

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

FOR THE UPGRADING OF
ISLAND WASTE MANAGEMENT CENTER
IN N. HOLHUDHOO

Prepared by: Ahmed Hassaan Zuhair
Prepared for: Ministry of Environment

October 2019

Contents

List of Figures	2
DECLARATION OF THE AUTHOR.....	3
NON-TECHNICAL SUMMARY.....	4
سَمَرٌ ذُرُورٌ.....	6
CHAPTER 1 INTRODUCTION	8
1.1. Project Background and Justification.....	8
1.2. Environmental and Social Management Plan and Environmental Permits	9
1.3. Desk Study Review	11
1.4. Report Preparation and Acknowledgement	12
CHAPTER 2 PROJECT DESCRIPTION.....	13
2.1. Location and Study Area	13
2.2. Existing Facilities at the Waste Management Centre	15
2.3. Project Components	16
2.4. Construction Schedule	20
2.5. Project Inputs and Outputs.....	21
CHAPTER 3 EXISTING ENVIRONMENT.....	23
3.1. Current Waste Management Practices.....	23
3.2. Island Waste Management Plan	27
3.3. Project Site and Access Road	29
3.4. Unassigned Waste Dumping	31
3.5. Vegetation Removal.....	31
3.6. Coastal Erosion.....	31
3.7. Environmentally Protected Areas and Sensitive Areas.....	32
3.8. Areas of Historic and Cultural Significance	33
3.9. Socio-Economic Environment	33
CHAPTER 4 IMPACT IDENTIFICATION	40
4.1. Impact Assessment Methodology.....	40
4.2. Potential Impacts of the Project	43
CHAPTER 5 MITIGATION MEASURES	48
CHAPTER 7 TRAINING RECOMMENDATIONS.....	62
CHAPTER 8 MONITORING AND REPORTING	64
8.1. Monitoring Activities.....	64
8.2. Reporting Procedures	65

8.3. Implementation Schedule	66
8.4. Contractual Measures	67
8.5. Cost Estimate for ESMP Implementation	67
8.6. Grievance Redress Mechanism	68
CHAPTER 9 STAKEHOLDER CONSULTATION	72
9.1. Introduction.....	72
9.2. Summary of consultation with Island Council and IWMC operators	72
9.3. Household Perception Survey.....	76
9.4. Summary of Consultations with Waste Management Committee	79
9.4. Summary of Consultations with the General Public.....	80
CHAPTER 10 RECOMMENDATIONS AND CONCLUSION.....	82
REFERENCES.....	83
APPENDICES	85

List of Figures

Figure 1 Site Plan of the IWMC	13
Figure 2 Layout of the proposed development	14
Figure 3 Existing facilities at the proposed site	15
Figure 4 Collection vehicle and M2S staffs	24
Figure 5 Inorganic waste segregated in jumbo bags	24
Figure 6 One of the bins used for collecting fish waste	25
Figure 7 Food waste bins brought to harbor & the vessel used for sea disposal	25
Figure 8 C&D waste disposal area.....	26
Figure 9 Panoramic view of the existing IWMC.....	29
Figure 10 Metal waste pile at the site	30
Figure 11 temporary waste storage area west of the IWMC	30
Figure 12 Shoreline adjacent to IWMC being protected by rock boulder revetment	32
Figure 13 Environmentally Sensitive Areas with 10km radius of Holhudhoo.....	32
Figure 14 Comparison of Land Areas in Nona Atoll	34
Figure 15 Population density by islands for Noonu Atoll.....	34
Figure 16 Household composition in terms of gender	77
Figure 17 Volume of waste generated at households per day	77
Figure 18 Perception of the IWMC site.....	78

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.



Ahmed Hassaan Zuhair

Environmental and Social Safeguards Specialist

Maldives Clean Environment Project

Ministry of Environment

NON-TECHNICAL SUMMARY

The proposed project for the upgrading of the Island Waste Management Center (IWMC) in N. Holhudhoo is funded by the World Bank and executed through the Maldives Clean Environment Project (MCEP). The aim of the project is to develop a proper IWMC in the island, with adequate storage facilities and security and safety features to facilitate storage of inorganic waste for longer durations, create space for compost production, and eliminate the threat of regularly occurring fires at the center, which would in turn safeguard the wellbeing of the nearby residents.

Although N. Holhudhoo has a well organized and sound household segregation and collection system, at present, they are unable to store the waste brought to the IWMC properly due to the existing IWMC being completely damaged through the fire incident of 2018. Hence, waste is being stored in bare ground increasing the potential for contamination of soil and groundwater due to leachate runoff. Furthermore, unauthorized fires on accumulated waste are a regular occurrence in the island which has been causing severe negative impacts to the nearby residents as a result of the fumes generated.

To alleviate these issues, the project intends to develop the IWMC with proper storage cells, leachate and stormwater collection drains, installation of fire safety equipment, high boundary walls and a vegetation buffer towards the side closest to residential population.

All construction activities will be managed inside the existing boundary of the IWMC, which does not contain any vegetation. Hence, vegetation clearance is not required at any scale for the proposed upgrading works. Potential indirect impacts during transport and storage of construction material and waste can be effectively managed, by regular supervision and employing best practice approaches. Likewise, impacts common to construction activities such as those associated with dust and noise can be minimized by regularly watering the site, installing dust screens and not conducting construction activities during night time. No environmentally sensitive or protected site exist in the island.

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, it will facilitate the island council to smoothly manage waste in Holhudhoo under current arrangements. The council already has recruited staffs that are even now managing waste in the IWMC site, while waste collection services are provided through a third-party company. Additionally, the council has agreed to install surveillance cameras and hire a security guard to increase safety of the IWMC and ensure that in case of a repeat of a fire incident, it gets attendant immediately. Training on composting for IWMC staffs have already been provided, while a refresher will be covered through MCEP after completion of the IWMC. A community mobilization program is planned for 20 October 2019. 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 6 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 addition to the perceivable environmental and public health related benefits.

No permanent negative impacts are likely to occur as a result of the project as the project does not involve removal of vegetation.

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.

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CHAPTER 1 INTRODUCTION

1.1. Project Background and Justification

The project takes place in Noonu Atoll Holhudhoo located with geographic coordinates 5°45'20.79" N and 73°15'46.12" E. The island has a total land area of 17.2 hectare and a population of 2211. Daily generation of waste in Holhudhoo is estimated to be 1,773.6 kilograms (kg). Kitchen waste and green waste are the dominant type of waste generated in the island, followed by used nappies, plastic waste and metal waste.

An Island Waste Management Center (IWMC) was constructed in 2014 through Maldives Environmental Management Project (MEMP) at the south side of the island. However, this IWMC was completely damaged during a fire incident that happened in 2018. Most of the waste management equipment except few 120L bins supplied through MEMP were also lost during this incident. Only part of the IWMC in a usable condition is the compost slab that will be retained and incorporated into the new design.

Although open burning of waste is not being practice in Holhudhoo, unauthorized fires on accumulate waste in the IWMC are a regular occurrence in island with the latest incident reported to occur on 4 June 2019. As a consequence, the residents nearby are being exposed to fumes, which has become a major public health hazard. The IWMC exists at a close proximity to some of the residential houses due to limited land area and lack of an alternative space in the island. The site has been publicly endorsed and subsequently reflected in the approved Land Use Plan (LUP).

At present waste is being managed at the boundary of the IWMC and the adjacent 1000 square feet (sqf) temporary area developed by the council to store segregated inorganic waste. There is no proper boundary separating the IWMC from the surrounding roads or rest of the areas nearby, which is a major security impediment increasing the risk of unauthorized access and potential for further fires. Furthermore, the waste is being stored at bare ground in both of the aforementioned locations, increasing the risk of leachate and subsequent contamination of soil and groundwater.

The proposed project is, therefore, designed to address these limitations. High perimeter walls will enclose the IWMC boundary, while proper storage cells with concrete slabs and roofing will be constructed to facilitate storage of waste in a safe manner. Furthermore, provisions will be made to increase security features of the IWMC, such as installation of fire safety equipment, alarm systems and surveillance cameras (the latter two will be financed by the Island Council).

Once the upgrading of IWMC is completed, it will facilitate the island council to smoothly manage waste in Holhudhoo under current arrangements. The council already has a good waste collection system (in which household segregation is also practiced), which is still in effect.

This project will provide the basic infrastructure for management of waste at the island level and ensure composting is undertaken at the island. The waste operators have already been given the required training to undertake composting. The waste that is not manageable at the island level will be stored and transferred to a central regional facility at once 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 [ME], 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.

1.2. Environmental and Social 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 [ME], 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 prepare an EMP for the project and to submit for review and approval. 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, although an EMP is required as per the local regulation, an Environmental and Social Management Plan (ESMP) will be developed for the proposed project and simultaneously submitted to the World Bank for approval. This document is prepared consistent to the ESAMF.

A separate land selection process was not followed for this project since the project is undertaken in an existing IWMC site that has also been reflected in the LUP approved by Ministry of Planning and National Infrastructure (MPNI).

Other major laws, regulations and policies applicable to this project (both national and the World Bank) are reflected in table 1.

Table 1 Laws applicable to the project

#	Relevant laws, regulations, policies and guidelines	Requirement	Application specific to project
1	National Waste Management Policy 2015	National	The establishment of an IWMC is prerequisite to facilitate waste management at island level.
2	Waste Management Regulation	National	<ul style="list-style-type: none"> • The regulation reflects the following: <ul style="list-style-type: none"> - Sets standards for waste collection, transfer, treatment, storage, waste site management, landfills and managing hazardous waste. - Defines approval procedures for waste sites and waste transfer. - Standards and permits required for waste transport on land and sea, including transboundary movements. - Defines reporting and monitoring requirements and procedures. - Defines procedures to implement WMR and penalties for non-compliance. • The IWMC was designed conforming to the provisions of Waste Management Regulation.
3	National Policy on Health Care Waste Management	National	<ul style="list-style-type: none"> • Stipulates that all health facilities have to be responsible for the safe management of health care waste in an environmentally sound manner that minimizes risk to the community and the staff involved in its management. • The IWMC should not accept healthcare waste as it has to be managed separate from the general waste directly at the health center.
4	The Land Act (1/2002)	National	<ul style="list-style-type: none"> • All transactions concerning the issuing, receiving, owning, selling, lease, utilizing and using Maldivian land shall be conducted in compliance with this Act.
5	Land Use Planning Regulations and Guidelines (2005)	National	<ul style="list-style-type: none"> • The Land Use Plan (LUP) of Holhudhoo has demarcated an area for IWMC. • The LUP of islands are reviewed by MNPI in consultation with MLSA and EPA. The LUP of Holhudhoo is approved by MNPI. • Although the IWMC is located at a close proximity to some residential houses, MNPI has given consent to the land use given the scarcity of land and unavailability of an alternative location.
6	Environmental Guidelines for Site Selection of Waste Management Centers (2017)	National	<ul style="list-style-type: none"> • Provides recommendation for optimum zoning of IWMC sites. • Although the IWMC is located at a close proximity to some residential houses, MNPI in consultation with EPA has given consent to the land use given the scarcity of land and unavailability of an alternative location.
7	Coral mining regulation	National	Coral mining from house reef and atoll rim is banned.

8	Sand mining regulation	National	Sand should not be mined from any part of an inhabited island, beach or the newly reclaimed island beach. Sand should also not be mined from within 100 ft. of the shoreline
9	Law on Cultural and Historical Places and Objects of the Maldives (27/79) WB PS8 (2012)	National World Bank	Requires client to develop provisions for managing chance finds through 'a chance find procedure' which will be applied in the event that cultural heritage is subsequently discovered. The client shall not disturb any chance find further until an assessment by competent professionals is made.
10	World Bank Group Environmental Health and Safety Guidelines for SWM Facilities	World Bank	Sets procedures to reduce the risk of accidents and injuries, minimize dust and air quality related impacts, reduce the probability spillage of oil and hazardous substances and leachate on site due to stormwater run-off during operations of waste management facilities.
11	Employment Act (02/08)	National	<ul style="list-style-type: none"> • Worker shall not be forced to work for more than 48 hours per week. • Workers shall not be made to work for more than 6 days a week consecutively without providing 24 hours for rest. • Workers shall not be made to work continuously for more than 5 hours without providing a break for at least 30 minutes. • Salary should be paid to all permanent contract workers once a month. • Minimum 03 meals shall be provided to construction staff per day or appropriate meal break time shall be provided.
12	Immigration Act (01/07)	National	<ul style="list-style-type: none"> • All expatriate workers must have proper work visas and work permit cards.

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 the proposed construction and establishment of sewerage system at N. Holhudhoo (Shaiq, 2014a).
- EIA for the proposed shore protection measures at Holhudhoo Island, Noonu Atoll (Shaiq, 2014b)
- EIA for the proposed harbor rehabilitation, Holhudhoo, Noonu Atoll (Fizah & Zahid, 2014).
- ESMP for the construction and operation of an Island Waste Management Center in Dhonfanu, Baa Atoll (Shaiq, 2019).
- ESMP for the establishment of Island Waste Management Center in M. Mulah (Saleem, 2018a).
- ESMP for the establishment of Island Waste Management Center in Th. Madifushi (Saleem, 2018b).
- ESMP for the proposed upgrading of Island Waste Management Center in R. Ungoofaaruu (Zuhair, 2019).

- EMP for the proposed development of Island Waste Management Center in F. Magoodhoo (Zuhair, 2017).
- EMP for upgrading Island Waste Management Center Fuvahmulah (Zuhair, 2016a).
- EMP for upgrading Island Waste Management Center Hulhudhoo-Meedhoo (Zuhair, 2016b).
- Maldives Clean Environment Project Environmental and Social Assessment and Management Framework (ESAMF) & Resettlement Policy Framework (RPF) (Ministry of Environment [ME], 2016).
- Island Waste Management Plan of Noonu Holhudhoo (Holhudhoo Council, 2017).
- Environmental, Health, and Safety Guidelines for Waste Management Facilities (World Bank Group [WBG], 2007).
- Operational Environmental and Social Management Plan for RWMF – Zone 2, Vandhoo, Raa Atoll (Zuhair, 2018).

1.4. Report Preparation and Acknowledgement

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 B.

The author would like to acknowledge the assistance and support received from the following people in organizing and undertaking field surveys and stakeholder consultations.

1. Mr. Mohamed Afraz, Civil Engineer of MCEP
2. Ms. Aishath Ajfaan Jawaadh, APC of MCEP
3. Mr. Ahmed Saleem, APC of MCEP
4. Mr. Abdul Raheem Mohamed, Project Coordinator of MCEP
5. Mr. Mohamed Afrah, Vice President of Holhudhoo Council
6. Mr. Mohamed Shanim, Municipal Supervisor of Holhudhoo Council
7. Mr. Abdulla Hameed, Assistant Director of Holhudhoo Council

CHAPTER 2 PROJECT DESCRIPTION

2.1. Location and Study Area

The project takes place in Holhudhoo, an inhabited island located in the southern half of Noonu Atoll with the geographic coordinates 5°45'20.79" N and 73°15'46.12" E. Noonu atoll forms the southern end of the largest natural atoll in the Maldives archipelago locally known as Thiladhunmathi Atoll.

Out of the 13 inhabited islands of Noonu Atoll, five islands are found within a 10km radius of Holhudhoo, namely, Fohdhoo, Maafaru, Velidhoo, Magoodhoo and Miladhoo. Holhudhoo is 630m long and 380m wide, corresponding to a total land area of 17.2 hectares. The population of the island at present stands at 2211.

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



Figure 1 Site Plan of the IWMC

The project involves upgrading of the existing IWMC located at the southern tip of the island, which was severely damaged during a fire incident in 2018. All the infrastructure of the IWMC including the perimeter fence, gates and masonry walls were damaged beyond repair except the existing compost slab. As such, the project intends to construct new perimeter walls, collection bay area, store room, hazardous waste storage area and equipment room, while the existing compost slab will be the only infrastructure that will be retained. Additionally, an office with a toilet and a resting area for workers will be developed. Parts of the existing fence still remains but is not in a repairable condition. Moreover, given the close proximity of the IWMC to some residential houses, construction of a perimeter wall instead of a fence will ensure mitigation of potential nuisance to the nearby population during operations. It also has the added benefit of ensuring increased security, which is particularly important to the context of Holuhdoo, since the foregoing mentioned fire incident is believed to have been caused by an unauthorized entry into the premise. All of the indented upgrading works will be managed within the existing boundary of the IWMC. The size of the IWMC will be 870 sqm after completion of the project.

The layout of the proposed design is reflected in figure 2.

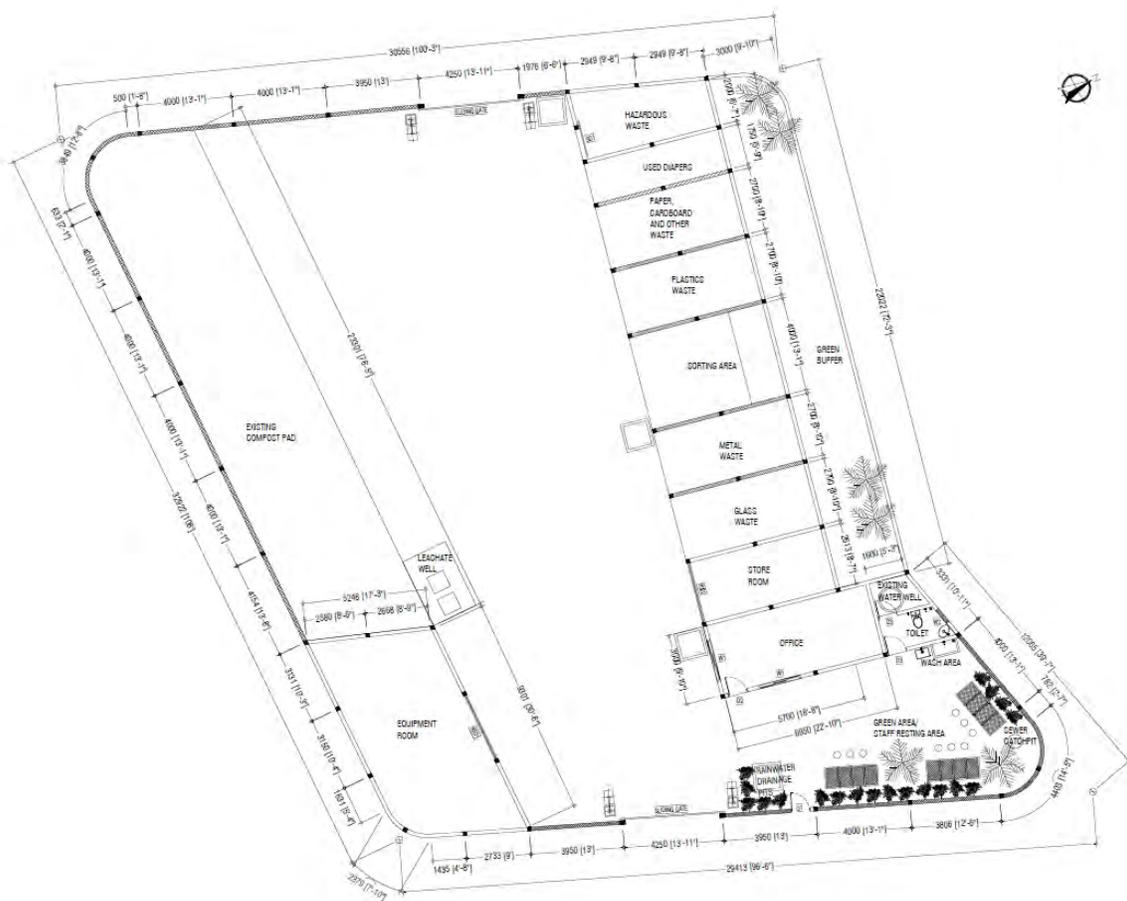


Figure 2 Layout of the proposed development

2.2. Existing Facilities at the Waste Management Centre

The layout of existing infrastructure at the proposed site are reflected in figure 3.

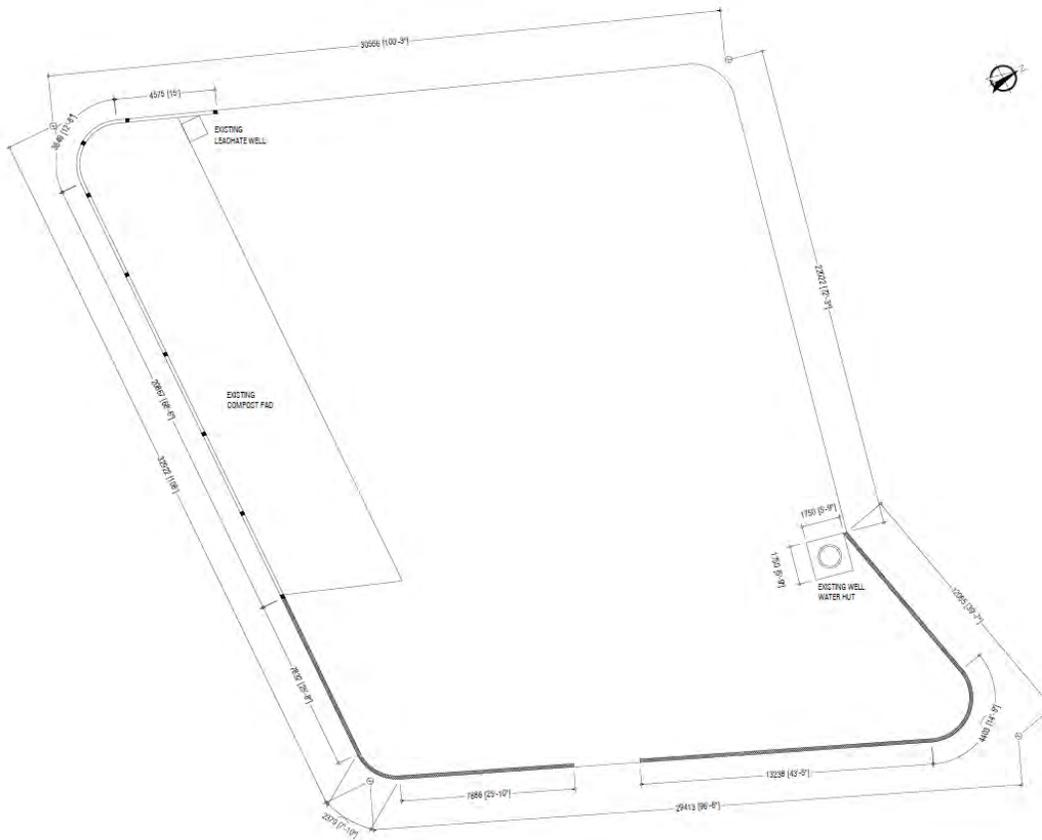


Figure 3 Existing facilities at the proposed site

Details of existing facilities at the IWMC are given below.

1. Existing Compost Slab

A 117.5 sqm compost slab exists at the facility. This compost slab has a leachate collection well, but cannot be utilized due to being damaged. A new leachate collection well will be constructed for collection of leachates during compost production. The compost slab will be retained and incorporated into the new design.

2. Existing Gate, Fence and parts of wall

The existing gate, fence and wall at the south side of the IWMC are severely damaged during the fire incident and will be demolished and removed during site clearance.

3. Existing Groundwater well and hut

A groundwater well of 1m diameter is present at the north east side of the site enclosed in a hut. The hut will be demolished, while the well will be retained to provide water to the center.

2.3. 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:

Vegetation clearance is not required as the proposed upgrading of the center will be managed within the existing boundary of the IWMC. The old gate, fence and the wall at the south side will be demolished and removed. Debris generated will be reused for construction as much as possible, while remaining unusable material will be disposed in the area designated for construction and demolition (C&D) waste disposal.

b) Clean-up of existing waste:

According to a recent waste audit conducted by the Ministry of Environment, 57 tons of accumulated waste was found in Holhudhoo. The type and quantity of accumulated waste as per this study is provided in table 2.

Table 2 Holhudhoo Waste Audit

Waste Type	Estimated Quantity (tons)
Metal	6
Glass	4
Plastic	20
Green Waste	18

Diapers	5
Organic Waste	4
Total	57

However, regional waste collection was in progress during the site visit. Hence most of the waste previously accumulated at the site were no longer present, as it was removed and loaded to the landing craft of WAMCO, Saafu-1, to be subsequently taken to the Zone2 RWMF situated in Raa Vandhoo. Only a few metal wastes currently remain at the site found piled up towards the southern corner. This pile is also expected to be removed within the next couple of days through the on-going regional waste collection and subsequently transferred to the subject RWMF.

Appendix 6 of the ESAMF gives options for closure of small open dump sites, which is reflected in Appendix D 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.

2. Construction of Boundary Wall

A 2.5m high masonry wall will be constructed at the boundary of the IWMC. This wall will enclose the IWMC and ensure mitigation of any potential negative impacts to the nearby residents. The wall is held together by 150mm 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.

3. Construction of Office and Toilet

An office and a toilet will be constructed at the north side of the IWMC. A 12000 BTU air-condition, lights, ceiling fans and sockets will be installed at the office. The toilet will have adequate ventilation. A wash area will be constructed adjoining the toilet. The structure will consist of 4m high walls. Superstructure of the block will be made of concrete footings, columns and beams. The roofing will be made of LYSAGHT roofing sheets. Timber roofing frame will be supported by concrete roofing beams.

The sewage pipes of the toilet will be connected to the sewage network of the island. The distance between the IWMC and the nearest sewer connection point is 48.8m (160ft).

4. Construction of Collection Bay Area, Store Room and Handouts Waste Storage

The collection bay area will have 6 compartments including a sorting area at the center, and storage areas designated for metal waste, plastic waste, glass waste, used diapers and paper / cardboard / other waste. A 75mm thick screed will be laid at the ground and 1.5m high masonry walls will be constructed at either side of each compartment supported by a concrete column. A 4m high wall will be constructed at the back (side of the IWMC facing residential area), while the front side of the structure will be open. Roofing will be laid using LYSAGHT roofing sheets.

A hazardous waste storage area will be constructed adjoining the collection bay area to the west and a store room to the east. Both of these rooms will be fully enclosed by 4m high masonry walls and LYSAGHT roofing sheets. Access to the hazardous waste storage area will be provided through a sliding door and a roller shutter door will be installed at the store room. Lights and exhaust fans will be installed.

5. Construction of Equipment Room

A room for storing equipment will be constructed adjacent to the existing compost slab at the south eastern corner of the IWMC. Similar to store room and hazardous waste storage, the equipment room will be enclosed from all sides via 4m high masonry walls and LYSAGHT roofing sheets, while access will be through a roller shutter door. Lights, sockets, 2 ceiling fans and 2 exhaust fans will be installed.

6. 3-Phase Electricity

The nearest 3 phase distribution box is located 18.3m (60ft) away from the IWMC. A 25sqmm 4 core power supply cable will be laid from this distribution box to the distribution board at the equipment room.

7. Plumbing Works

Internal water piping will be laid to connect water to the center. A water pump will be installed to connect water to the toilet, wash area and compost pad area from the groundwater well. Wash area and the compost pad area will be supplied with 2 water taps each to withdraw water. Water required for composting during operational phase will be drawn through the well.

8. Leachate and Storm Water Management

Rainwater pits will be constructed at the west and center of the collection bay, and the resting area. A new leachate collection well will be constructed for collection of leachates during compost production. This well will be connected to the sewer system of the island through the nearest sewer point.

9. Supply and installation of firefighting equipment

The contractor will supply and install the following firefighting equipment as part of the contract and as reflected in the BOQ.

- 50KG DCP Trolley for collection bay (nos 2)
- 50LTR Foam Trolley for collection bay (nos 1)
- Wet Chemical 6Ltr with Cabinet for hazardous waste area (nos 1)
- Water 9Ltr with Cabinet for Office Area – Outside (nos 1)
- CO2 2KG with Cabinet for Office Area – Outside (nos 1)

Operational phase of the proposed development includes the following:

1. Supply of Waste Management Equipment and PPEs

The project will provide one waste management equipment and a collection vehicle for all upgrading and new centers to be developed in Zone 2 under MCEP. Holhudhoo Council's was consulted regarding this. The equipment council prefers is a waste compacting machine. The project team is currently in the process of finalizing the list of equipment and vehicles and their specifications. These items will be procured in bulk as they have to be sourced internationally and hence will not be included in the BOQ of individual contracts. The project will also consider providing PPEs required for composting such as gloves, shovels and rubber boots.

