MACHINERY FOR TRACK WORKS

Type of track Machinery (Trolley or Multipurpose)

Different type of trolley for multiple task

Type of track Machinery

Movement of LWR to/from location site

Threading of Rail

Manual Jack of Rail

Type of track Machinery in Railway Construction

Type of track Machinery used in Railway Construction

Locomotive & PTH (main component to drive in track)

Railway Construction (Heavy Type Machinery)

In the construction of railway industry, heavy machinery require for the faster completion and good quality product. Time and cost saving will benefit to all parties.

Manual construction of railway no longer practical for the railway industry. The railway industry player in Malaysia lack of resources to own heavy machinery for railway construction.

Railway Construction (Heavy Machinery)

The machinery use in the railway track has to fulfill criteria such as:

- Registration & Regulation Machinery list
- Track Worthiness Index – TWI in order to operate on the track (by Operator)
- Maintenance Record (Routine & Periodic)
- Joint Inspection to verify & validate the performance of the machine (Ex Tamper)
- Monitoring of the supply of machinery

Railway Accident & Incident

Railway Construction (Incident / Accident)

Railway Construction (Incident / Accident)

Railway Construction (Incident / Accident)

Heavy rain (flooding) wash away ballast and sub ballast – track with sleeper hanging

Railway Construction (Incident / Accident)

Flooding to the entire site (including access)

Railway Construction (Incident / Accident)

Train derailment (for sending goods)

Caused by alignment and overloading

Railway Construction (Incident / Accident)

Train derailment (passengers)

Caused by alignment and track buckling

Railway Construction (Incident / Accident)

Train derailment (passengers)

Caused by stolen steel plate, fastening system)

Railway Construction (Incident / Accident)

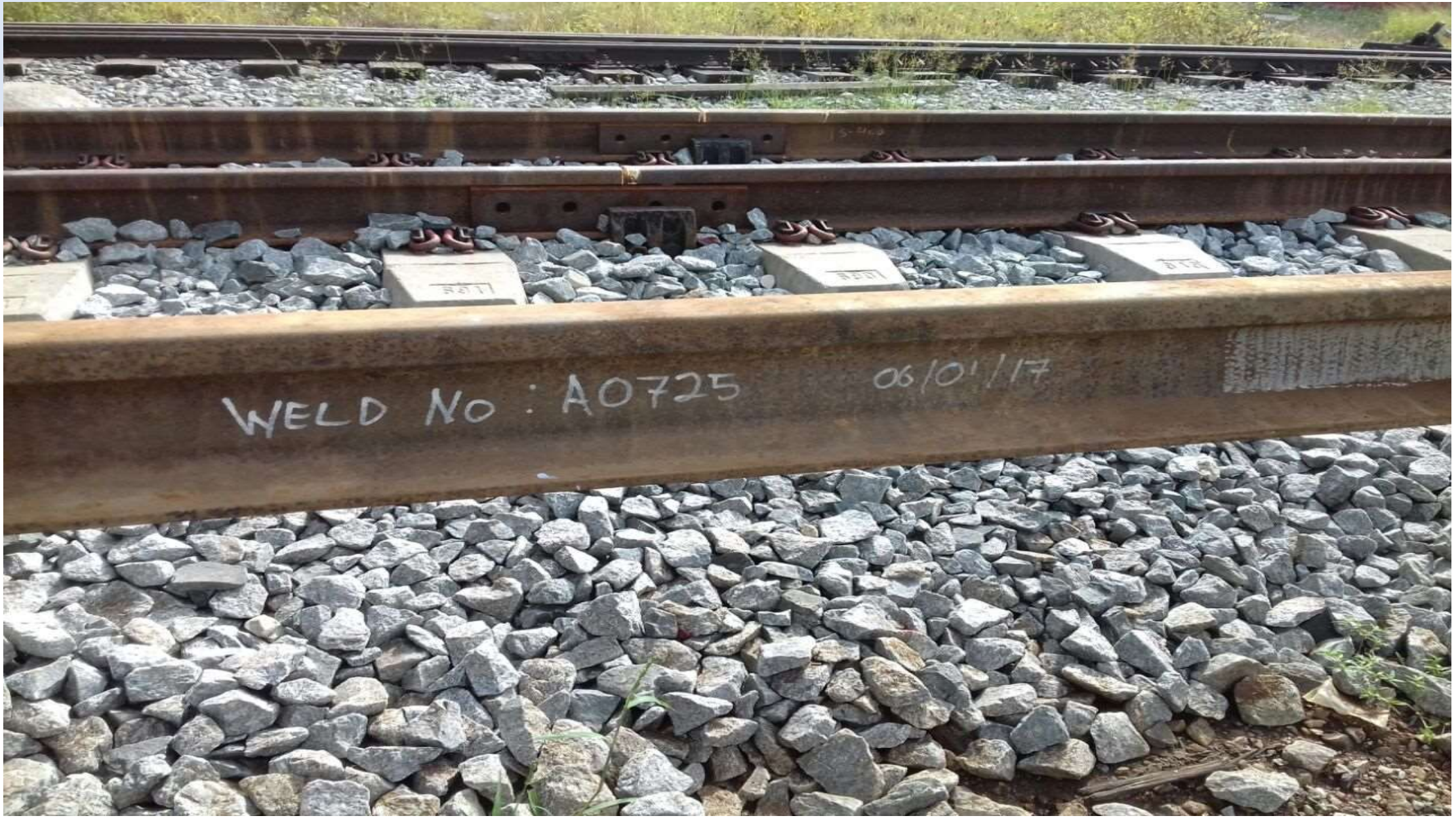
Train derailment (passengers) Caused by track gauge in Tanjung Malim Station

