ENVIRONMENTAL AND SCOCIAL MANAGEMENT PLAN

FOR THE UPGRADING OF
ISLAND WASTE MANAGEMENT CENTER
IN LH. KURENDHOO

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Prepared for: Ministry of Environment

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DECLARATION OF THE AUTHOR

I hereby declare that the information provided in this ESMP are true, complete and accurate to the best of my knowledge and is based on the information available at the time of writing.

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NON-TECHNICAL SUMMARY

The proposed project for the upgrading of the Island Waste Management Center (IWMC) in Lh. Kurendhoo is funded by the World Bank and executed through the Maldives Clean Environment Project (MCEP). The aim of the project is to safeguards the existing IWMC from the threat of erosion and prevent waste entering the lagoon and sea, severely impacting marine organism and ecology.

At present, a boundary of only 5 feet exists between the boundary wall of the IWMC and the shoreline due to severe erosion occurring at the south-east side of the island. The primary cause of this erosion is believed to be the coastal protection structure constructed west of the IWMC to safeguard the football ground not having been extended to cover the IWMC. As a result, the natural flow of sediments was altered, escalating erosion at the south-east corner of the island, where the IWMC is located.

To alleviate this issue, the project, intends to shift the south eastern boundary wall of the IWMC up to the existing collection bay area and expand the IWMC towards the north west to compensate for the space lost. By doing so, the area between the shoreline and the boundary wall will be increased to about 6 meters delaying the time taken for the erosion to reach the infrastructure. Additionally, the island council plans to place construction waste in this side of the island to further mitigate impacts of erosion. A toilet and a groundwater well will be developed as a part of the upgrading works.

The proposed area for extension contains only one coconut palm and 3 trees which do not belong to any individual and therefore, do not have to provide compensation. It is recommended to relocate these trees to the vegetation line which would offer additional protection against erosion. Football ground is located adjacent to the IWMC. To mitigate any potential impacts to the users of the ground, instead of a fence, a 3.5m high masonry wall will be constructed at the side of the IWMC facing the ground. It is important to note that the football ground project commenced after the original IWCM project was completed. The nearest residential house to the IWMC is located 30 m away, therefore, no major impacts to the residential population is envisaged to occur during the construction and operations of the IWMC.

No environmentally sensitive or protected site exist in the island. However, a place of historic significance (tomb of Habashee) is found in Kurendhoo, which is located at the opposite side of the island and hence no impacts are envisaged.

The project will provide basic infrastructure necessary to manage waste at island level and ensure composting is undertaken in the island. After completion of upgrading of IWMC and the stored waste in the existing IWMC removed, it will facilitate the island council to smoothly manage waste in Kurendhoo under current arrangements. The council already has recruited staffs to manage the IWMC and the same staffs are expected to be utilized for waste collection and operation. Training on composting for island level staffs and machinery such as, shredders, wood chippers and bottle crushers will be provided to facilitate adequate functioning of the IWMC. Waste that is not manageable at the island level needs to be stored and regularly transferred to Zone 2 RWMF. All civil works of the project are expected to be completed within 3 months.

Environmental impacts of the project were evaluated using the Rapid Impact Assessment Method (RIAM). Majority of the impacts envisaged for the project are highly positive. The project is expected to bring

numerous economic benefits to the island community, in additional to the perceivable environmental and public health related benefits. The only permanent negative impact likely to occur as a result of the project is related to the removal of vegetation. However, the amount of vegetation clearance involved is minimal and therefore, if the mitigation measures proposed in this management plan are adhered, almost all the negative impacts can be brought to an acceptable level.

The monitoring program proposed in the ESMP will ensure the implementation of the mitigation measures and assist in the identification of unforeseen impacts throughout the project.

Overall, the project is expected to provide significant socio-economic and environmental benefits for the local community.

ސާރާ ޚުލާސާ

ޅ. ކުރެންދޫ ކުނި މެނޭޖްކުރާ މަރުކަޒު އިމާރާތްކުރުން އަޕްގްރޭޑްކުރުމުގެ މަޝްރޫޢަކީ ޕްރޮޕޯޒް ބޭނުންވާ ހިތް އެހީގައި ކުރިއަށް ގެންދާ މަޝްރޫއު ކޯޕިން އެންވަޔަރަންމަންޓަލް ޕްރޮޓެކްޝަން (އީ.ޕީ.އޭ) ގެ ހަރަދުގައި ކުރިއަށް ގެންދާ މަޝްރޫޢެކެވެ. މި މަޝްރޫޢުގެ މައިގަނޑު މަޤްޞަދަކީ ރަށް ގިރުމުގެ ސަބަބުން ކުނި މެނޭޖްކުރާ މަރުކަޒަށް ލިބޭ ގެއްލުން ގެއްލުވާލުމާއި އިތުރު ހިމާޔަތްކުރުމެވެ.

ކުރެންދޫގެ އިރު ދެކުނު ފަރާތުން ވަރަށް ބޮޑަށް ރަށް ގިރުމުގެ ސަބަބުން މިހާރުގެ ގޮތުގައި ގާތްގަނޑަކަށް ވަނީ ކުނި މެނޭޖްކުރާ މަރުކަޒާ އަށް 5 މީޓަރަށް ކައިރިވެފައެވެ. ރަށް ގިރުމުގެ މައިގަނޑު ސަބަބަކީ ކަނޑުގައި ބޮޑުވަމުން ދާ ރާޅާއި ކަރަންޓު ކަމަށް ދެކެވޭ ކަމުގައި ރިޕޯޓުކުރެވިފައިވާ ފަރާތުގެ 220 މީޓަރުގެ ބީޗު ހިމެނޭ ރަށުގެ ކުނި މެނޭޖްކުރާ ސަރަހައްދު ހިމާޔަތްކުރުމަށް ފަސްގަނޑު ބެހެއްޓުމާއި ގިނަ ބާވަތުގެ ކަންތައް ކުރަން ބަލާފައެވެ.

މި މަޝްރޫޢުގެ ދަށުން ކުނި މެނޭޖްކުރާ މަރުކަޒުގެ ހުޅަނގު އުތުރު ފަރާތް ބެލެހެއްޓުމަށް ބޭނުންކުރާނެ، އިރު ދެކުނު ފަރާތުގެ ފަރު ކުނި ގެދޮރު ބެހެއްޓުމަށް ހަދާފައިވާ ހަމަ އަރާ ސަރަހައްދުގެ ބިމެއްގެ ބޮޑުމިން ގެނައުމަށް ގޮތްތަކެއް ހުށަހަޅާފައިވާ ކަމަށް ޖިއޮސިންތެޓިކް ފައިބަރު ގަނޑު އިރު ދެކުނު ފަރާތުގެ ކުނި ހަރުގަނޑު ބަލަހައްޓަނީ ދުރުމިން 5 މީޓަރުން 6 މީޓަރު (19.7 ފޫޓް) އަށް އިތުރުވެގެން ދާނެއެވެ. މިގޮތުން ކުނި މެނޭޖްކުރާ މަރުކަޒަށް ބަދަލުގެނައުމަށްފަހު ރިފަށް އަސަރު އިތުރަށް ކުރުމުގެ ސަރަހައްދުގެ ބީޗު ފަހަރުގެ ކުރި ދުވަހުން ކުނިކަހާ ތަކެތި ގެނެސް ފަސްގަނޑު އެޅުމަށް ދާނެ ގޮތެއް ކުނި މެނޭޖްކުރާ މަރުކަޒުގެ ރައްކާތެރިކަން ވަރަށް ބޮޑުވެގެން ދާނެއެވެ. މިމަޝްރޫޢުގެ ދަށުން ގާއިމުކުރާ ބީޗު ކަނޑާ ކުރިމަތިލާ ގޮތަށް ހަމަކުރެވޭނެއެވެ.

އިރު ދެކުނު ފަރާތުން ކުނި މެނޭޖްކުރާ ބީޗު ހަމަޖެއްސުމަށް ސަރަހައްދަށް ބާލާ ސަރަހައްދެއް މެދުތެރޭ ހުރި ރަށްތިރީގެ ނަގައިލި ސަރަހައްދަށް
ނިސްބަތްވާ 1 މީޓަރު ސަރަހައްދެއް ބެހެއްޓުމަށް 3 މަސް ހިއްސާ ކުރެވޭނެ ބަދަލެއް ހަމަޖެހިފައިވާ ނިޒާމެއް ބެހެއްޓުމަށް ދިމާވެއެވެ. މަޝްރޫޢުގެ
މަސައްކަތަށް ބޭނުންވާ ސަރަހައްދުގައި ފަސްގަނޑު ޖަމާކުރުމަށް ކަނޑާފަހަރު އެކުލަވާފައި ބަލަހައްޓާ ރަށެއް އިރު ދެކުނު ފަރާތުގެ ސަރަހައްދު
ބެލެހެއްޓުމަށް ހުރި ސަރަހައްދު ދިމާވާނެ ކަމަށް ނުދެވޭ ހުރިހާ ބަދަލެއް ގެނެސް ކުރުމަށް ޖަހާ ތަކެތި ބޭނުންކުރެވޭ ވާގި ރަނގަޅު ދެމެހެއްޓުމަށް
ބޭނުން ކުރެވޭ ފަރާތްތަކުގެ ޚިދުމަތް ލިބެން ހުރެއެވެ. މަޝްރޫޢުގެ ކަނޑު ސަމާލުކަމަށް ގެނައުން ކުނި މެނޭޖްކުރާ ސަރަހައްދަށް ބަދަލުވާ ފެހި
ގަސްތަކެއް ބަހައްޓާ ސަރަހައްދުގެ ކަނޑު ފަޅުގެ ބޮޑު ތަކެތި ހިފެހެއްޓޭނެ ސަރަހައްދާ ފަޅު ދިމާލަށް އިންސާނުން ވެސް ސަރަހައްދުގެ
އިންސާނުން 3.5 މީޓަރު އުފުލުމަށް ވަނީ ކަނޑައަޅާފައެވެ.

ކުރެންދޫގައި ދިރިއުޅޭ ފަރާތް ރައްކާތެރިވާ ސަރަހައްދު ނުވަތަ ދިރުއުޅޭ ބައިން ނާޖެހޭ ސަރަހައްދަށް ހަދައެވެ. ހަމަވުމަށް ތިރީގެ
ފަރާތް މިހާރު ސަރަހައްދު ކުރެންދޫގައި ބޭއްވެއެވެ. މިތަނަކީ ކުނީގެ ހުރިހާ ދިރުމާއި ސަރަހައްދުގައިވާ ޝަކުވާ ހަމަޖެހޭ މަގުސަދެވެ.
މިސަރަހައްދު ބޮޑުކުރި ކުރެންދޫގެ އަތިރި ފަރާތުގެއިލާނެގޮތަކަށް މަޝްރޫޢުގެ ސަބަބުން މިސަރަހައްދުން އެއްވެސް ނުރަވާ އަސަރެއް ފޯރާނެކަމަށް
ނުބެލެވެއެވެ.

މަޝްރޫޢުގެ ދަށުން ކުރެންދޫގައި ދެމެހެއްޓި ބެލެހެއްޓި ކުނި މެނޭޖްކުރުން ބޭނުންވާ އާބާދީތަކާއި ކަނޑައަޅާފައިވާ ބަޔަކު ކަނޑައަޅާފައިވާ ތަކެތިން
ފޯރުކުރެވިގެންދާނެއެވެ. މަޝްރޫޢުގެ ދަށުން ބަރުގަދަ ކުނި މެނޭޖްކުރާ ކުނި މެނޭޖްކުރާ އަދި މަސައްކަތު ނިމުމުން ކުނި މެނޭޖްކުރާ
ހުރުމަށް ފޯރުކުރެވޭނެ މަސައްކަތު ކުރެވިދާނެ ކުރެންދޫގައި ހުރި ސަރަހައްދު ހިމެނޭ ގިނަ ފަރާތަކަށް ކުނި މެނޭޖްކުރާ ބައި ފޯރުކުރާ އަދި ކުނި
މެނޭޖްކުރާ އުސޫލާއި އެއްގޮތަށް ރަށް ކުޅުވާ ފަރާތްތަކުން ބަލަހައްޓަނީއެވެ. އަދި ރަށުގެ ސަރަހައްދުގައި މެނޭޖްކުރާ ކުނި ގެއުޅުން ސަރަހައްދު ކަނޑާ
ގެންދިއުމަށް ހަމަޖެހިފައެވެ. މިމަޝްރޫޢުގެ އަދި މަސައްކަތު 3 މަސްދުވަސް ހޭދަވާނެ ހިސާބަކަށް ލަފާކުރެވިފައެވެ.

ލިބުމަށްފަހު ތިމާގެ ކުއްލި ހާލަތުގައި ބަދަލުތަކެއް ގެނައުމަށް ބޭނުންވާ ކަންކަމުގައި ކުރިން ލިބިފައިވާ ހުއްދަ ބާތިލްވާ ނަމަ ނުވަތަ ހުއްދަ ލިބުމަށް ހުށަހެޅުމުގައި ދޮގު ކަންކަން ކުރިއަށް ގެންދާ ނަމަ ނުވަތަ ހުއްދަ ލިބުމަށް ހުށަހެޅުމުގައި ދޮގު ކަންކަން ކުރިއަށް ގެންދާ ނަމ

CHAPTER 1 INTRODUCTION

1.1. Project Background and Justification

Kurendhoo is one of the inhabited islands of the Maldives located in Lhaviyani Atoll with geographic coordinates 05°20'02"N 73°27'50"E. Kurendhoo has a total land area of about 20 hectares and is a moderately inhabited island with slightly over 72.4 persons per hectare. The registered population of the island is 2060 people. However, actual number of people living in the island is believed to be half of the registered population. Kurendhoo is in a strategic location given that it is located in the middle of all inhabited islands of the atoll with easy access for inter- and intra-atoll travel. It is said that Kurendhoo cannot be missed by those who travel from Male' to the north of Maldives and vice-versa. The closest inhabited island is Maafilaafushi, which was chosen by the Government as a potential growth-focused island.

A 378 sqm IWMC was developed in the south-east side of Kurendhoo by the World Bank funded Maldives Environmental Management Project (MEMP) in the year 2014. However, due to extensive erosion from the south east side of the island, at present there exists a buffer of only 5 feet between the boundary wall east of the IWMC and the adjacent shoreline. Therefore, due to progression of erosion there is a high probability of the safety of IWMC to get compromised and an urgent need to protect the IWMC. Hence, Ministry of Environment (ME) through the World Bank Funded Maldives Clean Environment Project (MCEP) is proposing to shift the south eastern boundary wall of the IWMC up to the existing collection bay area and do minor upgrading works.

The IWMC will be expanded towards the north west to compensate for the space lost from the south side. The existing perimeter wall in the south will be left as it is to offer additional protection against coastal erosion, while the orientation of the sorting area will be changed from facing south to face north. The existing collection bay area and compost pad will be utilized. A small office with a toilet and a groundwater well will be developed as part of upgrading works. The size of the IWMC after upgrading will be maintained at 368.4 sqm.

Once the upgrading of IWMC is completed and the stored waste in the existing IWMC removed, it will facilitate the island council to smoothly manage waste in Kurendhoo under current arrangements. The council already has recruited staffs to manage the IWMC and the same staffs are expected to be utilized for waste collection and operation. Collection services are at present provided daily through a 350 kg pickup.

This project will provide the basic infrastructure for management of waste at the island level and ensure composting is undertaken at the island. Appropriate training will be provided to island level staffs for this purpose. Based on fund availability, machinery such as, shredders, wood chippers and bottle crushers will be provided for the adequate functioning of the IWMC. The waste that is not manageable at the island level will be stored and transferred to a central regional facility at least twice a month.

Previous research suggests that 70% of the waste generated in the Maldives are organic in nature, of which majority is food waste (Peterson, 2013). Thus, composting alone will significantly reduce the amount of waste that requires disposing. Moreover, economic benefits could be attained through selling of compost. This model of managing waste as much as possible at the island level prior to transfer of waste to the regional facility is the model promoted via the waste management policy of the Maldives (Ministry of Environment and Energy [MEE], 2015).

Waste that cannot be management at island level has to be regularly transferred to Zone 2 Regional Waste Management Facility (RWMF) located in Raa Atoll Vandhoo. The Council has made an agreement with the operator of the Vandhoo RWMF, Waste Management Corporation (WAMCO), for regional collection, at the beginning of this year. However, WAMCO has not yet commenced island collection due to issues with the regional incineration plant, which is a major concern for the effective management of waste at island level.

1.2. Environmental Management Plan and Environmental Permits

The Maldives national requirements for Environmental Impact Assessment are set out in the Environmental Impact Assessment (EIA) Regulations, 2012. Part III of this regulation includes a description of the Screening Process applied to development proposals. Schedule D of the Regulations provides a screening list of all development types for which full EIA is mandatory. According to Schedule D included in Amendment 2 to the EIA regulations 2012, waste management practices that require preparation of an EIA are:

1. Projects involving operation of large incinerators with a capacity of more than 10 tons per day.

2. Development of large waste management centers that treats more than 10 tons of waste per day.

3. Projects that involve development of a landfill by using waste.

Proposed developments that do not fall within Schedule D are subject to manual screening by the Environmental Protection Agency (EPA), for which a Screening Form must be submitted providing relevant development details. Within 10 days, the EPA will decide whether the proposed development is approved, or needs further study, which may be required in the form of an EIA or Environmental Management Plan (EMP) (Ministry of Environment and Energy [MEE], 2012).

The proposed development is small scale and therefore is not listed under the Schedule D of the EIA Regulation. A screening process was followed and the screening decision from EPA was to proceed with civil works without an Environmental Assessment since the proposed project is not envisaged to have any negative environmental impacts. The screening decision from EPA is provided in Appendix A of this report.

It is mentioned in the Environmental and Social Assessment and Management Framework (ESAMF) of MCEP that prior to the approval of disbursement of funds for project sub-components, International Development Association (IDA) will have to clear all safeguards documentation. Therefore, even if an Environmental Assessment is not required at national level, for upgrading project, the original ESMP has to be updated to reflect additional works and re-submitted to the World Bank for approval prior to commencement of civil works. This document is prepared consistent to the ESAMF.

An ESMP was prepared by MEMP for the original IWMC project, which was approved by the world bank. Relevant information from the original ESMP was used to prepare this document. The previously prepared ESMP is provided in Appendix B.

A separate land selection process was not followed for this process since the project is undertaken in an existing IWMC site. The project site maintains a distance of 30 m from the nearest residential house.

1.3. Desk Study Review

A literature review was conducted to acquire background information related to the site and the general environment of the island, as well as to identify possible environmental impacts of projects of similar settings. In this context, the following documents were reviewed

- EIA for Dredging of a Swimming Area at Lh. Kurendhoo (Jameel, 2017).
- EIA for the proposed shore protection project in Lh. Kurendhoo (Zahid & Hussain, 2015)
- ESMP for the establishment of Island Waste Management Center in M. Mulah (Saleem, 2018)
- ESMP for the establishment of Island Waste Management Center in Th. Madifushi (Saleem, 2018)
- EMP for the proposed development of Island Waste Management Center in Dh. Rinbudhoo (Zuhair, 2018)
- EMP for the proposed development of Island Waste Management Center in F. Magoodhoo (Zuhair, 2018)
- EMP for upgrading Island Waste Management Center Fuvahmulah (Zuhair, 2016)
- EMP for upgrading Island Waste Management Center Hulhudhoo-Meedhoo (Zuhair, 2016)
- EMP for the establishment of Island Waste Management Center in HA. Muraidhoo, HA. Thakandhoo, HA. Molhadhoo, HDh. Finey, HDh. Hirimaradhoo, HDh. Kurinbi and HDh. Vaikaradhoo (Maldives Energy and Environmental Company [MEECO], 2017)
- Maldives Clean Environment Project Environmental and Social Assessment and Management Framework (ESAMF) & Resettlement Policy Framework (RPF) (Ministry of Environment and Energy [MEE], 2016)

1.4. Report Preparation

This report is prepared by Mr. Ahmed Hassaan Zuhair, the Environmental and Social Safeguards Specialist of MCEP. According to the second and third amendments to EIA regulations 2012, ESMP reports can be prepared by anyone with a minimum educational qualification of first degree in a field related to environment and do not necessarily have to be an EIA consultant registered in EPA. The educational certificates and curriculum vitae of the author is provided in Appendix C.

CHAPTER 2 PROJECT DESCRIPTION

2.1. Location and Study Area

The project takes place in Kurendhoo, one of the inhabited islands of the Maldives located in Lhaviyani Atoll with geographic coordinates 05°20'02"N 73°27'50"E.

The project involves upgrading of the existing 378 sqm IWMC located in the south east side of the island. This involves shifting the south eastern perimeter wall of the IWMC up to the existing collection bay area and expanding the IWMC towards the north west to compensate for the space lost from the south side. The existing perimeter wall in the south will be left as it is to offer additional protection against coastal erosion, while the orientation of the sorting area will be changed from facing south to face north. The size of the IWMC after upgrading will be maintained at 368.4 sqm.

An A-3 size map showing the study area is presented in Appendix D of the report. A scaled down version of this map is provided in figure 1.

Figure 1 Location of the proposed IWMC

2.2. Project Components

The proposed construction of IWMC will improve the overall waste management system of the island. The overall targets of island waste management projects include the following:

- Alleviate the waste management issues faced by the island community.
- Facilitate island council to establish rules and regulations for waste management through the development of the required infrastructure.
- Assist island council to establish a sound waste collection system through fee collection, which in turn can contribute to a part of the entire waste management cost.
- Reduce the waste produced and to use reusable materials.
- Aggregate all waste that is produced and dispose of it properly.
- Raise awareness of the community regarding the economic benefits of keeping the island clean.

Construction phase of the proposed development includes the following:

1. Site Preparation

    a) Site Clearance:

    The proposed area for extension contains one coconut palm and 3 trees which needs to be removed. During site preparation vegetation not belonging to individuals will be considered for relocation. Emphasis will be given to strengthen the exiting vegetation line of the island during relocation, which will enhance the island's natural defense against coastal erosion. Clearing would also include grubbing of weeds, shrubs and roots. The site needs to be levelled to bring it to the formation level. As the size of the site is relatively small, a vibratory plate compactor maybe required for levelling works.

    b) Clean-up of existing waste:

    The IWMC is currently filled with large quantities of accumulated inorganic waste. Therefore, prior to the commencement of construction, such waste needs to be removed from the site. Appendix 6 of the ESAMF gives options for closure of small open dump sites, which is reflected in Appendix E of the ESMP. However, the in-place closure method is not practicable in the context of Maldives, due to land scarcity, depth of water lens and potential for marine pollution. Hence, the only feasible option for cleanup is evacuation method, which involves removing the existing waste piles and transferring to a regional facility for treatment and final disposal.

    The Island Council is recommended to finalize a date with WAMCO for the clean-up and provide a written copy of this communication to ME, which in turn should be provided to interested parties by ME during the tender stage of the project. If WAMCO and the Island Council are unable to complete clean-up prior to the commencement of construction, the accumulated waste shall be temporarily transferred to the area within the existing IWMC that will no longer be a part of the IWMC when upgraded. However, it is still important that a date for clean-up is pre-agreed to take place by the time the upgrading works of the IWMC are completed, since the main purpose

of upgrading the facility is to account for erosion and potential entry of waste in the sea and associated impacts.

2. Demolition of existing Masonry Wall and Fence

   The existing 3.5m high masonry wall of the sorting area and 2.8m high fence of the compost pad will be demolished. The length of the masonry wall subjected for demolition is 1m, while a 1m by 8m area from the existing fence that covers the compost pad will be removed. Additionally, 4.5m from the western side fence will be removed.

   Although the existing perimeter wall and fencing established to the south falls outside the boundary considered for upgrading, it will not be demolished, as it would act as a form of defense against costal erosion.

