

**SECOND SCHEDULE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR
CADANGAN PENAMBAKAN LAUT SELUAS 679.188 EKAR DI ATAS TANAH KERAJAAN,
KAWASAN BANDAR XLV, DAERAH MELAKA TENGAH, NEGERI MELAKA
OLEH TETUAN LEAPTEC ENGINEERING SDN BHD.**

EXECUTIVE SUMMARY

Project Proponent:



Leaptec Engineering Sdn Bhd

Environmental Consultant:

ASPEC

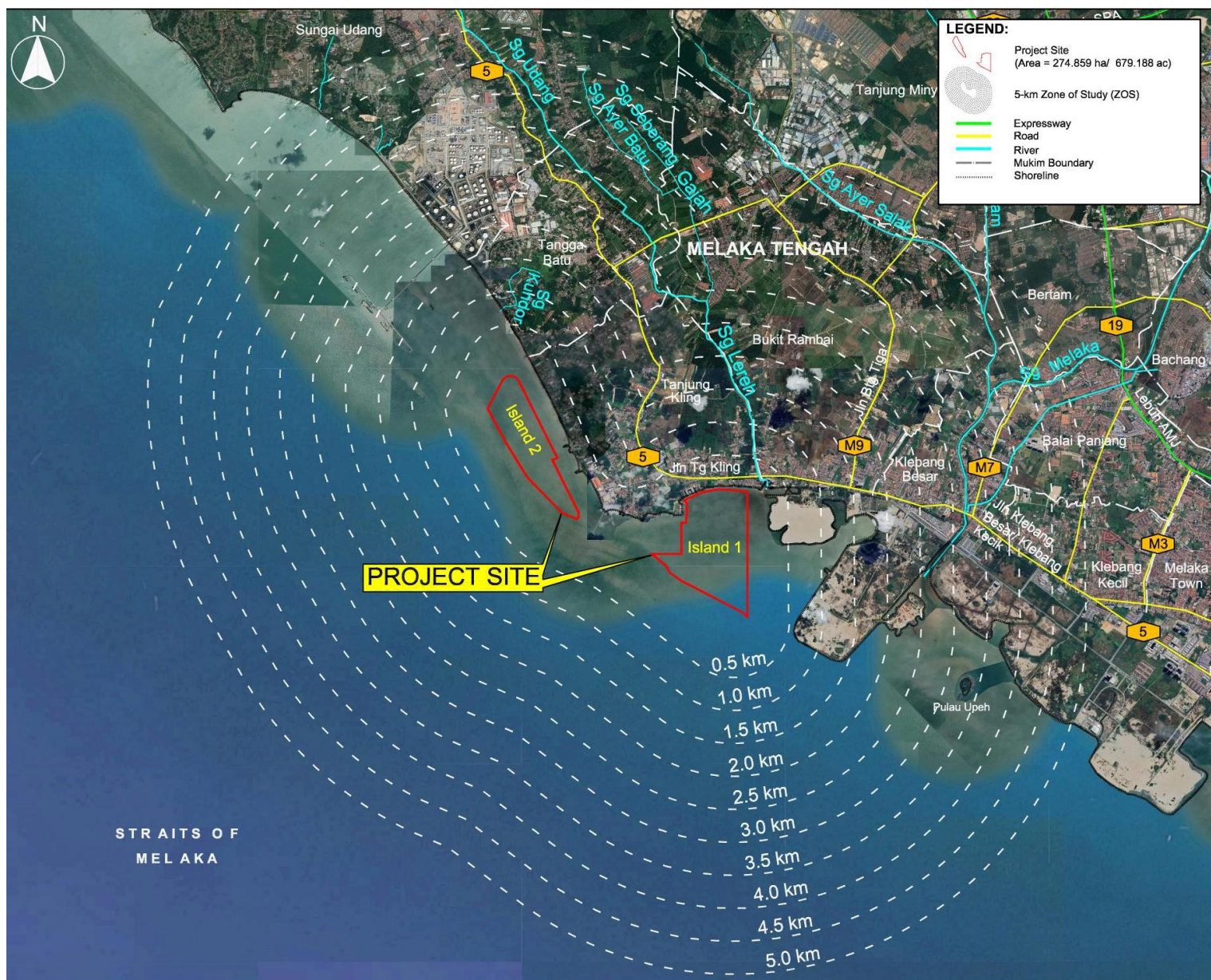
Asia Pacific Environmental Consultants Sdn Bhd

Project Brief

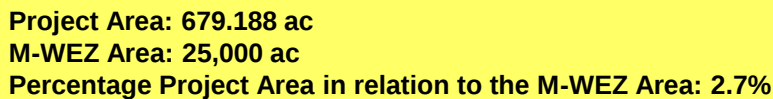
- Leaptec Engineering Sdn Bhd (LESB), the Project Proponent (PP), has entered into an arrangement with the State Government of Melaka to undertake reclamation and development of two man-made islands (Island 1 and Island 2) with a total area of 274.859 ha (679.188 ac).
- This EIA is for the reclamation component only.

Project Location

- The Project is located at Tg Kling, along the coast of Pantai Puteri to Sg Lereh, within the District of Melaka Tengah.
- The site can be accessed via Federal Route 5 (FR5) into Jalan Tg Bruas (Island 2) or via side road next to SK Lereh to the coast (Island 1).



- PELAN KONSESI TAMBAKAN SEMASA KAWASAN KORIDOR M-WEZ YANG TELAH DILULUSKAN**



PETALING JAYA: Leaptec Engineering Sdn Bhd, an indirect subsidiary of LBS Bina Group Bhd, has entered into a Memorandum of Understanding (MoU) with Desan Deniz Ins. Sdn. A.S.

Statutory Requirements

- The reclamation Project is mandatory under the Second Schedule of the *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015*, under Section 34A Environmental Quality Act 1974.

Schedule	Prescribed Activity
Second Schedule	Activity 7(a): Coastal reclamation or land reclamation along river banks involving an area of 50 hectares or more.
Second Schedule	Activity 7(b): Coastal reclamation or land reclamation along river banks within or adjacent or near to environmentally sensitive areas (ESA).
Second Schedule	Activity 7(c): Reclamation of man-made island.

Statement of Need



Complement State Development Policies

In line with the States development objectives and strategies to bring in investments via M-WEZ.

Expand Land Availability for High-Impact Development

Provide additional land banks for strategic large-scale development for sustainable long-term economic growth



Socio-economic Benefits

Provide job opportunities, generate new business, spur local economy, land value appreciation, etc.



Industrial and Maritime Trade Hub Development

Support for nearby ports in terms of industries and downstream support & logistics



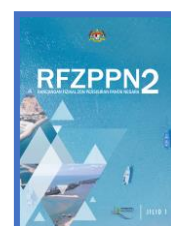
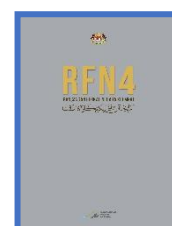
Attract Foreign Direct Investments

Provide foreign investment opportunities for the State.

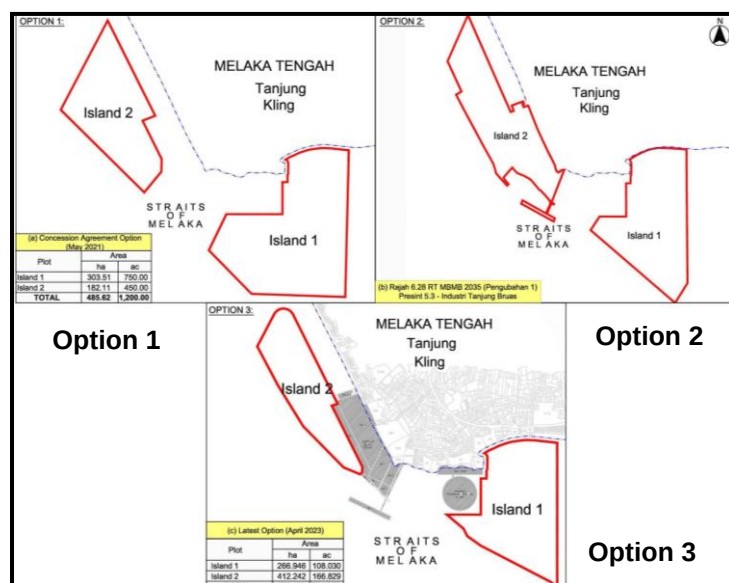


Policy Conformance

- The Project is in accordance with the national, state and district policies and development plans:
 - ✓ Twelfth Malaysia Plan (RMK-12).
 - ✓ *Rancangan Fizikal Negara Ke-4* (RFN-4).
 - ✓ *Rancangan Fizikal Zon Persisiran Pantai Negara-2* (RFZPPN-2).
 - ✓ *Rancangan Struktur Negeri* (RSN) *Melaka 2035*.
 - ✓ *Melakaku Maju Jaya 2035 Strategic Plan*.
 - ✓ *Blueprint M-WEZ Malaysia*.
 - ✓ *Rancangan Tempatan* (RTD) *Majlis Bandaraya Melaka Bersejarah* (MBMB) 2035 (Penggantian) (Warta No. 472, 16 Sept 2021).
 - ✓ *Draf RTD MBMB 2035 (Penggantian 1)*.



Project Options



Siting Option



Layout Option

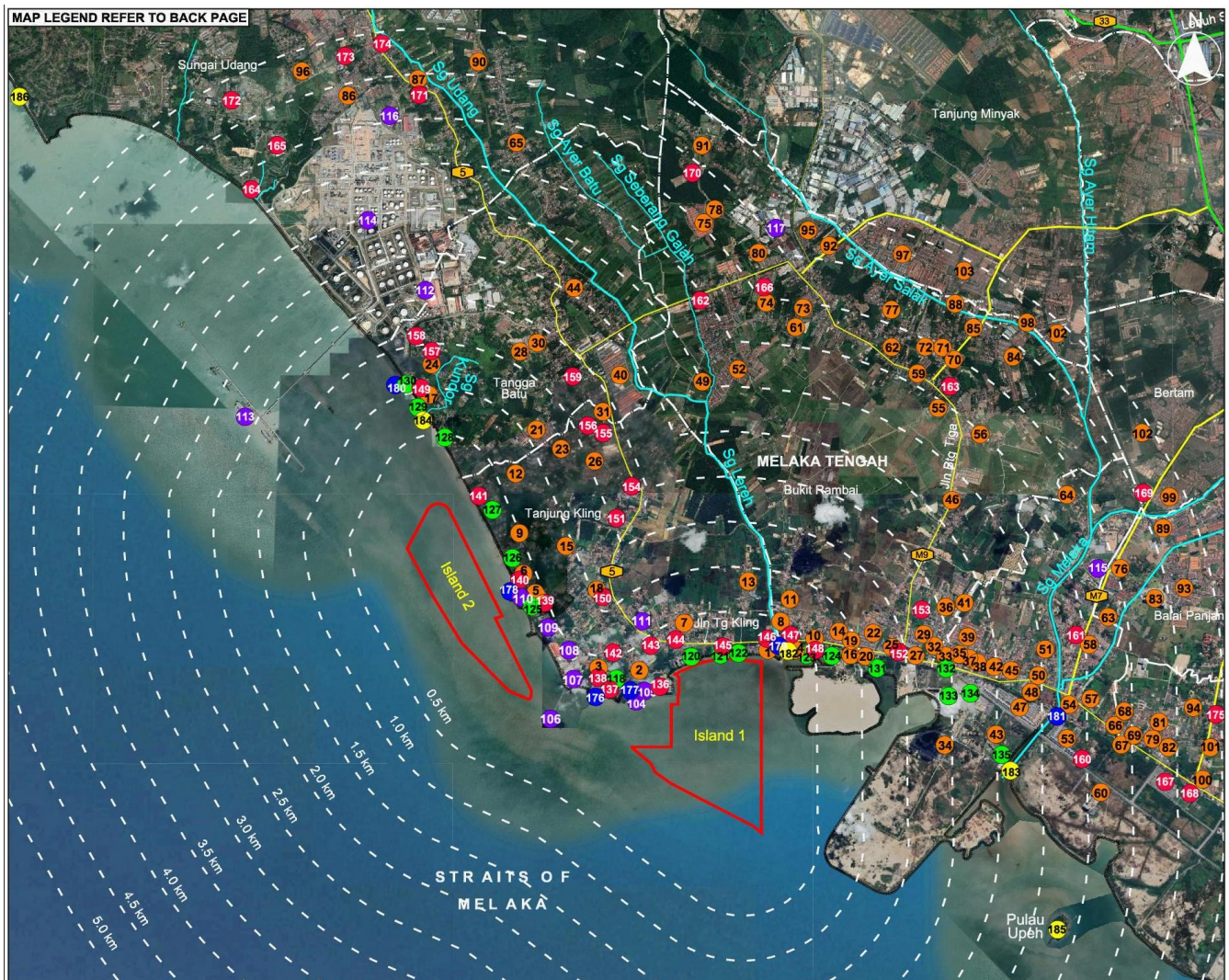


Sand Source Option



Technology Option

PROJECT LOCATION AND SURROUNDING (5-KM ZONE OF STUDY)