2. Waste Collection Services

After construction works are completed, the IWMC will be officially handed over to the Island Council of Holhudhoo. The Island Council will resume waste management services in the island according to the current arrangement.

The council has outsourced waste collection to a third party with a monthly remuneration fee of MVR 29,000. A total of 3 staffs are engaged in waste collection, while the collected waste is managed by 3 staffs from the council. Household collection services are provided at the rate of MVR 150 per registered household. Organic waste is collected daily while inorganic waste collection is done 2 times per week. Waste can also be carried to the IWMC individually by providing a monthly gate fee of MVR 50.

A 350KG pickup is currently being used to provide collection services. This pickup contains separate bins and jumbo bags for placing different categories of waste. Prior to collection, waste is segregated at household level in to the 7 categories, namely used diapers, kitchen waste, green waste, plastics, glass, metal cans and cardboard / paper / cloth. Household segregation is carried out by the households at their own bins.

3. 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.

The stored waste will be processed and made ready for regional transport according to WAMCO's guidelines for types of waste accepted at R. Vandhoo RWMF provided in Appendix E and transported to the harbor before the scheduled arrival of landing craft to the island.

4. Composting

Compostable waste will be transferred to the composting slab after removing branches and twigs. The removed branches 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.

5. Leachate Management

Leachate produced during composting will be collected in the leachate collection well and subsequently released to the sewer network of the island.

6. 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. Under this agreement regional collection has to be provided by WAMCO once a month. However, regional collection was last provided 4 months ago. Regional waste collection was progressing in Holhudhoo during the site visit. All the waste accumulated at the IWMC will be collected and brought to Vandhoo RWMF in this round. However, after this, WAMCO will negotiate with the council to amend the contract made with them, where the council will be pre-conditioned to segregate and pack waste according to WAMCO’s segregation guideline and bring to the harbor prior to their vessel reaching the island.

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

2.4. Construction Schedule

The construction activities of the project are expected to commence in December 2019. All civil works of the project is anticipated to be completed within 6 calendar months. A rough schedule for construction is provided in the table 3.

Table 3 Construction Schedule

Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Mobilization						
Site Preparation: Relocation of Existing Waste						
Civil Works						
Demobilization						

2.5. Project Inputs and Outputs

Major project inputs for the construction and operational phase of the proposed development are highlighted in table 4.

Table 4 Major Project Inputs

	Input Resource	Type and Amount	Means of obtaining the resource
CONSTRUCTION PHASE	Workers	8	Around 8 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. Contractor will make arrangements with the local council regarding accommodation arrangements.
	Site Supervisor	1	The site supervisor should ideally be local as he/she should be able to regularly communicate with the island council and the community over matters related to the project. It is important for the supervisor to have a fairly good understanding of social and cultural norms of the society.
	Site Engineer	1	The site engineer shall not necessarily be based in the project island but should visit frequently during construction.
	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, trucks or wheelbarrows (for land transport of construction material), transfer vessel, cement mixing machine.	Responsibility of the contractor. Local resources such as pickups for hire 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 Vehicle	Responsibility of the Island Council and 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 25sqmm 4 core power supply cable laid from the nearest distribution box to the waste yard distribution board.
	Labor	About 3 workers to manage waste in the IWMC and 3	Responsibility of the local council. From the local community or expatriate workers. Island council

	workers to provide collection services to the community.	or the outsourced third party 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 1,773.6 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 5.

Table 5 Major Project Outputs

	Output Resource	Type and Amount	Means of managing
	General Construction and Demolition Waste	Moderate amount of Solid Waste	Construction and demolition waste generated will be reused as much as possible. 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.	Reused within the community as much as possible. Remaining waste stored in their respective area within the IWMC and transferred to Vandhoo regional facility once 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 subsequent meetings held with the Island Council. Field observations were conducted from 2nd to 3rd October 2019 and meetings were held on 3rd September 2019 and 3rd October 2019, respectively.

3.1. Current Waste Management Practices

Household waste generation rates for islands in the north province region is 0.83 kg per person per day and commercial waste generation rates for the region is 0.22kg per employee per day (excluding resort staffs). Based on this, the daily generation of household waste in the island is estimated to be 1,773.6kg.

It is estimated that 58.7 tons of waste is generated per month in Holhudhoo which translates to 1.9 tons of waste per day. Major types of waste generated are plastic, green waste and used diapers, while metal waste, glass waste and cardboards are also produced to some extent, although comparatively less in number. The type of waste commonly generated in the island and their corresponding percentages and weights are reflected in table 6.

Table 6 Waste composition in Holhudhoo

Type of Waste	Percentage	Daily Weight (kg)	Monthly Weight (kg)
Organic Waste	46%	816	24,476
Metal Waste	12%	213	6,385
Plastic Waste	15%	266	7,981
Other Waste	22%	390	11,706
Hazardous / Priority Waste	5%	89	2,660
Total	100%	1,774	53,208

The council has outsourced waste collection to a local third-party private contractor called M2S on a monthly remuneration fee of MVR 29,000. A total of 3 workers are engaged in waste collection and the collection vehicle is driven by the owner, Mr. Mohamed Hussain. Kitchen waste and used diapers are collected daily from 7:00 to 9:30hrs, while inorganic waste and green waste are being collected twice per week from 9:30 to 12:00hrs and 12:00 to 13:30hrs, respectively. The households pay a monthly fee of MVR 150 to the council to receive this service. About 95% of the households are registered for this service. Only the 10 households located closest to the IWMC bring waste on their own by paying a monthly gate fee of MRV 50 to the council.

Waste is segregated into 7 parts at household level, namely used diapers, kitchen waste, green waste, plastics, glass, metal cans and cardboard / paper / cloth. Household segregation is carried out in their own bins. The households do not use plastic bags to store any type of waste at household level including food waste with the waste being directly disposed to the respective bins.

A 350KG diesel operated pickup is used by the contractor for household collection. For the purpose of collecting kitchen waste and used diapers, 7 nos. 120L trolleyed containers are placed in the pickup. Six of these containers are used for collecting kitchen waste and one for used diapers. The service provider empties household bins to these containers at each collection point or household. The container with used diapers is brought to the IWMC, where the IWMC staffs attend to it. The 120L container placed outside the IWMC for disposing kitchen waste of gate fee payers is then loaded to the vehicle and brought to the harbor along with the 6 containers containing kitchen waste collected from registered households, which subsequently get loaded to a vessel along with the fish waste, taken outside the reef and sea dumped. The council is not entitled for any additional payments to the vessel, as the contract made with M2S for waste collection is inclusive of this service. Two 120L bins are placed at the harbor area for disposing fish waste.



Figure 4 Collection vehicle and M2S staffs

The contractor resumes inorganic waste and green waste collection after this on days where other waste collection is provided. The emptied containers used for food waste and used diapers collection are taken back to the IWMC and kept there. Jumbo bags are used for this purpose. On average, the contractor collects 2 bags of plastic waste, 2 bags of green waste, 2 bags of used metal cans, 1 bag of glass and 2 bags of cardboard / paper / cloth on each day this service is being provided.



Figure 5 Inorganic waste segregated in jumbo bags

The collected waste is managed at the IWMC site by 3 salaried staffs of the council under the supervision of the Municipal Supervisor, Mr. Mohamed Shanim. After receiving waste at the IWMC, further segregation is done by the IWMC staffs. The inorganic proportion are then being stored in either jumbo bags or kept in open ground in the respective storage areas. These storage areas are not proper storage cells, but areas designated both inside the damaged IWMC boundary and the adjacent 90sqm area allocated west of the IWMC, for keeping different types of waste being brought to the IWMC. Green waste is kept on top of the existing compost pad. Nappies are stored in jumbo bags and taken to Thilafushi 2 to 3 times a month on Corporate Social Responsibility (CSR) by a boat operated by a community member of Holhudhoo that regularly takes waste to the Thilafushi RWMF from the nearby Velaa Private Island Resort (located 10km from Holhudhoo) on contract basis.



Figure 6 One of the bins used for collecting fish waste



Figure 7 Food waste bins brought to harbor & the vessel used for sea disposal

The IWMC does not accept C&D waste. The council has designated a separate area in the western side of the island, about 260m away from the IWMC, for disposing such waste. C&D waste is generally being reused to emplace in eroding areas of the island, while some are also being reused for construction backfilling.



Figure 8 C&D waste disposal area

Table 7 indicates the list of equipment provided to Holuhdoo Council initially through MEMP project and their current conditions.

Table 7 Conditions of WM equipment

Equipment	Received	Not Received	Condition
Compressor	√		Damaged in fire
Plastic Shredder		√	
Glass Crusher	√		Damaged in fire
Wood Chipper		√	
Dust bin (120 L)	√		12 in good condition
Dust bin (240 L)	√		4 in good condition
Dust bin (660 L)	√		Damaged in fire
Compost Sieve		√	
Compost Packing Machine		√	
Shovel	√		2 in good condition
Rake	√		2 in good condition
Wheelbarrow	√		1 in good condition
Gloves	√		
Safety Boots	√		3 in good condition
Safety Helmet	√		

3.2. Island Waste Management Plan

According to the Waste Management Regulation of the Maldives, Island Councils are required to formulate Island Waste Management Plans (IWMP) in coordination with the Atoll Councils and get subsequent approval from EPA. The Island Council of N. Holhudhoo has formulated an IWMP on 1st September 2017 in consultation with the relevant stakeholders and community members. This plan was approved by the EPA on 18 January 2018. The IWMP sets objectives, goals, user fees and activities on waste management for the next 5 years.

Goals and Objectives

The overarching objective of the IWMP is to sustainably manage waste in N. Holhudhoo in an environmentally friendly manner and thereby resolve the difficulties faced by the community including public health concerns.

Specific objectives of the plan are:

1. Formulate comprehensive regulations and principles on waste management and ensure its timely implementation;
2. Inform the community and increase public awareness on the advantages and benefits of keeping the island clean;
3. Procure waste management equipment and provide the required trainings;
4. Establish systematic mechanisms to collect waste from households and other places, and bring to the IWMC;
5. Make a community transition towards 3R concept by bringing a behavioral change;
6. Proper segregation, storage and management of waste in the IWMC; and
7. Manage waste in a financially sustainable model by taking user fees from households and other places.

Principles

Following are the list of principles given in the IWMP.

1. Practice household segregation to 6 parts, namely, kitchen waste, used nappies, green waste, plastic bottles, metal cans etc.
2. A 15% increase in the total amount of waste generated in the island is anticipated within the duration of the plan. Plastic waste will represent the most increase.
3. Provide waste collection services to households, businesses and institutions at least once a day.
4. Outsource waste collection services to a third party, either a private company, partnership, local investment or NGO.
5. Device a systematic mechanism to collect user fees.
6. Transfer of unmanageable inorganic waste to R. Vandhoo RWMF once a month. A contract has already been signed with WAMCO agreeing to this arrangement.

User Fees

The IWMP sets monthly user fees for providing Waste Management Services in the island.

Table 8 WM user fees

#		Fee (MVR)
1	NGOs	75.00
2	Households	150.00
3	Private Companies (Dhiraagu, Ooredoo)	1000.00
4	Workshops	250.00
5	Government Offices	500.00
6	Restaurants and Cafes	300.00
7	Carpentry	250.00
8	Special Events	150 – 300
9	Offices under the administration of Island Council	150.00
10	Boatbuilding huts	250.00
11	Political Party Offices	150.00
12	Businesses	100 – 500

Businesses are further categorized into four as reflected in table 9.

Table 9 User fees for businesses

#		Fees (MVR)
1	Wholesale shops	500.00
2	Retail shops that sell processed food, fruits and vegetables	200.00
3	Garment shops	200.00
4	Small shops	200.00

Waste Management Committee

A waste management committee was formulated under the IWMP. The committee has adequate representation from relevant sectors such as government offices, health, education, NGOs, women, community member, café / restaurants and businesses.

Table 10 Waste Management Committee members

#	Name	Address	Institution
1	Mohamed Naseer	Naaz	Holhudhoo Council
2	Mohamed Afrah	Aa Hiya	Holhudhoo Council
3	Ahmed Irfan	Uduvilla	Holhudhoo Council
4	Abdulla Hameed	Chaandhane Ge	Holhudhoo Council
5	Abdul Azeez	Three Rose	Holhudhoo Council
6	Mohamed Atheef	Ocean Reed	Health Centre
7	Ahmed Zuhree	Irumaa Ge	Meyna School
8	Ahmed Hamdhan Naseer	Blue Rest	Youth Centre
9	Mohamed Razeen	Three Rose	BAFA NGO
10	Hassan Asif	Farivaa Ge	BASE NGO
11	Ahmed Shareef	Plaza	One Community NGO
12	Aishath Huzana	Sheet Maa Ge	WDC
13	Abdul Muhsin	Ahseyri	Driver

14	Abdulla Nasrath	Maduvaree Ge	Business Owner
15	Mohamed Basheer	Morning Vaadhee	Business Owner
16	Hassan Mohamed	Neel	Business Owner
17	Mohamed Rasheed	Thadi Raimaa Ge	Construction Sector
18	Maayiz Mohamed	Ihram Ge	Construction Sector
19	Ahmed Thasleem	Karu Kooru	Community Worker
20	Hussain Mohamed	Neel Villa	Café' / Restaurant
21	Abdul Haadhee	Parkleen	Business Owner

The committee meets quarterly to discuss on matters related to waste management that includes:

1. Reviewing the progress made on activities that were planned for the concluding quarter;
2. Issues and challenges faced in implementation and how to resolve them; and
3. Propose way forward and agree on actions for next quarter.

The committee last met in June 2019 in response to a fire being put on the accumulated waste in the IWMC by an unknown source. Refer to chapter 9 (stakeholder consultations) for details of this meeting.

Stakeholder Consultation

The IWMP was prepared in consultation with relevant stakeholders. Details of this consultation is provided in chapter 9 (stakeholder consultations) including the list of stakeholders met and the main outcomes of the discussions held.

3.3. Project Site and Access Road

At the time of the visit, only a pile of metal waste was found at the proposed site towards south of the site boundary. This pile will also be removed through WAMCO's ongoing regional collection and hence the site is expected to be clear when the contractor mobilizes. Council will continue waste management activities at the site west of the IWMC where plastic waste and aluminum cans are currently being stored. This site will also be cleared through the ongoing regional collection, creating much needed space to manage waste in the interim till the upgrading of IWMC gets completed.



Figure 9 Panoramic view of the existing IWMC



Figure 10 Metal waste pile at the site



Figure 11 temporary waste storage area west of the IWMC

The site is easily accessible from all four sides. The proposed design has gates on west and east perimeter walls. The west of the IWMC opens up to Meyna Road which is the main road of the island that has direct access to the harbor without any deviating roads. The project site is the site designated for IWMC in the land use plan (LUP) of the island, which was approved by the Ministry of National Planning and Infrastructure (MNPI).

The EPA has provided recommendations for optimum zoning of the IWMC site (EPA, 2017). MNPI and MLSA consults EPA prior to finalization of LUPs. The requirement includes, the site being at least 30m from the vegetation line, at least 30m from a natural wetland area, at least 30m from the nearest environmental protected area (EPA) or environmentally sensitive area (ESA), and any infrastructure not being present within a 30m radius. However, the EPA allows certain exceptions depending on the size of the population and availability of land area. Holhudhoo falls under this category due to limited availability of land space (smallest in the atoll), high population density (highest in the atoll) and the majority of the coastline of the island being protected through rock boulder revetments. The field survey done on the island recorded the locations of the aforementioned categories, which is reflected in table 11.

Table 11 Distances between the proposed site and priority locations

Location	Distance from site (m)
Revetment	7
Residential Area	10
Recreational Area	60
EPAs and ESAs	NA
Vegetation line	NA

3.4. Unassigned Waste Dumping

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

3.5. Vegetation Removal

The proposed project will be undertaken inside the boundary of the existing IWMC and therefore vegetation removal is not required.

3.6. Coastal Erosion

About 90% of the shoreline of Holhudhoo is protected by rock boulder revetments, while the northern side of the island is heavily modified with a harbor basin, breakwater, quay wall and reclaimed land. A 160m revetment is present at the southern rim of the island, which is the coastal area closest to the IWMC. This revetment should provide sufficient protection to the IWMC, annulling any potential threats of erosion to the proposed infrastructure.

Slight erosion is occurring at the western side of the island adjacent to the revetment laid at this side, which extends to a distance of approximately 40m. This is the only area of the island subject to erosion at present. The council is managing C&D waste at this location. Some C&D waste is found emplaced at this area to act as a line of defense against erosion.



Figure 12 Shoreline adjacent to IWMC being protected by rock boulder revetment

3.7. Environmentally Protected Areas and Sensitive Areas

Environmentally protected or sensitive areas are not present in Holhudhoo. There are two protected areas within 10 km of Holhudhoo: Fodhipparu declared as an environmentally sensitive area lies within about 6.11 km from the project site and Thanburudhoo, a terrestrial protected area lies within 4.8 km from Holhudhoo. However, these sites are not expected to be affected by the project. The environmentally sensitive areas are depicted in figure 13 below.

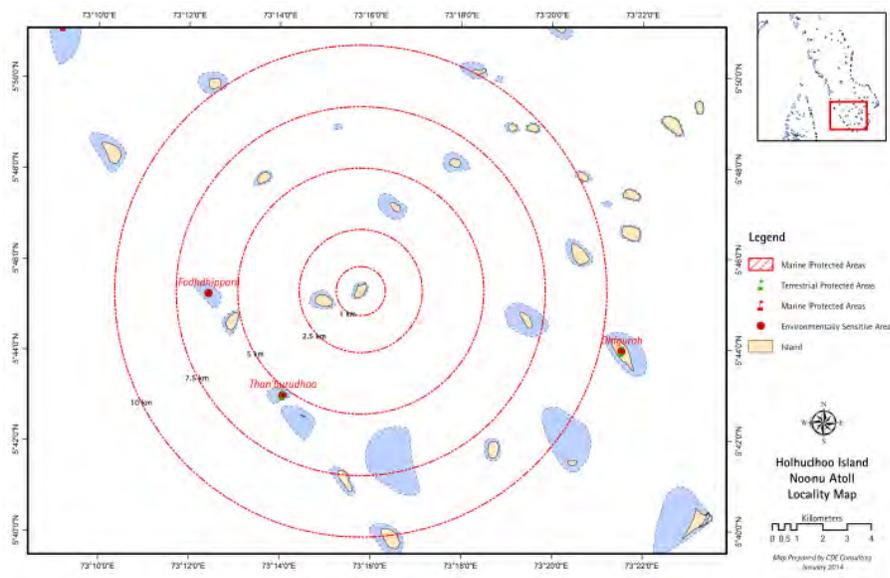


Figure 13 Environmentally Sensitive Areas with 10km radius of Holhudhoo

3.8. Areas of Historic and Cultural Significance

There are 4 mosques and 1 cemetery on the island. However, there are no mosques of cultural significance. The project site maintains a sufficient distance from the cemetery. The cemetery is located at the other side of the island approximately 412m away from the project site.

3.9. Socio-Economic Environment

3.9.1. Population

The total population of Holhudhoo estimated in 2014 census is 1,683 corresponding to 764 males and 874 females. The 2014 census reports the total residential population of the island to be 1,508 and foreigners to be 130 (National Bureau of Statistic [NBS], 2014). The table below depicts comparison of total population with 2006 census.

Table 12 Average Annual Growth Rate, N. Holhudhoo

	Census 2006	Census 2014	Percentage change in population (2006 – 2014)
Total	1,527	1,683	10.2%
Male	680	764	12.3%
Female	847	874	3.2%

According to the census, from 2006 to 2014, the total population of Holhudhoo had increased by 10.2%.

The information provided by the Council indicates the present total population of Holhudhoo to be 2211 and the total residential population to be 1800. This corresponds to a further increase in the total population by 31.4% from 2014 to 2019.

Holhudhoo accounts for the second largest population of the atoll and shares 17.5% of the population of *Noonu* Atoll with a land area of 17.2 hectares.

Figure 14 below shows the land area (in hectares) by locality for *Noonu* Atoll.

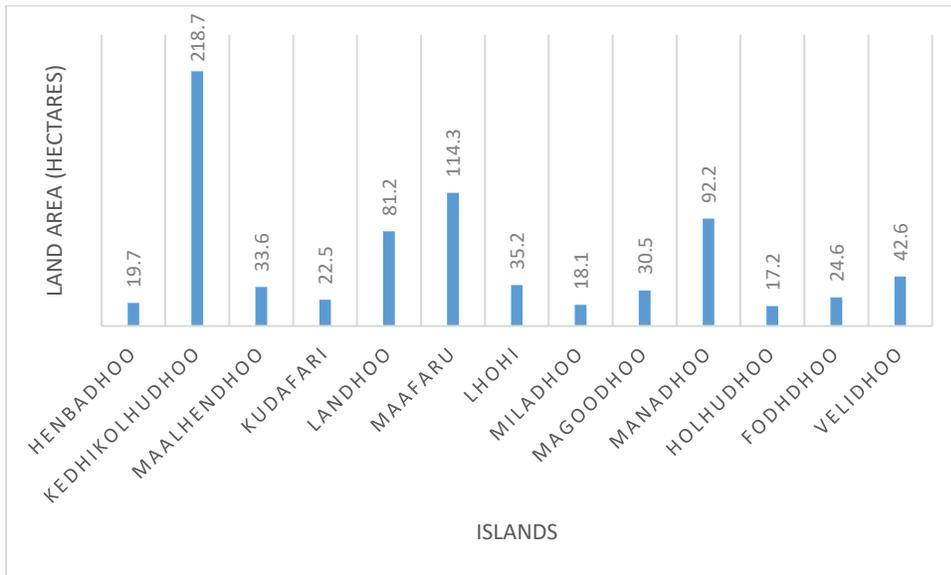


Figure 14 Comparison of Land Areas in Nona Atoll

As seen from figure 14, *Holhudhoo* has the smallest land area among the thirteen administrative islands of the atoll, with a total land area of 17.20 hectares. Correspondingly, figure 15 below shows that it had the highest population density from the atoll, where its population density is 95 people living per hectare.

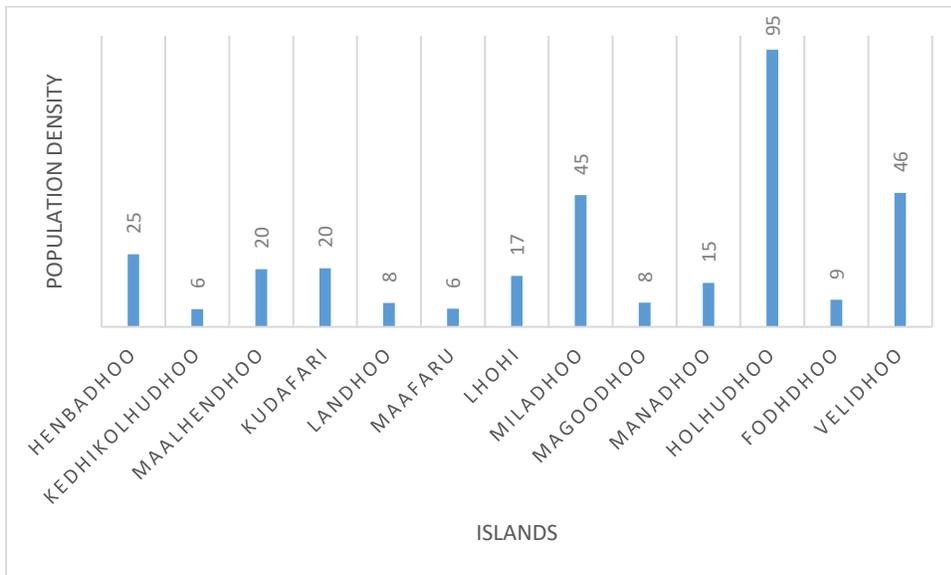


Figure 15 Population density by islands for Noonu Atoll

3.9.2. Households

There are 340 households in Holhudhoo representing houses, flats and apartments.

3.9.3. Education and Literacy Level

Meyna School is the government school in Holhudhoo that provides formal education from preschool up to GCE Advanced Level (year 12). At present 466 students; 235 female and 231 male students are being taught by 43 teachers (20 expatriates).

MI college operates one of its campuses in Holhudhoo, which offers higher education programs ranging from certificate level to master degree. These programs are offered in affiliation with some well recognized universities and colleges worldwide, including:

- ITC, United Nations, Switzerland
- CPA, Ireland
- City & Guilds, UK
- OUSL (Open University of Sri Lanka), Sri Lanka
- UTHM (Universiti Tun Hussein Onn Malaysia)
- ARENA MULTIMEDIA, India
- APTECH, India
- AOD (Academy of Design- Sri Lanka)

According to Census 2014, 97.7% of the resident population in Holhudhoo is literate in mother tongue and 68.6% literate in English language. Literacy in both languages were determined by the person's ability to read and write, with understanding of the language (NBS, 2014).

3.9.4. Health

There is one health center in the island, serviced by 2 doctors and 12 nurses, in addition to a privately-owned pharmacy serviced by 3 pharmacists on rotating duties.

3.9.5. Employment, Economic Activities and Business Establishments

57.1% of the population of *Holhudhoo* above the age of 15 is economically active with 90.2% being employed and 9.8% unemployed (NBS, 2014).

Majority of the people in Holhudhoo are employed in construction sector. There are 6 construction companies in the island, engaged in projects of various scales, including resort develop projects within the atoll. Other employment sectors include education, health and social work, fishing, selling goods (wholesale and retail shops), and restaurant and café business.

Only one fishing vessel is operated in Holhudhoo. The island also has 36 shops, 4 cafés, 1 grocery store that provides catering services to the school and 1 guesthouse with an occupancy of 8 beds. Furthermore, there are 2 workshops, 2 carpentries and 1 tailor shop. A total 31 land vehicles are registered on Holhudhoo.

3.9.6. Non-Governmental Organizations

There are 4 registered NGOs in the island. Names of NGOs, their current status and associated activities or main area of focus is reflected in the table 13 below.

Table 13 NGOs in Holhudhoo

#	Name of NGO	Status	Focus Area
1	Banyan Association for All (BAFA)	Active	Youth empowerment and sports
2	Better Environment for Youth Society (BASE)	Active	Awareness, island cleanups and environmental activities
3	Holhudhoo Islamic Moment (HIMS)	Active	Religious awareness
4	Meyna School Former Students Association	Inactive	NA

3.9.7. Council Secretariat

According to the 6th Amendment to the Decentralization Act of the Maldives, 3 members constitute the island councils of islands with a population of less than 3000, while 5 members are elected for island councils of islands with more than 3000 in population. In the Act, the tenure of the council is specified as 3 years from the date of election. It also states that a new council shall be elected 30 days prior to the end of the current council's term.

As the island of Holhudhoo has a population of 2211, the Island Council is comprised of 3 members, namely, President Mr. Mohamed Naseer, Vice President Mr. Mohamed Afrah and Member Mr. Ahmed Irfan. The council took oath on 4 June 2017.

The President and Vice President of the island council are elected by a secret ballot held among the elected members of the island council. If a member's post is vacated before the end of the tenure, another member shall be elected within 45 days through a bi-election. The elected member in a bi-election will remain in the post till the end of the term of that council.

The President and Vice-President of the Councils are responsible for day to day operational management of the Council. The responsibility of Council members includes attending official meetings of the Council, discussion and reaching resolutions on the agenda items for the meetings, and participation in the making of policies needed to achieve the objectives of the Council.

