

Chapter**4****Project Options****4.1 Introduction**

The Project site and proposed layout design have been selected after consideration of various other possible and applicable options, inclusive of the “no project option”. These are discussed in the following sections and justifications for the final selected site and layout are documented.

4.2 Project Siting

Muhibbah’s Group is currently operating its shipyard and fabrication yard at Telok Gong, next to South Port in Port Klang, Selangor. Future expansions of these facilities are deemed difficult due to limited availability of land in the area.

In June 2016, Muhibbah Engineering (M) Bhd (MEB) was given the authority by the *Perbadanan Setiausaha Kerajaan Pahang* to develop 3 plots of land with total area of 500 acres along the coast of Mukim Sungai Karang in the District of Kuantan and in proximity to Kuantan Port (**Figure 1.4.1**). MEB has taken this opportunity to propose the Kuantan Maritime Hub (KMH) which is planned for a much bigger shipyard and fabrication yard with associated maritime industrial park as well as institution, business and residential parks.

The proposed Project site is selected based on several site specific advantages as described in the following.

Strategic location with close proximity to potential customers

The proposed KMH will benefits vessels calling Kuantan Port and the deep-water port (currently under construction) and offshore supply vessels from the East Coast oil fields and supply base for ship maintenance and repairs works and any other marine engineering requirement. Meanwhile the steel fabrication yard will cater for offshore and onshore requirement especially fabrication of large steel structures, which are common requirement for the offshore oil fields and onshore industries in the Gebeng – Kuantan areas as well as other oil and gas industries and infrastructures in the east coast region. It is believed that the proposed KMH could contribute as one of the key catalyst to support new investments and future developments within the East Coast Economic Region.



Readily available area and compatible land use

The Project requires sizable land area and its key activities are required to be sited on industrial area. The availability and allocation of 500 acres by the State Government for Phase 1 development substantiate the land area requirement for initial investment and development of the proposed KMH. Even though the allocated area need to be reclaimed, MEB sees the opportunity to consider and design a sustainable layout for Phase 1 and also future Phases 2 and 3 land uses. The options on layout design are discussed in Section 4.3.

As the proposed site is surrounded by industrial land use zoning and it is within the port limit, the proposed Project site has been zoned for industrial use under the *Draf Rancangan Tempatan Daerah Kuantan 2035* as shown on **Figure 1.7.1**.

Accessibility

The proposed site has open access to the sea and the proposed KMH will have a dedicated navigation channel to the proposed shipyard and fabrication yard. With its dedicated navigation channel, the launching of marine vessels and transportation barges will be much at ease and the proposed Project site is deemed strategic to serve these potential customers with shorter delivery time to projects in the east coast region.

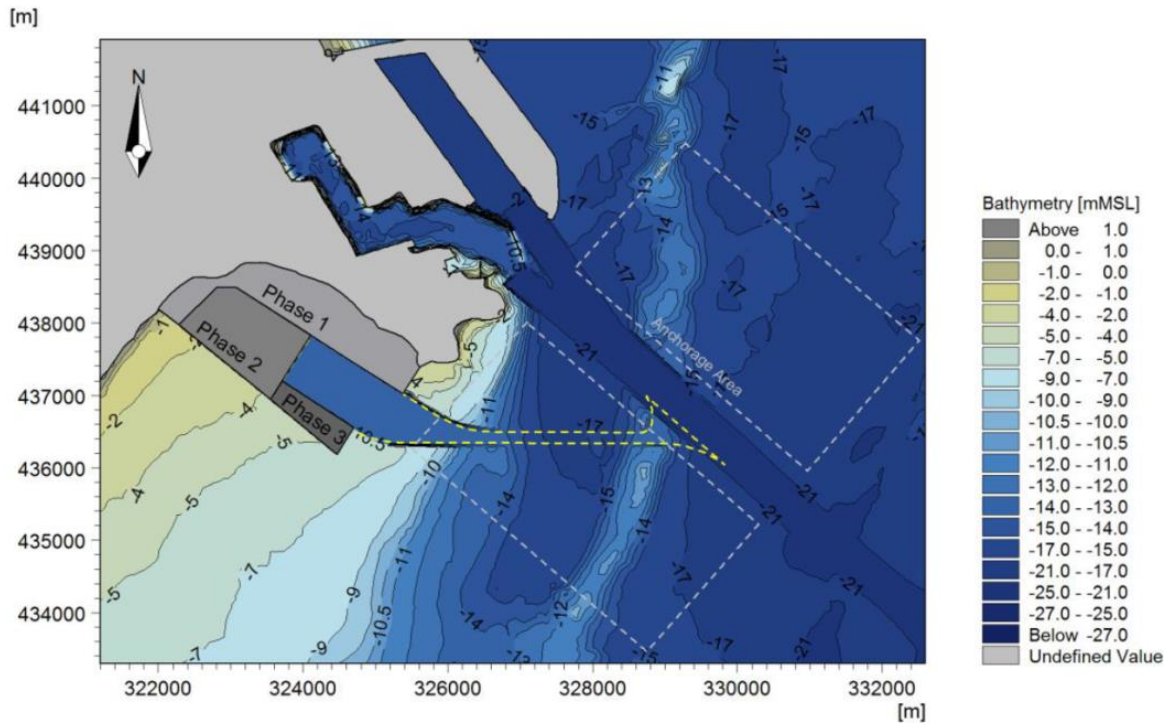
The Project site is easily accessible by land via Federal Route 3 (along Jalan Pintasan Kuantan) and Federal Route 2 (along Jalan Kuantan – Kemaman). The site is approximately 20 km from Kuantan town and about 260 km from Kuala Lumpur. Another associated access to the site is Jalan Tanjung Gelang.

