LRT SHAH ALAM LINE:

TRANSFORMING KLANG VALLEY CONNECTIVITY

Target Revenue Service Date:
30 September 2025

MRT KAJANG LINE

LRT KELANA JAYA LINE

Bandar Utama (STN01, 9) · Kayu Ara (STN02) · BU 11 (Bandar Utama 11) (STN03) · Tropicana (STN04) · Damansara Idaman (STN05) · SS 7 (STN06) · Glenmarie 2 (STN07, 27) Glenmarie · Temasya (STN08) · Kerjaya (STN09) · Stadium Shah Alam (STN10) · Tunnel Ventilation Control (STN11) · Dato' Menteri (STN12) · Raja Muda (STN13) · UiTM Shah Alam (STN14) · Seksyen 7 Shah Alam (STN15) · Bukit Raja (STN16) · Bandar Baru Klang (STN17) · Pasar Klang (STN18) · Jalan Meru (STN19) · Pasar Jawa (STN20) · Taman Selatan (STN21) · Seri Andalas (STN22) · Klang Jaya (STN23) · Bandar Bukit Tinggi (STN24) · Bandar Botanik (STN25) · Johan Setia (STN26)

The LRT3 project, also known as the LRT Shah Alam Line, will connect two million people between Bandar Utama and Klang when it goes live in 2025.

The Line has **two integrated stations**, 'Glenmarie 2' and 'Bandar Utama', linking seamlessly with existing transit lines such as the MRT Sungai Buloh – Kajang line via the Bandar Utama Station and the LRT Kelana Jaya line via the Glenmarie 2 Station, enhancing accessibility and alleviating traffic congestion.

The LRT Shah Alam Line is set to transform daily commutes and has been designed to accommodate up to **24,960 passengers per hour per direction**, making it a highly efficient mode of transport, suitable for accommodating daily commuters in the Klang Valley.

The line prioritises speed and efficiency, boasting a **journey time of under 60 minutes from end to end**. With trains running at six-minute intervals during peak hours and **operating at speeds of 80 km/h**, commuters can expect faster, smoother, and more convenient travel.

Legends:

- LRT Shah Alam Line Station
- LRT Shah Alam Line Provisional Station
- Interchange Station
- LRT Kelana Jaya Line Station
- MRT Kajang Line Station
- Underground

QUICK FACTS

Caters to **> 2 MIL** population in the Western Corridor of Klang Valley

86,700 anticipated ridership per day in 1st year

20 elevated stations completed

37 KM in length (2km underground)

End-to-end journey time of **<60 MINUTES** at 6 minute frequency during peak hours

1,461 PIERS varying height from 3 to 20 metres

Designed for **24,960** passengers per hour per direction

126,100 anticipated ridership per day by 5th year

5 reinstated stations planned for completion by 2028

2,300 parking bays at 6 stations

22 X 3-car trains

80 KM/H operational speed

34,748,976 MILLION working hours of construction activity without a reportable incident

Schedule to commence in **3RD QUARTER** of 2025

A BLEND OF PAST AND PRESENT: THE AESTHETIC VISION OF LRT STATIONS

The design vision for the LRT Shah Alam Line stations was to create a minimalistic yet modern structure. The aim was to appeal to future generations and encourage them to embrace public transportation as a sustainable mode of commuting.

The station design was inspired by traditional Malay headwear, the *Tanjak*, which represents a level of prestige, history, and confidence. This incorporation of cultural elements into the design not only paid homage to the country's deep-rooted ethnic traditions but also adds a unique charm to the stations.

The folded and pleated *songket* of *Tanjak* translates into the two planes of the metal deck structure that wraps the elevated stations. Practical yet dynamic, the varied edges do not just create a non-streamline form but also function well in relation to the design's response to climatic needs. With the pitch design, we had left a portion of the centre section open to direct sunlight, representing the open central area of an actual *Tanjak*, which ensures not only efficient ventilation but also allows natural light to filter in, creating a pleasant and comfortable environment for commuters.

