

EXECUTIVE SUMMARY

MENAIKTARAF JAMBATAN DI KG TOK FAKIR JALAN T119 SEKSYEN 6.70 DAERAH MARANG, TERENGGANU

INTRODUCTION

- JKR plans to carry out a project entitled "Menaiktaraf Jambatan di Kg Tok Fakir Jalan T119 Seksyen 6.70 Daerah Marang, Terengganu".
- The proposed project will replace and upgrade the width of the existing bridge with a new bridge following JKR R2 standard on Sg. Alur Pak Mining in Mukim Merchang, District of Marang, Terengganu.
- Providing safe and improve road connectivity and accessibility between Kg Tok Fakir with the surrounding villages and communities in Marang district.

PROJECT OWNER



Kementerian
Kemajuan
Desa & Wilayah

PROJECT IMPLEMENTER

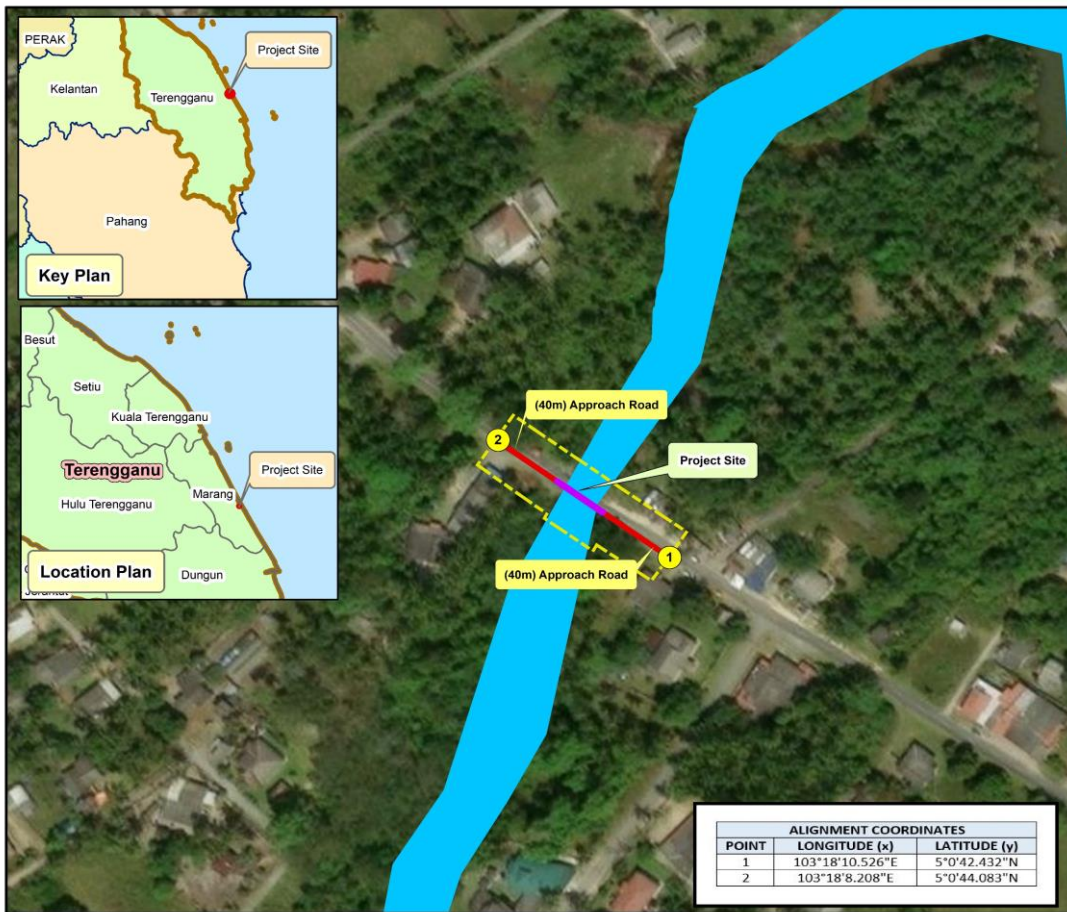


Jabatan Kerja
Raya

EIA CONSULTANT



Wiranda (M)
Sdn. Bhd.



