MINUTES OF MEETING

Discussion Topic: SIA for Proposed Reclamation and Development of the Sunrise City Mixed Development at Seberang Takir, Mukim of Kuala Nerus, Kuala Terengganu

Date of Meeting: 29th April 2019 (Monday)

Place: Research and Development Division
PLANMalaysia, Wisma UOA Damansara

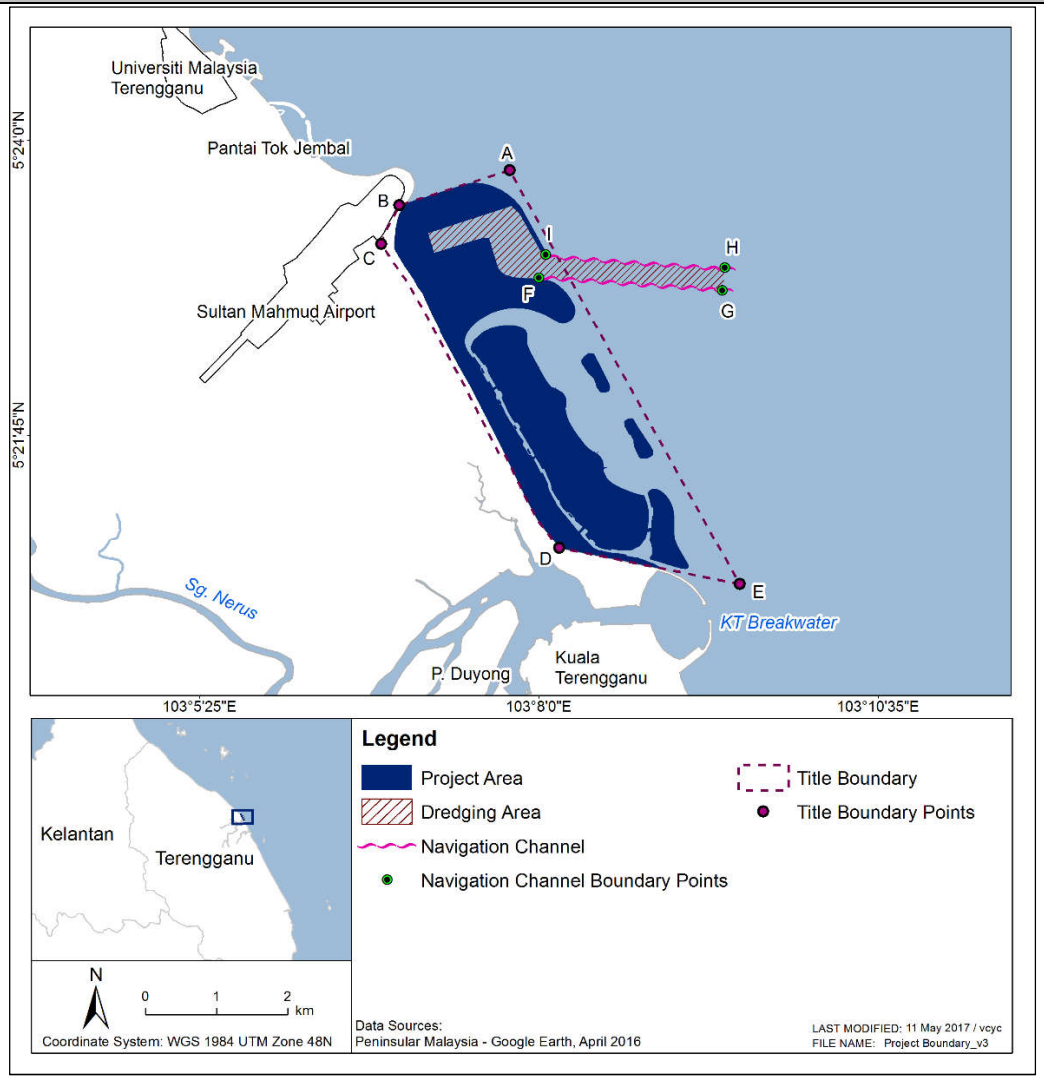
Time: 10.00 AM

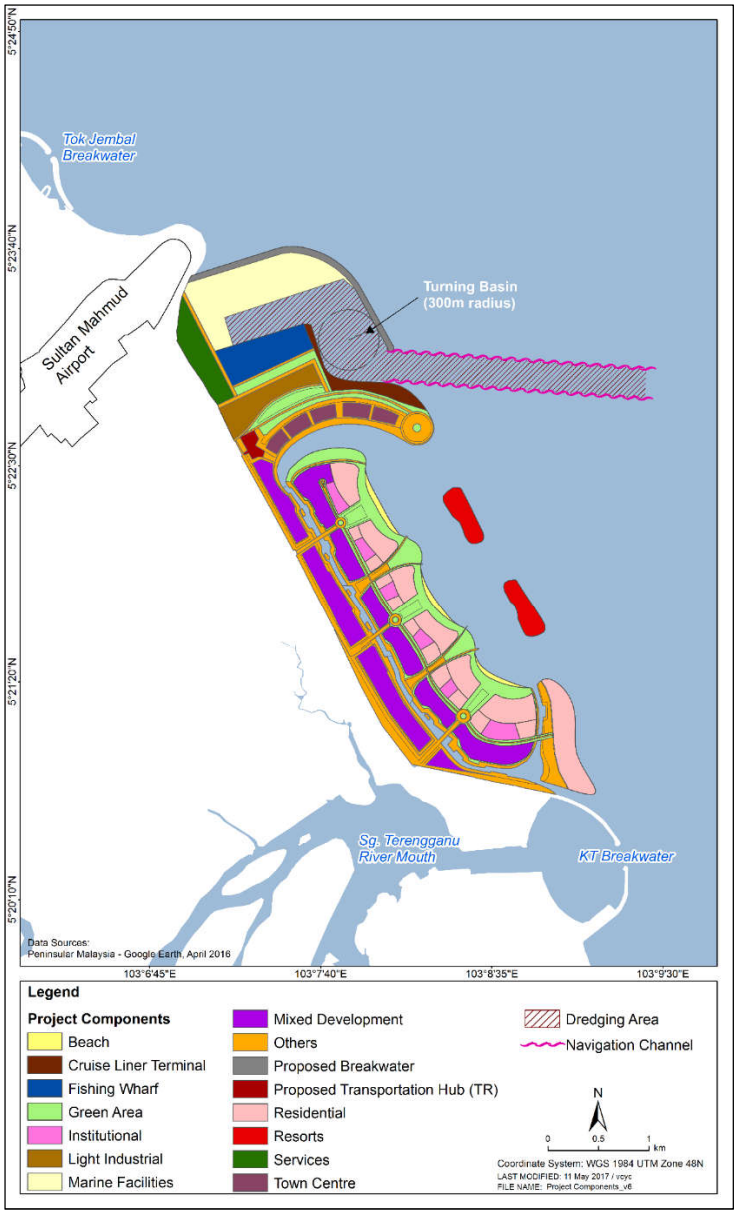
1. ATTENDANCE

Name of Attendees	Position	Department/Office	Email Address	Contact No.
Pn. Sanisah binti Shafie	Ketua Penolong Pengarah Kanan / Pegawai Perancang Bandar dan Desa J52	PLANMalaysia	sanisah@townplan.gov.my	03-2081 6141
Pn. Lilian Tai Yee Chi	Pegawai Perancang Bandar dan Desa J44	PLANMalaysia	lilian@townplan.gov.my	03-2081 6118
Mohamad Hafiz Bin Yahya	Environmental Exec.	DHI Water&Environment	hay@dhigroup.com	019-642 2505
Mohamad Azmin bin Abdullah	Town Planner Exec.	Nilaimas Services	azminnilaimas@gmail.com	010-427 5386
Amalina binti Abd Samat	Town Planner Exec.	Nilaimas Services	amalinanilaimas@gmail.com	013-223 9427

2. OVERVIEW OF DISCUSSION

No.	Items	Person in Charge	Action
1.	**Chairman's Greetings**		
	The discussion is chaired by Puan Sanisah binti Shafie. Chairman has been informed that the consultants require PLANMalaysia's advice regarding to the SIA for the proposed reclamation project in Kuala Terengganu.	Puan Sanisah binti Shafie	Noted
2.	**Introducing Team Members of the SIA Project**		
	Round table introductory from consultant team	Hafiz Azmin Amalina	Noted
3.	**Project Description**		
	Chairman and Puan Lilian has been informed on the details of the proposed reclamation project; 1. The Project is Proposed Reclamation and Development of the Sunrise City Mixed Development at Mukim Seberang Takir, District of Kuala Nerus, Kuala Terengganu, Terengganu. 2. The Project Proponent is ELCCA Properties Sdn. Bhd. (Private Developer). 3. The EIA Consultant is DHI Water & Environment (M) Sdn Bhd. 4. The SIA Consultant is Nilaimas Services. 5. The Project is a mixed development with an area of 1,898 acres (768 hectares) and extends along the shoreline between the Kuala Terengganu Airport to the north and Kuala Terengganu Breakwater to the south.	Hafiz Azmin Amalina	Noted