The stations' concept is not just about aesthetics, but also functionality, spanning over two floors and equipped with various amenities. The station is also designed to be fully accessible to all users, including individuals with disabilities, reflecting our commitment to inclusivity in providing a seamless travel experience for all. These features include ramps for wheelchair users, elevators for easy movement between floors, wide doorways for accessibility, and tactile paving to guide visually impaired passengers. Amenities and services provided include accessible toilets, Braille signage and priority seating areas.

All buildings are designed appropriately to relate them to their surroundings and, where necessary, to stations and other public sections of the LRT system. Architectural finishes and materials for the main public spaces in the stations consider safety, comfort, durability, aesthetics, and long-term maintenance.

Implementing passive building design strategies into the project was a significant step towards creating a more sustainable built environment. These strategies prioritise natural elements such as optimising natural lighting, ventilation, and insulation. They reduce the reliance on energy-intensive mechanical systems, offering long-term benefits such as cost savings through reduced energy consumption, lower GHG emissions, and decreased maintenance requirements compared to active systems that rely on complex technologies. Hence, to have a more sustainable built environment and to create a lively and liveable city, the following strategies were implemented:

Internal building temperature management 01

- To allow a comfortable temperature for commuters, a jack roof system was implemented into the design. The system allows hot air to pass out from the internal building for internal temperature management. Roof materials are installed with energy-efficient rock wool insulation to help provide occupants with a more comfortable internal temperature.

Maximise usage of daylighting 02

- A slim and shallow building massing allows more natural daylight to penetrate the building. This reduces the internal lighting energy usage.

Façade as weather protection 03

- The general building façade has been slightly cantilevered and tapered to prevent rainwater from entering the station's concourse and platform areas.

Promote pedestrian urban connectivity 04

- There is pedestrian connectivity from both main directions. This allows easy connectivity for the public to enter the building and promotes public transportation usage. At the ground level, anti-climb fencing has also been introduced along the sidewalk to promote a safe environment for the building surroundings.

Water Efficient strategy 05

- Sanitary fittings for efficient water usage, such as water-saving dual-flush toilets and low-flow faucets, are installed.

Local Materials Usage 06

- Local building materials selection were prioritised as much as possible to reduce GHG emissions from transportation.

LRT SHAH ALAM LINE'S BACKBONE – THE DEPOT

The project also included the construction of the LRT Shah Alam Line's 147-acre Depot, a sprawling complex equivalent to 112 football fields, that will serve as the operational heart of the line. Strategically located in Johan Setia, south of Klang, this state-of-the-art facility houses 18 buildings and facilities, including:

1

Operation Control Centre

At the heart of the depot is the 34,091 sq. ft. Operation Control Centre (OCC). Inside is the Control Centre Room (CCR), which is vital for controlling, monitoring, and maintaining the trains once operations commence.

The control centre is designed to meet safety standards and complies with ISO 11064 to meet safety standards with specific ergonomic features to provide a comfortable working environment, including for people with disabilities.

The CCR has two levels with custom-built computer workstations for control operators and a large video wall that shows the entire line. The layout of the video wall and consoles considered the operators' horizontal and vertical viewing angles.

The room is also installed with an acoustic wall and soundproofing with absorptive material to eliminate sound reflection and reverberation. These measures prevent noise from outside the room from impacting the internal acoustics of the room and vice versa, allowing comfortable noise levels and easy communication between operators within the room.

2

Heavy & Light Maintenance Building

The Heavy & Light Maintenance Building, a substantial facility encompassing 594,343 square feet, equivalent to approximately 45 standard badminton courts, plays a pivotal role in the Line's operations. This dedicated space facilitates the comprehensive maintenance of trains, ensuring that every component, from wheels and brakes to hydraulics and on-board computer systems, undergo rigorous inspection and testing. The building's capacity enables the maintenance of up to fourteen Light Rail Vehicles (LRVs) simultaneously.