LEGEND:

Settlement:

- 1 Tmn Spring Garden
- 2 Tmn Sri Nilam
- 3 Kg Tg Kling
- 4 Kg Leroh
- 5 Kg Balik Bukit
- 6 Ocean Palms
- 7 Kg Pengkalan Perigi
- 8 Tg Samudera Condominium
- 9 Pekan Tg Kling
- 10 Rumah Pangsa Leroh
- 11 Tmn Peringkat Permai
- 12 Kg Pinang A
- 13 Kg Pinang B
- 14 Kg Pantan Rombang
- 15 Kg Pengkalan Lanjut
- 16 Kg Bahagia
- 17 Kg Bukit Darat
- 18 Sri Bayan Condominium
- 19 Regalia Beachfront Residence
- 20 Kg Bukit Gedung
- 21 Tmn Puncak Maju
- 22 Marina Point (Under Construction)
- 23 Kg Tanah Merah Jaya
- 24 Tmn Nirwana
- 25 Tmn Seri Gelam
- 26 Kg Pantan Kundur
- 27 Batang Tiga
- 28 Tmn Seri Tanjung
- 29 Golden Coast Condominium
- 30 Pangsapuri Tmn Tangga Batu
- 31 Tmn Pantan Emas
- 32 Tmn Tangga Batu
- 33 Kg Ghaffar Baba
- 34 Tmn Muhibbah
- 35 Tmn Tay Boon Seng
- 36 The Rise Residence and Resort (Under Construction)
- 37 Tmn Cempaka
- 38 Tmn Pasir Emas
- 39 Tmn Sayang Selasih
- 40 Tmn Orkid
- 41 Tmn Meranti
- 42 Tmn Tangga Batu Perdana
- 43 Tmn Muhibbah
- 44 Tmn Mawar
- 45 Klebang One le tower
- 46 Kg Tangga Batu
- 47 Tmn Mayfair
- 48 Kg Rambai Tengah
- 49 Tmn Klebang Utama
- 50 Kondo Klebang Delima
- 51 Tmn Rambai Emas
- 52 Tmn Kenanga
- 53 Kg Tengah
- 54 Tmn Bukit Rambai
- 55 Tmn Kota Laksamana Jaya
- 56 Kayangan Villa
- 57 Tmn Klebang Besar
- 58 Rumah Awam Bukit Rambai 2
- 59 Kg Bukit Rambai
- 60 Tmn Permai
- 61 Kg Pulau Gadong
- 62 Tmn Rambai Ria
- 63 Kesumas Residensi Klebang 2
- 64 Kg Gedung Lalang

- 65 Tmn Rambai Mesra
- 66 Tmn Gadong Indah
- 67 Kg Setulang Daeng
- 68 Kg Paya Rumpit Jaya
- 69 Tmn Gambira
- 70 Lagenda Condominium
- 71 Kg Baru Klebang Kecil
- 72 Selat Horizon Condominium
- 73 Tmn Rambai Harmoni
- 74 Kg Tengah
- 75 Tmn Rambai Mutiara
- 76 Tmn Rambai Murni 2
- 77 Tmn Rambai Utama Sentosa
- 78 Tmn Rambai Idaman
- 79 Rumah Awam 2
- 80 Kg Paya Mengkuang
- 81 Tmn Ayer Salak
- 82 Golden Showers Condominium
- 83 Tmn Rambai Sutera
- 84 Tmn Klebang Jaya
- 85 Tmn Melati
- 86 PRIMA Melaka Tengah 2
- 87 Tmn Sri Rambai 1
- 88 Tmn Arked Sri Rambai
- 89 Tmn Peruna
- 90 Kg Sg Udang
- 91 Kg Bukit Dato A
- 92 Tmn Gadong Bahagia
- 93 Tmn Sungai Udang
- 94 Kg Ayer Salak
- 95 Tmn Rambai Permai
- 96 Tmn Pokok Mangga
- 97 Kg Batak
- 98 Tmn Rambai Indah
- 99 Kem Desa Tun Razak
- 100 Tmn Rambai Jaya
- 101 Kg Bukit Dato B
- 102 Tmn Gadong Perdana
- 103 Casuarina Park
- 104 Kg Pekan Mangga
- 105 Tmn Tanjung Minyak
- 106 Tmn Rambai Utama

Industry and Port:

- 107 Jetty ANR Maju Jaya S/B
- 108 ANR Maju Jaya S/B
- 109 Tg Brusa Port Jetty
- 110 Tg Brusa Port
- 111 Zon Perindustrian Bebas Tg Kling
- 112 Pahlawan Power Sdn Bhd
- 113 Jetty KMB
- 114 Scientex / Sukasa Strapping Sdn Bhd
- 115 Kawasan Perindustrian Tangga Batu
- 116 Petronas Dagang Bhd Terminal
- 117 Petronas Regasification
- 118 Terminal Sungai Udang
- 119 Malindo F&B Sdn Bhd
- 120 Malaysian Refining Company Sdn Bhd
- 121 Kawasan Perindustrian Bukit Rambai

Heritage, Recreation & Tourism:

- 122 Hang Tuah's Mausoleum
- 123 Motel Tanjung Kling
- 124 Everly Resort Hotel Malacca/ Riviera Bay Resort Condominium
- 125 Shah's Beach Resort
- 126 Pantan Leroh
- 127 Kobera Chalet
- 128 Klebang Beach Resort
- 129 Puteri Qashrina Chalet
- 130 Motel Tg Kling
- 131 Medan Selera Puteri Malam
- 132 Hotel Pantan Puteri
- 133 Puteri Qashrina Chalet
- 134 Mutiara Melaka Beach Resort
- 135 D'Oasis Corner
- 136 Pantan Kundur
- 137 Seafarer Restaurant Sdn Bhd
- 138 Medan MBMS Klebang Besar
- 139 Medan Selera Persisiran Pantan
- 140 Pantan Leroh
- 141 Dataran 1 Malaysia
- 142 Malacca Submarine Museum
- 143 The Malacca Club
- 144 Balai Raya Kg Hailam Melaka
- 145 Institut Koreksional Malaysia
- 146 Surau Tanjung Kling
- 147 Surau Al-Kauthar
- 148 Pejabat Laut Negeri Melaka
- 149 Klinik Desa Pantan Kundur
- 150 Masjid Al-Hilal Pantan Rombang
- 151 Balai Polis Tg Kling
- 152 Masjid Tg Kling
- 153 Pejabat Pos Tg Kling
- 154 SK Leroh
- 155 SJK(C) Ek Te
- 156 Sekolah Tunas Bakti
- 157 Kuarters Kakitangan Sekolah
- 158 Masjid Pokok Asam
- 159 Rumah Anak-Anak Yatim Sultan
- 160 Salahuddin Abdul Aziz Shah Al-Haj
- 161 Masjid Bukit Gedung
- 162 SMK Kampung Gelam
- 163 Masjid Batang Tiga
- 164 Balai Polis Batang Tiga
- 165 SMK Klebang Besar
- 166 SK Kg Gelam
- 167 Klinik Kesihatan Seri Tanjung
- 168 SMK Seri Tanjung
- 169 Masjid Mohsinin
- 170 SRA Jaim Pantan Kundur
- 171 SK Pantan Kundur
- 172 SJK(C) Poh Lan
- 173 Kompleks Japerun Klebang
- 174 SK Klebang Besar
- 175 Balai Bomba dan Penyelamat Tangga Batu
- 176 SK Bukit Rambai
- 177 Pusat Penyelaman Combat
- 178 SK Kem Gerakhas
- 179 SMK Bukit Rambai
- 180 Oriental Melaka Straits Medical
- 181 Oriental Nilam College of Nursing and Health Sciences

- 182 Kompleks Pertanian Pulau Gadong
- 183 Church of St. Mary
- 184 SRJK (C) St Mary
- 185 SK Sungai Udang
- 186 Kem Terendak
- 187 Klinik Kesihatan Sg Udang
- 188 SJK(C) Sungai Udang
- 189 SJK (C) Lih Jen

Fishery:

- 190 Mak Long Belacan Tanjung
- 191 Pengkalan Nelayan Balik Bukit
- 192 Balai Nelayan Tg Kling/
- 193 Jeti Pendaratan Ikan Nelayan
- 194 Pantan Hailam Tanjung Kling
- 195 Pasar Nelayan Pantan Puteri/
- 196 Balai Nelayan Pantan Puteri
- 197 LKMT Sg Leroh Jetty
- 198 Pantan Kundur Services
- 199 Fishermen Jetty Klebang

ESA:

- 200 Sg Leroh Estuary
- 201 Sg Ayer Salak Estuary
- 202 Sg Kundur Estuary
- 203 Pulau Upeh (Turtle Landing)
- 204 Kem Terendak (Turtle Landing)



Pantan Kundur



Pantan Puteri



Balik Bukit

PROJECT DESCRIPTION

- The Project is **only for the reclamation** of the Project area, while the top-side development is subject to a separate EIA.
- Project main components:



**Sand Bund and
Ground Treatment**



**Shoreline Protection
(Rock Revetment)**



**Reclamation Works
(Sand Filling)**

Item	Details
Project location	Daerah Melaka Tengah, Melaka Bandaraya Bersejarah.
Project size	274.859 ha (679.188 ac).
Phases	Four phases
Platform level	+4.65 m CD.
Fill volume	31.7 million m ³
Sand source(s)	Bahtera Teroka Sdn Bhd. <i>*Source to be confirmed by reclamation contractors.</i>
Vessels	(a) 3 in 1 Conveyer Belt Vessel – Sand bund construction. (b) Trailer Suction Hopper Dredger (TSHD) – Sand transport and filling.
Sediment control measures	Perimeter sand bund and double-layered silt curtains.
Ground treatment	Surcharge with prefabricated vertical drains (PVD).
Shoreline protection	Rock revetment with underlying geotextile layer.
Rock requirement	1.7 million m ³
Rock source	Local quarry in Melaka. <i>*Source to be confirmed by reclamation contractors.</i>
Dredging	None.
Disposal area	None.
Reclamation duration	11 years (five years each phase)

PROJECT ACTIVITIES

Pre-Reclamation

1. Site possession and preparation.
2. Pre-reclamation survey works.
3. Data Gathering for EIA.



Laying Double-layer Silt Curtain

Reclamation

1. Installation of boundary marker dan silt curtain.
2. Construction of sand bund.
3. Reclamation works to design level using TSHD.