No.	Items	Person in Charge	Action
			

No.	Items	Person in Charge	Action
	6. The concept plan for the top side development as shown below;  7. Chairman and Puan Lilian aware that the concept plan is not finalize yet the consultants intend to do the SIA report for the reclamation part only (exclude the Top Side Development) under SIA First Category – Reclamation.		
4.	**PLANMalaysia's Comments and Advices**		
	1. Chairman explained that the SIA cannot be prepared for the reclamation purpose only. The SIA must be prepared for reclamation **INCLUDING** the top side development.	Puan Sanisah & Puan Lilian	Noted

No.	Items	Person in Charge	Action
	2. Project Proponent need to finalize their concept plan, which for minimum requirement must include; • access road to the project site; • acreage for every proposed development; • land use percentage in mixed development. so that the social assessment (such as projected employment and population) can be done by the SIA consultant. 3. Chairman explained the flow for the KM, EIA and SIA approval, where SIA can be prepared when the KM (concept plan) has been approved by the State Planning Committee (SPC). 4. The SIA will be presented in MPFN after the KM (concept plan) has been approved by the JK Kawal Selia and JK Kerja in Federal Level. 5. The current conceptual plan of the proposed top side development is adequate for SIA consultant to proceed with the SIA report.		

Annex C

Marine Department

MINUTES OF MEETING

Meeting with Marine Department Eastern Region
Proposed Reclamation and Development of the Sunrise City Mixed Development at Mukim Seberang Takir, District of Kuala Nerus, Kuala Terengganu, Terengganu

DATE OF MEETING	**:**	**8th July 2019 (Monday)**
VENUE	**:**	**Bilik Mesyuarat, 2nd Floor, Eastern Region Marine Department, Marine Department Malaysia, Jalan Balik Bukit, 20300 Kuala Terengganu, Terengganu**
TIME	**:**	**2.30pm – 3.40pm**

ATTENDEES:

#	NAME	ROLE	ORGANIZATION
1.	Burhanudin Bin Abdullah (Chairman)	Authority	Marine Department (Eastern Region)
2.	Norazihan Bin Mohd. Daud	Authority	Marine Department (Eastern Region)
3.	Zabur Han B. Hassan	Authority	Marine Department (Eastern Region)
4.	Johari Bin Mohamed	Authority	Marine Department (Eastern Region)
5.	Uthama	Project Owner	Elcaa Properties
6.	Mohamad Hafiz Bin Yahya	EIA Consultant	DHI
7.	Abdul Rahman Nair	MRA Consultant	KASI
8.	Tan Seng Leong	MRA Consultant	KASI
9.	Ahmad Zohri	MRA Consultant	KASI

AGENDA:

1.0	OPENING REMARKS
2.0	PROJECT BRIEFING
3.0	PRESENTATION OF TERMS OF REFERENCE (TOR)
4.0	CONCERNS FROM MARINE DEPARTMENT - Navigational Concerns - HAZID Workshop Stakeholders
5.0	REQUEST FOR DATA
6.0	ADJOURNMENT

NO.	ITEM	ACTION PARTY
1.0	**OPENING REMARKS**	
1.1	Meeting started at 2.30pm with opening remarks by Chairman.	INFO
2.0	**PROJECT BRIEFING**	
2.1	DHI presented information regarding the project, covering EIA requirements, EIA schedule and basic project information (size of reclamation, etc.).	INFO
2.2	KASI presented more information regarding the project such as project location, sand source location, main ferry route between Terengganu and Pulau Redang as well as frequency of construction / reclamation vessel movements.	INFO
3.0	**PRESENTATION OF TERMS OF REFERENCE (TOR)**	
3.1	KASI presented the TOR of the study, which covers the following: ➢ Collect data for the study, including conducting a site survey to the project site; ➢ Carry out desktop assessment of proposed reclamation and data to identify potential navigation hazards / concerns; ➢ Conduct Hazard Identification (HAZID) workshop with all identified stakeholders and authorities; ➢ Prepare MRA Report incorporating all findings and recommendations; ➢ Submission and presentation of MRA Report to Marine Department Malaysia; ➢ Collation of comments from Marine Department Malaysia and resubmission of Final MRA Report; ➢ Presentation of Final MRA Report.	INFO
3.2	KASI briefed that the MRA will only cover the construction / reclamation stage of the project only. The top-side / operational stage of the project will be covered under a separate MRA later.	INFO
3.3	Marine Department Eastern Region raised concerns that any reclamation in Malaysian waters must get approval from IMW and MMDC (MOT requirement) or risk being fined. Project Owner will look into this requirement.	INFO
4.0	**CONCERNS FROM MARINE DEPARTMENT**	
4.1	KASI shared three (3) pre-identified potential risks associated with the project, as follows: ➢ Potential interaction between construction / reclamation vessels and ferries ➢ Potential interaction between construction / reclamation vessels and fishing vessels ➢ Potential interaction between construction / reclamation vessels and Kertih Port traffic	INFO

NO.	ITEM	ACTION PARTY
4.2	Marine Department Eastern Region raised the following additional concerns: ➢ Potential interaction between construction / reclamation vessels and OSVs at Pulau Duyong jetty (daily movements) – operated by AIMS Global ➢ Potential interaction between construction / reclamation vessels and leisure vessels (yachts) – operated by Duyong Marina Resort ➢ Potential interaction between construction / reclamation vessels and research vessels – operated by University Malaysia Terengganu ➢ Potential interaction between construction / reclamation vessels and Dungun STS Points (4 points)	KASI
4.3	The committee agreed that the following stakeholders should be invited to participate in the Hazard Identification (HAZID) workshop: ➢ Marine Department (Eastern Region) ➢ Kertih Port Operator and Pilots ➢ Ferry Operators ➢ Fisheries Department ➢ Persatuan Nelayan ➢ APMM / Marine Police ➢ Duyong Marina ➢ Asal Jasa Sdn Bhd ➢ AIMS Global	KASI
4.4	KASI proposed the 4th week of July to conduct the HAZID workshop. Marine Department Eastern Region will confirm availability.	MARDEP
5.0	**REQUEST FOR DATA**	
5.1	KASI is to write into Marine Department Eastern Region to request for the following data: ➢ Ferry and OSV traffic statistics ➢ Coordinates of the four (4) STS points at Dungun ➢ Marine accident statistics in Kuala Terengganu	KASI
5.2	Marine Department Eastern Region advised KASI to approach the following entities for data: ➢ **Jabatan Perikanan Terengganu** for fishing activities information at Kijal, Paka / Kertih, Dungun, Merchang, Marang, Cendering and Kuala Terengganu ➢ **AIMS Global** for OSV traffic routes ➢ **Duyong Marina Resort** for leisure vessel (yachts) statistics ➢ **University Malaysia Terengganu** for research vessel information ➢ **Kertih Port** for Kertih Port call statistics ➢ **Asal Jasa** for Dungun STS statistics	KASI
6.0	**ADJOURNEMENT** Meeting adjourned at 3.40pm.	INFO

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Annex D

LKIM Chendering, Terengganu

MINUTES OF MEETING

Project No : 62801461-03
Project Title : Proposed Reclamation and Capital Dredging for the Sunrise City Mixed Development at Mukim Kuala Nerus, Kuala Terengganu, Terengganu, Malaysia
Subject : Agency engagement for fisheries and fishermen with LKIM Chendering

Date and Time : 21 August 2019/ 1000-1215
Venue : LKIM Chendering

Present : YM Tengku Mohd Anuar Tengku Mahmood- LKIM Chendering
Pn. Khuzaimah Husain- LKIM Chendering
En. Izwan Iliadi Iliassa- LKIM Chendering
En. Che Wan Mohamad Mulia Che Wan Johar-LKIM Chendering
En. Zailani Hassan- LKIM Chendering
Pn. Noor Ana Harunal Rashid- LKIM Chendering
En. Hafidzan Syazwan Mohd Rashid- Persatuan Nelayan Kawasan K. Terengganu Utara (PNKKTU)
En Zahar Mamat- Persatuan Nelayan Negeri Terengganu (PENENTU)
Tania Golingi (DHI)
Mohamad Hafiz Yahya (DHI)