3

Stabling Yard

A stabling yard at the depot is a facility where trains are parked when they are not in service, similar to an airport's hangar for aeroplanes. This area acts as a 'home base' and is used for storing trains, typically during off-peak hours or overnight, ensuring that each train is securely stored and ready for its next journey. This facility accommodates six stabling tracks, each capable of storing four LRVs simultaneously.

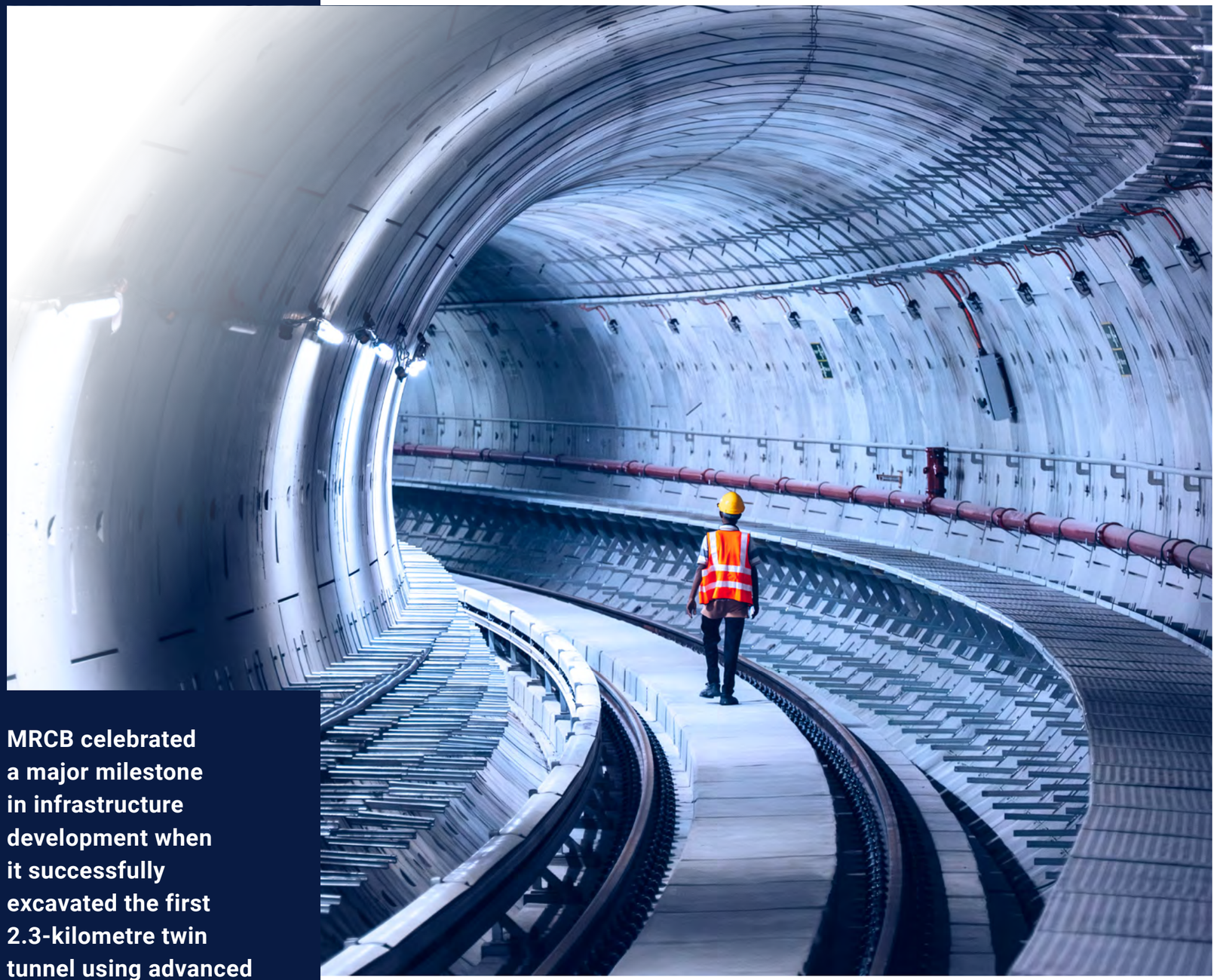
Beyond just parking the LRVs on the tracks, the stabling yard may also be used for minor maintenance tasks, inspections, and cleaning of the train carriages, where minor checks and tune-ups are performed to keep the vehicles in top condition. It is an essential component of a train depot, helping to ensure that trains are properly managed, maintained, and ready for service when needed.

