

# Executive Summary

## 1.0 INTRODUCTION

- 1.1 The Environmental Impact Assessment (EIA) report is prepared for the **Proposed Development of Additional Buildings On the Existing Car Park Area and Roof of Mahkota Parade Shopping Mall On Lot 1337 in Melaka City, District of Melaka Tengah, Melaka**. The Project consists of 420 units of serviced apartments, 540 hotel rooms, commercial units, convention hall, car park, supporting facilities and infrastructures. The total area to be developed is approximately 4 acres of land (1.62 ha.).
- 1.2 The proposed Project is a prescribed activity that falls under **Activity No. 12(a)** of **Schedule 1** of the **Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 2015** made under **Section 34A** of the **Environmental Quality Act, 1974**. The Project initiator is required to prepare and submit an Environmental Impact Assessment (EIA) report to ensure the Environmental Impact Assessment is undertaken, consonant with the protocols established by the Director General of the Department of Environment (DOE), Malaysia.
- 1.3 This project is initiated by **Messrs. MTrustee Berhad**. Any enquiries regarding the Project may be directed to:

**MTRUSTEE BERHAD**

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- 1.4 The EIA report is prepared and submitted by an EIA study team led by **Datuk Ir. Othman Abdul Rahim**, an EIA Consultant registered with the Department of Environment (DOE Reg. No. C0006). Enquiries and correspondence pertaining to this report can be made to:

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## **2.0 STATEMENT OF NEED**

- 2.1 The Melaka Government has adopted a strategy of developing the State into a City-State by the year 2020. It aims to achieve this mainly by intensively developing the industrial and tourism sectors which will have a positive impact on population, job opportunities and demand for residential, commercial and industrial properties. In order to meet the growing demand of the tourism sector, the State Government of Melaka is planning to develop 20,000 hotel rooms and homestay over the next three years. (Source: 15 Million Tourists Expected in Malacca. *The Star*, p. 1, 19 January 2014).
- 2.2 As such, the proposed Project intends to contribute to the development of tourism in the State by taking all factors into account. By taking into consideration the location of the site as well as the land price in this area, the proposed site is suitable to be developed into a high-rise building consisting of a hotel, serviced apartments, commercial units with basic infrastructures and facilities. The Project is envisaged to complement the existing land use and would become one of the attractions for economic growth.

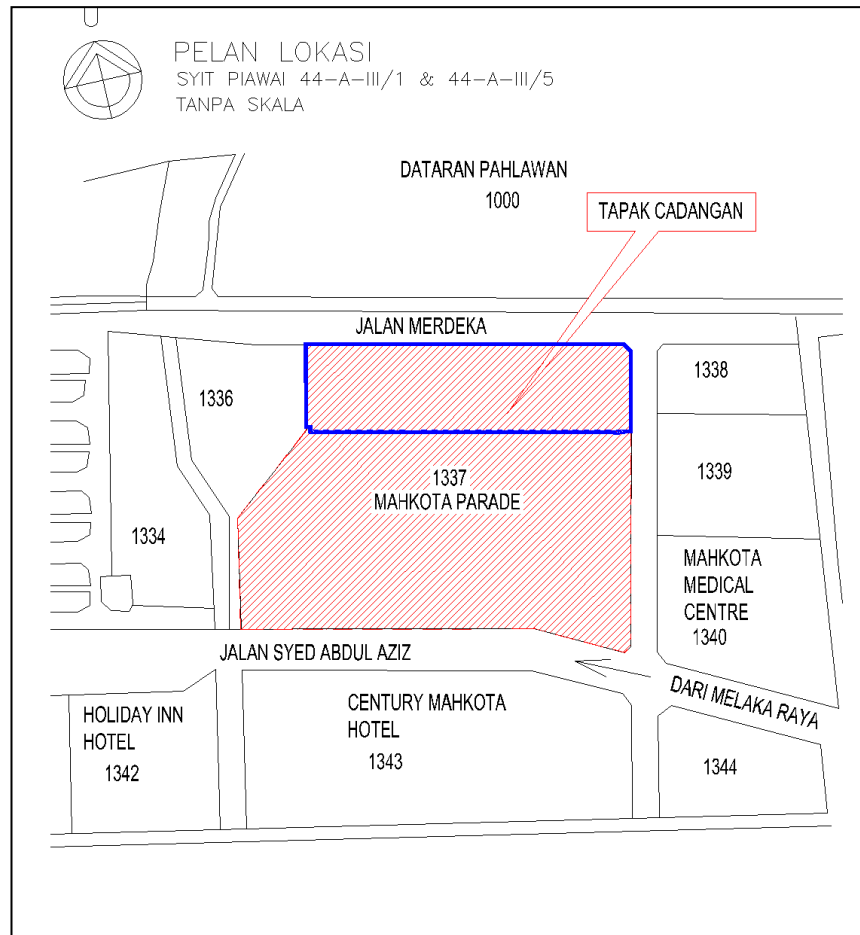
2.4 The proposed Project has been conceived to achieve the following objectives:-

- Provide tourist accommodation, viz., hotel with amenities and recreational facilities;
- Advocate of State government aspiration in ensuring steady growth of the basic and necessary tourism supply, viz., tourist accommodation in the State;
- To fully utilise the available space for sustainable development; and
- To increase the business opportunity for the local community and generate higher revenue for the local municipality, thus spurring the local economic development in the State.