LOCATION PLAN

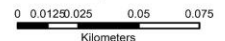


Legend

- Alignment Point
- Bridge (20m)
- Approach Road
- ROW
- Main River



1:2,000



SITE INFO

Mukim Merchang
Daerah Marang
Terengganu

LEGISLATIVE REQUIREMENT

Activity 20 – Road

(c) Construction of road, tunnel or bridge traversing or adjacent or near to environmentally sensitive areas.

STATEMENT OF NEED

To help road users and transporters especially the residents of Kg. Tok Fakir to pass through the village road and across Sg. Alur Pak Mining safely.

To avoid the risk of accidents due to narrow bridges, insufficient space for road users

Improving the quality of life and facilitate socio-economic development of the communities in Kg. Tok Fakir, Marang, Terengganu

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PROJECT CONCEPT

Replacing the existing bridge with a new and upgraded bridge with JKR R2 standard

Designing a 20 m long and 11 m wide concrete bridge

Upgrading of 40 m (left) & 40 m (right) of the roadway to the bridge

Drainage construction

Utility relocation

Installation of street lights & road furniture works

Temporary road and bridge diversion during construction

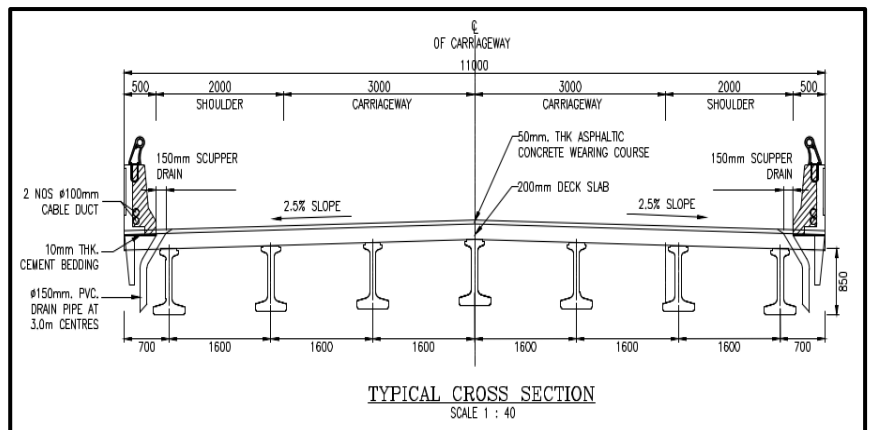
Demolition of the existing bridge

Other related works if necessary

R2 BRIDGE DESIGN

PAVEMENT STRUCTURE		THICKNESS (mm)
Asphaltic Concrete Wearing Course		50
COMPONENT	UNIT	WIDTH (mm)
Carriageway	2	3000
Shoulder	2	2000
Parapet	2	500

TYPICAL CROSS SECTION OF BRIDGE



PROJECT ACTIVITIES

Pre-construction

- Site investigation, geological study, water quality, air, noise and vibration study, and socio-economic study.

Construction

- **Site Preparation** - Establishment of temporary base camp (if any), site office, temporary portable toilet and storage facilities, drainage work and access road.
- **Traffic Control** – Temporary bridge for traffic diversion
- **Land Clearing** - Felling of trees within the ROW, utilities relocation, transportation of biomass to landfill.
- **Earthwork Activities** - Cut, fill and ground levelling, management of top soil, stockpiling, and relocations utilities.
- **Construction of Bridge and Road** - Construction of bridge (piling) and road (paving, rolling) and permanent drainage system.
- **Demolition of the Existing Bridge**

Operation

- Road and bridge operation, maintenance work.