The Project site is located about 30 km away from Sultan Haji Ahmad Shah Airport in Kuantan. Moreover, with the proposed new railway link infrastructure project, East Coast Rail Link (ECRL), the access option to the site from the northern and western states will increase and there is a planned stop station near Kuantan Port.

4.3 Layout Options

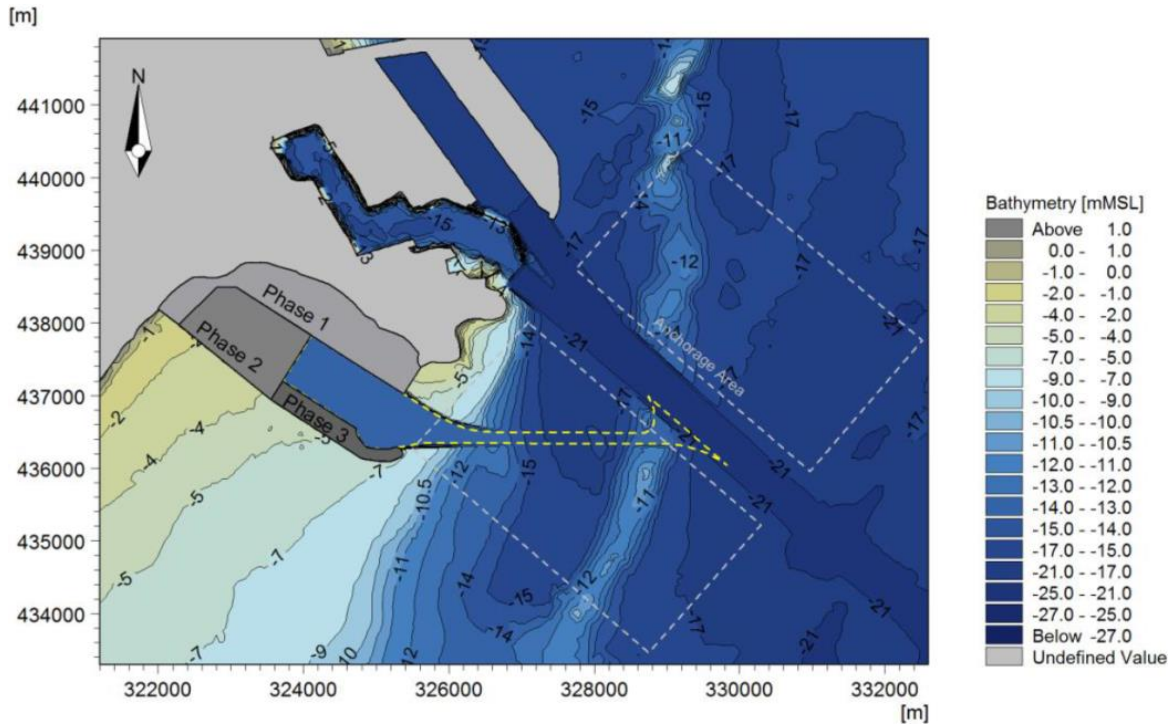
Four different proposed layouts were considered and the main differences between these layouts were the configuration on the southern (single) pier and the orientation of navigation channel. These different layouts are shown and described below.