Railway Construction (Incident / Accident)

Excavator boom attached and pinned to the excavator (Fall to the track side)

Railway Construction (Incident / Accident) - Defect

Railway Construction (Incident / Accident) - Defect



Railway Construction (Incident / Accident) - Defect

Railway Construction (Incident / Accident) - Defect

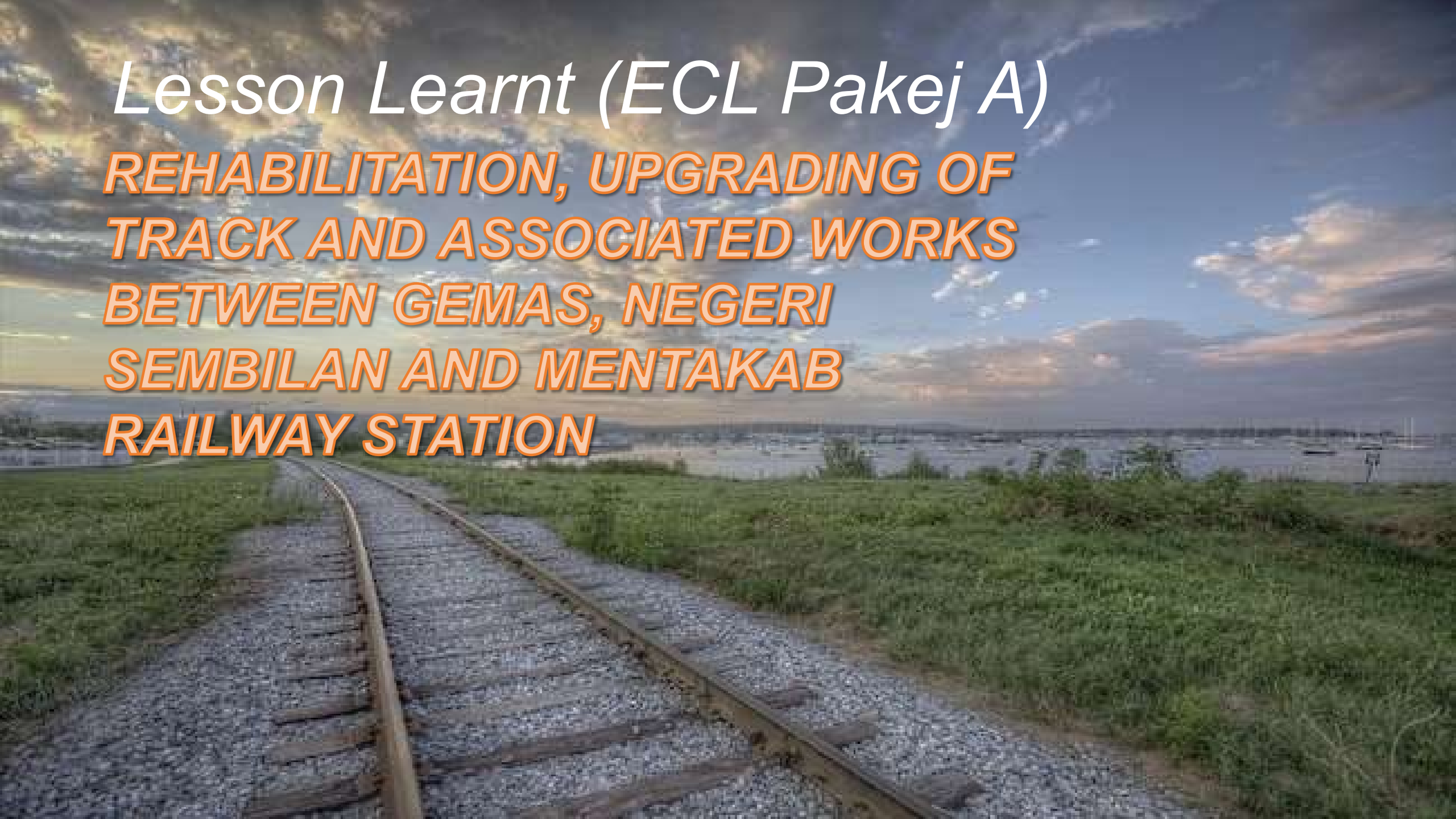
Railway Construction (Incident / Accident)

