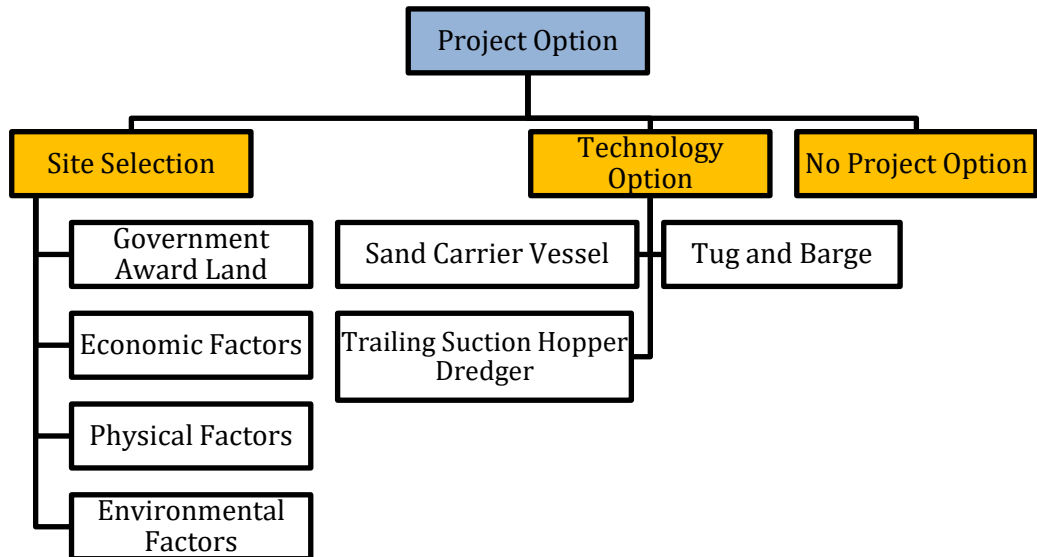


4.0 PROJECT OPTIONS

This section briefly describes several project options which provide clearer basis of choice among the options for the decision maker and relevant parties involved.

This comprises of the following aspects:



4.1 Site Selection

The selection of the project location has taken into account the following reasons:

4.1.1 Government Award Land

The site has been granted to Awan Plasma Sdn Bhd by the state government of Melaka under a concession agreement for the development of the aforementioned project. Basically, it can be considered that the proposed location has already identified by the state government to be developed by the Project Proponent. This location is fixed and is not possible to change.

The project site is in the coastal area of the state of Melaka and it is also in line with the most of the National, State and Regional Planning Policy and Regulations as described in **Section 1.5**.

4.1.2 Economic Factors

The proposed location of the project has also been determined strategically to its maximum value due to the following reasons:

- Sand source is available within 20km radius from the proposed project site.
- High market demands and return on investment of seafront property especially in the State of Melaka.
- Existing road and infrastructure system are favorable for the reclamation and seafront development.

4.1.3 Physical Factors

Impacts on the hydrodynamic condition at and around the project site has been reviewed and assessed. As detailed in Hydraulic Study Report submitted to JPS, the simulation results clearly indicate that the reclamation work at the proposed location will not create any significant change nearby the area. It is evident from the study result that the proposed project may cause no significant change in the pattern of maximum and mean current speed at and around the project site.

4.1.4 Environmental Impacts Factors

There is no mangrove forest observed in the immediate vicinity of the project site nor is it reported in the NPP3. The area is also not known for the presence of corals (Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia, 2012), hence it is anticipated that there will be no corals found within the project site. However, there is a turtle nesting site located at Pulau Upeh, situated some 2.8 km southeast of the project site.

Meanwhile, based on the statistical data and on-site observation, the marine traffic in the vicinity of the project area is not very heavy and it is not anticipated to cause significant impacts to this aspect.

4.2 Technology Option

The choice of reclamation method will affect the net environmental impact and geotechnical properties of the reclamation area. The EIA study scope will look into several methods of reclamation. The preferred method will depend upon the type of fill material, foundation soil, topography of the seabed, availability of equipment and allowable fine material for reclamation.

Available methods that have been taken into consideration for the reclamation include sand carrier vessel, tug and barge and Trailing Suction Hopper Dredger. Advantages and disadvantages of each methods are discussed below:

Table 4-1 Proposed Technology Options

No	Technology Option	Description
1	Sand Carrier Vessel	<p>This type of sand carrier is designed and invented by shipyard at China and they have been used for many project especially for sand transportation and dredging projects in China.</p> <p>The most unique of this type of vessel is they can operate in 3 in 1 method, which is self- sand suction, self-propel & self-sand discharging.</p> <p>Normally, sub-contractor will standby another sand dredger to accommodate those vessels without self -suction function and also can be serving those vessels in the event of suction pump failure.</p> <p>For the proposed project site conditions, vessels full laden's maximum water draft 3.5 m upon high tide is the most ideal and appropriate for the reclamation. Sand carrier is very user friendly and suitable for Melaka's water depth as well as low fuel consumption. Sand carrier applied by sub-contractor will source the sands for reclamation purpose from the nearest sand source and transporting to the project site.</p>
2	Tug and Barge	<p>Tug and barge for sand transportation is most conventional method used for land reclamation in those days. This method has been phased out by many of reclamation contractor for reclamation project.</p> <p>However tug and barge may still use for armour rocks transportation for rock revetment construction whereby for the site access via road transportation is inconvenience.</p> <p>Tug and barge are not user friendly due to involve of triple handling, i.e. sandpump ship/dredger is require to extract the sand to the barge, tug is required to tow the barge to designated discharge area and it need excavator to excavate the sand to tipper and discharge on land.</p> <p>This method is too relies on water tide and extremely slow to complete one circle of operation.</p>
3	Trailing Suction Hopper Dredger (TSHD)	<p>Trailing Suction Hopper Dredger is a ship that is only suitable for deep-sea navigation with its ability to load high capacity (from 10,000.00 m³ – 30,000.00 m³ / voyage). It is a free sailing vessel and is ideal for dredging in harbours and shipping channels as well as offshore.</p>

No	Technology Option	Description
		<p>TSHD is very suitable for long sailing distance under strong wind and wave conditions. Inability to work in very restricted area is one of its disadvantages, thereby, it is not suitable for Melaka's water depth and the operation cost and fuel consumption is extremely high.</p> <p>The production of a Trailing Suction Hopper Dredger depends on many factors, such as soil characteristics, dredging depth, weather conditions, marine traffic, tide, current flow, distance, etc. Operation of TSHD might cause dilution of the dredged materials during the loading process, which is not favorable for the reclamation.</p>

4.3 No-Project Option

Adapting the “NO-Project” Option would maintain the current site conditions. Nevertheless, it should be noted that the surrounding areas of the proposed project site are being developed rapidly, the proposed project site will not be acceptable for the economic growth if remain a status quo situation. Meanwhile, as Pantai Klebang has already been earmarked by the state government as one of the target areas in tourist facilities and accommodation development, it is anticipated that the status quo situation may not last a very long time.

With the “No-Project” Option, the proposed project site will also lose the opportunity to bring more economic progress and revenue to the state government. It will subsequently affect to economy and growth of the tourism industry of the state and national.