Construction of Sand Bund

4. Ground treatment works.
5. Testing & removal of surcharge to platform level.
6. Construction of permanent rock revetment.
7. Survey works.



Shoreline Protection Works

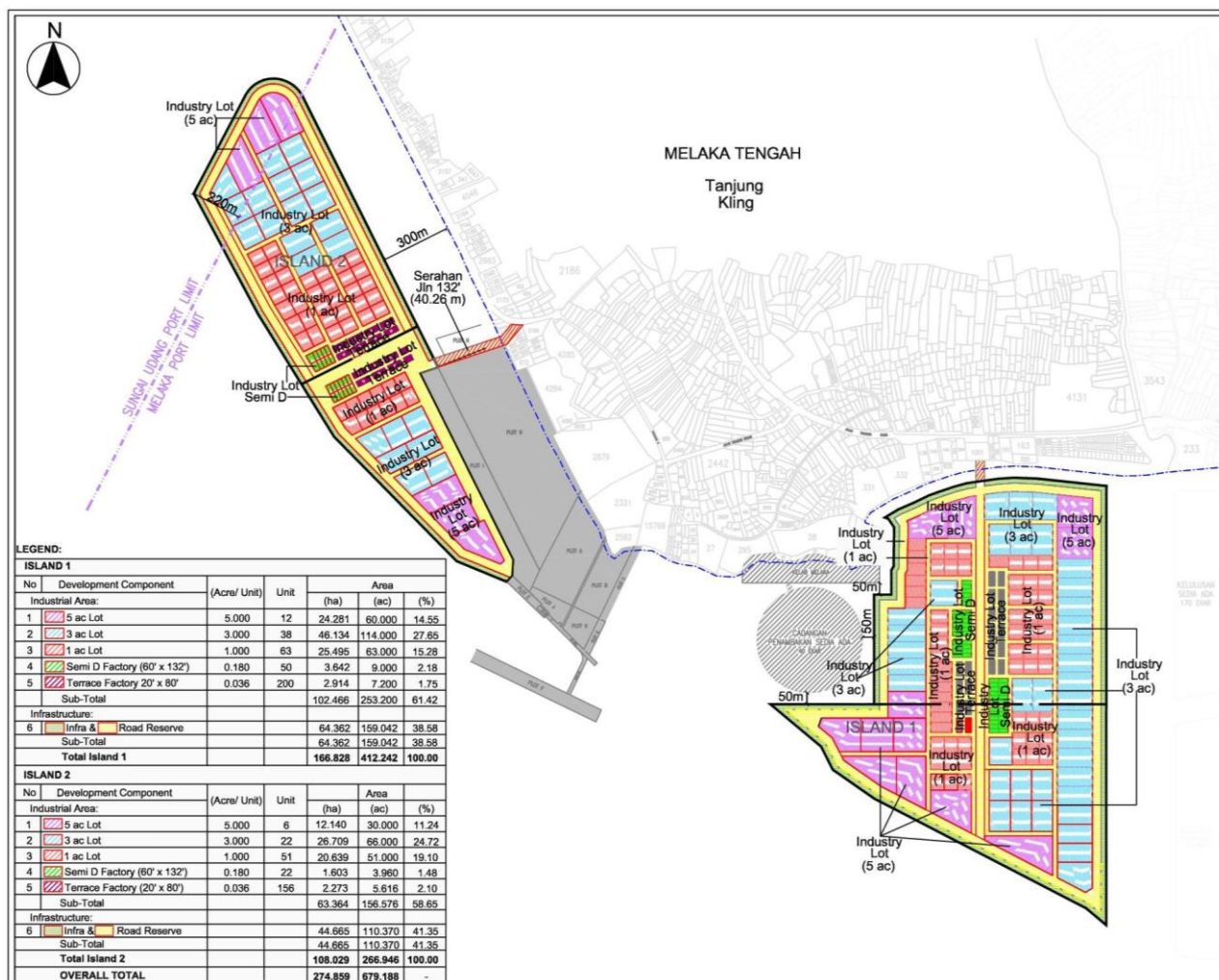
Post-Reclamation

Top side development is not included in this EIA and will be the sole responsibility of the future developer.

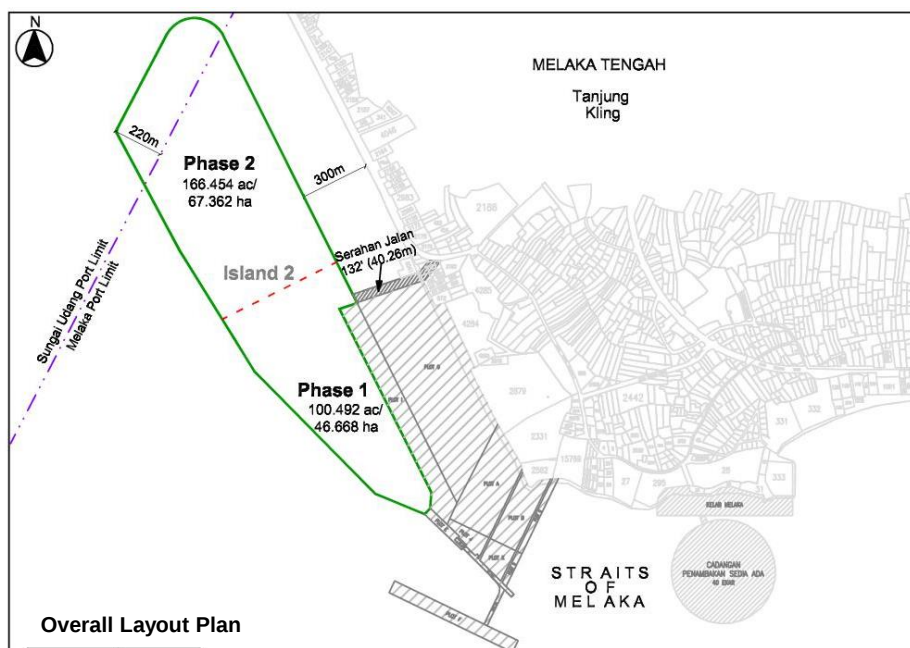


Sand Filling and Ground Treatment

Project Layout



RECLAMATION PHASING (ISLAND 2)



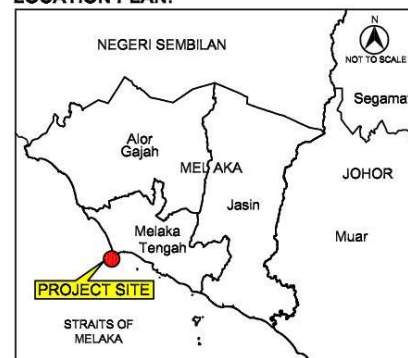
LEGEND:

- Island 2 (Area = 108.029 ha/ 266.946 ac)
- Phasing Boundary
- Silt Curtain
- Reclaimed Direction
- Port Limit
- Permanent Rock Revetment (Primary Armour Rock)
- Temporary Rock Revetment
- Secondary Armour Rock for Revetment
- Sand Bund
- Reclaimed Land
- Diaphragm Wall

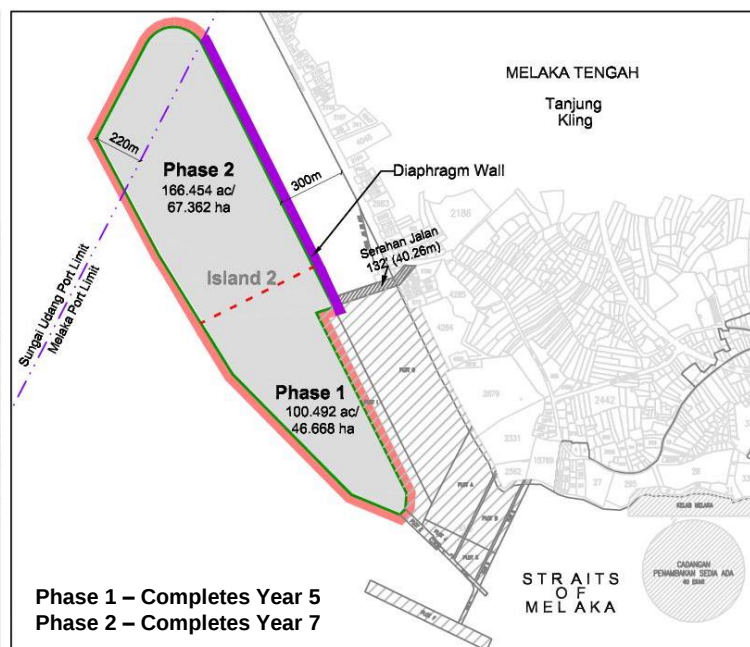
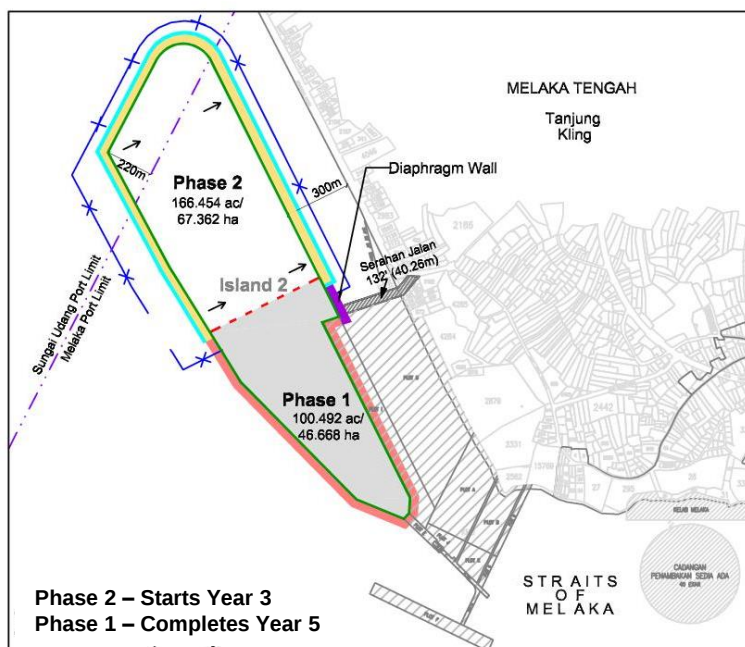
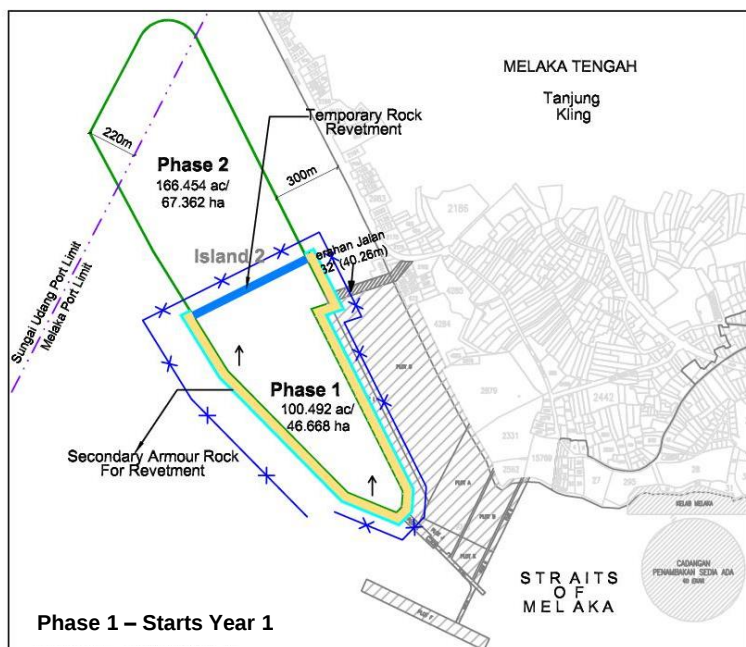
DATA SOURCE:

- (1) Project Boundary, Pelan Susunatur Awalan, No. Plan: 50030/AA/TGBRUAS/WD/PS/01, Rev. No: 13, Anuar Aziz Architect, 13 April 2023.
- (2) Schematic Illustration of Reclamation Sequence, HHS Integrated Sdn Bhd (HSSI), Sept 2023.