3. Construction of Masonry Wall

   A 3.5m high masonry wall will be constructed at the south, southwest and southeast side of the IWMC. This wall will enclose the open end of the existing sorting area and will cover the compost pad and the area proposed for office, toilet and groundwater well. The wall is held together by 150 mm thick concrete columns which will be casted in 150mm thick foundation beams. The strip foundation below the masonry wall has a depth of 0.6m. The trenches required to receive the strip foundation and footings will be excavated manually.

4. Construction of Premier Fence

   The northern area of the IWMC will be fenced except the gate area. The fencing includes a 150mm thick masonry wall of 0.6m height from ground level, followed by the PVC coated mesh fence of elevation 2.8m from ground level. The mesh is held together by 50mm diameter GI pipes vertically at equal centers which are welded to three evenly spaced 50mm GI pipes horizontally. The strip foundation below the masonry wall has a depth of 0.6 m and a thickness of 150 mm. The trenches required to receive the strip foundation and footings will be excavated manually.

5. Construction of Office and Toilet

   A 15.7 sqm office and a 2.6 sqm toilet will be constructed at the south east side of the IWMC adjoining the storage area. The structure consists of a 3.5m high wall for the office and toilet. The 150 mm masonry wall and roof beams are supported by reinforced concrete columns 150 x 150 mm size. The roofing is made of LYSAGHT roofing sheets. The roof truss is made of 50 mm GI pipe horizontal members and 25 mm GI pipe vertical members.

6. Construction of Septic Tank

   A septic tank will be constructed to manage the sewage generated from the toilet during the operational phase. The tank will be constructed to ensure water tightness. Waterproof paint will be used on the masonry wall.

The septic tank consists of a primary tank of 1.3 m by 1.3 m made of 150 mm brick wall, covered with 75 mm thick concrete with 6 mm reinforcing steel placed at 150 mm center to center. The primary tank is 2 m deep. The primary tank is connected by a 100 mm diameter PVC pipe to a secondary tank of the same dimensions filled with 1m of coral stone and white sand filling. The bottom 1m of this secondary tank is perforated with 25mm equally distributed holes to allow for discharge of treated effluent.

7. Groundwater Well

   The existing groundwater well in the IWMC will fall outside the boundary after the proposed upgrading works. Therefore, a groundwater well 1m in diameter will be constructed at the southeast corner of the IWMC. The well will be enclosed by a lid. Manual excavation is sufficient for the purpose due to the small scale of the scope of works involved. Water required for composting during operational phase will be drawn through this well.

   The existing well is constructed inside a hut and hence it is not necessary to permanently close the well as it can be utilized for other purposes. However, if the well is to be left unused for long periods, it is advisable to permanently close the well as it may become a potential site for mosquito breeding.

8. Collection Bay Area and Compost Slab

   The existing storage area, equipment room, compost pad and leachate collection drain will be used. Leachate produced during operational phase will be collected in the leachate collection drain and regularly removed for disposal.

   The storage area has different compartments for storing segregated waste including metals, glass, plastics, paper and hazardous waste. The size of the existing compost pad is 91.3 sqm, which is 0.1m thick and laid at 1% slope.

Operational phase of the proposed development includes the following:

1. Waste Collection Services

   After construction works are completed the IWMC will be officially handed over to the Island Council of Lh. Kurendhoo. The Island Council will resume waste management services in the island according to the current arrangement. Daily collection services are provided by the council at the rate of MVR 150 for households and businesses, MVR 300 for institutions, and MVR 500 for health center. Collection service is provided from 7:30 am to 3:00 pm in all week days except Friday. On Friday's collection service is provided from 7:30 am to 10:30 am. Waste can also be carried to the IWMC individually by providing a gate fee.

   The vessel used for collection contains 3 bins for placing 3 categories of waste, namely kitchen waste, glass and metals, and nappies. Prior to collection waste, is segregated at household level

in to the aforementioned 3 categories. Household segregation is carried out by the households at their own bins.

2. Sorting

   Collected waste will be kept in the waste storing area and sorted into compostable waste and other waste. After sorting the non-compostable inorganic waste will be compacted / crushed / shredded and stored in the designated areas for metal, paper and cardboard, plastic, glass and hazardous waste.

3. Composting

   Compostable waste will be transferred to the composting slab after removing branches and twigs. The removed braches and twigs will be fed into a wood chipper. Mixing will be done to provide optimum Carbon-Nitrogen ratio. After mixing windrow composting will be practiced at the compost slab.

   Windrow composting involves, stacking raw materials, roughly equal quantities of “green” and “brown” material into a compost pile and turning the pile regularly, ideally every seven days at a minimal level. The process is labor intensive. The three essential conditions for composting is right temperature, moisture content and oxygen. Food waste and garden waste can be used for composting.

4. Leachate Management

   Leachate produced during composting will be collected in leachate collection drain.

5. Waste Transport to a Regional Facility

   Based on the population and the estimated quantity of waste generated at the island, stored inorganic waste that cannot be managed at island level needs to be regularly transferred to Vandhoo RWMF once every month or two months. The Island Council has signed an agreement with WAMCO for regional collection in April 2018. Under this agreement regional collection will be provided by WAMCO once a month. However, according to Council WAMCO has not commenced regional collection to date and the Council is yet to receive a copy of the signed agreement.

For further details, refer to the detailed engineering drawing provided in Appendix F and draft Bill of Quantities (BOQ) provided in Appendix G.

2.3. Construction Schedule

The construction activities of the project are expected to commence in January 2019. All civil works of the project is anticipated to be completed within 3 calendar months. A rough schedule for construction is provided in the table 1.

Table 1 Construction Schedule

Activity	Month 1	Month 2	Month 3
Mobilization			
Site Clearance			
Civil Works			
Demobilization			

2.4. Project Inputs and Outputs

Major project inputs for the construction and operational phase of the proposed development are highlighted in table 2.

Table 2 Major Project Inputs

	Input Resource	Type and Amount	Means of obtaining the resource
CONSTRUCTION PHASE	Workers	10	Around 10 workers. Contractor is encouraged to use local or regional workers as much as possible. If expatriate workers are used, they must carry valid work permits. Construction workers are expected to be accommodated in local houses and / or guesthouses. No temporary site setup is required for this project. Contract will make arrangements with the local council regarding accommodation arrangements.
	Water for Construction	150 liters per day	Groundwater wells present in the island.
	Construction Materials	Concrete, cement, flood lights, G.I. pipes, metal sliding doors, emulsion paint, Lysaght Roofing Sheet, 3 phase power sockets, ceiling fan and Timber	Imported or purchased where available locally. Contractor will make arrangements to import or purchase these materials and transport to the island.
	Construction Machinery	Pickups or trucks (for land transport of construction material), transfer vessel.	Responsibility of the contractor. Local resources will be utilized as much as possible. If not available locally the contractor will import these machineries.
	Fuel	Diesel	Local suppliers

OPERATIONAL PHASE	Equipment	Glass crusher, Metal Can Baler, Plastic Shredder, Wood Chipper, Compost Sieve, Waste Collection Vessel	Responsibility of the proponent. Purchased locally or imported.
	Water for composting	Groundwater	Groundwater well within the IWMC
	Power	3-phase power for operation of waste management equipment.	From the existing 25 sqmm 4 core power supply cable laid from the nearest distribution box to the waste yard distribution board.
	Labor	About 5 workers to manage waste in the IWMC and provide collection services to the community.	Responsibility of the local council. From the local community or expatriate workers. Island council will make accommodation arrangements within local houses and guesthouses if expatriate workers are recruited.
	Fuel	Diesel	Local suppliers.
	Waste	Waste generated within the island. Approximately 1,648 kilograms per day.	Waste will be collected from households and businesses within the island.

Major project outputs for construction and operational phase of the project are described in table 3.

Table 3 Major Project Outputs

	Output Resource	Type and Amount	Means of managing
CONSTRUCTION PHASE	Green Waste	Small quantity	Piled and left in the periphery for natural degeneration. Larger tree trunks and branches, etc. shall be chipped. Or removed to the disposal site designated by the council.
	General Construction Waste	Moderate amount of Solid Waste	General construction waste will be reused as much as possible. Placing construction waste in the eroding area is recommended to temporarily protect the adjacent shoreline. Any remaining waste will be transferred to the nearest regional facility by the contractor.
	Municipal Waste	Small quantity	Removed to the disposal site designated by the council.
	Soil	Excavation for substructure	To be used as backfilling during construction.

	Dust	Moderate amount during cement mixing and excavation	Wet the construction site regularly.
	Waste oil and diesel	Small quantity	Barreled and transfer to the nearest regional waste management facility for disposal.
	Greenhouse Gas Emissions	Small quantity. Emissions from construction material transporting vehicles and construction machinery.	All vehicles and machinery must be well tuned.
OPERATIONAL PHASE	Compost	Open windrow composting.	Used locally for agricultural purposes or sold to nearby resorts.
	Inorganic Waste	Crushed glass, compacted metal, shredded plastic.	Stored in their respective area within the IWMC and transferred to Vandhoo regional facility once or twice a month.
	Greenhouse Gas Emissions	Electricity usage. Minute quantity.	N/A

CHAPTER 3 EXISTING ENVIRONMENT

The existing environment is described based on field observations. No detailed data collection and survey, analysis techniques are used for this purpose as this is an ESMP, not a full ESIA report.

Information regarding existing environment of the project site and existing waste management practices within the island were obtained through field observations and a meeting held with the Island Council. Field observation and meeting were held on 8 March 2018. The list of participants in the meeting and their designation are provided in Appendix H.

3.1. Current Waste Management Practices

The daily generation of waste in Lh Kurendhoo is estimated to be 1,648 kilograms (kg). In addition to kitchen waste, major types of waste produced at the island are nappies, plastics and metal waste. Green waste from abandoned homes (falhu goathi) is also a major contributor to the island waste stream. 70% of the waste produced in the island are biodegradable in nature. Therefore, majority of the waste generated at the island can be effectively managed at the source island itself subjected that a fully functional and operational waste management system is established in the island.

Although the IWMC constructed under MEMP has a compost pad, due to limited availability of space within the IWMC the council is currently not able to practice compost production. The council has designated an area in the southwest side of the island for managing general household waste. This area is located 130m west of the IWMC and 7m west of the football ground. Kitchen waste collected at this area is dumped in to the adjacent lagoon after removing plastic bags, while nappies and green waste are burnt. Some residential houses are located very close to the general waste management area, the nearest house being located just 10m away. However, as this site is located at the southwest side, the wind direction at this area is outwards, therefore, the general public is not expected to be significantly affected by the fumes generated from burning. Nevertheless, the issue of smell and potential impact of fumes due to seasonal change of wind direction exist. The council had also received several complaints from nearby residents expressing concern towards current unsound waste management practice and perceived impact on their health and general wellbeing.

Other inorganic waste generated at Kurendhoo such as metals and plastics are collected and stored in the existing IWMC. Inorganic waste is stored in the different compartments of the collection bay area without any compaction due to lack of waste management equipment. Table 4 gives details of the equipment provided through MEMP.

Table 4 Waste management equipment provided through MEMP

Equipment	Quantity
120L Bins	16
240L Bins	14
660L Bins	7
Plastic Shredder	0
Wood Chipper	0
Can Crusher	1
Glass Crusher	0

According to the council the can crusher has electrical issues and is not functioning properly. The 120L bins are kept in the collection vehicle and used for daily waste collection. The 240L and 660L bins are kept at collection bay area of the IWMC. General construction waste is placed in the eroding areas of the islands after removing metals.

The council uses a 350 kg pickup for waste collection. Bins allocated for collection of 3 categories of waste namely, general waste, metals and plastics, and nappies are placed in the pickup. Prior to collection, waste is segregated at household level into the aforementioned 3 categories. Household segregation is carried out by the households using their own bins.

Daily collection services are provided by the council at the rate of MVR 150 for households and businesses, MVR 300 for institutions, and MVR 500 for health center. Collection services are provided from 7:30 am to 3:00 pm in all week days except Friday. Collection time on Friday's are from 7:30 am to 10:30 am. Households also have the option to carry waste to the IWMC themselves by providing a gate fee. Four expatriate staffs and a local supervisor are employed by the council to undertake waste management activities.

The Council has signed an agreement with WAMCO for regional collection. However, according to the Council, they have not yet received the signed copy of the agreement from WAMCO and WAMCO has not yet commenced collecting waste from the island. Therefore, at present, the IWMC is filled with accumulated waste.

Figure 2 Existing IWMC

Figure 3 Panoramic view of the existing IWMC

3.2. Island Waste Management Regulation

The island waste management regulation of Lh Kurendhoo is formulated under clause 3 of the Environmental Protection and Preservation Act of the Maldives and published in government gazette.

The regulation sets general rules for waste management in Kurendhoo. A summary of the main components of this regulation is provided below. The full regulation is provided in Appendix I.

a) **Household Segregation:** The regulation states that waste shall be segregated at household level into the following categories.
   1. Kitchen Waste
   2. Plastic bags and other plastic waste
   3. Green waste
   4. Nappy
   5. Glass bottles and other glass waste
   6. Small construction waste

b) **Waste Management Areas:** The council has 2 areas designated for waste management, namely, the southwest side for managing general household waste and the island waste management center for managing plastic, glass and metal waste.

c) **Waste Collection Service:** Unless stated otherwise, waste collection services will be provided by the council. The council is responsible for collecting and transferring waste from households, businesses and institutions to the designated waste management areas. Permission from the council must be sort for disposal of construction and demolition (C&D) waste. The council will provide details of C&D disposal location when issuing permission. Collection services are not provided for C&D waste, which has to be carried to the disposal area by the producers themselves.

d) **Open Burning**: Burning of waste by households at their backyards are not permissible from the date at which the regulation becomes effective. Individuals are also not permitted to burn waste at the general waste management area.

e) Collection Fees:

Following are the details of monthly fees taken for waste collection services provided by the council.

#	Details	Rates (MVR)
1	Households	150
2	Abandoned homes	75
3	Businesses / Shops	150
4	Restaurants	150
5	Workshops	150
6	Carpentries	150
7	Communication Service Providers	500
8	NGO's	150
9	Offices	300
10	Health Center	500

Waste collection services are also provided for bulky waste at the following rates on special request

#	Details	Per trip rate (MVR)
1	For registered households, businesses etc.	70
2	For unregistered households, businesses etc.	100

Gate fees charged by the IWMC for waste carried by individuals

#	Details	Per trip rate (MVR)
1	Wheelbarrow, handcarts etc.	10
2	Island Pickup	15
3	Other pickups	20

Fees must be paid to the council by the service recipients every month. If fees are not paid, collection service will be temporality ceased, until the service recipient pays the fee and overdue charges.

f) **Regional Collection:** Waste not managed at island level will be taken to Vandhoo RWMF once a month by WAMCO. A percentage of the collection fee will go to regional collection and will be paid to WAMCO by the council every month. This equates to MVR 30.00 from the individual collection fee and 30% of the fee from the rest of the sectors.

3.3. Unassigned Waste Dumping

The roads of the island generally appeared clean. Unassigned waste dumping was not observed during the site visit.

3.4. Project Site and Access Road

There is direct access to the project site through *nikagas magu* towards north of IWMC, which is considered as a major road of the island. The main gate of the IWMC will face *nikigas magu.*

3.5. Coastal Erosion

Geographically Kurendhoo is formed with very narrow reef/lagoon area thus without any protected lagoon. Because of this island beach has experienced server erosion over the years. To tackle the erosion problem, protection is done on north and south shoreline of the island.

The main coastal feature on the island is the harbor which is located on north western side of the island. The island also has a 220m long rock bolder revetment at the south side of the island, which was constructed to safeguard the football ground and to offer protection against erosion. However, as shown in figure 4 the revetment does not cover the IWMC which is located just few meters away from the eastern corner of the revetment. This is believed to be the primary reason for the costal erosion observed at this side of the island. The eroding area at the south side extends to about 100m from the eastern corner of the revetment.

Figure 4 Aerial image of the south-west corner of Kurendhoo

At present, a buffer of only 5 ft exists between the outer boundary wall of the IWMC and the shoreline. This buffer would be increased to 6 m after IWMC upgrading works are completed. The council also plans to place C&D waste at the shoreline adjacent to the IWMC as a temporary costal protection measure and to safeguard the IWMC against future erosion.

Figure 5 Erosion near IWMC

Figure 6 End point of revetment

3.6. Vegetation

The proposed area for extension contains one coconut palm and 3 trees. Table 5 indicates the number and type of vegetation present at the site.

Table 5 Quantity and Type of Vegetation

Name	Local Name	Scientific Name	Quantity
Indian Almond	Midhili	*Terminalia catappa*	2
Sea Hibiscus	Dhiggaa	*Hibiscus tiliaceus L.*	1
Coconut Palm	Dhiveh ruh	*Cocos nucifera L.*	1

Figure 7 Banyan Tree located close to the IWMC

As shown in figure 7 a banyan tree is located close to the IWMC, but is outside the boundary of the project site and is also separated by a road. Therefore, there will be no impacts to the banyan tree from the proposed development.

3.7. Environmental Sensitive Areas

Protected and/or environmental sensitive sites does not exist in the island of Kurendhoo. A historically significant place, namely the tomb of Sheikh Najeeb, is present in Kurendhoo. However, this place is located at the north side of the island within the boundaries of the old Friday mosque and is about 400 m away from the project site. Therefore, no negative impacts are envisaged to occur to the tomb due to the proposed development.

3.8. Socio-Economic Environment

According to the Island Council, the present registered population of Kurendhoo is 2060. The latest available census data however indicates that the population of the island was 1,259 in 2014 including 82 foreigners. Census 2014 also indicates that there has been an overall reduction in the population of most of the Atolls in Maldives including Lhaviyani Atoll with a rapid increase in inward migration in the Greater Male' Region or Male' City. The resident population of Lhaviyani Atoll has reduced from 8,266 to 7,905 between 2006 and 2014 (National Bureau of Statistics, 2014).

Table 6 Resident Population of Kurendhoo (National Bureau of Statistics, 2014)

Total			Maldivians			Foreigners		
Both Sexes	**Male**	**Female**	**Both Sexes**	**Male**	**Female**	**Both Sexes**	**Male**	**Female**
1,259	636	623	1,177	563	614	82	73	9

Kurendhoo has two schools and provides education up to the higher secondary level following which students can enrol to GCE Advanced level. There is one Health Centre located just opposite to the harbour, close to the boat beaching area. At present, there are four NGOs operating in the island.

The island has narrow roads with a few wide roads and only has few vehicles. The island has good mobile phone coverage with over 90% of people with access to mobile phone.

Historically, Kurendhoo has been an agricultural island. The island is well known for its curry leaves, which is grown in almost every household. The soil is considered to be quite fertile due to the presence of underlying bedrock layer which helps to moisturize the sand facilitating composting. The island used to have a comparatively large area of marsh or wetland with large mangrove trees, mainly marsh apples. The area was later filled and none of the mangroves exist today.

Fishing and tourism are the dominant economic activity at present with many young adults being employed in nearby resorts and safari vessels. Furthermore, some of the well-known businessmen in the island owns safaris themselves.

A historically significant place exists in the island of Kurendhoo. The island is famous among Maldivians for the tomb of Sheikh Najeeb al Habashee. According to historical literature, the Sheikh arrived Male' in an African merchant ship and decided to stay. He used to make his late night and early morning prayers on a spot at the east end of Male'. The Sheikh used to recite the Quran beautifully and is said to have taught the Quran to several people. During the reign of Sultan Sayyidh Ahmed Shareeful Makkee (1510-1513), Sheikh Najeeb was among the royal clerics who recited Quran and other prayers in the inner chamber of the royal palace. The wife of the sultan fell in love with the holy man's voice but the sheikh was annoyed by her attention and left Male' to arrive at Kurendhoo. Since there was no one on the island he knew, he left his dhoni (small sailing vessel), washed at a well nearby and began to pray in a clear spot in the bush. A toddy man in a coconut tree noticed this and made acquittance with the sheikh, offered toddy and invited him to come to his house. But the sheikh passed away that night and was found at the very spot he had been praying. This news was brought to the attention of the island chief and they decided to bury him at the spot he died. Kurendhoo Tomb Well was discovered when digging his grave and its water was used to wash the sheikh's body. The discovery was considered a divine revelation, and until recently the well was treated as sacred. The bottom half of the well was fashioned from a single rock, and the top section from coral stones. During the tomb's construction, a small house was built over the well to protect it from the weather. It became known as the 'sheltered well'. The place of the tomb is now

called Kurendhoo Loa Ziyaarai, located adjacent to the old Friday mosque. (Luthfee as cited in Dhivehi Bavana, n.d.).

Figure 8 Kurendhoo Loa Ziyaarai (left) and ancient Friday mosque (right)

CHAPTER 4 IMPACT IDENTIFICATION

This chapter describes the key adverse and beneficial impacts envisaged for both construction and operational phase of the project and the methodology used for impact prediction.

4.1. Impact Assessment Methodology

Potential impacts of the project were determined based on the author's experience in the field of study, evaluation of previous impact assessment reports of similar projects, filed observations and information provided by the Island Council. Rapid Impact Assessment Method (RIAM) is used for impact prediction.

RIAM is a contemporary analytical tool used in many EIAs for impact prediction since 1995. This method attempts to troubleshoot many of the shortcomings of the traditionally used impact identification techniques particularly the issue of subjectivity and transparency. The concepts of RIAM were first developed by Pastakia (1998) which were then tested in the field by Jensen (1998).

The RIAM method defines important assessment criteria and provides an accurate and independent score for each condition. The impacts of the project activities are evaluated against environmental components and a score is derived for each component reflective of the degree of impact envisaged from t0 he component.

The two important assessment criteria used in the system are

(A) Criteria that are important to the condition and can individually alter the score obtained, and

(B) Criteria that are of value to the situation, but cannot individually alter the obtained score.

Criteria A is subdivided in to two components and criteria B in to three components. Table 7 describes these subcomponents and the scale used to assign scores (Pastakia and Jens, 1998).

Table 7 RIAM Assessment Criteria

Criteria	Scale	Description
A1: Importance of condition	4	Important to national / international interests
	3	Important to regional / national interest
	2	Important to areas immediately outside the local condition
	1	Important only to the local condition
	0	No importance

A2: Magnitude of change/effect	+3	Major positive benefit
	+2	Significant improvement in status quo
	+1	Improvement in status quo
	0	No change / status quo
	-1	Negative change to status quo
	-2	Significant negative dis-benefit or change
	-3	Major dis-benefit or change
B1: Permanence	1	Temporary
	2	Permanent
	3	No change / not applicable
B2: Reversibility	1	No change
	2	Reversible
	3	Irreversible
B3: Cumulative	1	No change / not applicable
	2	Non-cumulative / single
	3	Cumulative / synergistic

Criteria group A scores are multiplied so that it holds more weightage. In contrast, criteria group B scores are added together to provide a single sum to ensure that individual value scores do not influence the overall score.

The sum of the group (B) scores are then multiplied by the result of the group (A) scores to provide a final assessment score (ES) for the condition. This is represented by the formula below:

(A1) X (A2) = (AT)

(B1) + (B2) + (B3) = (BT)

ES = (BT) x (AT)

The environmental components that are evaluated under RIAM technique will fall under any one of the following four categories.

• Physical/Chemical (PC)

Covering all physical and chemical aspects of the environment.

• Biological/Ecological (BE)

Covering all biological aspects of the environment.

• Sociological/Cultural (SC)

Covering all human aspects of the environment, including cultural aspects.

• Economic/Operational (EO)

Qualitatively to identify the economic consequences of environmental change, both temporary and permanent.

The following environmental components were investigated for both the construction and operational phase of the proposed IWMC development project (Pastakia and Jens, 1998).

1. Physical / Chemical (PC)
   Groundwater
   Air
   Soil
   Noise
   Waste

2. Biological / Ecological (BE)
   Vegetation
   Fauna
   Wetlands and marine habitats

3. Social / Cultural
   Road Closure
   Health and Safety

4. Economic / Operational (EO)
   Economic benefit or burden

Final assessment of each component is evaluated based on the ES values and range brands provided in table 8.

