condition to the contractor to provide an independent checker. See **Evidence 7.2d**. This issue will be discussed again with the same evidence on **Unit 7** on Project Risk Management.

We also anticipate problem with supply of building materials and took steps in helping contractors to secure supply from some local suppliers. See **Evidence 5.4a** earlier where supply of construction materials is discussed in the minutes of meeting.

Normally issues raised in LPT project would be brought up to the attention of team member through the monthly coordination meeting. The issues would be recorded in the minutes of meeting together with the officer responsible for managing it. Therefore if there are any issues raised specific to structures, I have to deal with the soonest possible. For pressing issues the matter is raised immediately directly either verbally or through e-mail. Those requiring escalation would be brought up to the relevant superior or JKR Top Management either verbally, through e-mail, memo or letter.

See **Evidence 6.5a** on my e-mail communication with the S.O Representative on issue regarding construction that need quick solving. See also my e-mail communication with the Construction Director on issue that need his advice to solve in **Exhibit 6.5b.**

6.6 JKR Specific – Dispute Management : Administer Dispute

General Manager (Structures) LPT2 Project

The Program Manager defines dispute resolution procedures according to the conditions of contract, identifies nature of disputes to enable objective analysis on the subject of disagreement. Refer the dispute in writing to the Superintending Officer (S.O)/ Project Director (P.D) of the contract for negotiation by providing the S.O/P.D with the analysis and proposed resolutions.

If there is any dispute in LPT2 project and the matter is brought to the attention of me as a general manager I would bring the dispute to the attention of the S.O for him to administer the dispute in accordance to the Dispute Administration Procedure as spelled out in the Contract Document. See Clause 54 of the Condition of Contract PWD230A in **Evidence 6.6a**.

Evidence:

- 6.1a – Internal Memo LPT2
- 6.1b – Construction Plan LPT2
- 6.1c - Contact List of Consultant LPT2

- 6.1d – Minutes of Meeting discussing on website of LPT2
- 6.1e – Contact List Establishment of Scheduling Office
- 6.1f – Scheduled Report and Meetings Establishment of Scheduling Office
- 6.2a – List of Files LPT2
- 6.2b – e-mail from Construction Director regarding document management LPT2
- 6.2c – Letter to Consultant LPT2
- 6.2d – Duty List for Exhibition LPT2
- 6.2e – Brochure of LPT2
- 6.5a – e-mail with SO Representative on construction issue LPT2
- 6.5b – e-mail with Construction Director on design issue
- 6.6a – Dispute Administration in Condition of Contract

UNIT 7 : PLAN AND MANAGE RISK

7.1 Determine Project Risk Events

General Manager (Structures) LPT2 Project

When we started LPT2 project in 2004 there was no proper risk management system in JKR yet. However we have already anticipated the risk that may emerge in this project based on JKR experience of road projects. Risk mitigation or risk avoidance was then carried out based on the anticipated risk.

At the planning stage of LPT2 we realised that the construction of this projects would require a huge supply of main materials such as steel, cement and sand. To avoid packages demanding for material supply at the same time the construction of the 16 packages were spaced out and in the overall implementation work program as shown in earlier **evidence** of the master implementation program.

Amongst the risk that was recognised early on for **bridge** design was the tendency of Malaysian contractors to offer **alternative design** during construction. Offering alternative design may be an optimum solution for some bridge projects but for LPT2 projects we want to maintain the standard and consistency of the design. Moreover the project team have to review any alternative design proposed and thus this process may **delay** the construction of the project. We also want to ensure the design fees paid to the consultant is not wasted.

For structures in the project some of the risk mitigation measures are as follows:-

i) In order to guide all LPT2 consultant firms to produce consistent design, the Term of Reference (TOR) specified the type of beams that would be designed by the consultant based on the bridge locations and total span length. (See **Evidence 7.1a** on TOR of structures).

ii) A clause was added in the tender document specifying that no alternative design will be allowed. This is to avoid the successful contractor from offering alternative design at construction stage and unnecessarily delay the project, (See **Evidence 7.1b** of tender document)

Project Manager, PROKOM

In PROKOM project risk is determined through brainstorming sessions. This can be carried out in a workshop attended by all project major stakeholders using the procedures spelled out in the Risk Management Guidelines published by PROKOM. Risks identified are analysed and documented in Risk Register. For small project it is sufficient to have a brainstorming session with the project team during the scope definition phase and the risks identified are documented in Risk Table as in **Evidence 7.1c**. (see also earlier **Evidence 1.1e** on Scope Definition of Scheduling).