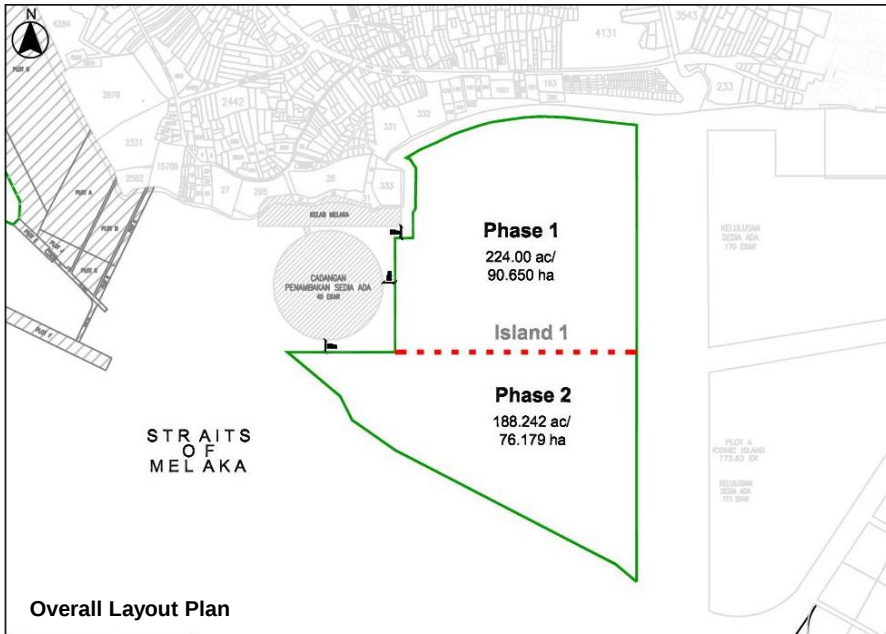
LOCATION PLAN:



KEY PLAN:



RECLAMATION PHASING (ISLAND 1)



LEGEND:

- Island 1
(Area = 166.83 ha/ 412.24 ac)
- Phasing Boundary
- Silt Curtain
- Reclaimed Direction
- Permanent Rock Revetment (Primary Armour Rock)
- Temporary Rock Revetment
- Sand Bund
- Reclaimed Land
- Diaphragm Wall

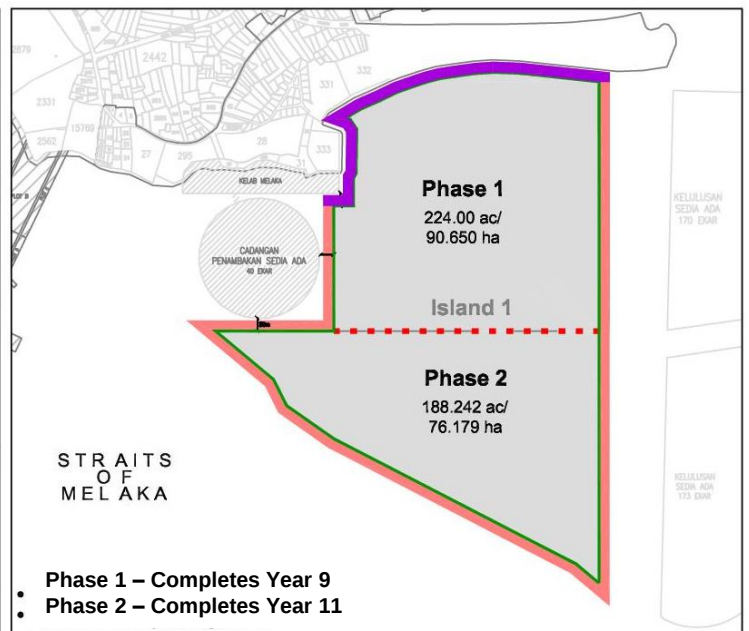
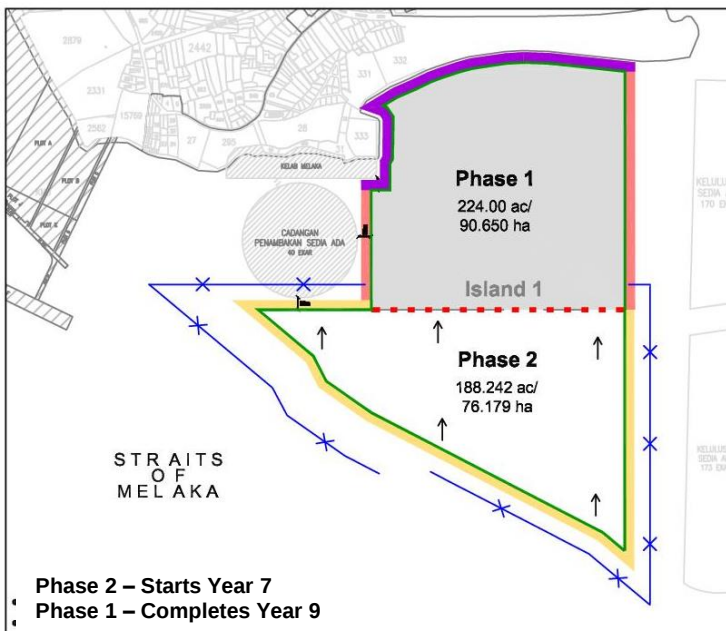
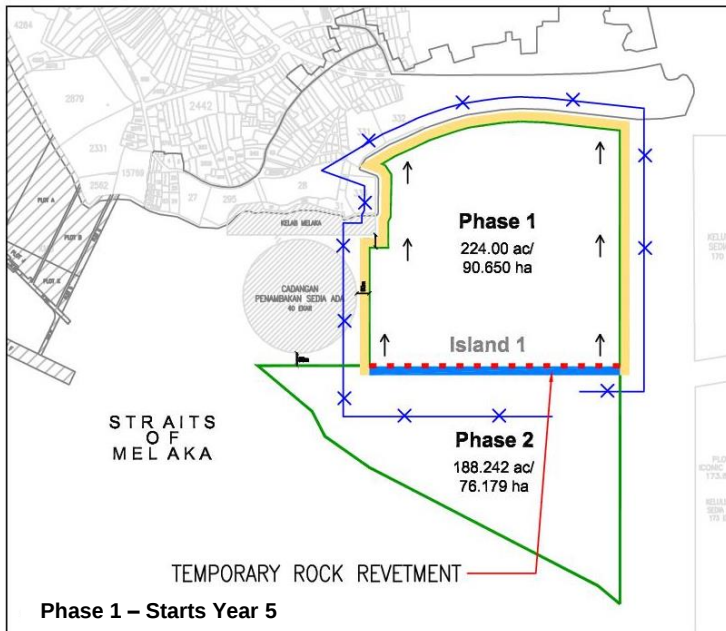
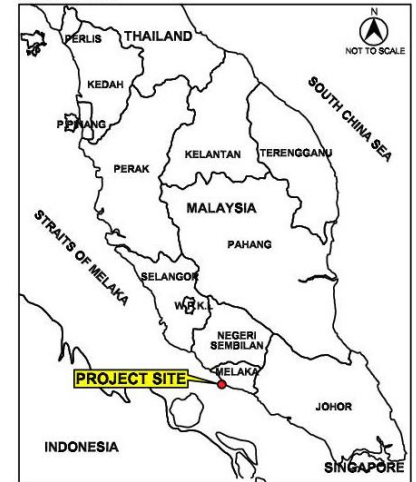
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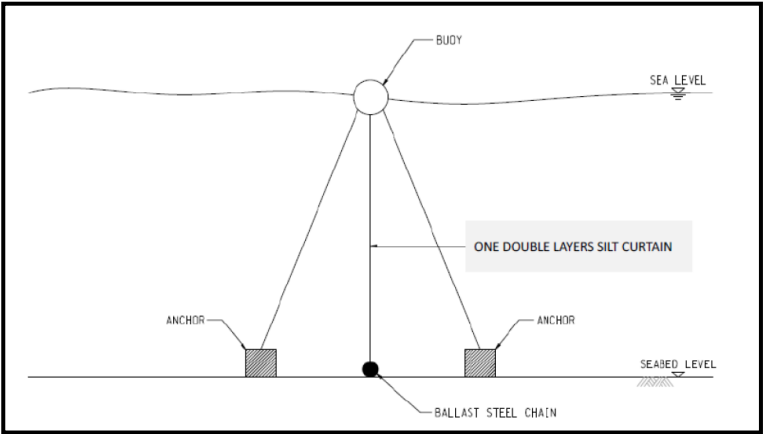
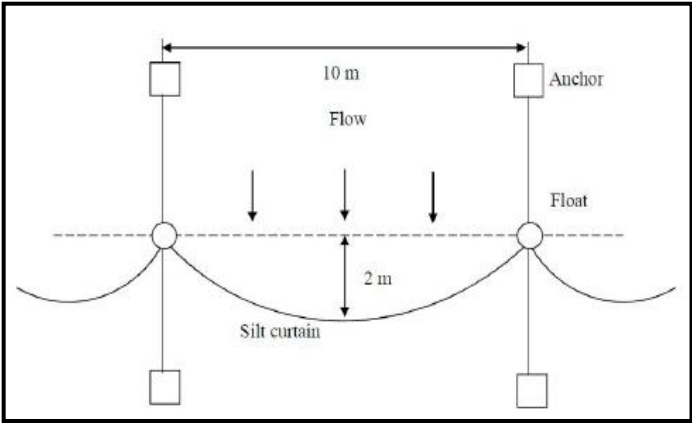
LOCATION PLAN:



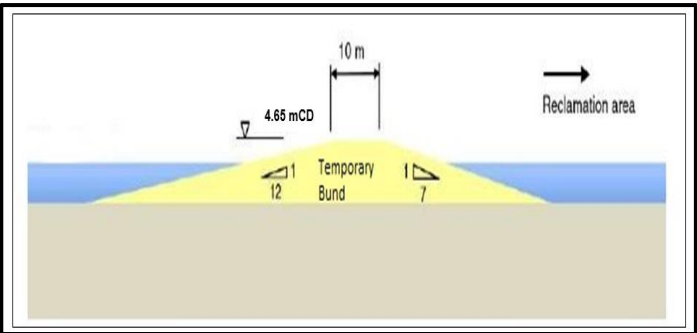
KEY PLAN:



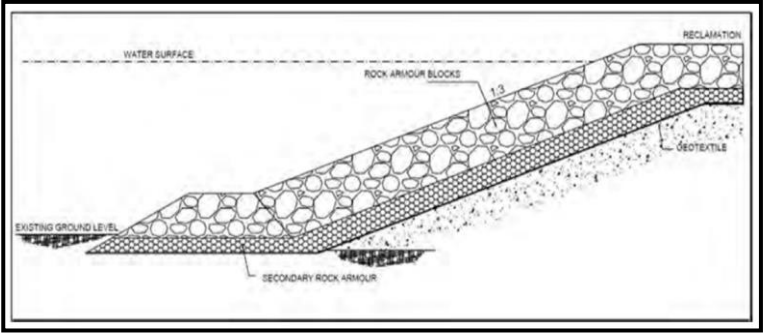
Protection Measures



Double-layered Silt Curtain



Temporary Sand Bund Cross Section



Typical Revetment Cross Section

Vessels



3 in 1 Conveyor Belt Vessel



Trailer Suction Hopper Dredger

Project Schedule and Phasing

Island	Phase	Year											
		*2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
2	1												
	2												
1	1												
	2												

Source: HSS Integrated Sdn Bhd, 2023.
Note: *The start of reclamation is estimated and is dependent on obtaining all relevant authority approvals prior to commencement of work.