Layout Option 4 is selected as it does not impact the existing Kuantan Port anchorage zone and does not require the use of the Kuantan Port navigation channel to access the proposed KMH. As such, no conflict of marine traffic with the Kuantan Port is anticipated and the proposed KMH would enjoy ease of operation especially during launching of marine vessels as well as movement of transportation barges to deliver raw materials and fabricated products.



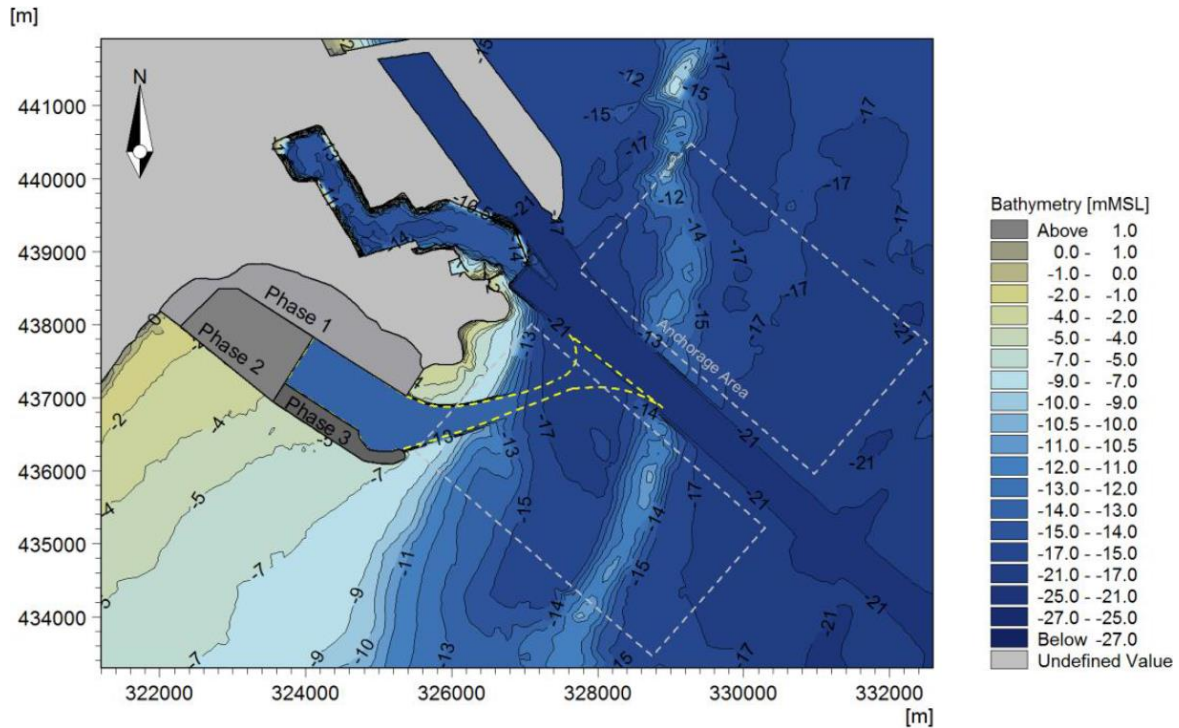
Layout Option 1

Features the reclamation configuration corresponding to the original proposal by MEB, with a navigation channel linking with the Kuantan Port navigation channel. The benefit of this channel is the capital dredging is relatively small. However, the proposed channel cuts through the designated anchorage zone of the Kuantan Port.