Table 8 Environmental Scores and Range Bands

Environmental Scores	Range Value	Range Value (Numeric)	Description
108 to 72	E	5	**Major positive**
71 to 36	D	4	**Significant positive**
35 to 19	C	3	**Moderate positive**
10 to 18	B	2	**Positive**
1 to 9	A	1	**Slight Positive**
0	N	0	**No change**
-1 to -9	-A	-1	**Slight negative**
-10 to -18	-B	-2	**Negative**
-19 to -35	-C	-3	**Moderate negative**
-36 to -71	-D	-4	**Significant negative**
-72 to -108	**-E**	**-5**	**Major negative**

4.2. Potential Impacts of the Project

Potential adverse and beneficial impacts of construction and operation phase of the proposed IWMC were identified using the rapid impact assessment method specified in the forgoing section.

4.2.1. Construction Phase Impacts

Summary of the scores and range values obtained for each evaluated environmental component evaluated for the construction phase are provided in table 9.

Table 9 Construction Phase Impacts

Environmental Category	Total Score	Range Value	Range Value (Numeric)	Description
Construction Phase				
1. Physical / Chemical				
Ground Water	-5	-A	-1	Slight negative
Soil	-3	-A	-1	Slight negative
Noise	-5	-A	-1	Slight negative
Air	-5	-A	-1	Slight negative

Waste	-5	-A	-1	Slight negative
2. Biological / Ecological				
Vegetation	-8	-B	-2	Slight negative
Fauna	-7	-A	-1	Slight negative
3. Sociological / Cultural				
Road Closure	-6	-A	-1	Slight negative
Health and Safety	-5	-A	-1	Slight negative
Sociocultural Conflict	-4	-A	-1	Slight negative
4. Economic				
Loss or benefit	+8	A	1	Slight Positive

No permanent negative impacts are envisaged for the construction phase of the project except for clearance of vegetation. However, this will also not cause a major negative impact to the environment since only 4 trees are considered for removal. Moreover, the medium sized coconut palm located is a public property and does not belong to any particular individual. Hence the removal of this palm is not perceived to lead to any specific loss of economic benefits.

All other impacts during construction phase are temporary and reversible. Additionally, a slight positive impact to the local economy is envisaged from the construction phase as the contractor may obtain certain materials required for construction locally depending on availability. Similarly, the contractor may hire local employees for construction works creating job opportunities within the island. Even if expatriate workers are hired, demand for resources such as food and accommodation for construction workers, equipment, machinery, vehicles and vessels hire will likely benefit the local suppliers and businesses. However, this prospect is only temporary as the opportunity will cease after the completion of construction works.

4.2.2. Operational Phase Impacts

Scores and range values predicted for the operational phase of the proposed development are portrayed in table 10.

Table 10 Operational Phase Impacts

Environmental Category	Total Score	Range Value	Range Value (Numeric)	Description
Operational Phase				
1. Physical / Chemical				
Ground Water	+32	C	3	Moderate positive
Soil	+32	C	3	Moderate positive

Noise	-5	-A	-1	Slight negative
Air	+42	D	4	Significant positive
Waste	+84	E	5	Major positive
2. Biological / Ecological				
Vegetation	0	N	0	No change
Fauna	+36	N	4	Significant positive
3. Sociological / Cultural				
Road Closure	0	N	0	No change
Health and Safety	+63	D	4	Significant positive
Sociocultural Conflict	-4	-A	-1	Slight negative
4. Economic				
Loss or benefit	+54	D	4	Significant positive

Most of the impacts during operational phase are expected to be positive if the proposed mitigation measures suggested in this management plan are stringently followed. Moving the boundary wall further from the eroding area will delay any potential damage that will be caused by erosion to the infrastructure and subsequently remove the threat of waste entering the lagoon and impacting marine biota. Coral reefs that provide food, tourism income, and protection from storms and waves are highly susceptible to plastic pollution. For instance, plastic debris can cut open corals' delicate skin, exposing them to infection. Similarly, ocean plastic trash is often colonized by bacteria that can directly introduce disease to corals. Moreover, plastic can shade corals, blocking light and creating conditions that allow certain pathogens to thrive. Marine organisms like sea turtles can also get tangled in plastic bags and die from suffocation. Hence, removing this threat will significantly benefit the marine ecosystem and indirectly, the community and local and well as national economy.

Clearance of accumulated waste in the IWMC will create much needed space for waste management activities and facilitate smooth operations of the IWMC. Additionally, after partaking in the compost training, island waste management staffs will be better equipped to practice compost production from organic waste, which will significantly reduce the amount of food waste going into sea, as well as cease open burning of green waste. Moreover, a fully operational IWMC and regular transfer of unmanageable waste to the Vandhoo RWMF will assist the island council to completely phase out current practice of open burning of waste at the southwest side of the island. The operation of the IWMC will also improve the overall cleanliness of the island and will reduce littering and dumping of waste to unassigned areas. These activities would prevent pollution of soil, groundwater, coastal areas and forested areas and in turn assist in the preservation of biodiversity.

The upgrading of the IWMC involves construction of a 3.5m high masonry wall at the side of the IWMC facing the football ground. At present, the boundary of the IWMC and the football ground are only separated by a fence. The parameter wall will act as a barrier to dust and noise during operations

minimizing impacts to the users of football ground and thereby resulting in an overall improvement to the status quo.

Workforce demand is expected to be high during the operational stage as well, with a number of low skilled jobs and skilled jobs made available to provide waste collection, composting and waste processing services. In contrast to the construction phase, the jobs created during operational phase will be permanent or for long term. Furthermore, if a market for composted material and recyclables can be found, the IWMC can self-sustain by cost recovery which will be positive for the island economy.

As expected, some amount of noise will be generated during waste processing activities undertaken in the IWMC. However, the noise generated during the operational phase is expected to be very small. Battery operated vehicles are proposed to be used for waste collection, while individuals are not expected to be affected by noise pollution due to the IWMC being located very far from residential areas. Additionally, if expatriate workers are employed to provide waste management services, a slight negative impact is anticipated in sociocultural terms, as the arrival of a new group of foreign workers to the island may create conflict with the residential population if local culture is overlooked or not respected.

CHAPTER 5 MITIGATION MEASURES

One of the most important functions of an Environmental and Social Management Plan (ESMP) is to propose ways to manage the negative impacts that are likely to occur as a result of the proposed development. For this purpose, it is essential to identify mitigation measures to minimize impacts and identify cost of mitigation measures and parties that are responsible for implementation of these measures. As highlighted in the description provided in the chapter 4, most of the negative impacts envisaged for the proposed development occur during construction phase. Therefore, the proposed mitigation measures mostly focus on the construction phase of the project. However, the slight negative impacts envisaged for the operational phase are also taken into consideration and mitigation measures are proposed for these impacts as well.

Table 11 provides details of the key mitigation measures for various environmental and socioeconomic aspects that are impacted as a result of the project.

Table 11 Mitigation measures proposed for significant impacts

Environmental Management Plan			
Impact	**Mitigation Measure**	**Responsible Party**	**Cost of Mitigation**
Management of Impacts during Preconstruction and Design Phase			
1. Physical / Chemical			
Contamination of groundwater and surface water	Ensure (i) waste storage areas are covered to prevent contaminated storm water runoff, and (ii) hazardous waste storage area is bounded. The material processing or storage areas of the facility should have a leachate barrier system that forms a secure barrier between the groundwater, soil, and substrata and the composting or stored organics, as well as systems for collecting and treating leachate such as a concrete pad with open drainage channels that drain in to a leachate collection pond. Design and maintain the slope and orientation of windrows and/or leachate drains such that free drainage of leachate to a collection drain is facilitated and ponding of leachate is avoided; shape the piles and windrows to maximize run-off and hence reduce infiltration.	ME	N/A

Noise pollution	Ensure that the outer boundary wall of the area considered for extension has a minimum distance of 30 m from the residential population and commonly used public places.	Island Council	N/A
Marine water pollution	Ensure that a minimum buffer of 20 m is maintained between the IWMC and the vegetation line.	Island Council	N/A
2. Biological			
Negative impacts on ecologically significant wetland and marine habitats	Ensure IWMC is not designed with a wetland or marine outfall and sets a minimum distance of 30 m from environmentally sensitive areas.	ME, Island Council	N/A
Negative impact due to vegetation removal	Consideration should be given during detailed designing stage to build infrastructure around existing vegetation, thus minimizing any clearance.	ME, Island Council	N/A
Management of Impacts during Construction Phase			
1. Physical / Chemical			
Note: All construction activities should be undertaken in the presence of an experienced supervisor.			
Contamination of groundwater and surface water due to chemical spillage and seepage	Hazardous waste such as waste oil and diesel should be stored in sealed containers and placed on a hard concrete surface and transferred to the nearest regional waste management facility for final disposal. Stored containers should be regularly inspected to identify any leakages.	Contractor	Cost associated with purchasing of containers and transport to RWMF
Soil contamination due to chemical seepage.	Hazardous waste such as waste oil and diesel should be stored in sealed containers and placed on a hard concrete surface and transferred to the nearest regional waste management facility for final disposal. Stored containers should be regularly inspected to identify any leakages.	Contractor	Cost associated with purchasing of container and transport to RWMF
Noise pollution due to construction activities and use of machinery	Ensure construction activities occur between 8 am and 6 pm.	Contractor	Cost associated with purchasing ear muffs

	Construction workers should wear ear muffs when using machinery that produce significant noise. The proposed development will not emit significant level of noise due to the scale of work involved.		
Negative impact on air quality	All vehicles used in the project should have an up to date road worthiness certificate. All vehicles and machinery should be well tuned. Ensure that construction site is wetted to minimize impact of dust as a result of the project. Materials that are stockpiled at the location for long period of time should be covered to minimize impact of dust generation due to windy conditions. Similar to above (relate to noise), there will not be significant impact on the air quality.	Contractor	N/A
Construction waste	Ensure waste materials are either reused by community or transferred to a regional facility at the end of the construction phase activities.	Contractor	Cost associated with transport to RWMF
2. Biological			
Negative impacts due to vegetation removal	Any large trees and palms will be translocated to other areas of the island. When translocating in order to ensure survival the following mitigation measures should be followed: • Palms and trees should be dug two to three feet from the trunk. • In order to ensure that the rootball is intact the area surrounding the palm or the tree should be wetted prior to being dug. • The rootball should be kept wet until replanted at new site.	Island Council	Cost associated with translocation and providing compensation

	All vegetation clearance activities should be confined to areas where infrastructure is proposed. Compensation should be provided for palms and trees owned by individuals prior to removal. Plant 2 trees for every vegetation removed. No vegetation within 20 meters of the shoreline should be cleared as per land use planning regulation of the Maldives.		
Negative impact on fauna	Identify trees and shrubs that are common nesting grounds for birds and avoid clearance of such vegetation. If necessary, relocate construction site away from such grounds. Another possible option is to relocate trees and shrubs to other areas of the island. Schedule construction outside of the breeding season. Ensure that all construction material imported to the island are free of any alien species or pests.	Island Council	Cost associated with translocation
3. Sociological and Cultural			
Health and Safety of construction workers	All workers should be provided with safety gear and should ensure that safety gear is utilized at all times. This includes: safety hats, boots, glasses, masks and gloves. Ear muffs shall be provided where equipment or machinery that produces significant amount of noise is used. Chemical-Liquid protective gloves should be used when handling any chemicals, waste oil or other liquid waste. No open electrical wiring or cables should be kept on site.	Contractor	Cost associated with purchasing safety materials.

	Health and Safety briefing should be given to all construction workers. The maximum working hours of all construction workers should be 48 hours per week as per the Employment Act of Maldives. Meals should be provided to construction staff 3 times a day. Safe drinking water should be supplied to construction workers. Appropriate sleeping arrangements shall be made for the construction workers.		
Fire hazard	Ensure that electrical wires are installed properly by a certified person. Ensure that portable extinguishers are readily available in case of an emergency fire.	Contractor	Cost associated with hiring an expert electrician and purchasing of fire extinguishers
Sociocultural conflict due to arrival of expatriate workers	Ensure that local workers are used as much as possible. If expatriate workers are used ensure that they respect the local culture. The contractor in collaboration with the Island Council shall undertake a training to sensitize the labor to the local context and customs. This training should also cover topics related to Gender-based violence. To mitigate conflict that may arise due to the arrival of expatriate workers, the consultant should develop a "Code of Conduct" outlining the set of rules that that the workers have to follow to persevere the social norms and religious values of the society. The Code of Conduct should also specify penalties for breaching these rules and should be thoroughly communicated to workers prior to mobilization.	Contractor	Cost associated with hiring staffs

4. Economic			
Benefit to local economy	Ensure that construction materials are purchased from the island as much as possible. Preference shall be given to hire local construction workers from the island and the atoll or region.	Contractor	Cost associated with material purchase
Management of Impacts during Operational Phase			
1. Physical / Chemical			
Waste processing and storage. Litter, odor and vector nuisance.	Ensure that primary waste collection services are provided at least daily. Secondary transfer to a regional facility shall be arranged at least twice a month. Adequate bins with closures must be provided at the drop off locations if the IWMP has demarcated them. Waste collection vehicles and transfer vessels must be secured from all sides to prevent spillage.	Island Council/ IWMC Manger	Cost associated with IWMC operation
	Provide composting training to all laborers and management staff of the facility.	ME	Cost of providing compost training
	Control of the incoming waste stream is necessary to ensure safe and effective processing, treatment, and disposal of the Waste and the quality of end products (e.g., quality compost). • Visually evaluate, weigh, and document incoming waste loads; • Conduct visual inspection of the incoming waste, along with sorting and removal procedures, can minimize this potential hazard; • Reject or, if the facility is equipped to process the waste, segregate potentially hazardous materials or wastes identified, including infectious waste, and manage as a hazardous or infectious waste, as applicable; • Analyze suspected hazardous materials before acceptance so that	Island Council / IWMC Manager	Cost associated with purchasing jumbo bags and/or containers

	they are segregated relative to compatibility and so that they can be adequately treated and disposed of; • Separate recoverable secondary materials for recycling and organic waste for composting to the extent practical. • Waste that cannot be managed at island level must be processed (chipped, crushed or compacted) and stored in containers or jumbo bags and kept in the respective bays within the IWMC for transportation to Vandhoo RWMF. • The jumbo bags and/or containers must be appropriately labeled to indicate the type of waste they contain. • Maintain log records of all outgoing waste either in terms of weight or volume of jumbo bags and/or containers. The log sheets must be provided to the regional collection supervise or vessel caption.		
Hazardous Waste Management and Transportation	Do not accept medical hazardous waste as it has to be managed by the island health center and incinerated separately. Types of hazardous waste managed at the health center mainly include needles, syringes, expired medicine and contaminated materials (cloth/gauze/disposable gloves). Other types of hazardous wastes generated within the households including small batteries, solvents, paints, used oils, pharmaceuticals and old lights which use mercury shall be managed at the IWMC. Incoming hazardous waste to the IWMC should be stored in the hazardous waste storage room and regularly transported to Vandhoo RWMF. The following measures must be taken during transportation of hazardous waste:	Island Council / IWMC Manager	

	• Use containers appropriate for the wastes they are intended to carry; • If drums or other containers are used to transport waste, containers should be in good condition and compatible with the waste and are adequately secured in the transport vehicle; • Adequately label all transport tanks and containers to identify the contents, hazards, and actions required in various emergency situations. Tampons and nappies, while indicated as hazardous wastes in the ESMP, are biodegradable and can be composted. The high temperature of the composting process has been documented to eradicate any harmful pathogens containing potential biohazards.		
Noise pollution during waste management	Depending on availability, battery operated vehicles can be used to provide collection services. Waste handling works involving operation of machinery shall be undertaken during day time.	Island Council, ME	Cost associated with purchasing collection vehicles
Air emissions from MSW collection and transport	Emissions from on-road vehicles shall be regulated through national and regional programs. All waste transport vehicles must have up to date road worthiness licenses. Optimize waste collection routes to minimize distance traveled and overall fuel use and emissions Drivers shall be instructed on the benefits of driving practices which reduce both the risk of accidents and fuel consumption, including measured acceleration and driving within safe speed limits.	Island Council, ME	Cost of training drivers

	When the IWMC and RWMF becomes operational no open burning shall be practiced.		
2. Sociological and Cultural			
Health and Safety of waste handling staffs	Provide workers with appropriate protective clothing, Gloves, respiratory face masks and slip-resistant shoes for waste transport workers and hard-soled safety shoes for all workers to avoid puncture wounds to the feet. For workers near loud equipment, include noise protection such as ear muffs. For workers near heavy mobile equipment, buckets, cranes, and at the discharge location for collection trucks, include provision of hard hats; Establish engineering and materials norms for special facility and stationary equipment design requirements that minimize exposure to hazards (e.g., ventilation, air conditioning, enclosed conveyor belts, low loading and sorting heights, non- skid flooring, safety rails on stairs and walkways, spill protection and containment, noise control, dust suppression, gas alarm systems, fire alarm and control systems, and evacuation facilities).	Island Council	Cost of purchasing safety materials
Fire hazard	Burning of waste at the IWMC should never be practiced under any circumstances. Naked flames shall not be allowed at the IWMC. Ensure that waste management staffs are briefed of fire hazard management. Firefighting equipment, including clear aisles among windrows and access to an adequate water supply shall be made available with access to pumps.	Island Council, ME	Const of purchasing equipment

	Smoking should be prohibited inside the premise of the IWMC, placing awareness signs in the premise. Highly flammable areas such as those area allocated for the storage of paper, wood and cardboards, should be clearly marked with appropriate sign boards indicating the flammable nature of the waste.		
Sociocultural conflict	Ensure that waste handling staffs are selected from the local community as much as possible. If expatriate workers are used ensure that they respect the local culture. Conduct a training to sensitize the labor to the local context and customs. This training should also cover topics related to Gender-based violence. Develop a "Code of Conduct" outlining the set of rules that that the workers have to follow to persevere the social norms and religious values of the society. The Code of Conduct should also specify penalties for breaching these rules and should be thoroughly communicated to workers prior to mobilization.	Island Council	Cost associated with hiring staffs
3. Economic			
Collection Fee	Ensure that the collection fees are feasible for the community. Undertake consultation meetings with stakeholders and set a suitable collection fee acceptable to the community.	Island Council	Cost associated with conducing stakeholder sessions
Employment Opportunities	Ensure that waste handling staffs are selected from the local community as much as possible.	Island Council	Cost associated with hiring staffs

Proponents commitment to undertake proposed mitigation measures is provided in Appendix J.

CHAPTER 6 ENVIRONMENTAL MONITORING

This chapter provides the environmental monitoring plan. The inclusion of a monitoring plan in the ESMP is essential to assess the effect of the project on natural and cultural environment. It is a tool used to measure the accuracy of predictions and to determine whether the proposed mitigation measures have been effectively carried out by the proponent as recommended in the ESMP. Another important aspect of environmental monitoring is its capacity to determine unforeseen impacts that have not been predicted during the impact identification stage. It should be noted that adopting of mitigation measures do not guarantee unforeseen impacts.

The monitoring plan is based on existing environmental conditions outlined in chapter 3 and the impact analysis described in chapter 4. The monitoring plan of this project focuses mostly on the construction phase, particularly removal of vegetation, as previously mentioned, since the only significant negative impact that is likely to occur as a result of the project are associated with vegetation clearance.

The main key objectives of the environmental monitoring plan are to:

1. determine whether the proposed mitigation measures in this management plan are followed during removal and translocation of vegetation from the project site.
2. analyse the effectiveness of the operation of IWMC in terms of spillage prevention and overall cleanliness of the island.

6.1. Monitoring Program

The monitoring program recommended for the proposed development of IWMC is provided in table 12.

Table 12 Monitoring Program

Aspect	Parameter	Frequency	Responsible Party	Cost of Monitoring (MVR)
		Construction Phase		
Vegetation Clearance	Log records of number and type of trees cleared	Once during construction phase	Island Council, Contractor	N/A
Implementation of Construction Mitigation Measures	Records of successful implementation of mitigation measures	Monthly during construction period	Contractor, MEE	18,000
Grievance	Log records of number of complaints received and actions taken during construction phase	Throughout the construction phase	Contractor, MEE	9,000

Operational Phase				
Spillage Assessment	Waste Collection Arrangements Littering around the island (Beach, harbor area and other public areas) Spillage during transfer to IWMC Any Spillage within the IWMC Proper use of IWMC Spillage during transfer to regional waste facility	Once when the project is completed and one year after project completion	MEE	18,000
Grievance	Log records of number of complaints received and actions taken during operational phase	Throughout the operational phase	Island Council	9,000

6.2. Responsibility

The overall responsibility of monitoring lies with the Proponent or Contractor assigned by the Proponent. A commitment letter by the proponent for undertaking the monitoring program is provided in Appendix J.

6.3. Reporting

Reporting will be carried out by the environmental consultant assigned for the purpose by the proponent. The report will include;

- Details of the site;
- Methodology of data collection and data analysis;
- Major findings;
- Section contrasting findings with the baseline; and

• Mitigation measures that would be implemented based on the monitoring.

Sample Format

• Introduction

• Aims and Objective

• Method

• Results

• Conclusion and recommendations

A detailed environmental monitoring report is required to be compiled and submitted to EPA annually, based on the data collected for monitoring the parameters included in the monitoring program given in this report.

6.4. Grievance Redress Mechanism

Based on the ESAMF, MCEP has formulated a Grievance Redress Mechanism (GRM). GRM is established to receive and facilitate grievances of the affected persons during the implementation of the project.

Ms. Aishath Wishama Vice President of the Island Council was briefed on the GRM and setting a focal point for managing GRM. The council will nominate a focal point for this purpose and make the complaint forms physically available from the council front office. Information on the GRM will also be displayed in the Council's Notice Board. Kurendhoo Council does not have a website or a Facebook page, but will provide link to the GRM forms if a website or a social media page is created in future.

Following are the details of the GRM developed by the MCEP. The council nominated Mr. Mujthaba Moosa (Assistant Municipal Service Officer, Ph: 7773646) to manage grievances at tier 1. GRM at tier 2 will be managed by the ESS Specialist of MCEP. Tier 2 GRM forms will be made accessible from the respective council office and MEE front office and is published in MEE website. Below are the links.

English page: http://www.environment.gov.mv/v2/en/download/7189

Dhivehi page: http://www.environment.gov.mv/v2/dv/download/7191

The option of using mobile phones and/or social media for receiving informal grievances can be explored given the 90 percent mobile penetration in the island.

