



**DEPARTMENT OF ENVIRONMENT**  
MINISTRY OF ENVIRONMENT AND WATER

# **ENVIRONMENTAL IMPACT ASSESSMENT (EIA) GUIDELINES FOR TRANSPORTATION AND ROAD PROJECTS**



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Jabatan Alam Sekitar

**Department of Environment, Malaysia**

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## **ACKNOWLEDGEMENT**

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The Department is also grateful to all DOE staff for their efforts and passion in steering the Guidelines into reality for the benefits of streamlining and improving EIA reports preparation in the country.

Finally, DOE also hopes that the Guidelines will be used in the context of EQA 1974 for the betterment of Environmental Management in the country.

## PREFACE

This **Environmental Impact Assessment Guidelines for Transportation and Road Projects** is prepared in accordance with the requirements in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, of the Environmental Quality Act (EQA) 1974 (Act 127).

The guidelines shall be read and referred together with the **Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016)**. Compliance with the requirements set out in this Guideline and the EGIM will fulfil the obligations of the Project Proponent as stated under section 34A (2C) of the EQA 1974.

The guidelines is specifically prepared to guide the Project Proponent and EIA Consultant to prepare Environmental Impact Assessments for activities that is subjected to the prescribed activities listed in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

Transportations and roads projects make crucial contributions to economic development and growth and bring about important social benefits. In addition, roads provide access to employment, social, health and education services whilst opening more areas to stimulate economic and social development.

Sustainable transport and road developments are defined as the freedom of mobility of both, people and goods, without sacrificing essential human or ecological values including affordability for socially disadvantaged groups without compromising on long-term financial feasibility. Generally, this infers on efficient road and transportation projects at a reasonable cost with an acceptable level of safety, without generating wastes and pollution in excess of the environment's ability to absorb them.

It is important in EIA to address indirect and cumulative impacts of roads project. Particularly when forested areas are affected that lead to significant forest degradation as a result of encroachment, hunting and poaching activities and habitat fragmentation.



As such, the concept of sustainable road and transportation development has to be promoted, ie, constructed to reduce environmental impacts; designed to optimise the alignment (vertical and horizontal including considerations of ecological constraints and operational use); resilient to future environmental and economic pressures (e.g., climate change and resource scarcity); and adaptable to changing uses including increased travel volumes, greater demand for public and active transport.

Therefore, the Guideline has emphasized the need to address those sustainable concepts as an integral part of the Environmental Assessment process.

This Guideline is intended to be a reference tool and shall assist the Project Proponent and the EIA Consultant to identify appropriate stakeholders and government agencies to be engaged prior to carrying out the development. Stakeholders' engagement shall be an avenue to gauge their concerns, identify the main issues and to propose effective mitigating measures. The EIA process will provide adequate mechanisms to enable the general public and relevant stakeholder agencies access to contribute their views and comments. Their recommendations will be considered in the EIA and by the EIA Technical Review Committee (EIATRC). It is envisioned that with the holistic approach taken to address all stakeholder concerns, the vision of the Department of Environment: Environmental Conservation for the Well-being of the People can be realised.

The Guideline shall only be used within the framework of the EQA 1974 including its future updates, and its subsidiary regulations. It will be further updated as and when deemed necessary by the Director General of Environmental Quality.

The DOE wishes to express its appreciation to all users for using the Guideline in the spirit of ensuring compliance to the Environmental Quality Act 1974 and its subsidiary legislations.

A handwritten signature in black ink, appearing to read 'Norlin Binti Jaafar', followed by a small black dot.

**(NORLIN BINTI JAAFAR)**  
**Director General**  
**Department of Environment**

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# ABBREVIATIONS

<b>Als</b>	Appointed Individuals
<b>AN</b>	Ammoniacal Nitrogen
<b>APCS</b>	Air Pollution Control Systems
<b>BAT</b>	Best Available Technologies
<b>BATNEEC</b>	Best Available Technology Not Entailing Excessive Costs
<b>BMPs</b>	Best Management Practices
<b>BOD</b>	Biochemical Oxygen Demand
<b>BQ</b>	Bill of Quantities
<b>C&amp;D</b>	Construction and demolition
<b>CAR</b>	Corrective Action Report
<b>CESA</b>	Coastal Environmentally Sensitive Area
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild
<b>CM</b>	Compliance Monitoring
<b>COA</b>	Conditions of Approval
<b>DG</b>	Director General
<b>DID</b>	Department of Irrigation and Drainage/ <i>Jabatan Pengairan dan Saliran</i>
<b>DO</b>	Dissolved Oxygen/Development Order
<b>DOE</b>	Department of Environment/ <i>Jabatan Alam Sekitar</i>
<b>DOF</b>	Department of Fisheries/ <i>Jabatan Perikanan</i>
<b>DOSH</b>	Department of Occupational Safety and Health/ <i>Jabatan Keselamatan dan Kesihatan Pekerja</i>
<b>EB</b>	Environmental Budget
<b>EC</b>	Environmental Competency
<b>EF</b>	Environmental Facility
<b>e.g.</b>	Example
<b>EGIM</b>	Environmental Impact Assessment Guideline in Malaysia
<b>EIA</b>	Environmental Impact Assessment
<b>EIATRC</b>	Environmental Impact Assessment Technical Review Committee
<b>EM</b>	Environmental Mainstreaming
<b>EMC</b>	Environmental Monitoring Committee

<b>EMCR</b>	Environmental Monitoring Compliance Report
<b>EMP</b>	Environmental Management Plan
<b>EMR</b>	Environmental Monitoring Report
<b>EMT</b>	Environmental Mainstreaming Tools
<b>EO</b>	Environmental Officer
<b>EP</b>	Environmental Policy
<b>EPD</b>	Environmental Protection Department
<b>EPMC</b>	Environmental Performance Monitoring Committee
<b>EQA</b>	Environmental Quality Act
<b>EQR</b>	Environmental Quality Report
<b>ERCMC</b>	Environmental Regulatory Compliance Monitoring Committee
<b>ERP</b>	Emergency Response Plan
<b>ESA</b>	Environmentally Sensitive Areas
<b>ESC</b>	Erosion and Sediment Control
<b>ESCP</b>	Erosion and Sediment Control Plan
<b>ESI</b>	Environmental Scoping Information
<b>ESM</b>	Environmental Scoping Matrix
<b>ET</b>	Environmental Transparency
<b>etc.</b>	<i>Et cetera</i>
<b>FGDs</b>	Focus Group Discussions
<b>FIA</b>	Fisheries Impact Assessment
<b>GAs</b>	Government Agencies
<b>GIS</b>	Geographic Information System
<b>GTM</b>	Geological Terrain Mapping
<b>HIA</b>	Health Impact Assessment
<b>HQ</b>	Headquarters
<b>HRA</b>	Health Risk Assessment
<b>i.e.</b>	<i>id est</i>
<b>IETS</b>	Industrial Effluent Treatment Systems
<b>ILO</b>	International Labour Organisation

<b>IM</b>	Impact Monitoring
<b>ISMP</b>	Integrated Shoreline Management Plan
<b>IWK</b>	Indah Water Konsortium
<b>JAKOA</b>	<i>Jabatan Kemajuan Orang Asli Malaysia</i>
<b>JKPTG</b>	Department of Director General of Lands and Mines/ <i>Jabatan Ketua Pengarah Tanah dan Galian</i>
<b>JKR</b>	Public Works Department/ <i>Jabatan Kerja Raya</i>
<b>JMG</b>	Minerals and Geoscience Department/ <i>Jabatan Mineral dan Geosains</i>
<b>JPSM</b>	Forestry Department of Peninsular Malaysia/ <i>Jabatan Perhutanan Semenanjung Malaysia</i>
<b>JPSPN</b>	National Solid Waste Management Department/ <i>Jabatan Pengurusan Sisa Pepejal Negara</i>
<b>KASA</b>	Ministry of Environment and Water/ <i>Kementerian Alam Sekitar dan Air</i>
<b>KPKT</b>	Ministry of Urban Wellbeing, Housing and Local Government/ <i>Kementerian Perumahan dan Kerajaan Tempatan</i>
<b>KSAS</b>	<i>Kawasan Sensitif Alam Sekitar</i>
<b>L10</b>	Ten percentile level
<b>L50</b>	Fifty percentile level
<b>L90</b>	Ninety percentile level
<b>LAC</b>	Limit of Acceptable Change
<b>LAeq</b>	Equivalent A-Weighted Continuous Sound Level
<b>LCP</b>	<i>Laporan Cadangan Pemajuan</i>
<b>LD-P2M2</b>	Land Disturbance Pollution Prevention and Mitigation Measures
<b>Lmax</b>	Maximum A-Weighted Continuous Sound Level
<b>Lmin</b>	Minimum A-Weighted Continuous Sound Level
<b>LOS</b>	Level of Service
<b>MAAQS</b>	Malaysian Ambient Air Quality Standards
<b>METMalaysia</b>	Malaysian Meteorological Department/ <i>Jabatan Meteorologi Malaysia</i>
<b>MOH</b>	Ministry of Health/ <i>Kementerian Kesihatan Malaysia</i>
<b>MOM</b>	Minutes of Meeting
<b>MPFN</b>	National Physical Planning Council/ <i>Majlis Perancang Fizikal Negara</i>
<b>MSL</b>	Mean Sea Level
<b>MSMA-2</b>	<i>Manual Saliran Mesra Alam Edisi-2</i>

<b>MUSLE</b>	Modified Universal Soil Loss Equation
<b>MWQI</b>	Marine Water Quality Index
<b>NGOs</b>	Non-governmental Organisations
<b>NLC</b>	National Land Code
<b>NPCZP</b>	National Physical Coastal Zone Plan
<b>NPP-CZ</b>	National Physical Plan-Coastal Zone
<b>NPP-2</b>	National Physical Plan-2
<b>NPP-3</b>	National Physical Plan-3
<b>NREB</b>	National Resources and Environment Board
<b>NTU</b>	Nephelometric Turbidity Units
<b>NWQS</b>	National Water Quality Standards of Malaysia
<b>O&amp;G</b>	Oil and Grease
<b>OSC</b>	One-Stop Centre
<b>PE</b>	Population Equivalent
<b>P2M2</b>	Pollution Prevention and Mitigation Measures
<b>PBT</b>	Local Authorities/ <i>Pihak Berkuasa Tempatan</i>
<b>PD</b>	<i>Pertumbuhan Dinamik Bandar dan Luar Bandar</i>
<b>PERHILITAN</b>	Department of Wildlife and National Parks Peninsular! <i>Jabatan Perlindungan Hidupan Liar dan Taman Negara Semenanjung Malaysia</i>
<b>PLANMalaysia</b>	Department of Town and Country Planning/ <i>Jabatan Perancangan Bandar dan Desa</i>
<b>PM</b>	Performance Monitoring
<b>PM10</b>	Particulate Matter 10 micrometres or less in diameter
<b>PM2.5</b>	Particulate Matter 2.5 micrometres or less in diameter
<b>PPV</b>	Peak Particle Velocity
<b>PTD</b>	Land and District Office/ <i>Pejabat Tanah dan Daerah</i>
<b>PTG</b>	Land and Minerals Office/ <i>Pejabat Tanah dan Galian</i>
<b>PVD</b>	Prefabricated Vertical Drain System
<b>Q&amp;A</b>	Questions and Answers
<b>RAC</b>	Report Adequacy Check
<b>RFZPPN</b>	<i>Rancangan Fizikal Zon Persisiran Pantai Negara</i>
<b>ROW</b>	Right of Way
<b>RUSLE</b>	Revised Universal Soil Loss Equation

<b>SAMM</b>	<i>Skim Akreditasi Makmal Malaysia</i>
<b>SAP</b>	Special Area Plans
<b>SI</b>	Soil Investigation
<b>SIA</b>	Social Impact Assessment
<b>SIDRA</b>	Signalised and Unsignalised Intersection Design and Research
<b>SMA</b>	Special Management Areas
<b>SPAN</b>	National Water Commission of Malaysia/ <i>Suruhanjaya Perkhidmatan Air Negara</i>
<b>SPC</b>	State Planning Committee
<b>SR</b>	Self-Regulation
<b>SS</b>	Suspended Solids
<b>SSA</b>	Site Sustainability Assessment
<b>STP</b>	Sewage Treatment Plant
<b>STS</b>	Sewage Treatment Systems
<b>SWMM</b>	Storm Water Management Model
<b>TCPA</b>	Town and Country Planning Act
<b>TIA</b>	Traffic Impact Assessment
<b>TNB</b>	Tenaga Nasional Berhad
<b>TOC</b>	Table of Contents
<b>TOR</b>	Terms of Reference
<b>TORAC</b>	Terms of Reference Adequacy Check
<b>TRC</b>	Technical Review Committee
<b>TSS</b>	Total Suspended Solids
<b>UNEP</b>	United Nations Environment Programme
<b>UPEN</b>	State Economic Planning Unit/ <i>Unit Perancang Ekonomi Negeri</i>
<b>USEPA</b>	United States Environmental Protection Agency
<b>WIPs</b>	Water Intake Points
<b>WQI</b>	Water Quality Index
<b>WTP</b>	Water Treatment Plants
<b>WWF</b>	World Wildlife Fund for Nature
<b>ZOI</b>	Zone of Impact
<b>ZOS</b>	Zone of Study

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# PREAMBLE

## EIA GUIDELINES FOR TRANSPORTATION AND ROAD PROJECTS: GUIDELINE OVERVIEW

### CHAPTER 1: Introduction

#### First Schedule Activity 20: Road

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

#### Second Schedule Activity 17: Transportation

- a) Construction of new routes or branch line for a mass rapid transport project
- b) Construction of new railway route or railway branch lines

### CHAPTER 2: Environmental Project Planning

- Terms and Definition
- Characteristics of Road Categories
- Policy & Guideline Compliance



### CHAPTER 3: Approach & Methodology

#### Scenarios for EIA Screening

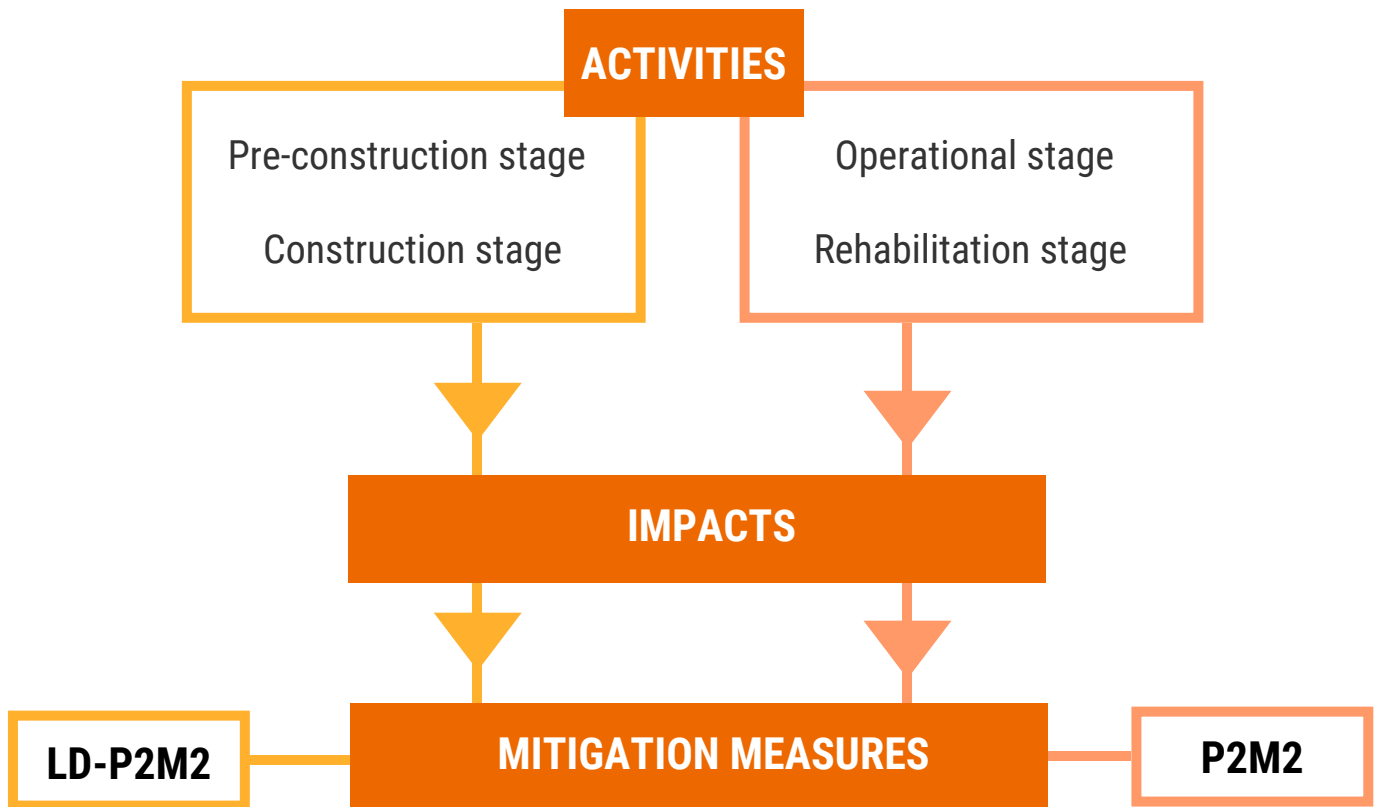
<b>Activity 20 (a):</b> <ul style="list-style-type: none"> <li>• New expressway &amp; upgrading of expressway <span style="color: green;">✔</span></li> </ul>	R6 and U6 Expressway + R5 Highway <span style="color: green;">✔</span>
<b>Activity 20 (b):</b> <ul style="list-style-type: none"> <li>• New highway (without toll) <span style="color: green;">✔</span></li> <li>• Upgrading of highway without ROW <span style="color: red;">✘</span></li> <li>• New highway (with toll) <span style="color: green;">✔</span></li> <li>• Upgrading of highway with toll <span style="color: green;">✔</span></li> </ul>	Interchange works/Spur roads added out of ROW after an EIA is approved for original Expressway/ Highway <span style="color: green;">✔</span>  Upgrading or expansion within the existing ROW <span style="color: red;">✘</span>
<b>Activity 20 (c):</b> <ul style="list-style-type: none"> <li>• New road, tunnel or bridge excluding R1 &amp; R2 road <span style="color: green;">✔</span></li> </ul>	Bridge/road near ESAs (Rank 1, 2 & 3) <span style="color: green;">✔</span>  Construction of Bus Rapid Transit (BRT) <span style="color: red;">✘</span>  Construction of new bridge /road/tunnel connecting from mainland to island but not traversing or adjacent or near to ESAs <span style="color: red;">✘</span>

### CHAPTER 4: Baseline Data

#### Baseline data collection shall cover 3 major environmental components:

- Physico-chemical environment
- Biological environment
- Socio-economic environment

## CHAPTER 5 & 6: Evaluation of Impact & Mitigation Measures



## CHAPTER 7: Environmental Management Plan

Performance Monitoring (PM)

Compliance Monitoring (CM)

Impact Monitoring (IM)

## CHAPTER 8: Reporting & Review

### Submission & Review Process

#### First Schedule Activities

- Submission to DOE State Office
- 3 hard copies + 1 soft copy (CD) to State DOE + 1 distribution by soft-copy (CD) to agency/AI/NGOs for comment
- Public display **not** required

#### Second Schedule Activities

- Submission to DOE HQ
- 3 hard copies + 1 soft copy (CD) to relevant State DOEs + 1 distribution by soft-copy (CD) to agency/AI/NGOs for comment
- Public display required

# 1 INTRODUCTION

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The guidelines shall be entitled Environmental Impact Assessment (EIA) Guidelines for Transportation and Road Projects (hereinafter referred to as the 'Guidelines') is prepared to take into account the latest requirements in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, of the Environmental Quality Act (EQA) 1974 (Act 127).

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The Environmental Quality (Prescribe Activities)(Environmental Impact Assessment) Order 2015 came into force on 28th August 2015, which is now divided into;

➔ **1** First Schedule (21 Prescribed Activities)

➔ **2** Second Schedule (17 Prescribed Activities)

The EIA Guidelines for Transportation and Road Projects shall be read and referred to together with the Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016).

Compliance with the requirements set out in this Guidelines and the EGIM will fulfil the obligations of the Project Proponent as stated under Section 34A (2C) of the EQA 1974.

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The legal adherence is based on sub-sections of the EQA 1974 (as of 5th February 2015), as follows:



### **SECTION 34A (1)** .....

The Minister, in consultation with the council, may by order prescribe any activity, which may have significant environmental impacts as prescribed activity



### **SECTION 34A (2)** .....

Any person intending to carry out any prescribed activity shall appoint a Qualified Person to conduct an EIA and submit a report thereof to the Director General in the Director General may prescribe



### **SECTION 34A (2A)** .....

The Minister, in consultation with the council, may by order prescribe any activity, which may have significant environmental impacts as prescribed activity



### **SECTION 34A (2B)** .....

The qualified person who submits the report shall:

- Be responsible for the environmental impact assessment;
- Ensure that the report & the recommendation do not contain any false or misleading information;
- Take a professional indemnity insurance for the recommendations & any liability arising from the EIA

# EIA DEVELOPMENT



The EIA process entails studies to identify, predict, evaluate and quantify the impacts (both beneficial and adverse) on the environment of a proposed project or development and to communicate the said information to those concerned.

The benefit of having an EIA is to facilitate decision-making for both the DOE and the Local Authorities from an environmental perspective.

The EIA report shall also assist the stakeholders including the Project Proponent in identifying the significant environmental impacts; appropriate abatement and mitigating measures; programmes for monitoring environmental compliance; within the development plan prior to and/or during project implementation.

## OBJECTIVES — of the — GUIDELINES

### GUIDANCE

Provide clear and concise guidance on EIA project planning and preparation to the stakeholders, Project Proponents, Qualified Persons (i.e. DOE-registered Environmental Consultants), Government Agencies (GAs), Enforcement Officers and other project-related practitioners.

### SCOPE

Clearly define the scope of the EIA with a focus on the significant environmental issues relevant to the DOE's functional areas, whilst also taking into consideration the environmental requirements by other authorities or agencies, to facilitate overall decision-making and project approval.

### PROCEDURE

To integrate and establish procedures to aid in evaluation for implementation of EIA studies involving Transportation and Road projects in Malaysia.

### FRAMEWORK

Provide a clear framework for DOE to assess and approve the EIA report.

### INTEGRATION

Facilitate integration of the EIA into the overall project planning and development cycle in order to ensure compliance with and adherence to the legal environmental requirements within the framework on environmental sustainability.

### UNDERSTANDING

To provide an understanding of the EIA procedures, preparation, and submission of the EIA Report for review and approval

### STEP-BY-STEP GUIDANCE

Provide a detailed step-by-step guidance with explanation of the various EIA procedures and submissions, comprising of:

- i. Environmental Scoping Information (ESI)
- ii. Terms of Reference (TOR)

### REQUIREMENTS

Provide mandatory requirements for environmentally acceptable Transportation and Road projects allowed by the authority within its jurisdiction.

# APPLICABILITY OF THE GUIDELINES

The proposed guidelines are specifically prepared to guide the Qualified Person or Project Proponent to prepare an Environmental Impact Assessment (EIA) under Transportation and Road Projects that is subjected to the following prescribed activities listed in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015:

## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*



- a) Construction of new routes or branch line for a mass rapid transport project
- b) Construction of new railway route or railway branch lines

*Note: This Second Schedule Activity is also applicable to the States of Sabah and Sarawak*

For a project that involves more than one prescribed activity, the EIA shall incorporate all key issues inherent in all relevant prescribed activities of the project. If one of them falls under the Second Schedule, then the project is deemed to fall under the requirements of the Second Schedule.

The prescribed activities mentioned above shall not apply to the State of Sabah and Sarawak except for **Second Schedule Activity 16: Transportation** which is applicable for the state of Sarawak, whereby both states are subjected to separate state legislations and requirements as shown below

### Environmental Legislation for Sabah & Sarawak

STATE	LEGISLATION	AUTHORITY
	Environment Protection Enactment (Prescribed Activities) (Environmental Impact Assessment) Order, 2005	Environment Protection Department (EPD)
	Natural Resource and Environment Ordinance (Prescribed Activities) Order, 1994	Natural Resource and Environment Board (NREB)

# OVERVIEW of the ENVIRONMENTAL ASSESSMENT PROCESS

## 1 PROJECT BRIEF

The Project Proponent must provide basic information to enable the Qualified Person to understand and carry out an initial assessment.

This is to assist in determining which Prescribed Activity and Schedule of the project falls under based on the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015.

## 2 LEGAL REQUIREMENTS

During the Environmental Screening Process, the Qualified Person shall identify the legal requirements of the project based on the information provided by the Project Proponent.

## 3 EXISTING POLICIES

The Project Proponent is required to check if project is aligned to existing policies and clear all policy matters related to the project prior submitting the EIA report.

## 4 STAKEHOLDER ENGAGEMENT

The Project Proponent and the Qualified Person shall preliminary engage with the DOE (via the designated officer in charge) and the relevant Government Agencies (GAs) to determine the requirements to be included in the TOR.

The Qualified Person can also engage with other relevant stakeholders to obtain site information and data for the scoping.

# OVERVIEW of the ENVIRONMENTAL ASSESSMENT PROCESS

## 5 TOR & ESI PREPARATION

Upon determining that the project requires an EIA, the Environmental Scoping Information (ESI) and Terms of Reference (TOR) must be prepared.

The Qualified Person shall obtain secondary data to assist in the Environmental Scoping. At this point of the study, qualitative data is sufficient for scoping of significant impacts for the TOR.

Relevant information required for the TOR that the Qualified Person is required to furnish includes:

- Site Suitability Assessment (SSA)
- Determination of the study boundary
- Overview of baseline data
- Identification of key project activities
- Identification of significant impacts and priority setting

## 6 PREPARATION & SUBMISSION OF TOR

The Qualified Person shall review all data obtained during scoping to prepare the TOR report based on DOE requirements in the EGIM (DOE, 2016). The report shall be submitted to DOE for review and endorsement.

## 7 BASELINE DATA COLLECTION FOR EIA

After the TOR endorsement, baseline data collection, primary and secondary data, shall be carried out to obtain detailed information of the existing environment of the project site and its surroundings.

## 8 COMPLETION OF EIA REPORT

Major studies and components of the EIA report shall cover the following:

- Identify & predict the significant environmental issues & impacts
- Carry out detailed environmental assessment on the most significant issues but still addressing the less significant issues
- Identify suitable pollution prevention & mitigation measures (P2M2s) to minimize any negative impacts arising from the development of the projects
- Provide the EMP framework in line with the Self-Regulation concept

\* Details can be referred to in **Chapters 5 – 7**.

# OVERVIEW of the ENVIRONMENTAL ASSESSMENT PROCESS

## 9 DRAFT EIA REPORT

All assessments and findings must be included in the EIA report. Take note that the results of studies required by other GAs must be incorporated into the report but not to append the individual reports. These reports must however be submitted to the respective GAs for the soonest review.

The format of the EIA report is detailed in Chapter 8.

## 10 PUBLIC ENGAGEMENT

Upon completing of the Draft EIA report, the Project Proponent and Qualified Person shall undertake an engagement with the relevant stakeholders (those who will be affected by the project e.g. community or institutions, businesses etc.)

The objective is to brief these stakeholders about the project, what it entails, the potential environmental issues and the proposed P2M2s, with the aim to seek their thoughts and feedback. All findings from the public engagement shall be incorporated into the final EIA report

## 11 EIA REPORT SUBMISSION

The EIA report shall be submitted to DOE State/HQ for review

The Qualified Person shall note the difference in requirements for a First Schedule and Second Schedule EIA and followed the required procedures

## 12 EIA REPORT EVALUATION

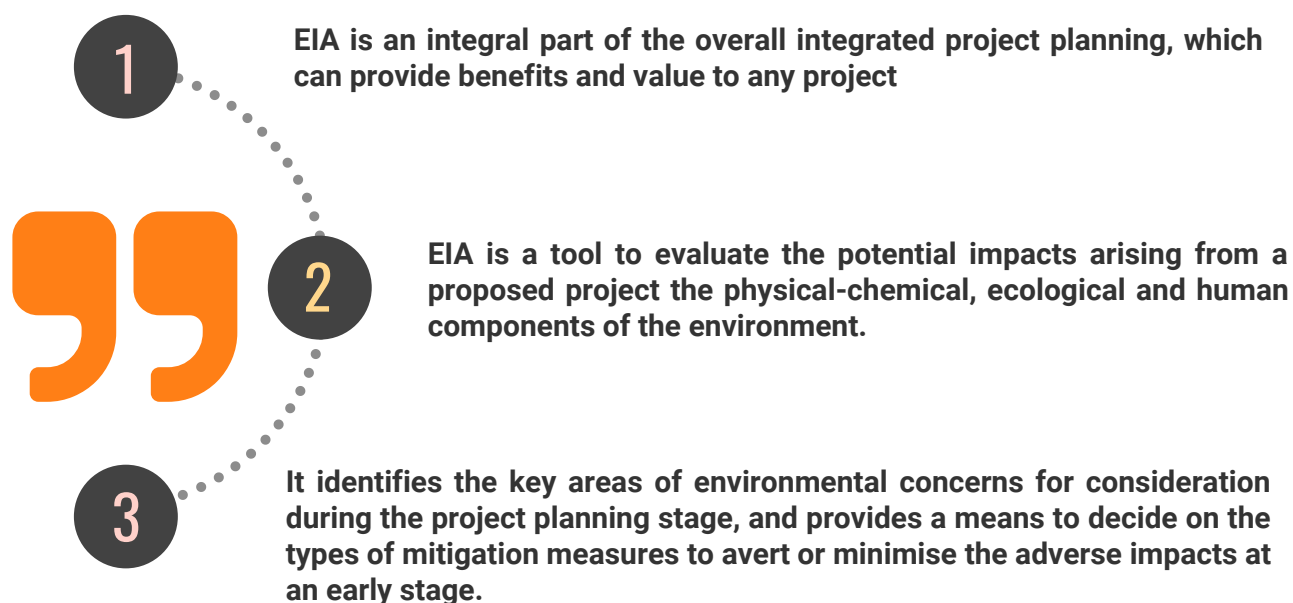
## 13 EIA REPORT APPROVAL



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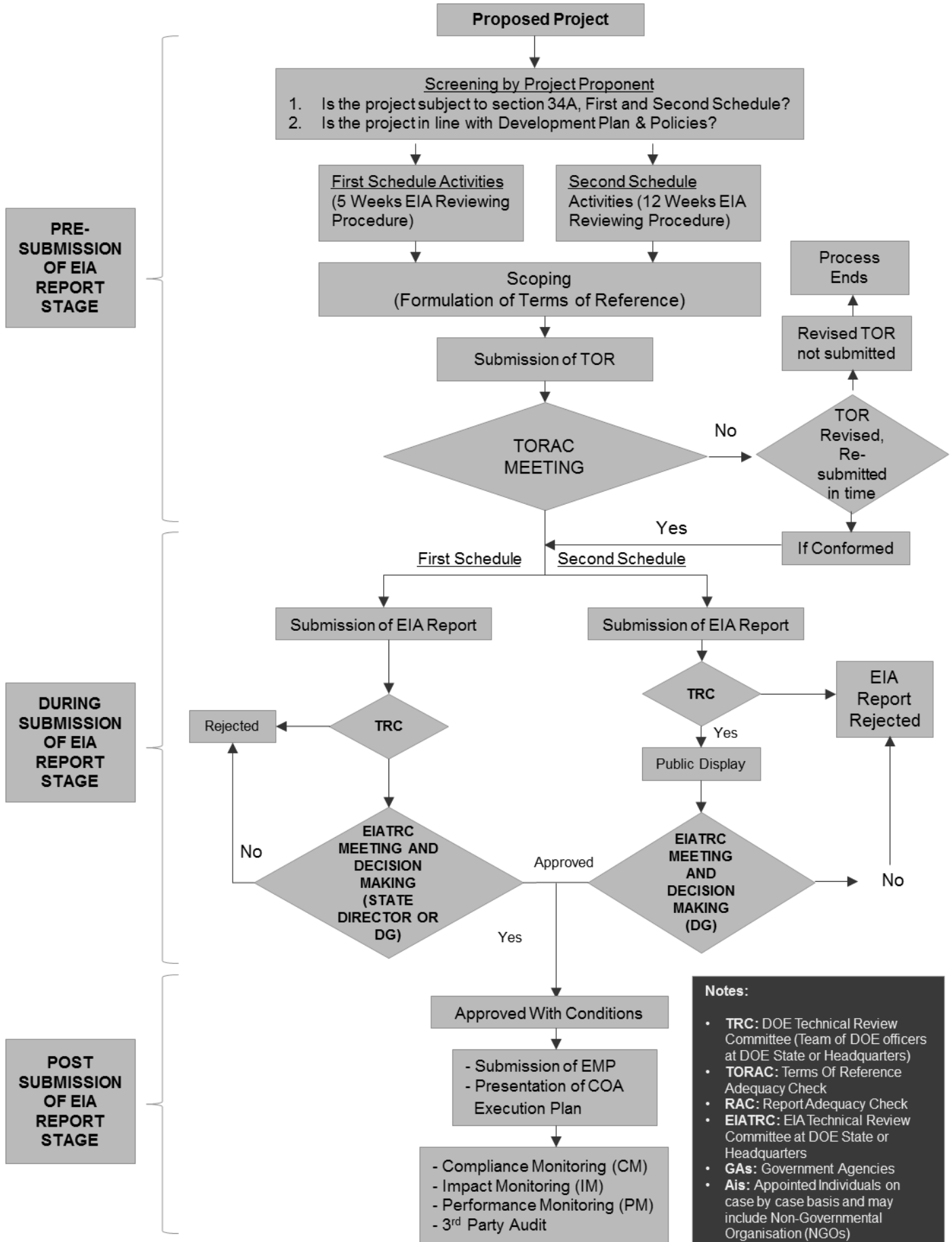
# 2 ENVIRONMENTAL PROJECT PLANNING

## ENVIRONMENTAL IMPACT ASSESSMENT PROCESS



A summary of the EIA procedure is shown in the next page

# EIA PROCEDURE IN MALAYSIA



SOURCE: Environmental Impact Assessment Guideline in Malaysia (EGIM) [Department of Environment (DOE), 2016].

# INTEGRATION OF ENVIRONMENTAL COMPLIANCE INTO PROJECT PLANNING

A typical project cycle involves many phases and requires inputs from various technical specialists and consultants to provide for submissions and applications to the various approving authorities, e.g. local authority. Throughout, the environmental assessment can be incorporated into the following phases:

1

## PLANNING PHASE

The Project Proponent:-

- will develop a conceptual proposal and identify suitable sites for feasibility assessment.
- to ensure that all national and state policies related to the project are addressed with the relevant authorities before carrying out the EIA.



**Environmental Screening and Scoping:** The Project Proponent shall carry out initial screening to determine if the Project falls under any prescribed activity based on the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

If it does, then a scoping exercise will be undertaken to assess the environmental aspects of the site. This will ensure that the significant environmental issues are scoped early and identification of possible pollution prevention and mitigation measures (P2M2s) can be incorporated into the project design early on.

Findings shall be presented in the Terms of Reference (TOR) report for the Department of Environment's (DOE's) endorsement.

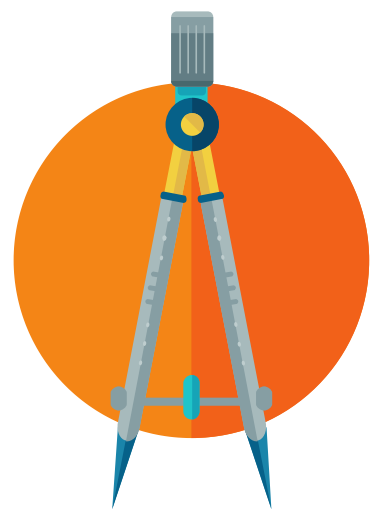
2

## FEASIBILITY & PROJECT DESIGN PHASE

The Project Proponent will conduct the technical studies and project design for submission to the approving authorities, represented by various government technical agencies, which will review the application and provide the approvals if all submissions are in order.

**Environmental Impact Assessment (EIA):** If a project is a prescribed activity under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, an EIA is required to be prepared and approved by the DOE before a project can be submitted for development order (DO) approval by the local authorities.

The Project Proponent and Qualified Person(s) shall carry out the studies identified in the Terms of Reference (TOR) during the screening and scoping stage, and develop P2M2 for the project.



# INTEGRATION OF ENVIRONMENTAL COMPLIANCE INTO PROJECT PLANNING

A typical project cycle involves many phases and requires inputs from various technical specialists and consultants to provide for submissions and applications to the various approving authorities, e.g. local authority. Throughout, the environmental assessment can be incorporated into the following phases:

## 3 CONSTRUCTION & OPERATIONAL PHASE .....



Upon obtaining the project approval, e.g. DO, the project shall proceed with construction and later on, operations.

Typical activities include site access establishment, mobilisation of machineries and equipment, setting up base camp, land clearing and structural works.

**Post-EIA:** Environmental controls and management will be through the Environmental Management Plan (EMP) which will be utilised by the Project Proponent and contractors to implement the P2M2s and environmental monitoring and auditing, throughout the construction phase and where necessary, into the operational phase.

# PROJECT BRIEF



At the start of a project, **Project Proponent** shall provide a project brief, containing basic information of the project, as an overview to the **Qualified Person**. This will facilitate identification of the scope and requirements of the environmental compliance for that project.

The **Qualified Person** registered (**Environmental Consultant**) shall then assess if the project falls within a prescribed activity based on the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015.

All these information shall then form part of the **Terms of Reference (TOR)** but may be subjected to changes as the project commences. Information provided shall be ensured to be adequate and provide a basis for the environmental screening and scoping, which can be detailed or revised later in the EIA.

## ENVIRONMENTAL LEGISLATIVE REQUIREMENTS



The **Environmental Quality Act (EQA) 1974 (Act 127)** is the main legislation governing environmental management in Malaysia.