Legend:
Sand Bund Construction
Reclamation Works
Ground Treatment and Revetment Works

SIGNIFICANT IMPACT ASSESSMENT



EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES

Landuse



EXISTING ENVIRONMENT

1. Settlements/Villages/Township

- There are ~103 nos. settlements within the 5-km ZOS.
- Within the 1-km coastal ZOI: ~ 22 nos. of kampungs, condominiums and residential tamans.

2. Other Built-up Areas

- **Industries:** ~15 nos. of industrial areas; major site is the Petronas Regassification Terminal (RGT) to the north, along with several industrial estates. Maritime, port and fishery-based industries are found mainly near the coast.
- **Commercial & Tourism Areas:** Pantai Kundor, Rombang and Puteri near Island 2 are popular recreational and tourism areas. Along Pantai Lereh and Pantai Klebang are also several resorts/homestays and popular for recreational fishery.

3. Fish Landing Area

- Nine main fishermen jetties are within the 5-km ZOI,

4. Others

- The Project is located within parts of the Sg Udang and Melaka Port Limits.
- The Project is located outside of the *Zon yang Dilindungi Pulau Upeh dan Pulau Besar* and Melaka UNESCO Heritage City Zone.

POTENTIAL IMPACT

RECLAMATION PHASE

- The current waterbody will be reclaimed and changed into new land area suitable for development.
- Visual and physical impacts to Pantai Kundor, Rombang & Puteri which may affect recreational and tourism activities.
- Interface with KMB and Tg Pelepas Port expansion located adjacent to Island 2.
- Impacts on fishery areas within Zone A and nearby fishing jetties/landing area access.

POST-RECLAMATION PHASE

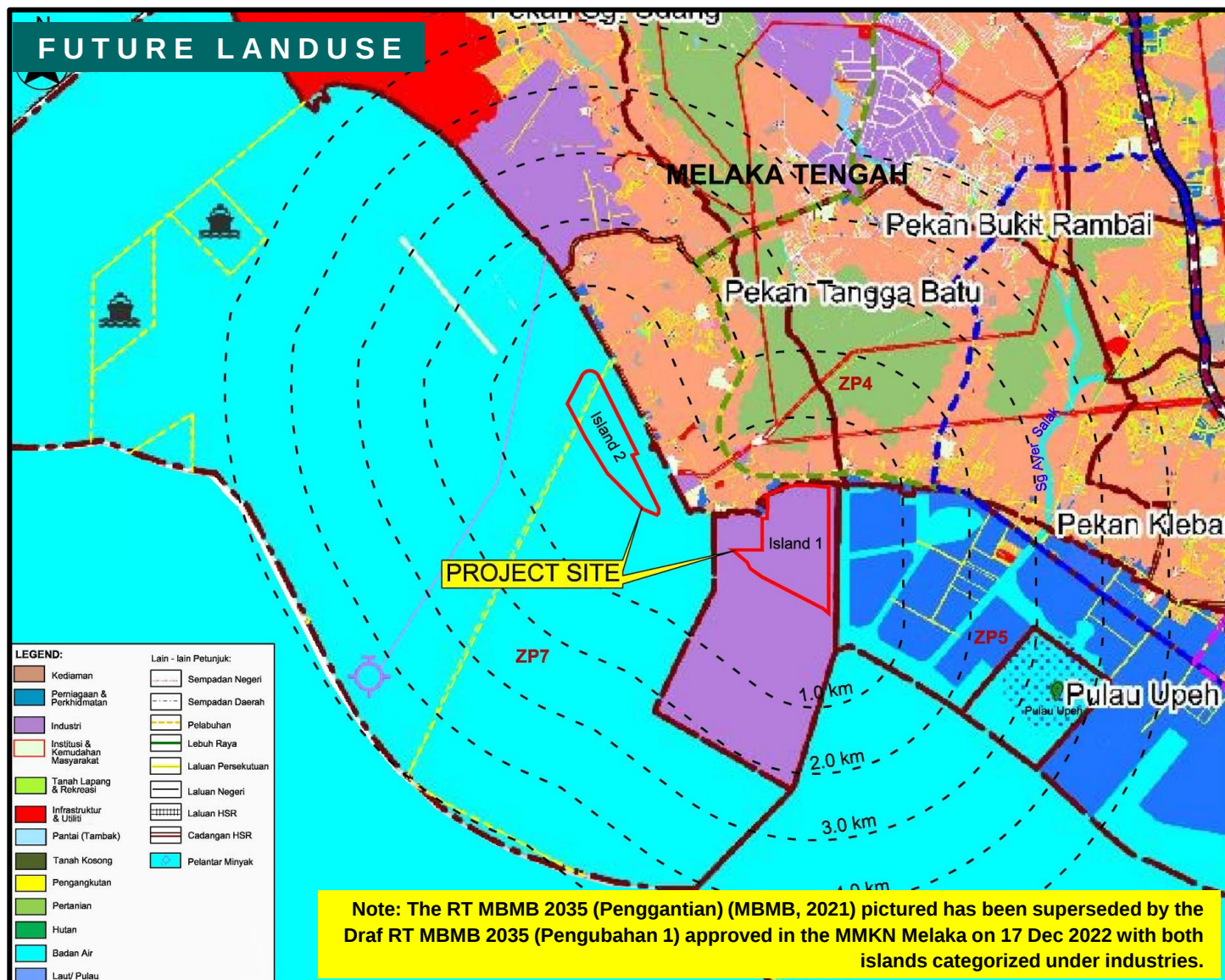
- Proposed is aligned with the state development policy and gazetted landuse (industry).
- Compatibility effects to nearby landuse receptors, i.e. Pantai Puteri, Tg Kling and Taman Spring Garden. Permanent loss of seaview and aesthetics affecting coastal properties.

POLLUTION PREVENTION AND MITIGATION MEASURES (P2M2)

RECLAMATION AND POST-RECLAMATION PHASES

- Adhere to local authority guidelines for the topside development.
- Ensure adequate buffer areas are provided to nearby communities.
- Consider adoption of green building/green cities approach for topside development to offset negative impacts from the development.
- Close cooperation between other reclamation concessionaires.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



5. Future Landuse

The Project site and adjacent areas (*Zon Perancangan 5: Klebang*) are zoned for reclamation and industrial development as per the *RT MBMB 2035 (Pengubahan 1)*.

6. Environmentally Sensitive Areas (ESAs)

Pulau Upeh (Rank 1 ESA) is located ~3.5 km from Project site boundary, classified as a turtle landing site.

The Project site (Island 1) is Rank 2.



EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Climate

EXISTING ENVIRONMENT

- **Rainfall:** Highest: 2,648.0 mm (2022); Lowest: 1,389.8 mm (2013).
- **Raindays:** Highest: 207 days (2022); Lowest: 162 days (2013).
- **Temperature:** Annual mean: 27.2°C (2011) to 28.3°C (2016);
Monthly mean : 26.9°C (Dec & Jan) to 28.3°C (May).
- **Humidity:** Mean Annual Daily RH: 76.6% to 82.8%; Mean 24-Hr Monthly RH: 76.8% to 83.7%.
- **Surface wind:** Mostly blowing from northeast (35.1%); north (12.0%); south (10.0%).
- **Clouds:** 6.8 – 7.0 oktas.



Physical Marine Environment

EXISTING ENVIRONMENT

1. Bathymetry

- Average depth: -5 to -15 mCD, offshore depth ~-22 to -55 mCD.

2. Tides and Waves

- Mean high water spring: 1.17 to 1.31 m MSL;
Mean high water neap: 0.66 to 1.25 m MSL.
- Mean low water spring: -0.66 to -1.05 m MSL;
Mean low water neap: -0.54 to -0.97 m MSL.
- Prevailing offshore wave height: ~1.0 m during both the Northeast and Southwest monsoons.

3. Current

- Mean current speed: <0.2 m/s, 0.5 m/s offshore.
- Maximum current speed: 0.8 m/s – 1.7 m/s.

4. Waves

- NE Monsoon: Southeasterly, nearshore <0.4 m/s, offshore 0.6 m.
- SW Monsoon: Northwesterly, nearshore <0.4 m/s, offshore 0.5 m.

5. Wind

- Northwest wind predominate the NE Monsoon (Nov – Mar), southeast winds predominate the SW Monsoon (May – Sept) and NW winds predominate the Inter-Monsoon (Apr – Oct).

6. Seabed Profile

- Mainly clayey silt and silty sand.
- Sandy for offshore areas.

7. Sediment Transport

- Offshore Mean: 1.2×10^{-4} m³/s/m.
- Offshore Maximum: 1.2×10^{-3} m³/s/m.
- Shoreline Mean: 2×10^{-5} m³/s/m.
- Shoreline Maximum: 1.2×10^{-4} m³/s/m.

8. Marine Sediment Quality

- Chemical test indicates that most heavy metals within the sediment were below the Intervention Values (Dutch Standard). Arsenic, copper and mercury levels at several SI sites had exceeded the Target Values (Dutch Standard)/Threshold Levels (US NOAA).

9. Coastal Erosion

- The site is considered low in terms of coastal erosion risk.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Physical Marine Environment

POTENTIAL IMPACT

RECLAMATION PHASE:

1. Water Level

- Impact is negligible for mean and max water level

2. Current Speed

- Minimal and localised current flow reduction. With Committed Developments, reduction observed along the shoreline and nearshore areas in the vicinity of the Project site.

3. Wave Height

- Changes are localised along the vicinity and boundary of the Project site.

3. Sediment Transport

- Impacts are minimal and localised to the Project site and nearby areas. Cumulative impacts will result in wider extent of transport reduction in the offshore areas.

4. Sediment Plume Dispersion

- Potential sediment plume impacts expected to be insignificant (with installation of double-layered silt curtain and sand bund).

5. Morphological Changes

- Changes in sedimentation and erosion near Project boundary and Tg Bruas Port of <0.2 m/year. Bed level offshore will be ± 0.5 mg/L.

6. Sediment Budget

- Reduction along the coast post-reclamation.

7. Shoreline Evolution

- Changes to bed profile of <0.2 m/year. Erosion observable at Pantai Kundor at Year 5, but reverts back to initial bed level at Year 10. Less erosion at Pantai Puteri.