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EXISTING ENVIRONMENT

TOPOGRAPHY

- Generally flat area.
- Elevation range at 3.177 m a.s.l.

METEOROLOGY

- Nearest station : Hospital Dungun
- March shows the lowest monthly average rainfall (75.8 mm)
- December shows the highest monthly average rainfall (800.2 mm).

WATER INTAKE



- Loji Air Serdang**
- Sources from Sg. Dungun
 - 25 km radius to Southeast
 - Intake point is in different catchment

SURROUNDING LAND USE



Human Settlement



Fisheries Activity



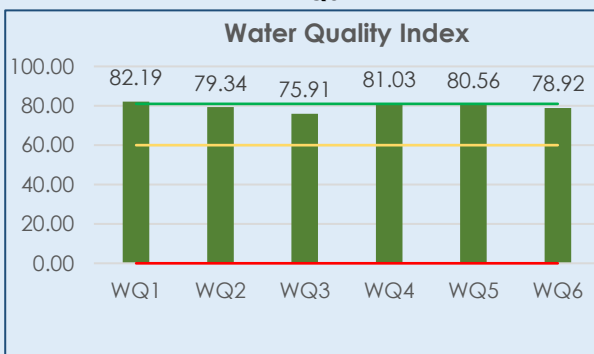
Tourism Industry



Agriculture

WATER QUALITY

Water Quality Index



- 6 water sampling points
- WQI ranged between 75.91 to 82.19
- Categorized as clean and fall under Class II (W1, W4, & W5), While W2, W3, & W6 categorised as slightly polluted.

AIR QUALITY

PARAMETER	*STANDARD (2020)/ $\mu\text{g}/\text{m}^3$	STATION ID	
		A1	A2
PM10 ($\mu\text{g}/\text{m}^3$)	100 (24 hrs)	31	39
PM2.5 ($\mu\text{g}/\text{m}^3$)	35 (24 hrs)	11	14
SO ₂ ($\mu\text{g}/\text{m}^3$)	80 (24 hrs)	< 5	< 5
NO ₂ ($\mu\text{g}/\text{m}^3$)	70 (24 hrs)	< 0.5	< 0.5
O ₃ ($\mu\text{g}/\text{m}^3$)	100 (8 hrs)	< 5	< 5
CO (mg/m^3)	10 (8 hrs)	0.7	0.7

- 2 sampling stations
- All complied with the limits prescribed in the New Malaysia Ambient Air Quality Standard 2020

NOISE LEVEL

- 2 sampling stations
- All the points comply with *Environmental Noise Limits and Control, Third Edition, 2019*

STATION ID	RESULT (dBA)		*LIMIT
	DAY	NIGHT	
N1	62.4	59.6	D:65 N:60
N2	56.7	57.5	

VIBRATION LEVEL

- 2 sampling stations
- All complied with the limits stated by DOE

STATION ID	DAY		NIGHT	
	mm/s	Hz	mm/s	Hz
V1	0.177	40	0.164	25
V2	0.234	25	0.223	63
LIMIT	0.8 – 1.6 (mm/s)		0.4 (mm/s)	

