THE DESIGN, CONSTRUCTION, EQUIPPING, COMMISSIONING AND MAINTENANCE OF WOMEN AND CHILD HOSPITAL (600 BEDS) AT KUALA LUMPUR HOSPITAL (PACKAGE I & II)

RISK MANAGEMENT PLAN

Cawangan Kerja Kesihatan
Ibu Pejabat JKR Malaysia

Version 1.1

13 August 2008

Build Status

Version	Date	Author	Reason	Sections
1.0	10 July 08	PCKK	First Report Based On The Risk Management Workshop Held At Shah Alam, 10-11 June 2008.	
1.1	13 Aug 08			

Summary of Women and Child Hospital, HKL Risk Profile

The proposed Women and Child Hospital is to be a 600 beds hospital. It will function as the National Referral Hospital and center of excellence for Women and Child Disease. It will provide secondary and tertiary care services in the speciality of Obstetric / Gynaecology and Paediatric. The hospital will also become a premier centre for research and training in these 2 disciplines.

- **Package 1: Relocation Works, Demolition Works and Site Clearance Works.**
- **Package 2 Fasa 1: Preliminaries, Builders Works, Piling, Mechanical & Electrical Works, Total Hospital Information System (except 'Clinical Softwares'), External Works, Group 1 Medical Equipments, Non-Medical Equipments and Furniture**

Executive Summary For Package 1:

Contact Title	: The Design, Construction, Equipping, Commissioning and Maintenance of the Women and Child Hospital (600 beds) at Kuala Lumpur – Package 1
Turnkey Contractor	: Ranhill Berhad
Contract Sum	: RM 15,500,000.00
Contract Period	: 8 Months
Date of LOA *(Letter of Award)*	: 10 December 2007
Commencement Date	: 17 December 2007
Completion Date	: 16 August 2008
List of Consultant	: i) Architect : Arkitek Kitas Sdn. 39A, Jalan Ipoh, 51200, Kuala Lumpur. ii) Civil & Structure : Ranhill Consulting Sdn. Bhd. 24th Floor, Empire Tower, 182 Jalan Tun Razak, 50400, Kuala Lumpur. iii) Mechanical & Electrical : Ranhill Consulting Sdn. Bhd. 25th Floor Empire Tower, 182 Jalan Tun Razak,50400, Kuala Lumpur iv) Quantity Surveyor : KSK Associates Sdn. Bhd. 29A, Jalan SS4C/5, Taman Raya Sayang, 47301, Petaling Jaya, Selangor . v) Surveyor : Syarikat Mahyuddin & Siew Sdn Bhd
Scope Of Works	a) Relocation works b) Demolition works c) Site clearance

Risk Management Plan

Executive Summary For Package 2:

Contact Title	: The Design, Construction, Equipping, Commissioning and Maintenance of the Women and Child Hospital (600 beds) at Kuala Lumpur – Package 2 Fasa 1
Turnkey Contractor	: Ranhill Berhad
Contract Sum	: RM 704,790,933.00
Contract Period	: 40 Months
Date of LOA *(Letter of Award)*	: 10 December 2007
Commencement Date	: 17 August 2008
Completion Date	: 16 December 2011
List of Consultant	i Architect : Arkitek Kitas Sdn. 39A, Jalan Ipoh, 51200, Kuala Lumpur. ii Civil & Structure : Ranhill Consulting Sdn. Bhd. 24th Floor, Empire Tower, 182 Jalan Tun Razak, 50400, Kuala Lumpur. iii Mechanical & Electrical : Ranhill Consulting Sdn. Bhd. 25th Floor Empire Tower, 182 Jalan Tun Razak,50400, Kuala Lumpur iv Quantity Surveyor : KSK Associates Sdn. Bhd. 29A, Jalan SS4C/5, Taman Raya Sayang, 47301, Petaling Jaya, Selangor . v. Medical and Equipment Planner : Mediconsult Planning & Consulting Svc Sdn Bhd A13/5/5 Jalan Ampang Utama 2/2, One Ampang Business Avenue, 68000 Ampang
Scope Of Works	Phase I involving: (i) Kerja-kerja awalan, Kerja-kerja bangunan, Kerja-kerja cerucuk, Kerja-kerja mekanikal dan elektrikal, Total Hospital Information System – THIS (kecuali 'clinical software'), Kerja-kerja Sekitar Bangunan, 'Medical Equipment (Group I), 'Non-Medical Equipment' dan 'Furniture' Phase II involving of: (i) Completing, testing, commissioning and maintenance of the Phase 1 Hospital with scope of work : a. Medical Equipment (Group II) b. Loose Medical Equipment (Group III and Group IV) c. Vehicles d. Total Hospital Information System – THIS ('clinical softwares)

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1. INTRODUCTION

The objective of this Risk Management Plan is to identify possible risks and mitigation strategies for the development and construction of **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** to be delivered in 8 months with the quality and function that meets the stakeholders' expectation.

1.1. Background

There are always risks associated with a project. The purpose of risk management is to ensure levels of risk and uncertainty are effectively managed, so that the project is completed successfully on time and within budget. The risk management process enables stakeholders involved in a project to identify possible risks and the manner in which these risks can be contained and the likely cost of mitigation strategies.

Proper risk management allows the project to prosper through taking and avoiding risks. Good risk management will greatly improve the transparency of how the project operates, providing a roadmap to achieve strategic goals and objectives and reassurance over the management of risks.

Successful management of the Project requires informed, proactive, and timely management of risks. The specific objectives of this risk management plan and approach are:

- Ensure critical risks impacting scope, schedule, budget, business performance, and/or change management are proactively identified, communicated, mitigated, and escalated in a timely manner.
- Facilitate attention to key risks impacting the project and individual teams.
- Produce meaningful information that allows project management to focus efforts on the "right" (e.g., high likelihood and high impact) risks with an effective coordination of effort.
- Ensure appropriate stakeholders are informed and, if applicable, participate in the mitigation.
- Record an audit trail of discussions and mitigation of project risks.

The goal of this Risk Management Plan (RMP) is to proactively identify and address risks early in the project and throughout its lifecycle in order to avoid surprises.

1.2. Purpose

This document describes how the **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** project team will perform the job of managing risks for the project. It defines roles and responsibilities for stakeholders in the risk processes, the risk management activities that will be carried out, the schedule and subsequent budget for risk management activities and subsequently the tools and techniques that will be used.

This RMP presents the process for implementing proactive risk management as part of the overall management of the **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** project. Risk management is a program management tool to assess and mitigate events that might adversely impact the project. Therefore, risk management increases the probability/likelihood of project success.

This RMP will:

- Serve as a basis for identifying alternatives to achieve cost, schedule, and performance goals.
- Assist in making decisions on budget and funding priorities.
- Provide risk information for milestone decisions.
- Allow monitoring the health of the project as it proceeds.

The RMP describes methods for identifying, analyzing, prioritizing, and tracking risk drivers; developing risk-handling plans; and planning for adequate resources to handle risk.

It assigns specific responsibilities for the management of risk and prescribes the documenting, monitoring, and reporting processes to be followed.

1.3. Project Summary

Client:	Kementerian Kesihatan Malaysia (KKM)
End User:	Kuala Lumpur Hospital (HKL)
Location:	Di Sebahagian Lot 24, Jln Dr. latiff, Mukim Kuala Lumpur (Within HKL area, adjacent Paediatric Institute). Refer to below Illustration 1.0
Site:	The site is situated adjacent to the existing Paediatric Institute of the General Hospital, Kuala Lumpur and has a total area of 6.9 acres. Refer to below Illustration 1.0.