Specific duties of the Council President are as follows:

- (a) Conduct council meetings and preside over these meetings;
- (b) Administer and direct the council towards achieving its objectives;
- (c) Publish and implement the decisions of the council through the Council's Administrative Office;
- (d) Oversee the compilation of the council reports and ensure that the reports are submitted on time to the relevant authorities;
- (e) Foster and maintain good relations and cooperation between the council and Government authorities, associations and groups;
- (f) Monitor to see if the council's finances are managed by the Council's Administrative Office, according to the decisions made by the council;

- (g) Facilitate a mechanism to keep records of the Council's revenue and expenditures;
- (h) Perform other work assigned by the atoll council and the island council.

Specific duties of the Council Vice President are as follows:

- (a) Assist the President of the council in performing council's work;
- (b) Perform the duties of the President of the island council, during such times as when the President of the island council is incapacitated or is excused or if the post is vacant. In addition to this, undertake responsibilities assigned by the president of the council;
- (c) Perform other work assigned by the island council.

Specific duties of the Island Council Members are as follows:

- (a) Work towards achieving the objectives of the island council.
- (b) Carryout any work assigned by the council as per the procedures of the island council.

The island council is responsible for providing the following municipal services to the people of the island:

- (a) Build and maintain roads of the island;
- (b) Dispose waste in a reasonably safe manner at the island level as it does not create any inconvenience to the community;
- (c) Maintain the jetty of the island, build and maintain wharf, and operate the ferry terminal of the island;
- (d) In accordance with the Law of the Maldives, take necessary measures to alleviate the land erosion problem and maintain the jetty and the breakwater of the island;
- (e) In accordance with the law of the Maldives, provide and maintain public facilities such as water, electricity, and sewage system;
- (f) In accordance with the Law of the Maldives, provide primary health care and other basic health security services;
- (g) In accordance with the Law of the Maldives, provide preschool education and organize and conduct educational and vocational programs to train adults;
- (h) Administer the island library, archive official documents, preserve old and historical documents of the island in the library and with the help of modern facilities, provide access to information;
- (i) Maintain social centers, play grounds or sports fields and provide sporting facilities, public parks and entertainment services;
- (j) In accordance with the Law of the Maldives, run a center to provide social security services, take measures to stop domestic violence and provide the victims of such violence with security and assistance and put in place a system to help senior citizens and people with special needs;
- (k) In accordance with the Land Law of the Maldives and in a manner which does not contravene the island's Land Use Plan, allocate land and register land and buildings, and monitor if all building work undertaken is in accordance with the building regulations of the Maldives and other regulations by

relevant Government ministries, and in accordance with the Land Laws and other such Laws of the Maldives, keep record of all dealings undertaken by parties in regards to matters of land;

(l) Maintain a land registry of the island and provide information required for the national land registration authority;

(m) Maintain mosques;

(n) Maintain cemeteries, establish burial service mechanism and organize for burial services;

(o) Maintain historical places and promote and revive culture;

(p) Commemorate religious and national days of importance and hold religious and national functions;

(q) Organise to sweep and clean the roads, maintain cleanliness of the island and its beauty;

(r) Provide the island with adequate lighting at night;

(s) Pest controlling;

(t) Establish a mechanism that provides assistance in an event of emergency;

(u) Monitor and check if shops, tea boutiques, restaurants, café's, guest houses and public markets comply with standards, rules and regulations set by the law of the Maldives and take corrective measures;

(v) Organize and manage for pedestrians, motor vehicles and non-motor vehicles to use the roads as according to the standards set by the statutes of the Maldives, and organize and manage public land and sea transport services which levy a fee to operate in compliance with the standards set by the relevant Government authority;

(w) Assist the Courts of Law and Government authorities to execute the sentences passed by the Courts of Law.

(x) Issuing and cancellation of permits and registries; that Government ministries provide through the island councils, and on matters that fall within the jurisdiction of the island council, and on matters that have been assigned to the island council under various laws;

(y) Manage the birth and death registry of the island, and gather and maintain the statistical records of the island, maintain a registry of citizen and noncitizen of the island, and maintain a registry of foreigners living on the island;

(z) Provide other services that are prescribed by Laws.

3.9.8. Electricity

Electricity is provided by FENAKA Corporation 24 hours a day. The power house is located north of the island at a close proximity to the harbor and cemetery. The distance between the IWMC and the power house is 420m.

FENAKA uses 3 diesel generators of capacity 520kW, 400kW and 250kW to provide electricity to the island.

3.9.9. Sewerage

Sewerage is managed by FENAKA through the existing sewerage network established in the island. It is a conventional gravity collection system with two pump stations, one of which is an outfall pump station. The connection chamber of each of the registered household is connected to this network. The sewerage is discharged from the main pumping station to the sea through a sea outfall laid using anchor blocks. The sea outfall is located at the south west side of the island (Shaiq, 2014a).

3.9.10. Water Supply

Even though there is a desalination plant on the island, due to damaged parts, including filters, product water is not suitable for drinking. However, there are 39 community rainwater tanks and over 280 household tanks. The households currently use rainwater for drinking. A water network system is, however, planned for Holhudhoo, with works expected to commence in the first quarter of 2020.

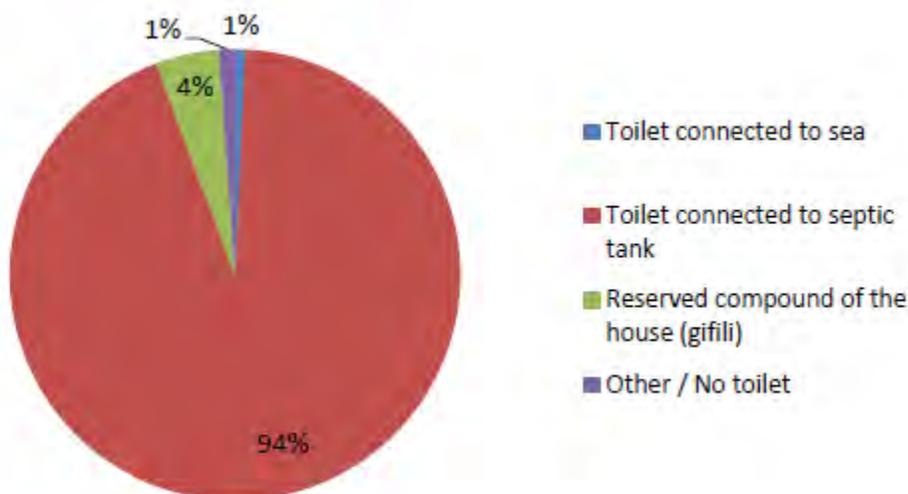
3.9.11. Transport and Communication

Sea transport to and from the island is facilitated by the island harbor. There is a total of 5 vessels registered in the island. As of November 2012, 96% of the population had telephone services available at their homes

3.9.12. Fuel used for cooking

For cooking purposes, most of the households use gas (80%) while 14% use oil, 5% use fire wood, and 1% had not stated.

Table 14 Fuel used for cooking (NBS, 2006)



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, field 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 the 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 into two components and criteria B into three components. Table 15 describes these subcomponents and the scale used to assign scores (Pastakia and Jens, 1998).

Table 15 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:

$$(A1) \times (A2) = (AT)$$

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

$$ES = (BT) \times (AT)$$

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 (of workers and nearby residents)
Sociocultural conflict
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 16.

Table 16 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 17.

Table 17 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	-12	-B	-2	Negative
Fauna	-12	-B	-2	Negative
3. Sociological / Cultural				
Road Closure	-6	-A	-1	Slight negative
Health and Safety	-5	-A	-1	Slight negative

Sociocultural Conflict	-8	-A	-1	Slight negative
4. Economic				
Loss or benefit	+8	A	1	Slight Positive

Site Preparation

The site proposed for the upgrading of the waste management center does not contain any vegetation. Therefore, no direct negative impacts to the biodiversity is perceived to occur as a result of the project since uprooting or cutting down of palms and trees or clearance of shrubs are not required at any scale.

Mobilization, Transport and Storage of Construction Materials

In case of illegal sand mining from the island lagoon, a direct negative impact to seawater quality in terms of increased turbidity will be felt coupled with potential exacerbation of coastal erosion and loss of beach aesthetics. However, any such impacts will be short term, while more importantly such acts shall never be practiced as it is prohibited by law and will result in the cancellation of the contract and further penalties from EPA if found guilty. As such, the possibility of such an incident happening is unlikely and hence is ruled out as a potential impact of the project.

Although no direct negative impacts are envisaged to occur to the flora and fauna from the construction phase, the transport and supply of construction materials and machineries to the site may impose indirect negative impacts to the terrestrial and aquatic biodiversity and slight negative impacts to the soil and groundwater. The impacts may arise from accidental spillage of construction materials (cement bags, timber, iron bars etc.), accidental oil spills (used oil) and damage to vegetation as a result of improper handling and careless driving during transportation of materials.

Spillage of oil to the ground has a high potency to contaminate soil and groundwater. Likewise, an oil spill to marine waters may lead to death of marine organism, as it would significantly diminish the dissolved oxygen content of seawater supplemented by an increase in carbon dioxide concentration, leading to suffocation of marine organisms. In addition to smothering, coral reef and aquatic flora and fauna, will be at extreme risk from exposure to toxic substances contained within oil. However, the project is not expected to generate large quantities of used oil since only a cement mixing machine is proposed to be used, which may even not require changing of oil during the lifespan of the construction period. Any potential spillage of used oil to seawater is considered as an indirect impact as used oil generated (if any) is expected to be properly stored in sealed container, introduced to the island waste management stream and ultimately transferred to Vandhoo RWMF.

Construction Waste

Inappropriate handling of construction waste which will be generated during the upgrading of the IWMC and its disposal into the surrounding environment may contaminate groundwater and pollute marine environment. The types of waste generated during construction are primarily comprised of plastics, paper, empty cement bags, empty aggregate bags, pieces of GI pipes, PVC mesh, wood, waste oil and other irregular objects. Such items if disposed improperly can reduce the aesthetic beauty of the island and degrade ground and marine water quality, which would in turn affect human health and marine organisms.

Socio-Cultural

A sociocultural negative impact may arise due to influx of a foreign labor force that have limited understanding of local context and might not respect the cultural and religious norms followed by the local community. But such impacts will also be temporary, limited only to construction phase.

A slight negative impact to the regular traffic flow is also possible during transfer of construction materials to the project site, especially since the site is located at opposite ends of the island to the harbor. However, any such impact is expected to be temporary and minute, since construction materials are usually transferred to the project island only once in such type of projects and as there are not many vehicles operating in Holhudhoo.

The workers may also be subjected to slight negative health and safety impacts if proper PPEs are not worn during progression of construction works. The nearby residents may also experience impacts from dust during cement mixing since residential areas exists at a relatively close proximity to the site.

Economic

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 18.

Table 18 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	-20	-C	-3	Moderate 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.

Waste Management

Upgrading of the IWMC will provide adequate storage space needed to manage and store island waste in a systematic and organized manner. The project will also facilitate the operator to resume compost production. The IWMC operators have already undergone the required training and the council informs that they will commence compost production as soon as the project gets completed. A refresher will be covered through the community mobilization program planned to be held on 20th October 2019.

Groundwater, Soil, Seawater and Noise

The collection bay area of the IWMC has concrete screed and roofing, while a leachate collection well and stormwater drains will be installed, which would ensure proper management of leachate and stormwater runoff during operations of the center. At present, the waste is kept in open ground without any barrier or cover on top, making leachate and subsequent contamination of groundwater and soil a high probability. Therefore, the project is expected to moderately improve the soil and groundwater condition of the island.

Moreover, with the upgraded center, the operator should be able to store and pack waste according to WAMCO's segregation guideline for transfer of waste to Vandhoo RWMF, thereby, reducing the probability of any potential waste spillage from the landing craft during transfer of waste to Vandhoo.

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 as heavy machineries that emit significant noise are not expected to be used.

Air Quality, Public Health and Nuisance to Community

A fully functional IWMC with added security features (elevated perimeter walls, installation of surveillance cameras, firefighting equipment etc.) will assist in mitigating the regularly occurring fires on accumulated waste put up by unknown sources. As highlighted in chapter 3, in addition to the financial damage caused by loss of expensive infrastructure and equipment, these fires are also causing nuisance to the nearby residents and is becoming a major public health concern. Open burning of waste is known to cause numerous health implications to people having respiratory diseases such as asthma, bronchitis,

emphysema, and pneumonia. Hence, the project is expected to bring about major positive impacts towards the health and wellbeing of the society by reducing the probability of unauthorized fires and associated respiratory diseases. The health benefits perceived would also indirectly contribute to reduce the amount of money spent by individuals on healthcare.

In addition to this, bad smell from used nappies are also currently felt by nearby households. The design of the IWMC has considered a special storage cell for used nappies, which would facilitate its proper storage until final disposal at the RWMF. This storage cell will have 4m high walls towards the side facing the residential area and an additional 3m long vegetation buffer which would act as a further barrier.

Socio-Economic

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.

Similar to construction phase, a moderate negative impact maybe possible in terms of sociocultural conflict if expatriate workers are employed to provide waste management services. However, in contrast, the impact at operational phase is considered moderately negative, since IWMC staffs are expected to be employed for longer duration given that the operations of the IWMC will be continuous.

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

Table 19 Mitigation measures proposed for significant impacts

Environmental Management Plan			
Impact	Mitigation Measure	Responsible Party	Cost of Mitigation
<i>Management of Impacts during Preconstruction and Design Phase</i>			
1. Physical / Chemical			
Contamination of groundwater and soil through leachate and stormwater runoff.	<p>Ensure (i) waste storage areas are covered to prevent contaminated storm water runoff, and (ii) hazardous waste storage area is bounded.</p> <p>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 well.</p> <p>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.</p>	P: Civil Engineer, MCEP	Included in the overall project budget.

Noise pollution	Construction of high perimeter walls and inclusion of a 3m long vegetation buffer within the boundary of the IWMC towards the side facing the residential area.	P: Civil Engineer, MCEP	Included in the overall project budget.
	Ensure that the outer boundary wall of the IWMC maintains a minimum distance of 30m from commonly used public places.	P: Island Council S: MLSA, EPA	No cost involved
Impacts of air pollution to nearby residents due to fire hazard and open burning of waste	Construction of high perimeter walls and inclusion of a 3m long vegetation buffer within the boundary of the IWMC towards the side facing the residential area.	P: Civil Engineer, MCEP	Included in the overall project budget.
	Include provision for firefighting equipment in IWMC design and BOQ.	P: Civil Engineer & Project Manager, MCEP	Included in the overall project budget.
	Installation of surveillance cameras and fire alarm systems (smoke detectors).	P: Island Council	
Marine water pollution	Ensure that a minimum buffer of 5m is maintained between the IWMC and southside revetment.	P: Island Council S: MLSA, EPA	No cost involved
2. Biological			
Negative impacts on ecologically significant wetland and marine habitats	Ensure IWMC is not designed within a wetland or marine outfall and sets a minimum distance of 30m from environmentally sensitive areas.	P: Island Council S: MLSA, EPA	No cost involved
Negative impact due to vegetation removal	Consideration should be given during detailed designing stage to build infrastructure around existing vegetation, thus minimizing any clearance.	P: Island Council S: MCEP	No cost involved
3. Sociological and Cultural			
Public health impacts and damage to public and private property due to potential fires and open burning.	Include provision for firefighting equipment in IWMC design and BOQ.	P: Civil Engineer & Project Manager, MCEP	Included in the overall project budget.
	Design sign boards for no smoking, fire safety and storage cells in the collection bay area. Include printing and fixing of the sign board as parts of works of the contractor.	P: Communications Specialist, MCEP S: Civil Engineer, MCEP	
	Installation of surveillance cameras and fire alarm systems (smoke detectors).	P: Island Council	Included in the IC budget.

4. Economic			
Creating comfortable work environment for potential workers	Include office, toilet and resting areas in the IWMC design.	P: Civil Engineer, MCEP	Included in the overall project budget.
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 soil due to chemical spillage and seepage	<p>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.</p> <p>Stored containers should be regularly inspected to identify any leakages.</p>	P: Contractor S: IC Supervisor	Cost associated with purchasing of containers and transport to RWMF
Noise pollution due to construction activities and use of machinery	<p>Ensure construction activities occur between 8 am and 6 pm.</p> <p>Construction workers should wear ear muffs when using machinery that produce significant noise.</p> <p>The proposed development will not emit significant level of noise due to the scale of work involved.</p>	P: Contractor	Cost associated with purchasing ear muffs
Negative impact on air quality during transfer of construction materials and progression of works	<p>During transport of construction materials from the harbor to the site, all sand and aggregate should be transported in covered vehicles or wheelbarrows and vehicle movement should be via routes that are well away from community roads where possible. Transportation should be at low vehicular speeds and loading and unloading should be conducted within the site.</p> <p>All vehicles used in the project should have an up to date road worthiness certificate.</p> <p>All vehicles and machinery should be well tuned.</p> <p>Ensure that construction site is wetted to minimize impact of dust as a result of the project.</p>	P: Contractor	No cost involved.

	<p>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.</p> <p>Similar to above (relate to noise), there will not be significant impact on the air quality.</p>		
Coastal erosion and loss of beach aesthetics due to sand mining	<p>Ensure that all construction materials including sand are sourced in compliance with the national laws and regulation.</p> <p>Sand should not be sourced from the beach or lagoon of an inhabited island, tourist resort, or any protected island. This includes the area of the island designated for sand mining of local public use.</p>	P: Contractor	Cost associated with purchasing sand from a reputable source (hardware shops) and transporting to the island.
C&D waste produced during demolition of the existing IWMCs	<p>Reuse the waste produced during demolition of the existing fence footings, pump hut and damaged walls for construction of the new IWMC as much as possible.</p> <p>Consideration shall also be given to reuse the general C&D waste generated in the island as much as possible.</p> <p>Any remaining C&D waste shall be disposed at the area designated by the council for C&D waste disposal.</p>	P: Contractor S: Island Council	Cost associated with transport to RWMF
Littering and general waste generated by construction workers	<p>Place a bin at the site to dispose general waste generated by the workers.</p> <p>Establish procedures for general waste disposal which should include actions to be taken if the procedures are breached.</p>	P: Contractor	Cost associated with purchasing a bin
2. Biological			
Negative impacts to vegetation due to improper handling and driving during material transportation.	<p>Workers will be informed to avoid damaging trees and disturbances to animals and to generally avoid engaging in destructive activities to the environment intentional or unintentional.</p> <p>Avoid roads with significant vegetation during transportation within the island.</p> <p>Avoid bringing heavy vehicles to the island where possible.</p>	P: Contractor	No cost involved

<p>Negative impact on fauna during material transport</p>	<p>Workers will be informed to avoid damaging trees and disturbances to animals and to generally avoid engaging in destructive activities to the environment intentional or unintentional.</p> <p>Materials shall be obtained from the closest source.</p> <p>The materials shall be brought in bulk and transported to the island within a single trip where possible.</p> <p>The materials shall be stored at the project site or in a close proximity to avoid unnecessary movement of vehicles within the island through the construction phase.</p> <p>Ensure that all construction materials imported to the island are free of any alien species or pests.</p> <p>Ensure that oils and paints are properly sealed prior to transportation.</p> <p>Ensure that materials are not kept beyond the height of the sides of the vessels and are properly covered, when transporting via sea.</p>	<p>P: Contractor</p>	<p>Cost associated with purchasing of containers designed for storing hazardous substances.</p>
<p>3. Sociological and Cultural</p>			
<p>Health and Safety of construction workers</p>	<p>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.</p> <p>Ear muffs shall be provided where equipment or machinery that emit significant amount of noise is used.</p> <p>Chemical-Liquid protective gloves should be used when handling any chemicals, waste oil or other liquid waste.</p> <p>No open electrical wiring or cables should be kept on site.</p> <p>Health and Safety briefing should be given to all construction workers.</p> <p>The maximum working hours of all construction workers should be 48 hours per week as per the Employment Act of Maldives.</p>	<p>P: Contractor</p>	<p>Cost associated with purchasing safety materials.</p>

	<p>Meals should be provided to construction staffs 3 times a day.</p> <p>Safe drinking water should be supplied to construction workers.</p> <p>Appropriate sleeping arrangements shall be made for the construction workers.</p> <p>A safety inspection checklist should be prepared taking into consideration what the workers are supposed to be wearing and monitored monthly and recorded in the monitoring.</p>		
Health and safety of public	<p>Demarcate the site boundary through taping or hoarding.</p> <p>Place sign boards to indicate that only authorized personnel are allowed entry.</p> <p>Make sure that the general public do not have access to the site and its vicinity. Regularly monitor for entrance of residents.</p> <p>Make sure that public chairs are not found at the vicinity of the site.</p>	<p>P: Contractor S: Island Council</p>	<p>Cost associated with designing and printing sign boards.</p>
Fire hazard	<p>Ensure that electrical wires are installed properly by a certified person.</p> <p>Ensure that portable extinguishers are readily available in case of an emergency fire.</p>	<p>P: Contractor</p>	<p>Cost associated with hiring an expert electrician and purchasing of fire extinguishers</p>
Sociocultural conflict due to arrival of expatriate workers	<p>Ensure that local workers are used as much as possible. If expatriate workers are used ensure that they respect the local culture.</p> <p>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.</p> <p>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</p>	<p>P: Contractor S: Island Council</p>	<p>Cost associated with hiring staffs</p>

	<p>Waste collection vehicles and transfer vessels must be secured from all sides to prevent spillage.</p> <p>Provide composting training to all laborers and management staff of the facility.</p> <p>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).</p> <ul style="list-style-type: none"> • 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 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. 	<p>P: ME S: MCEP</p> <p>P: Island Council / IWMC Manager</p>	<p>Cost of providing compost training</p> <p>Cost associated with purchasing jumbo bags and/or containers</p>
<p>Hazardous Waste Management and Transportation</p>	<p>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).</p>	<p>P: Island Council /IWMC Manager</p>	<p>Cost associated with purchasing containers designed to store hazardous waste and printing of labels.</p>

	<p>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.</p> <p>Incoming hazardous waste to the IWMC should be stored in the hazardous waste storage room and regularly transported to Vandhoo RWMF.</p> <p>The following measures must be taken during transportation of hazardous waste:</p> <ul style="list-style-type: none"> • 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. <div data-bbox="562 743 982 1016" data-label="Image"> </div> <p>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.</p>		
<p>Marine Water Pollution and associated impacts to marine organisms due to potential spillage of waste to the sea during transfer of waste from</p>	<p>The IWMC operators and the island council should ensure implementation of the following measures prior to regional transfer:</p> <ul style="list-style-type: none"> • All outgoing waste from the IWMC shall be stored in bins or jumbo bags and properly labeled to indicate the type of waste. Below are some examples of the signages that can be used to label bins and jumbo bags: 	<p>P: Island Council /IWMC Operators</p>	<p>Cost associated with printing the labels.</p>

**the IWMC to the RWMF
(loading and unloading)**



- Maintain log records of all outgoing waste from the IWMC either in terms of weight or volume of jumbo bags and bins and provide to WAMCO during regional collection.

P: WAMCO Management

WAMCO should make sure that the following measures are implemented during loading and unloading of waste into the collection vessel (landing craft):

P: WAMCO Management

- Provide jumbo bags or bins required for regional collection to the councils.
- Prepare a collection manual that gives instructions related to storage of waste for regional collection and share with the councils. The manual should clearly specify the types of waste that are accepted and not accepted for regional collection, categories to which waste has to be sorted and packaged by the councils (plastics, glass, nappies, metals, hazardous etc.) and any special requirements for packaging waste such as hazardous waste (sealed containers, proper signage etc.).
- Prepare a schedule for regional collection and share with the respective councils. In addition to this, it is recommended to inform the exact date of regional collection to the respective council 3 days prior to arrival of the transfer vessel (landing craft).

P: RWMF Manager / Supervisor

Cost of purchasing jumbo bags and bins

Cost of printing manual, posters and billboards

	<ul style="list-style-type: none"> • Properly label the jumbo bags or bins to reflect the type of waste (if this has not been done by the councils). • Record data of all loaded waste in terms of weight or jumbo bags and bins (volume of the bags and bins must be specified). • Waste must not be kept in the open in any circumstance during transfer. • Hazardous waste (such as batteries, paint, thinner, fiber glass etc.) should be kept in the landing craft in sealed containers. The containers should be properly labeled with appropriate signs (for example hazardous, flammable, toxic etc.). Hazardous waste should be kept away from flammable waste such as wood, plastic and paper. • All waste loaded to the transfer vessel should be covered from the top to minimize potential for spillage during transport. • The height of loaded waste should not exceed the height of sides of the landing craft. In circumstances where excessive waste is absolutely necessary to be loaded, the sides should be lifted to meet this requirement. • Log records of all unloaded waste (incoming waste to the RWMF) should be recorded either in terms of unloaded weight or volume of bins and jumbo bags for different categories of waste. • Maintaining log records of loaded and unloaded waste quantities are critical and compulsory as it can indicate the amount of waste lost to the sea during transfer (if any). • Give proper instructions and training to the staffs involved in regional collection. 	<p>P: Collection Supervisor</p> <p>P: RWMF Manager / Supervisor</p> <p>P: Collection Supervisor / RWMF Manager</p> <p>P: WAMCO Management</p>	
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	<ul style="list-style-type: none"> • Loading shall be undertaken under the direct supervision of a qualified responsible staff. This staff or supervisor will monitor all activities related to regional collection and transfer and ensure that environmental compliance is achieved. • The waste transfer vessel must be equipped with firefighting equipment and smoke detectors. • The waste transfer vessel should be equipped with navigational safety equipment such as life vests. • The landing craft should be accompanied by a whaler to be used for accessing islands that do not have harbors. 	<p>P: WAMCO Management</p> <p>P: WAMCO Management</p> <p>P: WAMCO Management</p> <p>P: WAMCO Management / PMU</p>	<p>Cost of purchasing safety equipment</p> <p>Cost of purchasing whaler</p>
Noise pollution during waste management	<p>Depending on availability, battery operated vehicles can be used to provide collection services.</p> <p>Waste handling works involving operation of machinery shall be undertaken during day time.</p>	<p>P: Island Council S: MCEP (for vehicle)</p>	<p>Cost associated with purchasing collection vehicles</p>
Air emissions from MSW collection and transport	<p>Emissions from on-road vehicles shall be regulated through national and regional programs.</p> <p>All waste transport vehicles must have up to date road worthiness licenses.</p> <p>Optimize waste collection routes to minimize distance traveled and overall fuel use and emissions</p> <p>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.</p> <p>When the IWMC and RWMF becomes operational no open burning shall be practiced.</p>	<p>P: Island Council S: EPA</p>	<p>Cost of training drivers</p>

2. Sociological and Cultural			
Health and Safety of waste handling staffs	<p>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.</p> <p>For workers near loud equipment, include noise protection such as ear muffs.</p> <p>For workers near heavy mobile equipment, buckets, cranes, and at the discharge location for collection trucks, include provision of hard hats;</p> <p>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).</p>	P: Island Council	Cost of purchasing safety materials
Fire hazard	<p>Burning of waste at the IWMC should never be practiced under any circumstances. Naked flames shall not be allowed at the IWMC.</p> <p>Ensure that waste management staffs are briefed of fire hazard management.</p> <p>Firefighting equipment, including clear aisles among windrows and access to an adequate water supply shall be made available with access to pumps.</p> <p>Smoking should be prohibited inside the premise of the IWMC, placing awareness signs in the premise.</p> <p>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.</p> <p>Installation of cameras, fire alarm system and hiring of security guard for 24hrs surveillance.</p>	P: Island Council S: MCEP (for sign boards)	<p>Cost of purchasing equipment</p> <p>Cost of printing and placing sign boards included with the overall project budget.</p> <p>Cost of purchasing cameras, alarms. MVR 10,000.00</p>

	Fire safety training on how to use the installed equipment and act in case of an emergency fire should be provided to the security guard and all the waste management staffs of the IWMC		Salary of security guard (approximately MVR 4000.00 per month)
Sociocultural conflict	<p>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.</p> <p>Conduct a training to sensitize the labor to the local context and customs. This training should also cover topics related to Gender-based violence.</p> <p>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.</p>	P: 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.	P: Island Council	Cost associated with conducting stakeholder sessions
Employment Opportunities	Ensure that waste handling staffs are selected from the local community as much as possible.	P: Island Council	Cost associated with hiring staffs

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

CHAPTER 7 TRAINING RECOMMENDATIONS

Training is essential for ensuring that the ESMP provisions are implemented efficiently and effectively. MCEP shall therefore ensure that all persons that have roles to play in the implementation of the ESMP are competent with appropriate education, training or experience. Similarly, the contractors shall be required to undertake general HSE awareness for their project workforce and specific training for those whose work may significantly have impact on the environment. The Island Council in collaboration with the MCEP shall also devise and execute training programs targeted for staffs of IWMC to facilitate effective and sound management of waste during household collection and operations of the center. Furthermore, MCEP and the Island Council shall conduct community mobilization and public awareness programs to enhance knowledge of the community on good waste management practices and to promote implementation of 3R concept.