Perkara-perkara penting perlu dilaksanakan semasa berlakunya sebarang kemalangan, insiden, kecederaan, kebakaran dan lain-lain perkara yang tidak diingini iaitu:

- Laporan Ringkas dalam masa 24 jam (Borang Pendaftaran Kamalangan & Borang Siasatan Insiden)
- Laporan Tindakan Sementara (2 hari)
- Laporan Tindakan Susulan dalam masa (3 hari)
- Laporan Keseluruhan bersama cadangan (7 hari)
- Surat permohonan peruntukan tambahan (30 hari)

Lesson Learnt (ECL Pakej A)

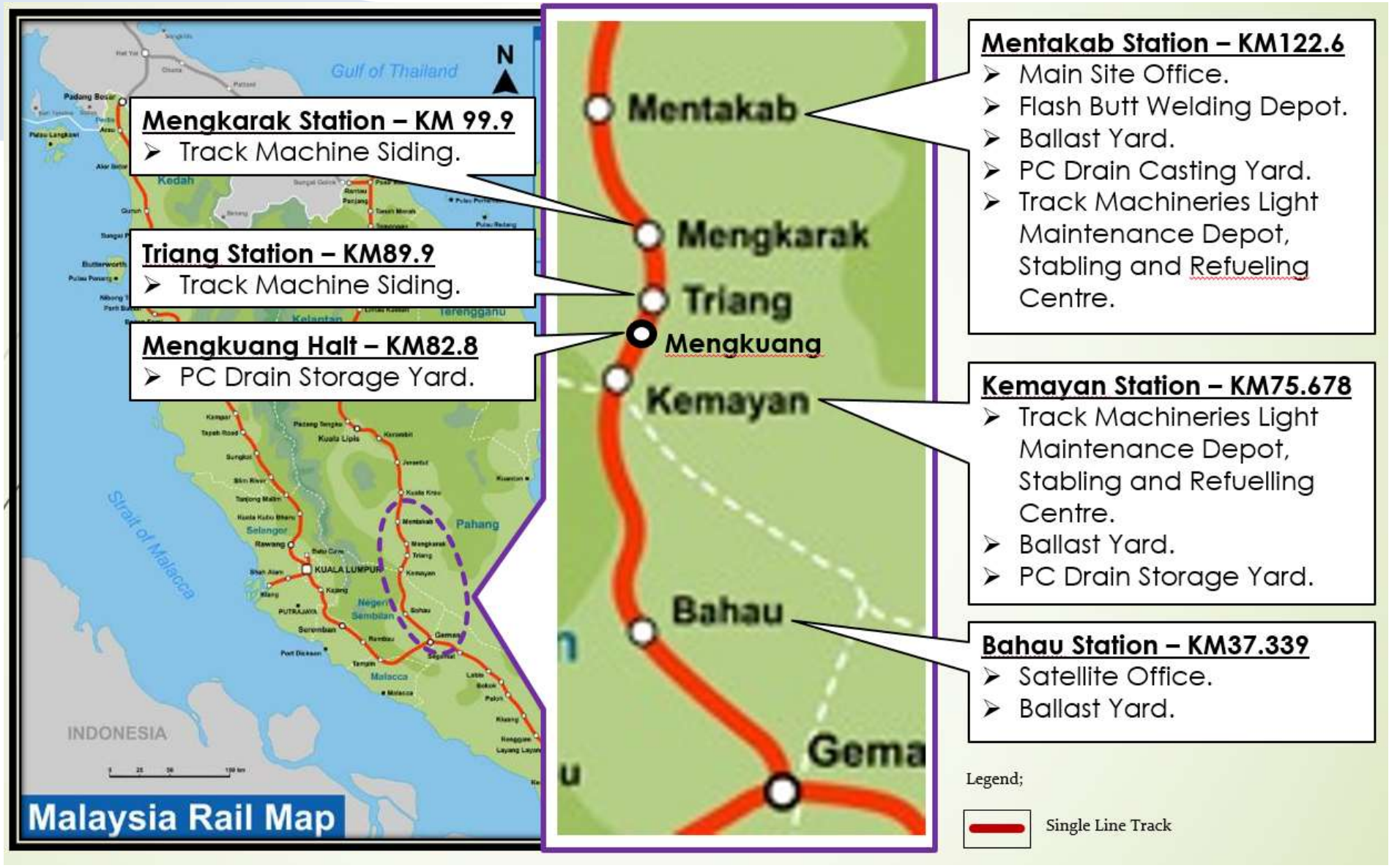
REHABILITATION, UPGRADING OF TRACK AND ASSOCIATED WORKS BETWEEN GEMAS, NEGERI SEMBILAN AND MENTAKAB RAILWAY STATION



Maklumat Projek

PAKEJ A (GEMAS – MENTAKAB)		
No. kontrak	:	KP/KEW/41/2015
Pemilik	:	Kementerian Pengangkutan Malaysia
Agensi Pelaksana	:	Jabatan Kerja Raya Malaysia
Kontraktor	:	Hikmat Asia Sdn. Bhd.
Tarikh Milik Tapak Asal	:	6 Februari 2016 (asal)
Tarikh Milik Tapak ditangguhkan	:	1 April 2016 (pindaan)
Tempoh Kontrak	:	36 Bulan
Tarikh Siap (Asal)	:	20 Februari 2019