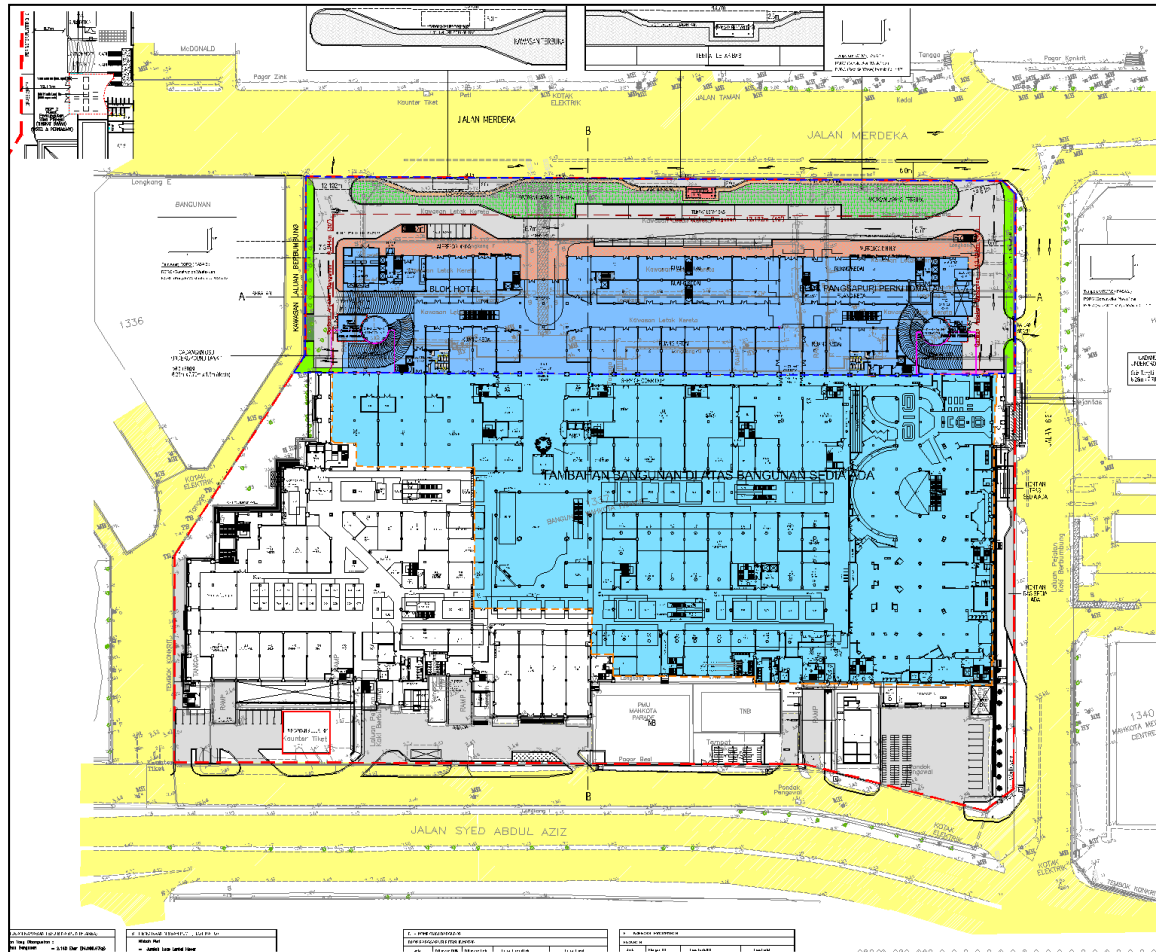
### 3.0 PROJECT DESCRIPTION

3.1 The development is proposed on a 4-acre land at the existing Mahkota Parade shopping mall area. Hatten Hotel and Mahkota Medical Centre are located just across the road to the east of the project site while The Explorer Hotel can be found at the west of the site. Dataran Pahlawan Megamall is located to the north of the site and to the south of site is where Mahkota Hotel is located at. The site is accessible from Jalan Merdeka which stretches at the north of the site and from Jalan Syed Abdul Aziz which stretches at the south of the site.

3.2 The proposed project involves the transformation of part of the existing Mahkota Parade shopping mall and its open car park area into a mixed commercial development consisting of a hotel, serviced apartments, commercial units as well as basic facilities and infrastructures. **Figure 1** shows the site plan of the Project while **Figure 2** is the layout plan of the Project.