Table 20 Training program for the Implementation of ESMP

Training Activity	Participants	Type of Training and Content	Responsibility	Scheduling	Cost Estimates
Strengthening capacity of contractor on reporting and implementation of ESMP	Managing Director and Site Supervisor of Contractor	Meeting Reporting Template	Safeguards Specialist of MCEP	Pre-bid meeting Kick-off meeting	NA
Strengthening PMU's capacity on compliance monitoring	APCs	Briefing Reporting Template	Safeguards Specialist of MCEP	Construction Phase	NA
General Awareness Health, Safety and Environment (HSE)	Worker on Site	HSE Introduction / Orientation (site safety rules, PPE, Emergency response etc.) Daily tool box talk for workers at the start of each day's job.	Site Supervisor of Contractor	Pre-construction phase. Construction phase	NA
Community Mobilization	Waste Management Committee	Introduction to WM Policy Introduction to WM Regulation Roles of WMC Implementation of IWMP	Communications Specialist of MCEP	Pre-construction phase. 20 to 23 October 2019 planned	Travel cost of facilitators. Designing and printing of training materials and flyers to be used for door to door campaign

		Household waste segregation Door to Door campaign			
Compost Training Refresher	IWMC staffs	Introduction to compost preparation using organic waste Step by step guidance on windrow composting	Zone-2 Project Coordinator of MCEP WMPCD Island Council Communications Specialist of MCEP	Prior to commencement of operations	Travel cost of trainer Developing and printing of Training Manual
Fire safety training and drills	IWMC staffs Nearby Residents	Introduction to Fire safety Hands on training of the equipment installed at IWMC Details of safety procedures and evacuation plan during a fire	Island Council through retired firefighter	Prior to commencement of operations	Cost associated with training hall and refreshments

CHAPTER 8 MONITORING AND REPORTING

8.1. Monitoring Activities

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 main key objectives of the environmental and social monitoring plan are to:

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

The monitoring plan for the ESMP is presented in table 21. Monitoring results shall be documented with preventive/corrective actions to be implemented.

Table 21 Monitoring Plan

Aspect	Parameter	Frequency	Responsible Party	Cost of Monitoring (MVR)
Construction Phase				
Implementation of mitigation measures during construction	Records of successful implementation of mitigation measures	Monthly during construction period	Contractor MCEP	18,000 cost of traveling to the island
Groundwater Quality	Visual observations and perceptions of nearby residents. Salinity, smell, color of water of the groundwater well within the IWMC	Once during mobilization prior to construction and once after completion of the project	Contractor MCEP	9,000 Cost of traveling to the island
Grievance	Log records of number of complaints received and actions taken during construction phase	Throughout the construction phase	Island Council MCEP	9,000
Operational Phase				
Implementation of mitigation measures during operations of the IWMCs	Records of successful implementation of mitigation measures.	6 months after commencement of operations	Island Council / IWMC Operator	Included in Operational Cost

Spillage Assessment	<p>Waste Collection Arrangements</p> <p>Littering around the island (Beach, harbor area and other public areas)</p> <p>Spillage during transfer to IWMC</p> <p>Any Spillage within the IWMC</p> <p>Proper use of IWMC</p> <p>Spillage during transfer to regional waste facility</p>	Once when the project is completed and one year after project completion	<p>Island Council / IWMC Operator</p> <p>WAMCO</p>	Included in Operational Cost
Groundwater Quality	Visual observations and perceptions of nearby residents. Salinity, smell, color of water of the groundwater well within the IWMC.	6 months after commencement of operations	Island Council, IWMC Operator	Included in Operational Cost
Grievance	Log records of number of complaints received and actions taken during operational phase	Throughout the operational phase	Island Council	Included in Operational Cost

8.2. Reporting Procedures

The reporting procedures presented in table 22 have been developed in order to ensure that the proponent is able to receive feedback from the implementation of the ESMP on an ongoing basis and to take rapid corrective actions if there are issues of non-conformance.

Table 22 Reporting Procedures

Phase	Responsibility	Deliverables	Accountability
Construction	Contractor	<p>Monthly monitoring progress reports (3 to 6) prepared consistent to the template provide by the Safeguards Specialist of MCEP.</p> <p>These reports should indicate the level of implementation of mitigation measures and must be accompanied by photographic evidence.</p>	<p>Contractor. To be attached with interim payment claims made by the contractor.</p> <p>Payments to be released subject to timely submission of the monitoring reports.</p>
	Zone 2 APC	Two (2) interim reports prepared consistent to the template provide by	MCEP.

8.4. Contractual Measures

Implementing the mitigation measures are an obligation of the contractor during the construction phase of the project. The EPA and World Bank approved ESMP should form part of the contract and the mitigation matrix shall be extracted from the ESMP and reflected as an appendix to the contract. In addition to this, the following clauses should be incorporated in to the contract document of the selected contractor as condition of the contract to ensure effective, timely and stringent implementation of the ESMP.

1. Retention payment will be released after defects are rectified and compensating for any significant environmental and social safeguards violations.
2. Payment claims made by the Contractor should be accompanied by progress reports that reflect works completed and Environmental and Social mitigation measures implemented. Payments will only be released after verifying the authenticity of these reports.
3. The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. Fundamental breaches of Contract shall include, but shall not be limited to, the following:
 - If the Contractor fails to implement the mitigation measures proposed in the ESMP of the project.
 - If the Contractor fails to submit staff list and valid work permits of the expatriate staffs within 10 days of signing the agreement.

8.5. Cost Estimate for ESMP Implementation

To effectively implement the mitigation and monitoring measures recommended in this ESMP, necessary provision will have to be made. The cost of these measures has been estimated in consultation with the Civil Engineer and Project Coordinator of MCEP, separately for construction and operational phase and presented in table 24 and table 25. The BOQ will reflect the items specified in table 24 and the bidders should consider these costs while preparing bid documents. The overall project budget should consider the cost estimates presented in both the tables. The total estimated cost for the ESMP implementation is MVR 60,000 for construction phase and MVR 137,500.00 for operational phase.

Table 24 Estimated budget for ESMP implementation during construction phase

#	Item	Responsibility	Cost Estimate (MVR)
1	PPEs required for construction such as hard hats, gloves, safety shoes and safety harness.	Contractor	10,000.00
2	Firefighting Equipment: <ul style="list-style-type: none">• 50KG DCP Trolley for collection bay (nos 2)• 50LTR Foam Trolley for collection bay (nos 1)• Wet Chemical 6Ltr with Cabinet for hazardous waste area (nos 1)• Water 9Ltr with Cabinet for Office Area – Outside (nos 1)	Contractor	35,000.00

	• CO2 2KG with Cabinet for Office Area – Outside (nos 1)		
3	Project board and Construction Safety sign board	Contractor	3,000.00
4	IWMC name board, collection bay labels and fire safety sign boards.	Contractor	5,000.00
5	Bin for placing general waste	Contractor	1000.00
6	Site demarcation through hoarding	Contractor	1000.00
	Subtotal		55,000.00
	Contingency	10% of Sub-Total	5,500.00
	Total		60,000.00

Table 25 Estimated budget for ESMP implementation during operational phase

#	Item	Responsibility	Cost Estimate (MVR)
1	PPEs required for operations such as gloves, safety shoes and masks.	Island Council	10,000.00
2	Fire safety Training	Island Council	10,000.00
3	Yearly servicing of the firefighting equipment	Island Council	5,000.00
6	Community Mobilization and Awareness	MCEP	100,000.00
	Subtotal		125,000.00
	Contingency	10% of Sub-Total	12,500.00
	Total		137,500.00

8.6. 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.

Mr. Mohamed Afrah, the Vice-President of the Island Council was briefed on the GRM and setting a focal point for managing GRM during the meeting held on 3rd September 2019. This was followed by an official letter from ME requesting for the same (dated 30 September 2019). The council confirmed in writing that they 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, website and social media pages.

Following are the details of the GRM developed by MCEP. The council nominated Mr. Abdulla Hameed (Assistant Director, Ph: 7724418, E: holhudhoo.office@gmail.com) 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 ME front office and is published in ME 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>

A poster that give information on the GRM and QR code for downloading the forms was prepared by MCEP and printed copies will be forwarded to the Island Council after initiation of the project. These posters will be displayed in the council notice board, as well as other communal places like schools, health center and youth center.

Tiers of Grievance Mechanism	Nodal Person for Contact	Contact Communication and other facilitation by the project	Timeframe to address grievance
<p>First Tier: Island Council</p>	<p>Island Council will be the first point of contact for any grievances.</p> <p>The staff designated as the waste management focal point by the island council will manage grievances on behalf of the council.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>Council will provide assistance to fill the form for those who cannot write.</p> <p>The council should keep separate registries for informal and formal complaints and maintain records of all complaints received.</p> <p>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.</p> <p>If the complaint is resolved within 15 working days, the council must communicate the decision to the aggrieved party in writing.</p> <p>The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 working days.</p> <p>If no acknowledgement is submitted from the aggrieved party within this period, then the decision will be considered as accepted.</p> <p>If a complaint requires more time to address, this requirement must be communicated to the aggrieved</p>	<p>15 working days</p>

		<p>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.</p> <p>The staff designated as the waste management focal point by the island council will manage and provide feedback for grievances submitted to the council.</p>	
<p>Second Tier: Ministry of Environment (ME)</p>	<p>Environmental and Social Safeguards Specialist at the Project Management Unit (PMU) will be the focal point.</p>	<p>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.</p> <p>A copy of the Tier 1 Complaint Form should be submitted with the Tier 2 Complaint Form.</p> <p>MEE will forward the grievance to PMU.</p> <p>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.</p> <p>Environment and Social Safeguards Officer at the PMU will be the contact person in processing a grievance through the Second Tier.</p> <p>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.</p> <p>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.</p> <p>If the complaint is resolved within 15 working days, the PMU must communicate the decision to the aggrieved party in writing.</p> <p>The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 working days.</p>	<p>15 working days</p>

		<p>If no acknowledgement is submitted from the aggrieved party, then the decision will be considered as accepted.</p> <p>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.</p> <p>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.</p>	
<p>Third Tier: Judiciary Power / Assistance to Vulnerable Persons beyond the Project's Grievance Redress Mechanism</p>	<p>Judiciary system is an option for an aggrieved person and/or community in case that the other tiers have not been effective</p>	<p>The legal system is accessible to all aggrieved persons.</p> <p>Assistance from the PMU of MCEP is available only for vulnerable person(s)* as per this grievance mechanism.</p> <p>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.</p> <p>The verdict of the Courts will be final.</p>	<p>As per established Judicial Procedure</p>

*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 9 STAKEHOLDER CONSULTATION

9.1. Introduction

Consultations with stakeholders were undertaken on different occasions, which included meetings with political appointees and civil services staffs of the council, consultation with the waste management committee and general public during formulation of IWMP and a public perception survey conducted by MCEP during the site visit to find out concerns of the public on current waste management practices and how best to rectify those issues through the proposed new design. During these consultations an overview of the project, the proposed interventions as well as the scope and objectives of the ESMP and the GRM were presented to the stakeholders. Furthermore, the challenges that could impede the implementation of the project, potential environmental and social impacts that could arise from civil works and the support needed from beneficiary communities to ensure successful implementation were also discussed.

9.2. Summary of consultation with Island Council and IWMC operators

The island council was consulted twice during the preparation of the ESMP. First consultation was held in Male' on 3rd September 2019 with the vice president of the council. The second consultation was held during the site visit with the civil service head, IWMC operator and third-party collection service provider on 3rd October 2019. Below is the summary of these 2 consultations.

Table 26 First consultation with island council

Items	Description
Date of Consultation	3 September 2019
Venue	Ministry of Environment Male', Maldives
Name of Stakeholders	1. Mohamed Afrah, Council Vice President P: 7529389 E: holhudhoo.office@gmail.com
Participants from MCEP	1. Mr. Ahmed Hassaan Zuhair, Environmental and Social Safeguards Specialist (MCEP) P: 7886707 E: ahmed.hassaan@environment.gov.mv 2. Mr. Mohamed Afraaz, Civil Engineer (MCEP) P: 9877766 E: mohamed.afraaz@environmnet.gov.mv 3. Mr. Abdul Raheem, Project Coordinator (MCEP) P: 7999263 E: abdul.raheem@environmnet.gov.mv 4. Ms. Aishath Ajfaan Jawaadh, Assistant Project Coordinator (MCEP) P: 9975558 E: aishath.ajfaan@environment.gov.mv
Language of communication	Dhivehi
Introduction	The objective of the meeting is to acquire details of the ongoing waste management/disposal practices in the island and other information required to develop the ESMP for the upgrading works of the existing IWMC
Summary of Main Discussions	Discussion on the new drawing of the IWMC: <ul style="list-style-type: none"> Mr. Afrah, enquired about the possibility of increasing the clear height of the collection bay and to alter roof gutter to back of the building to prevent potential damage during entry of heavy vehicles used by WAMCO for regional collection. He also put forward the suggestion to establish a

jetty/harbor next to IWMC area as in order to save inland transportation and time.

- Mr. Hassaan noted that only during initial clean up heavy vehicles will enter into the IWMC as the new strategy of WAMCO includes segregation of the disposed waste at the center and transporting the segregated waste to harbor for transfer. He also highlighted that after initial clean up only newly generated waste will be remaining and thus there won't be any need for heavy vehicles. He also highlighted that a harbor or jetty is out of the scope of the project as well as ME and any such plans intended by the council should be brought to the attention of MNPI.
- In regard to this, Mr. Afrah noted that it will be complicated to implement as said as island council does not have the required vehicles to transfer the waste.
- Mr. Hassaan enquired Mr. Abdul Raheem if Holhudhoo will be supplied with a waste collection vehicle under MCEP, which he confirmed.
- Mr. Afrah requested if it will possible to allocate one cell from the sorting area to used diapers as it is one of the types of waste produced. Note: 15 jumbo bags of diaper waste are produced per month. And the current practice is to transfer few jumbo bags whilst the nearby resort (Velaa Private Island) transports waste to Thilafushi. However, only insignificant numbers of bags are transported as it highly depends on the availability of free space in the vessel (around 2 jumbo bags per month is sent to Thilafushi)
- Mr. Abdul Raheem responded that according to the waste composition of the island sorting cell can be utilized.

Discussions on electricity and sewer connection:

- Mr. Afraz noted that as sewage pipe of the toilets in the IWMC needs to be connected to the sewage system, it will be easier to connect the leachate collection tank simultaneously.
- When enquired by Mr. Afraz, Mr. Afrah informed that the main electricity cable was destroyed and thus a new cable needs to be laid from the nearest 3 phase distribution box.

Discussion on fire safety:

- Mr. Hassaan queried whether burning of waste pile in the center is still carried out.
- Mr. Afrah stated that due to nuisance people still put fires in the waste pile.
- Fire prevention and control methods that will be opted after completion of civil works of IWMC was highlighted by Mr. Afraz and Mr. Hassaan; fire extinguishers will be installed and council was highly recommended to higher security officers to avoid fire incidents. In addition to this, Mr. Afraz noted that in the sorting area, cells will be arranged to control fire outbreak (contrasting cells with low conductivity materials).
- Mr. Afrah further stated that the council plans to install surveillance cameras in the IWMC after its completion.

IWMP and Waste Management Committee:

- IWMP was prepared in consultation with the public and stakeholders and is approved by EPA. The community consultation sessions were carried out as awareness sessions focused on women where IWMP and fee structure were discussed and endorsed.
- Waste Management Committee is established and meets quarterly.

	<ul style="list-style-type: none"> Mr. Hassaan highlighted on the planned trip to N.Holhudhoo within upcoming week and noted that community consultations in nearby residence will be carried out during this visit. <p>Vehicle and Equipment:</p> <ul style="list-style-type: none"> Appropriate vehicle for the island for waste collection: <ul style="list-style-type: none"> Currently vehicle with weight of 350KG is used for waste collection with 4 rounds per day to collect organic waste from households. Mr. Afrah noted that there are both advantages and disadvantages with this size of collection truck as majority of the roads in the island is very narrow and stated that it will be best to give an answer after discussing with the people involved in waste collection. Upon the query Mr. Afrah stated that the most crucial machinery needed for island at present is a pressing machine. <p>On resuming composting:</p> <ul style="list-style-type: none"> Details of composting stated by Mr. Afrah as follows: <ul style="list-style-type: none"> Many people in the island have completed the compost training. If proper mechanism is established, composting can be carried out in the island.
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Table 27 Second consultation with Island Council

Items	Description
Date of Consultation	3 October 2019
Venue	Council Secretariat Office, IWMC site N. Holhudhoo, Maldives
Name of Stakeholders	<ol style="list-style-type: none"> Hameed, Assistant Director, Holhudhoo Council P: 7724418, E: holhudhoo.office@gmail.com Mohamed Shanim, Municipal Supervisor (IWMC supervisor), Holhudhoo Council P: 7383632, E: holhudhoo.office@gmail.com Mohamed Hussain, Owner, M2S (collection service provider)
Participants from MCEP	<ol style="list-style-type: none"> Mr. Ahmed Hassaan Zuhair, Environmental and Social Safeguards Specialist (MCEP) P: 7886707 E: ahmed.hassaan@environment.gov.mv Mr. Mohamed Afraz, Civil Engineer (MCEP) P: 9877766 E: mohamed.afrah@environment.gov.mv Ms. Ahmed Saleem, Assistant Project Coordinator (MCEP) P: 9808189 E: ahmed.saleem@environment.gov.mv
Language of communication	Dhivehi
Introduction	The objectives of these discussions were to acquire background information on the existing environment of the proposed development and to provide information on the GRM and support needed from beneficiary communities to ensure successful implementation of ESMP.
Summary of Main Discussions	<p>On waste collection services:</p> <ul style="list-style-type: none"> Provided by a third part company called M2S on monthly remuneration basis. MVR 29,000 is the agreed monthly fee.

- 95% of the households are registered for household collection service. The remaining 5% brings waste on their own by paying gate fee of MVR 50. A 120L bin is placed outside the IWMC for own waste bringers.
- Households do not store food waste in plastic bags, instead is disposed directly into the allocated bin.
- Household segregation is done at their own bins.
- This service is provided in 350KG pickup of M2S equipped with bins and jumbo bags.
- Food waste and used nappies are collected daily, while other waste is collected twice a week. The island is divided into 2 parts for providing other waste collection service.
- 2 nos 120L bins are placed in the harbor area for disposing fish waste.
- According to Mr. Hussain, on average 2 jumbos of green waste, 2 jumbos of plastic bottles, 2 jumbos of cans, 1 jumbo of glass waste and 2 jumbos of paper / cloth area collected.

On waste management arrangements:

- Food waste is disposed into the sea (outside reef) daily through a fishing vessel hired by M2S.
- Green waste is kept on top of the compost pad.
- Inorganic waste is kept at the designed areas inside the IWMC boundary and adjacent temporary area developed by the council for waste storage.
- Used oil is managed and disposed by Fenaka and is not brought to the IWMC.

On socio-economic environment:

- Information about education providers, economic ventures, health center, NGOs etc. were provided by Mr. Shanim and Mr. Hameed.

On fire safety:

- Mr. Hassaan highlighted that the IWMC will be provided with necessary firefighting equipment through the contractor and it is important for the council to hire a security guard and provide the person and the IWMC operators with necessary training, in addition to installing surveillance cameras. In this regard he further enquired about the availability of a firefighting trainer within the island.
- Mr. Shanim stated that there is a retired licensed MNDF firefighting trainer in Holhudhoo who will be willing to provide the required training to the IWMC operators.

On GRM:

- Mr. Hassaan briefed the council on the GRM system that needs to be established throughout the lifespan of the project. This system will be used to receive and address complaints by the public. He stated that the council needs to consult with the relevant stakeholders / waste management committee prior to making a decision on official complains received at tire 1.
- Mr. Hassaan requested the council to display the GRM posters which will be provided through MCEP in public places like school notice board, community center, youth center, health center etc. to which Mr. Shanim agreed.
- Mr. Hassaan also requested the council to post GRM posters in council website and social media pages to which Mr. Hameed agreed.

9.3. Household Perception Survey

The households that exist closest to the IWMC were surveyed to identify the constraints they face in terms of current waste management practices employed in the island and to find out their views towards the project. Signed consent from the surveyed households were acquired for using and publishing the results of this survey. The survey method employed is both by means of survey forms and face to face interviews. The sample size of the survey is 5. Following are the main themes that were surveyed.

- Name of House
- Number of Residents: Men, Women and Children
- Household Generation of Waste (in terms of weight / volume / number of containers): Organic (Daily) and Inorganic (Weekly)
- Current waste disposal method: Organic and Inorganic
- Household Segregation: Yes or No
- How segregated waste is stored: bins or containers or other means
- How waste is taken to the IWMC: Own or Council's collection system
- Perception of the waste collection fee: Satisfied or Not Satisfied (If not satisfied is chosen specify the recommended amount)
- Perception of the IWMC location: Satisfied or Not Satisfied (If not satisfied is chosen specify the reason)
- Features to include in the project to minimize impacts to the nearby residents:
 - Establish a green vegetation buffer between the IWMC and the households.
 - Increase the clear height of the perimeter walls.
 - Prohibit open burning of waste
 - Proper storage of waste at the IWMC
 - Regular transfer of waste to the RWMF
 - Install firefighting equipment
 - Other (please specify)

Name of the surveyed houses and the household and their respective distances from the IWMC are indicated in table 28.

Table 28 Details of surveyed households

#	House Name	Household Name	Distance from the IWMC (ft)
1	Refeegee Aabaadh	Ms. Shimanaa	25
2	Kaleen	Mr. Abdul Hakeem	150
3	Vasmeeru Fini	Mr. Moosa Ali	600
4	Ehery	Mr. Jaufar Mohamed	180
5	Marry Lodge	Mr. Madheeh Mohamed	200

The results of this survey are presented below.

Number of Households

On average the surveyed households were mostly comprised of women, followed by men and then children. There results are presented in figure 16.

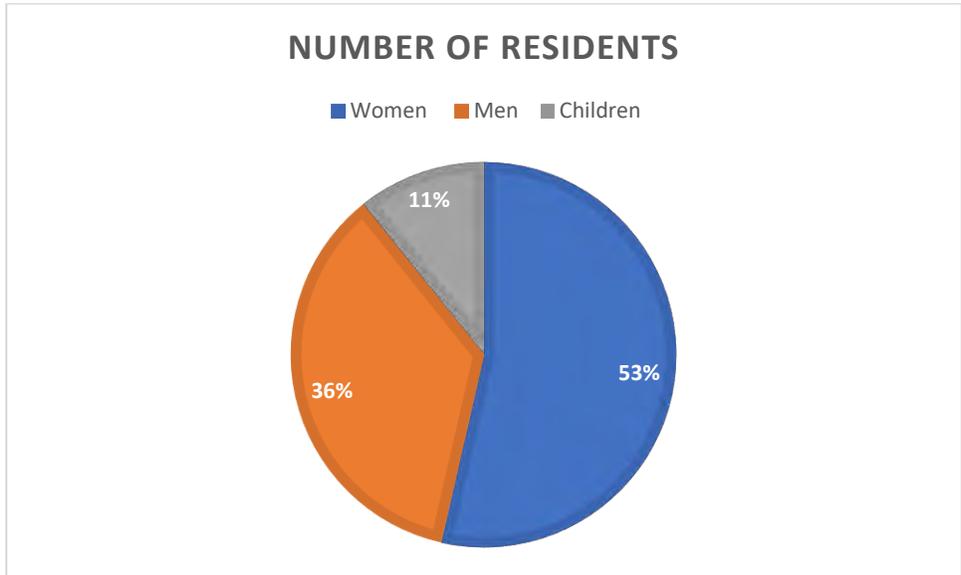


Figure 16 Household composition in terms of gender

Household Waste Generation

The households were asked to provide the estimated daily quantities of waste generated at the households for both organic and inorganic waste. However, since all the households found it difficult to provide the amount of inorganic waste generated per day, weekly data was acquired for inorganic waste. Four households stated that 1 container of organic waste is generated daily, while one household stated that half a container of organic waste is generated. As for inorganic waste, three households stated that 1 container is generated per week, while one household stated that 2 containers are generated weekly and another household stated that only half a container is generated. The size of the containers used are on average 20L. Based on this the total quantity of daily household generation of organic and inorganic waste for the surveyed sample size were estimated and presented in the figure 17 below.

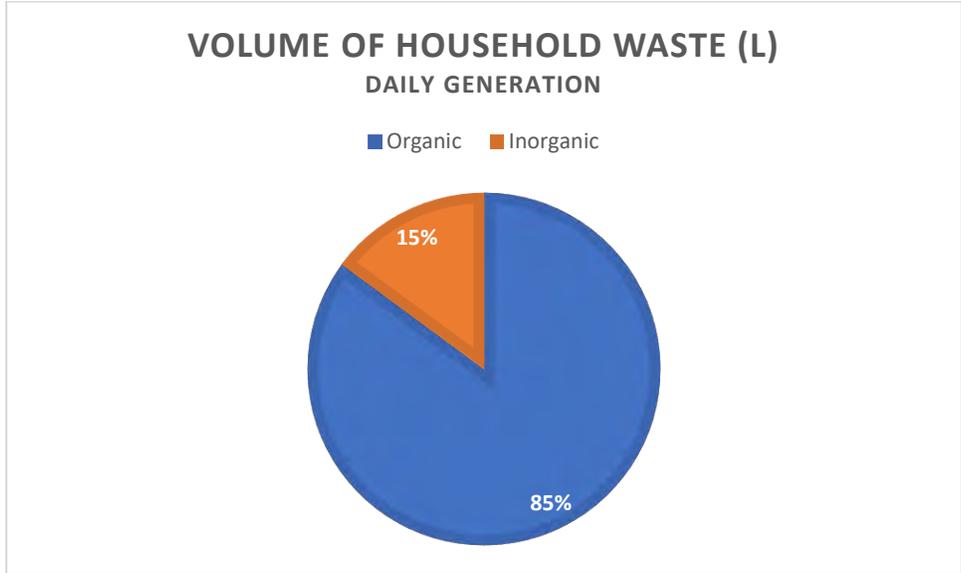


Figure 17 Volume of waste generated at households per day

Waste Disposal Method

All the 5 households stated that organic waste is transferred to the IWMC daily while inorganic waste is disposed twice per week.

Household Segregation

The households were queried if waste is segregated at household level. All the households stated that household waste segregation is practiced at their own bins.

Item used to store waste

All the surveyed households store waste in 20L buckets.

How waste is taken to the IWMC

Four of the surveyed households send waste to the IWMC through the council's collection system, while one household take waste to the IWMC on their own by paying the entitled gate fee.

Perception of the waste collection fee

The households were asked to provide their feedback on the waste collection fee taken by the council. Only one household stated that they are not satisfied with the fee taken by the council, the reason being their house located right next to the IWMC. The suggested fee was MVR 50. In response to this, the council repetitive suggested for the household to withdraw their registration from the collection system and instead to register as an own waste bringer.