I have also participated in Risk Management workshops conducted by PROKOM for UPNM project. For Risk Management workshops on other projects carried out by SBUs, I have been a facilitator and presenter. (See **Evidence 7.1d** for appointment letter from CKK)

7.2 Monitor And Control Project Risk

General Manager (Structures) LPT2 Project

In LPT2 the identified risk are monitored through the project monthly meeting as well as management meeting. In late 2007 the anticipated risk on supply of material was realised and as a results a few meetings was held in order to find a solution. (see **Evidence 7.2a** on minutes of meetings internal and with contractors).

As for the risk on alternative design, it was realized when the contractor for Package 2 still proposed alternative design despite the stated clause in the tender document. See the proposal in **Evidence 7.2b.** When the team did not agree to the proposal the matter was escalated to the JKR Deputy Director General. Since he allowed the contractor to submit the proposal, the team decided to let contractor to present the detail proposal. A second opinion from Bridge Unit was also obtained. See **Evidence 7.2c** for letter from Bridge Unit JKR and **Evidence 7.2d** on minutes of meeting chaired by TKPKR on the alternative design.

In order for the alternative design to be beneficial to JKR a few conditions were put to the contractor such as getting a qualified independent checker to certify the design and there must be some financial savings to the Government. The alternative design portion also became a design and built component where the contractor is fully responsible for the design and supervision.

LPT2 had a few meetings with the independent checker for alternative design of package 2. See **Evidence 7.2e.** When we doubts the findings of the checker and feels that the alternative design may not fully comply with our requirement the independent checker was asked to explain. See letter to the independent checker from LPT2 in **Evidence 7.2f**.

Project Manager, PROKOM

In line with the risk management procedures, a risk management plan must be prepared based on the identified risks. This plan is used by project manager to monitor and control the risk. As for my project risk documented in the risk table, it is my responsibility to monitor this regularly. See **Evidence 7.2g** on e-mail to SBU reminding them on the naming of officer to be trained.

7.3 Assess Risk Management Outcomes

During interim reviews/reports and at project finalisation, the risk management process and outcomes are evaluated as a source of project quality improvement and recommendations for improvement are actioned by the Project Managers and Program Manager. Reports to analyse the effectiveness of containment/responses to risks are also generated by the qualitative risk database. These are included in the **project completion report** and should be done progressively.

In LPT2 the additional clauses and terms in the Term of Reference for structure as mentioned earlier in **Evidence 7.1a** was prepared based on the experience and outcomes of previous projects done under Cawangan Jalan.

Risk encounter and realised in Establishment of Scheduling Office was also documented in the Status Report as shown in earlier **Evidence 2.2e**.

Evidence:

- 7.1a – TOR on structure LPT2
- 7.1b – Part of tender document LPT2
- 7.1c – Risk Table Establishment of Scheduling Office
- 7.1d - Appointment letter as risk management workshop presenter and facilitator
- 7.2a – Minutes of Meeting
- 7.2b – Proposal on Alternative design from Contractor
- 7.2c – Letter from Bridge Unit
- 7.2d – Minutes of Meeting on Alternative Design
- 7.2e – Discussion with Independent Checker
- 7.2f – Letter to Independent Checker
- 7.2g – e-mail to Cawangan Jalan

UNIT 8 : PLAN AND MANAGE PROCUREMENT

8.1 Determine procurement requirements

General Manager LPT2 Project

The Project Manager is part of the team that determines the requirement for each project. This is determined through the project scope definition and is known and calculated as part of the Go/No Go decision making.

In LPT2, the overall procurement requirement identified at the planning stage was on the preliminary works (such as survey and soil investigation works), the design service (either to be done totally in-house or outsource to consultant firms), supervision and construction. (See **Evidence 8.1a** on minutes of meeting and presentation notes to KPKR. See also Evidence **8.1b** on minutes of Technical and Financial meeting and presentation notes.)