By keeping the trains organised and in optimal condition, the stabling yard plays a vital role in maintaining the punctuality and reliability of the LRT3 service.

4

Train Washing Plant

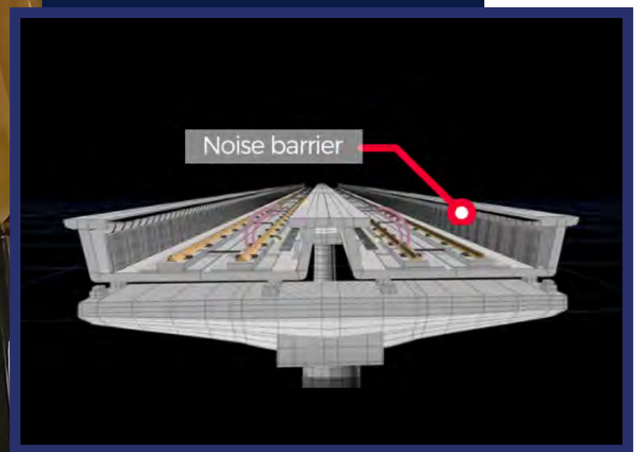
The train washing plant functions as a high-powered cleaning station. This plant was designed to handle the thorough cleaning of every train, similar to how a car wash services vehicles. This not only enhances the train's visual appeal for passengers but also promotes safety by removing debris that could obscure potential issues and extend the train's lifespan by preventing corrosion.

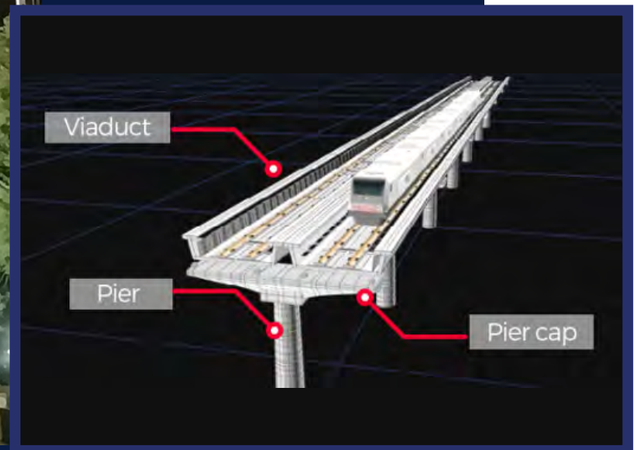


MRCB celebrated a major milestone in infrastructure development when it successfully excavated the first 2.3-kilometre twin tunnel using advanced Tunnel Boring Machines (TBMs) in Shah Alam, Selangor.

Located between Persiaran Hishamuddin & Persiaran Dato Menteri in Shah Alam, the twin tunnels, each boasting a spacious 5,800 mm inner diameter, wide enough to fit two full-sized cars side-by-side, showcases MRCB's commitment to cutting-edge technology. Each of the 19,632 precast segments that line the tunnels were meticulously designed and placed, ensuring the tunnel's stability and longevity. The construction of these complex tunnels involved a dedicated team of 270 personnel.

FIRST U-TROUGH TECHNOLOGY IN MALAYSIA





Another first was MRCB's use of innovative U-Trough Girder technology, which allowed construction components to be pre-fabricated, a method known worldwide for being efficient and cost-effective. This was the first project in Malaysia to utilise this groundbreaking technology, which not only puts Malaysia on the global map of infrastructure innovation but also sets a new standard for future railway projects in the country.