P 2 M 2

RECLAMATION PHASE:

1. Sediment Transport

- A shoreline monitoring plan (SMP) shall be carried out to monitor the long-term changes of the coastline and the seabed post-reclamation based on the cumulative sedimentation/erosion yearly rate.

2. Shoreline Monitoring Plan (SMP)

- Shoreline monitoring shall be carried out as follows and the monitoring report shall be submitted to DID Malaysia in accordance with the following timeframe:
 - Once before Project commencement (as baseline data).
 - Every three months during Project activities (Quarterly).
 - Every six months after completion of Project (Bi-yearly).
- River cross-section survey of Sg Lereh as part of the SMP.

POST-RECLAMATION PHASE:

- Continuation of SMP, remedial action shall be taken by PP if there are any significant impacts observed during monitoring.



SHORELINE MONITORING PLAN

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Water Quality

EXISTING ENVIRONMENT

MARINE WATER

- **Standards:** Class 1 (MW7), Class 2 (MW2, MW3, MW4, MW8, MW9 & MW13) and Class E1 Interim limits (MW1, MW5 & MW6) of the MMWQS .
- **Compliance:** Most of the analysed parameters were within the permissible limits with the exceptions of TSS, PO₄, NO₃, Ammonia, Hg, Cu, Zn, *faecal coliform*, *Enterococci* and TDS at several sampling stations.
- **Malaysian Marine Water Quality Index (MMWQI):** 'Good' to 'Excellent' for all marine points.

RIVER WATER

- **Standard:** National Water Quality Standards Class IIA/B (RW1 – RW4)..
- **Compliance:** Most of analysed parameters were within the limits except for TSS, BOD, COD, AN, total coliform and faecal coliform at several sampling stations.
- **Water Quality Index (WQI):** WQI was Class II – III ('Slightly Polluted').

POTENTIAL IMPACT

RECLAMATION PHASE

- Sediment spillage during sand bund construction and from dewatering discharge.
- Siltation due to sediment plume.
- Potential oil leakage/spillage leading to oil spills affecting the coastal area and its vicinity.
- Accidental leaks and spills of fuel/lubricant from vessels/machinery can occur during refuelling or servicing, resulting in contamination of soil and waterways.
- Management of waste disposal (fuels and chemicals, solid wastes, scheduled wastes, sewage and sullage).
- Heavy metal disturbance from seabed could affect marine life.

POST-RECLAMATION PHASE

- Increased pollutant flushing time from 6 – 12 hours to 12 – 24 hours which is still within the recommended e-folding value of four days. In the worst case, with the KMB Reclamation, flow will be reduced, increasing flushing time at Pantai Puteri to 64 hours.

P2M2

RECLAMATION PHASE

- Dredger operation management during mining and transport.
- Deployment of double-layered silt curtain around the sand bund to reduce sediment dispersion to surrounding waters, towards ESRs.
- Effective management of solid wastes.
- Have an Oil Spill Management Plan prepared and oil spill kit at the ready.
- Direct discharge of untreated sewage to the coast is prohibited.
- Manage scheduled wastes in accordance to DOE guidelines.
- Vessel discharges are to adhere to the requirements of MARPOL 73/78 regulations.
- Conduct periodic water quality monitoring.

POST-RECLAMATION PHASE

- Implement LDP2M2 as required to manage erosion and sedimentation.
- Prohibit discharges into restricted waters.
- Monitor flushing and pollution along canals and drainage areas.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Air Quality & Noise Level

EXISTING ENVIRONMENT

AIR QUALITY

- All measured parameters had complied with the limits of MAAQS (2020).

NOISE LEVEL

- All points, except for N4 & N5, complied with DOE permissible limits for both day and night time, in accordance with the First Schedule – Recommended Permissible Sound Level (L_{Aeq}) by Receiving Landuse for New Development.

POTENTIAL IMPACT

RECLAMATION PHASE

Air quality

- Minor impacts from vessel and machinery emissions.
- Dispersion of airborne dust by vehicular movement causing localised dust clouds.
- Indiscriminate open burning.
- Stench odour from unsanitary condition.

Noise level

- Traffic and marine vessels-related noise is expected during working hours.
- Nearest coastal receptors will likely experience increase in noise levels, resulting in nuisance.
- Workers working in high noise environment may suffer hearing impairment if long-term exposure.
- Underwater noise is expected to be intermittent and non-impulsive, thus not significant in terms of scale and length of reclamation work.
- Marine wildlife may still exhibit avoidance behaviour near to the Project site, but unlikely to exceed lethal threshold.

P2M2

RECLAMATION PHASE

Air quality:

- Manage vessel and vehicular emissions.
- Conduct water bowing during dry weather along logistic routes and have a wash trough at the entrance of the site.
- Ensure wastes are collected and disposed of regularly to licensed landfills.
- Prohibit all open burning at site.
- Desludge all temporary toilets regularly.
- Conduct regular air quality monitoring near sensitive receptors.

Noise level:

- Put up perimeter hoardings.
- Regular maintenance of machinery and vessels.
- Adopt source reduction methods at high noise areas, i.e enclosure, padding, etc.
- Provide PPE to workers and limit working hours, i.e. shifts.
- Periodic noise monitoring at noise sensitive receptors (NSRs) to ensure no exceedance.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Hydrology and Drainage

EXISTING ENVIRONMENT



- **River Basin:** Three major river basins: Sg Melaka, Sg Lereh and Sg Kundor
- **Drainage:** Coastal drainage can be found within the ZOS.
- **Flood Risk:** A total of 14 flooding incidents were reported from 2015 – 2021 in the 5-km ZOS, most were due to reasons other than coastal floodings.

POTENTIAL IMPACT

RECLAMATION & POST-RECLAMATION PHASE

- Silt and debris may accumulate and cause blockage of the drainage canals, leading to localised flooding.
- Sg Lereh estuary could silt up and cause flow restrictions.
- Erosion and sedimentation from platform could enter waterways and drains.

P2M2

POST-RECLAMATION PHASE

- Carry out periodic monitoring and maintenance on the Sg Lereh estuary and drainage to clear out any obstruction.
- Ensure no indiscriminate disposal of wastes to the drains and waterways.
- Implement the ESCP/LDP2M2 if there is a period of no development.
- Topside development to build drainage based on MSMA 2 requirements.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Marine and Coastal Ecology

EXISTING ENVIRONMENT

PLANKTON AND MACROBENTHOS

- **Phytoplankton:** 26 taxa from 6 *phyla*. Ochrophyta was the prominent phylum. Diversity Index (H'): 1.5 – 3.5.
- **Zooplankton:** 93 – 99% of samples were from phylum Arthropoda with densities of 2,717 to 43,696 ind./m³. H': 1.31 – 2.03.
- **Macrobenthos:** 15 taxa from four *phyla*. Density of 0 – 578 ind./m². H': 0 – 0.54.
- **HAB:** None detected among samples.

MARINE FISHERY

- **Fishing Zone:** Zone A (up to 8 nm).
- **Landing Areas:** 17 *pengkalan* within Melaka Tengah District, eight of which are within the 5-km ZOS.
- **Licensed Fishermen:** Total of 521 fishermen registered within Melaka Tengah District (2021).
- **Fish Landing:** Annual fish catch for Melaka Tengah: 797.02 – 883.77 MT (2017 – 2022).
- **Diversity:** 105 individuals were caught comprising 16 species from 14 families including grouper, snapper, mackerel, threadfins, stingray, wolf herring, etc.
- **Aquaculture:** there are no aquaculture activities within the ZOS.

UDANG GERAGAU

- **Annual Catch, Melaka:** 226 tonnes (1991) to 5 tonnes (2020).
- **Activity:** Seasonal, usually once a month, informal activity by local fishermen.
- **Main Locations:** Pantai Kundor, Tg Kling, Pulau Melaka.
- **Gear Type:** Sungkur
- **Catch Volume (Nov 2023):** 9 to 10 kg/day.

RECREATIONAL FISHING

- **Main Sites:** Klebang, Pantai Lereh, Malacca Club, Sg Lereh, Pantai Puteri, Pantai Kundor.

MARINE TURTLES

- **Landing Site:** 21 nos. of turtle landing sites in Melaka with Pulau Upeh being the closest to the Project site (~3.5 km). The other site is Kem Terendak (~6 km).
- **Turtle Landing Nos.:** Turtle landings for Pulau Upeh have been declining from over 100 (2011) to a low of 12 (2022).
- **Species:** Hawksbill turtles (CE) and Green turtles (EN).

MARINE MAMMALS

- **Species:** Five species are known to be found in Melaka waters. Irrawaddy Dolphin (EN) was spotted nearby while Indo-Pacific Humpback Dolphin (VU) was observed near Pulau Besar.

SEAGRASSES AND SEaweeds

- No significant seagrass areas within the ZOS.
- Small patches of seaweeds along Pulau Upeh comprising a total of nine species, the majority of which were *Caulerpa sp.*

CORAL REEFS

- Majority of Melaka's pristine reefs are found at the Pulau Besar Island Cluster and Melaka Marine Park.
- Studies of coral reefs at Pulau Upeh recorded a total of 12 species of coral reef from seven families.
- Most of the area around Pulau Upeh, were rated as 'Poor' in terms of live coral cover.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Marine and Coastal Ecology

EXISTING ENVIRONMENT

TERRESTRIAL FLORA

- A total of 48 species from 27 families of flora was found along the coast, mainly trees, shrubs, creepers and grasses along sandy beaches, estuarine habitats and shallow mudflats.
- Remnant mangroves observed at Sg Ayer Salak/Malim and Sg Lereh.

POTENTIAL IMPACT

RECLAMATION PHASE

- High turbidity will reduce sunlight penetration, hence affect photosynthesis.
- Loss of benthic habitat and life due to smothering of seabed.
- Sedimentation may affect *udang geragau* population.
- Loss of fishery resources affects fishermen.
- Oil spills and vessel discharge may impair water quality, disrupt the food chain and cause wildlife injury and death.
- Water pollution can adversely affect water quality.
- Reclamation activities may affect turtle nesting behaviour, i.e. vessel movement, light pollution, water quality deterioration.
- Marine mammals may lose feeding areas but are capable of migrating to nearby sites.
- Vessel strike may cause injury and death of marine wildlife.
- Underwater noise may lead to masking and avoidance behaviour in marine wildlife in active reclamation areas.
- Coastal habitat loss can lead to increased HWC incidents to nearby areas.

POST-RECLAMATION PHASE

- Loss of productivity from reclaimed area.
- Reduced fish stocks and fisheries.

TERRESTRIAL FAUNA

- **Mammals:** A total of eight species of mammals were observed within the coastal ZOS, most were common domestic animals with exception of Common Otter (NT) and Smooth-coated Otter (VU) spotted along Sg Lereh coast and Sg Ayer Salak/Malim.
- **Herpetofauna:** 12 species were observed comprising frogs, lizards and snakes.
- **Crocodiles:** A total of seven Saltwater Crocodiles were observed (four Class 6, one Class 2, one Class 9 and one undetermined) at Sg Ayer Salak/Malam.
- **Avifauna:** A total of 43 species from 27 families, dominated by family Columbidae (5 species) and family Stumidae (3 species).
- **Human Wildlife Conflicts:** Average reports were 58 – 83 cases per year (2016 – 2020), most cases were from long-tailed macaque (243 cases), wild boar (45 cases) and Common palm civet (28 cases).

P 2 M 2

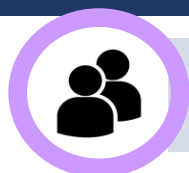
RECLAMATION PHASE

- Implement water pollution mitigation measures, particularly for sediment plume.
- Implement Oil Spill Response Plan.
- Manage vessel traffic and active work area to minimise impacts to ESAs.
- Implement HWC Management Plan.
- Implement noise and lighting controls.
- Carry out monitoring of water quality and marine ecology.