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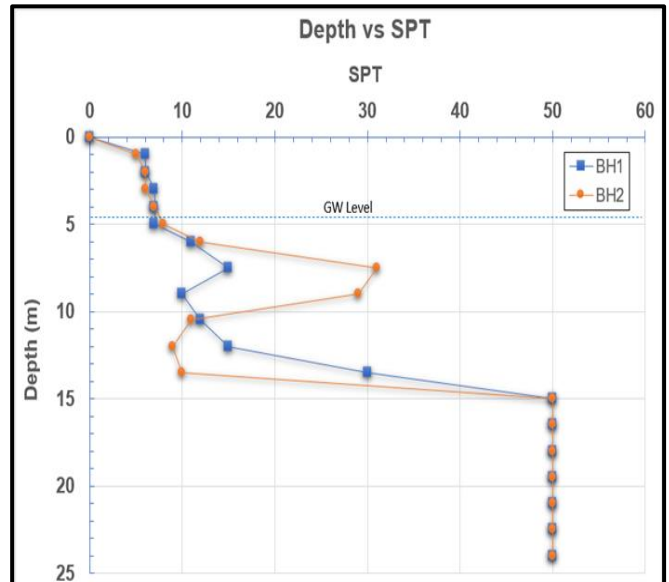
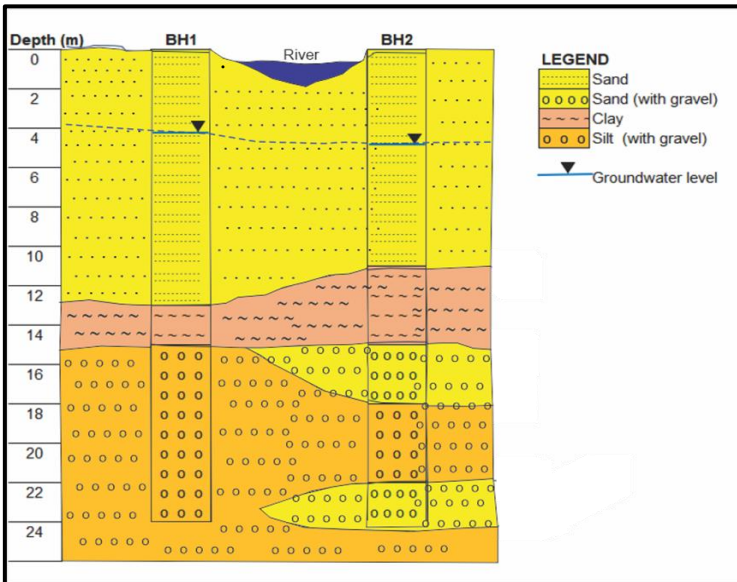
HYDROLOGY

- The project traverse across Sg. Alur Pak Mining
- Stormwater from the Project site will be discharged into Sg. Alur Pak Mining and Sg. Merchang before it finally flows into the South China Sea.
- Catchment of Sg. Alur Pak Mining with total area of 12.562 km².

GEOLOGY & MINERAL

- 9 geology outcrops and 2 boreholes were selected
- Comprised of superficial deposit of sand and two rock types, namely Carbonaceous metasediments consisting of quartzite and phyllite
- The proposed bridge is located inside the Quaternary deposits consisting mainly of fine to medium light to dark brown sand deposits.
- No existence of dark economic minerals at the proposed project site

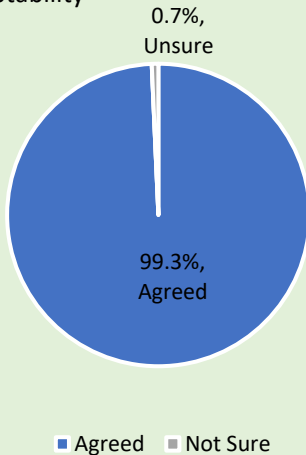
GEOLOGIC CROSS SECTION FROM BH1 – BH2



SOCIO-ECONOMY

140 respondents participated in the socio-economic survey

Level of Acceptability



Potential Positive and Negative Impacts	Response (%)
Provide residents with more comfortable and accessible roads	92.1% (agreed)
Able to resolve connectivity issues during floods	66.4% (disagreed)
Employment opportunities for the local population	85.0% (disagreed)
Business opportunities for the local population	81.4% (disagreed)
Provide long-term economic benefits to the locals	86.4% (disagreed)
Increase the property value of the resident	85.7% (disagreed)
Encourage development in the surrounding area	71.4% (disagreed)
Increase trade facilities and infrastructure	61.4% (disagreed)
Affect the existing jobs & local income	99.3% (disagreed)
Affect the aesthetic value of the environment	100.0% (disagreed)
Disruption of daily activities	99.3% (disagreed)
Affecting the residents' property value	100.0% (disagreed)
Land acquisition from residents	100.0% (disagreed)
Disruption of utilities	99.3% (disagreed)
Damage to the resident's property	100.0% (disagreed)
Traffic congestion	97.9% (disagreed)
Road damage	99.3% (disagreed)
Road accident risk	98.6% (disagreed)
Increase the number of vehicles passing through residential areas	97.1% (disagreed)