The DOE under the **Ministry of Environment and Water (KASA)** is the main agency tasked to implement the **EQA 1974 (Act 127)**. It has overall functions and responsibilities on the environmental management and enforcement as prescribed under the said legislation and its subsidiary legislations and regulations.

Amendments to this main legislation and new subsidiary legislations or regulations may be enacted from time to time, pertinent and relevant to changing circumstances. The regulations made under any previous legislations thereof, will then need to be amended and/or updated; or new regulations may be proposed when new environmental policies are adopted by the DOE to protect the environment.



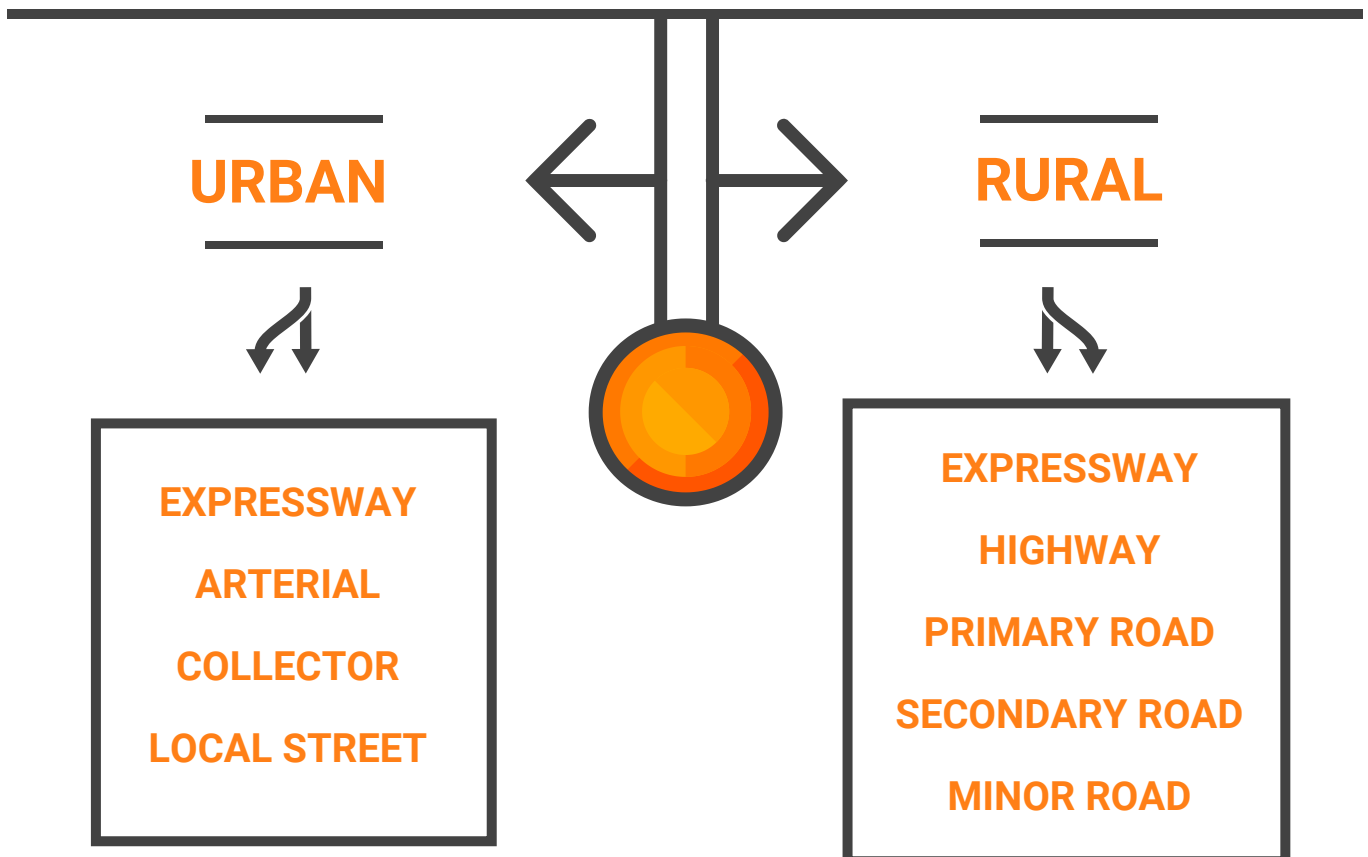
# TERMS & DEFINITION

The following terms and definitions are applicable for:

**SCHEDULE 1**  
— Activity 20 —  
**ROADS**

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/ adjacent/near to environmentally sensitive areas

Each road has its function according to its role either in the National Network, Regional Network, State Network or City/Town Network. The most basic function of a road is transportation. This can be further divided into two sub-functions; namely mobility and accessibility. However, these two sub-functions are in trade off. To enhance one, the other must be limited.



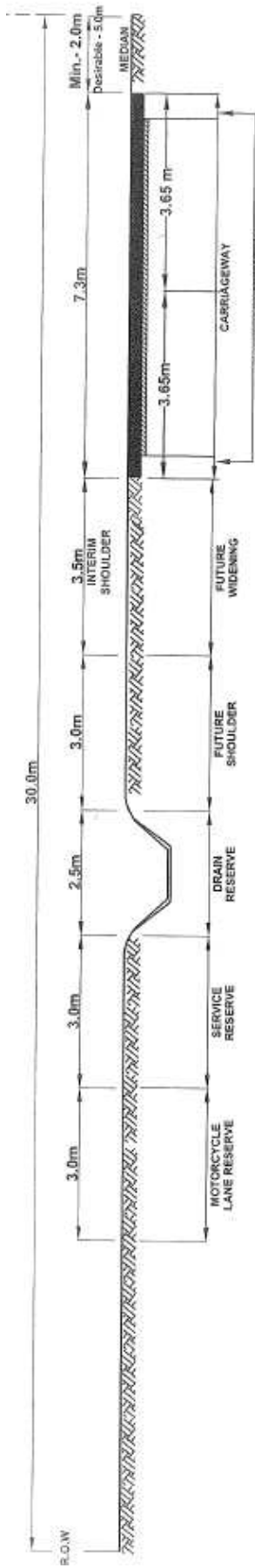
# EXPRESSWAY

An Expressway is a **divided highway** for **through traffic** with **full control of access** and **always with grade separations at all intersections**.

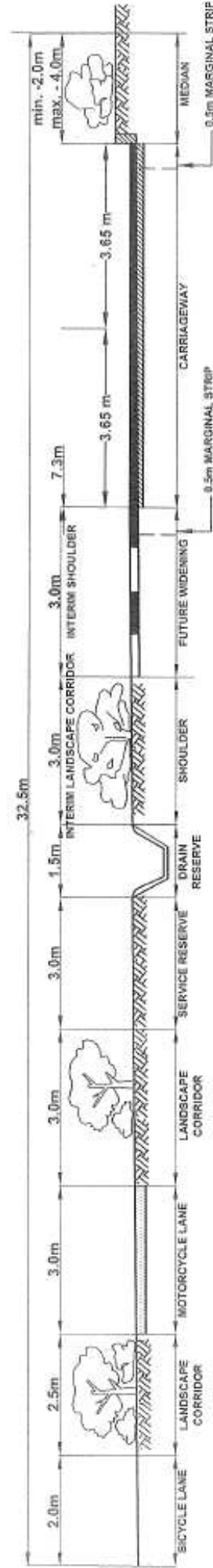
In **rural areas**, they apply to the interstate highways for through traffic and form the basic framework of National Road Transportation for fast travel. They serve long trips and provide higher speed of travelling and comfort. To maintain this, they are fully access controlled and are designed to the highest standards.

In **urban areas**, they form the basic framework of road transportation system in urbanized area for through traffic. They also serve relatively long trips and smooth traffic flow with full access control and complement the **Rural Expressway**.

All expressways including the ramps will have full access control. However, in urban areas, it may be appropriate to allow left in – left out access with service interchange ramps to enhance connectivity to the existing road network. Any such connections on entry ramps should provide for appropriate acceleration distances onto the expressway, and any access on an exit ramp shall have adequate deceleration distance so that safety is not affected. Any such connections should be assessed for the likely usage and the traffic capacity determined.



**R6 EXPRESSWAY**  
( Note: Drawing Shows Half Width of Typical X-Section)



**U6 EXPRESSWAY**  
( Note: Drawing Shows Half Width of Typical X-Section)

Source: Arahan Teknik (Jalan) 8-86 - A Design of Roads (2015)

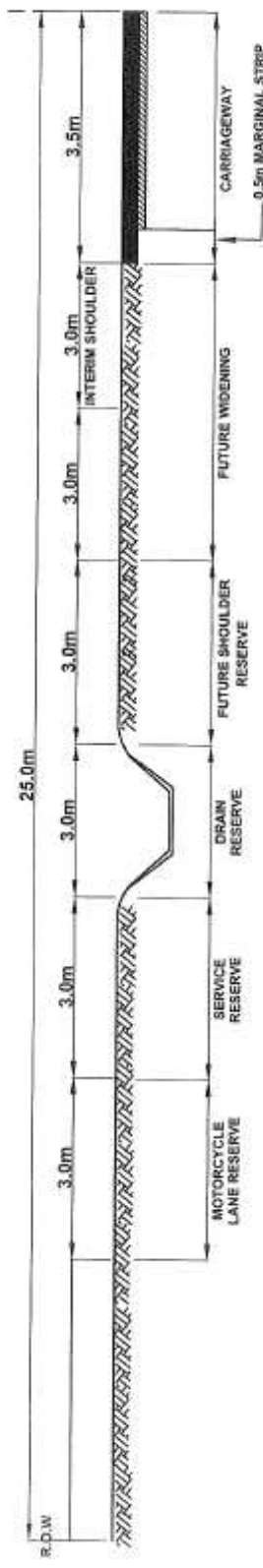
## HIGHWAY

They constitute the interstate national network for intermediate traffic volumes and complement the expressway network. They **usually link up directly or indirectly the Federal capital, State capitals, large urban centres and** points of entry/exit to the country. They serve long to intermediate trip lengths. Speed of travel is not as important as in Expressway but relatively high to medium speed is necessary. Smooth traffic is provided with partial access control.

## PRIMARY ROAD

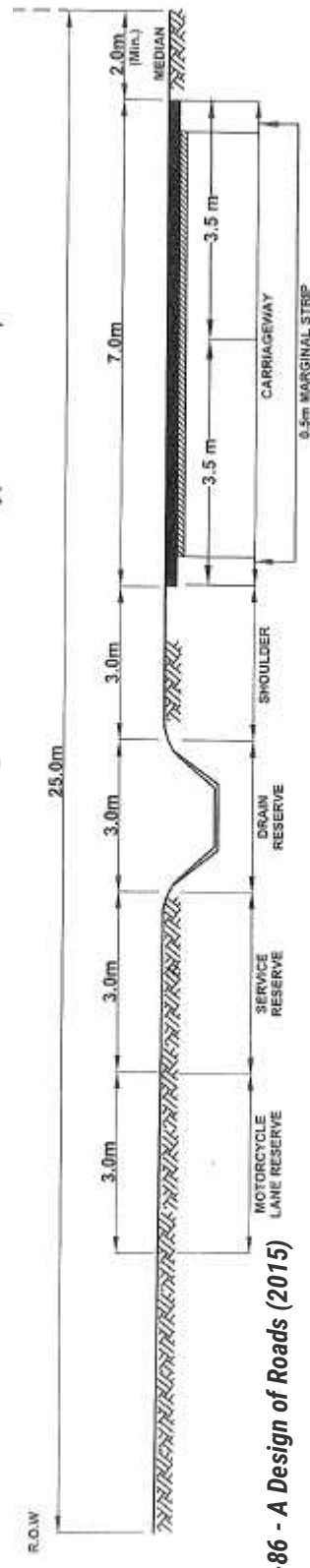
They constitute the major roads forming the basic network of the road transportation system within a state. They serve intermediate trip lengths and medium travelling speeds. Smooth traffic is provided with partial access control. They usually link the State capitals and District capitals or other major towns.

### R5 PRIMARY ROAD - INITIAL



( Note: Drawing Shows Half Width of Typical X-Section)

### R5 PRIMARY ROAD - FUTURE

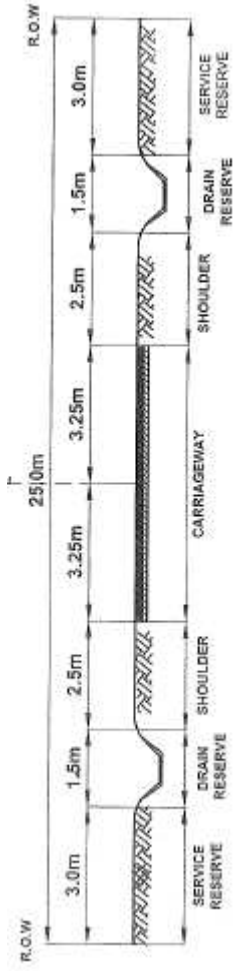


( Note: Drawing Shows Half Width of Typical X-Section)

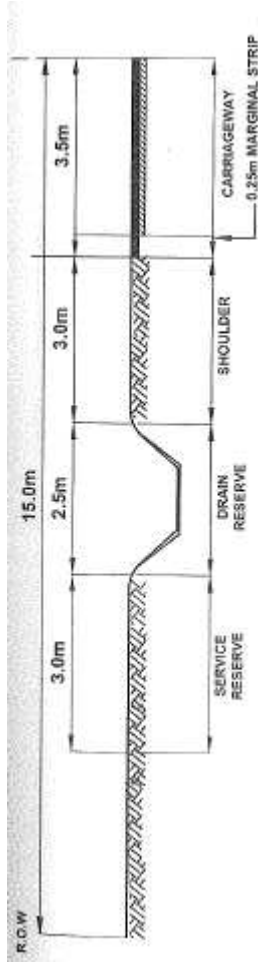
Source: Arahan Teknik (Jalan) 8-86 - A Design of Roads (2015)

# SECONDARY ROADS

They constitute the major roads forming the basic network of the road transportation system with a District or Regional Development Area. They serve intermediate trip lengths with partial access control. They usually link up the major towns within the District or Regional Development Area.



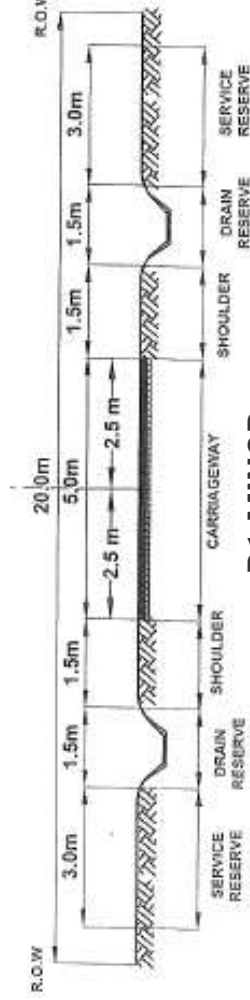
**R3 SECONDARY**



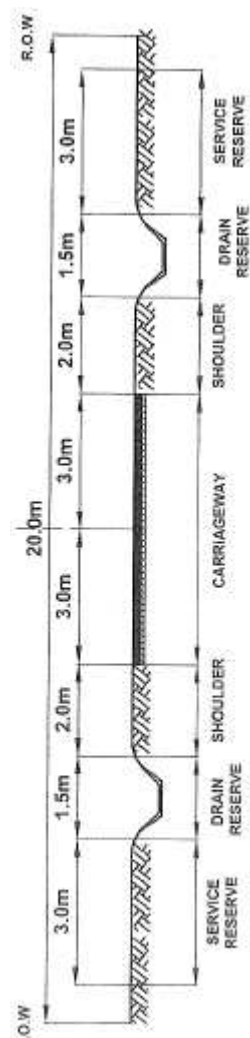
**R4 SECONDARY**

# MINOR ROADS

They apply to all roads other than those described above in the rural areas. They form the basic road network within a Land Scheme or other sparsely populated rural area. They also include roads with special functions such as holiday resort roads, security roads or access roads to microwave stations. They serve mainly local traffic with short trip lengths with no access control.



**R1 MINOR**

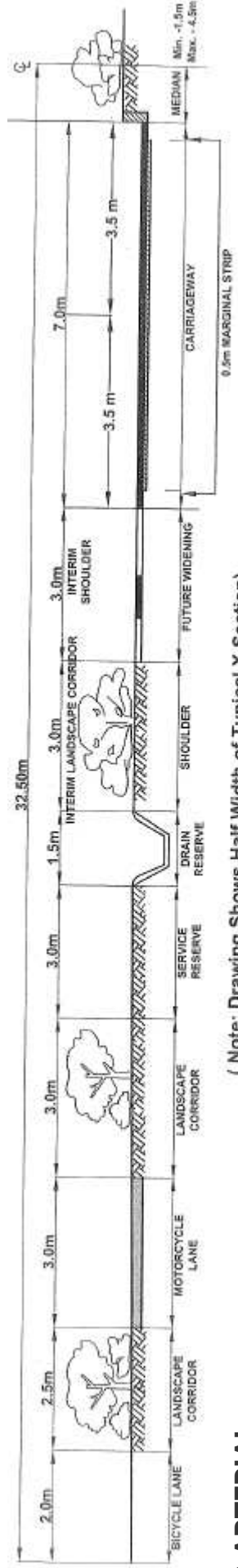


**R2 MINOR**

Source: *Arahan Teknik (Jalan) 8-86 - A Design of Roads (2015)*

# ARTERIALS

An arterial is a continuous road within partial access control for through traffic within urban areas. Basically, it conveys traffic from residential areas to the vicinity of the central business district or form one part of a city to another which does not intend to penetrate the city center. Arterials do not penetrate identifiable neighbourhoods. Smooth traffic flow is essential since it carries large traffic volumes.

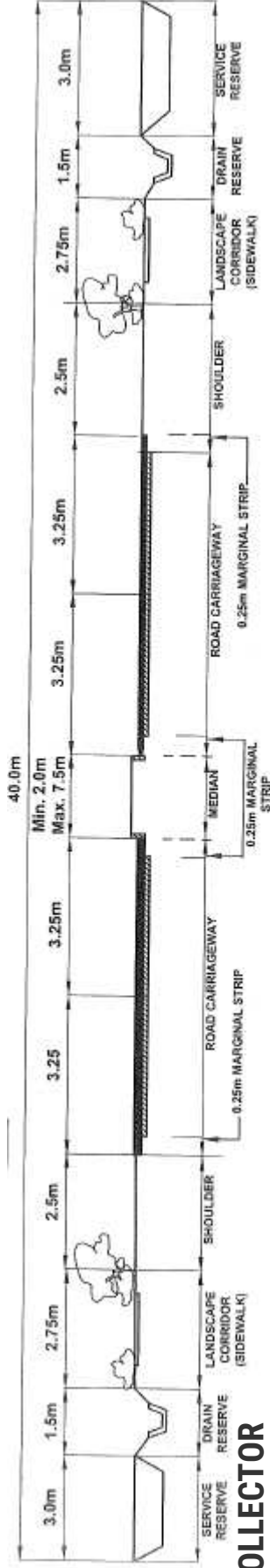


( Note: Drawing Shows Half Width of Typical X-Section)

## U3 ARTERIAL

# COLLECTORS

A collector road is a road with partial access control designed to serve as a collector or distributor of traffic between the arterial and the local road systems. Collectors are the major road which penetrate and serve identifiable neighbourhoods, commercial areas and industrial areas.



( Note: Drawing Shows Full Width of Typical X-Section)

## U3 COLLECTOR

Source: *Arahan Teknik (Jalan) 8-86 - A Design of Roads (2015)*

# CHARACTERISTICS OF ROAD CATEGORIES

AREA	ROAD CATEGORY	TRIP LENGTH			DESIGN VOLUME			SPEED			NETWORK
		LONG	MED	SHORT	HIGH	MED	LOW	HIGH	MED	LOW	
<b>RURAL</b>	EXPRESSWAY	■	■	□	■	■	□	■	■	□	NATIONAL NETWORK
	HIGHWAY	■	■	□	■	■	□	■	■	□	NATIONAL NETWORK
	PRIMARY ROAD	■	■	□	■	■	□	□	■	□	STATE NETWORK
	SECONDARY ROAD	□	■	■	□	■	■	□	■	■	DISTRICT NETWORK
	MINOR ROAD	□	■	■	□	□	■	□	□	■	SUPPORTING NETWORK
<b>URBAN</b>	EXPRESSWAY	■	■	□	■	■	□	□	■	□	NATIONAL NETWORK
	ARTERIAL	□	■	■	■	■	□	□	■	■	MAJOR LINKS TO URBAN CENTRES
	COLLECTOR	□	■	■	□	■	■	□	■	■	MAJOR STREETS WITHIN URBAN CENTRES
	LOCAL STREET	□	□	■	□	□	■	□	□	■	MINOR STREETS/ TOWN NETWORK

Source: A Guide On Geometric Design of Roads - ATJ 8/86 (Pindaan 2015), JKR Malaysia



## BRIDGE

A **Bridge** is a structure built to span physical obstacles such as a body of water, valley or road for the purpose of providing passage over the obstacle



## ENVIRONMENTALLY SENSITIVE AREAS (ESAs)

Areas of critically importance which has characteristics of significant biodiversity value: natural heritage, scenic beauty, provision of important ecosystem services, and/or is easily degraded due to natural and anthropogenic impacts, warranting its protection and conservation.

Quantum of distance for Environmentally Sensitive Area:-

- **Traversing** - to cross an area of land or water
- **Near to** - sharing a common boundary with ESA of Rank 1
- **Adjacent** - Project Site is within 500 m boundary of ESA of Rank 1



## TUNNEL

A **Tunnel** is an artificial underground passage, especially one built through a hill or under a building, road or river

# SCHEDULE 2

## Activity 16

# TRANSPORTATION

a) Construction of new routes or branch line for a mass rapid transport project

b) Construction of new railway route or railway branch lines

*Note: This Second Schedule Activity is also applicable to the States of Sabah and Sarawak*

## MASS RAPID TRANSPORT

The term “**mass rapid transport**” is not defined within any of the legislations but a ‘rapid transit system’ is taken to mean:

‘a public transport system in an urban area with high capacity, high frequency, is fast and is segregated from other traffic.



Scope covers all rail-based rapid transit systems.

**Railway** means any kind of railway for the public carriage of passengers or goods or both, or any portion thereof, and **includes:**

## RAILWAY

- All rails, beams, cables, sidings, or branches worked over for the purpose of, or in connection with, a railway;
- All rolling-stock used for the purpose of traffic; and
- In so far as the context allows, a railway under construction by or for any railway company.

### But does not include:

- The Penang Hill Railway & the Sabah Railway
- any railway used or, in the case of a railway to be constructed, intended to be used, by any person for the carriage of goods within any premises occupied by such person;
- any railway used or, in the case of a railway to be constructed, intended to be used, wholly or mainly for the carriage of passengers within any amusement or recreational premises;
- such other railways as may be prescribed



# Policy & Guideline Compliance



## Policy & Legal Requirements






The Project has to meet all legal and environmental requirements (statutory and non-statutory) and procedures of Malaysia. The project shall be in line with and not contradict the current national and state development policies and plans, especially for high impact projects.



Due diligence shall be undertaken in regards to policy compliance and study requirements with the relevant agencies and government departments. The Project Proponent and Qualified Person are to determine the specific compliance requirements, based on the scope and nature of the project.

Existing legal provisions and policies on the guidelines for Transportation and Road and ESA Framework for Peninsular Malaysia are as tabulated in the following pages.

### General Policy Adherence for Transportation & Road Projects

Agencies/Department	Legal Requirements	Required Output
<p>Project approvals and/or supporting documents</p> <p>National Physical Planning Council of Malaysia (MPFN) State Planning Committee (SPC)</p> <p>Regional Development Authority Local Authority (PBT)</p>	<p>Town &amp; Country Planning Act 1976 (Act 172)</p>	<p>To ensure that the project complies with the national and state policies and requirements for transportation and road development</p>
<p>Adherence to land use compatibility (local/special area plan)</p> <p>Development requirements in/near ESAs</p> <p>Social Impact Assessment (SIA) requirements</p> <p> Federal Department of Town and Country Plan</p> <p>Local Authority (PBT)</p>	<p>Town &amp; Country Planning Act 1976 (Act 172)</p> <p>Town &amp; Country Planning (Amendment) Act 2017 (Act A1522)</p>	<p>To ensure that the project complies with structure/local plans &amp; are compatible with the surrounding land use</p> <p>To determine the need for SIA for the project</p>
<p>Approval of any project &amp; activities within the marine park limits</p> <p>Additional requirements e.g. mitigation plan, pollution control</p> <p> Division of Marine Park, Department of Fisheries Malaysia</p>	<p>Fisheries Act 1985 (Act 317)</p> <p>Marine Parks Establishment Order Malaysia 1994</p>	<p>To ensure that the project is allowed to be developed within the marine park waters &amp; all requirements from the department are met</p>

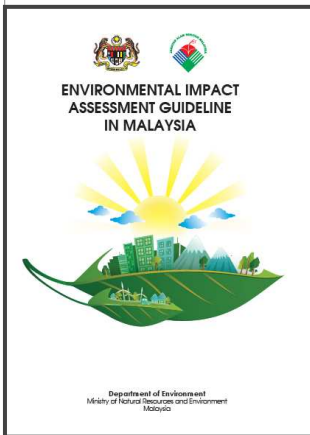
Agencies/Department	Legal Requirements	Required Output
<p>Land status compliance</p> <p>Land acquisition</p> <p>Minerals release</p> <p>Sand source approvals (if reclamation is involved)</p>	 <p>District &amp; Land Office (PTG) Marine Department of Malaysia</p>	<p>National Land Code 1965 (Act 56)</p> <p>To ensure that the Project Proponent owns the land and the status is the correct with its intended development</p> <p>To ensure there are no constraints on the land that may prohibit it from being a source</p>
<p>Geological Terrain Mapping (GTM) requirements</p> <p>Geotechnical report requirements</p> <p>Slope stability &amp; protection requirements</p> <p>Traffic Impact Assessments (TIA) requirements</p>	 	<p>National Land Code 1965 (Act 35)</p> <p>Minerals Development Act 1994 (Act 525)</p> <p>Geological Survey Act 1974 (Act 129)</p> <p>Road Transport Act 1987 (Act 333)</p> <p>To ensure that the topography, terrain &amp; geological features within the site is suitable for development</p> <p>To determine the need to carry out a TIA</p>
<p>Development requirements in Central Forest Spine (CFS) areas &amp; linkages (primary &amp; secondary) &amp; in permanent reserved forests (PRF)</p>		<p>Forestry Act 1984 (and amendments thereof) (Act 313)</p> <p>To determine the status of the forest. Ensuring it can be developed and is not within PRF, water catchment, etc.</p>
<p>Development requirements in/near wildlife sanctuaries and other protected areas</p> <p>Protection of flora and fauna</p> <p>Require for animal relocation plan, viaduct crossings etc.</p>		<p>Wildlife Conservation Act 2010 (Act 716)</p> <p>To determine the sensitivity of the site in terms of flora and fauna species and constraints for development</p>

Agencies/Department	Legal Requirements	Required Output
<p>Hydraulic study requirements</p> <p>Permission for river diversion</p> <p>Requirement for river reserves</p> <p>Storm water management requirements (MSA-2)</p> <p>Erosion and sediment Control Plan (ESCP)</p>	 <p><b>JABATAN PENGAIRAN DAN SALIRAN MALAYSIA</b></p> <p>State Water Authority</p>	<p>Street Drainage and Building Act 1974 (Act 133)</p> <p>State enactments on water resources, river basins and coastal areas</p> <p>Determine the hydrological condition of the site &amp; requirements pertaining to changes in river system &amp; runoff management requirements</p>
<p>Development requirements within Orang Asli settlements &amp; their roaming areas, agriculture plots, cultural, heritage, religious and archaeological sites</p>	 	<p>Aboriginal Peoples Act 1954 (Revision 1974) (Act 134)</p> <p>To ensure that the area is not occupied by Orang Asli community and if so, how to manage impacts</p> <p>To ensure cultural, religious or archaeological heritage areas are not impacted</p>

### List of Policies & Plans Relevant to Development

Policies & Plans	Details & Scope
<p>National Physical Plan-3 (NPP-3) (JPBD,2016)</p> <p>State Structure &amp; Local Plans (Various local authorities &amp; publishing dates)</p>	<p>National spatial planning guidelines; environmentally sensitive areas (ESAs)</p> <p>State and local level planning guidelines for road and transportation development; includes development controls</p>
<p>National Policy on Biological Diversity 2016 – 2025 (NRE, 2016)</p>	<p>Covers specifically 17 national biodiversity targets with corresponding goals and action plans to achieve within 2016 – 2025</p>

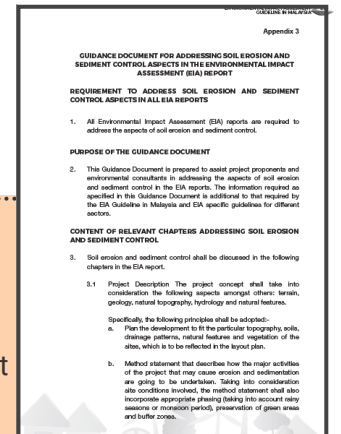
# List of Relevant Guidelines & Guidance Documents Related to Development Planning



## 01

### **Environmental Impact Assessment Guidelines in Malaysia (EGiM), (DOE, 2016)**

Provide guidance to project proponent and qualified person in the preparation of the EIA Reports.



## 02

### **Guidance Document for Addressing Soil Erosion and Sediment Control (ESC): Aspects in the EIA Report as per Appendix 3 of the Environmental Impact Assessment Guidelines in Malaysia (EGiM). (DOE, 2016).**

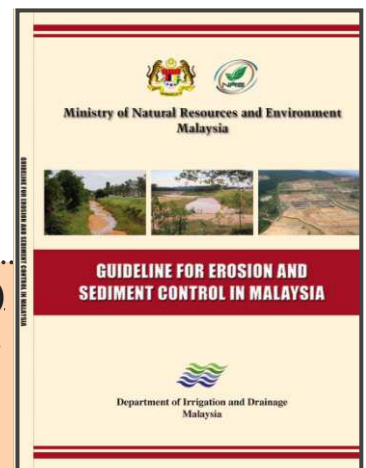
EIA reporting format concerning section on soil erosion & sediment control.



## 03

### **Garis Panduan Perancangan Kawasan Sensitif Alam Sekitar (PLANMalaysia, 2017).**

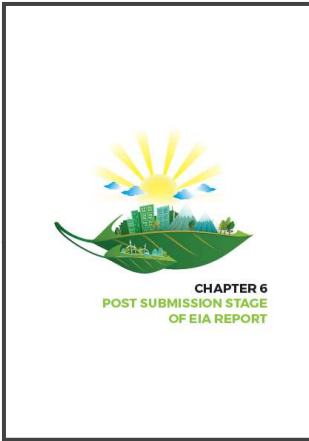
Provides the requirements for development in ESAs.



## 04

### **Guidelines for Erosion and Sediment Control in Malaysia (DID, 2010)**

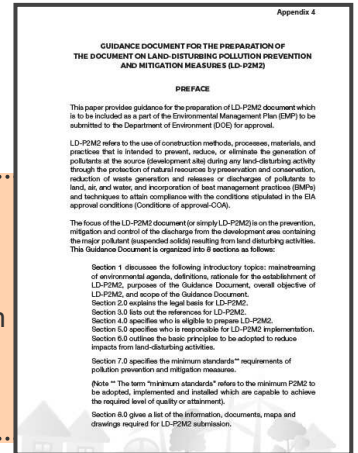
Guidelines for prevention & control of soil erosion and siltation for specific projects including examples of control measures & BMPs.



05

**Guidance Document for the preparation and submission of Environmental Management Plan (EMP) as per Chapter 6 of the EGIM (DOE, 2016).**

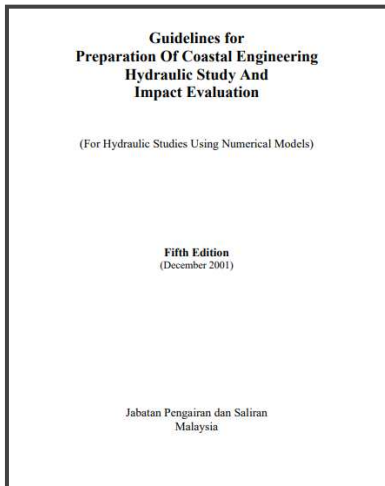
Guidance for the preparation of the EMP post-EIA including translating into action, the pollution prevention and mitigation measures (P2M2s) recommended in the EIA and the Conditions of Approval (COA).



06

**Guidance Document for the preparation of the document on Land-Disturbing Pollution Prevention and Mitigation Measures (LDP2M2) as per Appendix 4 of the EGIM (DOE, 2016).**

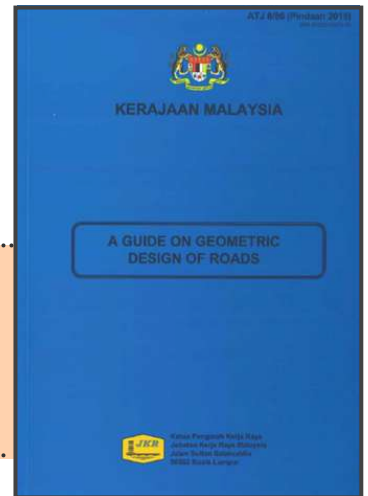
For the landward development components only, in the preparation of the LD-P2M2 document, which is to be included as part of the EMP to be submitted to DOE for approval



07

**Guidelines for the Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation (DID, 2001).**

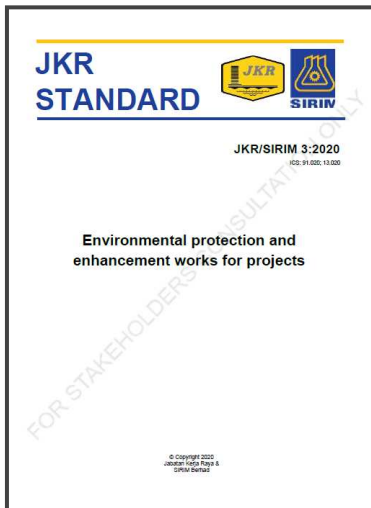
Provides requirements for preparation of hydraulic reports for coastal projects



08

**A Guide on Geometric Design of Roads, ATJ 8/86 (Pindaan 2015) (JKR 2015)**

Provides road classification



09

**JKR Standard 2020: Environmental Protection & Enhancement Works for Projects**  
Mandatory reference

# ESA Framework for Peninsular Malaysia

as extracted from NPP3

## TAHAP 1

Kawasan Sensitif Alam Sekitar	Kriteria Pengurusan
<p>Kawasan Perlindungan sedia ada &amp; cadangan baharu</p> <p>Habitat terancam di luar Kawasan Perlindungan:</p> <ul style="list-style-type: none"> <li>Kawasan pendaratan penyu, dataran rumput laut, kawasan terumbu karang, singkapan batu kapur, permatang kuarza &amp; tapak persinggahan burung.</li> </ul>	<p>Pemajuan<sup>1</sup>, pertanian atau pembalakan tidak dibenarkan kecuali ekopelancongan, penyelidikan dan pendidikan baharu</p> <p>Habitat terancam di luar Kawasan Perlindungan hendaklah dikenal pasti diperingkat Rancangan Struktur Negeri &amp; Rancangan Tempatan;</p> <p>Pelan pengurusan perlu disediakan di mana habitat dikenal pasti dan diwartakan.</p>
<p>Kawasan tadahan empangan sedia ada &amp; cadangan baharu</p>	<p>Kemudahan infrastruktur selain daripada infrastruktur empangan adalah tidak dibenarkan;</p> <p>Aktiviti pembalakan &amp; pertanian tidak dibenarkan</p>
<p>Kawasan melebihi kontur 1000m</p>	<p>Pembangunan bandar &amp; pertanian yang baharu di kawasan tanah tinggi hanya dibenarkan di dalam dua Kawasan Pengurusan Khas (KPK) 2 iaitu:</p> <ul style="list-style-type: none"> <li>Cameron Highlands – Kinta – Lojing</li> <li>Genting Highlands – Bukit Tinggi – Janda Baik</li> </ul> <p>Bagi KPK Cameron Highlands – Kinta – Lojing &amp; Genting Highlands – Bukit Tinggi – Janda Baik, pembangunan pertanian baharu hanya dibenarkan di luakawasan hutan simpan &amp; kawasan tadahan air</p> <p>Pembangunan baharu tidak dibenarkan di dalam KPK Bukit Fraser</p> <p>Pembangunan sedia ada perlu mematuhi strategi &amp; garis panduan yang terkandung dalam Kajian Penyelarasan Pembangunan Bukit Fraser<sup>3</sup></p> <p>Bagi kawasan tanah tinggi yang telah dibangunkan, kawalan perlu dilaksanakan melalui penyediaan Rancangan Kawasan Khas (RKK)</p> <p>Semua pembangunan &amp; pertanian di kawasan melebihi kontur 1000m hendaklah mematuhi di kawasan peraturan &amp; garis panduan sedia ada &amp; akan datang secara menyeluruh</p>

## TAHAP 2

### Kawasan Sensitif Alam Sekitar

### Kriteria Pengurusan

*Semua hutan & tanah bench di luar perlindungan*

*Pembangunan atau pertanian tidak dibenarkan. Pembalakan mampan & ekopelancongan berimpak rendah dibenarkan tetapi tertakluk kepada halangan setempat;*

*Aktiviti pembalakan mampan harus diberi penekanan dalam pemantauan & penguatkuasaan*

*Kawasan tanah gambut, tanah lembut, lubang benam & bekas lombong bawah tanah*

*Pemetaan kawasan ini di peringkat Rancangan Struktur Negeri & Rancangan Tempatan*

*Kajian kesesuaian tapak perlu dijalankan sebelum kawasan ini dibangunkan*

*Zon penampakan 500m di sekeliling KSAS Tahap 1*

*Zon penampakan (500m) perlu diubahsuai jika terdapat pembangunan yang sedia ada atau yang telah dirancang (komited) tetapi kawalan perlu disediakan mengikut ciri-ciri kawasan tersebut*

*Inventori penggunaan tanah perlu dijalankan pada peringkat Rancangan Tempatan di mana sempadan zon penampakan perlu diperkemas kini dengan mengambil kira:*

*Pembangunan sedia ada iaitu kawasan perindustrian, pertanian, pertempatan & lain-lain;*

*Perancangan pembangunan yang terancang (komited);*

*Perancangan yang melibatkan pembangunan infrastruktur yang kritikal seperti lebuh raya, landasan kereta api, talian penghantaran elektrik dan sebagainya.*

*Kawasan antara kontur 300m – 1000m*

*Semua pembangunan & pertanian di kawasan ini hendaklah mematuhi*

*Peraturan & garis panduan sedia ada & akan datang secara menyeluruh*

*Kawasan ini perlu dikenal pasti, dipetakan & diperincikan pada peringkat Rancangan Struktur Negeri & Rancangan Tempatan*

# TAHAP 3

Kawasan Sensitif Alam Sekitar	Kriteria Pengurusan
Zon penampakan 500m di sekeliling KSAS Tahap 2	Pembangunan terkawal di mana jenis & intensity pembangunan perlu tertakluk kepada ciri-ciri halangan. Ciri-ciri halangan termasuk zon persisiran pantai yang mengalami hakisan & kawasan yang terdedah kepada ancaman banjir.
Kawasan tadahan takat pengambilan air & zon recaj air tanah	Kawasan-kawasan tadahan takat pengambilan air & zon recaj perlu dikenalpasti pada peringkat Rancangan Struktur Negeri & Rancangan Tempatan.
Pulau – pulau & Taman Laut	Semua pembangunan di pulau-pulau & taman laut perlu mematuhi peraturan & garis panduan sedia ada & akan datang secara menyeluruhs
Kawasan persisiran pantai	Semua pembinaan di persisiran pantai perlu mematuhi RFZPPN, ISMP negeri, garis panduan sedia ada & akan datang secara menyeluruhs

**Source: National Physical Plan 3 (NPP3)**

- 1  
Seperti mana yang dinyatakan di dalam Akta 172, Akta Perancangan Bandar Dan Desa, 1976
- 2  
Berdasarkan Kajian Pembangunan Mampan Kawasan tanah Tinggi Semenanjung Malaysia. UPE, Jabatan Perdana Menteri, Putrajaya, 2012
- 3  
JAS.2008. Kajian Penyelarasan Pembangunan di Bukit Fraser, Pahang. Jabatan Alam Sekitar, Putrajaya.
- 4  
Kajian Pelan Pengurusan Khusus (Pemuliharaan) Tanah Tinggi Kinta – Cameron Highlands - Lojing, JPBD SM, 2012.  
Garis Panduan Pembangunan Di Kawasan Bukit, Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan, 1997  
Panduan Pembangunan Pertanian di Tanah Bercerun, Jabatan Pertanian, 2000  
Garis Panduan Pembangunan Di Kawasan Tanah Tinggi, Kementerian Sumber Asli dan Alam Sekitar, 2005  
Garis Panduan Pembangunan Di Kawasan Bukit dan Tanah Tinggi, Jabatan Perancangan Bandar dan Desa, 2009  
Garis Panduan Pembangunan Di Kawasan Bukit dan Tanah Tinggi Negeri Selangor, 2010  
Jadual Pertama, Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Ke Atas Alam Sekeliling), 2015, Jabatan Alam Sekitar Malaysia  
Safety Guideline for Hill Site Development, Penang, 2012
- 5  
Garis Panduan Perancangan Pembangunan Fizikal di Pulau-Pulau dan Taman Laut, Jabatan Perancangan Bandar dan Desa, 2014  
Rancangan Fizikal Zon Persisiran Pantai Negara, Jabatan Perancangan Bandar dan Desa, 2010  
Garis Panduan Eko Pelancongan Kebangsaan, Kementerian Kebudayaan Kesenian dan Pelancongan, 1997  
Garis Panduan Kawalan Hakisan Berikutan dari Pembangunan di Kawasan Pantai, Jabatan Pengairan dan Saliran, 1997  
National Integrated Coastal Zone Management Policy, Unit Perancang Ekonomi, 2005  
Pelan Pengurusan Persisiran Pantai Bersepadu (ISMP), Jabatan Pengairan dan Saliran Negeri

# Stakeholder Engagement



The EIA process has provided adequate mechanisms to enable the general public access to contribute their views and comments. Their recommendations will be taken into account in the EIA and by the EIA Technical Review Committee (EIATRC).