Agenda

1. Presentation of EIA findings focusing on the fishermen and fisheries
2. Discussion of the issues relevant to fishermen and fisheries due to the project activities

Minutes

Item	Description	Remark
1.	**Discussion on FADs** • Persatuan Nelayan Utara (PNKKTU) - should verify the 3 FADs close to the project site and monitor during construction as although not directly removed, may be still impacted.	DHIto incorporate in the EIA report.
2	**Fishing season** • Shrimp season after NE monsoon (around February or March) - in project area they do fish in the shallow waters right up to the beach (pukat tarik) • Sept / oct also high season for fish. • March / April high season for prawn / squid. • Feb / March is prawn season near shore.	Info
3	**Registered fishermen** • Registered boats - there are also a lot of unlicensed boats in the area. Around 100 unregistered estimated by PN Utara. Only the unregistered boats would land along the beach. • Registered fishermen in Kuala Nerus around 1,796 fishermen in report – the number is estimated to be up to 2000 inclusive unlicensed • Unregistered fishermen are also full-time fishermen.	Info
4.	**Landing Areas** • Tok Jembal and Seberang Takir is crowded. • Advised against Tok Jembal as the jetty is already crowded • LKIM confirmed all jetties listed by DOF within K. Nerus district:	Info

Item	Description	Remark
	- Seberang Tuan Cik- Inside Sg. Terengganu, near Bkt tunggal (Persatuan Nelayan Kawasan Kuala Terengganu Selatan) - Seberang Takir- (Persatuan Nelayan Kawasan Kuala Terengganu Utara) - Batu Rakit- Further north near the Institut Teknologi Petroleum (INSTEP) - Mengabang Telipot- near UMT - Seberang Tumbuh near Bukit Tunggal - Hulu Takir has a jambatan that might be suitable for an alternative landing site. • There was a proposed site for aquapolitan / floating market - potentially could be used as an alternative site. • Seberang Pak Abu near Seberang Takir can potentially be the new fish landing jetty	
5.	**Compensation** • Unjam to be offset at other potential area • Compensation due to the potential reduction of fish catch due to suspended sediment must be included during construction at least • Only licensed fishermen to be compensated • To give compensation through Persatuan Nelayan Utara and Selatan, as fishermen from selatan still fish in the project area.	To be included in EIA report.
6.	**Other concerns** • Raised by PNKKTU and LKIM Chendering-Proposed fishing jetty in Sunrise City development site - is it really a specific area allocated for fishing vessels only ? Prefer a proper zone for fishermen, not combined / congested with other vessels/ e.g. industry etc. Should cater for at least 137 boats (85 outboard+ 52 Zone A in board) • Fish diversity from survey seems low – only 2 samplings occasions probably not adequate	Info

End of Meeting

Minutes Prepared by : Tania Golingi
Date : 22nd August 2019

Annex E

Jabatan Pengairan dan Saliran Malaysia

MINUTES OF MEETING

Project No	:	62801461-03
Project Title	:	Proposed Reclamation and Capital Dredging for the Sunrise City Mixed Development at Mukim Kuala Nerus, Kuala Terengganu, Terengganu, Malaysia
Subject	:	Hydraulic Study Presentation to JPS Malaysia
Date and Time	:	22 August 2019/ 1430-1630
Venue	:	Bilik Mesyuarat, Bahagian Pengurusan Zon Pantai, JPS Malaysia
Present	:	Pn. Siti Aishah Binti Hashim – JPS Malaysia – Chairman of the meeting Ir. Mahran bin Mahamud – JPS Malaysia Pn. Nina Mazuin Binti Mohamad Ramli – JPS Malaysia Elcca Properties Sdn Bhd – 3 representatives JPS Terengganu – 1 representative Dr. Juan C Savioli – DHI Malaysia Tania Golingi – DHI Malaysia Syed Mohazri Syed Hazari – DHI Malaysia Chua Jing Fen – DHI Malaysia

Agenda

1. Presentation of hydraulic study findings.

Minutes

Item	Description	Remark
1	Opening remark • Meeting started at 2:45pm and a round table introductory from all attendees. • Chairman welcomed all attendees to the meeting and mentioned that the purpose of the meeting was to present and discuss the hydraulic assessment findings for project Proposed Reclamation and Capital Dredging for the Sunrise City Mixed Development at Mukim Kuala Nerus, Kuala Terengganu, Terengganu, Malaysia.	INFO
2	Introduction of the project by the proponent of the Sunrise project • The project involves a land reclamation with the size of 1,898 acres on the shoreline between Kuala Terengganu (KT) breakwater and Sultan Mahmud Airport runway extension. • The hydraulic and EIA studies address only the reclamation and dredging activities associated with the proposed development. Separate EIAs will be carried out for the topside development components as the design details become available.	INFO
3	Presentation on the hydraulic study findings by DHI, which covers the followings: • Project layout information, construction methods, and planned project schedule. • Primary and secondary data collection for the hydraulic study, and site visits. • Quantification of potential long-term and temporary hydraulic impacts associated with proposed developments, e.g. impacts on current flows, open sea water levels, water levels at Sg Terengganu, waves, adjacent coastlines, sediment transports, and sediment spill excursion during construction periods. • Presentation of four proposed mitigation measures planned for this project based on the hydraulic study findings, including shoreline monitoring, water quality monitoring, installation of silt curtains and sand bunding at the proposed reclamation areas.	INFO

Item	Description	Remark
4	Discussions on JPS concerns	INFO
4.1	Adjacent coastline and sediment transports • Erosion is observed along the coastline immediately north of the Sultan Mahmud Airport runway extension following the works carried out for the extension of the runway. In year 2016, a recreational breakwater known as "Tok Jembal Breakwater" and three parallel offshore breakwaters were constructed to protect the coastline. This stretch of coast is now stabilized, however the erosive process has been shifted to the further northern areas. • The proposed Sunrise project is located in an isolated coastal cell separated from nearby beaches by the large features, KT breakwater and Sultan Mahmud Airport runway extension. The sediment transport is confined within this coastal cell with minimum exchange with nearby areas. The sediment transport assessment that has been carried out in the hydraulic study shows that the proposed Sunrise project does not modify the present sediment transport mechanism. • Pantai Batu Buruk immediately south of KT breakwater and the shoreline fronting UMT where a coastal protection scheme has been implemented by JPS are not expected to suffer any significant impacts due to the Sunrise works.	
4.2	Flooding risk along Sg Terengganu • No changes in maximum water levels along the Sg Terengganu during the maximum discharge event with the presence of the Sunrise project. The project will not impose any changes on the flooding risks along Sg Terengganu.	
4.3	Flushing capacities inside the proposed inner channel and dredged basin • Flushing capacities at these two areas (project site) are limited. • The watercourses in these two areas must be well managed by the project proponent to ensure that no pollutants are discharged into the waterways.	
4.4	Suspended sediment and sedimentation impact on Fish Aggregating Device (FAD) – during construction periods • The model predicts that the impact zone from sedimentation will affect the FADs north of the Sunrise project and near the southern part of the Project especially during Phase 2. The impact however, is limited to a minor impact, with no mortality of corals or seaweed expected.	
5	Adjournment • JPS concerns have been discussed accordingly during the meeting. • JPS letter on hydraulic report will be issued. • Meeting adjourned at 4:30pm.	INFO

End of Meeting

Minutes Prepared by : Chua Jing Fen
Date : 30 August 2019

Appendix H

Reclamation Layout Optimization Report

Proposed Reclamation and Development of the Sunrise City Mixed Development at Mukim Seberang Takir, District of Kuala Nerus, Kuala Terengganu, Terengganu

Hydraulic Study for Layout Optimisation

Elcca Properties Sdn. Bhd.