This technology features an integrated design with a built-in noise barrier, effectively minimising noise pollution during operation, making it an ideal solution for projects in densely populated areas.

The use of the pre-fabricated U-trough technology also allowed for a quicker installation process. Unlike the traditional Segmental Box Girder (SBG) method, which takes three days to install one span, the U-Trough Girder technology could be installed within a day, reducing construction-related disruptions to local communities residing close to the project.

The U-Trough Girder technology was not just a construction method; it's an innovation in infrastructure development, paving the way for more efficient and effective construction projects. The LRT Shah Alam Line project was a testament to this, showcasing how innovative technologies and engineering can transform the way we build our cities.

The implementation of the U-Trough Girder project technology is one of the key initiatives under the Industrial Collaboration Programme (ICP), a government-driven initiative designed to leverage public sector procurement to stimulate local industry growth, technology transfer, and economic development.

This technology exemplifies MRCB's commitment to innovation, sustainability, and efficiency. It has not only enhanced our construction methodologies but also contributed to reducing material waste and accelerating project timelines, solidifying our position as a leader in responsible infrastructure development.

A total of 2,040 units of U-trough girders were cast and installed for the LRT Shah Alam line.

LONG-SPAN STRUCTURES FOR EFFICIENT TRANSIT

The project's long-span structures, a significant feature of the LRT Shah Alam Line, were strategically designed to optimise the alignment and minimise the number of piers required. The successful completion of 17 long-span structures, varying from 35m to 108m, are seamlessly integrated with U-trough girders employing advanced engineering techniques, ensuring the structural integrity and durability of these long-span structures.

LIGHT RAIL VEHICLES (LRV) WITH CUTTING-EDGE SUSTAINABILITY FEATURES

Green Technology Features

Inverter Air Conditioner & Smart Air-Cond System
Having Temperature Sensors and Load Sensors for ensuring energy efficiency

Regenerative Braking System & Recycle Power DC to AC System
Excess DC voltage will be inverted to AC and re-injected back into 33kV Network

LED Lights & Smart Interior Lighting System
Utilising natural sunlight for energy optimisation

Interior Accessibility Features

A Perch Seat

B Cantilever & longitudinal seats arrangement

C LED Backlit LCD Panel

D Safety Belt

E Wheelchair space in each car

Upon the commencement of operations, a fleet of 22 three-car Light Rail Vehicles (LRVs) will be deployed to serve commuters travelling between Bandar Utama and Johan Setia. Each LRV has been meticulously assembled at Batu Gajah, Perak, with a length of approximately 60 metres and a width of 2.7 metres. These state-of-the-art vehicles offer ample passenger capacity, with 102 designated seats and a total carrying capacity of 624 passengers.

It has the first of its kind smart interior lighting system and LED lights that actively conserve energy. The LRVs also use asbestos-free friction brakes, significantly reducing air contamination. The regenerative braking system is another noteworthy feature which converts the dynamic braking effect into electrical energy, reducing energy consumption and enhancing efficiency. Additionally, the LRVs are designed with a smart air conditioning system that is ozone-friendly, reducing the impact on the ozone layer.

The LRV, capable of reaching a maximum speed of 80 km/h, offers efficient end-to-end journeys in less than 60 minutes. Designed for a 30-year service life, these LRVs have undergone meticulous testing and maintenance at the LRT3 Depot in Johan Setia. Each LRV requires approximately two months to assemble and 45 days of rigorous factory testing. A fleet of 19 LRVs will operate simultaneously, when the service commences.

EMPOWERING COMMUNITIES THROUGH INDUSTRIAL COLLABORATION PROGRAMME (ICP)

The Industrial Collaboration Programme (ICP), is a Malaysian government initiative designed to boost national technology development by connecting local companies with government procurement needs. Launched in 2014 by the Ministry of Finance, ICP encourages technology transfer and local technology development and produces local expertise in public projects.