The mechanisms for stakeholders' participation in the EIA process can be direct, indirect and formal or informal. **The EGIM (DOE, 2016)** has succinctly highlighted this as follows:

...“EIA is a multi-disciplinary study on the environmental components such as water quality, air quality, waste management, environmentally sensitive areas and natural resources. It involves the participation of government agencies, non-governmental agencies (NGOs), academicians, experts and environmental practitioners including qualified and competent persons, industries and public at large. Hence, the EIA process should provide adequate opportunities to all stakeholders including the affected public to express their concerns and provide inputs for decision making process by relevant approving authority.”

## Identification of Stakeholders

The selection of stakeholders can be generally grouped into three main groups from:



Government Agencies (GAs) which have the powers and legal rights to administer, enforce and approve the project

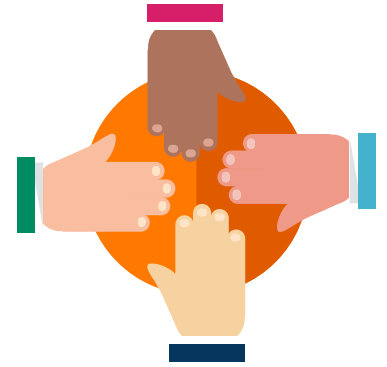


General public, organisations, properties and land owners who may be directly or indirectly be affected by the project




Special interest groups or organisations representing their interests' e.g. non-governmental organisations (NGOs) related to environmental conservation

The table below provides list of possible stakeholders to be considered for stakeholder engagement process related to Transportation and Road project. Please note that the list provided below is an indicative, but non-exhaustive where the relevant stakeholders may vary depends on the project nature. The Qualified Person may identify any relevant stakeholders to be engaged for the project.



## List of Possible Stakeholders

		ROLES & RESPONSIBILITY
1		<ul style="list-style-type: none"> <li>Administration of the EIA process under EQA 1974</li> <li>Responsible for the issuance of the COA for the EIA</li> <li>Post EIA approvals, monitoring and enforcement</li> </ul>
2	<b>Project Proponent</b>	<ul style="list-style-type: none"> <li>The party to carry out the development and responsible for obtaining all necessary approvals for the site</li> <li>Involved in the management of the project at all stages of development</li> </ul>
3	<b>Relevant Government Agencies (GAs)</b>	<ul style="list-style-type: none"> <li>GAs which have roles and functions in the project and are responsible for the issuance of approvals for studies, technical reports and plans for the project</li> <li>Engagements shall assist in determining GA requirements for the project that needs to be addressed by the Project Proponent, and also to assist in obtaining information under their respective agencies jurisdiction</li> <li>The possible GAs to be considered for engagements are as follows: <ul style="list-style-type: none"> <li>State Economic Planning Unit</li> <li>Department of Director General of Lands &amp; Mines</li> <li>Federal/State Department of Town &amp; Country Planning (PLANMalaysia)/PLAN@State</li> <li>Public Works Department</li> <li>Local Authorities</li> <li>Department of Drainage &amp; Irrigation (DID)</li> <li>Federal/State Forestry Department</li> <li>Ministry of Transport (MOT)</li> <li>Department of Wildlife &amp; National Parks Peninsular Malaysia (PERHILITAN)</li> <li>Malaysian Highway Authority</li> <li><i>Prasarana Malaysia Berhad</i></li> <li><i>Keretapi Tanah Melayu Berhad</i></li> <li>Other relevant agency/agencies</li> </ul> </li> </ul>
4	<b>Affected Public &amp; Local Population</b>	<ul style="list-style-type: none"> <li>The public or local population that may be directly or indirectly affected by the project and whose concerns and interests need to be addressed as part of the EIA</li> <li>Preliminary engagement may include identifying public concerns for the project that needs to be addressed and feedback on mitigation measures</li> <li>These may include; Local residents, tourists &amp; land owners</li> </ul>
5	<b>NGOs</b>	<ul style="list-style-type: none"> <li>Provide input and feedback on issue of special interest. These may include; NGOs related to environment + other related NGOs</li> </ul>



# METHODS in ENGAGEMENT



Identify areas of policy and regulatory compliance from the relevant GAs.



Obtain stakeholder feedback in identifying areas of improvement to the initial design and concept



Obtain initial data and views from the GAs and stakeholders (communities, local leaders, etc.) to assist in preparation of the TOR



## Documentation & Reporting



Proof of engagement can be in the form of written report, official response letter from the GAs, minutes of meeting (MOM), photos, etc.

Findings from the stakeholder engagement shall be incorporated into the TOR, especially in regards to policy compliance



# 3 APPROACH & METHODOLOGY

The Terms of Reference (TOR) is the first major milestone in the overall Environmental Impact Assessment (EIA) procedure process. The Project Proponent and Qualified Person are required to carry out the environmental screening and scoping, with the findings incorporated into the TOR.

This Chapter shall detail the steps in the preparation and submission of the TOR for the endorsement of the Department of Environment (DOE).

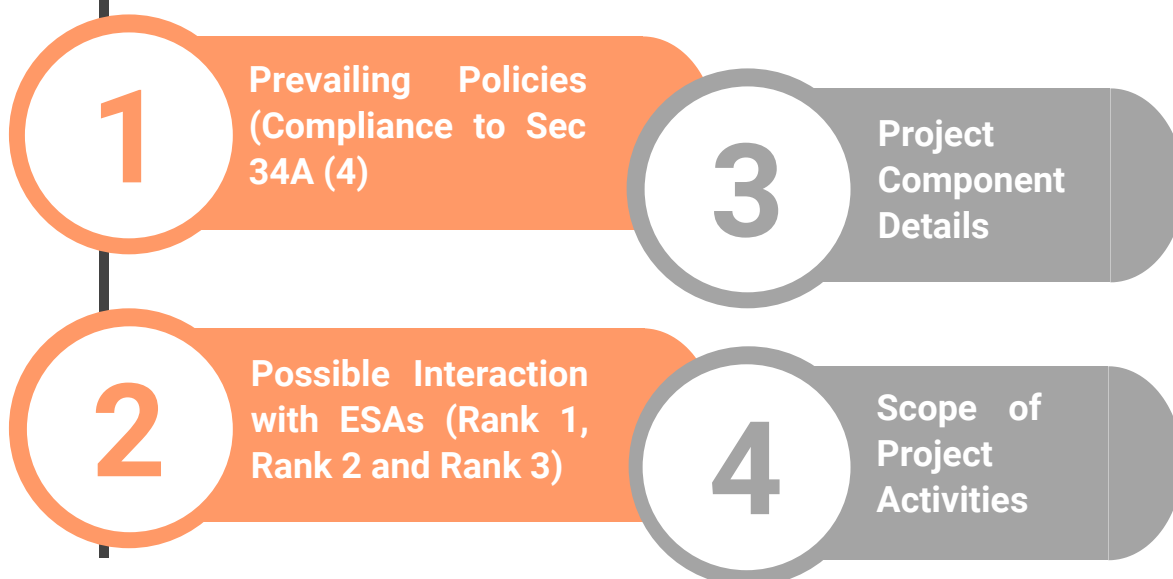


## Environmental Screening Aspects

Environmental Screening is carried out to determine whether a proposed project is a prescribed activity under the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015.

Screening is important as there are a large number of projects and activities that are potentially subject to an EIA. It also important that any project shall be screened to have complied with all national and/or state policy matters before proceeding with an EIA.

If the proposed project has components falling within BOTH First and Second Schedule prescribed activities, the Second Schedule EIA shall prevail and shall encompass all EIA requirements required of those activities. In which case, all other relevant EIA Guidelines must be referred.



# Screening for EIA

As stated under EQA Section 34A (1):

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

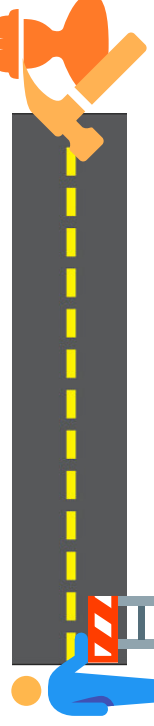
## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

- a) Construction of new routes or branch line for a mass rapid transport project
  - b) Construction of new railway route or railway branch lines
- Note:** *This Second Schedule Activity is also applicable to the States of Sabah & Sarawak*

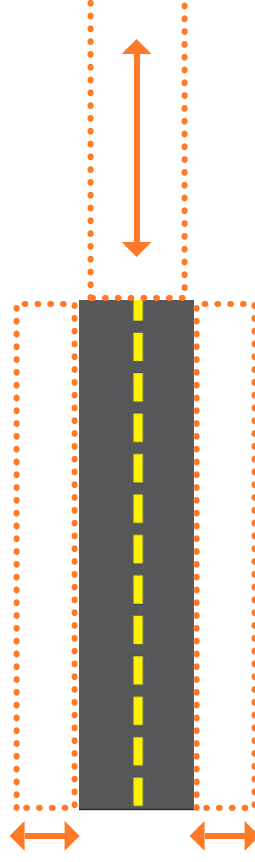
## SCENARIOS

### Activity 20 (a):

#### New expressway



#### Upgrading of expressway



**SUBJECT TO EIA**

# Screening for EIA

As stated under EQA Section 34A (1):

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

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## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

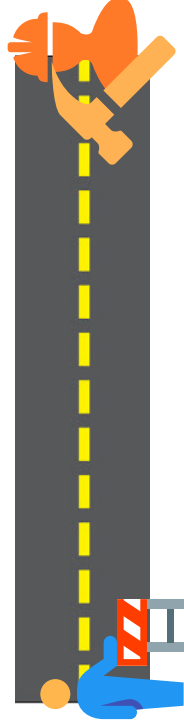
- a) Construction of new routes or branch line for a mass rapid transport project
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## SCENARIOS

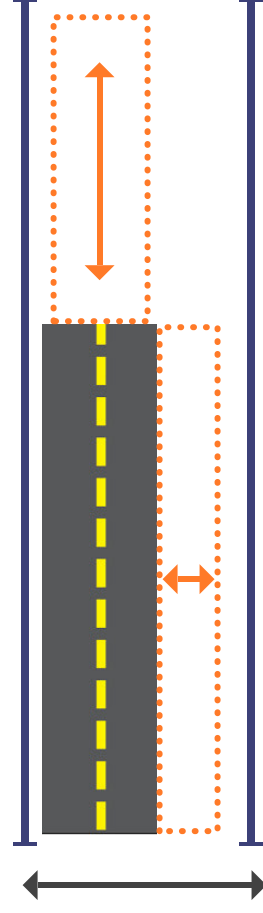
## SUBJECT TO EIA

### Activity 20 (b):

New highway (without toll)



Upgrading of highway within ROW



# Screening for EIA

As stated under **EQA Section 34A (1)**:

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

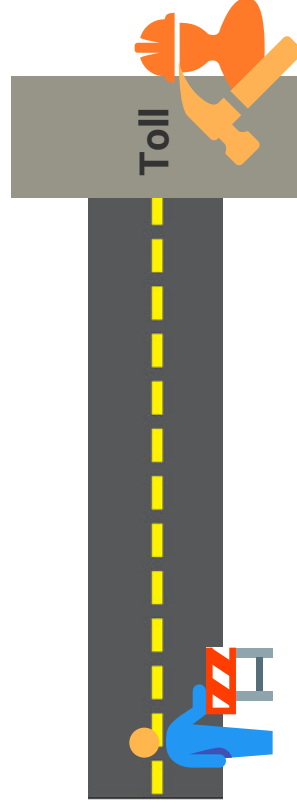
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- a) Construction of new routes or branch line for a mass rapid transport project
  - b) Construction of new railway route or railway branch lines
- Note:** *This Second Schedule Activity is also applicable to the States of Sabah & Sarawak*

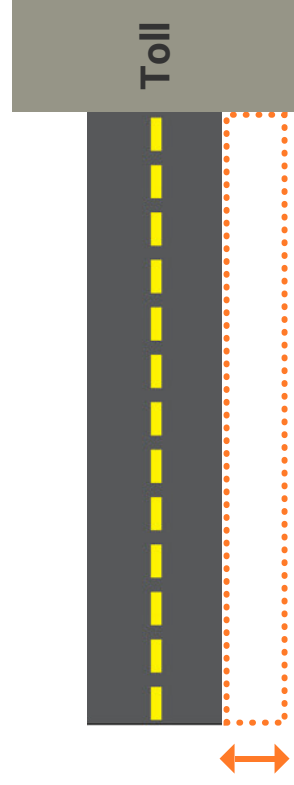
## SCENARIOS

### Activity 20 (b):

New highway with toll



Upgrading of highway with toll



**SUBJECT TO EIA**



# Screening for EIA

As stated under EQA Section 34A (1):

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

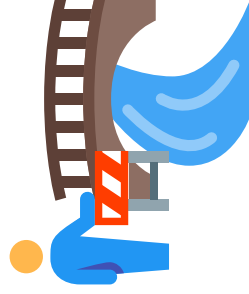
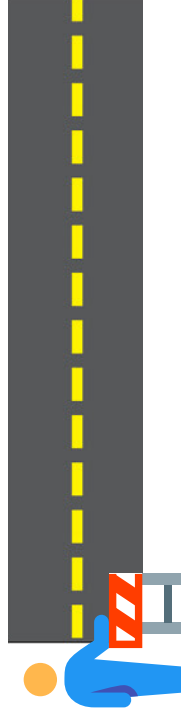
## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

- a) Construction of new routes or branch line for a mass rapid transport project
  - b) Construction of new railway route or railway branch lines
- Note:** This Second Schedule Activity is also applicable to the States of Sabah & Sarawak

## SCENARIOS

### Activity 20 (c):

New road, tunnel or bridge excluding R1 & R2 Design Standard



\*However, screening by State Department office is needed to further determine requirement for EIA for R1 & R2 Design Standard roads

## SUBJECT TO EIA



# Screening for EIA

As stated under **EQA Section 34A (1)**:

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

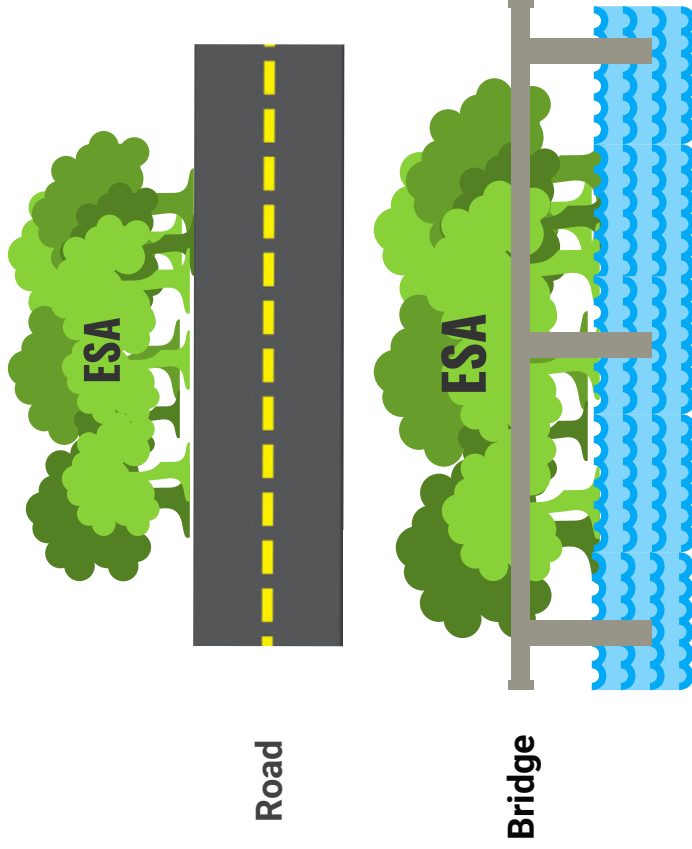
## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

- a) Construction of new routes or branch line for a mass rapid transport project
  - b) Construction of new railway route or railway branch lines
- Note:** *This Second Schedule Activity is also applicable to the States of Sabah & Sarawak*

### SCENARIOS



Road

Bridge

**Bridge/Road near ESAs  
(Rank 1, 2 & 3)**

**SUBJECT TO EIA**



# Screening for EIA

As stated under EQA Section 34A (1):

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
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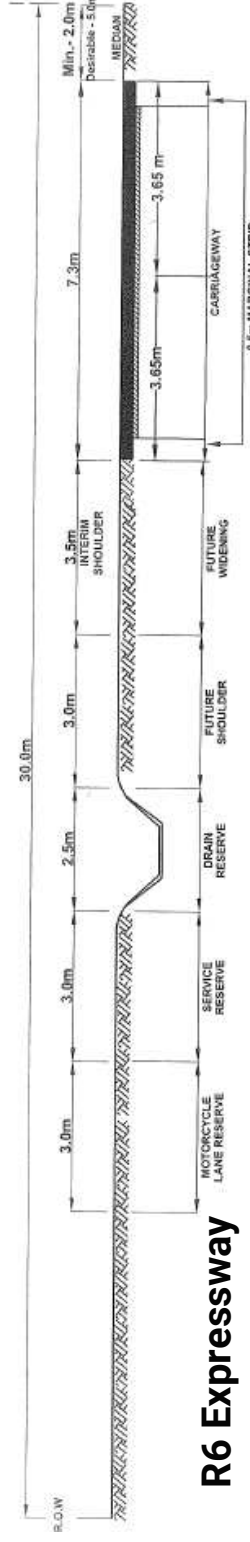
## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

- a) Construction of new routes or branch line for a mass rapid transport project
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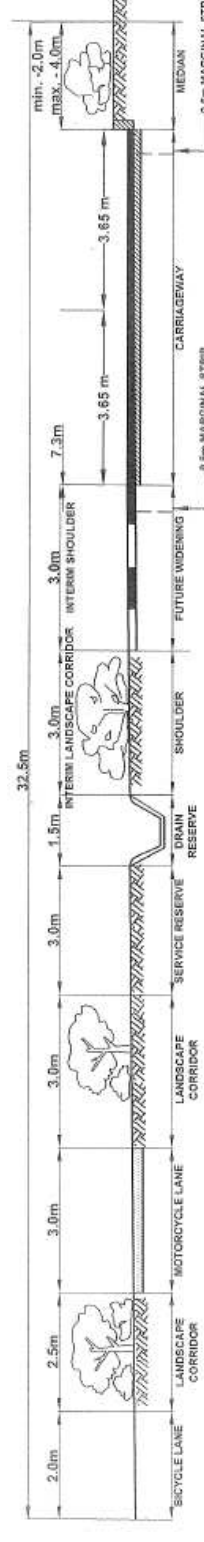
**Note:** This Second Schedule Activity is also applicable to the States of Sabah & Sarawak

## SCENARIOS

## SUBJECT TO EIA



R6 Expressway



U6 Expressway



R5 HIGHWAY



# Screening for EIA

As stated under EQA Section 34A (1):

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

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- a) Construction of expressways
- b) Construction of highways
- c) Construction of road, tunnel or bridge traversing/adjacent/near to environmentally sensitive areas

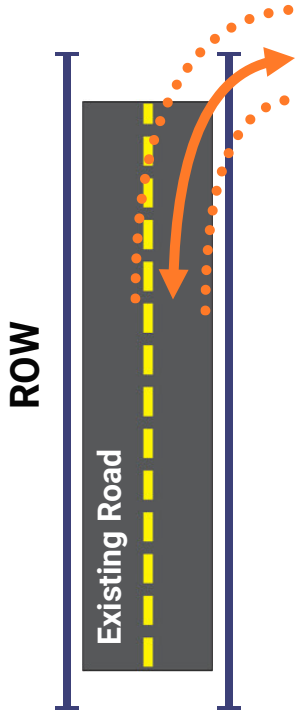
## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

- a) Construction of new routes or branch line for a mass rapid transport project
  - b) Construction of new railway route or railway branch lines
- Note:** This Second Schedule Activity is also applicable to the States of Sabah & Sarawak

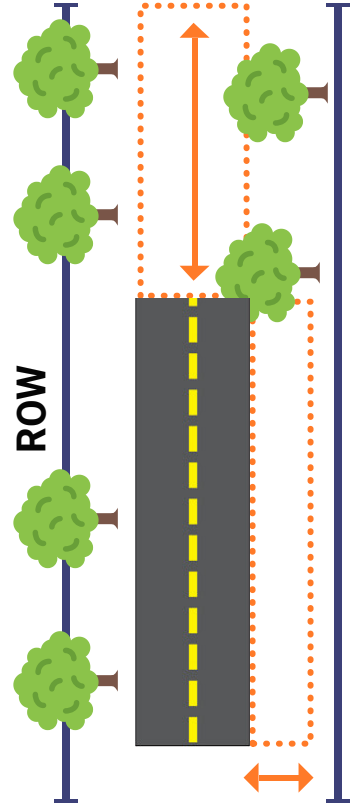
# SCENARIOS

# SUBJECT TO EIA

Interchange works/Spur roads added out of ROW after an EIA is approved for original Expressway/ Highway



Upgrading or expansion within the existing ROW



# Screening for EIA



As stated under **EQA Section 34A (1)**:

The Minister, after consultation with the Council, may by order prescribe any activity which may have significant environmental impact as prescribed activity

## FIRST SCHEDULE ACTIVITY 20: ROAD

- a) Construction of expressways
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## SECOND SCHEDULE ACTIVITY 17: TRANSPORTATION\*

- a) Construction of new routes or branch line for a mass rapid transport project
- b) Construction of new railway route or railway branch lines

**Note:** This Second Schedule Activity is also applicable to the States of Sabah & Sarawak

## SCENARIOS

**Construction of Bus Rapid Transit (BRT)**



Sunway BRT

Source: thesundayly.my

**Construction of new bridge/road/tunnel connecting from mainland to island BUT NOT traversing or adjacent or near to ESAs**



Sultan Azlan Shah Bridge



Source: thesundayly.my

Penang Bridge

## SUBJECT TO EIA



# ENVIRONMENTAL SCOPING

The main objective of environmental scoping is to identify the environmental attributes and issues to determine the focus, depth, and spatial and temporal boundaries of the EIA that are deemed significant and requiring assessment in detail as part of the EIA process.

The **Scoping Exercise** comprises the following steps:

1

## **SITE SUITABILITY ASSESSMENT (SSA)**

Based on the site constraints and technical studies, the project proponent shall consider all alternatives or options to refine and improve upon the original concept design.

2

## **DETERMINATION OF STUDY BOUNDARY**

The Qualified Person shall determine the extent of the Zone of Study (ZOS) and Zone of Impact (ZOI) based on site conditions and environmental sensitivity.

3

## **BASELINE DATA REVIEW**

The qualified person shall carry out qualitative assessment based on desktop study and literature review. These may be supplemented by initial site investigations and public engagements.

4

## **DETERMINATION OF KEY PROJECT ACTIVITIES**

The Project Proponent shall outline the key project activities that will be carried out during the various phases of the project (pre-construction, construction and operations)

5

## **IDENTIFICATION OF SIGNIFICANT IMPACTS AND PRIORITY**

This step will involve preliminary identification of significant issues for further detailed assessment in the EIA. Non-significant issues shall also be addressed accordingly in the EIA study but through general/qualitative impact prediction and evaluation.

6

## **SELECTION OF MITIGATION MEASURES**

Based on the identified significant impacts, the Qualified Person shall determine the potential mitigation measures that need to be provided in detail in the EIA.

7

## **PREPARATION AND SUBMISSION OF ESI AND TOR**

Findings from the scoping shall be compiled, collated, analysed and reported for DOE's endorsement.

Scoping shall be carried out at an early stage of the project cycle. It enables the EIA to focus only on the significant issues, impacts and sensitive receptors.

Scoping shall encompass all environmental aspects (physical-chemical, biological and socio-economic) to enable an overall evaluation of the significant impacts. At the start of the scoping exercise, no attempt should be made to exclude or pre-judge any issues of concern.

**S**ite

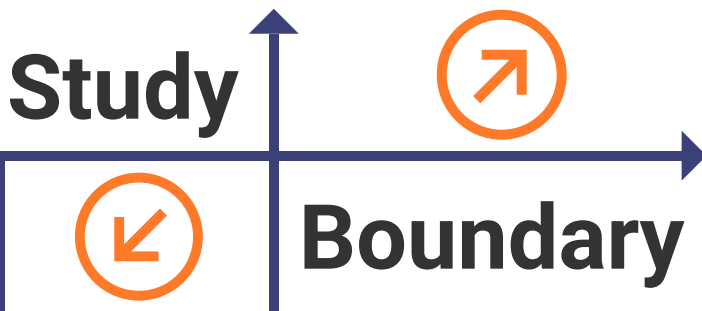
**S**uitability

**A**ssessment

This step may involve a re-evaluation of the project concept, design and components to take into account the new selected options. At this juncture, the P2M2s and BMPs can still be incorporated into the project design for the final option. The final selected option shall be environmentally feasible and pragmatic.

During project planning, the Project Proponent shall consider alternatives and options to the proposed concept and layout based on the findings in the feasibility reports and from the scoping exercise. This will form part of the SSA detailed in the EGIM (DOE, 2016) and required for the EIA.

A 'No Project' option shall also be assessed and its implications discussed comparatively with the 'With Project' option.



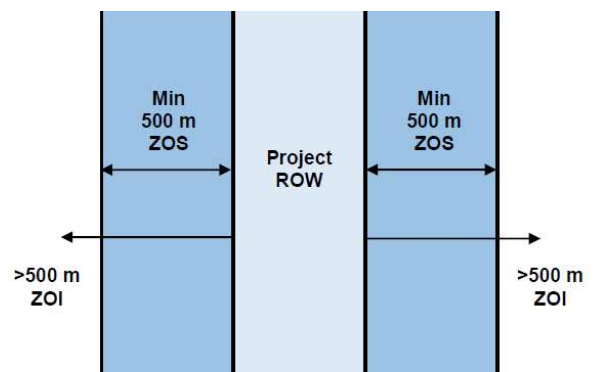
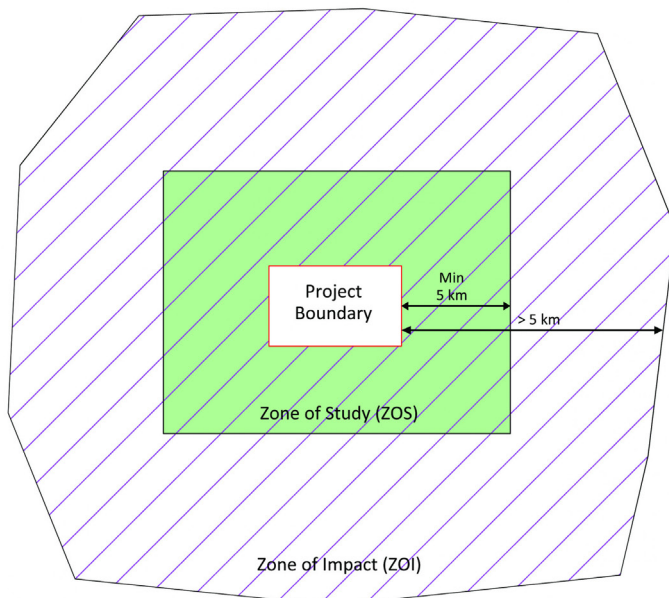
The scoping exercise also determines the study boundaries so that baseline information can be gathered for the TOR/ESI.

The Qualified Person shall obtain the necessary relevant information on the project and the surrounding ZOS, either from available secondary sources or through preliminary data gathering at the site.

ZOS is the study area encompassing a 5 km radius from project boundary. However, potential impacts from Project may extend beyond the ZOS and hence, that area is referred as ZOI.

For linear projects like roads, ZOS covers a 1 km corridor (500 m on either side of the Right of Way [ROW]) while ZOI may extend further, based on EIA.

Level of detail for environmental studies shall be based on factors such as project area size, type, activities and potential impacts to surrounding areas, which shall be determined by the Qualified Person in carrying out the EIA.



LEGEND  
Zone of Impact (ZOI)  
Zone of Study (ZOS)

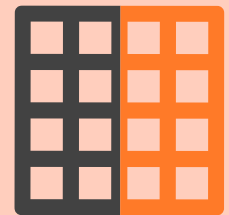
# BASELINE DATA REVIEW

Baseline information shall be qualitative but adequate to assess the potential impacts resulting from the project on the sensitive receptors. However, if there is available supporting information available, these can be included as well.

If any of the items in the list are unavailable at the time of scoping (but is important to the EIA) it must be recorded as items to be addressed at the EIA stage. Items irrelevant or insignificant to the project can and shall be omitted during scoping.

The relevant items shall be prioritised based on the levels of significance.

## DETERMINATION OF KEY PROJECT ACTIVITIES



Project activities are the basis for assessing the potential impacts for transportation and road projects. The key activities can be categorized based on the project phases that are:



Pre-construction Phase



Operational Phase

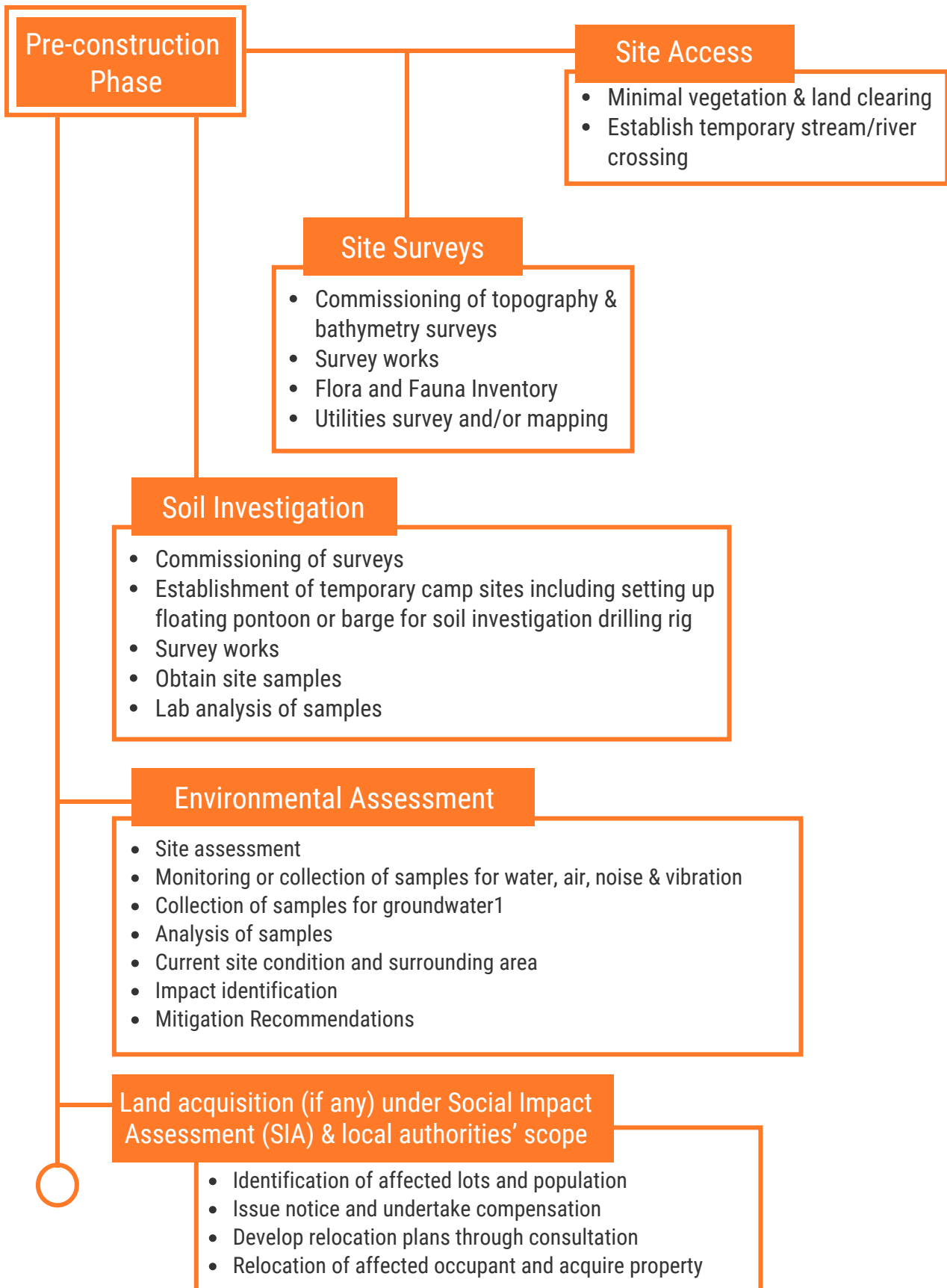


Construction Phase

The pre-construction activities include pre-feasibility, feasibility and design stage of the project.

The summary list of activities in a typical transportation and road project by phases is shown in the following pages. The list is not exhaustive and the Qualified Person shall add or delete to the list, whenever and wherever necessary.