62801461-RPT-121 Rev. 01

June 2017

The expert in WATER ENVIRONMENTS

This report has been prepared under the DHI Business Management System certified by Bureau Veritas to comply with ISO 9001 (Quality Management)

Proposed Reclamation and Development of the Sunrise City Mixed Development at Mukim Seberang Takir, District of Kuala Nerus, Kuala Terengganu, Terengganu

Hydraulic Study for Layout Optimisation

Prepared for	Elcca Properties Sdn. Bhd.
Represented by	Mr Liew Ah Yong

Conceptual Layout

Current Revision Approvals

	Name / Title	Signature	Date
Prepared by	Mark Oliver		Jun 22, 2017
Reviewed by	Juan Savioli		Jun 23, 2017
Approved by	Mark Oliver		Jun 23, 2017

Classification

☐ Open	☒ Restricted	☐ Confidential

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Document Information

Project No.	62801461		
Project Title	Proposed Reclamation and Development of the Sunrise City Mixed Development at Mukim Seberang Takir, District of Kuala Nerus, Kuala Terengganu, Terengganu		
Subject	Hydraulic Study for Layout Optimisation		
Client	Elcca Properties Sdn. Bhd.		
Document No.	62801461-RPT-121	**Rev**	01

Distribution	**Type of Data**	**No of copies**
Elcca Properties Sdn. Bhd.	Digital	1
DHI Water & Environment (M) Sdn. Bhd.	Digital	1

Document Revision History

Rev	**Rev Date**	**Description of Change/ Reason for Issue**	**Prepared by**	**Checked by**	**Approved by**
01	Jun 23, 2017	Issued for Client Review	mao	jcs	mao

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CONTENTS

FIGURES

TABLES

1 Introduction

Elcca Properties Sdn. Bhd (EPSB) is planning a reclamation project referred to as Sunrise City on the shoreline between the northern breakwater at the Kuala Terengganu river mouth and Sultan Mahmud Airport. This will be a mixed development including a new town centre, residential and commercial areas, hotels and tourism facilities, a cruise liner terminal, a ship repair area and light industries.

The location of the proposed development together with the allowable development area and the outline project layout are set out in Figure 1.1.

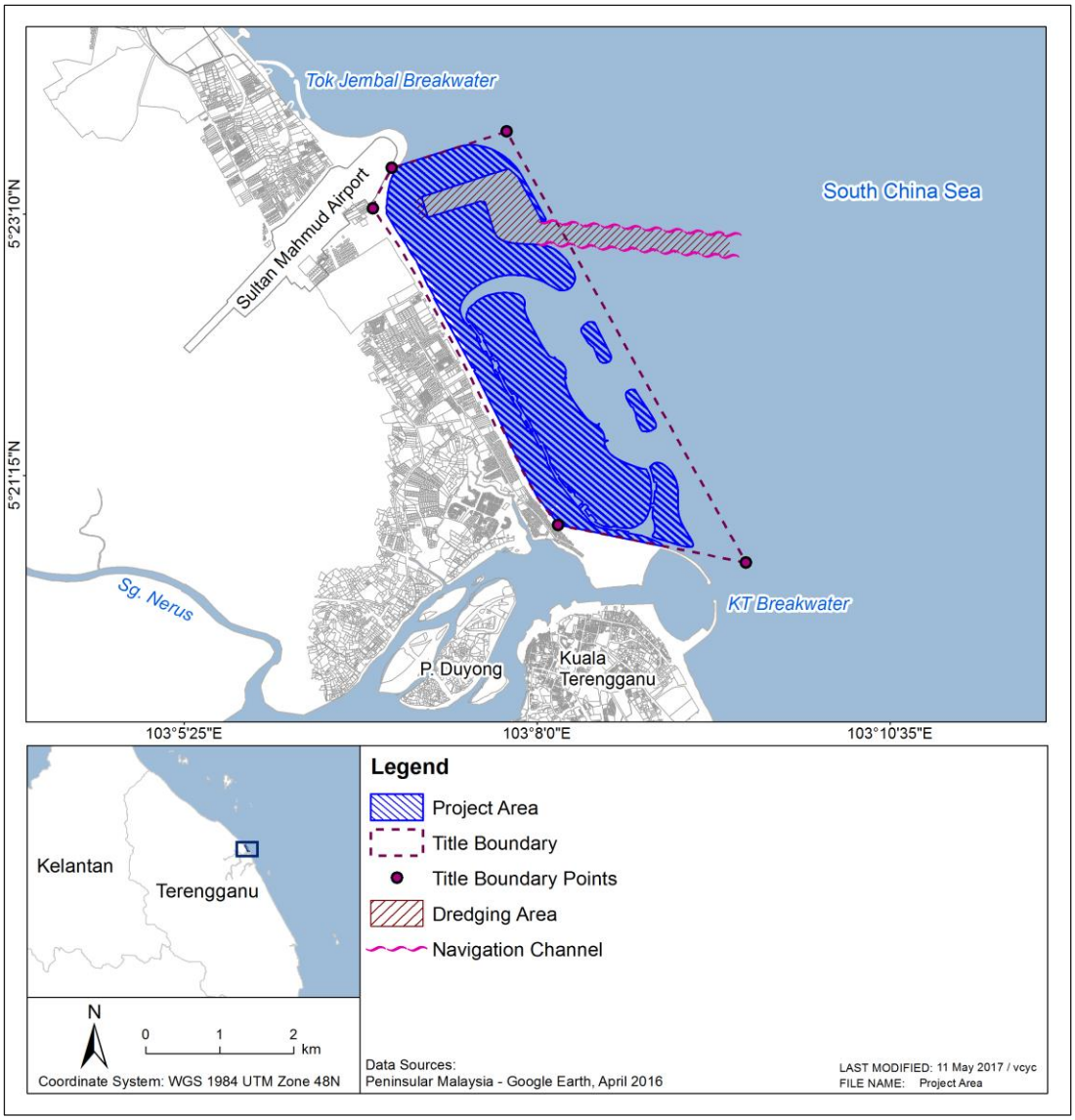

Figure 1.1 Project Location.

DHI Water and Environment (M) Sdn Bhd (DHI) has been commissioned by EPSB to carry out Initial Studies for the Project as follows:

1 Hydraulic Modelling to support the development of an optimised masterplan layout; and
2 Preparation of the Terms of Reference (TOR) for the EIA, and submission of this TOR to DOE.

The objective of the hydraulic modelling for layout optimisation is to:

- Provide input the assessment of the overall reclamation outline that meets the project objectives and minimizes impacts in nearby areas;
- Identify suitable areas for recreational beaches within the development and to recommend layout in these areas to allow the design of stable and good quality beaches;
- Optimise internal channel layout, alignment and depths to balance navigational, water quality, recreational and other stakeholder aspirations;
- Identify a suitable location for the release of treated sewage effluent from the development;
- To assess the navigation channel and berth areas for the cruise liner terminal and ship repair facility and optimise to provide safe navigation conditions.

The hydraulic modelling for layout optimisation was carried out in close cooperation with other parties involved in the development of the project layout, and in particular BCT ARKITEK who had responsibility for the preparation of the master plan layout. At the time of writing this report an optimised layout has been prepared. This has been incorporated in the TOR for the EIA which was submitted to DOE on 16 May 2017.

This report describes the hydraulic modelling carried out to support the development of the optimised layout. The development of this layout has been an iterative process with recommendations for changes to the layout being given to BCT as they became available, and updated layouts received from BCT being tested in the hydraulic models.

1.1 Scope of Work for the Modelling Studies

To achieve the objective of the study the following numerical models were utilised:

- MIKE 21 HD. This is the base hydrodynamic model and was used to assess the current conditions within the development and changes to currents in the surrounding areas.
- MIKE 21 AD. The advection dispersion model was used to assess the flushing of a conservative tracer in the channels and berthing areas of the proposed development to allow an assessment to be made of long term water quality within these areas.
- MIKE 21 SW. Used to model wave conditions in the vicinity of the development, and to make initial assessment of wave conditions in the vicinity of the breakwater and cruise liner terminal.
- MIKE 21 BW. Used for detailed modelling of wave conditions in the vicinity of the cruise liner terminal, ship repair facility and proposed beaches.

1.2 Reclamation Layouts Used in the Modelling

A total of 9 project layouts have been considered in the modelling for the layout optimisation. These are shown in Figure 1.2 and Figure 1.10.

The key issues considered in each of these layouts and changes incorporated are summarised below:

- **Layout 1.** This is the base layout provided by EPSB at the start of the study. Currents and flushing capacity were modelled for this layout.
- **Layout 2.** This layout is modified in line with early data from BCT with the offshore islands reduced in size and nearshore layout modified. Currents and flushing capacity were modelled for this layout.
- **Layout 3.** This is a minor modification to Layout 2. Currents and flushing capacity were modelled for this layout.
- **Layout 4.** This is a minor modification to Layout 3. Currents and flushing capacity were modelled for this layout.