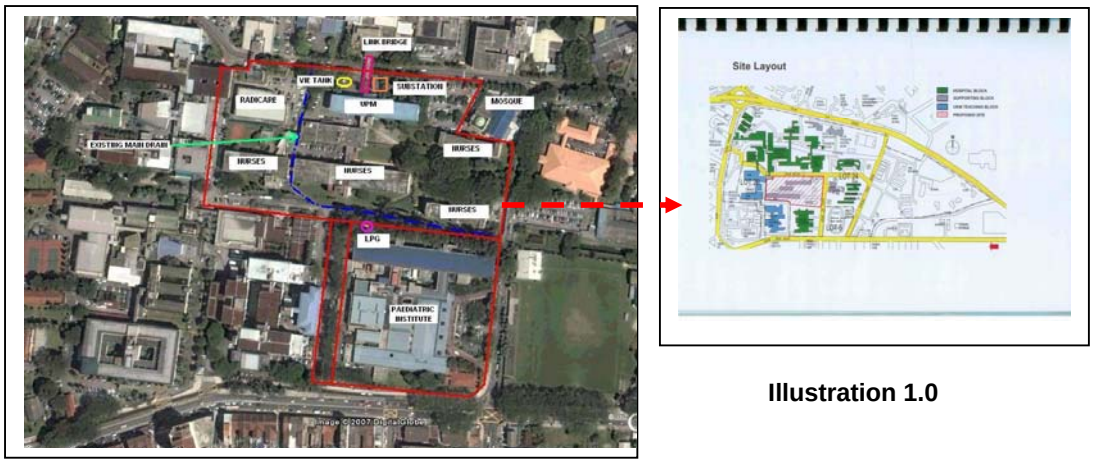

Illustration 1.0

Scope of work for Package I:

Identify, carry out all relocations of services and structures available on the site which are effected by construction of new works as follows:

i) Relocation of Civil & Structural, M& E Works

a) Diversion of existing monsoon drain to make way for injection piles
b) Existing sewer line to be diverted to match proposed new hospital development and connection to last manhole off-site.
c) Capped and demolish water pipes lines and new tapping at Jln Dr. Latiff to serve Paediatric Institute and proposed new hospital development.
d) Relocation of LPG Tank to free the area for new access way.
e) Provide new base for VIE Tank, piping connection and construct new Gas Store Room complete with manifolds and connection.
f) Diversion of LV supply from PE4 for mosque and main kitchen.
g) Relocation of SCADA fibre optic cables and reconfigures system to cater for relocation of cables.
h) Diversion and reconnection of HT cables to fore go PE4 and remove existing HT cables cutting across building site.

ii) Demolition Works

a) Demolition of existing Student Nurses Hostel, Kitchen Nurses Hostel, Staff Nurses Hostel, Nurses Hostel and Radicare Office – (all 6 blocks).
b) Demolition of existing TNB Substation 2 and HKL PE No. 4 and link bridge at Staff Nurses Hostel.
c) Demolition of existing monsoon drain, existing service manholes and utilities.

iii) Site Clearance

a) Removal and relocation of existing trees within site boundary.

Scope of work for Package II –Phase I:

Consist of planning, designing, integrating with other multi-discplinary requirements, specifying and subsequently constructiong and completing, commissioning and handing over of new Women and Child Hospital :

i) 600 inpatient beds including

- 4 nos of 2nd & 3rd class wards to be built in shell
- 22 LDR suites (16 delivery rooms to be fully fitted and equipped)
  (6 delivery rooms to be built in shell)

ii) Supporting Buildings.

The facilities are as follows (Phase 1):

i) Outpatient services : specialist clinics
ii) Outpatient services : Emergency Services
iii) Inpatient Services (Wards)
iv) Intensive Care Services
v) Diagnostic and Treatment Services
vi) Clinical Support Services
vii) Non Clinical Support Services
viii) Training, Education and Research
ix) Administration
x) Staff Facilities
xi) General Amenities

1.3.1. Project Governance

Refer to JKR Project Team Organization Chart (Appendix D).

1.4. Scope and Context

This Risk Management Plan identifies the procedures used to manage risk throughout the project. In addition to documenting the approach to risk identification and analysis, the plan covers who is responsible for managing risks, how risks will be tracked throughout the project lifecycle, and how mitigation and contingency plans are developed and implemented. This document also briefly describes how the project participates in division-level risk management activities and reporting.

This RMP identifies the procedures used to manage risk throughout the project. In addition to documenting the approach to risk identification and analysis, the plan covers who is responsible for managing risks, how risks will be tracked throughout the project lifecycle, and how mitigation and contingency plans are developed and implemented.

Risk management starts at the beginning of the project (Initiation Phase) with initial planning and assessing and is carried out at all levels within the project: project, team, and contractor. The risk management process ensures that risks are mitigated at the appropriate level and communicated as appropriate. While this plan provides guidance on managing all levels of risks, the primary focus is on risks at the project level; assuming that similar processes are in effect within the individual teams and contractors that comprise the project.

Risk management is an integral part of overall project planning and management and effective project planning and management requires effective identification and assessment of risks and determining what mitigating actions are required. Managing the effective completion of mitigation actions should be integrated with overall project tasks and assignments.

Risk management also works in concert with issue management. The key difference between issue management and risk management is the element of uncertainty inherent in risks. Uncertain events that could impact the project should be identified and managed through this RMP. Note that risks could lead to identification of issues and issues could drive identification or resolution of risks.

1.5. Definitions, Acronyms and Abbreviations

Update Attachment C with any project specific definitions. Include in this section project specific acronyms or abbreviations that are used.

2. RISK MANAGEMENT PROCESS

This section describes the JKR project risk management process and provides an overview of the **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** risk management approach. Risk management is defined as the act or practice of controlling risk and includes risk planning, assessing risk areas, developing risk-handling options, monitoring risks to determine how risks have changed, and documenting the overall risk management program. Figure1 shows, in general terms, the overall risk management process that has been followed

in the **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** project. Each of the risk management functions shown in the figure is discussed in the following paragraphs, along with specific procedures for executing them.

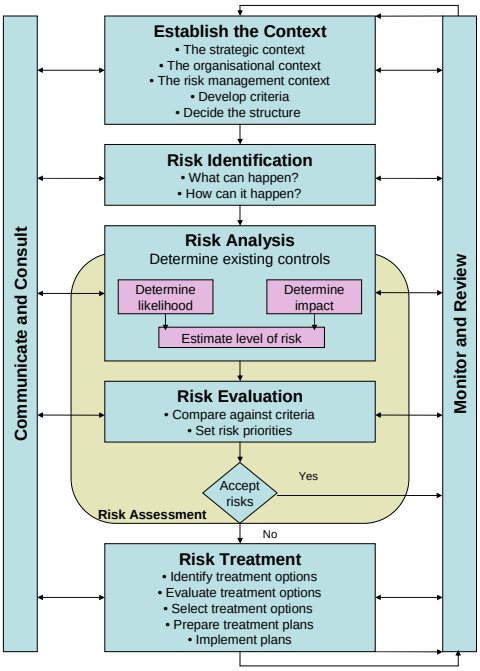

Figure 1: JKR Project Risk Management Process

2.1. Establish the Context

Establishing the context for the **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** project consists of the up-front activities necessary to execute a successful risk management program. It is an integral part of normal project planning and management. The planning addresses each of the other risk management functions, resulting in an organised and thorough approach to assess, handle, and monitor risks. It also assigns responsibilities for specific risk management actions and establishes risk reporting and documentation requirements. This RMP serves as the basis for all detailed risk planning, which must be continuous.

2.1.1. Responsibilities

The project manager (or delegate or risk manager if appropriate) is responsible for conducting risk planning, using this RMP as the basis. Planning covers all aspects of risk management to

including assessment, handling options, and monitoring of risk mitigation activities. The project management monitors the planning activities of the team to ensure that they are consistent with this RMP and that appropriate revisions to this plan are made when required to reflect significant changes resulting from the team planning efforts.

Each person involved in the design, production, operation, and support of the project is a part of the risk management process. This involvement is continuous and should be considered a part of the normal management process.

2.1.2. Documentation

This RMP establishes the basic documentation and reporting requirements for the project. Team members should identify any additional requirements that might be needed to effectively manage risk at their level. Any such additional requirements must not conflict with the basic requirements in this RMP.

2.2. Risk Identification

Risk identification is the first step in the assessment process. The basic process involves reviewing the entire **Women and Child Hospital, Kuala Lumpur Hospital (600 Beds)** project to determine those critical events that would prevent the project from achieving its objectives. All identified risks were documented in the Risk Register (see Appendix A).

Risks were identified by the team, including the contractors, which allowed the identification of significant concerns earlier than otherwise might be the case and the identification of those events in critical areas that need to be dealt with to avoid adverse consequences/impacts. Likewise, individuals involved in the detailed and day-to-day technical, cost, and scheduling aspects of the project are most aware of the potential problems (risks) that need to be managed.

For the purpose of this assessment, risks were identified in the Post Award stage of the project implementation.

2.2.1. Tools and Techniques

Tools and techniques used in the risk identification and mitigation strategies for this project were as follows:

- Brainstorming, with a facilitator (PROKOM) and range of stakeholders (HOPT, HODT and contractor)
- Interviews with stakeholders (contractor)
- Experience from other project matrix and published data for norms.