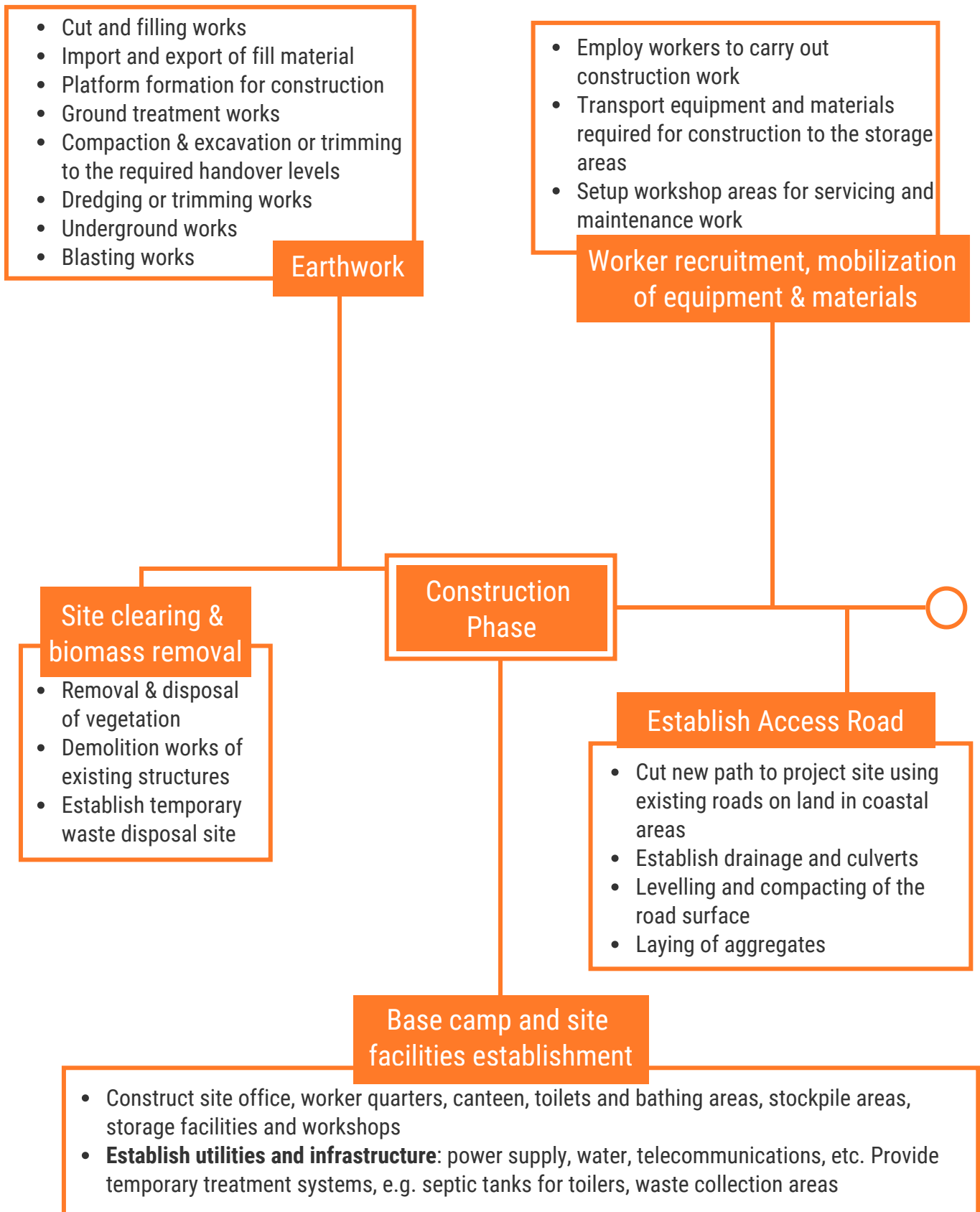
# List of Typical Project Activities during Pre-Construction Phase



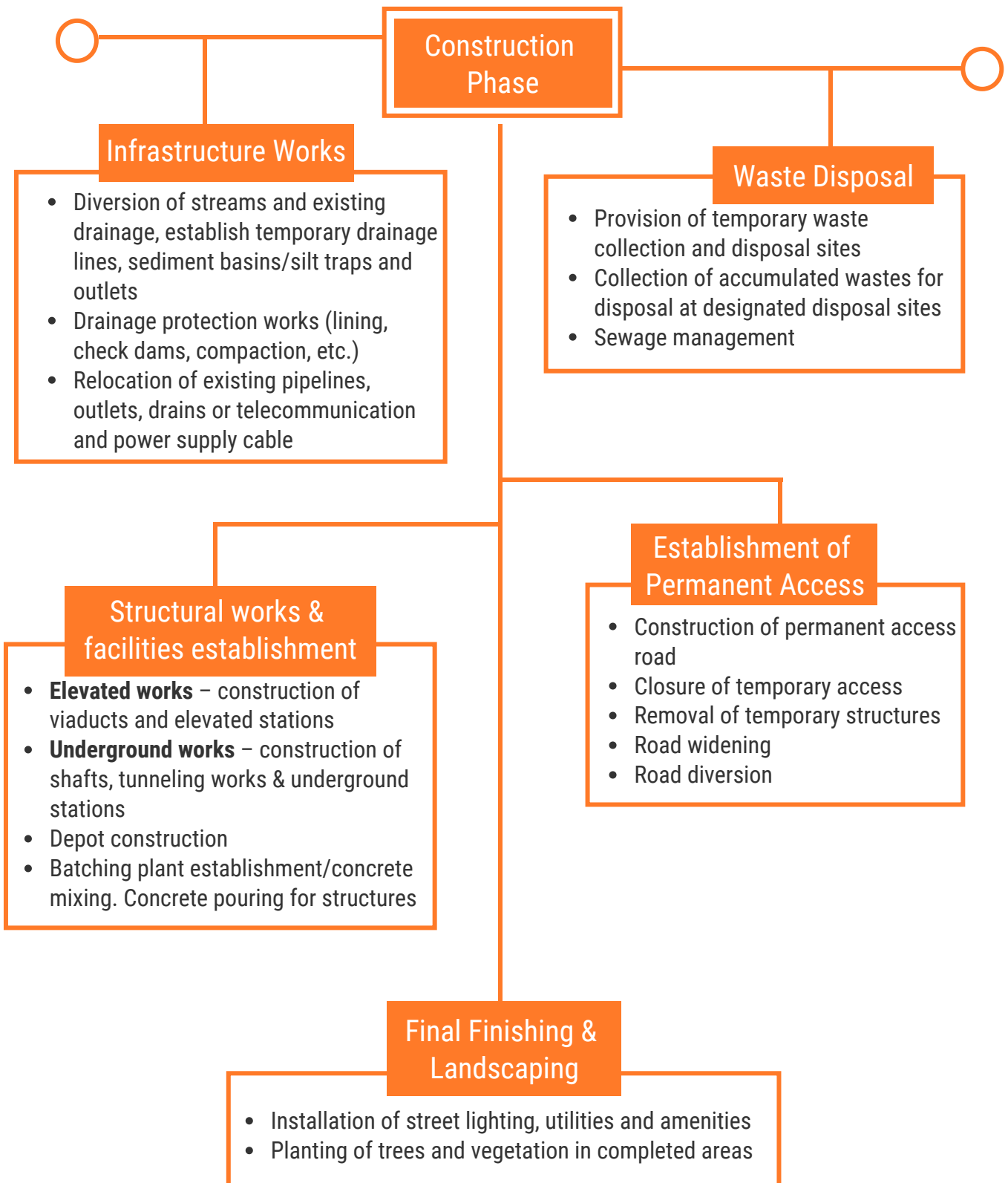
**Note:** The list is not exhaustive & not all the above may be relevant to the project. It is the responsibility of the Proponent & Qualified Person to determine the relevant information required for environmental assessment & compliance.

1 - Based on *Prosedur Operasi Tetap (SOP) Program Pengawasan Kualiti Air Tanah Jabatan Alam Sekitar, (2019)*

# List of Typical Project Activities with Issues of Concern during Construction Phase

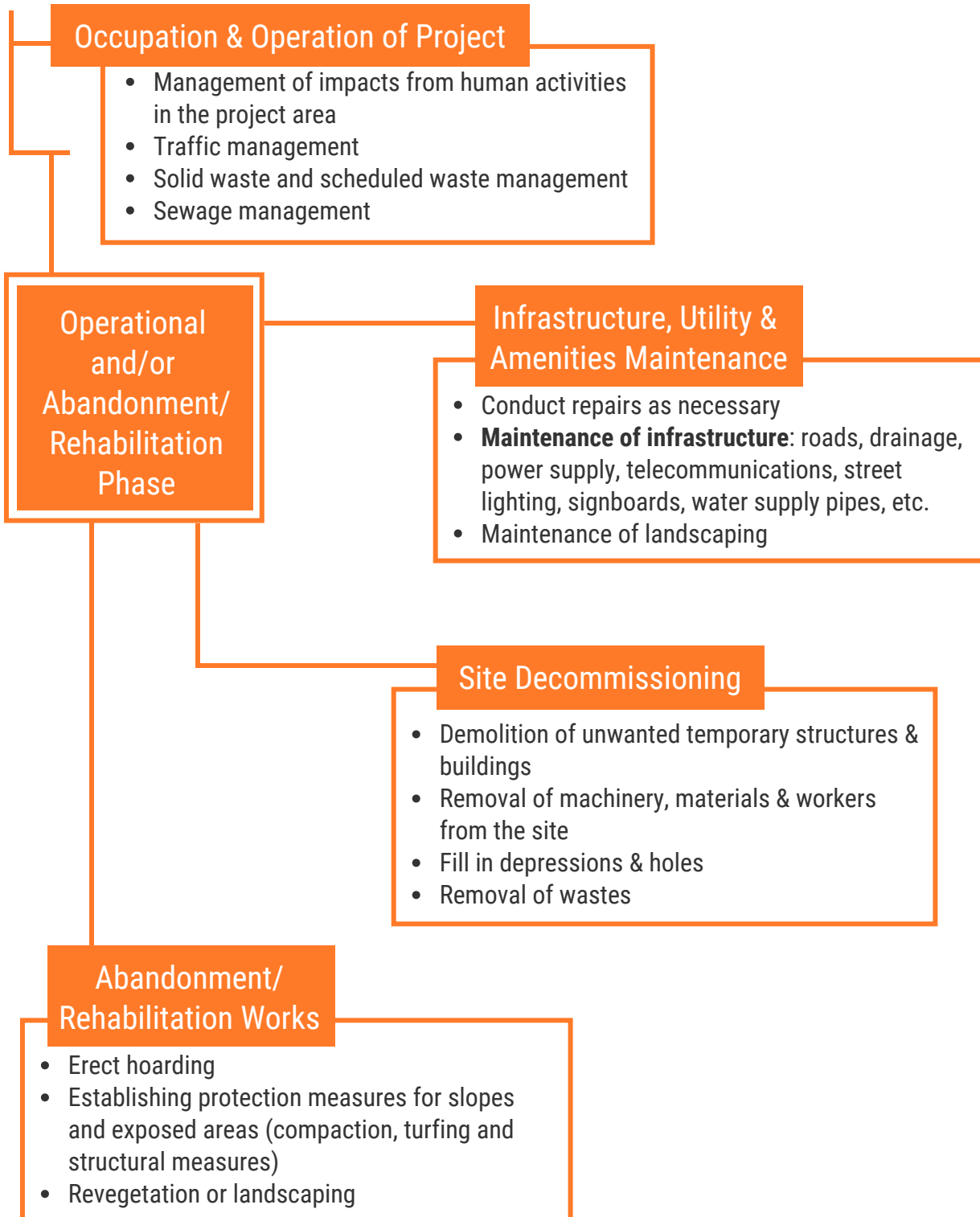


# List of Typical Project Activities with Issues of Concern during Construction Phase (cont.)



**Note:** The list is not exhaustive & not all the above may be relevant to the project. It is the responsibility of the Protect Proponent & Qualified Person to determine the relevant information required for environmental assessment & compliance.

# List of Typical Project Activities with Issues of Concern during Operational and/or Abandonment/Rehabilitation Phase



**Note:** The list is not exhaustive & not all the above may be relevant to the project. It is the responsibility of the Protect Proponent & Qualified Person to determine the relevant information required for environmental assessment & compliance.

# Identification of

**Significant  
Impacts**



**Priority  
Settings**

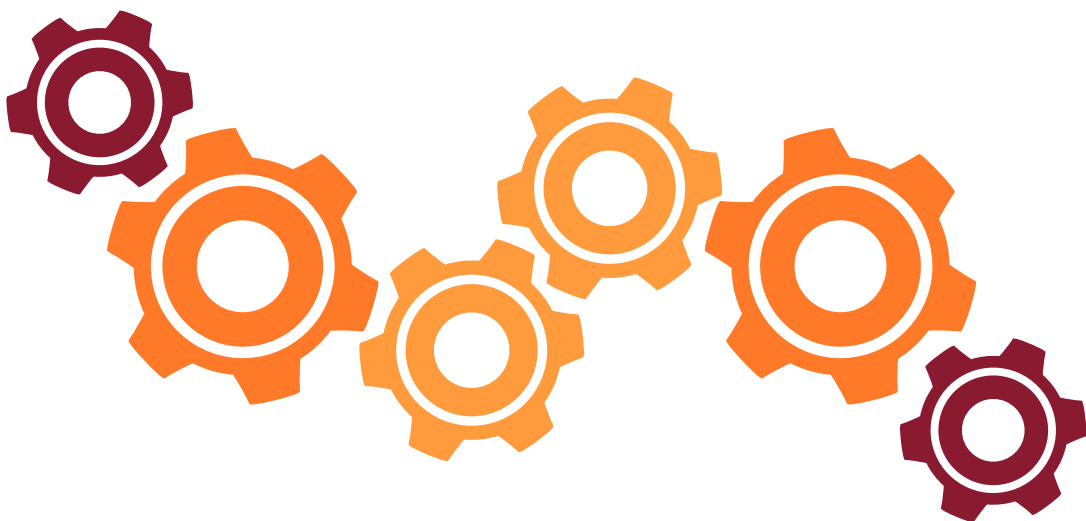
There are many methods and tools to conduct the scoping exercise. These include checklists, matrices, or any other accepted methods, to assist in systematically organising, collating and analysing the data for the project.

At the TOR stage, qualitative assessment is adequate but quantitative data can be provided to support the assessment. **Table 3.1** lists the advantages and disadvantages of the various common methods used.

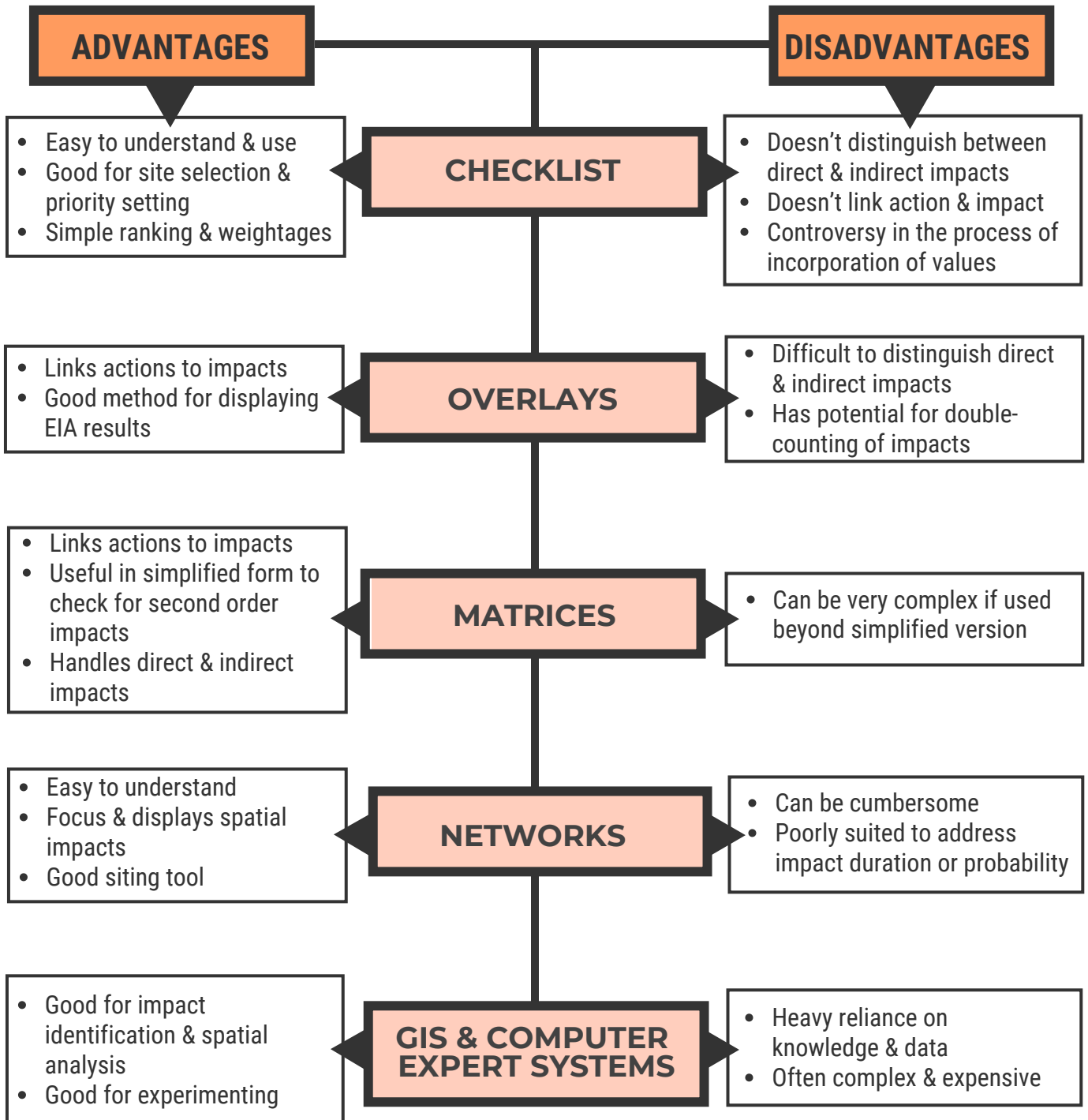
A useful tool is the **Environmental Scoping Matrix (ESM)** to amalgamate the scores from a series of criteria; ranging from **major** to **minor** negative and positive formats of environmental impacts

The Qualified Person and the Project Proponent's input is vital at this stage as their knowledge and experience would ensure appropriate weightage is given to the issues under assessment.

From the scoping outputs, a priority list of environmental impacts shall be determined for in-depth studies and assessments in the EIA.



# Advantages & Disadvantages of Impact Identification Methods



Source: EIA Training Resource Manual. Second Edition, (UNEP, 2002)

# KEY ISSUES RELATED TO: TRANSPORTATION & ROAD PROJECTS

## ECOLOGY & SUSTAINABILITY

Ecology is important for maintaining the natural balance and sustainability of the ecosystem. Its components and processes include the variety of flora and fauna, genetic variety, the various communities and ecosystems in which they occur, and the ecological and evolutionary processes that keeps them functional.

Development involving land clearing will degrade the overall integrity of the area. Forest fragmentation can restrict the free movement of animals within their roaming range and human disturbance may drive many away from their habitats. The degree of impact depends on the extent and size of the development.

Any disturbance to them could lead to environmental deterioration. The Marine Park Department, Department of Wildlife and National Parks Peninsular Malaysia (PERHILITAN) and Federal/State Forestry Department, have to be engaged to discuss measures for ecological sustainability before proceeding with the EIA.

## SITE ACCESS (LAND & SEA)

When constructing at sea, marine transport is required. Two considerations must be taken into account;

- the management of vessels in terms of passageways, and
- anchorage, harbourage, refueling, waste management areas and locations for stockpiling materials brought via the sea.

Vessel activity near to sensitive areas may result in deterioration of the marine ecology, water pollution and disrupt existing marine traffic.

Impacts from land access may not be as severe if roads and tracks are already available. However, if a new access is built, this will involve land clearing and construction works, which leads to erosion, sedimentation and loss of flora and fauna. The effects are also felt downstream where the eroded materials accumulate and cause localised ponding and flooding, some of which are caused by improperly constructed stream crossings that obstruct natural stream flows.

## HYDROLOGY

During and after land clearing and platforming, the natural physical terrain and drainage of the area will change hydrologically and morphologically. Silt from erosion will result in shallower streams. The local groundwater table and drainage structure may also change.

# KEY ISSUES RELATED TO: TRANSPORTATION & ROAD PROJECTS

## VISUAL EFFECTS

Removal of vegetation and exposure of the bare areas will have a negative visual impact compared to a natural scenery with greenery. The design of buildings and landscaping can help to blend in with the natural environment to provide a positive visual appeal.

Any deterioration of the marine parks and coastal areas will mar the aesthetics and scenic quality of these areas. Similarly, man-made structures may not be compatible with the natural environment that results in lowering the aesthetic value for tourism.

## NOISE & VIBRATION

Noise and vibration can be significant during the construction and operation of transportation and road project. The noise and vibration issues usually relates to the impact on human beings. Therefore, the most significant sources of noise and vibration are from transportations and vehicles usage along the road or platform and increasing traffic volume.

## AIR

During and after land clearing and platforming, the natural physical terrain and drainage of the area will change hydrologically and morphologically. Silt from erosion will result in shallower streams. The local groundwater table and drainage structure may also change.

## CARRYING CAPACITY

For land and marine ecology and coastal areas, the carrying capacity of the area should be considered to avoid detrimental effects such as overcrowding, causing discomfort to the locals, stress on utilities, amenities and infrastructure (waste, water supply, electricity, sewerage treatment, etc.), and the environment.

# DETERMINING EIA STUDY REQUIREMENTS

The preceding sections have identified the key environmental impacts. The following tables provides a list of the studies for the EIA study and a list of Indicative studies that may or may not be required by other Government Agencies (GAs) related to transportation and road development on landward and/or seaward respectively.

Both lists are indicative and non-exhaustive and the Qualified Person's judgement is needed since Transportation and Road projects may involve landward and/or seaward.

## Relevant Studies for EIA involving activities at Landward and/or Sea






Study Reference	Prescribed Activity			
	First Schedule Activity 20: Road	Second Schedule Activity 16: Transportation		
	Landward and/or Sea#1	Landward Only	Landward and/or Sea#2	Sea Only#2
Slope Analysis (Landward) Terrain & Slope				
Soil Erosion Analysis (Landward) Soil Loss & Sediment Yield				
LD-P2M2 (Landward)				
Pollution Study				
Baseline Sampling (water, air, noise, vibration)				
Topographic Survey				
Bathymetry Survey				
Hydraulic Study				
Shoreline Survey				
Ecological Habitat Mapping				
Carrying Capacity				
Stakeholder				
Post-EIA Monitoring Programme				
Other Study Requirements by GAs	Dependent on the relevant GAs requirement			

**Notes:**

- First Schedule Activity 20: (a) Construction of expressways (b) Construction of highways (c) Construction of road, tunnel or bridge traversing or adjacent or near to environmentally sensitive areas
- Second Schedule Activity 16: (a) Construction of new routes or branch line for a mass rapid transport project (b) Construction of new railway route or railway branch lines
- #1 Coastal reclamation or land reclamation along river banks < 50 hectares.
- #2 Coastal reclamation or land reclamation along river banks > 50 hectares
- \*1 Based on site conditions and project activities.
- \*2 Requirements based on the Guidelines for Preparation of Coastal Engineering Hydraulic Study and Impact Evaluation [Department of Irrigation and Drainage (DID), 2001].
- \*3 Requirements based on DID Manual Volume 2 - Coastal Management (DID, 2009)
- \*4 If adjacent to ESAs Rank I, II and III as defined by NPP3.
- \*5 Carrying capacity shall be based on PLANMalaysia criteria and requirements

**Study Requirements by Other GAs (if applicable)**

Study Requirements	GA Involved
Soil Investigation	
Erosion and Sediment Control Plan (ESCP)	 <p data-bbox="880 1249 1193 1305"><b>JABATAN PENGAIRAN DAN SALIRAN MALAYSIA</b></p>
Fisheries Resources Assessment	
Marine Risk Assessment (MRA)	
Zoning Compatibility	Local Authority (PBT)

Study Requirements	GA Involved
Traffic Impact Assessment (TIA)	
Health Impact Assessment (HIA)	
Terrestrial, Aquatic & Marine Flora & Fauna Assessment	   
Wastes (biomass, scheduled wastes: construction, municipal etc.)	 <p>Local Authority (PBT)</p>  
Heritage Impact Assessment (HA)	
Social Impact Assessment (SIA)	

**Note:** The list is not exhaustive and not all the above may be relevant to the project. It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment & compliance

# Selection of Mitigation Measures

Based on the significant impact, the Qualified Person shall assess the best available technologies (BATs) and options for pollution prevention and mitigation measures (P2M2) to address the identified key environmental issues.

At this point in the TOR/ESI, the identified measures shall be qualitative and descriptive in nature only, to be further detailed in the EIA stage.

## Selection of Method

There are many methods and tools to conduct the scoping exercise. These include checklists, matrices, or any other accepted methods, to help in systematically organising and analysing the compiled data for the project. At this stage, qualitative assessment is adequate.

An Environmental Scoping Matrix is a useful tool in identifying first-order effects that will give an indication of the focus and content of the EIA study. The matrix amalgamates the scores from the series of criteria; ranging them from major to minor in negative and positive formats of environmental impacts (Refer to Figure 3.6).

A Qualified Person with experience shall complete the scoping exercise and matrix. However, the Project Proponent's input is vital at this stage because the severity of impacts varies from one project to another and their know-how and experience would ensure appropriate weightage is given to the issues under assessment.

From the scoping matrix outputs, a priority list of environmental impacts shall be determined for in-depth studies and assessments in the EIA.

## Preparation & Submission of TOR/ESI

Findings from the scoping exercise shall be incorporated into the ESI as information to develop the TOR.

The TOR shall be submitted to DOE for review and endorsement before proceeding to the EIA stage.

# EIA Matrix for Potential Impacts

**MATRIX OF POTENTIAL ENVIRONMENTAL IMPACTS ARISING FROM THE PROJECT DEVELOPMENT**  
**MATRIX**

	<input type="checkbox"/> Significant and unavoidable impacts <input checked="" type="checkbox"/> Environmental impact that is potentially avoidable on a temporary basis and will return equilibrium after suitable period of time <input checked="" type="checkbox"/> Environmental impact that is potentially avoidable but cannot be avoided in suitable position. Close monitoring and control is recommended. <input checked="" type="checkbox"/> Potentially significant adverse environmental impact for which a design solution has been identified <input checked="" type="checkbox"/> Avoidable and significant adverse environmental impact <input checked="" type="checkbox"/> Significant unavoidable environmental	PROJECT ACTIVITIES																								
		SITE INVESTIGATION			CONSTRUCTION							OPERATIONS AND MAINTENANCE														
		Land Survey	Environmental Surveying	Engineering Investigation	Socio-Economic Surveying	Hydraulic Study	Access by Boat/Floating Pontoon	Site Clearing/Land Development	Worker Camps/Maintenance Yards	Drainage System	Sedimentation Control Structures	Erosion Control	Utility Construction (Inbuilt Installation)	Building Construction Activities	Scheduled Waste Disposal	Solid Waste Disposal	Landscaping	Abandonment Plan (if Any)	Employment/Labour Force	Utilities Management	Solid Waste Disposal and Recovery	Traffic/Transportation (Boat)	Maintenance	Accidental/Fire Control		
<b>Identification of Activities</b>																										
ENVIRONMENTAL COMPONENTS	PHYSICO-CHEMICAL	LAND	Landforms	T																						
			Soil Profile		T																					
			Soil Composition		T																					
			Slope Stability																							
			Subsidence and Compaction		T			N	N		E				N				N							
			Seismicity		T																					
			Flood Plains/Swamps																							
	Land Use		T	T			T	N	T			E	E	E		E	N							N		
	Buffer Zones		T	T			N	N								E										
	SURFACE WATER	Flow Variation				T		N	N	E	E			N											E	
		Water Quality		T			T	N	N	N	E	E	E	N	N	N	E	N			N				E	
		Drainage Pattern				T		N	N	E	E			E	N	N	N	N							N	
		Water Balance																								
		Flooding						N																		
		Existing Use		T				N	N					E			E	N								
GROUNDWATER	Water Table			T			N		T				N													
	Flow Regime		T				N		T				N													
	Water Quality		T				N		T				N	N	N											
	Recharge								T																	
	Aquifer Characteristic																									
	Existing Use																									
ATMOSPHERE	Air Quality		T				N	N					N			E	N							N	E	
	Air Flow																									
	Climatic Changes						N																			
	Visibility						N						N			N										
NOISE	Intensity		T				N	N	N				N	N					N					N	E	
	Duration		T				N	N	N				N	N					N					N	E	
	Frequency						N	N	N				N	N					N					N	E	
ENVIRONMENTAL & BIOLOGICAL	SPECIES AND POPULATIONS	Terrestrial Vegetation		T				N	O				N			E	N									
		Terrestrial Wildlife		T	T	T				O				O				O								
		Other Terrestrial Fauna		T					N	O				N			E	N								
		Aquatic/Marine Flora					T							N											N	
		Fish					T							N											N	
	Other Aquatic/Marine Fauna					T							N											N		
	HABITATS & COMMUNITIES	Terrestrial Habitats		T				N	O					N			E	N								
Terrestrial Communities			T				N	N					N													
Aquatic Habitats						T							N											N		
Aquatic Communities						T							N											N		
HUMAN	HEALTH AND SAFETY	Physical Safety		T	T	T	T	T	T	N	N		E	N	N	N	N	N	E	N	N	N	E	E	E	
		Psychological Well-Being					T	T	N	N				N	N	N	N	E	O	E	E	N	N	E	E	
		Parasitic Disease								N																
		Communicable Disease								N																
		Physiological Disease								N																
SOCIAL AND ECONOMIC	Employment		E	E	E	E	E	E					E	E		E	O		E	E			E	E		
	Housing													E			O									
	Education																									
	Utilities												E	E			O		E					E		
	Amenities												E	E			O		E					E		
	Property & Settlement												E	E			O							E		
AESTHETIC AND CULTURAL	Landforms		T				T	O	T				N	N		E	N							E		
	Wilderness		T	T	T				O																	
	Water Quality		T				T	N	N	E	E	E	N	N	N	N	E	N					N	E		
	Atmospheric Quality						N	N					N	N		E	N						N	E		
	Climate																									
	Tranquility					T	T	N	T				N	N		N	E	N					N	E		
	Sense of Community					T	T	N	T				E	N		N							N			
	Community Structure					T		N	T				E										E	N		
	Historic Places/Structures																									
	Religious Places/Structures													E												
	Landscape								O								E	N							E	

# TOR TABLE OF CONTENTS (TOC)



The TOR and ESI are required for prescribed activities, which fall within either the First or Second Schedules.

The report(s) shall be prepared in accordance with the format detailed under the Guidance Document for Preparing TOR under Appendix 8 of the EGIM (DOE, 2016).

## TOR Adequacy Check (TORAC)

The output from scoping is documented as the Environmental Scoping Information (ESI). The ESI shall provide the basic information of the current environment issues with identified key impacts that need to be assessed in detail. All these will then be incorporated as the scope of work in the Terms of Reference (TOR).

1

The adequacy of the scoping exercise and TOR can be decided in a TORAC meeting, chaired by the DOE Headquarters (HQ)/State Director. However, the need for a TORAC meeting will depend on the nature of the project.

2

A review shall be carried out by the EIA Technical Review Committee (EIATRC) comprising the DOE officers and appointed individuals (AIs) and/or GAs.

3

When the Report is accepted the Project Proponent shall proceed to the EIA stage.

4

# 4 ENVIRONMENTAL IMPACT ASSESSMENT: BASELINE DATA



After endorsement is given by the Department of Environment (DOE) for the Terms of Reference (TOR) or the Revised TOR, the Project Proponent and Qualified Person shall then proceed with the Environmental Impact Assessment (EIA) study.

Compared to the TOR stage, the EIA stage requires detailed information to be incorporated into the Report. At this stage of work, the preliminaries for the project would have been completed and the overall project planning has moved on to the detailed design stage alongside with the essential technical assessments and studies.

The following Chapters shall detail the requirements for baseline data collection as part of the EIA.

## BASELINE DATA COLLECTION & ANALYSIS

Preliminary data, mostly based on secondary data and initial site assessment, would have been collected during the environmental screening and TOR stage to provide an overview of the existing environment.

Based on those data, the methodology and approach in obtaining detailed data and technical studies would have been identified and approved by the EIA Technical Review Committee (EIATRC) and incorporated into the TOR.

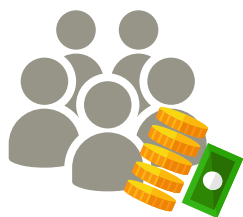
During the EIA stage, in-depth information and more data shall be collected and collated to describe the existing environment.



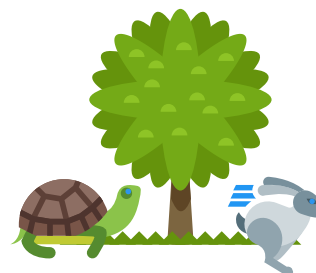
**The scope shall cover the three major environmental components:**



**Physical-Chemical Environment**



**Socio-economic Environment**



**Biological Environment**






























**The collected environmental baseline must be appropriate to provide sufficient grounds to draw up the potential impacts for which mitigation measures will be planned for any negative impacts.**

















Supporting information and relevant studies required by other approving agencies shall also be incorporated into the EIA to provide an overall comprehensive assessment. Supporting information, studies or reports shall be endorsed by the respective GAs which has authority to do so. Table in the following page provides the major environmental components for the EIA.

# Environmental Baseline Scope & Requirements

Aspect	Scope & Requirement	Relevant Agencies for Reference
<p>Terrain</p> 	<ul style="list-style-type: none"> <li>• Description of existing topography based on land &amp; hydrographic surveys.</li> <li>• Slope Analysis or Geological Terrain Mapping (GTM) of the project site &amp; surrounding areas (To be prepared &amp; certified by a Professional Geologist)</li> </ul>	
<p>Geology &amp; Soil</p> 	<ul style="list-style-type: none"> <li>• Description of local and regional soil and geology.</li> <li>• Analysis of soil profile obtained from soil investigations.</li> <li>• Estimates of soil loss and sediment yield of the project site.</li> </ul>	  <p>JABATAN PENGAIRAN DAN SALIRAN MALAYSIA</p> 
<p>Hydrogeology</p> 	<ul style="list-style-type: none"> <li>• Seismicity assessment</li> <li>• Hydrogeological assessment</li> </ul>	 
<p>Hydrology</p> 	<ul style="list-style-type: none"> <li>• Description of hydrological systems within and surrounding the project site (rivers, streams and drainage)</li> <li>• Identification of downstream receptors such as water intake points (WIPs) and water treatment plants (WTPs).</li> <li>• Flood risk analysis, if required.</li> </ul>	 <p>JABATAN PENGAIRAN DAN SALIRAN MALAYSIA</p> 
<p>Water Quality</p> 	<ul style="list-style-type: none"> <li>• Sampling and analysis of water quality of waterways and water bodies within the Zone of Impact (ZOI).</li> </ul>	 <p>State Regulatory Agencies on Water</p>

Aspect	Scope & Requirement	Relevant Agencies for Reference
Air Quality 	<ul style="list-style-type: none"> <li>Sampling and analysis of ambient air quality of the project site and nearby sensitive receptors.</li> </ul>	
Noise Level & Vibration 	<ul style="list-style-type: none"> <li>Measurement and analysis of ambient noise and vibration levels of the project site and nearby sensitive receptors.</li> </ul>	
Waste 	<ul style="list-style-type: none"> <li>Estimation of the amount of biomass &amp; solid waste generated from site clearing &amp; project site respectively</li> <li>Identification of potential scheduled waste generated from the project site.</li> <li>Identification of future spoil disposal areas.</li> </ul>	 <b>Local Authority</b>
Land Use 	<ul style="list-style-type: none"> <li>Description of existing &amp; future land use (<b>map + description</b>) within ZOI</li> <li>Identification of environmentally sensitive areas (ESAs) &amp; impact receptors</li> <li>Land use compatibility assessment</li> </ul>	 <b>Local Authority</b>
Climate 	<ul style="list-style-type: none"> <li>Obtain long-term (min. 5 year) climate data to define the weather patterns for the project site</li> </ul>	
Ecology 	<ul style="list-style-type: none"> <li>Habitat mapping of ESAs (terrestrial &amp; aquatic)</li> <li>Provide an inventory and assess the terrestrial &amp; aquatic biodiversity within the Project Site</li> <li>Identify any endemic, endangered, threatened &amp; near extinct species within the project site &amp; surrounding ZOI</li> <li>Human wildlife conflict &amp; roadkill</li> </ul>	 

Aspect	Scope & Requirement	Relevant Agencies for Reference
Socio-economy 	<ul style="list-style-type: none"> <li>Data on demography &amp; socio-economic profiles of stakeholders within the ZOI</li> <li>This shall be based on the findings of the SIA, if any.</li> </ul>	 
History, Culture & Archaeology 	<ul style="list-style-type: none"> <li>Identify locations of significant historical, cultural, heritage &amp; archaeological values e.g.; graves, ritual areas, heritage buildings, artifacts &amp; pre-human habitation</li> </ul>	 
Land Traffic 	<ul style="list-style-type: none"> <li>Existing traffic within &amp; surrounding the project site</li> <li>Shall be based on the findings of the TIA, if any.</li> </ul>	
Marine Traffic 	<ul style="list-style-type: none"> <li>Shall be based on the findings of the Marine Department &amp; Fisheries Department's needs</li> </ul>	
Infrastructure, Utilities & Amenities 	<ul style="list-style-type: none"> <li>Availability of existing &amp; future utilities (water, electricity, sewage, waste management, road networks, tele-communication etc.)</li> <li>Discharge points of sewage &amp; effluent</li> <li>Based on the findings of the Laporan Cadangan Pemaju (LCP), if any, or obtained from the Project Proponent</li> </ul>	   Local Authority (PBT) Water Supply Authority/Providers

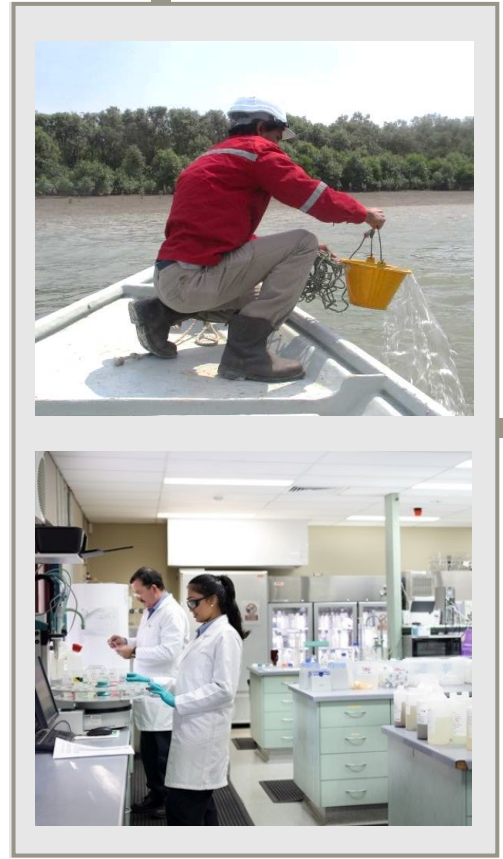
# PRIMARY DATA COLLECTION

Primary data collection is necessary to fill in the gaps in information identified during the TOR/ESI stage.