Tiers of Grievance Mechanism	Nodal Person for Contact	Contact Communication and other facilitation by the project	Timeframe to address grievance
First Tier: Island Council	Island Council will be the first point of contact for any grievances. The staff designated as the waste management focal point by the island council will manage grievances on behalf of the council.	GRM should be publicly displayed in the construction site as well as the council office. GRM should also be outlined in official website and/or social media pages of Council, MEE (and/or the project), including contact details of the nodal person in each tier. Grievances can be addressed informally by contacting the council through email / telephone / in person. If the grievance cannot be resolved informally, an aggrieved party must submit a complaint on the Tier I Complaint Form. A copy of the form (with the council seal) should be provided to the aggrieved party as evidence of receipt. Electronic version of the complaint form should be available from the websites and/or social media pages of MEE and the council. Physical copies of the form should be available from the council front office. Council will provide assistance to fill the form for those who cannot write. The council should keep separate registries for informal and formal complaints and maintain records of all complaints received. The council will discuss the matter with the Women's Development Committee and other relevant stakeholders (Farmers, Fishermen, School, Health Center etc.), where deemed necessary and attain views of them. If such meetings are arranged, the date, time, location or venue, list of participants (with contact details) and a summary of the main outcome of the consultation must be annexed to the written decision issued by the council. If the complaint is resolved within 15 working days, the council must communicate the decision to the aggrieved party in writing. The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 working days. If no acknowledgement is submitted from the aggrieved party within this period, then the decision will be considered as accepted. If a complaint requires more time to address, this requirement must be communicated to the aggrieved party in writing and the aggrieved party must consent and sign-off the request for the extension to take effect. An extension can be made to an additional 15 working days. The staff designated as the waste management focal point by the island council will manage and provide feedback for grievances submitted to the council.	15 working days

Second Tier: Ministry of Environment (ME)	Environmental and Social Safeguards Specialist at the Project Management Unit (PMU) will be the focal point.	If the grievance cannot be resolved through Tier 1 to the satisfaction of the aggrieved party or if the issue is outside the jurisdiction of the council (issues related to RWMF), an aggrieved party may submit a complaint on the Tier 2 Complaint Form. A copy of the form (with MEE seal) should be provided to the aggrieved party as evidence of receipt. Electronic version of the complaint form should be available from the websites and/or social media pages of MEE and the council. Physical copies of the form should be available from the council and MEE front office. A copy of the Tier 1 Complaint Form should be submitted with the Tier 2 Complaint Form. MEE will forward the grievance to PMU. PMU screens the grievance and determine if its related to MCEP. If it is unrelated, the aggrieved party must be notified in writing and the way forward must be outlined to them including the necessary government institutions to follow up. Environment and Social Safeguards Officer at the PMU will be the contact person in processing a grievance through the Second Tier. PMU will discuss the matter with EPA and other relevant institutions, where deemed necessary and attains views of them. PMU will also arrange site visits and hold onsite discussions and meetings if necessary. The PMU will be responsible to ensure that there is no cost imposed on the aggrieved person, due to the grievance mechanism at the second tier. If the complaint is resolved within 15 working days, the PMU must communicate the decision to the aggrieved party in writing. The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 working days. If no acknowledgement is submitted from the aggrieved party, then the decision will be considered as accepted. If a complaint requires more time to address, this requirement must be communicated to the aggrieved party in writing and the aggrieved party must consent and sign-off the request for the extension to take effect. An extension can be made to an additional 15 working days. If the grievance is not resolved to the satisfaction of the aggrieved party within 15 working days of submission of the grievance to tier 2 then the aggrieved party may notify the MEE, in writing, of the intention to move to tier 3.	15 working days

Third Tier: Judiciary Power / Assistance to Vulnerable Persons beyond the Project's Grievance Redress Mechanism	Judiciary system is an option for an aggrieved person and/or community in case that the other tiers have not been effective	The legal system is accessible to all aggrieved persons. Assistance from the PMU of MCEP is available only for vulnerable person(s)* as per this grievance mechanism. In cases where vulnerable person(s) are unable to access the legal system, the Attorney General´s office will provide legal support to the vulnerable person(s). The PMU must assist the vulnerable person(s) in getting this support from Attorney General´s Office. PMU must also ensure that there is no cost imposed on the aggrieved person if the person belongs to the vulnerable groups. The list of vulnerable groups is as defined in the footnote but may be further defined by MEE. The verdict of the Courts will be final.	As per established Judicial Procedure

*Vulnerable person(s): A vulnerable person(s) for the purpose of this project is a person who is poor, physically or mentally disabled/handicapped, destitute, disadvantaged for ethnic or social reasons, an orphan, a widow, a person above sixty years of age, or a woman heading a household.

CHAPTER 7 RECOMMENDATIONS AND CONCLUSION

The upgrading of the IWMC at Lh. Kurendhoo is a much-needed development to safeguard the existing IWMC and bring the IWMC back to operating condition. The operation of the IWMC will improve the current waste disposal practices adopted in the island and alleviate the current concerns of environmental pollution and public health. The project will also bring about economic benefits to the island by increasing revenue through the sale of composted material and recyclables and by creating employment opportunities.

The only permanent negative impact that is likely to occur as a result of the project is vegetation clearance. However, the amount of vegetation clearance involved is minimal and therefore, if the mitigation measures proposed in the management plan are adhered, almost all the negative impacts can be brought to an acceptable level.

The author's recommendation for the project include;

- To include this ESMP as a part of the contractor's contract.
- Implement the mitigation measures proposed in the ESMP.
- Conduct regular monitoring and supervision works during construction and operational phase.

The aim of this ESMP is to guide the proponent in implementing the project with conformity to EIA regulation 2012 and the ESAMF of MCEP.

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APPENDICES

APPENDIX A

EIA Screening Decision

بسم الله الرحمن الرحيم

Environmental Protection Agency
އެންވަޔަރަންމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ

ނަންބަރު: 203-EIARES/438/2018/138

ސްކްރީނިންގ ކުރުމަށްފަހު ނިންމިގޮތް

Screening Decision

މިއީ ލ. ކުރެންދޫގައި ކުރި ވޭސްޓްމެނޭޖްމަންޓް މަރުކަޒު އަޕްގްރޭޑު ކުރުމުގެ މަޝްރޫއު ކުރިއަށްގެންދިއުމުގެ ކަމުގައި މި މަޝްރޫއު ސްކްރީނިންގ ކުރުމަށްފަހު ނިންމިގޮތް
އެންގުމަށްޓަކައި މިނިސްޓްރީ އޮފް އެންވަޔަރަންމަންޓް އެންޑް އެނަރޖީއަށް ދޫކުރާ ރަސްމީ ލިޔުމެކެވެ.

This is an official document issued to **Ministry of Environment & Energy**, for the purpose of communicating the decision made after screening of the project; **Upgrading of Existing Island Waste Management Centre at Lh. Kurendhoo.**

މި މަޝްރޫއުގެ ސަބަބުން ތިމާވެށްޓަށް ނުރަނގަޅު ބޮޑު އަސަރެއް ކުރުވާނެ ކަމަށް ފެނެއެވެ. ވީމާ، ތިމާވެށްޓަށް އަސަރު ފޯރާނެ މިންވަރު ބެލުމުގެ ރިޕޯޓެއް ހުށަހަޅާށެވެ. This project is likely to cause significant negative environmental impacts. Hence, please submit an EIA report.	☐
މި މަޝްރޫއުގެ މަސައްކަތުތަކަށް ތިމާވެށީގެ ފުރަތަމަ ދިރާސާއެއް ހުށަހަޅާށެވެ. Submit an Initial Environmental Examination for this project	☐
މި މަޝްރޫއުގެ މަސައްކަތުތަކަށް ތިމާވެށީގެ މެނޭޖްމަންޓް ޕްލޭނެއް ހުށަހަޅާށެވެ. Submit an Environmental Management Plan for this project	☐
މި މަޝްރޫއުގެ ސަބަބުން ތިމާވެށްޓަށް ނުރަނގަޅު ބޮޑު އަސަރެއް ކުރުވާނެ ކަމަށް ނުފެނެއެވެ. ވީމާ، މި މަޝްރޫއުގެ މަސައްކަތްކުރިއަށް ގެންދިއުން އެދެން ހުއްދަ ދެވިފައިވާކަމުގައި ދަންނަވަމެވެ. This project is unlikely to have a significant negative impact on the environment. Hence, you may proceed with the project.	☑
މި މަޝްރޫއުގެ ސަބަބުން ތިމާވެށްޓަށް ކުރާނެ ނުރަނގަޅު އަސަރުތައް ކުޑަކުރުމަށް މި އޭޖެންސީއިން އަންގާ ފިޔަވަޅުތައް އެޅުމާއެކު މަސައްކަތް ކުރިއަށްގެންދަން ދަންނަވަމެވެ. The measures stipulated by this agency shall be used to mitigate the negative environmental impacts of the project.	☐

މިއީ ތިމާވެށީގެ ގޮތުން ކުރެވިފައިވާ ސްކްރީނިންގއެކެވެ. ވީމާ، މި މަސައްކަތް ކުރުމަށް ސަރުކާރުގެ އެހެން ކަމާބެހޭ އެންމެހާ އިދާރާތަކުން ބޭނުންވާ ހުއްދަތައް ހޯދުމަށްފަހު
ނަގަންޖެހޭނެކަމުގައި ދަންނަވަމެވެ.

This is an environmental screening. Hence, obtain all necessary approvals/permits from other relevant government authorities before commencement of the project activities.

Screening Institution: **Environmental Protection Agency of Maldives**

Date: **25th July 2018**

Name: **Mr. Ibrahim Naeem**

Designation: **Director General**

Signature:

ސްކްރީނިންގ ކުރި އިދާރާ: އެންވަޔަރަންމަންޓަލް ޕްރޮޓެކްޝަން އޭޖެންސީ،
ދިވެހިރާއްޖެ

ތާރީޚު: 25 ޖުލައި 2018

ނަން: އަލްފާޟިލް އިބްރާހީމް ނަޢީމް

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ސޮއި:

APPENDIX B

Original ESMP Report of Lh. Kurendhoo IWMC Project

ENVIROMEMENTAL MANAGEMENT PLAN

for Island Waste Management Services

Kurendhoo

Faadhippolhu (Lhaviyani) Atoll

Maldives Environmental Management Project
Ministry of Environment and Energy
Male' – Republic of Maldives

BACKGROUND

Although the Maldives Environmental Management Project (MEMP) is categorized as a Category "A" project for environmental assessment (EA), this categorization was determined on the basis that the selection of the Regional Waste Management Facility (RWMF)island site, and construction and operationsRWMF for the may have adverse social and environmental impacts on sensitive environments. Other components and sub-components of the Project (including island waste management activities) were not considered to have the same inherent environmental and social risk.

During Project preparation it was not be possible to undertake a full category "A" environmental assessment in accordance with the World Bank ***Operating Policy*** (**OP/BP/GP 4.01)** for the RWMF until the process (Best Practical Environmental Option at least cost) for selection of the Regional waste management system had been undertaken. In lieu of a project specific EA, an ***Environmental and Social Management Framework (the ESMF)*** was prepared which defines the scope and application environmental assessment processes to Project activities.

ISLAND WASTE MANAGEMENT PLANS

In accordance with the ESMF,specific ***Island Waste Management Plans (IWMP)***will be developed for each of the 46 inhabited islands within the RWMF catchment.The IWMP will detail the waste management activities to be undertaken at island level.

Island Waste Management Plan activities may include, but are not necessarily limited to; primary waste collection services, island waste management center operation, waste transfer activities, composting, metal recovery, etc.

While most island waste management activities are expected to have generic environmental and/or social impacts that are manageable through***Environmental Management Plans***(EMP(s)) there may be some activities that may carry a higher risk of environmental and social impacts. These activities may require a higher level of environmental and social impact assessment.

ENVIRONMENTAL ASSESSMENT OF ISLAND WASTE MANAGEMENT ACTIVITIES:

Initial Environmental Evaluation (IEE)

Initial Environmental Evaluation for island waste management activities is a requirement of the **Maldives Environmental Impact Assessment Regulation 2007.**The screening process is the first step in the EA process. The objective of the IEE screening process is to rapidly identify environmental and social aspects of the island environment which may be impacted upon by the proposed island waste management activities. The IEE screening checklist is provided in ***Annex 1.***

As many of the island waste management activities supported under the MEMP will be located around the Island Waste Management Center a separate site specific screen checklist for this facility has been provided in **Annex 3.**

Environmental Management Screening

All island waste management activities proposed in the IWMP will be the subject of an environment and socialscreening as the key management tool for identifying and assessing risk of environmental and social impact. An outcome of the above environmental and/or social reviews will, in most cases, be the development of ***Environmental Management Plans***. The EMP screening checklist is provided in **Annex 2.**

Where there are little or no environmental or social issues the proposed activities may move to implementation.

Environmental Management Plans

For IWMP activities which may impact on environmental and social aspects of the island an EMP (or Action Plan) will be prepared.

The EMP will describe and prioritizes the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified in the screening assessmentand on other relevant findings. The template for the EMP is provided in **Annex 4.**

Measuresand actions that address identified impacts and risks will favor the avoidance and prevention of impacts over minimization, mitigation wherever technically and financially feasible.Where risks and impacts cannot be avoided or prevented, mitigation measures and actions will be identified so that the IWM activities operates in compliance with applicable national laws and regulations etc., and meets the requirements of relevant World Bank performance standards.

INSTITUTIONAL ARRANGEMENTS:

Roles and Responsibilities

The **Maldives Environmental Protection Agency (EPA)**will have overall responsibility for ensuring the EMP is;(i) undertaken in accordance with the relevant environmental laws and regulations, (ii) conducted to a standard acceptable to the Government of the Republic of Maldives, and (iii) periodically auditingcompliance.

The ***MEMPPMU waste management component Coordinator*** is responsible for:(i) coordinating the EMP process and activities on behalf of MEMP, including but not limited to the IEE, EMP screening, EMP development and EMP audits, and (ii) preparing other standard EMP management documents such as weekly inspection and reporting templates.

The ***Island Council*** will be responsible for (i) coordinating community input and consultation into the IWM EMP development process, (ii) inspection of IWM activities, and (iii) implementing necessary corrective and preventive actions.

Institutional responsibility for mitigation

Operational activities covered under this EMP will be largely managed (incl. mitigation) through the island Council. The island council has overall responsibility for waste management at island level. In some cases, the activities may be undertaken on behalf of the Island Council by the Utilities Company. Where activities are undertaken with the use of project funds a clause will be added to ensure responsibility for maintaining appropriate environmental standards and undertaking mitigation where identified by the Island Council. Where activities funded by the project are under taken by private entities under contract to the island office, a similar clause will be required.

All construction activities will be undertaken under contract irrespective of who issues the contract. Where this occurs, a clause requiring the contractor to maintain appropriate environmental standards and undertake mitigation will be required.

EMP MANAGEMENT SYSTEM

EMP Database

The MEMP PMU waste management component coordinator will develop a database in Microsoft Access or Excel consisting of the EMP data (screening and EMP). The database will have the facility to record outcomes of audits and inspections. Once completed, the database will be handed over to the EPA who will be responsible for maintaining and updating the database on a quarterly basis.

EMPMonitoring, Reporting and Record Keeping

Procedures to monitor compliance with the EMPs will be mechanisms, such as inspections and audits. The Island Council will assign an official to inspect IWM activities on a weekly basis. The EPA will review the inspection reports and audit compliance of a sample number of EMPs on a quarterly basis.

The Island Council will prepare a weekly inspection report in a format acceptable to EPA and Department of Public Health (DPH). The report will be maintained in the Council files for the EPA and DPH quarterly review.

COMMUNITY ENGAGEMENT, CONSULTATION, DISCLOSURE AND GREIVANCE

Consultation
All reasonable efforts will be made to consult relevant stakeholders in the preparation of ***Island Waste Management Plans (IWMPs).***

For people likely to be adversely impacted by the Island waste management activities, consultation will be iterative and their views will feed into the EMP decision-making process.

Engagement
Where practicable and appropriate Community Centered Development (CCD) procurement procedures will be utilized which further engage the community in the tendering, bid assessment, contracting, contractor oversight and monitoring of Island waste management activities.

Disclosure
The EPA will publicly disclose all environmental management plan(s) for public review and comment in appropriate locations in the Project area.

Grievance Mechanism
If the EPA anticipates ongoing adverse impacts on affected communities, the MEMP PMU will establish a grievance mechanism to receive and facilitate resolution about the environmental and social performance.

The MEMP website will enable the community opportunity to raise concerns electronically.

ACRONYMS

MEMP	Maldives Environmental Management Project
EA	Environmental Assessment
RWMF	Regional Waste Management Facility
ESMF	Environmental and Social Management Framework
IWMP	Island Waste Management Plan
EMP	Environmental Management Plan
IEE	Initial Environmental Evaluation
IWM	Island Waste Management
EPA	Environmental Protection Agency
PMU	Project Management Unit
DPH	Department of Public Health
CCD	Community Centered Development
NGO	Non-Governmental Organization
IWMC	Island Waste Management Center
CBO	Community Based Organization
CND	Construction and Demolition

LOCAL NAMES USED

Hirundhu	*Thespesia Populnea*
Magoo	*Scaevola Taccada*
Dhiggaa	*Hibiscus Tiliaceus*
Dhunburi	*Ochrosia Borbonica*
Kaani	*Cordia Subcordata*
Funa	*Calophyllum Inophyllum*
Magoo	*Scaevola Taccada*
Halaveli	*Suriana Maritima*
Kuredhi	*Phemphis Acidula*
Boashi	*Tournefortia Argentina*
Midhili	*Terminalia Catappa*
Nika	*Ficus Bengalensis*

Annex 1
Initial Environmental Evaluation Checklist

Island name: Kurendhoo

GPS location: Longitude 73°27'49.34"E - Latitude5°20'2.02"N

Area: 19.7 hectares

Length: 664.84 m Width: 402.57 m

Population: 1250

No. of households: 125

No. of abandoned houses: 300

Does the island have a land use plan detailing future land use development activities including waste management? ✓

Waste Management Practices

Amount of solid waste generated:
[Note: To be calculated from waste audit data for the Region]

Calculated based on the Waste Audit undertaken in January 2011 and based on the reported population, total waste generated in the island is about **1 tonne per day**.

Waste composition:
[Note: To be calculated from waste audit data for the Region]

CATEGORY	% BY WEIGHT	% BY VOLUME
Paper/Cardboard	4%	10%
Organics	66%	46%

Glass	2%	1%
Plastics	5%	23%
Metals	2%	6%
Infectious	8%	5%
Other (inert, dust)	13%	9%

Current practice of waste management collection/ treatment/disposal activities undertaken in the island by Utilities/Island Council:

Collection:

Currently, there is no organized waste collection system in the island. Some households take their waste to the designated dumping site on their own. Waste is dumped all around the island.

Treatment:

There is no treatment done in the waste dumping area except for open burning.

Disposal:

There are no disposal methods in place.

Island waste Management undertaken directly/indirectly by community groups/ NGOs/Private parties:

A local NGO 'Keesa' is assisting the Council to look after the site for a nominal monthly fee of MVR 4700.

Environmental issues arising from these practices:

Without a proper and organizedwaste collection and treatment system, waste has become a real issue for the community. Open burning and near shore dumping of waste, create health and safety risks to the community.

Groundwater:

Describe the condition and use of Groundwater in the island:
[Note: Where water quality equipment is available, take indicative quality parameters: pH, EC. Salinity]

The ground water lens is not in a good condition especially around the southern and western side of the island. Water is generally good in the central part of the island.

Foreshore:

Describe the condition of the foreshore:**[Note: make reference to scale and extent of engineered reclamation and coastal protection works, informal erosion and reclamation works – i.e., construction demolition rubble, waste disposal, and quantity of litter/flotsam. Where possible make observations about the origin of the waste- island, resort, other].**

Moderate level of liter and CND dumping noted within the green belt and beach. Near shore lagoon is also polluted with waste. No sea grass beds noted.

Significant level of beach erosion on all sides. And heavy erosion from the north side towards the cemetery. Harbor off-side vegetated mainly with *Hirundhu* and *Dhiggaa*. A 10-hactare area on the south west side of the island was reclaimed during the recent harbor development project.

Air quality:

List any point source air emissions:**[Note: Powerhouses, Burning waste]**

Power house located on to the south west side and waste burning activities at waste dumping site of the island are the main sources of emission. Houses near the powerhouse cannot harvest rain water during rainy season as the roofs are covered with smoke residue.

List any diffuse source air emissions:**[Note: as well as motor vehicles etc. take into consideration home based commercial fish processing etc]**

The island has motorcycles (70), pickup (2), a van and an ambulance, speed boats (01), small dhonis (25) and large fishing vessels (3).

Noise amenity:

What are the major noise sources?
[Note: Where noise meter is available take 15minute time weighted average dbA for maximum (top to L10 (top 10% of noise profile) and minimum (L90 bottom 10% of noise profile]

Powerhouse and vehicles are the major noise sources.

Vegetation:

Describe dominant vegetation species on the island **[Note: Name species most present- local name will suffice if species not known]:**

The most dominant species are coconut palms, *Dhigga, hirundhu, funa* and *nika*

Describe dominant coastal vegetation on the island:

Patches of coastal vegetation including *Dhiggaa*, *Hirundhu* and *magoo* were observed.

Are there any large timber species on the island?**[Where possible make reference to the island register of timer species. If island does not have a register assume no time species or use observation and judgment]**

A few *Funa* trees and many coconut palms were noted in addition to *hirundhu* and *dhigga.*

Reef ecosystem:

Describe the general condition of the near shore house reef:**[Refer to litter flotsam, oils, nets, presence of dredging in reef area]**

The reef is not so healthy and heavily disturbed with litter flotsam.

Ecologically important habitats:

Are there any ecologically sensitive habitats in or on the island (**Note: sea grass beds, mangroves, wetlands other**)?

No ecologically sensitive habitats observed.

Octopus and reef fishes are abundant near the island.

Rare and endangered species:

Are there any known rare and endanger species on the islands? **[Note: Include caged protected species or other protected species observed]**

Not observed.

Protected Areas:

Are there any protected areas in the near vicinity of the island?**[Note include dive spots, caves, etc.. which have significant appeal to local residences as well as resorts, and sites which have formal protection]**

No.

Are there any cultural or historical sites that may historical or archaeological significance on the island?**[Include sites or objects, trees etc.. which have specific relevance to local population as well as those which may be formally recorded]**

There is an old tomb know as 'Habsheegefaanu Ziyaarai' believed to be historically significant.

Economic activities:

What are the main income activities on the island (fishing, agriculture, tourism)?

Fishing and agriculture are the main income activities for the islanders. More than 80% of youth from the island works in the tourism sector.

Do tourists come to the island? **[How many/ how often]**

Palm Beach, Kuredhdhoo and Kanuhura resort organize weekly excursions to the island.

Water supply and Sewage:

Describe arrangements for water supply and Sewage disposal on the island.**[Note include information about whether the system includes treatment facilities and sewerage discharge – ie, is sewerage treated prior to disposal or direct discharge through-out fall, or local discharge from houses to sea etc.]**

No water supply system and sewage disposal system in place. Rain water is used for drinking purpose

No water supply system and sewage disposal system in place. Rain water is used for drinking purpose.

Energy and Fuel supply:

Describe arrangements for power supply and fuel supply and storage on the island and mechanism in place in case of leakage **(Note: include observations about environmental protection mechanisms – bunding etc.)**

Powerhouse has 3 generators with a total capacity of 450KV. 20,000 litres fuel storage is available within the powerhouse premises. 2 local shops also sell fuel stored in barrels.

Two parties supply cooking gas in the island.

Transport:

Does the community have its own Dhoni for transport of people and goods?

No community vessels.

Is there an island based ferry service – to Male? To other?

There is an atoll-based ferry system in place. Regular speed boat ferries operate between Male and the island.

Health Post:

Is there a health post on the island?

Yes. There is a health centre.

School:

What grade does the school teach up to?

Up to Grade 10

Community Groups:

What other community groups are there on the island?

5 NGOs and 4 sports clubs are active in the island.

What are the principle activities of these groups?

Sports, social activities and cultural activities.