**Figure 1: Site Plan**



**Figure 2: Layout Plan**

3.3 The proposed development will be developed in two phases and there will be construction of basement involve. The components involved during each phase of the development are as follows:

**Phase 1**

- a) 1 block of 30-storey serviced apartment (420 units);
- b) Supporting facilities at 6<sup>th</sup> floor;
- c) 5-storey commercial areas (from underground to 3<sup>rd</sup> floor);
- d) Car park at 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> floors; and
- e) 1 unit of electrical substation.

## Phase 2

- a) 1 block of 20-storey hotel (540 rooms);
- b) Convention hall at 6<sup>th</sup> floor;
- c) Supporting facilities at 7<sup>th</sup> floor;
- d) Public park at 5<sup>th</sup> floor;
- e) Car park at 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> floors; and
- f) 5-storey commercial areas (from underground to 3<sup>rd</sup> floor).

3.4 The percentage and acreage for each development category are summarised in **Table 1**.

**Table 1: Details of the Proposed Component**

| Component                                                                                                    | Unit     | Area (acre)  | Percentage (%) |
|--------------------------------------------------------------------------------------------------------------|----------|--------------|----------------|
| <b>Plinth Area</b>                                                                                           |          |              |                |
| Additional building consisting of commercial areas, serviced apartments, hotel and refuse collection points. | 1        | 2.084        | 52.05          |
| Taxi Stand                                                                                                   | 1        | 0.009        | 0.22           |
| Electrical Substation                                                                                        | 1        | 0.056        | 1.40           |
| <b>Sub-total</b>                                                                                             | <b>3</b> | <b>2.149</b> | <b>53.67</b>   |
| <b>Open Spaces</b>                                                                                           |          |              |                |
| Perimeter Planting                                                                                           | -        | 0.108        | 2.70           |
| Open Space                                                                                                   | -        | 0.374        | 9.34           |
| Walkway                                                                                                      | -        | 0.083        | 2.07           |
| Alfresco Dining / Foyer                                                                                      | -        | 0.355        | 8.87           |
| Road / Car Park                                                                                              | -        | 0.935        | 23.35          |
| <b>Sub-total</b>                                                                                             | <b>-</b> | <b>1.855</b> | <b>46.33</b>   |
| <b>GRAND TOTAL</b>                                                                                           |          | <b>4.004</b> | <b>100.00</b>  |

Based on **Table 1**, the main component of the development is the additional building consisting of commercial areas, serviced apartments and hotel. The proposed serviced apartments will consist of facilities such as kindergarten, library, prayer room, swimming pool and gymnasium. As for the proposed hotel, facilities such as meeting room, swimming pool, pool side lounge and convention hall will be developed.

#### **4.0 EXISTING ENVIRONMENT**

- 4.1 The topography of the site can be described as generally flat. The higher levels within the site are mostly scattered at the southern portion of the site, while the lower levels of the site are found mostly at the northern portion of the site.
- 4.2 According to the Geological Survey Map, the main geological character of this area is Devonian. The rock types in this category are phyllite, schist and slate. Some interbeds of conglomerate, chert and rare volcanics are also available within this category.
- 4.3 From the Reconnaissance Soil Map of Negeri Melaka, the type of soil within the site is designated as Urban Land.
- 4.4 There is no river within the Project site. Surface runoff is discharged to the existing drains surrounding the project site and directly into the Straits of Melaka.
- 4.5 The meteorological data was obtained from Batu Berendam Airport Principal Station (No. Station: 48665 – N 02°16', E 102°15') of the Malaysian Meteorological Service Department. The area is characterized as hot humid days and cool nights. Based on the rainfall data from 1968 - 2014, the annual mean rainfall for Melaka is about 1,965.6 mm with the annual mean raindays of 171 days. For the period monitored, the wettest month of the year falls on the month of November which recorded a value of 234.5 mm with the highest corresponding raindays of 24 days. Meanwhile, the driest month occurs in January with an average rainfall of 81.8 mm (corresponding raindays of 9 days).