Tarikh Siap (Semasa)	:	16 April 2019 (EOT 1 : 55 Hari)
Nilai kontrak	:	RM216,963,842.20 (termasuk 6% GST)

Lokasi Tapak



- *Survey for existing track*
- *Design for trackworks*
- *Infrastructure works*
- *Bridge works*
- *Trackworks*
- *System works*

Project Details

The Project is 123km distance (Ch 0.836 – Ch 123.836)

Goes Through Diverse Areas

- *Rural*
- *Urban*
- *Sub-Urban*
- *Agricultural*
- *Industrial (Light Industry area)*

Various Mix of Structures Such As

- *Bridges (Concrete, Masonry and Steel)*
- *Culverts (Box, Masonry, brickwork and concrete)*
- *Embankments (Gabion wall, fill compacted)*
- *Stations (Mentakab, Mengkarak, Triang, Kemayan & Bahau)*

Scope of Works

1. *Survey Works*
2. *Design & Construct – Upgrading of Trackworks*
3. *Supply Track Materials*
4. *Maintenance of Existing Track – Replacement of 50,000 timber sleepers*
5. *Track Rehabilitation Works*
6. *Mud Pumping*
7. *Replacement of Turnouts (21 nos)*
8. *Replacement of Level Crossings (13 location)*
9. *Station Yard Works & Signaling Works*