Perception of IWMC location

As shown in figure 18, 60% of the households were not satisfied with the existing location of the IWMC, while 40% indicated that they were satisfied.

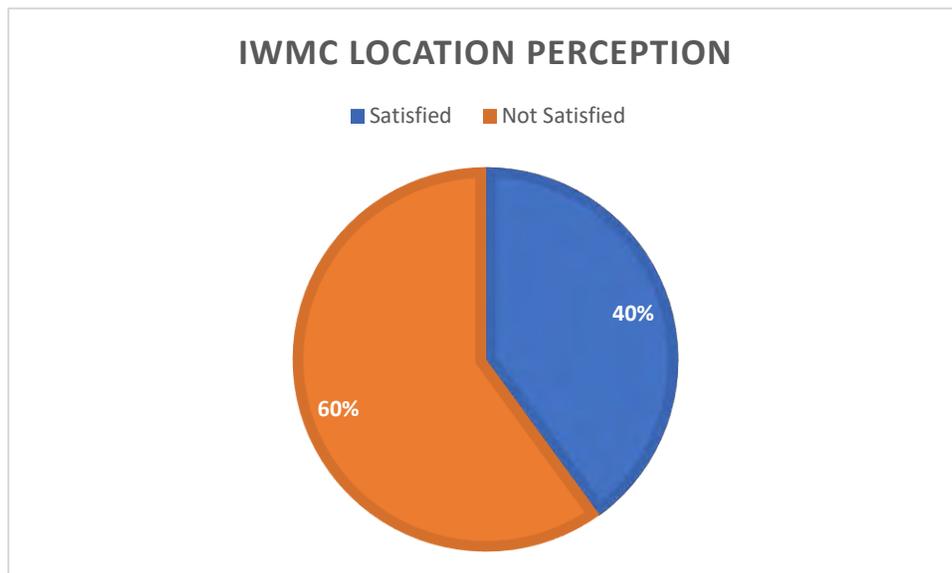


Figure 18 Perception of the IWMC site

The major reason stated by the households not satisfied with the location was in relation to the regularly occurring unauthorized fires put on the waste piles of the IWMC and its associate health impacts, coupled

with potential damage to properties and household gardens. All the households, however, indicated that they will be happy with the existing location subject to appropriate actions being taken to mitigate and avert such incidents in the future, particularly given that no alternative space is available at the island.

Features to include in the project to minimize impacts to the nearby residents

All the households agreed that the provisions made through the upgraded design of the IWMC are important features to mitigate negative impacts currently faced by the community due to present waste management arrangements. The agreed features are presented below:

- Establishing a green vegetation buffer between the IWMC and the households.
- Increasing the clear height of the perimeter walls.
- Prohibiting open burning of waste.
- Proper storage of waste at the IWMC.
- Regular transfer of waste to the RWMF.
- Installation of firefighting equipment.

Further to this, one household enquired about the possibility of relocating the IWMC site to an area away from residential population. In response to this, the council representative highlighted that the location was decided through a public meeting where it was endorsed by the majority of the local population and is subsequently reflected in the approved LUP of the island. He also stressed on the land scarcity issue and the lack of an alternative space in Holhudhoo. The project team further highlighted that special provisions are included in the design to minimize such impacts to the nearby residents.

Copies of the signed survey forms are provided in Appendix J.

9.4. Summary of Consultations with Waste Management Committee

The Island Council had consulted waste management committee twice within the past year or so, in response to unauthorized fires put on the waste piles at the IWMC on 4 June 2019 and 20 July 2018 respectively. The summary of these two consultations are presented in table 29 and 30.

Table 29 Details of WMC consultation on June 2019

Items	Description
Date of Consultation	6 June 2019
Venue	Conference Hall, Council Secretariat Office N. Holhudhoo, Maldives
Stakeholders Consulted	<ol style="list-style-type: none"> 1. Members of Waste Management Committee (details provided in table 10) 2. Police 3. NGOs
Language of communication	Dhivehi
Introduction	The objective of this meeting was to discuss the specifics of unauthorized fire incident on IWMC that happened at the midnight of 4 June 2019 and brainstorm on the actions to taken to increase security and prevent a repeat of such issues.
Summary of Main Discussions	<ul style="list-style-type: none"> • The committee members stressed the importance of enhancing the role of police to prevent such incidents from happening in the future.

	<ul style="list-style-type: none"> Local police to do a thorough investigation of the incident to identify the source of these fires and to take appropriate actions or impose penalties under the law on associated people. On how to continue waste collection services despite the current challenges and limitation and without a proper IWMC. To find a way to demarcate the boundary of the IWMC and enclose it so as to minimize unauthorized access.
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Table 30 Details of WMC consultation on July 2018

Items	Description
Date of Consultation	21 July 2018
Venue	Conference Hall, Council Secretariat Office N. Holhudhoo, Maldives
Stakeholders Consulted	1. Members of Waste Management Committee (details provided in table 10)
Language of communication	Dhivehi
Introduction	The objective of this meeting was to discuss way forward on waste management and on how to continue to provide the service after the entire IWMC including waste management equipment were damaged during the unauthorized fire incident that happened on 20 July 2019 at 4:43 hrs.
Summary of Main Discussions	<ul style="list-style-type: none"> To share with the committee specific details of the damaged caused to the IWMC through the fire. To discuss on how to proceed with upgrading and rebuilding of the IWMC. To develop a low-cost temporary waste storage area adjacent to the IWMC to store inorganic waste prior to transfer to RWMF. To continue household waste collection service despite the IWMC being damaged.

Copies of the meeting minutes are provided in Appendix K.

9.4. Summary of Consultations with the General Public

Holhudhoo council and the Waste Management Committee had consulted the general public during the finalization stage of the IWMP. About 50% of the participants of this meeting were women. A summary and the outcomes of this consultation are presented in table 31.

Table 31 Details of consultation with General Public

Items	Description
Date of Consultation	21 September 2017
Venue	Conference Hall, Council Secretariat Office N. Holhudhoo, Maldives
Stakeholders Consulted	<ol style="list-style-type: none"> Mohamed Naseer, Holhudhoo Council Mohamed Afrah, Holhudhoo Council Ahmed Irufan, Holhudhoo Council Abdulla Hameed, Holhudhoo Council Abdul Azeez, Holhudhoo Council Ahmed Zuhuree, Meyna School Shadhiya M. Manik, Health Center Ali Resheed, Health Center

	<p>9. Fathimath Laila, Health Center 10. Ali Nimaal, Police Station 11. Firudhaus M. Nizar, Police Station 12. Fathimath Ali, Iru Uthuru Villi 13. Aroosha Ismail, Iru medhu Villi 14. Aishath Hizana, WDC 15. Ahmed Saleem, Driver 16. Aminath Nasva, Iru medhu Villi 17. Luguma, Iru dhekunu 18. Mariyam Rasheeda, Iru dhekunu 19. Aishath Shunaza, Iru dhekunu 20. Mariyam Hamida, Hulagu uthuru 21. Hawwa Zaahira, Hulhagu uthuru 22. Sareefa, Iru medhu villi 23. Aishath Mohamed, Iru medhu villi 24. Aishath Slava, Iru uthuru vili 25. Aishath Hassan, Iru medhu villi 26. Fathimath Moosa, Hulhagu medhu 27. Ahmed Maajidh, Iru dhekunu</p>
Language of communication	Dhivehi
Introduction	The objective of this meeting was to inform the public on the waste management activities planned by the council and the committee and to publicly endorse the IWMP prior to its finalization at island level and submission to EPA for approval.
Summary of Main Discussions	<p>The meeting commenced on 21:00 hrs. The IWMP was presented to the public by the council and the waste management committee. The floor was then opened to the public to express their views towards the plan. The meeting concluded at 22:30 hrs. Following is a summary of the main points discussed:</p> <ul style="list-style-type: none"> • Waste management arrangements in the island were explained to the public by the council. • Household segregation and the parts to which waste will be segregated was agreed with the community. It was agreed to use households’ own bins for storing the segregated waste. • It was recommended and agreed by the public that the best and most feasible approach will be to outsource waste collection services to a local third party. The collected waste brought to the IWMC will, however, be managed under the direct supervision of the council. • It was agreed for the council to daily monitor if waste collection services and waste management activities are carried out in line with the IWMP for a period of 3 months. And from 4th month onwards to monitor the activities fortnightly and to take appropriate action for non-compliance issues. • To seek funding for waste management through government and non-government sources.

Copies of the meeting minutes are provided in Appendix L.

CHAPTER 10 RECOMMENDATIONS AND CONCLUSION

The upgrading of the IWMC in N. Holhudhoo is a much-needed development to avert waste management constraints at the island, increase security of the IWMC, as well as safeguard the wellbeing of the nearby residents. A fully functional IWMC with proper boundaries, storage cells and added security features will enable the Island Council to properly monitor the center, manage security and mitigate the regularly occurring unauthorized fires that have been causing severe impacts to the nearby residents. The project is also expected to improve the soil and groundwater quality of the island, as the storage cells of the IWMC are designed with proper barriers such as concrete floors and roofing which will eventually ensure prevention of leachate runoff. In addition to this, 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.

No permanent negative impacts to the environment are likely to occur as a result of the project as the site is devoid of any significant vegetation. Potential indirect negative impacts to the flora and fauna during transport and storage of construction material can be effectively minimized or even completely eradicated, if the mitigation measures proposed in the management plan are adhered.

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

APPENDIX B

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. Maaniga (5th Floor), 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, brochures 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 solid waste management regulation, standards on biodegradable plastic bags and Environmental impact assessment regulation.

ENVIRONMENT 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)
- Training on Geo- Enabling Method for Monitoring and Supervision (GEMS) 15 – 20 Sept 2019
Chennai, India
- TESTO Mobile Stack Emissions Monitoring Training 6 Feb 2019
Male', Maldives
- Introduction to Mapping with Drones 10 – 14 Sept 2018
Geoinformatics Center, Asian Institute of Technology (AIT) *Pathumthani, Thailand*
- World Bank Procurement Training 2-4 Oct 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 <i>170 Kessels Rd, Nathan QLD 4122, Australia</i>	Master of Urban and Environmental Planning	2 March 2014 – 15 December 2015	English
University of Mysore <i>Mysore, Karnataka, India</i>	Bachelor of Science	1 Jul 2007 – 30 Jun 2010	English
Centre for Higher Secondary Education <i>Male', Maldives</i>	London GCE Advanced Level	1 Jun 2002 -30 Jun 2004	English
Majeediyya School <i>Male', Maldives</i>	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 AND PUBLICATIONS

- Author of Environmental and Social Management Plan for the proposed upgrading of Island Waste Management Center in R. Ungoofaaru (February 2019).
- Author of Environmental and Social Management Plan for the proposed upgrading of Island Waste Management Center in Lh. Kurendhoo (November 2018).
- Author of Operational Environmental and Social Management Plan for Regional Waste Management Facility – Zone 2, Vandhoo, Raa Atoll (September 2018).
- 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 Dh. Rinbudhoo (January 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 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
Cooperative Research Centre for Water Sensitive Cities
E: d.lowchoy@griffith.edu.au
- 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

APPENDIX C

A3 Map of the Project Site



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 MAAFANNU, MALÉ (20392), REPUBLIC OF MALDIVES,
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PROJECT	UPGRADING OF WASTE MANAGEMENT CENTRE N.HOLHUDHOO	DESIGN BY	AFRAZ	
TITLE	LOCATION PLAN	STRUCTURE BY	AFRAZ	
CLIENT DEPARTMENT	WMPC DEPARTMENT	DRAWN BY	AFRAZ	
PAPER SIZE	A3	SCALE	1:1500	
PAGE NO.	00	DWG NO.	HOLH-A2-00	
		DATE	13.10.2019	

APPENDIX D

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.

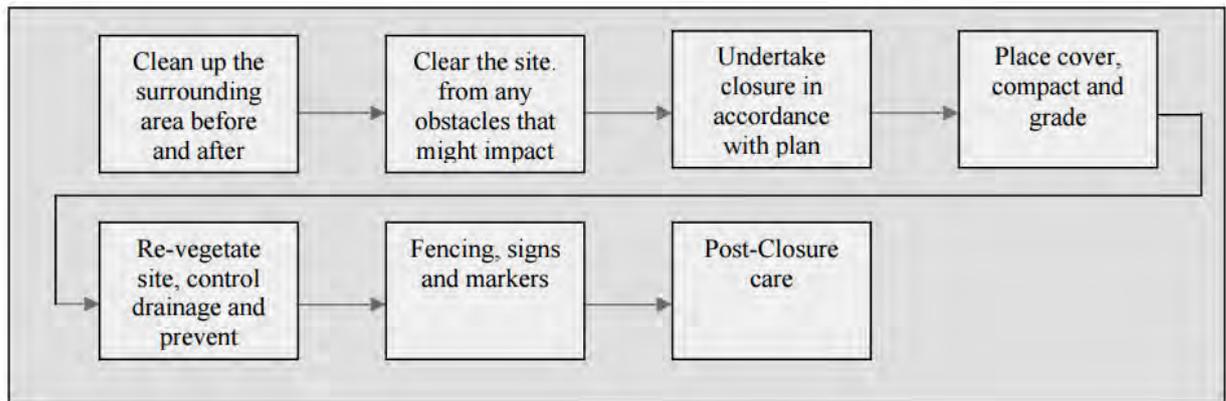
1.1. In-Place Closure

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 E

Segregation Guideline of WAMCO for Regional Waste Collection

GUIDELINES FOR TYPES OF WASTE ACCEPTED AT R. VANDHOO REGIONAL WASTE MANAGEMENT FACILITY

Waste Management Corporation Ltd.
(WAMCO)

Combustible waste



This includes materials that are not made of metal, glass, or fiber glass, such as paper, plastic, nappies, wood, leaves, etc. Combustible waste must be kept separate from sand, and also metal, glass, or fiber glass.

Tar



If tar, kept in closed containers, is brought to the facility, it will be accepted.

Metal



Products made of metal must be kept in a way that is easy to be picked up. It must also be kept separate from other types of waste.

Fiber



Products made of fiber such as mats, carpets, or resin products must be kept separate from sand and other waste types.

Heavy paper material



Heavy paper material such as cardboard boxes must be kept separate from other types of waste.

Wood waste



This waste includes wood such as palm trees without leaves. This type of waste must be chopped as much as possible, kept in a way that is easy to be picked up. It must also be kept separate from sand and other types of waste.

Plastic



Plastic waste includes plastic bottles, plastic containers, regiform boxes, etc. Plastic waste must be separated in a way that it is easy to pick up, and must be kept separate from sand and other types of waste.

Glass



Including bottles and other products made of glass, this type of waste must be kept separate from other types of waste.

Construction & Demolition (C&D)



Construction and demolition (C&D) waste will not be accepted at this facility.

INFORMATION

All waste that is brought to R. Vandhoo Regional Waste Management Facility (RWMF) must be separated as per the guidelines outlined in this pamphlet.

Please note that waste brought to R. Vandhoo RWMF that does not adhere to the guidelines will not be accepted at this facility.

Head Office:	3 rd flr, Ma.Jambugasdhoshuge, K. Malé, Maldives
Phone:	3000581
Hotline:	1666
Email:	info@wamco.com.mv
Website:	www.wamco.com.mv



APPENDIX F

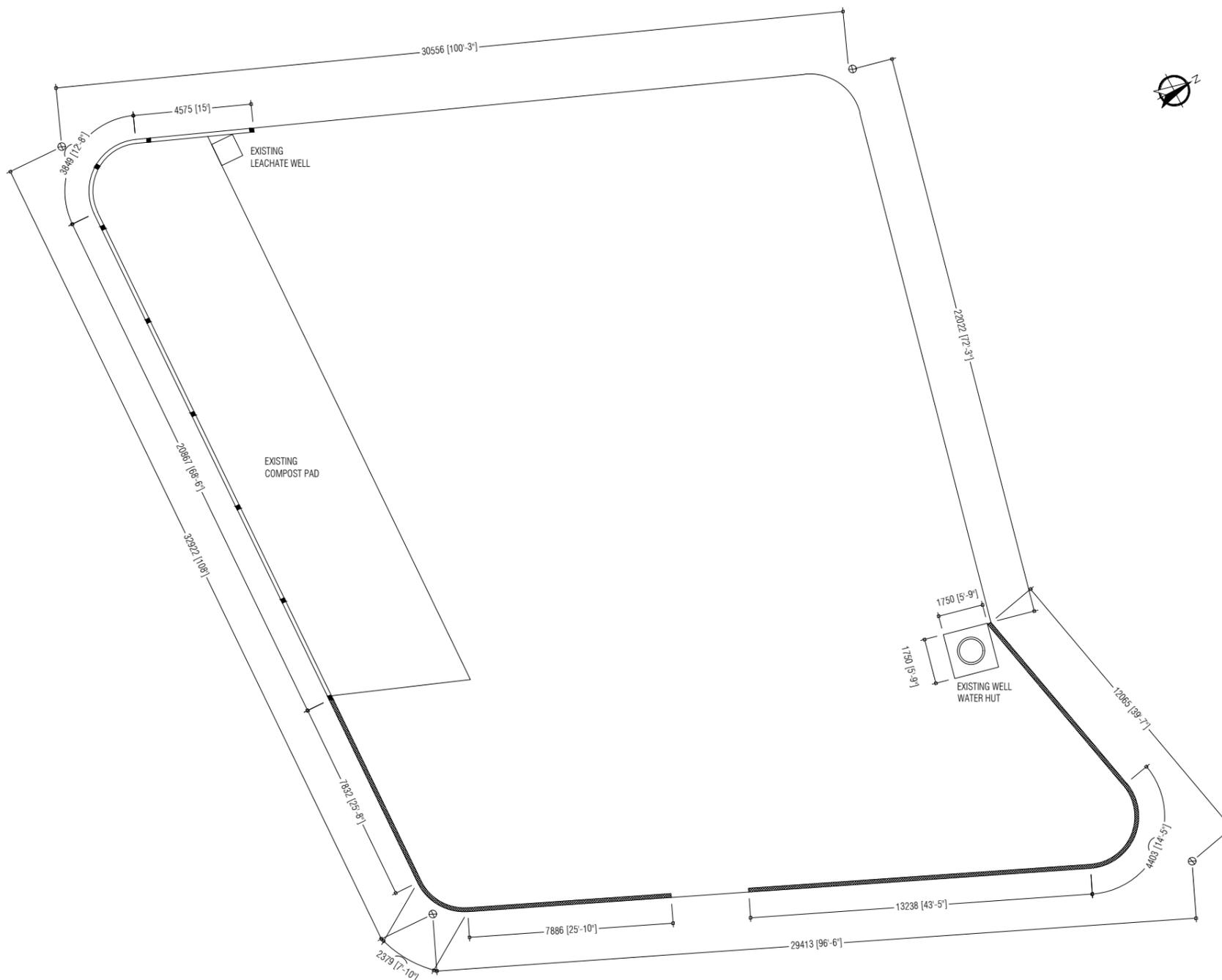
Detailed Engineering Drawing

UPGRADING OF N.HOLHUDHOO ISLAND WASTE MANAGEMENT CENTRE



PREPARED BY:
MALDIVES CLEAN ENVIRONMENT PROJECT
MINISTRY OF ENVIRONMENT

2019

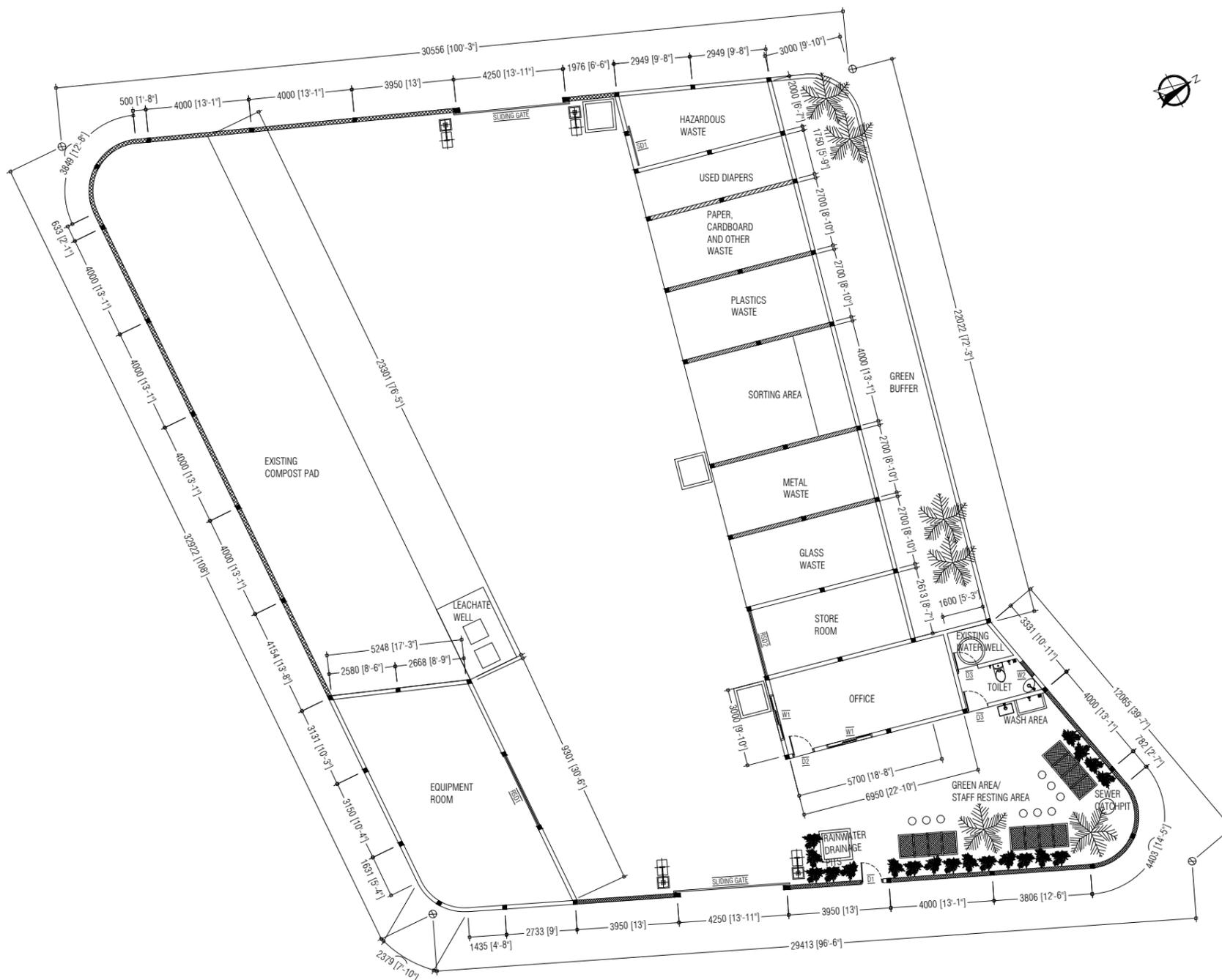


NOTE:

- 3000mm HEIGHT WALL
- 900mm HEIGHT WALL

APPROVED BY	PROJECT	DESIGN BY	AMENDMENTS
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	TITLE	STRUCTURE BY	
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	CLIENT DEPARTMENT	DRAWN BY	
	WMPC DEPARTMENT	AFRAZ	
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		DATE 13.10.2019	

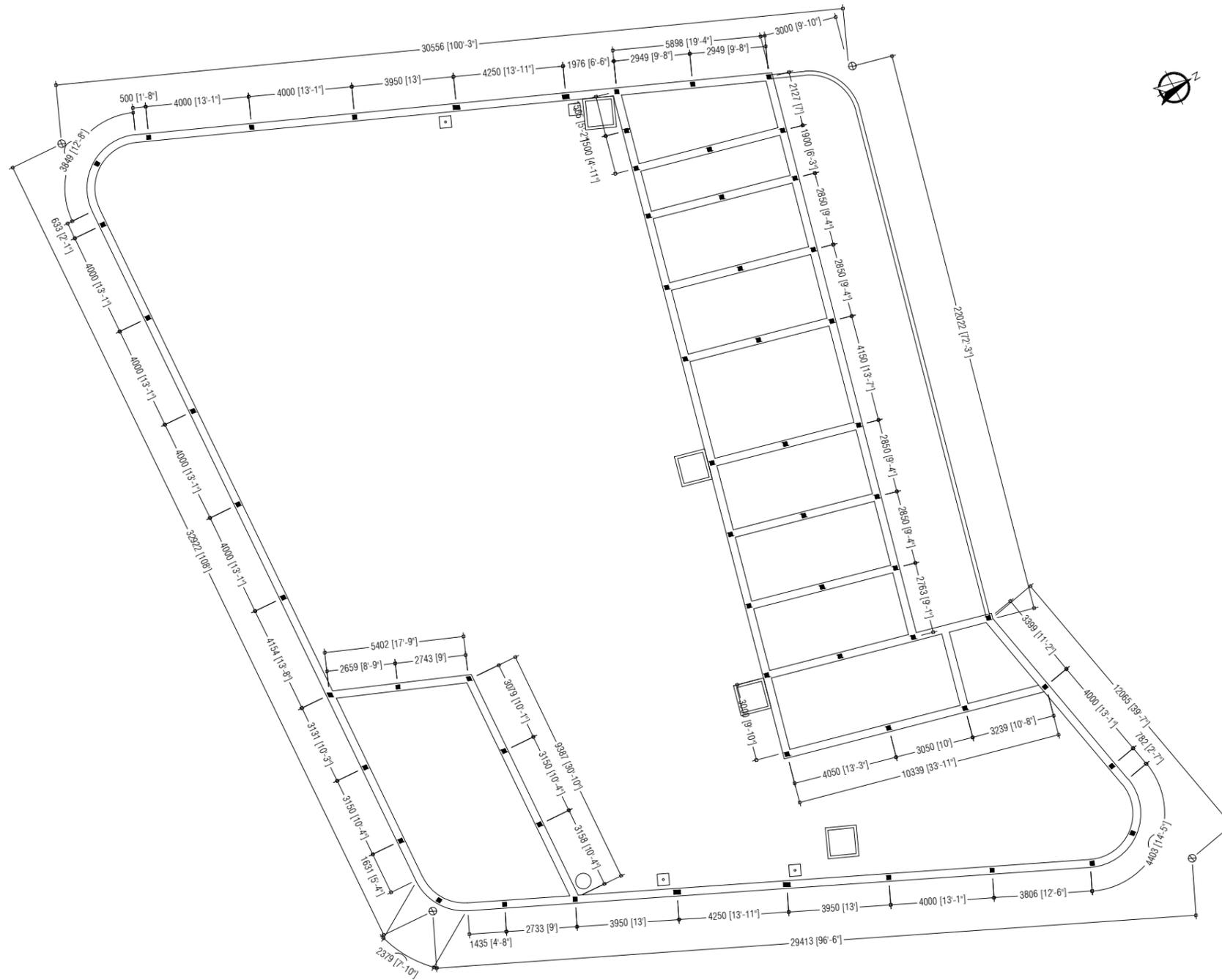
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NOTE:

- 1500mm HEIGHT WALL [100mm HOLLOW BLOCK]
- 4000mm HEIGHT WALL [100mm HOLLOW BLOCK]
- 2500mm HEIGHT WALL [100mm HOLLOW BLOCK]

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<p>MCEP MINISTRY OF ENVIROMENT GREEN BUILDING, HANDHUVAREE HIGUN, MAAFANNU, MALE (20392), REPUBLIC OF MALDIVES. TEL: +960-3018431, +960-3018300, FAX: +960-328301</p>	UPGRADING OF WASTE MANAGEMENT CENTRE N. HOLHUDHOO	AFRAZ	
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	WMPC DEPARTMENT	AFRAZ	
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	DATE	13.10.2019	