- 4.6 The annual wind rose for Melaka indicates that the dominant wind is blowing from Northeast (26.9%). The percentage of calm condition occurrences for Melaka is about 20.2% of the time. The annual 24-hour mean relative humidity is about 82.6% with the lowest and highest monthly 24-hour mean relative humidity recorded in the month of February and November with values of 77.5% and 85.4% respectively. The average maximum and minimum mean daily temperature are 31.9°C and 23.5°C respectively.
- 4.7 Information on water quality was analysed at four (4) locations (W1, W2, W3 and W4). The water samples were collected on 29<sup>th</sup> September 2016 from the existing drain surrounding the Project site. From the monitoring result, it is found that most of the detected parameters at all sampling locations have exceeded the Class IIA INWQS limit. It can be concluded that the existing water quality surrounding the Project site is very polluted.
- 4.8 Ambient air quality was measured using High Volume Sampler at seven (7) locations (A1 to A7) for Total Suspended Particulate (TSP). The results obtained indicate that the ambient air quality is relatively well below the Recommended Malaysian Air Quality Guidelines of 260µg/m<sup>3</sup>. The concentration of TSP detected at sampling location A1, A2, A3, A4, A5, A6 and A7 are 68µg/m<sup>3</sup>, 67µg/m<sup>3</sup>, 60µg/m<sup>3</sup>, 64µg/m<sup>3</sup>, 66µg/m<sup>3</sup>, 50µg/m<sup>3</sup> and 55µg/m<sup>3</sup> respectively.
- 4.9 Noise levels were recorded during daytime, evening time and night time at seven (7) locations (N1 to N7). The average LAeq readings recorded during day time, evening time and night time have exceeded the maximum permissible LAeq level of 60dB(A), 60dB(A) and 50dB(A) respectively. The main reason why all of the noise level at all monitoring locations have exceeded the maximum permissible level is because the Project site is located in an urban area and near to the main road whereby a lot of vehicles will pass through the monitoring locations and the noise from the vehicles will surely influence the noise level.
- 4.10 The proposed Project is located in a flat land and it is near to the coast line. Currently, the existing use of the site is car park and the site is surrounded by commercial

buildings. Thus, the biological components and ecology can be considered as not significant to be assessed.

- 4.11 Based on the Malaysia Population Distribution and Housing Census 2010, a total of 63,854 people were recorded in Mukim Bandar Melaka with a total number of households of about 17,287 with an average family size of 4.0. As for the ethnic composition, the total population recorded is only based on Malaysian citizenship, excluding non-Malaysian citizens. In overall, Chinese is the largest ethnic group with 38,725 people (60.7%), followed by Malay with 17,420 people (27.3%), Indian with 2,899 people (4.5%), 1,328 (2.1%) from other ethnic groups and other Bumiputra with 363 people (0.6%).
- 4.12 The proposed project is located in the city centre, in front of the existing Mahkota Parade Shopping Mall. The main roads surrounding the Project site are Jalan Merdeka and Jalan Syed Abdul Aziz. The data on the traffic volume was obtained from the Traffic Impact Assessment (TIA) report which was prepared by O & L Jurutera Perunding Sdn. Bhd. The locations of the traffic count are as in **Figure 3**.