Besides the above, the following tools and techniques are also applicable for risk identification and mitigation strategies:

- Scenario, business analysis and event tree modelling.
- Dependency modelling.
- Reviewing project information, including plans, analysis and designs.
- Checklists.

2.2.2. Risk Register

The key output of the risk identification phase is the risk register. The risk register for the project is shown at Attachment A.

Note: At this stage just a list of identified risks would appear in the risk register. The risk register Attachment A has had further analysis applied to the risks.

2.3. Risk Analysis

Risk analysis can be undertaken using similar methods as used for risk identification and is also a continuous process in the same way that risk identification is and the two may often be combined, in a structured way, into one activity.

Project or program risks are analysed to identify the:

- Estimated likelihood that the risk will occur (preferably probability using quantitative methods);
- Estimated impacts of the risk occurring in terms of its cost, schedule, 'quality' and other impacts on the project objectives including its products;
- The most appropriate risk owner; and
- Potential impact of the risk on third parties such as other projects and organisations.

It can also be useful at this stage of the analysis to conduct an initial high level assessment of whether the risk should be managed. There are three cases where a risk may not need managing by a project:

- The likelihood of it happening is extremely small.

- The impacts are insignificant and require no treatment
- The risk belongs outside the project; in this case the outside owners must formally take responsibility for it.

2.3.1. Updated Risk Register

The risk register is updated with the likelihood and impact Information and the consequent risk rating as per Attachment A.

2.4. Risk Evaluation

Typically an analysis or review of the risks associated with a project is made and a decision formed on what risks need treatment and what are their associated priorities. The first action is to sort the analysed risks by classifying them as one of:

- Accepted Risks, risks that are currently acceptable and do not require treatment, but will be kept under review.
- Rejected Risks, risks that are considered non-existent after analysis or of no significance.
- Significant Risks to be treated, these may need prioritisation.

Classification and prioritisation will be against risk criteria in the light of contexts and policies established in the Risk Management Plan.

Note: At this point in time, overall JKR policies for risk management have not been developed and a review of the risks was undertaken only at the project level and in the first instance the risks were accepted and treatment measures will be undertaken.

2.5. Risk Treatments

An initial identification and assessment of measures to modify the identified risks was performed and the preparation of treatments for the risks identified. Risk Owners should also be assigned and may be members of the project team, business or other managers elsewhere in JKR, participating agencies or other stakeholder bodies. They will require an appropriate allocation of resources for their task(s), which may require negotiation by the sponsor depending on their relationship to the project.

Treatments are aimed to either reduce the risk's likelihood or impacts or both. Preparation of treatments requires inputs from stakeholders and coordination with the Project Manager.

Normally if there is an unacceptable risk of a treatment failing (or not being found) or when a risk may reach an unacceptable level then a contingency plan must be developed.

2.5.1. Risk Assessment Worksheets

The output of the identification and assessment of the high priority risks is shown at Attachment B. At this stage some implementation measures have been identified (Future Strategies) but actions arising from these strategies, should, where possible, be included as activities in the project management plan.

2.6. Risk Monitoring and Reporting

The project manager as overall responsibility for monitoring and managing all aspects of the risk management process, unless the risk management activities have been assigned to a separate risk manager. To ensure that significant risks are effectively monitored, risk-handling actions should be reflected in integrated project planning and scheduling.

Risk status should be reported on an exception basis at the weekly project status meetings, with a full risk review conducted on a monthly basis.

3. RISK MANAGEMENT ORGANISATION

The risk organization for the **Woman and Child Hospital, Kuala Lumpur Hospital** project is not a separate organisation, but rather risk is integrated into the project's existing structure. A role is typically assigned to a Risk Manager who in turn is the overall coordinator of the project's Risk Management Program.

Note: This role in most projects will be performed by the Project Manager, but depending on the size of the project this role may be performed by a dedicated person.

The Risk Manager is responsible for:

- Maintaining this RMP
- Briefing the PM on the status of project risk
- Tracking efforts to reduce moderate and high risk to acceptable levels
- Providing risk management training
- Facilitating risk assessments
- Preparing risk briefings, reports, and documents required for project reviews and the acquisition milestone decision processes.

The project team is responsible for implementing risk management tasks as per this Plan. This includes the following responsibilities:

- Review and recommend to the Risk Manager changes on the overall risk management approach based on lessons learned
- As directed, update the project risk assessments made during the applicable project phase
- Review and be prepared to justify the risk assessments made and the risk mitigation plans proposed
- Report risk to the PM, with information to the Risk Manager via the Risk Register or Risk Assessment Forms
- Ensure that risk is a consideration at each project review.

It is also important that the user/owner organisation remains fully involved in the risk management process, and identifies risks associated with future operation of the project deliverable(s).

ATTACHMENT A

RISK REGISTER

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RISK REGISTER

Project Title : **The Design, Construction, Equipping, Commissioning and Maintenance of Women & Child Hospital (600 Beds) at Kuala Lumpur** (Package 1 and 2)	Date : 11 Jun 2008
Project No. :	Compiled by :
Project Mgr : Ar. Aziah Bt. Ibrahim	Reviewed by :

CATEGORY OF PROJECT RISK	
1. Political	9. Contractual
2. Scope	10. Technical
3. Schedule	11. Environmental
4. Financial	12. Suppliers
5. Human Resources	13. Industrial relations
6. Quality	14. Organisational
7. Communications	15. OH & S
8. Other resources	16. Cultural

Likelihood	Impact Rating	Risk Rating
5. Almost certain	V. Severe	E– Extreme risk, immediate action required
4. Likely	IV. Major	H – High risk, will jeopardize project if not managed
3. Possible	III. Moderate	M – Medium risk, will impact time, cost or quality if not managed
2. Unlikely	II. Minor	L – Low risk, acceptable project management risk, monitor only
1. Rare	I. Insignificant	

Risk Matrix

LIKELIHOOD						
	5	H	H	H	E	E
	4	M	M	H	E	E
	3	L	M	M	H	E
	2	L	L	M	H	H
	1	L	L	M	M	H
		I	***II***	***III***	***IV***	***V***
		IMPACT				

1.0 PLANNING & PROCUREMENT RISKS 2.0 DESIGN RISKS 3.0 CONSTRUCTION RISKS 4.0 HAND OVER RISKS

1.0 PLANNING AND PROCUREMENT RISKS

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
	PACKAGE I							
1.1	If this site is chosen then it will affect the cost, time and quality of the project.	10	5	V	**E**	* Resolved & accepted- (quote mitigation measures)		
1.2	If the contract scopes are not clear then it will affect the construction cost and time and quality of the project.	9	4	IV	**E**	* Resolved & accepted- (quote mitigation measures)		
1.3	If the health risks are not properly considered then it will affect the proper function of HKL.	15	5	IV	**E**	* Resolved & accepted- (quote mitigation measures)		
	PACKAGE II							
1.4	If the scope is not finalised then it will prolong the planning stage and delay the construction and project completion.	2	4	IV	**E**	o Provide clear need statements in the pre-bid documents. o Provide clear operational policies for W&C hospital. o Pengarah HKL to empower key personnel to attend all meetings	Pengarah HKL & Pengarah BP&P KKM	o 1 month o **To be determine later.**
1.5	If there is insufficient budget then the project will be delayed.	4	4	IV	**E**	o Request for additional funds during the recent mid-term review exercise. o Minimize the changes to existing scope.	o BP&P KKM Pengarah HKL	o Request has been put forward

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
1.6	If there is lack-of skilled manpower then it will prolong the planning stage and delay the construction and project completion, increase the cost and reduce the quality of the project.	5	5	IV	**E**	o Competitive remuneration package. o Giving project incentive. o Conducive working environment. o Improving and strengthening the operations structure.	Ranhill Berhad	o On going process
1.7	If there is an increase in costs then it might delay the delivery of projects to the client and reduce the quality of the project.	4	5	III	**E**	o To implement value engineering of the design to reduce the cost and ensure quality especially on the M&E aspect. o Ranhill Berhad to approach government to consider VOP (variation of price) for this project. o JKR to follow-up the VOP approval.	Ranhill	o July 2008 o July 2008
1.8	Ineffective Communication between the stakeholders	7	3	III	M			
1.9	Design cannot meet clients requirements	10	3	III	M			