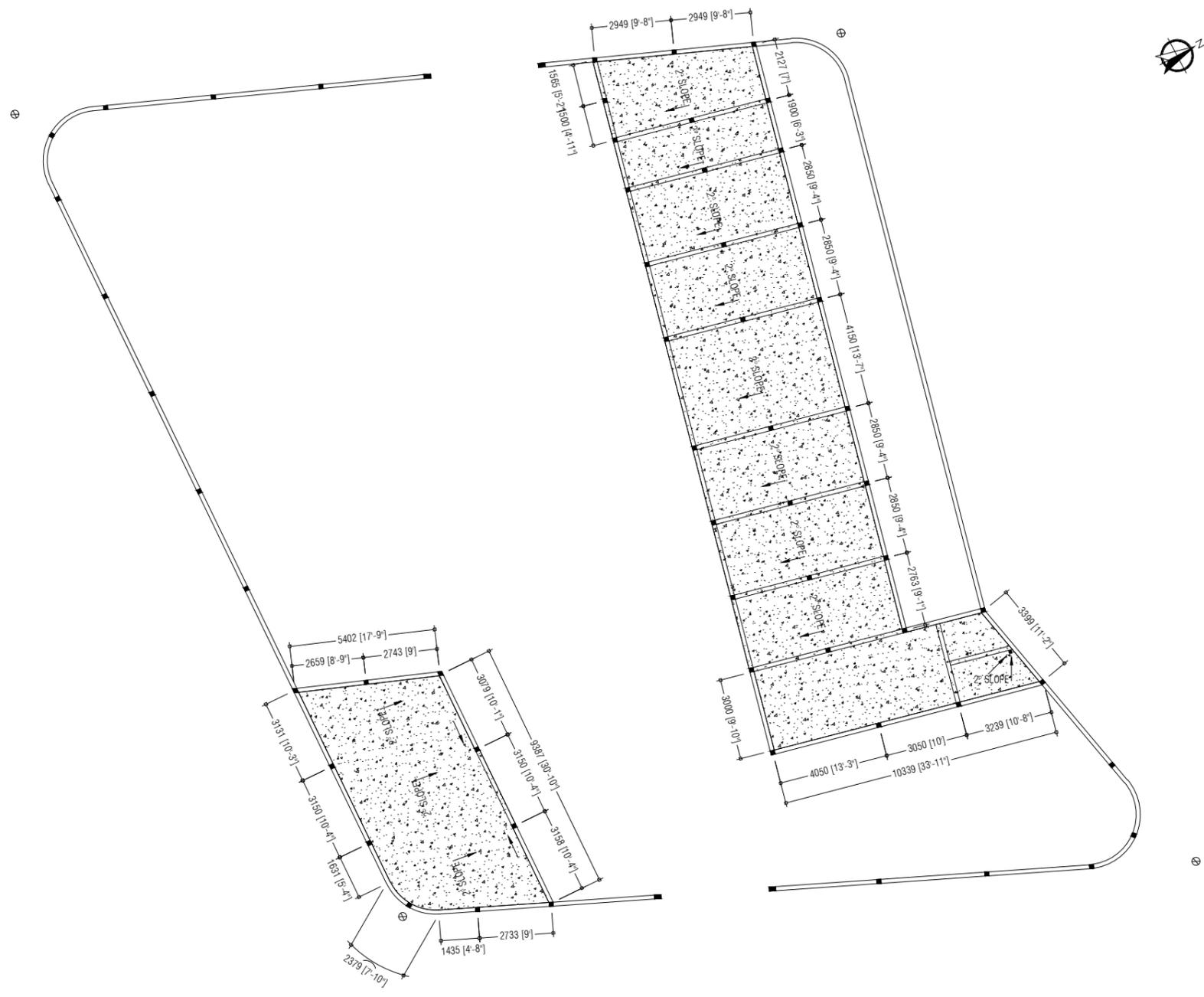
NOTE:

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

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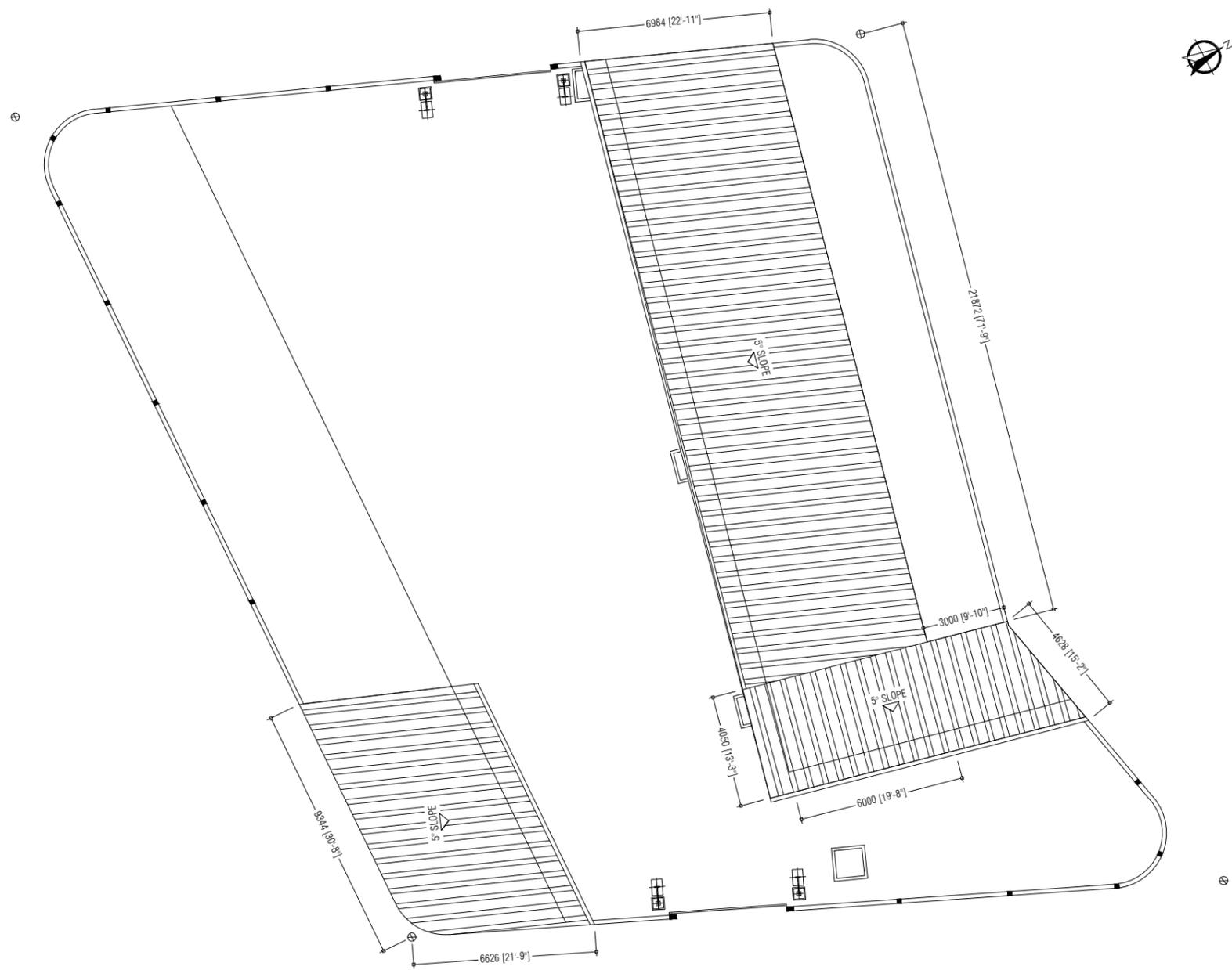


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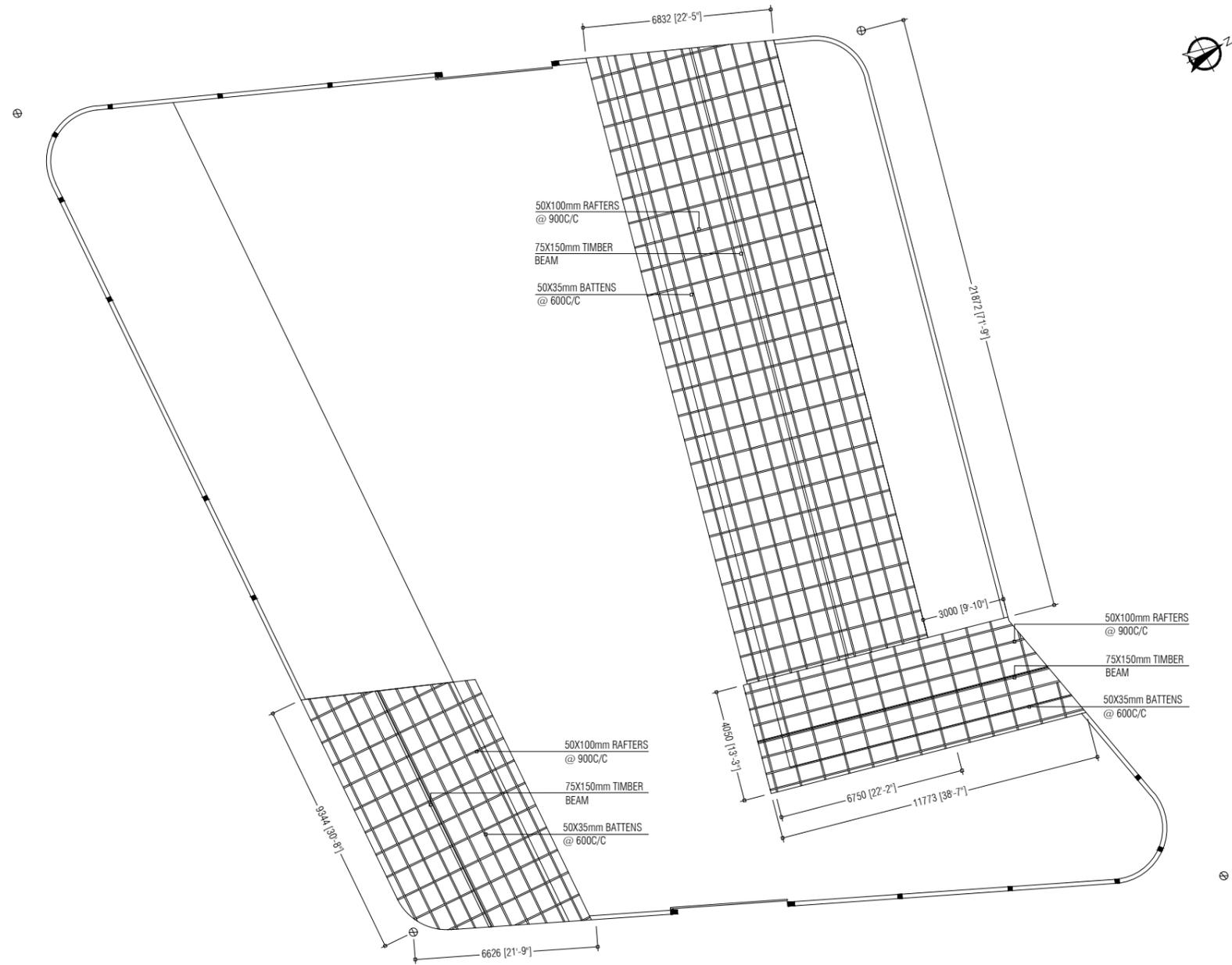


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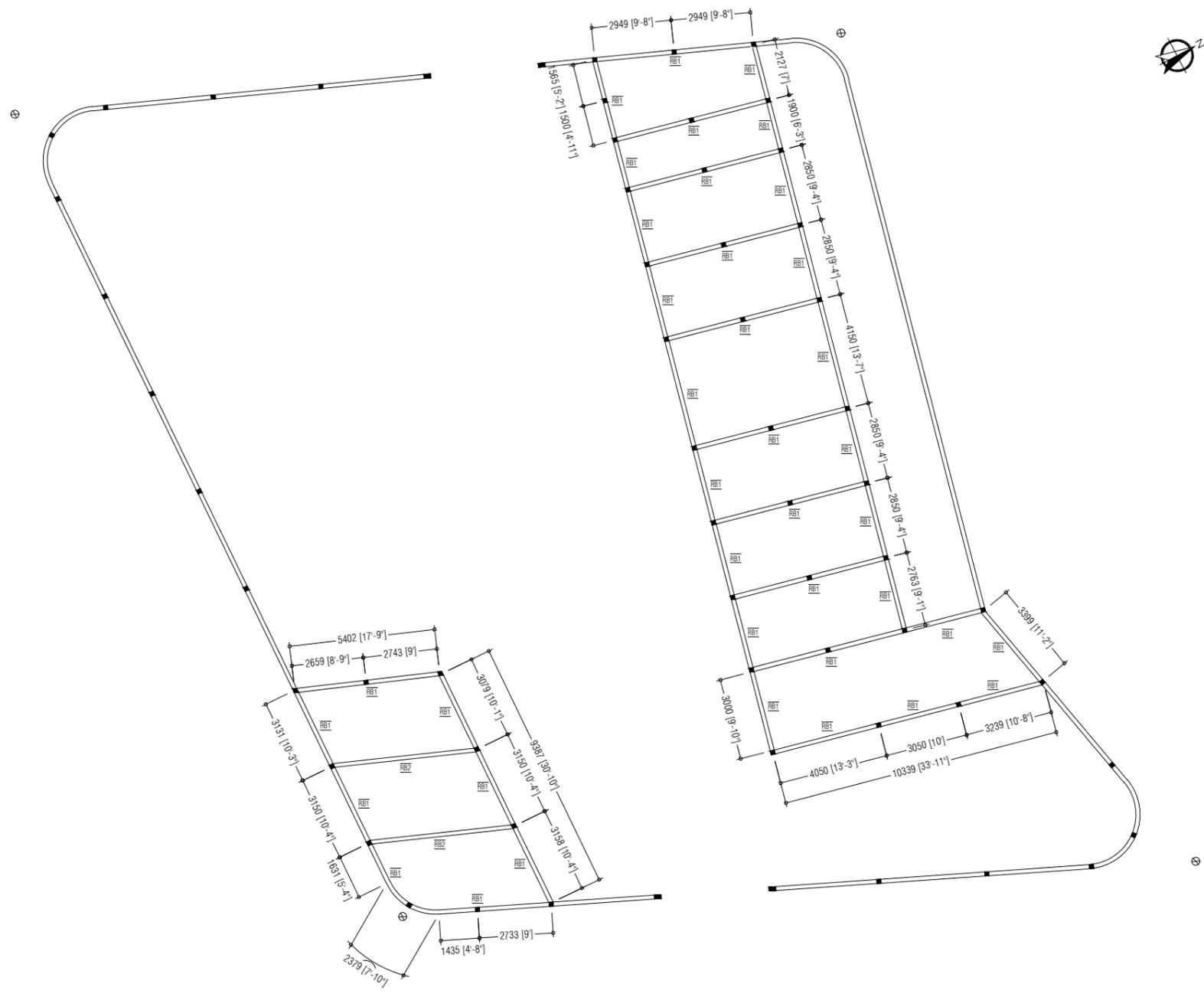
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	WMPC DEPARTMENT	AFRAZ	
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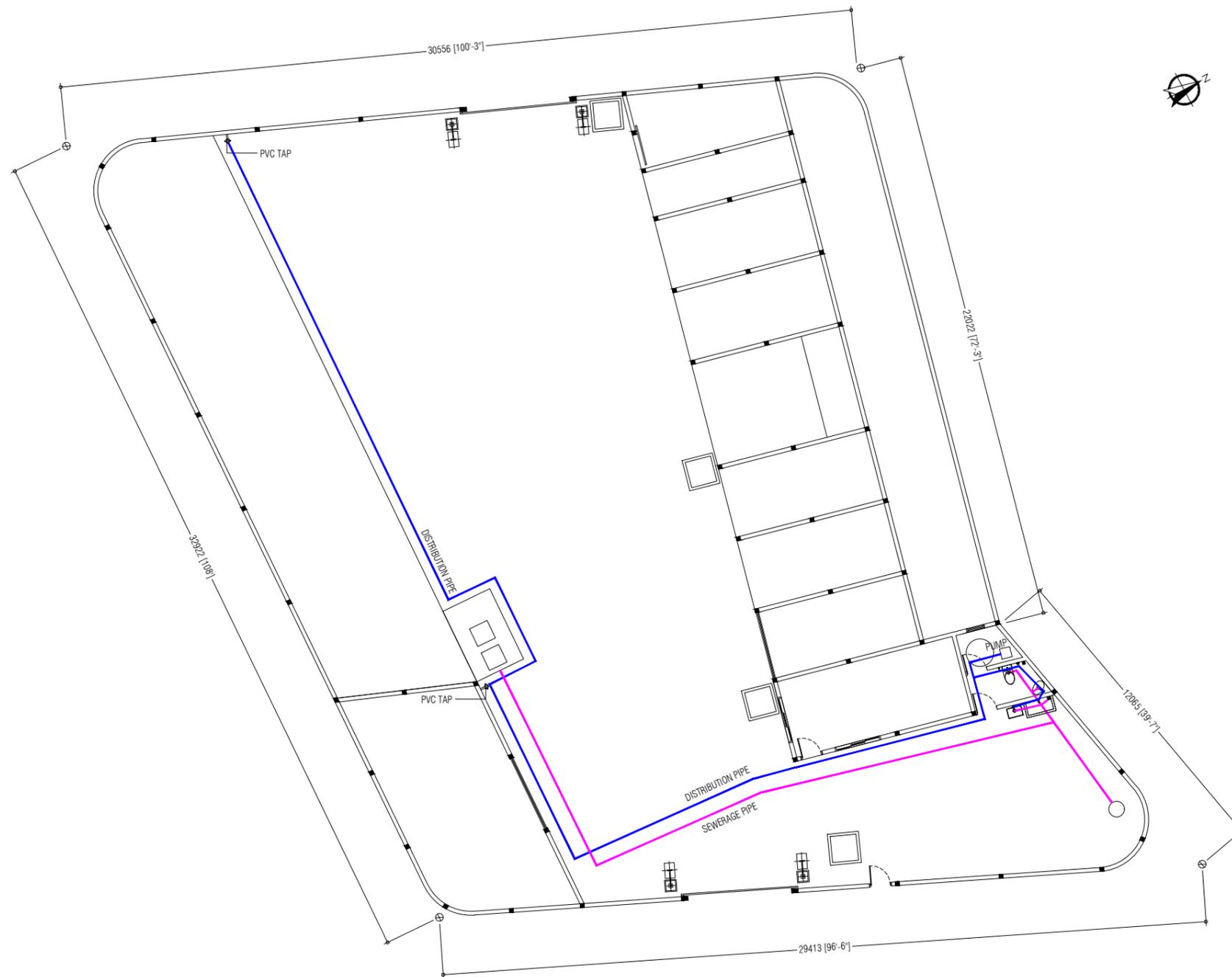
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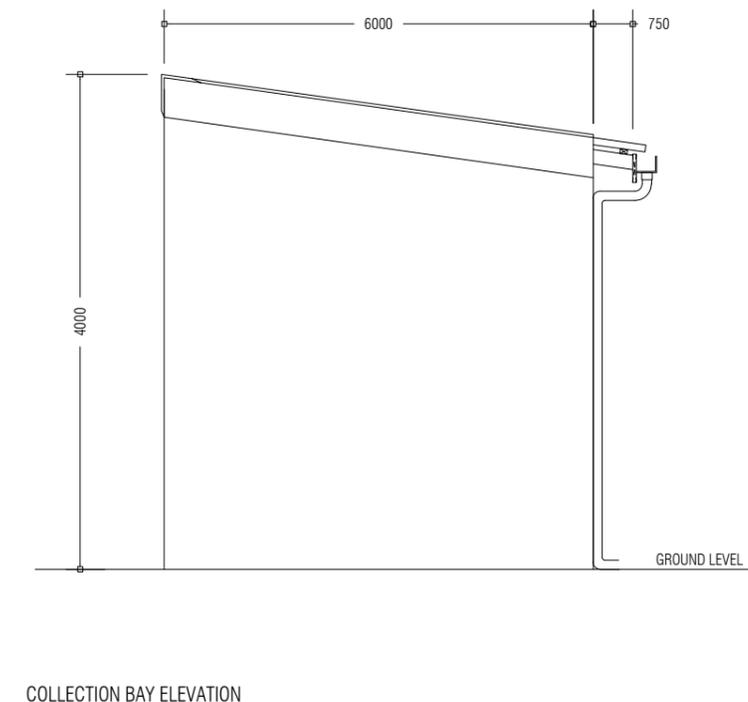
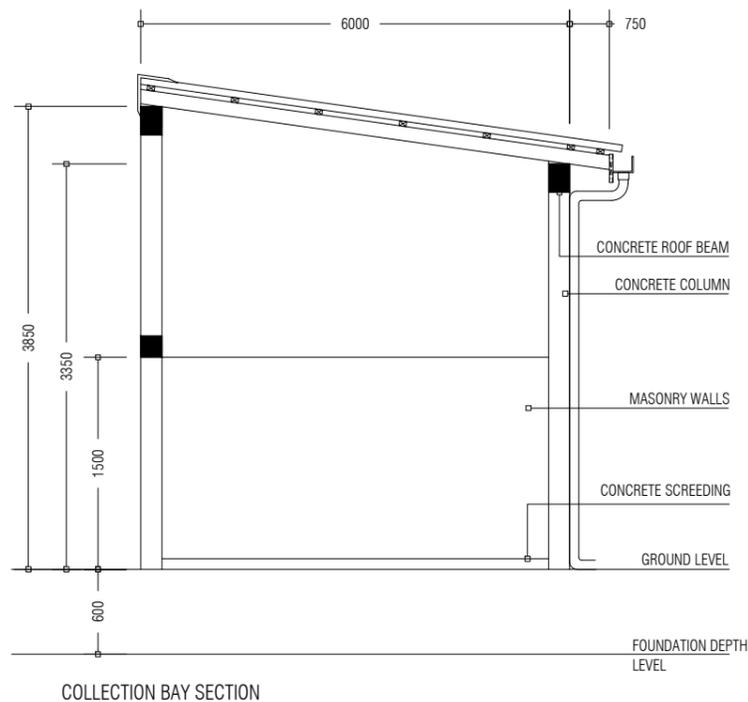
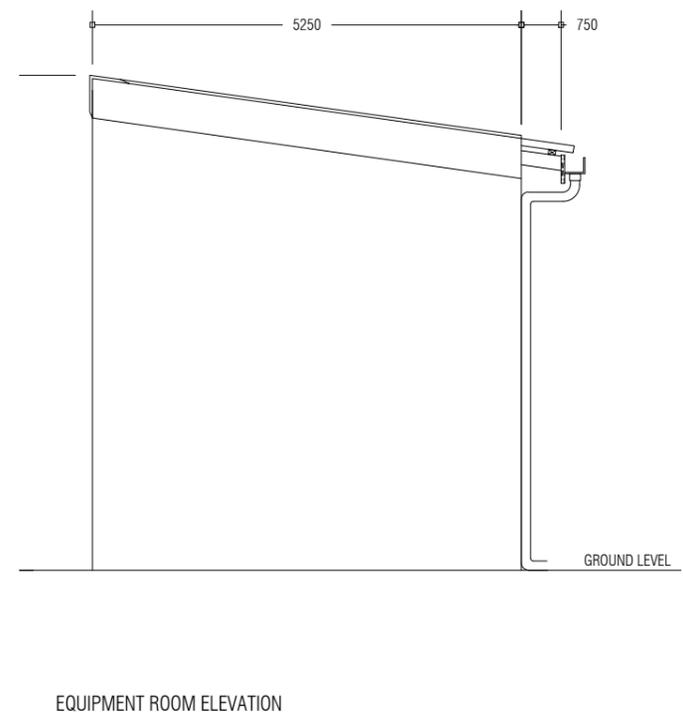
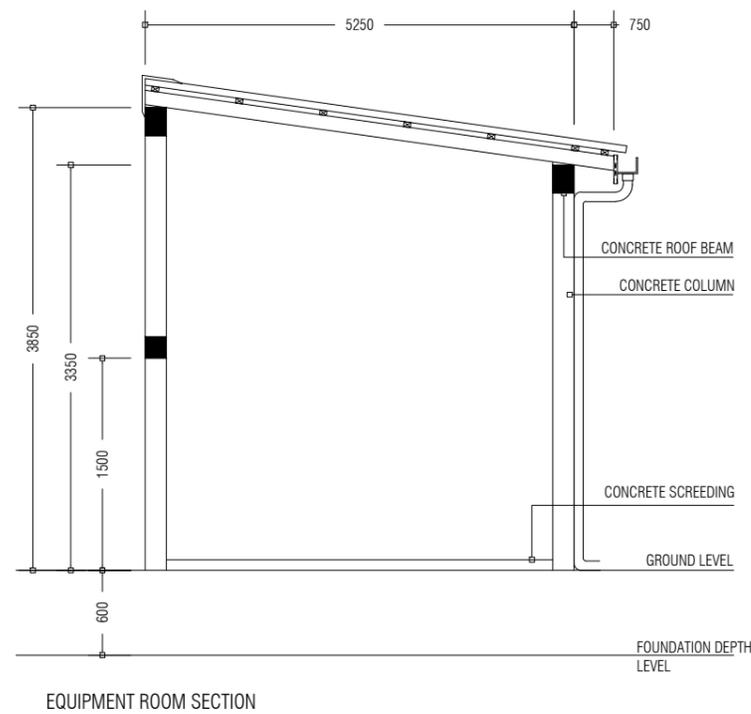
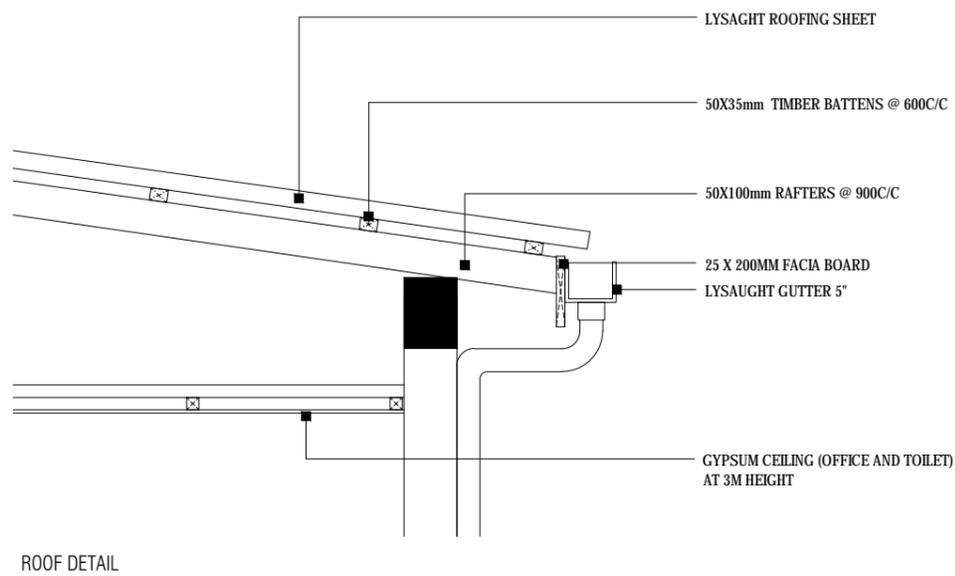
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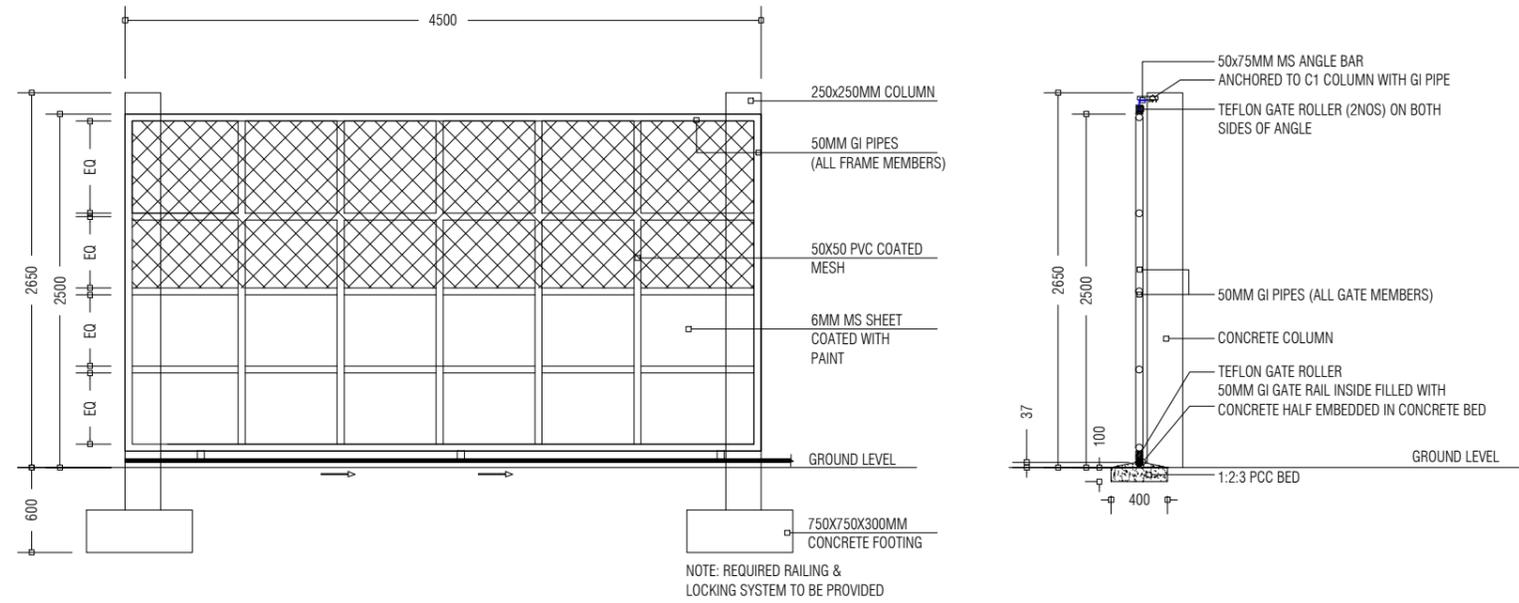