Annex 2

Island Environmental Management Plan Screening Checklist

Impacts: **S – Significant** **M – Medium** **L - Low**

Project Type	Social Category	Env. Category	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	X
PRIMARY COLLECTION OF SOLID WASTE																									
Primary collection of waste (storage)	M	L									X	X	X	X		X				X					
Primary Collection of waste (loading/ unloading)	L	L													X	X				X					
Primary collection of waste (transport/vehicle)	M	L														X									
ISLAND WASTE MANAGEMENT CENTRE																									
Site Selection	M	M	X		X	X				X		X	X									X			
IWMC construction	L	L													X				X			X			
General waste storage	L	M						X	X	X	X				X	X				X					X
Hazardous waste storage	L	M			X			X	X	X					X										X
Composting (with putrescible/ sewage sludge)	M	M				X		X	X	X		X		X	X					X					X
Composting (with putrescible waste only)	M	M	X					X	X	X				X	X					X					X
Incineration (clinical waste)	M	S												X	X						X		X		
Incineration (general)	M	M												X	X						X		X		
Open burning (organic/ general)	S	S			X								X	X	X			X			X	X	X		
Metal recovery (can crushing/ storage)	L	L									X				X										
PET recovery (PET shredding/storage)	L	L									X				X				X						
Glass crushing/ storage	L	L									X				X				X						
Paper & card compacting	L	L									X														
SECONDARY COLLECTION OF WASTE																									
Secondary transfer of waste to harbor (vehicle)																X									
Transfer to vessel (vehicle to vessel)															X	X	X								
NON- IWMC WASTE MANAGEMENT ACTIVITIES																									
Landfilling	S	S	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Biogas (sewage sludge/ putrescible)	M	L																		X					
Animal husbandry	L	L			X									X						X					
Fish feeding	L	M															X								
Waste oil recovery (oil/ water separation)	L	S	X					X	X				X	X	X							X			X
Septic tank sludge pumping	L	M													X					X					

Harbour waste management	L	L														X									X
Land reclamation	S	S				X	X	X	X		X		X	X	X	X	X			X				X	X	X
OFF ISLAND WASTE MANAGEMENT ACTIVITIES																										
Resort waste secondary collection (harbor)	L	L													X		X						X			
Resort beach cleaning	L	L													X											

Code	Impact	Code	Impact	Code	Impact
A	Land acquisition	I	Raptor & vectors	Q	Noise
B	Displacement/relocation	J	Urban Congestion	R	Odour
C	Land Use	K	Aesthetic and Tranquility	S	Smoke
D	Hydrology and drainage Pattern	L	Public Health	T	Disturbance to Other Services
E	Water logging/ flooding	M	Work Place Health & Safety	U	Air Quality
F	Surface Water Quality	N	Litter (wind-blown etc.)	V	Coastal processes
G	Ground Water Quality	O	Flotsam (litter in water)	X	Marine pollution
H	Destruction of Habitat/Flora Fauna	P	Fire hazard		

Note: Impacts for landfill, land reclamation, waste oil recovery and open burning are considered as significant and would require a full EIA and cannot be covered by this EMP process. Composting may attract a higher level of Environmental Assessment depending on the scale & extent and potential impacts.

Annex 3:

Island Waste management Center Location Checklist

Atoll	Lhaviyani	Island	Kurendhoo
Population	1250	Island Area (ha):	19.7 ha
Preferred/ Alternative Location (circle one)		Checklist compiled by:	Ahmed Nizam
Location Description:	South side of the island		

ASSESSMENT CRITERIA	CRITERIA MET	CRITERIA NOT MET
Space	✓	
a) Minimum space is available on dry land for:		
Population/Area (m2) (circle one):		
500/204	1000/280 (circled)	1500/360 2500/532
Accessibility		
a) Island is accessible by landing craft/barge/cargo dhoni	✓	
b) Site is accessible via roadway from harbour	✓	
Protection of Ground Water Resources		
a) Site is not a wetland	✓	
b) Site is 30m away from a groundwater well	✓	
Landscape & Wind Direction		
a) Site is above the highest seasonal high tide elevation	✓	
b) Site is selected with consideration to wind direction in both easterly and westerly monsoons	✓	
c) Site is flat	✓	
d) Site is 15m inland from tidal zone	✓	
e) Coastal vegetation within 15m will not be affected	✓	
f) Site is not in a lagoon	✓	

g)	Site is not in an erosion prone area	✓	

Distance from residences or community areas .....

a)	Minimum distance of 30 m from site to nearest house		✓
b)	Minimum distance of 40 m from site to nearest community area ...	✓	
	If less than 30/40 m, distance from site to nearest house/ community area is:		

Site vacancy .....

a)	Site is vacant	✓	
b)	Site requires removal of	-	

Site history .....

a)	Site is/was used for waste management		✓

Government designated site .....

a)	Site is designated as a waste management area by the GOM/ Council	✓	

DECISION: Selected site meets the criteria and is considered appropriate for the establishment of an Island Waste Management Centre.

Annex 4:

Environmental and Social Management Plan

- *Note: Potential Significance is given in terms of potential impact of doing nothing VS potential impact of intervention
- For the purpose of this EMP, all waste dump sites are referred to as IWMCs

IMPACT	Potential Significance*						LOCATION	Mitigation Measure	Recommended Monitoring	Institutional Responsibility	
	No Impact	Impact Unknown	No Significant Impact	Significant L	Significant M	Significant H				Implementing Agency	Support Agency
Poor primary collections operations leading to:											
Litter, odour, vector/ raptor nuisance to nearby residences				✓			All drop off sites	Ensure(i) waste is collected at least daily (ii) Adequate bins with closures are provided at the drop off.	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office
Work place health and safety issues				✓			All drop off sites	Ensure (i) employees are equipped with boots, gloves and coveralls (ii) bins are fit for purpose	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office
Poor IWMC design leading to:											
Contamination of groundwater and surface waters		✓					IWMC site	Ensure (i) waste storage areas are covered to prevent contaminated stormwater run- off (ii) Hazardouswaste storage area is bunded. (iii) Constructed with concrete hardstand.	Approval of IWMC Design and routine construction monitoring	Island Council	EPA & Regional Office

IMPACT	Potential Significance*						LOCATION	Mitigation Measure	Recommended Monitoring	Institutional Responsibility	
	No Impact	Impact Unknown	No Significant Impact	Significant						Implementing Agency	Support Agency
				L	M	H					
Marine pollution		✓					IWMC site	Ensure no marine outfall/ discharge from IWMC	Approval of IWMC design and routine construction monitoring	Island Council	EPA and Regional Office
Poor siting of IWMC leading to:											
Noise, vector/ raptor, odour nuisance to nearby residences.	✓ Site is already located according to approved criteria.						IWMC sites	Ensure (i) for IWMCs site selection criteria sets a minimum distance to residences for IWMC, and (ii) Primary collection from drop off points occurs daily.	Sites/ locations approved prior to construction.	Island Council	EPA and Regional Office
Aesthetics & tranquillity, Urban congestion, public health	✓ Site is already located according to approved criteria.						IWM sited	Ensure (i) adequate screening, (ii) control of operating hrs, (iii)adequate buffers in accordance to landuse plan etc.	Sites/ locations approved prior to construction.	Island Council	EPA and Regional Office
Destruction of Habitat/Flora Fauna	✓ Site is already located according to approved criteria.						IWMC sites	Ensure site selection criteria requires at least one cleared site to be nominated.	Site approved prior to construction.	EPA and Regional Office of DHA	Island Council
Poor construction management leading to:											
Noise nuisance to nearby residences		✓					IWM sites	Ensure construction activities occur between 8 am and 4 pm	Daily inspections during construction phase	Island Council/ Utilities/contractor	EPA and Regional Office

IMPACT	Potential Significance*						LOCATION	Mitigation Measure	Recommended Monitoring	Institutional Responsibility	
	No Impact	Impact Unknown	No Significant Impact	Significant						Implementing Agency	Support Agency
				L	M	H					
Dust nuisance to nearby residences		✓					IWM sites	Complaint based mitigation may include screens or wetting of source materials	Daily inspections during construction phase	Island Council/ Utilities/ contractor	EPA and Regional Office
Stockpiles of Construction and Demolition wastes		✓					WMC sites	Materials	Ensure waste materials are either reused by community or removed from island at the end of construction phased activities	Island Council/ Utilities/contractor	EPA and Regional Office
Poor operation of waste facilities leading to:											
Noise nuisance to nearby residences.		✓					IWMC activities	Ensure IWMC activities occur between 8 am and 4 pm	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office
Vector breeding raptor, litter, public health		✓					IWMC activities	Ensure (i) organic wastes are stored in covered bins, (ii) cans are crushed and stored undercover or in covered bins	Weekly inspections and quarterly reviews	Island Council	EPA, Ministry of Health, Regional Office
Odour nuisance to nearby residences.		✓					IWMC activities	Ensure (i) organic waste is stored in covered bins (ii) secondary collection from IWMC occurs at least weekly (iii) provide composting training.	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office
Workplace health & safety		✓					IWMC activities	Ensure (i) employees are equipped with boots, gloves and coveralls (ii) adequate	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office

IMPACT	Potential Significance*						LOCATION	Mitigation Measure	Recommended Monitoring	Institutional Responsibility	
	No Impact	Impact Unknown	No Significant Impact	Significant						Implementing Agency	Support Agency
				L	M	H					
								training in use of equipment (iii) adequate training in workplace health issues relating to handling of compost.. etc			
Poor secondary collection operations											
Litter, flotsam nuisance		✓					Harbour	Ensure (i) bins with closures are provided during vessel loading or storage of materials at harbour	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office
Workplace health and safety				✓			Harbour	Ensure (i) employees are equipped with boots, gloves and coveralls (ii) bins are fit for purpose	Weekly inspections and quarterly reviews	Island Council	EPA and Regional Office

APPENDIX C

CV and Certificates of Author

CURRICULUM VITAE *Ahmed Hassaan Zuhair*

PERSONAL DETAILS

- Full name: Ahmed Hassaan Zuhair
- Date of birth: 02 Aug 1985
- Mailing address: H. Raadha, Sikka Goalh, Male' 20082, Maldives
- Residential address: G.Vehi, Male', Maldives
- Mobile telephone number: (+960)7886707
- Email address: hassaan.zuhair@gmail.com

WORK EXPERIENCE

ENVIRONMENTAL AND SOCIAL SAFEGUARDS SPECIALIST

- Name of Employer: Maldives Clean Environmental Project (MCEP)
  World Bank
  Ministry of Environment and Energy, Male', Maldives
- Position title: Environmental and Social Safeguards Specialist
- Period of work: July 2018 to present
- Major Responsibilities:
  - Ensure environmental and social safeguard measures are adequately implemented in MCEP administered by the MCEP PMU/MEE.
  - Educate project affected families on the relevant environmental and social safeguards issues and relevant policies.
  - Where applicable, develop information, education and communication (IEC) materials and facilitate workshops on good environmental and social practices relevant to all projects administered by the PMU/MEE.
  - Co-ordinate with the various island administration offices on periodic basis on environmental issues.
  - Assist GoM in ensuring environmental responsibilities of the project, such as compliance with the environmental protection laws and regulations of the country.
  - Assist GoM in ensuring social responsibilities of the project, such as compliance with the labour laws, prohibition of child labour, HIV/AIDS and gender issues.
  - Ensure safeguard measures are adequately implemented.
  - Establish a grievance redress system and assist community in the redress of their grievances through the system.'

ENVIRONMENTAL AND SOCIAL SAFEGUARDS OFFICER

- Name of Employer: Maldives Clean Environmental Project (MCEP)
  World Bank
  Ministry of Environment and Energy, Male', Maldives
- Position title: Environmental and Social Safeguards Officer
- Period of work: June 2017 to June 2018
- Major Responsibilities:
  - Ensure environmental and social safeguard measures are adequately implemented in MCEP administered by the MCEP PMU/MEE.
  - Educate project affected families on the relevant environmental and social safeguards issues and relevant policies.
  - Where applicable, develop information, education and communication (IEC) materials and facilitate workshops on good environmental and social practices relevant to all projects administered by the PMU/MEE.
  - Co-ordinate with the various island administration offices on periodic basis on environmental issues.
  - Assist GoM in ensuring environmental responsibilities of the project, such as compliance with the environmental protection laws and regulations of the country.
  - Assist GoM in ensuring social responsibilities of the project, such as compliance with the labour laws, prohibition of child labour, HIV/AIDS and gender issues.
  - Ensure safeguard measures are adequately implemented.
  - Establish a grievance redress system and assist community in the redress of their grievances through the system.

ENVIRONMENT ANALYST

- Name of Employer: Ministry of Environment and Energy, Male', Maldives
- Position title: Environment Analyst (Coastal Unit)
- Period of work: March 2016 to May 2017
- Major Responsibilities:
  - Managing Coastal PSIP projects and donor assisted projects (ORIO and KAFED).
  - Ensuring the implementation of the project components are in line with the government policies and/or donor requirements.
  - Interacting with the financial, procurement and technical staff of the Ministry and EPA to enable smooth implementation of the project components.
  - Coordination among the stakeholders including the atoll/island councils, contractors and engineers in resolving various issues that come up during the implementation.
  - Processing bills raised by contractors.
  - Preparing and compilation of the project progress reports, quarterly reports and updates in a timely manner.
  - Providing information, monthly progress reports and other documentation requested by the Project Director for review and/or for presentation to Steering/Technical committees, donor review missions or by other relevant authorities of the Government in a timely manner.
  - Preparation of Terms of Reference, Tender Documents and Evaluation of Bids and Proposals.
  - Preparing Contract Documents and Contract Amendments.

- Monitoring the progress of project activities on a regular basis.
- Visiting project sites periodically and reporting back on the status of on-site activities to the management.
- Participating in EIA scoping meetings related to the project and guiding contractors in the EIA application process.
- Ensuring that the projects are formulated in an environmentally friendly and sustainable manner by consulting EPA and other relevant parties.

ENVIRONMENT ANALYST

- Name of Employer: Ministry of Environment and Energy, Male', Maldives
- Position title: Environment Analyst (Awareness Unit)
- Period of work: July 2010 to December 2013
- Major Responsibilities:
  - Conducting regional environmental awareness sessions in different atolls.
  - Conducting waste management workshops in different regions of Maldives.
  - Organizing and celebrating major environmental significant days at national level.
  - Preparing booklets, broachers and newsletters in view to increase public knowledge on existing environmental issues in Maldives.
  - Creating Environmental Awareness through Media.
  - Provided assistance to legal unit in drafting sold waste management regulation, standards on biodegradable plastic bags and Environmental impact assessment regulation.

ENVRIONMENT OFFICER (T)

- Name of Employer: Ministry of Environment, Energy and Water , Male', Maldives
- Position held: Environment Officer (Trainee)
- Period of work: February 2005 – July 2007
- Major Responsibilities:
  - Provide assistance in facilitating and carrying out various works in relation to environmental awareness and community mobilization.
  - Writing and publishing 2005 World Environment Day Awareness handbook.
  - Conducting a weekly environmental awareness raising radio program on national radio.

Additional Experience

- Registered EIA Reviewer in EPA (since April 2016)

• World Bank Procurement Training	September 2017 *Colombo, Sri Lanka*
• Training Program for Environmental Regulators	19-30 Nov 2012 *New Delhi, India*
• Consultation for the Asia-Pacific Region in preparation for the fifth session of the intergovernmental negotiating committee on mercury	31 Oct - 1 Nov 2012 *Bangkok, Thailand*
• Tbilisi+35: Intergovernmental conference on Environmental Education for Sustainable Development	6-7 Sept 2012 *Tbilisi, Georgia*
• Third Asia Pacific Regional Meeting on SAICM	8-9 Sep 2011 *Beijing, China*
• UNITAR Regional Workshop on Nanotechnology and Manufactured Nanomaterials	6-7 Sep 2011 *Beijing, China*
• UNEP/OECD Workshop on Perfluorinated Chemicals and transition to safer alternatives	5 Sep 2011 *Beijing, China*
• Seminar on Integrated Coastal Management for Developing Countries	Oct/Nov 2010 *Xiamen, China*
• Capacity building in ecosystem based management approaches for the Coastal areas in the Maldives	18 – 20 June 2007 *The University of Queensland*
• Training on preparation and interpretation of Climate Risk profile for the Maldives	20 – 21 Feb 2006 *Ministry of Environment, Maldives*

ACADEMIC RECORD

Name and address of institution	Degree obtained (Master and Bachelor only)	Study period from - to	Medium of instruction
Griffith University *170 Kessels Rd, Nathan QLD 4122, Australia*	Master of Urban and Environmental Planning	2 March 2014 – 15 December 2015	English
University of Mysore *Mysore, Karnataka, India*	Bachelor of Science	1 Jul 2007 – 30 Jun 2010	English
Centre for Higher Secondary Education *Male', Maldives*	London GCE Advanced Level	1 Jun 2002 -30 Jun 2004	English
Majeediyya School *Male', Maldives*	London GCE Ordinary Level	1 Jan 1999 – 31 Jan 2002	English

AWARDS / HONOURS/ COMMENDATIONS

- PIA (Planning Institute of Australia) Awards for Planning Excellence 2015 - Commendation for Outstanding Student Project "Connected with Water: Integrated and Adaptive Water Management Framework" – University Sponsored by Queensland Government.
- Griffith Award for Academic Excellence 2015.
- Griffith Award for Academic Excellence 2014.
- Australia Awards Scholarship 2014.
- Certificate of Acknowledgement in recognition of outstanding contribution to Earth Hour campaign 2013.
- Certificate of Achievement (Discipline Prize), Majeediyya School.
- Certificate of Achievement (Passed in all curriculum subjects), Majeediyya School.

RESEARCH EXPERIENCE PUBLICATIONS

- Coauthor of Environmental Impact Assessment Report for the proposed tourist jetty at Hulhumale' (June 2018).
- Author of Environmental Management Plan for the proposed development of Island Waste Management Center in F. Magoodhoo (December 2017).
- Author of Environmental Management Plan for the proposed development of Island Waste Management Center in Dh. Rinbudhoo (January 2018).
- Author of Environmental Management Plan for the proposed development of Island Waste Management Center in Th. Vandhoo (September 2017).
- Coauthor of Environmental Impact Assessment Report for the proposed agricultural project at R. Ungulu.
- Coauthor of Environmental Impact Assessment Report for the proposed 10 storey residential development at H. Sandhaleege.
- Connected with Water: Integrated and Adaptive Water Management Framework for South East Queensland (Studio Project, Griffith University).
- Urban Analysis of Brisbane CBD – Case Study (Studio Project, Griffith University).
- Feasibility Study for Low Density Residential Development in Park Ridge Queensland (Studio Project, Griffith University).

- Effects of leachates on the quality of ground water (Bachelor of Science Dissertation, University of Mysore).
- Pemphis Newsletter Issue number 22 – 40 (Publication of Ministry of Environment and Energy).
- Environment Impact Assessment Regulations 2012 (Publication of Ministry of Environment and Energy).
- Standards on Biodegradable Plastic Bags 2012 (Publication of Ministry of Environment and Energy).
- State of the Environment of Maldives 2011 (Publication of Ministry of Environment and Energy).

REFEREES

- Professor Darryl LOW CHOY
  Professor – Environment and Landscape Planning
  Urban Research Program

  Head of Discipline (Planning)
  School of Environment
  Griffith University
  Brisbane, QLD 4111 Australia

  Program Co-Leader
  Program B: Waster Sensitive Urbanism
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- Dr Tooran Alizadeh
  Lecturer, Urban & Environmental Planning
  Griffith School of Environment
  Griffith University
  Brisbane, QLD 4111 Australia
  E: t.alizadeh@griffith.edu.au

- Ahmed Murthaza
  Director General, Waste and Pollution Control Department
  Ministry of Environment & Energy, Male', Maldives
  Work: (+960) 3004315 / Mobile: (+960)7771504

Sincerely,

Ahmed Hassaan Zuhair

Griffith UNIVERSITY
Queensland, Australia

Maldives Qualifications Authority
Male', Maldives
RECOGNITION OF QUALIFICATIONS
According to Maldives National Qualifications Framework, this qualification is recognized as a
Level 9 MASTER'S DEGREE
Name: Nazima Mohamed
Signature: Nazima Date: 5.1.2016

By the authority of the Council

Ahmed Hassaan Zuhair

is hereby granted the

MASTER OF URBAN AND ENVIRONMENTAL PLANNING

under the Common Seal of Griffith University

on the 15th day of December 2015

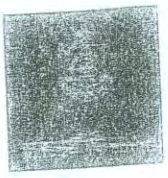
Maldives Qualifications Authority
Male', Maldives
Attestation
This is a true copy of the original of this document, attested without alteration.
on behalf of MQA
Aminath Rasheeda
Signature: Date: 5.1.2016

Ian O'Connor.
Vice Chancellor and President

Griffith UNIVERSITY

Henry Smerdon
Chancellor

UNIVERSITY OF MYSORE
ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯ



We, the Chancellor, the Pro-Chancellor, the Vice-Chancellor and Members of the Syndicate of the University of Mysore do hereby certify that

ಮೈಸೂರು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಕುಲಾಧಿಪತಿಗಳು, ಸಮಕುಲಾಧಿಪತಿಗಳು, ಕುಲಪತಿಗಳು ಹಾಗೂ ಸಿಂಡಿಕೇಟಿನ ಸದಸ್ಯರಾದ ನಾವು

AHMED HASSAAN ZUHAIR

has been awarded the Degree of

ಅವರು ಯುವರಾಜ ಕಾಲೇಜು, ಮೈಸೂರು (ಸ್ವಾಯತ್ತ ಸಂ. UGC No. F 13.2/2004/Desk/Ac Dated 28-01-2005) ನಿಗದಿತ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಉತ್ತೀರ್ಣರಾಗಿರುವುದರಿಂದ

BACHELOR OF SCIENCE

ಬ್ಯಾಚೆಲರ್ ಆಫ್ ಸೈನ್ಸ್

on being duly certified to have passed the prescribed examination conducted by

YUVARAJA'S COLLEGE, MYSORE
(Autonomous vide UGC No. F 13.2/2004/Desk/Ac Dated 28-01-2005)

ಪದವಿಯನ್ನು ಅವರಿಗೆ ಪ್ರದಾನ ಮಾಡಲಾಗಿದೆಯೆಂದು ಪ್ರಮಾಣೀಕರಿಸುತ್ತೇವೆ

Reg. No. and Year YB071137 MAY / JUNE 2010
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Class FIRST CLASS WITH DISTINCTION

Given under the seal of the University
ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಮೊಹರಿನೊಂದಿಗೆ ನೀಡಲಾಗಿದೆ

Date of Convocation 10/04/2011
ಪಟ್ಟಿಕೋತ್ಸವದ ದಿನಾಂಕ

Mysore/ಮೈಸೂರು

Sl.No./ಕ್ರಮ ಸಂಖ್ಯೆ № 0738

Vice-Chancellor
ಕುಲಪತಿ

Maldives Qualifications Authority
Male', Maldives
RECOGNITION OF QUALIFICATIONS
According to Maldives National Qualifications Framework, this is recognized as a Level 7 (SEVEN) qualification
Name: ABDUL WAHID IBRAHIM
Signature: Date: 21.7.2017

Ministry of Environment and Energy
ATTESTATION
This is a true copy of the original of this document, attested without alteration
Name: MIRUZA Mohd Designation: A. DIRECTOR
Signature: Date: 14/07/2017

Maldives Qualifications Authority
ATTESTATION
This is a true copy of the original of this document, attested without alteration
On behalf of MQA
AMINATH RASHEEDA
Signature: Date: 21/7/2017

APPENDIX D

A3 Map of the Project Site


LH. KURENDHOO IWMC
SITE LAYOUTS 04.07.18
PROPOSED IWMC BOUNDARY
EXISTING IWMC BOUNDARY

APPENDIX E

Guidelines for Environmental Closure of Small Open Dump Sites

Guidelines for Environmental Closure of Small Open Dump Sites

The following guidelines are developed in line with recommendations made via the Guidelines for Design and Operation of Municipal Solid Waste Landfills in Tropical Climates prepared by the International Solid Waste Association in 2013 and have been amended to suite the project context.

1. Environmental Closure Methods

In the context of the Maldives and current solid waste management practices the following two principle 3 methods should be adopted to environmentally close the current waste management locations. Field evaluations have shown that these sites contain small open dump sites, where inorganic waste material such plastics, glass metal have been mixed with garden waste and soil.

1. Closing by covering the waste (in-place method)
2. Closing by removing the waste from the site (evacuation method)

However, in the context of the Maldives the

Which option to use should be explored via the feasibility studies to be conducted for each island, taking into consideration the sustainability and affordability of waste management options in the local context, all the while remaining cognizant of trying to affect real improvement in relation to the actual and potential environmental effects of the dump site?

When choosing a closure/upgrading method it should be borne in mind, that it is not always the most technically advanced solution that is the most appropriate. Depending on the situation, simple improvements of operational aspects (such as applying cover soil and eliminating open burning) can often result in marked site performance and greatly reduced environmental impacts. The key principle should always be to keep things simple and sustainable in a local context, while maximizing actual improvement in environmental performance.