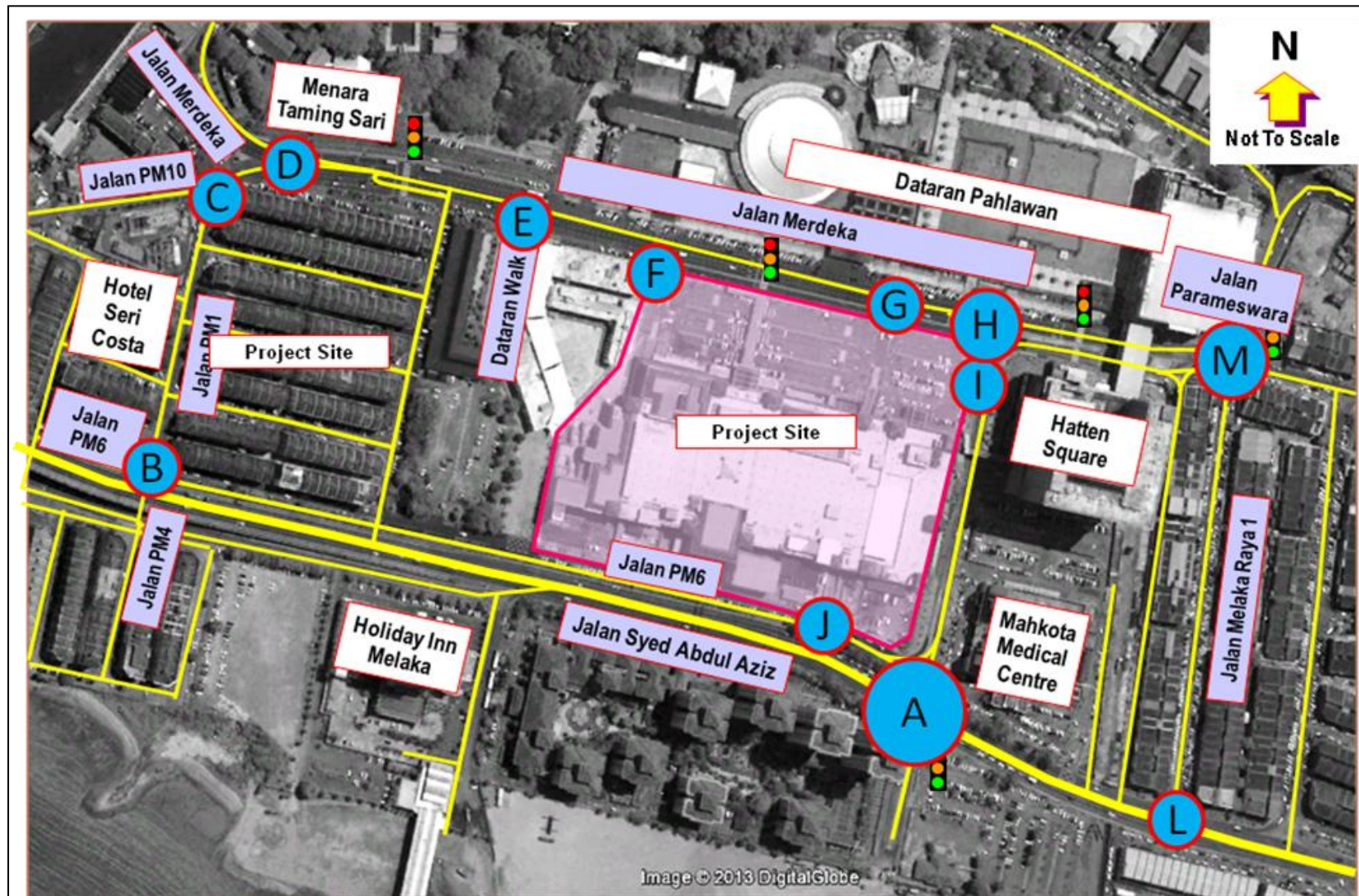


Figure 3: Location of the Traffic Count

From the Traffic Impact Assessment (TIA) report, it was found that the lane capacity for all junctions is still within its capacity. As for the LOS, it shows that the LOS result for Junctions A, E, G and M are already at LOS F even without the development of the Project.

## **5.0 POTENTIAL SIGNIFICANT IMPACTS AND MITIGATING MEASURES**

- 5.1 The Project activities expected to have potential impact on the environment were broadly classified into four categories, viz., pre-construction, construction, operation and project abandonment. Impact assessments were carried out for each activity. Several impacts were assessed and the mitigating measures were proposed in order to control the effects. In arriving at decisions on environmental impacts, the guidelines given in the reference 'A Handbook of Environmental Impact Assessment Guideline' published by DOE were used.
- 5.2 The potential significant impacts and mitigating measures are described in **Table 2**.

**Table 2: Potential Significant Impact And Mitigating Measures**

| <b>Issue</b>           | <b>Source of Impact</b>                                                                           | <b>Potential Impact</b>                                                                                                                                                       | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil erosion           | -Excavation works.<br>-Movement of heavy lorries carrying fill materials.<br>-Construction works. | Erosion is not expected to be significant on this flat paved area except during excavation works for basement which would confine the eroded area within the excavated areas. | Negligible                                                                              | -Provision of proper entrance for construction traffic.<br>-Entrance sweeping and drainage maintenance.<br>-Filling and stockpile materials which are subjected to erosive force shall be properly located within the project site and covered.<br>-Preparation of ESCP plan / LD-P2M2 whenever it is needed and practical to be implemented on-site.<br>- Non-construction measures or actions for the BMP should be referred and adopted whenever and wherever possible. |
| Hydrological regimes   | Increase of surface runoff is not expected to happen.                                             | No impact.                                                                                                                                                                    | Negligible                                                                              | Proper internal drainage system shall be constructed and maintained at all times.                                                                                                                                                                                                                                                                                                                                                                                          |
| Solid waste generation | i. During construction phase:<br>-Waste from labour camp.<br>-Waste from construction             | -Cause health hazard to the workers and the public in the nearby                                                                                                              | Severe                                                                                  | i. During construction phase:<br>- Waste generated shall be collected and disposed off at the approved landfill site.                                                                                                                                                                                                                                                                                                                                                      |

| <b>Issue</b> | <b>Source of Impact</b>                                                                                                               | <b>Potential Impact</b>                                                                                                                                                                                              | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | works.                                                                                                                                | area.<br>- Result in unsightly and squalid conditions and eventually might end up in the sea.<br>-Providing habitats for disease vectors→ jeopardise the public's safety and the ecosystem of the surrounding areas. |                                                                                         | -Any reusable or recyclable waste should be segregated as to enable recycling and waste minimisation to take place.<br>- Any open burning and illegal dumping is strictly prohibited.<br>- Provide on each level a special place to collect the construction waste.<br>- Management to provide a group to manage the construction waste.                                                                                                                        |
|              | ii. During operational phase:<br>-Estimated solid waste generated is 9,941.89kg/day<br>-Improper and unorganized collection of waste. | - Create health hazard and habitats for disease vectors.<br>-The rubbish accumulation will create eyesore and bad odor.                                                                                              | Severe                                                                                  | ii. During operational phase:<br>- A system of waste collection should be set up to ensure that regular and frequent collection of waste are carried out and disposed at the designated landfill sites.<br>- Collection of solid waste shall be performed by the privatised garbage contractors appointed by SWcorp.<br>-Properly designed storage and collection method should be considered for wet solid waste<br>- The wet solid waste from the kitchen and |