The procurement requirement for each package is then managed by the general manager (package) together with others such as structures, EIA, Road Safety and geotechnical manager, with the agreement of the program manager.

Government decided that JKR portion on LPT2 to be tendered as conventional (i.e design either in-house or by consultant and later tender out). (See **Evidence 8.1c** on chronology of events for LPT2) Final decision on procurement was to split the construction of the main alignment into 16 packages. The need for toll plazas, rest areas and JPJ weighbridge are to be decided later by the Government. At the same time the project main site office was tendered design and build as one contract. (**A list of LPT2 packages can be assessed through SKALA**)

My involvement in the planning of the procurement of preliminary works and design service are:-

i) Provide location of bridges requiring survey works and review the standard term of reference for bridge site survey

ii) Manage boreholes requirements for soil investigation works at bridge locations

iii) Advise manpower requirement for structure design and help contributing towards decision on what packages are to be designed as in-houses and outsource requirement.

iv) Manage the needs for structure design through the Term of Reference for consultant service. See earlier **evidence 4.1a** on the TOR for structure.

v) Manage tender documents on structure for procurement of contractors.

Besides being part of planning team for those services I was responsible for procuring books and reference materials for the use of LPT2 Project Team. The reference materials required are based on the project areas requirement such as highway engineering, bridge engineering, geotechnical engineering, land acquisition, materials etc. This was obtained though direct consultation or recommendations of my colleagues and superiors. (See **Evidence 8.1d** on list of books and reference materials to be procured)

8.2 Establish Agreed Procurement Processes

General Manager LPT2 Project

For JKR projects the procurement processes have been established and made mandatory according to the **Treasury Instructions**, KPKR Instructions and other Governments Policies. The process is also incorporated in the JKR SPK. (A copy of the SPK Procurement Process is available on JKR website.) Hence all packages in LPT2 follow the same process.

Strategies for procurement are forecast at the project planning stage by Program Manager and Project Manager. The Program Manager ensures that any procurement issues are planned and addressed in the planning in conjunction with the Project Manager and Procurement Manager. The Procurement Manager supervises all procurement processes.

For the procurement of design consultants, invitation letters were sent to a list of consultants who had good track records with JKR. See earlier **evidence 5.1d** on the invitation letter. The consultants are ranked and short listed based on their proposals. Final decision on successful consultants comes from Treasury.

The successful consultant firms enter into contract with Government through standardised formats of agreement documents. See **evidence 4.1a** earlier.

In procuring the reference books for LPT2, the process followed **Treasury Instruction**. The books can be purchased direct from the suppliers registered with Treasury, through quotation system for purchases less than RM20,000. Based on the list or required books or reference materials, a few invitations for quotations were sent to the suppliers. (See **Evidence 8.2a** for list of suppliers obtained from Cawangan Jalan and **Evidence 8.2b** on invitation for quotations sent to the suppliers.)

8.3 Conduct Procurement Process Activities

General Manager LPT2 Project

The procurement process for physical project is well defined within JKR and Treasury's Instruction. Any specific requirements for a project are addressed in the planning phase in conjunction with the Procurement Manager. Where LPT2 needs to outsource, especially for sub-contractors or consultants, the Procurement Team are guided by the Project Manager on the requirement, and endorsed by the Program Manager. Any specific requirements for a project are managed by the Procurement Manager in conjunction with the Project Manager to ensure effective project coordination. A major role of the Program Manager is to lead the contract negotiation team for external contracts. The Project Manager is usually part of the negotiation team.

Even though I was not the Procurement Manager for LPT2 or the package manager I played a role in the procurement of consultancy and contractors service. My role in the procurement of design consultant service is in the management of the Need Statement for structural works. (See **earlier evidence 4.1a** which includes a copy of the Need Statement). I also assist the package manager to evaluate the technical strength of the consultant firm on structures. (See **Evidence 8.3a** on formats of evaluation). Among the criteria that I look for was the experience of the structural engineer and whether he or she is the permanent staff of the firm.