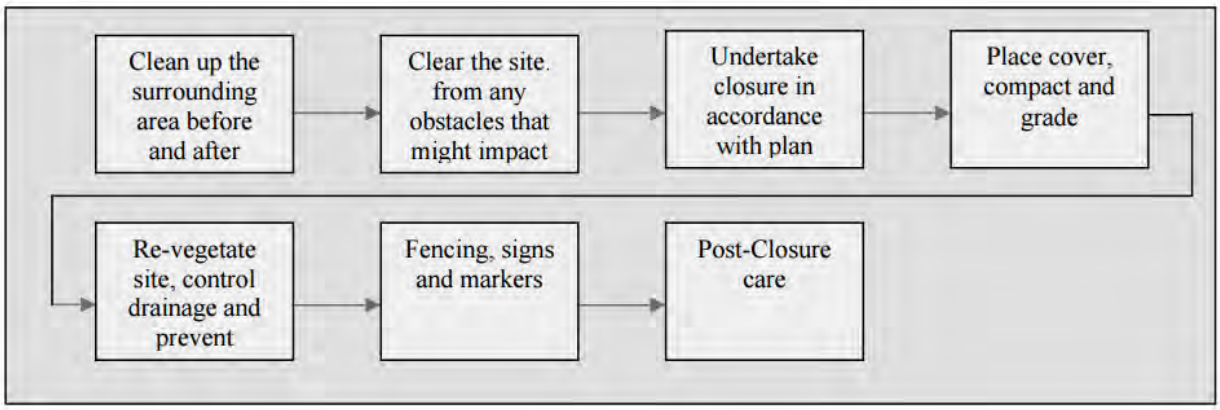
1.1. In-Place Closure

This method is the most commonly used option. The solid waste is left at the site and covered with a layer of local soil and re-vegetated. The function of the cover layer is to:

- Reduce waste exposure to wind and vectors
- Prevent people and animals from scavenging
- Control odor
- Minimize the risk of fires
- Stop people from using the site
- Control infiltration of rainwater / surface water
- Control migration of landfill gas
- Serve as growth medium for vegetation
- Support suitable post-closure activities

The ability of the cover layer to limit infiltration of water into the dump is an essential environmental protection measure. This is achieved through a suitable combination of cover soil type, thickness, slope and vegetation. In other than very arid conditions a clay cover layer is best suited as it minimizes leachate production, and controls landfill gas migration and odor. The durability of the cap layer and the degree of resistance that the cover offers to infiltration are important design considerations. What constitutes a suitable cap design is site specific and depends on the climate, locally available soil materials and plant

types, the extent of protection necessary for the local aquifer and surface water systems etc. Typical operational steps for in-place closing of an open dump are shown in the figure below.



When deciding on a suitable final contour for the closed dump, consideration should to be given to the management of surface water and erosion in the Post- closure period. Post closure care may be defined as requirements placed upon solid waste management facilities after closure to ensure environmental impacts are controlled and public health and safety are adequately maintained, for a specified number of years after closure (typically 20 years may be considered and appropriate period of time for Post-closure care of an open dump).

1.1.1. Basic Principles of In-Place Closure

The following steps need to be adhered to during the closure process:

- The dumpsite should be cleaned up and demarcated in a manner that will prohibit public access in order to avoid risk to the public. Recyclables should be separated to be managed appropriately.
- After closing the site to public access, the facility and surrounding area should be cleaned up so that any waste piles or piles of metallic materials, burnable materials, debris, and windblown paper are consolidated and placed in a final disposal cell for final covering.
- Particular attention should be given to any environmentally sensitive areas where waste may have been piled too steeply, may have been placed in or next to wetlands or beaches, or where wastes have been placed in drainage ways or in areas that impede surface water drainage.
- Site closure should help moderate the environmental impact of such improper disposal.
- As appropriate, waste materials may need to be moved or relocated to higher portions of the site, or the waste may be placed in appropriate areas to help sloping of the closed site.
- It is important to promote surface water drainage from landfill areas in order to keep surface water from filtering into and through the garbage, thus creating a hazard of ground water and surface water degradation.
    - A primary concern of site closure is the slope of filled portions of the site to promote surface water runoff without causing ponding or severe erosion of the final cover.
- The slope or grade of the land and the length strongly affects soil erosion of the slope.
    - Final slopes of filled portions of the landfill site should be at least 2 percent in grade and should not exceed 8 percent in grade.
    - Slopes of up to 12 percent may be used where the slope length is short and run off is not concentrated or increased by adjacent slopes.
- Terraces, waterways, diversions or other measures should be used as appropriate to minimize soil erosion. The USDA Universal Soil Loss Equation may be used to predict soil loss and the life of the cover.

1.1.2. Application of a Final Cover in In-Place Closure

- After the open landfilled areas have been sloped and all waste buried, compacted, and covered, an inert waste landfill site should be covered with at least 20-25 inches of clay-rich soil and 36 inches for municipal solid waste landfills that contain organic matter.
- In the Maldives due to the lack of abundant clay-rich soil, more dense sandy soil may be used.
- This final cover of soil should be placed in layers.
    - The first or deepest being about 12 inches for inert waste landfills or 18 inches for municipal solid waste landfills, which should be carefully compacted in six-inch lifts to minimize surface water infiltration. Compaction testing of this "barrier layer" may be required to ensure the soil material be properly placed.
    - An additional 12-18 inch of soil material should be placed over the compacted clay layer to help protect it from damage due to erosion, plant roots, vehicular traffic, freezing and thawing, etc. This "buffer layer" also provides a rooting depth for the final vegetative cover.
    - Based on site conditions, additional layers may be desirable. At least six inches of topsoil or suitable plant growth material such as compost, should be spread over the site.
    - Where possible Soil nutrient testing of the topsoil is suggested. Soil pH, nitrogen, potassium, phosphorous, conductivity, bulk density, and organic matter are suggested parameters.
    - Based on this analysis, appropriate organic matter may be added to the topsoil to increase fertility.

1.1.3. Site Revegetation and Long Term Management

- The site should be revegetated when practicable to a mixture of native grass or shrub species as recommended by the local environmental protection agency.
- Tree plantings may be placed around the landfill site, however, unless special precautions are taken, trees should not be planted on top of the landfill and should not be planted in positions which will cause excessive soil drifting on the landfill.
- Tree plantings help improve the aesthetics of the landfill site and may improve the site for long term use as wildlife habitat, scenic areas, etc.
- As appropriate, the landfill site may need additional covering applied, additional erosion control structures installed, and/or reseeding of the vegetative cover.
- In the post-closure period there may be regulatory requirements to establish a monitoring programme to assess risks over the long term. The basic principles are as follows, to:
    - Maintain the Integrity of the Cover layer through regular maintenance to address:
        - Settlement, cap subsidence, slope instability and vegetation cover
        - Storm water run-off / run-on drainage controls, and drain and cap erosion
    - Operate, Monitor and Maintain
        - Leachate management system (if any)
        - Landfill gas controls and wells (if any)
        - Groundwater wells; stream sampling (if any)

1.2. Evacuation Method-Removing Waste

- With this method the solid waste in the open dump is excavated and disposed off-site (typically to a sanitary landfill, or a waste incineration plant). As no sanitary landfills are currently located in the Maldives the final disposal option will be incineration at the Regional Waste Management Center in the North in Vandhoo Island in the Raa Atoll.
- Where possible, from the large amounts of accumulated cans, bottles, metal and plastic waste found in the dumpsites of inhabited islands the option of sourcing them to recyclers or companies that partake in resource recovery should be explored.

- For all such material that can be incinerated as per the National Incineration guidelines, the MEE along with WAMCO should facilitate with the IWMC and organize for the material to be transported accordingly to the incineration plant at Vandhoo.
  In the event that transportation to the Vandhoo facility will not be financially viable a second option is, once a site for the Regional Waste Management Center for Zone IV has been established, an onsite storage facility should be constructed and all material that can be incinerated should be transported via barge to this location and stored. The material can be sourced for initial testing and commissioning of the incinerator.
- All material that cannot be incinerated nor has a recyclable/resource value should be sorted should be either incorporated in to the existing open dump site prior to In-Place Closure.
- In the case of the small-medium scale open dump piles that are mixed with soil and other organic matter, unless properly sorted, incineration will not be an option. Thus for these In-Place Closure should be adopted.

APPENDIX F

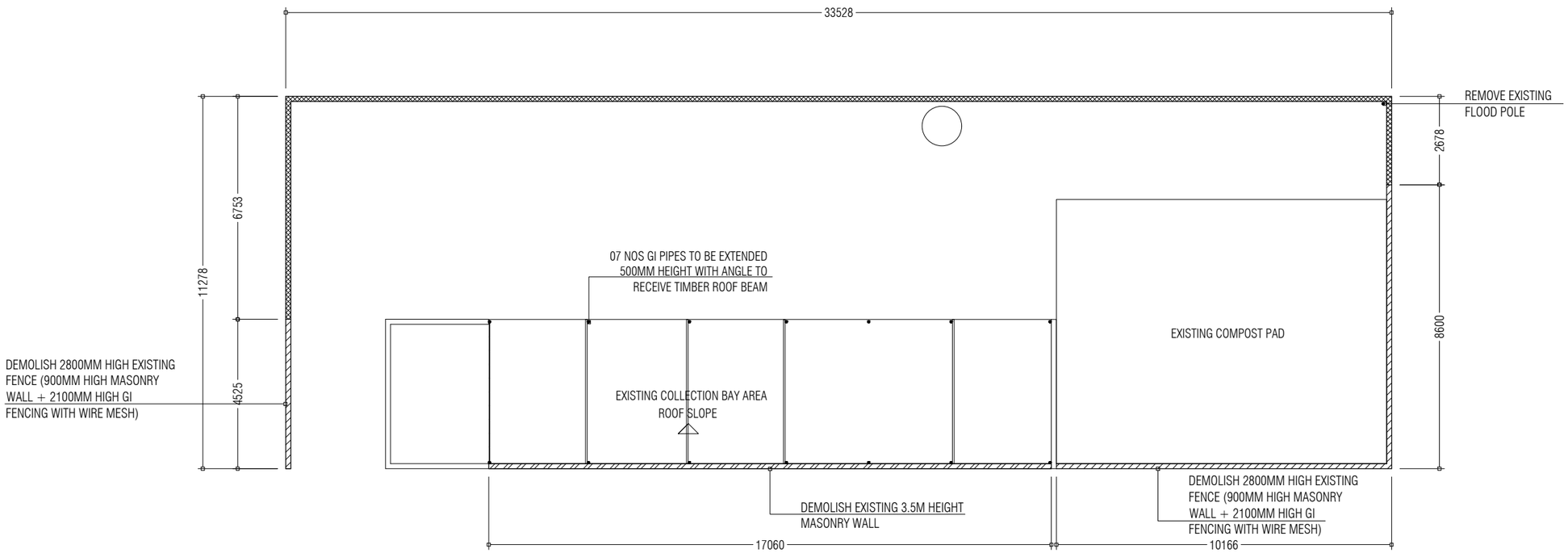
Detailed Engineering Drawing

UPGRADING OF LH. KURENDHOO ISLAND WASTE MANAGEMENT CENTRE

PREPARED BY:

MALDIVES CLEAN ENVIRONMENT PROJECT
MINISTRY OF ENVIRONMENT AND ENERGY

2018



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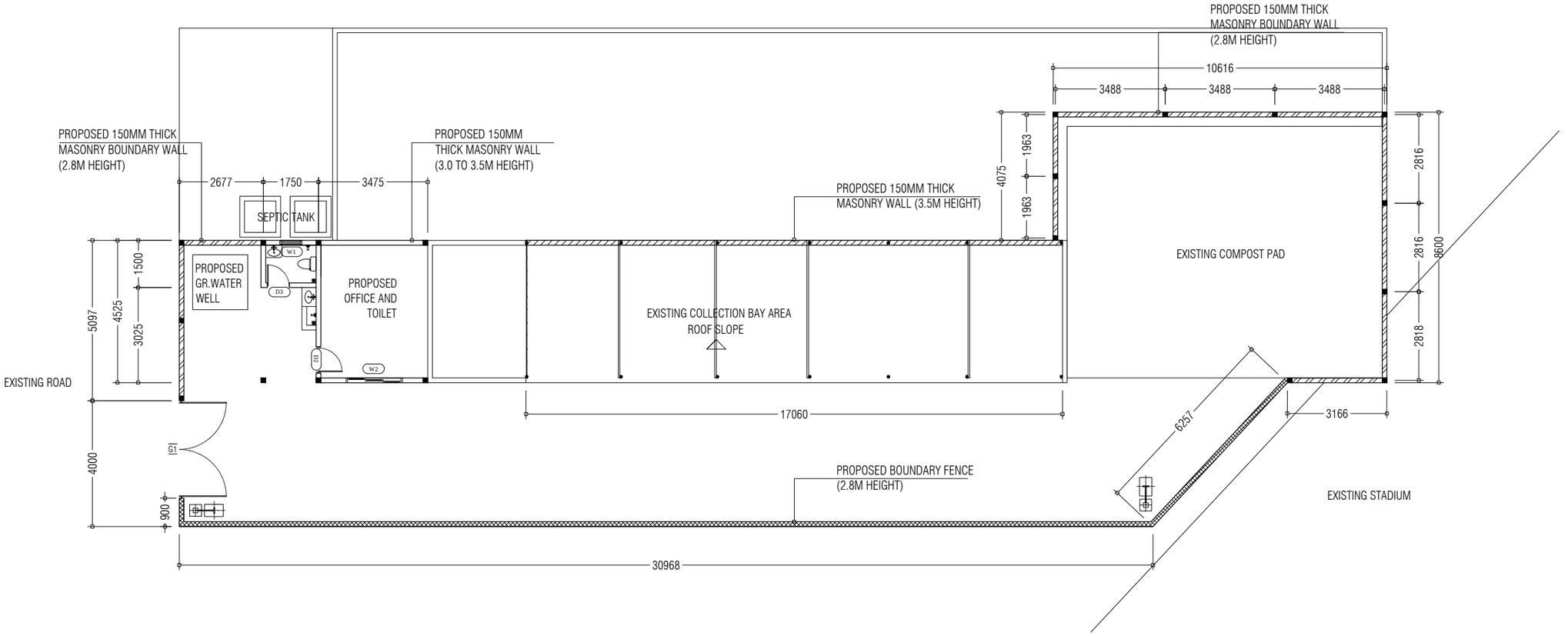
MCEP MINISTRY OF ENVIROMENT AND ENERGY GREEN BUILDING, HANDHUVAREE HIGUN, MAAFANNU, MALE' (20392), REPUBLIC OF MALDIVES, TEL: +960-3018431, +960-3018300, FAX: +960-328301	TITLE DEMOLITION PLAN	STRUCTURE BY AFRAZ	
	CLIENT DEPARTMENT WMPC DEPARTMENT	DRAWN BY AFRAZ	
	PAPER SIZE A3 PAGE NO. 01	SCALE 1:150 DWG NO. KUR A1-01 DATE 08.07.2018	



NOTE:

- 3500mm HEIGHT WALL [150mm HOLLOW BOCK]
- 2800mm HEIGHT PERIMETER WALL [150mm HOLLOW BOCK]
- PERIMETER FENCE [150mm HOLLOW BOCK]

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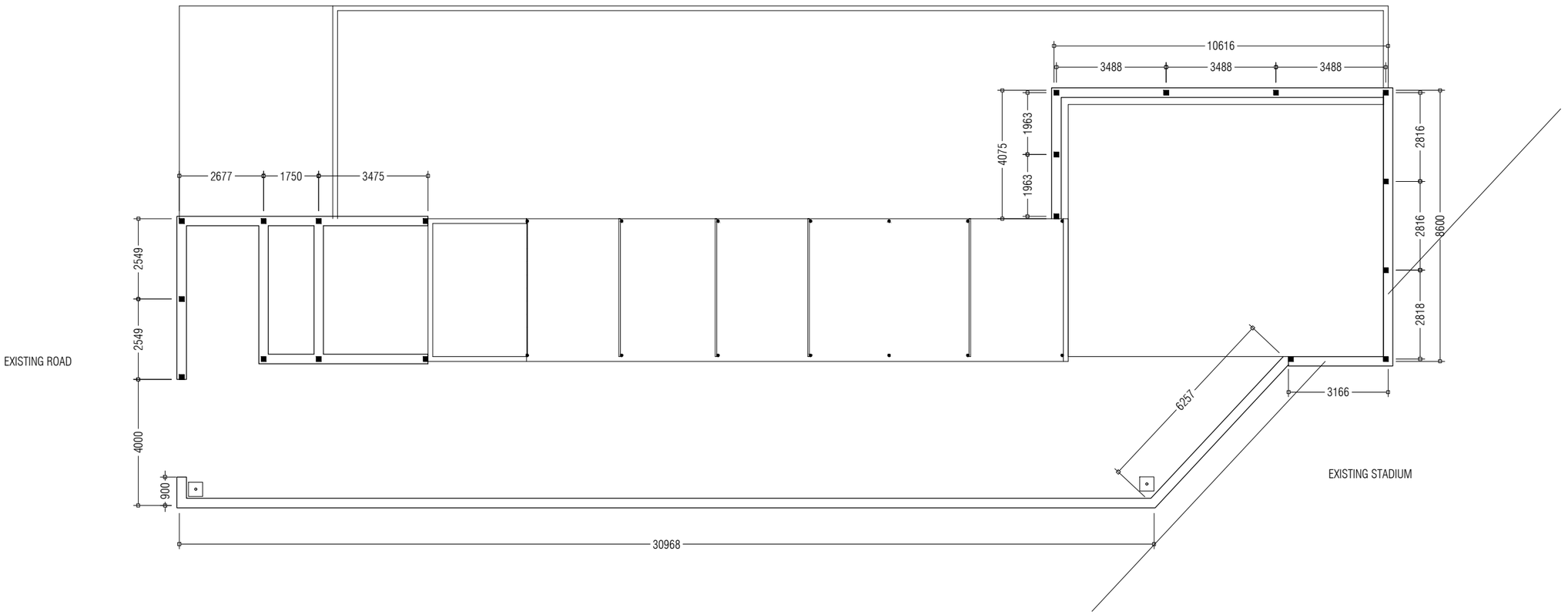

NOTE:

- FOUNDATION BEAMS [300mm width]
- COLUMN, C1 [150X150mm]
- LAMP POST FOOTING [450X450mm]

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	UPGRADING OF WASTE MANAGEMENT CENTRE LH. KURENDHOO	AFRAZ	
	TITLE	STRUCTURE BY	
	FOUNDATION BEAM PLAN	AFRAZ	
	CLIENT DEPARTMENT	DRAWN BY	
	WMPC DEPARTMENT	AFRAZ	
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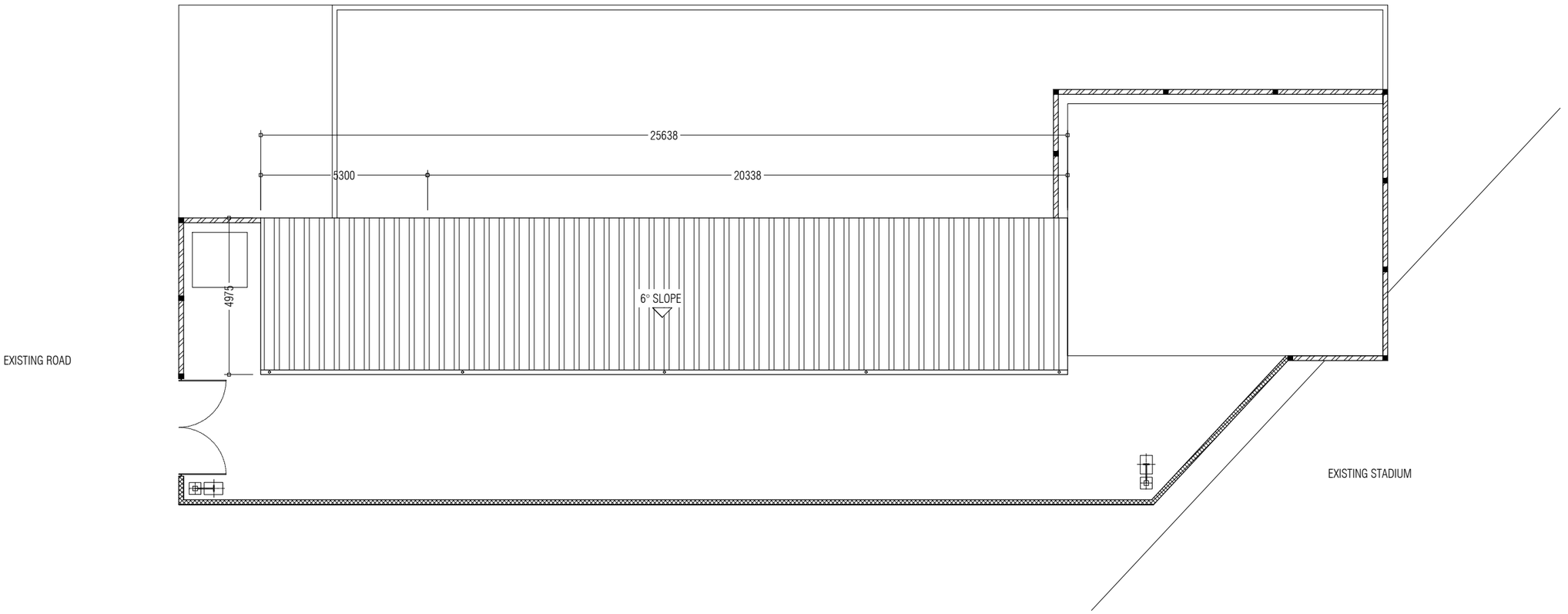

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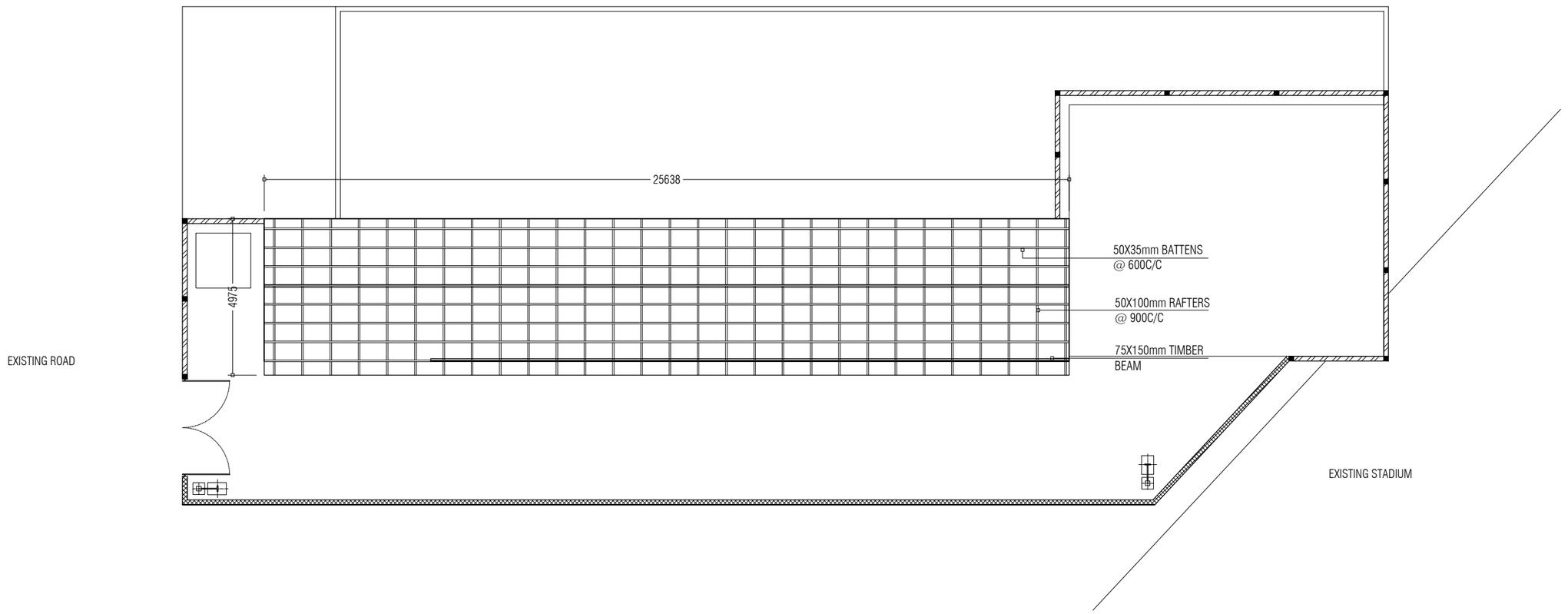