| Issue                      | Source of Impact                                                                                                                                                                                     | Potential Impact                                                                                                                                                                                        | Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible) | Mitigating Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                                                                                                                                                                                                      |                                                                                                                                                                                                         |                                                                                  | <p>other food and beverage outlets should be collected and kept in a chilled or air conditioned storage system until collected by the garbage trucks for disposal.</p> <ul style="list-style-type: none"> <li>- Proper garbage collection system should be provided in every unit of hotel and serviced apartment.</li> <li>- Proper housekeeping service shall be practised in order to ensure the units are clean.</li> <li>- Adequate garbage bins shall also be provided at public areas.</li> <li>- It is mandatory to separate the solid waste at source.</li> <li>- Reuse or recycling of garbage should be taken into consideration.</li> </ul> |
| Scheduled waste generation | <p>i. During construction phase:</p> <ul style="list-style-type: none"> <li>- Maintenance of machineries / heavy vehicles on site.</li> <li>- Use of chemical for the construction works.</li> </ul> | <ul style="list-style-type: none"> <li>- Spent oil → will cause water pollution if spills / leaks and cause health hazard if exposed to extreme temperature.</li> <li>- Pose a threat to the</li> </ul> | Severe                                                                           | <p>i. During construction phase:</p> <ul style="list-style-type: none"> <li>- The waste oils shall be stored in 200 L drums and shall be collected by licensed scheduled waste contractor approved by DOE for recycling or disposal.</li> <li>- Temporary storage of the scheduled</li> </ul>                                                                                                                                                                                                                                                                                                                                                           |

| Issue | Source of Impact                                                                                          | Potential Impact                                                                                                                                                     | Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible) | Mitigating Measures                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                                                                                                           | surrounding soil → if it is not properly managed and disposed during the construction stage.<br>- Directly contribute to the degradation of the surrounding ecology. |                                                                                  | waste shall have an impermeable floor, bunded and covered with a simple structure of roofing to protect the container from the weather.<br>- The storage area for schedule waste shall be enclosed on at least 3 sides, have adequate ventilation, be covered to prevent from rainfall from entering, be arranged so that incompatible materials are appropriately separated and have a signboard set up with the word DANGER. |
|       | ii. During operational phase:<br>- Maintenance work that involves usage of chemicals, oil, lubricants etc | -If it is not handled or managed accordingly, would undoubtedly cause a detrimental impact to the water quality at the nearby watercourse.                           | Negligible                                                                       | ii. During operational phase:<br>The management shall enforce the ruling of no scheduled waste to be thrown within the premises.                                                                                                                                                                                                                                                                                               |

| Issue         | Source of Impact                                                                                                                                                                                                                                     | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible) | Mitigating Measures                                                                                                                                                                                                               |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water quality | i. During construction phase:<br>- Activities during excavation for foundation works and stockpiling earth.<br>- Improper disposal of used oil or lubricant.<br>- Disposal of construction waste.<br>- Solid waste and wastewater from workers camp. | - Excess runoff flows together with sediment along the way to the sea will increase the turbidity and the concentration of suspended solids in the seawater.<br>- Used engine oil is often poured “down the drain” and its concentration in a small area may cause severe localised pollution.<br>- Liquid waste from construction sites such as lubrication oil and chemicals, if discharged down the drains or down slope, will eventually end up in the sea.<br>- Workers camp will affect the water quality if sewage, sullage and garbage are improperly discharged or disposed. | Low                                                                              | i. During construction phase:<br>- Provision of silt/ sedimentation traps / filter.<br>- Temporary drains and earth bunds.<br>- Adequate toilets / sanitary facilities for workers camp.<br>- Provision of secondary containment. |

| Issue | Source of Impact                                                                                                                                                                        | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible) | Mitigating Measures                                                                                                                                                                                   |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | ii. During operational phase:<br>-2,052m <sup>3</sup> of wastewater will be generated with the corresponding influent load of 501.66kg of BOD <sub>5</sub> /day and 620.23kg of SS/day. | <ul style="list-style-type: none"> <li>- If the effluent is not treated, it will impose a major pollution to the receiving watercourse.</li> <li>- Odour brought about by the decomposition of organic matter into pungent Hydrogen Sulphide gas.</li> <li>- However, the loading is not expected to impose significant impacts to the surrounding seawater as the wastewater will be channelled and treated by a properly designed centralised Sewerage Treatment Plant (STP).</li> </ul> | Negligible                                                                       | ii. During operational phase: <ul style="list-style-type: none"> <li>- Proper management of used oil from the oil interceptor or grease traps.</li> <li>- Proper sewerage treatment plant.</li> </ul> |