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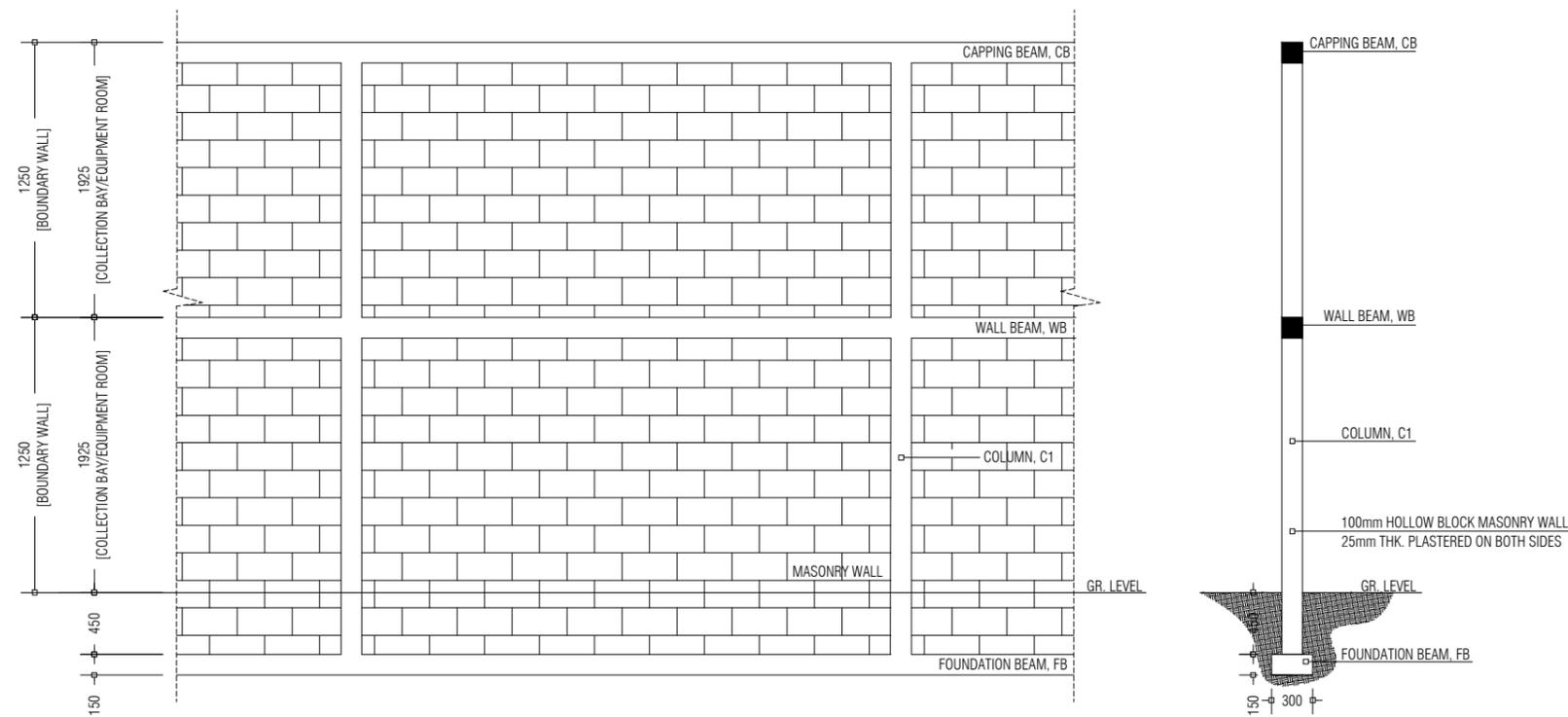


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		DATE 13.10.2019	



ENTREANCE GATES (SLIDING GATE)

NOTE:
ALL WELDS FOR THE
GI MEMBERS ARE
5mm FILLET WELDS



BUILDINGS AND BOUNDARY WALL ELEVATIONS

BUILDINGS WALL DETAIL

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UPGRADING OF WASTE MANAGEMENT CENTRE
N.HOLHUDHOO

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AFRAZ

AMENDMENTS

TITLE
GATE SCHEDULE, FENCING DETAIL, WALL DETAIL

STRUCTURE BY
AFRAZ

CLIENT DEPARTMENT
WMPC DEPARTMENT

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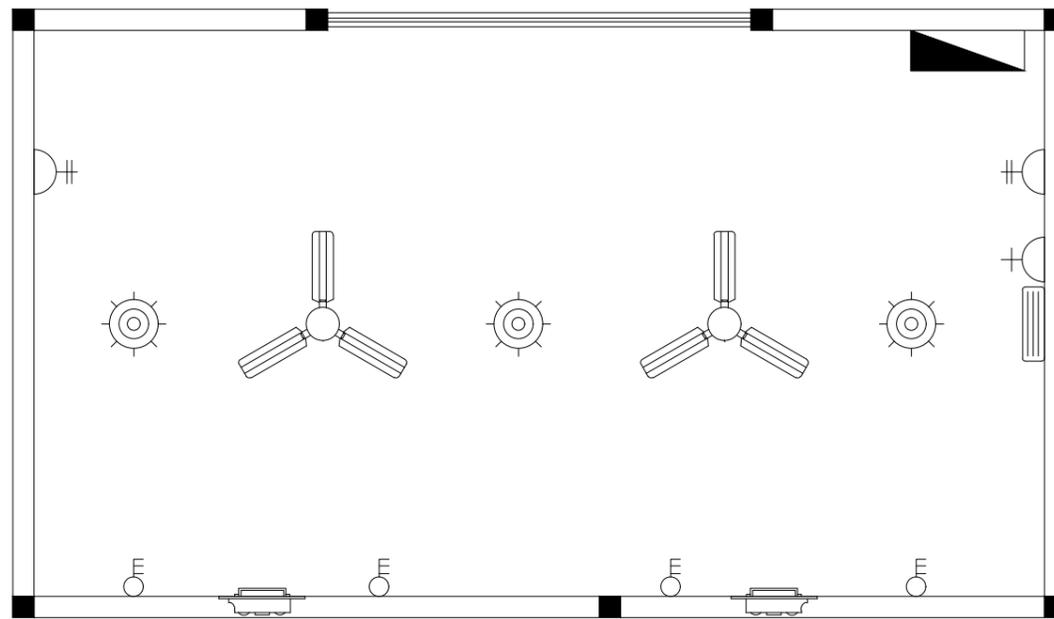
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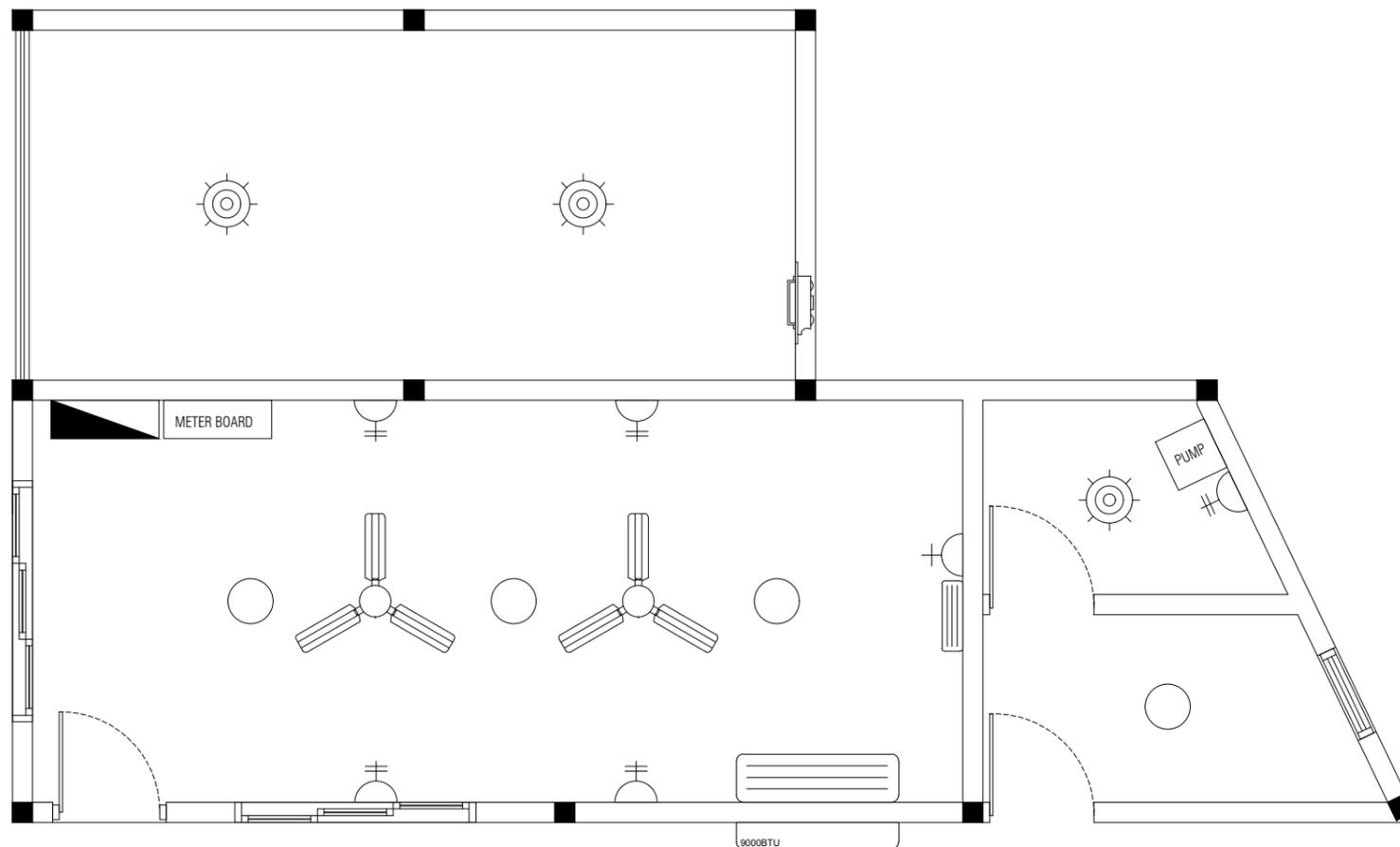
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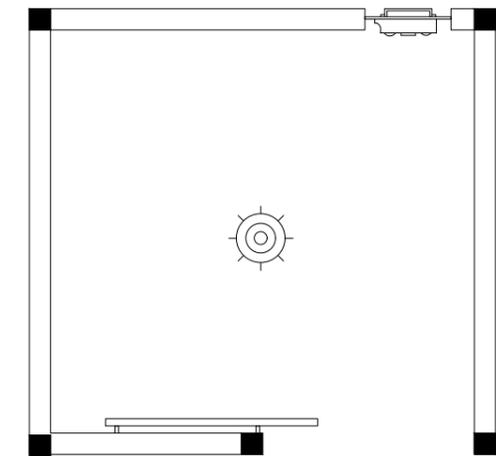
MCEP
MINISTRY OF ENVIROMENT
GREEN BUILDING, HANDHUVAREE HIGUN,
MAAFANNU, MALE (20392), REPUBLIC OF MALDIVES,
TEL: +960-3018431, +960-3018300, FAX: +960-328301



EQUIPMENT ROOM

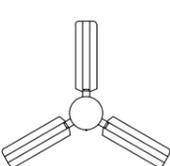
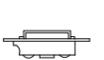


STORE, TOILET AND OFFICE AREA



HAZARDOUS WASTE STORAGE

LEGEND

- METER BOARD 
- DISTRIBUTION BOARDS 
- 20W LED LIGHT (DAY LIGHT) 
- 18W CEILING MOUNT LIGHT (WARM WHITE) 
- 13AMP DOUBLE SOCKET 
- 3 PHASE, 15A POWER POINTS [1.5m ABOVE GROUND] 
- CEILING FAN 
- EXHAUST FAN 
- AC WITH OUTLET 

APPROVED BY

PROJECT
UPGRADING OF WASTE MANAGEMENT CENTRE
N.HOLHUDHOO

DESIGN BY
AFRAZ

AMENDMENTS

TITLE
ELECTRICAL PLAN
CLIENT DEPARTMENT
WMPC DEPARTMENT

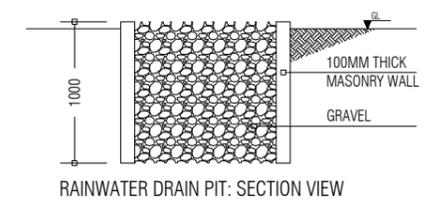
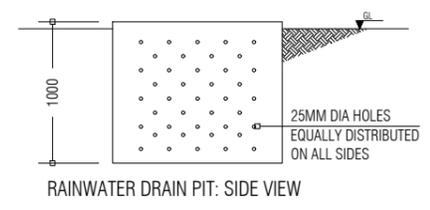
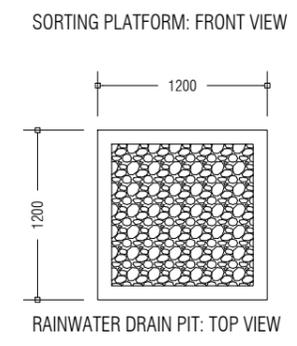
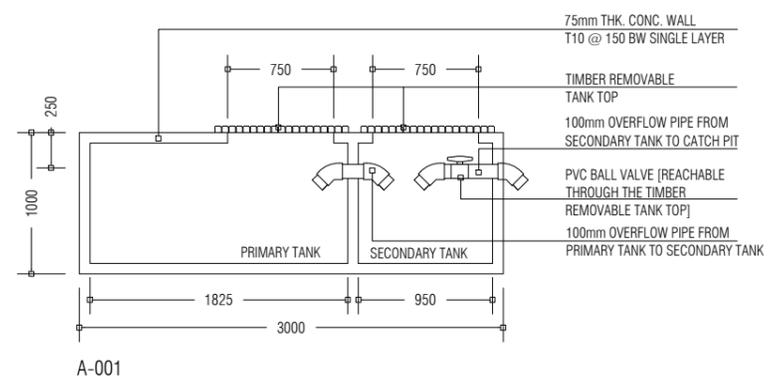
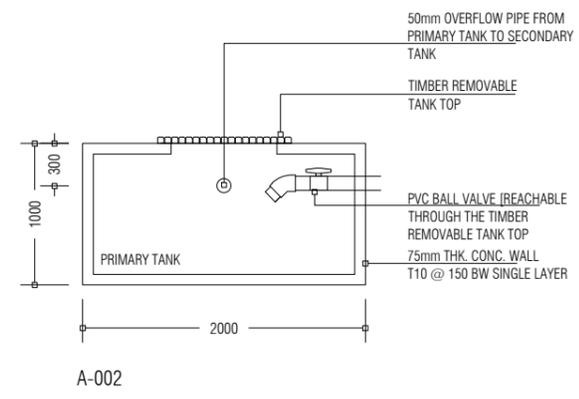
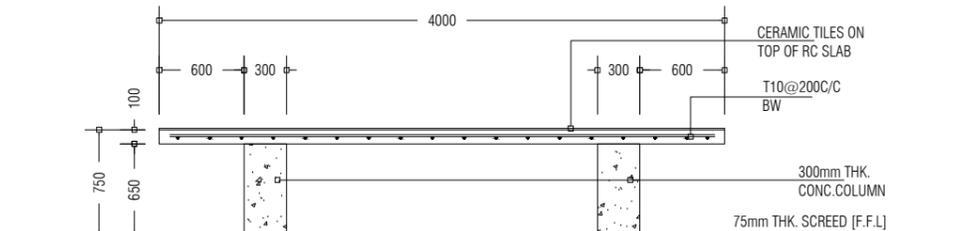
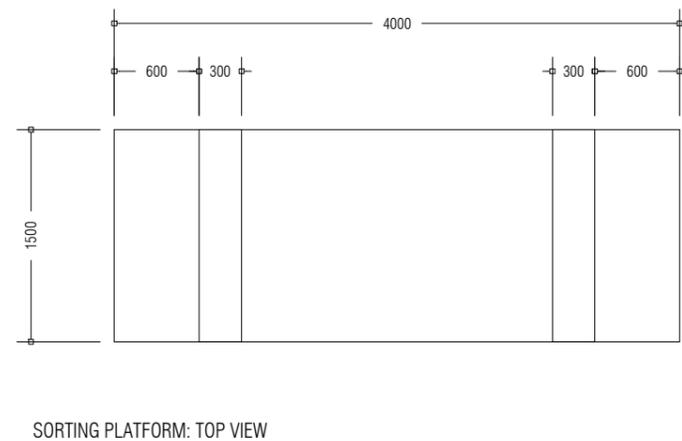
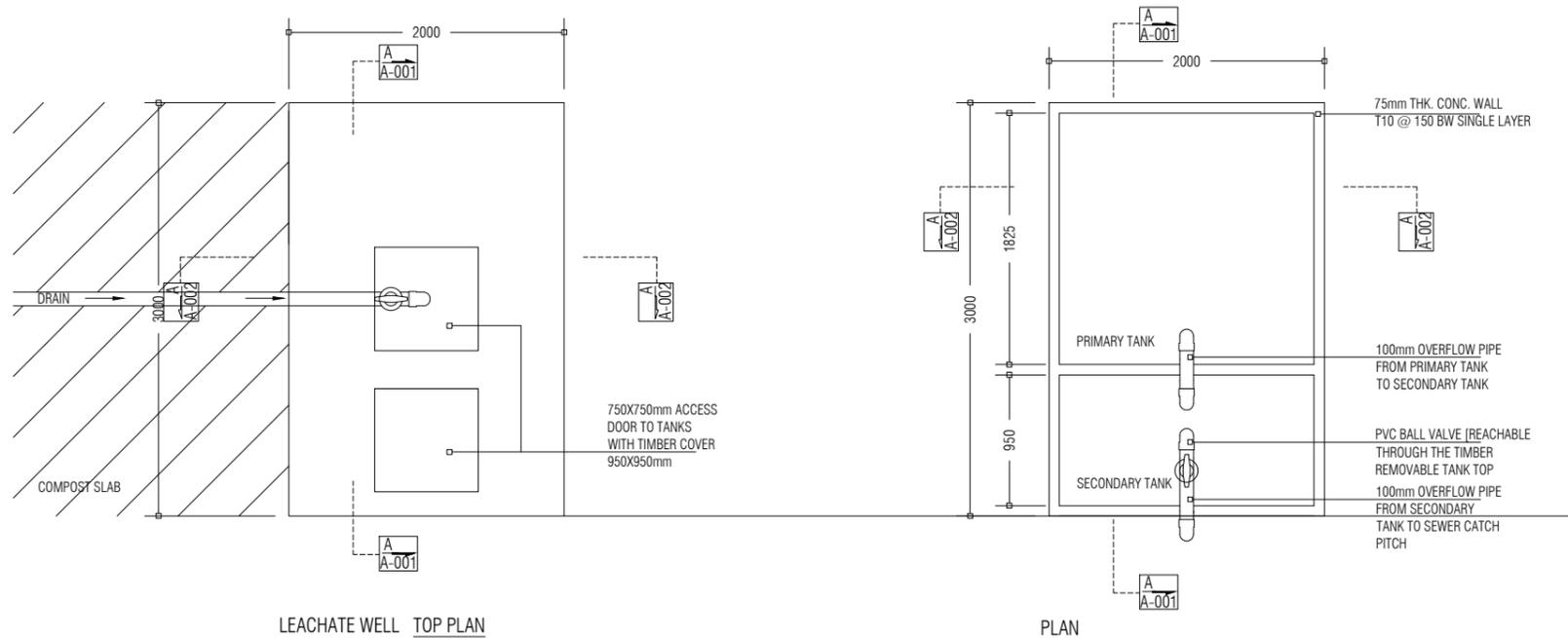
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PAPER SIZE A3
PAGE NO. 10

SCALE 1:150
DWG NO. HOLH-E1-10
DATE 13.10.2019



MCEP
MINISTRY OF ENVIROMENT
GREEN BUILDING, HANDHUVAREE HIGUN,
MAAFANNU, MALÉ (20392), REPUBLIC OF MALDIVES,
TEL: +960-3018431, +960-3018300, FAX: +960-328301



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PROJECT
UPGRADING OF WASTE MANAGEMENT CENTRE
N.HOLHUDHOO

DESIGN BY
AFRAZ

AMENDMENTS



TITLE
LEACHATE WELL [PLAN, SECTION, ELEVATION], GROUND WATER WELL SECTION
SORTING PLATFORM [PLAN, ELEVATION], RAINWATER DRAIN PIT

CLIENT DEPARTMENT
WMPC DEPARTMENT

STRUCTURE BY
AFRAZ

DRAWN BY
AFRAZ

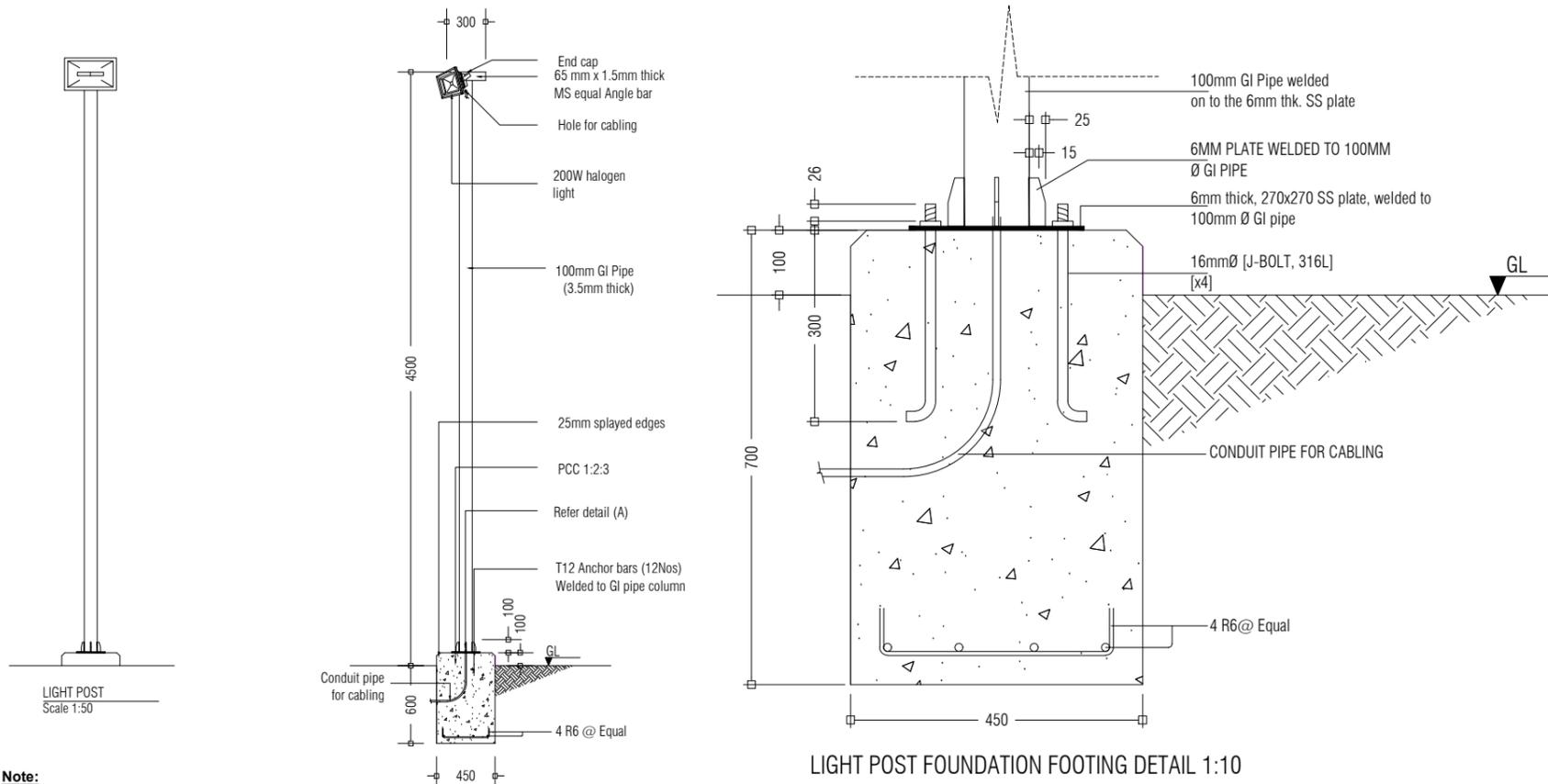
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PAGE NO. 11

SCALE 1:50

DWG NO. HOLH-D1-11

DATE 13.10.2019

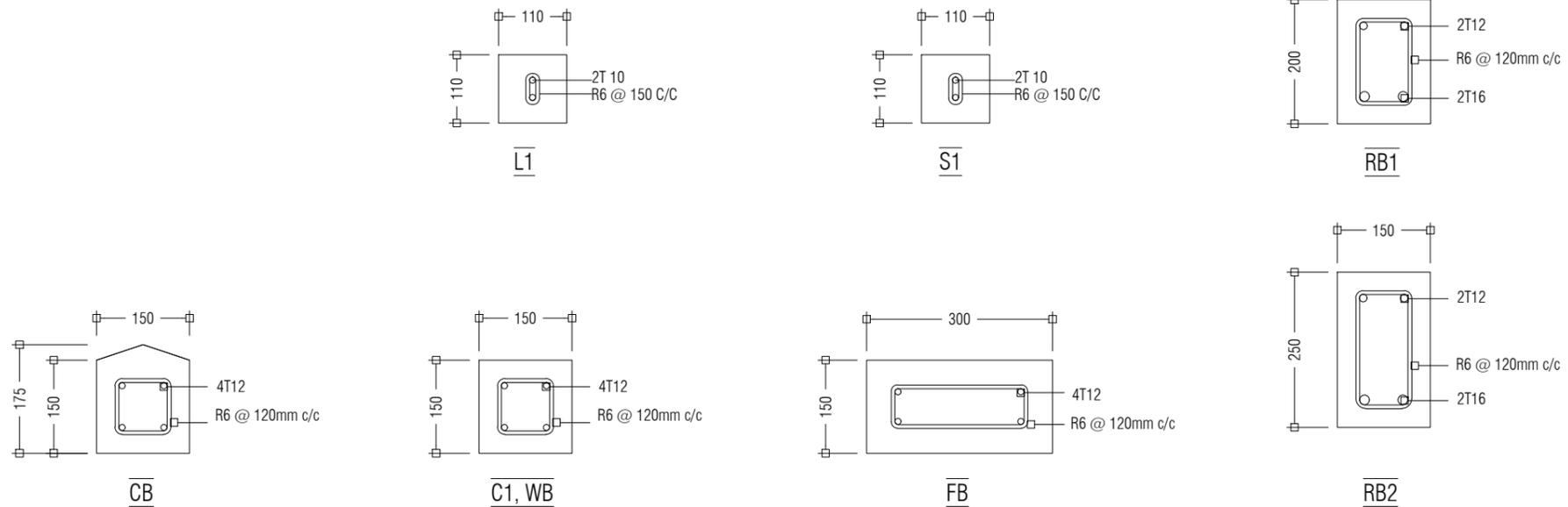


Note:

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

LIGHT POST DETAIL
Scale 1:50

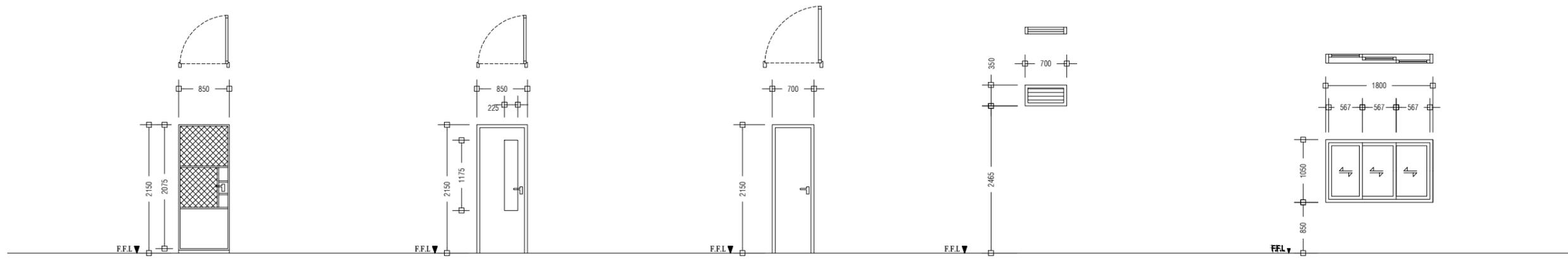
LIGHT POST FOUNDATION FOOTING DETAIL 1:10



CONCRETE COVERS:
FB: 40mm
ALL OTHERS: 30mm

COLUMN AND BEAM DETAILS

APPROVED BY	PROJECT	DESIGN BY	AMENDMENTS
	UPGRADING OF WASTE MANAGEMENT CENTRE N.HOLHUDHOO	AFRAZ	
	TITLE	STRUCTURE BY	
	STRUCTURAL DETAILS	AFRAZ	
	CLIENT DEPARTMENT	DRAWN BY	
	WMPC DEPARTMENT	AFRAZ	
PAPER SIZE	A3	SCALE	1:50, 1:20, 1:10
PAGE NO.	12	DWG NO.	HITHA-D1-12
		DATE	13.10.2019



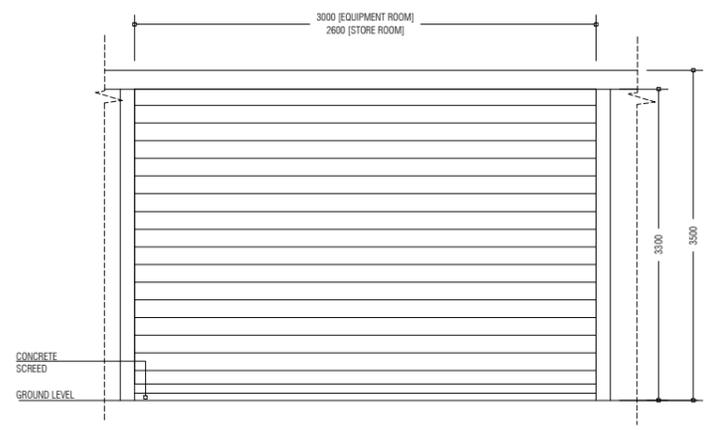
D1	SWING TYPE GATE
REMARKS	G1 PIPE (50MM) FRAMED GATE WITH PVC COATED WIRE MESH AND MS SHEET COATED WITH PAINT, G1 PIPE TWO COAT PAINTED 01 DOOR KNOB WITH LOCK SET 04 HINGES
LOCATION	GROUND FLOOR
QUANTITY	NO.S 01
OPEN AREA	1.83m ²

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	1.83m ²

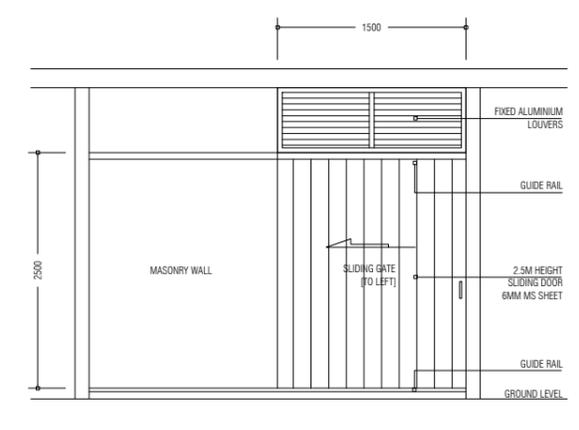
D3	SWING TYPE DOOR
REMARKS	ALUMINIUM DOOR WITH DOOR KNOB AND 1 LOCK SET 04 HINGES
LOCATION	GROUND FLOOR
QUANTITY	NO.S 02
OPEN AREA	1.5m ²

W1	ALUMINIUM LOUVER WINDOW
REMARKS	ALUMINIUM FRAMED, ALUMINIUM LOUVERED, FINISHED WITH WHITE COATED PAINT
LOCATION	GROUND FLOOR
QUANTITY	NO.S 1
OPEN AREA	0.25m ²

W2	ALUMINIUM SLIDING WINDOW
REMARKS	ALUMINIUM FRAMED, TINTED BLACK GLASS, FINISHED WITH WHITE POWDER COATED PAINT
LOCATION	GROUND FLOOR
QUANTITY	NO.S 02
OPEN AREA	1.80m ²



EQUIPMENT ROOM RSD



HAZADIOUS WASTE SD1

APPROVED BY	PROJECT	DESIGN BY	AMENDMENTS
	UPGRADING OF WASTE MANAGEMENT CENTRE N.HOLHUDHOO	AFRAZ	
	TITLE	STRUCTURE BY	
	DOOR AND WINDOW SCHEDULE	AFRAZ	
	CLIENT DEPARTMENT	DRAWN BY	
	WMPC DEPARTMENT	AFRAZ	
	PAPER SIZE A3	SCALE 1:75	
	PAGE NO. 13	DWG NO. HOLH-A2-13	
		DATE 13.10.2019	

APPENDIX G

Bill of Quantities

UPGRADING OF WASTE MANAGEMENT CENTRE - N.HOLHUDHOO
Bill of Quantities
SUMMARY SHEET

Bill No	Item	Amount
1	Preliminaries	
2	Site Clearance	
3	Earth works	
4	Concrete works	
5	Structural steel works	
6	Masonry works	
7	Plastering works	
8	Painting works	
9	Roofing works	
10	Electrical works	
11	Plumbing works	
12	Doors and windows	
13	Fire fighting	
14	Tiling works	
15	Miscellaneous Works	
Sub Total		
GST 6%		
GRAND TOTAL		

**UPGRADING OF WASTE MANAGEMENT CENTRE
N. HOLHUDHOO
Bill of Quantities**

No	Item	Unit	Quantity	Rate	Amount
1	Preliminaries				
1.1	Mobilization to site	LS	1.00		
1.2	Site management cost including set up of temporary services for contractor's services as maybe necessary	LS	1.00		
1.3	Setup sign boards on site as specified	LS	1.00		
1.4	Clean up site upon completion of works	LS	1.00		
1.5	Demobilization	LS	1.00		
2	Site Clearance				
2.1	Allow for all site clean up work, relocation of existing waste to the nearby temporary location identified by island council. Note: Major site cleanup has already been done and any residual waste may need to be relocated.	LS	1.00		
2.2	Demolition and removal of existing 2m high masonry wall including the concrete columns and footings. (Demolition materials may be used as filling materials after proper gradation).	m	29.32		
2.3	Demolition and removal of existing 900mm high masonry wall including the concrete columns and footings. (Demolition materials may be used as filling materials after proper gradation).	m	47.81		
2.4	Demolition of existing water well hut. Rate shall include removal of roofing, demolition of masonry walls and footing. (Demolition materials may be used as filling materials after proper gradation).	LS	1.00		
3	Earth works				
	<i>Filling, ground levelling and compaction of IWMC site.</i>				
3.1	Ground filling with sand, levelling and compaction work for IWMC site. Rate shall include for any required cut and fill, removal of debris waste on the site (site cleanup has been done already). Finished floor level shall be 100mm above existing road level. Finished site ground level shall be same level as existing road level. Demolition waste materials from site may be used for filling after appropriate gradation along with sand (any steel or other materials must be removed).	m ²	670.00		
	<i>Excavation work for foundations as follows</i>				
3.2	Collection bay building block foundation	m ³	22.28		
3.3	Equipment room building block foundation	m ³	5.27		
3.4	Perimeter wall foundation	m ³	11.61		
3.5	Flood light pole	m ³	0.49		
3.6	Leachate collection tank	m ³	6.00		
3.7	Setting up sewer connection (sewer catch pit) in the location shown	LS	1.00		
3.8	Setting up rainwater drain pits in the location shown	Nos	4.00		
4	Concrete works				
	<i>Collection Bay Building Block</i>				
4.1	Provide 75mm concrete floor screed according to the slope shown in drawing. Reinforcement for the slab shall be R6@150 BW single layer	m ³	12.09		

No	Item	Unit	Quantity	Rate	Amount
4.2	Foundation beam (FB) cast according to drawing. Reinforcement shall be as shown on drawing	m ³	5.57		
4.3	Middle wall beams (WB) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	2.71		
4.4	Roof beams (RB1) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	3.62		
4.5	Columns (C1) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	3.19		
4.6	Concrete column for sorting area platform cast according to drawing.	m ³	0.59		
4.7	Provide 100mm thick reinforced concrete slab for sorting area platform cast according to drawing. Reinforcements shall be as shown on drawing.	m ³	0.60		
	<i>Equipment Room Building Block</i>				
4.8	Provide 75mm concrete floor screed according to the slope shown in drawing. Reinforcement for the slab shall be R6@150 BW single layer	m ³	3.42		
4.9	Foundation beam (FB) cast according to drawing. Reinforcement shall be as shown on drawing	m ³	1.32		
4.1	Middle wall beams (WB) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	0.56		
4.11	Roof beams (RB1) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	0.88		
4.12	Roof beams (RB2) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	1.10		
4.13	Columns (C1) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	0.97		
	<i>Compost Slab</i>				
4.14	Rehabilitation of leachate drain including changing the slope of drain to proposed leachate well. Rate shall include cleaning the drain (100mm diameter semi-circular drain), application of chemical cement grout to drain to make slope (including bonding agents and chemical additives).	LS	1.00		
4.15	Leachate collection tanks as shown on drawing. Rate shall include all formwork, casting and placing of the tank including the overflow pipes and valves.	Nos	1.00		
	<i>Boundary walls</i>				
4.16	Foundation beam (FB) cast according to drawing. Reinforcement shall be as shown on drawing	m ³	2.90		
4.17	Middle wall beams (WB) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	1.30		
4.18	Capping beams (CB) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	1.30		
4.19	Columns (C1) cast according to drawing. Reinforcement shall be as shown on drawing.	m ³	0.93		
	<i>Other</i>				
4.20	Foundation for flood light pole	m ³	0.57		
4.21	All concrete works of entrance gates. Reinforcement shall be as shown on drawing.	LS	1.00		
5	Structural steel works				
5.1	Provide 75mm G.I pipe as flood light fixing poles. Rate shall include installation charges as shown on drawing.	Nos	4.00		
6	Masonry works				
	<i>Masonry walls of 100mm thick masonry blocks</i>				

No	Item	Unit	Quantity	Rate	Amount
	<i>Collection Bay Building Block</i>				
6.1	Hollow block masonry walls, 3.8m from FFL	m ²	265.53		
6.2	Hollow block masonry walls for bays separation, 1.5m height from FFL	m ²	41.63		
	<i>Equipment Room Building Block</i>				
6.3	Hollow block masonry walls, 4m from FFL	m ²	97.88		
	<i>Boundary walls</i>				
6.4	Hollow block masonry walls, 2.5m height from GL	m ²	165.33		
7	Plastering works				
	<i>Plastering on masonry block walls, 25mm thickness plastering on each side of walls</i>				
	<i>Collection Bay Building Block</i>				
7.1	Hollow block masonry walls, 3.8m from FFL	m ²	558.31		
7.2	Hollow block masonry walls for bays separation, 1.5m height from FFL	m ²	87.75		
	<i>Equipment Room Building Block</i>				
7.3	Hollow block masonry walls, 3.8m from FFL	m ²	207.61		
	<i>Boundary walls</i>				
7.4	Hollow block masonry walls, 2.5m height from GL	m ²	390.81		
8	Painting works				
	GENERAL				
	<i>Emulsion paint coating: one primer coat and two top coat. Wall paint color: Nippon paint offwhite 5039 or equivalent</i>				
	<i>Collection Bay Building Block</i>				
8.1	Hollow block masonry walls, 3.8m from FFL	m ²	558.31		
8.2	Hollow block masonry walls for bays separation, 1.5m height from FFL	m ²	87.75		
	<i>Equipment Room Building Block</i>				
8.3	Hollow block masonry walls, 3.8m from FFL	m ²	207.61		
	<i>Boundary walls</i>				
8.4	Hollow block masonry walls, 2.5m height from GL	m ²	390.81		
	<i>Other</i>				
8.5	Apply paint coating on flood light pole	no	2.00		
8.6	Apply emulsion paint coating on the removable timber covers of the leachate collection tanks	no	2.00		
9	Roofing works				
	<i>Collection Bay Building Block</i>				
9.1	Lysaght roofing sheet (maroon color) for collection bay area. Rate shall include all necessary laps, fastening, fixtures and sealing of joints	m ²	199.57		
9.2	Roof flashing. Rate shall include fastening and sealing of joints	m	42.50		
9.3	Timber beams - 150 x 75mm. Rate shall include for all fixing and joints.	m	33.71		
9.4	Timber rafters - 100 x 50mm. Rate shall include for all fixing and joints	m	220.43		
9.5	Timber battens - 50 x 38mm. Rate shall include for all fixing and joints.	m	330.64		
9.6	Provide a 5" lysaght roof gutter with 2" x 3" down pipes as shown in drawings. Rates shall include all materials and fastenings.	LS	1.00		
	<i>Equipment Room Building Block</i>				

No	Item	Unit	Quantity	Rate	Amount
9.7	Lysaght roofing sheet (maroon color) for collection bay area. Rate shall include all necessary laps, fastening, fixtures and sealing of joints	m ²	56.70		
9.8	Roof flashing. Rate shall include fastening and sealing of joints	m	22.60		
9.9	Timber beams - 150 x 75mm. Rate shall include for all fixing and joints.	m	9.87		
9.10	Timber rafters - 100 x 50mm. Rate shall include for all fixing and joints	m	68.80		
9.11	Timber battens - 50 x 38mm. Rate shall include for all fixing and joints.	m	103.21		
9.12	Provide a 5" lysaght roof gutter with 2" x 3" down pipes as shown in drawings. Rates shall include all materials and fastenings.	LS	1.00		
10	Electrical works				
	GENERAL				
	<i>(a) Design, provide and install electrical network for the entire building complete in accordance to standards set by the local governing body.</i>				
	<i>(c) The cost shall include for: screws, nails, bolts, nuts, standard cable fixing or supporting clips, brackets, straps, rivets, plugs and all incidental accessories.</i>				
	<i>(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.</i>				
	<i>(e) Rates shall include switches, electrical isolators, conduits, fittings, equipment and similar items shall include for: all fixings to various building surfaces.</i>				
	<i>(h) Contractor shall provide all cabling, wiring, conduits, etc. required for completing all electrical installations.</i>				
	<i>(g) All sockets & switches shall be ABB or clipsal or equivalent</i>				
10.1	Provide 3 phase 15A power sockets as shown in drawing. Rate shall include connection to circuit breaker using 6sqmm power supply cable and all necessary accessories	no	4.00		
10.2	Supply and install 20W ceiling mount LED light as shown in drawing, with switches near respective entrance doors. Rate shall include connection to circuit breaker	no	7.00		
10.3	Supply and install 18W ceiling mount LED light as shown in drawing, with switches near respective entrance doors. Rate shall include connection to circuit breaker	no	4.00		
10.4	Supply and install 10W wall mount LED emergency light as shown in drawing, with sockets as required. Rate shall include connection to circuit breaker	no	2.00		
10.5	Supply and installation of ceiling fans as shown in drawing. with fan controller near the respective entrance doors, connection to circuit breaker and all necessary accessories	no	4.00		
10.6	Supply and installation of 12,000BTU AC as shown in drawing with connection to circuit breaker and all necessary accessories	no	1.00		
10.7	Supply and fix electric meter, 4 pole MCCB, Single Phase distribution board and 3 Phase distribution board as shown on drawing. Earth link and connection to earth rod with proper earth pit should be provided as well	LS	1.00		

No	Item	Unit	Quantity	Rate	Amount
10.8	Supply and installation of exhaust fans as shown in drawing. Rate shall include provision of switch near the respective entrance, connection to circuit breaker and all necessary accessories	no	4.00		
10.9	Provide 25 sqmm 4 core power supply cable from nearest distribution box to collection bay area distribution board, and from collection bay area to composting area distribution board.	m	60.00		
10.10	Provide 13 A power socket for well water pump inside well room. Rate shall include connection to circuit breaker.	no	1.00		
10.11	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	8.00		
10.12	Supply and install well water pump. Rate shall include its fixing inside the store room.	no	1.00		
11	Plumbing works				
	<i>Water piping works</i>				
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	1.00		
	<i>Sewer network connection and piping works</i>				
11.2	Provide sewer network connection for toilet and leachate well. Rate shall include installation of sewer catch pit, connection piping of flush toilet, drains and leachate well to the catch pit, provision of appropriate drain, bends, fittings and others as deemed necessary. Rate shall also include connection fees of sewer to main sewer network.	LS	1.00		
	<i>Fittings</i>				
11.3	Wash Closet (one piece) (Cotto C1111 Victor or Equivalent)	no	1.00		
11.4	Wash basin complete with pedestal and gully trap.	no	2.00		
11.5	Muslim shower complete with valve, shower head and hose.	no	1.00		
11.6	PVC tap for wash area	no	1.00		
11.7	Floor drains	no	2.00		
11.8	PVC taps at ends of outlet pipes.	no	2.00		
11.9	Supply 25mm diameter flexible hose	m	25.00		
12	Doors and windows				
	GENERAL				
	<i>All doors should be lockable.</i>				
	Fabrication and installation of doors:				
12.1	SLIDING DOOR. Supply and installation of sliding door for hazardous waste room as per drawings and specifications. Rate shall include all cuts, welds, applying protective coating to welded joints, painting the door and proper fixing of the door. Rate shall include fabrication and fixing of guide rails and wheels as well.	no	1.00		

No	Item	Unit	Quantity	Rate	Amount
12.2	RSD01. Supply and installation of roller shutter door for equipment room as per drawings and specifications. Rate shall include all cuts, welds, applying protective coating to welded joints, painting the door and proper fixing of the door. Rate shall include fabrication and fixing of guide rails and wheels as well.	no	1.00		
12.3	RSD02. Supply and installation of roller shutter door for store room as per drawings and specifications. Rate shall include all cuts, welds, applying protective coating to welded joints, painting the door and proper fixing of the door. Rate shall include fabrication and fixing of guide rails and wheels as well.	no	1.00		
12.4	SLIDING GATE. Supply and installation of steel sliding gate as per drawings and specifications. Rate shall include all cuts, welds, applying protective coating to welded joints, painting the door and properly fixing the door to the boundary wall columns.	no	2.00		
12.5	D1. Supply and installation of steel door as per drawings and specifications. Rate shall include all cuts, welds, applying protective coating to welded joints, painting the door and properly fixing the door to the boundary wall columns.	no	1.00		
12.6	D2. Supply and installation of aluminium door as per drawings and specifications. Rate shall include all cuts, sealants,screws etc necessary for proper fixing of the door.	no	1.00		
12.7	D3. Supply and installation of aluminium door as per drawings and specifications. Rate shall include all cuts, sealants,screws etc necessary for proper fixing of the door.	no	2.00		
12.8	W1. Supply and installation of aluminium sliding window as per drawings and specifications. Rate shall include all cuts, sealants,screws etc necessary for proper fixing of the door.	no	2.00		
12.9	W2. Supply and installation of aluminium louver window as per drawings and specifications. Rate shall include all cuts, sealants,screws etc necessary for proper fixing of the door.	no	1.00		
13	Fire fighting				
	<i>Supply and installation of fire fighting equipment</i>				
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		

No	Item	Unit	Quantity	Rate	Amount
13.5	CO2 2KG with Cabinet for Office Area - Outside	no	1.00		
14	Tiling works				
14.1	Supply and laying 300x300mm ceramic tiles (white color) for office.	m ²	20.85		
14.2	Supply and laying of 300x300mm ceramic tiles (white color) for toilet floor and ceiling height of walls.	m ²	30.16		
14.3	Supply and laying of 300x300mm ceramic tiles (cream color) for the top and the sides of the concrete slab for sorting area platform	m ²	7.10		
15	Miscellaneous Works				
	<i>Damp proof membrane</i>				
15.1	Provide 500 gauge HDPE damp proof membrane below collection bay building block floor slab	m ²	161.17		
15.2	Provide 500 gauge HDPE damp proof membrane below equipment room building block floor slab	m ²	45.54		
	<i>Compost slab</i>				
15.3	Provide timber removable covers for the leachate collection tank of size 750x750mm. Rates shall include all materials, fastenings and handles.	no	2.00		
15.4	Connection of compost slab drain to primary tank of the leachate tank including ball valve	no	1.00		
	<i>Rainwater drain pits</i>				
15.50	Provide rainwater drain pits as shown in drawing. Rate shall include the connection of downpipes to the drain pits, providing gravel, bends, fittings and others as maybe necessary.	no	4.00		
	<i>Ceiling works</i>				
15.60	Provide suspended ceiling using 6mm gypsum board inside office and toilet. Rate shall include all ceiling support work, applying putty and painting the surface with primer and two coats of finishing paint. (Nippon paint offwhite 5039 or equivalent)	m ²	24.80		
	<i>Sign boards</i>				
15.7	Fabricate and install 900 x 600 IWMC name board on 5mm plastic sheet as per design specifications provided by client. All letters, logos and symbols used on the board should be acrylic painted.	no	1.00		
15.8	Fabricate and install 900 x 300 fire safety sign boards on 5mm plastic sheet as per design specifications provided by client. All letters, logos and symbols used on the board should be acrylic painted.	no	5.00		
15.9	Fabricate and install 900 x 600 collection bay sign boards on 5mm plastic sheet as per design specifications provided by client. All letters, logos and symbols used on the board should be acrylic painted.	no	8.00		

TOTAL

APPENDIX H

Commitment for Mitigation and Monitoring

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



Ministry of Environment

Male', Republic of Maldives.

ދިވެހިރާއްޖޭގެ ޖުމްހޫރިއްޔާ ގުޅިގެން
މާފަންނު، 20392

ދިވެހިރާއްޖޭގެ ޖުމްހޫރިއްޔާ ގުޅިގެން
މާފަންނު، 20392

Date: 22 October 2019

No: 438-WMPC/203/2019/59

Mr. Ibrahim Naeem,
Director General,
Environmental Protection Agency,
Green Building, Handhuvaree Hingun, Maafannu,
Male', 20392, Maldives.

Dear Sir,

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 N. Holhudhoo has been prepared in accordance with the EIA Regulations 2012 and its amendments, issued by the Ministry of Environment.

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

Sincerely,

Arshath Rashfa,
Assistant Director



Green Building, Handhuvaree Hingun,
Maafannu, Male', 20392, Republic of Maldives.

+{(960) 301 8300

www.environment.gov.mv

Page 1 of 1

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މާފަންނު، 20392

secretariat@environment.gov.mv

www.twitter.com/ENVgovMV

www.facebook.com/environment.gov.mv

APPENDIX J

Signed Survey Forms

8. نامبر آندونکر سائنس سوسائٽي سرٽيفڪيٽ ڏيڻ فرما ٿو؟

ريڪورڊ ڪري ريڪورڊ نه ڪري

(ريڪورڊ ڪرڻ لاءِ ٻي ڪمپيوٽر سسٽم آڏون ٽيبل ٺاهڻو)

9. نامبر ڏانهن ڪو به ڪمپيوٽر سسٽم فرمائڻ

ريڪورڊ ڪري ريڪورڊ نه ڪري

ريڪورڊ ڪرڻ لاءِ

.....

10. ڊائريڪٽر ڊپارٽمنٽ ۾ ٻين ٽي سيڪشن ۾ ڪم ڪرڻو آسان ٿاڻو ٺاهڻو ڏيڻ لاءِ ٽيبل ٺاهڻو

ڊائريڪٽر ڊپارٽمنٽ ۾ ڪم ڪرڻو آسان ٿاڻو ٺاهڻو ڏيڻ لاءِ ٽيبل ٺاهڻو

ڊائريڪٽر ڊپارٽمنٽ ۾ ڪم ڪرڻو آسان ٿاڻو ٺاهڻو

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8. نام این شرکت را در کادر زیر درج کنید.

نام شرکت:

نام شرکت:

9. نام شرکت را در کادر زیر درج کنید.

نام شرکت:

نام شرکت:

10. در کادر زیر نام شرکت را درج کنید.

نام شرکت:

APPENDIX K

Meeting Minutes of consultation with Waste Management Committee

APPENDIX L

Meeting Minutes of Consultation with the General Public



Ahmed Hassaan Zuhair <ahmed.hassaan@environment.gov.mv>

Submission of ESMP report of N. Holhudhoo IWMC project

Ahmed Hassaan Zuhair <ahmed.hassaan@environment.gov.mv>

Tue, Oct 22, 2019 at 1:19 PM

To: admnhr.noon@gmail.com

Cc: Environmental Compliance and Assessment <eca@epa.gov.mv>, Ahmed Nizam <ahmed.nizam@environment.gov.mv>

Dear Sir / Madam,

EPA requires the proponent of development projects to share EIA and EMP reports with the respective atoll councils prior to submission to EPA. Hence, as the proponent of the project, the Ministry of Environment is hereby submitting the Environmental and Social Management Plan (ESMP) for the proposed **Upgrading of Island Waste Management Center in Noonu Holhudhoo**.

This report is provided only for your reference since the project island exists within the jurisdiction of your administration. The report will subsequently be submitted to EPA (also copied in this email) for review and clearance.

Best Regards,

--

Ahmed Hassaan Zuhair

Environmental and Social Safeguards Specialist

Maldives Clean Environment Project

Ministry of Environment, Green Building, Handhuvaree Hingun, Maafannu, Male', 20392, Maldives.
Office (Direct): +(960) 3018442 | Office (PABX): +(960) 3018300

Email: ahmed.hassaan@environment.gov.mv | Web: www.environment.gov.mv



ESMP_N. Holhudhoo IWMC Upgrading.pdf

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