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POTENTIAL IMPACTS & MITIGATION MEASURES

POTENTIAL IMPACTS	MITIGATION MEASURES
<p>Air Quality</p> <ul style="list-style-type: none"> ➤ Dust emission from earthmoving activities and vehicle tyres – potential respiratory issue for workers. ➤ Vehicle pollutant emissions – affect human health. <p><u>Operational stage</u></p> <ul style="list-style-type: none"> ➤ Air pollutants generated by motor vehicles (insignificant). 	<ul style="list-style-type: none"> ➤ Materials such as sand, gravel and cement, and waste soil should be stored neatly ➤ Limiting vehicle speed ➤ Provide wash trough/ water jet at the entrance ➤ Maintain the sealed road with crusher run or gravel ➤ Vehicles and equipment should be regularly serviced and maintained ➤ Properly designed roadside vegetation and barriers.
<p>Noise Level & Vibration</p> <ul style="list-style-type: none"> ➤ Use of heavy machinery – elevated noise level ➤ Movement of construction vehicles – intermittent noise & vibration ➤ Pile drilling – sudden loud noise & vibration <p><u>Operational stage</u></p> <ul style="list-style-type: none"> ➤ Noise and vibration from moving vehicles and maintenance work (insignificant). 	<ul style="list-style-type: none"> ➤ Servicing and maintaining vehicles & machineries. ➤ Work should be limited to daytime hours only ➤ Using quieter machinery. ➤ Enforce lower site speeds limits to reduce vibration peaks. ➤ Planting of vegetation and barriers.
<p>Water Quality</p> <ul style="list-style-type: none"> ➤ Accidental Spillage of Oil and Grease ➤ Loose sediment being carried off site via surface runoff (sedimentation). ➤ Sewage generation from workers at site <p><u>Operational stage</u></p> <ul style="list-style-type: none"> ➤ Suspended sediment causing silting of the water way. ➤ Litter is unsightly and pollutes the waterways. 	<ul style="list-style-type: none"> ➤ Used oil must be stored in containers and managed as Scheduled Waste ➤ Regular maintenance for machineries. ➤ Installation of BMPs such as silt trap, silt fence, crusher run, temporary earthdrain, etc. ➤ Provide temporary and portable toilet. ➤ Road shoulders in the area replanted with grass or other vegetation.
<p>Soil Erosion and Sedimentation</p> <ul style="list-style-type: none"> ➤ Soil erosion and sedimentation will occur during site clearing and earthwork activities. ➤ Reduce river depth/drain capacity. 	<ul style="list-style-type: none"> ➤ Installation of BMPs such as silt trap, silt fence, crusher run, temporary earthdrain, etc. ➤ Construction work have to be carried out by phase. ➤ Drainage maintenance program should be instituted. (pg 8-55)
<p>Hydrology</p> <ul style="list-style-type: none"> ➤ The increased of surface run-off during construction work ➤ Flooding problem due to increase of directly connected impervious area. 	<ul style="list-style-type: none"> ➤ Installation of BMPs such as silt trap, silt fence, crusher run, temporary earthdrain, etc. ➤ Proper temporary/permanent drainage.(pg 8-31)
<p>Waste Generation</p> <ul style="list-style-type: none"> ➤ Biomass ➤ Sewage and solid wastes ➤ Scheduled wastes (SW) ➤ Construction wastes 	<ul style="list-style-type: none"> ➤ No open burning. ➤ Provide garbage and RORO bins. ➤ Proper storage area with recycle bins. ➤ Proper scheduled wastes (SW) management according to SW regulations.
<p>Traffic</p> <ul style="list-style-type: none"> ➤ Affect local traffic and the daily lives of the local residents ➤ Safety hazards for both, road users and pedestrians, including increased risk of accidents 	<ul style="list-style-type: none"> ➤ Movement of heavy vehicles should be conducted within working hours only. ➤ Road marking and signage for road diversion. ➤ To assign a worker for traffic control.
<p>Socio-economy</p> <ul style="list-style-type: none"> ➤ Influx of foreign workers. ➤ Traffic disruption. ➤ Pollution (air, noise and vibration). <p><u>Operational stage</u></p> <ul style="list-style-type: none"> ➤ Increase traffic volume. ➤ Promote growth and development. 	<ul style="list-style-type: none"> ➤ Contractor must provide adequate utilities, amenities, and facilities to the foreign workers to avoid disturbance to the locals. ➤ Provide Traffic Management Plan ➤ Residents shall be notified first before any site works to allow them to prepare themselves.