Common methodologies include on-the-ground surveys and sampling programmes at-site. The sampling/study boundary shall be within the project's ZOI.

Samples collected must be analysed by a Skim Akreditasi Makmal Malaysia (SAMM) Accredited Laboratory. Details of sampling (person in charge, time, date and location of sampling) must be clearly stated. All certificates and data shall be included.

The scope and requirement for such studies are to be determined by the respective GAs and report are to be approved by the said GAs before incorporation as part of the EIA.



# SECONDARY DATA COLLECTION



Secondary data can be referred from other official sources to support the EIA.

Sources of information must be clearly state along with its date of the publication in the EIA



# 5 ENVIRONMENTAL IMPACT ASSESSMENT: EVALUATION OF IMPACTS

There are many methods to evaluate the impacts. Generally, all methods of impact evaluation seek to compare the existing environment against a predicted future environment caused by various project activities in all phases of project development.

Predictions and assessments are made through qualitative or quantitative approaches and methods that form the basis of evaluation. While there is no one method that fits all requirements, the predictive and assessment method chosen must have at least the following attributes:

- 1 Established & proven models/methods
- 2 Adequate, accurate & up-to-date data for assessment
- 3 Results can be replicated & reproducible by independent evaluators
- 4 Cost-effective & for any software, it can be purchased (propriety software & tools can be used). If possible use of widely accepted freeware is encouraged.



It is up to the Qualified Person to select the best method to conduct investigations and generate reliable scenarios and datasets to ascertain the magnitude, extent and significance of any impacts from the project.

# PREDICTION & EVALUATION OF IMPACTS

The Scoping Exercise would have determined the types of studies that need to be carried out during the Environmental Impact Assessment (EIA) stage (refer **Section 3.8**). Hence, the endorsed Terms of Reference (TOR) need to be referred in order to ensure the EIA is focused.

The level of details in the impact identification shall commensurate with the following factors:

- **Intensity of development**
- **Sensitivity of nearby receptors**
- **Magnitude & complexity of impacts**
- **Area of impacts (localized vs transboundary)**
- **Potential pollution sources from the project**
- **Scale of the project (land area, total disturbed areas etc.)**
- **Probability of cumulative impacts on adjacent land**







*Source: International Institute for Environment and Development*

# Impacts of Transportation and Road Activities








The typical issues and impacts associated during pre-construction, construction, operational and abandonment/rehabilitation stage for transportation and road activities are as follows:

## 1 TYPICAL ISSUES & IMPACTS DURING PRE-CONSTRUCTION STAGE





Activities	Issues	Impacts
Site access, site surveys including topography, bathymetry survey & soil investigation	 Ecology	<ul style="list-style-type: none"> <li>• Threats to wildlife (poaching/hunting)</li> <li>• Disturbance to flora &amp; fauna habitats</li> <li>• Water pollution &amp; effects on water bodies</li> </ul>
	 Safety & Health	<ul style="list-style-type: none"> <li>• Work-related injuries</li> <li>• Accidents</li> <li>• Improper waste management attracts pests &amp; scavengers</li> </ul>
Land Acquisition (if any) under SIA and local authorities' scope	 Socio-economy	<ul style="list-style-type: none"> <li>• Loss of income &amp; job opportunities</li> <li>• Loss of heritage building/site &amp; culture</li> </ul>
	 Community	<ul style="list-style-type: none"> <li>• Homelessness</li> <li>• Increased demand for new settlements</li> <li>• Increased demand for facilities, utilities &amp; amenities</li> </ul>

**Note:** The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

## 2 TYPICAL ISSUES & IMPACTS DURING CONSTRUCTION STAGE

Activities	Issues	Impacts
<ul style="list-style-type: none"> <li>Establish access road</li> <li>Site clearing</li> </ul>	 <p>Ecology</p>	<ul style="list-style-type: none"> <li>Disturbance &amp; possibly loss of water bodies and terrestrial fauna &amp; flora</li> <li>Threat to wildlife (hunting/poaching)</li> </ul>
<ul style="list-style-type: none"> <li>Setting up site facilities &amp; base camp</li> <li>Earthwork</li> <li>Infrastructure works</li> <li>Structural works</li> </ul>	 <p>Waste</p>	<ul style="list-style-type: none"> <li>Biomass wastes from land clearing &amp; trimming works</li> <li>Solid waste from work camps &amp; top-side development</li> <li>Construction &amp; demolition (C&amp;D) wastes</li> <li>Scheduled wastes from workshops &amp; refueling stations can result in land &amp; water contamination</li> <li>Odour &amp; unsightliness from improper waste management at site</li> </ul>
	 <p>Water Quality</p>	<ul style="list-style-type: none"> <li>Increase runoff &amp; turbidity into nearby water courses</li> <li>Water pollution due to leakage of oil &amp; chemicals from equipment/machinery operations &amp; slurry discharge from tunneling.</li> <li>Affect adjacent watercourses or downstream drainage systems</li> </ul>
	 <p>Erosion &amp; Sedimentation</p>	<ul style="list-style-type: none"> <li>Soil erosion &amp; sedimentation</li> <li>Accretion &amp; erosion of coastal areas</li> <li>Affect aesthetic value of adjacent areas</li> </ul>
	 <p>Hydraulics &amp; Hydrodynamics</p>	<ul style="list-style-type: none"> <li>Altered costal watercourses</li> <li>Storm surges resulting in coastal flooding</li> <li>Changes in wave climate; current speed &amp; direction; tidal conditions; and pollutant dispersion patterns.</li> </ul>
	 <p>Flooding</p>	<ul style="list-style-type: none"> <li>The conversion of land use &amp; decreasing permeability</li> <li>Obstruction of waterways</li> </ul>
	 <p>Air Quality</p>	<ul style="list-style-type: none"> <li>Open burning by workers</li> <li>Emission from fuel burning equipment</li> <li>Emissions from construction site traffic</li> <li>Dust generation</li> </ul>









## 2 TYPICAL ISSUES & IMPACTS DURING CONSTRUCTION STAGE (cont.)

Activities	Issues	Impacts
<ul style="list-style-type: none"> <li>Establish access road</li> <li>Site clearing</li> <li>Setting up site facilities &amp; base camp</li> </ul>	 <p>Traffic</p>	<ul style="list-style-type: none"> <li>Heavy vehicles access along public roads</li> <li>Spillage onto roads i.e. earth, soil &amp; slurry</li> <li>Damage to roads</li> <li>Safety risk to road users &amp; communities</li> <li>Traffic congestion – road closure &amp; diversion</li> </ul>
<ul style="list-style-type: none"> <li>Earthwork</li> <li>Infrastructure works</li> </ul>	 <p>Noise &amp; Vibration</p>	<ul style="list-style-type: none"> <li>High noise &amp; vibration levels from piling, tunneling, demolition works, machineries &amp; vessels</li> <li>Damage to surrounding structure/building</li> </ul>
<ul style="list-style-type: none"> <li>Structural works</li> </ul>	 <p>Safety &amp; Health</p>	<ul style="list-style-type: none"> <li>Work-related injuries</li> <li>Improper waste management attracts pests &amp; scavengers</li> <li>Accidents</li> <li>Risk of communal disease spread</li> </ul>
	 <p>Socio-economy</p>	<ul style="list-style-type: none"> <li>Increase job opportunities, employment &amp; business</li> <li>Conflicts due to presence of foreign workers</li> <li>Increased demand for facilities, utilities &amp; amenities</li> <li>Nuisance &amp; disturbance to nearby communities</li> </ul>

**Note:** The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.

### 3





## TYPICAL ISSUES & IMPACTS DURING OPERATIONAL STAGE

Activities	Issues	Impacts
Transportation & Road Operation	 Ecology	<ul style="list-style-type: none"> <li>• Long-term implications on flora and fauna</li> <li>• May drive some species away from the local area</li> </ul>
	 Water Quality	<ul style="list-style-type: none"> <li>• Pollution from spills or leaks of fuel &amp; oil</li> <li>• Sewage &amp; sullage from operations</li> </ul>
	 Traffic	<ul style="list-style-type: none"> <li>• Transportation &amp; accessibility as highway network system, inter-urban, road &amp; rail transport to be upgraded &amp; extended to support the Project</li> <li>• Road traffic volume is expected to increase</li> </ul>
	 Noise & Vibration	<ul style="list-style-type: none"> <li>• Transport &amp; vehicular noise particularly at areas near to the development</li> <li>• Damage to surrounding structure/building.</li> </ul>
	 Air	<ul style="list-style-type: none"> <li>• An increase in road traffic volume resulting in an increase in vehicle emissions</li> </ul>
	 Waste	<ul style="list-style-type: none"> <li>• Solid waste generated from passengers using the transportation &amp; vehicles on the roads</li> </ul>
	 Socio-economy	<ul style="list-style-type: none"> <li>• Increase job opportunities, employment &amp; business</li> <li>• Increase of land &amp; property values</li> <li>• Increased demand for facilities, utilities &amp; amenities</li> <li>• Continued migration of people away from the site</li> </ul>
	 Safety & Health	<ul style="list-style-type: none"> <li>• Work-related injuries</li> <li>• Improper waste management attracts pests &amp; scavengers</li> <li>• Accidents</li> <li>• Safety &amp; health risks</li> </ul>

**Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.**

### 3

## TYPICAL ISSUES & IMPACTS DURING OPERATIONAL STAGE (cont.)








Activities	Issues	Impacts
<ul style="list-style-type: none"> <li>• Transportation</li> <li>• Road Maintenance &amp; Repair</li> </ul>	 Water Quality	<ul style="list-style-type: none"> <li>• Pollution from spills or leaks of fuel &amp; oil</li> </ul>
	 Waste	<ul style="list-style-type: none"> <li>• Scheduled wastes from maintenance works</li> </ul>
	 Safety & Health	<ul style="list-style-type: none"> <li>• Work-related injuries</li> <li>• Safety &amp; health risks</li> </ul>
	 Socio-economy	<ul style="list-style-type: none"> <li>• Increase job opportunities, employment &amp; business</li> </ul>

**Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.**



3

**TYPICAL ISSUES & IMPACTS DURING & AFTER ABANDONMENT & REHABILITATION STAGE**

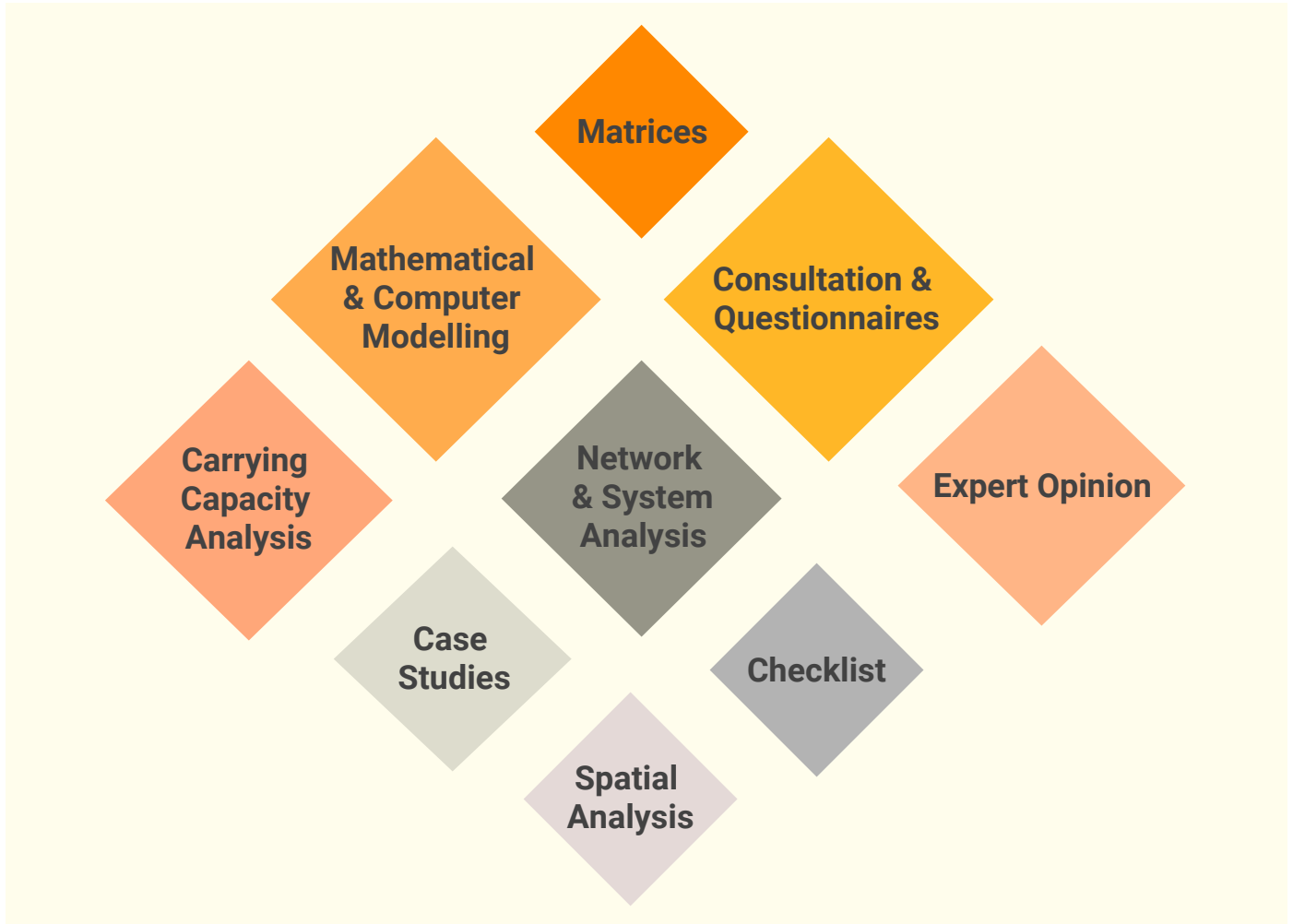
Activities	Issues	Impacts
<ul style="list-style-type: none"> <li>Decommissioning</li> <li>Abandonment includes demolition of structures</li> </ul>	 Water	<ul style="list-style-type: none"> <li>Disturbance of contaminated soil &amp; subsequent pollution of watercourses</li> <li>Pollution from spills or leaks of fuel, oil &amp; construction</li> </ul>
	 Hydraulic & Hydrodynamics	<ul style="list-style-type: none"> <li>Change in flow velocities</li> <li>Increased flood risk</li> <li>Changes in wave climate; current speed &amp; direction; tidal conditions; &amp; pollutant dispersion patterns</li> </ul>
	 Erosion & Sedimentation /Coastal Erosion	<ul style="list-style-type: none"> <li>Long-term accretion or erosion of coastal areas due to hydraulic changes</li> <li>Increased erosion &amp; subsequent changes in bed bank stability</li> </ul>
	 Waste	<ul style="list-style-type: none"> <li>Construction &amp; demolition (C&amp;D) waste management</li> </ul>
	 Community	<ul style="list-style-type: none"> <li>Decreased property values</li> <li>Provide temporary berthing area &amp; shelter to fishing vessels</li> </ul>
	 Socio-economy	<ul style="list-style-type: none"> <li>Loss of job opportunities</li> </ul>
	 Visual Impact	<ul style="list-style-type: none"> <li>Loss of vistas</li> </ul>

*Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.*

# Predictive Methods & Tools



Impact assessment can utilise a wide range of predictive tools and models. Among the accepted methods include:



Where possible, simple methodology is preferred, though this depends on the complexity of the impacts. Whichever method is chosen, it must be appropriate to address the problem, taking into consideration the localised conditions of the site.

For **computer modelling**, the following information is required:

- 1 Name & description of method/model
- 2 Model set-up
- 3 Data collection & analysis
- 4 Calibration & validation
- 5 Detail of scenarios for modelling
- 6 Presentation of results (raw data, table form, graphs)
- 7 Limitations in data collection or method chosen

It has to be noted that all modelling exercises carried out shall capture the impacts under the various scenarios, either for **short-, mid- to long-term**. The modelling studies shall undergo **verification, calibration and validation**. The outputs of the modelling studies shall be presented in a concise manner and all uncertainties shall be discussed.

Technical reports, data analysis and tables and raw data, where necessary, shall be included as part of the appendix of the EIA to support the impact assessment methodology.









Ultimately, the main text for impact assessment in the EIA shall be the predictive results and outputs of studies, which have to be in sufficient technical details to support the assessment. It must also be written in a manner that is easily understood by decision makers and the public.

The tables in the following pages summarises examples of the available and accepted prediction methods for impact assessment and expected outputs and lists the evaluation criteria for various environmental components as a guide.






The list is not exhaustive. The Qualified Person has to propose the best methods relevant to the project under study, or to select one of the methods in the list









## EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS

Impacts	Prediction Methods	Output
 <p>Hydraulic &amp; Hydrodynamics</p>	<ul style="list-style-type: none"> <li>Use of hydraulic &amp; hydrodynamics models that meet the DID requirements</li> <li>2D/3D modelling software e.g.  <b>Delft3D</b></li> </ul>	<ul style="list-style-type: none"> <li>Sediment dispersion from reclamation &amp; other construction works.</li> <li>Changes in the wave, water level &amp; current condition at the project site during &amp; after project implementation.</li> <li>Sediment transport along the project site during pre &amp; post construction phase.</li> </ul>
 <p>Erosion &amp; Sedimentation</p>	<ul style="list-style-type: none"> <li>Revised Universal Soil Loss Equation (RUSLE)</li> <li>Modified Universal Soil Loss Equation (MUSLE)</li> <li>Computer models</li> </ul>	<ul style="list-style-type: none"> <li>Soil loss rates &amp; sediment yield</li> <li>Erosion risk &amp; potential soil loss maps</li> </ul>
 <p>Hydrology</p>	<ul style="list-style-type: none"> <li>Hydrological procedures (DID), computer models for estimating peak flood, runoff, watershed analysis, &amp; flood plain, e.g.                             <ul style="list-style-type: none"> <li>HEC-HMS</li> <li>HEC-RAS</li> <li>FLO-2D</li> <li>TUFLOW</li> <li>EXTRAN</li> <li>SWMM</li> </ul> </li> <li>Hydrological analysis in accordance with Manual Saliran Mesra Alam Edisi-2 (MSMA-2).</li> </ul>	<ul style="list-style-type: none"> <li>Estimation of pre-construction &amp; post-construction runoff</li> </ul>
 <p>Water Quality</p>	<ul style="list-style-type: none"> <li>Mathematical models (1D, 2D or 3D) analysis of pollution loads &amp; dispersion in waterways e.g.  <b>MIKE11</b>  <b>QUAL2K</b></li> <li>Simple mass balance models e.g. Streeter-Phelps Model</li> <li>Operational sewage discharge modelled using Ouai2K, Delft etc.</li> </ul>	<ul style="list-style-type: none"> <li>Estimation of TSS (erosion) &amp; AN (sewage) concentration affecting a stretch of river &amp; downstream sensitive areas</li> <li>Estimation of pollution load &amp; extent of effect on sensitive receptors</li> </ul>
 <p>Air</p>	<ul style="list-style-type: none"> <li>Gaussian plume dispersion model to assess dust generation &amp; gas dispersion over an area under the worst case scenario</li> </ul>	<ul style="list-style-type: none"> <li>Dispersion contour map indicating levels at sensitive receptors</li> <li>Comparison of computed values with the Malaysian Ambient Air Quality Standards (MAAQS)</li> </ul>

## EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS

Impacts	Prediction Methods	Output
 Noise Level	<ul style="list-style-type: none"> <li>Mathematical models to assess noise levels for point source or linear sources</li> <li>Traffic noise models</li> <li>Noise modelling software e.g.                               </li> </ul> <ul style="list-style-type: none"> <li>or other acoustic models</li> </ul>	<ul style="list-style-type: none"> <li>Quantitative values for noise level at sensitive receptors</li> <li>Noise contour map, indicating levels at sensitive areas</li> <li>Comparison of computed values to DOE's permissible noise limits</li> </ul>
 Biomass	<ul style="list-style-type: none"> <li>Estimation on total biomass based on vegetation types &amp; published studies values</li> </ul>	<ul style="list-style-type: none"> <li>Predicted biomass waste generation</li> </ul>
 Scheduled Waste	<ul style="list-style-type: none"> <li>Identification of potential scheduled wastes of generation during construction &amp; operations based on project activities</li> </ul>	<ul style="list-style-type: none"> <li>Predicted scheduled waste generation</li> </ul>
 Ecology	<ul style="list-style-type: none"> <li>Comparative assessment of conservation status &amp; sensitivity of habitat, flora &amp; fauna</li> <li>Ecological models for species diversity &amp; population changes</li> <li>Limit of Acceptable Change (LAC)</li> <li>Spatial models e.g. GLOBIO3                              </li> </ul>	<ul style="list-style-type: none"> <li>Habitat map</li> <li>Species inventory, especially of rare, endangered, threatened &amp; near extinct species that may require protection</li> </ul>
 Socio-economy	<ul style="list-style-type: none"> <li>Social &amp; economic surveys on affected population</li> <li>Perception survey to ascertain acceptance of project.</li> <li>Social Impact Assessment (SIA)</li> </ul>	<ul style="list-style-type: none"> <li>Socio-economic profiling</li> <li>Public opinion survey results</li> <li>Stakeholder feedback for EIA including possible mitigation measures</li> </ul>
 Land Use	<ul style="list-style-type: none"> <li>Compatibility assessment based on structure plan, local plan &amp; other guidelines</li> <li>Adherence to required setback based on national &amp; state guidelines</li> </ul>	<ul style="list-style-type: none"> <li>Land use compatibility &amp; buffer requirements</li> </ul>







## EXAMPLES OF PREDICTION METHODS FOR ENVIRONMENTAL IMPACTS

Impacts	Prediction Methods	Output
 Public Health	<ul style="list-style-type: none"> <li>Qualitative/quantitative health risk assessment (NRA) encompassing hazard identification, exposure assessment &amp; risk characterisation</li> </ul>	<ul style="list-style-type: none"> <li>Potential health impacts to nearby populations.</li> </ul>
 Solid Waste	<ul style="list-style-type: none"> <li>Waste generation estimation based on population</li> </ul>	<ul style="list-style-type: none"> <li>Predicted waste generation</li> </ul>
 Traffic	<ul style="list-style-type: none"> <li>TIA, including simulation of peak traffic flows under various scenarios &amp; junction analysis e.g. Signalised &amp; Unsignalised Intersection Design &amp; research Aid (SIDRA)</li> </ul>	<ul style="list-style-type: none"> <li>Comparison of traffic scenarios pre &amp; post-project &amp; need for road improvements</li> </ul>
 Marine Traffic	<ul style="list-style-type: none"> <li>MRA to determine risk of accidents &amp; incidents during construction &amp; operations</li> <li>Marine risk traffic assessment (MRTA)</li> </ul>	<ul style="list-style-type: none"> <li>Identification on probability to potential risk involving vessels, both human &amp; marine organism</li> <li>Comparison of marine traffic before &amp; after situations</li> </ul>
 Infrastructure & Utilities	<ul style="list-style-type: none"> <li>Existing demand estimation methods by regulators e.g. population equivalent (P.E) calculations [National Water Services Commission (SPAN)].</li> <li>Comparison of existing supply to meet future demand to determine adequacy.</li> </ul>	<ul style="list-style-type: none"> <li>Estimates of demand</li> </ul>
 Aesthetics	<ul style="list-style-type: none"> <li>Visual assessment on scenic &amp; aesthetic value of the area</li> <li>2D &amp; 3D Viewshed Analysis</li> <li>Economic valuation</li> </ul>	<ul style="list-style-type: none"> <li>Before &amp; after scenarios</li> </ul>

## CRITERIA & STANDARDS FOR ENVIRONMENTAL PARAMETERS

Impacts	Evaluation Criteria
 <p>Erosion &amp; Sedimentation</p>	<p><b>Guidance documents:</b></p> <ul style="list-style-type: none"> <li>• Guidance Document for Addressing Soil Erosion &amp; Sediment Control Aspects in the EIA Report (DOE)</li> <li>• Guidance Document for the Preparation of the Document on LD-P2M2 (DOE)</li> <li>• Guidelines on LD-P2M2 (DOE, 2017)</li> <li>• Guidelines for Erosion &amp; Sediment Control in Malaysia (DID)</li> <li>• Manual Saliran Mesra Alam Edisi-2 (MSMA-2)</li> </ul>
 <p>Water Quality &amp; Pollution Control</p>	<ul style="list-style-type: none"> <li>• Ambient water quality: National Water Quality Standards (NWQS)</li> <li>• Ambient marine water quality: Malaysia Marine Water Quality Criteria &amp; Standards (MMWQCS)</li> <li>• Sewage discharge: Environmental Quality (Sewage) Regulations 2009</li> <li>• Toilets &amp; septic tanks: SPAN approved design &amp; requirements</li> </ul>
 <p>Flood/Runoff Management</p>	<ul style="list-style-type: none"> <li>• MSMA-2 requirements</li> </ul>
 <p>Air Quality</p>	<ul style="list-style-type: none"> <li>• Environmental Quality (clean Air) Regulations 2014</li> <li>• Malaysian Ambient Air Quality Standards (MAAQS)</li> <li>• MARPOL Annex VI on ship emissions</li> </ul>
 <p>Noise Level</p>	<ul style="list-style-type: none"> <li>• The Planning Guidelines for Environmental Noise Limits &amp; Control (DOE)</li> <li>• Factories &amp; Machinery (Noise Exposure) Regulations 1989</li> </ul>
 <p>Vibration</p>	<ul style="list-style-type: none"> <li>• The Planning Guidelines for Environmental Vibration Limits &amp; Control (DOE)</li> </ul>
 <p>Ecology</p>	<ul style="list-style-type: none"> <li>• International Union no the Conservation of Nature (IUCN) &amp; Convention on International Trade in Endangered Species of Wild fauna &amp; Fauna (CITES) listing</li> <li>• Fisheries Act 1985</li> <li>• Wildlife Conservation Act 2010</li> <li>• Feedback from the Department of Marine Park Malaysia, Department of Fisheries (DOF), PERHILITAN &amp; State Forestry Department</li> </ul>
 <p>Visual Aesthetics</p>	<ul style="list-style-type: none"> <li>• Public perception on acceptability</li> </ul>

## CRITERIA & STANDARDS FOR ENVIRONMENTAL PARAMETERS

Impacts	Evaluation Criteria
 Land Use	<ul style="list-style-type: none"> <li>• Structure Plans, Local Plans, Special Area Plans (SAP)</li> <li>• Environmental Sensitive Area (ESA) Listing under the National Physical Plan-3 (NPP-3)</li> <li>• Marine Park Management Plan</li> <li>• Requirements in the National Physical Coastal Zone PLAN (NPCZP)</li> <li>• Local authority requirements</li> </ul>
 Land Traffic	<ul style="list-style-type: none"> <li>• Acceptable level of service (LOS) for traffic flows</li> <li>• Local authority requirement</li> </ul>
 Marine Traffic & Risk	<ul style="list-style-type: none"> <li>• Recommendations from the Marine Department of Peninsular Malaysia &amp; Port Authorities</li> </ul>
 Safety & Health	<ul style="list-style-type: none"> <li>• Occupational Safety &amp; Health Act 1994</li> <li>• Factory &amp; Machinery Act 1967</li> <li>• Department of Safety &amp; Health (DOSH) requirements</li> <li>• International Labour Organisation (ILO) &amp; their guidelines</li> <li>• Guideline Document on HIA in EIA (DOE)</li> <li>• EIA Guidelines for Risk Assessment (DOE)</li> </ul>
 Waste	<p><b>Scheduled Wastes:</b></p> <ul style="list-style-type: none"> <li>• Environmental Quality (Scheduled Wastes) Regulations 2005</li> </ul> <p><b>Other Wastes:</b></p> <ul style="list-style-type: none"> <li>• Solid Waste &amp; Public Cleaning Management Act 2007</li> <li>• Local authority requirements</li> </ul>
 Socio-economy	<ul style="list-style-type: none"> <li>• Public perception on acceptability</li> <li>• National Heritage Register (National Heritage Department), if applicable</li> <li>• Preservation of cultural, heritage, historical &amp; archaeological items &amp; sites of significance, if applicable</li> <li>• SIA requirements in the context of the Town &amp; Country Planning Act (Amendment) 2017 (Act A1522) for three categories:                             <ul style="list-style-type: none"> <li>• <b>SIA Category 1:</b> Development projects under subsection 20B (1) &amp; (2) of ACT A1522 for coastal reclamation projects &amp; major national infrastructure.</li> <li>• <b>SIA Category 2:</b> Development projects under subsection 22(2A) Act 172 for new township development for population over 10,000 people OR covering an area over 100 ha or BOTH, major national infrastructure &amp; development on slope &amp; hill</li> <li>• <b>SIA Category 3:</b> any other development projects with significant social impacts as order by the National Physical Planning Council (MPFN) from time to time</li> </ul> </li> </ul> <p><b>Note: Refer to the Social Impact Assessment (SIA) Preparation Manual for Development Projects (2nd Edition) for the list of projects that require SIA preparation in Appendix D</b></p>

## ASSESSMENT REQUIREMENTS

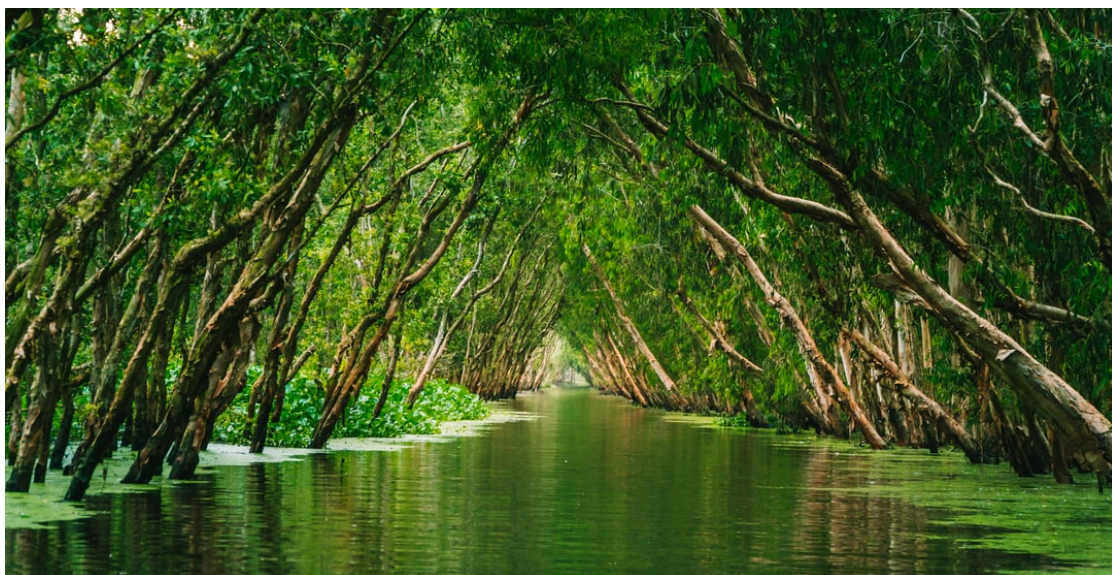
- Inventory of existing flora & fauna in the project area & surrounding impact zones to ascertain the level of biodiversity
- Identification of critical species benchmarked with the lists published by the International Union for Conservation of Nature (IUCN) red list or similar references
- Assessment can be based on field surveys e.g. camera traps, coral transects, spot diving, baiting etc., or literature review to produce the inventory.
- Presence of important flora & fauna that require relocation or protection demands measures to be proposed

## EVALUATION CRITERIA

- Level of encroachment into ESAs e.g. permanent reserved forests (PRF), national/state parks, or marine parks with ecologically rich habitats like coral reefs, seagrass and mangroves
- Indication of possible loss of habitat & its flora & fauna
- Activities that could disturb animal behavior, leading to their dispersal/limits their range.
- Potential impacts from pollution e.g. sediment plume, sewage & oil spills
- Effects of increased accessibility to the project site & opening up of pristine areas e.g. establishing access roads, leads to poaching risks
- Impacts from increased human-wildlife conflicts (HWC)
- Impacts from operational activities e.g. tourism & recreation

## OUTPUT

- Highlight important areas (via habitat map) which should not be built-upon, or if there is no other option, to determine suitable mitigation measures to minimize the impacts or replace the lost area
- Identification of critical areas to incorporate mitigation measures such as viaducts to allow for safe passage of animals or need to translocate important coral species at risk from the project & how to implement.



## 2 HYDROLOGY & HYDRAULICS

### ASSESSMENT REQUIREMENTS

- Levels of change due to the transportation & road project on the local hydrology & hydraulics in terms of waves, water level, current velocity, sediment transport etc.
- The long term impacts shall be addressed & assessed.

### EVALUATION CRITERIA

- Carry out hydraulic study to develop a model of the hydrological & hydrodynamic conditions of the coastal areas around the project site.
- Developed scenarios to assess the impacts from the project under different conditions such as the construction & operation phase, tidal conditions & seasonal changes
- Determine the extent of change for waves, water level, currents, sediment transport etc.
- Assess impacts of change on ESAs

### OUTPUT

- Visual maps representing the degree of change of the coastal parameters under different conditions
- Assessment of the level of change at the sensitive receptors to determine potential impacts
- Identification of the best construction method, layout & conditions that will minimize impacts.



## 3 EROSION & SEDIMENTATION (including Sediment Plume)

### ASSESSMENT REQUIREMENTS

- Assessment of the scale of land clearing & removal of vegetative cover at the site to determine the rate of erosion.
- Assessment of the conditions of the hydrological & drainage systems & how they may be altered as streams & rivers are diverted and/or become silted up, leading to increased runoff volume & velocity while their retention time & infiltration rates are reduced.
- Similarly, assess erosion & sedimentation that will likewise affect the aquatic ecology & water pollution
- Determine existing coastal morphology & landforms to ascertain the erosional & accretion areas.
- Determination of potential project activities that may result in generation of sediment plumes e.g. dredging, filling works, piling works
- Assessment of the severity & extent of the sediment spread in sensitive coastal waters, leading to water quality deterioration.
- Assess effectiveness of mitigation measures in reducing sediment plume
- Ascertain the level of change to coastal morphology due to construction & identify risk areas that may require protection structures.
- Temporary impacts during construction shall be addressed & assessed.

### EVALUATION OF IMPACTS

#### Land erosion & sedimentation:

- Calculate rate of soil erosion & sediment yield using standard formulae & site specific information to determine extent of erosion & sedimentation
- Provide erosion examples with or without mitigation measures in assessment
- Run simulation to determine the best management practices (BMPs) that shall be adopted to minimise negative effects.

#### Sediment plume:

- Using hydraulic & hydrodynamic models to model different scenarios to determine the level of sediment plume & suspended solids.
- Provide scenarios with or without mitigation measures & analyse the effectiveness of the mitigation measures.
- Coastal monitoring survey can be proposed or carried out to determine the changes of the shoreline during & after construction phase

### OUTPUT

- Avoidance principles/technical & engineering solutions to be applied to the project design & layout to minimize erosion & sediment plume
- Identify & incorporate suitable BMPs through LD-P2M2 based on modelling results
- Identify buffers & setbacks for structures due to changes in the coastline

ASSESSMENT  
REQUIREMENTS

- Assessment of type & scale of water quality impairment to nearby water bodies caused by transportation and road works.
- Determine the potential sources of pollution e.g. sedimentation from construction works, sewage & sullage discharge from worker quarters & oil & grease (O & G) spills.
- Determine the extent of sediment plume spread under different coastal conditions & their impacts on marine sensitive areas.
- Assess impacts of improper sewage treatment increasing nutrients in coastal waters leading to ecological degradation.

EVALUATION  
OF IMPACTS

- Choose the most suitable model to simulate pollution loadings in watercourses & determine the magnitude of the impacts further downstream.
- At the project site, identify potential water polluting sources e.g. toilets, worker quarters, canteen etc., and develop the respective BMPs.
- Determine impacts from sediment plume (see also *Erosion & Sedimentation*) at the project site & surrounding areas
- Determine whether the pollution load will affect any sensitive receptors

## OUTPUT

- Suitable BMPs & treatment systems to be identified to minimize the effects of discharges to waterways e.g. silt traps, sewage treatment systems, silt curtains, etc.
- Effectiveness of BMPs can be simulated to estimate load reductions & ensure pollutants are controlled to reduce offsite impacts & meet the requirements & standard of various agencies.

ASSESSMENT  
REQUIREMENTS

- Determination of type, size, numbers and function of vessels used during construction phase as well as the required facilities
- Assess the risk from increased vessel traffic that may result including but not limited to collision risk, navigational hazards & pollution
- Determine the need for safety & control measures for safe operation of vessels at all stages of work

EVALUATION  
OF IMPACTS

- Marine Risk Assessment (MRA) to be carried out as required if the project site is situated within a heavily trafficked coastal area e.g. jetties, port etc.
- If no detailed study is required, assessment shall focus on qualitative measures of the current vessel traffic & hazard scenarios
- MRA will provide an overview of the current & future marine traffic scenario, & the increase risk when marine traffic is involved for safety of vessels & water pollution control measures.

## ASSESSMENT REQUIREMENTS

- Determine where there is land & property acquisition & relocation of communities i.e. Orang Asli
- Assess the views & perception of the affected stakeholders & their inputs, recommendation & requirements of the project & mitigation measures to address their concern
- Assessment of impacts to coastal users i.e. fishermen, aquaculture, tourism operators
- Determination of coastal carrying capacity is crucial as to avoid deterioration of the environment, increase in utility & amenity demand, impair natural resources & degrades the quality of tourism & recreational devices

## EVALUATION OF IMPACTS

- Land & property acquisition & relocation of communities must first be settled by the Project Proponent prior to EIA commissioning & submissions
- For the EIA, impacts are evaluated mainly on the communities living within the ZOS. If there is a need those in the ZOI will also be assessed.
- Statistical reliability should be taken into consideration
- Main findings from SIA to be incorporated into EIA.
- For the case of marine parks, carrying capacity & impacts on tourism & recreation shall also be addressed.