Linked to macroeconomic frameworks such as Malaysia's Vision 2020, Malaysia's Five-Year Development Plans, and the Industrial Masterplan, the ICP is designed to align businesses with the nation's economic goals. To be eligible for the ICP, businesses must meet a set of rigorous criteria. They must offer a unique product or service, conduct a feasibility study to forecast the impact of their product or services, and present an idea that has never been executed in Malaysia before. This ensures that only the most innovative and impactful businesses are selected.

As a leading urban property developer, MRCB has consistently demonstrated its dedication to creating sustainable and liveable environments. This commitment is evident in our involvement through the LRT3 project which we awarded 64 contracts for under the ICP, with a total value of RM20 million, all in the pursuit of excellence and innovation.

Each proposal sent to MRCB went through a meticulous filterisation process before being forwarded to the Technology Depository Agency to be filtered further. As of December 2024, a total of 45 projects have been completed.

A notable project is MRCB's collaboration with MAHSA University to introduce environmentally friendly mosquito control kits to combat the spread of Aedes mosquito and lower the levels of dengue in the community. Unlike traditional methods that rely on harmful pesticides, these kits use environmentally friendly means to control the mosquito population. This reduces the risk of dengue and minimises the impact on the environment.

The kits have been installed in most of the LRT Shah Alam Line project sites, including the Centralised Labour Quarters (CLQs) and nearby residences. This strategic implementation ensures that the kits have the maximum impact in areas where they are most needed.

MRCB assisted by providing financial support, ensuring compliance, facilitating stakeholder engagement and monitoring the progress to ensure the project was executed seamlessly.

ICP has also provided opportunities for various institutions, such as The Institute of Engineers Malaysia (IEM) to provide a comprehensive and standardised programme for local graduate engineers. This initiative is designed to facilitate progressive training to help these engineers attain a minimum level of professional competency and orientation.

The programme is not an alternative to existing Pre-Professional Engineer preparatory training programmes. Instead, it serves as a guideline to assist and facilitate graduate engineers in their pursuit of professional interviews for first-tier Professional Engineering qualifications.

The PROJECT'S Key Milestones

2016

24 August
Launch of project

2017

1 March
Construction of Depot commenced

2018

April
1st U-girder installation

2020

10 February
CIDB 5-Star INFRASTAR Certification awarded

2021

29 December
Tunnel Boring Machine 2 Breakthrough

25 October
Tunnel Boring Machine 1 Breakthrough

25 December
Deployment of Tunnel Boring Machine 2

2 November
Deployment of Tunnel Boring Machine 1

2023

23 January
Completion of the viaduct's foundation works (Pier works)

February
Power Supply to Depot

March
Commencement of LRV Testing at Depot

April
Completion of U-girder Installation

2024

June
Commencement of LRV testing on mainline

December
Completion of Long Span Works

October
Power Supply to Track

10 May
Completion of LRV Delivery to Depot

AWARDS & ACHIEVEMENTS

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1. **MSOSH Gold Merit Award 2019**
   for Excellent Occupational, Safety and Health (OSH) Performance.

2. **Safety and Health Assessment System in Construction Industry (SHASSIC) 5-star certificate and a score of 96%**
   for meeting CIS 10: 2018 Safety and Health Assessment System in Construction.

3. **British Safety Council International Safety Award 2020**
   for demonstrating a strong commitment to good health and safety management for the year 2019.

4. **5-star Sustainable INFRASTAR certification for the design phase of the project in 2020**.
   The LRT3 project is the first rail infrastructure project to receive a 5-star rating for Environmental Sustainability in Malaysia.

5. **Safety, Health, Environmental & Quality (SHEQ) Day Sustainable INFRASTAR 2022 Award**
   for the LRT3 project (design stage).

6. **Land Public Transport Agency (APAD) Railway Project Achievement Awards 2024**
   for safety management commitments and practices on the LRT3 project.

> “MRCB has supported my journey from Engineer to Manager, helping me to overcome challenges, refine my skills and continuously grow in the industry. ”

Atteyah Balqis
Trackworks Manager
(LRT3 Project)