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ENVIRONMENTAL MANAGEMENT PLAN (EMP)



ENVIRONMENTAL MONITORING PROGRAMME

To provide a database against environmental impacts of the project.

To provide an early indication if any environmental control measures fail to achieve the acceptable standard.

AUDIT PROGRAMME

Represent Jabatan Kerja Raya (JKR) efforts to monitor the implementation of environmental protection measures by the contractor.

Provision of third party environmental auditor.

REMEDIAL ACTION

EMP consists of measures that are proposed to mitigate potential adverse impacts through guidelines/procedures to be followed in compliance with the regulations imposed by the authorities.

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PERFORMANCE MONITORING (PM)

LD-P2M2 TOOLS	PARAMETERS	RECOMMENDED LIMITS	FREQUENCY
Silt trap	Structure and performance	-	Monthly and after 12.5 mm rainfall
Perimeter drain	Performance	-	Biweekly
Earth drain with check dam	Sediment level		
Wash trough	Sediment level		
Temporary or permanent waterway crossing (culvert/bridge)	Structure and performance		

COMPLIANCE MONITORING (CM)

COMPONENTS	PARAMETERS	COMPLIANCE LIMITS	FREQUENCY
Air quality	PM ₁₀	100 µg/m ³	Quarterly
	PM _{2.5}	35 µg/m ³	
Noise level	L _{Aeq}	Day: 60 dBA Night: 55 dBA	
Vibration	Peak Particle Velocity (PPV)	Day: 0.8 – 1.6 mm/s Night: 0.4 mm/s	
Water quality (Discharged from silt trap)	Total suspended solids (TSS)	50 mg/l	Monthly and after 12.5 mm rainfall
	Turbidity	250 NTU	

IMPACT MONITORING (IM)

COMPONENTS	PARAMETERS	COMPLIANCE LIMITS	MONITORING LOCATIONS	FREQUENCY
Air quality	PM ₁₀	100 µg/m ³	Two (2) monitoring locations	Quarterly
	PM _{2.5}	35 µg/m ³		Quarterly
Noise level	L _{Aeq}	Day: 60 dBA Night: 55 dBA		Quarterly
Vibration	RMS Velocity at Z-axis	Day: 0.2 – 0.4 mm/s Night: 0.2 mm/s		Quarterly
Water quality	TSS	50 mg/l	Six (6) monitoring locations	Monthly
	Turbidity	250 NTU		
	DO	5-7 mg/l		
	BOD	3 mg/l		
	COD	25 mg/l		
	NH ₃ -N	0.3 mg/l		
	pH	6-9		
	Oil and Grease	40;N mg/l		
Faecal Coliform	400 count/ 100 ml			