POST-RECLAMATION PHASE

- Work with the state on marine and fishery resources replenishment programme, e.g. *tukun* & *unjam* deployment, deployment, fund research activities for marine conservation, CSR Programme, etc.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Socio-Economy

EXISTING ENVIRONMENT

SOCIAL SURVEY

- **Sampling frame:** 600 respondents within 5-km ZOS (400 nos. local community and 200 nos. fishermen community).
- **Awareness of respondents:** 62.7% were unaware of the Project.
- **Level of acceptance:** 39.8% (locals) dan 98.5% (fishermen) informed they would be significantly affected by the Project.
- **Main concerns:** Social issues from workers; safety and security; traffic congestion; pollution; visual and aesthetic impacts; affects tourism activities; proximity to residential areas; impacts on marine resources; impacts on fishermen income; increased marine traffic.
- **Focal Group Discussions:** A total of five FGDs were carried out including community leaders, government agencies, Department of Fisheries (DOF) Melaka, *Lembaga Kemajuan Ikan Malaysia* (LKIM), *Persatuan Nelayan Kawasan* (PNK) Melaka Selatan and one major public dialogue with local communities, fishermen and other stakeholders.

POTENTIAL IMPACT

RECLAMATION PHASE

- Social ills and disease spread.
- Site impacts may result in nuisance to nearby receptors, i.e. dust and noise, odour.
- Increased risk of marine accidents.
- Injury and accident risks to workers within the site.
- Impact on fishermen livelihood due to loss of fishery area and lower fishery resources.
- Impacts to downstream industries, i.e. *belacan* industry.
- Damage to fishermen nets and accident risks.
- Impacts to tourists and recreationists at Pantai Rombang/Puteri/Lereh.
- Increased road traffic.
- Visual and aesthetics impacts on coastal properties and activities.
- Provision of job and business opportunities.

P2M2

PRE-RECLAMATION PHASE

- State to establish a Fishermen Consultative Committee (FCC) as a forum to allow for stakeholder communication and conflict resolution.
- Stakeholder engagement with relevant/affected parties for feedback.

RECLAMATION PHASE

- Establishment of a Community Consultative Committee (CCC) and grievance management mechanism (GMM) as a platform to channel any problem/complaints to be addressed by the PP.
- PP to engage a liaison person to address all complaints and engage with the community.
- Suitable compensation for licensed fishermen impacted by the Project.
- Establishment of strict SOPs for marine traffic and site safety.
- Give first choice of refusal to locals before hiring foreign workers.
- Have a Safety and Health Officer (SHO) to manage site safety and manage workers
- Adopt BMPs to minimise impacts to nearby receptors.
- Enhance beneficial impacts to local communities and businesses.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Public Health

EXISTING ENVIRONMENT

- Surveys indicate that the community within the ZOS are well provided for in terms of basic necessities and utilities, e.g. piped water supply, toilet facilities, waste collection services,
- A large majority of locals depend on local seafood as a major protein source.
- Common reported illness and health conditions of the local population includes hypertension, diabetes mellitus, joint pains and asthma. Dengue cases in the area are reported to be higher than the National incidence rate while cancer prevalence were below.
- Assessment of the water quality and sediments within the ZOS indicates that the heavy metal content were generally below the prescribed limits and does not pose significant risk to human health with exception of elevated aluminium in the marine water and also pollutants from inland of Sg Lereh. Risks from body contact and ingestion by the community are generally low.

POTENTIAL IMPACT

RECLAMATION PHASE

- While dust generation is expected to be low, exposure to airborne dust from the Project should still be monitored and mitigation measures taken as not to affect nearby communities as well as worker's health.
- Increased noise level, especially along coastal receptors are expected to occur, exceeding the recommended noise guidelines in the worst case scenario. As such to reduce nuisance and potential health impacts, all mitigation measures to manage noise from the site is to be implemented.
- Daily noise exposure for workers are to be managed to ensure no long term impacts to their hearing.
- Minimal impacts expected from bioaccumulation of heavy metals in seafood as the reclamation works will not include dredging works.
- Risk of water-borne disease from flood are unlikely.
- Workers may be exposed to safety risks such as accidents during work,.
- Communicable disease risks can occur if overcrowding or improper accommodations are provided for workers.

P2M2

RECLAMATION PHASE

- Adopt all air quality and dust control BMPs.
- Ensure noise levels are adhered to and reclamation works confined to day time only.
- Adopt all water pollution control measures and BMPS.
- Ensure proper waste management on-site.
- Continuous engagement with fishermen community to reduce risk and ensure safety at sea.
- All health and disease prevention measures for workers to be in place.
- Worker accommodations to adhere to authority requirements, if any.
- Safety and Health Officer to be appointed at site to manage all aspect of site safety, including public safety.
- Workers are to be provided with suitable PPE when working in risk activities to safeguard them against high noise and dust.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Underwater Heritage

EXISTING ENVIRONMENT

- Underwater Heritage Impact Assessment (HIA) was undertaken by Prof. Madya Dr Asyaari from Institut Alam dan Tamadun Melayu (ATMA), Universiti Kebangsaan Malaysia (UKM).
- Locals were interviewed on any artefacts found in the Study area, while surveys using multi-beam echo sounders, sub-bottom profiling, magnetometer and scuba diving verification were undertaken.
- A total of 12 locations were identified as having anomalies based on the multibeam survey, two anomalies using the sub-bottom profiler and 19 anomalies using the magnetometer.
- Scuba divers were deployed to verify these locations with potential objects of interest. In the end, all locations were found to not have yielded any significant artefact of heritage value.
- Random search yielded porcelain and pottery fragments near Pulau Upeh, dating to the Ming Dynasty of 15th to 16th century.



Artefact fragments found at Pulau Upeh.

POTENTIAL IMPACT

RECLAMATION PHASE

- No significant impacts are expected as the Project site is located outside of the main area where shipwrecks are likely to be found.
- The fragments of pottery and ceramics near Pulau Upeh are of low heritage and conservation value.
- Most other objects found within the site generally comprise waste material, coral fragments and rocks which are without any heritage value.

P 2 M 2

RECLAMATION PHASE

- Reclamation should be undertaken cautiously, and in the event any historical artefacts of value is found in the course of reclamation, the PP shall report immediately to PERZIM and the National Heritage Department to allow for recovery and conservation before work can be allowed to resume.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Marine Traffic

EXISTING ENVIRONMENT

- **Mean traffic movement:** 10,861 monthly and 128,484 annual vessel movement within the ZOS.
- **Nearest port:** Sg Udang Port dan Melaka Port.
- **Traffic density:** Medium to high, ~51 to 221 routes/0.08 km²/year
- **Marine activities:** Petroleum/LNG/LPG, dry bulk, bunkering and repair, passenger cruise stop station, ship-to-ship (STS), land and sea reclamation.
- **Obstructions/Underwater Infrastructure:** Six major wrecks/obstructions (nearest is 1.9 nm from Project site), also a disused submarine cable and two pipeline networks.

POTENTIAL IMPACT

RECLAMATION PHASE

- Vessel activities along the route are expected to increase during reclamation.
- Increased marine traffic and accident risks (e.g. collision, allision, grounding).
- Shipping activities can affect fishing activities, pose risk to the fishermen and damage fishing equipment.
- Vessel discharge to coastal waters may result in pollution.
- Vessel emission and noise.
- Vessel security is not expected to be an issue.

P2M2

RECLAMATION PHASE

- Establish a proper operations team to monitor vessel navigation operations throughout the reclamation.
- Comply with maritime safety regulations and standard operational procedures (SOPs) from the Marine Department of Malaysia at all times.
- Establish coordination and communication with shore control base station.
- Adopt the Vessel Passageway Plan.
- Comply with the emergency plan (ERP, SSAS) in the event of an accident..
- Vessels shall not operate in bad weather and are required to be anchored at the designated shelter area.



Waste Management

POTENTIAL IMPACT

RECLAMATION PHASE

- Municipal wastes, scheduled wastes and liquid wastes will be generated which can contaminate marine waters and soil.

P2M2

RECLAMATION PHASE

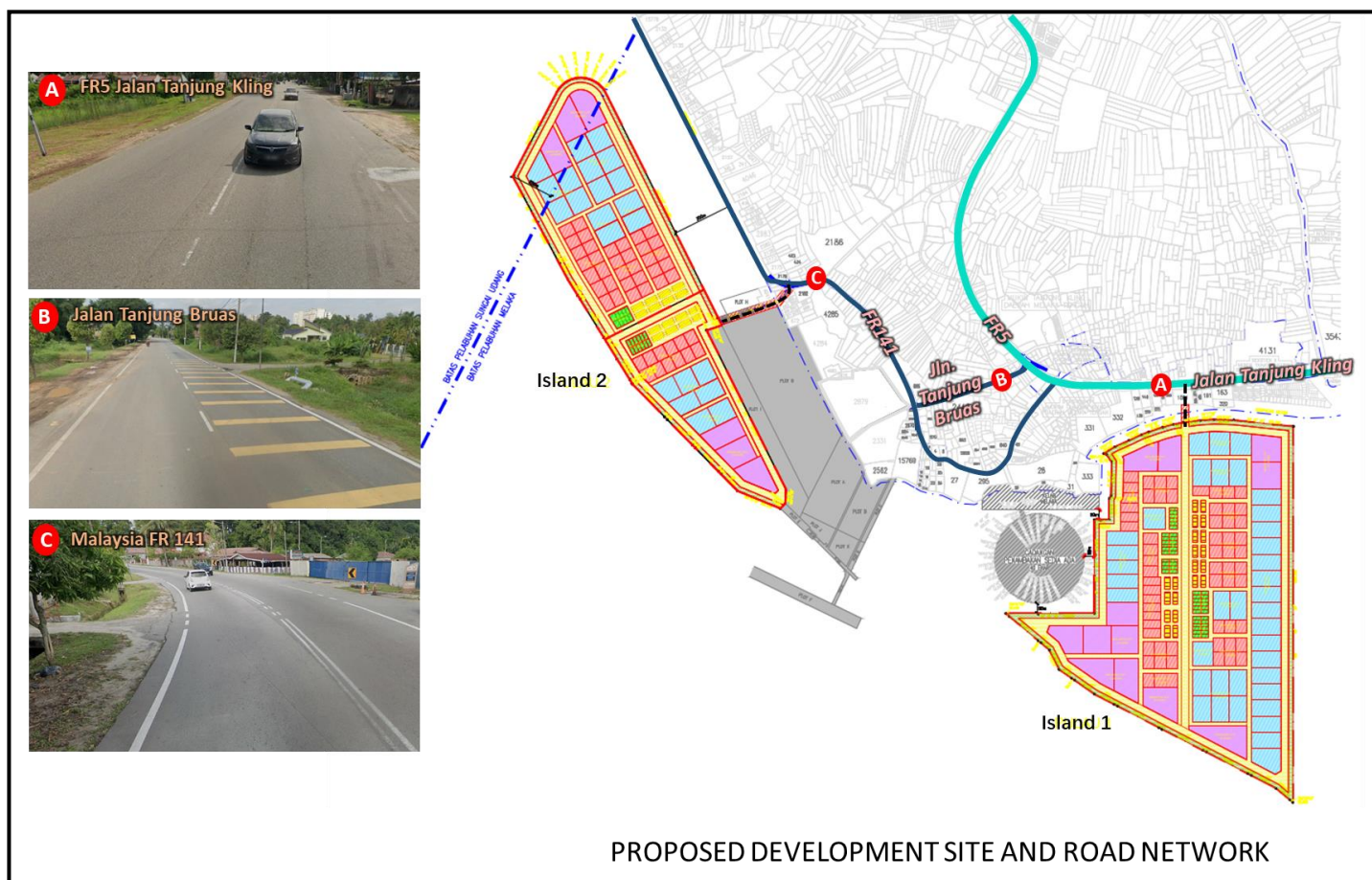
- Properly disposed of generated wastes to public landfill (municipal wastes) and secured landfill (scheduled wastes).
- Properly manage vessel discharge.