Scope of Works

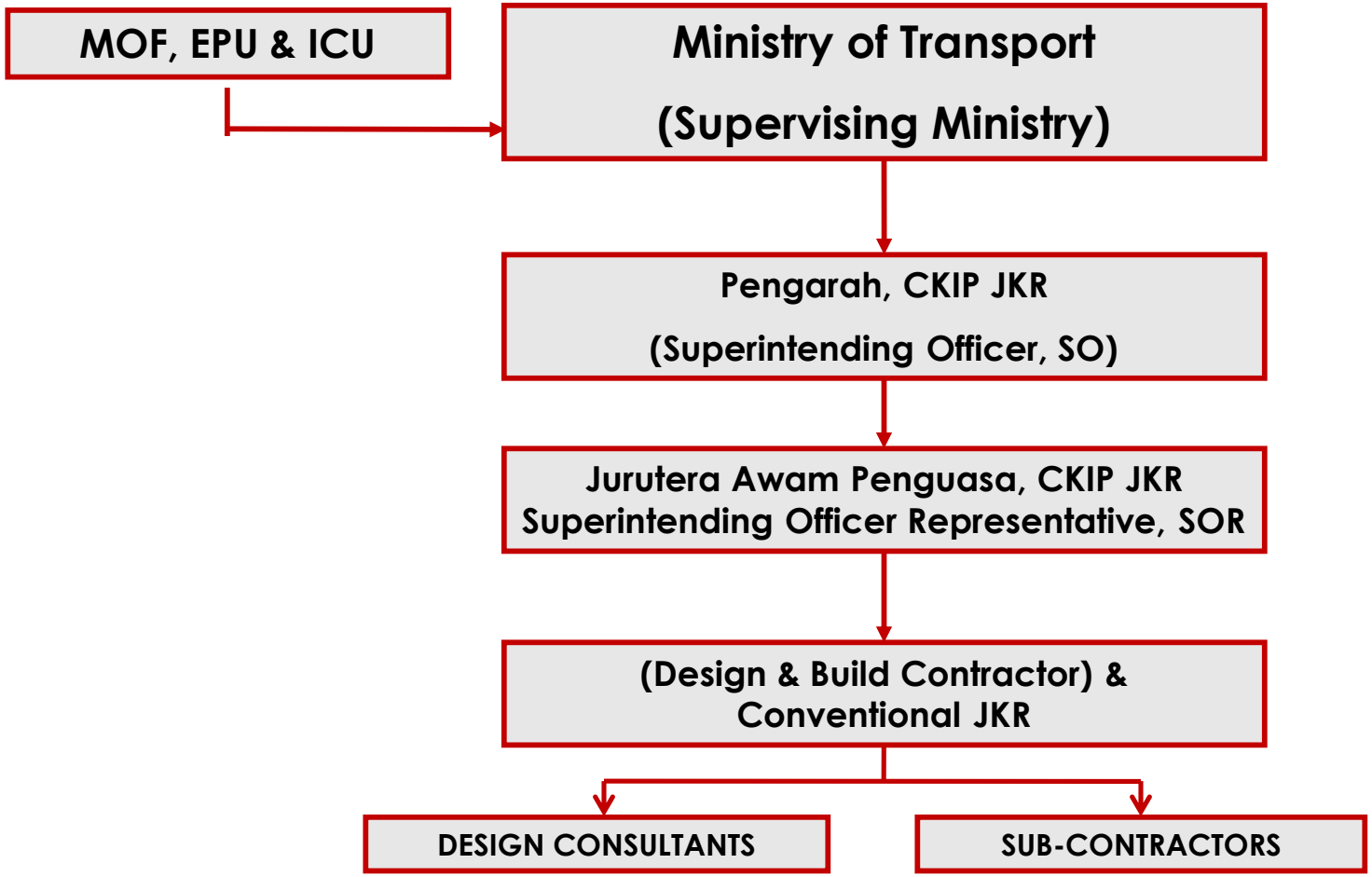
10. Renewal Steel Bridge Sleepers

11. Drainage & Culvert Extension

12. Reprofile Slope & Cess Widening

13. Protection Works to Pier No. 3 & No. 4 Triang Bridge

PROJECT ORGANISATION CHART

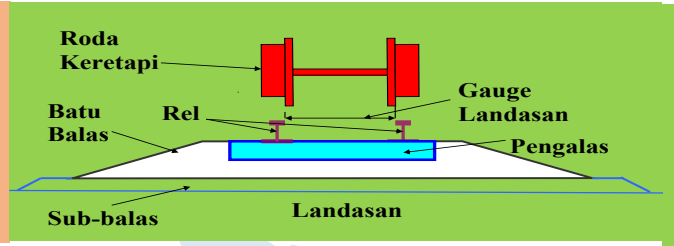


ISSUES / PROBLEMS

1. *LOCAL AUTHORITIES*
    - *Additional Requests*
    - *Development Deceleration*
    - *Relocations Of Services (Electrical, Water Supply, Telecommunication and others)*
2. *EXISTING STRUCTURES*
3. *LOCAL RESIDENTS AND ASSOCIATIONS*
4. *INCLEMENT AND RARE WEATHER*
    - *Flooding and dry season*
5. *MUCH TIME NEEDED FOR REQUEST & APPROVAL*

LANDASAN KERETA API UTAMA

KERJA-KERJA MENAIK TARAF LANDASAN SEDIA ADA (123KM)



LANDASAN SEMASA

- ❑Pengalas kayu
- ❑Rel BS 80A
- ❑Batu balas sedia ada

CADANGAN NAIK TARAF

- ❑Pengalas konkrit
- ❑Rel UIC54kg
- ❑Batu balas baru

Keadaan landasan sedia ada sebelum kerja naik taraf

Rel kimpal berpanjangan 144meter UIC54kg dihantar ke tapak dan disusun di tepi landasan menggunakan 'rail train'

Rel dan pengalas kayu sedia ada dibongkar sebelum batu balas lama dikorek ke sub-balas

Sub-balas dipadatkan

Rel & pengalas konkrit (panel 18meter) disusun di atas sub-balas / aras formasi menggunakan mesin PTH

Batu balas baru dihamparkan di atas panel 18meter menggunakan mesin 'ballast wagon'

Rel panel 18meter ditukar dengan rel kimpal berpanjangan 144meter UIC54kg