- **Layout 5.** Breakwater layout and reclamation in the vicinity of the cruise terminal modified to assess impact on wave conditions at the Cruise Terminal. Reclamation layout modified to improve flushing. Currents, flushing capacity and wave conditions were modelled for this layout.
- **Layout 6.** Breakwater layout and reclamation in the vicinity of the cruise terminal modified to allow for turning circle requirements. Currents and wave conditions were modelled for this layout.
- **Layout 7.** Breakwater length reduced and reclamation layout modified in the vicinity of the cruise terminal. Currents and wave conditions were modelled for this layout.
- **Layout 8.** This layout is based on the final layout agreed with BCT. Reclamation shape is optimised, offshore islands added and final configuration of breakwater, Cruise Terminal and basin for ship repair facility included. Currents, flushing capacity and detailed wave conditions at the Cruise Terminal and beach areas were modelled for this layout.
- **Layout 9.** This layout I similar to Layout 8 except that the channel layout close to the existing Kuala Terengganu northern breakwater was modified to improve flushing capacity. Currents and flushing capacity were modelled for this layout.

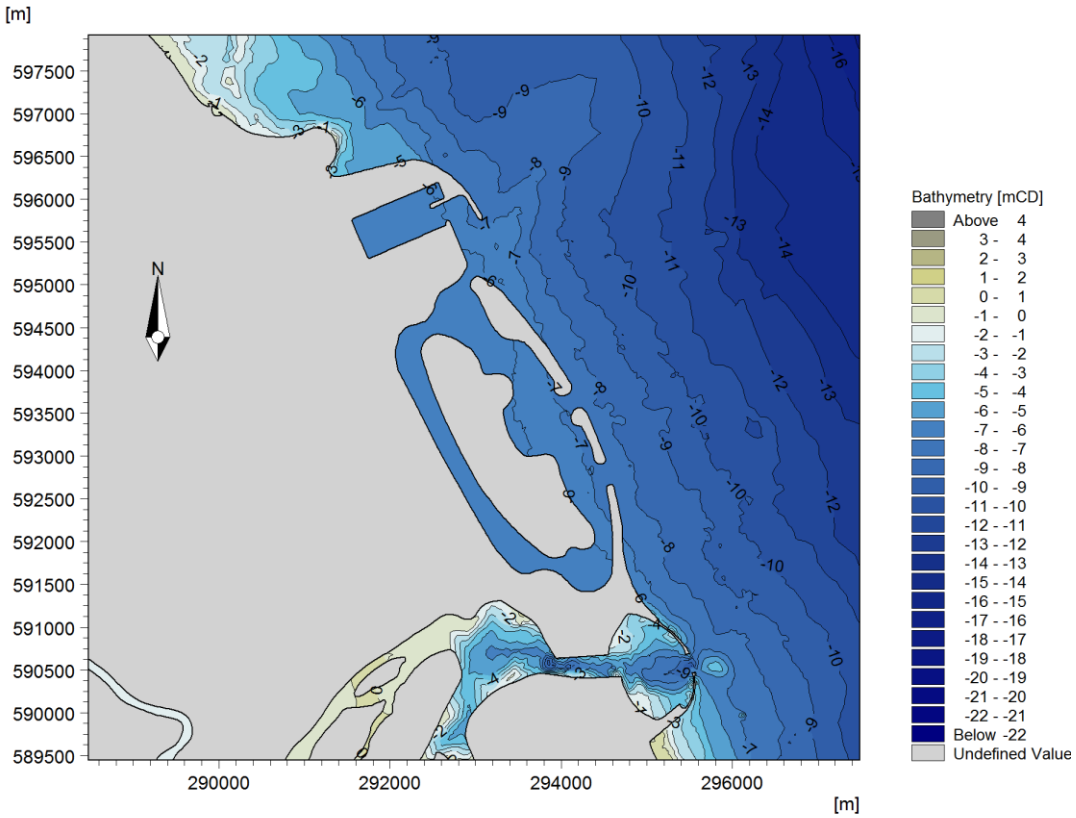

Figure 1.2 Layout 1. This is the base layout provided by EPSB at the start of the Study

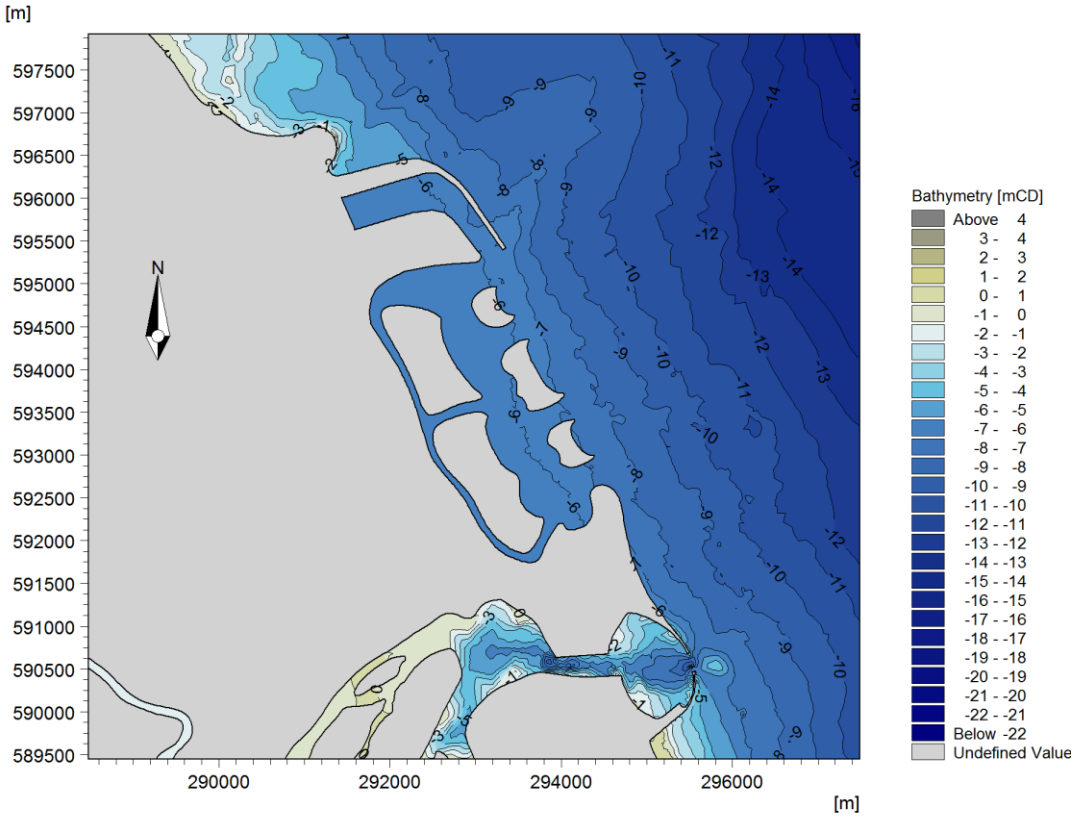

Figure 1.3 Layout 2.