## OUTPUT

- Findings from the human environment, mainly from surveys & focal group discussions (FGDs) are contentious & often skewed. Therefore, the assessments should have overall on-the-ground reviews even after the surveys are interpreted by the Qualified Person
- Assessment of the carrying capacity of the coastal areas & marine parks to determine any exceedance.



## 7 AIR QUALITY & NOISE

### ASSESSMENT REQUIREMENTS

#### Air Quality:

- Identification of potential air pollution generating sources from the project site & nearby sensitive receptors that may result in elevated dust levels & dispersions from construction & rock blasting works

#### Noise Levels:

- Assessment of high ambient noise environment & activities that pose impairment hazard to the workers & any nearby receptors from machineries & equipment on-site. Underwater noise impacts shall also be ascertained if there are any underwater project activities that may result in increase in noise levels e.g. piling, dredging, etc.

### EVALUATION OF IMPACTS

#### Air Quality:

- Air quality models are mainly Gaussian-based & many are available in the market. Use the most suitable one to simulate the air pollutant dispersion patterns & map it to determine the range of impacts

#### Noise Levels:

- This again can be modelled or calculated based on increase in noise levels, mapped as noise contours over a given area.

### OUTPUT

- Identification of proper temporary disposal sites & storage facilities for wastes generated on-site and mitigation measures against any impacts.
- Mitigations measures for proper waste management to be incorporated into site management to ensure that all wastes are properly managed & disposed at designated locations so as not to pollute the environment.



Source: freemalaysiatoday.com

## 8 WASTE MANAGEMENT

### ASSESSMENT REQUIREMENTS

- Identify the types of wastes generated during construction & operation phase such as biomass, scheduled, construction, domestic & municipal wastes & their impacts.

### EVALUATION OF IMPACTS

- Identify & estimate the quantum of all waste sources with the assistance of the technical & engineering consultants
- Assess the severity of impacts from improper management of such wastes on water quality, odour, air quality & public health.
- Location of potential storage areas within the project site
- Identify locations where the wastes will be eventually disposed.

### OUTPUT

- Identification of proper temporary disposal sites & storage facilities for wastes generated on-site and mitigation measures against any impacts.
- Mitigations measures for proper waste management to be incorporated into site management to ensure that all wastes are properly managed & disposed at designated locations so as not to pollute the environment.

## 9 LAND & MARINE TRAFFIC

### ASSESSMENT REQUIREMENTS

- Description of how construction materials, workers & machinery are mobilized to & fro from the construction site. Higher vehicle volumes can cause congestion, damaged roads, material spillage & increased risk of road accidents
- Marine traffic from vessels bringing in construction materials & anchoring at the project site, will increase the risk of congestions causing higher risk of collisions with other vessels such as tourist/fishermen boats.

### EVALUATION OF IMPACTS

- To study & incorporate the main findings from the land & marine traffic assessments in the EIA. The TIA is carried out separately by a Traffic Consultant & endorsed by the Public Works Department (JKR).
- MRA is carried out by a Qualified Person & the report submitted to the Marine Department of Peninsular Malaysia.
- The main concern in the EIA (risk to accidents, air quality, public health), are communities living along the coastal area during construction.
- During the operation phase, the extra volume of traffic generated by the project will also affect that same communities & tourists,

### OUTPUT

- Potential issues related to land & marine traffic & incorporation of structural & non-structural measures to address the issues as proposed in the TIA & MRA
- Identification of risk factors from various activities to communities & tourists such as from accidents, health, etc.

### ASSESSMENT REQUIREMENTS

- Construction entails higher risks to the safety & health of the workers & any surrounding communities from pollution, diseases, accidents & hazard, which must be fully assessed.

### EVALUATION OF IMPACTS

- Use risk assessment models to ascertain the level of risk from specific activities
- Determine the level of risk to neighbouring receptors to ascertain whether the level is within acceptable levels
- In terms of health, surveys on existing health conditions of receptors can assist in monitoring for sudden decrease in community health during pre and post project implementation.

### OUTPUT

- The qualitative/quantitative risks to receptors can assist to determine the types of BMP necessary to reduce the risks
- Findings from the HIA can also provide possible preventative & mitigation measures to safeguard worker & community health during construction & operation



## Outcomes from Assessment

The method to determine the level of significant impact is to benchmark the results against the stipulated current criteria & standard limits imposed by the DOE & other various GAs.

In situations where no local standards/limits are available, regional & international limits examples can instead be adopted based on the expert opinion of the Qualified Person.

**HOWEVER**, the chosen criteria & standards must be suitable & relevant to local conditions.



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# 6 ENVIRONMENTAL IMPACT ASSESSMENT: MITIGATION MEASURES

This Chapter shall focus on Pollution Prevention & Mitigation Measures (P2M2s) that serves to address the significant adverse environmental impacts identified during the scoping exercise & impact assessment phases of the Environmental Impact Assessment (EIA). The mitigation measures provided in this Chapter shall serve as a guide only.

The implementation of P2M2 is intended to achieve the following:

Avoidance of negative impacts through selection of alternatives to implement the preventive measures

Enhance & amplify the beneficial impacts.

When an impact cannot be avoided, to adopt effective and practical mitigation measures to minimise the impacts.

Ensure that residual impacts are kept within acceptable levels.

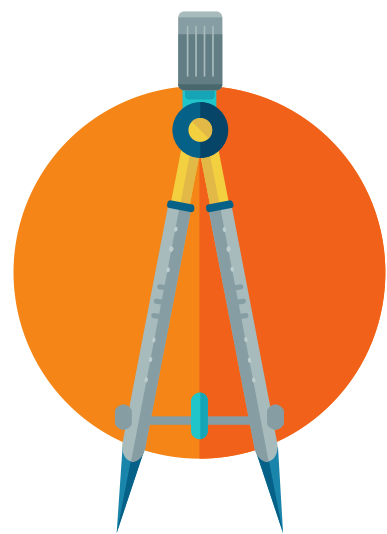


The Qualified Person shall also propose best management practices (BMPs) based on the findings of the EIA for the project site.

➔ The P2M2s and BMPs shall be incorporated into the overall design of the project.

➔ The Project Proponent and Qualified Person shall recommend alternative measures and/or introduce newer technology whenever these are proven more effective. At the EIA stage, the P2M2 shall be detailed out as best as possible and reported in the EIA Report.

➔ The submission of the EIA and the pledge given by the Project Proponent shall reflect the agreement and commitment towards ensuring implementation of the mitigation measures on-site during all stages of work.



## PRINCIPLE AND ADOPTION OF P2M2

1

The need & extent of P2M2s required shall correspond to the significance of the predicted impact. Once an issue is identified as significant, P2M2s must be identified & elaborated on in detail in the EIA. For minor issues, management actions & simple measures need only be highlighted

2

Priority shall be on control at source & rectifying the effects, e.g. use of erosion control covers on slopes & silt trap management

3

Solutions shall be project specific & designed for the site conditions instead of using generic solution proposals. P2M2s need not be complex & costly, but instead be practical, easy to implement & effective.

4

The EIA shall include adequate explanation on the design & function of a P2M2, supported by diagrams, illustrations, photos & maps. The technical reports & specifications shall be included in the appendix of the EIA

5

The use of new technology is encouraged if it can be proved to be effective in mitigating the impacts. The Project Proponent or the Qualified Person is responsible to provide proof & supporting evidence that the proposed technology is tried & tested & able to address the impacts.

6

P2M2s require regular inspection, maintenance & rehabilitation & these shall be incorporated as part of the management requirements of the project, including the allocation of adequate budgets for such purposes.

7

Effectiveness of P2M2s shall be documented through implementation of a comprehensive monitoring programme.

## Land-Disturbing Pollution Prevention & Mitigation Measures (LD-P2M2)



LD-P2M2 is a newly mandated requirement by DOE under the mainstreaming environmental agenda to affect a paradigm shift towards a culture of self-regulation (SR), placing the onus of environmental protection clearly on the Project Proponent to implement and comply.

The LD-P2M2 is required as long as there are any land disturbing activities, subject to Section 34A of the EQA 1974, carried out during project development.

The LD-P2M2 forms an integral part of the EIA process and must be taken into account during the project planning cycle to ensure that the recommendations in the document are incorporated into the project.

During project implementation, it shall act as a reference document for the Project Proponent, contractors and Environmental Officer (EO) in implementing P2M2s and BMPs on-site, and in facilitating monitoring, audit and enforcement.

The Guidance Document for the Preparation of the Document on Land-Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2) in Appendix 4 of the EGIM (DOE, 2016) and "Guidelines on LD-P2M2 by DOE" (2017) shall be referred in the preparation of the LD-P2M2.

## LD-P2M2 PRINCIPLES

The LD-P2M2 is to be prepared and endorsed by a DOE registered consultant who holds a certification issued by DOE, as a professional for erosion and sediment control (CPESC).

The basic principles to develop the LD-P2M2 shall include:

- Preservation and stabilisation of drainage and waterways.
- Minimise the extent and duration of disturbance.
- Control of runoff flows into, through and from the site via stable drainage structures.
- Installation of perimeter controls.
- Stabilisation of disturbed areas in a timely manner.
- Protection of steep slopes.
- Use of sediment controls to prevent off-site damage.
- Protect inlets, storm drain outfalls and culverts.
- Provide access and general construction controls.
- Inspect and maintain BMPs for control measures.
- Employ experienced and competent persons for monitoring and consistently conduct relevant training.

# LD-P2M2

## STANDARD REQUIREMENTS AND SUBMISSION CHECKLIST

The LD-P2M2 report shall include all required information as per the **LD-P2M2 Submission Checklist** and accompanied by relevant technical drawings and maps.

The Project Proponent is required to make a legal pledge to undertake efforts, measures, actions or due diligence in accomplishing the overarching goal of protecting the environment and in mitigating the adverse environmental impacts in the process of the proposed project development.

LD-P2M2 Submission Checklist	
REQUIREMENTS	INFORMATION TO BE INCLUDED
Project Activity & Implementation	<ul style="list-style-type: none"> <li>• Phasing plan.</li> <li>• Project implementation schedule.</li> <li>• Description of construction activities.</li> <li>• Construction schedule complete with timeline or charts for P2M2s installation.</li> <li>• Construction method statements.</li> </ul>
Information & Analysis on Project Development	<ul style="list-style-type: none"> <li>• Selected weather &amp; rainfall data.</li> <li>• Site runoff velocity and flow rates (pre &amp; post-development).</li> <li>• Description of site soil and geological characteristics (type, erodibility, hydrologic group, percentage dispersible material, excavation depth, etc.).</li> <li>• Description of adjacent areas that may be affected by land disturbance.</li> <li>• List of drainage, streams &amp; river onsite as well as receiving streams and rivers.</li> <li>• List of P2M2s proposed.</li> <li>• Access roads &amp; project components located outside of project boundary.</li> <li>• Earthworks cut and fill volume.</li> <li>• Availability of rocks materials.</li> <li>• Biomass management.</li> <li>• Solid (construction waste) &amp; domestic waste management.</li> <li>• Spill prevention &amp; control plan.</li> <li>• Hazardous waste management.</li> <li>• Soil loss prediction (pre, during &amp; post-development) for with and without LD-P2M2 implementation scenarios.</li> <li>• Calculation for sediment traps/basins &amp; projected runoff flows.</li> </ul>
Map of Site Plan with Existing Conditions	<ul style="list-style-type: none"> <li>• Topographic survey map.</li> <li>• Geological Terrain Map.</li> <li>• Erosion risk map.</li> <li>• Landuse map.</li> <li>• Site development plan map.</li> </ul>

**Source:** Guidance Document for the Preparation of the Document on LD-P2M2, DOE, 2016.

# P2M2 for Transportation & Road Projects



## P2M2 for Transportation & Road Projects

1. Pre-construction stage
2. Construction stage
3. Operational stage



### 1 P2M2 DURING PRE-CONSTRUCTION STAGE

Activities	Issues	P2M2
Site surveys including topography, bathymetry survey, soil investigation & environmental assessment	<p>Ecology</p>	<ul style="list-style-type: none"> <li>• Ban on poaching/hunting</li> <li>• Any sightings of rare, endemic, &amp; endangered flora &amp; fauna are to be notified to the relevant authorities e.g. the Forestry Department of Peninsular Malaysia (JPSM), PERHILITAN</li> </ul>
	<p>Safety &amp; Health</p>	<ul style="list-style-type: none"> <li>• Provide Personal Protective Equipment for workers</li> <li>• Proper handling of waste management</li> </ul>
Land Acquisition (if any) under SIA and local authorities' scope	<p>Socio-economy</p>	<ul style="list-style-type: none"> <li>• Generate more employment and multi facet economic benefits</li> </ul>






Wildlife Monitoring using a Camera Trap



Site Survey



Soil Investigation

Activities	Issues	P2M2
<ul style="list-style-type: none"> <li>• Establish access road</li> <li>• Site clearing</li> <li>• Setting up site facilities and base camp</li> <li>• Establish vessel facilities</li> <li>• Worker recruitment, mobilisation of equipment &amp; materials</li> <li>• Earthwork</li> <li>• Infrastructure works</li> <li>• Structural works</li> <li>• Waste disposal</li> <li>• Establishment of permanent access</li> <li>• Final finishing and landscaping</li> </ul>	 <p>Ecology</p>	<ul style="list-style-type: none"> <li>• Construction activities are to be confined to be within the designated work area &amp; remaining areas to be untouched.</li> <li>• Where necessary structural measures are put in place to reduce impacts of forest fragmentation &amp; allow safe passage for wildlife i.e. viaducts &amp; tunnels</li> <li>• Ban on poaching/hunting</li> <li>• Wildlife management plan (WMP)</li> <li>• Wildlife conservation awareness program for the construction workers</li> <li>• Designate vessel traffic lanes &amp; anchorage areas</li> <li>• Any sightings of rare, endemic and endangered flora &amp; fauna are to be notified to the relevant authorities e.g. PERHILITAN, DOF, State Forestry Departments etc. for the appropriate actions</li> <li>• Habitat enrichment</li> <li>• Wildlife crossing signage</li> </ul>
	 <p>Wastes</p>	<ul style="list-style-type: none"> <li>• Provide waste bins &amp; disposed at approved dumpsite</li> <li>• Housekeeping</li> <li>• Scheduled waste storage area with sufficient bunding, labelling &amp; waste inventory</li> </ul>
	 <p>Erosion &amp; Sedimentation</p>	<ul style="list-style-type: none"> <li>• Establishment, implementation &amp; maintenance of LD-P2M2</li> <li>• Development phasing</li> <li>• Retain as much of the natural vegetation as possible</li> <li>• Reducing total area &amp; period of exposure of the worked terrain to a minimum</li> <li>• Construct drainage network to channel runoff from the site</li> <li>• Ensure that any discharge from the project site is properly channeled into a treatment system before final discharge</li> <li>• Stabilize disturbed areas &amp; apply protection measures as soon as practicable</li> <li>• Proper construction methods for marine construction</li> </ul>



Mulching



Earth Drain



Check Dam



Silt Trap



Sediment Basin








Slit Fence and Gabion







Sediment Forebay



Geomat / Fiber Blanket

Activities	Issues	P2M2
<ul style="list-style-type: none"> <li>• Establish access road</li> <li>• Site clearing</li> <li>• Setting up site facilities and base camp</li> <li>• Establish vessel facilities</li> <li>• Worker recruitment, mobilisation of equipment &amp; materials</li> <li>• Earthwork</li> <li>• Infrastructure works</li> <li>• Structural works</li> <li>• Waste disposal</li> <li>• Establishment of permanent access</li> <li>• Final finishing and landscaping</li> </ul>	 <p>Hydraulics &amp; Hydrodynamics</p>	<ul style="list-style-type: none"> <li>• Structural &amp; non-structural measures can be adopted to reduce runoff velocity, increase retention time within site &amp; manage runoff volume to nearby waterways</li> <li>• Preservation of existing waterways, drainage &amp; buffers</li> <li>• Hydraulic study shall assess all aspects of the project to assess the impacts &amp; the recommendations of the study shall form the basis for the mitigation measures</li> </ul>
	 <p>Water Quality</p>	<ul style="list-style-type: none"> <li>• Establishment, implementation &amp; maintenance of LD-P2M2</li> <li>• Septic tank &amp; toilet facility at workers camp as per SPAN requirements</li> <li>• Establish proper workshop area</li> <li>• Proper management of scheduled waste</li> <li>• Vessel management &amp; requirements for pollution control measures</li> <li>• Oil spill management plan &amp; provision of oil spill kit</li> </ul>
	 <p>Flooding</p>	<ul style="list-style-type: none"> <li>• Further study on the river flow</li> <li>• All ESCP or LD-P2M2 implementation shall be regularly inspected &amp; maintained properly to ensure functionality.</li> </ul>
	 <p>Air Quality</p>	<ul style="list-style-type: none"> <li>• Provision of wheel washing facilities</li> <li>• Frequent wetting of the ground</li> <li>• Measures to reduce equipment &amp; vehicular emissions</li> <li>• Employing the use of covered vehicles for transportation</li> </ul>
	 <p>Noise</p>	<ul style="list-style-type: none"> <li>• Perimeter hoarding</li> <li>• Scheduling of piling</li> <li>• Regular maintenance for machinery &amp; vehicles</li> <li>• Personal Protective Equipment (PPE) for workers</li> <li>• Noise barriers for construction &amp; operational phase of project</li> </ul>

Activities	Issues	P2M2
<ul style="list-style-type: none"> <li>Establish access road</li> <li>Site clearing</li> <li>Setting up site facilities and base camp</li> <li>Establish vessel facilities</li> <li>Worker recruitment, mobilisation of equipment &amp; materials</li> <li>Earthwork</li> <li>Infrastructure works</li> <li>Structural works</li> <li>Waste disposal</li> <li>Establishment of permanent access</li> <li>Final finishing and landscaping</li> </ul>	 Land Traffic	<ul style="list-style-type: none"> <li>Traffic management plan</li> <li>Speed limits</li> </ul>
	 Marine Traffic	<ul style="list-style-type: none"> <li>Issuance of Mariner's Notice during construction</li> <li>Deploy navigational aids such as lights &amp; buoys to demarcate the work area &amp; warn others not to trespass</li> <li>Regular maintenance on vessels</li> </ul>
	 Safety & Health	<ul style="list-style-type: none"> <li>Provide Personal Protective Equipment for workers</li> <li>Housekeeping &amp; Standard Operating Procedure</li> </ul>
	 Socio-economy	<ul style="list-style-type: none"> <li>Constantly monitor &amp; supervise the foreign workers</li> <li>Set up a community centre</li> </ul>

**Note: The list is not exhaustive and not all the above may be relevant to the project, It is the responsibility of the Project Proponent and Qualified Person to determine the relevant information required for environmental assessment and compliance.**



**Construction of an animal viaduct**



Coil Logs



Wheel Washing Facilities



Water Browser



Noise Barrier



Waste Management










Turfing



Site Office



Worker Quarters

Activities	Issues	P2M2
<ul style="list-style-type: none"> <li>• Transportation and Road during operational stage</li> <li>• Transportation and Road maintenance &amp; repair</li> </ul>	 Ecology	<ul style="list-style-type: none"> <li>• Any sightings of rare, endemic and endangered flora &amp; fauna are to be notified to the relevant authorities e.g. PERHILITAN, DOF, State Forestry Departments or local approving authorities etc. for the appropriate actions</li> </ul>
	 Water Quality	<ul style="list-style-type: none"> <li>• Proper management of sewage treatment from toilets in stations</li> </ul>
	 Traffic	<ul style="list-style-type: none"> <li>• Proper traffic control devices &amp; traffic signs must be installed at relevant intervals &amp; follow guidelines &amp; design standard</li> <li>• All maintenance work shall be carried out during off-peak period</li> </ul>
	 Noise & Vibration	<ul style="list-style-type: none"> <li>• Landscaping</li> <li>• Noise absorbers/barriers</li> <li>• Vibration absorbers</li> <li>• Provide a buffer zone</li> </ul>
	 Air Quality	<ul style="list-style-type: none"> <li>• All emission from vehicles &amp; fuel burning equipment must abide by the emission standards of DOE</li> </ul>
	 Waste	<ul style="list-style-type: none"> <li>• Proper management in handling the scheduled waste from the maintenance</li> </ul>
	 Safety & Health	<ul style="list-style-type: none"> <li>• Safety or warning signage</li> </ul>



## Residual Impacts

Residual impacts include the remaining impacts that will persist even after implementation of all mitigation measures.

The extent of residual impacts needs to be clearly assessed and detailed in the EIA report.

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# 7 ENVIRONMENTAL IMPACT ASSESSMENT: ENVIRONMENTAL MANAGEMENT PLAN

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The Environmental Management Plan (EMP) is a legal document prepared by the Project Proponent, incorporating the Land-Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2), other pollution prevention and mitigation measures (P2M2s) and best management practices (BMPs) as recommended in the Environmental Impact Assessment (EIA), including the Conditions of Approval (COA) by the Department of Environment (DOE).



The EMP shall function as a project implementation tool for the Environmental Management Team to carry out mitigation works on-site. The key contents of the EMP are required to be translated into a format for incorporation into the Bill of Quantities (BQ) for the work scopes of the contractors during construction and operations.



Other than mitigation measures, the EMP shall include an environmental monitoring and audit programme to assess the effectiveness of the P2M2s implementation. The EMP is a living document and has to be updated if there are major changes to the project design, layout or method statement that may result in impacts to the environment.

## LEGAL ADHERENCE

### Section 34 A (6)

Any person intending to carry out a prescribe activity shall not carry out such activity until the report required under this section to be submitted to the Director General has been submitted and approved.

### Section 34 A (7)

If the Director general approves the report, the person carrying out the prescribed activity in the course of carrying out such activity, shall provide sufficient proof that the conditions attached to the report (if any) are being complied with and that the proposed measures to be taken to prevent, reduce or control the adverse impact on the environment are being incorporated into the design, construction and operation of the prescribed activity.

### Section 34 A (8)

Any person who contravenes this section shall be guilty of an offence and shall be liable to a fine not exceeding five hundred thousand ringgit or to imprisonment for a period not exceeding five years or to both and to a further fine of one thousand ringgit for every day that offence is continued after a notice by the Director General requiring him to comply with the act specified therein has been served upon him.

### Section 34 AA (2)

The prohibition order to stop work order may be issued for the purpose of prevention the prescribed activities from continuing:

- Either absolutely or conditionally
- For such period as the Director General may determine or
- Until requirements to remedy as the Director General may direct have been complied with.

### Section 34 AA (1)

The Director General may issue a prohibition order or stop work order to the person carrying out the prescribed activities-

- Without the approval under subsection 34A(3)
- Who violates any conditions attached to the approval of the report or
- Which in the opinion of the Director General are being carried out in a manner that is likely to cause environmental damage.

### Section 34 AA (3)

Any person who contravenes this section shall be guilty of an offence and shall be liable-

- To a fine not exceeding five hundred thousand ringgit or to imprisonment for a period not exceeding five years or to both
- For a continuous offence, to a fine not exceeding one thousand ringgit for every day during which the offence continues after a notice has been served by the Director General upon the person requiring the person to comply with the act specified in it.

# EMP FRAMEWORK

In the EIA phase, the project may not have sufficient detailed information on the project work plan to produce a comprehensive EMP. The EMP chapter in the EIA will only be an EMP framework for eventual morphing into a full EMP after the EIA approval stage.

The Project Proponent can decide to undertake the detailed EMP at the same time as the EIA Report and both can be submitted concurrently. The EMP can later be updated to incorporate the requirements of the COAs.

The EMP format, shall be based on the requirements stated within the Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016), and shall contain details of the LD-P2M2 Document and proposed monitoring and audit programme.

**The main topics required to be incorporated into the EMP framework shall include the following:**



## ENVIRONMENTAL MANAGEMENT ORGANISATION



The Project Proponent shall be required to identify and setup an **Environmental Management Unit (EMU)** to ensure that all EIA Conditions of Approval (COAs) and P2M2s are implemented during the construction and operational phases of the project.

For large-scale projects involving multiple packages, the respective main contractors are required to have their respective **Environmental Teams (ETs)** with minimum personnel comprising an **Environmental Manager (EM)** and **Environmental Officer (EO)**.

The organisation chart along with the roles and responsibility of all parties in charge of environmental management for the project shall be included in the EMP framework.

## ENVIRONMENTAL COMMUNICATION

The mode of communication between the EMU and the respective ET must be clearly defined. Lines of communication between the Project Proponent and EMU with the relevant stakeholders must be clearly spelled out, these is not only limited to project site management but also in engagements with affected communities and the general public.

## MONITORING & AUDIT PROGRAMME

The environmental monitoring and audit programme are important components of the EMP. Monitoring and audit shall be implemented during the post-EIA stage.

# MONITORING CATEGORY

Environmental monitoring can be categorised into three main types:

01

## PERFORMANCE MONITORING (PM)

- Relates to the monitoring of the performance treatment systems such as industrial effluent treatment systems (IETS), sewage treatment systems (STS) and air pollution control systems (APCS).
- This shall be undertaken by a Competent Person with expertise in the related treatment system.



02

## COMPLIANCE MONITORING (CM)

- Relates to the monitoring of P2M2s within the site and their performance. Measurements are usually taken either of the ambient parameters (water, air and noise) or of the discharge (sewage, sediment basin).
- This task shall be carried out by a Qualified Person such as the Environmental Officer (EO) and/or the Environmental Consultant.



03

## IMPACT MONITORING (IM)

- Impact monitoring may only be required in cases where there is a possibility that the impacts may still affect receptors outside of the project boundary despite implementation of P2M2s.
- This task must be carried out by a Competent Person associated with the accredited laboratory.



*The environmental monitoring and audit programme are important components of the EMP. Monitoring and audit shall be implemented during the post-EIA stage.*

# MONITORING METHODOLOGY

The extent of monitoring shall be determined by the scale of the project and of the predicted impacts. Monitoring covers both within the project site and outside of its boundary where impacts are perceived to affect sensitive receptors.

Details of the monitoring programme are to be decided upon by the Qualified Person or Environmental Consultants, and be included in the EIA to be approved by DOE before implementation. For specific projects, the monitoring programme shall be required to be tailored to the site conditions and type of development.

## ENVIRONMENTAL AUDIT

Environmental auditing is a post-EIA evaluation process to determine compliance to the COAs by the Project Proponent.

Audit requirements are guided by the requirements in the Environmental Audit Guidance Manual by DOE. The audit must be undertaken by an independent party as a DOE registered auditor.

The typical audit process involves:



### PRE-AUDIT

Preparation of a pre-audit checklist and information request to the auditee. Submission of a notification of audit to DOE.



### ON-SITE AUDIT

Briefing to the auditee by Lead Auditor. Audit shall include documentation review, site inspection, interviews with relevant personnel to obtain the necessary information to gauge compliance and site sampling (optional). Auditee will be briefed at the Closing Meeting with the on-site Audit Summary submitted to the state DOE.



### POST-AUDIT

Lead Auditor shall submit an Audit Report to the state DOE and the Project Proponent to respond with a Corrective Action Report (CAR) within three weeks from the audit date.

# REPORTING



The **EMP framework** shall contain a proposed reporting schedule for the various submissions post-EIA which shall include, but not limited to:



- Environmental Compliance Reporting
- Monitoring
- Auditing



## SELF-REGULATION



Environmental Mainstreaming (EM) is a strategic tool that allows for the cultural evolution of embracing the environmental agenda at all levels of the organisational structure of the Project Proponent.

With the understanding of EM, all key personnel in an Organisation can play a role in safe guarding our environment in an effective manner. As such, the elements as espoused in the EM Tools (EMT) provide a Guide in achieving the ultimate Goal of Environmental Excellence in an Organisation.



# 8 ENVIRONMENTAL IMPACT ASSESSMENT: REPORTING AND REVIEW

This chapter provides the required format for Environmental Impact Assessment (EIA) report preparation for submission to the Department of Environment (DOE) for approval of study

## EIA REPORT

An EIA shall be written in a concise manner that is easy to understand and be able to convey the main message to the decision makers.

The Environmental Impact Assessment Guideline in Malaysia (EGIM) (DOE, 2016) provides the specifications and format for EIA reporting.

## EIA REPORT FORMAT

### 1. DECLARATION

Declaration from the Project Proponent & Qualified Person(s) in the format detailed in Appendix 9 of EGIM (DOE, 2016)

### 2. EXECUTIVE SUMMARY

Executive Summary of the EIA Report in Bahasa Malaysia and English.

### 3. INTRODUCTION

Brief introduction to the project, Project Proponent (address, key person and contact information), Environmental Firm (address, key person and contact information) and EIA Team Members (name, academic qualifications, areas of study, signature).

### 4. POLICY, REGULATORY & LEGAL REQUIREMENT

Review of the policy, regulatory & legal requirements for the project.

### 5. TERMS OF REFERENCE (TOR)

Terms of Reference (TOR) for the EIA Study as endorsed by the DOE. Endorsement letter from DOE to be attached as appendix to the EIA report.

### 6. STATEMENT OF NEED

Statement of need for the project.



### 7. PROJECT OPTIONS

Deliberation on the alternatives and project options.

## EIA REPORT FORMAT

### 8. DESCRIPTION OF THE PROJECT

Detailed description of the project including site information, concept and breakdown of major components, material and manpower requirements, project activities and time schedule (refer to **Recommended Project Description in EIA Report** overleaf)

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### 9. BASELINE CONDITION

Description of the baseline conditions (physical, chemical, ecology and socio-economy) within the Zone of Study (ZOS) that may be impacted by the project.

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### 10. SIGNIFICANT IMPACTS

Assessment of the significant impacts (positive and negative), prediction of the extent and effects on nearby sensitive receptors and proposal of pollution prevention and mitigation measures (P2M2s) to minimise or enhance these impacts and any potential residual impacts.

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### 11. PUBLIC CONSULTATION & ENGAGEMENT

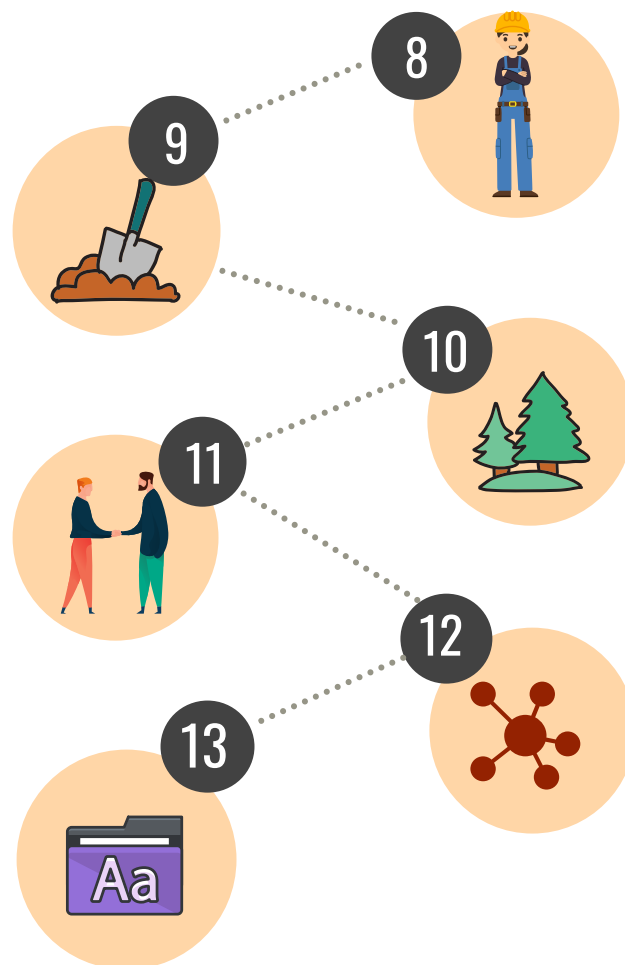
Details & visual representation/ recordings of public consultation and engagement as part of EIA requirements.

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### 12. EMP

Environmental Management Plan (EMP) incorporating the Land-Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2), monitoring and audit programme.

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### 13. APPENDICES

Appendices containing technical studies, supporting documentation, results of analysis, list of references, etc.

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*An EIA Checklist can be referred in **Appendix E***

# Recommended Project Description in EIA Report

## 1 Project Details

- Project title.
- Name and contact details of the Project Proponent (contact person, address, telephone number, e-mail address).
- Name of registered EIA Consulting Firm (EIA Team Leader, address, telephone number, e-mail address).
- Location of project (coordinates, lot no, district, etc.).
- Relevant map showing project location and accessibility.

## 2 Location

- General site plan including Zone of Study (ZOS) (5-km radius from project boundary and/or 1-km corridor [0.5 km on either side along the Right of Way (ROW) for linear projects]).
- Project boundary and layout including boundary coordinates.
- Description of location in relation to identifiable landmarks (e.g. city centres, main roads, towns, etc.).

## 3 Project Component & Design Details

- Project details (land area, buffer requirements, lots and land status).
- Project concept.
- Project components.
- Technology use.
- Examples of similar project type and scale.

Note: The above shall be supported with technical drawings, illustration and diagrams.

## 4 Project Activities

- Method statement to be provided for major project activities during pre-construction, construction and operational stages.
- Manpower requirements.
- Resource requirements (e.g. soil and aggregate sources, spoil disposal area, etc.).

## 5 Infrastructure, Utilities & Amenities Requirement

Details of the estimated demand for:

- Water supply.
- Electricity.
- Sewerage.
- Telecommunications.
- Transport system.
- Waste management.

## 6 Project Implementation Schedule

- The estimated timeline for various stages of project implementation from planning, to construction and operational stages.
- Details of each stages of implementation.

## EXECUTIVE SUMMARY

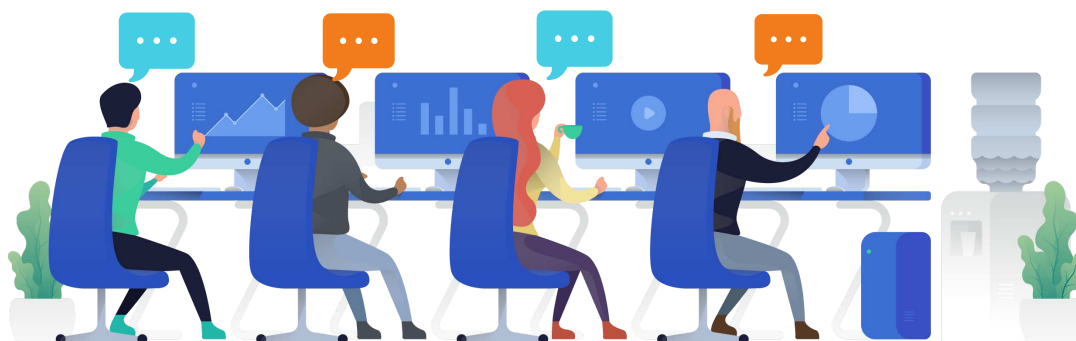
The Executive Summary provides a concise brief of the findings & recommendations from the EIA for decision makers to review. The Executive Summary shall be short and written in non-technical language, both in Bahasa Malaysia and English, presenting the following information:



Soft copy of the Executive Summary (PDF format) shall be submitted to DOE along with soft copy of the full EIA report.

## DATA DELIVERABLES

- The Project Proponent shall make available all relevant data collected during the EIA study to be submitted (raw and processed format) along with the EIA report.
- Examples of such data includes – sampling results (certificates and raw data), modelling databases, baseline data (surveys, hydrographic data and climate data), metadata files, etc.
- This data shall be provided to the relevant government agencies upon request.



# STAKEHOLDER ENGAGEMENT

## Pre-consultation



With relevant government agencies who have vast technical expertise and experience in their specific areas have an important role to play providing relevant inputs towards the environmental impacts.

## Social Economic Survey



For EIAs under the First Schedule, public engagement is mandatory. It can take many forms but the common one is through a project briefing with the stakeholders within the Zone of Impact (ZOI). In the briefing, the Project Proponent and EIA Team shall present the project brief followed by a questions and answers (Q&A) session. All discussions will be recorded and reported in the EIA. The Project Proponent is encouraged to carry out stakeholder engagements voluntarily even for First Schedule EIAs.

## Documentation



Documentation: The public participation process shall be properly documented and reported in the EIA.

The report shall contain the following:

- Zone of Impact (ZOI) stakeholders.
- List of surveyed participants.
- Copies of survey forms.
- Brief summary of findings from the event e.g. pre-consultation and meeting notes, list of questions and responses, photograph of event.





**The pre-consultation and meeting notes shall form part of the appendix in the EIA, and the issues brought up and responses from the Project Proponent, must be clearly stated and discussed in the EIA report.**



# EIA REPORT

## SUBMISSION & REVIEW PROCESS






Components	First Schedule Activities
Report Submission	 Submission to DOE State Office
No. of Reports	<b>3</b> hard copies + <b>1</b> soft-copy (CD) to State DOE + <b>1</b> soft-copy (CD) to DOE HQ + <b>1</b> distribution by soft-copy (CD) to agency/AI/NGOs for comment
No. of Revised EIA (if needed)	<b>3</b> hard copies + <b>1</b> soft-copy (CD)
Review Timeline	<b>25</b> working days ( 5 weeks)
Public Participation	
Public Display	
Web Display	Not required. Submit soft-copy (CD) of the EIA Report to DOE State Office
Advertisement	

Source: Adapted from EGIM, DOE, 2016.