Batu balas diratakan dan dibentuk menggunakan mesin 'ballast regulator'

Batu balas dipadatkan menggunakan mesin 'tamping'

Bacaan landasan diambil menggunakan 'track gauge'

Landasan yang siap dinaik taraf diuji (roll-over) untuk kebolehfungsian

Keadaan landasan selepas kerja naik taraf

KERJA-KERJA ‘MUD PUMPING’

Komponen Landasan

Keadaan tipikal batu balas sedia ada yang telah bercampur dengan lumpur (mud pumping)

Pengalas kayu sedia ada ditanggalkan dan batu balas bercampur lumpur dikorek ke sub-balas

Sub-balas dipadatkan

‘Geotextile’ dihamparkan di atas sub-balas yang telah dipadatkan

100mm pasir dan ‘geogrid’ dihamparkan di atas ‘geotextile’

Pengalas kayu dipasang semula dan guni diisi batu balas diletakkan di bawah pengalas sebagai sokongan

Batu balas baru dihamparkan di atas ‘geogrid’ menggunakan mesin ‘ballast wagon’

Batu balas diratakan dan dibentuk menggunakan mesin ‘ballast regulator’

Batu balas dipadatkan menggunakan mesin ‘tamping’

Bacaan landasan diambil menggunakan ‘track gauge’

Verify, validate & certify – Level Crossing Construction

Verify, validate & certify – Level Crossing Construction

Verify, validate & certify – Level Crossing Construction

Final checking & inspection work by JKR & KTMB with contractor prior opening to traffic

Routine checking & inspection work by JKR after opening for traffic

Inspection work by JKR & contractor to check on defect and settlement on the level crossing

THANK YOU

AND SEE YOU IN FUTURE