2.0 DESIGN RISKS

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
2.1	Need statement is not comprehensive – changes in design – delay in design schedule	2	5	IV.	E	o To review the need statement during room data interaction o To issue addendum of need statement (minutes of room data interaction) to Contractor	JKR/KKM JKR/KKM	End of August 2008 End of August 2008
2.2	New building in functional hospital compound – disruption in hospital operation - health hazard to existing patient (immunocompromised patients and chronic lungs disorder)	15	5	V.	E	o To move out patients to other hospital o To install HEPA Filter to the affected wards (Oncology & Respiratory)	HKL/KKM KKM	Immediate Action Immediate Action
2.3	Unforeseen existing M&E services – Disruption to existing hospital operation	10	4	IV.	E	o Continuous monitoring during sub-structure work	Contractor	-
2.4	Incoherence between ministerial policies and operational procedures – Additional scope /cost /changes in	2	4	IV.	E	o To formulate /upgrade the communication skills	KKM	ASAP

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
	design					between the departments o To develop a communication plan within the working parties.		
2.5	Room data after negotiation – Serious Cost & Design implication	4	5	IV	E	o To balance up the total cost (within the contract sum)	JKR / KKM /Contractor	After Room Data Interaction
2.6	Design fault (Architectural / M&E / C&S / Planner) by designer – Causing a lot of defects/building integrity	10	3	V	E	o To verify the consultant's design	JKR	Before construction
2.7	Design information is not sufficient – risk to structural design	10	3	IV.	H	o To design structural component after getting all the necessary information from other discipline (Room data)	Contractor /Consultant	End of August 2008
2.8	Fast changing Medical Technologies / Equipment – Disruption to project schedule – Changes in design (*Delay in design process*)	10	4	III.	H	o To provide a provisional sum to cater for unforeseen changes in medical technologies*	Contractor	End of August 2008

Ref No. (WBS)	Risk Event There is a risk that ……..	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
						(*To be discuss further*) • *To finalize the TSA earlier**		To be determine later
2.9	Insufficient design detail – Difficulty in construction and increase in cost	10	3	IV	H	o To check the final drawing before construction	Contractor /Consultant	End of August 2008
2.10	Policy for hospital design does not cater for diseases outbreak - Contamination and cost implication for later renovation	15	3	IV	H	o To decide to convert one of the wards to become an Isolation Ward. o To established a new SOP regarding transfer of index patient from admitting area (A&E or clinics) to the ward	HKL/KKM HKL	(12 June 2008)* December 2011*
2.11	Re-organization of JKR Matrix Structure – Lack Co-ordination between JKR and may cause project delay	14	3	IV	H	o To established a mechanism for a better co-ordination and communication (*develop a communication plan within*	JKR JKR	Immediately To be determine

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that ……..	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
						JKR/stakeholder)* o No more policy change during the construction period		later
2.12	Brands preference for Medical Equipment/Client - Cost implication to the Contractor/Government	4	3	III.	M			
2.13	Late design instruction /information to contractor – Delay in design completion	10	3	III	M			
2.14	Late material approval – Delay in project implementation	3	3	III	M			
2.15	Not abiding to decision in TSA - Cost implication	4	3	III	M			
2.16	Insufficient space allocation for M&E maintenance space – Difficulty in maintaining the hospital services	10	3	III	M			

3.0 CONSTRUCTION RISKS

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
3.1	Uncontrolled escalation of construction cost after contract signing will lead to contract review may result in delay of the project completion.	4	5	V	**E**	o Request for Variation of Price (VOP) by contractor. o Request for review the material specification. o Request for review the design/system.	Contractor/JKR (CM) Consultants/JKR (HODT) Consultants/JKR (HODT)	Before contract binding (16.11.2008) Before site possession (17.8.2008) Before site possession (17.8.2008)
3.2	Due to the site location, there would be unforeseen events that may delay the work progress resulting in delay of the project	3	4	IV	**E**	o Do proper logistic planning o Provide offsite facilities o Implement Environmental Management Plan (EMP) o *Dengue – fogging at the right*	Contractor Contractor Contractor	Before site possession(17.8.2008) During construction/ before superstructure (1.2.2009) Before site possession(17.8.2008) During

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
						time	Contractor	construction
3.3	If there is delay in approval / response and new requirements from local authorities, then may result in redesign and/or delay in implementation	7	5	IV	**E**	o JKR to get involvement from local authorities o Have closer rapport with authorities	JKR Contractor	Every site meeting(monthly) Before each construction activities (12.06.2008-16.12.2011)
3.4	If there is continuous shortage of manpower (technical staff and skilled labours) then the quality of workmanship will decreased	5	4	IV	**E**	o Improve payment to sub-contractor /supplier – every two weeks o Offer attractive salary/perks to technical staff	Contractor Contractor/Consultants	During construction (every 2 wks) Before and during construction (12.06.2008-16.12.2011)
3.5	As the design was not confirmed at time of issuance of Letter of Acceptance, possible incorporation of end users requirements would involve time to redesign and variation in cost.	10	5	IV	**E**	o Maintain design decision made through out construction period	KKM/HKL	During construction period (12.06.2008-16.12.2011)

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
3.6	If there is delay in delivery of external infra services by public utilities, then project schedule will be upset and may delay project delivery.	3	4	IV	**E**	o Early hand over of utility facilities (TNB substation etc)	Contractor/consultants	Before Jun 2010
3.7	Changes in end users requirements during construction may require redesign and reworks resulting in delays and variation of works.	3	3	IV	H	o No major design changes provided sufficient allocation o Ensure change control procedure is complied	KKM/ HKL JKR/KKM/HKL/Contractor	During construction (12.06.2008-16.12.2011) During construction (12.06.2008-16.12.2011)
3.8	If the Main Project Director Representative (CM) is not appointed then there may be lack of proper contract management on behalf of government resulting in poor communication and integration	5	5	III	H	o Appoint Main Project Director Representative (CM) **URGENTLY**	JKR	30.6.2008
3.9	Lack of Continuity Of Project Director – 4 x changes	14	3	III	M			
3.10	Material resources procurement	12	3	III	M			

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
3.11	Public relation (public complaint)	7	3	III	M			
3.12	Site condition - limestone (effect on type of pile)	4	3	III	M			
3.13	Unforeseen services clash	3	3	III	M			
3.14	H&S	3	3	III	M			

4.0 HANDOVER RISKS

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
4.1	If there is late handover from JKR to client then the DLP will less benefit the client	3	4	IV	**E**	o Frequent auditing on quality and workmanship, establish and implement QA/QC o Regular Technical and Site Meeting o Provide a schedule for training programme o To ensure CIDB certification for all level of supervision and construction team o To have adequate numbers of construction supervision staff	JKR(CM)&Contractor (PM) JKR(CM)&Contractor (PM) JKR(CM)&Contractor JKR(CM)&Contractor	16 August 2008 16 August 2008 Start in August 2008 until completion

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
						o Rationalize T&C costing o To provide continuous technical training to all construction team members (JKR) o To improve communication between all parties	JKR's Top Management JKR (HOPT/CKUB) JKR (PROKOM/CPK) JKR (PM/HOPT/CM)	Commencement of work 16 August 2008 Before finalization of the contract Start in August 2008 until completion Start in August 2008 until completion
4.2	If the system provided not fully functioning then there will be delayed in handing over	10	4	IV	**E**	o Rationalize T&C costing o Close monitoring and control of T&C schedule o Direct payment to supplier through deed of assignment	JKR (HOPT,CKUB) JKR (CM)	Before finalization of the contract 6 month before CPC

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
						o To improve communication between all parties e.g. meeting, workshop, seminar etc	JKR (PD) JKR (PD), Client, Contractors	75% of M&E work Upon appointment of subcontractors/suppliers Start in August 2008 until completion
4.3	If incomplete and late submission of Project Documentation then it will affect maintenance and operation by the client	9	5	II	H	o Direct payment to supplier through deed of assignment o Rationalize cost on item as-built drawing, O&M Manual and training o Appoint independent checker for as-built drawing	JKR (PD) JKR (HOPT/CKUB) JKR (HOPT/CKUB/HODT)	Upon appointment of subcontractors/suppliers August 2008 August 2008
4.4	If the issuance of approval by authority is late then the handing over will be delayed	10	3	IV	H	o To monitor consultant submission for approval	JKR(CM) & Contractor	August 2008