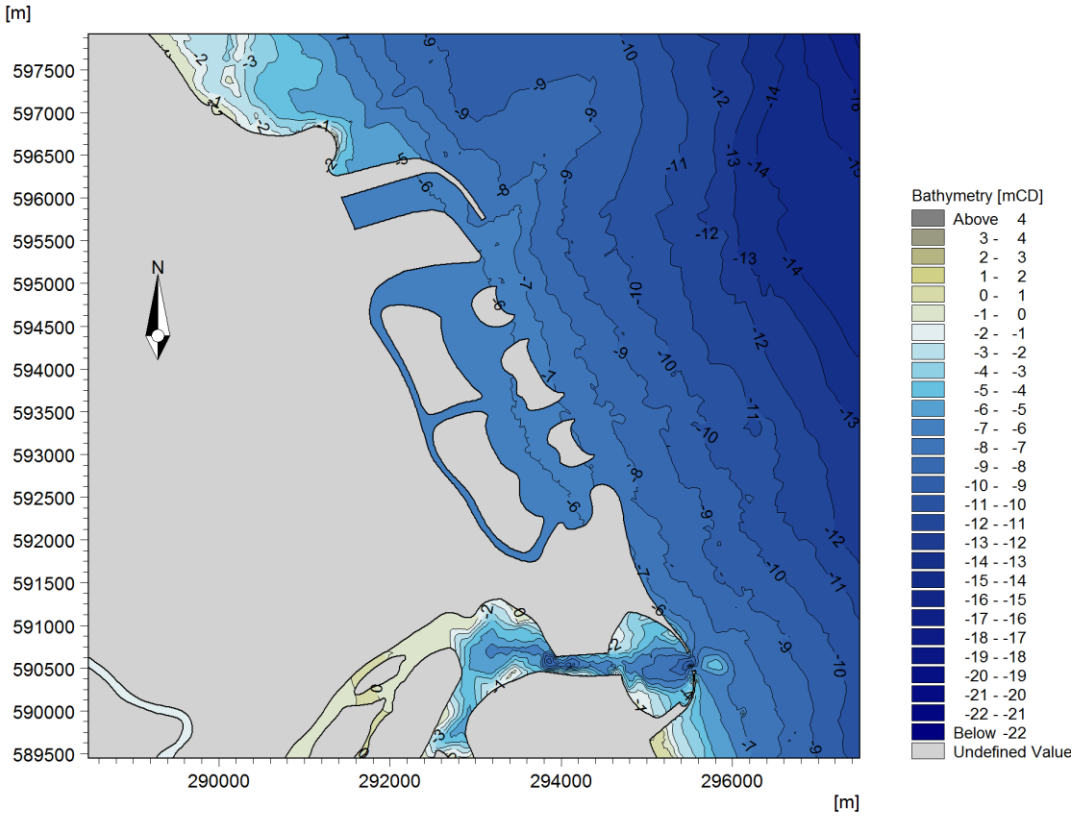

Figure 1.4 Layout 3

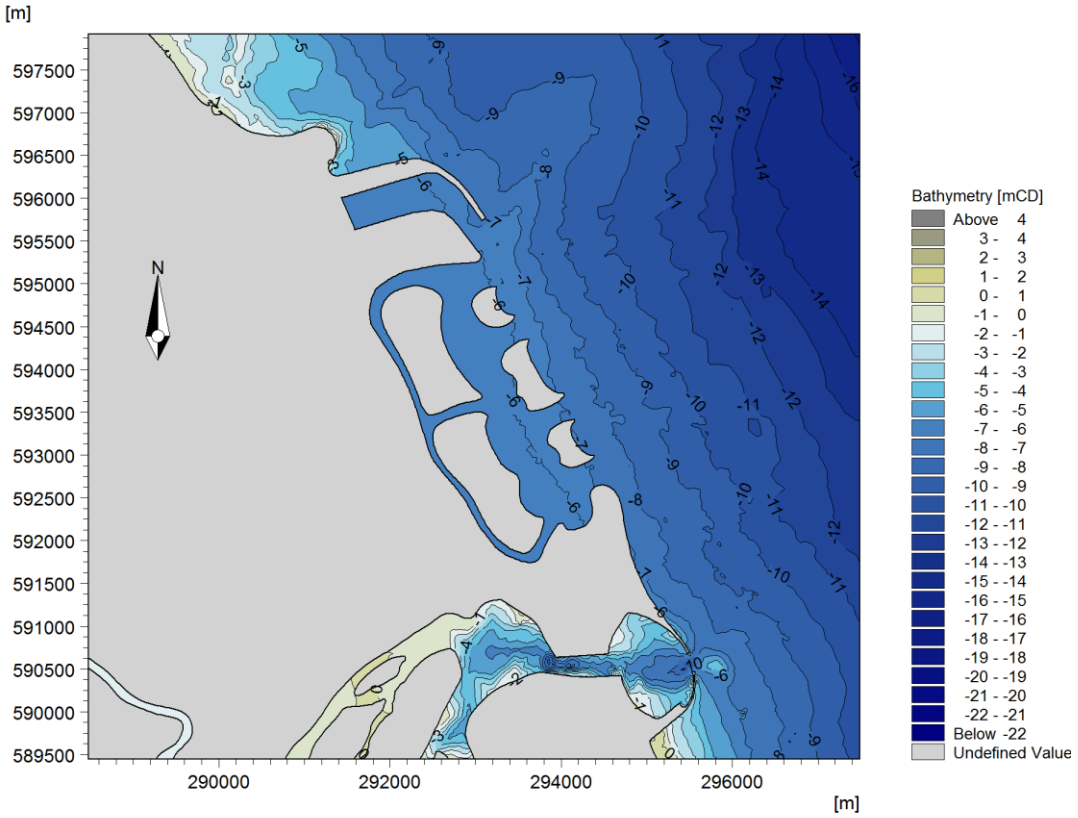

Figure 1.5 Layout 4

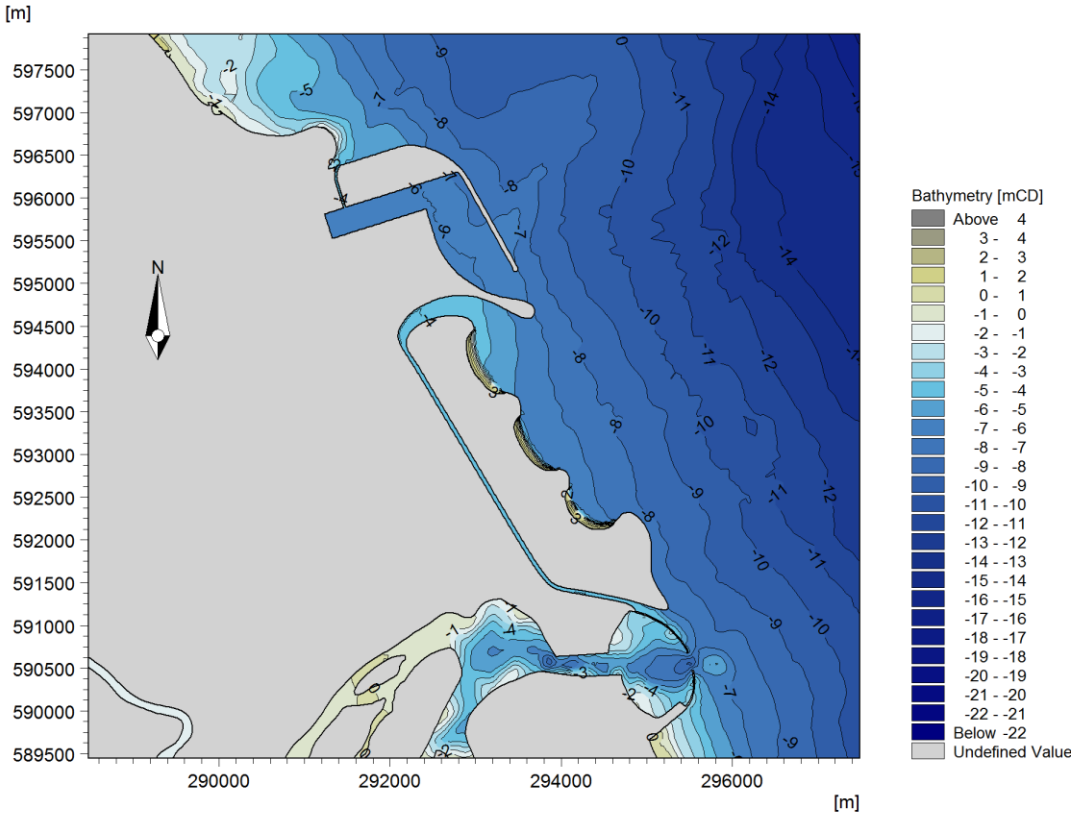

Figure 1.6 Layout 5

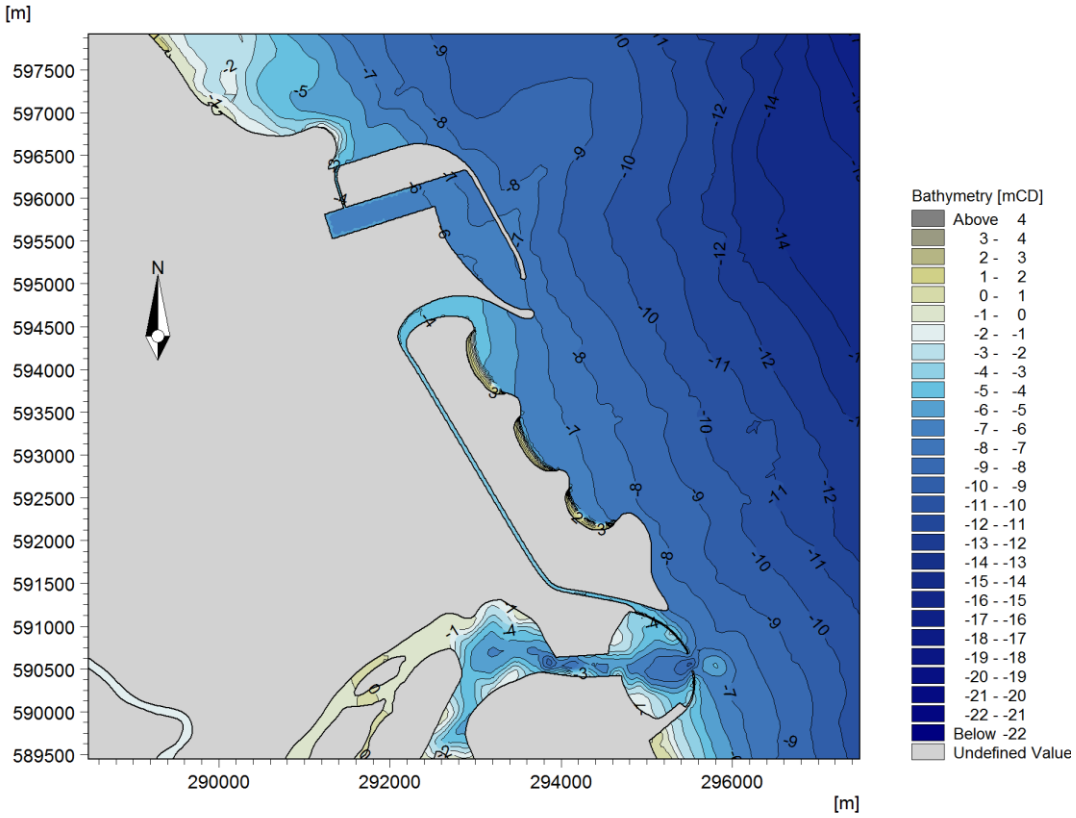

Figure 1.7 Layout 6

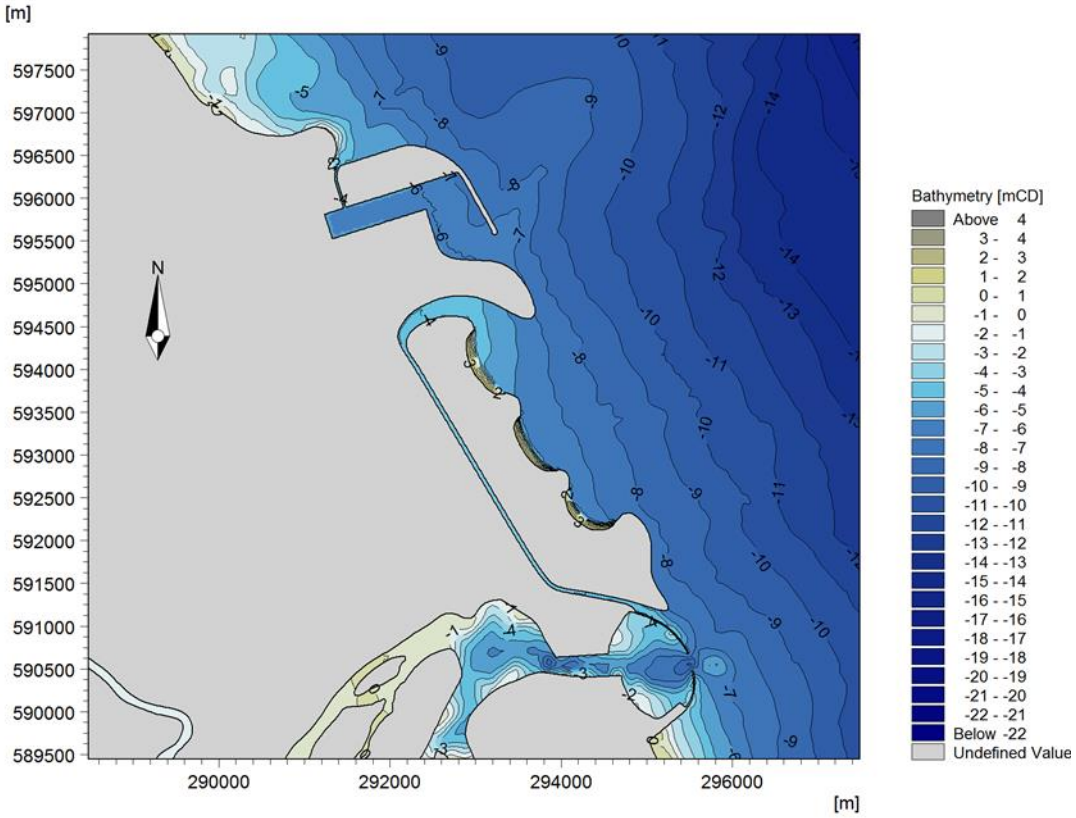

Figure 1.8 Layout 7

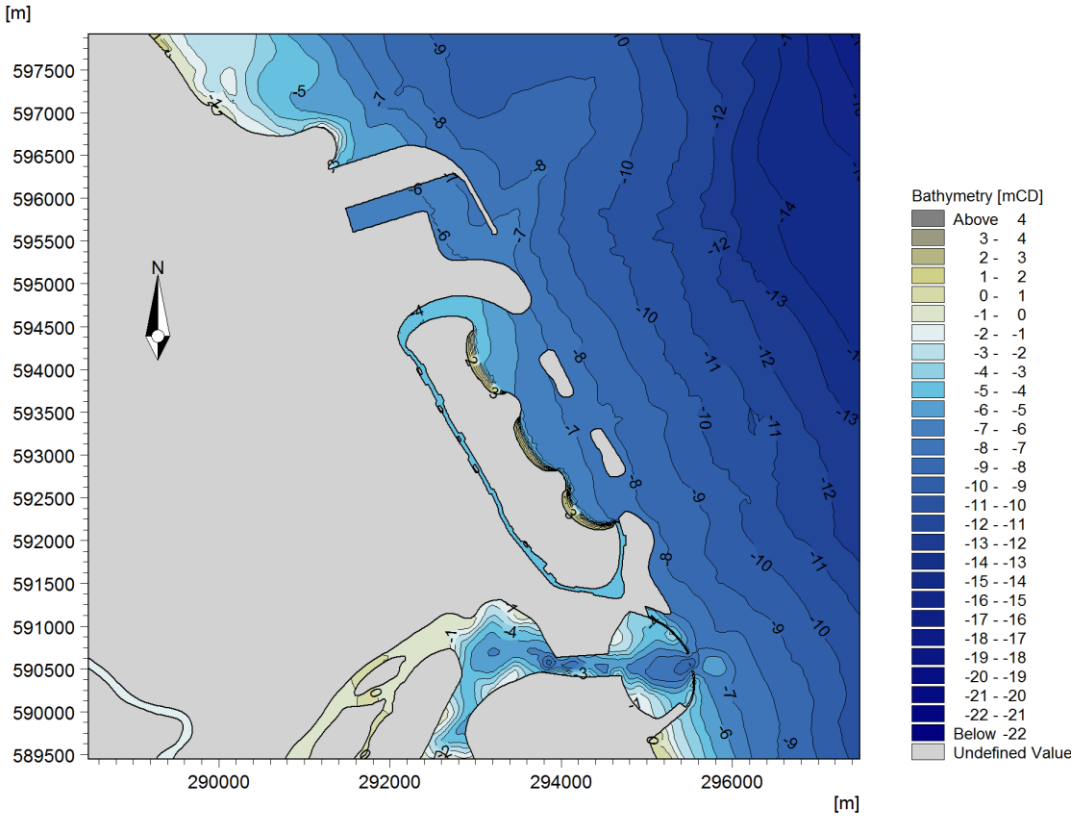

Figure 1.9 Layout 8

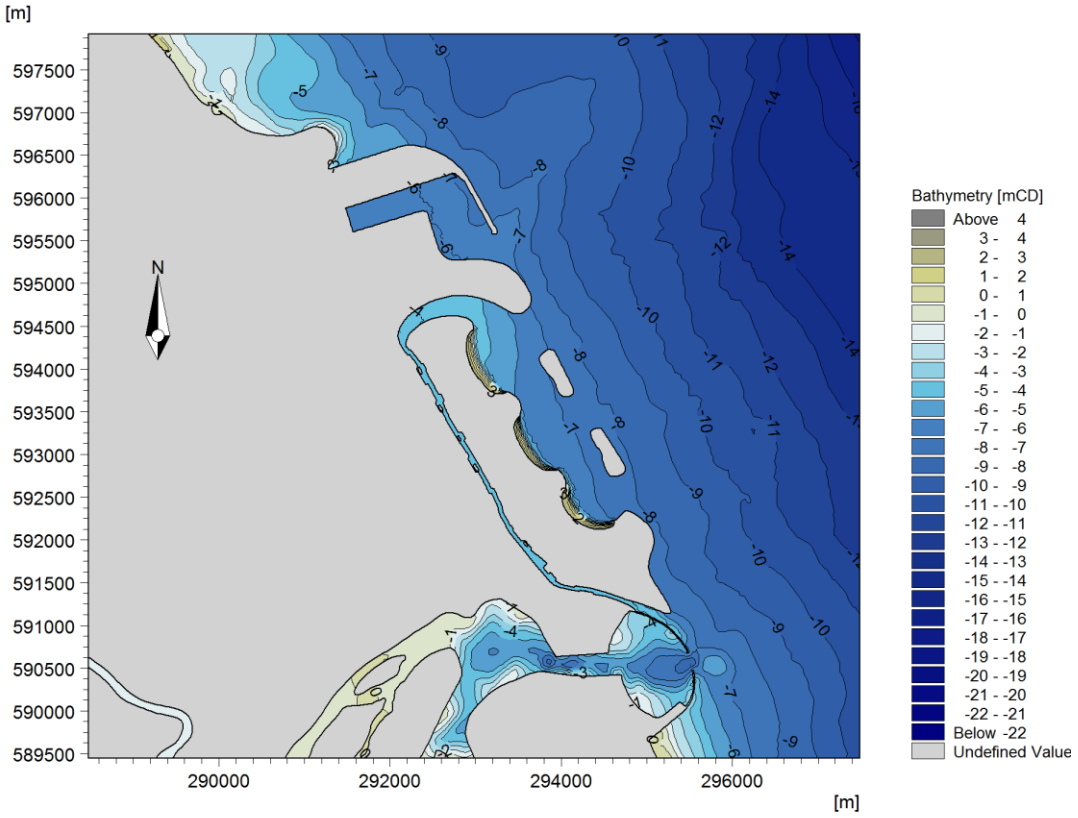

Figure 1.10 Layout 9

2 Modelling of Currents

The currents in the vicinity of the proposed development have been modelled and data extracted showing typical current patterns for flood and ebb tides, and mean and maximum current speeds for a 14 day period that includes both