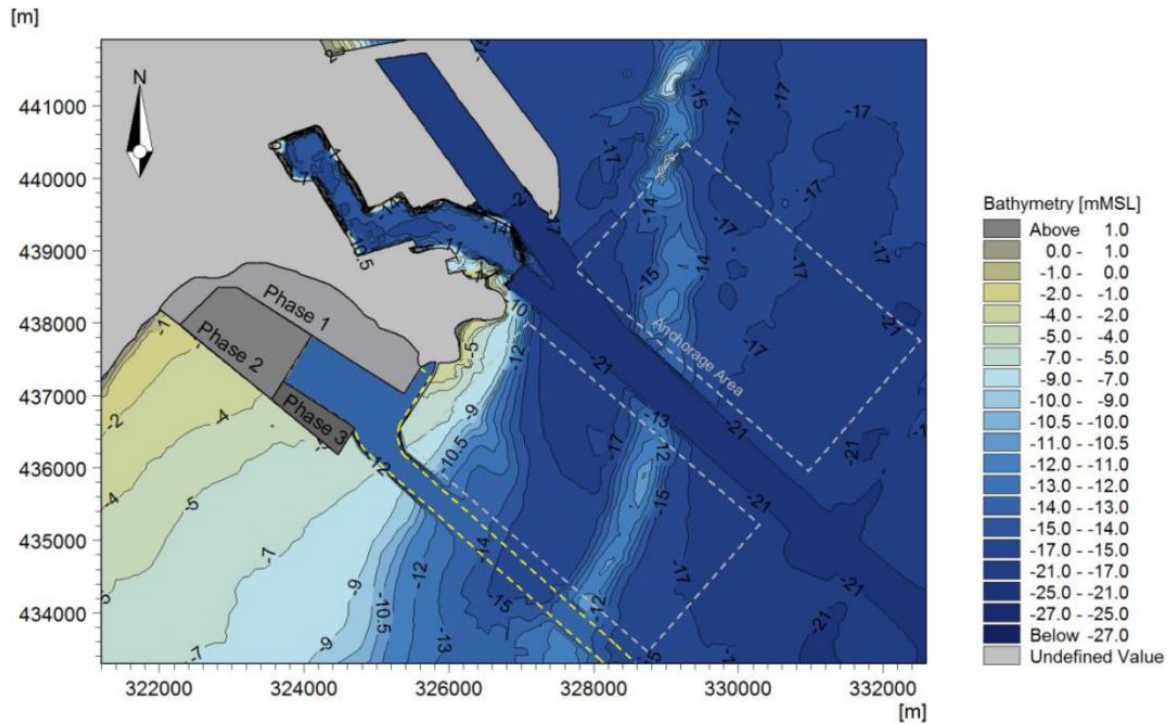
Layout Option 2

Identical to Layout Option 1 but with a breakwater being introduced on the tip of Phase 3 (single) pier. This additional arm is tested for its ability to provide wave sheltering.



Layout Option 3

Navigation channel is shifted further northward, making the junction between proposed channel and Kuantan Port channel is located on the landward side of the sand bar, and with a breakwater on Phase 3 (single) pier. However, the proposed channel still cuts through the anchorage zone of Kuantan Port.



Layout Option 4

Proposed navigation channel is aligned with the southern boundary of the anchorage zone and does not encroach into it. Given the restriction imposed by the anchorage zone to the north, the channel constitutes the shortest possible waterway to reach -12m CD and furthermore involves close to minimal dredging capital. The dredging area is extended along the outer Phase 1 reclamation water frontage towards the headland forming a dredge pocket north of the main basin. This layout is the chosen layout.

4.4 No Project Option

The benefits of considering the “No Project Option” will be the absence of all environmental impacts predicted in **Chapter 7** of this EIA report and its associated costs as a result of the proposed Project. In summary, environmental concerns associated with the implementation of the proposed Project could include the following if mitigation or control measures are not incorporated in the design:

- Potential for degradation of water quality;
- Potential for adverse consequences to the environment including aquatic life, as a result of abnormal operations and accidental releases of hazardous materials;
- Generation of wastes and scheduled wastes; and
- Occupational exposure of workers to potentially hazardous conditions and materials in the work environment.

Nonetheless, the “No Project Option” will also present the loss of potential social, economic and technology benefits. Potential benefits which may be lost in the event of “No Project Option” include:

- Significant capital investment;
- Investment on building human capital: MEB will provide technical training with the belief in knowledge transfer and providing specialised skills training;
- Upstream benefits: demand for raw materials especially by the fabrication yard;
- Downstream benefits: an integrated maritime hub to service and support other maritime users and providers;
- Service sector benefits: the Project will stimulate local and national service/supply industries such as maintenance services, telecommunications, transport, shipping, port handling, freight, insurance, warehousing, banking and financial services, etc.; and
- Macro-economic benefits: contribute and support developments within ECER and potential exports of fabricated products and shipbuilding ship repair services;

Effective mitigation and control measures can adequately address the potential environmental concerns posed by the implementation of this Project. The details of these measures are discussed in **Chapter 7** of this EIA report. Thus, the benefits of the Project should outweigh the residual environmental impacts.