EXISTING ENVIRONMENT: IMPACT ASSESSMENT & MITIGATION MEASURES



Land Traffic

EXISTING ENVIRONMENT



- Trip distribution was most significant along Lebuhraya SPA with higher traffic into the highway during the AM Peak and higher traffic exiting the highway during the PM Peak.
- The Level of Service (LOS) for the midblock section along Jalan Tanjung Kling, Jalan Tanjung Bruas and FR141 leading to the Project site were still good with LOS A to LOS C.
- The junction performance analysis for eight junctions (J1 to J8) showed varying results with the best at Junction J3 (Jalan Tanjung Kling – Jalan Kampung Bukit Gedung) with LOS A and the worst being Junction J8 (Lebuhraya SPA – Jalan Bi 7) with LOS F for both peak hours. The other junctions ranged from LOS A – LOS D.

POTENTIAL IMPACT

RECLAMATION PHASE

- Main source of traffic will be from logistic vehicles and machinery.

POST-RECLAMATION PHASE

- Increased top-side traffic would result in lower LOS along the main roads and junctions near the Project site.

P2M2

RECLAMATION PHASE

- Proposal to upgrade Jalan Tanjung Kling (FR5) from a two-lane to four-lane road.
- Proposal to upgrade Jalan Tanjung Bruas from a two-lane to four-lane road.
- Proposed junction upgrading (J1, J2, JA & JB).

Environmental Monitoring and Surveillance Plan – PERFORMANCE MONITORING (PM)

COMPONENT	COMPLIANCE REQUIREMENT	LOCATION	FREQUENCY
Marine Water Quality	➤ Class 2 of MMWQCS. ➤ Trigger limit: 10 mg/L above ambient levels	➤ SC1 – SC8	➤ Weekly by the EO. ➤ Monthly by EnvMC. ➤ Throughout the reclamation. ➤ Monthly Environmental Report (MER) to DOE Melaka.
Sand perimeter and silt curtain	➤ BMP condition and functionality. ➤ Maintenance records.	➤ Along the sand bund dan silt curtain.	➤ Weekly inspection and after storm events by EO. ➤ Monthly by EnvMC and certified personnel (for silt curtain). ➤ Throughout the reclamation. ➤ Quarterly Environmental Report (QER) to DOE Melaka.

PROPOSED MONITORING LOCATIONS



Environmental Monitoring and Surveillance Plan – COMPLIANCE MONITORING (CM)

COMPONENT	COMPLIANCE REQUIREMENT	LOCATION	FREQUENCY
Solid Waste Management/ Housekeeping	➤ Solid Waste and Public Cleansing Management Act 2007. ➤ MARPOL 1973/1978. ➤ EIA COAs (if any).	➤ Project Site ➤ Vessels	➤ Daily by EO. ➤ Monthly by EnvMC. ➤ Throughout reclamation ➤ Site observations to be compiled into the QER to DOE Melaka.
Fuel, Chemicals and Scheduled Waste Management	➤ Environmental Quality Act 1974. ➤ Environmental Quality (Scheduled Wastes) Regulations 2005 ➤ Environmental Quality (Scheduled Wastes) (Amendment) Regulations 2007 ➤ MARPOL 1973/1978.	➤ Project Site ➤ Storage Area ➤ Vessels	➤ Daily by EO. ➤ Monthly by EnvMC. ➤ Throughout reclamation. ➤ Site observations to be compiled into the QER to DOE Melaka.
Sewage	➤ Environmental Quality (Sewage) Regulations 2009. ➤ MARPOL 1973. ➤ EIA COAs (if any).	➤ Project Site ➤ Vessels	➤ Daily by EO. ➤ Monthly by EnvMC. ➤ Throughout reclamation ➤ Site observations to be compiled into the QER to DOE Melaka.
Safety and Health	➤ Occupational Safety and Health Act 1994. ➤ Guidelines for Public Safety and Health at Construction Sites (1st Revision) (DOSH, 2007).	➤ Project Site ➤ Vessels	➤ Weekly by the SHO. ➤ Monthly by EnvMC. ➤ Throughout reclamation. ➤ Site observations to be compiled into the QER to DOE Melaka.

Legend:

EO: Environmental Officer;
 SHO: Safety & Health Officer;
 DOF: Department of Fishery;
 DID: Department of Irrigation and Drainage;
 QER: Quarterly Environmental Report.

EnvMC: Environmental Monitoring Consultant;
 DOE: Department of Environment;
 PHN: Pusat Hidrografi Negara;
 MER: Monthly Environmental Report;

Environmental Monitoring and Surveillance Plan – IMPACT MONITORING (IM)

COMPONENT	COMPLIANCE REQUIREMENT	LOCATION	FREQUENCY
Marine Water Quality	➤ Maintain baseline water quality. ➤ Interim Class E1 of MMWQS: MW1, MW5 and MW6 ➤ Class 1 of MMWQS: MW7 ➤ Class 2 of MMWQS: MW2, MW3, MW4, MW8 to MW13 ➤ EIA COAs (if any).	➤ 13 nos. (MW 1 – MW13).	➤ Monthly by EnvMC. ➤ Throughout reclamation. ➤ Data to be compiled into the QER to DOE Melaka.
Ambient Air Quality	➤ MAAQS.	➤ 6 nos. (A1 – A6).	➤ Quarterly by EnvMC. ➤ Throughout reclamation. ➤ Data to be compiled into the QER to DOE Melaka.
Noise Level	➤ First Schedule, Guidelines for Environmental Noise Limits and Control, 3rd Edition, (DOE, Reprint 2021).	➤ 6 nos. (N1 – N6).	➤ Quarterly by EnvMC. ➤ Throughout reclamation. ➤ Data to be compiled into the QER to DOE Melaka.
Marine Ecology	<u>Phytoplankton/ Zooplankton /Macrobenthos</u> ➤ Maintain baseline results.	➤ 10 nos. (B1 – B10).	➤ Quarterly by EnvMC. ➤ Report to be submitted to DOE/DOF Melaka.
	<u>Marine fisheries</u> ➤ Maintain baseline results.	➤ 5 nos. (F1 – F5).	➤ Half-yearly by EnvMC. ➤ Report to be submitted to DOE/DOF Melaka.
	<u>Marine turtles and mammals</u> ➤ Site observation and incident reporting.	➤ Within the Project Zone of Impact (ZOI).	➤ EO to report on any incident to relevant authorities.

Legend:

EO: Environmental Officer;
 SHO: Safety & Health Officer;
 DOF: Department of Fishery;
 DID: Department of Irrigation and Drainage;
 QER: Quarterly Environmental Report.

EnvMC: Environmental Monitoring Consultant;
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 MER: Monthly Environmental Report;

Environmental Monitoring and Surveillance Plan – IMPACT MONITORING (IM)

COMPONENT	COMPLIANCE REQUIREMENT	LOCATION	FREQUENCY
Shoreline Monitoring	➤ DID Malaysia requirements as part of Shoreline Monitoring Programme.	➤ Subject to the Shoreline Monitoring Programme approved by DID.	➤ Once before Project commencement (as baseline data). ➤ Quarterly by surveyor during reclamation. ➤ Bi-yearly after Project completion by surveyor (continuous conducted for 3 years). ➤ Report to be submitted to DID.
Bathymetry Survey	➤ Requirements from DID Malaysia/PHN.	➤ Cover the area extent as per the pre-reclamation survey.	➤ Same as Shoreline Monitoring Programme. ➤ Survey results to be submitted to PHN.
Public Complaints Monitoring	➤ Social Impact Management Plan (SIMP).	➤ Within the ZOI involving relevant stakeholders	➤ Throughout the reclamation.

Legend:

EO: Environmental Officer;
 SHO: Safety & Health Officer;
 DOF: Department of Fishery;
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 QER: Quarterly Environmental Report.

EnvMC: Environmental Monitoring Consultant;
 DOE: Department of Environment;
 PHN: Pusat Hidrografi Negara;
 MER: Monthly Environmental Report;

GUIDED SELF REGULATIONS



Environmental Policy



Environmental Budget



Environmental Monitoring Committee



Environmental Facility



Environmental Competency



Environmental Reporting & Communication

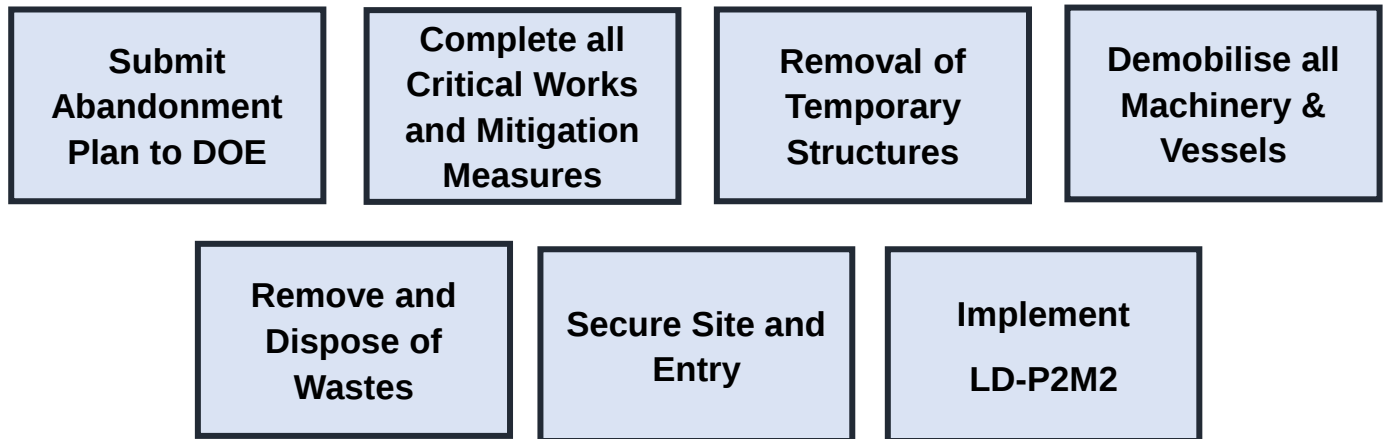


Environmental Transparency

STUDY FINDINGS

PROJECT ABANDONMENT/CLOSURE

In the event that the site is abandoned or closed, the following steps are to be taken:



Environmental Aspect	Impact Rank	Residual Impact
Landuse	Moderate	Moderate
Hydrology and Drainage	Moderate	Low
Hydraulics and Hydrodynamics	Moderate	Low
Water Quality	High	Moderate
Air Quality	Moderate	Low
Noise Level	Moderate	Low
Terrestrial Ecology	Low	Low
Marine Ecology	High	High
Socio-economy	High	Moderate/ Positive Benefit
Heritage	Low	Low
Public Health and Safety	Moderate	Low
Wastes	Low	Low
Marine Traffic	Moderate	Low
Land Traffic	Low	Low