Risk Management Plan

Ref No. (WBS)	Risk Event There is a risk that …….	Category of Risk	Likelihood Rating	Impact Rating	Risk Rating	Treatment Measures	Responsible Party	Action Date
						o To organize frequent technical meeting with authority	JKR(CM) & Contractor	August 2008
4.5	If quality of works not met then the client will not accept the project (client point of view) resulting in non handing over of the project	6	3	III	M	o To involve end-user in finalizing TSA/room data interaction o To provide continuous technical training to all construction team members (JKR) o To issue CPC only if all contractual requirements are fully complied by the contractor	JKR (HOPT) & KKM JKR (PD) JKR (CM)	June 2008 August 2008 December 2011
4.6	If the client is not ready to accept then the project will not be delivered according to schedule	5	3	III	M	o To initiate pre-handing over meeting o To recruit and train new staff	JKR (CM) KKM	Jun 2011 August 2008
4.7	If the equipment to be provided by client is not compatible with the system will result delay in handing over	10	3	III	M	o Appropriate personnel to be involve in TSA/room data interaction o To review TSA periodically towards the end of the contract	JKR(HOPT)& KKM JKR(CM/HOPT) & KKM	August 2008 Jun 2011

ATTACHMENT B

RISK ANALYSIS TEMPLATE

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Risk Analysis 1.4

Risk No: 1.4	**Risk Title:** Scope not finalized		
Risk Description: If the scope is not finalised then it will prolong the planning stage, increase the cost and delay the construction and project completion.			
Risk Nature: **Strategic & Operational**	**Risk Category:** 2	**Risk Owner:** HOPT	**Business Unit:** CKK

Risk Factors:	**Possible Effects:**
o client's need statement are unclear and incomplete to the contractor. o Hospital operational policies are too general. o interaction was done after the award, therefore ambiguities in the need statement are not clarified. o high turn-over of end user team during planning stage.	o Delays the planning process. o Client didn't get what they want. o Increased the cost & budget.

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Verbal reminder by the HOPT and Contractor to the Client during interactions.	L
o Internal Memos between divisions at Ministry of Health.	L

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Provide clear need statements in the pre-bid documents. o Provide clear operational policies for W&C hospital. o Pengarah HKL to empower key personnel to attend all meetings.	Pengarah HKL & Pengarah BP&P KKM	o 1 months o **To be determine later.**

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (L)**	
	4	4	4	4	2	2

Risk Analysis 1.5

Risk No: 1.5	**Risk Title:** Insufficient budget		
Risk Description: If there is insufficient budget then the project will be delayed.			
Risk Nature: ~~**Strategic**~~**/ Operational**	**Risk Category:** 4	**Risk Owner:** KKM	**Business Unit:** Unit Pembangunan KKM

Risk Factors:	**Possible Effects:**
o Uncertain economic situation of the country o Political decision to reduce country expenditure. o Increase in scope and specifications	o Delay in project implementation o Increase in project costs o More costly for new technology

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Request for additional funds. o Verbal reminder by the HOPT and Contractor to the Client during interactions. o Internal Memos between divisions at Ministry of Health. o Financial projection by JKR and commitment by KKM	L

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Request for additional funds during the recent mid-term review exercise. o Minimize the changes to existing scope.	o BP&P KKM o Pengarah HKL	o Request has been put forward

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (L)**	
	4	4	4	4	2	2

Risk Analysis 1.6

Risk No: 1.6	**Risk Title:** Lack-of skilled manpower		
Risk Description: If there is lack-of skilled manpower then it will prolong the planning stage and delay the construction and project completion, increase the cost and reduce the quality of the project.			
Risk Nature: ~~Strategic~~/Operational	**Risk Category:** 5	**Risk Owner:** Contractor	**Business Unit:** Ranhill Berhad

Risk Factors:	**Possible Effects:**
o worldwide booming of construction industries. o better remuneration abroad.	o Delay in project completion o Increase contractor costs by appointing inexperienced personnel o Poor performance affect the quality of the project

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Better remuneration package. o Recruitment of competent and skilled manpower	L

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Competitive remuneration package. o Giving project incentive. o Conducive working environment. o Improving and strengthening the operations structure.	Ranhill Berhad	o On going process

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (M)**	
	5	5	5	5	3	3

Risk Analysis 1.7

Risk No: 1.7	**Risk Title: Increase in construction cost**		
Risk Description: If there is an increase in costs then it might delay the delivery of projects to the client and reduce the quality of the project.			
Risk Nature: Operational	**Risk Category: 4**	**Risk Owner: Ranhill**	**Business Unit:** Project Team

Risk Factors:	**Possible Effects:**
o Global economy such as fluctuation of exchange rate and also	o Increase in the price of construction materials.

inflation. o Increase in scope after awarding the project to the contractor o Unable to fully understand the needs statements by contractor.	o Increase in labour cost. o Increase in contractor's cost for construction. o Increase in contractor's cost

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Allowed some contingency fund.	L

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To implement value engineering of the design to reduce the cost and ensure quality especially on the M&E aspect. o Ranhill to approach government to consider VOP (variation of price) for this project.	Ranhill	o July 2008 o July 2008

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (M)**	
	4	5	4	4	3	2

Risk Analysis 2.1

Risk No: 2.1	**Risk Title: Need Statement Is Not Comprehensive**		
Risk Description:			
Risk Nature: Strategic/Operational	**Risk Category: 2**	**Risk Owner: JKR/KKM**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o The Hospital is first of its kind in Malaysia o Medical Brief/Medical Equipment Brief is too generic/functional detail not enough o Need statement by JKR (Arc/M/E/C/S/G) too be more specific	o Delay in design schedule o Changes in design o Increased in cost to the government o Output not meeting end user's functional requirement

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To review the need statement during room data interaction	**JKR/KKM**	End of August 2008
o To issue addendum of need statement (minutes of room data interaction) to Contractor	**JKR/KKM**	End of August 2008

Assessed Risk Date Last Review	Inherent Risk (E)		Assessed Risk (E)		Target Risk (…..)	
	5	IV	5	IV		

Risk Analysis 2.2

Risk No: 2.2	**Risk Title:** New building in National Referral hospital (**HKL**) compound		
Risk Description: Construction activities will expose high risk patients to health hazard			
Risk Nature: Strategic/Operational	**Risk Category: 15**	**Risk Owner: HKL**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Spores and dust in the environment o .. o ..	o Can cause invasive fungal infection in immunocompromised patients o Dust aggravating chronic lung disease o ..

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Fumigation being carried out fortnightly in the respective wards o All opening are being sealed	**M** **M**

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To move out patients to other hospital o To install HEPA Filter to the affected wards (Oncology & Respiratory)	HKL/KKM KKM	Immediate Action Immediate Action

Assessed Risk Date Last Review	Inherent Risk (E)		Assessed Risk (E)		Target Risk (…..)	
	5	V	5	V		

Risk Analysis 2.3

Risk No: 2.3	**Risk Title:** Unforeseen existing M&E services		
Risk Description: Interruption in existing M&E services			
Risk Nature: Strategic/Operational	**Risk Category: 10**	**Risk Owner: Contractor**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Unknown cables/pipes running underground o .. o ..	o Interruption to the existing infrastructure o .. o ..

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Rerouting all the known existing services o .. o ..	H

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Continuous monitoring during sub-structure work o ..	Contractor	-

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (…..)**	
	4	IV	4	IV		

Risk Analysis 2.4

Risk No: 2.4	**Risk Title:** Disparity between ministerial policies and operational procedures		
Risk Description:			
Risk Nature: Strategic/Operational	**Risk Category: 2**	**Risk Owner: KKM**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Lack of communication between top down management in implementing new policies o Lack of manpower o Multi tasking officer who need to execute different jobs	o Delay in finalizing the scope of the project o Frequent changes in design resulting in a lot of abortive work o Additional cost incurred due to VO o Design might not meet the functional requirement of the end user

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To formulate/upgrade the communication skills between the departments o ..	KKM	ASAP

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (…..)**	
	4	IV	4	IV		

Risk Analysis 2.5

Risk No: 2.5	**Risk Title:** Room data after negotiation		
Risk Description: Room data interaction is done after the project awarded			
Risk Nature: Strategic/Operational	**Risk Category: 4**	**Risk Owner: JKR/KKM**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Urgency in implementing the project o Political influences in implementing the project o ..	o Project scope was not finalized thus altering the initial design which eventually increased the overall cost of the project o ..