For the procurement of the surveyor contractors again my role is to furnish the package manager with the relevant Term of Reference for survey works for the structures location. For the procurement of soil investigation works, I was involved in the selection and negotiation with Soil Investigations Contractors and later manage the preparation of tender evaluation report to the tender board. (See **Evidence 8.3b** for minutes of meeting on distribution of works for SI and **Evidence 8.3c** for a copy of the **Tender Report**).

8.4 Implement Contract

General Manager LPT2 Project

The contract management process is generally managed through the Procurement Manager for external suppliers. Project Managers and project team members usually hold responsibility for coordination and on-site management of contractors. Any specific requirements for a project are managed by the Procurement Manager in conjunction with the Project Manager to ensure effective project coordination.

In LPT2, I played a role in implementing contract with the consulting firms during the design stage. My role is ensuring that the consultant supply the service required as stated in the agreement especially in term of the structures of the project. Since the consultant firm are paid according to their progress, I managed this through regular meetings, progress reports and checking the product outputs such as the drawings and bill of quantities. (Explained in earlier units such as Time and Quality)

In managing the procurement of the library documents, local orders (LO) were issued to the supplier (See **Evidence 8.4a**. Status of order is also tracked by status report from the supplier.(See **Evidence 8.4b** on status of order from a supplier). Once the supplier delivered the product I checked that the documents are what I ordered and certified the invoice.(See **Evidence 8.4c** on Invoice sent together with the books.) Before the LO is sent to JKR financial officer to prepare payment to the vendors, I would ensure the vendors endorsed the Local Order. Normally all payments are made direct to their account. See **Evidence 8.4d** for payment voucher and **8.4e** for a copy of receipt received from supplier.

8.5 Manage Contract Finalisation Procedures

General Manager LPT2 Project

At project completion, all issues including variation claims, disputes, final payments, training, support manuals and warranty conditions are finalised by the Procurement Manager and Project Manager and reported in a contract close-out statement that is reviewed by the Program Manager. The procurement process is reported on by way of the project completion report. For LPT2 project this is managed by the S.O Representative with the approval of the S.O. Currently none of the package is completed in construction yet.

The finalisation of the procurement agreement for design service is managed by the Package Manager. The contract is finalised once the consultant firms has supplied all items described in the Agreement and Term of Reference. My role as General Manager (Structure) is to inform the Package manager on the status of the service in term of structure. See **Evidence 8.5a** on memos regarding the needs for finalisation of construction drawings and design report and **Evidence 8.5b** on contents of final report prepared by consultant firms. LPT2 Project team later would report to the top management on the completion of design phase of each package through our monthly progress report as shown in earlier evidence.

I finalised the contract of supplying books for LPT when the supplier has completed sending the books and payment made. Once payment has been received by the supplier, I made sure the company issue receipts. Receipts that are received are kept in files for records. (See **Evidence 8.4e** earlier on receipts received from supplier for purchases of books.) Lists of books purchased are recorded and distributed for team members to view or borrow.

Evidence:

- 8.1a – Minutes of meeting and presentation notes to KPKR.
- 8.1b – minutes of technical and financial meeting and presentation notes
- 8.1c – chronology of events in LPT2
- 8.1d – List of books to be purchased
- 8.2a – List of books suppliers
- 8.2b – invitation to suppliers to send quotations
- 8.3a – formats of evaluation
- 8.3b – minutes of meeting (distribution of SI Works)
- 8.3c – Tender Report for SI Works
- 8.4a – Local Orders for purchase of books
- 8.4b – Status Report of Order
- 8.4c – Invoice for purchase of books
- 8.4d – Payment voucher
- 8.4e – Receipt
- 8.5a – Memos on Design Report and Construction Drawing
- 8.5b – Cover of Final Report by Consultant

UNIT 9 : PLAN AND MANAGE PROJECT INTEGRATIVE PROCESSES

9.1 Implement Integration Of The Nine Functions Of Project Management

General Manager LPT2 Project

Plan for overall management of LPT2 was prepared in the project Quality Plan as shown in earlier evidence. The quality plan includes all the knowledge areas except risk. In LPT2, integration management is regularly done at package and program level. At program level there is monthly management meeting where all aspects of the projects are discussed such as progress, financial expenditure, scope, procurement and others including any issues rose. This meeting is normally chaired by the Construction Director and attended by all General Managers including me as the General Manager for Structure cum Competency and Training. It is at this forum that the overall progress is monitored and any issue that needs cross reference between discipline or packages raised and resolved. See **Evidence 9.1a** on minutes of meeting as well as earlier **evidence 3.2c**.