| <b>Issue</b>        | <b>Source of Impact</b>                                                                                          | <b>Potential Impact</b>                                                                                           | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient air quality | i. During construction phase:<br>- Material transportation and vehicular movements.<br>-Construction activities. | -Will affect health and visibility.<br>- Piling activities could contribute to air pollution during construction. | Severe.                                                                                 | i) During construction phase:<br>-Water dampening operation.<br>-Speed limit for moving traffic.<br>-Provision of tyre washing facility.<br>-Proper approach on transporting construction material.<br>-Proper method and environmental friendly material.<br>-Provision of construction debris net to prevent / reduce dust and as a safety measure.<br>- Provision of scaffolding.<br>-Provision of hoarding. |
|                     | ii. During operational phase:<br>- Additional vehicles movements.                                                | - Additional cars and motorcycles will produce additional emissions.                                              | Low                                                                                     | ii) During operational phase:<br>- Air pollution during operational phase is not likely to be significant as the proposed project does not involve any industrial activities which generate gaseous emission.                                                                                                                                                                                                   |

| <b>Issue</b> | <b>Source of Impact</b>                                                                                                                     | <b>Potential Impact</b>                                                                                                                                    | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noise level  | i. During construction phase:<br>– Noise from machineries and equipment.                                                                    | - Noise impacts during earthworks and construction are mainly short term and confined to the period of works.<br>-Will influence noise levels in the area. | Severe                                                                                  | i. During construction phase:<br>- Limit working hours to daylight hours only and construction activities are not allowed on rest day.<br>- Controlling the speed of the vehicles entering the project site.<br>- Hoarding should be placed as the first stage prior to the commencement of the construction.<br>- The material used should be an absorbent type e.g. plywood.<br>- The use of injection piling shall be taken into consideration.<br>- All machineries and equipment that will be used must be in a good and efficient condition. |
|              | ii. During operational phase:<br>- Vehicles arriving and leaving the Project site.<br>- Increase in traffic generated by population growth. | -Have an indirect impact on the tranquility of the surrounding area.                                                                                       | Moderate                                                                                | ii. During operational phase:<br>- Trees which have the ability to absorb noise (e.g. peace lily, sweetheart plant, Madagascan dragon tree and weeping fig) to be planted at the site to reduce the noise impact.                                                                                                                                                                                                                                                                                                                                  |

| <b>Issue</b>     | <b>Source of Impact</b>                                                                     | <b>Potential Impact</b>                                                                                                                                              | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vibration Impact | -Piling activities.<br>-Equipments, machineries and transporting vehicles used at the site. | -If pile insertion process is not done properly, it might create adverse impact to the surrounding buildings and interfere with the comfort of the surrounding area. | Severe during construction, negligible during operation.                                | - Usage of efficient machineries and proper maintenance of the equipment will help to ensure minimum vibration impact to the nearby area.<br>- Injection piling / bore piling system is highly recommended to be used to prevent / reduce the vibration impact to the surrounding. |

| <b>Issue</b>          | <b>Source of Impact</b>                                                                                                                                                                                                                            | <b>Potential Impact</b>                                                                                                                                                                                                                                                                                                                                                                    | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                                                                |
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| Socio-economic impact | i. During construction phase:<br>- Material transportation.<br>- Construction traffic, vehicular movement and mobilisation of heavy machinery.<br>- Additional of heavy vehicles transporting construction material.<br>- Use of immigrant labour. | -Public community in the surrounding may be subjected to air pollution (dust) and noise interference.<br>- Cause an interference to the nearby road users and commercial activities in the vicinity, especially at the entrance to the site.<br>- Create extra congestion to the existing traffic.<br>-If the development involves foreign labour, it will result in some social problems. | Severe                                                                                  | <ul style="list-style-type: none"> <li>- Project Proponent should ensure that their contractors provide suitable accommodation with adequate sanitary and toilet facilities for the workers.</li> <li>- Enforce sufficient control over the workers, especially immigrant labour so that no social problems will arise.</li> <li>- Having adequate and professional site management staff during construction.</li> </ul> |
|                       | ii. During operational phase:<br>- Completion of the development                                                                                                                                                                                   | - It is expected to result in many positive impacts for the locals as the development will                                                                                                                                                                                                                                                                                                 | Negligible                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                           |

| <b>Issue</b>                             | <b>Source of Impact</b>                                                                                                                          | <b>Potential Impact</b>                                                                        | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |                                                                                                                                                  | create employment opportunities.<br>- Yield more positive socio-economic benefits.             |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                         |
| Biological component and aquatic ecology | Since the Project is located on an existing developed land, the biological component and ecology of the site are not expected to be significant. |                                                                                                | Negligible                                                                              | It is recommended that during the operation of the Project, suitable coastal vegetation/ plants be grown along the walkway.                                                                                                                                                                                                                                                             |
| Traffic Impact                           | i. During construction phase:<br>-Construction vehicles                                                                                          | -Cause traffic congestion, noise and traffic hazard if the traffic is not properly controlled. | Severe                                                                                  | i. During construction phase:<br>- Haulage activities, material transportation and heavy vehicles ingressing and egressing the site to be scheduled away from the commuter peak hours.<br>- The allocation of warning signboards as a warning of heavy vehicles access and egress shall also be adopted at the road near to the entrance of the Project site during construction stage. |