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To balance up the total cost (within the contract sum) o ..	JKR/KKM/Contractor	After Room Data Interaction

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (…..)**	
	5	IV	5	IV		

Risk Analysis 2.6

Risk No: 2.6	**Risk Title:** Design fault (Architectural / M&E / C&S / Planner) by designer		
Risk Description: Design does not meet the particular standards/specification/code of practice			
Risk Nature: Strategic/Operational	**Risk Category: 10**	**Risk Owner: Contractor**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Consultant/contractor did not interpret the medical brief/need statement/etc. properly o Consultant/contractor are not aware of the latest JKR specification	o Causing a lot of defects to building (Arc/M&E/C&S) o Building integrity is compromised

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Hiring an Independent Checker(C&S) o Auditing the design by JKR (C&S) o ..	H H

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To verify the consultant's design o ..	JKR	Before construction

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (…..)**	
	3	IV	3	IV		

Risk Analysis 2.7

Risk No: 2.7	**Risk Title:** Design information is not sufficient (**Structural**)		
Risk Description: Insufficient input from other discipline for structural design analysis may cause structural defect/failure			
Risk Nature: Strategic/Operational	**Risk Category: 10**	**Risk Owner: Contractor**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Lack of communication between design team	o Failure/defect to structural components

o Structural design done before Archi/M&E drawing was finalized. o ..	o Structural design does not cater for Archi/M&E requirement o Delay in design process

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To design structural component after getting all the necessary information from other discipline (Room data) o ..	**Contractor/Consultant**	End of August 2008

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (…..)**	
	3	IV	3	IV		

Risk Analysis 2.8

Risk No: 2.8	**Risk Title:** Fast changing Medical Technologies / Equipment		
Risk Description: Ever changing medical technologies requires equipment to be bought at later stage of construction.			
Risk Nature: Strategic/Operational	**Risk Category: 10**	**Risk Owner: Contractor**	**Business Unit: CKK**

Risk Management Plan

Risk Factors:	Possible Effects:
o Medical technologies/specification always being updated o End user's requirement always changing/higher specification o New policies from client	o Disruption to project schedule o Equipment become obsolete/upgraded o Increase in cost o Design does not cater for the new technologies

Existing Risk Treatments:	Effectiveness: (H, M, L)
o Clause is provided in the contract to supply latest model of the equipment six months before delivery. o .. o ..	**M**

New Risk Treatments :	Responsibility:	Deadline:
o To provide a provisional sum to cater for unforeseen changes in medical technologies o	Contractor	End of August 2008

Assessed Risk Date Last Review	Inherent Risk (H)		Assessed Risk (H)		Target Risk (…..)	
	4	III	4	III		

Risk Analysis 2.9

Risk No: 2.9	**Risk Title:** Insufficient design detail		
Risk Description: Insufficient design detail from all discipline involved in the design stage.			
Risk Nature: **Strategic/Operational**	**Risk Category: 10**	**Risk Owner: Contractor**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o New specification/policies were implemented after the design stage. o Not enough time to prepare the drawing. o Not enough personnel to prepare/check the drawing	o Difficulty in construction o Increase in cost o Difficulty in maintenance.

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Contractor to submit the final drawing to be checked by JKR o o ..	**H**

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To check the final drawing before construction o ..	Contractor/Consultant	End of August 2008

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (…..)**	
	3	**IV**	3	IV		

Risk Analysis 2.10

Risk No: 2.10	**Risk Title:** Policy for hospital design does not cater for diseases outbreak		
Risk Description: Current hospital design does not cater for any aerosolized outbreak			
Risk Nature: **Strategic/Operational**	**Risk Category: 15**	**Risk Owner: HKL/KKM**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Current hospital policies does not accept any patient with external disease outbreak (From community) o Index patient with highly contagious disease being admitted to the hospital	o Airborne disease can spread throughout the hospital. o .. o ..

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Isolation room has been provided. o ..	**H**

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To convert one of the wards to become an Isolation Ward. o To established a new SOP regarding transfer of index patient from admitting area (A&E or clinics) to the ward	HKL/KKM HKL	December 2011 December 2011

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (…..)**	
	3	IV	3	IV		

Risk Analysis 2.11

Risk No: 2.11	**Risk Title:** Re-organization of JKR Matrix Structure		
Risk Description: JKR new policy causing difficulty in co-ordination and communication among various disciplines.			
Risk Nature: Strategic/Operational	**Risk Category: 14**	**Risk Owner: JKR**	**Business Unit: CKK**

Risk Factors:	**Possible Effects:**
o Decision made by policy makers o .. o ..	o May cause project delay. o Lack of co-ordination between JKR expertise o ..

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To established a mechanism for a better co-ordination and communication	JKR	Immediately
o No more policy change during the construction period	JKR	To be determine later

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (…..)**	
	3	**IV**	3	IV		

Risk Analysis 3.1

Risk No: 3.1	**Risk Title: :** Escalation of prices		
Risk Description: Escalation of prices for package 1 & 2 (RM 15.5 + 704 juta) – kontrak telah di tandatangani.- Project delay			
Risk Nature: Strategic/Operational	**Risk Category: 4**	**Risk Owner: Contractor**	**Business Unit:CKK, JKR**

Risk Factors:	**Possible Effects:**
o Fuel price up o Fixed contract sum o	o Operating cost up o Procurement cost up o Absorb losses o Compromise quality and time

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Request for Variation of Price (VOP) by contractor. o Request for review the material specification. o Request for review the design/system.	Contractor/JKR (CM) Consultants/JKR (HODT) Consultants/JKR (HODT)	Before contract binding (16.11.2008) Before site possession (17.8.2008) Before site possession(17.8.2008)

Assessed Risk Date Last Review	Inherent Risk (E)		Assessed Risk (E)		Target Risk (M)	
	5	V	5	V	3	III

Risk Analysis 3.2

Risk No: 3.2	Risk Title: : Site Constrains		
Risk Description: Site Constrains - Affecting work program			
Risk Nature: Strategic/Operational	**Risk Category: 3**	**Risk Owner: Contractor**	**Business Unit:CKK, JKR**

Risk Factors:	Possible Effects:
o Location - Middle of HKL o Existing infrastructure o Public traffic access o Accessibility o Haphazard public parking o Relocation of services o Environmental impact – noise, dust o Working hrs limited- daylight only	o Lack of working spaces/logistic o Supply cut (blackout) o Affect Hospital operation and patient care o Difficulty in delay recovery

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Underground Survey (utilities mapping)	M
o Piloting	H
o Close communication with Radicare/hospital	H

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Do proper logistic planning	Contractor	Before site possession(17.8.2008)
o Provide offsite facilities	Contractor	During construction/before superstructure (1 Feb 2009)
o Implement Environmental Management Plan (EMP)	Contractor	Before site possession(17.8.2008)

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (M)**		**Target Risk (M)**	
	4	IV	3	III	3	II

Risk Analysis 3.3

Risk No:3.3	**Risk Title: :** Approving Authority problems		
Risk Description: Delay in obtaining authority approval (DBKL, SYABAS, IWK, TNB, TELEKOM etc)			
Risk Nature: Strategic/Operational	**Risk Category: 7**	**Risk Owner: Consultant/Contractor**	**Business Unit:CKK, JKR**

Risk Management Plan

Risk Factors:	Possible Effects:
o Condition imposed by authority o Change of requirement o Organizational change	o Delay in commencement o Unbudgeted cost o Unforeseened design implication

Existing Risk Treatments:	Effectiveness: (H, M, L)
o Close rapport with authorities o Use connection from sub-contractor	L M

New Risk Treatments :	Responsibility:	Deadline:
o JKR to get involvement from authority	JKR	Every site meeting(monthly)
o Have closer rapport with authorities	Contractor	Before each construction activities (12.06.2008-16.12.2011)

Assessed Risk Date Last Review	Inherent Risk (E)		Assessed Risk (H)		Target Risk (M)	
	5	IV	4	III	3	III

Risk Analysis 3.4

Risk No: 3.4	**Risk Title: :** Manpower problem		
Risk Description: Shortage of manpower-technical/high skill labour			
Risk Nature: Strategic/Operational	**Risk Category: 5**	**Risk Owner: Consultant/Contractor**	**Business Unit:CKK, JKR**

Risk Factors:	**Possible Effects:**
o Difficulty in sourcing engineers, quantity surveyor, site staff etc o Difficulty in sourcing skill labour	o Quality of design, detailing, cost advice – compromised o Quality of construction management affected (QA/QC) o Low quality of end product – not meeting client satisfaction

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Maintain close relationship with labour supplier	M
o Pay premium price compared to market value	H
o To pay on time	H