There is also interfacing meeting where the objectives is to ensure continuity and consistency between packages. This meeting has to be attended by all consultant firms involved. Regular interfacing meeting is also held between the project team and Malaysian Highway Authority (LLM).

At package level there is regular progress meeting during the design stage normally chaired by the Head of Project Team and attended by team members. If the package is design by consultant firm then they have to attend every meeting. See **Evidence 9.1b** on minutes of package meeting. Once the package goes into construction the integration is done at a pre construction meeting followed by monthly site meeting. See **Evidence 9.1c** on notes on pre construction meeting and **evidence 4.5a** on site meeting earlier.

Besides being involved in all the meetings described above, the structure team within LPT2 project also carried out integration on structures by regular discussion with groups and coordination meeting with the consultant firms who carried out the design. **See Evidence 9.1d** on coordination meeting with the consultant firms and **9.1e** held internally within the structure team.

Project Manager, PROKOM

In PROKOM integration of all nine knowledge areas are managed based on project management plan prepared at the start of the project. As the project progress, contents of PMP are reviewed to update any changes necessary. Status report is prepared monthly (See earlier **evidence 2.2f** on status report.)

9.2 Coordinate Internal And External Environments

General Manager LPT2 Project

In implementing LPT2 project we have to coordinate internal environments within JKR by ensuring that the project meets JKR objectives in delivering project in RMK9 :- to be on time, within budget and meeting the quality planned. At the same time we must maintain the overall program objectives under the Infra Business Sector especially in term of time and cost. See **Evidence 9.2a** on minutes of meeting with Deputy Director General Business Sector discussing overall performance of the Infra Sector.

We must also make sure that the project progress contributes to the department's progress as promised. See earlier evidence on progress report and minutes of LPT2 management meeting discussing on financial progress. See also **Evidence 9.2b** on memo regarding preparation for briefing to KPKR.

The project team in answerable direct to the Deputy Director General (Infra). However in term of technical practice we still refer to Cawangan Jalan and Unit Jambatan especially in term of policy to ensure consistency within the department. As seen in earlier **evidence 7.2c** comments on alternative design for bridge is referred to Unit Jambatan.

The Project Team also meets other stakeholder such as the Government of Terengganu (En Kamalaldin is the team representative for any state meeting that concern LPT2 project). We had a forum with the contractors of Terengganu who are a major stakeholder for construction phase of the

project as described in earlier evidence on communication. At that forum a lot of issue was raised and became input during scope and procurement process.

Public interest in the project is also addressed by participating in exhibition during the Senior Officers Conference in Terengganu as shown in photos below. The exhibition was opened to the public.



Parliament questions on the project are also managed through Ministry of Works. See **Evidence 9.2c** on correspondence regarding parliament question

9.3 Implement Project Activities Throughout Life Cycle

General Manager LPT2 Project

The procedures and documentations throughout the project life cycle in JKR such as planning, design, procurement, construction and handover are guided by SPK. As the general manager of structure in LPT2 project, it was my responsibility to manage, monitor and control the design phase activities according to SPK such as preparation of design plan, determination of the scope for structures, requirement for procurement of consultant service in term of structural design and finally review verification and validation of the design. Progress is reported to the package manager and program manager through regular package meeting and project management team meeting. **All these processed had been explained in all earlier units.**

I also maintain an overview across all projects and intervenes where required to provide facilitation, coaching and elevate issues to senior management for resolution. This was referred in earlier evidence such as in the Unit on Risks and other issues discussed in the management meetings.

Evidence:

- 9.1a - minutes of management meeting
- 9.1b - minutes of package meeting
- 9.1c - notes on pre construction meeting
- 9.1d – structure coordination meeting
- 9.1e – project team (structure) meeting
- 9.2a – minutes of meeting sector infra.
- 9.2b - memo on preparation of briefing notes to KPKR
- 9.2c – correspondence regarding parliament questions.