| Issue | Source of Impact                                                                                                           | Potential Impact          | Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible) | Mitigating Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | ii. During operational phase:<br>- Management staffs and from the shopping mall and hotel / serviced apartments' visitors. | -Cause traffic congestion | Severe                                                                           | ii. During operational phase:<br>- Jalan Syed Abdul Aziz - the authorities to take into consideration to solve the congestions by proposing grade separated interchanges for all junctions along Jalan Melaka Raya and Jalan Syed Abdul Aziz to ease the congestion on the existing road.<br>- Jalan Merdeka – Jalan Parameswara - the authorities to have a proper traffic dispersal scheme to disperse traffic for these congested tourism areas.<br>- The proposed access is recommended to be a right in and right out junction, but at separate locations of the development.<br>- Vehicles egressing from the development to exit through Jalan Merdeka.<br>- The exit location must be placed further from Jalan Mahkota so that the weaving length is sufficient for vehicles to manoeuvre.<br>- Ensure a proper maintenance of the nearby roads. |

| <b>Issue</b> | <b>Source of Impact</b>                                                                                                                                                                                             | <b>Potential Impact</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Magnitude of Significant Potential Impact (Severe / Moderate / Low / Negligible)</b> | <b>Mitigating Measures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Abandonment  | <ul style="list-style-type: none"> <li>-Abandonment during buildings foundation works prior to the completion of piling activities.</li> <li>-Abandonment during the building proper construction stage.</li> </ul> | <ul style="list-style-type: none"> <li>- The site shall be left behind with un-aesthetic repercussions</li> <li>- Induce additional financial burden to the Government.</li> <li>- Leave behind half completed structures and unmanaged construction materials.</li> <li>-Create adverse socio-economic impacts to the general populace.</li> <li>- Create a suitable habitat for harboring pests and disease vectors; and a potential site for indulgence in anti-social behavior.</li> </ul> | Severe                                                                                  | <ul style="list-style-type: none"> <li>- A proper abandonment plan shall be prepared appropriately to ensure all measures are taken care off.</li> <li>- If the abandonment occurs during construction, all equipments shall be removed from the site and revegetation shall also be considered.</li> <li>- For any scheduled wastes and solid / liquid wastes available at the site, they must be disposed off in the correct manner at the specified approved areas.</li> </ul> |

## 6.0 ENVIRONMENTAL MONITORING PROGRAMME

6.1 During construction phase, monitoring for surface water quality, silt traps / sediment pond discharge, ambient air quality, noise level and vibration shall be done. Details of the monitoring are as follow.

**Table 3: Details of the Monitoring Programme**

| <b>Monitoring Programme</b>          | <b>Parameters</b>                                                                                                         | <b>Frequency of Monitoring</b>                                                                                                                           |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface water Quality                | Suspended solid, pH, BOD <sub>5</sub> , COD, DO, Ammoniacal Nitrogen as N, <i>E.Coli</i> , heavy metals and oil & grease. | Once per month.                                                                                                                                          |
| Silt traps / sediment pond discharge | Total suspended solid (TSS).                                                                                              | Once per month and after every storm event, whenever the recorded rainfall intensity exceeded 12.5mm/hour.                                               |
| Ambient air quality                  | Total Suspended Particulate (TSP).                                                                                        | Quarterly interval or earlier should it be required by the DOE.                                                                                          |
| Noise level                          | $L_{eq}$ , $L_{max}$ , $L_{min}$ and $L_n$ continuously for 24-hour duration.                                             | Quarterly interval or earlier should it be required by the DOE.<br>It is recommended to conduct the monitoring 4 times throughout the piling activities. |
| Vibration                            | Maximum peak                                                                                                              | Once a month throughout the construction period and 4 times throughout the piling works                                                                  |

- 6.2 During operation phase, the surface water quality is envisaged to have very minimal impact. Thus, no monitoring is proposed during the operational phase. As for the ambient air quality monitoring and noise level monitoring, it can be carried out should it be required by the DOE. Parameter for the air quality monitoring should be TSP while  $L_{eq}$ ,  $L_{max}$ ,  $L_{min}$  and  $L_n$  should be carried out continuously for 24-hour duration for noise level measurement should it is required by the DOE.

## **7.0 CONCLUSION**

- 7.1 The development of the site into a mixed commercial development consisting of a hotel, serviced apartments, commercial units and facilities and infrastructures is considered a suitable option for the project site. The completion of the Project will have a positive impact on the socio-economy of the area as well as the State, by utilising the available land with a compatible development in order to cater for the increase of tourists accommodation demand. The economic and social benefits accruing from its implementation are far greater than if the 'No-Project option' or other Project alternatives are chosen.
- 7.2 With careful planning and good construction and management practices, the Project will not bring about any significant adverse environmental impacts on the surroundings but rather its implementation will contribute to the development of the State in general.