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Improve payment to sub-contractor/supplier – every two weeks	Contractor	During construction (every 2 wks)
o Offer attractive salary/perks to technical staff	Contractor/Consultant	Before and during construction (12.06.2008-16.12.2011)

Assessed Risk Date Last Review	Inherent Risk (E)		Assessed Risk (M)		Target Risk (M)	
	4	IV	3	III	3	II

Risk Analysis 3.5

Risk No: 3.5	Risk Title: Design not confirmed – at signing of contract document		
Risk Description: Contract awarded before design confirmed			
Risk Nature: Strategic/Operational	**Risk Category: 10**	**Risk Owner:Consultant/Contractor**	**Business Unit:CKK, JKR**

Risk Factors:	Possible Effects:
o Change in policy by client/government/JKR o Change in requirements by client/end user	o Delay in confirming the design o Delay in work implementation o Increase in project cost

Existing Risk Treatments:	Effectiveness: (H, M, L)
o Have knowledgeable and experienced consultants o Interaction with end user o	M H

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Maintain design decision made through out construction period o ..	KKM/HKL	During construction period (12.06.2008- 16.12.2011)

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (H)**		**Target Risk (M)**	
	5	IV	4	III	3	III

Risk Analysis 3.6

Risk No: 3.6	**Risk Title:** External services / public utility supply – problem in scheduling		
Risk Description: Delayed Delivery of public utilities affecting contractors works program			
Risk Nature: Strategic/Operational	**Risk Category: 3**	**Risk Owner: Contractor**	**Business Unit:CKK, JKR**

Risk Factors:	**Possible Effects:**
o Delayed in termination of utilities o Delayed in supply of electricity o	o Delay in T&C o Delay in CCC o Delay in handing over o

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Close rapport with public utilities companies	M
o Invite public utilities companies for site meeting	M

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Early hand over of utility facilities (TNB substation etc)	Contractor/consultants	Before Jun 2010

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (M)**	
	4	IV	4	IV	3	III

Risk Analysis 3.7

Risk No: 3.7	**Risk Title:** Design changes – end user request during construction stage		
Risk Description: Request for changes by end user during construction stage			
Risk Nature: Strategic/Operational	**Risk Category: 3**	**Risk Owner: Contractor**	**Business Unit:CKK, JKR**

Risk Factors:	**Possible Effects:**
o Floor layout arrangement o room arrangement o Brand changes o Medical Equipment group 2 & 3 changes o	o Delay in replanning & preparation of new construction drawings o If already constructed, to be rectified to suit new design o Rectification may have knock –on effect on other works eg M&E o Change of equipment will result in M&E reworks & cost increase o

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o Interaction & close relationship with all parties o	M

New Risk Treatments :	**Responsibility:**	**Deadline:**
o No major design changes provided sufficient allocation o Ensure change control procedure is complied	KKM/ HKL JKR/KKM/HKL/Contractor	During construction (12.06.2008- 16.12.2011) During construction (12.06.2008- 16.12.2011)

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (M)**		**Target Risk (M)**	
	3	IV	3	III	3	II

Risk Analysis 3.8

Risk No: 3.8	**Risk Title:** No Main Project Director Representative (CM)		
Risk Description: No Main Project Director Representative (CM)			
Risk Nature: Strategic/Operational	**Risk Category: 5**	**Risk Owner: JKR**	**Business Unit:CKK, JKR**

Risk Factors:	**Possible Effects:**
o Insufficient manpower ???	o Unsatisfied client o Lack of proper coordination/communication between contractor,

	client, end user & authorities o Poor auditing of project & construction o

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o -	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Appoint Main Project Director Representative (CM) **URGENTLY**	JKR	30.6.2008

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (L)**	
	5	III	5	III	1	I

Risk Analysis 4.1

Risk No: 4.1	**Risk Title: Late Handover**		
Risk Description : If there is late handover from JKR to client, then the Defect Liability Period (DLP) will less benefit the client			
Risk Nature: **Operational**	**Risk Category: 3 (Schedule)**	**Risk Owner: Construction Manager (WPD)**	**Business Unit: CKK, JKR**

Risk Management Plan

Risk Factors:	Possible Effects:
o Many defect o Poor coordination – M&E services between supplier, contractor, subcontractor etc. o Non-Compliance with T&C requirement o Delay in training o Conflicting perception between JKR and client	o Affecting the serviceability and function of the hospital o Service disruption to end user o Service disruption to end user o Misused and abuse of equipment operation o Strain relationship between client and JKR o Extra cost for compliance

Existing Risk Treatments:	Effectiveness: (H, M, L)
o … o …	

New Risk Treatments :	Responsibility:	Deadline:
o Frequent auditing on quality and workmanship, establish and implement QA/QC	JKR(CM)&Contractor (PM)	16 August 2008
o Regular Technical and Site Meeting	JKR(CM)&Contractor (PM)	16 August 2008
o Provide a schedule for training programme	JKR(CM)&Contractor (PM)	16 August 2008
o To ensure CIDB certification for all level of supervision and construction team	JKR(CM)&Contractor (PM)	Commencement of work
o To have adequate numbers of construction supervision staff	JKR's Top Management	16 August 2008
o Rationalise T&C costing	JKR (HOPT/CKUB)	Before finalization of the contract
o To provide continuous technical training to all construction team members (JKR)	JKR (PROKOM/CPK)	Start in August 2008 until completion

o To improve communication between all parties	JKR (PM/HOPT/CM)	Start in August 2008 until completion

Assessed Risk Date Last Review	**Inherent Risk (E)**		**Assessed Risk (E)**		**Target Risk (M)**	
	4	IV	4	IV	3	III

Risk Analysis 4.2

Risk No: 4.2	**Risk Title: Testing & Commissioning**		
Risk Description: If the system provided not fully functioning then there will be delay in handing over			
Risk Nature: Operational	**Risk Category: 10**	**Risk Owner: Construction Manager (WPD)**	**Business Unit: CKK, JKR**

Risk Factors:	**Possible Effects:**
o Not fully compliance with technical requirement, during T&C o Poor coordination – M&E services between supplier, contractor, subcontractor etc. o Additional requirement from authorities o Specialist Supplier/Vendor-non performance e.g non-payment, company take-over	o Delay in operation/training o Service disruption to end user o Additional contract cost o No service back up

Risk Management Plan

Existing Risk Treatments:	Effectiveness: (H, M, L)
o o .. o ..	

New Risk Treatments :	Responsibility:	Deadline:
o Rationalise T&C costing	JKR (HOPT,CKUB)	Before finalization of the contract
o Close monitoring and control of T&C schedule	JKR (CM)	6 month before CPC 75% of M&E work
o Direct payment to supplier through deed of assignment	JKR (PD)	Upon appointment of subcontractors/suppliers
o To improve communication between all parties e.g meeting, workshop, seminar etc	JKR (PD), Client, Contractors	Start in August 2008 until completion

Assessed Risk Date Last Review	Inherent Risk (E)		Assessed Risk (E)		Target Risk (M)	
	4	IV	4	IV	3	II

Risk Analysis 4.3

Risk No: 4.3	Risk Title: Project Documentation		
Risk Description: If incomplete and late submission of Project Documentation then it will affect maintenance and operation by the client			
Risk Nature: Operational	**Risk Category: Contractual**	**Risk Owner: Construction Manager**	**Business Unit: CKK**

Risk Factors:	Possible Effects:
o Specialist Supplier/Vendor-non performance e.g non-payment, company take-over o Delay in verification and certification by consultant/authorities o Improper verification of as-built drawing by consultant	o Delay in operation/training o Delay in handing over o Unable to operate and maintain properly o Problem in future maintenance

Existing Risk Treatments:	Effectiveness: (H, M, L)
o .. o ..	

New Risk Treatments :	Responsibility:	Deadline:
o Direct payment to supplier through deed of assignment	JKR (PD)	Upon appointment of subcontractors/suppliers Before finalization of the

o Rationalise cost on item as-built drawing, O&M Manual and training o Appoint independent checker for as-built drawing	JKR (HOPT/CKUB) JKR (HOPT/CKUB/HODT)	contract Before finalization of the contract

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (M)**	
	5	II	5	II	3	II

Risk Analysis 4.4

Risk No: 4.4	**Risk Title: Authority approval**		
Risk Description: If the issuance of approval by authority is late then the handing over will be delayed			
Risk Nature: Operational	**Risk Category: 10**	**Risk Owner: Construction Manager (WPD)**	**Business Unit: CKK, JKR**

Risk Factors:	**Possible Effects:**
o New legislative and statutory requirement (BOMBA, JKKP, Suruhanjaya Tenaga etc.) o Late submission by consultant o No follow up by the consultant and contractor o Late payment of contribution fees	o Delay in handing over o Delay in connection o Delay in processing o Delay in connection o ..