spring and neap tides. The modelling was all carried out for a pure tide condition and does not include the effects of the NE and SW monsoon winds and waves. As the monsoon conditions only have a small impact away from the nearshore area the data presented is considered to be broadly representative of conditions through the year.

The modelling of current conditions is used to give an assessment of the suitability of the current conditions for navigation within the proposed development and whether there are likely to be impacts on other navigation.

Data is presented below for the existing conditions and Layouts 1, 2, 8 and 9, which illustrate the key current patterns. The modelling of Layouts 3 to 7 showed very similar conditions to Layouts 1 and 2.

2.1 Existing Conditions

Typical flood and ebb tide current patterns for the existing condition are shown in Figure 2.1 and Figure 2.2, with mean and maximum currents being shown in Figure 2.3. Maximum current speeds occur at the outer end of the airport reclamation and in the vicinity of the Kuala Terengganu northern breakwater, maximum speed is approximately 0.7m/sec.

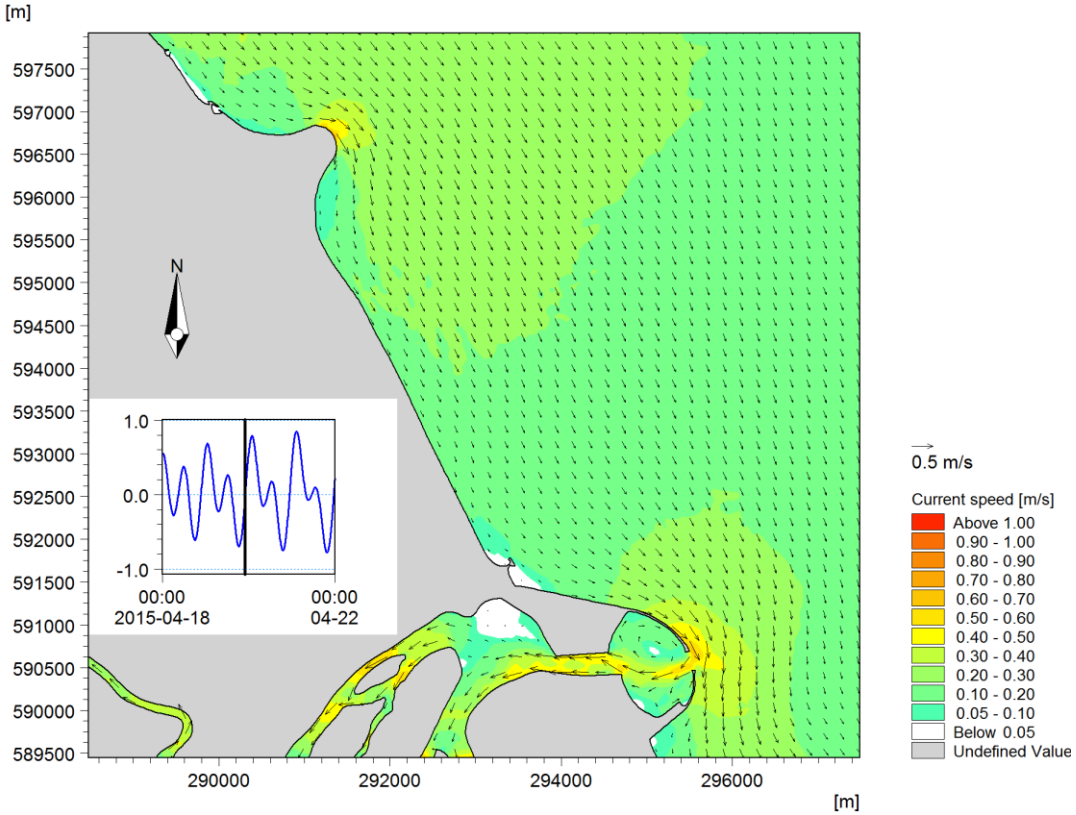

Figure 2.1 Modelled tidal current condition during flood tide for existing condition

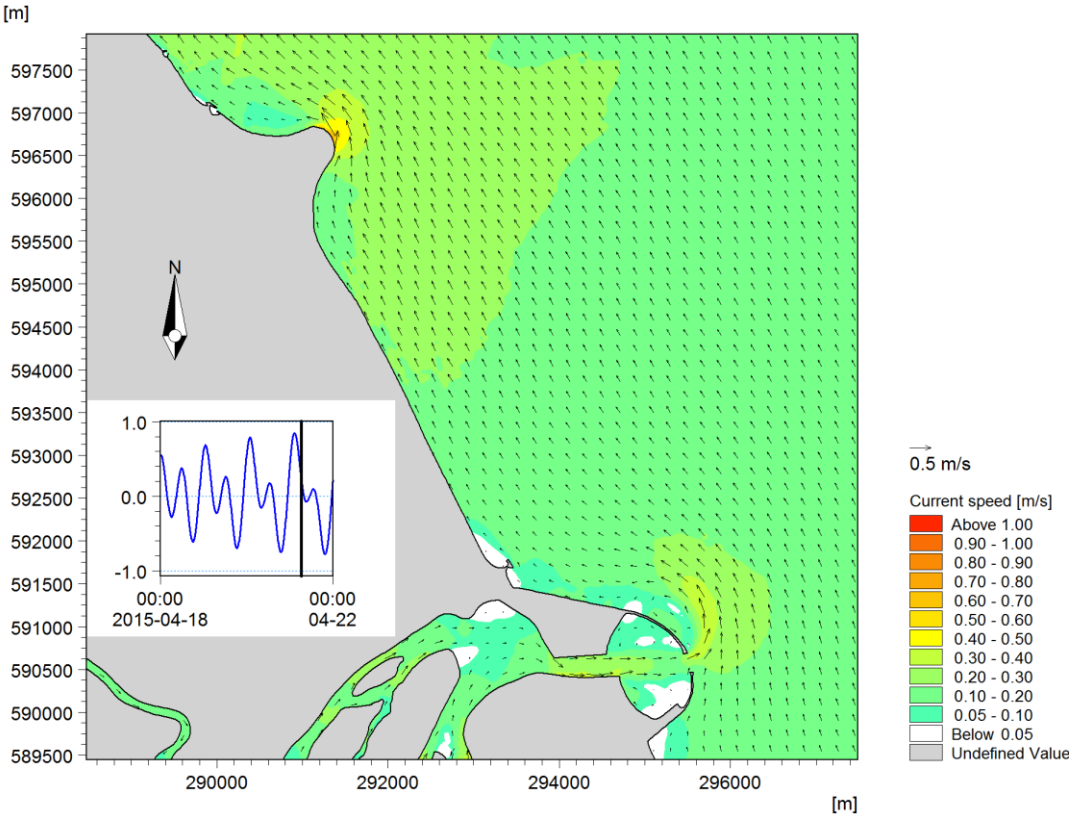

Figure 2.2 Modelled tidal current condition during ebb tide for existing condition