# EIA REPORT

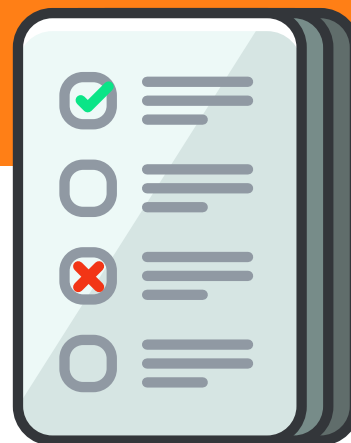
## SUBMISSION & REVIEW PROCESS



Components	Second Schedule Activities
Report Submission	 Submission to DOE HQ
No. of Reports	<b>3</b> hard copies + <b>1</b> soft-copy (CD) to State DOE + <b>1</b> hard-copy to relevant State DOEs + <b>1</b> distribution by soft-copy (CD) to agency/AI/NGOs for comment
No. of Revised EIA (if needed)	<b>3</b> hard copies + <b>1</b> soft-copy (CD)
Review Timeline	<b>60</b> working days (12 weeks)
Public Participation	
Public Display	
Web Display	Required. Submit soft-copy (CD) of the EIA Report to DOE State Office
Advertisement	Advertised in 2 major newspaper outlets for 3 consecutive days

Source: Adapted from EGIM, DOE, 2016.

# EIA REPORT



## EVALUATION CRITERIA

As stated in the following sections of the EQA 1974 :-

### SECTION 34A (2c)

The report shall be in in accordance with the guidelines as the Director General may prescribe and shall contain-

- an assessment of the impact such activity will have or is likely to have on the environment; and
- the proposed measures that shall be undertaken to prevent, reduce or control the adverse impact on the environment.

### SECTION 34A (4)

If the Director General is of the opinion that the report is not in accordance with the development or physical plan approved by relevant authorities OR does not satisfy the requirements under subsection (2C), the report shall not be approved.

Reasons will be given by the Director General and shall inform the person & the relevant approving authority accordingly.

### SECTION 34A (3)

If the report satisfies the requirements of subsection 2C, the Director General examining said report shall approve it with or without conditions attached thereto.

Subsequently the Director General shall inform the person intending to carry out the prescribe activity & the relevant approving authorities accordingly.

### SECTION 34A (5)

The Director General may require the person to submit any other report to him/her, in addition to the report required to be submitted under subsection 34A(2), relating to the environmental impact for his approval.

Thus, The EIA report submission shall be in line with the steps and procedures outlined in the EGIM (DOE, 2016). An EIA Checklist can be used to assist in conducting self-check of the quality of the EIA prior to submission to the EIA. An EIA checklist is appended in **Annex E**, which is required to be filled in by the Qualified Person and included in the EIA report. During the reviewing process, the possible outcomes of the EIATRC meetings are:

**1**

Approval of the EIA Report, provided that the report meets with the requirements of Section 34A (3) of the Environmental Quality Act (EQA) 1974.

**2**

Shall not approve the EIA Report, where the report does not meet the requirements of Section 34A (3) of the EQA 1974

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### If the EIA is approved



**Conditions of Approval (COA)** will be issued by the DOE to the Project Proponent.

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# REFERENCE

A Guide On Geometric Design of Roads – ATJ 8/86 (Pindaan 2015) – JKR Malaysia

Department of Irrigation and Drainage. (2009). DID Manual: Coastal Management.

Department of Environment. (2016), Environmental Impact Assessment (EIA) Guidelines In Malaysia.

Department of Environment (2012). Guidelines for Siting and Zoning of Industry and Residential Areas.

Department of Environment. (2017). Environmental Impact Assessment Guidelines for Development in Coastal Areas and Marine Parks.

Department of Environment. (2017). Environmental Impact Assessment Guidelines for Development in National and State Parks.

Department of Environment. (2017). Environmental Impact Assessment Guidelines for Development in Slope and Hill Areas.

Department of Environment. (2017). Environmental Impact Assessment Guidelines for Land Reclamation and Dredging.

Department of Environment. (2017). Environmental Impact Assessment Guidelines for Development of Ports .

Department of Environment. (2017). Guidelines on Land Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2).

Department of Environment. (2010). Environment Protection (Prescribed Activities) (Environmental Impact Assessment) Order 2005.

Enviro Enhance Sdn. Bhd. (2017). Kajian Pembentukan Garispanduan Alam Sekitar: Garispanduan EIA bagi Aktiviti Penebusgunaan Tanah dan Pengorekan, Pelabuhan, Kuari dan Perlombongan - Interim Report.

European Commission & Milieu Ltd. (2017). Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report. Luxembourg: European Union.

FDTCP. (2010). National Physical Plan-2. Malaysia: Federal Department of Town and Country Planning.

FDTCP. (2016). National Physical Plan-3. Malaysia: Federal Department of Town and Country Planning.

# REFERENCE

Fisheries Act 1985 (Act 317). (2012). Malaysia: The Commissioner of Law Revision.

Immigration Act 1959/63 (Act 155). (2006). Malaysia: The Commissioner of Law Revision.

Jabatan Perancangan Bandar dan Desa Negeri Selangor. (n.d.). Bab 5: Aspek alam sekitar dalam perancangan. Manual Garis Panduan dan Piawaian Perancangan Negeri Selangor.

Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia. (2000). Garis Panduan dan Piawaian Perancangan Kawasan Pantai. Malaysia: Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia.

Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia. (2012). Rancangan Fizikal Zon Persisiran Pantai Negara. Malaysia: Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia.

JKR Standard 2020: Environmental Protection and Enhancement Works for Projects (2020), JKR Malaysia.

Legal Research Board (2000). National Land Code (Act 56 of 1965) & Regulation. International Law Book Services, Kuala Lumpur.

MLTIC (2015). Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015.

Town and Country Planning Act 1976 (Act 172). (2006). Malaysia: The Commissioner of Law Revision.

Wathern, P. (1988). Environmental Impact Assessment: Theory and Practice. United Kingdom: Taylor & Francis Group.

# GLOSSARY

<b>Analysis</b>	An examination in order to understand.
<b>Anchorage</b>	An area off the coast which is suitable for a ship to anchor.
<b>Appointed Individuals (AIs)</b>	Persons appointed to be part of the TRC with expertise and specialist knowledge on specific fields/subjects to contribute to the technical review of a report.
<b>Approving Authority/Agencies</b>	Any government ministry, agencies or department with the authority to approved a project and/or activity under their jurisdiction by law.
<b>Aquatic</b>	Pertaining the ecosystem influenced by water and all its plants and animal that live within or nearby which has adapted to life in such environment.
<b>Assessment</b>	Examination in order to decide.
<b>Auditing</b>	Evaluation process carried out by an independent auditor to determine effectiveness and performance of P2M2 and to ensure compliance of a project with Condition Of Approval (COA).
<b>Backshore</b>	That zone of the shore or beach lying between the foreshore and the coastline comprising the berm or berms and acted upon by waves only during severe storms, especially when combined with exceptionally high water.
<b>Bank</b>	<ul style="list-style-type: none"><li>• The rising ground bordering a lake, river, or sea; or of a river or channel, for which it is designated as right or left as the observer is facing downstream.</li><li>• An elevation of the sea floor or larger area, located on a continental (or island) shoals.</li></ul>
<b>Baseline Data</b>	Site specific data pertaining to the existing environment (physical, chemical, biological and human). It establishes the ambient situation, usually before some drastic change occurs, e.g. a major project.
<b>Baseline Studies</b>	Baseline studies are fundamental surveys of the physico-chemical, biological, and human environment. They may be specific to a particular project or they may have to be provide a data-base for future Environmental Assessment or Environmental Impact Assessment at other localities.
<b>Basin</b>	A depressed area with no surface outlet, such as a lake basin or an enclosed sea.
<b>Bathymetry</b>	The measurement of water depths in oceans, seas, and lakes; also information derived from such measurement.
<b>Beach</b>	On a shore, the area on which the wave break and over which shore debris, such as sand, shingle, pebbles accumulate. A beach includes backshore and foreshore.
<b>Bed</b>	The bottom of a watercourse, or any body of water.
<b>Best Available Technology (BAT)</b>	The most current and advanced technologies and methods available for pollution prevention and management.
<b>Best Management Practices (BMPs)</b>	Using the best controlling measures to prevent or mitigate pollution of other sources of environmental impact.
<b>Bill of Quantities (BQ)</b>	Itemised list of construction works and management requirements for a project issued to a contractor or specialist to quote.

<b>Biological Diversity/Biodiversity</b>	The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.
<b>Breakwater</b>	A structure protecting a shore area, harbour, anchorage, or basin from waves.
<b>Buffer Zone</b>	An area designated around the boundary of a project and/or adjacent to environmentally sensitive areas where no or limited development is allowed for the purpose of mitigating against any environmental impact from the site to the surrounding areas or vice versa.
<b>Carrying Capacity</b>	<ul style="list-style-type: none"> <li>• Maximum population size if the species that the environment can sustain indefinitely, given the flood, habitat, water, and other necessities available in the environment.</li> <li>• The ability of a built resource or natural resource to absorb population growth and related physical development without degradation.</li> </ul>
<b>Catchment</b>	The area determined by landform within which falling rain will contribute to runoff at a particular point such as a stream or river. Often, it is used synonymously with basin or watershed.
<b>Chart Datum</b>	<ul style="list-style-type: none"> <li>• The plane or level to which soundings (or elevations) or tide heights are referenced (usually Low Water Datum).</li> </ul>
<b>Checklist</b>	A list for verification purposes, a comprehensive list; an inventory.
<b>Coastal Protection</b>	Any structural and non-structural works used in the reduction of erosion of the coastline.
<b>Community</b>	Any naturally occurring group of different organisms sharing a particular habitat.
<b>Compliance Monitoring (CM)</b>	Monitoring of P2M2 installed within the project site to ensure they are functional and effective in treating pollutants.
<b>Conditions of Approval (COA)</b>	A set of legally binding instructions and requirements prepared by DOE after the end of EIA process for the Project Proponent to abide by for all phases of the development.
<b>Coral Reefs</b>	A coral-alga mound or ridge of in-place coral colonies and skeletal fragments, carbonate sand, and organically-secreted calcium carbonate. A coral reef is built up around wave-resistant framework, usually of older coral colonies.
<b>Cumulative Impact</b>	The total sum from combination of various activities or sources resulting in accumulation and aggregation of multiple impacts which would be significantly expanded as compared to a single event.
<b>Cut and Fill</b>	Procedure in which the elevation of a landform surface is modified by the removal or addition of surface material.
<b>Data</b>	A general term used to denote any kind or all facts in the form of numbers, letters, text or symbols. (Raw facts or statistics which alone have little or no meaning, but as a group allow some meaningful relationships to be drawn).
<b>Development Order (DO)</b>	A legal approval for a Project Proponent to proceed with the construction of a project once they have satisfied the requirements of the approving authority, i.e. One Stop Centre (OSC).

<b>Disposal Area</b>	A designated or gazette area specifically for the storage of waste or excess materials generated from construction.
<b>Drainage</b>	Natural or artificial removal of surface and sub-surface water from an area.
<b>Earthworks</b>	<ul style="list-style-type: none"> <li>• Excavation and relocation of large quantities of soil and earth to form slopes, platforms, embankments, etc.</li> </ul>
<b>Ecology</b>	The study of the habits and modes of life-living organisms (such as plants and animals), and their relationships to each other and their environment.
<b>Ecosystem</b>	A dynamic complex of plant, animal and microorganism communities and their non-living environment that interact as a function unit.
<b>Emergency Response Plan (ERP)</b>	A manual incorporating all measures, actions, roles and responsibilities for the project team to take action during emergencies and crisis, covers various scenarios that may occur during construction and operations.
<b>Environment</b>	The surrounding zone (the specific zone to be affected by the project), all natural resources (physical and biological and human resources people, economic development and quality of life values).
<b>Environment Impact Assessment (EIA)</b>	A study to identify, predict, evaluate and communicate information about the impacts (both beneficial and adverse) on the environment of a proposed development activity and to detail out the mitigating measures prior to project approval and implementation.
<b>Environmental Management Plan (EMP)</b>	A legally binding document which spells out in concise details the environmental requirements and P2M2 as detailed in the EIA and LD-P2M2 as well as other information, e.g. environmental budget, monitoring and audit programmes and roles and responsibilities of the Environmental Management Team (EMT).
<b>Environmental Management Team (EMT)</b>	Special team comprising of relevant personnel of a project with specific roles and responsibilities in the management of environmental matters at-site.
<b>Environmental Manager (EM)</b>	A person mandated to oversee all aspects of managing environmental compliance for a project, usually heads the EMT.
<b>Environmental Monitoring</b>	Observation of effects of development projects on environmental resources and values, including sampling, analysis, temporary monitoring during project construction stage and continuing periodic monitoring following commencement of project operations. Environmental monitoring allows the actual impacts of the project to be measured and improves the data-base for future impact prediction.
<b>Environmental Officer</b>	The site personnel directly in charge of supervising a site to ensure that all P2M2 are in place, maintained and repaired and that all requirements within the COA are adhered by the contractors. Other task includes training of staff, taking samples for reporting and attending site walkabouts and meetings.
<b>Environmental Performance Monitoring Committee (EPMC)</b>	Organisational setup within the Project Proponent which shall manage environmental compliance at the working group level during construction and operation phases of a project.

<b>Environmental Pledge/Declaration</b>	Statement by the Project Proponent and/or Qualified Person preparing the EIA that they have carried out the study in the proper manner and all facts and figures are to their knowledge true and correct and that they will carry out the recommendations and P2M2 for the project as described in the EIA.
<b>Environmental Regulatory Compliance Monitoring Committee (ERCMC)</b>	Organisational setup within the Project Proponent which shall management environmental compliance at the policy level during construction and operational phase of a project.
<b>Environmental Scoping Information (ESI)</b>	A report detailing the findings of the environmental scoping carried out for a site to allow for decision making through identification of significant impacts, proposals for mitigation measures and required studies.
<b>Environmental Scoping Matrix</b>	Technique to integrated large amounts of information for a rapid assessment in identifying significant impacts based on project activities and their impacts on different aspects of the environment.
<b>Environmentally Sensitive Areas (ESA)</b>	Areas of critical importance which has characteristics of significant biodiversity value; natural heritage; scenic beauty; provision of important ecosystem services; and/or is easily degraded due to natural and anthropogenic impacts, warranting its protection and conservation.
<b>Erosion</b>	The detachment or wearing away of the earth's surface, particularly soil or loose materials, by flowing water, wind or other geological agents.
<b>Erosion and Sediment Control Plan (ESCP)</b>	Document incorporating all erosion and sediment control measures as required by the Department of Irrigation and Drainage (DID) for a site. Usually prepared by a professional engineer (PE) to be endorsed by DID.
<b>Eutrophication</b>	The natural process of nutrient enrichment of water body which is enhanced by phosphate and nitrate waste from human activity. It can cause excessive organic growth and depletion of oxygen concentrations, resulting in death of aquatic animals and higher plants.
<b>Geological Terrain Mapping (GTM)</b>	Report prepared by a licensed Geologist required by the Minerals and Geoscience Department (JMG) to be submitted for DO approval, contains information on the terrain, geological makeup, soils and slope classification to allow for assessment of site suitability for construction.
<b>Geology</b>	The science which has for its object the investigation of the earth's crust, of the strata which enter into its composition with their mutual relations, and of the successive changes to which their present condition and position are due.
<b>Government Agencies (GAs)</b>	Personnel from government ministries, agencies and/or department with a role in specific committees, approving authorities or decision making bodies.
<b>Self-Regulation (SR)</b>	An initiative by DOE to cultivate environmental ownership and excellence in environmental commitment from the sectors regulated by DOE especially in regards to performance monitoring of pollution control measures, scheduled reporting, record keeping, qualified persons and involvement of environmental professionals with specific roles.
<b>Habitat</b>	The normal abode or locality of an animal or plant; the physical environment of a community; the place where a person or thing can usually be found.

<b>Health Impact Assessment (HIA)</b>	A report which assesses the health impacts of policies, plans and projects using qualitative, quantitative and participatory techniques for decision making. Usually required by the Ministry of Health (MOH) or Department of Health (DOH) for projects with health implications to nearby populations.
<b>Hydraulic Report</b>	A detailed technical report used in the assessment of impacts from a project/activity on the coastal and marine environment based on various scenarios and site conditions.
<b>Hydrology</b>	The study of the rainfall and runoff process and related to the derivation of hydrographs for given floods, droughts and seasonal pattern of inundation.
<b>Impact Monitoring (IM)</b>	Monitoring of impacts outside of the project site to ascertain its origin and magnitude.
<b>Land Acquisition/ Alienation</b>	The act of obtaining, either voluntarily or by law, the necessary land from existing landowners. May involve relocation of existing population on the said piece of land.
<b>Land Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2)</b>	Document incorporating construction methods, processes, materials and practices intended to prevent, reduce or eliminate the generation of pollutants at the source (development area) during any land-disturbing activity through the protection of natural resources through incorporation of BMPs.
<b>Land-Disturbing Activities</b>	Activities such as clearing of trees or vegetation, excavating, raising or sloping of ground, trenching, grading and blasting.
<b>Mangroves</b>	One of several genera of tropical trees or shrubs which produce many prop roots and grow along low-lying coasts into shallow water.
<b>Marine Risk Assessment (MRA)</b>	Technical document which studies the existing marine traffic of the area of proposed project, identifying constraints for navigation and risk of potential collision or mishaps during vessel operations.
<b>Method Statement</b>	A detailed scope and account of proposed construction techniques, equipment and machinery usage and structural and non-structural measures applied in carrying out construction, usually prepared by the Contractors.
<b>Mitigation and Abatement Measures</b>	These are measures adopted into the final project plan which either moderate or completely forestall potential environmental impact.
<b>Modelling</b>	To simulate a particular feature of the world using mathematical and computer aids to better understand, define, quantify and visualise the process.
<b>Monitoring</b>	To measure, systematically and repeatedly, the continuing conditions to track change(s).
<b>Noise</b>	A sound, especially one that is loud or unpleasant or that causes disturbance.
<b>Oil spill</b>	Release of a liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity and is a form of pollution.
<b>Outfall</b>	The place where a river, drain, or sewer empties into the sea, a river or a lake.
<b>Performance Monitoring (PM)</b>	Monitoring of performance system.
<b>Pile</b>	A long, heavy timber or section of concrete or metal that is driven or jetted into the earth or seabed to serve as a support or protection.
<b>Piling</b>	A group of piles

<b>Pollution Prevention and Mitigation Measures (P2M2)</b>	The various methods (structural and non-structural) required to ensure that pollution does not occur or at least minimised as a result of a project.
<b>Prescribed Activity</b>	Any activity specified by the Director General of Environment under the Environmental Quality (Prescribed Activity) (Environmental Impact Assessment) Order 2015, as requiring to undergo an EIA.
<b>Project Activities</b>	Specified tasks undertaken throughout the course of a project (earthworks, construction or operational) which serves to meet certain objectives.
<b>Project Brief</b>	Information pertaining to a project or development, including the details of the project, layout, method statement, location, etc. which can assist in assessment of the project.
<b>Project Proponent</b>	The main person, organisation or body which is proposing to undertake a project or activity.
<b>Public Display</b>	Mandatory viewing of Second Schedule EIA for fixed period of time whereby the public can forward recommendations and objections to the report for consideration by DOE in the EIA approval process.
<b>Public Participation/Engagement</b>	The process whereby the public and related stakeholders are allowed the opportunity to participate in the planning, decision making, objection, idea sharing and/or approval of a project which may affect them. Can be mandated or voluntary.
<b>Qualified Person</b>	A person appointed by the Director General of Environment or is certified by/registered with DOE under Section 34A (2B) to carry out an EIA study.
<b>Recreation</b>	Activity of leisure, leisure being discretionary time.
<b>Residual Impacts</b>	Impacts that still persist despite P2M2 and BMPs put in place.
<b>Revised TOR</b>	Final version of the TOR after incorporation of comments from the TRC and additional information.
<b>Risk</b>	A combination of the likelihood of an occurrence of a hazardous event with specified period or in specified circumstances.
<b>Runoff</b>	The portion of precipitation that runs off the surface as opposed to soaking in.
<b>Sampling Station</b>	Location identified and designated for collection of environmental data (air, water, noise, vibration, ecology, etc.).
<b>Schedule</b>	Categorisation of Prescribed Activities divided into the First Schedule (EIA without need for public display and will be processed by DOE State) and Second Schedule (EIA requiring public display and will be processed by DOE HQ).
<b>Scheduled Wastes</b>	Any form of toxic and hazardous wastes listed under the First Schedule of the Environmental Quality (Schedule Wastes) Regulations 2005 (Amendment 2007).
<b>Scoping</b>	Initial phase in an EIA to identify the key environmental issues and the study spatial and temporal boundaries.
<b>Screening</b>	Process by which a proposed development project is identified as being subjected to a regulatory provision requiring an EIA.
<b>Sedimentation</b>	The deposition of sediment from suspension in water.

<b>Self-regulation</b>	The adoption and implementation of measures and practices by a Project Proponent on their own initiative without requiring intervention of the authorities to safeguard the environment and meet all regulatory requirements of the country.
<b>Setback</b>	Distance which a building or other structure is set back from a street or road, a river, a shore or any other place which is deemed to need protection.
<b>Sewage</b>	<ul style="list-style-type: none"> <li>• Any liquid waste or wastewater discharge containing human, animal, domestic or putrescible matter in suspension or solution, and includes liquids containing chemicals in solution either in the raw, treated or partially treated form.</li> <li>• Any liquid discharges containing human excreta, animal or vegetable matters in suspension or solution derived from domestic activities and being generated from household, commercial, institutional and industrial premises including liquid discharges from water closets, basins, sinks, bathrooms and other sanitary appliances but excluding rain water and prohibited effluent.</li> </ul>
<b>Sewage Treatment System (STS)/Plant (STP)</b>	Any facility designed and constructed for the purpose of reducing potential of the sewage to cause pollution.
<b>Siltation</b>	The deposition or accumulation of silt that is suspended in a body of water.
<b>Site Suitability Assessment (SSA)</b>	A study on the suitability of various sites and the determination based on specific criteria on the best possible site for a project.
<b>Social Impact Assessment (SIA)</b>	A process to identify, predict, evaluate and communicate information about the social impacts of a proposed project, policy, programme or plan on a community and their activities, and to choose the best development option and subsequently propose mitigation measures.
<b>Soil Investigation (SI)</b>	Technical study on the soil and sub-surface strata of a project site to determine the sub-surface conditions and engineering requirements needed prior to a development
<b>Spoil</b>	Rock and debris produced by tunnelling, dredging and other excavations.
<b>Statement of Need</b>	A brief on the justifications for a project, including supporting arguments and evidence on the necessity of the project and benefits that will be generated.
<b>Stormwater</b>	Water that originates during precipitation events, e.g. rainfall.
<b>Sullage</b>	Wastewater that arise from domestic activities such as washing in bathrooms and kitchen, including water from food preparation and dishwashing, which does not contain human excreta.
<b>Suspended Sediment</b>	Sediment suspended in a fluid by its (fluid) turbulent flow.
<b>Technical Review Committee (TRC)</b>	A panel of decision makers comprising DOE officer, AIs and GAs that are selected to review the TOR and/or EIA to provide approval based on the reports submitted by the Project Proponent and Qualified Person(s).

<b>Terms of Reference (TOR)</b>	Product from scoping process which sets the objectives, defines the scope, and establishes the strategy and schedule for EIA process to address identified significant issues.
<b>Terrain</b>	Pertaining to the physical features of a land or area.
<b>Tide</b>	<ul style="list-style-type: none"> <li>The periodic rising and falling of the water that result from gravitational attraction of the moon and sun and other astronomical bodies acting upon the rotating earth.</li> </ul>
<b>Topography</b>	The configuration of the surface of the earth, including its relief, the position of its streams, roads, cities, etc. The earth's natural and physical features collectively.
<b>TOR Adequacy Check (TORAC)</b>	A review by a selected panel of DOE officers, AIs and/or GAs on whether a TOR has been prepared in accordance with DOE requirements and contains all necessary information for decision making to be made.
<b>Traffic Impact Assessment (TIA)</b>	A study/report on the condition of the roads and traffic in an area and if there is adequate capacity to meet the increasing demand from a project or to identify measures required to ensure that traffic will be smooth and uninterrupted.
<b>Vessels</b>	Any crafts travelling on water.
<b>Visual/Aesthetics</b>	Pleasing scenery, vistas and view to and view to an audience.
<b>Wastes</b>	Any substance which is discarded after primary use. Comprises of various types of wastes, such as municipal wastes, scheduled wastes, biomass wastes, etc.
<b>Water quality</b>	A term to describe the chemical, physical and biological characteristics of water.
<b>Water Quality Index (WQI)</b>	An index integrating six water quality parameters to provide a general categorisation to determine the condition of the water source.
<b>Zone of Impact (ZOI)</b>	The maximum area which will receive the impacts from the project.
<b>Zone of Study (ZOS)</b>	Boundary identified for the EIA Study which would be the main spatial area to carry out baseline data gathering, determine extent of modelling and assessment and other supporting studies.

# APPENDIX A

## APPENDIX A

### RIVER WATER QUALITY

#### National Water Quality Standards (NWQS) for Malaysia

Parameter	Unit	Class					
		I	IIA	IIB	III	IV	V
AN	mg/L	0.1	0.3	0.3	0.9	2.7	>2.7
BOD	mg/L	1	3	3	6	12	>12
COD	mg/L	10	25	25	50	100	>100
DO	mg/L	7	5 – 7	5 – 7	3 – 5	<3	<1
pH	-	6.5 – 8.5	6 – 9	6 – 9	5 – 9	5 – 9	-
Colour	TCU	15	150	150	-	-	-
Electric Conductivity*	µS/cm	1,000	1,000	-	-	6,000	-
Floatables	-	N	N	N	-	-	-
Odour	-	N	N	N	-	-	-
Salinity	%	0.5	1	-	-	2	-
Taste	-	N	N	N	-	-	-
Total Dissolved Solids	mg/L	500	1,000	-	-	4,00	-
TSS	mg/L	25	50	50	150	300	300
Temperature	°C	-	Normal + 2°C	-	Normal + 2°C	-	-
Turbidity	NTU	5	50	50	-	-	-
Faecal Coliform**	count/100 mL	10	100	400	5,000 (20,000) <sup>a</sup>	5,000 (20,000) <sup>a</sup>	-
Total Coliform	count/100 mL	100	5,000	5,000	50,000	50,000	>50,000

Source: Malaysia Environmental Quality Report (EQR) 2015, DOQ, 2015.

Notes: N = No visible floatable materials or debris, no objectionable odour or no objectionable taste.

\* = Related parameters, only one recommended for use.

\*\* = Geometric mean.

a = Maximum not to be exceeded.

**National Water Quality Standards (NWQS) for Malaysia (Continued)**

Parameter	Unit	Class				
		I	IIA/IIB	III	IV	V
Aluminium, Al	mg/L	NATURAL LEVELS OF ABSENT	-	(0.06)	0.5	LEVELS ABOVE IV
Arsenic, Ar	mg/L		0.05	0.4 (0.05)	0.1	
Barium, Ba	mg/L		1	-	-	
Cadmium, Cd	mg/L		0.01	0.01* (0.01)	0.01	
Chromium, Cr(IV)	mg/L		0.05	1.4 (0.05)	0.1	
Chromium, Cr(III)	mg/L		-	2.5	-	
Copper, Cu	mg/L		0.02	-	0.2	
Hardness	mg/L		250	-	-	
Calcium, Ca	mg/L		-	-	-	
Magnesium, Mg	mg/L		-	-	-	
Sodium, Na	mg/L		-	-	3 SAR	
Potassium, K	mg/L		-	-	-	
Iron, Fe	mg/L		1	1	1 (Leaf) 5 (Others)	
Lead, Pb			0.05	0.02* (0.01)	5	
Manganese, Mn	mg/L		0.1	0.1	0.2	
Mercury, Hg	mg/L		0.001	0.004 (0.0001)	0.002	
Nickel, Ni	mg/L		0.05	0.9*	0.2	
Selenium, Se	mg/L		0.01	0.25 (0.04)	0.02	
Silver, Ag	mg/L		0.05	0.0002	-	
Stanium, Sn	mg/L		-	0.004	-	
Uranium, U	mg/L	-	-	-		
Zinc, Zn	mg/L	5	0.4*	2		
Boron, B	mg/L	1	(3.4)	0.8		
Chlorine, Cl	mg/L	200	-	80		
Chlorine, Cl <sub>2</sub>	mg/L	-	(0.02)	-		
Cyanide, CN	mg/L	0.02	0.06 (0.02)	-		
Flouride, F	mg/L	1.5	10	1		

Source: Malaysia EQR 2015, DOE, 2015.

Notes: \* = At hardness 50 mg/L CaCO<sub>3</sub>

# = Maximum (unbracketed) and 24-hour average (bracketed) concentrations.

N = Free from visible film sheen, discolouration and deposits.

**National Water Quality Standards (NWQS) for Malaysia (Continued)**

Parameter	Unit	Class				
		I	IIA/IIB	III	IV	V
Nitrite, NO <sub>2</sub>	mg/L	NATURAL  LEVELS  OR  ABSENT	0.4	0.4 (0.03)	-	LEVELS    ABOVE  IV
Nitrate, NO <sub>3</sub>	mg/L		7	-	5	
Phosphorus, P	mg/L		0.2	0.1	-	
Silica	mg/L		50	-	-	
Sulphide, SO <sub>4</sub>	mg/L		250	-	-	
Sulfur, S	mg/L		0.05	(0.001)	-	
Carbon dioxide, CO <sub>2</sub>	mg/L		-	-	-	
Gross – alfa	Bq/L		0.1	-	-	
Gross – beta	Bq/L		1	-	-	
Ra –226	Bq/L		<0.1	-	-	
Sr – 90	Bq/L		<1	-	-	
CCE	µg/L		500	-	-	
MBAS/BAS	µg/L		500	5,000 (200)	-	
O&G (Mineral)	µg/L		40; N	N	-	
O&G (Emulsified edible)	µg/L		7,000; N	N	-	
PCB	µg/L		0.1	6 (0.05)	-	
Phenol	µg/L		10	-	-	
Aldrin/Dieldrin	µg/L		0.02	0.2 (0.01)	-	
BHC	µg/L		2	9 (0.1)	-	
Chlordane	µg/L		0.08	2 (0.02)	-	
Ƨ – DDT	µg/L	0.1	(1)	-		
Endosulfan	µg/L	10	-	-		
Heptachlor/ Epoxide	µg/L	0.05	0.9 (0.06)	-		
Lindane	µg/L	2	3 (0.4)	-		
2,4 – D	µg/L	70	450	-		
2,4,5 – T	µg/L	10	160	-		
2,4,5 – TP	µg/L	4	850	-		
Paraquat	µg/L	10	1,800	-		

Source: Malaysia EQR 2015, DOE, 2015.

Notes: \* = At hardness 50 mg/L CaCO<sub>3</sub>

# = Maximum (unbracketed) and 24-hour average (bracketed) concentrations.

N = Free from visible film sheen, discolouration and deposits.

### DOE Water Quality Classification by WQI

Water Quality Index	Index Range		
	Clean	Slightly Polluted	Polluted
WQI	81 – 100	60 – 80	0 – 59

### DOE WQI Classification

Parameter	Unit	Class				
		I	II	III	IV	V
AN	mg/L	<0.1	0.1 – 0.3	0.3 – 0.9	0.9 – 2.7	>2.7
BOD	mg/L	<1	1 – 3	3 – 6	6 – 12	>12
COD	mg/L	<10	10 – 25	25 – 50	50 – 100	>100
DO	mg/L	>7	5 – 7	3 – 5	1 – 3	<1
pH	-	>7.0	6.0 – 7.0	5.0 – 6.0	<5	>5.0
TSS	mg/L	<25	25 – 50	50 – 150	150 – 300	>300
	<b>WQI</b>	<b>&gt;92.7</b>	<b>76.5 – 92.7</b>	<b>51.9 – 76.5</b>	<b>31.0 – 51.9</b>	<b>&lt;31.0</b>

Source: Malaysia EQR 2015, DOE, 2015.

## MARINE WATER QUALITY

### Marine Water Quality Criteria and Standards for Malaysia (MWQCS)

Parameter	Unit	Class 1	Class 2	Class 3	Class E
		Preservation, Marine Protected Areas, Marine Parks	Marine life, Fisheries, Coral reefs, Recreational and Mariculture	Ports, Oil and Gas Fields	Mangroves, Estuarine and Rivermouth Water
Temperature	°C	≤ 2°C increase over maximum ambient	≤ 2°C increase over maximum ambient	≤ 2°C increase over maximum ambient	≤ 2°C increase over maximum ambient
Dissolved Oxygen	mg/L	>80% saturation	5	3	4
Total Suspended Solids	mg/L	25 mg/L or ≤ 10% increase in seasonal average, whichever is lower	50 mg/L (25 mg/L) or ≤ 10% increase in seasonal average, whichever is lower	100 mg/L or ≤ 10% increase in seasonal average, whichever is lower	100mg/L or ≤ 30% increase in seasonal average, whichever is lower
Oil and Grease	mg/L	0.01	0.14	5.0	0.14
Mercury*	µg/L	0.04	0.16 (0.04)	50	0.5
Cadmium	µg/L	0.5	2 (3)	10	2
Chromium (VI)	µg/L	5	10	48	10
Copper	µg/L	1.3	2.9	10	2.9
Arsenic (III)*	µg/L	3	20 (3)	50	20 (3)
Lead	µg/L	4.4	8.5	50	8.5
Zinc	µg/L	15	50	100	50
Cyanide	µg/L	2	7	20	7
Ammonia (unionised)	µg/L	35	70	320	70
Nitrite (NO <sub>2</sub> )	µg/L	10	55	1,000	55
Nitrate (NO <sub>3</sub> )	µg/L	10	60	1,000	60
Phosphate	µg/L	5	75	670	75
Phenol	µg/L	1	10	100	10

Parameter	Unit	Class 1	Class 2	Class 3	Class E
		Preservation, Marine Protected Areas, Marine Parks	Marine life, Fisheries, Coral reefs, Recreational and Mariculture	Ports, Oil and Gas Fields	Mangroves, Estuarine and Rivermouth Water
Tributyltin (TBT)	µg/L	0.001	0.01	0.05	0.01
Faecal coliform	-	70 faecal coliform count/100 mL	100 faecal coliform count/100 mL & (70 faecal coliform count/100 mL)	200 faecal coliform count/100 mL	100 faecal coliform count/100 mL & (70 faecal coliform count/100 mL)
Polycyclic Aromatic Hydrocarbons (PAHs)	µg/L	100	200	1,000	1,000

Source: Malaysia EQR 2015, DOE, 2015

Note: \* MWQCS in parentheses are for coastal and marine water areas where seafood for human consumption is applicable.

### Marine Water Quality Index Classification

Marine Water Quality Index	Index Range			
	Excellent	Good	Moderate	Poor
MWQI	90 – 100	80 – <90	50 – <80	0 – <50

Source: Malaysia EQR 2015, DOE, 2015

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# APPENDIX B

**APPENDIX B**  
**AIR QUALITY**  
**Malaysian Ambient Air Quality Standards (MAAQS)**

<b>Pollutant</b>	<b>Unit</b>	<b>Averaging Time</b>	<b>Standard (2020)</b>
PM <sub>10</sub>	µg/m <sup>3</sup>	1 year	40
		24 hours	100
PM <sub>2.5</sub>	µg/m <sup>3</sup>	1 year	15
		24 hours	35
SO <sub>2</sub>	µg/m <sup>3</sup>	1 hour	250
		24 hours	80
CO	mg/m <sup>3</sup>	1 hour	30
		8 hours	10
NO <sub>2</sub>	µg/m <sup>3</sup>	1 hour	280
		24 hours	70
O <sub>3</sub>	µg/m <sup>3</sup>	1 hour	180
		8 hours	100

Source: DOE Notice 1/2015, DOE, 2015. Note: IT = Interim

# APPENDIX C

## APPENDIX C

### SCHEDULE OF PERMISSIBLE SOUND LEVELS

#### FIRST SCHEDULE

#### RECOMMENDED PERMISSIBLE SOUND LEVEL ( $L_{Aeq}$ ) BY RECEIVING LAND USE FOR NEW DEVELOPMENT

Receiving Land Use Category	$L_{Aeq}$ Day 7.00 am – 10.00 pm	$L_{Aeq}$ Night 10.00pm – 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship).	55 dBA	50 dBA
Suburban Residential (Medium Density), Recreational	60 dBA	55 dBA
Urban Residential (High Density), Mixed Development	65 dBA	60 dBA
Commercial Business Zones	65 dBA	60 dBA
Industrial Zones	70 dBA	65 dBA

#### SECOND SCHEDULE

#### RECOMMENDED PERMISSIBLE SOUND LEVEL ( $L_{Aeq}$ ) BY RECEIVING LAND USE FOR EXISTING BUILT UP AREAS

Receiving Land Use Category	$L_{Aeq}$ Day 7.00 am – 10.00 pm	$L_{Aeq}$ Night 10.00pm – 7.00 am
Low Density Residential, Noise Sensitive Receptors, Institutional (School, Hospital, Worship).	60 dBA	55 dBA
Suburban and Urban Residential, Mixed Development	65 dBA	60 dBA
Commercial Business Zones	70 dBA	65 dBA
Industrial Zones	75 dBA	75 dBA

Note: The above prescribed  $L_{Aeq}$  limits are representative noise levels consistent with developed areas without noise disturbance generally deemed acceptable to majority of receptors occupying in premises at the respective land category.

### THIRD SCHEDULE

#### RECOMMENDED PERMISSIBLE SOUND LEVEL ( $L_{Aeq}$ ) TO BE MAINTAINED AT THE EXISTING NOISE CLIMATE

Existing Levels	Recommended Permissible Levels*
$L_{Aeq}$	Existing $L_{Aeq}$

Notes

1. Existing  $L_{Aeq}$  is determined from baseline measurements of the prevailing noise in the absence of the new noise sources(s); typically undertaken just prior to the operations of the new road, railway line or industrial premises operations, or alternatively with the noise source(s) being assessed to be temporarily disabled.
2. Due to uncertainty in measurements, noise levels within  $\pm 1.5$  dBA of the Existing  $L_{Aeq}$  is acceptable and deemed maintained at the existing noise climate.