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To monitor consultant submission for approval o To organize frequent technical meeting with authority	JKR(CM) & Contractor JKR(CM) & Contractor	August 2008 August 2008

Assessed Risk Date Last Review	**Inherent Risk (H)**		**Assessed Risk (H)**		**Target Risk (L)**	
	3	IV	3	IV	2	II

Risk Analysis 4.5

Risk No: 4.5	**Risk Title: Client Acceptance**		
Risk Description: If quality of works not met then the client will not accept the project (client point of view) resulting in non-handing over of the project			
Risk Nature: **Operational**	**Risk Category: Quality**	**Risk Owner: Construction Manager (WPD)**	**Business Unit:CKK**

Risk Management Plan

Risk Factors:	Possible Effects:
o TSA not well defined o Poor supervision	o Delay in handing over o Additional cost due to additional requirement o Non accreditation by the governing body o Too many defect

Existing Risk Treatments:	Effectiveness: (H, M, L)
o ..	

New Risk Treatments :	Responsibility:	Deadline:
o To involve end-user in finalising TSA/room data interaction	JKR (HOPT) & KKM	June 2008
o To provide continuous technical training to all construction team members (JKR)	JKR (PD)	August 2008
o To issue CPC only if all contractual requirements are fully complied by the contractor	JKR (CM)	December 2011

Assessed Risk Date Last Review	Inherent Risk (M)		Assessed Risk (M)		Target Risk (L)	
	3	III	3	III	2	II

Risk Analysis 4.6

Risk No: 4.6	**Risk Title: Client Constraints**		
Risk Description: If the client is not ready to accept then the project will not be deliver according to schedule			
Risk Nature: Operational	**Risk Category: 5**	**Risk Owner: Construction Manager (WPD)**	**Business Unit: CKK, JKR**

Risk Factors:	**Possible Effects:**
o Hospital support service not awarded o Inadequate human resource o Change in requirement due to change in management/specialist	o Delay in training/operation o Delay in handing over o Additional cost

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o To initiate pre-handing over meeting o To recruit and train new staff	JKR (CM) KKM	Jun 2011 August 2008

Assessed Risk Date Last Review	**Inherent Risk (M)**		**Assessed Risk (M)**		**Target Risk (L)**	
	3	III	3	III	2	II

Risk Analysis 4.7

Risk No: 4.7	**Risk Title: System Incompatible**		
Risk Description: If the equipment to be provided by client is not compatible with the system will result delay in handing over			
Risk Nature: Operational	**Risk Category: 10**	**Risk Owner: Construction Manager (WPD)**	**Business Unit: CKK,JKR**

Risk Factors:	**Possible Effects:**
o Discrepancies in the equipment specification used by client/contract o ..	o Delay in handing over o Additional cost

Existing Risk Treatments:	**Effectiveness: (H, M, L)**
o .. o .. o ..	

New Risk Treatments :	**Responsibility:**	**Deadline:**
o Appropriate personnel to be involve in TSA/room data interaction	JKR(HOPT)& KKM	August 2008
o To review TSA periodically towards the end of the contract	JKR(CM/HOPT) & KKM	Jun 2011

Assessed Risk Date Last Review	**Inherent Risk (M)**		**Assessed Risk (M)**		**Target Risk (L)**	
	3	III	3	III	2	II

Risk Analysis Worksheet Instructions:

1.	**Risk No:**	Sequential numbering of each risk identified.
2.	**Risk Title:**	Give the risk a title.
3.	**Risk Description:**	Provide a brief description of the risk.
4.	**Risk nature:**	Select one of the following – **Strategic or Operational.**
5.	**Risk Category:**	Select the appropriate category (Section 3.3) to classify the risk:
6.	**Risk Owner:**	Person responsible for managing the risk.
7.	**Business Unit:**	Provide name of Business Unit, including project name.
8.	**Risk factors:**	Describe the causes of the risk.
9.	**Possible Effects:**	Describe the impacts of the risk arising.
10.	**Existing Risk Treatments:**	Identify all existing risk treatments and controls that are in place and any mitigating factors.
11.	**Effectiveness (H,M,L):**	Rate the effectiveness of the existing risk treatments as either High (H), Medium (M) or Low (L).
12.	**New Risk Treatments:**	Identify a range of options or strategies for treating risks.
13.	**Responsibility**	Specify person who is responsible for the implementation of each future strategy.
14.	**Deadline:**	Specify a final date when the implementation of the strategy will be completed.
15.	**Assessed Risk at Last Review:**	Specify date of last assessment and the assessed level/score. If this is the first time the risk has been identified then field is not applicable.
16.	**Inherent Risk:**	Determine the risk level by applying the risk matrix assuming no Existing Risk Treatments.
17.	**Assessed Risk:**	Determine the risk level by applying the risk matrix after forming a judgment on the effectiveness of Existing Risk Treatments.
18.	**Target Risk:**	Advise the target level that will be achieved after implementation of the future strategies. The target risk is the desired risk level after implementation of future strategies. There may be instances where the target risk remains high due to the nature of the activity undertaken. In this case future strategies should be closely monitored and reported.

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ATTACHMENT C

DEFINITIONS

DEFINITIONS

Assumptions List	A record of the assumptions embedded in the project plan. Assumptions that are not validated are potential risks.
Business Case	The document that justifies the need for the system to be delivered by a project, what the business changes will be and the resources required to deliver, operate and dispose of the system. It provides the basis for project funding and may undergo approved revisions during the project
Impact	The outcome of an event expressed in qualitative or quantitative terms (for example, financial or reputational) being a loss, injury, disadvantage or gain
Inherent Risk	A raw risk that is a risk that has no mitigation factors or treatments applied to it.
Monitoring and Accountability	The processes used to manage the Enterprise Risk Management Framework on an on-going basis to reduce risk and take advantage of risk as an opportunity.
Opportunity	The possibility of realizing a favorable outcome and the impact this outcome has on the involved party. Opportunity is positive risk and can be identified and managed in a similar way.
Probability	A qualitative description of the likelihood and/or frequency of a risk occurring.
Residual risk	The degree of risk left after mitigation factors have been identified.
Risk	Risk is anything that may happen that impacts the achievement of an organization's objectives. Risk encompasses the following three dimensions: • **Hazard -** preventing an exposure from turning into a loss • **Uncertainty -** coping with volatility and change; and • **Opportunity -** harnessing opportunities to one's advantage. Risk is an event having a cause and a impact that could be either positive or negative.
Risk Acceptance	The informed decision to accept the impact and the likelihood of a particular risk.
Risk Analysis	A systematic use of available information to determine how often specified evens may occur and the magnitude of their impacts.
Risk Appetite	Risk appetite is the amount of risk, on a broad level, an entity of willing to accept in pursuit of objectives. It reflects that organization's risk management philosophy and, in turn, influences the organization's culture and operating style.
Risk Avoidance	An informed decision not to become involved in a risk situation.
Risk Event	The occurrence of an event, which has the potential to affect the viability of a project.
Risk Management Framework	A formalized process for managing risk on an explicit basis. The framework consists of a risk assessment, response and accountability for the risk and mitigation activities around it.

Risk Manager	The role responsible for operating the project's risk management process and the custodian of the Risk Management Plan and Risk Register
Risk Mitigation	The processes built into the controls environment, such as policies, frameworks, accountabilities etc to lower the residual risk.
Risk Owner	A designated position in an organisation assigned the responsibility for managing a specific risk
Risk Reduction	A selective application of appropriate techniques and management principles to reduce either the likelihood of an occurrence or its impacts, or both.
Risk Register	A record, under formal change control, of all identified risks, their assessment, treatments and outcomes
Risk Retention	Intentionally or unintentionally retaining the responsibility for loss or financial burden or loss within the organization.
Risk Response	The decision to accept, decline, treat or mitigate a risk or share a risk with another party.
Risk Sharing	Sharing the responsibility for the impact of a risk with another party such as through an outsourcing contract or insurance policy.
Strategic Risk	Any risk event which has serious or catastrophic consequence even though the likelihood of occurrence may be quite low
Uncertainty	The gap between the information required to estimate an outcome and the information already possessed by the decision maker

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ATTACHMENT D

JKR PROJECT TEAM ORGANIZATION CHART