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PROJECT	UPGRADING OF WASTE MANAGEMENT CENTRE LH. KURENDHOO
TITLE	ROOF STRUCTURE PLAN
CLIENT DEPARTMENT	WMPC DEPARTMENT
PAPER SIZE	A3
PAGE NO.	05
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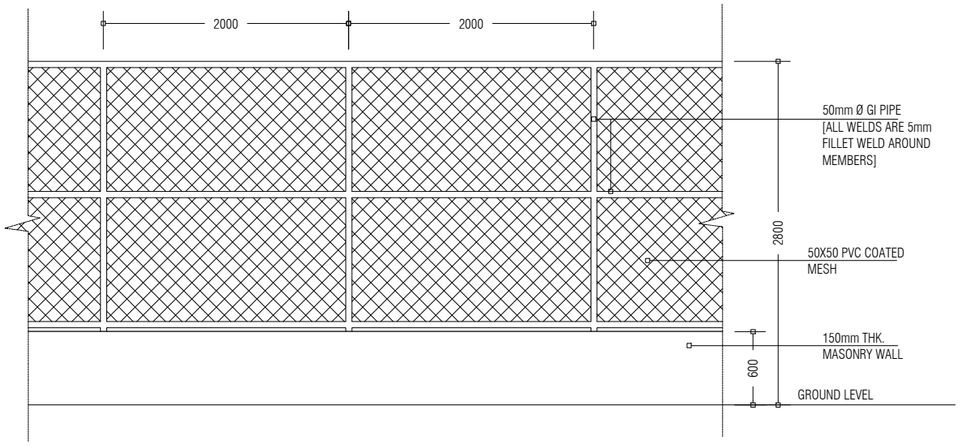
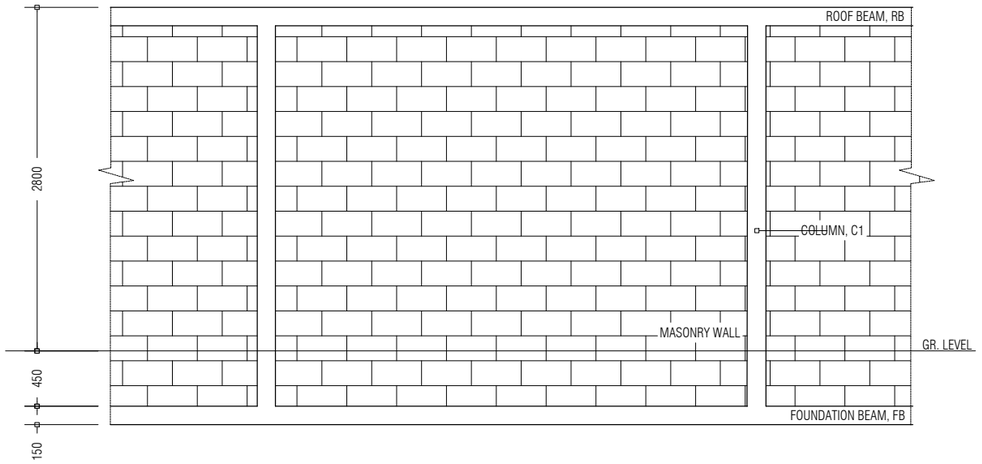
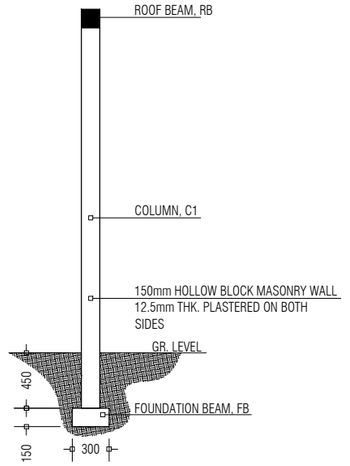
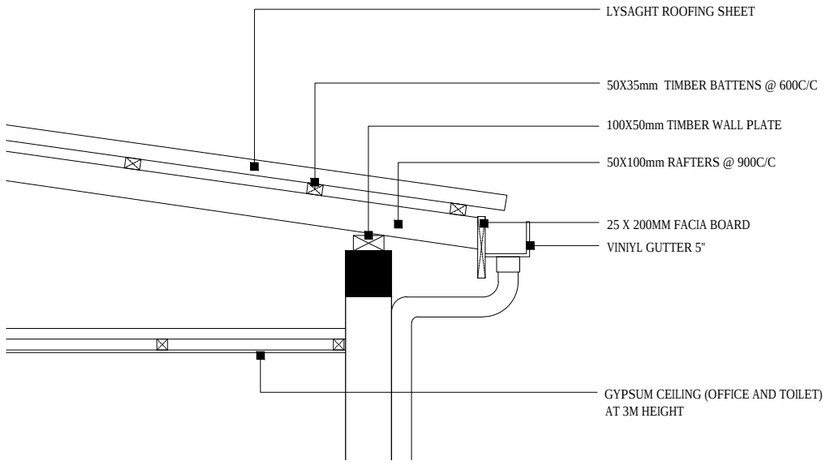
DATE	08.07.2018

AMENDMENTS









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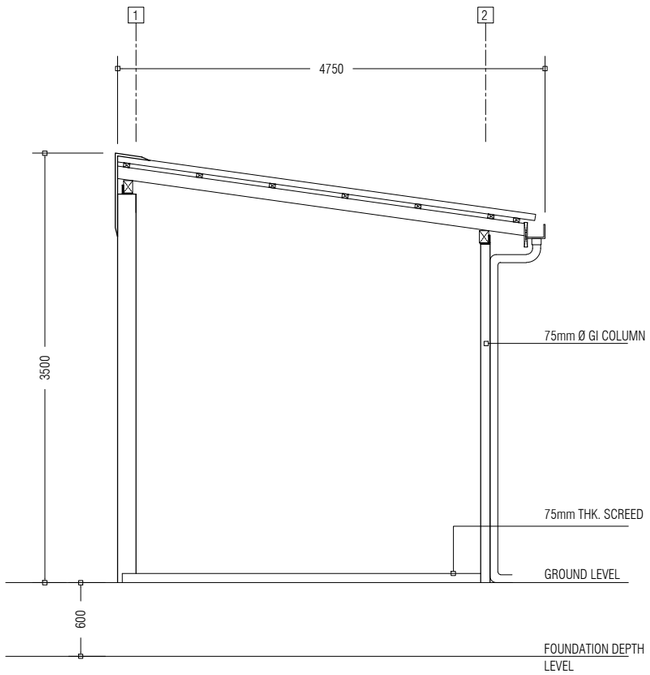
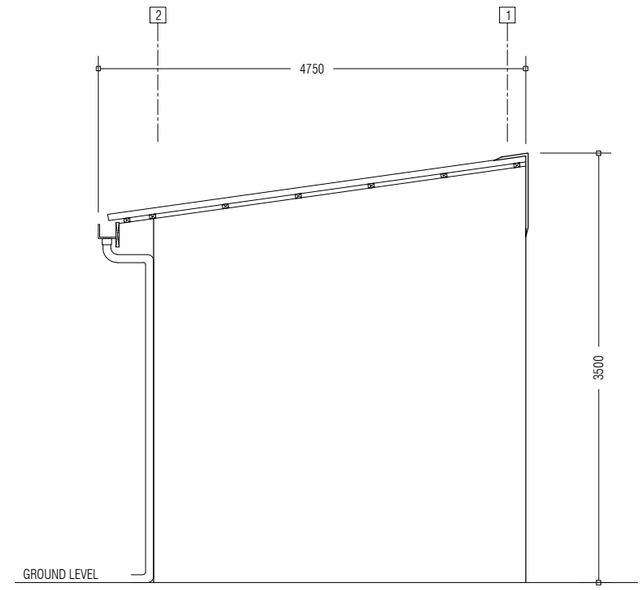


COLLECTION BAY SECTION



COLLECTION BAY ELEVATION

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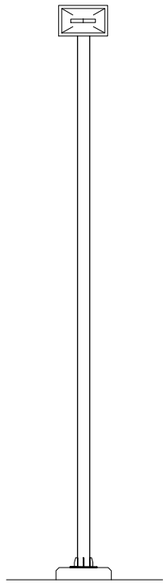
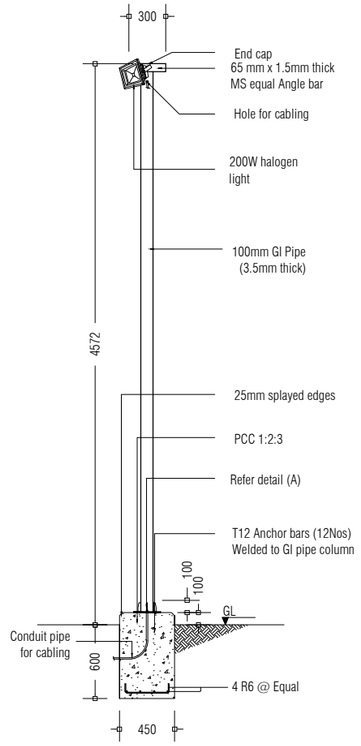
		DATE 08.07.2018	



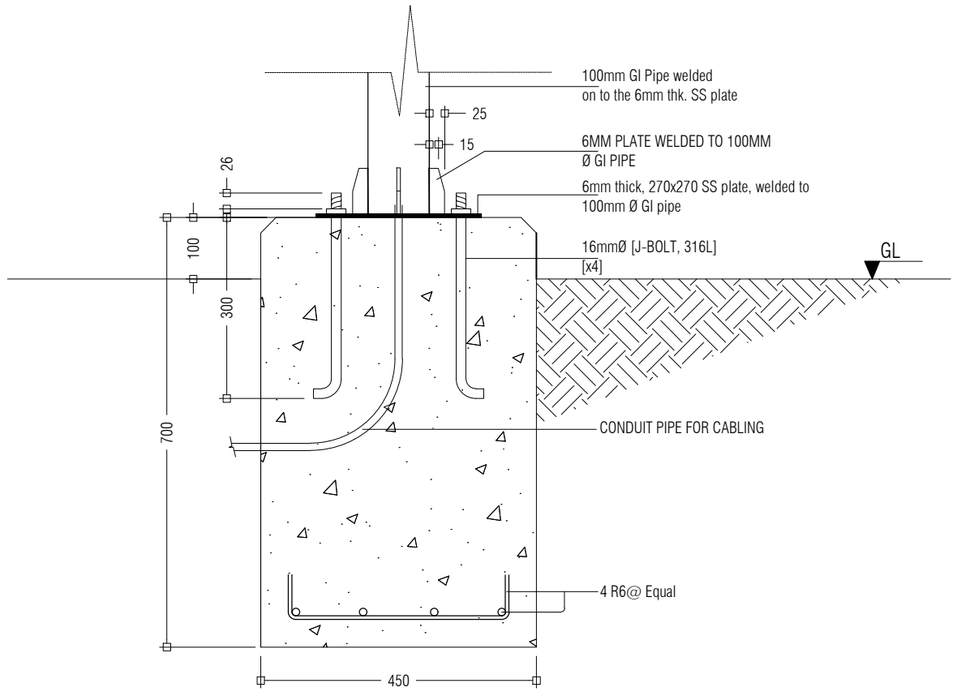
LIGHT POST
Scale 1:50



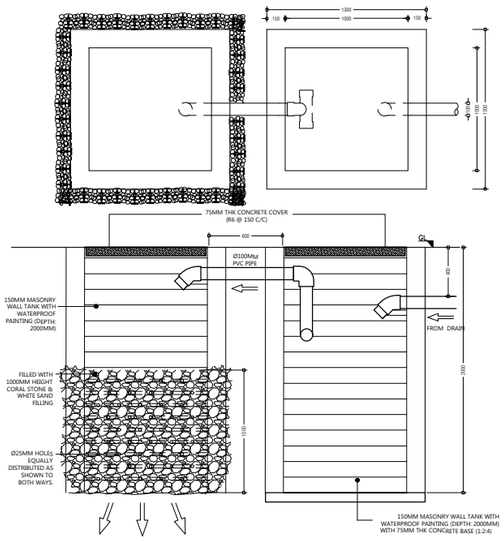
LIGHT POST DETAIL
Scale 1:50

Note:

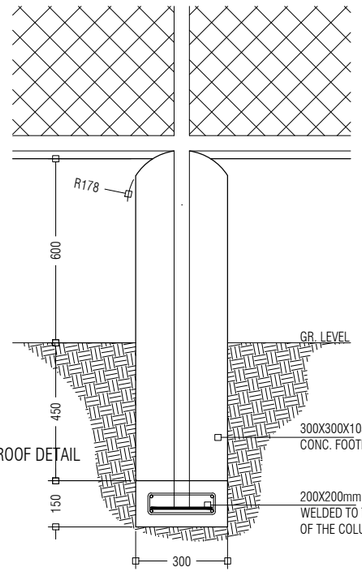
* Concrete cover: 50mm
* GI pipe to be painted with 1 coat of sealer
  & 2 coats of finishing paint. (Sigma, maroon colour)



LIGHT POST FOUNDATION FOOTING DETAIL 1:10

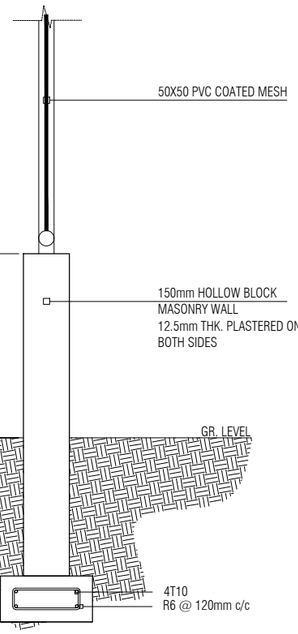


SECTIONAL ELEVATION

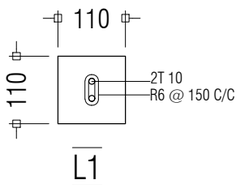


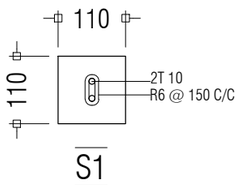
ROOF DETAIL

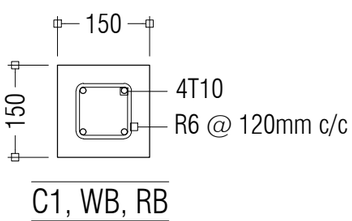
PERIMETER FENCE FOUNDATION DETAIL

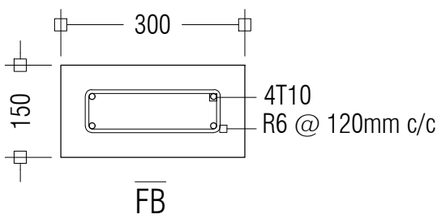


PERIMETER FENCE WALL FOUNDATION DETAIL

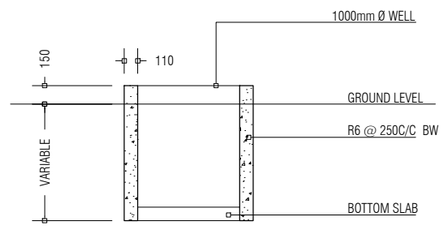








COLUMN AND BEAM DETAILS



ground water well

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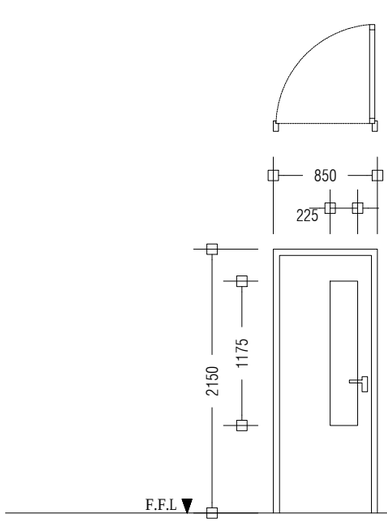

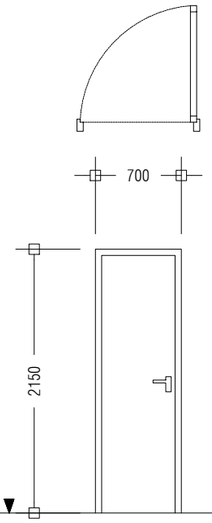

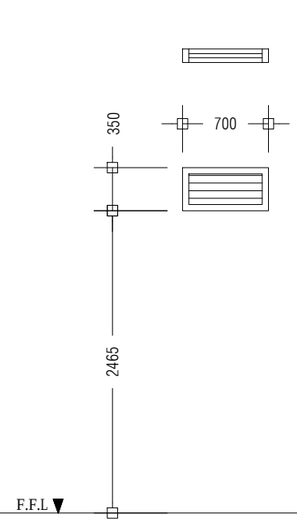

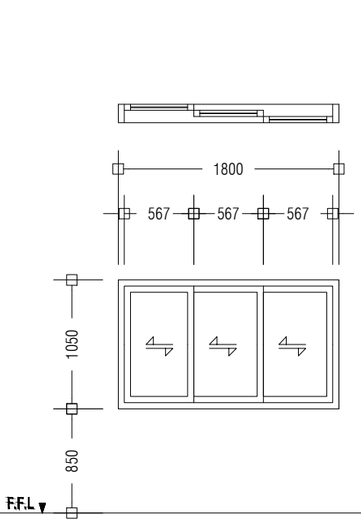

D2	SWING TYPE DOOR
REMARKS	ALUMINUM DOOR WITH CLEAR GLASS PANEL 01 DOOR KNOB WITH LOCK SET 04 HINGES DOOR STOPPER, FINISHED WITH WHITE COATED PAINT
LOCATION	GROUND FLOOR
QUANTITY	NO.S 01
OPEN AREA	1.83 m²

D3	SWING TYPE DOOR
REMARKS	ALUMINIUM DOOR WITH DOOR KNOB AND 1 LOCK SET
LOCATION	GROUND FLOOR
QUANTITY	NO.S 01
OPEN AREA	1.51m²

W1	ALUNINIUM LOUVER WINDOW
REMARKS	ALUMINUM FRAMED, ALUMINIUM LOUVERED, FINISHED WITH WHITE COATED PAINT
LOCATION	GROUND FLOOR
QUANTITY	NO.S 1
OPEN AREA	0.15 m²

W2	ALUMINIUM SLIDING WINDOW
REMARKS	ALUMINUM FRAMED, TINTED BLACK GLASS, FINISHED WITH TIMBER POWDER COATED PAINT
LOCATION	GROUND FLOOR
QUANTITY	NO.S 01
OPEN AREA	1.89 m²

APPROVED BY

MCEP
MINISTRY OF ENVIROMENT AND ENERGY
GREEN BUILDING, HANDHUVAREE HIGUN,
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PROJECT	UPGRADING OF WASTE MANAGEMENT CENTRE LH. KURENDHOO
TITLE	DOOR AND WINDOW SCHEDULE
CLIENT DEPARTMENT	WMPC DEPARTMENT
PAPER SIZE	A3
PAGE NO.	08

DESIGN BY	AFRAZ
STRUCTURE BY	AFRAZ
DRAWN BY	AFRAZ
SCALE	1:150
DWG NO.	KUR A1-08
DATE	08.07.2018

AMENDMENTS

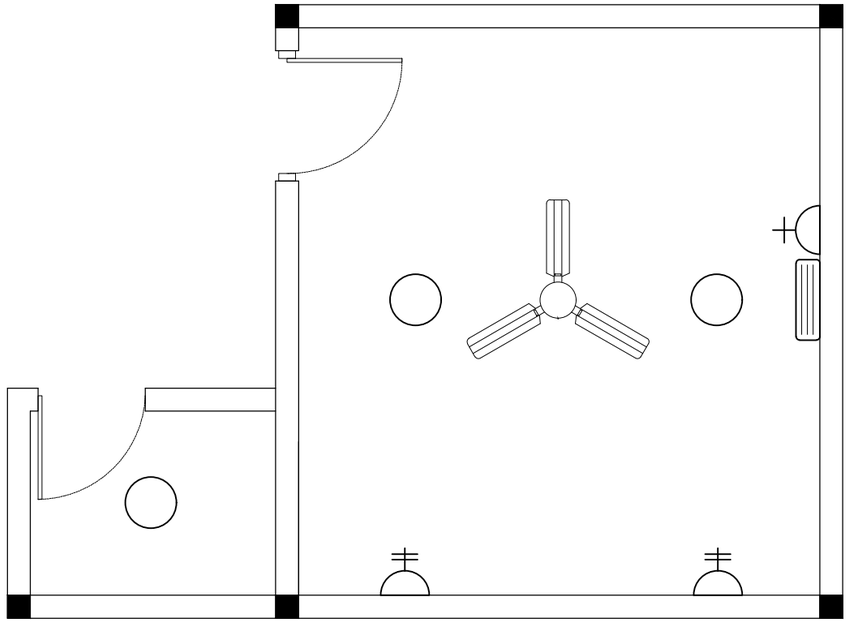
18W CEILING MOUNT LIGHT (WARM WHITE)

13AMP DOUBLE SOCKET

3 PHASE, 15A POWER POINTS [1.5m ABOVE GROUND]

CEILING FAN

EMERGENCY LIGHT WITH POWER SOCKET



OFFICE/TOILET

MCEP
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APPROVED BY	
PROJECT	UPGRADING OF WASTE MANAGEMENT CENTRE LH. KURENDHOO
TITLE	ELECTRICAL LAYOUT
CLIENT DEPARTMENT	WMPC DEPARTMENT
PAPER SIZE	A3
PAGE NO.	09
DESIGN BY	AFRAZ
STRUCTURE BY	AFRAZ
DRAWN BY	AFRAZ
SCALE	1:40
DWG NO.	KUR A1-09
DATE	08.07.2018
AMENDMENTS	

APPENDIX G

Bill of Quantities

CONSTRUCTION OF WASTE MANAGEMENT CENTRE
Bill of Quantities

No	Item	Unit	Quantity	Rate	Amount
1	**Preliminaries**				
1.1	Mobilization to site	LS	1		
1.2	Site management cost including set up of tempory services for contractor's services as maybe ncessary	LS	1		
1.3	Setup sign boards on site as specified	LS	1		
1.4	Clean up site upon completion of works	LS	1		
1.5	Demobilization	LS	1		
2	**Site preparation works**				
2.1	Demolition of existing masonry walls of collection bay as shown in drawing.	LS	1		
2.2	Demolition of existing perimeter fence and wall as shown in drawing.	LS	1		
2.3	Removal of existing roofing sheets and roof framing of existing collection bay area. The materals shall be removed in such a way that these can be re-used to change roof slope.	LS	1		
3	**Earth works**				
	Allow for all excavation work as follows				
3.1	Office and toilet foundation beam	m3	2.99		
3.2	Perimeter fence foundation beam	m3	7.43		
3.3	Perimeter wall foundation beam	m3	6.17		
3.4	Flood light pole foundation	m3	0.24		
3.5	Septic tank	LS	1.00		
3.6	Ground levelling and compaction works for ground slab works for office and toilet.	m^2	24.01		
3.7	Setting up a 900mm dia ground water well in the location shown	LS	1		
4	**Concrete works**				
	Office/Toilet Building				
4.1	Provide 75mm concrete floor screed with slope in toilet towards drain. Reinforcement for the slab shall be R6@150 BW single layer.	m3	1.38		
4.2	Wall Footing beam cast according to drawing. Reinforcement shall be as shown on drawing	m3	1.09		
4.3	Roof beams cast according to drawing. Reinforcement shall be as shown on drawing.	m3	0.35		
4.4	Columns cast according to drawing. Reinforcement shall be as shown on drawing.	m3	0.47		
	Perimeter Wall				
4.5	Perimeter wall columns	m3	1.23		
4.6	Perimeter wall foundation beam	m3	1.54		
4.7	Perimeter fence column footings	m3	2.05		
4.8	Perimeter fence foundation beam	m3	1.86		
	Other				
4.9	Foundation for flood light pole	m3	0.28		
4.10	Ground water well (900mm dia) casting work. Rate shall include setting the well in place to the required depth based on ground water level, including bottom slab and cover slab.	LS	1		
5	**Structural steel works**				
	Perimeter fence				