### FOURTH SCHEDULE

#### LIMITING SOUND LEVEL ( $L_{Aeq}$ ) FROM ROAD TRAFFIC (FOR NEW ROADS AND/OR REDEVELOPMENT OF EXISTING ROADS)

Receiving Land Use Category	$L_{Aeq}$ Day 7.00 am – 10.00 pm	$L_{Aeq}$ Night 10.00pm – 7.00 am
<b>Noise Sensitive Areas Low Density Residential Areas</b>	60 dBA	55 dBA
<b>Suburban and Urban Residential (Medium and High Density)</b>	65 dBA	60 dBA
<b>Commercial and Mixed Development</b>	70 dBA	65 dBA
<b>Industrial</b>	75 dBA	70 dBA

Note: In situations where the existing sound levels of receptors are higher than limits prescribed above, or within (less than) 2 dBA of the above prescribed limits, the maximum permissible levels stipulated in Schedule 3 shall apply.

## FIFTH SCHEDULE

### LIMITING SOUND LEVEL ( $L_{Aeq}$ and $L_{max}$ ) FROM RAILWAY AND TRANSIT TRAINS (FOR NEW RAILWAY & TRANSIT LINES AND RE-ALIGNMENTS)

Receiving Land Use Category	$L_{Aeq}$ Day 7.00 am – 10.00 pm	$L_{Aeq}$ Night 10.00pm – 7.00 am	$L_{max}$ Day & Night
<b>Noise Sensitive Areas Low Density and Suburban Residential Areas</b>	60 dBA	55 dBA	75 dBA*
<b>Urban Residential Areas</b>	65 dBA	60 dBA	80 dBA*
<b>Commercial and Mixed Development</b>	70 dBA	65 dBA	80 dBA*
<b>Industrial</b>	75 dBA	75 dBA	NA

Note:

- \* $L_{max}$  noise levels prescribes herein are for train pass-by events only; assessed on trains pass-by events averaged over one hour (i.e. averages of train pass-by  $L_{max}$  noise levels from all train in one hour). Care in measurements must be exercised to ensure the  $L_{max}$  levels being measure and assessed are not from extraneous noise sources (typically road traffic vehicle pass-by, horns, sirens, etc.) not related to train pass-by events.
- In situations where the existing  $L_{Aeq}$  sound levels of receptors are higher than limits prescribes above or within (less than) 2 dBA of the prescribed limits, the maximum permissible  $L_{Aeq}$  levels stipulated in Schedule 3 shall apply.

## ANNEX A

### SCHEDULE OF RECOMMENDED VIBRATION LIMITS

#### SCHEDULE 1

#### **RECOMMENDED LIMITS FOR DAMAGE RISK IN BUILDINGS FROM STEADY STATE VIBRATION**

Damage Description	Vertical Vibration Peak Velocity $V_{max}$ , [mm/s] (0 to Peak) (10 – 100 Hz)
Safe	Less than 3
Caution Level (Damage Not Necessary Inevitable)	3 to 5
Minor Damage	5 to 30
Major Damage	More Than 30

(Source: ISO DP 4888: 1975)

## SCHEDULE 2

### RECOMMENDED LIMITS FOR DAMAGE RISK IN BUILDINGS FROM SHORT TERM VIBRATION

Type of Structure	Vibration Velocity $v_i$ [mm/s] at foundation (as defined by the respective rating curves of Figure 1)	Vibration Velocity $v_i$ [mm/s] at plane of floor of uppermost full storey (all frequencies)
Industrial buildings and building of similar design	Curve C	40
Commercial building, dwelling and buildings of similar design and/or use	Curve B	15
Structures that, because of their particular sensitivity to vibration, do not correspond to those listed above, or of great intrinsic value (e.g. residential houses, or buildings that are under preservation order)	Curve A	8

(Source: DIN 4150/3)

## SCHEDULE 3

### RECOMMENDED LIMITS FOR DAMAGE RISK IN BUILDINGS FROM SINGLE EVENT IMPULSIVE EXCITATION \*

Type of Structure	Ground Vibration Peak Particle Velocity $V_{max}$ [mm/s]	
	At low frequency < 40 Hz	At high frequency >40 Hz
Industrial buildings and buildings of similar design	40	50
Commercial building, dwelling and buildings of similar design and/or use	20	50
Structures that, because of their particular sensitivity to vibration, do not correspond to those listed above, or of great intrinsic value (e.g. residential houses, or buildings that are under preservation order)	12	50

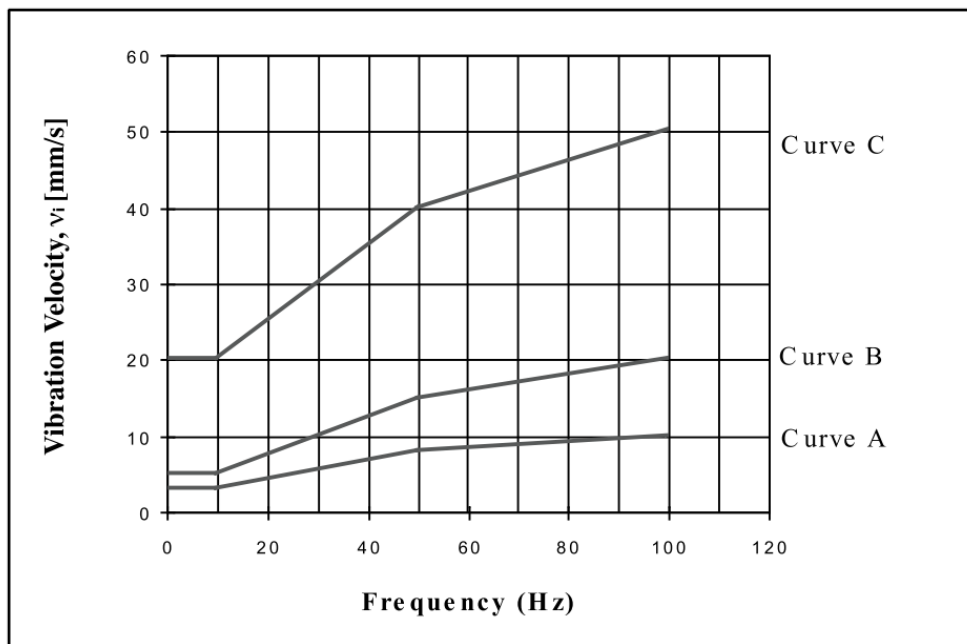
*\*Single event impulsive excitation not exceeding 3 occurrences per day.*

*(Adapted from DIN 42150/3, and Swiss Standard for Vibration Damage to Buildings).*

## SCHEDULE 4

### ACCEPTABLE ROAD TRAFFIC INDUCED VIBRATIONS IN BUILDINGS

Type of Building and Foundation	Recommended Vertical Velocity Limit, $v_{max}$ [mm/s]
-Especially sensitive buildings, and buildings of cultural and historical value	1
-Newly built buildings, and/or foundation of a foot plate (spread footings)	2
-Buildings on cohesion piles	3
-Buildings on bearing piles or friction piles	5



**FIGURE 1**

Foundation Vibration velocity Limiting Values for Vectorial Sum of Vibration Levels in Three Orthogonal Axes.

## SCHEDULE 5

### RECOMMENDED LIMITS FOR HUMAN RESPONSE AND ANNOYANCE FORM STEADY STATE VIBRATIONS

<b>Receiving Land Use Category</b>	<b>Day Time 7.00 am – 10.00 pm</b>	<b>Night Time 10.00 pm – 7.00 am</b>
Vibration Sensitive Areas	Curve 1	Curve 1
Residential	Curve 2 to Curve 4	Curve 2
Commercial, Business	Curve 4 to Curve 8	Curve 4
Industrial	Curve 8 to Curve 16	Curve 8 to Curve 16

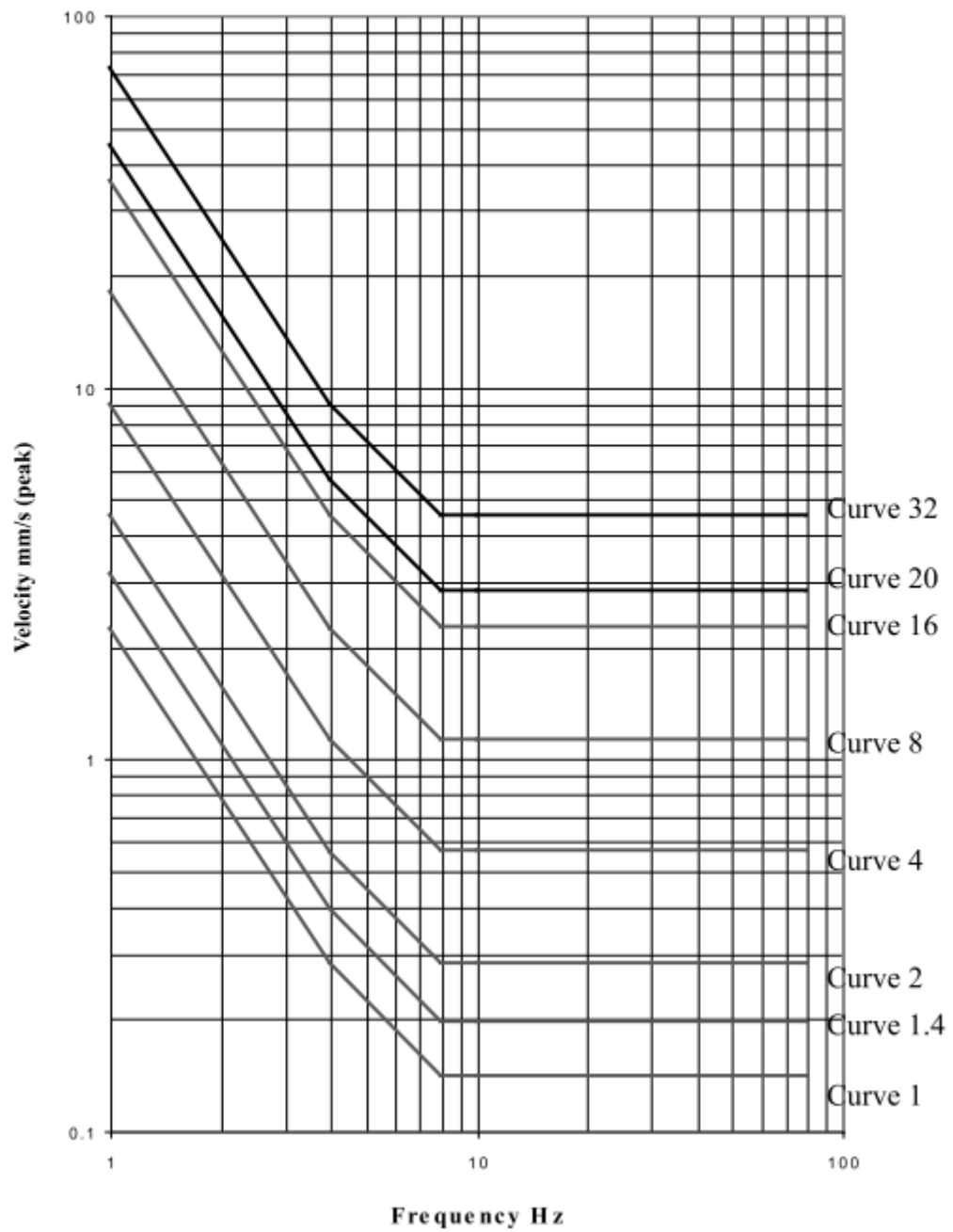
## SCHEDULE 6

### RECOMMENDED LIMITS FOR HUMAN RESPONSE AND ANNOYANCE FORM STEADY SHORT TERM VIBRATIONS

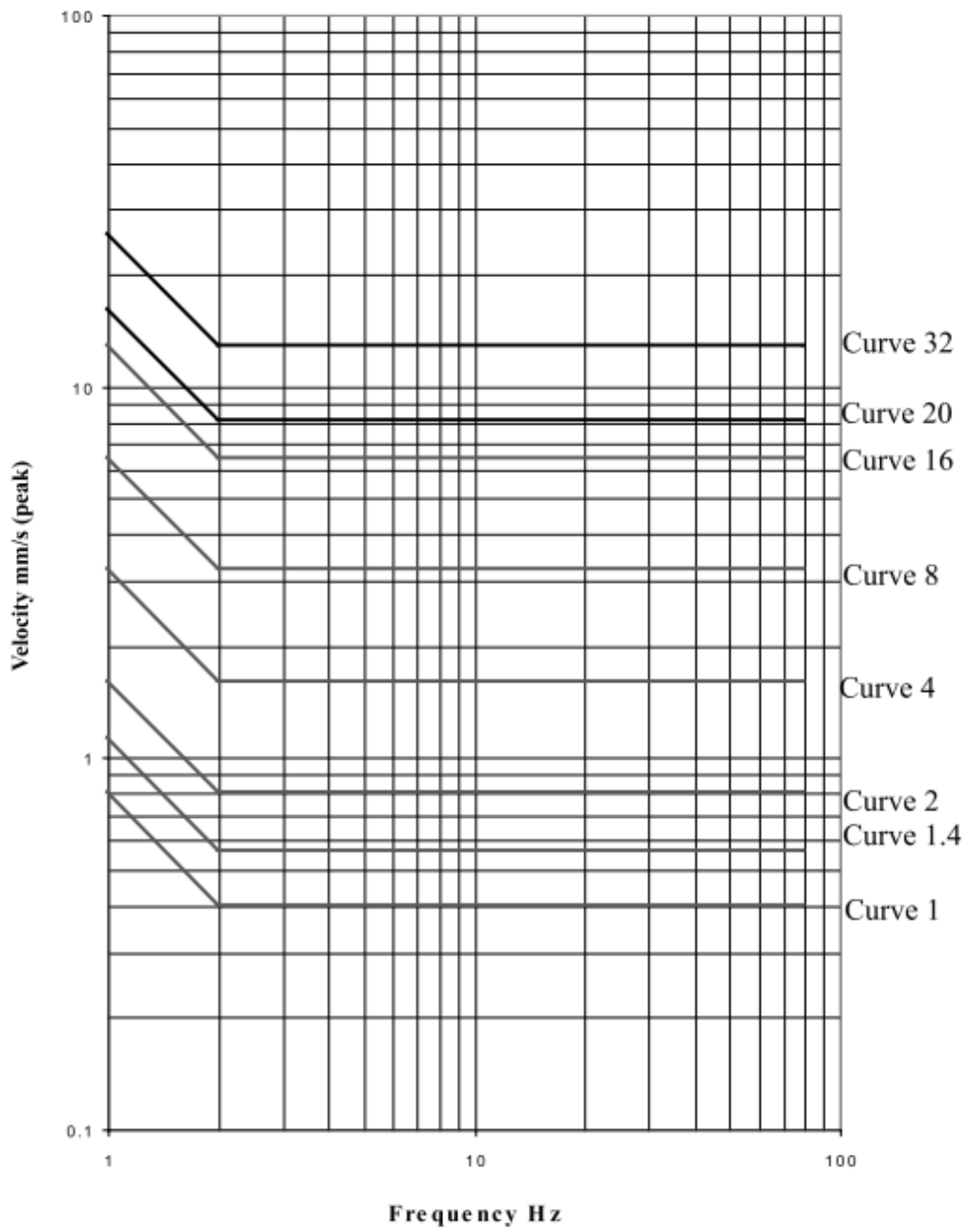
<b>Receiving Land Use Category</b>	<b>Day Time 7.00 am – 10.00 pm</b>	<b>Night Time 10.00 pm – 7.00 am</b>
Vibration Sensitive Areas	Curve 1	Curve 1
Residential	Curve 8 to Curve 16	Curve 4
Commercial, Business	Curve 16 to Curve 20	Curve 16 to Curve 20
Industrial	Curve 32	Curve 32

*The above stipulated curves are defined in Figure 2 and 3. The base Curve 1 is based on the vibration perception threshold for human response as defined by BS 6472:1992 and ISO 2631. The designated numbers of subsequent curves are multiplying factors of the base curve.*

*(Source: ISO 2631 and BS 6472)*



**FIGURE 2. Building vibration z-axis curves for peak velocity**



**FIGURE 3. Building vibration x- and y-axis curves for peak velocity**

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# APPENDIX D

## APPENDIX D

### SIA KATEGORI 1

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
<b>PNEBUSGUNAAN PINGGIR LAUT</b>			
1	Penebusgunaan Pinggir Laut	Penebusgunaan Pinggir Laut	<ul style="list-style-type: none"> <li>▪ Yang meliputi 50 hektar atau lebih; dan</li> <li>▪ Tidak termasuk penebusgunaan untuk pembinaan jeti atau pemulihan pantai (oleh JPS)</li> </ul>
<b>PNEBUSGUNAAN PINGGIR LAUT</b>			
2	Lapangan Terbang	<ul style="list-style-type: none"> <li>▪ Lapangan Terbang Antarabangsa</li> <li>▪ Lapangan Terbang Domestik</li> <li>▪ Lapangan Terbang Tentera</li> </ul>	<ul style="list-style-type: none"> <li>▪ Melibatkan lapangan terbang penumpang &amp; kargo</li> <li>▪ Termasuk projek menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada, atau pembinaan landasan terbang baru, yang melibatkan pengambilan balik tanah</li> </ul>
	Pelabuhan Laut	<ul style="list-style-type: none"> <li>▪ Pelabuhan Nasional</li> <li>▪ Pelabuhan Wilayah</li> <li>▪ Pelabuhan Negeri – yang terletak di sempadan negeri</li> <li>▪ Pangkalan Tentera Laut</li> </ul>	<ul style="list-style-type: none"> <li>▪ Merangkumi pelabuhan penumpang &amp; kargo</li> <li>▪ Termasuk project menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada</li> <li>▪ Tidak termasuk jeti penumpang, nelayan/ APMM/ Polis Marin</li> </ul>
	Pelabuhan Darat	<ul style="list-style-type: none"> <li>▪ Pelabuhan darat</li> </ul>	<ul style="list-style-type: none"> <li>▪ Semua pelabuhan darat</li> <li>▪ Termasuk project menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada</li> </ul>
	Rangkaian Pengangkutan Kereta Api	<ul style="list-style-type: none"> <li>▪ Landasan &amp; stesen kereta api</li> </ul>	<ul style="list-style-type: none"> <li>▪ Melibatkan kereta api penumpang &amp; barang</li> <li>▪ Termasuklah kereta api laju, kereta api antara bandar</li> <li>▪ Melibatkan landasan yang merentasi 2 negeri atau lebih</li> <li>▪ Projek menaik taraf yang melibatkan pembinaan landasan baru yang melibatkan pengambilan balik tanah</li> </ul>
	Pelabuhan Laut	<ul style="list-style-type: none"> <li>▪ Lebuhraya ekspres (<i>expressway</i>)</li> <li>▪ Lebuhraya (<i>highway</i>)</li> </ul>	<ul style="list-style-type: none"> <li>▪ <i>Expressway &amp; highway</i> adalah seperti mana diklasifikasi oleh JKR &amp; LLM</li> <li>▪ Lebuhraya hendaklah merentasi 2 negeri (termasuk Wilayah Persekutuan) atau lebih</li> <li>▪ Termasuk projek menaik taraf yang melibatkan pengambilan balik tanah</li> </ul>

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
2	Stesen Jana Kuasa	<ul style="list-style-type: none"> <li>Loji &amp; stesen jana kuasa</li> </ul>	<ul style="list-style-type: none"> <li>Semua loji &amp; stesen jana kuasa nuclear</li> <li>Loji &amp; stesen jana kuasa yang membekalkan kuasa kepada 2 negeri atau lebih (termasuk solar/ <i>wind farm</i>)</li> <li>Termasuk projek menaik taraf yang melibatkan pengambilan balik tanah</li> </ul>
	Empangan	<ul style="list-style-type: none"> <li>Empangan bekalan air</li> <li>Empangan hidro elektrik</li> <li>Empangan pengairan</li> </ul>	<ul style="list-style-type: none"> <li>Melibatkan pembinaan empangan atau kolam takuagan air dengan kawasan pembukaan seluas 100 hektar atau lebih</li> <li>Projek menaik taraf empangan yang melibatkan perluasan kawasan melebihi 50% kawasan</li> </ul>
	Tapak Pembuangan Sisa Toksik	<ul style="list-style-type: none"> <li>Tapak pembuangan sisa toksik</li> </ul>	<ul style="list-style-type: none"> <li>Semua tapak pembuangan sisa toksik</li> <li>Termasuk projek menaik taraf yang melibatkan perluasan kawasan melebihi 50% kawasan sedia ada yang melibatkan pengambilan balik tanah</li> </ul>
3	<b>INFRASTRUKTUR LAIN YANG BERKEPENTINGAN NEGARA</b>		
	<p>Akan ditentukan oleh MPFN dari semasa ke semasa, dengan tumpuan kepada:</p> <ul style="list-style-type: none"> <li>Infrastruktur yang merentasi 2 negeri atau lebih</li> <li>Infrastruktur yang melibatkan tadahan penduduk 2 negeri atau lebih</li> </ul>		

## SIA KATEGORI 2

BIL	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
1	<b>PERBANDARAN BARU</b>	
	Perbandaran Baru	<ul style="list-style-type: none"> <li>Keluasan melebihi 100 hektar atau bilangan penduduk melebihi 10,000 orang</li> <li>Mengakibatkan penempatan semula komuniti sedia ada</li> </ul>
2	<b>INFRASTRUKTUR UTAMA</b>	
	Lapangan Terbang (termasuk <i>short take off landing ports (STOLports)</i> swasta)	<ul style="list-style-type: none"> <li>Infrastruktur utama selain daripada yang termasuk di bawah SIA Kategori 1</li> <li>Infrastruktur yang dicadangkan di dalam kawasan <i>sensitive receptor</i> yang menimbulkan impak social ketara</li> </ul>
	Pelabuhan Laut (termasuk terminal kontena swasta)	
	Landsan Kereta Api & lebuh raya termasuk <i>dedicated trail</i> & lebuh raya swasta)	
Empangan & stesen jana kuasa		
3	<b>PEMBANGUNAN DI PUNCAK ATAU LERENG BUKIT</b>	
	Kawasan puncak atau lereng bukit	<ul style="list-style-type: none"> <li>Pembangunan seperti mana Panduan Pelaksanaan Akta 172: Pemohonan Cadangan Pemajuan Di Bawah Perenggan 22(2A)(c), Akta 172 (PPA 13) melibatkan: <ul style="list-style-type: none"> <li>Keluasan <math>\geq 20</math> hektar</li> <li>Kawasan pembangunan merupakan kawasan yang mempunyai lebih dair 50% kawasan berkecernuan <math>25^\circ</math></li> <li>Cadangan pembangunan yang berdensiti tinggi iaitu <math>\geq 40</math> unit per ekar (100 unit per hektar) bagi cadangan perumahan &amp; <math>\geq 1:4</math> nisbah plot bagi perniagaan</li> </ul> </li> </ul>

## SIA KATEGORI 3

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
1	Pusat Hiburan/ Taman Tema	<ul style="list-style-type: none"> <li>Pusat hiburan</li> <li>Taman tema</li> </ul>	<ul style="list-style-type: none"> <li>Pembinaan baru termasuk projek menaik taraf pada skala yang menyumbang kepada sensitivity masyarakat sekitar</li> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh menjejaskan kualiti hidup &amp; mendatangkan kacau ganggu &amp; lain-lain impak</li> </ul>

BIL	KATEGORI	JENIS PEMBANGUNAN	CIRI-CIRI PEMBANGUNAN
2	Kawasan Perkuburan/ Krematorium/ Kolumbarium	<ul style="list-style-type: none"> <li>Semua jenis perkuburan (mengikut kaum)</li> <li>Semua jenis Krematorium</li> <li>Semua jenis Kolumbarium</li> </ul>	<ul style="list-style-type: none"> <li>Pembinaan baru termasuk projek menaik taraf pada skala yang menyumbang kepada sensitivity masyarakat sekitar</li> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh menjejaskan kualiti hidup &amp; mendatangkan kacau ganggu &amp; lain-lain impak</li> </ul>
3	Perlombongan (Bergantung kepada PBT yang mengenakan KM)	<ul style="list-style-type: none"> <li>Semua jenis perlombongan</li> <li>Termasuk semua jenis pecahan batu</li> <li>Kuari</li> <li>Pengorekan mineral</li> <li>Pengorekan pasir</li> </ul>	<ul style="list-style-type: none"> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan, bahaya &amp; bahaya</li> </ul>
4	Kawasan Perindustrian Utama	Semua jenis kawasan perindustrian utama berskala besar	<ul style="list-style-type: none"> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan &amp; bahaya serta kacau ganggu</li> <li>Mewujudkan impak ekonomi &amp; kesejahteraan material kepada komuniti</li> <li>Mempunyai impikasi ke atas nilai hartanah sekitar</li> </ul>
5	Projek akuakultur/ penternakan berskala besar	<ul style="list-style-type: none"> <li>Pusat hiburan</li> <li>Taman tema</li> </ul>	<ul style="list-style-type: none"> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan, bahaya &amp; pencemaran</li> <li>Mampu menjejaskan nilai persekitaran/ kualiti estetik</li> <li>Meningkatkan bebanan infrastruktur fizikal &amp; menjejaskan daya huni petempatan sekitar</li> </ul>
6	Loji & Pusat Penapisan Minyak & Gas	<ul style="list-style-type: none"> <li>Pusat hiburan</li> <li>Taman tema</li> </ul>	<ul style="list-style-type: none"> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada keselamatan, &amp; bahaya seperti asap, letupan &amp; kebocoran minyak</li> </ul>
7	Incinerator & Tapak Pelupusan Sisa Pepejal	<ul style="list-style-type: none"> <li>Pusat hiburan</li> <li>Taman tema</li> </ul>	<ul style="list-style-type: none"> <li>Terdapat di sekitarnya petempatan-petempatan yang dikhuatiri boleh mengalami kualiti persekitaran hidup yang terjejas termasuk pendedahan kepada pencemaran seperti pencemaran bau</li> <li>Meliputi kawasan tadahan penduduk 2 negeri atau lebih</li> </ul>
8	Lain-lain projek pembangunan yang ditentukan oleh PLANMalaysia@Negeri & Pihak Berkuasa Tempatan (PBT) dari semasa ke semasa		

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# APPENDIX E

## APPENDIX E

### ENVIRONMENTAL IMPACT ASSESSMENT (EIA) CHECKLIST FOR PRESCRIBED ACTIVITY:

- 1) **FIRST SCHEDULE:** (a) Construction of expressways.  
**ACTIVITY 20:** (b) Construction of highways.  
**ROAD** (c) Construction of road, tunnel or bridge traversing or adjacent or near to environmentally sensitive areas.
- 2) **SECOND SCHEDULE:** (a) Construction of new routes or branch line for a mass rapid transport project.  
**ACTIVITY 16 :** (b) Construction of new railway route or railway branch lines.  
**TRANSPORTATION**

- A. This checklist shall be used by the EIA Consultant in assessing the EIA report prepared by the EIA Consultant, under the Environmental Quality (Prescribed Activities)(Environmental Impact Assessment) Order 2015, Environmental Quality Act, 1974.
- B. All information disclosed and assessed in this checklist must be accurate, true, correct and based on critical issues of the proposed project and site.
- C. The Project Proponent and EIA consultants shall be fully responsible for the information given/specified in this checklist.
- D. Please tick in the box :-

**FIRST SCHEDULE –**  
**ACTIVITY 20: ROAD**

- Activity 20 (a)  
 Activity 20 (b)  
 Activity 20 (c)

**SECOND SCHEDULE –**  
**ACTIVITY 16: TRANSPORTATION**

- Activity 16 (a)  
 Activity 16(b)

- E. Please tick in the box as follows:-  
√ - Complete; or X - Incomplete; or N.A - Not Applicable

### 1.0 PROJECT BACKGROUND

#### 1.1 Project Title

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**1.2 Project Location**

a. Alignment Coordinates

Longitude	Latitude

b. Total alignment length (km) : \_\_\_\_\_

c. Lot No./ P.T of ROW: \_\_\_\_\_

d. HSD/ HSM : \_\_\_\_\_

e. Mukim : \_\_\_\_\_

f. District : \_\_\_\_\_

g. State : \_\_\_\_\_

**1.3 Project Approving Authority**

a. Agency : \_\_\_\_\_

**1.4 Project Proponent**

a. Company Name: \_\_\_\_\_

b. Address : \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

c. Company Registration No. : \_\_\_\_\_

d. Person In Charge : \_\_\_\_\_

e. Designation : \_\_\_\_\_

- f. Telephone : \_\_\_\_\_
- g. E-mail : \_\_\_\_\_
- h. Fax : \_\_\_\_\_

**1.5 EIA Consultant**

- a. Company Name: \_\_\_\_\_
- b. Address : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- c. EIA Team Leader : \_\_\_\_\_
- d. Registration No. : \_\_\_\_\_
- e. Telephone : \_\_\_\_\_
- f. Fax : \_\_\_\_\_
- g. E-mail : \_\_\_\_\_

**1.6 Terms of Reference (TOR)**

- a. Letter of TOR comments from the Department of Environment (State Office) \_\_\_\_\_
- b. Date of TOR letter : \_\_\_\_\_
- c. Reference number: \_\_\_\_\_

Tick and page number

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**2.0 GUIDELINES, GUIDANCE DOCUMENTS AND OTHER REFERENCES**

- 2.1** List of guidelines, guidance documents and other references referred to during the preparation of the EIA report.

Tick and page number

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<p><b>3.0 EIA CONSULTANT</b></p> <p><b>3.1</b> List of EIA Study Team Members (EIA Consultants and Subject Consultants).</p> <p><b>3.2</b> A soft copy of the EIA report (including Executive Summary) - attached.</p> <p><b>3.3</b> A soft copy of raw data used in the EIA study – attached.</p>	<p style="text-align: center;"><b>Tick and page number</b></p> <table border="1" style="width: 100%; height: 100%;"> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> </table>												
<p><b>4.0 EIA REPORT</b></p> <p><b>4.1</b> Documents – to be included at the beginning of the EIA report.</p> <p>a. List of EIA Study Team Members (EIA Consultants and Subject Consultants).</p> <p>b. List of Assistant Consultants.</p> <p>c. Declaration from Project Initiator.</p> <p>d. Declaration from EIA Study Team Leader.</p> <p>e. Declaration from EIA Team Members.</p>	<p style="text-align: center;"><b>Tick and page number</b></p> <table border="1" style="width: 100%; height: 100%;"> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> </table>												
<p><b>4.2 <u>Executive Summary</u></b> (as a ‘stand-alone’ document) in addition to summarizing the main findings and issues, also containing the following information:</p> <p>a. Name / title of Project.</p> <p>b. Name &amp; Contact Details of the Project Proponent (contact person, address, tel, fax, e-mail).</p> <p>c. Name of the EIA Consultant (firm) &amp; Contact Person (Address, Tel, Fax, E mail).</p> <p>d. Location of the project (including where applicable, coordinates, lot numbers, sub-district and district name).</p> <p>e. Relevant maps showing project location and sensitive receptors.</p> <p>f. Brief description – project development and existing environment including baseline study.</p> <p>g. Summary of the main findings and issues mitigating measures.</p> <p><i>Note: Executive Summary in two languages (English and Bahasa Melayu) shall be submitted to DOE in both hard copy and soft copy.</i></p>	<p style="text-align: center;"><b>Tick and page number</b></p> <table border="1" style="width: 100%; height: 100%;"> <tr> <td style="width: 50%; height: 40px;"></td> <td style="width: 50%; height: 40px;"></td> </tr> </table>												

<p><b>4.3 <u>Introduction</u></b></p> <p>a. Title of the Project and Project Brief</p> <p>b. Project Proponent and consultant details.</p> <p>c. Project location.</p> <p>d. Relevant maps showing project location.</p> <p>e. Legal requirement</p> <p>f. In line with any development plans, policies or any decision of the Authority namely (but not limited to) National Physical Plan, Structure Plan, Local Plan and others.</p>	<p style="text-align: center;"><b>Tick and page number</b></p> <table border="1" style="width: 100%; height: 100%;"> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> <tr><td style="width: 50%; height: 25px;"></td><td style="width: 50%; height: 25px;"></td></tr> </table>														
<p><b>4.4 <u>Statement of Need</u></b></p>	<p style="text-align: center;"><b>Tick and page number</b></p> <table border="1" style="width: 100%; height: 100%;"> <tr> <td style="width: 50%; height: 30px;"></td> <td style="width: 50%; height: 30px;"></td> </tr> </table>														
<p><b>4.5 <u>Project and Site Options</u></b></p> <p>a. Project options.</p> <p>b. No project option.</p>	<p style="text-align: center;"><b>Tick and page number</b></p> <table border="1" style="width: 100%; height: 100%;"> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> </table>														
<p><b>4.5 <u>Project Description</u></b></p> <p>a. Detailed explanation of the proposed project, size, components, and development phases.</p> <ul style="list-style-type: none"> <li>• Layout Plan as shown in Figure _____</li> </ul> <p>b. Project Activities – Construction and Operational</p> <p>c. Work schedule outlining phases of development and activities involved.</p>	<table border="1" style="width: 100%; height: 100%;"> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> <tr><td style="width: 50%; height: 30px;"></td><td style="width: 50%; height: 30px;"></td></tr> </table>														

**4.6 Description of Existing Environment**

Tick and page number

a. Description on the sampling methodologies, location (with justification), monitoring stations and sampling parameters.

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b. Identification of the baseline data for the following environmental components :-

i. Physico-chemical

- Landuse
- Topography
- Bathymetry
- Hydrology and Streamflow
- Geology and soil
- Surface water quality
- Marine water quality
- Groundwater quality
- Air quality
- Noise Level
- Vibration Level


ii. Biological Diversity (Flora & Fauna)

- Terrestrial/Forest Habitat
  - Upper Dipterocarp Forest
  - Hill Dipterocarp forest
  - Lowland forest
  - Peat swamp forest
  - Riparian forest
  - Limestone forest
  
- Aquatic Habitat
  - Rivers/Streams
  - Lakes
  - Reservoirs
  - Swamps
  - Rice-fields

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- Marine & Coastal Habitat
  - Mangroves
  - Mudflats
  - Lagoons and estuaries
  - Beach Forest
  - Seagrass
  - Sandy beaches
  - Rocky shores
  - Coral reefs
  - Islands

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iii. Human

- Socio economic study
  - demography
- Aesthetic and Cultural/ Heritage
- Fishermen/ Orang Asli Community


c. Maps, diagrams, photos (clearly state the source of documents) which are included in the report such as (but not limited to) :-

- i. Topography map as shown in Figure \_\_\_\_\_
- ii. Survey plan as shown in Figure \_\_\_\_\_
- iii. Geological map as shown in Figure \_\_\_\_\_
- iv. Soil map as shown in Figure \_\_\_\_\_
- v. Hydrology map as shown in Figure \_\_\_\_\_
- vi. Borehole location as shown in Figure \_\_\_\_\_
- vii. Landuse map within the coverage of at least 5 km radius with 250m interval as shown in Figure \_\_\_\_\_
- viii. Nearest sensitive receptors as shown in Figure \_\_\_\_\_
- ix. ESA map as shown in Figure \_\_\_\_\_



**4.7 Soil Erosion and Sediment Control Aspects**

- a. The chapter on Soil Erosion and Sediment Control Aspects was prepared by (name of the consultant) \_\_\_\_\_, who is a Certified Professional In Erosion And Sediment Control (CPESC) with the CPESC registration number \_\_\_\_\_, in accordance to the Guidelines on Land Disturbing Pollution Prevention and Mitigation Measures (LD-P2M2) by the DOE.
  
- b. The conceptual LD-P2M2 drawings indicating effective mitigating measures or Best Management Practices (BMPs) to be implemented on the site are described in chapter \_ on page \_\_\_ of the EIA report, and illustrated in Figure \_\_\_ on page \_\_\_ of the EIA report.

Tick and page number





<p>b. Cover all stages of development:-</p> <ul style="list-style-type: none"> <li>(i) Site Clearing/ Earthwork</li> <li>(ii) Building Construction</li> <li>(iii) Final Stabilization</li> <li>(iv) Project Abandonment</li> </ul>	<table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>								
<p><b>4.10 <u>Summary of Critical Issues/Impacts and Proposed Mitigation Measures</u></b></p> <p>a. Critical issue/impact 1 (specify): _____  _____</p> <p>Proposed mitigation measure(s) to mitigate/ minimize the impact (specify): _____  _____</p> <p>b. Critical issue/impact 2 (specify): _____  _____</p> <p>Proposed mitigation measure(s) to mitigate/ minimize the impact (specify): _____  _____</p> <p>c. Critical issue/impact 3 (specify): _____  _____</p> <p>Proposed mitigation measure(s) to mitigate/ minimize the impact (specify): _____  _____</p>	<p>Tick and page number</p> <table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>								
<p><b>4.11 Residual Impacts</b></p> <ul style="list-style-type: none"> <li>a. Identification of residual impacts and their significance.</li> <li>b. Recommendation for the management of residual impacts.</li> </ul>	<p>Tick and page number</p> <table border="1"> <tr><td></td><td></td></tr> <tr><td></td><td></td></tr> </table>								

<p><b>4.12 Framework of the Environmental Management Plan (EMP)</b></p> <p>a. Brief description of the components of the EMP.</p>	<p>Tick and page number</p> <table border="1" style="width: 100%; height: 40px;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> </table>				
<p><b>4.13 <u>Conclusion</u></b></p> <p>a. Summary of the proposed project in terms of project concept, impacts and recommended mitigating measures.</p> <p>b. Recommendation by the EIA Consultant on the EIA report.</p>	<p>Tick and page number</p> <table border="1" style="width: 100%; height: 80px;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> </table>				
<p><b>5.0 DECLARATION OF SELF-ASSESSMENT</b></p> <p><b>5.1 <u>EIA Team Leader</u></b></p> <p>I hereby declare on the followings:-</p> <p>a. The information provided in this assessment is correct, accurate, liable and represent the studies in the EIA report; and</p> <p>b. I shall be held liable for any misleading information in any part of this checklist.</p> <p>Signature : _____</p> <p>Name : _____</p> <p>MyKad / Passport No. : _____</p> <p>Registration Number Validity : _____</p> <p>Designation : _____</p> <p>Date : _____</p> <p>Official Stamp:</p>	<p>Tick and page number</p> <table border="1" style="width: 100%; height: 40px;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;"></td> </tr> </table>				





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