No	Item	Unit	Quantity	Rate	Amount
5.1	Perimeter fence using 50mm G.I pipe as shown on drawing. GI pipes GI pipes taken from existing fence shall be used for horizonta members. New GI pipes shall be used for GI fence columns. Rate shall include all cuttings, weldings, applying of protective coating for welded joints, and, setting up the fence.	m	38.30		
	Flood light pole				
5.2	Provide 75mm G.I pipe as flood light fixing poles. Rate shall include installation charges as shown on drawing.	Nos	2		
6	**Masonry works**				
	Office/Toilet walls of thickness 150mm				
6.1	3500mm high walls	m²	65.69		
	Collection bay area walls of thickness 150mm				
6.2	3500mm high walls	m²	59.71		
	Perimeter walls of thickness 150mm				
6.3	600mm high wall for perimeter wall	m²	40.22		
6.4	2800mm high wall for perimeter wall	m²	106.18		
7	**Plastering works**				
	Office/Toilet walls				
7.1	25mm plastering on 3500mm high walls	m²	131.38		
	Collection bay area walls				
7.2	25mm plastering on 3500mm high walls	m²	119.42		
	Perimeter Walls				
7.3	25mm plastering on 600mm wall for perimeter fence	m2	80.43		
7.4	25mm plastering on 2800mm perimeter wall	m2	212.35		
8	**Painting works**				
	Office/Toilet walls				
8.1	Apply emulsion paint coating on 3500mm high walls. Rate shall include 1 primer coat and 2 paint coats.	m²	131.38		
	Collection bay area walls				
8.2	Apply emulsion paint coating on 3500mm high walls. Rate shall include 1 primer coat and 2 paint coats.	m²	119.42		
	Perimeter Wall				
8.3	Apply emulsion paint coating on 600mm high walls. Rate shall include 1 primer coat and 2 paint coats.	m²	80.43		
8.4	Apply emulsion paint coating on 2800mm high walls. Rate shall include 1 primer coat and 2 paint coats.	m²	212.35		
	Perimeter Wall Steel members				
8.5	Apply emulsion paint coating on G.I members of newly proposed perimeter fence	LS	1		
8.6	Apply emulsion paint coating on G.I members and MS Sheets of existing gate	no	1		
	Other				
8.70	Apply paint coating on flood light pole	no	2		
9	**Roofing works**				
	Office/Toilet area				

No	Item	Unit	Quantity	Rate	Amount
9.1	Lysaght roofing sheet. Rate shall include all necessary laps, fastening, fixtures and sealing of joints	m²	26.37		
9.2	Roof flashing. Rate shall include fastening and sealing of joints	m	9.83		
9.3	Timber beams - 150 x 75mm. Rate shall include for all fixing and joints.	m	5.30		
9.4	Timber rafters - 100 x 50mm. Rate shall include for all fixing and joints	m	29.30		
9.5	Timber battens - 50 x 35mm. Rate shall include for all fixing and joints.	m	43.95		
	Collection bay area				
9.6	Fixing of existing lysaght roofing sheet in existing collection bay area after changing the roof frame as shown in drawing in order to flip the roof slope. Existing roofing sheets to be re-used. Rate shall include all necessary laps, fastening, fixtures and sealing of joints	m²	101.49		
9.7	Fixing of existing roofing frame members as shown in the drawing (existing roof slope needs to be flipped as shown). Existing roofing members to be re-used.	LS	1		
9.8	Fixing of existing roof flashing in existing collection bay area after changing the roof frame as shown in drawing. Rate shall include fastening and sealing of joints	m	17.06		
	For full length of roof				
9.9	Provide a 5" vinyl roof gutter with 2" x 3" down pipes as shown in drawings. Rates shall include all materials and fastenings.	LS	1		
10	**Electrical works**				
	GENERAL				
	(a) Design, provide and install electrical network for the entire building complete in accordance to standards set by the local governing body.				
	(c) The cost shall include for: screws, nails, bolts, nuts, standard cable fixing or supporting clips, brackets, straps, rivets, plugs and all incidental accessories.				
	(d) The cost shall also include for trenching including: excavation, maintaining faces of excavations, backfilling, compaction, appropriate cable covers, warning tape and disposal of surplus soil.				
	(e) Rates shall include switches, electrical isolators, conduits, fittings, equipment and similar items shall include for: all fixings to various building surfaces.				
	(h) Contractor shall provide all cabling, wiring, conduits, etc. required for completing all electrical installations.				
	(g) All sockets & switches shall be ABB or clipsal or equivalent				
10.1	Provide 13 A power sockets for office area as shown in drawing. Rate shall include connection to circuit breaker.	no	2		
10.2	Provide 18W ceiling mount LED light as shown in drawing, with switches near respective entrance doors. Rate shall include connection to circuit breaker	no	3		
10.3	Supply and installation of ceiling fan as shown in drawing. with fan controller near the respective entrance doors, connection to circuit breaker and all necessary accessories	no	1		

No	Item	Unit	Quantity	Rate	Amount
10.4	Supply and installation of emergency light as shown in drawing. with required socket. Rate shall include connection to circuit breaker and all necessary accessories	no	1		
	Other				
10.5	Provide 13 A power socket for well water pump inside equipment room. Rate shall include connection to circuit breaker.	no	1		
10.6	Provide 200 W flood light for illuminating the waste yard. Rate shall include connecting each light to a switch near circuit breaker and providing power to the switch	no	2		
10.7	Installation of existing well water pump inside equipment room.	no	1		
11	**Plumbing works**				
11.1	Complete construction of fresh water pipe work including all pipe work, vent pipe work, fittings, valves, etc including outlet pipes to PVC taps, plumbing to toilet and wash area as shown in drawings.	LS	1		
11.2	Wash Closet (one piece) (Cotto C1111 Victor or Equivalent)	no	1		
11.3	Wash basin complete with pedestal and gully trap.	no	2		
11.4	Muslim shower complete with valve, shower head and hose.	no	1		
11.5	PVC tap for wash area	no	1		
11.6	Floor drains	no	2		
11.7	PVC taps at ends of outlet pipes.	no	1		
12	**Doors and windows**				
	(a) Rates shall include for:				
	i) Locks, latches, closers, push plates, pull handles, bolts, kick plates, hinges and all necessary door and window hardware as shown on the door and window schedule.				
	ii) Door and window frames, mullions, transoms, trims, glazing, tinting, timber panels, boardings, framing, lining, fastenings and all fixings.				
	iii) Application of all painting, varnish, etc. as specified.				
	iv) Fixing sealant at joints as shown on the drawing.				
	v) Hanging doors in prepared frames and adjusting for correct fit.				
	(b) Sizes given in the drawing are overall outside dimensions of actual doors and windows. Exact sizes to be measured on site before fabrication.				
	(c) Thickness and sizes of glass panels are shown on the drawings and doors and windows schedule.				
	(d) Glass block panels and glazing assemblies shall be enumerated and include for all metal frames, reinforcement, joints and the like.				
	(e) All glass shall be from an approved manufacture to suit with the specific requirements.				

No	Item	Unit	Quantity	Rate	Amount
12.1	G1. Removing existing gate and fixing it to the proposed new boundary fence/wall. Rate shall include all cuts, welds, applying protective coating to welded joints, painting the frame and properly fixing the door to the fence.	no	1		
12.2	D2. Rate shall include all cuts, and properly fixing the door to the fence.	no	1		
12.3	D3. Rate shall include all cuts, and properly fixing the door to the fence.	no	1		
12.4	W1. Rate shall include all cuts, and properly fixing the door to the fence.	no	1		
12.5	W2. Rate shall include all cuts, and properly fixing the door to the fence.	no	1		
13	**Fire fighting**				
	Supply and installation of fire fighting equipment				
13.1	50KG DCP Trolley for collection bay	no	2.00		
13.2	50LTR Foam Trolley for collection bay	no	1.00		
13.3	Wet Chemical 6Ltr with Cabinet for hazardous waste area	no	1.00		
13.4	Water 9Ltr with Cabinet for Office Area - Outside	no	1.00		
13.5	CO2 2KG with Cabinet for Office Area - Outside	no	1.00		
14	**Other Works**				
	Office/Toilet area				
14.1	Provide HDPE membrane below collection bay floor slab	m2	18.37		
	Fixing of 300x300mm tiles in toilet floor and 1.2m height of toilet wall.	m2	10.43		
	Perimeter Wall				
14.2	50 x 50 PVC coated mesh. Rate shall include properly securing the mesh to G.I steel frame	m2	90.86		
	Ground water well				
14.3	Provide alunimiun cover	no	1		
				TOTAL	

APPENDIX H

Council Meeting Participants List

List of Participants

Lh. Kurendhoo IWMC Upgrading Project Consultation

Data: 8 March 2018

Location: Lh. Kurendhoo

Time: 15:00 hrs

Name	Institution	Designation	Contact Number
Ismail Mahdhee	Kurendhoo Council	President	7998045
Aishath Wishama	Kurendhoo Council	Vice President	7995894
Ali Amir	Ministry of Environment	Deputy Minister	9992647
Ahmed Nizam	MCEP	Project Manager	7972248
Ahmed Hassaan Zuhair	MCEP	ESS Specialist	7886707
Mohamed Afraz	MCEP	Civil Engineer	9877766

APPENDIX I

Island Waste Management Regulation

ހ.ކުޅުދުއްފުށި

ކުނި މެނޭޖްކުރުމުގެ އުސޫލު

މިއީ ޤާނޫނު ނަންބަރު: 4/93 (ދިވެހިރާއްޖޭގެ ތިމާވެށި ހިމާޔަތްކުރުމާއި ދެމެހެއްޓުމާބެހޭ ޤާނޫނުގެ 7 ވަނަ މާއްދާއާއި ހަވާލާދީ އެ ޤާނޫނުގެ 3 ވަނަ މާއްދާގެ ދަށުން ބޭއްވިގެން، ދިވެހިރާއްޖޭގައި ކުނި މެނޭޖްކުރުމުގައި އަމަލުކުރަންވީ ގޮތުގެ ކަނޑައަޅާ ބަޔާންކުރާ ގަވާއިދާއި ޤާނޫނު ނަންބަރު: 7/2010 (ދިވެހިރާއްޖޭގެ އިދާރީ ދާއިރާތައް ލާމަރުކަޒީ އުސޫލުން ހިންގުމުގެ ޤާނޫނު) ގެ 151 ވަނަ މާއްދާގެ (ނ)އިން ބާރު ލިބިގެން އެކުލަވާލެވުނު ކުނި އުކާލުމާއި، ކުނި ނައްތާލުމުގެ ގަވާއިދުގެ ދަށުން ހަދާފައިވާ ހ.ކުޅުދުއްފުށީގެ ކުނިމެނޭޖްކުރުމުގެ އުސޫލެވެ.

1. ގެގެއި ކުނި ބަލަހައްޓައި ބެހެއްޓުން:

(ހ)މި އުސޫލުގެ ދަށުން، ދިރިއުޅޭގެތަކާއި ދުކާންތަކާއި ގެސްޓްހައުސްތައް، ސައިޓު، ކާފޭ، ރެސްޓޯރެންޓް، ވިޔަފާރި އިމާރާތްތަކާއި، ސަރުކާރުގެ މުއައްސަސާތަކާއި މިނޫންވެސް ތަންތަނުގައި، ކުނި ބެލެހެއްޓުމަށް ހާއްސަކޮށްފައިވާ ތަނެއް ކަނޑައަޅާފައި ހުންނަންވާނެއެވެ.

(ނ)ކުނި ބެލެހެއްޓުމަށް ހާއްސަކޮށްފައިވާ ތަނެއް ފިޔަވައި އެހެން އެއްވެސް ތަނެއްގައި ކުނި ބޭލުމަށް، ނުވަތަ އެއްކަލަފައި ބެހެއްޓުމަކީ މަނާކަމެކެވެ.

2. ގެގެއިން ބައިބަޔަށް ކުނީގެ ބާވަތްތައް ވަކިކުރުން:

ކުނީގެ ބާވަތްތައް ވަކިކުރުމުގައި ހުންނަންވާނީ ތިރީގައި މިދަންނަވާ ގޮތުގެ މަތިންނެވެ.

1. ކުނިވާ ތާޒާ ކުނި (ބަދިގޭ ވޭސްޓިން)
2. ޕްލާސްޓިކް ތަކެއްޗާއި ޕްލާސްޓިކް ފުޅި
3. ފަތް ކުނި
4. ޓިން
5. ބިއްލޫރިއާއި ބިއްލޫރި ފުޅި
6. ކުނި ގަނޑުމުގެ ގައުކުނި
7. އަނދާ ބާވަތުގެ ހުރިހާ ކުނިތައް
8. ޓާޔަރު، ބެޓެރި، އިލެކްޓްރޯނިކް ތަކެތި

އަދި މިގޮތަށް ވަކިކޮށް އެކުލަވާ ކުނީގެ ބާވަތްތައް، ކުނިކޮށިގައި ވަކިވަކިން ބަހައްޓަންވާނެއެވެ.

3. ގޭގެއިން ކުނި ނަގާނެ ގޮތް:

ކުނި އުކާލުމާއި، ކުނި ނައްތާލުމުގެ ގަވާއިދުގެ 3 ވަނަ މާއްދާގެ ދަށުން ކުނި އަށް ތަންތަނުގެ ގޮތުގައި ކައުންސިލުން ކަނޑައަޅާ ތަންތަނަށް:

(ހ) ...

(ނ) ...

4. ކުނި އުފުލުން:

(ހ) ...

(ނ) ...

(1) މި އުސޫލުގެ 3 ވަނަ ނަންބަރު (ހ)އަދި(ނ) ...

(2) ...

5. އަމިއްލަ ފަރާތްތަކުން ކުނި އުކާލުމަށް ހަމަޖެހިފައިވާ ގަޑިތައް:

ޕްރޮގްރާމްގެ ދަށުން ކުނި އުފުލޭނީ

ހުކުރު ދުވަހު ހެނދުނު 8:30 އިން 9:00 އަށް

ހުކުރު ދުވަސް ފިޔަވައި ކޮންމެ ދުވަހަކު މެންދުރު 12:30 އިން 13:00 އަށް

6. ކުނި އުކާލުމާއި ކުނި ބެލެހެއްޓުމާބެހޭ ...

(ހ) ...

(ނ) ...

(ށ) ...

7. ފީ ނެގުމާއި ފީ ދެއްކުން

(ހ) ...

(ނ) ...

(ރ) ...

(ބ) ...

8. ވަކިތަނަކުން ކުނި ގެންދިއުން

(ހ) ...

ސާފު ކެންދޫ

ހަރަދުނަރުގެ ވަސް ޖަނަވާ

ފަޅުރައްޓެ ޖުވެނިން ބ.ކެންދޫ ކައުންސިލް

ކުނި މެނޭޖްކުރުމުގެ ޤަވާއިދު

ވިޔަފާރި ކެންދޫ ކައުންސިލްގެ އިދާރާ
ކެންދޫ، ދިވެހިރާއްޖެ

އާއިލާތަކުން އަހަރަކަށް ކުނި އުކާލުމުގެ ފީ

ކުދި ބަރުގައި ކުނިގެންދާކަމުގެ ގޯނިފުށަށް (ދުވަހަކަށް)	5.00
އަށް ފޫޓު ކުރީގައި ކުނިގެންދާކަމުގެ ގޯނިފުށަށް (ދުވަހަކަށް)	10.00
އަށް ފޫޓު ވިހި ފޫޓު ކުނިގެންދާކަމުގެ ގޯނިފުށަށް (ދުވަހަކަށް)	15.00
ވިހި ފޫޓު ކުނިގެންދާކަމުގެ ގޯނިފުށަށް (ދުވަހަކަށް)	20.00

ސާފު ކެންދޫ-ހަރަދުނަރުގެ ވަސް ޖަނަވާ

މިނިސްޓްރީ އޮފް އެންވަޔަރަންމަންޓް އެންޑް އެނަރޖީ ގެ "ކުނި މެނޭޖްކުރުމުގެ ގަވާއިދު 11 ވަނަ މާއްދާ"، ގެ ދަށުން ދިވެހިރާއްޖޭގައި އެއްވެސް ތަނަކަށް ކުނި އެއްލުމާއި އަލިފާން ރޯކުރުން.

(ހ) ކުނިގެ ބާވަތްތަކުގައި އުފެދޭ ބިރުވެރިކަމާއި އެކަމުގެ ނުރައްކާތެރިކަމުގެ އަދި ބޮޑުތަކެތި އިނދެގެން ހުރުމާއި ގުޅިގެން ބޮޑުތަކަތީ.

(ށ) އަންނަނިވި ބޮޑުބޮޑު އެއްވެސް ތަނެއްގައި ކުނިއަޅައިގެން ނުވާނެއެވެ. އަދި އުފެދު ބޮޑުބޮޑު އެއްވެސް ބާވަތެއްގެ ކުނިއެއްލުމަކީ މި ގަވާއިދުގެ ދަށުން ކުށެކެވެ.

(1) ޤާނޫނު ނަންބަރު 93/4 ގެ ދަށުން ހިމާޔަތްކޮށްފައިވާ ސަރަހައްދުތައް

(2) ކުޅި އަދި ބޮޑުސްބެން (3) ފަޅު (4) ފަރު (5) ވިލު (6) ރަށުތެރޭގެ ވަލުތެރެ (7) ރަށުތެރޭގެ ގޯތިފަށް (8) ބޯހިދަރު (9) ރަށުތެރޭގެ އަތިރިމަތި (10) ޒޯނެއް (11) ކުޅުގަނޑު (ނ) އެއްވެސް ފަރާތަކުން މި މާއްދާގެ (ށ) ގެ ދަށުން ކުނިއެއްލުމަކީ ހުއްދަނުވާނެ ކަމެއްގެ ގޮތުގައި ކުށެއްގެ ގޮތުގައި ބެލޭނެއެވެ.

(ށ) ރ. ވަނަފަރާތް، ކުނި ގެންދިއުމުގެ މަސައްކަތަށް ކުރާ ގެސްޓްހައުސް 30.00 ރުފިޔާ އަދި، ޗ ދުވަހު ބަލަހައްޓަން ކުރާ ފީގެ 30% ދަށުން ފަސްއަހަރު ވާނެއެވެ.

(މި ފަރާތުން ކުނި މެނޭޖްކުރުން ކުރާ ފީގެ ބަޔާން ކުރެވެއެވެ.)

9. ވިޔަފާރި ހިންގާ ފަރާތްތަކުން ކުނިއުކާލުމުގެ ފީ ތަފްޞީލް:

(ހ) ވިޔަފާރި ހިންގާ ފަރާތްތަކުން ކުނިގެންދިއުމަށް ދެއްކުން ލާޒިމުކުރެވޭ.

(ށ) ވިޔަފާރި ހިންގާ ފަރާތްތަކުން ކުނިއުކާލުމުގެ ފީ ތަފްޞީލް:

#	ވިޔަފާރީގެ ބާވަތް ތަފްޞީލް	ފީ
1	ގެސްޓްހައުސް	150.00
2	ފަޅު ގޯތި ބާވަތް އަތުން ދިއްލާލާ ރިޕެއަރިންގ ބާވަތް ގޯތި	75.00
4	ވަރކްޝޮޕްތައް	150.00
5	ކެފޭ، ރެސްޓޯރަންޓް، ކޮފީޝޮޕް	150.00
6	ހޯލްސޭލް ޝޮޕް	150.00
7	ފަރުނީޗަރު ޝޮޕް	150.00
8	ޑައިވް ސެންޓަރ ކޮންޕެނީ	500.00
11	ޖަނަރޭޓަރ	150.00
12	ކޮންސްޓްރަކްޝަން ސައިޓް، ކުނިގެ ރީސައިކަލްކުރާ ތަން، ވެލްޑިންގ ވަރކްޝޮޕް، ސްޓޯރ ހައުސް، ޖެނެރޭޓަރ ސެޓް، ފޮތި ބާލާ ތަން، ބޯޓު ސްޓޯރު	300.00
13	ކުނިގެ ހިމާޔަތް ދަރުމަ، ރ. އަތޮޅު މަރުކަޒު	500.00
14	ޑޮކް ޔާޑު ތަނެއް	
15	އިންޑަސްޓްރީ ވެސްކުރާ ކުނިގެ ބާވަތެއް ލިޔުން	

ގެސްޓްހައުސްތަކުގައި ކުނި އުކާލުމުގެ ޚިދުމަތް ދޫކުރާ އަގުތައް

(ހަފްތާ ދުވަހުގެ އަގު)

ވާހަކަ ދެކެވޭ ގޮތަށް ގެސްޓްހައުސްގައި ކޮޓަރި ހުރިހާ ގެސްޓްހައުސްތަކުގައި ކޮންމެ ކޮޓަރިއެއްގައި ކުނި އުކާލާނީ (ދުވަހަކަށް)	70.00
ވާހަކަ ދެކެވޭ ގޮތަށް ގެސްޓްހައުސްގައި ކޮޓަރި ހުރިހާ ގެސްޓްހައުސްތަކުގައި ކޮންމެ ކޮޓަރިއެއްގައި ކުނި އުކާލާނީ (ދުވަހަކަށް)	100.00

APPENDIX J

Commitment for Mitigation and Monitoring

بسم الله الرحمن الرحيم

Ministry of Environment
Male', Republic of Maldives.

ހިސާބާއި ދާއިރާތަކުގެ ވަޒީރުގެ ދަފްތަރު،
މާލެ، ދިވެހިރާއްޖެ.

ދިވެހިރާއްޖެ - ދުނިޔެބޭންކު ގްރޫޕްގެ ހަލާތު ހިންގުން

Date: 27 November 2018

No: 438/WB/2018/3

Mr. James Orehmie Monday,
Task Team Leader for MCEP,
Senior Environmental Engineer,
World Bank Group,
5th Floor, West Side, The Gate Building,
DIFC, P O Box 118071, Dubai, UAE.

Sub: Commitment to undertake Mitigation and Environmental Monitoring

The Environmental and Social Management Plan (ESMP) prepared for the proposed upgrading of Island Waste Management Centre (IWMC) in Lh. Kurendhoo has been prepared in accordance with the ESAMF of MCEP and the EIA Regulations 2012 of the Maldives.

We would like to confirm our commitment to the proposed mitigation measures and the monitoring programme that has been highlighted in the ESMP report prepared for the above referenced project.

Sincerely,

Ahmed Murthaza,
Director General

Green Building, Handhuvaree Hingun,
Maafannu, Male', 20392, Republic of Maldives.
+(960) 301 8300
+(960) 301 8301
www.environment.gov.mv

ގްރީން ބިލްޑިން، ހަންދުވަރީ ހިންގުން،
ފާހަނާ، މާލެ، 20392، ދިވެހިރާއްޖެ.
secretariat@environment.gov.mv
www.twitter.com/ENVgovMV
www.facebook.com/environment.gov.mv